MORTEX PRODUCTS, INC.

TECHNICAL GUIDE

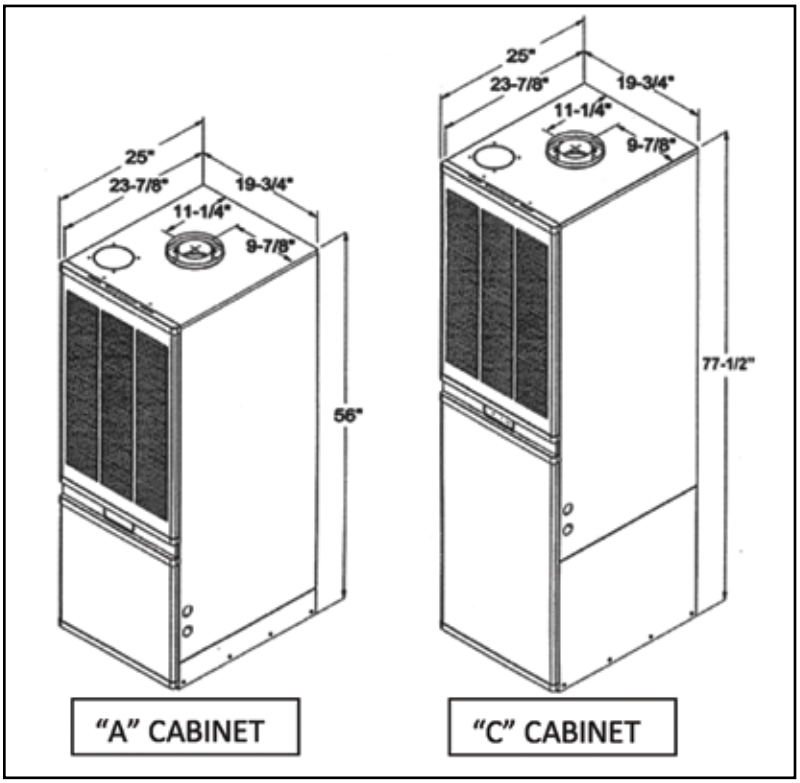
SEALED COMBUSTION
DOWNFLOW GAS FURNACE

SIZES: 60, 70, 77, 90
MODELS : G18D SERIES

Intertek

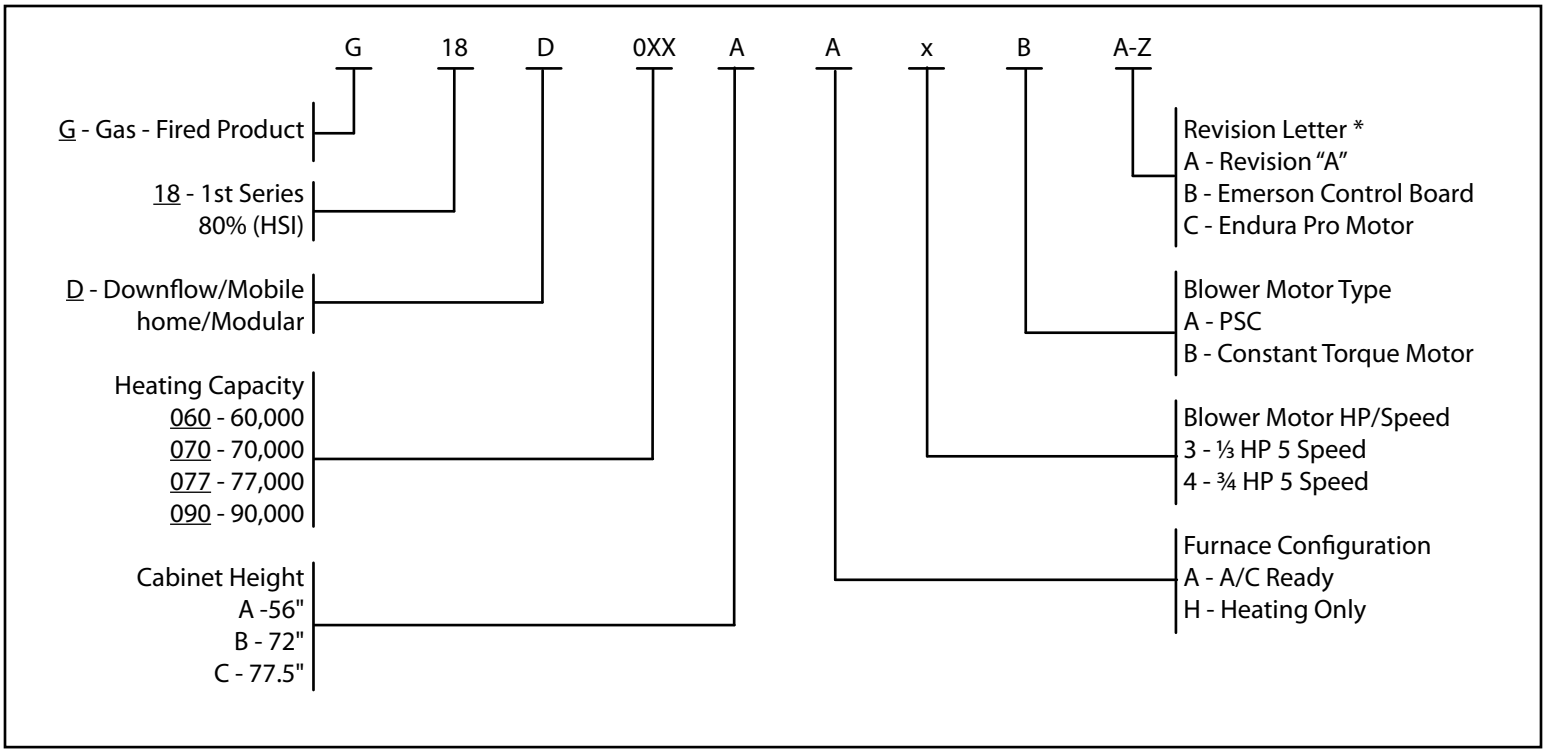
CAUTION: READ ALL SAFETY GUIDES
BEFORE INSTALLING THIS GUIDE

These downflow furnaces are specially designed for installation in Manufactured (Mobile) Homes or Modular Housing. Four heating capacities and two blower choices handle heating and cooling up to 5 tons in any climate. All blowers are multi-speed to fine tune airflow to the home ensuring quiet operation, high operating efficiency and comfort.



FEATURES:

- HEATING ONLY or HEATING & A/C UNITS
- ELECTRONIC IGNITION
- SEALED COMBUSTION VENTING
- ALUMINIZED STEEL HEAT EXCHANGER
- ZERO CLEARANCE TO CONSTRUCTION
- BUILT IN "A" COIL CABINET – 25 ½" H (C-cab)
- SHORTER A/C FURNACE ONLY 77 ½"H
- PLEATED AIR FILTERS
- CONTOURED WHITE DOOR PANELS



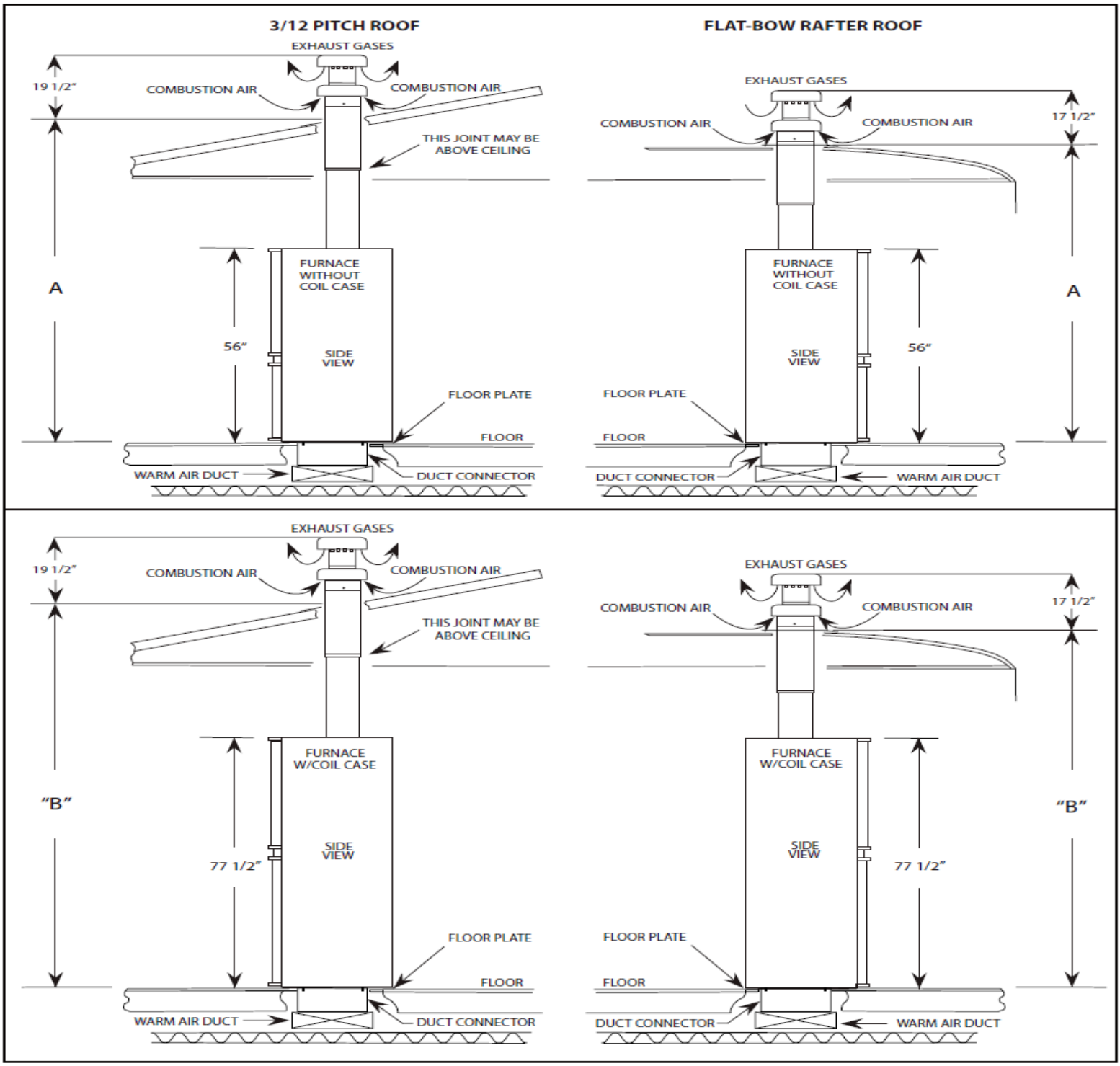
Model Number Nomenclature

FURNACE SPECIFICATIONS

Model No.	G18D060AH3BC	G18D070AH3BC	G18D077AH3BC	G18D090AH3BC	G18D060CA3BC	G18D070CA3BC	G18D077CA3BC	G18D090CA3BC	G18D060CA4BC	G18D070CA4BC	G18D077CA4BC	G18D090CA4BC
Input, BTHH	60,000	70,000	77,000	90,000	60,000	70,000	77,000	90,000	60,000	70,000	77,000	90,000
Output, BTUH	48,000	56,000	61,600	72,000	48,000	56,000	61,600	72,000	48,000	56,000	61,600	72,000
AFUE, %	80	80	80	80	80	80	80	80	80	80	80	80
With A-Coil Cabinet	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES
Ignition Type	Hot Surface	Hot Surface	Hot Surface	Hot Surface	Hot Surface	Hot Surface	Hot Surface	Hot Surface	Hot Surface	Hot Surface	Hot Surface	Hot Surface
Air Temp Rise Range, °F	40-70	40-70	40-70	45-75	40-70	40-70	40-70	45-75	40-70	40-70	40-70	45-75
Max Outlet Air Temp, °F	170	170	170	175	170	170	170	175	170	170	170	175
Natural Gas Orifice Size	27	22	19	17	27	22	19	17	27	22	19	17
Propane (LP) Orifice Size	44	42	41	37	44	42	41	37	44	42	41	37
Blower and Motor	10 x 8,1/3 HP, 4 Speed, Constant Torque				10 x 8,1/3 HP, 4 Speed, Constant Torque				10 x 8, 3/4 HP, 4 Speed, Constant Torque			
Blower Motor FLA	2.4				2.4				5.3			
Max Duct External Static Pressure	0.3"W.C.											
Fuel	Natural Gas (Factory Equipped) , Propane (LP) Orifice Furnished											
High Altitude	For elevations above 2,000 feet , reduce input 4% for each 1,000 feet of elevation above sea level											
Furnace Flue Pipe	Must Use RJS Roof Jack for Sloped Roof or RJF Roof Jack for Flat Roof											
Gas Connection	1/2" FPT											
Electric Service	115 VAC, 60 Hz, 1 Phase											
Max Fuse or Circuit Breaker Size	15 Amps											
Thermostat Circuit	24 VAC, 60 Hz, 40 VA, 0.49A Operating Current											
Filters	2 - 16"x 20"x 1"											

TOP	LEFT SIDE	RIGHT SIDE	BACK	FRONT ALCOVE	FRONT CLOSET	DUCT	ROOF JACK
6 in	0 in	0 in	0 in	18 in	6 in	0 in	6 in

Furnace Clearances to Combustibles



The Sealed Combustion Vent System Consists of: Roof Jack Body and Roof Jack Crown			Furnace Series G18D – A, 56" H	Furnace Series G18D – C, 77 1/2"H
Part # Roof Jack Body	**Telescoping Range**	**For: Flat or Sloped Roof**	**"A" Adjustable Height**	**"C" Adjustable Height**
90-RJF1729-AL	17"– 29"	FLAT	73" – 85"	94 1/2" – 106 1/2"
90-RJF2551-AL	25" – 51"	FLAT	81"–107"	102 1/2"– 128 1/2"
90-RJS1729-AL	17" – 29"	3/12	73" – 85"	94 1/2" – 106 1/2"
90-RJS2551-AL	25" – 51"	3/12	81"–107"	102 1/2"– 128 1/2"
90-RJS3868-AL	38"– 68"	3/12	94"–124"	115 1/2"– 145 1/2"
90-RJS6399-AL	63"– 99"	3/12	119"–155"	140 1/2"– 176 1/2"
Part # Roof Jack Crown	MUST USE WITH ROOF JACK BODY			
90-RJCRWN-AL				

Input	Output	Cabinet Width	Max. External Static Pressure, Duct (inches W.C.)	AFUE	Air Temp. Rise Range (°F)
60,000	48,000	19.5"	0.30	80%	40-70
70,000	56,000	19.5"	0.30	80%	40-70
77,000	61,600	19.5"	0.30	80%	40-70
90,000	72,000	19.5"	0.30	80%	45-75
Input	**Maximum Outlet Air Temp**	**Blower Size**	**Maximum Overcurrent Protection Amps**	**Minimum Wire Size (AWG) @ 75 Ft. One Way**	
60,000	170	10" x 8"	15	14	
70,000	170	10" x 8"	15	14	
77,000	170	10" x 8"	15	14	
90,000	175	10" x 8"	15	14	

Ratings, Physical and Electrical Data

Model	G18D060AH3BC	G18D070AH3BC	G18D077AH3BC	G18D090AH3BC
Blower Motor HP	1/3	1/3	1/3	1/3
Blower Motor Speeds	4	4	4	4
Blower Motor FLA	2.4	2.4	2.4	2.4
Nominal Air Flow (CFM)	1,100	1,100	1,100	1,100
24 VAC Amps	0.49	0.49	0.49	0.49
Total Unit Amps	3.89	3.89	3.89	3.89

Heating Only Models Blower and Motor Data

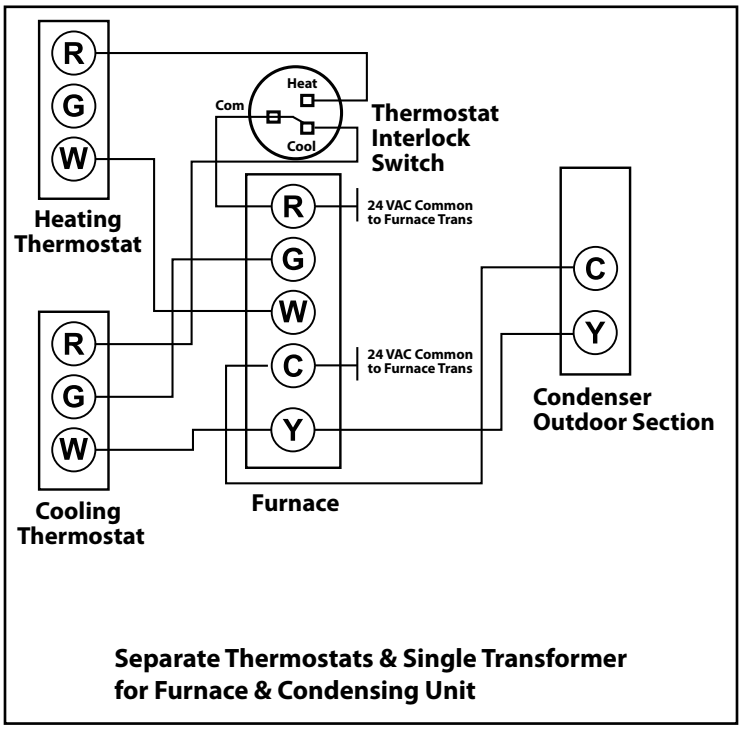
Model	G18D060CA3BC	G18D070CA3BC	G18D077CA3BC	G18D090CA3BC
Blower Motor HP	1/3	1/3	1/3	1/3
Blower Motor Speeds	4	4	4	4
Blower Motor FLA	2.4	2.4	2.4	2.4
Nominal Air Flow (CFM)	1,100	1,100	1,100	1,100
24 VAC Amps	0.49	0.49	0.49	0.49
Total Unit Amps	3.89	3.89	3.89	3.89

A/C Ready Short Cabinet Models Blower and Motor Data

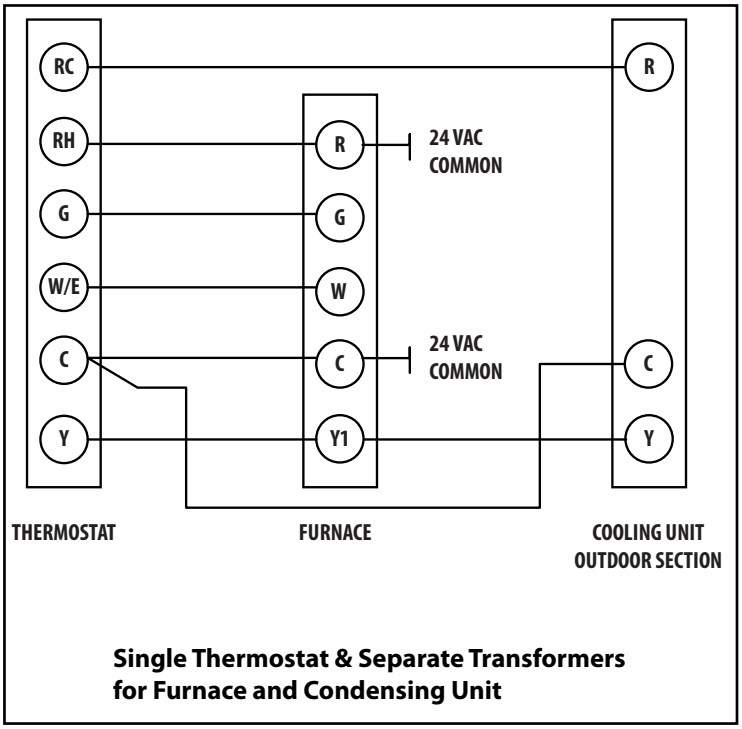
Model	G18D060CA4BC	G18D070CA4BC	G18D077CA4BC	G18D090CA4BC
Blower Motor HP	3/4	3/4	3/4	3/4
Blower Motor Speeds	4	4	4	4
Blower Motor FLA	5.3	5.3	5.3	5.3
Nominal Air Flow	1,700	1,700	1,700	1,700

A/C Ready Tall Cabinet Models Blower and Motor Data

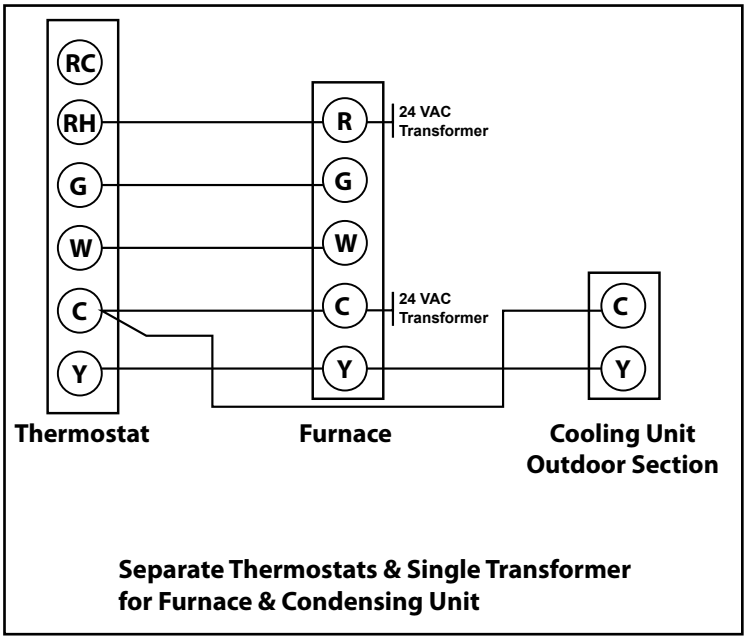
THERMOSTAT/LOW VOLTAGE CONNECTIONS



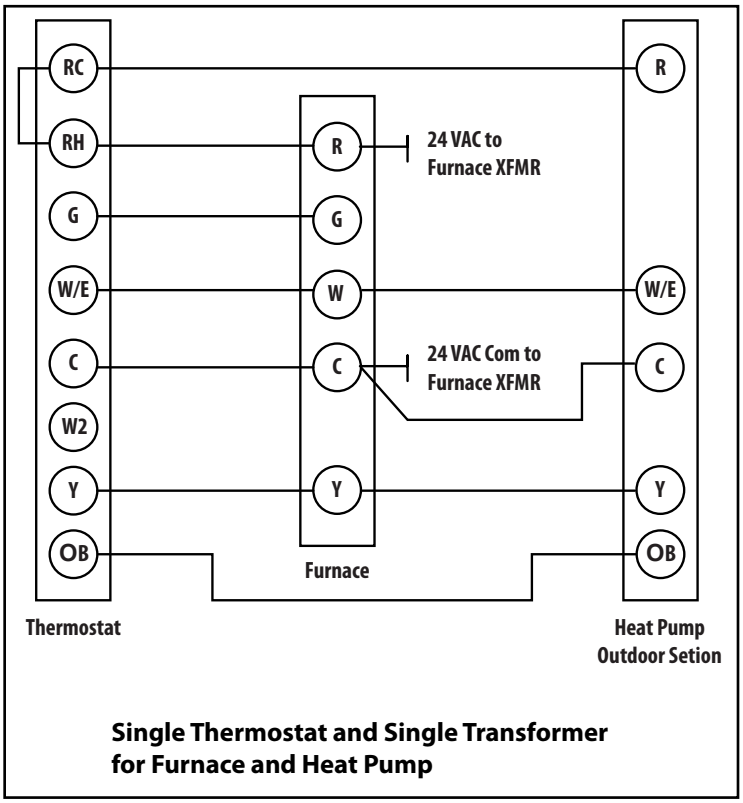
Separate Thermostats & Single Transformer for Furnace & Condensing Unit



Single Thermostat & Separate Transformers for Furnace and Condensing Unit

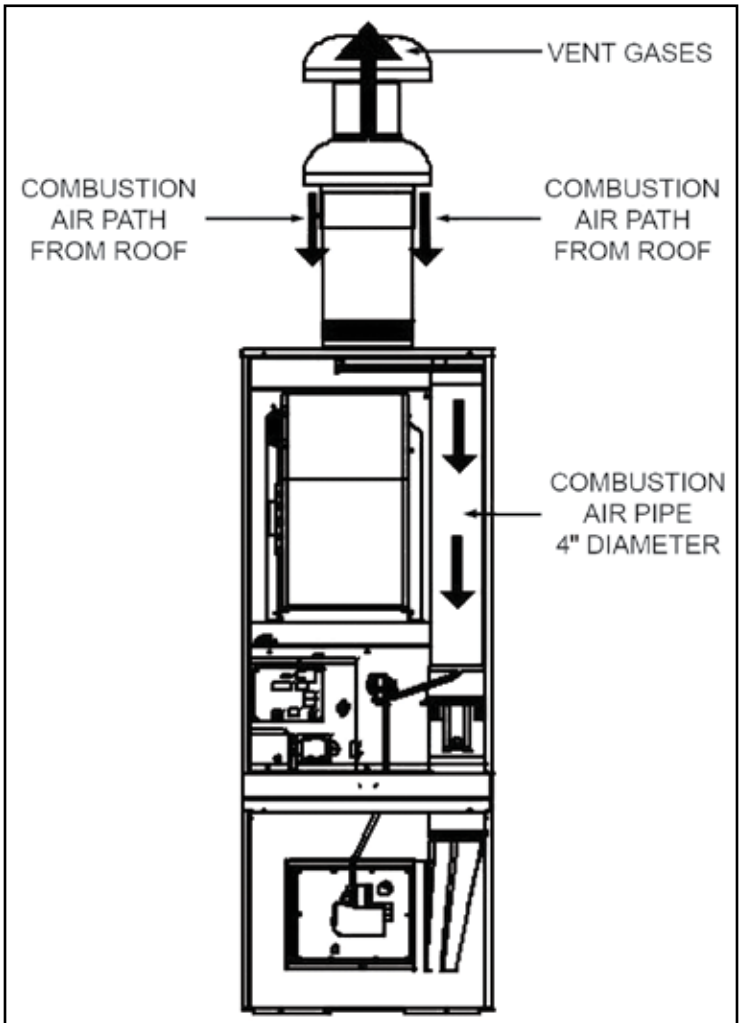


Separate Thermostats & Single Transformer for Furnace & Condensing Unit

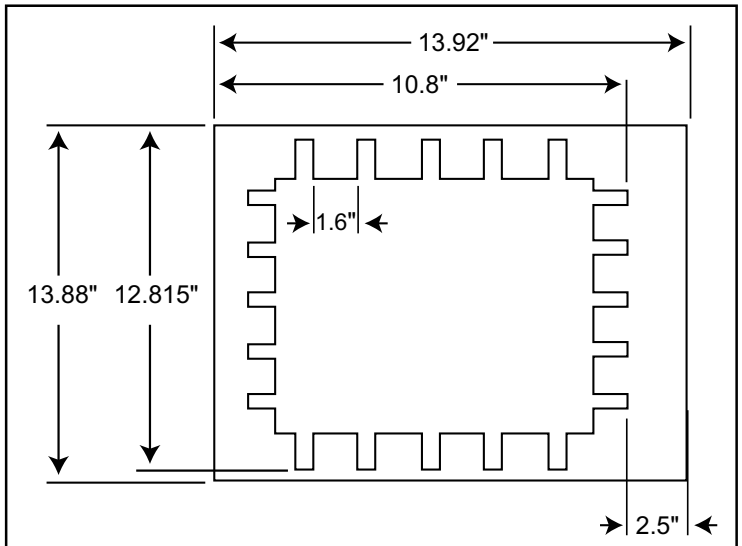


Single Thermostat and Single Transformer for Furnace and Heat Pump

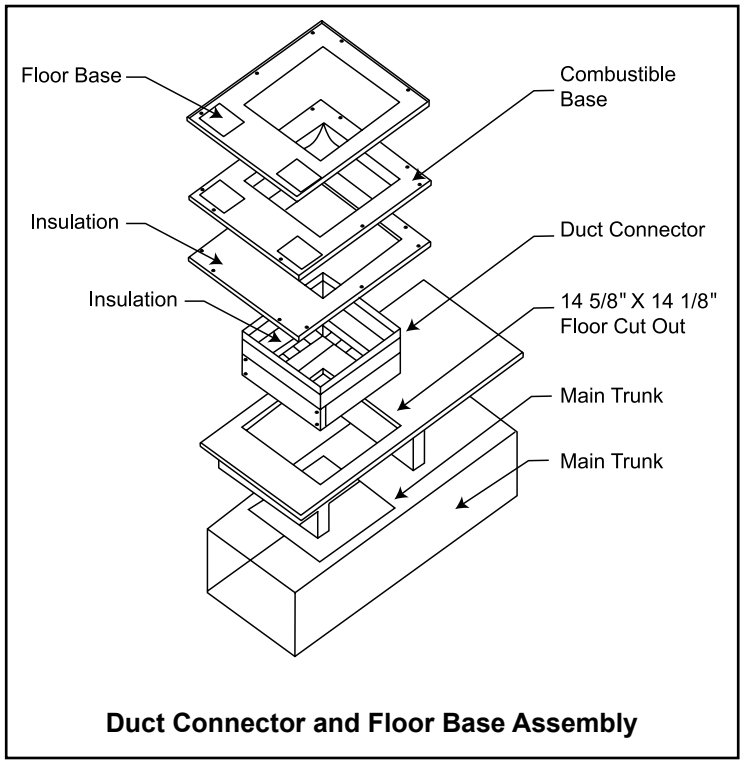
COMBUSTION AIR PATH, COMBUSTIBLE FLOOR BASE, AND DUCT CONNECTOR



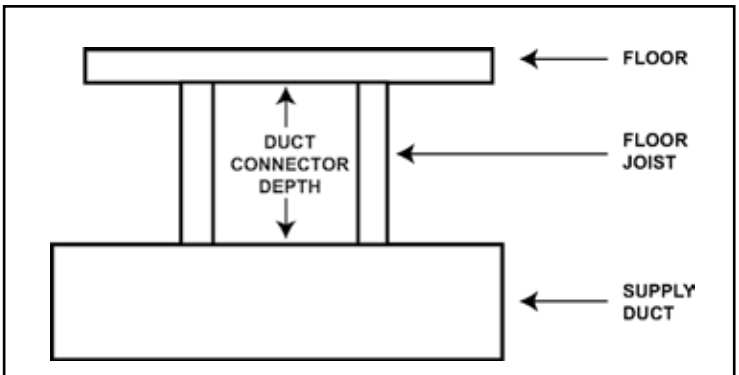
Combustion Air Path Through Furnace Casing



Duct Connector Dimensions



Duct Connector and Floor Base Assembly



Duct Connector Depth

HIGH ALTITUDE DERATE CHARTS - MAIN BURNER ORIFICE SIZE

NATURAL GAS												
ELAVATION	60,000 BTU FURNACE			70,000 BTU FURNACE			77,000 BTU FURNACE			90,000 BTU FURNACE		
	PART NO	ORIF DIA	DRILL SIZE	PART NO	ORIF DIA	DRILL SIZE	PART NO	ORIF DIA	DRILL SIZE	PART NO	ORIF DIA	DRILL SIZE
SEA LEVEL	72AG-144	0.1440"	27	72AG-157	0.1570"	22	72AG-166	0.1660"	19	72AG-173	0.1730"	17
2000	72AG-1405	0.1405"	28	72AG-154	0.1540"	23	72AG-161	0.1610"	20	72AG-1695	0.1695"	18
2000	72AG-1405	0.1405"	28	72AG-152	0.1520"	24	72AG-161	0.1610"	20	72AG-166	0.1660"	19
4000	72AG-136	0.1360"	29	72AG-1495	0.1495"	25	72AG-159	0.1590"	21	72AG-166	0.1660"	19
5000	72AG-136	0.1360"	29	72AG-147	0.1470"	26	72AG-157	0.1570"	22	72AG-161	0.1610"	20
6000	72AG-136	0.1360"	29	72AG-144	0.1440"	27	72AG-154	0.1540"	23	72AG-159	0.1590"	21
7000	72AG-1285	0.1285"	30	72AG-144	0.1440"	27	72AG-1494	0.1494"	25	72AG-157	0.1570"	22
8000	72AG-1285	0.1285"	30	72AG-1405	0.1405"	28	72AG-147	0.1470"	26	72AG-154	0.1540"	23
9000	72AG-1285	0.1285"	30	72AG-136	0.1360"	29	72AG-144	0.1440"	27	72AG-152	0.1520"	24
10000	72AG-120	0.1200"	31	72AG-136	0.1360"	29	72AG-1405	0.1405"	28	72AG-147	0.1470"	26

PROPANE (LP) GAS												
ELAVATION	60,000 BTU FURNACE			70,000 BTU FURNACE			77,000 BTU FURNACE			90,000 BTU FURNACE		
	PART NO	ORIF DIA	DRILL SIZE	PART NO	ORIF DIA	DRILL SIZE	PART NO	ORIF DIA	DRILL SIZE	PART NO	ORIF DIA	DRILL SIZE
SEA LEVEL	72AG-086	0.0860"	44	72AG-0935	0.0935"	42	72AG-096	0.0960"	41	72AG-104	0.1040"	37
2000	72AG-082	0.0820"	45	72AG-0935	0.0935"	42	72AG-0935	0.0935"	42	72AG-1015	0.1015"	38
2000	72AG-082	0.0820"	45	72AG-089	0.0890"	43	72AG-0935	0.0935"	42	72AG-0995	0.0995"	39
4000	72AG-082	0.0820"	45	72AG-089	0.0890"	43	72AG-0935	0.0935"	42	72AG-0995	0.0995"	39
5000	72AG-081	0.0810"	46	72AG-089	0.0890"	43	72AG-089	0.0890"	43	72AG-098	0.0980"	40
6000	72AG-078	0.0780"	47	72AG-086	0.0860"	44	72AG-089	0.0890"	43	72AG-096	0.0960"	41
7000	72AG-078	0.0780"	47	72AG-086	0.0860"	44	72AG-086	0.0860"	44	72AG-0935	0.0935"	42
8000	72AG-076	0.0760"	48	72AG-082	0.0820"	45	72AG-086	0.0860"	44	72AG-0935	0.0935"	42
9000	72AG-076	0.0760"	48	72AG-081	0.0810"	46	72AG-082	0.0820"	45	72AG-089	0.0890"	43
10000	72AG-073	0.0730"	49	72AG-078	0.0780"	47	72AG-081	0.0810"	46	72AG-089	0.0890"	43

ACCESSORIES

PART NUMBER	DESCRIPTION	NOTES
90-RJF1729-AL	ROOF JACK FOR FLAT METAL ROOF	Height: 17" - 29"
90-RJF2551-AL	ROOF JACK FOR FLAT METAL ROOF	Height: 25" - 51"
90-RJS1729-AL	ROOF JACK FOR 3/12 SLOPED ROOF	Height: 17" - 29"
90-RJS2551-AL	ROOF JACK FOR 3/12 SLOPED ROOF	Height: 25" - 51"
90-RJS3868-AL	ROOF JACK FOR 3/12 SLOPED ROOF	Height: 38" - 68"
90-RJS6399-AL**	ROOF JACK FOR 3/12 SLOPED ROOF	Height: 63" - 99"
CROWN ASSEMBLY & FIELD SUPPLIED SEALANT REQUIRED FOR EACH ROOF JACK BODY PURCHASED		
90-RJCRWN-AL	CROWN ASSEMBLY, RJ, GAS	All Roof Jacks
DUCT CONNECTOR WITH FLOOR BASE THAT MAY BE REQUIRED FOR EACH FURNACE (SEE INSTALLATION INSTRUCTIONS)		
90-DCU0-01	1" - 4" DUCT CONNECTOR	
90-DCU0-02	6" - 8" DUCT CONNECTOR	
90-DCU0-03	8" - 12" DUCT CONNECTOR	
	FURNACE AND ROOF JACK ACCESSORIES	
90-OUTXT16-AL	RJ 16" EXT OUTDOOR	All Roof Jacks
90-INSXT10-AL	RJ 10" EXT INDOOR	All Roof Jacks
90-RJS56	5-6/12 SLOPE ADAPTER	All Roof Jacks
90-TRM-RNG	CEILING RING	All Roof Jacks
R87JAZ002	DOOR, UPPER, ALL MODELS	All Furnaces
R87JAZ003	DOOR, LOWER, "A" MODEL	G18 Model A
R87JAZ005	DOOR, LOWER, "C" MODEL	G18 Model C

INTEGRATED CONTROL BOARD DIAGNOSTIC CODES

1 Flash - System Lockout. Ignition Retries Exceeded
Failure to sense flame is often caused by carbon deposits on the flame sensor, a disconnected or shorted flame sensor lead, or a poorly grounded furnace. Carbon deposits can be cleaned with emery cloth or steel wool. Verify the sensor is not contacting the burner and is located in a good position to sense flame.

The ignitor must be positioned to light the gas when the valve opens. If the ignitor has been replaced, verify the position has not changed.

Check sensor lead for shorting and verify the furnace is grounded properly. Verify the gas supply to gas valve, the gas valve is in the "ON" position and is furnace lighting properly. Verify flame engulfs the flame sensor during ignition attempts and gas pressures are correct.

2 Flashes - Pressure Switch Stuck Closed
Check the pressure switch function and verify the combustion air motor is off.

3 Flashes - Pressure Switch Stuck Open
Check pressure switch function and tubing. Verify the combustion air motor is running and pulling sufficient vacuum to engage pressure switch.

4 Flashes - Open Limit Switch
Verify continuity through the main limit switch located in the control box and the manual reset limit switch located next to the blower.

5 Flashes - Flame Sensed More Than 4.24 seconds After Gas Valve is De-Energized.

Verify the gas valve is opening and shutting down properly. Flame in burner assembly should extinguish promptly at the end of the cycle. Check orifice and gas pressure.

6 Flashes – Flame Rollout Switch Open
The furnace does not have a rollout switch. The 12 pin plug has a purple jumper wire in place of the switch. Check the jumper wire to be sure it is securely inserted into the plug.

7 Flashes - Low Flame Sense Signal
Low flame sense current is often caused by carbon deposits on the flame sensor, a poorly grounded furnace or a mis-aligned flame sense probe. Carbon deposits can be cleaned with emery cloth or steel wool. Check furnace and control board grounding. Verify the flame sensor is located in the flame. The minimum current for proper operation is 0.5 DC micro amps.

8 Flashes - Ignitor Relay Fault
The ignitor relay on the control board has failed. Replace the control board.

9 Flashes - Twinning Fault
If twinning is used, verify field installed wiring is connected correctly. Verify both control boards are the same model.

10 Flashes - Open Fuse
Verify the 3 amp fuse on the control board has opened. Verify there are no shorted circuits and replace the fuse.

11 Flashes - Ignitor Open (External to the Control)
Verify the ignitor is operating correctly and has not failed by checking to see if it glows during the ignition cycle. If it does not glow during the ignition cycle, replace the ignitor.

12 Flashes - Combustion Air Blower Relay Error
The relay built into the control board has failed. Replace the control board.

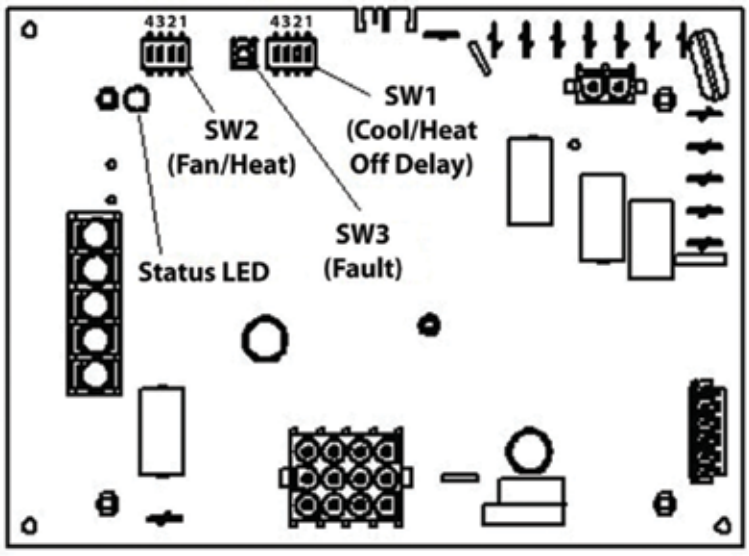
Rapid Flash - Reverse Polarity
Reverse the incoming power wires connected to the control board "L1" and "Neutral" terminals.

Continuous On - Normal Operation - No Fault

Off - Control Failure / No Power / Internal Fault / IEQ Loss
Verify there is 115 VAC across the control board "L1" and "Neutral" terminals. Replace control if power is at the control and the LED is off.

Fault Code Retrieval: The control will flash the last 5 fault codes that occurred when the push button is pressed to give the service tech more troubleshooting capability. The last fault code is flashed first.

Flame Sense Current
Normal flame sense current is approximately 2.8 micro amps DC. Minimum flame sense current threshold is 0.5 micro amps DC.



Integrated Furnace Control Board

BLOWER PERFORMANCE – WITH FILTERS / WITHOUT COOLING COIL

Furnace Model Number	Mtr HP	Speed Tap	CFM @ 0.10" W.C. E.S.P	CFM @ 0.20" W.C. E.S.P	CFM @ 0.30" W.C. E.S.P	CFM @ 0.40" W.C. E.S.P	CFM @ 0.50" W.C. E.S.P	CFM @ 0.60" W.C. E.S.P	CFM @ 0.70" W.C. E.S.P	CFM @ 0.80" W.C. E.S.P	CFM @ 0.90" W.C. E.S.P	CFM @ 1.00" W.C. E.S.P
G18D---AH3BC G18D---CA3BC	1/3	T4 *	635	463	194	--	--	--	--	--	--	--
		T3	964	901	814	734	630	516	361	109	--	--
		T2	1134	1078	1007	943	857	778	680	566	422	--
		T1	1286	1217	1157	1094	1026	957	880	756	593	299
G18D---CA4BC	3/4	T4 *	884	678	485	360	333	258	136	--	--	--
		T3	1337	1280	1221	1145	1089	1018	955	890	823	629
		T2	1553	1485	1415	1347	1258	1125	979	973	802	535
		T1	1650	1537	1454	1366	1227	1166	1035	1021	853	578

NOTE: Speed tap T4 should only be used for the constant circulation mode.

DIP SWITCH SETTINGS FOR CIRCULATING BLOWER MOTOR SPEEDS AND HEATING BLOWER OFF DELAY

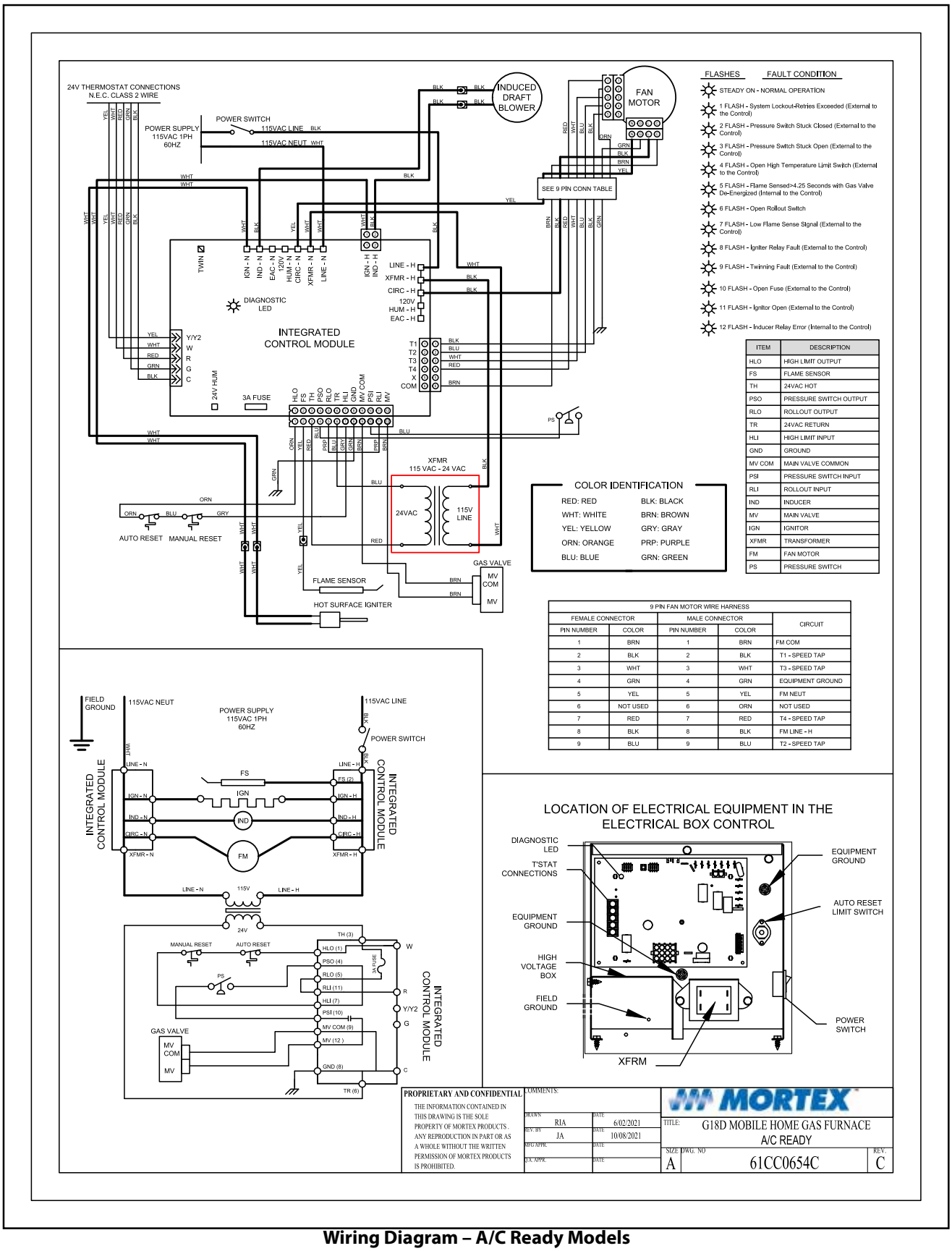
Cooling Mode Dip Switch Settings (SW1)											
Motor Speed Tap Number											
T1 Factory Setting			T2			T3			T4		
SW1 Dip Switch Number and Setting			SW1 Dip Switch Number and Setting			SW1 Dip Switch Number and Setting			SW1 Dip Switch Number and Setting		
1	2	3	1	2	3	1	2	3	1	2	3
Off	Off	Off	On	Off	Off	On	On	Off	Off	On	Off

Heating Mode Dip Switch Settings (SW2)							
Motor Speed Tap Number							
T1		T2 Factory Setting		T3		T4	
SW2 Dip Switch Number and Setting		SW2 Dip Switch Number and Setting		SW2 Dip Switch Number and Setting		SW2 Dip Switch Number and Setting	
1	2	1	2	1	2	1	2
Off	Off	On	Off	On	On	Off	On

Constant Circulation Dip Switch Settings (SW2)					
Motor Speed Tap Number					
T1 Factory Setting		T2		T4	
SW2 Dip Switch Number and Setting		SW2 Dip Switch Number and Setting		SW2 Dip Switch Number and Setting	
3	4	3	4	3	4
Off	Off	On	Off	Off	On

Heating Blower Off Delay Dip Switch Setting (SW1)	
150 Seconds (Factory Setting)	100 Seconds
SW1 Dip Switch Number and Setting	SW1 Dip Switch Number and Setting
4	4
On	Off

SECTION 9: WIRING DIAGRAMS

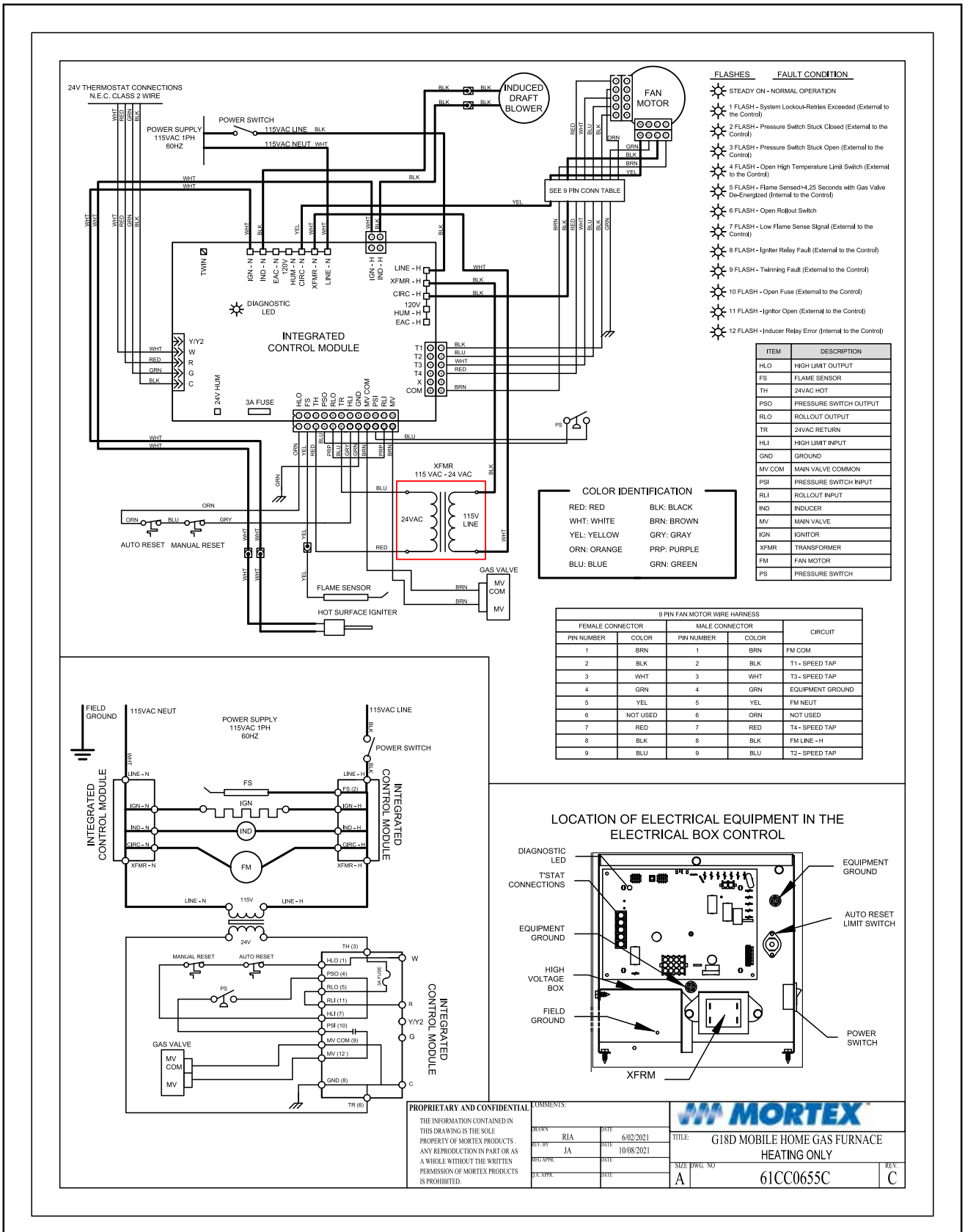


ITEM	DESCRIPTION
HLO	HIGH LIMIT OUTPUT
FS	FLAME SENSOR
TH	24VAC HOT
PSO	PRESSURE SWITCH OUTPUT
RLO	ROLLOUT OUTPUT
TR	24VAC RETURN
HLI	HIGH LIMIT INPUT
GND	GROUND
MV COM	MAIN VALVE COMMON
PSI	PRESSURE SWITCH INPUT
RLI	ROLLOUT INPUT
IND	INDUCER
MV	MAIN VALVE
IGN	IGNITOR
XFMR	TRANSFORMER
FM	FAN MOTOR
PS	PRESSURE SWITCH

9 PIN FAN MOTOR WIRE HARNESS				
FEMALE CONNECTOR		MALE CONNECTOR		CIRCUIT
PIN NUMBER	COLOR	PIN NUMBER	COLOR	
1	BRN	1	BRN	FM COM
2	BLK	2	BLK	T1 - SPEED TAP
3	WHT	3	WHT	T3 - SPEED TAP
4	GRN	4	GRN	EQUIPMENT GROUND
5	YEL	5	YEL	FM NEUT
6	NOT USED	6	ORN	NOT USED
7	RED	7	RED	T4 - SPEED TAP
8	BLK	8	BLK	FM LINE - H
9	BLU	9	BLU	T2 - SPEED TAP

Wiring Diagram – A/C Ready Models

NOTE: If any of the original wires supplied with this furnace must be replaced, replace with Type 105°C thermoplastic or equivalent wire.



ITEM	DESCRIPTION
HLO	HIGH LIMIT OUTPUT
FS	FLAME SENSOR
TH	24VAC HOT
PSO	PRESSURE SWITCH OUTPUT
RLO	ROLLOUT OUTPUT
TR	24VAC RETURN
HLI	HIGH LIMIT INPUT
GND	GROUND
MV COM	MAIN VALVE COMMON
PSI	PRESSURE SWITCH INPUT
RLI	ROLLOUT INPUT
IND	INDUCER
MV	MAIN VALVE
IGN	IGNITOR
XFMR	TRANSFORMER
FM	FAN MOTOR
PS	PRESSURE SWITCH

9 PIN FAN MOTOR WIRE HARNESS				
FEMALE CONNECTOR		MALE CONNECTOR		CIRCUIT
PIN NUMBER	COLOR	PIN NUMBER	COLOR	
1	BRN	1	BRN	FM COM
2	BLK	2	BLK	T1 - SPEED TAP
3	WHT	3	WHT	T3 - SPEED TAP
4	GRN	4	GRN	EQUIPMENT GROUND
5	YEL	5	YEL	FM NEUT
6	NOT USED	6	ORN	NOT USED
7	RED	7	RED	T4 - SPEED TAP
8	BLK	8	BLK	FM LINE - H
9	BLU	9	BLU	T2 - SPEED TAP

Wiring Diagram – Heating Only Models

NOTE: If any of the original wires supplied with this furnace must be replaced, replace with Type 105°C thermoplastic or equivalent wire.

G18 WITH COIL CABINET

G18 WITHOUT COIL CABINET

61GF0102B
Supersedes: 61GF0102A