PH13(N,P)R

SPLIT SYSTEM HEAT PUMP
For Use With R–22 Refrigerant
1–1/2 TO 5 TONS (018 – 060)

Product Data

*Units factory–shipped with no refrigerant.
Dry nitrogen charge only.

FEATURES AND BENEFITS

AVAILABLE SIZES:

Nominal sizes are available from 018 through 060 to meet the needs of residential and light commercial applications. Factory charged with dry nitrogen (no refrigerant).

PERFORMANCE:

All models are verified for efficiency and capacity by AHRI.

ELECTRICAL RANGE:

Units offered in single phase 208/230v are 018-060, three phase 208/230v in 048 and 060.

FAN MOTOR:

The totally enclosed fan motor provides greater reliability under adverse conditions and dependable performance for many years. The permanent split capacitor type motor was designed for optimum efficiency. The motor was then qualified under extreme conditions to help ensure a long, reliable life.

CABINET:

A weather protective cabinet of prepainted steel is protected underneath by a galvanized coating and treated with a layer of zinc phosphate for a finish that will last for many years. All screws on cabinet exterior are coated for a long-lasting, rust-resistant, quality appearance.

UNIT DESIGN:

The copper tube, enhanced sine wave, aluminum fin coil is designed for optimum heat transfer. Vertical air discharge carries sound and condenser air up and away from adjacent patio areas and foliage. The base pan is designed for easy removal of water, dirt, and leaves.

DEFROST CONTROL BOARD:

Incorporates defrost relay, defrost timer, and low voltage terminations. The defrost control is a time/temperature initiation/termination control which includes three field-selectable time periods of 30, 60 and 90 minutes.

COMPRESSOR:

Each compressor is protected with internal temperature- and current-sensitive overloads. An internal pressure relief valve provides high pressure protection to the refrigerant system. For improved serviceability, all models are equipped with a compressor terminal plug.

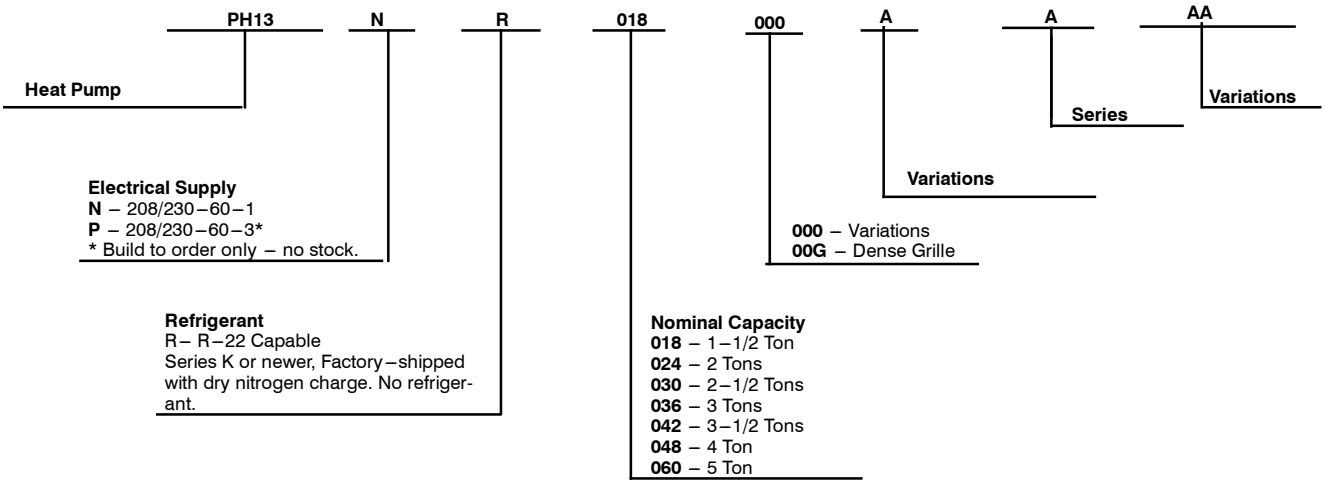
SERVICE VALVES:

Both service valves are brass, front seating type with sweat connections. Valves are externally located so refrigerant tube connections can be made quickly and easily. Each valve has a service port for ease of checking operating refrigerant pressures.

SERVICEABILITY:

One access panel provides access to electrical controls. Removal of top gives access to fan motor, compressor, and condenser coil.

PRODUCT NUMBER NOMENCLATURE



Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

ISO 9001:2000

SPECIFICATIONS

UNIT SIZE – SERIES	018 – K	024 – K	030 – K	036 – K
ELECTRICAL				
Unit Volts—Phase—Hertz	208/230—1—60		208/230—1—60	208/230—1—60
Operating Voltage Range	187—253			
Unit Ampacity for Wire Sizing (MCA)	10.9	14.3	18.4	20.4
Min Wire Size (60°C/75°C Copper) (AWG)*	14	14	14	12
Maximum Length (60°C/75°C) (Ft)†	72 / 68	53 / 50	41 / 39	60 / 57
Max Branch Circuit Fuse Size (Amps)‡	15	20	30	30
Compressor Rated Load Amps	8.3	10.8	14.1	15.4
Locked Rotor Amps	40.3	56.0	75.0	87.0
Fan Motor HP and RPM	1/12 &1100	1/10 &1100	1/10 &1100	1/5 & 1100
Full Load Amps	0.5	0.8	0.8	1.1
COMPRESSOR AND REFRIGERANT				
Compressor Type	Scroll			
Refrigerant Type (Field Installed)	R – 22			
Refrigerant Charge†† lb (kg)	5.35 (2.43)	4.68 (2.12)	5.29 (2.40)	6.50 (2.95)
Refrigerant Tubes (In. OD)	3/4	3/4	3/4	7/8
Vapor and Liquid (Up to 80 Ft)	3/8	3/8	3/8	
OUTDOOR COIL AND FAN				
Coil Face Area (Sq Ft)	9.80	12.60	15.14	17.30
Rated Airflow (CFM)	1700	2000	2600	3100
OPTIONAL EQUIPMENT				
Time – Delay Relay	KAATD0101TDR			
Outdoor Thermostat	KHAOT0301FST			
Secondary Outdoor Thermostat	KHAOT0201SEC			
Cycle Protector	KSACY0101AAA			
Crankcase Heater	KAACH1401AAA		KAACH1201AAA	
Compressor Start Assist—Capacitor/Relay	KSAHS1501AAA			
Sound Hood	KSASH1801COP			KSASH0601COP
TXV Kits (Hard Shutoff)	KSATX0601HSO			
Low Pressure Switch	Standard			
High – Pressure Switch	Standard			
MotorMaster® Low – Ambient Controller‡‡	KSALA0601AAA			
Ball Bearing Fan Motor	HC32GE234	HC34GE239	HC34GE240	HC38GE219
Liquid Line Filter Drier (RCD)	KH43LZ072			
Evaporator Freeze Thermostat**	KAAFT0101AAA			
Isolation Relay**	KHAIR0101AAA			
Liquid Solenoid Valve	KHALS0401LLS			
Start Assist PTC	KAACS0201PTC			

See notes on page 4

SPECIFICATIONS (CONT.)

UNIT SIZE – SERIES	042 – K	048 – K		060 – K	
ELECTRICAL					
Unit Volts—Phase—Hertz	208/230—1—60	208/230—1—60	208/230—3—60	208/230—1—60	208/230—3—60
Operating Voltage Range	187—253				
Unit Ampacity for Wire Sizing (MCA)	25.4	28.7	20.7	33.0	21.2
Min Wire Size (60°C/75°C Copper) (AWG)*	10	10	12	8	12
Maximum Length (60°C/75°C) (Ft)†	77 / 73	69 / 66	60 / 57	94 / 90	57 / 54
Max Branch Circuit Fuse Size (Amps)‡	40	40	30	50	30
Compressor Rated Load Amps	19.2	21.8	12.2	25.3	15.8
Locked Rotor Amps	112.0	137.0	114.0	146.0	114.0
Fan Motor HP and RPM	1/4 &1100	1/4 & 1100		1/4 & 1100	
Full Load Amps	1.4	1.4		1.4	
COMPRESSOR AND REFRIGERANT					
Compressor Type	Scroll				
Refrigerant Type (Field Installed)	R – 22				
Refrigerant Charge†† lb (kg)	7.50 (3.40)	9.13 (4.14)		13.03 (5.91)	
Refrigerant Tubes (In. OD) Vapor and Liquid (Up to 80 Ft)	7/8 3/8	1 – 1/8 3/8		1 – 1/8	
OUTDOOR COIL AND FAN					
Coil Face Area (Sq Ft)	23.79	15.14		23.79	
Rated Airflow (CFM)	3400	3400		3400	
OPTIONAL EQUIPMENT					
Time – Delay Relay	KAATD0101TDR				
Outdoor Thermostat	KHAOT0301FST				
Secondary Outdoor Thermostat	KHAOT0201SEC				
Cycle Protector	KSACY0101AAA				
Crankcase Heater	KAACH1201AAA				
Compressor Start Assist— Capacitor/Relay	KSAHS1501AAA			KSAHS1601AAA	
Sound Hood	KSASH0601COP			KSASH2101COP	
TXV Kits (Hard Shutoff)	KSATX0601HSO	KSATX0701HSO		KSATX1001HSO	
Low – Pressure Switch	Standard				
High – Pressure Switch	Standard				
MotorMaster® Low – Ambient Controller‡‡	KSALA0601AAA				
Ball Bearing Fan Motor	HC40GE226				
Liquid Line Filter Drier (RCD)	KH43LZ072				
Evaporator Freeze Thermostat**	KAAFT0101AAA				
Isolation Relay**	KHAIR0101AAA				
Liquid Solenoid Valve	KHALS0401LLS				
Service Alarm	KHASA0101AAA				
Start Assist PTC	KAACS0201PTC				

* The ampacity of non – metallic (NM) sheathed cable shall be that of 60° C (140° F) conductors per NEC 1999, Article 336 – 26. If wire used is other than specified in chart, refer to applicable tables available in 2011 NEC. Copper wire must be used from disconnect to unit.

† Length shown is as measured 1 way along the wire path between the unit and the service panel for a voltage drop not to exceed 2%.

‡ Units may use fuses or circuit breakers (U.S. only).

** Consult low – ambient control Installation Instructions for application.

†† Field – installed refrigerant charge for 15 ft (4.6 m) of lineset and tested indoor coil.

‡‡ Required accessories include fan motor with ball bearings, crankcase heater, compressor start assist, evaporator freeze stat, isolation relay, hard shut – off TXV or liquid line solenoid valve.

A-WEIGHTED SOUND POWER

UNIT SIZE – SERIES	Standard Rating (dBA)	TYPICAL OCTAVE BAND SPECTRUM (dBA without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018–K	76	52.5	57.0	64.5	65.5	60.5	57.5	53.5
024–K	76	57.5	59.5	68.0	69.0	66.0	63.5	60.5
030–K	76	55.0	62.0	68.5	71.0	67.5	69.0	58.5
036–K	77	55.5	66.5	69.5	72.0	70.5	66.0	60.0
042–K	80	60.5	65.5	71.0	72.5	70.0	66.0	62.5
048–K	80	63.0	69.5	74.5	75.0	73.0	68.5	62.0
060–K	80	60.0	68.5	72.0	72.5	71.0	68.5	61.0

Note: Tested in accordance with AHRI standard 270–2008 (Not listed with AHRI)

METERING DEVICE

UNIT SIZE–SERIES	OUTDOOR PISTON	REQUIRED SUBCOOLING °F (°C)	INDOOR METERING DEVICE
018–K	42	21 (11.7)	TXV*
024–K	52	13 (7.2)	
030–K	57	12 (6.7)	
036–K	63	14 (7.8)	
042–K	67	14 (7.8)	
048–K	73	16 (8.9)	
060–K	76	16 (8.9)	

* TXV must be ordered separately when indoor coil is not equipped with a TXV. TXV must be hard–shutoff type.

RECOMMENDED TUBE DIAMETERS

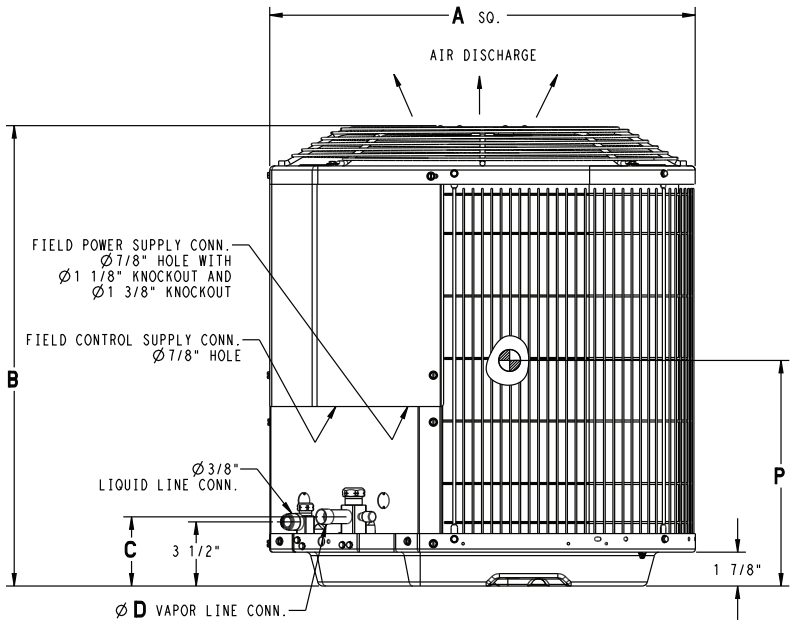
UNIT SIZE	TUBE LENGTH ft. (m)*	LIQUID TUBE DIAMETER (In.)	VAPOR TUBE DIAMETER (In.)
018, 024, 030	0 to 80 (0 to 24.38)	3/8	3/4
036, 042			7/8
048, 060			1–1/8

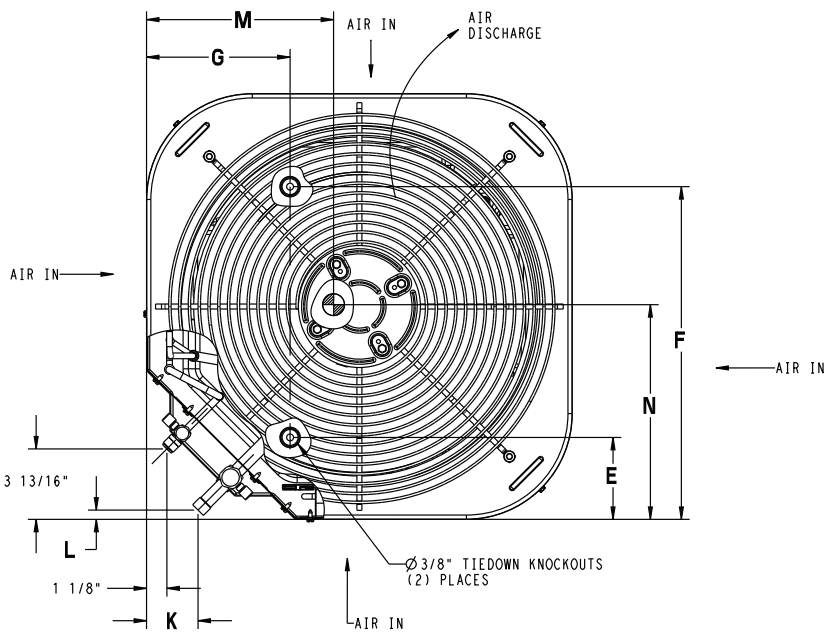
* For tube set over 80 ft / 24.38 m horizontal and/or 20 ft / 6.10 m vertical differential, consult Residential Piping and Long Line Guideline.

DIMENSIONS - ENGLISH

UNIT	SERIES	ELECTRICAL CHARACTERISTICS				A	B	C	D	E	F	G	K	L	M	N	P	OPERATING WEIGHT (LBS)	SHIPPING WEIGHT (LBS)	SHIPPING DIMENSIONS (L x W x H)
PH13NR018	K	X	O	O	O	23 1/8"	28 7/16"	3 3/4"	3/4"	4 7/16"	18 1/16"	7 13/16"	2 13/16"	1/2"	11 1/2"	10 1/2"	12 1/2"	119	134	24 1/8" X 24 1/8" X 30 5/8"
PH13NR024	K	X	O	O	O	23 1/8"	35 3/16"	3 3/4"	3/4"	4 7/16"	18 1/16"	7 13/16"	2 13/16"	1/2"	11 1/2"	10 1/2"	14 1/2"	126	143	24 1/8" X 24 1/8" X 37 7/16"
PH13NR030	K	X	O	O	O	31 3/16"	28 7/16"	3 3/4"	3/4"	6 9/16"	24 11/16"	9 1/8"	2 13/16"	1/2"	15"	15"	12"	161	183	32 3/16" X 32 3/16" X 30 5/8"
PH13NR036	K	X	O	O	O	31 3/16"	31 13/16"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	15"	15"	11 1/2"	177	198	32 3/16" X 32 3/16" X 34"
PH13NR042	K	X	O	O	O	31 3/16"	38 5/8"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	15"	15"	15 1/2"	198	223	32 3/16" X 32 3/16" X 40 13/16"
PH13NR048	K	X	O	O	O	31 3/16"	28 7/16"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	15"	15"	12"	207	230	32 3/16" X 32 3/16" X 30 5/8"
PH13PR048	K	O	O	X	O	31 3/16"	28 7/16"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	15"	15"	12"	207	230	32 3/16" X 32 3/16" X 30 5/8"
PH13NR060	K	X	O	O	O	31 3/16"	42"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	15"	15"	16"	273	298	32 3/16" X 32 3/16" X 44 1/4"
PH13PR060	K	O	O	X	O	31 3/16"	42"	3 7/8"	7/8"	6 9/16"	24 11/16"	9 1/8"	2 15/16"	5/8"	15"	15"	16"	273	298	32 3/16" X 32 3/16" X 44 1/4"
		208/230-1-60	230-1-60	208/230-3-60	460-3-60															

X = YES
O = NO



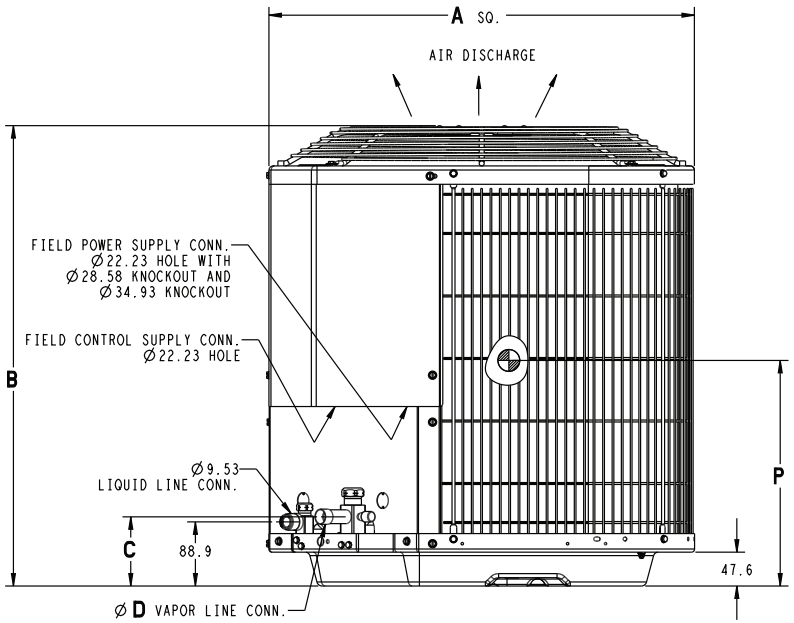


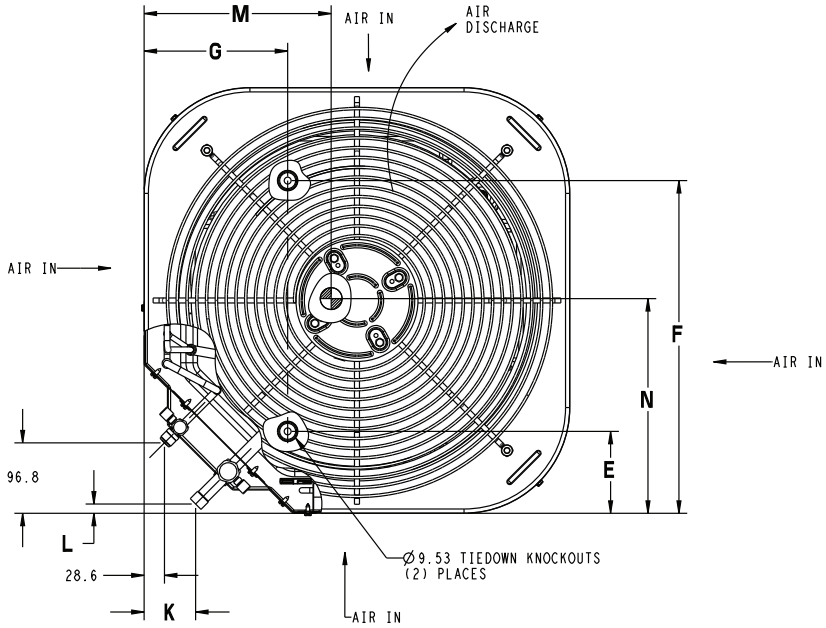
UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18,24	23 1/2" X 23 1/2"
--	26" X 26"
30,36,42,48,60	31 1/2" X 31 1/2"
--	35" X 35"

DIMENSIONS - SI

UNIT	SERIES	ELECTRICAL CHARACTERISTICS				A	B	C	D	E	F	G	K	L	M	N	P	OPERATING WEIGHT (Kgs)	SHIPPING WEIGHT (Kgs)	SHIPPING DIMENSIONS (L x W x H)
PH13NR018	K	X	O	O	O	587.4	722.3	95.2	19.0	112.7	458.8	198.4	71.4	12.7	292.1	266.7	317.5	54.0	60.8	612.8 X 612.8 X 777.9
PH13NR024	K	X	O	O	O	587.4	893.8	95.2	19.0	112.7	458.8	198.4	71.4	12.7	292.1	266.7	368.3	57.2	64.9	612.8 X 612.8 X 950.9
PH13NR030	K	X	O	O	O	792.2	722.3	95.2	19.0	166.7	627.1	231.8	71.4	12.7	381.0	381.0	304.8	73.0	83.0	817.6 X 817.6 X 777.9
PH13NR036	K	X	O	O	O	792.2	808.0	98.4	22.2	166.7	627.1	231.8	74.6	15.9	381.0	381.0	292.1	80.3	89.8	817.6 X 817.6 X 863.6
PH13NR042	K	X	O	O	O	792.2	981.1	98.4	22.2	166.7	627.1	231.8	74.6	15.9	381.0	381.0	393.7	89.8	101.2	817.6 X 817.6 X 1036.6
PH13NR048	K	X	O	O	O	792.2	722.3	98.4	22.2	166.7	627.1	231.8	74.6	15.9	381.0	381.0	304.8	93.9	104.3	817.6 X 817.6 X 777.9
PH13PR048	K	O	O	X	O	792.2	722.3	98.4	22.2	166.7	627.1	231.8	74.6	15.9	381.0	381.0	304.8	93.9	104.3	817.6 X 817.6 X 777.9
PH13NR060	K	X	O	O	O	792.2	1066.8	98.4	22.2	166.7	627.1	231.8	74.6	15.9	381.0	381.0	406.4	123.8	135.2	817.6 X 817.6 X 1124.0
PH13PR060	K	O	O	X	O	792.2	1066.8	98.4	22.2	166.7	627.1	231.8	74.6	15.9	381.0	381.0	406.4	123.8	135.2	817.6 X 817.6 X 1124.0
		208/230-1-60	230-1-60	208/230-3-60	460-3-60															

X = YES
O = NO





UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18,24	596.9 X 596.9
--	660.4 X 660.4
30,36,42,48,60	800.1 X 800.1
--	889.0 X 889.0

OPTIONAL EQUIPMENT USAGE GUIDELINE

ACCESSORY	REQUIRED FOR LOW–AMBIENT APPLICATIONS (Below 55°F / 12.8°C)	REQUIRED FOR LONG–LINE APPLICATIONS* (Over 80 ft / 24.38 m)
Ball Bearing Fan Motor	Yes	No
Compressor Crankcase Heater	Yes	Yes
Compressor Start Assist Capacitor and Relay	Yes	Yes
Evaporator Freeze Thermostat	Yes	No
Isolation Relay	Yes	No
Liquid–Line Solenoid Valve or Hard Shutoff TXV	Yes	See Long–Line Application Guideline
MotorMaster® Low–Ambient Controller	Yes	No
Wind Baffle	See Low–Ambient Instructions	No
Support Feet	Recommended	No

* For tubing line sets between 80 and 175 ft (24.38 and 53.34 m)., refer to Residential Split Systems Long–Line Application Guideline.

ACCESSORY DESCRIPTION AND USAGE (Listed Alphabetically)

1. Ball-Bearing Fan Motor

A fan motor with ball bearings, which permits speed reduction while maintaining bearing lubrication.

Usage Guideline:

Required on all units when MotorMaster®-Low-Ambient Controller is installed.

2. Compressor Crankcase Heater

An electric resistance heater which mounts to the base of the compressor to keep the lubricant warm during off cycles. Improves compressor lubrication on restart and minimizes the chance of liquid slugging.

Usage Guideline:

Required in low ambient applications.

Required in long line applications.

Suggested in all commercial applications.

3. Compressor Sound Hood

Wraparound sound reducing cover for the compressor. Reduces the sound level by about 2 dBA.

Usage Guideline:

Suggested when unit is installed closer than 15 ft (4.57 m) to quiet areas-bedrooms, etc.

Suggested when unit is installed between two houses less than 10 ft (3.05 m) apart.

4. Compressor Start Assist - Capacitor and Relay

Start capacitor and relay gives a ”hard” boost to compressor motor at each start up.

Usage Guideline:

Required for single-phase scroll compressors in the following applications:
Long line
Low ambient

Suggested for all compressors in areas with a history of low voltage problems.

5. Compressor Start Assist - PTC Type

Solid-state electrical device which gives a ”soft” boost to the single-phase compressor motor at each start up.

Usage Guideline:

Suggested when compressor power supply is marginal
Suggested in reciprocating single-phase compressor applications with rapid pressure balance (RPB) expansion valve on indoor coil.

6. Cycle Protector

Solid-state timing device which prevents compressor rapid recycling. Control provides an approximate 5-minute delay after power to the compressor has been interrupted for any reason, including normal room thermostat cycling.

Usage Guideline:

Installations in areas where power interruptions are frequent.

Where user is likely to play with the room thermostat.

All commercial installations.

Installations where interconnecting tube length exceeds 80 ft (24.38 m).

High-rise applications.

7. Evaporator Freeze Thermostat

An SPST temperature-actuated switch that stops unit operation when evaporator reaches freeze-up conditions.

Usage Guideline:

Required when low ambient kit has been added.

8. High-Pressure Switch

Auto reset SPST switch activated by refrigerant pressure on high side of refrigerant circuit. Cycles compressor off if refrigerant pressure rises to 426 ± 10 psig and resets at 320 ± 20 psig. Provides protection against compressor damage due to loss of outdoor airflow.

Usage Guideline:

Suggested in installations exposed to ”very dirty” outdoor air.

Suggested in installations where condenser inlet air temperature exceeds 125°F (51.7°C).

9. Isolation Relay

An SPDT relay which switches the low-ambient controller out of the outdoor fan motor circuit when the heat pump switches to heating mode.

Usage Guideline:

Required in all heat pumps where low-ambient kit has been added.

10. Liquid-Line Solenoid Valve (LLS)

This device serves two purposes. It is an electrically operated shutoff valve which stops and starts refrigerant liquid flow in response to compressor operation. It maintains a column of refrigerant liquid ready for action at next compressor operation cycle. It also provides system protection against off-Kycle refrigerant migration.

Usage Guideline:

Required in air conditioner long line applications with a piston indoor metering device to prevent off cycle refrigerant migration. A hard shutoff TXV can be used instead of LLS in single flow air conditioner applications. See Long Line Application Guideline.

ACCESSORY DESCRIPTION AND USAGE (Listed Alphabetically)(Cont.)

11. MotorMaster®-Low-Ambient Controller

A fan speed control device activated by a temperature sensor, designed to control condenser fan motor speed in response to the saturated, condensing temperature during operation in cooling mode only. For outdoor temperatures down to -20°F (±11.0°C), it maintains condensing temperature at 100°F ± 10°F (37.8°C ±5.5°C).

Usage Guideline:

A MotorMaster®-Low-Ambient Controller or Low-Ambient Pressure Switch must be used when cooling operation is used at outdoor temperatures below 55°F / 12.8°C.

Suggested for all commercial applications.

12. Outdoor Air Temperature Sensor

Designed for use with Payne Thermostats listed in this publication. The device enables the thermostat to display the outdoor temperature. This device also is required to enable special thermostat features such as auxiliary heat lock out.

Usage Guideline:

Suggested for all Payne thermostats listed in this publication.

13. Thermostatic Expansion Valve (TXV) Single-Klow

A modulating flow-Kontrol valve which meters refrigerant liquid flow rate into the evaporator in response to the superheat of the refrigerant gas leaving the evaporator. Kit includes valve, adapter tubes, and external equalizer tube. Both hard shutoff and RPB valves are available.

Usage Guideline:

Required to achieve AHRI ratings in certain equipment
combinations. Refer to combination ratings.

Hard shut off TXV or LLS required in air conditioner long line applications.

Required for use on all zoning systems.

14. Time-Delay Relay

An SPST delay relay which briefly continues operation of indoor blower motor to provide additional cooling after the compressor cycles off.

NOTE: Most indoor unit controls include this feature. For those that do not, use the guideline below.

Usage Guideline:

For improved efficiency ratings for certain combinations of indoor and outdoor units. Refer to AHRI Unitary Directory.

15. Winter Start Control

An SPST delay relay which bypasses the Low-Pressure Switch for approximately 3 minutes to permit start-up for cooling operation under low load conditions.

Usage Guideline:

All air conditioners to which Low-Pressure Switch and Low-Ambient Controller have been added

SYSTEM DESIGN

1. Intended for outdoor installation with free air inlet and outlet. Outdoor fan external static pressure available is less than 0.01-in. w.0c.
2. Minimum outdoor operating air temperature without low-ambient operation accessory is 55°F (12.8°C).
3. Maximum outdoor operating air temperature is 115°F (46.1°C).
4. For reliable operation, unit should be level in all horizontal planes.
5. Maximum elevation of indoor coil above or below base of outdoor unit is: indoor coil above = 80 ft (24.38 m), indoor coil below = 200 ft (60.96).
6. For interconnecting refrigerant tube lengths greater than 80 ft (24.38 m) horizontal or 20 ft (6.10 m) vertical differential, consult Residential Split System Long-Line Application Guideline available from equipment distributor.
7. Crankcase heater required when interconnecting refrigerant tube length exceeds 80 ft (24.38 m).
8. If any refrigerant tubing is buried, provide a minimum 6 in (152.4 mm). vertical rise to the valve connections at the unit. Refrigerant tubing lengths up to 36 in (914.4 mm). may be buried without further consideration.
9. Use only copper wire for electric connection at unit. Aluminum and clad aluminum are not acceptable for the type of connector provided.

Catalog No. SS-PH13NRDRY-01

Replaces: New