

LRP13HP/LRP13AC/LRP13GE/LRP13GN/LRP15GE/LRP15HP SERIES UNITS



Table of Contents

Specifications - LRP13HP	5
Specifications - LRP13AC	6
Specifications – LRP13GE / LRP13GX	7
Specifications – LRP13GN	8
Specifications – LRP15GE / LRP15GX	9
Specifications – LRP15HP	10
Electric Heat Capacities – LRP13HP and AC Models – LRP15HP	11
Gas Heat Capacities – LRP13GE Only	11
Gas Heat Capacities – LRP15GE Only	11
Gas Heat Capacities – LRP13GN Only	11
Electrical	12
Typical Parts Arrangement	18
Unit Applications	21
Blower Data – LRP13HP	26
Blower Data – LRP13AC	27
Blower Data – LRP13GE / LRP13GX.....	28
Blower Data – LRP13GN.....	29
Blower Data – LRP15GE / LRP15GX.....	30
Blower Data – LRP15HP	31
Wiring Diagrams and Sequence of Operation	42
LRP13GN – Heating Components and Operation.....	53

⚠ WARNING

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 licensed professional HVAC installer or equivalent, service agency, or the gas supplier.

⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFCs, HCFCs and HFCs) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for noncompliance.

⚠ CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

⚠ WARNING



Electric Shock Hazard. Can cause injury or death. Unit must be properly grounded in accordance with national and local codes.

Line voltage is present at all components when unit is not in operation on units with single-pole contactors. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies.

The LRP13/15 series packaged units are available in sizes ranging from 2 through 5 tons (7.0 through 17.6 kW). The LRP13/15 unit is designed for R-454B refrigerant and for outdoor residential use only. Units can be installed at ground level or on rooftops. The LRP13 units utilize a scroll compressor. LRP15GE/GX/HP units utilize a two-stage compressor. Information contained in this manual is intended for use by qualified service technicians only. All specifications 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.

WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odor.

CAUTION

Servicing shall be performed only as recommended by the manufacturer.

WARNING

Ducts connected to an appliance shall not contain a potential ignition source

WARNING

Every working procedure that affects safety means shall only be carried out by competent persons. This appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure they do not play with the appliance.

IMPORTANT

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out.

IMPORTANT

Verify cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

IMPORTANT

Pipe work, including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.

CAUTION

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need recalibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

CAUTION

Some soaps used for leak detection are corrosive to certain metals. Carefully rinse piping thoroughly after leak test has been completed. Do not use matches, candles, flame or other sources of ignition to check for gas leaks.

WARNING

PARTIAL UNITS shall only be connected to an appliance suitable for the same refrigerant.

IMPORTANT

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed and, since flammability is a consideration, procedures such as safely remove refrigerant following local and national regulations, purging the circuit with inert gas, evacuating (optional for A2L), purging with inert gas (optional for A2L), or opening the circuit by cutting or brazing be adhered to. The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants.

This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

IMPORTANT

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak tested on completion of charging, but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

IMPORTANT

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i. e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

IMPORTANT

After completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements;

– Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of .2 oz. per year of refrigerant or better, under pressure.

No leak shall be detected.

IMPORTANT

Prior to beginning work on systems containing **FLAMMABLE REFRIGERANTS**, safety checks are necessary to ensure that the risk of ignition is minimized.

IMPORTANT

Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

IMPORTANT

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

IMPORTANT

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

IMPORTANT

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO² fire extinguisher adjacent to the charging area.

IMPORTANT

No person carrying out work in relation to a **REFRIGERATING SYSTEM** which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

IMPORTANT

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using **FLAMMABLE REFRIGERANTS**:

- the actual **REFRIGERANT CHARGE** is in accordance with the room size within which the refrigerant containing parts are installed;
- the ventilation machinery and outlets are operating adequately and are not obstructed;
- if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
- refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

IMPORTANT

Sealed electrical components shall be replaced.

IMPORTANT

Intrinsically safe components must be replaced.

Specifications - LRP13HP

Size			24	30	36	42	48	60	
Nominal Tonnage			2	2.5	3	3.5	4	5	
Cooling / Heating Performance	Cooling	Total capacity - Btuh	23,000	28,600	34,000	39,500	45,500	56,000	
		¹ SEER2 (Btuh/Watt)	13.4	13.4	13.4	13.4	13.4	13.4	
		¹ EER2 (Btuh/Watt)	10.6	10.6	10.6	10.6	10.6	10.6	
	High Temperature Heat	Total capacity - Btuh	21,600	25,800	32,600	40,000	47,000	58,000	
		¹ HSPF2 (Region IV)	6.7	6.7	6.7	6.7	6.7	6.7	
		¹ COP	3.4	3.7	3.6	3.5	3.6	3.3	
	Low Temperature Heat	Total capacity - Btuh	11,900	15,000	18,300	22,500	28,200	33,300	
		¹ COP	1.9	2.2	2.1	2.1	2.3	2.0	
² Sound Rating Number			dBa	78	78	78	78	79	78
Refrigerant			Type	R-454B	R-454B	R-454B	R-454B	R-454B	R-454B
			Charge	5 lbs. 1 oz.	5 lbs. 1 oz.	6 lbs. 5 oz.	9 lbs. 6 oz.	8 lbs. 15 oz.	9 lbs. 6 oz.
Compressor Type (number)			Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)
Outdoor Coil	Net face area - ft. ²		16.4	16.4	16.4	16.6	16.6	18.6	
	Tube diameter - in.		5/16	5/16	5/16	5/16	5/16	5/16	
	Rows		1	1	1	2	2	2	
	Fins - in.		22	22	22	22	22	22	
Outdoor Fan	HP		1/6	1/6	1/6	1/4	1/4	1/4	
	Diameter - in.		22	22	22	24	24	24	
	Blades		4	4	4	3	3	3	
Indoor Coil	Net face area - ft. ²		4.4	4.4	4.4	6.8	6.8	6.8	
	Tube Diameter - in.		5/16	3/8	3/8	3/8	3/8	3/8	
	Rows		3	3	3	3	3	3	
	Fins - in.		15	15	15	15	15	15	
	Condensate drain size (NPT) - in.		3/4	3/4	3/4	3/4	3/4	3/4	
Indoor Blower			HP	1/3	1/2	1/2	3/4	3/4	1
			Wheel (Number) diameter x width - in.	(1) 10 x 6	(1) 10 x 6	(1) 10 x 8	(1) 10 x 10	(1) 10 x 10	(1) 12 x 10
Net weight of basic unit - lbs.			369	379	388	460	464	503	
Shipping weight of basic unit - lbs.			374	384	393	465	469	508	

¹ AHRI Certified to AHRI Standard 210/240:

Cooling Ratings - 95°F outdoor air temperature and 80°F db/67°F wb entering indoor coil air.

High Temperature Heating Ratings - 47°F db/43°F wb outdoor air temperature and 70°F entering indoor coil air.

Low Temperature Heating Ratings - 17°F db/15°F wb outdoor air temperature and 70°F entering indoor coil air.

² Sound Rating Number rated in accordance with test conditions included in AHRI Standard 270.

³ HACR type circuit breaker or fuse.

⁴ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

Specifications - LRP13AC

Size		24	30	36	42	48	60
Nominal Tonnage		2	2.5	3	3.5	4	5
Cooling Performance	Total cooling capacity - Btuh	22,600	28,400	33,400	40,000	44,500	57,500
	¹ SEER2 (Btuh/Watt)	13.4	13.4	13.4	13.4	13.4	13.4
	¹ EER2 (Btuh/Watt)	10.6	10.6	10.6	10.6	10.6	10.6
² Sound Rating Number	dBA	77	79	78	78	77	78
Refrigerant	Type	R-454B	R-454B	R-454B	R-454B	R-454B	R-454B
	Charge	4 lbs. 6 oz.	4 lbs. 9 oz.	4 lbs. 8 oz.	5 lbs. 6 oz.	5 lbs. 5 oz.	7 lbs. 13 oz.
Compressor Type (number)		Rotary (1)	Rotary (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)
Outdoor Coil	Net face area - ft. ²	14.6	16.4	16.4	19.5	19.5	16.6
	Tube diameter - in.	5/16	5/16	5/16	5/16	5/16	5/16
	Rows	1	1	1	1	1	2
	Fins - in.	26	26	26	26	26	22
Outdoor Fan	HP	1/6	1/6	1/6	1/4	1/4	1/4
	Diameter - in.	22	22	22	24	24	24
	Blades	4	4	4	3	3	3
Indoor Coil	Net face area - ft. ²	4.4	4.4	4.4	6.8	6.8	6.8
	Tube diameter - in.	3/8	5/16	5/16	5/16	5/16	3/8
	Rows	2	3	3	3	3	3
	Fins - in.	16	16	15	15	15	15
	Condensate drain size (NPT) - in.	3/4	3/4	3/4	3/4	3/4	3/4
Indoor Blower	HP	1/3	1/2	1/2	3/4	3/4	1
	Wheel (Number) diameter x width - in.	(1) 10 x 6	(1) 10 x 6	(1) 10 x 8	(1) 10 x 10	(1) 10 x 10	(1) 12 x 9
Net weight of basic unit - lbs.		367	379	387	460	461	503
Shipping weight of basic unit - lbs.		372	384	392	465	466	508

NOTE-Extremes of operating range are plus and minus 10% of line voltage.

¹ AHRI Certified to AHRI Standard 210/240; 95°F outdoor air temperature, 80°F db/67°F wb entering evaporator air.

² Sound Rating Number rated in accordance with test conditions included in AHRI Standard 270.

³ HACR type circuit breaker or fuse.

⁴ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

Specifications – LRP13GE / LRP13GX

Size		24	30	36	42	48	60
Nominal Tonnage		2	2.5	3	3.5	4	5
Cooling Performance	Total cooling capacity - Btuh	22,600	28,400	33,400	40,000	44,500	57,500
	¹ SEER2 (Btuh/Watt)	13.4	13.4	13.4	13.4	13.4	13.4
	¹ EER2 (Btuh/Watt)	10.6	10.6	10.6	10.6	10.6	10.6
² Sound Rating Number	dBA	77	79	78	78	77	78
Refrigerant	Type	R-454B	R-454B	R-454B	R-454B	R-454B	R-454B
	Charge	4 lbs. 6 oz.	4 lbs. 9 oz.	4 lbs. 8 oz.	5 lbs. 6 oz.	5 lbs. 5 oz.	7 lbs. 13 oz.
Compressor Type (number)		Rotary (1)	Rotary (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)
Outdoor Coil	Net face area - ft. ²	14.6	16.4	16.4	19.5	19.5	16.6
	Tube diameter - in.	5/16	5/16	5/16	5/16	5/16	5/16
	Rows	1	1	1	1	1	2
	Fins - in.	26	26	26	26	26	22
Outdoor Fan	HP	1/6	1/6	1/6	1/4	1/4	1/4
	Diameter - in.	22	22	22	24	24	24
	Blades	4	4	4	3	3	3
Indoor Coil	Net face area - ft. ²	4.4	4.4	4.4	6.8	6.8	6.8
	Tube diameter - in.	3/8	5/16	5/16	5/16	5/16	3/8
	Rows	2	3	3	3	3	3
	Fins - in.	16	16	15	15	15	15
	Condensate drain size (NPT) - in.	3/4	3/4	3/4	3/4	3/4	3/4
Indoor Blower	HP	1/3	1/2	1/2	3/4	3/4	1
	Wheel (Number) diameter x width - in.	(1) 10 x 6	(1) 10 x 6	(1) 10 x 8	(1) 10 x 10	(1) 10 x 10	(1) 12 x 9
Net weight of basic unit - lbs. (heat size)		388 (-054)	400 (-054)	419 (-072)	- - -	506 (-108)	543 (-108)
		394 (-072)	406 (-072)	425 (-090)	496 (-090)	543 (126)	549 (126)
Shipping weight of basic unit - lbs. (heat size)		403 (-054)	405 (-054)	424 (-072)	- - -	511 (-108)	548 (-108)
		399 (-072)	411 (-072)	430 (-090)	501 (-090)	548 (-126)	554 (-126)

Specifications – LRP13GN

Size		24	30	36	42	48	60
Nominal Tonnage		2	2.5	3	3.5	4	5
Gas Heat Available - See Page Page 11		-054	-054	-054	-072	-072	-072
Cooling Performance	Total cooling capacity - Btuh	22,600	28,400	33,400	40,000	44,500	57,500
	¹ SEER2 (Btuh/Watt)	13.4	13.4	13.4	13.4	13.4	13.4
	¹ EER2 (Btuh/Watt)	10.6	10.6	10.6	10.6	10.6	10.6
² Sound Rating Number	dBA	77	79	78	78	77	78
Refrigerant	Type	R-454B	R-454B	R-454B	R-454B	R-454B	R-454B
	Charge	4 lbs. 6 oz.	4 lbs. 9 oz.	4 lbs. 8 oz.	5 lbs. 6 oz.	5 lbs. 5 oz.	7 lbs. 13 oz.
Compressor Type (number)		Rotary (1)	Rotary (1)	Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)
Outdoor Coil	Net face area - ft. ²	14.6	16.4	16.4	19.5	19.5	16.6
	Tube Diameter	5/16	5/16	5/16	5/16	5/16	5/16
	Rows	1	1	1	1	1	2
	Fins - in.	26	26	26	26	26	22
Outdoor Fan	HP	1/6	1/6	1/6	1/4	1/4	1/4
	Diameter - in.	22	22	22	24	24	24
	Blades	4	4	4	3	3	3
Indoor Coil	Net face area - ft. ²	4.4	4.4	4.4	6.8	6.8	6.8
	Tube diameter - in.	3/8	5/16	5/16	5/16	5/16	3/8
	Rows	2	3	3	3	3	3
	Fins - in.	16	16	15	15	15	15
	Condensate drain size (NPT) - in.	3/4	3/4	3/4	3/4	3/4	3/4
Indoor Blower	HP	1/3	1/2	1/2	3/4	3/4	1
	Wheel (Number) diameter x width - in.	(1) 10 x 6	(1) 10 x 6	(1) 10 x 8	(1) 10 x 10	(1) 10 x 10	(1) 12 x 9
Net weight of basic unit - lbs.		407	414	430	522	525	557
Shipping weight of basic unit (1 Pkg.) - lbs.		412	419	435	527	530	562

Specifications – LRP15GE / LRP15GX

Size		24	36	48	60
Nominal Tonnage		2	3	4	5
Gas Heat Available - See Page 11		-072	-072, -090	-108	-126
Cooling Performance	Total cooling capacity - Btuh	23,800	34,000	46,000	57,000
	¹ SEER2 (Btuh/Watt)	16.0	15.2	15.2	15.2
	¹ EER2 (Btuh/Watt)	12.0	11.5	11.5	11.5
	Total Unit Watts	1906	3030	3980	5014
² Sound Rating Number	dBA	73	74	73	74
Refrigerant	Type	R-454B	R-454B	R-454B	R-454B
	Charge	5 lbs. 0 oz.	5 lbs. 0 oz.	5 lbs. 12 oz.	7 lbs. 11 oz.
Compressor Type (number)		Two-Stage Scroll (1)			
Condensate drain size (fpt) - in.		3/4	3/4	3/4	3/4
Outdoor Coil	Net face area - ft. ²	14.6	16.4	19.5	19.1
	Tube Diameter	5/16	5/16	5/16	5/16
	Rows	1	1	1	2
	Fins per inch	26	26	26	22
Outdoor Coil Fan	HP	1/6	1/6	1/4	1/4
	Diameter - in.	22	22	24	24
	Blades	3	3	3	3
Indoor Coil	Net face area - ft. ²	4.4	4.4	6.8	6.8
	Tube Diameter	3/8	3/8	3/8	3/8
	Rows	3	3	3	3
	Fins per in.	15	15	15	15
Indoor Blower	HP	1/2	1/2	3/4	1
	Wheel (Number) diameter x width - in.	(1) 10 x 6	(1) 10 x 8	(1) 10 x 10	(1) 12 x 9
Net weight of basic unit - lbs.		411	420	522	558
Shipping weight of basic unit (1 Pkg.) - lbs.		421	430	532	568

Specifications – LRP15HP

Size			24	36	48	60
Nominal Tonnage			2	3	4	5
Cooling / Heating Performance	Cooling	Total capacity - Btuh	23,000	34,200	45,000	57,000
		¹ SEER2 (Btuh/Watt)	16.0	15.2	15.2	15.2
		¹ EER2 (Btuh/Watt)	12.0	11.5	11.5	11.5
		Total unit watts	1875	3025	3910	4950
	High Temperature Heat	Total capacity - Btuh	21,400	33,200	45,500	58,000
		¹ HSPF2 (Region IV)	7.2	7.2	7.2	7.2
		¹ COP	3.70	3.50	3.88	3.71
		Total unit watts	1800	2960	3930	5030
	Low Temperature Heat	Total capacity - Btuh	11,900	18,900	24,700	35,700
		¹ COP	2.10	2.20	2.09	2.34
Total unit watts		1660	2520	3460	4470	
² Sound Rating Number		dBA	71	71	74	74
Refrigerant		Type	R-454B	R-454B	R-454B	R-454B
		Charge	4 lbs. 8 oz.	6 lbs. 13 oz.	8 lbs. 15 oz.	9 lbs. 4 oz.
Compressor Type (number)			Two-Stage Scroll (1)			
Outdoor Coil	Net face area - ft. ²		16.3	15.5	18.6	18.6
	Tube diameter - in.		5/16	5/16	5/16	5/16
	Rows		1	2	2	2
	Fins - in.		22	22	22	22
Outdoor Fan	HP		1/2	1/2	1/2	1/2
	Diameter - in.		22	22	24	24
	Blades		3	3	3	3
Indoor Coil	Net face area - ft. ²		4.4	4.4	6.8	6.8
	Tube Diameter - in.		5/16	3/8	3/8	3/8
	Rows		3	3	3	3
	Fins - in.		15	15	15	15
	Condensate drain size (NPT) - in.		3/4	3/4	3/4	3/4
Indoor Blower	HP		1/2	1/2	3/4	1
	Blower wheel size dia. x width - in.		(1) 10 x 6	(1) 10 x 8	(1) 10 x 10	(1) 12 x 10
Net weight of basic unit - lbs.			411	446	526	541
Shipping weight of basic unit - lbs.			421	456	536	551

Electric Heat Capacities – LRP13HP and AC Models – LRP15HP

Input Voltage	5 kW			7.5 kW			10 kW			15 kW			20 kW		
	No of Steps	kW Input	KBtuh Output	No of Steps	kW Input	KBtuh Output	No of Steps	kW Input	KBtuh Output	No of Steps	kW Input	KBtuh Output	No of Steps	kW Input	KBtuh Output
208	1	3.8	12.8	1	5.6	19.2	1	7.5	25.6	1	11.2	38.2	1	15	51.2
220	1	4.2	14.3	1	6.3	21.5	1	8.4	28.7	1	12.6	43	1	16.8	57.3
230	1	4.6	15.7	1	6.9	23.5	1	9.2	31.3	1	13.8	47	1	18.4	62.7
240	1	5	17.1	1	7.5	25.6	1	10	34.1	1	15	51.2	1	20	68.2

Gas Heat Capacities – LRP13GE Only

Size		24, 30, 36	24, 30	36, 42	36, 42	48, 60	48, 60
Heating Input		-054	-072	-072	-090	-108	-126
Heating Capacity Btuh	Input	54,000	73,000	72,000	90,000	108,000	126,000
	Output	44,000	58,000	58,000	73,000	88,000	102,000
¹ AFUE		81%	81%	81%	81%	81%	81%
Temperature Rise - °F		30-60	40-70	35-65	40-70	40-70	45-75
Gas Supply Connection (FPT) - in.		1/2	1/2	1/2	1/2	1/2	1/2
Min. Recommended Gas Supply Pressure		5 in. w.g. Natural Gas, 11 in. w.g. LPG/Propane					

¹ Annual Fuel Utilization Efficiency based on U.S. DOE test procedures and FTC labeling regulations.

Gas Heat Capacities – LRP15GE Only

Size		24, 36	36	48	60
Heating Input		-072	-090	-108	-126
Heating Capacity Btuh	First Stage - Input	54,000	67,500	81,000	94,500
	Output	43,500	54,500	65,500	76,500
	Second Stage - Input	72,000	90,000	108,000	126,000
	Output	58,000	73,000	88,000	102,000
¹ AFUE		81%	81%	81%	81%
Temperature Rise - °F	First Stage	35 - 45	35 - 45	45 - 55	45 - 55
	Second Stage	45 - 55	45 - 55	50 - 60	50 - 60
Gas Supply Connection (FPT) - in.		1/2	1/2	1/2	1/2
Min. Recommended Gas Supply Pressure		5 in. w.g. Natural Gas, 11 in. w.g. LPG/Propane			

¹ Annual Fuel Utilization Efficiency based on U.S. DOE test procedures and FTC labeling regulations.

Gas Heat Capacities – LRP13GN Only

Size		24, 30, 36	42, 48, 60
Heating Input		-054	-072
Heating Capacity Btuh	Input	54,000	72,000
	Output	44,000	58,000
¹ AFUE		81%	81%
Temperature Rise - °F		30 - 60	25 - 55
Gas Supply Connection (FPT) - in.		1/2	1/2
Min. Recommended Gas Supply Pressure		5 in. w.g. Natural Gas, 11 in. w.g. LPG/Propane	

¹ Annual Fuel Utilization Efficiency based on U.S. DOE test procedures and FTC labeling regulations.

Electrical

ELECTRIC HEAT DATA - LRP13HP Only

Model			LRP13HPK24		LRP13HPK30		LRP13HPK36	
Voltage			208V	240V	208V	240V	208V	240V
¹ Maximum Overcurrent Protection (MOCP)	5 kW	Circuit 1	30.0	30	30	35	30	30
	7.5 kW	Circuit 1	40.0	45	40	45	40	45
	10 kW	Circuit 1	50.0	60	60	60	50	60
	15 kW	Circuit 1	---	---	---	---	50	60
		Circuit 2	---	---	---	---	25	30
² Minimum Circuit Ampacity (MCA)	5 kW	Circuit 1	26.1	29.5	27.7	31.2	26.3	29.8
	7.5 kW	Circuit 1	37.4	42.6	39	44.2	37.6	42.8
	10 kW	Circuit 1	48.6	55.6	50.3	57.2	48.9	55.8
	15 kW	Circuit 1	---	---	---	---	48.9	55.8
		Circuit 2	---	---	---	---	22.6	26
¹ Maximum Overcurrent Protection (MOCP) with Optional Single Point Power Supply	5 kW		40	45	50	50	50	60
	7.5 kW		60	60	60	70	60	70
	10 kW		70	70	70	80	70	80
	15 kW		---	---	---	---	100	110
² Minimum Circuit Ampacity (MCA) with Optional Single Point Power Supply	5 kW		40.0	43.5	43.5	47	47.4	50.8
	7.5 kW		51.3	56.5	54.8	60	58.7	63.9
	10 kW		62.6	69.5	66.1	73	69.9	76.9
	15 kW		---	---	---	---	92.5	102.9
Model No.			LRP13HPK42		LRP13HPK48		LRP13HPK60	
Voltage			208V	240V	208V	240V	208V	240V
¹ Maximum Overcurrent Protection (MOCP)	5 kW	Circuit 1	35	35	35	35	30	35
	7.5 kW	Circuit 1	45	50	45	50	40	45
	10 kW	Circuit 1	60	60	60	60	60	60
	15 kW	Circuit 1	60	60	60	60	60	60
		Circuit 2	25	30	25	30	25	30
	20 kW	Circuit 1	60	60	60	60	60	60
² Minimum Circuit Ampacity (MCA)		Circuit 2	50	60	50	60	50	60
	5 kW	Circuit 1	30.1	33.5	30.1	33.5	27.4	30.9
	7.5 kW	Circuit 1	41.4	46.6	41.4	46.6	38.7	43.9
	10 kW	Circuit 1	52.6	59.6	52.6	59.6	50.0	57
	15 kW	Circuit 1	52.6	59.6	52.6	59.6	50	57
		Circuit 2	22.6	26	22.6	26.0	50	22.6
¹ Maximum Overcurrent Protection (MOCP) with Optional Single Point Power Supply	20 kW	Circuit 1	50.6	59.6	52.6	59.6	53	57
		Circuit 2	45.1	52.1	45.1	52.1	45.1	52.1
	5 kW		60	60	60	70	80	80
	7.5 kW		70	70	70	80	90	90
	10 kW		80	80	80	90	90	100
² Minimum Circuit Ampacity (MCA) with Optional Single Point Power Supply	15 kW		100	110	100	125	110	125
	20 kW		125	150	125	150	150	150
	5 kW		50.5	53.9	54.6	58.1	60.1	63.6
	7.5 kW		61.7	67.0	65.9	71.1	71.4	76.6
	10 kW		73.0	80.0	77.2	84.1	82.7	89.6
	15 kW		95.6	106.0	99.8	110.2	105.3	115.7
	20 kW		118.2	132.1	122.3	136.2	127.8	141.7

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

NOTE- Extremes of operating range are plus and minus 10% of line voltage.

¹ HACR type breaker or fuse.

² Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRIC HEAT DATA - LRP13AC Only

Model			LRP13ACK24		LRP13ACK30		LRP13ACK36	
Voltage			208V	240V	208V	240V	208V	240V
¹ Maximum Overcurrent Protection (MOCP)	5 kW	Circuit 1	30	30	30	30	30	35
	7.5 kW	Circuit 1	40	45	40	45	40	45
	10 kW	Circuit 1	50	60	50	60	60	60
	15 kW	Circuit 1	---	---	---	---	60	60
		Circuit 2	---	---	---	---	25	30
² Minimum Circuit Ampacity (MCA)	5 kW	Circuit 1	26.1	29.5	25.8	29.3	26.6	30.0
	7.5 kW	Circuit 1	37.4	42.6	37.1	42.3	39.0	44.2
	10 kW	Circuit 1	48.6	55.6	48.4	55.3	50.3	57.2
	15 kW	Circuit 1	---	---	---	---	50.3	57.2
		Circuit 2	---	---	---	---	22.6	26
¹ Maximum Overcurrent Protection (MOCP) with Optional Single Point Power Supply	5 kW		30	30	30	30	30	35
	7.5 kW		40	45	40	45	40	45
	10 kW		50	60	50	60	60	60
	15 kW		---	---	---	---	80	90
² Minimum Circuit Ampacity (MCA) with Optional Single Point Power Supply	5 kW		26.1	29.5	25.8	29.3	22.7	31.2
	7.5 kW		37.4	42.6	37.1	42.3	39.0	44.2
	10 kW		48.6	55.6	48.4	55.3	50.3	57.2
	15 kW		---	---	---	---	72.8	83.3
Model No.			LRP13ACK42		LRP13ACK48		LRP13ACK60	
Voltage			208V	240V	208V	240V	208V	240V
¹ Maximum Overcurrent Protection (MOCP)	5 kW	Circuit 1	35	35	35	35	30	35
	7.5 kW	Circuit 1	40	45	40	45	45	50
	10 kW	Circuit 1	60	60	60	60	60	70
		Circuit 2	---	---	---	---	---	---
	15 kW	Circuit 1	60	60	60	60	60	70
		Circuit 2	25	30	25	30	25	30
	20 kW	Circuit 1	60	60	60	60	60	70
		Circuit 2	50	60	50	60	50	60
² Minimum Circuit Ampacity (MCA)	5 kW	Circuit 1	30.1	33.5	30.1	33.5	27.8	31.3
	7.5 kW	Circuit 1	38.7	43.9	39.5	44.7	43.4	48.6
	10 kW	Circuit 1	50.0	57.0	50.8	57.7	54.6	61.6
		Circuit 2	---	---	---	---	---	---
	15 kW	Circuit 1	50.0	57.0	50.8	57.7	54.6	61.6
		Circuit 2	22.6	26	22.6	26	22.6	26
	20 kW	Circuit 1	50.0	57.0	50.8	57.7	54.6	61.6
		Circuit 2	45.1	52.1	45.1	52.1	45.1	52.1
¹ Maximum Overcurrent Protection (MOCP) with Optional Single Point Power Supply	5 kW		30	35	30	35	60	60
	7.5 kW		40	45	40	45	50	50
	10 kW		60	60	60	60	60	70
	15 kW		80	90	80	90	80	90
	20 kW		100	110	100	110	100	125
² Minimum Circuit Ampacity (MCA) with Optional Single Point Power Supply	5 kW		27.4	30.9	28.2	31.7	39.7	39.7
	7.5 kW		38.7	43.9	39.5	44.7	43.4	48.6
	10 kW		50.0	57.0	50.8	57.7	54.6	61.6
	15 kW		72.6	83.0	73.3	83.8	77.2	87.6
	20 kW		95.2	109.0	95.9	109.8	99.8	113.7

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

NOTE- Extremes of operating range are plus and minus 10% of line voltage.

¹ HACR type breaker or fuse.

² Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRICAL DATA - LRP13GE Only

Line voltage data (Volts-Phase-Hz)		208/230V-1-60					
³ Maximum overcurrent protection (MOCP) amps		20	25	35	40	45	60
⁴ Minimum Circuit Ampacity (MCA)		14.8	17.5	22.9	26.5	28.7	39.7
Compressor	Rated load amps	8.8	11.1	14.3	16.7	18.0	24.3
Outdoor Coil Fan Motor	Full load amps	1.0	1.0	1.0	1.7	1.7	1.7
Indoor Blower Motor	Full load amps	2.8	2.6	4.1	3.9	4.5	7.6

NOTE-Extremes of operating range are plus and minus 10% of line voltage.

¹ AHRI Certified to AHRI Standard 210/240; 95°F outdoor air temperature, 80°F db/67°F wb entering evaporator air.

² Sound Rating Number rated in accordance with test conditions included in AHRI Standard 270.

³ HACR type circuit breaker or fuse.

⁴ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRICAL DATA - LRP13GN Only

Line voltage data (Volts-Phase-Hz)		208/230V-1-60					
³ Maximum overcurrent protection (MOCP) amps		20	25	35	40	45	60
⁴ Minimum Circuit Ampacity (MCA)		14.8	17.5	22.9	26.5	28.7	39.7
Compressor	Rated load amps	8.8	11.1	14.3	16.7	18.0	24.3
Outdoor Coil Fan Motor	Full load amps	1.0	1.0	1.0	1.7	1.7	1.7
Indoor Blower Motor	Full load amps	2.8	2.6	4.1	3.9	4.5	7.6

NOTE-Extremes of operating range are plus and minus 10% of line voltage.

¹ AHRI Certified to AHRI Standard 210/240; 95°F outdoor air temperature, 80°F db/67°F wb entering evaporator air.

² Sound Rating Number rated in accordance with test conditions included in AHRI Standard 270.

³ HACR type circuit breaker or fuse.

⁴ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRICAL DATA - LRP13HP Only

Line voltage data (Volts-Phase-Hz)		208/230V-1-60					
³ Maximum overcurrent protection (MOCP) amps		25	30	40	40	50	60
⁴ Minimum Circuit Ampacity (MCA)		17.5	20.9	24.8	27.9	32.0	37.5
Compressor	Rated load amps	10.9	12.7	16.6	16.2	19.5	25.6
Outdoor Coil Fan Motor	Full load amps	1.0	1.0	1.0	1.7	1.7	1.7
Indoor Blower Motor	Full load amps	2.8	4.1	3.0	6.0	6.0	3.9

¹ AHRI Certified to AHRI Standard 210/240:

Cooling Ratings - 95°F outdoor air temperature and 80°F db/67°F wb entering indoor coil air.

High Temperature Heating Ratings - 47°F db/43°F wb outdoor air temperature and 70°F entering indoor coil air.

Low Temperature Heating Ratings - 17°F db/15°F wb outdoor air temperature and 70°F entering indoor coil air.

² Sound Rating Number rated in accordance with test conditions included in AHRI Standard 270.

³ HACR type circuit breaker or fuse.

⁴ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRICAL DATA - LRP13AC Only

Line voltage data (Volts-Phase-Hz)		208/230V-1-60					
³ Maximum overcurrent protection (MOCP) amps		20	25	35	40	45	60
⁴ Minimum Circuit Ampacity (MCA)		14.8	17.5	22.9	26.5	28.7	39.7
Compressor	Rated load amps	8.8	11.1	14.3	16.7	18.0	24.3
Outdoor Coil Fan Motor	Full load amps	1.0	1.0	1.0	1.7	1.7	1.7
Indoor Blower Motor	Full load amps	2.8	2.6	4.1	3.9	4.5	7.6

NOTE-Extremes of operating range are plus and minus 10% of line voltage.

¹ AHRI Certified to AHRI Standard 210/240; 95°F outdoor air temperature, 80°F db/67°F wb entering evaporator air.

² Sound Rating Number rated in accordance with test conditions included in AHRI Standard 270.

³ HACR type circuit breaker or fuse.

⁴ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRICAL DATA - LRP15GE Only

Line voltage data (Volts-Phase-Hz)		208/230V-1-60			
³ Maximum overcurrent protection (MOCP) amps		25	35	45	60
⁴ Minimum Circuit Ampacity (MCA)		15.1	21.5	28.2	37.5
Compressor	Rated load amps	10.2	14.5	18.3	25.2
	Locked rotor amps	58.3	83.0	126.5	151.0
Outdoor Coil Fan Motor	Full load amps	1.0	1.0	1.7	1.7
	Locked rotor amps	1.9	1.9	3.2	3.2
Indoor Blower Motor	Full load amps	1.3	2.4	3.6	4.4
	Locked rotor amps	4.3	4.3	6.8	9.1

NOTE-Extremes of operating range are plus and minus 10% of line voltage.

¹ AHRI Certified to AHRI Standard 210/240; 95°F outdoor air temperature, 80°F db/67°F wb entering evaporator air.

² Sound Rating Number rated in accordance with test conditions included in AHRI Standard 270.

³ HACR type circuit breaker or fuse.

⁴ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRICAL DATA - LRP15HP Only

Line voltage data (Volts-Phase-Hz)		208/230V-1-60			
³ Maximum overcurrent protection (MOCP) amps		25	40	50	60
⁴ Minimum Circuit Ampacity (MCA)		17.1	25.1	31.7	39.7
Compressor	Rated load amps	10.2	15.3	19.5	25.2
Outdoor Coil Fan Motor	Full load amps	2.3	2.3	3.6	3.6
Indoor Blower Motor	Full load amps	2.0	3.7	3.8	4.6

¹ AHRI Certified to AHRI Standard 210/240:

Cooling Ratings - 95°F outdoor air temperature and 80°F db/67°F wb entering indoor coil air.

High Temperature Heating Ratings - 47°F db/43°F wb outdoor air temperature and 70°F entering indoor coil air.

Low Temperature Heating Ratings - 17°F db/15°F wb outdoor air temperature and 70°F entering indoor coil air.

² Sound Rating Number rated in accordance with test conditions included in AHRI Standard 270.

³ HACR type circuit breaker or fuse.

⁴ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRIC HEAT DATA - LRP15HP Only

Model			LRP15HPK24		LRP15HPK36		LRP15HPK48		LRP15HPK60	
Voltage			208V	240V	208V	240V	208V	240V	208V	240V
¹ Maximum Overcurrent Protection (MOCP)	5 kW	Circuit 1	30	30	30	35	30	35	30	35
	7.5 kW	Circuit 1	40	45	40	45	40	45	40	45
	10 kW	Circuit 1	50	60	50	60	50	60	60	60
	15 kW	Circuit 1	---	---	50	60	50	60	60	60
		Circuit 2	---	---	25	30	25	30	25	30
	20 kW	Circuit 1	---	---	---	---	50	60	60	60
		Circuit 2	---	---	---	---	50	60	50	60
	5 kW		45	45	50	60	60	70	80	80
	7.5 kW		60	60	60	70	70	80	90	90
	10 kW		70	70	80	80	80	90	100	100
² Minimum Circuit Ampacity (MCA)	15 kW		---	---	100	110	100	110	125	110
	20 kW		---	---	---	---	125	150	150	150
	5 kW	Circuit 1	25.1	28.5	27.2	30.7	27.3	30.8	28.3	31.8
	7.5 kW	Circuit 1	36.4	41.6	38.5	43.7	38.6	43.8	39.6	44.8
	10 kW	Circuit 1	47.6	54.6	49.8	56.7	49	56.8	50.9	57.8
	15 kW	Circuit 1	---	---	49.8	56.7	49	56.8	50.9	57.8
		Circuit 2	---	---	22.6	26	22.6	26	22.6	26
	20 kW	Circuit 1	---	---	---	---	49	56.8	50.9	57.8
		Circuit 2	---	---	---	---	45.1	52.1	45.1	52.1
	5 kW		39.7	43.1	47.7	51.2	54.3	57.8	62.3	65.7
² Minimum Circuit Ampacity (MCA) with Optional Single Point Power Supply	7.5 kW		51.0	56.2	59.0	64.2	65.6	70.8	73.6	78.8
	10 kW		62.2	69.2	70.3	77.2	76.9	83.8	84.8	91.8
	15 kW		---	---	92.8	103.2	99.5	109.9	107.4	117.8
	20 kW		---	---	---	---	122.0	135.9	130.0	143.9

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

NOTE- Extremes of operating range are plus and minus 10% of line voltage.

¹ HACR type breaker or fuse.

² Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

HIGH ALTITUDE DERATE

Units may be installed at altitudes up to 4500 feet above sea level without any modification. At altitudes above 4500 feet, units must be derated 4% for every 1000 feet above sea level. Example - At an altitude of 6000 feet the unit would require a derate of 24%.

NOTE - This is the only permissible derate for these units.

TABLE 1. Manifold Pressure Versus Altitude

Natural Gas				Propane (LP)		
Altitude (ft.)	Heating Value* (BTU/ft)	Manifold Pressure (in. w.c.)		Heating Value* (BTU/ft)	Manifold Pressure (in. w.c.)	
		High	Low		High	Low
2000	948	3.50	2.00	2278	10.00	5.60
3000	914	3.50	2.00	2196	10.00	5.60
4000	881	3.50	2.00	2116	10.00	5.60
4500	865	3.50	2.00	2077	10.00	5.60
5000	849	3.29	1.88	2039	9.41	5.38
5500	833	3.27	1.87	2000	9.35	5.34
6000	818	3.25	1.86	1964	9.29	5.31
6500	802	3.23	1.84	1927	9.24	5.28
7000	787	3.21	1.83	1891	9.18	5.25
7500	771	3.19	1.82	1853	9.12	5.21
* Consult local factory for actual heating value. Furnace input = Input Factor X Nameplate Input Above 7500 feet, call Lennox Technical Services for additional assistance.						

Typical Parts Arrangement

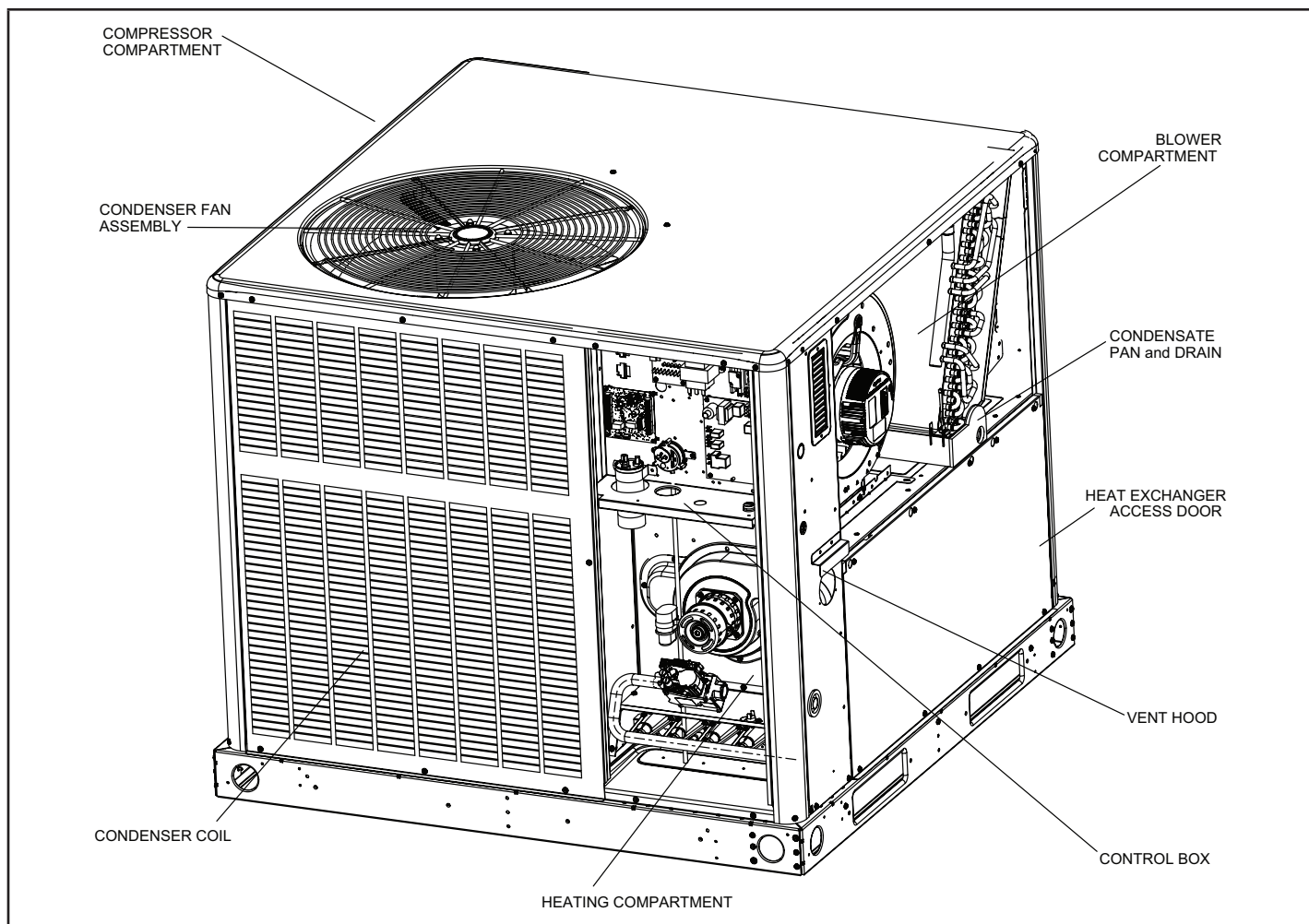


FIGURE 1. Typical Parts Arrangement – LRP13GE / LRP13GN

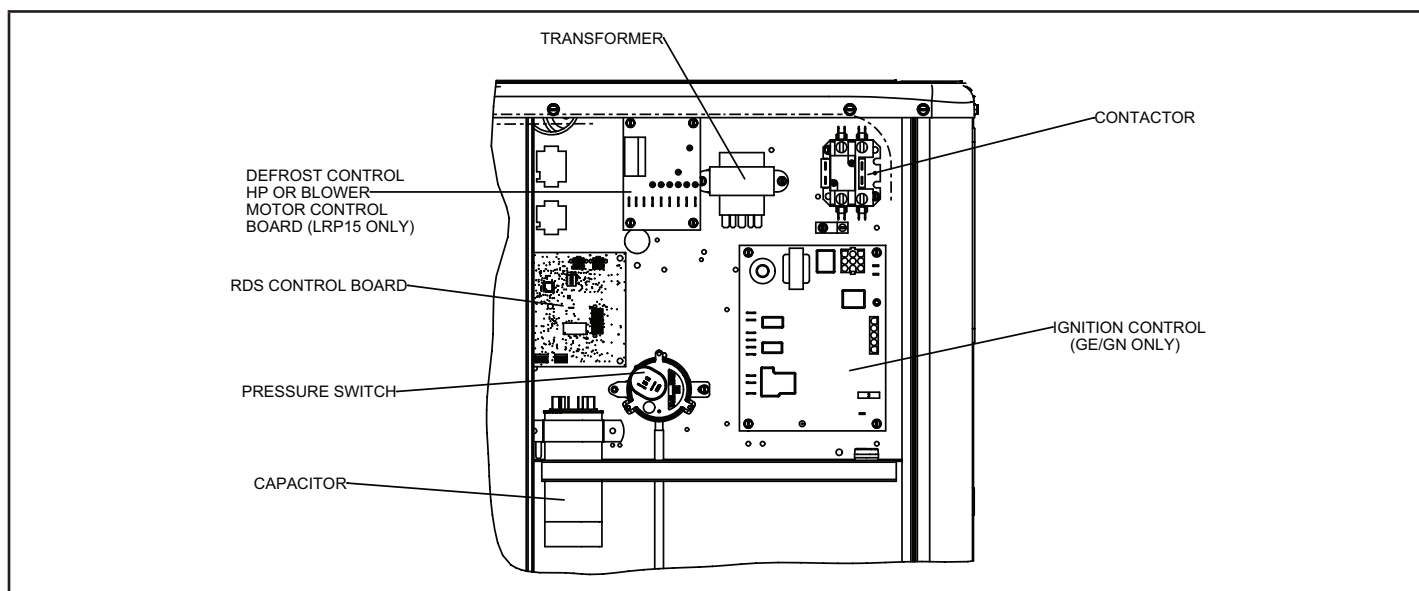


FIGURE 2. Typical Control Box - Gas Units

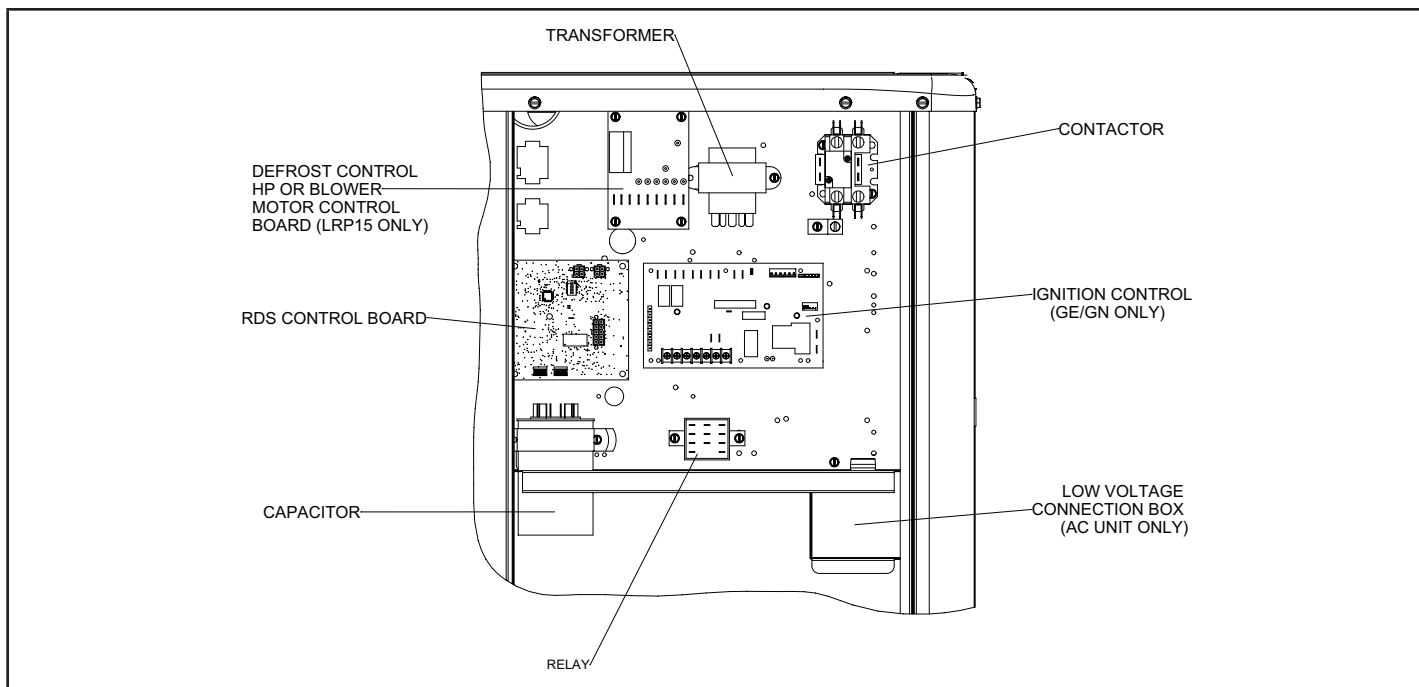


FIGURE 3. Typical Control Box - Heat Pump Units

Parts Arrangement – Contd.

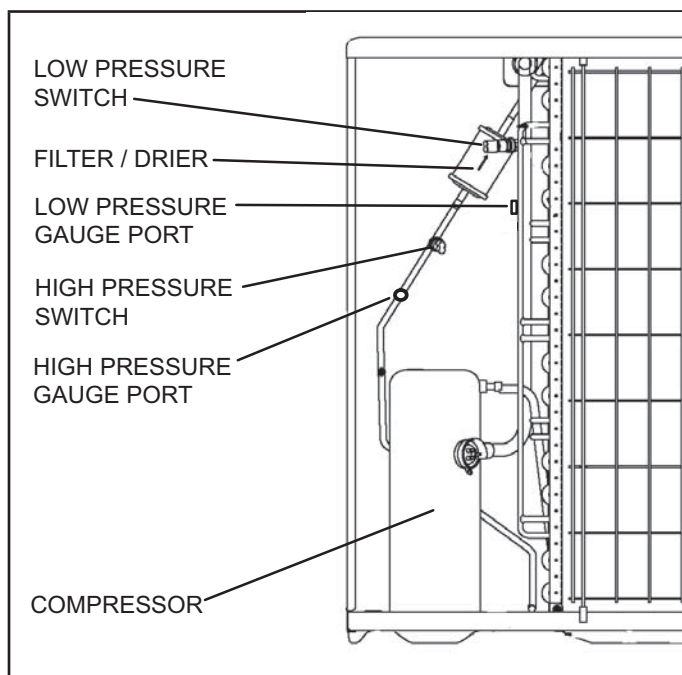


FIGURE 7. Compressor Compartment – AC, GE and GN Units

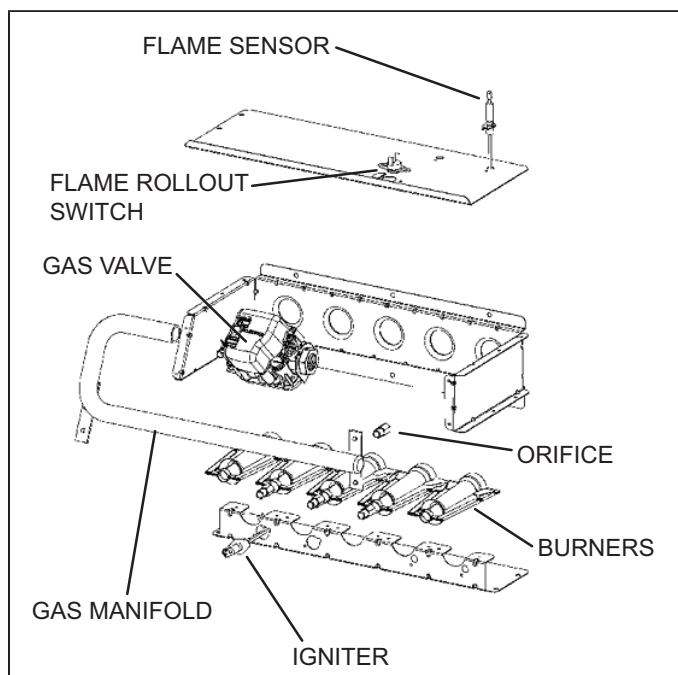


FIGURE 5. Burner Box Components – GE Units

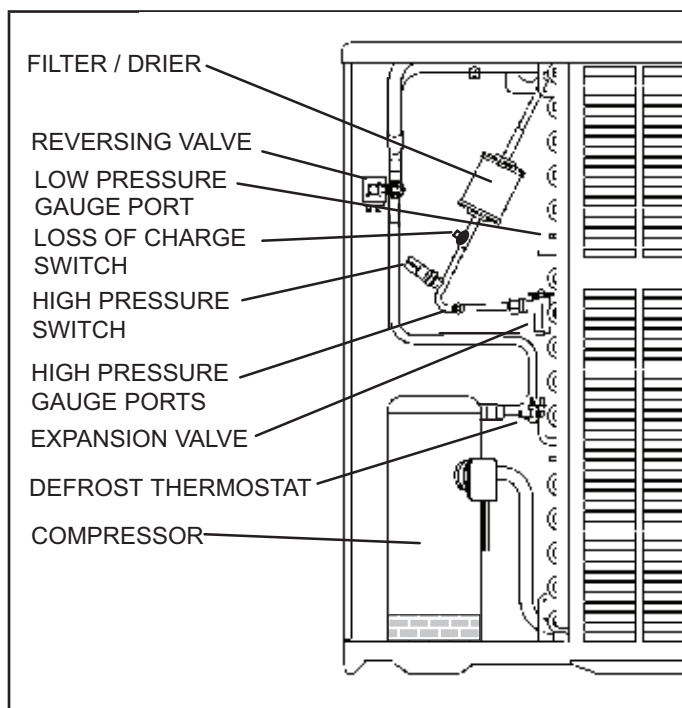


FIGURE 6. Compressor Compartment – HP Units

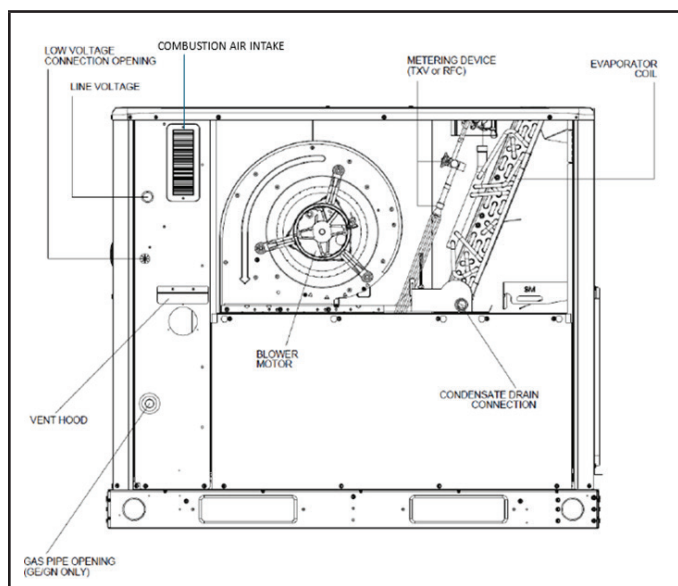


FIGURE 4. Blower Compartment

Unit Applications

LRP13HP

LRP13HP, 2 through 5 ton (7.0 through 17.6kW) model units, are single phase packaged heat pump units designed for outdoor installation on a slab or rooftop in residential applications. The units are available in two cabinet sizes. Optional electric heat must be field installed if required. Units are available with constant torque or PSC blower motors (units manufactured prior to 7/2019 equipped with PSC motors). In heating mode, the unit operates the heat pump for 1st stage heating. If 1st stage is not satisfied, the 2nd stage activates electric heat sections (secondary heat source). Refer to Product Specifications (EHB) for auxiliary heat selections. All heat pump units are equipped with single-stage cooling only.

LRP13AC

LRP13AC, 2 through 5 ton (7.0 through 17.6kW) model units, are single phase packaged air conditioning units designed for outdoor installation on a slab or rooftop in residential applications. The units are available in two cabinet sizes. Optional electric heat must be field installed if required. Refer to Product Specifications (EHB) for electric heat options. Units are available with constant torque or PSC blower motors (units manufactured prior to 7/2019 equipped with PSC motors). All LRP13AC units are equipped with single-stage cooling only.

LRP13GE

LRP13GE, 2 through 5 ton (7.0 through 17.6kW) model units, are single phase packaged air conditioning units designed for outdoor installation on a slab or rooftop in residential applications. The units are available in two cabinet sizes. A gas heat component is factory installed. Units are available with constant torque or PSC blower motors (units manufactured prior to 7/2019 equipped with PSC motors). All LRP13GE units are equipped with single-stage cooling and gas heat.

LRP13GN

LRP13GN, 2 through 5 ton (7.0 through 17.6kW) model units, are single phase packaged air conditioning units designed for outdoor installation on a slab or rooftop in residential applications. The units are available in two cabinet sizes. A gas heat component is factory installed. Units are available with constant torque or PSC blower motors (units manufactured prior to 7/2019 equipped with PSC motors). All LRP13GN units are equipped with single-stage cooling and gas heat.

LRP15HP

LRP15HP, 2 through 5 ton (7.0 through 17.6kW) model units, are single phase packaged heat pump units designed for outdoor installation on a slab or rooftop in residential applications. The units are available in two cabinet sizes. Optional electric heat must be field installed if required. Units are equipped with variable-speed ECM blower motors. All LRP15HP units are equipped with a two-stage Copeland compressor providing two-stage cooling. In heating mode, the unit operates the heat pump for 1st stage heating. If 1st stage is not satisfied, the 2nd stage activates electric heat sections (secondary heat source).

Refer to Product Specifications (EHB) for auxiliary heat selections.

LRP15GE

LRP15GE, 2 through 5 ton (7.0 through 17.6kW) model units, are single phase packaged air conditioning units designed for outdoor installation on a slab or rooftop in residential applications. The units are available in two cabinet sizes. A gas heat component is factory installed. Units are equipped with variable-speed ECM blower motors. All LRP15GE units are equipped with a two-stage Copeland compressor providing two-stage cooling and gas heat.

UNIT COMPONENTS / OPERATION

Unit components are shown in FIGURE 1.

Control Box Components

Control box components are shown in FIGURE 2.

Compressor Contactor K1

K1 is a 24VAC to line voltage single-pole contactor, which energizes the compressor and condenser fan in response to thermostat demand.

Control Transformer T1

All LRP13 series units use line voltage to 24VAC transformer mounted in the control box. The transformer supplies power to control circuits in the unit. Transformers use two primary voltage taps as shown in FIGURE 8.

NOTE - The unit is factory-shipped at 230/240 volts.

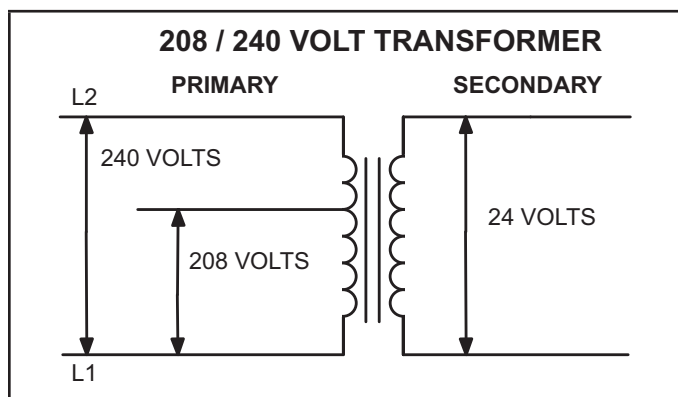


FIGURE 8

Dual Capacitor C12

The compressor and condenser fan in the LRP13/15 series units use permanent split capacitor motors. The capacitor is located in the control box. A dual rated capacitor is used for both the condenser fan motor and the compressor (see unit wiring diagram per respective unit). The fan side and the compressor side of the capacitor have different MFD ratings. See repair parts or nameplate for correct capacitor.

Ignition Control (A3)

⚠ WARNING

Shock hazard.

Disconnect power before servicing. Control 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.

The LRP13GE/LRP13GN and LRP15GE units include an ignition control which controls the combustion air inducer, gas valve and spark electrode. It receives signals from the limit switch, the rollout switch, the pressure prove switch and the flame sensor. The ignition control is shown in FIGURE 9. LED codes are in TABLE 2.

Electronic Ignition

On a W1 call the ignition control checks high temperature limit and rollout switch to make sure they are closed. The control then verifies that the pressure switch is open. If the pressure switch is closed, the control will flash code 3 on the LED and will wait indefinitely for the pressure switch to open. If the pressure switch is open, the control proceeds to the 15-second pre-purge.

The ignition control energizes the combustion air inducer, flashes a code 3 on the LED, and waits for the pressure switch to close.

When the pressure switch has closed, the LED code 3 flash stops and the control begins the 15-second pre-purge period. When the pre-purge time has expired, the control begins the ignition trial.

The ignition control energizes the gas valve and spark. The control ignores the flame sense signal for the first two seconds of the ignition trial. If the flame is established within 10 seconds, the control de-energizes the spark. If flame is not established within 10 seconds, the gas valve and spark are de-energized and the ignition control initiates a 30-second inter-purge sequence.

Approximately 30 seconds after the flame has been established, the circulating air blower starts. The ignition control inputs are continuously monitored to ensure that the limit switch, rollout switch and pressure switch are all closed, and that the flame remains established and heating demand is present.

Single-stage gas valve, single-speed combustion air inducer and circulating blower remain energized. If the thermostat signals a requirement for second-stage heat (W2) on the dual fuel unit, the ignition control initiates auxiliary or back-up heat operation.

When a signal for second-stage heat is received by the ignition control, the control energizes the gas valves on dual fuel units and single-speed combustion air inducer until the demand is satisfied.

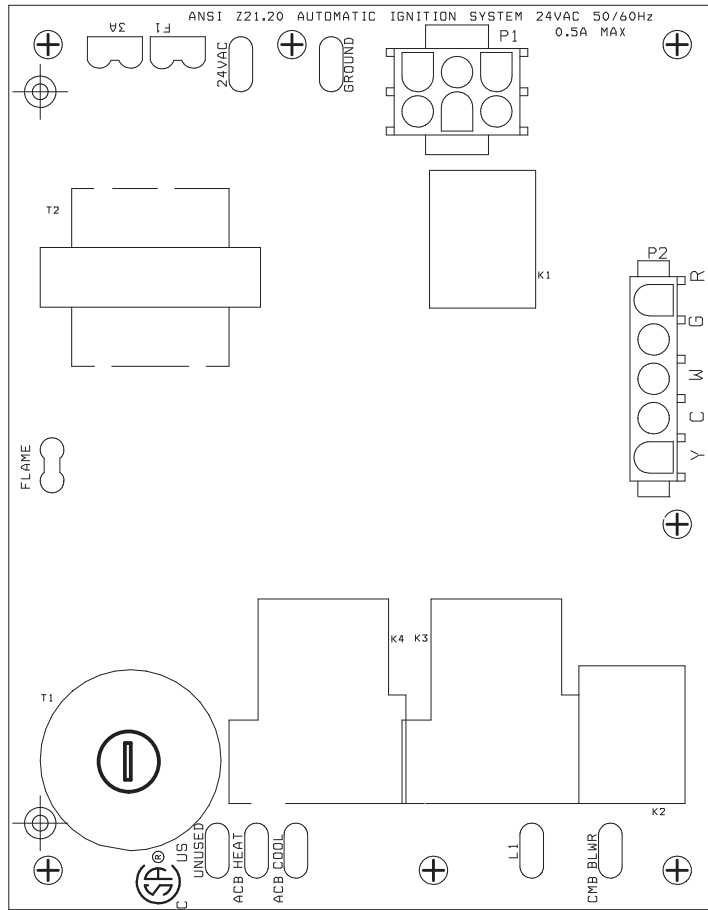
If a first-stage heat demand continues after the second-stage heat demand has been satisfied, the ignition control immediately de-energizes the gas valve. Heat pump operation continues until heating demand is satisfied.

When the heating demand is satisfied for dual fuel first stage, the control immediately de-energizes the compressor. The combustion air inducer remains energized for a 30-second post-purge period. The circulating air blower operates for 90 seconds after the gas valve is de-energized (GE/GN units only).

The combustion air inducer is energized for 30 seconds at a Y1 call for cooling to clear warm humid air out of the heat exchanger.

The ignition control LED flashes codes which indicate normal or abnormal operations. See TABLE 2.

IGNITION CONTROL (A3)



QUICK CONNECT CONNECTIONS:

.25 MALE QUICK CONNECTS:

T1 - SPARK MODULE
 24 VAC HOT
 GROUND = 24 VAC RETURN
 CMB BLOWER = COMBUSTION BLOWER (LINE VOLTAGE)
 LI = LINE VOLTAGE
 ACB COOL = AIR CIRCULATING BLOWER COOL
 SPEED (LINE VOLTAGE)
 ACB HEAT = AIR CIRCULATING BLOWER HEAT
 SPEED (LINE VOLTAGE)
 UNUSED

.19 MALE QUICK CONNECT:

FLAME = FLAME PROBE

MOLEX/AMP PLUG-IN DESCRIPTION:

1. ROLLOUT SWITCH RETURN
2. HI LIMIT RETURN/PRESSURE SWITCH OUT
3. GAS VALVE COMMON
4. GAS VALVE OUT
5. PRESSURE SWITCH RETURN
6. ROLLOUT SWITCH OUT

THERMOSTAT INPUT:

R = 24 VAC TO THERMOSTAT (RED)
 G = MANUAL FAN INPUT FROM THERMOSTAT (GREEN)
 W = HEAT DEMAND INPUT FROM THERMOSTAT (WHITE)
 C = COMMON GROUND TO THERMOSTAT
 Y = COOL DEMAND INPUT FROM THERMOSTAT (YELLOW)

HEAT MODE:

PREPURGE: 30 SEC.
 INTER-PURGE: 30 SEC.
 POST PURGE: 5 SEC.
 TRIAL TIME: 10 SEC.
 # TRIAL: 3
 BOARD TO RESET FROM LOCKOUT AFTER 60 MIN.

FAN ON DELAY:

COOL: 5 SEC. (FIXED)
 HEAT: 30 SEC. (FIXED)

FAN OFF DELAY:

COOL: 90 SEC. (FIXED)
 HEAT: 180 SEC. (FIXED)

FIGURE 9. Ignition Control – Gas-Heat Units Only

TABLE 2. LED Diagnostic Codes – Ignition Control

Slow Flash - 1 per second	Normal operation, no call for heat
Fast Flash - 2 per second	Normal operation, call for heat
Steady Off	Internal failure or no power
Steady On	Internal control failure
Code 2 - 2 flashes in 1 sec with 1 sec pause	Lockout, failed to detect or sustain flame, gas valve knob or switch off
Code 3 - 3 flashes in 1 1/2 sec with 1 sec pause	Pressure switch open or closed
Code 4 - 4 flashes in 2 sec with 1 sec pause	High temp limit or rollout switch open
Code 5 - 5 flashes in 2 1/2 sec with 1 sec pause	Flame sensed with gas valve de-energized

WARNING



Electric Shock Hazard. Can cause injury or death. Unit must be properly grounded in accordance with national and local codes.

Line voltage is present at all components when unit is not in operation on units with single-pole contactors. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies.

BLOWER CONTROL BOARD (A54) – LRP15 UNITS

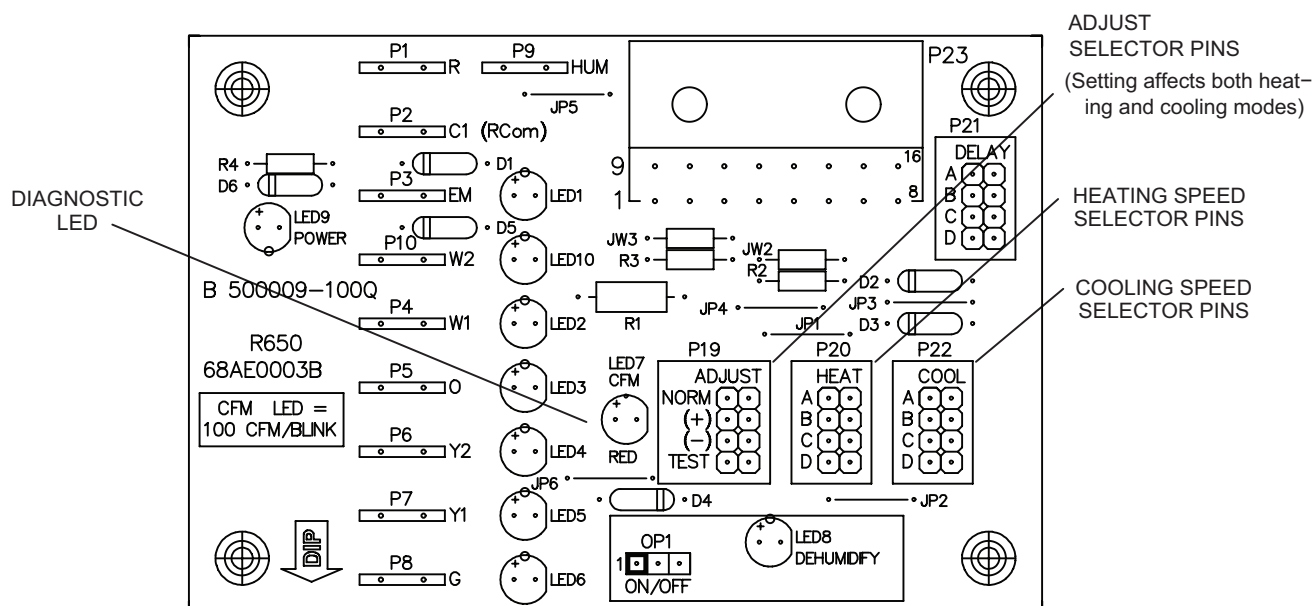


FIGURE 10. Blower Control Board (A54) – ECM Motor – LRP15GE / LRP15HP

Blower Control – Units with Constant Torque Motors

LRP13 units that are equipped with constant torque blower motors are energized from the W, G and Y 24 volt terminals from the room thermostat, which are connected to the control board in each unit. The constant torque motor is capable of maintaining a specified CFM throughout the external static range. Constant torque units are not equipped with a separate blower control.

BLOWER SPEED ADJUSTMENT / OPERATION LRP13 UNITS

Blower Speeds – Constant Torque Units

Fan speed on units equipped with constant torque motors is field-adjustable. See blower CFM chart for unit size.

Blower Speeds — LRP15GE/HP Units

Fan speed on the HEAT and COOL stage air volume selections are made by jumper pins.

Continuous Fan Operation

When the thermostat is set for “Continuous Fan” operation and there is no demand for heating or cooling, the blower on units with PSC motors will operate at cooling speed. On units with constant torque motors, the blower will operate at low speed with a G call.

NOTE - With the proper thermostat and sub-base, continuous blower operation is possible by closing the R to G circuit. Cooling blower delay is also functional in this mode.

Blower Control Board (A54) LRP15GE/HP Units

These units are equipped with a variable-speed motor which is controlled by a blower control board. See FIGURE 10.

On LRP15GE/HP units equipped with ECM motor and a two-stage electronic blower control, the indoor blower is energized by the ignition control.

The variable speed motor that is capable of maintaining a specified CFM throughout the external static range. A particular CFM can be obtained by positioning jumpers (COOL, HEAT, and ADJUST) on the blower control board. The HEAT and COOL jumpers are labeled A, B, C and D. Each of the letters corresponds with an air volume (CFM) setting. The ADJUST jumper is labeled NORM, +, - and Test. The + and - pin settings are used to add or subtract a percentage of the CFM selected. The Test jumper is used to operate the motor in the test mode. See FIGURE 10.

Factory settings for the blower speed jumpers are given in the wiring diagrams in FIGURE 23 (GE) and FIGURE 25 (HP). Use the blower data tables in this manual to determine the correct air volume for operation in heat and cool mode.

The CFM LED located on the blower control board flashes one time per 100 cfm to indicate selected blower speed. For example, if the unit is operating at 1000 CFM, CFM LED will flash 10 times. If the CFM is 1150, CFM LED will flash 11 full times plus one fast or half flash.

At times the light may appear to flicker or glow. This takes place when the control is communicating with the motor between cycles. This is normal operation.

Read through the jumper settings section before adjusting the jumper to obtain the appropriate blower speed.

To change jumper positions, gently pull the jumper off the pins and place it on the desired set of pins. The following section outlines the different jumper selections available and conditions associated with each one. Refer to FIGURE 11.

After the CFM for each application has been determined, the jumper settings must be adjusted to reflect those given in the blower tables. From the tables, determine which row most closely matches the desired CFM. Once a specific row has been chosen (+, NORMAL, or -), CFM volumes from other rows cannot be used. Below are descriptions of the jumper selections.

The variable speed motor slowly ramps up to and down from the selected air flow during both cooling and heating demand. This minimizes noise and eliminates the initial blast of air when the blower is initially energized.

ADJUST

The ADJUST pins allow the motor to run at normal speed, approximately 10 percent higher, or approximately 10 percent lower than normal speed. The blower data tables give three rows (+, NORMAL, and -) with their respective CFM volumes. Notice that the normal adjustment setting for cooling speed position B in LRP15HP24 Blower Performance table is 800 CFM. The + adjustment setting for that position is 880 CFM and the - adjustment setting is 720 CFM. After the adjustment setting has been determined, choose the remaining speed settings from those offered in the table in that row.

The TEST pin is available to bypass the blower control and run the motor at approximately 70 percent to make sure that the motor is operational. This is used mainly in troubleshooting. The G terminal must be energized for the motor to run.

COOL

The **COOL** jumper is used to determine the CFM during cooling operation. This jumper selection is activated for cooling when Y1 is energized. The blower motor runs at 80 percent of the selected air flow for the first 7-1/2 minutes of each cooling demand. This feature allows for greater humidity removal and saves energy. In the cooling mode, the blower control board delays blower operation for 5 seconds after the compressor starts. The blower continues to operate for 90 seconds after the compressor is de-energized.

HEAT

The **HEAT** jumper is used to determine CFM during gas heat operation only. These jumper selections are activated only when W1 is energized. In the heating mode, the blower control board delays blower operation for 30 seconds when W is energized at the thermostat upon call for heat. The blower continues to operate after the gas valve is de-energized for 180 seconds delayed off.

CONTINUOUS FAN

When the thermostat is set for "Continuous Fan" operation and there is no demand for heating or cooling, the blower control will provide 50 percent of the **COOL** CFM selected.

NOTE - With the proper thermostat and subbase, continuous blower operation is possible by closing the R to G circuit. Cooling blower delay is also functional in this mode.

DEHUMIDIFICATION

The blower control board includes an HUM terminal which provides for connection of a humidistat. The JW1 resistor on the blower control board must be cut to activate the HUM terminal. The humidistat must be wired to open on humidity rise. When the dehumidification circuit is used, the variable speed motor will reduce the selected air flow rate by 25 percent when humidity levels are high. An LED (D1) lights when the blower is operating in the dehumidification mode.

NOTE - This unit is not approved for installation as part of a zoning system.

POWER CONNECTOR	
PIN	DESCRIPTION
1	JUMPER PIN 1 TO PIN 2 FOR 120VAC LINE INPUT ONLY "
2	
3	CHASSIS GROUND
4	AC LINE
5	AC LINE

CONTROL CONNECTOR	
PIN	DESCRIPTION
1	C1
2	W/W1
3	C2
4	DELAY
5	COOL
6	Y1
7	ADJUST
8	OUT -
9	O
10	BK/PWM
11	HEAT
12	R
13	EM/W2
14	Y/Y2
15	G
16	OUT +

FIGURE 11

Blower Data – LRP13HP

Model No.	Blower Tap	Air Volume (cfm) at Various External Static Pressures - in. w.g.							
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
LRP13HP24	Tap 1 (Fan Only)	680	590	550	500	450	380	---	---
	Tap 2 (Low Cooling)	890	830	800	760	710	680	640	600
	Tap 3 (High Cooling)	1000	960	930	880	840	810	770	730
	¹ Tap 4 (Low Electric Heat)	890	830	800	760	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	840	810	770	730
LRP13HP30	Tap 1 (Fan Only)	680	640	600	570	530	490	---	---
	Tap 2 (Low Cooling)	1100	1070	1050	1020	990	960	930	900
	Tap 3 (High Cooling)	1180	1160	1130	1090	1070	1040	1010	960
	¹ Tap 4 (Low Electric Heat)	1100	1070	1050	1020	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	1070	1040	1010	960
LRP13HP36	Tap 1 (Fan Only)	860	810	760	710	660	590	550	490
	Tap 2 (Low Cooling)	1300	1265	1235	1200	1165	1125	1015	1040
	Tap 3 (High Cooling)	1475	1450	1420	1375	1345	1310	1275	1190
	¹ Tap 4 (Low Electric Heat)	1300	1265	1235	1200	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	1345	1310	1275	1190
LRP13HP42	Tap 1 (Fan Only)	800	720	640	550	475	390	310	---
	Tap 2 (Low Cooling)	1470	1410	1360	1300	1260	1210	1155	1095
	Tap 3 (High Cooling)	1700	1650	1610	1575	1560	1480	1480	1390
	¹ Tap 4 (Low Electric Heat)	1470	1410	1360	1300	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	1560	1480	1480	1390
LRP13HP48	Tap 1 (Fan Only)	1165	1075	1000	930	850	790	760	670
	Tap 2 (Low Cooling)	1675	1630	1600	1540	1490	1440	1390	1300
	Tap 3 (High Cooling)	1800	1770	1715	1690	1660	1610	1565	1500
	¹ Tap 4 (Low Electric Heat)	1675	1630	1600	1540	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	1660	1610	1565	1500
LRP13HP60	Tap 1 (Fan Only)	1400	1320	1260	1200	1120	1060	980	900
	Tap 2 (Low Cooling)	1920	1870	1820	1770	1720	1670	1450	1360
	Tap 3 (High Cooling)	2240	2200	2140	2100	2060	2020	1980	1950
	¹ Tap 4 (Low Electric Heat)	1920	1870	1820	1770	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	2060	2020	1980	1950

NOTE - All air data is measured external to unit without air filters.

¹ Taps 4 and 5 are used with Optional Electric Heat. Refer to Electric Heat nameplate for proper heat tap selection.

Blower Data – LRP13AC

Model No.	Blower Tap	Air Volume (cfm) at Various External Static Pressures - in. w.g.							
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
LRP13AC24	Tap 1 (Fan Only)	610	560	525	485	430	---	---	---
	Tap 2 (Low Cooling)	820	795	760	720	690	650	615	575
	Tap 3 (High Cooling)	950	920	880	850	820	800	760	720
	¹ Tap 4 (Low Electric Heat)	820	795	760	720	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	820	800	760	720
LRP13AC30	Tap 1 (Fan Only)	850	820	780	745	710	680	630	590
	Tap 2 (Low Cooling)	1040	1000	970	935	900	875	845	815
	Tap 3 (High Cooling)	1175	1145	1115	1080	1050	1015	990	945
	¹ Tap 4 (Low Electric Heat)	1040	1000	970	935	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	1050	1015	990	945
LRP13AC36	Tap 1 (Fan Only)	850	800	750	700	645	600	550	480
	Tap 2 (Low Cooling)	1245	1210	1175	1140	1100	1065	1025	975
	Tap 3 (High Cooling)	1400	1370	1335	1300	1265	1220	1180	1150
	¹ Tap 4 (Low Electric Heat)	1265	1210	1175	1160	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	1265	1220	1180	1150
LRP13AC42	Tap 1 (Fan Only)	800	720	640	550	475	390	310	---
	Tap 2 (Low Cooling)	1470	1410	1360	1300	1260	1210	1155	1095
	Tap 3 (High Cooling)	1700	1650	1610	1575	1540	1480	1430	1390
	¹ Tap 4 (Low Electric Heat)	1630	1410	1360	1300	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	1540	1480	1430	1390
LRP13AC48	Tap 1 (Fan Only)	1145	1075	1000	930	850	790	740	670
	Tap 2 (Low Cooling)	1675	1630	1600	1540	1490	1440	1390	1300
	Tap 3 (High Cooling)	1800	1770	1715	1690	1640	1610	1565	1500
	¹ Tap 4 (Low Electric Heat)	1675	1630	1600	1560	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	1640	1610	1565	1500
LRP13AC60	Tap 1 (Fan Only)	1400	1320	1260	1200	1120	1060	980	900
	Tap 2 (Low Cooling)	1920	1870	1820	1770	1720	1670	1450	1360
	Tap 3 (High Cooling)	2240	2200	2140	2100	2060	2020	1980	1950
	¹ Tap 4 (Low Electric Heat)	1920	1870	1820	1770	---	---	---	---
	¹ Tap 5 (High Electric Heat)	---	---	---	---	2060	2020	1980	1950

NOTE - All air data is measured external to unit without air filters.

¹ Taps 4 and 5 are used with Optional Electric Heat. Refer to Electric Heat nameplate for proper heat tap selection.

Blower Data – LRP13GE / LRP13GX

Model No.	Blower Tap	Air Volume (cfm) at Various External Static Pressures - in. w.g.									
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
LRP13GE24 LRP13GX24	Tap 1 (Fan Only)	610	560	525	485	430	---	---	---	---	---
	Tap 2 (Low Cooling)	820	795	760	720	690	650	615	575	540	470
	Tap 3 (High Cooling)	950	920	880	850	820	800	760	720	680	625
LRP13GE30 LRP13GX30	Tap 1 (Fan Only)	850	820	780	745	710	680	630	590	550	515
	Tap 2 (Low Cooling)	1040	1000	970	935	900	875	845	815	770	735
	Tap 3 (High Cooling)	1175	1145	1115	1080	1050	1015	990	945	900	860
LRP13GE36 LRP13GX36	Tap 1 (Fan Only)	850	800	750	700	645	600	550	480	435	---
	Tap 2 (Low Cooling)	1245	1210	1175	1140	1100	1065	1025	975	920	845
	Tap 3 (High Cooling)	1400	1370	1335	1300	1265	1220	1180	1150	1060	875
LRP13GE42 LRP13GX42	Tap 1 (Fan Only)	800	720	640	550	475	390	310	---	---	---
	Tap 2 (Low Cooling)	1470	1410	1360	1300	1260	1210	1155	1095	1000	940
	Tap 3 (High Cooling)	1700	1650	1610	1575	1540	1480	1430	1390	1340	1210
LRP13GE48 LRP13GX48	Tap 1 (Fan Only)	1145	1075	1000	930	850	790	740	670	570	490
	Tap 2 (Low Cooling)	1675	1630	1600	1540	1490	1440	1390	1300	1230	1125
	Tap 3 (High Cooling)	1800	1770	1715	1690	1640	1610	1565	1500	1460	1380
LRP13GE60 LRP13GX60	Tap 1 (Fan Only)	1400	1320	1260	1200	1120	1060	980	900	---	---
	Tap 2 (Low Cooling)	1920	1870	1820	1770	1720	1670	1450	1360	---	---
	Tap 3 (High Cooling)	2235	2195	2165	2130	2090	2060	2025	1985	1960	1940

NOTE - All air data is measured external to unit without air filters.

Blower Data – LRP13GN

Model No.	Blower Tap		Air Volume (cfm) at Various External Static Pressures - in. w.g.					
			0.1	0.2	0.3	0.4	0.5	0.6
LRP13GN24	Tap 1 (Fan Only)		640	590	545	495	445	385
	Tap 2 Cooling (Low Static)		820	785	750	715	675	635
	Tap 3 Cooling (High Static)		920	880	855	825	790	755
	Tap 4 Heating (Low Static)	CFM	925	890	865	830	795	765
		Rise (°F)	44	46	47	49	51	53
	Tap 5 Heating (High Static)	CFM	1005	970	940	910	880	855
		Rise (°F)	41	42	43	45	46	48
LRP13GN30	Tap 1 (Fan Only)		670	625	580	535	490	440
	Tap 2 Cooling (Low Static)		1020	985	955	920	890	860
	Tap 3 Cooling (High Static)		1125	1090	1055	1025	995	970
	Tap 4 Heating (Low Static)	CFM	935	895	860	835	800	765
		Rise (°F)	44	45	47	49	51	53
	Tap 5 Heating (High Static)	CFM	1020	990	955	925	895	865
		Rise (°F)	40	41	43	44	46	47
LRP13GN36	Tap 1 (Fan Only)		795	745	700	645	590	525
	Tap 2 Cooling (Low Static)		1250	1215	1180	1145	1115	1085
	Tap 3 Cooling (High Static)		1320	1290	1250	1225	1200	1170
	Tap 4 Heating (Low Static)	CFM	935	890	855	815	770	725
		Rise (°F)	44	46	48	50	53	56
	Tap 5 Heating (High Static)	CFM	1050	1010	970	935	895	860
		Rise (°F)	39	40	42	44	46	47
LRP13GN42	Tap 1 (Fan Only)		775	700	615	535	470	390
	Tap 2 Cooling (Low Static)		1460	1420	1380	1340	1300	1255
	Tap 3 Cooling (High Static)		1555	1525	1480	1445	1400	1365
	Tap 4 Heating (Low Static)	CFM	1410	1370	1325	1285	1240	1200
		Rise (°F)	39	40	41	42	44	45
	Tap 5 Heating (High Static)	CFM	1535	1495	1555	1415	1375	1335
		Rise (°F)	35	36	37	38	39	41
LRP13GN48	Tap 1 (Fan Only)		1065	1020	965	910	850	790
	Tap 2 Cooling (Low Static)		1665	1630	1595	1560	1530	1490
	Tap 3 Cooling (High Static)		1740	1705	1670	1635	1595	1545
	Tap 4 Heating (Low Static)	CFM	1405	1370	1325	1290	1245	1205
		Rise (°F)	39	40	41	42	44	45
	Tap 5 Heating (High Static)	CFM	1515	1480	1440	1405	1370	1325
		Rise (°F)	36	37	38	39	40	41
LRP13GN60	Tap 1 (Fan Only)		1240	1190	1125	1060	995	940
	Tap 2 Cooling (Low Static)		1885	1840	1800	1755	1715	1675
	Tap 3 Cooling (High Static)		1955	1915	1870	1835	1790	1760
	Tap 4 Heating (Low Static)	CFM	1420	1365	1315	1265	1215	1155
		Rise (°F)	38	40	41	43	45	47
	Tap 5 Heating (High Static)	CFM	1570	1520	1470	1420	1370	1320
		Rise (°F)	35	36	37	38	40	41

NOTE - All air data is measured external to unit without air filters.

Blower Data – LRP15GE / LRP15GX

LRP15GE24, LRP15GX24 Blower Performance

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

“ADJUST” Jumper Setting	Blower Control Jumper Speed Positions											
	“COOL” Speed - cfm				“HEAT” Speed - cfm				“CONTINUOUS FAN” Speed - cfm			
	A	B	C	D	A	B	C	D	A	B	C	D
+	1100	880	660	440	1100	1000	900	815	550	440	330	220
NORM	1000	800	600	400	1100	1000	900	815	500	400	300	200
—	900	720	540	360	1100	1000	900	815	450	360	270	180

LRP15GE36, LRP15GX36 Blower Performance

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

“ADJUST” Jumper Setting	Blower Control Jumper Speed Positions											
	“COOL” Speed - cfm				“HEAT” Speed - cfm				“CONTINUOUS FAN” Speed - cfm			
	A	B	C	D	A	B	C	D	A	B	C	D
+	1540	1320	1100	880	1400	1200	1100	975	770	660	550	440
NORM	1400	1200	1000	800	1400	1200	1100	975	700	600	500	400
—	1260	1080	900	720	1400	1200	1100	975	630	540	450	360

LRP15GE48, LRP15GX48 Blower Performance

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

“ADJUST” Jumper Setting	Blower Control Jumper Speed Positions											
	“COOL” Speed - cfm				“HEAT” Speed - cfm				“CONTINUOUS FAN” Speed - cfm			
	A	B	C	D	A	B	C	D	A	B	C	D
+	1980	1760	1540	1320	1350	1200	1100	1000	990	880	770	660
NORM	1800	1600	1400	1200	1350	1200	1100	1000	900	800	700	600
—	1620	1440	1260	1080	1350	1200	1100	1000	810	720	630	540

LRP15GE60, LRP15GX60 Blower Performance

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

“ADJUST” Jumper Setting	Blower Control Jumper Speed Positions											
	“COOL” Speed - cfm				“HEAT” Speed - cfm				“CONTINUOUS FAN” Speed - cfm			
	A	B	C	D	A	B	C	D	A	B	C	D
+	2200	1980	1760	1540	1480	1380	1280	1180	1100	990	880	770
NORM	2000	1800	1600	1400	1480	1380	1280	1180	1000	900	800	700
—	1800	1620	1440	1260	1480	1380	1280	1180	900	810	720	630

NOTE - All air data is measured external to unit without air filters.

NOTE - 1st Stage airflow is 70% of 2nd Stage airflow (full capacity) in cooling mode. In heating mode, low stage airflow is optimized for a 40°F temperature rise.

Blower Data – LRP15HP

LRP15HP24 Blower Performance

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

“ADJUST” Jumper Setting	Blower Control Jumper Speed Positions											
	“COOL” Speed - cfm				“HEAT” Speed - cfm				“CONTINUOUS FAN” Speed - cfm			
	A	¹ B	C	D	A	¹ B	C	D	A	B	C	D
+	1100	880	660	440	1150	1035	690	690	550	440	330	220
NORM	1000	800	600	400	1000	900	600	600	500	400	300	200
—	900	720	540	360	1000	900	600	600	450	360	270	180

LRP15HP36 Blower Performance

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

“ADJUST” Jumper Setting	Blower Control Jumper Speed Positions											
	“COOL” Speed - cfm				“HEAT” Speed - cfm				“CONTINUOUS FAN” Speed - cfm			
	A	¹ B	C	D	A	¹ B	C	D	A	B	C	D
+	1430	1320	1100	880	1495	1380	1150	1150	715	660	550	440
NORM	1300	1200	1000	800	1300	1250	1000	1000	650	600	500	400
—	1170	1080	900	720	1300	1200	1000	1000	585	540	450	360

LRP15HP48 Blower Performance

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

“ADJUST” Jumper Setting	Blower Control Jumper Speed Positions											
	“COOL” Speed - cfm				“HEAT” Speed - cfm				“CONTINUOUS FAN” Speed - cfm			
	A	¹ B	C	D	A	¹ B	C	D	A	B	C	D
+	1980	1760	1540	1320	2070	1840	1610	1610	990	880	770	660
NORM	1800	1600	1400	1200	1800	1600	1400	1400	900	800	700	600
—	1620	1440	1260	1080	1800	1600	1400	1400	810	720	630	540

LRP15HP60 Blower Performance

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

“ADJUST” Jumper Setting	Blower Control Jumper Speed Positions											
	“COOL” Speed - cfm				“HEAT” Speed - cfm				“CONTINUOUS FAN” Speed - cfm			
	A	¹ B	C	D	A	¹ B	C	D	A	B	C	D
+	2200	1980	1760	1540	2300	2070	1840	1840	1100	990	880	770
NORM	2000	1800	1600	1400	2000	1800	1600	1600	1000	900	800	700
—	1800	1620	1440	1260	2000	1800	1600	1600	900	810	720	630

¹ Factory Settings.

NOTE - All air data is measured external to unit without air filters.

NOTE - 1st Stage airflow is 70% of 2nd Stage airflow (full capacity) in cooling mode.

DEFROST CONTROL CMC1

NOTE - For geographic areas that experience low temperature and high humidity conditions (below 32°F and above 80% RH), the defrost timer pin must be field set at installation to a 60 or 30 minute defrost interval in order to ensure reliable system operation while in heating mode.

LRP13HP and LRP15HP units are equipped with a defrost control that includes the combined functions of time/ temperature defrost control, defrost relay, diagnostic LEDs and a low voltage terminal strip. See FIGURE 12.

The control provides automatic switching from call for heating to defrost mode and back. During the compressor cycle (call for defrost), the control accumulates compressor run time at 30, 60 or 90-minute field-adjustable intervals. If the defrost thermostat is closed when the selected compressor run time interval ends, the defrost relay is energized and the defrost begins.

The defrost timing is factory set to provide a 30-minute defrost interval. If the timing selector jumper is not in place, the control defaults to a 90-minute defrost interval. The maximum defrost period is 14 minutes and is not adjustable. See FIGURE 12 for the location of the defrost interval timing pins.

A test option is provided for troubleshooting. The test mode may be started any time the unit is in the heating mode and the defrost thermostat is closed or jumpered. If the jumper is in the TEST position at power up, the control will ignore the test pins. When the jumper is placed across the TEST pins for 2 seconds, the control will enter the defrost mode. If the jumper is removed before an additional 5-second period has elapsed (7 seconds total), the unit will remain in defrost mode until the defrost thermostat opens or 14 minutes have passed. If the jumper is not removed until after the additional 5-second period has elapsed, the defrost will terminate and the test option will not function again until the jumper is removed and reapplied.

NOTE - On early defrost controls, the defrost timing jumper must be in the 90-minute defrost interval before testing the defrost mode or the control will not enter defrost test mode.

The defrost control includes a compressor delay function which cycles the compressor off for 30 seconds while going into and coming out of the defrost cycle. This function is activated when the jumper is removed from the compressor delay pins.

NOTE - The 30-second compressor delay is not functional when the TEST pins are jumpered.

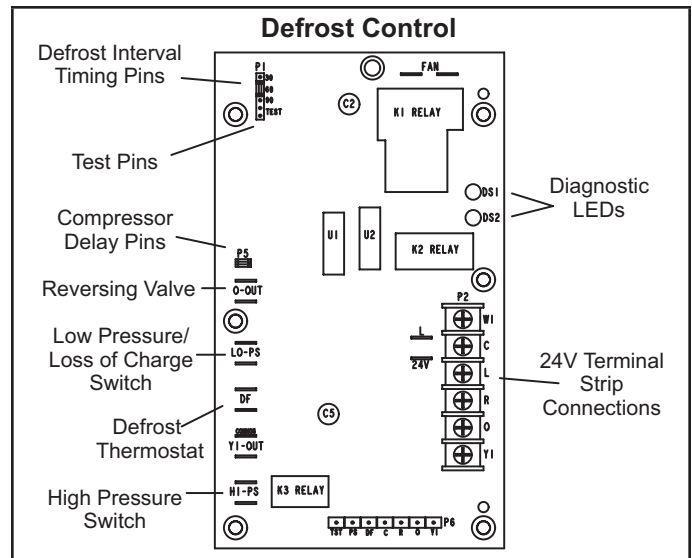


FIGURE 12

The defrost thermostat (S6) is located on the outdoor coil, near the bottom of the coil, affixed to the 3/8" stub. When the defrost thermostat senses a coil temperature of 42°F or cooler, the thermostat contacts close and send a signal to the defrost control to begin the defrost timing. The defrost thermostat also terminates the defrost when the coil distributor tube temperature warms to 70°F. The defrost control includes **HI-PS** and **LO-PS** terminals to receive signals from the unit high pressure switch and loss of charge switch.

During a single demand cycle, the defrost control locks out compressor operation after the fifth time that the circuit is interrupted by any pressure switch wired to the control. In addition, the diagnostic LEDs indicate a locked-out pressure switch after the fifth open pressure switch occurrence. Compressor operation remains locked out until power to the control is interrupted, then re-established, or until the jumper is applied to the TEST pins for 0.5 seconds.

NOTE - The defrost control ignores input from the loss of charge switch terminals as follows:

During the test mode;

During the defrost cycle;

During the 90-second start-up period;

During the first 90 seconds following a reversing valve switch between the heating and cooling modes.

EXCEPTION – If the TEST pins are jumpered and the 5-minute delay is being bypassed, the LO-PS terminal signal is not ignored during the 90-second start-up period.

The defrost control includes two diagnostic LEDs. LED codes indicate operating status. The diagnostics codes are given in TABLE 4.

Defrost System

Demand Defrost System

The demand defrost system measures differential temperatures to detect when the system is performing poorly because of ice build-up on the outdoor coil. The system “self-calibrates” when the defrost system starts and after each system defrost cycle. The demand defrost components on the control board are listed below. **NOTE:** *The demand defrost system accurately measures the performance of the system as frost accumulates on the outdoor coil. This typically will translate into longer running time between defrost cycles as more frost accumulates on the outdoor coil before the board initiates defrost cycles.*

Defrost System Sensors

Time & Temperature sensors can be located on liquid line between TXV and distributor tubes. See FIGURE 13.

Sensors connect to the defrost board through a field-replaceable harness assembly that plugs into the board. Through the sensors, the board detects outdoor ambient and coil fault conditions. As the detected temperature changes, the resistance across the sensor changes. Sensor resistance values can be checked by ohming across pins.

NOTE: *When checking the ohms across a sensor, be aware that a sensor showing a resistance value that is not within the range shown, may be performing as designed. However, if a shorted or open circuit is detected, then the sensor may be faulty and the sensor harness will need to be replaced.*

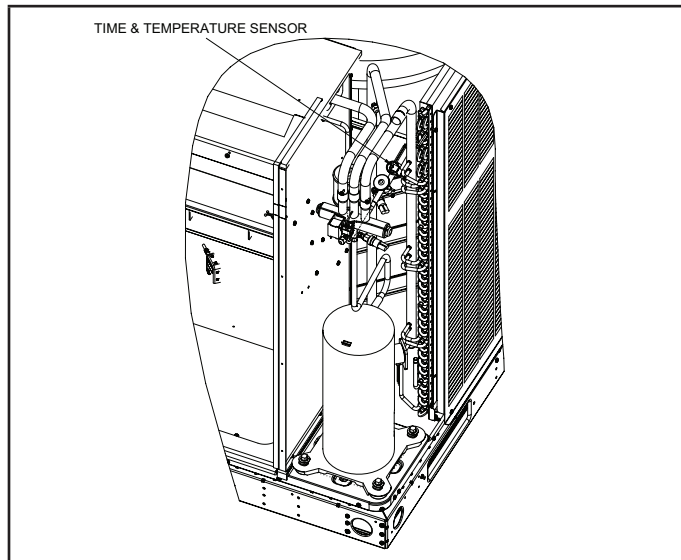


FIGURE 13

TABLE 3. Sensor Temp. / Resistance Range

Sensor	Temperature Range °F (°C)	Red LED (DS1)	Pins / Wire Color
Outdoor (ambient)	-35 (-37) to 120 (48)	280,000 to 3750	3 & 4 (black)
Coil	-35 (-37) to 120 (48)	280,000 to 3750	5 & 6 (brown)

NOTE: Sensor resistance decreases as sensed temperature increases.

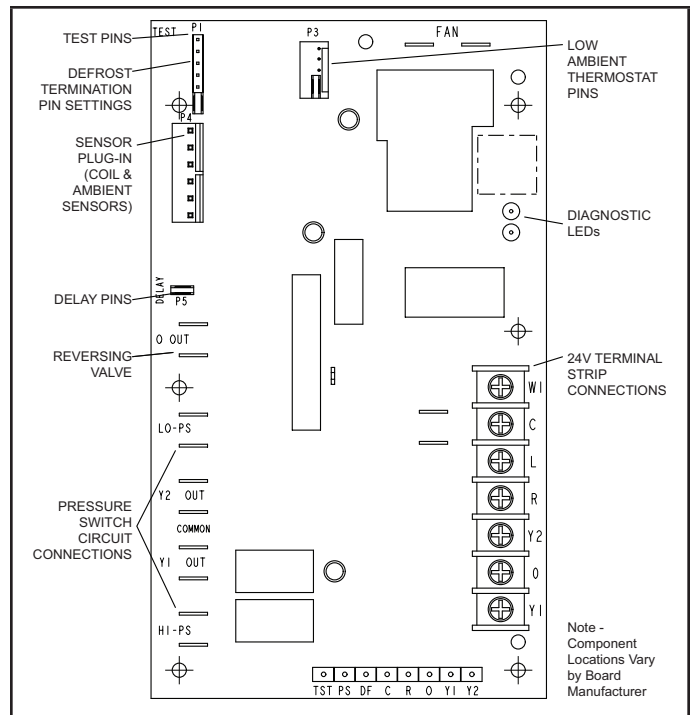


FIGURE 14. Demand Defrost Control Board
(2-Ton LRP13HP and LRP15HP Units)

Coil Sensor

The coil temperature sensor considers outdoor temperatures below -35°F (-37°C) or above 120°F (48°C) as a fault. If the coil temperature sensor is detected as being open, shorted or out of the temperature range of the sensor, the board will not perform demand or time/temperature defrost operation and will display the appropriate fault code. Heating and cooling operation will be allowed in this fault condition.

NOTE: *The coil temperature probe is designed with a spring clip to allow mounting to the outside coil tubing. Coil sensor location is important for proper defrost operation*

Demand Defrost Sensor

The demand defrost sensor considers outdoor temperatures below -35°F (-37°C) or above 120°F (48°C) as a fault. The sensor is located on the defrost board. If the ambient sensor is detected as being open, shorted or out of the temperature range of the sensor, the board will not perform demand defrost operation. The board will revert to time/temperature defrost operation and will display the appropriate fault code. Heating and cooling operation will be allowed in this fault condition.

NOTE: *Within a single room thermostat demand, if 5-strikes occur, the board will lockout the unit. Control board 24 volt power “R” must be cycled “OFF” or the “TEST” pins on board must be shorted between 1 to 2 seconds to reset the board.*

Defrost Temperature Termination Shunt (Jumper) Pins

The defrost board selections are: 50, 70, 90, and 100°F (10, 21, 32 and 38°C). The shunt termination pin is factory set at 50°F (10°C). If the temperature shunt is not installed, the default termination temperature is 90°F (32°C).

Delay Mode

The defrost system has a field-selectable function to reduce occasional sounds that may occur while the unit is cycling in and out of the defrost mode. When a jumper is installed on the DELAY pins, the compressor will be cycled off for 30 seconds going in and out of the defrost mode. Units are shipped with jumper installed on DELAY pins.

NOTE: *The 30 second compressor delay feature (known as the quiet shift) **must** be deactivated during any unit performance testing. The feature is deactivated by removing the jumper located on the compressor delay pins on the control board mounted inside the unit control box. This feature is optional for the homeowner, but may impact testing performance.*

Defrost Operation

The defrost control system has three basic operational modes: normal, calibration, and defrost.

- **Normal Mode**—The demand defrost system monitors the O line, to determine the system operating mode (heat/cool), outdoor ambient temperature, coil temperature (outdoor coil) and compressor run time to determine when a defrost cycle is required.
- **Calibration Mode** – The board is considered uncalibrated when power is applied to the board, after cool mode operation, or if the coil temperature exceeds the termination temperature when it is in heat mode.

Calibration of the board occurs after a defrost cycle to ensure that there is no ice on the coil. During calibration, the temperature of both the coil and the ambient sensor are measured to establish the temperature differential which is required to allow a defrost cycle.
- **Defrost Mode** – The following paragraphs provide a detailed description of the defrost system operation.

Defrost Cycles

The control board initiates a defrost cycle based on either frost detection or time.

- **Frost Detection**—If the compressor runs longer than 30 minutes and the actual difference between the clear coil and frosted coil temperatures exceeds the maximum difference allowed by the control, a defrost cycle will be initiated.

IMPORTANT - *The control board will allow a greater accumulation of frost and will initiate fewer defrost cycles than a time/ temperature defrost system.*

- **Time**—If 6 hours of heating mode compressor run time has elapsed since the last defrost cycle while the coil temperature remains below 35°F (2°C), the control board will initiate a defrost cycle.

Actuation

When the reversing valve is de-energized, the Y1 circuit is energized, and the coil temperature is below 35°F (2°C), the board logs the compressor run time. If the board is not calibrated, a defrost cycle will be initiated after 30 minutes of heating mode compressor run time. The control will attempt to self-calibrate after this (and all other) defrost cycle(s).

Calibration success depends on stable system temperatures during the 20-minute calibration period. If the board fails to calibrate, another defrost cycle will be initiated after 45 minutes of heating mode compressor run time. Once the control board is calibrated, it initiates a demand defrost cycle when the difference between the clear coil and frosted coil temperatures exceeds the maximum difference allowed by the control OR after 6 hours of heating mode compressor run time has been logged since the last defrost cycle.

NOTE: *If ambient or coil fault is detected, the board will not execute the "TEST" mode.*

Termination

The defrost cycle ends when the coil temperature exceeds the termination temperature or after 14 minutes of defrost operation. If the defrost is terminated by the 14-minute timer, another defrost cycle will be initiated after 30 minutes of run time.

5-Strike Lockout Feature

The internal control logic of the board counts the pressure switch trips only while the Y1 (Input) line is active. If a pressure switch opens and closes four times during a Y1 (Input), the control logic will reset the pressure switch trip counter to zero at the end of the Y1 (Input). If the pressure switch opens for a fifth time during the current Y1 (Input), the control will enter a lockout condition. The 5-strike pressure switch lockout condition can be reset by cycling OFF the 24-volt power to the control board or by shorting the TEST pins between 1 and 2 seconds. All timer functions (run times) will also be reset.

If a pressure switch opens while the Y1 Out line is engaged, a 5-minute short cycle will occur after the switch closes.

Nominal Defrost Time Selection Input

(Replaces High Stage Lock-In Temperature Selection Input) [BE1].

The nominal defrost time selection input is provided by the position of a selection shunt on the 0.100" P3 header. If the nominal defrost time shunt is not installed, the default nominal defrost time shall be 140 seconds. The controls shall be provided from the factory with the shunt installed in the 140 position. The nominal defrost time selection is used as the value for the Nom_def_time variable.

Position Definitions for P3 Header

- Connecting P3-1 and P3-2 will set the nominal defrost time to 140 seconds.
- Connecting P3-2 and P3-3 will set the nominal defrost time to 100 seconds.
- Connecting P3-3 and P3-4 will set the nominal defrost time to 60 seconds.
- Connecting P3-4 and P3-5 will set the nominal defrost time to 165 seconds.

[BE1] Modifying the function of the shunt on the P3 header to select the nominal defrost time. The high stage lock-in function is not needed for this unit since it is only single stage.

Diagnostic LEDs

The defrost board uses two LEDs for diagnostics. The LEDs flash a specific sequence according to the condition as shown in TABLE 4.

TABLE 4
Defrost Control Diagnostic LEDs

Mode	Green LED (DS2)	Red LED (DS1)
No Power to Control	OFF	OFF
Normal Operation / Power to Control	Simultaneous Slow Flash	
Anti-Short Cycle Lockout	Alternating Slow Flash	
Low Pressure Switch Fault	OFF	Slow Flash
Low Pressure Switch Lockout	OFF	ON
High Pressure Switch Fault	Slow Flash	OFF
High Pressure Switch Lockout	ON	OFF

BLOWER COMPARTMENT

Access panels can easily be removed for service.

Blower Wheel

Blower wheel size varies between models. See SPECIFICATIONS.

⚠ WARNING

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.

REFRIGERATION COMPONENTS

Compressor B1 – LRP13 Units

LRP13GE/GN and LRP13AC (-024 and -030 models) utilize a rotary compressor. All other LRP13 models utilize a scroll compressor. Compressors are energized by the K1 contactor found in the unit control box. Compressor specifications are found in the “ELECTRICAL DATA” section in this manual.

Compressor B1 – LRP15GE/HP Units

All LRP15GE units utilize a two-stage Copeland scroll compressor. Compressors are energized by the K1 contactor found in the unit control box. Compressor specifications are found in the “ELECTRICAL DATA” section in this manual.

WARNING

Electrical shock hazard. Compressor must be grounded. Do not operate without protective cover over terminals. Disconnect power before removing protective cover. Discharge capacitors before servicing unit. Failure to follow these precautions could cause electrical shock resulting in injury or death.

Condenser Fan B4 / Fan Motor B3 – LRP13 Units

LRP13 series units are equipped with a constant torque blower motor. The constant torque motor is capable of maintaining a specified CFM throughout the external static range. Indoor fans are equipped with a permanent magnet constant torque motor. These motors remain energized and are controlled by 24V signals. For high static applications, use Tap 3 for cooling speed and Tap 5 for heating speed.

All LRP13 series units use single phase condenser fan motors. Specifications for the condenser fans are at the front of this manual. See FIGURE 15 for fan and motor replacement dimensions.

Condenser Fan B4 / Fan Motor B3 – LRP15GE/HP Units

LRP15GE/HP units are equipped with a variable-speed direct-drive blower operated by a variable-speed ECM motor. The ECM motor maintains a specified air volume from 0 through 0.80 in. w.g. static range.

All LRP15GE/HP units use single phase condenser fan motors. Specifications for the condenser fans are at the front of this manual. See FIGURE 15 for fan and motor replacement dimensions.

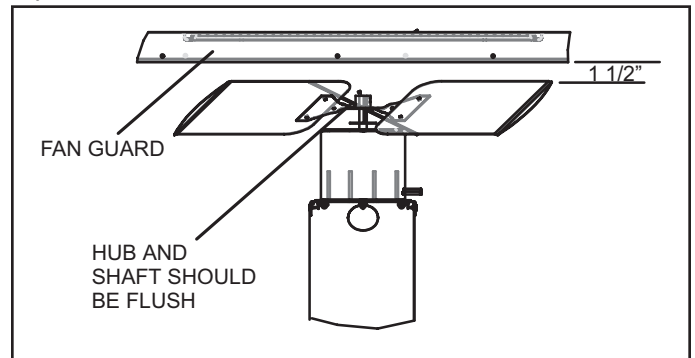


FIGURE 15

Reversing Valve L1

Reversing valve L1 has a 24 volt solenoid coil which reverses refrigerant flow during unit operation in all LRP13HP and LRP15HP units. The reversing valve is in the refrigerant circuit vapor line. The reversing valve coil is energized during cooling demand and during defrost.

Low Pressure Switch S79 (LRP13GE, AC, LRP15GE Units)

S79 is a N.C. auto-reset low pressure switch located on the suction line. The switch shuts off the compressor when suction pressure falls below the factory setting. The switch is ignored during the first 90 seconds of compressor start up and during defrost operation. On the LRP13/15 series units, the switch is set to open at 25 ± 5 psi and close at 40 ± 5 psi. S79 is not adjustable.

Loss of Charge Pressure Switch S79 (LRP13HP-02 – LRP15HP Units)

The low pressure switch is an auto-reset N.C. switch that opens on pressure drop. The switch is wired into the defrost board low pressure terminals and is located on the liquid (high pressure) line. When suction pressure drops to 40 psig (275.8 kPa) the switch opens and the compressor is de-energized. When suction pressure rises to 90 psig (620.5 kPa) the pressure switch will close.

High Pressure Switch S4

S4 is a N.C. auto-reset high pressure switch located on the discharge line. The switch shuts off the compressor when discharge pressure rises above the factory setting. The switch on LRP13/15 series units is set to open at $590 + 10$ psi and close at $418 + 10$ psi. S4 is not adjustable.

Float Switch

A float switch is included with the downflow kit or can be ordered as an accessory (float switch is factory installed on the LRP15 series). The float switch is designed to prevent condensate water from overflowing the condensate pan due to a restriction in the condensate drain line. The float switch is field-installed in the condensate drain pan near the drain exit (float switch is factory installed on the LRP15 series). Refer to the installation instruction for the float switch kit or the downflow kit for location and cutting of the red wire located in the blower compartment.

Refrigerant Leak Detection System

This unit is equipped with a Refrigerant Leak Detection System. The system consists of the RDS Non-Communicating Blower Control Board (RDSC) in the control compartment and a R454B Refrigerant Sensor near the coil. The Modes of Operation for the RDS Non-Communicating Blower Control Board are Initializing, Normal, Leak Detected, and Fault.

MODES OF OPERATION

Initializing

The RDS Non-Communicating Blower Control Board is establishing connection with the refrigerant detection sensor and sensor is “warming up”.

Normal

The HVAC system is functioning normally, i.e.,

responding to thermostat demand signals. The RDS Non-Communicating Blower Control Board has not detected a refrigerant leak.

Leak Detected (Mitigation)

When the RDS Non-Communicating Blower Control Board detects a refrigerant leak:

- 1 - The RDS Non-Communicating Blower Control Board shuts off the (R) output (24VAC power) to the thermostat, which de-energizes the outdoor unit compressor and heat sources, such as gas and/or electric strip heat. No heating or cooling demands will be met.
- 2 - The RDS Non-Communicating Blower Control Board activates the blower ventilation speed (G). The blower purges refrigerant from the cabinet, plenum, and ductwork.
- 3 - After the RDS Non-Communicating Blower Control Board determines the refrigerant levels are below the safety threshold, the blower will continue to function for an additional seven (7) minutes.
- 4 - After the blower sequence is complete, the HVAC system resumes normal operation.

NOTE - The HVAC system may not maintain a cooling or heating setpoint if a significant leak exists. Any refrigerant leaks that remain unaddressed for an extended time may cause the HVAC system to shut down on a low refrigerant pressure limit condition.

Fault/Service

When a fault is detected within the RDS Non-Communicating Blower Control Board, the indoor blower engages and remains engaged at a constant output until the fault is cleared.

DIAGNOSTIC CODES / TROUBLESHOOTING

The RDS Non-Communicating Blower Control Board is equipped with a multicolor LED. The LED signals the operational state of the RDS Non-Communicating Blower Control Board. To review the operational states, refer to TABLE 5, LED Operational Modes / Troubleshooting, for details.

Red diagnostic codes indicate a specific RDS Non-Communicating Blower Control Board issue. To determine the issue and possible troubleshooting actions, refer to TABLE 6, Red LED Diagnostic Codes / Troubleshooting.

The RDS Non-Communicating Blower Control Board is equipped with a Test/Reset button. The Test button can be used to complete several functions, depending on the mode of operation of the RDS Non-Communicating Blower Control Board. TABLE 7 lists the functions of the Test button during each mode of operation.

TABLE 5

LED Operational Modes / Troubleshooting

Operating Mode	LED Status	Action
Initializing	Flashing green	None
Monitoring	Solid green*	None
Mitigation (Leak Detected)	Flashing blue	Check coil tubes for leak. Repair the issue and restart the equipment.
Fault / Service	Solid blue, interrupted by red flash code	Refer to table for troubleshooting guidance.

*Solid green interrupted by a blue flash indicates the mitigation process has previously occurred.

TABLE 6**Red LED Diagnostic Codes / Troubleshooting**

Red Wink	Applies to Individual Sensor(s)	Issue	Action
1	Yes	RDS Sensor Fault	Replace sensor
2	No	VFD alarm / Drain pan overflow	Check VFD for alarms, remedy alarms present. If float switch is installed, verify proper switch mounting location, depth in pan, unobstructed condensate drain line; correct as needed.
3	Yes	Incompatible sensor installed	Replace sensor
4	Yes	Sensor communication issue	Check sensor connection. Ensure connection is clean and tight
5	No	R-input not available	Check for 24VAC power connected to thermostat R terminal on the RDSC. 24VAC power should only be provided at A194-R quick connection for the RDSC to function.
6	No	Invalid configuration of sensor count	Not applicable

TABLE 7**Test Button Functions**

Operation Mode	Press the Test button to...	Press	Action
Monitoring	Trigger a leak detection response. Verify all equipment is wired correctly into the RDSC (after installation).	Short	Clear purge-counter if prior mitigation has occurred; test mitigation.
		Long	Reset control.
Mitigating (Leak Detected)	Reset the RDSC to a normal mode of operation after a previous leak has been detected and purged from the HVAC system.	Short	If testing mitigation, end test.
Fault/Service	Reset the RDSC after troubleshooting and resolving a fault condition. If the fault is not resolved, the RDSC will enter the Fault mode again.	Short	Reevaluate fault condition - if cleared, return to monitoring, otherwise update indicator.
		Long	Reset control.

RDS SENSORS

Units are equipped with factory-installed RDS Sensors located on different points on the unit. The RDS sensors provide the Unit Controller with continuous readings for leaked refrigerant concentration levels and sensor health status (Good or Fault). These readings are used to modify unit operation to disperse the leaked refrigerant and to remove possible ignition sources. In addition, the Unit Controller uses these readings to initiate alarms to alert the operator of a refrigerant leak or faulty sensor(s).

SENSOR MAINTENANCE

It is recommended to check the state of the sensor every 6 months, at the beginning of each cooling and heating season.

- Check that the sensor cable is in good condition.
- Ensure that the sensor opening is clear and free of debris.
 - DO NOT use abrasive cleaning solutions or detergents to clean sensor opening.
 - DO NOT use flammable compressed air solutions to clean the sensor opening.
 - DO NOT vacuum sensor inlet opening, as this could cause damage to the sensor internal components.
- Replace sensor if the opening is not clean or free of debris.

NOTE - When cleaning the evaporator coil, remove the sensor from the coil. Recommended method is removal of bracket with sensor attached.

See FIGURE 16 for an example of a clear, unobstructed sensor inlet.

**FIGURE 16**

ELECTRIC HEAT

Matchups and Ratings

Matchups and ratings are listed with “ELECTRICAL DATA”.

Electric Heat Components

See FIGURE 17 for electric heat parts arrangement.

Limit Switches 1, 2, 3 and 4

Limit switches 1, 2, 3 and 4 are N.C. auto-reset high temperature limits located on the electric heat vest panel. Each heating element is wired in series with a high temperature limit. When the limit opens, the corresponding heating element is de-energized. All other heating elements remain energized. The limits will automatically close when temperatures return to normal. Limit rating will be on front side.

Heating Element HE1 through HE4

Heating elements are composed of helix-wound bare nichrome wire exposed directly to the air stream. The elements are supported by insulators mounted to the wire frame. Each element is energized independently by a corresponding relay located on the heat vest panel. Once energized, heat transfer is instantaneous.

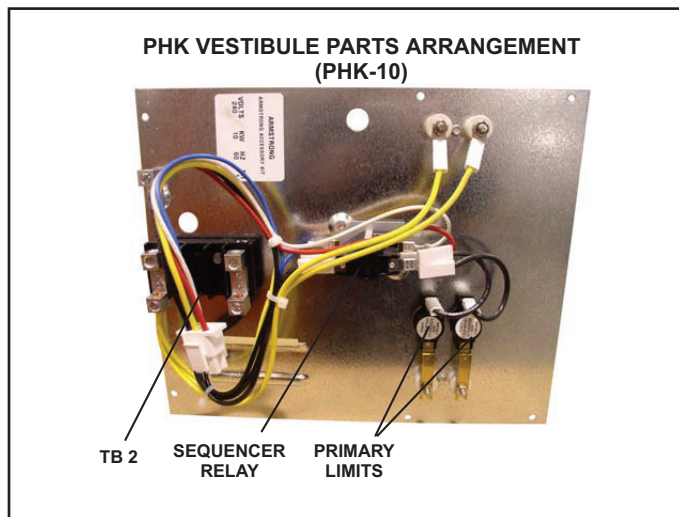


FIGURE 17

Terminal Strip TB2 PHK-05, -07, -10

All heating elements require either a second-line voltage power source or the use of the single-point power connection kit. For electric heat sections without circuit breakers or fuses, line voltage connections are made to terminal strip TB2.

Sequencer Relays 1 and 2

Relays 1 and 2 are N.O. sequencer relays with a resistive element for a coil and bi-metal disk which actuates the contacts. The relays are located on the electric heat vest panel and are energized by a 24V heating demand (W1 and W2) via jack/plug P2 which is used to connect electric heat to the blower control circuit. When energized, the internal resistance heats the bi-metal disk causing the contacts to close. When the relay is de-energized the disk cools and the contacts open. The relays energize different stages of heat, as well as the blower. The blower is always first on and last off. **NOTE** - As of 2015, all electric heaters must be equipped with a second relay to break the line voltage on the return side so that a path for the

electrical voltage is broken on both sides if an element goes to ground.

Circuit Breaker CB1 and CB2 (option) PHK-15, -20

Line voltage connections are made to circuit breakers CB1 and CB2 in electric heat sections with circuit breakers. TABLE 8 shows amp rating for each circuit breaker used. Twopole circuit breakers are used.

TABLE 8

Circuit Breakers		
UNIT	CB1 AMPS	CB2 AMPS
PHK15CP	60 AMPS	30 AMPS
PHK20CP	60 AMPS	60 AMPS

GAS HEAT

Gas Valve (GV1) LRP15GE Units

The LRP15GE uses a gas valve manufactured by White-Rodgers. The valve is two-stage internally redundant to assure safety shut off. If the valve must be replaced the same type valve must be used. The valve can be converted to LP (see options gas specifications for LP kit) and is adjustable on both high and low fire.

24VAC and gas control knob / switch are located on top of the valve. Terminals on the gas valve are connected to wires from the ignition control (A3). Inlet and outlet taps are located on the valve.

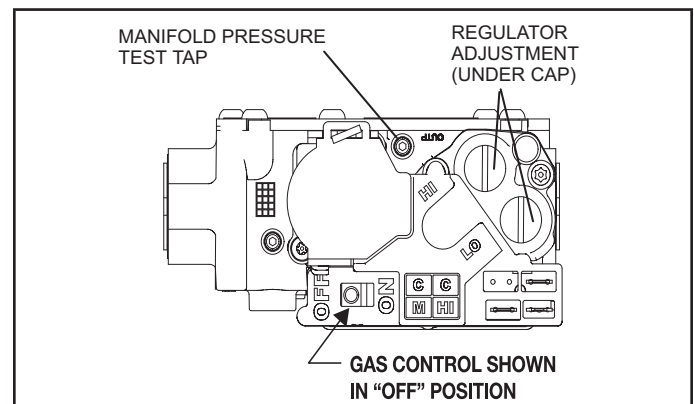


FIGURE 18

Control System Diagnostics

LED Status	Flashing Rate	Fault Description
Slow Flash	One flash per second	Normal operation: No call for heat
Fast Flash	Two flashes per second	Normal operation: Call for heat
2 Flash	Two flashes in 1 second with 1-second pause	System lockout: Failed to detect or sustain flame
3 Flash	Three flashes in 1.5 seconds with 1-second pause	Pressure switch senses incorrect pressure or gas valve coil is open
4 Flash	Four flashes in 2 seconds with 1-second pause	High limit or rollout switch open
5 Flash	Five flashes in 2.5 seconds with 1-second pause	Flame sensed and gas valve not energized
Steady	—	Internal failure: Micro-controller failure; self-check

TABLE 9. Fault Codes

CHARGING

 **CAUTION**

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

For maximum performance of the cooling system, the operating temperatures and pressure should be checked and subcooling determined at Standard ARI test conditions of 82° F outdoor temperature / 80° F indoor dry bulb / 67° F indoor wet bulb.

For maximum performance of the heat pump, the operating temperatures and pressure should be checked and subcooling determined at Standard ARI test conditions of 47° F outdoor temperature / 70° F indoor dry bulb.

If subcooling measurement deviates, refrigerant charge should be adjusted accordingly for maximum performance.

TABLE 10

AC Unit Cooling System Performance Values - LRP13		
Model	Suction Superheat + / - 3°	Liquid Subcooling + / - 2°
2 Ton	13	
2.5 Ton	15	
3 Ton	15	
3.5 Ton	13	
4 Ton	14	
5 Ton	16	
Based on outdoor ambient temperature of 82° F and indoor entering air of 80° F db, 67° F wb.		

TABLE 11

Heat Pump Cooling System Performance Values - LRP13HP / LRP15HP		
Model	Suction Superheat + / - 3°	Liquid Subcooling + / - 2°
2 Ton	17	
2.5 Ton	15	
3 Ton		8
3.5 Ton	17	
4 Ton	17	
5 Ton		11
Based on outdoor ambient temperature of 82° F and indoor entering air of 80° F db, 67° F wb.		

TABLE 12

Heat Pump Heating System Performance Values - LRP13HP / LRP15HP	
Model	Liquid Subcooling + / - 2°
2 Ton	27
2.5 Ton	10
3 Ton	11
3.5 Ton	34
4 Ton	39
5 Ton	46
Based on outdoor ambient temperature of 47° F and indoor entering air of 70° F db.	

TABLE 13

Unit Cooling System Performance Values - LRP15GE	
Model	Liquid Subcooling + / - 3°
2 Ton	9
3 Ton	10
4 Ton	7
5 Ton	11
Based on outdoor ambient temperature of 82° F and indoor entering air of 80° F db, 67° F wb.	

MAINTENANCE

The heating and air conditioning system should be inspected and maintained twice each year (before the start of the cooling and heating seasons) by a licensed professional HVAC technician. The technician is expected to check the following items. **These checks may only be conducted by a licensed professional HVAC technician.**

- 1 - Inspect component wiring for loose, worn or damaged connections. Check for any rubbing or pinching of wires. Confirm proper voltage plus amperage of outdoor unit.
- 2 - Check the cleanliness of fan and blade condition (cracks) and clean or replace them, if necessary.
- 3 - Inspect drain pan for debris and clean as necessary.
- 4 - Inspect the condition of refrigerant piping and confirm that pipes are not rubbing copper-to-copper. Also, check the condition of the insulation on the refrigerant lines. Repair, correct, or replace as necessary.

- 3 - Test capacitor. Replace as necessary.
- 4 - Inspect contactor contacts for pitting or burn marks. Replace as necessary.
- 5 - Check fan motor for worn bearings/bushings. Replace as necessary.
- 6 - Inspect and clean coils, if necessary and note any damage to coils or signs of leakage.

Filters

- 1 - Internal filter kits containing filter rails for 1 in. thick filters are available. Filters are not provided and must be field supplied. A filter is required, whether installed in the unit, in the ductwork or behind a filter grill in the conditioned area.

NOTE - If PCO is installed, an internal filter kit is not recommended.

- 2 - Filters should be inspected monthly. Replace disposable filters or clean permanent-type filters as necessary. Dirty filters are the most common cause of inadequate heating or cooling performance. Replace existing filter with a filter of like type and size. **DO NOT** replace a permanent-type filter with a disposable filter. Install new/clean filters with the arrows on the side pointing in the direction of airflow.

Healthy Climate® Photocatalytic Oxidation (PCO) Air Purification Accessory (LRP15 Series Only)

- 1 - The Healthy Climate® PCO cartridge and UVA lamp require annual replacement. An annual maintenance kit is available that includes the PCO cartridge and UVA lamp. More frequent replacement may be required in applications with heavier dust or dirt loads or in applications where a lower MERV filter is installed before the Healthy Climate® PCO cartridge. The field supplied filter should be changed at least annually, or according to the manufacturers recommended replacement cycle.

General System Test with System Operating

- 1 - Perform a general system test. Turn on the air conditioner to check operating functions such as the startup and shutoff operation. Check for unusual noises or odors, and measure indoor/outdoor temperatures and system pressures as needed. Check the refrigerant charge per the charging sticker information on the unit.
- 2 - Refer to the nameplate to determine the correct temperature rise for all gas units (GE / DF).
- 3 - Verify that system total static pressure and airflow settings are within specific operating parameters.
- 4 - Verify correct temperature drop across indoor coil.

POST START-UP CHECKLIST (GAS)

After the control circuit has been energized and the heating section is operating, make the following checks:

- 1 - Use soap solution to check for gas leaks in the unit piping as well as the supply piping.
- 2 - Check the supply gas pressure. It must be within the limits shown on rating nameplate. Supply pressure

5 - should be checked with all gas appliances in the building at full fire. At no time should the supply gas pressure exceed 10.5 inches w.c., nor drop below 5.0 inches w.c. for natural gas units. For propane gas, supply gas pressure should not drop below 11 inches w.c. If gas pressure is outside these limits, contact your gas supplier for corrective action.

6 - Check for correct manifold gas pressures. See Check and Adjust Manifold Pressure.

7 - Adjust temperature rise to the range specified on the rating plate.

Check and Adjust Manifold Pressure

After line pressure has been checked and adjusted, check manifold pressure. Refer to FIGURE 19 for location of manifold pressure adjustment screw and pressure tap outlet.

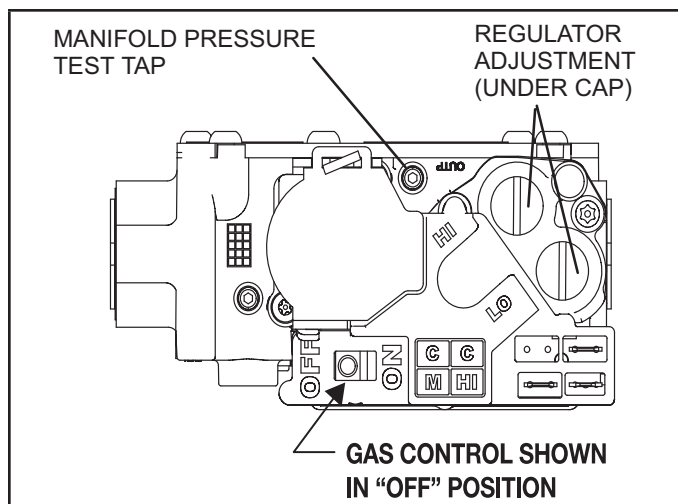


FIGURE 19

The gas valve is factory set and should not require adjustment. See the table below for pressures. The gas valve should completely and immediately cycle off in the event of gas or power failure. The manual shut-off knob or switch can be used to immediately shut off gas supply.

Manifold Pressure " w.c.		
1st Stage Heat	Natural	2.0 ± 0.3
	LP	5.6 ± 0.3
2nd Stage Heat	Natural	3.5 ± 0.3
	LP	10.0 ± 0.5

! 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.

- 1 - Connect a test gauge to the outlet pressure tap on the gas valve. Start the unit and allow five minutes for the unit to reach steady state.
- 2 - While waiting for the unit to stabilize, notice the flame. The flame should be stable without flashback and should not lift from the burner head. Natural gas should burn blue. L.P. gas should burn mostly

- 3 - After allowing the unit to stabilize for five minutes, record the manifold pressure.
- 4 - Disconnect heating demand as soon as an accurate reading has been obtained.

Proper Gas Flow (Approximate)

Final first-stage and second-stage manifold pressures must be within the allowable ranges for the gas being used. For Natural Gas: Check the furnace rate by observing gas meter, making sure all other gas appliances are turned off. The test hand on the meter should be timed for at least one revolution. Note the number of seconds for one revolution.

$$\text{BTU/HR} = \text{Cubic Feet Per Revolution} \times 3600 \times \text{Heating Value}$$

INPUT No. Seconds Per Revolution

The heating value of your gas can be obtained from your local utility.

For LP/Propane Gas: The only check for the output rate is to properly adjust the manifold pressure using a manometer. Typical manifold setpoint for installations at altitudes from 0 to 4500 feet above sea level is 10.0 inches W.C.

Wiring Diagrams and Sequence of Operation

LRP13HP Unit Wiring Diagram – Constant Torque Blower

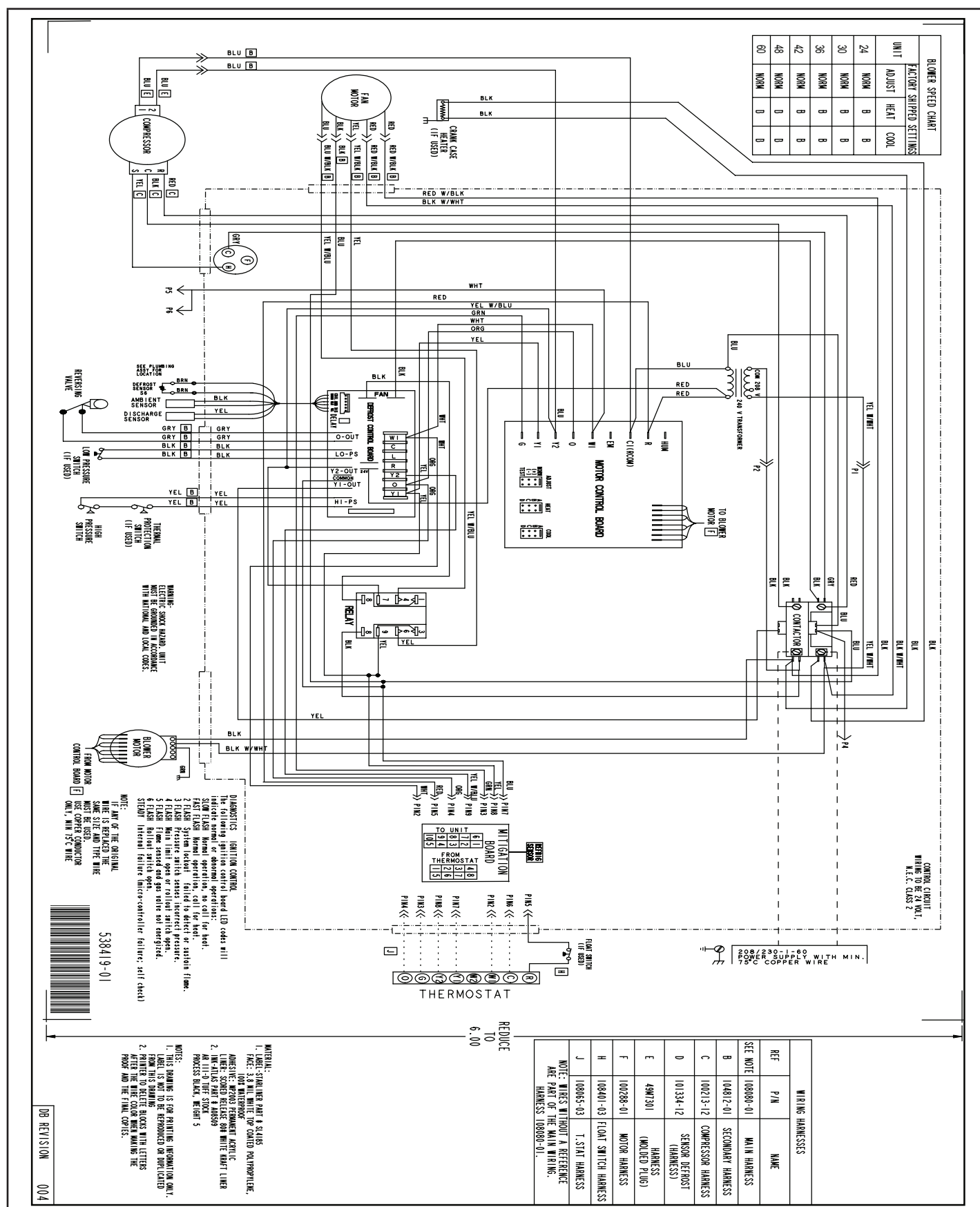


FIGURE 20

LRP13AC Unit Wiring Diagram – Constant Torque Blower

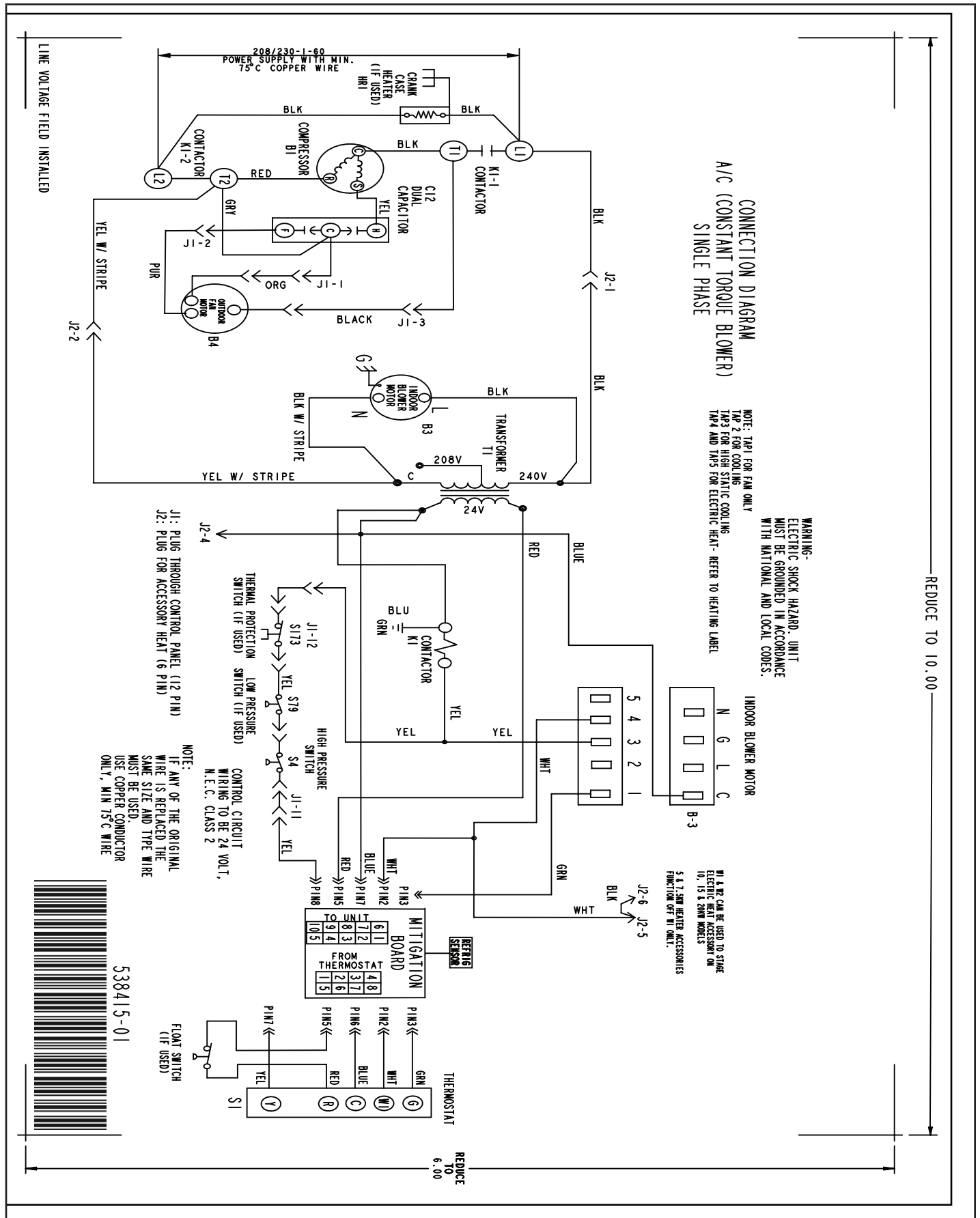


FIGURE 21

LRP13GE Unit Wiring Diagram – Constant Torque Blower

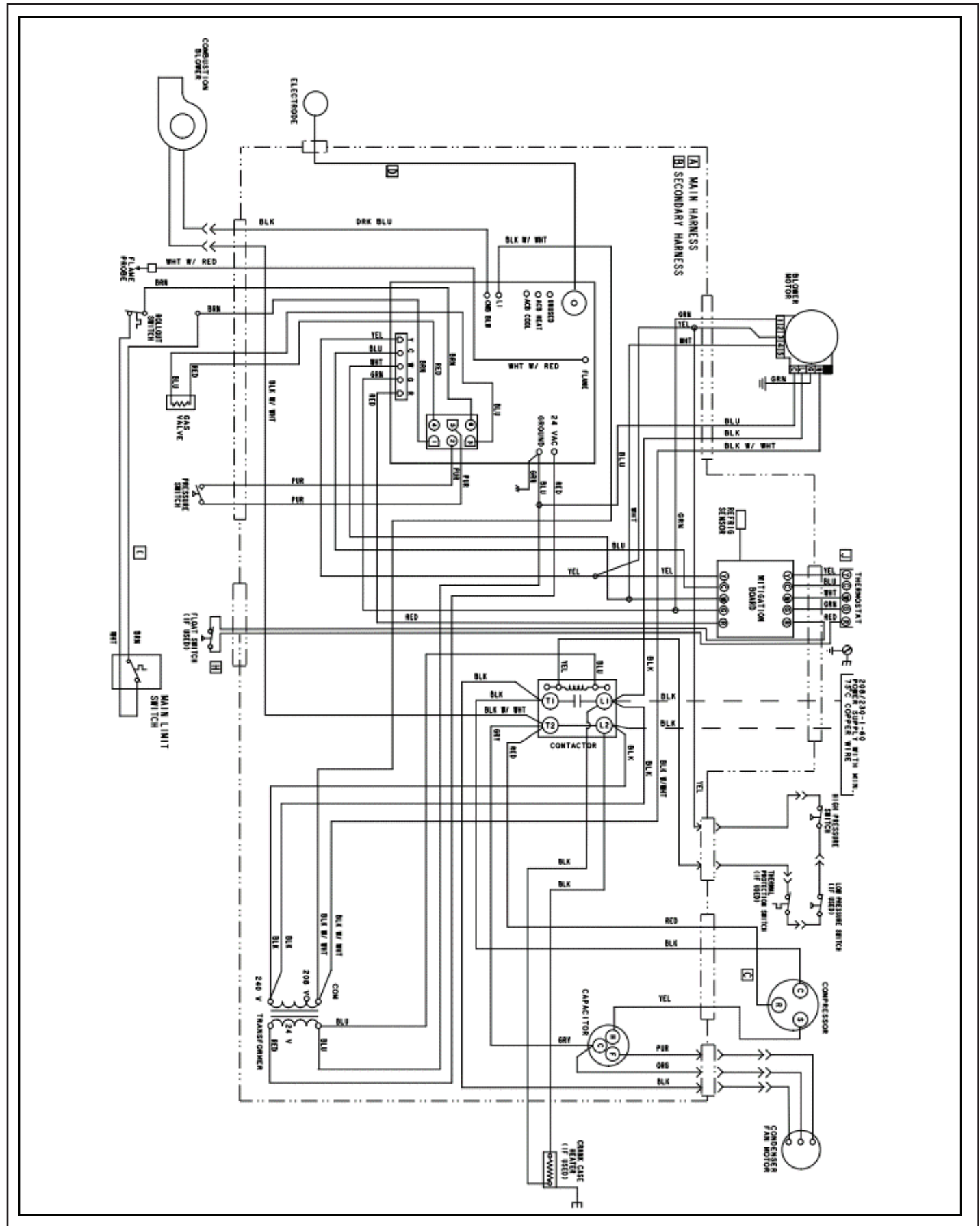


FIGURE 22

LRP15GE Wiring Diagram

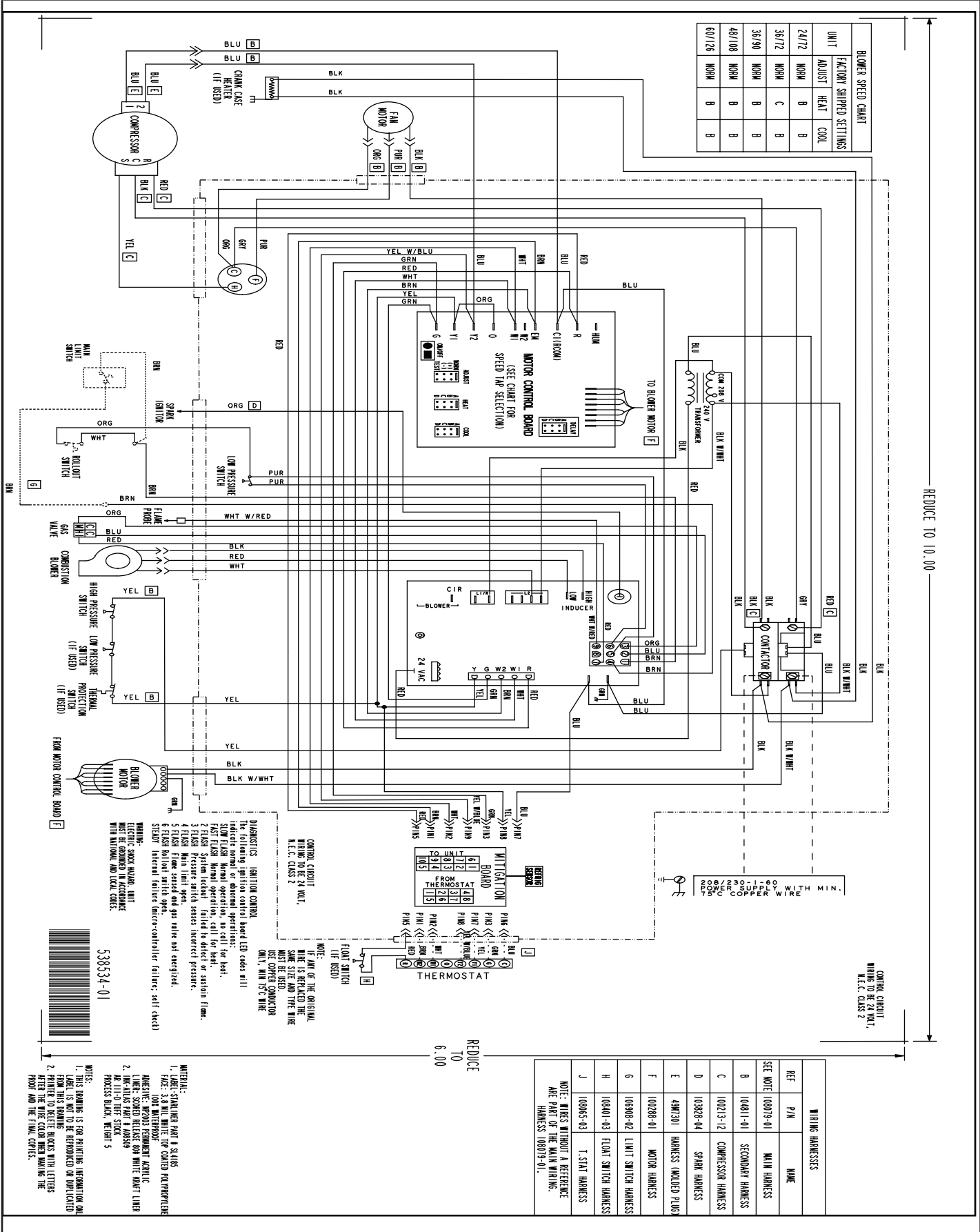


FIGURE 23

LRP15GE Unit Wiring – Single Phase

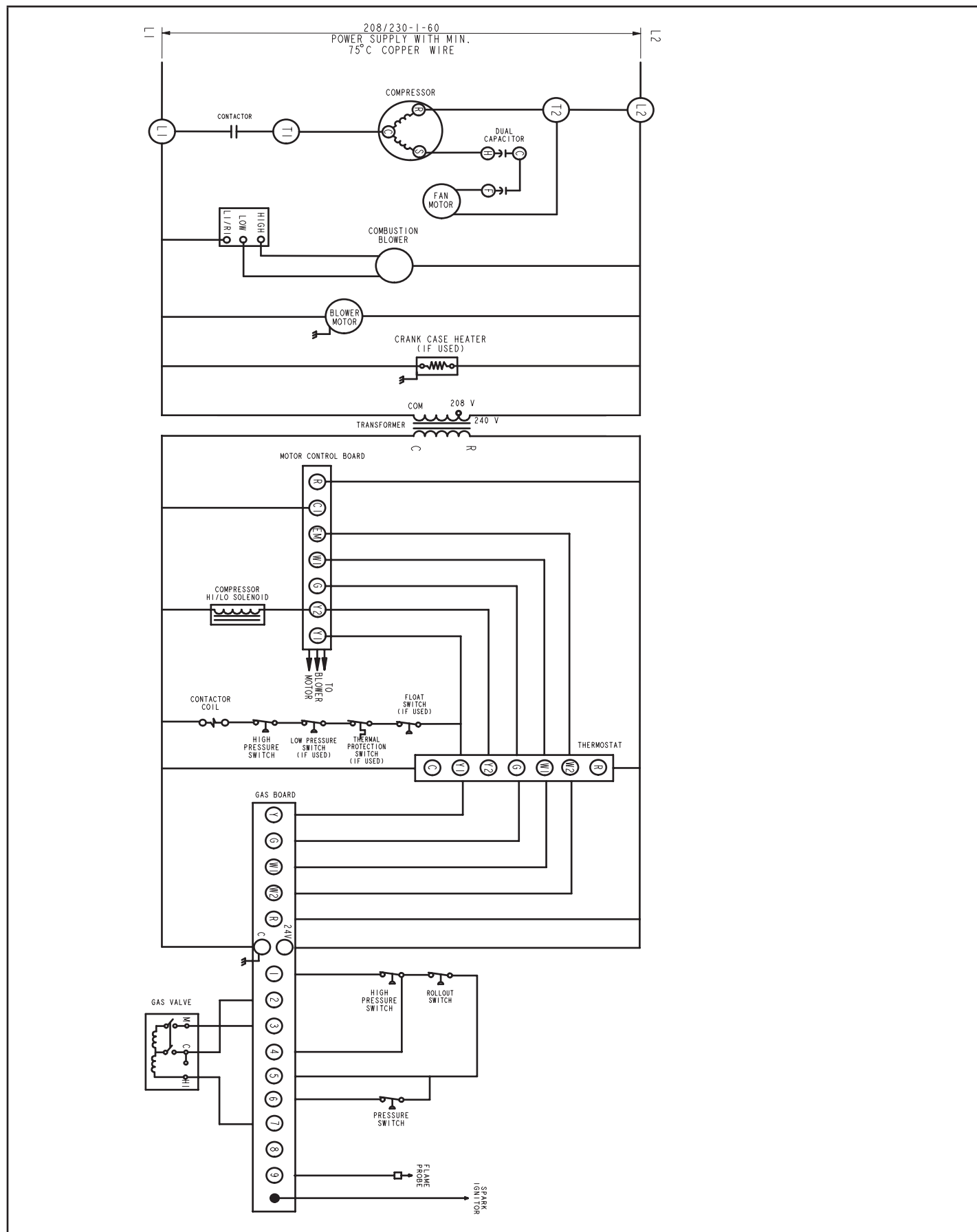


FIGURE 24

LRP15HP Wiring Diagram

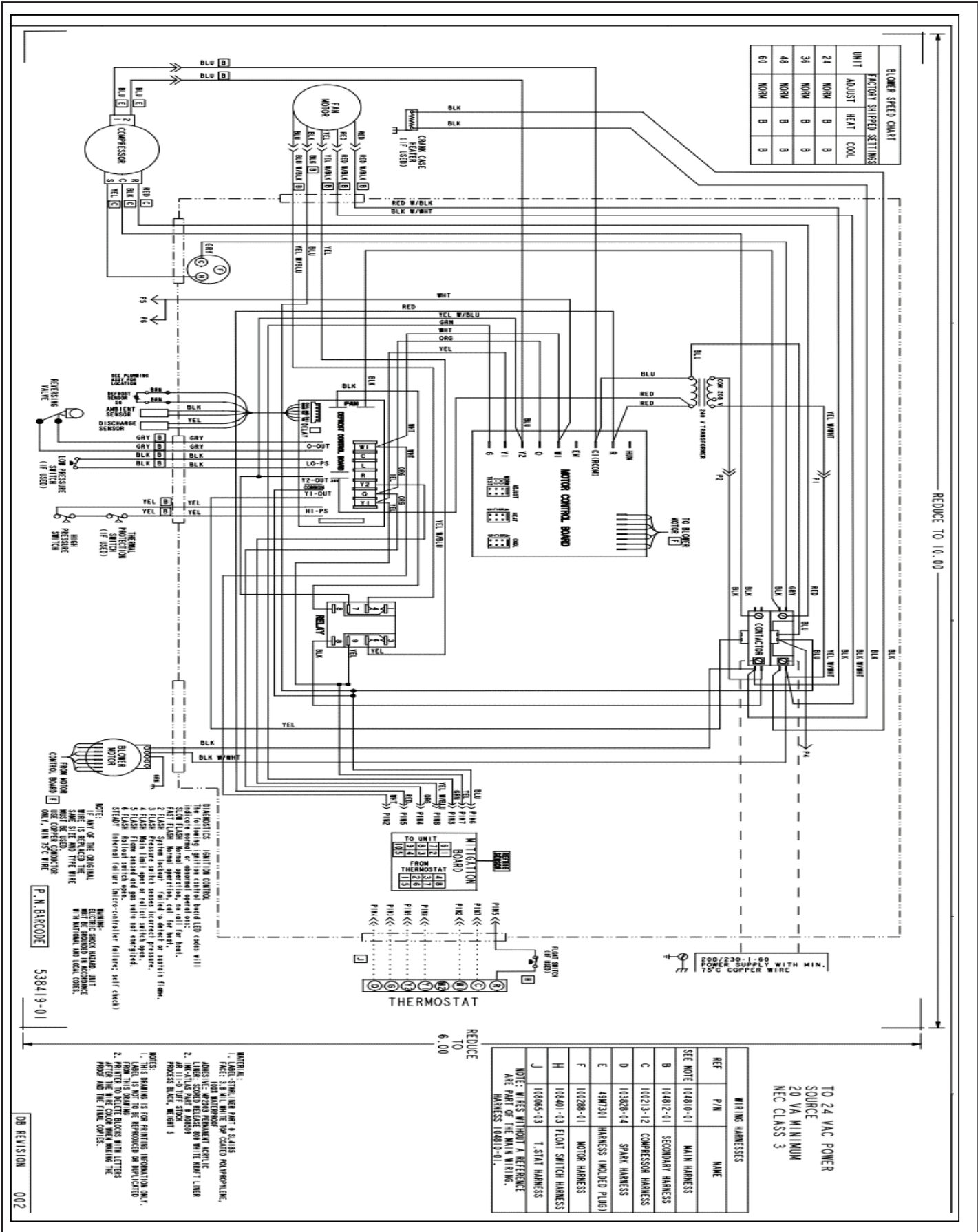


FIGURE 25

LRP15HP Unit Wiring – Single Phase

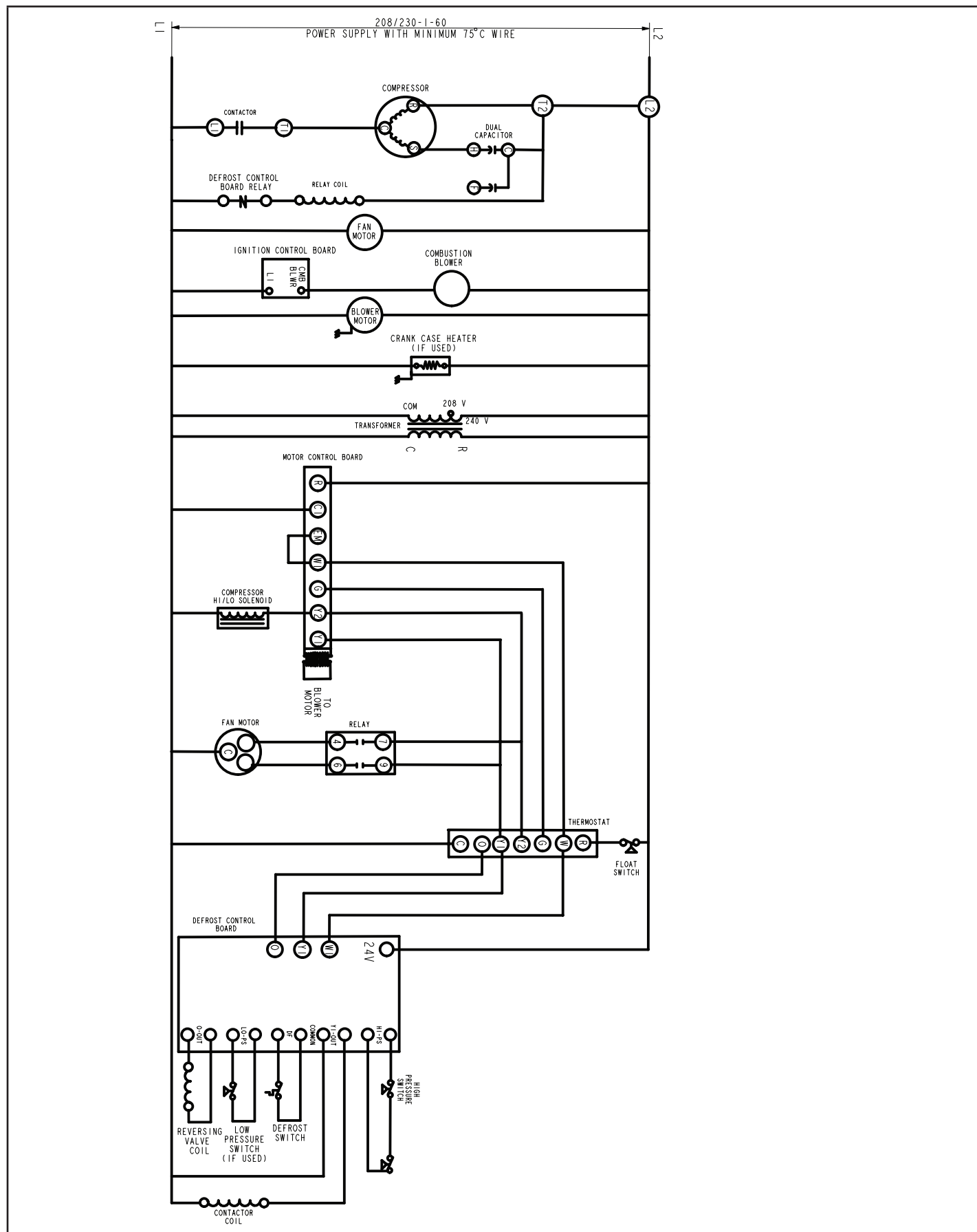


FIGURE 26

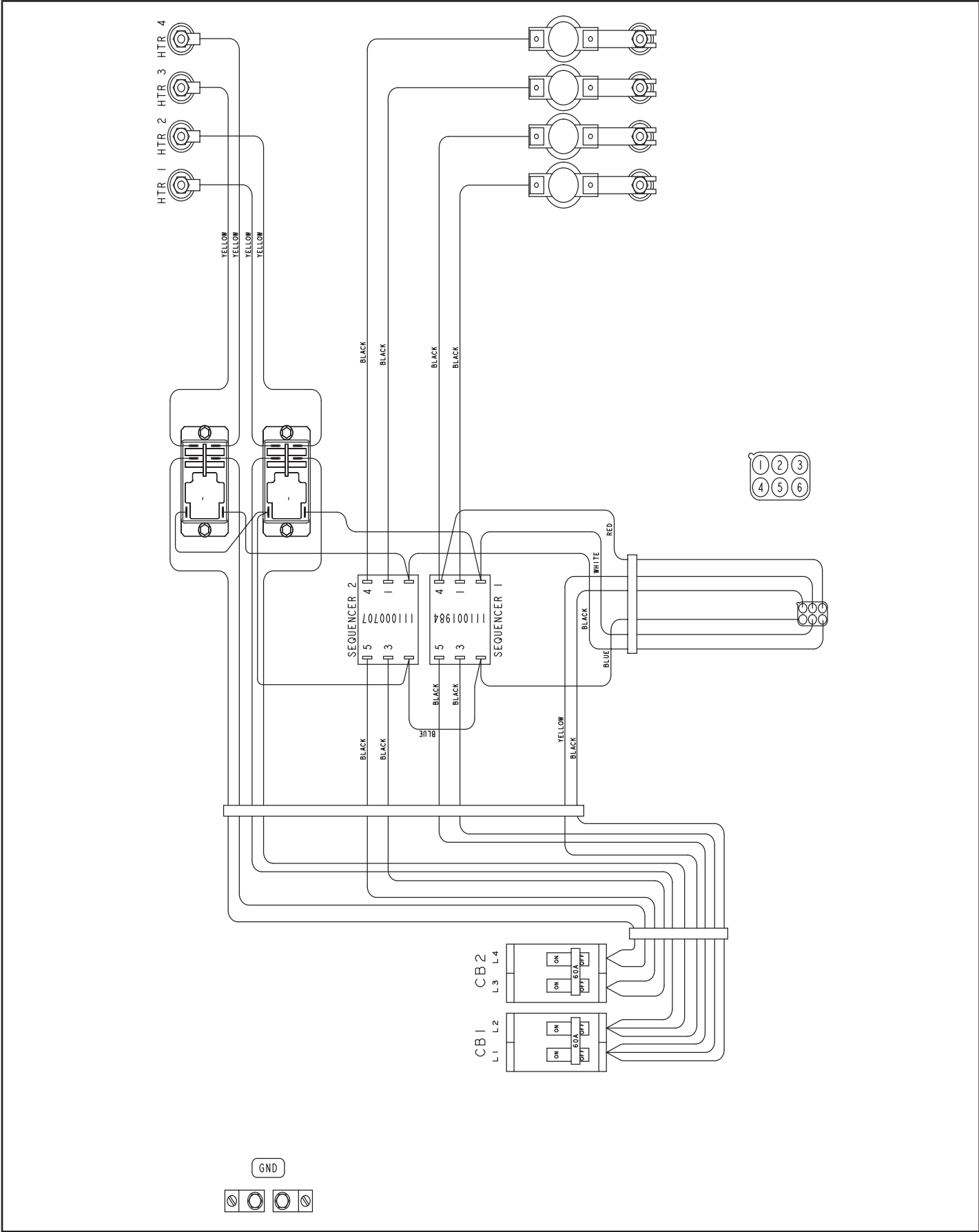


FIGURE 27

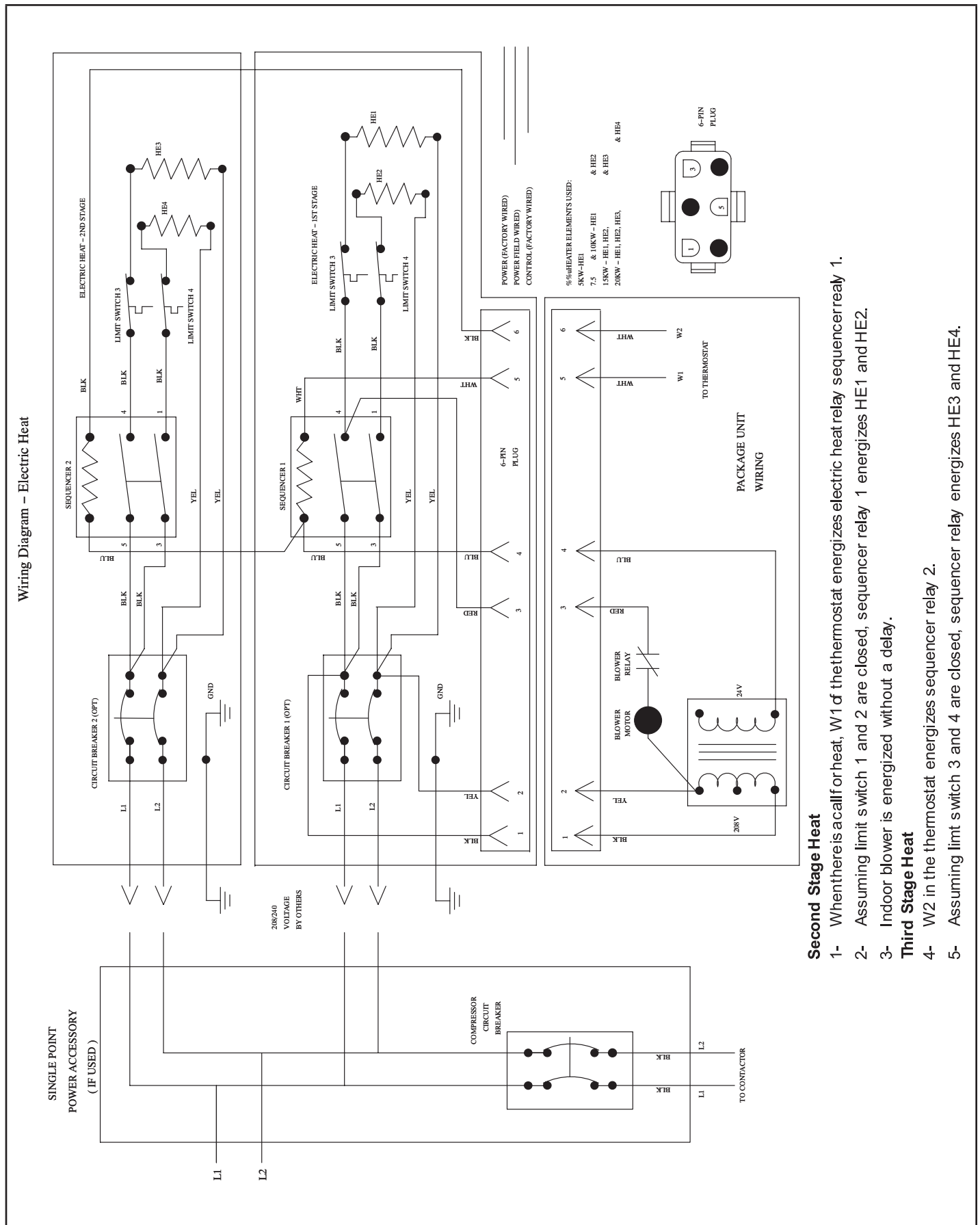


FIGURE 28

SEQUENCE OF OPERATION – SINGLE-STAGE COMPRESSOR

NOTE - The combustion air inducer is energized for 30 seconds at a Y1 call for cooling to clear warm humid air out of the heat exchanger.

Cooling

- 1 - Internal thermostat wiring energizes terminal "O" by cooling mode selection, energizing reversing valve L1.
- 2 - Cooling demand initiates at Y1 in the indoor thermostat.
- 3 - 24VAC from Y1 energizes compressor contactor K1.
- 4 - K1-1 closes energizing compressor B1 and outdoor fan motor B4.
- 5 - Compressor B1 and outdoor fan B4 begin immediate operation.
- 6 - 6- Evaporator blower B3 begins operation.
- 7 - When cool demand is satisfied, "Y1" in the indoor thermostat de-energizes K1 contactor. K1-1 opens de-energizing compressor B1 and outdoor fan B4. Evaporator blower B3 de-energizes after 90 seconds of time delay.
- 8 - Terminal "O" is de-energized when internal thermostat is out of cool mode, de-energizing reversing valve L1.

First Stage Heat Pump

- 1 - Heating demand initiates at "Y1" in the thermostat.
- 2 - 24VAC energizes compressor contactor K1.
- 3 - K1-1 closes energizing compressor B1 and outdoor fan B4.
- 4 - Evaporator blower B3 energizes after 5 seconds.
- 5 - When heat demand is satisfied, Y1 in the indoor thermostat de-energizes K1. K1-1 and K1-2 open and deenergizes compressor B1 and outdoor fan B4.
- 6 - Evaporator blower B3 de-energizes after 90 seconds.

Second Stage Auxiliary Heat

- 1 - Heating demand initiates at "Y1" and "W" in the thermostat. "W" can either be strip heat in a HP unit or gas burners in a DF unit.

Emergency Heat

- 1 - Emergency heat is energized by the room thermostat through "W".

Defrost Mode

- 1 - During heating operation when liquid line temperature drops to 42F or lower defrost switch S6 closes.
- 2 - Defrost control CMC1 begins timing. If defrost thermostat S6 remains closed at the end of 30, 60 or 90 minute period, defrost control energizes and defrost begins

NOTE - On early defrost controls, the defrost timing jumper must be in the 90-minute defrost interval before testing the defrost mode or the control will not enter defrost test mode.

- 5 - During defrost CMC1 energizes the reversing valve L1 and de-energizes the outdoor fan B4. If the compressor delay jumper is set, the compressor will turn off for 30 seconds while the reversing valve shifts either in or out of defrost mode.
- 6 - Defrost continues for 10 minutes or until defrost thermostat switch S6 opens (S6 will open when liquid line temperature reaches 70°). When defrost thermostat switch opens, defrost control CMC1 loses power and resets.
- 7 - When CMC1 resets, reversing valve L1 is de-energized while outdoor fan B4 is energized.

Gas Heat

- 1 - Heating demand W1 initiates at the indoor thermostat.
- 2 - Assuming all safety circuits are closed (with the exception of the pressure-prove switch open), A3 energizes the combustion air inducer blower B6. When the N.O. combustion air inducer pressure-prove switch S18 closes, a pre-purge period of 30 seconds follows.
- 3 - Ignition control A3 begins spark and energizes gas valve GV1.
- 4 - Gas valve GV1 opens. When flame is sensed, spark stops.
- 5 - After 30 seconds, ignition control A3 energizes circulating air blower B3.
- 6 - When heat demand is satisfied, the indoor thermostat de-energizes control A3 which de-energizes gas valve GV1 and combustion air inducer blower B6. Circulating air blower B3 runs for a designated period of 90 seconds.

SEQUENCE OF OPERATION – TWO-STAGE COMPRESSOR

The two-stage scroll compressor operates much like the standard scroll compressor. The two-stage compressor steps between low capacity and high capacity as required to meet cooling demand. The steps occur when gas is bypassed through a vent port in the first suction pocket. This bypassing of gas allows the compressor to operate at low capacity if thermostat demand allows, creating a more cost effective and efficient compressor. Full capacity is achieved by blocking the vent port with a slider ring. The slider ring (vent port cover) is controlled by a 24VDC internal solenoid in the open position allowing low capacity. When energized the internal solenoid closes the slider ring, blocking the vent port and bringing the compressor to full capacity.

Stepping can occur during a single thermostat demand as the motor runs continuously while the compressor steps from low to full capacity.

First and second stage cooling operate independent of each other and can modulate back and forth according to the thermostat demand.

First Stage Cooling (Low Capacity)

- 1 - Cooling demand initiates at Y1 at the thermostat.
- 2 - Voltage from terminal Y passes through S4 high pressure switch, energizes K1 compressor contactor, passes through the low pressure switch (S87) and returns to common side of the 24VAC power.
- 3 - K1 closes, energizing B1 compressor and B4 outdoor fan.
- 4 - Solenoid L34 is not energized so the slider ring remains open, limiting compressor to low capacity.

Second Stage Cooling (High Capacity)

Compressor is operating in first stage cooling. Second stage thermostat demand sends voltage to rectifier plug D4. D4 converts the AC voltage to DC voltage and energizes L34 unloader solenoid. L34 closes the slider ring, allowing the compressor to operate at high capacity.

LRP13GN – Heating Components and Operation

Gas Valve

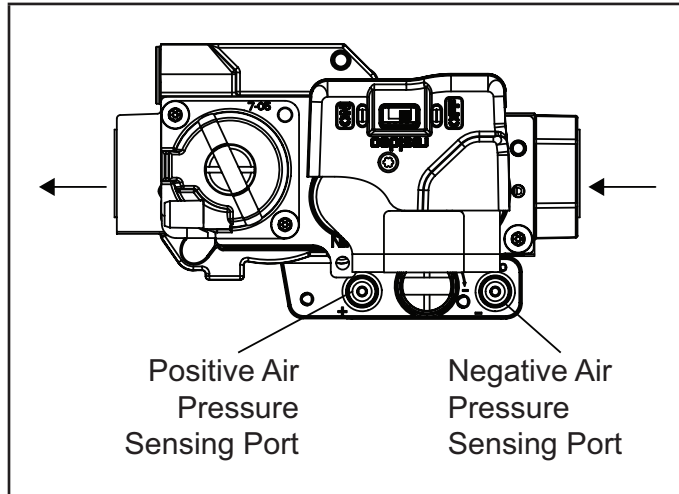


FIGURE 30. LRP13GN Gas Valve

The gas valve is factory set and does not require adjustment. See the table below for pressures. The gas valve should completely and immediately cycle off in the event of gas or power failure. The manual shut-off knob or switch can be used to immediately shut off gas supply.

Manifold Pressure (non-adjustable)	2.7 - 3.1" w.c.
---------------------------------------	-----------------

Gas Manifold

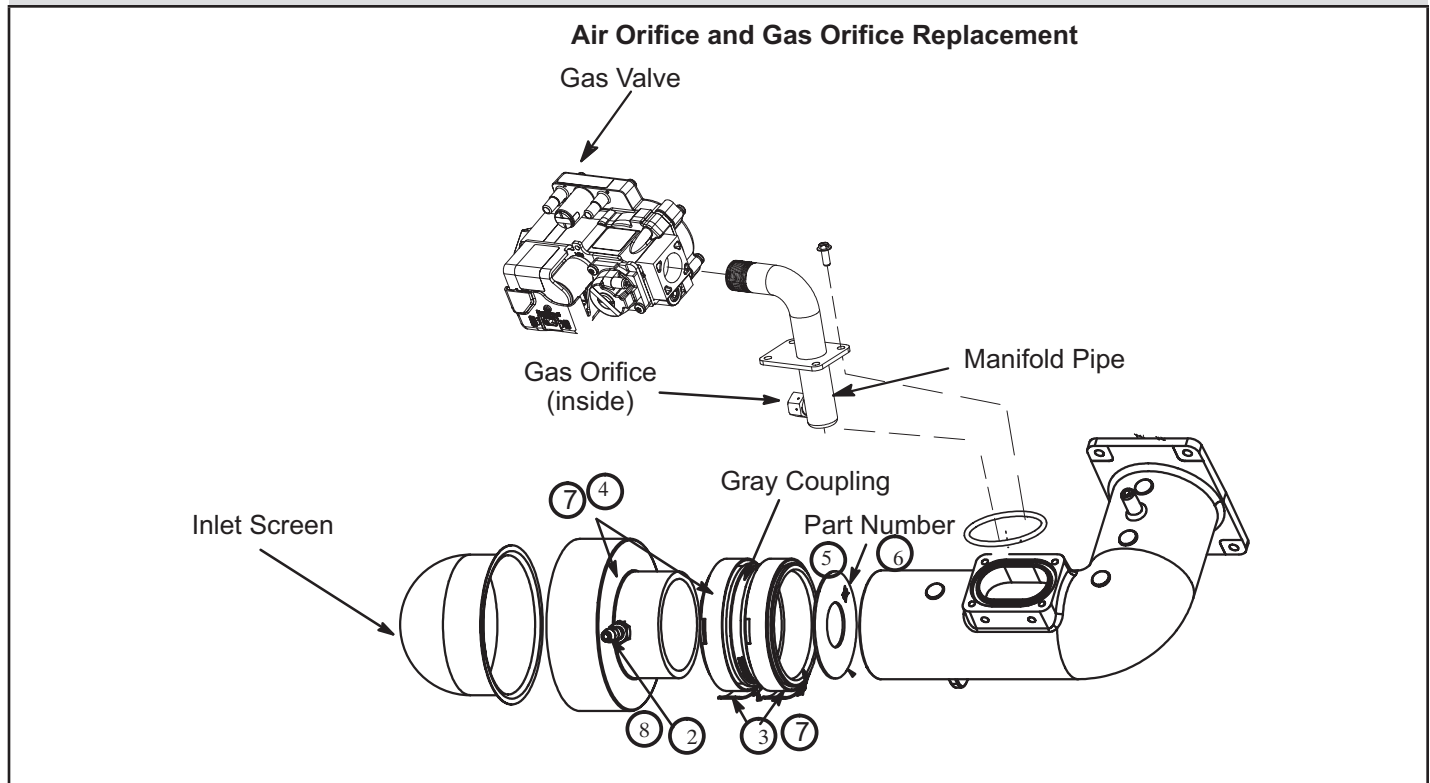


FIGURE 29

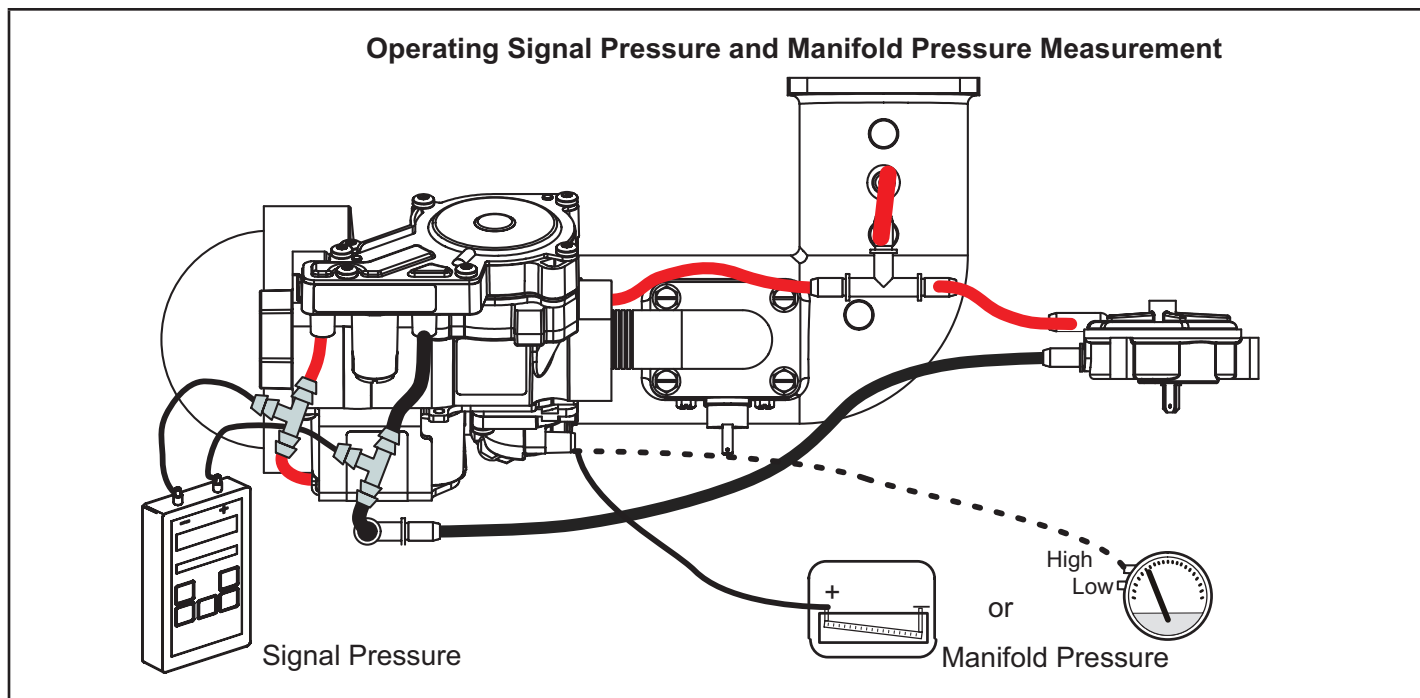


FIGURE 32

Manifold Pressure

A unit's Manifold Pressure is the product of the Signal Pressure x the Gas Valve's Amplification Factor ($MP = \Delta P \times AF$). If the manifold pressure is not within specification, it will be helpful to determine if it is the Signal Pressure or the Amplification Factor that is the culprit. The amplification factor is $4.0 \pm 20\%$ (so 3.2 – 4.8). Typical gas valves that we have encountered during development seem to range between 3.8 and 4.2.

Condition: Signal Pressure Amplification Factor Manifold Pressure Notes

- Nominal 0.72 4.0 2.9
- Low Amp 0.72 3.8 2.7 Not full AF tolerance range
- High Amp 0.72 4.2 3.0 Not full AF tolerance range
- Low Signal 0.67 4.0 2.7
- High Signal 0.77 4.0 3.1
- Both Low 0.67 3.8 2.6 Not full AF tolerance range
- Both High 0.77 4.2 3.2 Not full AF tolerance range

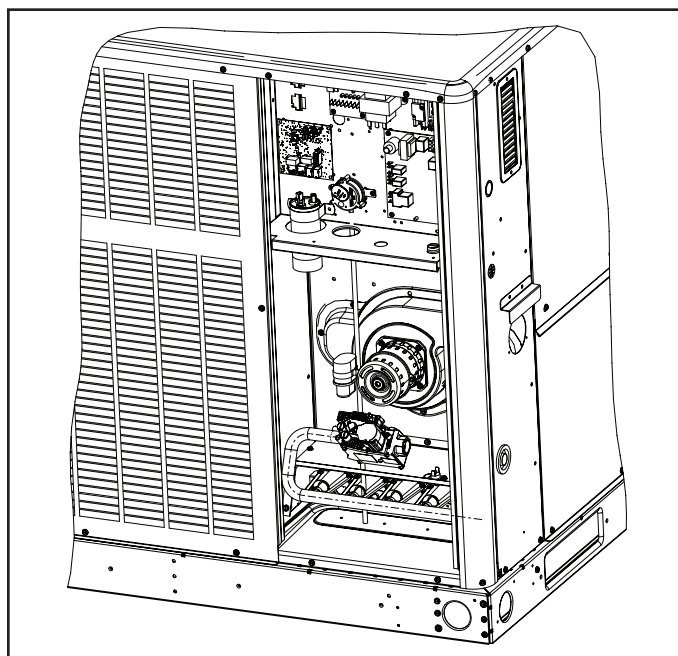


FIGURE 31. Typical Heating Parts Arrangement

Post-Start Checklist

After the entire control circuit has been energized and the heating section is operating, make the following checks:

- 1 - Check for gas leaks, using soapy solution, in the unit piping as well as the supply piping.
- 2 - Check the supply gas pressure. It must be within the limits shown on the rating plate. Supply pressure should be checked with all gas appliances in the building at full fire. At no time should the standby gas pressure exceed 13" w.c., nor the operation pressure drop below 5" w.c. for natural gas units. If gas pressure is outside these limits, contact the gas supplier for corrective action.

- 3 - Select indoor blower speed tap, which provides a temperature rise within the range specified on the rating plate.
- 4 - Verify manifold gas pressure

NOTE: For purpose of this measurement, the minimum permissible gas supply pressure is 5" w.c. for natural gas.

- a. Slide the gas valve switch to the "OFF" position (see FIGURE 30).
- b. Remove plug on valve marked "OUTLET PRESSURE."
- c. Install a water manometer.

- d. Slide the gas valve switch to the "ON" position and initiate a call for heat. During steady state operation, manifold pressure should be:

Manifold Pressure (non-adjustable)	2.7 - 3.1" w.c.
---	------------------------

- e. After verifying pressure, turn gas off, remove manometer fitting, and replace pipe plug and regulator cap.
- f. Put unit in operation and check plug for leaks using soapy solution.

Heat Exchanger

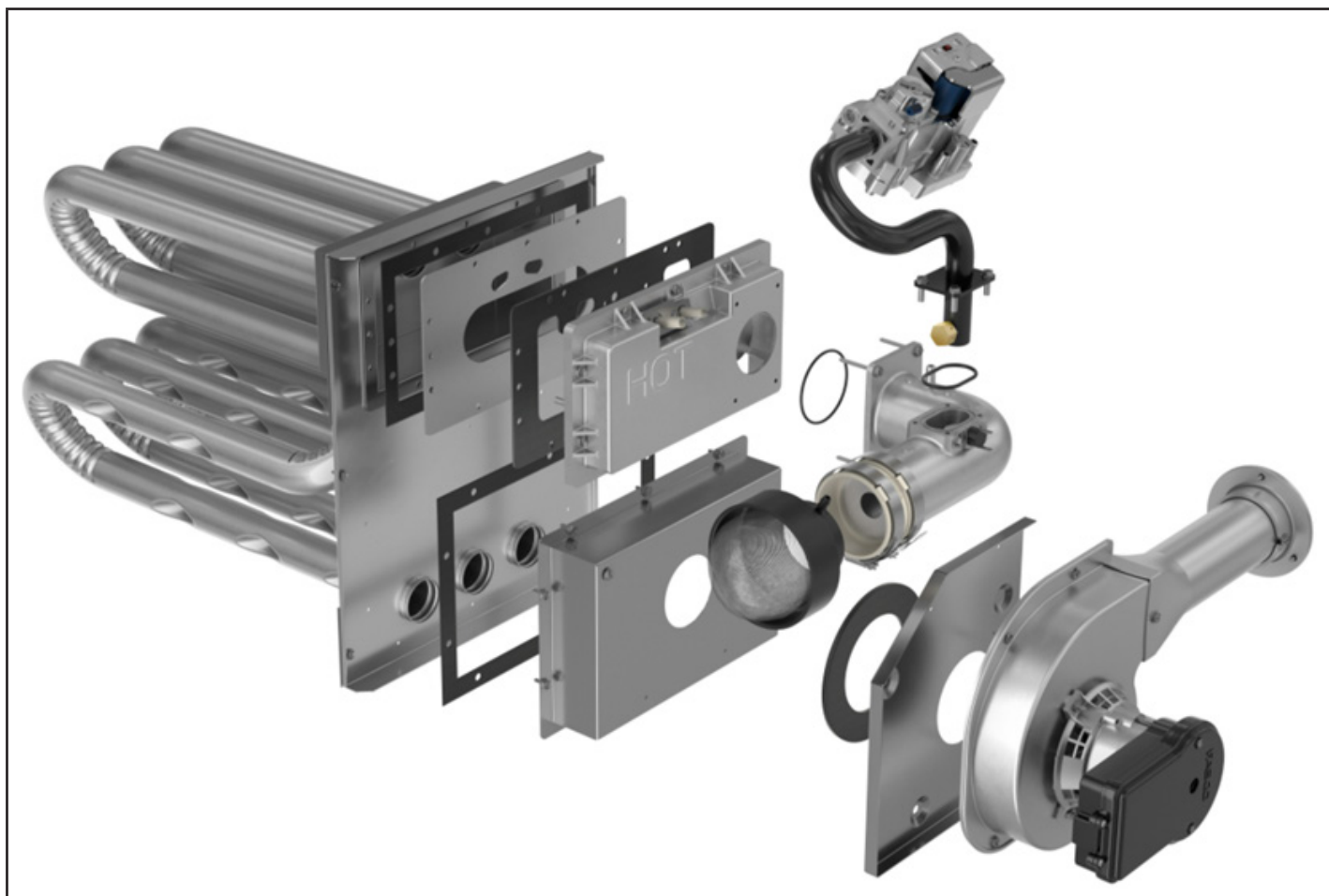


FIGURE 33. Gas Valve, Manifold and Heat Exchanger Assembly

ALTERNATE COMBUSTION AIR ORIFICE OPTIONS FOR RESOLVING RESONANCE ISSUES WITH ULN PACKAGE UNITS				
BTU	COMBUSTION AIR ORIFICE OPTION	ORIFICE SIZE	ORIFICE ID STAMP	PART NUMBER
54k	Factory Original	0.970	23	22J96
54k	Alternative Option 1	0.969	08	19X35
54k	Alternative Option 2	0.937	15	19X37
72k	Factory Original	1.140	24	22J97
72k	Alternative Option 1	1.125	03	19X31
72k	Alternative Option 2	1.105	12	21U24