

## 14 SEER SINGLE-STAGE HEAT PUMP WITH OBSERVER® COMMUNICATING CONTROL SYSTEM 1- 1/2 THRU 5 TONS SPLIT SYSTEM 208 / 230 Volt, 1- phase, 60 Hz REFRIGERATION CIRCUIT

- Copeland Scroll® compressors on select models
- Suction line accumulator factory installed
- Bi- flow filter- drier included for field installation
- Integrated solid state control with Time- Temperature Defrost
- External high and low refrigerant service ports
- Copper tube / aluminum fin coil

### PERFORMANCE

- Communicating, self- configuring operation when used with Observer® Wall Control (TSTAT0201CW)
- Outdoor temperature sensor factory installed
- Compressor sound blanket standard
- Isolation compressor grommets

### EASY TO INSTALL AND SERVICE

- Text based diagnostics with Observer® Communicating Wall Control
- Easy access service valves on all models
- Innovative control box design
- High and low pressure switches
- Only two screws to access control panel
- Factory charged with R- 410A refrigerant

### BUILT TO LAST

- High gloss, baked- on powder coat finish over galvanized steel
- Post- painted (black) coil fins
- Coated, weather- resistant cabinet screws
- Coated inlet grille with 3/8" (10mm) spacing for extra protection
- Corner posts for extra strength and style

### WARRANTY\*

- 3 year No Hassle Replacement™ limited warranty (when installed with Observer® Communicating Wall Control)
- 5 year parts limited warranty (including compressor and coil)
  - With timely registration, an additional 5 year parts limited warranty (including compressor and coil)

\* Applies to original purchaser/homeowner, some limitations may apply. See Warranty certificate for complete details.



TSTAT0201CW

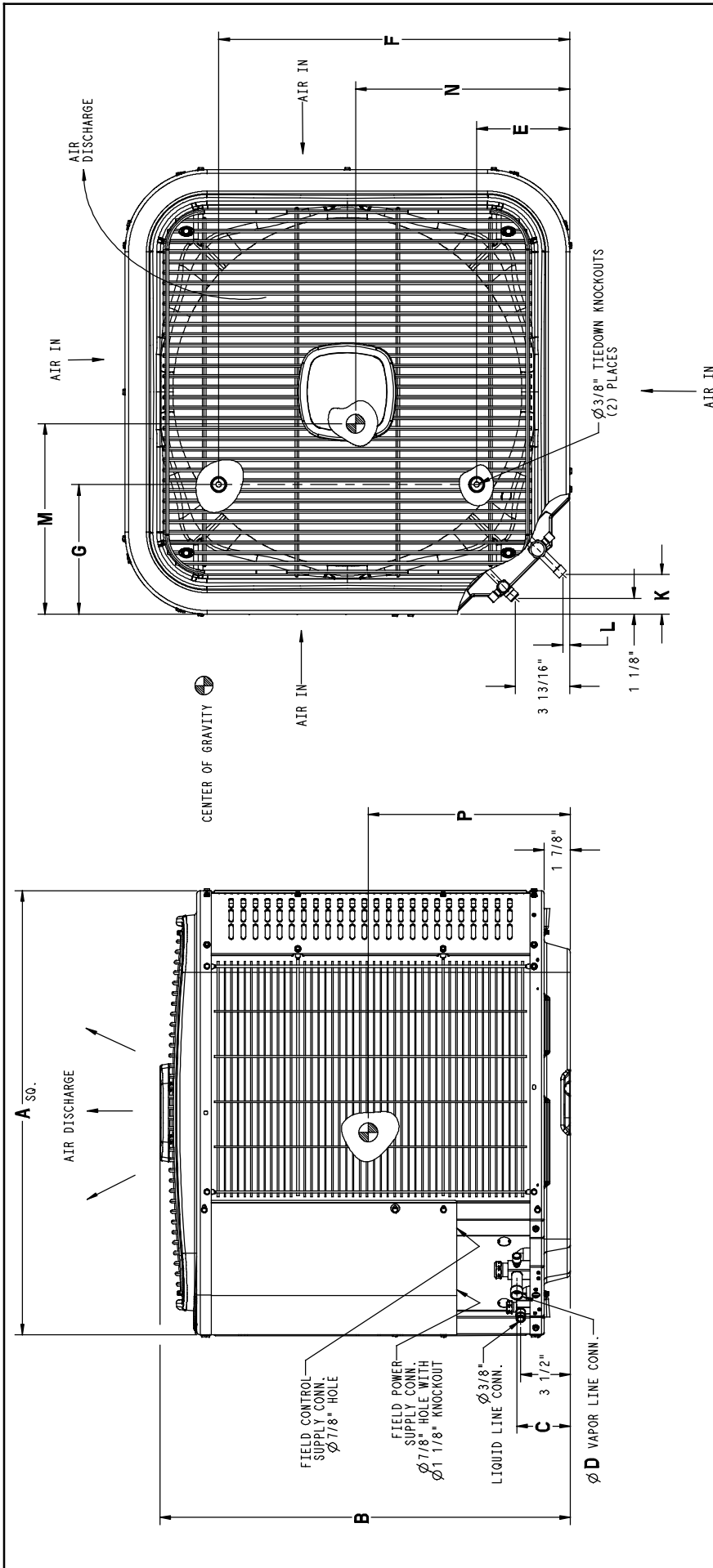


Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to [www.ahridirectory.org](http://www.ahridirectory.org).

Model Number	Size (tons)	Nominal Btu/hr	Min. Circuit Ampacity	Max. Fuse or Breaker	Operating Dimensions depth x width x height in. (mm)	Ship / Operate Weight lbs. (kg)
TSH418GKA	1- 1/2	18,000	11.8	20	31- 3/16 x 31- 3/16 x 28- 11/16 (792.5 x 792.5 x 729.3)	219 / 184 (99.3 / 83.5)
TSH424GKA	2	24,000	17.6	25	31- 3/16 x 31- 3/16 x 28- 11/16 (792.5 x 792.5 x 729.3)	195 / 164 (88.5 / 73.4)
TSH430GKA	2- 1/2	30,000	18.3	30	31- 3/16 x 31- 3/16 x 32- 1/8 (792.5 x 792.5 x 815.6)	216 / 182 (98.0 / 82.6)
TSH436GKA	3	36,000	20.0	30	31- 3/16 x 31- 3/16 x 28- 11/16 (792.5 x 792.5 x 729.3)	228 / 194 (103.4 / 88.0)
TSH442GKA	3- 1/2	42,000	24.0	40	31- 3/16 x 31- 3/16 x 38- 15/16 (792.5 x 792.5 x 988.4)	252 / 221 (114.3 / 100.2)
TSH448GKA	4	48,000	25.2	40	31- 3/16 x 31- 3/16 x 28- 11/16 (792.5 x 792.5 x 729.3)	252 / 221 (114.3 / 100.2)
TSH460GKA	5	60,000	32.0	50	31- 3/16 x 31- 3/16 x 32- 1/8 (792.5 x 792.5 x 815.6)	267 / 236 (121.1 / 107.0)

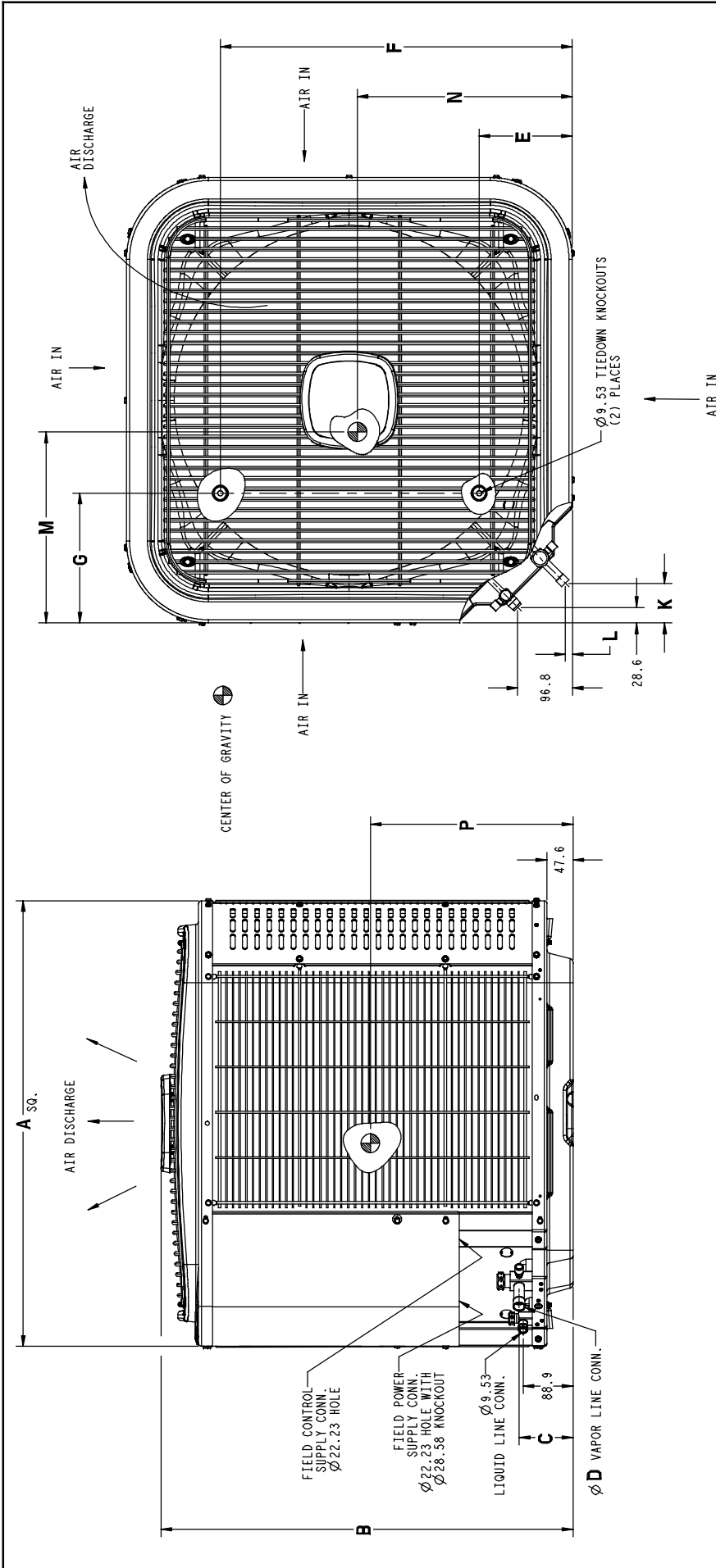
<b>OUTDOOR UNIT MODEL NUMBER IDENTIFICATION GUIDE (single phase)</b>											
Digit Position:	1	2	3	4	5, 6	7	8	9	10	11	12
Example Part Number:	<b>T</b>	<b>S</b>	<b>H</b>	<b>4</b>	<b>18</b>	<b>G</b>	<b>K</b>	<b>A</b>	<b>1</b>	<b>0</b>	<b>1</b>
H = Tempstar Mainline <b>BRANDING</b>											
S = Single stage communicating <b>KEY CHARACTERISTIC</b>											
A = Air Conditioner H = Heat Pump <b>TYPE</b>											
3 = 13 SEER 4 = 14 SEER 5 = 15 SEER 6 = 16 SEER 7 = 17 SEER 8 = 18 SEER <b>NOMINAL EFFICIENCY</b>											
18 = 18,000 BTUH = 1- 1/2 tons 24 = 24,000 BTUH = 2 tons 30 = 30,000 BTUH = 2- 1/2 tons 36 = 36,000 BTUH = 3 tons 42 = 42,000 BTUH = 3- 1/2 tons 48 = 48,000 BTUH = 4 tons 60 = 60,000 BTUH = 5 tons <b>NOMINAL CAPACITY</b>											
A = Standard Grille G = Coil Guard Grille C = Coastal <b>FEATURES</b>											
K = 208/230- 1- 60 <b>VOLTAGE</b>											
Sales Code											
Engineering Revision											
Extra Digit											
Extra Digit											

<b>ACCESSORIES PART NUMBER IDENTIFICATION GUIDE</b>									
Digit Position:	1	2	3	4	5	6, 7	8, 9	10, 11	
Example Part Number:	<b>N</b>	<b>A</b>	<b>S</b>	<b>A</b>	<b>0</b>	<b>01</b>	<b>01</b>	<b>CH</b>	
N = Non- Branded									
A = Accessory <b>PRODUCT GROUP</b>									
S = Split System (AC & HP) <b>KIT USAGE</b>									
A = Original B = 2nd Generation <b>MAJOR SERIES</b>									
0 = Generic or Not Applicable 4 = R- 410A <b>REFRIGERANT</b>									
Product Identifier Number									
Package Quantity									
Type of Kit (Example: CH = Crankcase Heater)									



Dimensions Inches (English)

Model TSH4	A	B	C	D	E	F	G	K	L	M	N	P	Minimum Mounting Pad Size	Crated Dimensions h x w x d
18	31-3/16	28-11/16	3-3/4	5/8	6-9/16	24-11/16	9-1/8	2-13/16	1/2	16	15	14	31-1/2x31-1/2	35-15/16 x 35-1/2 x 32-5/16
24	35	33-1/2	3-3/4	5/8	6-9/16	28-7/16	9-1/8	2-13/16	1/2	15-3/4	16-3/4	16-1/2	35 x 35	39-3/8 x 39-1/4 x 36-1/8
30	35	33-1/2	3-3/4	3/4	6-9/16	28-7/16	9-1/8	2-13/16	1/2	16-1/4	16	15-1/2	35 x 35	39-3/8 x 39-1/4 x 36-1/8
36	35	36-7/8	3-3/4	3/4	6-9/16	28-7/16	9-1/8	2-13/16	1/2	15-3/4	16-3/4	17	35 x 35	42-3/4 x 39-1/4 x 36-1/8
42	35	30-1/16	3-7/8	7/8	6-9/16	28-7/16	9-1/8	2-15/16	5/8	17	16-3/4	14-3/4	35 x 35	35-15/16 x 39-1/4 x 36-1/8
48	35	30-1/16	3-7/8	7/8	6-9/16	28-7/16	9-1/8	2-15/16	5/8	16-3/4	16-1/4	14	35 x 35	35-15/16 x 39-1/4 x 36-1/8
60	35	40-1/4	3-7/8	7/8	6-9/16	28-7/16	9-1/8	2-15/16	5/8	17-1/4	16-1/4	18-1/4	35 x 35	46-1/8 x 39-1/4 x 36-1/8



Dimensions mm (SI Metric)

Model TSH4	A	B	C	D	E	F	G	K	L	M	N	P	Minimum Mounting Pad Size	Crated Dimensions h x w x d
18	793	729	96	16	167	627	232	71	13	406	381	356	800 x 800	913 x 901 x 821
24	889	850	96	16	167	722	232	71	13	400	426	419	889 x 889	1000 x 998 x 918
30	889	850	96	19	167	722	232	71	13	413	406	394	889 x 889	1000 x 998 x 918
36	889	937	96	19	167	722	232	71	13	400	426	432	889 x 889	1086 x 998 x 918
42	889	764	98	22	167	722	232	75	16	432	426	375	889 x 889	913 x 998 x 918
48	889	764	98	22	167	722	232	75	16	426	413	356	889 x 889	913 x 998 x 918
60	889	1023	98	22	167	722	232	75	16	438	413	464	889 x 889	1172 x 998 x 918

PHYSICAL DATA							
Model Size	18	24	30	36	42	48	60
Nominal Cooling Capacity (BTU/hr)	18,000	24,000	30,000	36,000	42,000	48,000	60,000
Nominal SEER	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Compressor Type	Scroll						
REFRIGERANT	R- 410A						
Control	TXV (R- 410A Hard Shutoff)						
Outdoor Heating Piston #	42	46	49	57	61	65	78
Charge lb (kg)	5.6 (2.5)	6.8 (3.08)	6.4 (2.9)	7.67 (3.48)	8.25 (3.74)	8.68 (3.94)	10.6 (4.81)
COND FAN	Propeller Type, Direct Drive						
Air Discharge	Vertical						
Motor HP	1/12	1/12	1/4	1/5	1/4	1/4	1/4
Motor RPM	1100	1100	1100	1100	1100	1100	800
CFM	1700	2195	3365	3165	3800	3365	4470
VALVE CONNECT. (In. ID)							
Vapor	5/8	5/8	3/4	3/4	7/8	7/8	7/8
Liquid	3/8						
REFRIGERANT TUBES (In. OD)							
Rated Vapor*	5/8	5/8	3/4	3/4	7/8	7/8	1- 1/8
Liquid	3/8"						

\*Units are rated with 25 ft (7.6 m) of lineset length. See Vapor Line Sizing and Cooling Capacity Loss table when using other sizes and lengths of lineset.

**Note:** See unit Installation Instruction for proper installation.

ELECTRICAL DATA (208/230- 1- 60, voltage range 197V - 253V)												
Unit Size	V/PH	Operating Volts*		Compr		Fan	MCA	Min Wire Size†	Min Wire Size†	Max Length ft (m)‡	Max Length ft (m)‡	Max Fuse** or Ckt Brk Amps
		MAX	MIN	LRA	RLA	FLA		60° C	75° C	60° C	75° C	
18	208/230/1	253	197	48.0	9.00	0.50	11.8	14	14	66 (20.1)	62 (20.7)	20
24				62.9	10.9	0.50	14.1	14	14	46 (14.0)	44 (13.4)	25
30				72.5	13.5	1.40	18.3	14	14	44 (13.4)	42 (12.8)	30
36				75.0	15.1	1.10	20.0	12	12	57 (17.4)	54 (16.5)	30
42				105.5	18.1	1.40	24.0	10	10	71 (21.6)	68 (20.7)	40
48				108.0	19.0	1.40	25.2	10	10	69 (21.0)	66 (20.1)	40
60				144.2	24.4	1.52	32.0	8	10	91 (27.7)	56 (17.1)	50

\* Permissible limits of the voltage range at which the unit will operate satisfactorily

† If wire is applied at ambient greater than 30°C, consult table 310- 16 of the NEC (NFPA 70). The ampacity of non- metallic- sheathed cable (NM), trade name ROMEX, shall be that of 60°C conditions, per the NEC (NFPA 70) Article 336- 26. If other than uncoated (no- plated), 60 or 75°C insulation, copper wire (solid wire for 10 AWG or smaller, stranded wire for larger than 10 AWG) is used, consult applicable tables of the NEC (NFPA 70).

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

\*\* Time- Delay fuse.

**FLA** - Full Load Amps

**LRA** - Locked Rotor Amps

**MCA** - Minimum Circuit Amps

**RLA** - Rated Load Amps

**NOTE:** Control circuit is 24- V on all units and requires external power source. Copper wire must be used from service disconnect to unit. All motors/compressors contain internal overload protection.

Complies with 2010 requirements of ASHRAE Standards 90.1

A-WEIGHTED SOUND LEVEL (dBA)								
Unit Size	Standard Rating (dBA)	TYPICAL OCTAVE BAND SPECTRUM (dBA without tone adjustment)						
		125	250	500	1000	2000	4000	8000
18	71	53	53	60	63	57	54	44
24	73	46	55	63	64	60	55	50
30	76	45	61	61	69	61	58	52
36	75	45	59	66	65	61	58	51
42	74	49	62	62	64	60	58	49
48	79	54	66	69	70	67	64	56
60	73	51	64	62	63	59	56	49

NOTE: Tested in accordance with AHRI Standard 270- 08 (not listed in AHRI).

### VAPOR LINE SIZING AND COOLING CAPACITY LOSS

Acceptable vapor line diameters provide adequate oil return to the compressor while avoiding excessive capacity loss. The suction line diameters shown in the chart below are acceptable for HP systems with R- 410A refrigerant:

Vapor Line Sizing and Cooling Capacity Losses - R-410A Refrigerant 1- Stage Heat Pump Applications											
Unit Nominal Size (Btuh)	Maximum Liquid Line Diameters (In. OD)	Vapor Line Diameters (In. OD)	Cooling Capacity Loss (%) Total Equivalent Line Length ft. (m)								
			Standard Application		Long Line Application Requires Accessories						
			26-50 (7.9- 15.2)	51-80 (15.5- 24.4)	81- 100 (24.7- 30.5)	101- 125 (30.8- 38.1)	126- 150 (38.4- 45.7)	151- 175 (46.0- 50.3)	176- 200 (53.6- 60.0)	201- 225 (61.3- 68.6)	226- 250 (68.9- 76.2)
18,000 1- Stage HP with R- 410A	3/8	1/2	1	2	3	4	6	7	8	9	10
		5/8	0	0	1	1	1	2	2	3	3
24,000 1- Stage HP with R- 410A	3/8	5/8	0	1	1	2	3	3	4	4	5
		3/4	0	0	0	0	1	1	1	1	1
30,000 1- Stage HP with R- 410A	3/8	5/8	1	2	3	3	4	5	6	7	8
		3/4	0	0	1	1	1	2	2	2	3
		7/8	0	0	0	0	1	1	1	1	1
36,000 1- Stage HP with R- 410A	3/8	5/8	1	2	4	5	6	7	9	10	11
		3/4	0	0	1	1	2	2	3	3	4
		7/8	0	0	0	0	1	1	1	1	2
42,000 1- Stage HP with R- 410A	3/8	3/4	0	1	2	2	3	4	4	5	6
		7/8	0	0	1	1	1	2	2	2	3
48,000 1- Stage HP with R- 410A	3/8	3/4	0	1	2	3	4	5	5	6	7
		7/8	0	0	1	1	2	2	2	3	3
60,000 1- Stage HP with R- 410A	3/8	3/4	1	2	4	5	6	7	9	10	11
		7/8	0	1	2	2	3	4	4	5	5
		1- 1/8	0	0	0	1	1	1	1	1	1

Standard Length = 80 ft. (24.4 m) or less total equivalent length

Applications in this area are long line. Accessories are required as shown recommended on Long Line Application Guidelines

Applications in this area may have height restrictions that limit allowable total equivalent length, when outdoor unit is below indoor unit. See Long Line Application Guidelines

## REFRIGERANT PIPING LENGTH LIMITATIONS

### Maximum Line Lengths:

The maximum allowable total equivalent length for heat pumps varies depending on the vertical separation. See the tables below for allowable lengths depending on whether the outdoor unit is on the same level, above or below the indoor unit.

Maximum Line Lengths for Heat Pump Applications			
	MAXIMUM ACTUAL LENGTH ft (m)	MAXIMUM EQUIVALENT LENGTH† ft (m)	MAXIMUM VERTICAL SEPARATION ft (m)
Units on equal level	200 (61)	250 (76.2)	N/A
Outdoor unit ABOVE indoor unit	200 (61)	250 (76.2)	200 (61)
Outdoor unit BELOW indoor unit	See Table 'Maximum Total Equivalent Length: Outdoor Unit BELOW Indoor Unit'		

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

Maximum Total Equivalent Length <sup>†</sup> - Outdoor Unit BELOW Indoor Unit								
Unit Size	Liquid Line Diameter w/ TXV	HP with R-410A Refrigerant - Maximum Total Equivalent Length <sup>†</sup> Vertical Separation ft (m) Outdoor unit BELOW indoor unit;						
		0-20 (0 - 6.1)	21-30 (6.4 - 9.1)	31-40 (9.4 - 12.2)	41-50 (12.5 - 15.2)	51-60 (15.5 - 18.3)	61-70 (18.6 - 21.3)	71-80 (21.6 - 24.4)
18 HP with R-410A	3/8	250*	250*	250*	250*	250*	250*	250*
24 HP with R-410A	3/8	250*	250*	250*	250*	250*	250*	250*
30 HP with R-410A	3/8	250*	250*	250*	250*	250*	250*	250*
36 HP with R-410A	3/8	250*	250*	250*	250*	250*	250*	250*
42 HP with R-410A	3/8	250*	250*	250*	250*	250*	250*	150
48 HP with R-410A	3/8	250*	250*	250*	250*	230	160	--
60 HP with R-410A	3/8	250*	225*	190	150	110	--	--

\* Maximum actual length not to exceed 200 ft (61 m)

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

-- = outside acceptable range

## LONG LINE APPLICATIONS

An application is considered Long Line when the refrigerant level in the system requires the use of accessories to maintain acceptable refrigerant management for systems reliability. Defining a system as long line depends on the liquid line diameter, actual length of the tubing, and vertical separation between the indoor and outdoor units.

For Heat Pump systems, the chart below shows when an application is considered Long Line. Beyond these lengths, long line accessories are required:

HP WITH R-410A REFRIGERANT LONG LINE DESCRIPTION ft (m) Beyond these lengths, long line accessories are required			
Liquid Line Size	Units On Same Level	Outdoor Below Indoor	Outdoor Above Indoor
3/8	80 (24.4)	20 (6.1) vertical or 80 (24.4) total	80 (24.4)

Note: See Long Line Guideline for details

CHARGING SUBCOOLING (TXV- TYPE EXPANSION DEVICE)	
UNIT SIZE	REQUIRED SUBCOOLING °F (°C)
18	12 (- 11.1)
24	14 (- 10.0)
30	10 (- 12.2)
36	10 (- 12.2)
42	10 (- 12.2)
48	14 (- 10.0)
60	15 (- 9.4)

**COOLING & HEATING PERFORMANCE FOR COMBINATION RATINGS Indoor Models**

For complete ratings information, use the AHRI website directory search: [www.AHRIdirectory.org](http://www.AHRIdirectory.org). New ratings may be listed online before Specification Sheets are updated.

Outdoor Model	Indoor Model *Tested Combo	Factory Installed	Cooling 95°F (35°C)			Heat 47°F (8.3°C)		Heat 17°F (-8.3°C)		HSPF
			Capacity BTU/hr	SEER	EER	BTU/hr	COP	BTU/hr	COP	
				Stand- ard						
TSH418GKA101	FXM4X18**AL	TXV	18000	14	12.5	17600	3.86	10600	2.56	8.2
TSH424GKA101	FEM4X30**BL	TXV	24000	14	12.2	22000	3.84	13300	2.66	8.2
TSH430GKA101	FEM4X30**BL	TXV	28600	14	11.7	28600	3.62	17100	2.44	8.2
TSH436GKA101	FEM4X36**BL	TXV	33000	14	11.7	33800	3.62	21000	2.40	8.2
TSH442GKA101	FEM4X42**BL	TXV	40000	14	11.7	41000	3.62	25200	2.50	8.2
TSH448GKA101	FEM4X48**BL	TXV	46000	14	11.7	45500	3.64	27800	2.56	8.2
TSH460GKA101	FXM4X60**AL	TVX	57000	14	11.7	54500	3.70	33000	2.56	8.2

2009 ENERGY STAR compliance for combinations with all three: SEER 14.50 or higher and EER 12.00 or higher and HSPF 8.2 or higher.



ACCESSORY USAGE GUIDELINES			
Accessory	REQUIRED FOR APPLICATIONS IN SNOW- BELT REGION	REQUIRED FOR LOW- AMBIENT APPLICATIONS {Below 55°F (13°C)}	REQUIRED FOR LONG- LINE APPLICATIONS* {Over 80 Ft. (24.4m)}
Evaporator Freeze Thermostat	No	<b>Yes</b>	No
Accumulator	Standard (factory installed)	Standard (factory installed)	Standard (factory installed)
Low Ambient Kit (Pressure Switch)	No	<b>Yes</b>	No
Hard Start Kit (Capacitor & Relay)	No	<b>Yes</b>	<b>Yes</b>
Support Feet, 4" (102mm) tall	<b>Yes</b>	Recommended	No
Liquid Line Solenoid Valve	No	No	See Long- Line Application Guideline

\* For Line Set lengths between 80 and 200 ft (24.4 and 61m) horizontal. or more than 20 ft (6.1m) indoor- outdoor vertical separation, refer to the Long Line Application Guideline document.

ACCESSORIES		
Part Number	Description	Used On Model Size
NASA00101IK	ISLN Relay Kit	18, 24, 30, 36, 48
NASA00601CH	Crankcase Heater for Scroll Compressor (208/230 V)	18, 24, 30
NASA00501CH	Crankcase Heater for Scroll Compressor (208/230 V)	42, 60
NASA001SC	Start Component - PTC Device	ALL
NASA00201FS	Evaporator Freeze Thermostat	ALL
NASA401LS	Liquid Line Solenoid Valve, HP, R- 22 or R- 410A	ALL
NASA001TD	Time Delay Relay, Indoor Blower	ALL
NASA001AC	Anti- Cycle Timer (5 minute delay)	ALL
NASA014SC	Hard Start Kit (Capacitor & Relay)	18, 24, 30, 36
NASA005SC	Hard Start Kit (Capacitor & Relay)	42, 48, 60
NASA401LA	Low Ambient Kit (Pressure Switch), R- 410A	ALL
NASA00201SF	Support Feet, 4" (102mm) tall, 5 included	ALL
NASA001SJ	Sound Blanket Kit	48
NASA003SJ	Sound Blanket Kit	42, 60
NAEA40501TX	TXV Kit, R- 410A - for use with copper or tin fan coils	18, 24, 30
NAEA40601TX	TXV Kit, R- 410A - for use with copper or tin fan coils	36, 42
NAEA40701TX	TXV Kit, R- 410A - for use with copper or tin fan coils	48, 60
NAEB40501TX	TXV Kit, R- 410A - for use with aluminum fan coils	18, 24, 30
NAEB40601TX	TXV Kit, R- 410A - for use with aluminum fan coils	36,
NAEB40701TX	TXV Kit, R- 410A - for use with aluminum fan coils	42, 48, 60
TSTAT0201CW	Observer® Self Configuring Communicating Wall Control	ALL