

Installation and Owner's Manual

High Efficiency Air-Handler

Split System Heat Pump & Air Conditioner
 Up to 18 SEER
 2-5 Tons
 R410A

Air conditioning & Heating

NOTE: Appearance of unit may vary.

ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES

IMPORTANT — This Document is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

These instructions do not cover all variations in systems or provide for every possible contingency to be met in connection with the installation. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to your installing dealer or local distributor.

Note : *The manufacturer recommends installing only approved matched indoor and outdoor systems. All of the manufacturer's split systems are A.H.R.I. rated only with TXV indoor systems. Some of the benefits of installing approved matched indoor and outdoor split systems are maximum efficiency, optimum performance and the best overall system reliability.*

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Section 1 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 supply-ing 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 injuring 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, prop-erty damage, personal injury or death.

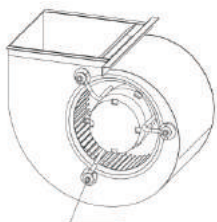


WARNING

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



WARNING



BLOWER MOTOR SHIPPING BOLT

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.



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 have labels stating that the product contains and / or produces Proposition 65 chemicals. Although we have not changed our processes, having the same label on all our product facilitates manufacturing and shipping. We cannot always know "when, or if" products will be sold in the California market.

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 and the State of California's OEHHA (Office of Environmental Health Hazard Assessment), at 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.



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 down-flow unit can cause a fire resulting in property damage, personal injury or death.

Section 2. Specifications

Model			24000	36000	48000	60000
Electrical Data	Voltage - Phase - Hz	V-Ph-Hz	208/230V-1Ph-60Hz			
	Minimum Circuit Ampacity	A	3.5	5.1	7.5	7.5
	Max. Overcurrent Protection	A	15	15	15	15
	Min / Max Volts	V-Ph-Hz	187/253			
Cooling	Capacity	Btu/h	24000	34500	47000	56000
	SEER	Btu/h/W	17.5	17.5	17.5	17.5
Heating	Capacity	Btu/h	24000	34500	46500	55000
	HSPF	Btu/h/W	9.5	9.0	9.5	9.5
Indoor Coil	Number of Rows		4 x 2	4 x 2	4 x 2	5 x 2
	Tube outside dia. / Type		7 mm / Innergroove tube			
	Fin spacing / Thickness / Type	mm / mm	1.6 / 0.095 / Hydrophilic aluminium			
	Tube pitch (a) x row pitch (b)	mm	13.37 x 21			
Indoor Motor	Type		ECM			
	Rated HP		1/3	1/2	3/4	3/4
	Rated RPM	r/min	770	870	1050	1120
	FLA	A	2.8	4.1	6	6
Indoor Fan	Material		Galvanized plate			
	Type		Centrifugal			
	Diameter	in.	11	11	11	11
	Height	in.	10-5/8	10-5/8	10-5/8	10-5/8
Indoor noise flow		CFM	830	1100	1500	1750
ESP		Pa	25	37.5	50	50
Indoor noise level		dB(A)	63	66	67	68
Metering Device	Throttle Type		TXV			
	Model number		3TR	3TR	5TR	5TR
Indoor Unit	Dimension (W x H x D)	mm	500 x 1162 x 560		560 x 1350 x 620	
		in.	19-5/8 x 45-3/4 x 22		22 x 53-1/8 x 24-3/8	
	Packing (W x H x D)	mm	580 x 1210 x 650		640 x 1390 x 710	
		in.	22-7/8 x 47-3/5 x 25-3/5		25-1/8 x 54-3/4 x 28	
	Net / Gross weight	kg	57 / 63	57 / 63	77 / 85	77 / 85
		lbs	126 / 139	126 / 139	170 / 188	170 / 188
Refrigerant piping Liquid Side / Gas Side		in.	3/8 / 3/4	3/8 / 3/4	3/8 / 7/8	3/8 / 7/8
Shipping per STD40HQ			154	154	104	104

Section 3. Unit Considerations

3.1 Unit Dimensions

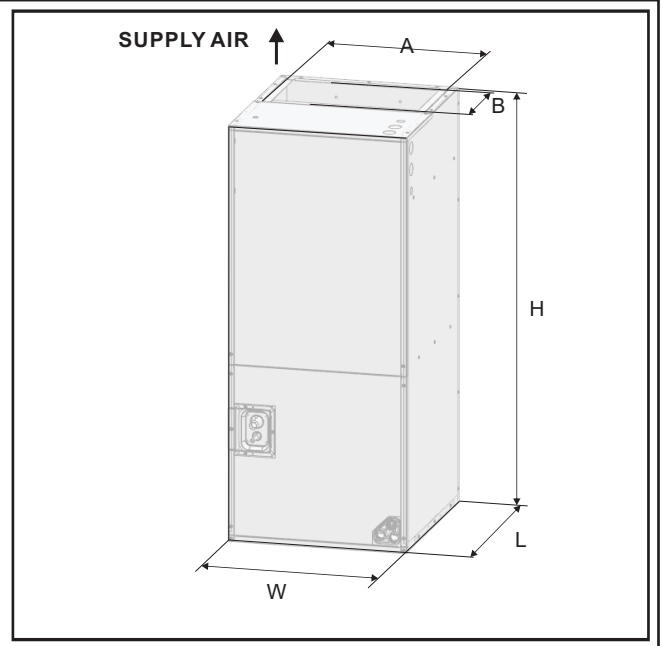
Unit Dimensions	
Models	H x W x L (Inches)
24/36	45-3/4 x 19-5/8 x 22
48/60	53-1/8 x 22 x 24-1/2

Supply Duct & Refrigeration Lines		
Models	Supplyduct (In)(A x B)	Liquid & Vapor Line
24/36	17-7/8" x 10-1/2"	3/8" x 3/4"
48/60	19-1/2" x 10-1/2"	3/8" x 7/8"

NOTE: 25" CLEARANCE IS REQUIRED IN THE FRONT OF THE UNIT FOR FILTER AND COIL MAINTENANCE.

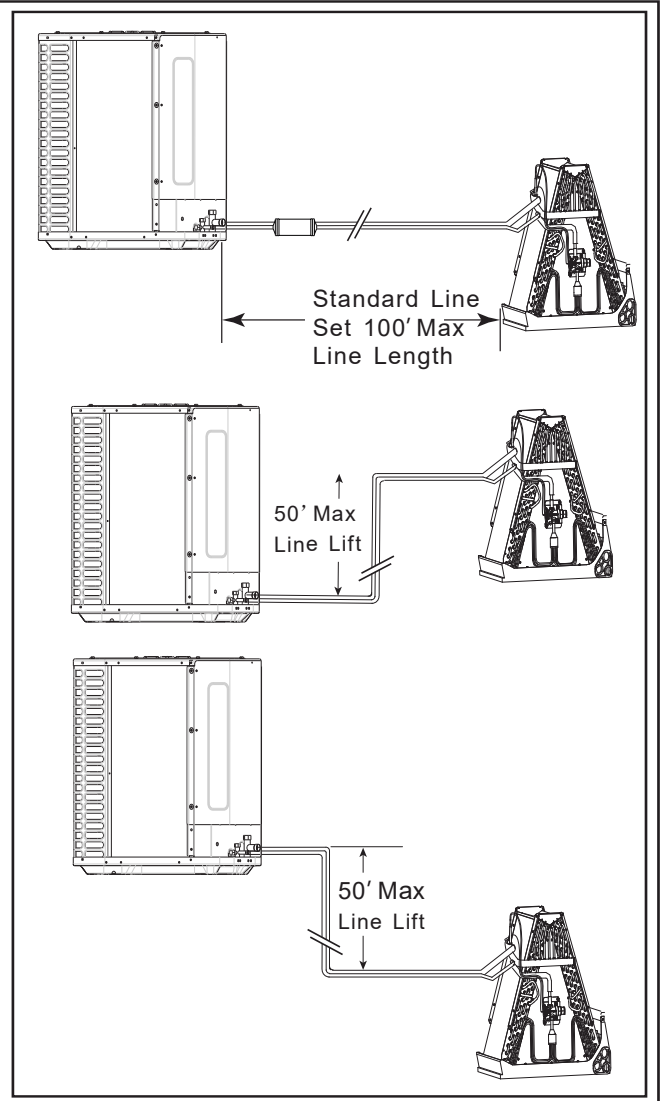
ELECTRICAL CONNECTIOS MAY EXIT TOP OR EITHER SIDE

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



3.2 Refrigerant Piping Limits

- Maximum line length = 100 feet.
- Maximum vertical length = 50 feet.
- Compressor crankcase heat is required for line lengths over 50 feet.
- Use only the line diameters indicated in Table 5.1.
- Such as the connecting tube is more than 60 feet, does not use large Suction line than recommend.



Section 4. 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.

Model	Line Sizes		Service Valve Connection Sizes	
	Suction Line	Liquid Line	Suction Line Connection	Liquid Line Connection
24/36	3/4	3/8	3/4	3/8
48/60	7/8	3/8	7/8	3/8

Section 5. Condensate Drain Tubing

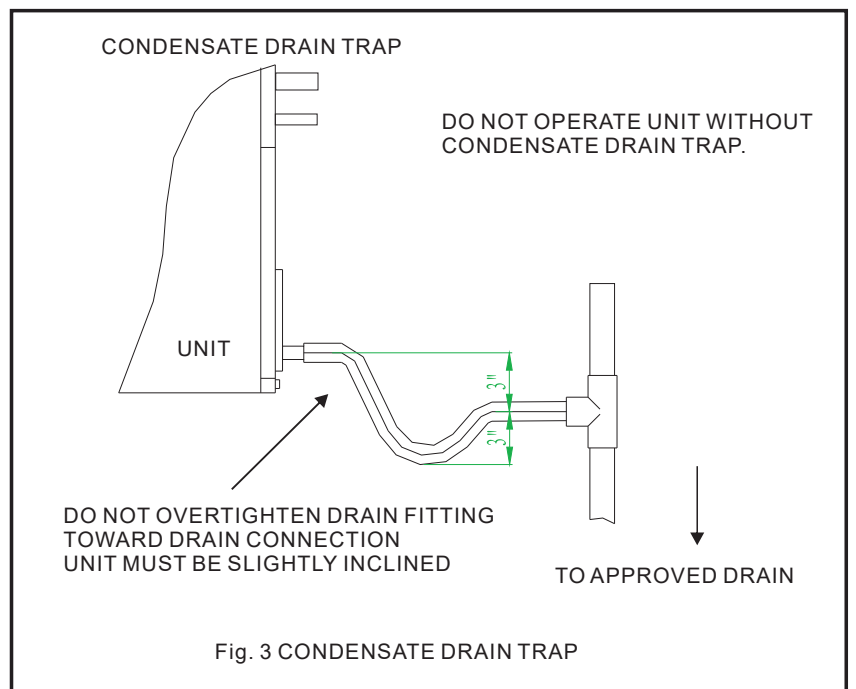
IMPORTANT

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.
 - * 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.



* 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.

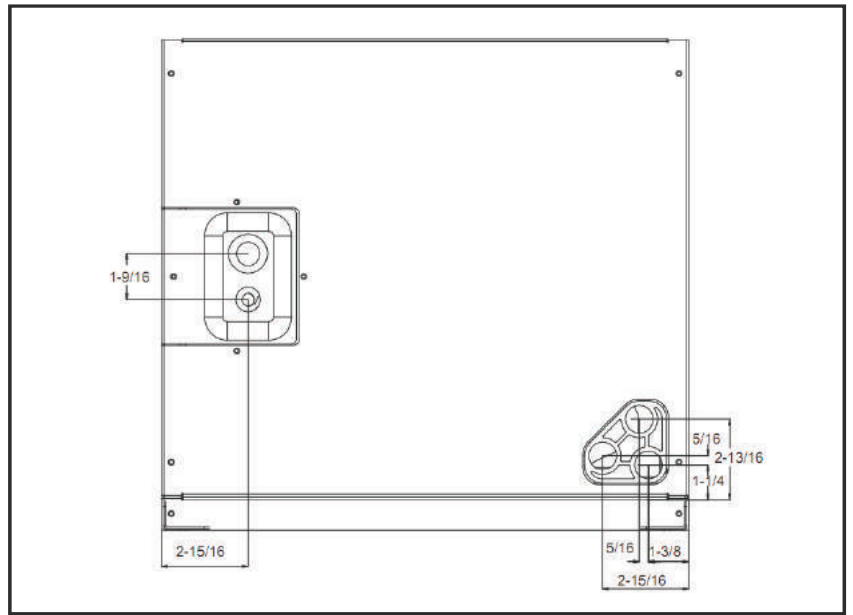
Section 6. Applications

VERTICAL UPFLOW

1. Vertical Upflow configuration is the factory set on all models.
2. 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.
3. 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.



Section 7. Electrical Wiring

Field wiring must comply with the National Electric Code and any applicable local ordinance.



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.

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 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. concentric knockouts are provided for connection of power wiring to unit.
- * Power wiring is connected to the power terminal block in unit electric cabinet.

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.
- * 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.

GROUNDING



WARNING

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

- * 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.

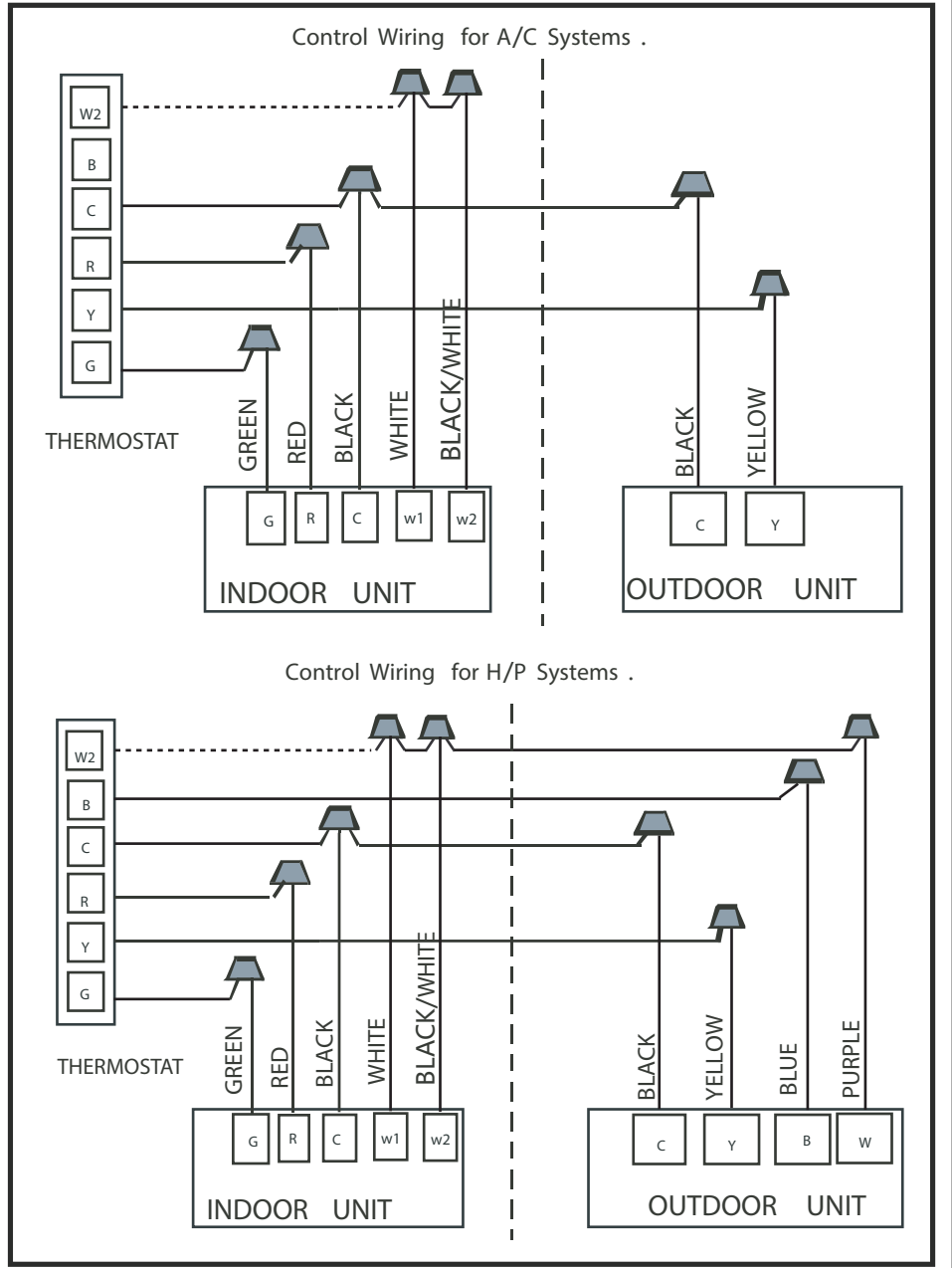
1. To avoid the electrical shock, please connect the air conditioner with the ground lug. The main power plug in the air conditioner has been joined with the ground wiring, please don't change it freely.

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.



7.1 Electric Wiring Gauge

Note: The cross-section areas of wires or lines should not be less than the corresponding ones listed in the table below; Besides, if the power wires is quite long from the unit, please choose the windings with larger cross-section area to guarantee the normal power supply.

		Model (cooling only type)				
		24K	36K	48K	60K	
Line Gauge	Indoor Unit Power Line	Line Quantity	3	3	3	3
		Line Diameter (AWG)	16	16	16	16
	Outdoor Unit Power Line	Line Quantity	3	3	3	3
		Line Diameter (AWG)	14	12	10	10
	Outdoor - Indoor Signal Line	Line Quantity	2	2	2	2
		Line Diameter (AWG)	18	18	18	18
Thermostat Signal Line	Line Quantity	4	4	4	4	
	Line Diameter (AWG)	18	18	18	18	
		Model (cooling & heating type)				
		24K	36K	48K	60K	
Line Gauge	Indoor Unit Power Line	Line Quantity	3	3	3	3
		Line Diameter (AWG)	16	16	16	16
	Outdoor Unit Power Line	Line Quantity	3	3	3	3
		Line Diameter (AWG)	14	12	10	10
	Outdoor - Indoor Signal Line	Line Quantity	2	2	2	2
		Line Diameter (AWG)	18	18	18	18
Thermostat Signal Line	Line Quantity	6	6	6	6	
	Line Diameter (AWG)	18	18	18	18	

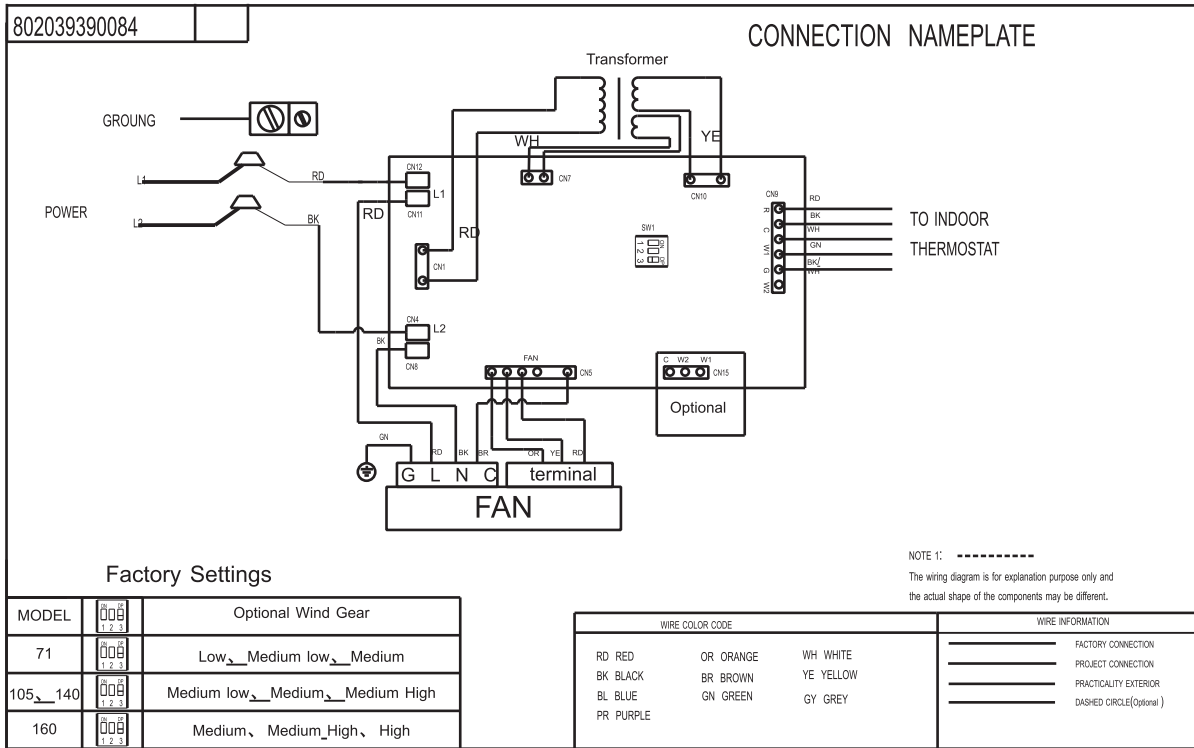
7.2 ELECTRIC KIT MCA/MOP DATA

Heat Kit Model	Air Handler Model	(kW)Electric Heat	MIN. Circuit Ampacity		MAX.Fuse or Breaker (HACR) Ampacity		Fan speed (AC/HP)		
			230	208	230	208	Low	Medi	High
EHK05A	24	5	27.2	24.6	30	25	●	●	●
EHK08A		7.5	40.8	36.9	45	40	--	●	
EHK10A		10	54.4	49.2	60	50	--	●	●
EHK05A	36	5	27.2	24.6	30	25	●	●	●
EHK08A		7.5	40.8	36.9		40	●	●	●
EHK10A		10	54.4	49.2	60	50	●	●	●
EHK15B		15	81	74	90	80	--	●	●
EHK20B		20	108	98	110	100	--	-	●
EHK05A	48	5	27.2	24.6	30	25	●	●	●
EHK08A		7.5	40.8	36.9	45	40	●	●	●
EHK10A		10	54.4	49.2	60	50	●	●	●
EHK15B		15	81	74	90	80	--	●	●
EHK20B		20	108	98	110	100	--	-	●
EHK05A	60	5	27.2	24.6	30	25	●	●	●
EHK08A		7.5	40.8	36.9	45	40	●	●	●
EHK10A		10	54.4	49.2	60	50	●	●	●
EHK15B		15	81	74	90	80	--	●	●
EHK20B		20	108	98	110	100	--	●	●

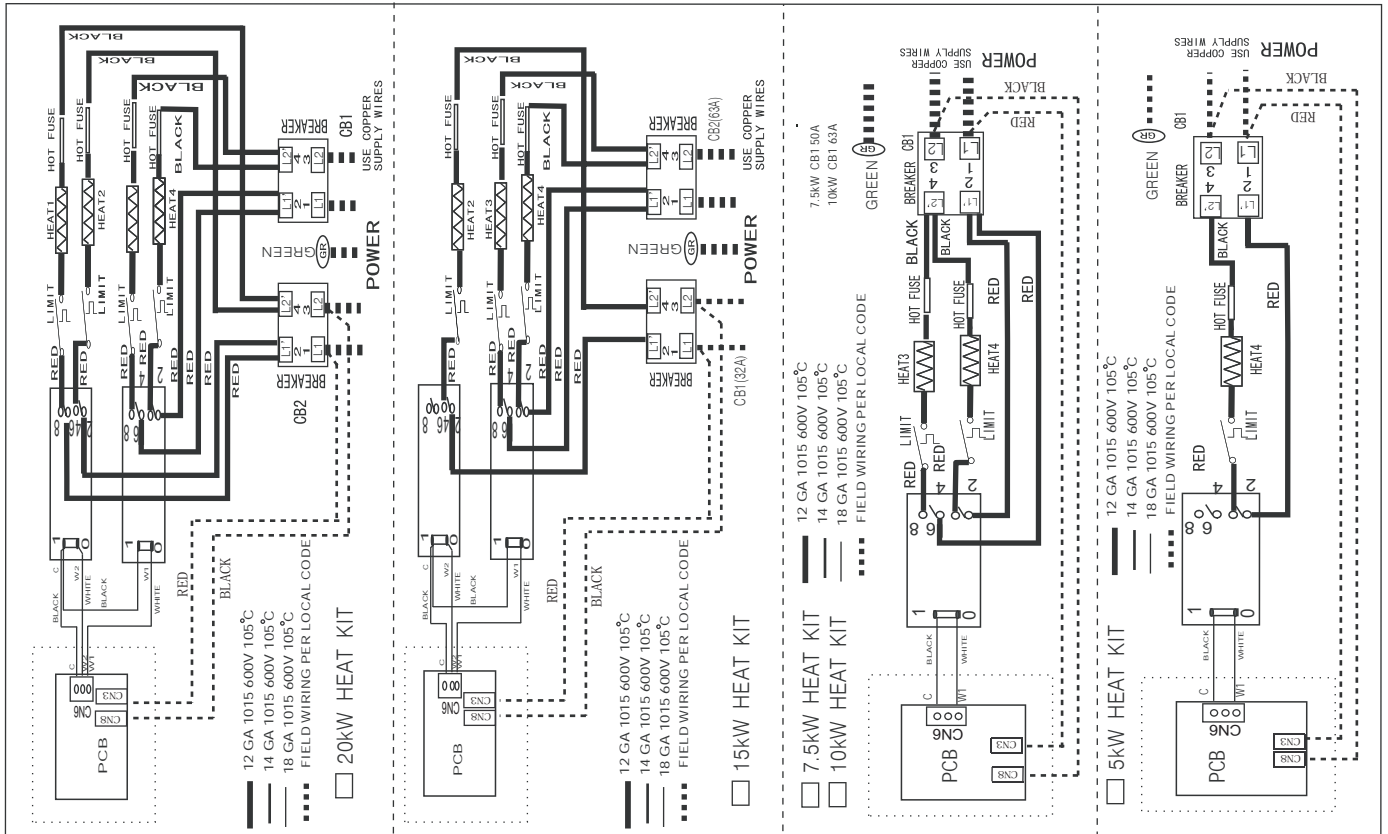
* Heat kit suitable for AHU 4-way position installation[● , --means not available].

Electric Heater Kits

NO.	Kit#	Description	Ref. Air Handler use
1	EHK05A	5kW Heat Strip	24,36,48,60
2	EHK08A	7.5kW Heat Strip	24,36,48,60
3	EHK10A	10kW Heat Strip	24,36,48,60
4	EHK15B	15kW Heat Strip, Double Breaker's panel	36,48,60
5	EHK20B	20kW Heat Strip, Double Breaker's panel	36,48,60



Applicable to 24k, 36k, 48k, 60k



Section 8. 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 external static applied to unit allows operation within the minimum and maximum limits shown in table below for both cooling and electric heat operation.

PSC-Airflow Performance (Standard CFM)

Model Number	Motor Speed		CFM(Watts)									
			External Static Pressure-Inches W.C.[kPa]									
			0[0]	0.1[.]	0.16[.04]	0.2[.05]	0.3[.07]	0.4[.10]	0.5			
24	Low	CFM	601	28	475	466	406	—	—	—	—	—
		RPM	396	79	42	58	37	—	—	—	—	—
		Watts	123.7	121.2	119	118.3	114.8	—	—	—	—	—
		Amps	0.61	0.61	0.6	0.6	0.59	—	—	—	—	—
	Middle	CFM	701	650	609	602	547	489	422	—	—	—
		RPM	480	544	596	609	672	737	789	—	—	—
		Watts	145	143	141	141	137	133	129.2	—	—	—
		Amps	0.68	0.67	0.67	0.67	0.66	0.65	0.64	—	—	—
	High	CFM	943	894	861	853	805	754	694	619	521	436
		RPM	623	670	707	717	764	805	849	896	941	973
		Watts	281	276	273	272	266	261	255	246	237	229
		Amps	1.32	1.31	1.30	1.30	1.28	1.27	1.25	1.23	1.21	1.18
36	Low	CFM	1077	1031	986	964	885	811	735	—	—	—
		RPM	504	573	628	651	712	763	806	—	—	—
		Watts	308	299	289	286	275	266	256	—	—	—
		Amps	1.37	1.34	1.3	1.29	1.26	.23	1.2	—	—	—
	Middle	CFM	1268	1220	1171	1150	1115	1045	898	816	736	—
		RPM	582	636	686	707	735	781	846	884	916	—
		Watts	334	327	318	316	310	302	285	275	265	—
		Amps	1.47	1.44	1.41	1.40	1.38	1.35	1.29	1.26	1.22	—
	High	CFM	1534	1478	1427	1407	1350	1306	1238	1044	941	845
		RPM	683	723	765	782	807	842	876	938	964	989
		Watts	461	451	441	434	427	416	406	373	360	344
		Amps	2.04	2.00	1.97	1.94	1.92	1.88	1.84	1.74	1.69	1.65
48	Low	CFM	1323	269	1182	1105	1031	949	863	—	—	—
		RPM	486	58	20	68	80	73	816	—	—	—
		Watts	434	4					360	—	—	—
		Amps	1.96	1.91	.87	.78	.72	.66	1.62	—	—	—
	Middle	CFM	1600	544	467	390	307	232	138	1064	—	—
		RPM	604	658	714	745	760	802	878	917	—	—
		Watts	486	4							—	—
		Amps	2.17	2	2.08	2.03	.96	1.88	1.82	1.76	—	—
	High	CFM	1792	1	1672	1572	1		1368	1296		971
		RPM	699	744	788	820	828	862	895	925	992	1013
		Watts	591	578	564				95	445	408	394
		Amps	2.37	2.34	2.31	2.28	2.24	2.25	2.22	2.19	2.11	2.08
60	Low	CFM	1379	1348	1295	1264	1254	1206	—	—	—	—
		RPM	650	95	38	64	73	07	—	—	—	—
		Watts	486	69	57	47	43	30	—	—	—	—
		Amps	1.6	1.59	1.57	1.55	1.55	1.51	—	—	—	—
	Middle	CFM	1671	1629	1576	1535	1524	1469	1409	1332	—	—
		RPM	761	803	835	857	863	888	912	944	—	—
		Watts	531	515	505	496	494	480	466	446	—	—
		Amps	2.60	2.32	2.28	2.25	2.24	2.21	2.16	2.11	—	—
	High	CFM	1943	1886	1828	1774	1757	1695	1628	1555	1456	1244
		RPM	874	901	922	942	945	960	978	995	1018	1051
		Watts	700	667	649	634	630	612	601	584	557	514
		Amps	3.18	3.09	3.03	2.98	2.97	2.92	2.89	2.84	2.77	2.65

ECM-Airflow Performance (Standard CFM)

Model Number	Motor Speed		SCFM(Watts)									
			External Static Pressure-Inches W.C.[kPa]									
			0[0]	0.1[.]	0.16[.04]	0.2[.05]	0.3[.07]	0.4[.10]	0.5			
24	Tap(5)	SCFM	1016	955	24	91	870	827	790	41	91	57
		Watts	138.8					74.1	184.8	194.9	201.4	2
	Tap(4)	SCFM	955	92	86	853	804	768	72	671	63	---
		Watts	118.1	124.7	13	135.4	41.6	15	161.8	168.6	17	---
	Tap(3) -Factory	SCFM	927	829	791	789	739	701	643	597	---	---
		Watts	109.0	104.6	111.7	114.9	120.5	30.6	13	146.6	---	---
	Tap(2)	SCFM	887						22	465	-	---
		Watts	97.3	8			93.0	98		111.7	---	---
	Tap(1)	SCFM	829	6								---
		Watts	80.5	7				60.3				---
36	Tap(5)	SCFM	1532	14	1428	1386	1372	1327	12	1210	11	1101
		Watts	233	247	262.1				81.2	290.4	298.1	310.3
	Tap(4)	SCFM	1408		297	1265	246	1197	1141	1073	1015	
		Watts	197.1									73.1
	Tap(3) -Factory	SCFM	1326	1230	174	1151				828	807	726
		Watts	147.9	64.6	72.2	75.4	83	189.7	20	216.9	221.1	224.9
	Tap(2)	SCFM	1236	175	1100				835	736	661	582
		Watts	124.3	30.1	133.1	1						
	Tap(1)	SCFM	1182	1141	1020	995	9	818	6			
		Watts	123.9						23.5	129.1	1	
48	Tap(5)	SCFM	2032	1								
		Watts	431.2	4								
	Tap(4)	SCFM	1769	1								
		Watts	296.2	3								
	Tap(3) -Factory	SCFM	1516	1								
		Watts	193.1	2								
	Tap(2)	SCFM	1375									896
		Watts	150.8	1			168.9	1				
	Tap(1)	SCFM	1337					965	904	786	731	697
		Watts	139	128.2	1			133.6	1			
60	Tap(5)	SCFM	2028				895	1852		759	1709	1654
		Watts	444.8	462.7	4							
	Tap(4) -Factory	SCFM	1773	1726	1678	16	1631	584	534	14	1432	1381
		Watts	305.1	3								
	Tap(3)	SCFM	1528	1473	421	1408	1			1201	1	
		Watts	205.1	2								
	Tap(2)	SCFM	1375									896
		Watts	150.8	1			168.9	1				
	Tap(1)	SCFM	1337					965	904	786	731	697
		Watts	139	128.2	1			133.6	1			

--- Shaded boxes represent airflow outside the required 300-450 cfm/ton.

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.

Section 9. 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 "0" 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.

Section 10. 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 PER-FORMANCE 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.

Section 10.1 Filter installation Dimensions

Dimensional Data

Model	Filter Size in. (mm)
24 / 36	16 x 20 (406 x 508)
48 / 60	20 x 22 (508 x 559)

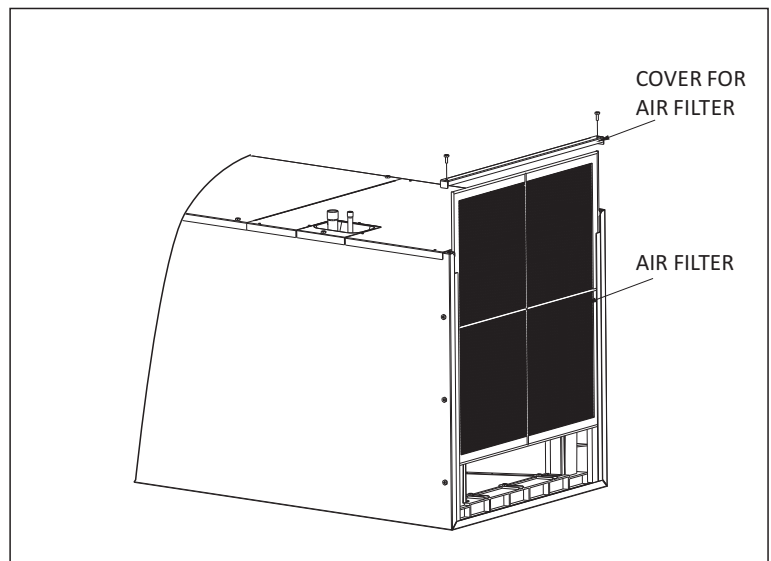
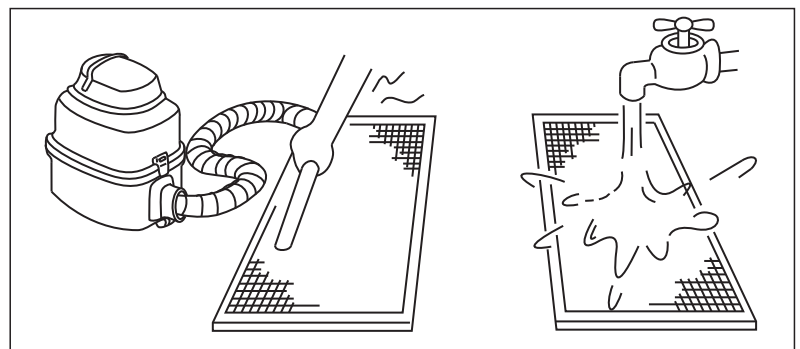


Fig. 4 EXTERNAL FILTER BASE

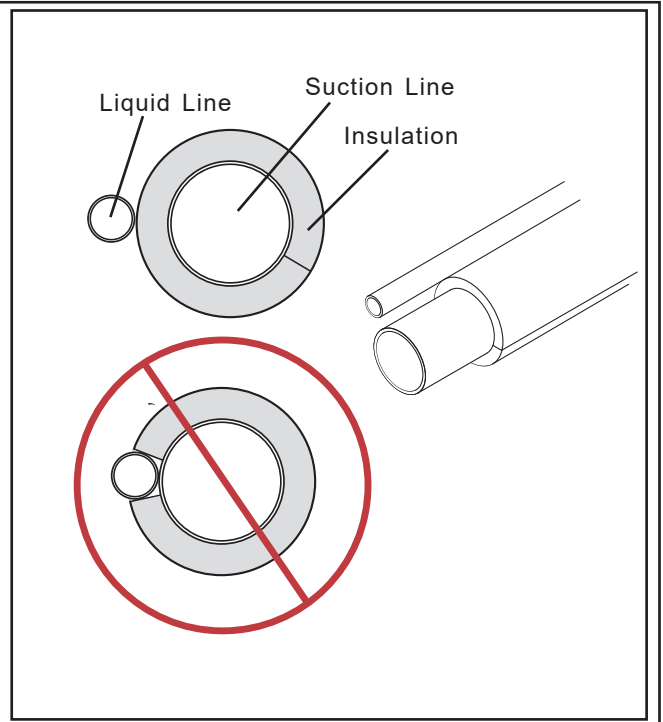
Air Filter Removal

1. Tear down the two bolts signed A and B, take down the cover for air filter, see in Figure 4.
2. Hold the edge of the air filter and extract out .
3. Clean the air filter (Vacuum cleaner or pure water may be used to clean the air filter. If the dust accumulation is too heavy, use soft brush and mild detergent to clean it and dry out in cool place) .



Section 11. Refrigerant Lines Insulation

Important: The Suction Line must always be insulated DO NOT allow the Liquid Line and Suction Line to come in direct (metal to metal) contact.



11.1 Reuse Existing Refrigerant Lines

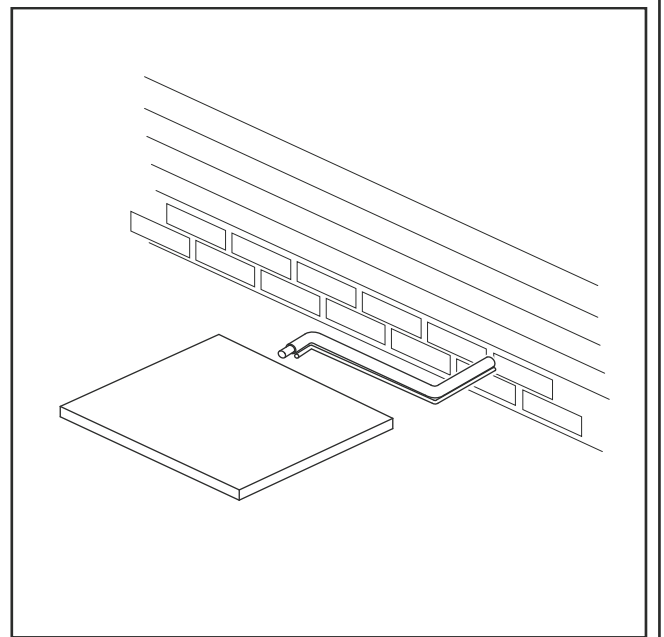
⚠ CAUTION

If using existing refrigerant lines make certain that all joints are brazed, not soldered.

For retrofit applications, where the existing refrigerant lines will be used, the following precautions should be taken:

- ☑ Ensure that the refrigerant lines are the correct size. Refer to Section 2.2 listed and Table 5.1.
- ☑ Ensure that the refrigerant lines are free of leaks, acid, and oil.

Note: The manufacturer recommends installing only approved matched indoor and outdoor systems. All of the manufacturer's split systems are A.H.R.I. rated only with TXV indoor systems. Some of the benefits of installing approved matched indoor and outdoor split systems are maximum efficiency, optimum performance and the best overall system reliability.



Section 12. Refrigerant Line Routing

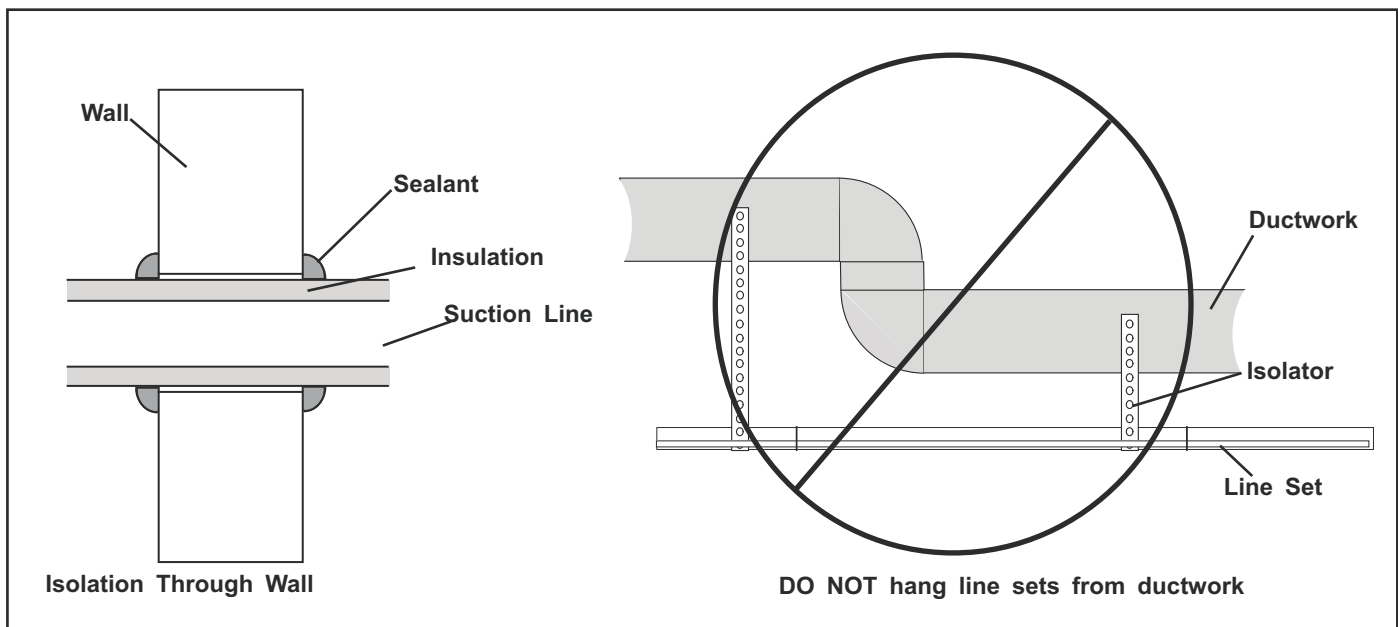
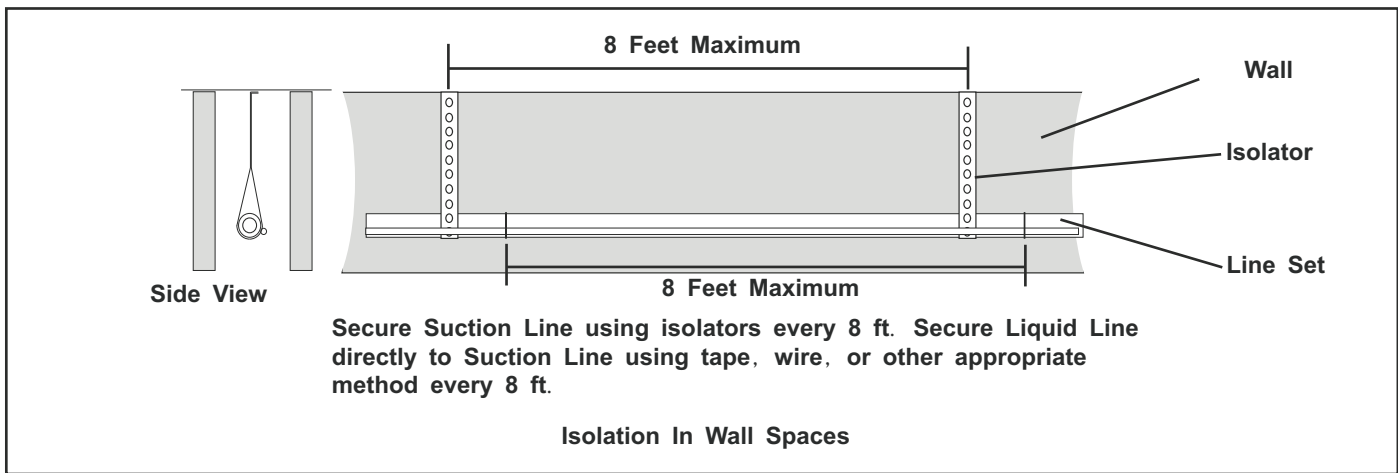
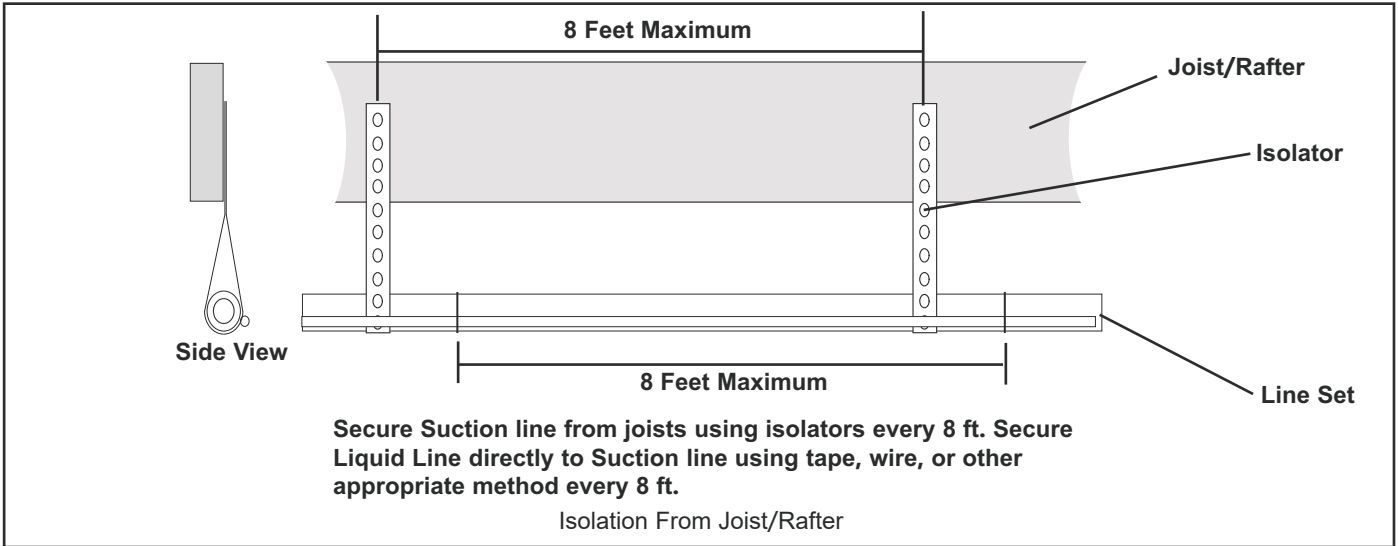
12.1 Precautions

Important: Take precautions to prevent noise within the building structure due to vibration transmission from the refrigerant lines.

For Example:

- ☑ When the refrigerant lines have to be fastened to floor joists or other framing in a structure, use isolation type hangers.
- ☑ Isolation hangers should also be used when refrigerant lines are run in stud spaces or enclosed ceilings.
- ☑ Where the refrigerant lines run through a wall or sill, they should be insulated and isolated.
- ☑ Isolate the lines from all ductwork.
- ☑ Minimize the number of 90° turns.

Comply with National, State, and Local Codes when isolating line sets from joists, rafters, walls, or other structural elements.

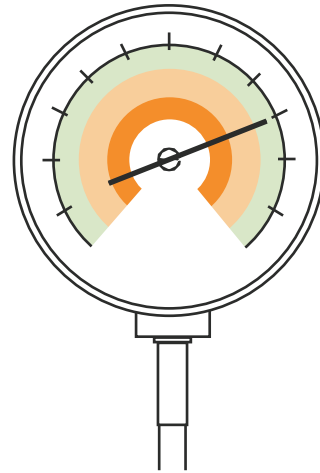


Section 13. Refrigerant Line Leak Check

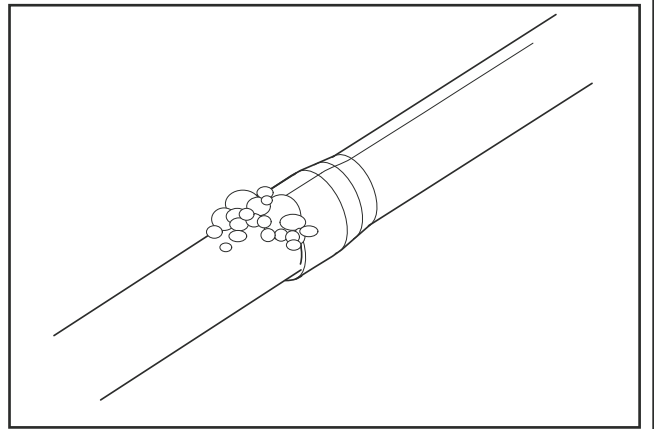
13.1 Check For Leaks

STEP 1 - Pressurize the refrigerant lines and evaporator coil to 150 PSIG using dry nitrogen.

150 PSIG



STEP 2 - Check for leaks by using a soapy solution or bubbles at each brazed location.

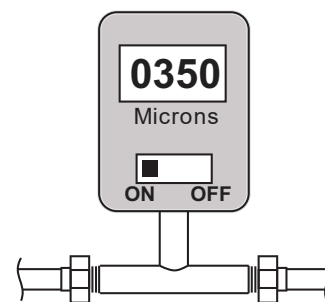


Section 14. Evacuation

14.1 Evacuate the Refrigerant Lines and Indoor Coil

Important: Do not open the service valves until the refrigerant lines and indoor coil leak check and evacuation are complete.

STEP 1- Evacuate until the micron gauge reads no higher than 350 microns, then close the valve to the vacuum pump.



STEP 2- Observe the micron gauge. Evacuation is complete if the micron gauge does not rise above 500 microns in one (1) minute.

Once evacuation is complete blank off the vacuum pump and micron gauge, and close the valves on the manifold gauge set.

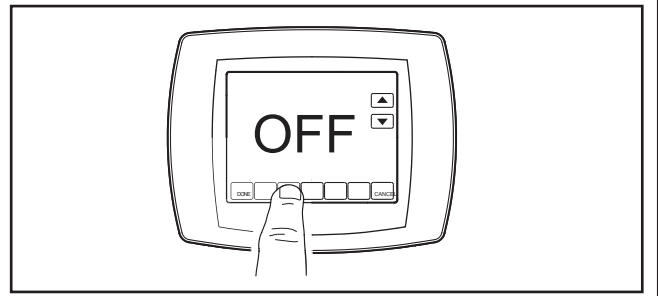


Section 15. Start Up

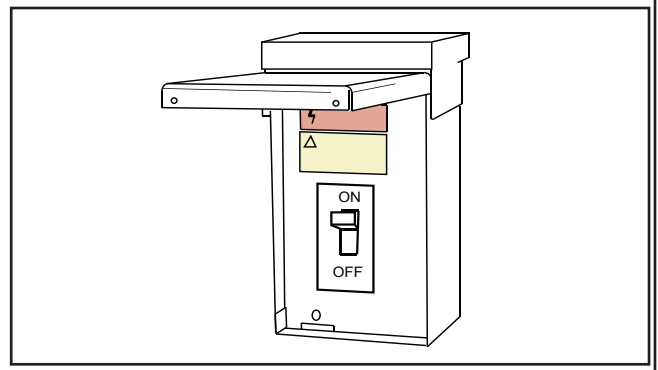
15.1 System Start Up

STEP 1 - Ensure Sections 6, 7, 8, 9, 10, 11, and 12 have been completed.

STEP 2 - Set System Thermostat to OFF.

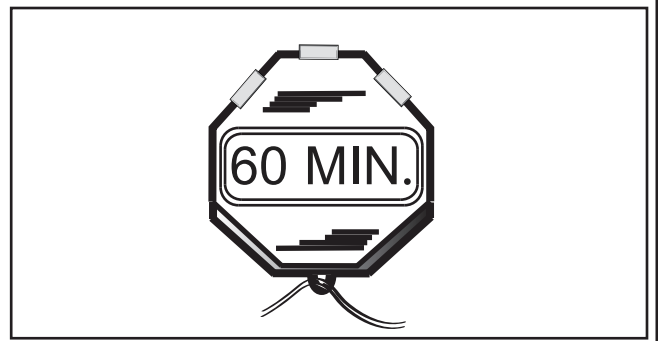


STEP 3 - Turn on disconnect to apply power to the indoor and outdoor units.

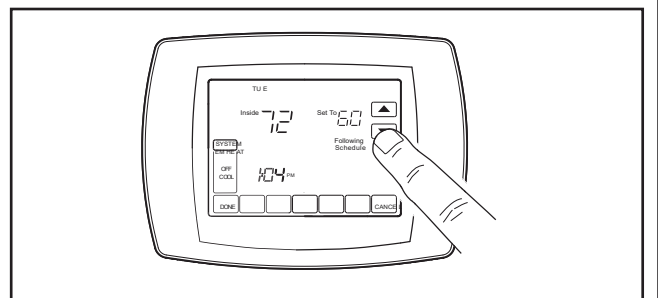


STEP 4 - Wait five (5) minutes before moving to Step 5 if no crankcase heater accessory is used,

Wait one (1) hour before starting the unit if compressor crankcase heater accessory is used and the Outdoor Ambient Temperature is below 70 °F.



STEP 5 - Set system thermostat to ON.

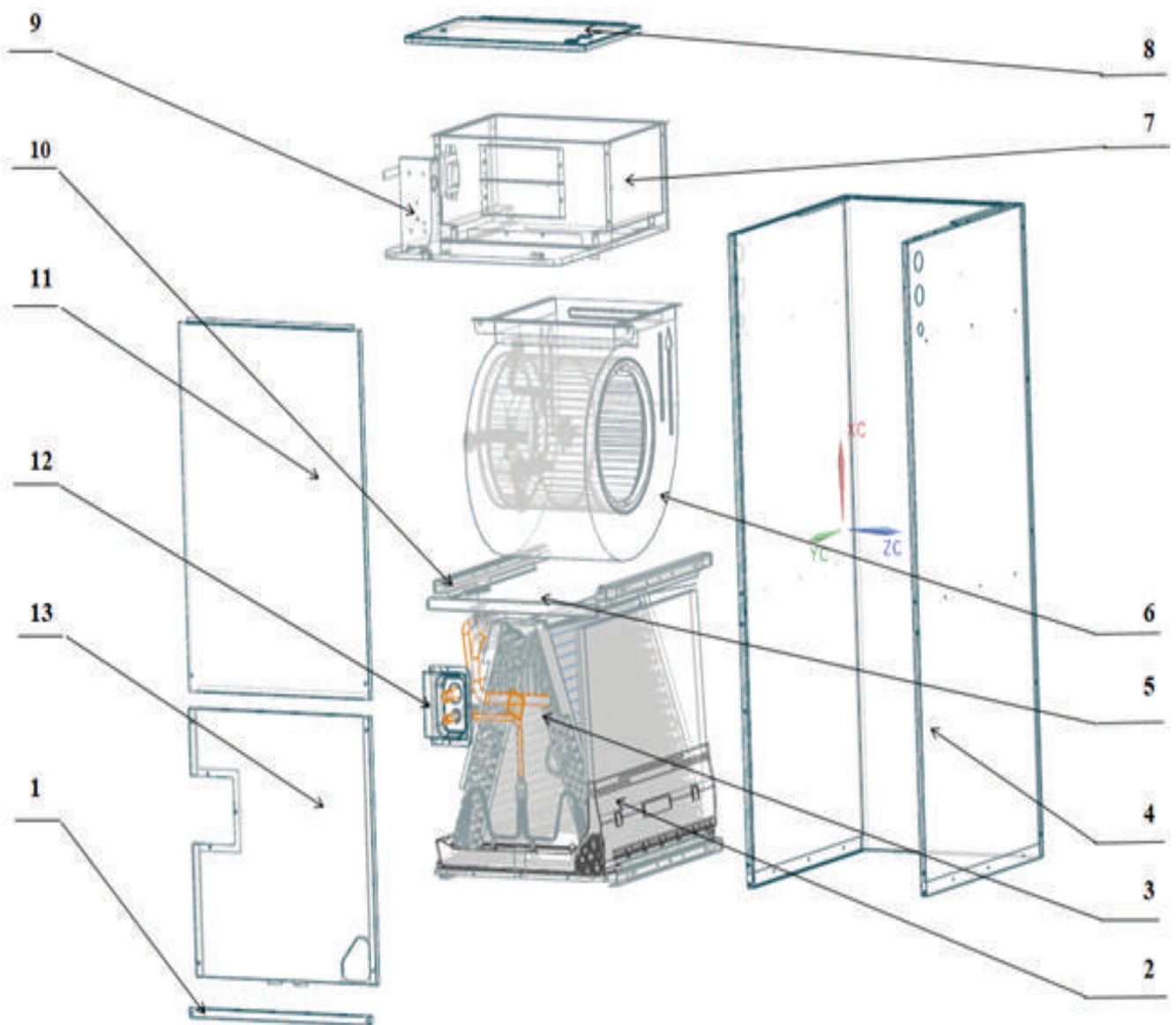


Section 16. Troubleshooting

16.1 Error codes for indoor unit

Display Mode	Status Description
Green light always on	No system alarm and error, normal standby
Red light always on	Evaporator tube temperature sensor (T2) failure
Green light always on, yellow light flashing	Evaporator high and low temperature protection
Green light flashing	System is is normal operating status

Section 17. Exploded View



No.	Part Name	Quantity
1	Filter Cover plate	1
2	Water pan components	1
2.1	Water pan# 1	1
2.2	Water pan# 2	1
2.3	Water pan fixed block	1
2.4	Water pan brace	2
3	Evaporator welding components	1
3.1	Air header Assembly	1
3.2	Diverter Assembly	1
3.3	Evaporator A	1
3.4	Evaporator B	1
3.5	Evaporator C	1
3.6	Evaporator D	1
3.7	Evaporator Baffle	2
3.8	Evaporator Water Baffle #1	2
3.9	Evaporator Water Baffle #2	1
3.10	Evaporator Water Baffle #3	1

No.	Part Name	Quantity
3.11	Evaporator Fixing Plate #1	1
3.12	Evaporator Fixing Plate #2	1
3.13	Evaporator Junction Plate	1
4	Chasiss assembly	1
5	Supporter	2
6.1	Right Volute Wind Wheel	1
6.2	Indoor Motor	1
7	Fan Motor Fixing plate assembly	1
7.1	Fan Motor Fixing plate	1
7.2	Wind Wheel Fixed Block	2
7.3	Fixed plate on air duct	1
7.4	Stator	2
7.5	air duct left stationary plate	1
7.6	air duct right stationary plate	1
8		1
9	ELectronic Control Components	1
9.1	ELectronic Control Mounting Plate	1
9.2	Main Board	1
9.3	Transformer	1
10	Water pan supporter assembly	4
11	Upper side plate assembly	1
12	Pipe Cover plate assembly	1
13	Lower side plate assembly	1

Section 18. Sensor Resistance

18.1. Pipe Sensor - 5 kΩ

Temperature (°F)	Resistance Min (KΩ)	Standard (KΩ)	Resistance Max (KΩ)	Voltage value (V)		Temperature (°F)	Resistance Min (KΩ)	Standard (KΩ)	Resistance Max (KΩ)	Voltage value (V)	
				5V - 4.3K						5V - 4.3K	
				drop down	pull up					drop down	pull up
-22	51.159	52.84	54.521	0.38	4.62	78.8	4.771	4.821	4.871	2.36	2.64
-20.2	48.659	50.232	51.805	0.39	4.61	80.6	4.599	4.649	4.699	2.4	2.6
-18.4	46.299	47.772	49.248	0.41	4.59	82.4	4.434	4.485	4.535	2.45	2.55
-16.6	44.071	45.452	46.832	0.43	4.57	84.2	4.277	4.327	4.377	2.49	2.51
-14.8	41.968	43.261	44.554	0.45	4.55	86	4.126	4.176	4.226	2.54	2.46
-13	39.981	41.193	42.405	0.47	4.53	87.8	3.981	4.031	4.081	2.58	2.42
-11.2	38.102	39.238	40.375	0.49	4.51	89.6	3.842	3.892	3.942	2.62	2.38
-9.4	36.326	37.391	38.457	0.52	4.48	91.4	3.709	3.759	3.808	2.67	2.34
-7.6	34.646	35.645	36.645	0.54	4.46	93.2	3.581	3.631	3.68	2.71	2.29
-5.8	33.055	33.993	34.931	0.56	4.44	95	3.495	3.508	3.557	2.77	2.23
-4	31.55	32.43	33.31	0.59	4.41	96.8	3.34	3.389	3.438	2.8	2.2
-2.2	30.097	30.923	31.748	0.61	4.39	98.6	3.226	3.275	3.323	2.84	2.16
-0.4	28.722	29.497	30.271	0.64	4.36	100.4	3.117	3.165	3.213	2.88	2.12
1.4	27.42	28.147	28.873	0.66	4.34	102.2	3.012	3.06	3.107	2.92	2.08
3.2	26.186	26.868	27.55	0.69	4.31	104	2.912	2.959	3.006	2.96	2.04
5	25.017	25.657	26.297	0.72	4.28	105.8	2.815	2.861	2.908	3	2
6.8	23.908	24.509	25.11	0.75	4.25	107.6	2.722	2.768	2.814	3.04	1.96
8.6	22.857	23.421	23.985	0.78	4.22	109.4	2.633	2.678	2.724	3.08	1.92
10.4	21.859	22.389	22.918	0.81	4.19	111.2	2.547	2.592	2.637	3.12	1.88
12.2	20.912	21.409	21.907	0.84	4.16	113	2.464	2.509	2.553	3.16	1.84
14	20.013	20.48	20.917	0.87	4.13	114.8	2.385	2.429	2.473	3.2	1.8
15.8	19.116	19.584	20.023	0.9	4.1	116.6	2.308	2.352	2.395	3.23	1.77
17.6	18.322	18.734	19.146	0.93	4.07	118.4	2.235	2.278	2.231	3.27	1.73
19.4	17.54	17.927	18.314	0.97	4.03	120.2	2.164	2.207	2.249	3.3	1.7
21.2	16.797	17.16	17.524	1	4	122	2.096	2.138	2.18	3.34	1.66
23	16.09	16.431	16.733	1.04	3.96	123.8	2.03	2.071	2.112	3.37	1.63
24.8	15.418	15.739	16.06	1.07	3.93	125.6	1.966	2.006	2.047	3.41	1.59
26.6	14.779	15.08	15.382	1.11	3.89	127.4	1.904	1.944	1.984	3.44	1.54
28.4	14.17	14.454	14.737	1.15	3.85	129.2	1.844	1.884	1.923	3.48	1.52
30.2	13.591	13.857	14.124	1.18	3.82	131	1.787	1.826	1.865	3.51	1.49
32	13.04	13.29	13.54	1.22	3.78	132.8	1.732	1.77	1.809	3.54	1.46
33.8	12.505	12.739	12.974	1.26	3.74	134.6	1.679	1.717	1.754	3.57	1.43
35.6	11.995	12.215	12.436	1.3	3.7	136.4	1.628	1.665	1.702	3.6	1.4
37.4	11.509	11.717	11.924	1.34	3.66	138.2	1.579	1.615	1.652	3.63	1.37
39.2	11.047	11.241	11.436	1.38	3.62	140	1.531	1.567	1.603	3.66	1.34
41	10.606	10.789	10.971	1.42	3.58	141.8	1.485	1.521	1.556	3.69	1.31
42.8	10.186	10.357	10.529	1.47	3.53	143.6	1.441	1.476	1.511	3.72	1.28
44.6	9.785	9.945	10.107	1.51	3.49	145.4	1.399	1.433	1.467	3.75	1.25
46.4	9.403	9.554	9.705	1.55	3.45	147.2	1.357	1.391	1.425	3.78	1.22
48.2	9.038	9.18	9.322	1.59	3.41	149	1.318	1.351	1.384	3.8	1.2
50	8.69	8.823	8.956	1.64	3.36	150.8	1.279	1.312	1.344	3.83	1.17
51.8	8.357	8.482	8.607	1.68	3.32	152.6	1.242	1.274	1.306	3.86	1.14
53.6	8.04	8.157	8.274	1.73	3.27	154.4	1.206	1.237	1.269	3.88	1.12
55.4	7.736	7.816	7.957	1.77	3.23	156.2	1.171	1.202	1.233	3.91	1.09
57.2	7.446	7.55	7.653	1.81	3.19	158	1.137	1.168	1.199	3.93	1.07
59	7.169	7.266	7.363	1.86	3.14	159.8	1.105	1.135	1.165	3.96	1.04
60.8	6.9	6.991	7.082	1.9	3.1	161.6	1.074	1.103	1.133	3.98	1.02
62.6	6.644	6.729	6.814	1.95	3.05	163.4	1.043	1.072	1.101	4	1
64.4	6.398	6.478	6.558	1.99	3.01	165.2	1.014	1.043	1.071	4.02	0.98
66.2	6.163	6.238	6.313	2.04	2.96	167	0.986	1.014	1.042	4.05	0.95
68	5.938	6.008	6.078	2.09	2.91	168.8	0.959	0.986	1.014	4.07	0.93
69.8	5.723	5.789	5.854	2.13	2.87	170.6	0.932	0.959	0.986	4.09	0.91
71.6	5.517	5.578	5.64	2.18	2.82	172.4	0.907	0.933	0.96	4.11	0.89
73.4	5.32	5.377	5.484	2.22	2.78	174.2	0.882	0.908	0.934	4.13	0.87
75.2	5.131	5.185	5.238	2.27	2.73	176	0.858	0.884	0.91	4.15	0.85
77	4.95	5	5.05	2.31	2.69						

Sensor resistance table 5kΩ