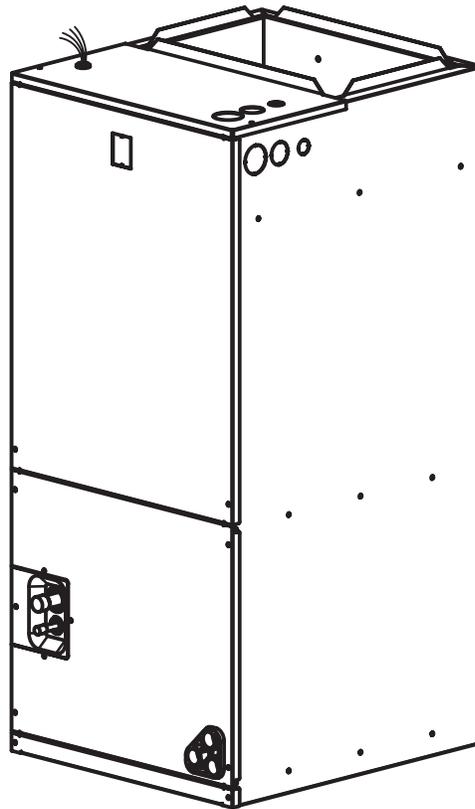


HEAT CONTROLLER, INC.

# INSTALLATION INSTRUCTIONS

## Air Handler

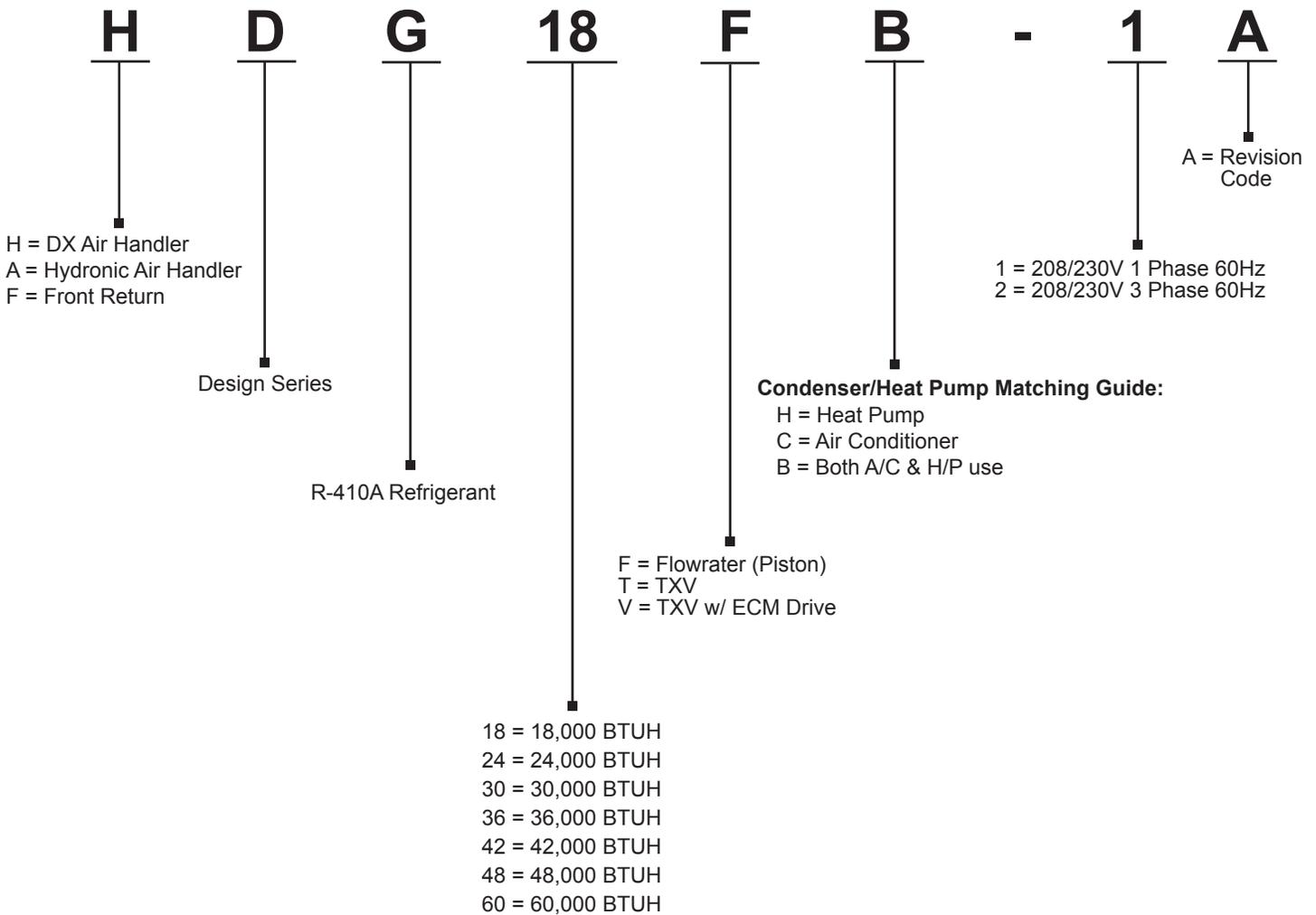


**HDG Series**  
1.5 to 5 Ton

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## 1.0 Nomenclature



**NOTE:** Not all model configurations are available. The nomenclature exists for future product line development. Consult your local distributor or Heat Controller's customer service department regarding available options.



### Warning

These instructions are intended as an aid to qualified licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instruction may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.

This document is customer property and is to remain with this unit.

These instructions do not cover all the different variations systems nor does it provide for every possible contingency to be met in connection with installation.

All phases of this installation must comply with NATIONAL STATE AND LOCAL CODES. If additional information is required please contact your local distributor.

## 2.0 Safety



This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.



This is an attention alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.



### Warning

Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.



### Warning

If removal of the blower assembly is required, all disconnect switches supplying power to the equipment must be de-energized and locked (if not in sight of unit ) so the field power wires can be safely removed from the blower assembly. Failure to do so can cause electrical shock resulting in personal injury or death.



### Warning

Because of possible damage to equipment or personal injury, installation, service, and maintenance should be performed by a trained, qualified service personnel. Consumer service is recommended only for filter cleaning / replacement. Never operate the unit with the access panels removed.



### Warning

These instructions are intended as an aid to qualified, licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instructions may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.



## Warning

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.



## Warning

**PROPOSITION 65:** This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to State of California to cause cancer.

All manufacturer products meet current federal OSHA Guidelines for safety. California Proposition 65 warnings are required for certain products, which are not covered by the OSHA standards.

California's Proposition 65 requires warnings for products sold in California that contain or produce any of over 600 listed chemicals known to the State of California to cause cancer or birth defects such as fiberglass insulation, lead in brass, and combustion products from natural gas.

All "new equipment" shipped for sale in California will only have labels stating that the product contains and /or produces Proposition 65 chemicals. We cannot always know "when, or if" products will be sold in the California market, thus all products may not be labeled when their final destination is unknown.

You may receive inquiries from customers about chemicals found in, or produced by, some of our heating and air-conditioning equipment, or found in natural gas used with some of our products. Listed below are those chemicals and substances commonly associated with similar equipment in our industry and other manufacturers.

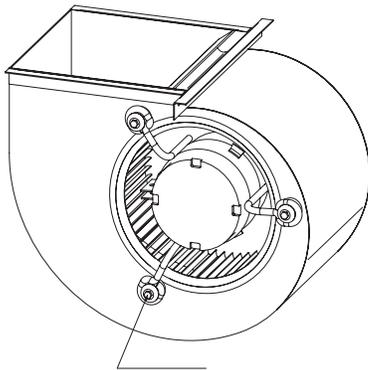
Glass Wool (Fiberglass) Insulation

Carbon Monoxide (CO).

Formaldehyde

Benzene

More details are available at the websites for OSHA (Occupational Safety and Health Administration), at [www.osha.gov](http://www.osha.gov) and the State of California's OEHHA (Office of Environmental Health Hazard Assessment), at [www.oehha.org](http://www.oehha.org). Consumer education is important since the chemicals and substances on the list are found in our daily lives. Most consumers are aware that products present safety and health risks, when improperly used, handled and maintained.



BLOWER MOTOR BOLT



## Warning

Make sure the blower motor support is tight (3-motor mount bolts) then check to see if wheel is secured to motor shaft before operating unit. To avoid electrical shock, which can result in injury or death, use only the screws furnished with the motor from the manufacturer.



## Warning

Do not install this unit in manufactured (mobile) homes. Improper installation is more likely in manufactured housing due to ductwork material, size, location and arrangement. Installations in manufactured housing can cause fire resulting in property damage, personal injury or death.

**EXCEPTION:** Manufactured housing installations are approved only with documentation by a recognized inspection authority that verifies that the installation has been made in compliance with the instructions and all warnings have been observed.



## Warning

Duct leaks can create an unbalanced system and draw pollutants such as direct, dust, fumes and odors into the home causing property damage. Fumes and odors from toxic, volatile or flammable chemicals, as well as automobile exhaust and carbon monoxide (CO), can be drawn into the living space through leaking ducts and unbalanced duct systems causing personal injury or death (see Figure 1).

- If air-moving equipment or ductwork is located in garages or off-garage storage areas, all joints, seams, and openings in the equipment and duct must be sealed to limit the migration of toxic fumes and odors including carbon monoxide from migrating into the living space.
- If air-moving equipment or ductwork is located in spaces containing fuel burning appliances such as water heaters or boilers, all joints, seams and openings in the equipment and duct must be sealed to prevent depressurization of the space and possible migration of combustion byproducts including carbon monoxide into the living space.



## Notice

When used in cooling applications, excessive sweating may occur when unit is installed in an unconditioned space. This can result in property damage.



## Notice

In compliance with recognized codes, it is recommended that an auxiliary drain pan be installed under all evaporator coils or units containing evaporator coils that are located in any area of a structure where damage to the building or building contents may occur as a result of an overflow of the coil drain pan or a stoppage in the primary condensate drain piping.



## Warning

The first 36 inches of supply air plenum and ductwork must be constructed of sheet metal as required by NFPA 90B. The supply air plenum or duct must have a solid sheet metal bottom directly under the unit with no openings, registers or flexible air ducts located in it. If flexible supply air ducts are used they may be located only in the vertical walls of rectangular plenum, a minimum of 6 inches from the solid bottom. Metal plenum or duct may be connected to the combustible floor base, if not, it must be connected to the unit supply duct exposed to the supply air opening from the downflow unit. Exposing combustible (non-metal) material to the supply opening of a downflow unit can cause a fire resulting in property damage, personal injury or death.

### Exception warning to downflow:

Installations on concrete floor slab with supply air plenum and ductwork completely encased must be not less than 2 inches of concrete (See NFPA 90A).

### 3.0 General

The unit can be positioned for bottom return air in the upflow position, left and right return in the horizontal position, top return in downflow position.

This Air Handler provides the flexibility for installation in any upflow or downflow horizontal application. The direct drive motors provides a selection of air volume to match any application. 3-Speed motors provide selections of air flow to meet desired applications.

Top and side power and control wiring, accessible screw terminals for control wiring all combine to make the installation easy, and minimize installation cost. Please contact your local distributor.

See Fig. 1 on Pg. 7

### 3.1 Unit Dimensions

NOTE: 24" CLEARANCE IS REQUIRED IN THE FRONT OF THE UNIT FOR FILTER AND COIL MAINTENANCE.

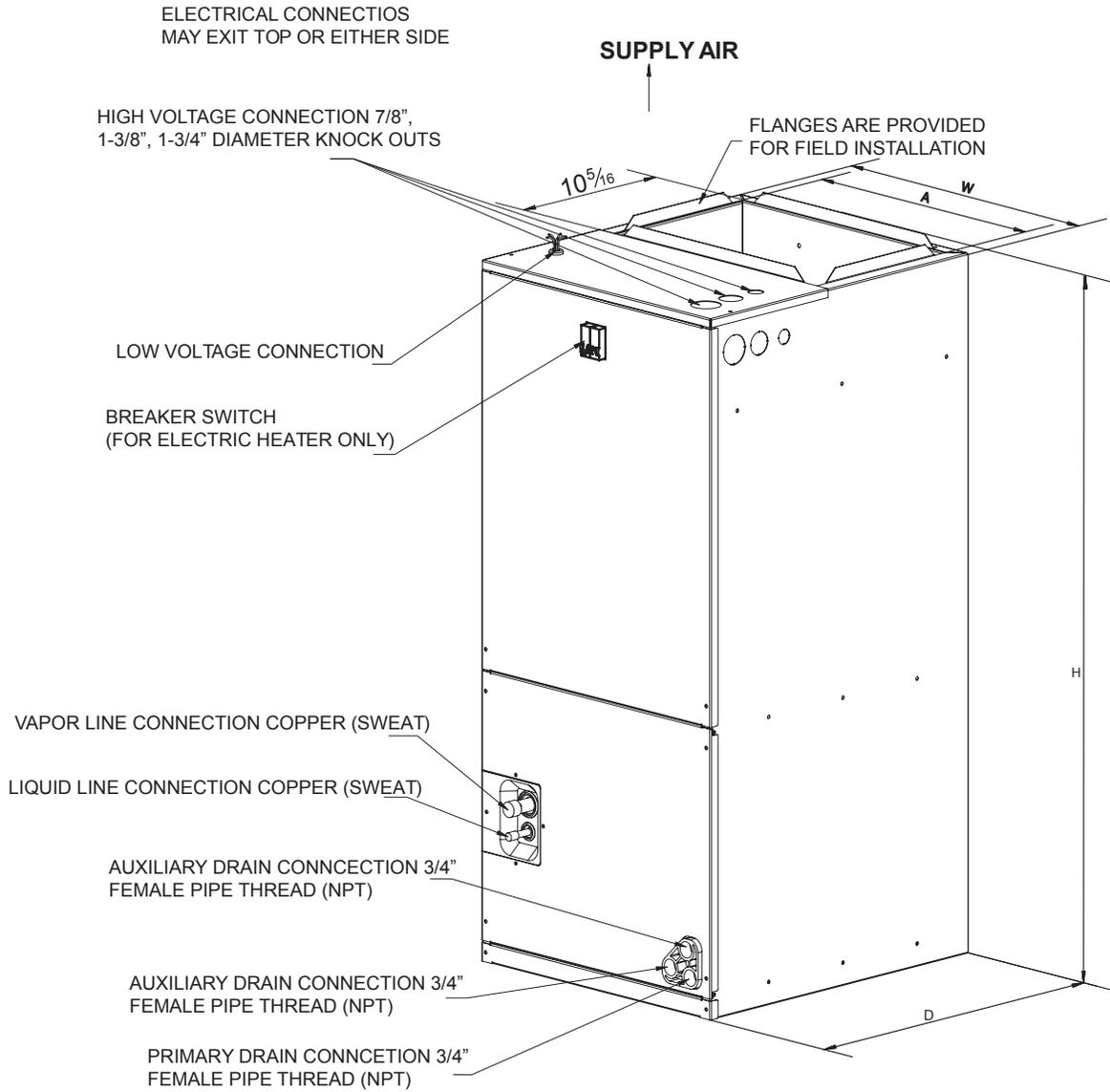


Fig. 1 Dimensions

UPFLOW UNIT SHOWN;  
UNIT MAY BE INSTALLED UPFLOW, DOWNFLOW,  
HORIZONTAL RIGHT, OR LEFT AIR SUPPLY.

### Dimensional Data

Model Size	Dimensions				Unit Weight lbs. [kg]	
	Unit Height in. [mm]	Unit Weight in. [mm]	Unit Length in. [mm]	Supply Duct "A" in [mm]	Net	Shipping
HDG18	41 3/8" [1050]	18 1/8" [460]	20 1/2" [520]	16" [406]	106 [48]	119 [54]
HDG 24	41 3/8" [1050]	18 1/8" [460]	20 1/2" [520]	16" [406]	106 [48]	119 [54]
HDG 30	41 3/8" [1050]	18 1/8" [460]	20 1/2" [520]	16" [406]	119 [54]	132 [60]
HDG36	46 1/2" [1180]	19 5/8" [500]	20 5/8" [550]	18" [456]	141 [64]	156 [71]
HDG42	46 1/2" [1180]	19 5/8" [500]	20 5/8" [550]	18" [456]	141 [64]	156 [71]
HDG48	54 1/2" [1385]	22" [560]	24" [610]	19 1/2" [496]	171 [78]	187 [85]
HDG60	54 1/2" [1385]	22" [560]	24" [610]	19 1/2" [496]	171 [78]	187 [85]

## 4.0 Applications

### 4.1 Vertical Upflow

- Vertical Upflow configuration is the factory set on all models (see Fig 1).
- If a side return air opening is required, field fabricate a return air plenum with an opening large enough to supply unit and strong enough to support unit weight.
- If return air is to be ducted, install duct flush with floor. Use fireproof resilient gasket 1/8 to 1/4 in. thick between the ducts, unit and floor. Set unit on floor over opening.

#### IMPORTANT NOTE

Torque applied to drain connections should not exceed 15.ft.lbs.(see Fig.1&2)

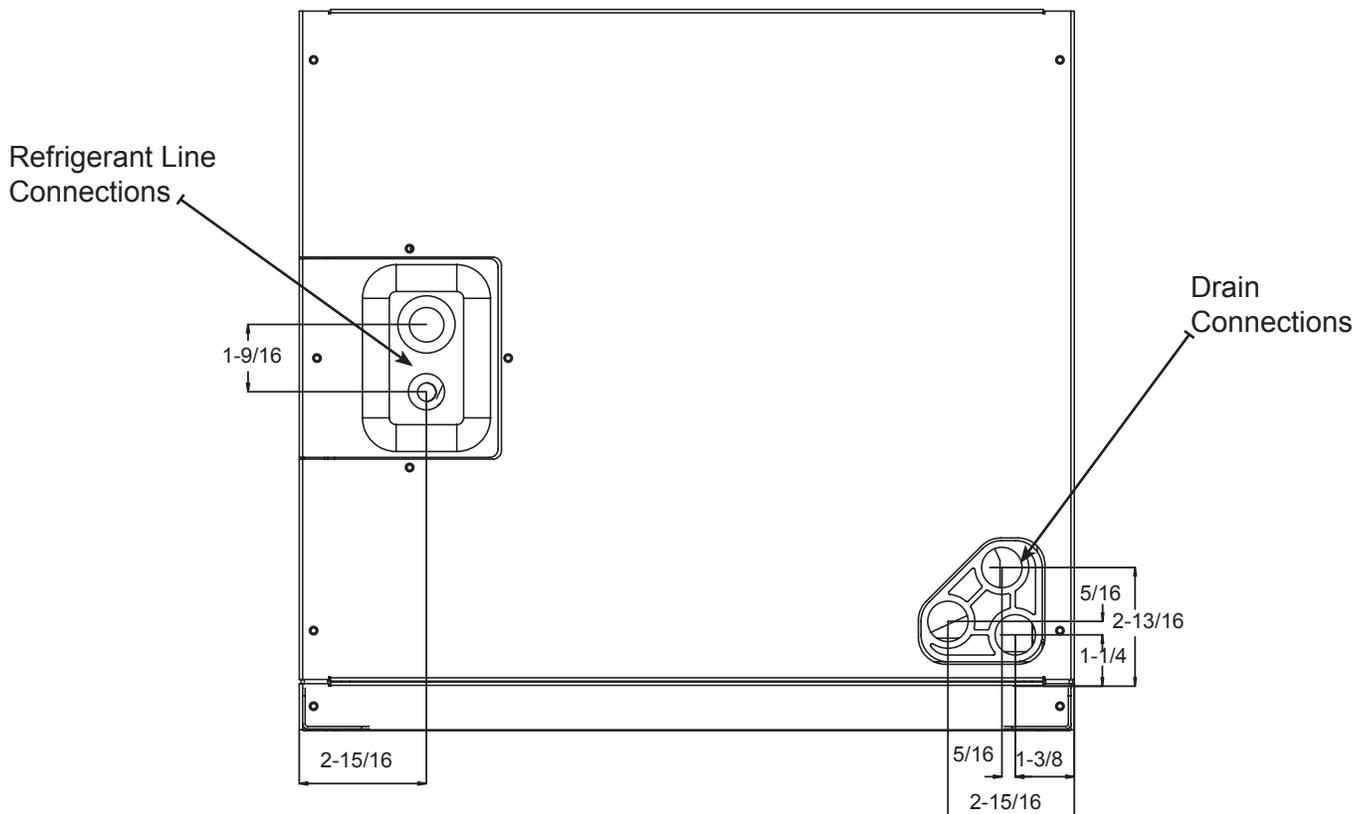


Fig. 2 Coil Connection Dimensions

### 4.2 Vertical Downflow

**Conversion to Vertical Downflow:** A vertical upflow unit may be converted to vertical downflow. Remove the door and indoor coil and reinstall 180° from original position. See Fig. 2~3.

**IMPORTANT:** To comply with certification agencies and the National Electric Code for horizontal right application, the circuit breaker(s) on field-installed electric heater kits must be re-installed per procedure below so that the breaker switch “on” position and marking is up and, “off” position and marking is down.

- To rotate breaker(s): Rotate one breaker set (circuit) at a time starting with the one on the right. Loosen both lugs on the load side of the breaker. (Make sure that wires are identified and are reinstalled into proper breaker). Wires are bundles with wire ties, one bundle going to the right lug and one bundle going to the left lug.

- Using a screwdriver or pencil, lift blue plastic tab with hole away from breaker until breaker releases from mounting opening.
- With breaker held in hand, rotate breaker so that “on” position is up, “off” position is down with unit in planned vertical mounting position. Insert right wire bundle into top right breaker lug, ensuring all strands of all wires are inserted fully into lug, and no wire insulation is in lug.
- Tighten lug as tight as possible while holding circuit breaker. Check wires and make sure each wire is secure and none are loose. Repeat for left wire bundle in left top circuit breaker lug.
- Replace breaker by inserting breaker mounting tab opposite white pull tab in opening, hook mounting tab over edge in opening.
- With screwdriver or pencil, pull blue tab with hole away from breaker while setting that side of breaker into opening. When breaker is in place, release tab, locking circuit breaker into location in opening.
- Repeat above operation for remaining breaker(s) (if more than one is provided).
- Replace single point wiring jumper bar, if it is used, on line side of breaker and tighten securely.
- Double check wires and lugs to make sure all are secure and tight. Check to make sure unit wiring to circuit breaker load lugs match that shown on the unit wiring diagram.



### Caution

When using the unit with electrical heater, the switch is used only for electrical heater on the front of panel.

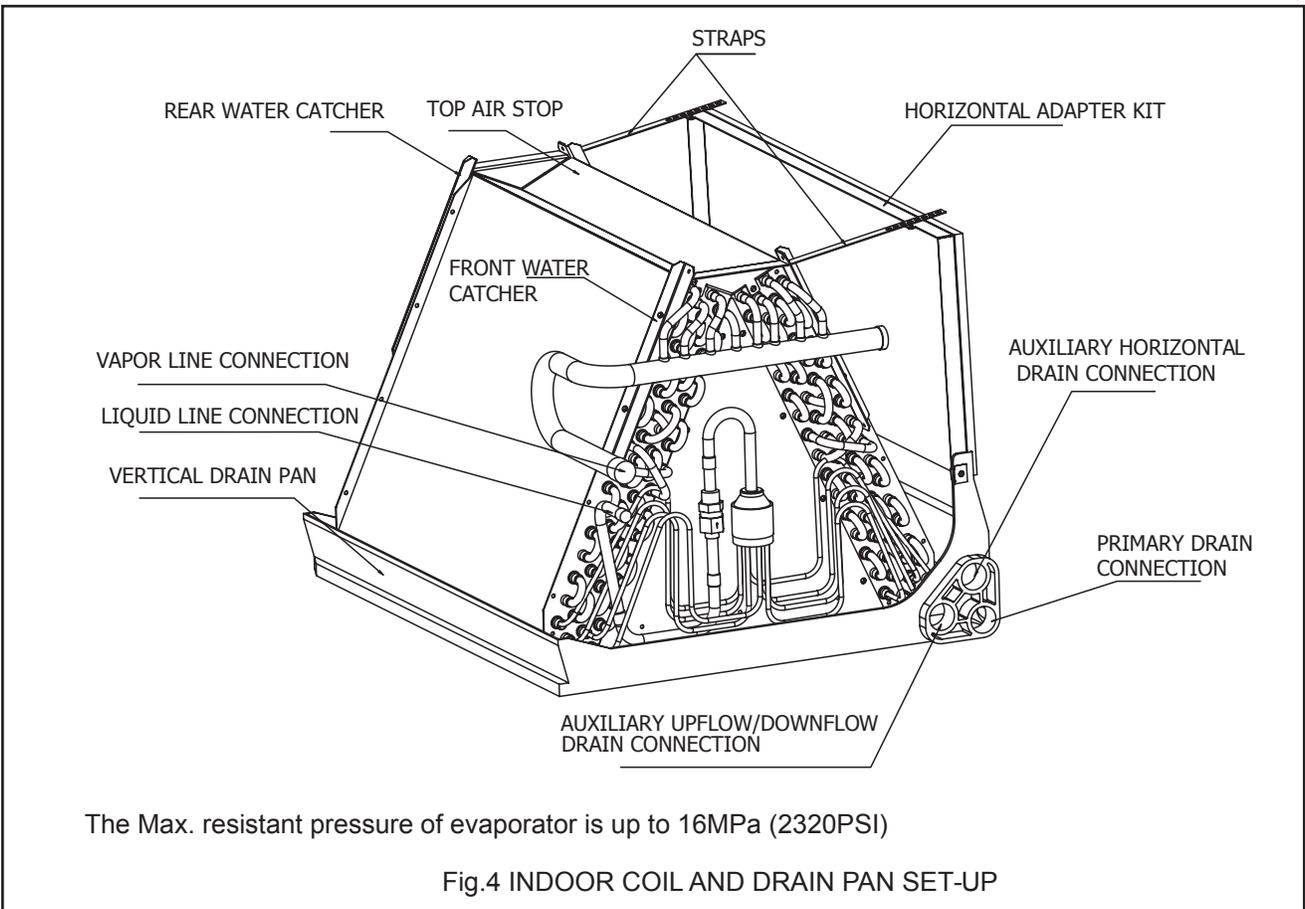
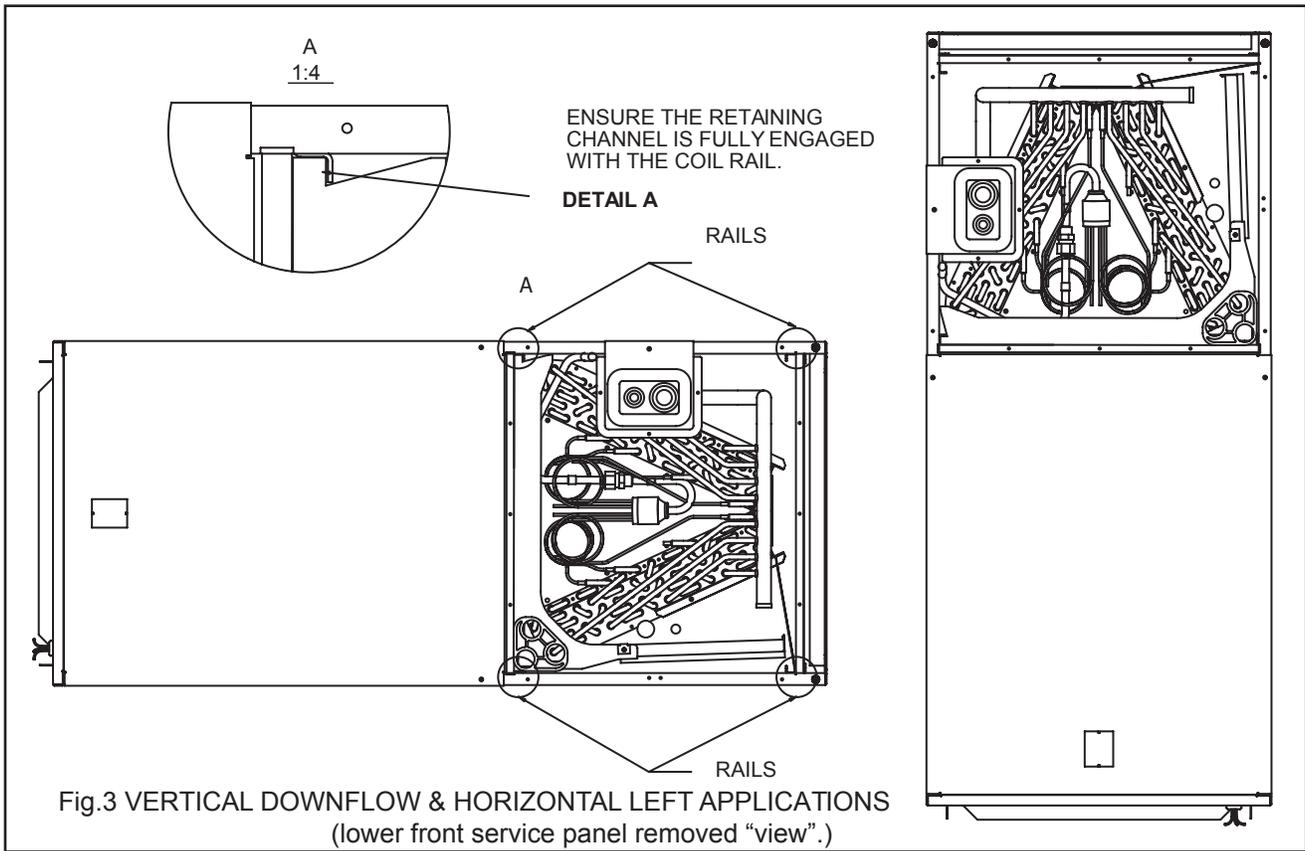
## 4.3 HORIZONTAL

Horizontal right is the default factory configuration for the units.

Horizontal left isn't the default factory configuration for the units.

Conversion to Horizontal: A vertical upflow unit may be converted to horizontal right by removing indoor coil assembly and reinstalling coil as shown for right hand air supply. And reinstall coil in unit as shown for right hand air supply.

- Reinstall the indoor coil 180° from original position. Ensure the retaining channel is fully engaged with the coil rail. See Fig. 3.
- Rotate unit into the downflow position, with the coil compartment on top and the blower compartment on bottom. See Fig. 3.
- Secondary drain pan kits are required when the unit is configured for the horizontal right position over a finished ceiling and/or living space.





## Caution

Horizontal units must be configured for right hand air supply or left hand air supply. Horizontal drain pan must be located under indoor coil. Failure to use the drain pan can result in property damage.

Conversion in Horizontal Direction: Horizontal left-hand supply can be changed to horizontal right-hand supply by removing the indoor coil and reinstalling 180° from original.

## 4.4 INSTALLATION IN AN UNCONDITIONED SPACE

**IMPORTANT:** There are two pairs of coil rails in the air handler for default and counter flow application. If the air handler is installed in an unconditioned space, the two unused coil rails should be removed to minimize air handler surface sweating. The coil rails can be easily removed by taking off the 6 mounting screws from both sides of the cabinet.

## 5.0 ELECTRICAL WIRING

Field wiring must comply with the National Electric Code (C.E.C. in Canada) and any applicable local ordinance.

Disconnect all power to unit before installing or servicing. More than one disconnect switch may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury or death.

### 5.1 POWER WIRING

It is important that proper electrical power is available for connection to the unit model being installed. See the unit nameplate, wiring diagram and electrical data in the installation instructions.

- If required, install a branch circuit disconnect of adequate size, located within sight of, and readily accessible to the unit.
- **IMPORTANT:** After the Electric Heater is installed, units may be equipped with one, two, or three 30/60 amp. circuit breakers. These breaker(s) protect the internal wiring in the event of a short circuit and serve as a disconnect. Circuit breakers installed within the unit do not provide over-current protection of the supply wiring and therefore may be sized larger than the branch circuit protection.
- Supply circuit power wiring must be 167°F [75°C] minimum copper conductors only. See Electrical Data In this section for ampacity, wire size and circuit protector requirement. Supply circuit protective devices may be either fuses or “HACR” type circuit breakers.
- Power wiring may be connected to either the right, left side or top. Three 7/8”, 1-3/8”, 1-3/4” diameter concentric knockouts are provided for connection of power wiring to unit.
- Power wiring is connected to the power terminal block in unit electric cabinet.

## 5.2 CONTROL WIRING

**IMPORTANT:** Class 2 low voltage control wiring should not be run in conduit with main power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used.

- Low voltage control wiring should be 18 Awg. color-coded. For lengths longer than 100 ft., 16 Awg. wire should be used.
- Low voltage control connections are made to low voltage pigtails extending from top of air handler (upflow position - see Figure 3). Connections for control wiring are made with wire nuts. Control wiring knockouts (5/8 and 7/8) are also provided on the right and left side of the unit for side connection.
- See wiring diagrams attached to indoor and outdoor sections to be connected.
- Make sure, after installation, separation of control wiring and power wiring has been maintained.

## 5.3 GROUNDING



### Caution

The unit must be permanently grounded. Failure to do so can result in electrical shock causing personal injury or death.

- This product must be sufficiently ground in accordance with National Electric Code (N.E.C. in Canada) and any applicable local ordinance.
- Grounding may be accomplished by grounding metal conduit when installed in accordance with electrical codes to the unit cabinet.
- Grounding may also be accomplished by attaching ground wire(s) to ground lug(s) provided in the unit wiring compartment.
- Ground lug(s) are located close to wire entrance on left side of unit (up-flow). Lug(s) may be moved to marked locations near wire entrance on right side of unit (upflow). If alternate location is more convenient.
- Use of multiple supply circuits require grounding of each circuit to lug(s) provided in unit.

### 5.4 Electrical Data– BLOWER ONLY, NO ELECTRIC HEAT

Model	Voltage	HP	RPM	SPEEDS	CIRCUIT AMPS.	MINIMUM CIRCUIT AMPACITY	MAXIMUM CIRCUIT PROTECTOR
HDG18	208/230-1-60	1/8	580	3	0.68	1	15(A)
HDG24	208/230-1-60	1/5	701	3	0.95	1.5	15(A)
HDG30	208/230-1-60	1/4	872	3	1.48	2	15(A)
HDG36	208/230-1-60	1/2	794	3	1.63	3	15(A)
HDG42	208/230-1-60	1/2	882	3	1.80	3	15(A)
HDG48	208/230-1-60	1/2	845	3	2.11	3	15(A)
HDG60	208/230-1-60	3/4	963	3	2.79	3	15(A)

### 5.5 Electrical Data– ELECTRIC HEAT

Air Handler Model	Heater Model No.	Heater kW (208V)	Heater kW (240V)	PH/Hz	Circuit Amps (208V)	Circuit Amps (240V)	Motor Ampacity	Minimum Circuit Ampacity (208V)	Minimum Circuit Ampacity (240V)	Maximum Circuit Protection (208V)	Maximum Circuit Protection (240V)
HDG18	7800-505-1D	3.8	5	1Ph/60Hz	18.1	20.8	0.68	23.5	26.9	25	30
	7800-508-1D	5.6	7.5		27.1	31.3	0.68	34.8	40	35	45
	7800-510-1D	7.5	10		36.1	41.7	0.68	46	53	50	60
HDG24	7800-505-1D	3.8	5	1Ph/60Hz	18.1	20.8	0.95	23.8	27.3	25	30
	7800-508-1D	5.6	7.5		27.1	31.3	0.95	35.1	40.3	40	45
	7800-510-1D	7.5	10		36.1	41.7	0.95	46.4	53.3	50	60
HDG30	7800-505-1D	3.8	5	1Ph/60Hz	18.1	20.8	1.48	24.5	27.9	25	30
	7800-508-1D	5.6	7.5		27.1	31.3	1.48	35.8	41	40	45
	7800-510-1D	7.5	10		36.1	41.7	1.48	47	54	50	60
HDG36	7800-505-1D	3.8	5	1Ph/60Hz	18.1	20.8	1.63	24.7	28.1	25	30
	7800-508-1D	5.6	7.5		27.1	31.3	1.63	35.9	41.1	40	45
	7800-510-1D	7.5	10		36.1	41.7	1.63	47.2	54.2	50	55
	7800-515-1D	11	15		54.2	62.5	1.63	69.8	80.2	70	90
	7800-520-1D	15	20		72.2	83.3	1.63	92.4	106.3	100	125
HDG42	7800-505-1D	3.8	5	1Ph/60Hz	18.1	20.8	1.80	24.9	28.3	25	30
	7800-508-1D	5.6	7.5		27.1	31.3	1.80	36.2	41.4	40	45
	7800-510-1D	7.5	10		36.1	41.7	1.80	47.4	54.4	50	60
	7800-515-1D	11	15		54.2	62.5	1.80	70	80.4	80	90
	7800-520-1D	15	20		72.2	83.3	1.80	92.6	106.5	100	125
HDG48	7800-505-1D	3.8	5	1Ph/60Hz	18.1	20.8	2.11	25.3	28.7	30	30
	7800-508-1D	5.6	7.5		27.1	31.3	2.11	36.5	41.7	40	45
	7800-510-1D	7.5	10		36.1	41.7	2.11	47.8	54.8	50	60
	7800-515-1D	11	15		54.2	62.5	2.11	70.4	80.8	80	90
	7800-520-1D	15	20		72.2	83.3	2.11	93	106.9	100	125
HDG60	7800-505-1D	3.8	5	1Ph/60Hz	18.1	20.8	2.79	26.1	29.6	30	30
	7800-508-1D	5.6	7.5		27.1	31.3	2.79	37.4	42.6	40	45
	7800-510-1D	7.5	10		36.1	41.7	2.79	48.7	55.6	50	60
	7800-515-1D	11	15		54.2	62.5	2.79	71.2	81.7	80	90
	7800-520-1D	15	20		72.2	83.3	2.79	93.8	107.7	100	125

## 6.0 Airflow Performance

Airflow performance data is based on cooling performance with a coil and no filter in place. Select performance table for appropriate unit size. Make sure external static applied to unit allows operation within the minimum and maximum limits shown in table below for both cooling and electric heat operation.

### Airflow Performance Data

Model Number	Motor Speed		CFM (Watts)									
			External Static Pressure-Inches W.C. [kPa]									
			0 [0]	0.1 [.02]	0.16 [.04]	0.2 [.05]	0.3 [.07]	0.4 [.10]	0.5 [.12]	0.6 [.15]	0.7 [.17]	0.8 [.20]
HDG18	Low	CFM	551	509	-	462	393	345	280	---		
		RPM	440	518	-	595	679	726	781	---		
		Watts	122.4	120	-	116.8	116.3	109.9	106.2	---		
		Amps	0.62	0.62	-	0.62	0.61	0.61	0.60	---		
	Middle	CFM	661	622	-	577	506	443	400	---		
		RPM	518	580	-	640	731	770	812	---		
		Watts	145.2	143	-	140.8	136.3	133.6	131.2	---		
		Amps	0.69	0.68	-	0.68	0.67	0.67	0.66	---		
	High	CFM	--	--	--	--	--	590	550	487	400	
		RPM	--	--	--	--	--	894	911	940	975	
		Watts	--	--	--	--	--	232	229.5	224.4	217.4	
		Amps	--	--	--	--	--	1.16	1.15	1.14	1.12	
HDG24	Low	CFM	646	623	-	592	553	506	453	---		
		RPM	528	591	-	650	728	790	840	---		
		Watts	169.4	166.4	-	163	157.5	151.3	146.3	---		
		Amps	0.79	0.78	-	0.78	0.77	0.76	0.75	---		
	Middle	CFM	815	802	-	771	733	681	613	---		
		RPM	658	701	-	743	790	841	888	---		
		Watts	218	216.6	-	214.4	211.4	207.4	203	---		
		Amps	0.96	0.95	-	0.95	0.94	0.93	0.92	---		
	High	CFM	--	--	--	--	--	780	695	607	515	
		RPM	--	--	--	--	--	919	956	986	1014	
		Watts	--	--	--	--	--	262.6	256.4	250.1	243	
		Amps	--	--	--	--	--	1.21	.181	.171	.15	
HDG30	Low	CFM	962	913	886	870	813	750	690	-	-	-
		RPM	729	754	798	809	858	873	902	-	-	-
		Watts	315	304	298	292	280	269	258	-	-	-
		Amps	1.39	1.35	1.32	1.30	1.26	1.22	1.19	-	-	-
	Middle	CFM	1094	1043	1012	988	927	861	788	-	-	-
		RPM	809	845	859	885	911	932	954	-	-	-
		Watts	334	325	319	315	303	290	279	-	-	-
		Amps	1.46	1.43	1.40	1.38	1.35	1.30	1.26	-	-	-
	High	CFM	1374	1311	1268	1240	1164	1084	996	910	828	744
		RPM	910	937	947	954	972	989	1004	1018	1033	1043
		Watts	440	427	419	413	398	381	366	352	340	331
		Amps	1.94	1.90	1.86	1.84	1.79	1.74	1.68	1.63	1.60	1.56

continued on next page

Model Number	Motor Speed		CFM (Watts)									
			External Static Pressure-Inches W.C. [kPa]									
			0 [0]	0.1 [.02]	0.16 [.04]	0.2 [.05]	0.3 [.07]	0.4 [.10]	0.5 [.12]	0.6 [.15]	0.7 [.17]	0.8 [.20]
HDG36	Low	CFM	1129	1088	1061	1040	988	941	819	-	-	-
		RPM	642	675	706	732	771	817	853	-	-	-
		Watts	322	312	306	301	289	269	254	-	-	-
		Amps	1.54	1.52	1.51	1.50	1.47	1.42	1.39	-	-	-
	Middle	CFM	1317	1268	1237	1217	1157	1111	1027	-	-	-
		RPM	776	810	841	874	905	935	966	-	-	-
		Watts	360	354	348	345	335	323	309	-	-	-
		Amps	1.69	1.67	1.66	1.65	1.63	1.60	1.57	-	-	-
	High	CFM	1643	1581	1544	1518	1446	1356	1261	1123	915	812
		RPM	868	883	895	906	931	955	978	1013	1028	1050
		Watts	463	451	443	438	429	415	401	371	356	343
		Amps	2.22	2.20	2.18	2.17	2.14	2.12	2.09	2.03	1.99	1.96
HDG42	Low	CFM	1239	1203	1178	1161	1117	1070	1000	-	-	-
		RPM	738	775	797	808	844	872	905	-	-	-
		Watts	396	385	376	371	360	345	327	-	-	-
		Amps	1.73	1.68	1.64	1.62	1.57	1.52	1.44	-	-	-
	Middle	CFM	1480	1431	1399	1379	1319	1259	1187	-	-	-
		RPM	843	865	882	893	915	937	959	-	-	-
		Watts	430	416	407	401	388	375	359	-	-	-
		Amps	1.87	1.81	1.77	1.75	1.69	1.63	1.57	-	-	-
	High	CFM	1738	1682	1639	1618	1548	1477	1378	1286	1042	908
		RPM	921	941	949	955	970	985	1002	1016	1042	1059
		Watts	508	493	486	478	460	445	431	412	373	354
		Amps	2.22	2.15	2.12	2.08	2.01	1.94	1.89	1.81	1.65	1.58
HDG48	Low	CFM	1471	1427	1395	1374	1316	1247	1180	--	--	-
		RPM	694	732	753	769	803	833	864	--	--	-
		Watts	381	376	372	370	364	357	349	--	--	-
		Amps	1.66	1.64	1.63	1.62	1.61	.581	.550	--	--	-
	Middle	CFM	1729	1678	1646	1625	1558	1491	1402	--	--	-
		RPM	790	817	833	845	876	898	920	--	--	-
		Watts	485	477	473	470	460	451	240	--	--	-
		Amps	2.14	2.12	2.09	2.08	2.06	2.03	1.99	--	--	-
	High	CFM	2045	1992	1951	1928	1847	1763	1677	1563	1450	1317
		RPM	895	920	932	938	956	972	987	1002	1015	1030
		Watts	641	627	617	612	596	582	566	546	528	507
		Amps	2.86	2.82	2.82	.782	.732	.682	.642	.572	.522	.450
HDG60	Low	CFM	1786	1740	1709	1688	1630	1562	1489	--	--	-
		RPM	830	843	849	856	890	921	942	--	--	-
		Watts	584	569	560	552	536	516	497	--	--	-
		Amps	2.64	2.59	2.55	2.54	2.58	2.42	2.37	--	--	-
	Middle	CFM	2140	2071	2039	2006	1932	1799	1677	--	--	-
		RPM	917	930	938	943	957	970	990	--	--	-
		Watts	645	630	623	617	602	585	569	--	--	-
		Amps	2.87	2.81	2.78	2.76	2.71	2.65	2.59	--	--	-
	High	CFM	2357	2276	2225	2188	2100	2004	1902	1764	1554	1393
		RPM	964	976	982	990	1001	1012	1022	1032	1042	1063
		Watts	754	733	718	710	693	673	650	630	607	575
		Amps	3.34	3.27	3.22	3.19	3.12	3.05	2.98	2.91	2.83	2.71

**Fan speed switch configurations:**

1. All motors are shipped from the factory at medium speed as default.
2. To change the fan speed to high speed:
  - Connect the black wire to the fan terminal
  - Connect the blue wire to the M1 terminal
  - Connect the red wire to the M2 terminal
3. To change the fan speed to low speed:
  - Connect the blue wire to the fan terminal
  - Connect the red wire to the M1 terminal
  - Connect the black wire to the M2 terminal

Terminal Fan speed	Fan	M1	M2
Medium	Red	Blue B	Black
High	Black	Blue	Red
Low	Blue	Red	Black

The air distribution system has the greatest effect on airflow. The duct system is totally controlled by the contractor. For this reason, the contractor should use only industry-recognized procedures.

Heat pump systems require a specified airflow. Each ton of cooling requires between 350 and 450 cubic feet of air per minute (CFM), or 400 CFM nominally.

Duct design and construction should be carefully done. System performance can be lowered dramatically through bad planning or workmanship.

Air supply diffusers must be selected and located carefully. They must be sized and positioned to deliver treated air along the perimeter of the space. If they are too small for their intended airflow, they become noisy. If they are not located properly, they cause drafts. Return air grilles must be properly sized to carry air back to the blower. If they are too small, they also cause noise.

The installers should balance the air distribution system to ensure proper quiet airflow to all rooms in the home. This ensures a comfortable living space.

An air velocity meter or airflow hood can give a reading of system CFM.

## 7.0 DUCTWORK

Field ductwork must comply with the National Fire Protection Association NFPA 90A, NFPA 90B and any applicable local ordinance.



### Warning

Do not, under any circumstances, connect return ductwork to any other heat producing device such as fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury or property damage.

Sheet metal ductwork run in unconditioned spaces must be insulated and covered with a vapor barrier. Fibrous ductwork may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Ductwork must comply with National Fire Protection Association as tested by U/L Standard 181 for Class I Air Ducts. Check local codes for requirements on ductwork and insulation.

- Duct system must be designed within the range of external static pressure the unit is designed to operate against. It is important that the system airflow be adequate. Make sure supply and return ductwork, grills, special filters, accessories, etc. are accounted for in total resistance. See airflow performance tables in this manual.
- Design the duct system in accordance with “ACCA” Manual “D” Design for Residential Winter and Summer Air Conditioning and Equipment Selection. Latest editions are available from: “ACCA” Air Conditioning Contractors of America, 1513 16th Street, N.W., Washington, D.C. 20036. If duct system incorporates flexible air duct, be sure pressure drop information (straight length plus all turns) shown in “ACCA” Manual “D” is accounted for in system.
- Supply plenum is attached to the 3/4” duct flanges supplied with the unit. Attach flanges around the blower outlet.

**IMPORTANT:** If an elbow is included in the plenum close to the unit, it must not be smaller than the dimensions of the supply duct flange on the unit.

- **IMPORTANT:** The front flange on the return duct if connected to the blower casing must not be screwed into the area where the power wiring is located. Drills or sharp screw points can damage insulation on wires located inside unit.
- Secure the supply and return ductwork to the unit flanges, using proper fasteners for the type of duct used and tape the duct-to-unit joint as required to prevent air leaks.

## 8.0 REFRIGERANT CONNECTIONS

Keep the coil connections sealed until refrigerant connections are made. See the Installation Instructions for the outdoor unit for details on line sizing, tubing installation, and charging information.

Coil is shipped with “No charge”. Evacuate the system before charging with refrigerant.

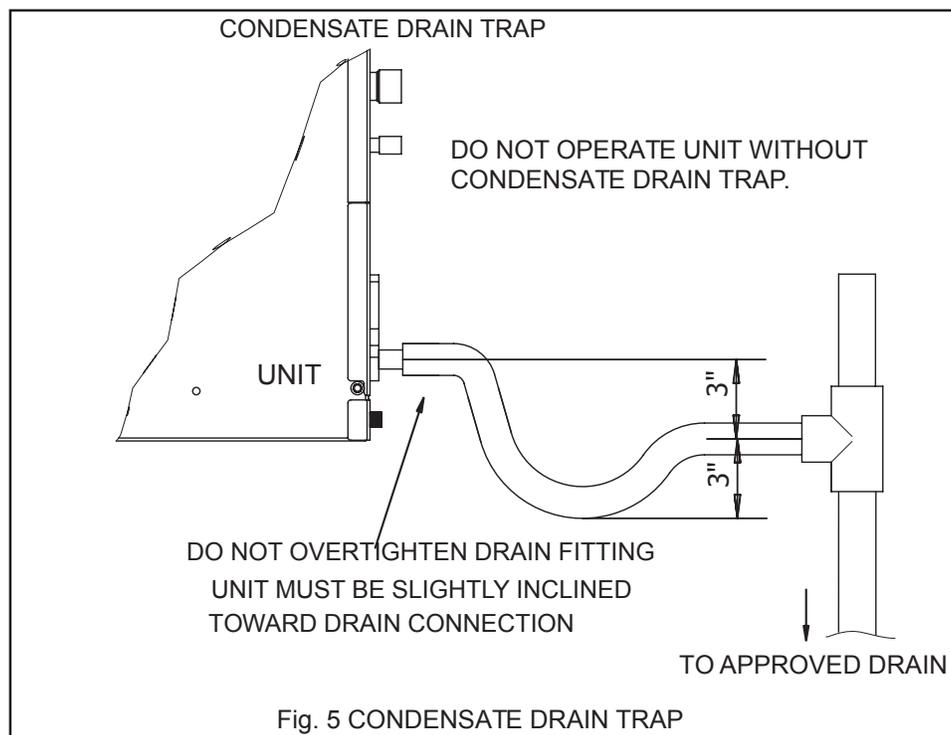
Install refrigerant tubing so that it does not block service access to the front of the unit.

Nitrogen should flow through the refrigerant lines while brazing.

Use a brazing shield to protect the cabinet’s paint and a wet rag to protect the rubber grommet from being damaged by torch flames. After the refrigerant connections are made, seal the gap around the connections with pressure sensitive gasket.

## 8.1 CONDENSATE DRAIN TUBING

Consult local codes for specific requirements.



### IMPORTANT:

1. When making drain fitting connections to the drain pan, use a thin layer of Teflon paste, silicone or Teflon tape and install, hand tighten.
  2. When making drain fitting connections to drain pan, do not overtighten. Over tightening fittings can split pipe connections on the drain pan.
- Install drain lines so they do not block service access to front of the unit. Minimum clearance of 24 inches is required for filter, coil or blower removal and service access.
  - Make sure unit is level or pitched slightly toward primary drain connection so that water will drain completely from the pan. (See Fig. 5)
  - Do not reduce drain line size less than connection size provided on condensate drain pan.
  - All drain lines must be pitched downward away from the unit a minimum of 1/8" per foot of line to ensure proper drainage.
  - Do not connect condensate drain line to a closed or open sewer pipe. Run condensate to an open drain or run line to a safe outdoor area.

- The drain line should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the line.
- Make provisions for disconnecting and cleaning of the primary drain line should it become necessary. Install a 3 inch trap in the primary drain line as close to the unit as possible. Make sure that the top of the trap is below connection to the drain pan to allow complete drainage of pan (See Fig. 5).
- Auxiliary drain line should be run to a place where it will be noticeable if it becomes operational. Homeowner should be warned that a problem exists if water should begin running from the auxiliary drain line.
- Plug the unused drain connection with the plugs provided in the parts bag, using a thin layer of teflon paste, silicone or teflon tape to form a water tight seal.
- Test condensate drain pan and drain line after installation is complete. Pour water into drain pan, enough to fill drain trap and line. Check to make sure drain pan is draining completely, no leaks are found in drain line fittings, and water is draining from the termination of the primary drain line.

## 8.2 Flowrator Piston Change

In most applications, there is no need to change the piston (orifice). However, in some applications, changing the piston size is required. If the application requires a different piston/flowrator, change the piston in the distributor of indoor coil before installing the coil. See Table 1 for orifice size.

### To change the piston, use following steps:

1. Remove cover panel.
2. Use Two wrenches.  
Loosen one turn to release pressure. (High pressure gas)
3. After releasing pressure.  
Loosen and carefully pull a part the two fittings to expose piston.
4. Remove factory installed piston and replace with recommended piston from Table 1 as shown in Fig.7.
5. Carefully reassemble assembly. (Hand tighten)  
Be sure to use teflon tape on thread for a complete seal.
6. Hand tighten and make sure assembly is properly connected and then torque to 10-30 ft/lb.

**NOTE:** Be careful not to bend tubing

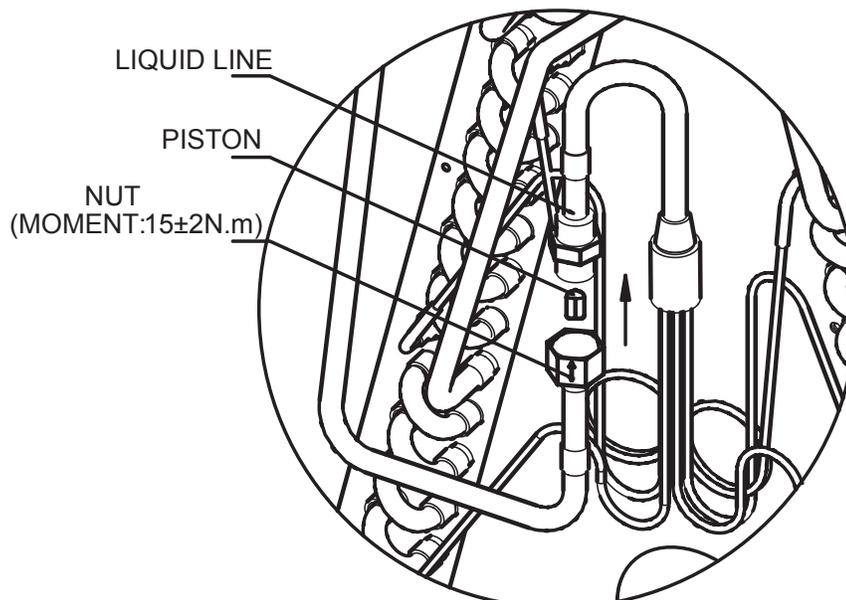


Fig. 6: Flowrator Piston Change

## Flowrator Piston Size Chart

**NOTE:** Pistons are factory installed for use with HRG-1D series heat pump. To use the coil with a RSG-1D series condenser, a piston change may be required. Refer to table below.

<b>Scroll Heat Pump Applications*</b>		
<b>Air Handler:</b>	<b>Heat Pumps</b>	<b>Piston Size</b>
HDG18FB-1A	HRG18S-1D	0.052 inch
HDG24FB-1A	HRG24S-1D	0.058 inch
HDG30FB-1A	HRG30S-1D	0.065 inch
HDG36FB-1A	HRG36S-1D	0.068 inch
HDG42FB-1A	HRG42S-1D	0.080 inch
HDG48FB-1A	HRG48S-1D	0.090 inch
HDG60FB-1A	HRG60S-1D	0.108 inch
<b>Scroll Compressor Condenser Applications**</b>		
<b>Air Handler:</b>	<b>Condensers</b>	<b>Piston Size</b>
HDG18FB-1A	RSG18S-1D	0.052 inch
HDG24FB-1A	RSG24S-1D	0.058 inch
HDG30FB-1A	RSG30S-1D	0.065 inch
HDG36FB-1A	RSG36S-1D	0.073 inch
HDG42FB-1A	RSG42S-1D	0.077 inch
HDG48FB-1A	RSG48S-1D	0.105 inch
HDG60FB-1A	RSG60S-1D	0.097 inch
<b>Rotary Compressor Condenser Applications**</b>		
<b>Air Handler:</b>	<b>Condensers</b>	<b>Piston Size</b>
HDG18FB-1A	RSG18R-1D	0.054 inch
HDG24FB-1A	RSG24R-1D	0.061 inch
HDG30FB-1A	RSG30R-1D	0.065 inch

\*PISTON REQUIRED FOR THIS APPLICATION IS FACTORY INSTALLED.

\*\*PISTON REQUIRED FOR THIS APPLICATION IS NOT FACTORY INSTALLED, REQUIRES FIELD CONVERSION.

## 9.0 AIR FILTER (not factory-installed)

- External filter or other means of filtration is required. Units should be sized for a maximum of 300 feet/ min. air velocity or what is recommended for the type filter installed.

Filter application and placement are critical to airflow, which may affect the heating and cooling system performance. Reduced airflow can shorten the life of the system's major components, such as motor, limits, elements, heat relays, evaporator coil or compressor. Consequently, we recommend that the return air duct system have only one filter location. For systems with a return air filter grill or multiple filter grills, can have a filter installed at each of the return air openings.

If adding high efficiency filters or electronic air filtration systems, it is very important that the air flow is not reduced. If air flow is reduced the overall performance and efficiency of the unit will be reduced. It is strongly recommended that a professional installation technician is contacted to ensure installation of these such filtration systems are installed correctly.

**IMPORTANT:** DO NOT DOUBLE FILTER THE RETURN AIR DUCT SYSTEM. DO NOT FILTER THE SUPPLY AIR DUCT SYSTEM. THIS WILL CHANGE THE PERFORMANCE OF THE UNIT AND REDUCE AIRFLOW .

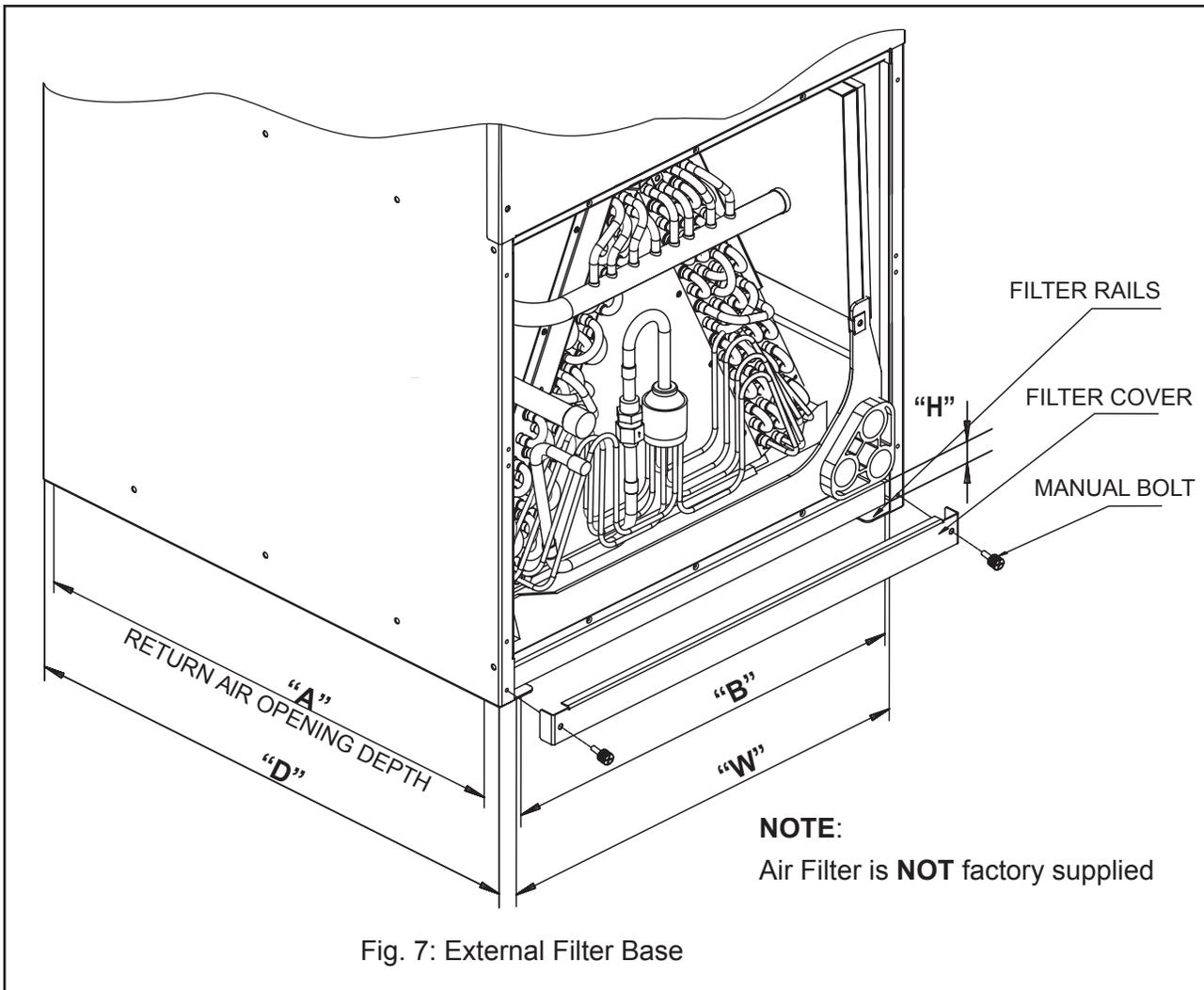


### Warning

Do not operate the system without filters. A portion of the dust entrained in the air may temporarily lodge in the duct runs and at the supply registers. Any circulated dust particles could be heated and charred by contact with the air handler elements. This residue could soil ceilings, walls, drapes, carpets and other articles in the house.

Soot damage may occur with filters in place, when certain types of candles, oil lamps or standing pilots are burned.

## 10.0 FILTER INSTALLATION DIMENSIONS



### DIMENSIONAL DATA

MODEL	FILTER SIZE* IN [mm]	"W" IN [mm]	"D" IN [mm]	"H" IN [mm]	Return width "A" IN	Return length "B" IN
HDG 18/24/30	16x20 [406x508]	16.8[426]	20.4[518]	1[25.4]	19.6	14.8
HDG 36/42	18x20 [457x508]	18.3[466]	21.6[548]	1[25.4]	20.8	16.3
HDG 48/60	20x22 [508x559]	20.7[526]	23.9[608]	1[25.4]	23	18.8

\* Air filter is not factory installed. Filter rack is provided. Field supplied filters must be installed per recommended sizes.

### AIR FILTER REMOVAL

1. Remove bolts manually, remove air filter recover, see in Fig 7;
2. Hold the edge of the air filter and extract out .
3. Replace the filter with a properly sized filter using the table above.

# 11.0 Wiring Diagram

1. To avoid the electrical shock, connect the air conditioner with the ground lug. The main power plug in the air conditioner has been joined with the ground wiring, please don't alter it.
2. The power socket is used as the air conditioner specially.
3. Don't pull the power wiring hard.
4. When connecting the air conditioner with the ground, observe the local codes.
5. If necessary, use the power fuse or the circuit, breaker or the corresponding scale ampere.

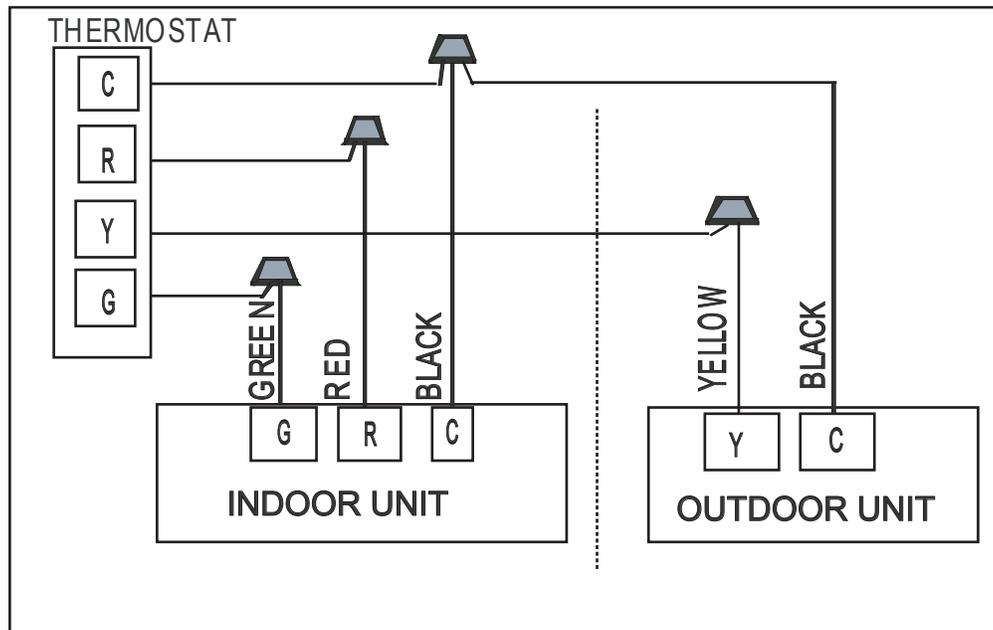


Fig. 8: Typical Thermostat Wiring for Cooling-Only Models

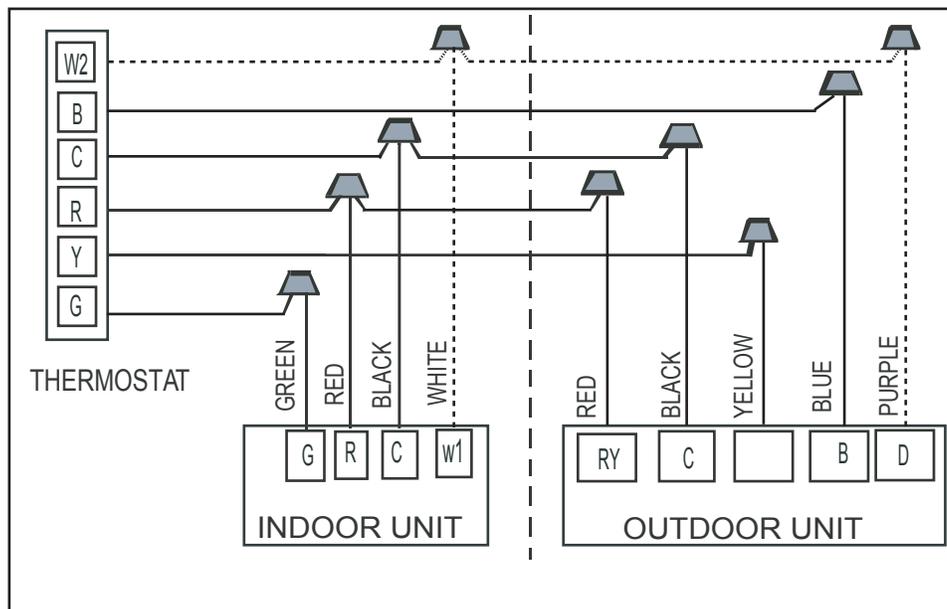


Fig. 9: Typical Thermostat Wiring for Heat Pump Models

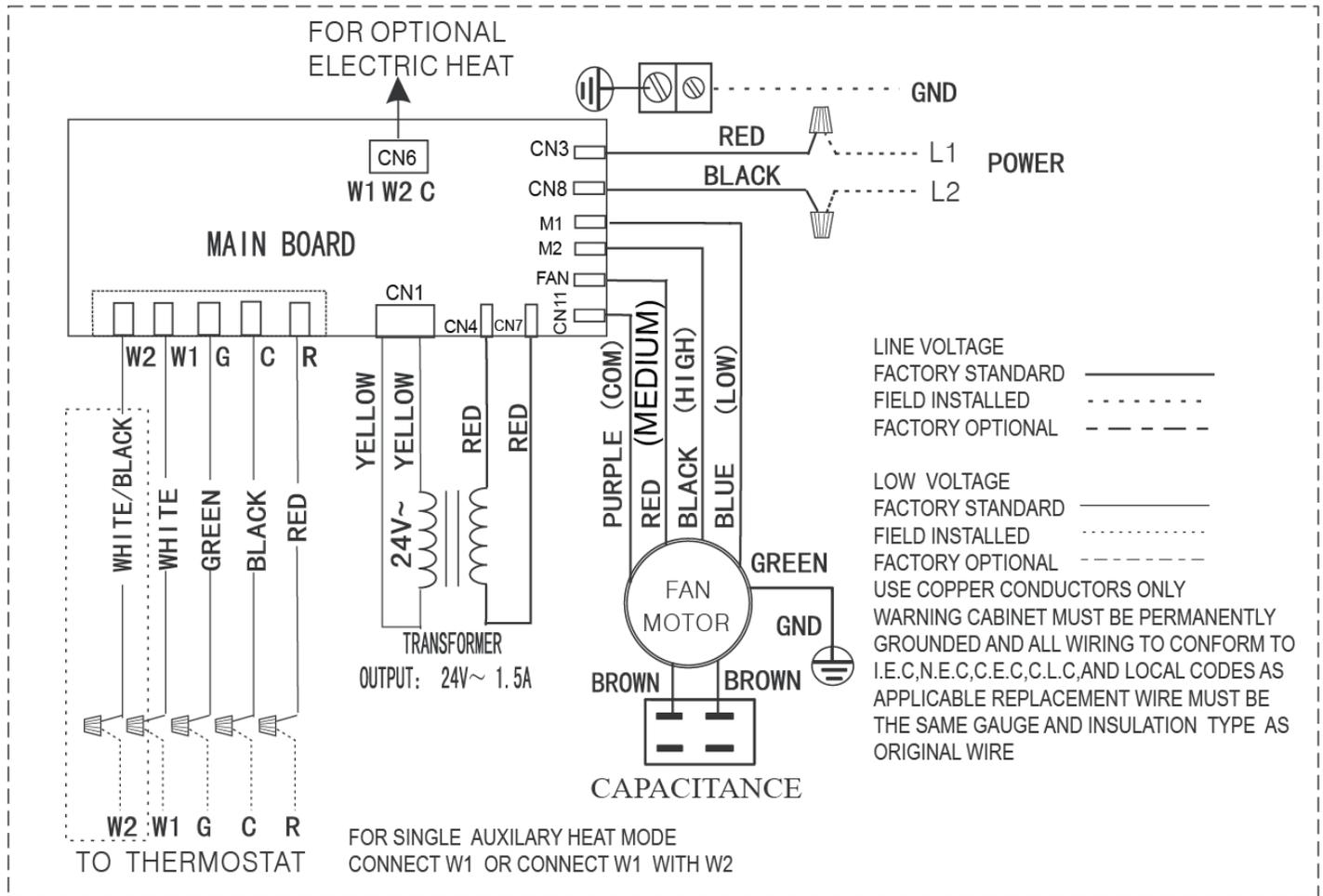


Fig. 10: Indoor Unit Wiring Diagram for A/C Systems and H/P Systems

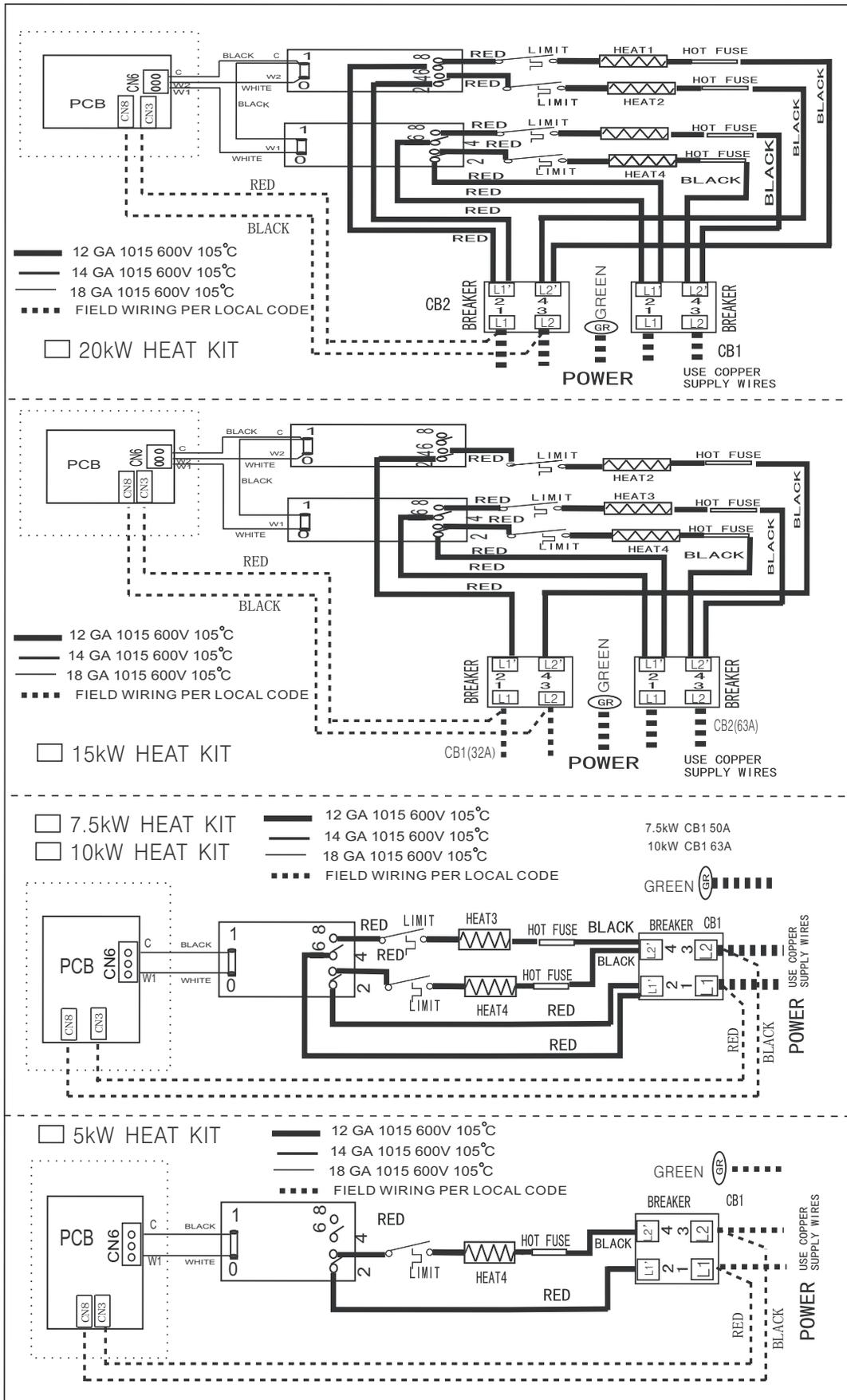


Fig. 11: Indoor Unit Wiring Diagram for Electric Heat

Design, material, performance data and components  
subject to change without notice.

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1900 Wellworth Ave., Jackson, MI 49203 ♦ Ph. 517-787-2100 ♦ Fax 517-787-9341

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