



MODEL: SP16 Heat Pumps

FORM NO. PSC-813 REV. 1



Sure Comfort® SP16 Two Stage Heat Pumps

- **Efficiencies: up to 16 SEER/up to 13 EER**
- **Nominal Sizes 2, 3, 4 and 5 Ton
[7.03, 10.6, 14.06 and 17.6 kW]**
- **Cooling Capacities 17.3 to 60.5 kBTU
[5.7 to 17.7 kW]**



“Proper sizing and installation of equipment is critical to achieve optimal performance. Split system air conditioners and heat pumps must be matched with appropriate coil components to meet Energy Star. Ask your Contractor for details or visit www.energystar.gov.”

- New composite base pan – dampens sound, secures wire grille, eliminates corrosion and reduces number of fasteners needed
- Improved tubing design – reduces vibration and stress, making unit quieter and reducing opportunity for leaks
- Optimized defrost characteristics - decrease defrosting and provide better home comfort
- Powder coat paint finish – for a long lasting professional finish
- Optimized reversing valve sizing – improves shifting performance for quieter unit operation and increased life of the system
- Enhanced mufflers – help to dissipate vibration energy for quieter unit operation
- Scroll compressor – a sound abating feature added to the compressor significantly reduces noise when system transitions in and out of defrost mode
- Modern cabinet aesthetics – increased curb appeal with visually appealing design
- Wire grille – provide coil protection, enhance cabinet strength, and increased cabinet rigidity
- Optimized fan orifice – optimizes airflow and reduces unit sound
- Rust resistant screws – confirmed through 1500-hour salt spray testing
- Service valve has between – 3"-4"-5" valve space – provides a minimum working area of 27-square inches for easier access
- Integrated heat pump lift receptacle – allows standard CPVC stands to be inserted into the base
- 15" wide, industry leading corner service access – makes repairs easier and faster.
- External gauge port access – allows easy connection of “low-loss” gauge ports
- Single-row condenser coil – makes unit lighter and allows thorough coil cleaning to maintain “out of the box” performance
- Fewer cabinet fasteners – allow for faster access to internal components and hassle-free panel removal
- Service trays – hold fasteners or caps during service calls
- QR code – provides technical information on demand for faster service calls
- Fan motor harness with extra-long wires – allows unit top to be removed without disconnecting fan wire

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Standard Feature Table

Feature	24	36	48	60
R-410a Refrigerant	√	√	√	√
Maximum SEER	16	16	16	16
Maximum EER	13	13	12.5	12.5
Scroll Compressor	√	√	√	√
Field Installed Filter Drier	√	√	√	√
Front Seating Service Valves	√	√	√	√
High Pressure Switch	√	√	√	√
Low Pressure Switch	√	√	√	√
Internal Pressure Relief Valve	√	√	√	√
Internal Thermal Overload	√	√	√	√
Long Line capability	√	√	√	√
Low Ambient capability with Kit	√	√	√	√
3-4-5 Service Valve Access	√	√	√	√
Composite Basepan	√	√	√	√
3 Screw Control Box Access	√	√	√	√
15" Access to Internal Components	√	√	√	√
Quick release louver panel design	√	√	√	√
No fasteners to remove along bottom	√	√	√	√
Optimized Venturi Airflow	√	√	√	√
Single row condenser coil	√	√	√	√
Powder coated paint	√	√	√	√
Rust resistant screws	√	√	√	√
QR code	√	√	√	√
External gauge ports	√	√	√	√
Service trays	√	√	√	√

√ = Standard

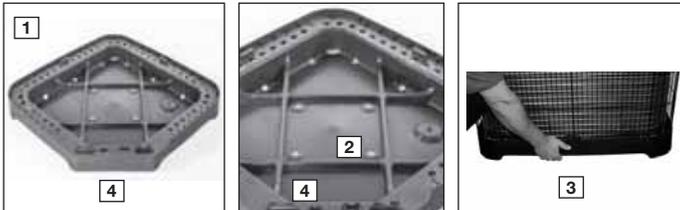
Available SKU

Available Models	Description
SP1624AJ1NA	Sure Comfort® 2 ton 16 SEER Two-Stage Heat Pump-208/230/1/60
SP1636AJ1NA	Sure Comfort® 3 ton 16 SEER Two-Stage Heat Pump-208/230/1/60
SP1648AJ1NA	Sure Comfort® 4 ton 16 SEER Two-Stage Heat Pump-208/230/1/60
SP1660AJ1NA	Sure Comfort® 5 ton 16 SEER Two-Stage Heat Pump-208/230/1/60

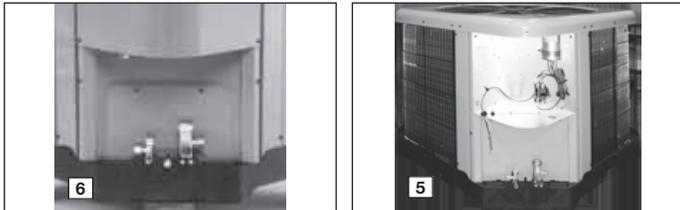
Introduction to SP16 Heat Pump

The SP16 is our 16 SEER heat pump and is part of the Sure Comfort heat pump product line that extends from 14 to 20 SEER. This highly featured and reliable heat pump is designed for years of reliable, efficient operation when matched with Sure Comfort indoor aluminum evaporator coils and furnaces or air handler units with aluminum evaporators.

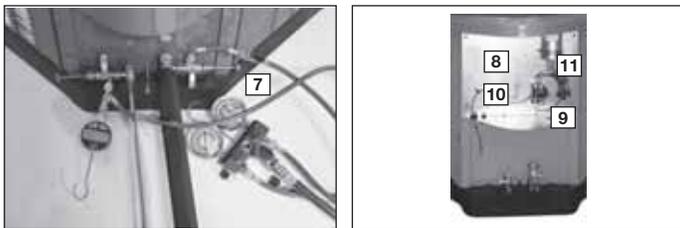
Our unique composite base (1) reduces sound emission, eliminates rattles, reduces fasteners, eliminates corrosion and has integrated brass compressor attachment inserts (2). Furthermore it has incorporated into the design, water management features, means for hand placement (3) for unit maneuvering, screw trays (4) and inserts for lifting off unit pad. (5)



Service Valves (6) are rigidly mounted in the composite base with 3" between suction and discharge valves, 4" clearance below service valves and a minimum of 5" above the service valves, creating industry leading installation ease.



The minimum 27 square-inches around the service valves allows ample room to remove service valve schrader prior to brazing, plenty of clearance for easy brazing of the suction and discharge lines to service valve outlets, easy access and hookup of low loss refrigerant gauges (7), and access to the service valve caps for opening. For applications with long-line lengths up to 250 feet total equivalent length, up to 200 feet condenser above evaporator, or up to 80 feet evaporator above condenser, the long-line instructions in the installation manual should be followed.



Controls are accessed from the corner of the unit by removing only three fasteners from the control access cover, revealing the industry's largest 15" wide and 14" tall control area (8). With all this room in the control area the high voltage electrical whip (9) can easily be inserted through the right size opening in the bottom of the control area. Routing it leads directly to contractor lugs for connection. The low voltage control wires (10) are easily connected to units low voltage wiring. If contactor or capacitor (11) needs to be replaced there is more than adequate space to make the repair.

If in the rare event, greater access is needed to internal components, such as the compressor, the top cover can be removed easily. Furthermore with the top cover removed the control panel can be removed (12). Extra wire length is incorporated into each outdoor fan and compressor so top cover and control panel can be positioned next to the unit. With minimal effort the plug can be removed from the compressor and the outdoor fan wires can be removed from the capacitor to allow even more uncluttered access to the interior of the unit (13). Outdoor coil heights range from as short as 22" to 32", aiding access to the compressor. Disassembly to this degree and complete reassembly only takes a first time service technician less than 10 minutes. (13)



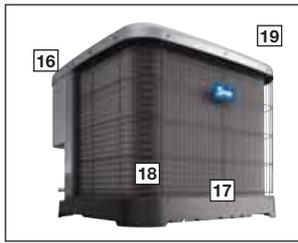
All SP16 units utilize single row coils (14) making cleaning easy and complete, restoring the performance of the heat pump back to out of the box performance levels year after year.

The outdoor fan motor has sleeve bearings and is inherently protected. The motor is totally enclosed for maximum protection from weather, dust and corrosion. Access to the outdoor fan is made by removing four fasteners from the fan grille. The outdoor fan can be removed from the fan grille by removing 4 fasteners in the rare case outdoor fan motor fails.

Each cabinet has optimized composite (15) fan orifice assuring efficient and quiet airflow.

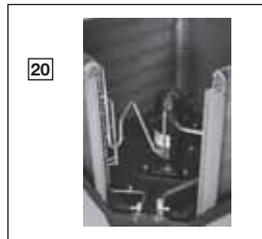


All cabinet painted parts have powder post paint (16) achieving 1000 hour salt spray rating, allowing the cabinet to retain its aesthetics throughout its life.



Scroll compressors with standard internal pressure relief and internal thermal overload are used on all capacities assuring longevity of high efficient and quiet operation for the life of the product.

Each unit is shipped with filter drier for field installation and will trap any moisture or dirt that could contaminate the refrigerant system.



Cabinets are durable and strong due to the composite base pan (17), wire grille (18), and drawn top cover (19).

Each SP16 capacity has undergone rigorous psychometric testing to assure performance ratings of capacity, SEER and EER per AHRI Standard 210/240 rating conditions. Also each unit bears the UL mark and each unit is certified to UL 1995 safety standards.



Each unit has undergone specific strain and modal testing to assure tubing (20) is outside the units natural frequency and that the suction and discharge lines connected to the compressor withstand any starting, steady state operation or shut down forces imposed by the compressor.

All units have been sound tested in sound chamber to AHRI 270 rating conditions, and A-weighted Sound Power Level tables produced, assuring units have acceptable noise qualities (see page 9). Each unit has been ran in cooling operation at 95°F and 82°F and sound ratings for the SP16 range from as low as 74 dBA to 77 dBA.

All units have been ship tested to assure units meet stringent “over the road” shipping conditions.

As manufactured all units in the SP16 family have cooling capability to 55 °F. Addition of low ambient control will allow the unit to operate down to 0°F. Factory testing is performed on each unit. All component parts meet well defined specification and continually go through receiving inspections. Each component installed on a unit is scanned, assuring correct component utilization for a given unit capacity and voltage. All condenser coils are leak tested with pressurization test to 550#’s and once installed and assembled, each units’ complete refrigerant system is helium leak tested. All units are fully charged from the factory for up to 15 feet of piping. All units are factory run tested. The SP16 has a 10-year conditional compressor and parts warranty (registration required).

Optional Accessories

(Refer to accessory chart for model #)

Compressor Crankcase Heater

Protects against refrigerant migration that can occur during low ambient operation

Compressor Sound Cover

- Reinforced vinyl compressor cover containing a 1½ inch thick batt of fiberglass insulation
- Open edges are sealed with a one-inch wide hook and loop fastening tape

Compressor Hard Start Kit

- Single-phase units are equipped with a PSC compressor motor, this type of motor normally does not need a potential relay and start capacitor
- Kit may be required to increase the compressor starting torque, in conditions such as low voltage

Low Ambient Kit

- heat pumps operate satisfactorily in the cooling mode down to 55°F outdoor air temperature without any additional controls
- This Kit can be added in the field enabling unit to operate properly down to 0° in the cooling mode
- Crankcase heater and freezestat should be installed on compressors equipped with a low ambient kit

3"/6"/12"

- Gray high density polyethylene feet are available to raise unit off of mounting surface away from moisture

Low Pressure

- Can be added in field enabling the unit to shut off compressor on loss of charge

NOTE: Unit can be purchased with high and low pressure installed at factory. (Refer to SKU list)

High Pressure

- Can be added in field enabling unit to shut off compressor if unit loses outdoor fan operation.

NOTE: Unit can be purchased with high and low pressure installed at factory. (Refer to SKU list)

Decorative Top

- Can be installed on fan grille

Heat Pumps

<u>S</u>	<u>P</u>	<u>14</u>	<u>24</u>	<u>A</u>	<u>J</u>	<u>1</u>	<u>N</u>	<u>A</u>	<u>*</u>
Brand	Product Category	SEER	Capacity	Major Series*	Voltage	Type	Controls	Minor Series**	Option Code
Sure Comfort	P - Heat Pump	13 - 13 SEER 14 - 14 SEER 15 - 15 SEER 16 - 16 SEER 17 - 17 SEER 20 - 20 SEER	18 - 1.5 T 24 - 2.0 T 30 - 2.5 T 36 - 3.0 T 42 - 3.5 T 48 - 4.0 T 60 - 5.0 T	A - 1st Design B - 2nd Design	J - 1ph, 208-230/60 C - 3ph, 208-230/60 D - 3ph, 460/60	1 - Single-stage V - Inverter P - Piston	C - Communicating N - Non-communicating	A - 1st Design	*TBD

Heat pumps (For Reference)

<u>S</u>	<u>A</u>	<u>14</u>	<u>24</u>	<u>A</u>	<u>J</u>	<u>1</u>	<u>N</u>	<u>A</u>	<u>*</u>
Brand	Product Category	SEER	Capacity	Major Series*	Voltage	Type	Controls	Minor Series**	Option Code
Sure Comfort	A - Air Conditioners	13 - 13 SEER 14 - 14 SEER 16 - 16 SEER 17 - 17 SEER 20 - 20 SEER	18 - 1.5 T 24 - 2.0 T 30 - 2.5 T 36 - 3.0 T 42 - 3.5 T 48 - 4.0 T 60 - 5.0 T	A - 1st Design B - 2nd Design	J - 1ph, 208-230/60 C - 3ph, 208-230/60 D - 3ph, 460/60	1 - Single-stage 2 - Two-stage V - Inverter	C - Communicating N - Non-communicating	A - 1st Design	*TBD

Furnace Coils (For Reference)

<u>S</u>	<u>C</u>	<u>F</u>	<u>24</u>	<u>17</u>	<u>S</u>	<u>I</u>	<u>A</u>	<u>M</u>	<u>C</u>	<u>A</u>	<u>*</u>
Brand	Product Category	Type	Capacity	Width	Efficiency	Metering Device	Major Series*	Orientation	Casing	Minor Series**	Option Code
Sure Comfort	C - Evap Coil F - Furn Coil H - Air-Handler Coil	F - Furn Coil H - Air-Handler Coil	24 - 2 ton 36 - 3 ton 48 - 4 ton 60 - 5 ton	14 - 14" 17 - 17.5" 21 - 21" 24 - 24.5"	S - Standard Eff. M - Mid Eff. H - High Eff.	T-TXV E-EEV P-Piston	A - 1st Design	M - Multi-poise V - Vertical only/ convertible H - Ded. Horizontal only	C - Cased U - Uncased	A - 1st Design	*TBD

[] Designates Metric Conversions

90%+ AFUE Gas Furnaces (For Reference)

<u>S</u>	<u>96</u>	<u>V</u>	<u>A</u>	<u>70</u>	<u>2</u>	<u>3</u>	<u>17</u>	<u>M</u>	<u>S</u>	<u>A</u>
Brand	Series	Motor	Major Rev	Input	Stages	Air Flow	Cabinet Width	Configuration	No _x	Minor Rev
Sure Comfort	90 - 90 AFUE 92 - 92 AFUE 95 - 95 AFUE 96 - 96 AFUE 97 - 97 AFUE	V - Variable speed T - Constant Torque (X-13) P - PSC	A - 1st Design	040 - 42K 060 - 56K 070 - 70K 080 - 85K 100 - 98K 115 - 112K	1 - Single-stage 2 - Two-stage M - Modulating	3 - up to 3 ton 5 - 3 1/2 up to 5 ton	14 - 14" 17 - 17.5" 21 - 21" 24 - 24.5"	M - Multi-poise	X - Low No _x S - Standard	A - 1st Design

80% AFUE Gas Furnaces (For Reference)

<u>S</u>	<u>80</u>	<u>2</u>	<u>V</u>	<u>A</u>	<u>075</u>	<u>3</u>	<u>17</u>	<u>M</u>	<u>S</u>	<u>A</u>
Brand	Series	Stages	Motor	Major Rev	Input	Air Flow	Cabinet Width	Configuration	No _x	Minor Rev
Sure Comfort	80 - 80+ AFUE	1 - Single-stage 2 - Two-stage M - Modulating	V - Variable speed T - Constant Torque (X-13) P - PSC premium S - PSC standard	A - 1st Design	050 - 50K 075 - 75K 100 - 100K 125 - 125K 150 - 150K	3 - up to 3 ton 4 - 2 1/2 to 4 ton 5 - 3 1/2 up to 5 ton	14 - 14" 17 - 17.5" 21 - 21" 24 - 24.5"	M - Multi D - Down Z - Down & zero clearance down flow	X - Low No _x S - Standard	A - 1st Design

Air Handlers (For Reference)

<u>S</u>	<u>H</u>	<u>1</u>	<u>T</u>	<u>24</u>	<u>17</u>	<u>S</u>	<u>I</u>	<u>A</u>	<u>N</u>	<u>A</u>	<u>A</u>	<u>000</u>	<u>*</u>
Brand	Product Category	Stages of Airflow	Motor Type	Capacity	Width	Coil Size	Metering Device	Major Series*	Controls	Voltage	Minor Series**	Factory Heat Cap Code	Option Code
Sure Comfort	H - Air Handler	1 - Single-stage 2 - Two-stage M - Modulating	V - Variable Speed T - Constant Torque P - PSC	24 - 2 ton 36 - 3 ton 48 - 4 ton 60 - 5 ton	14 - 14" 17 - 17.5" 21 - 21" 24 - 24.5"	S - Standard Eff. M - Mid Eff. H - High Eff.	T - TEV E - EEV P - Piston	A - 1st Design	C - Communicating N - Non-communicating	A - 1ph, 115/60 J - 1ph, 208-240/60 D - 3ph, 480/60	A - 1st Design	00 - no factory heat with option code	* TBD

[] Designates Metric Conversions

Physical Data				
Model No.#	SP1624A	SP1636A	SP1648A	SP1660A
Nominal Tonnage	2.0	3.0	4.0	5.0
Valve Connections				
Liquid Line O.D. – in.	3/8	3/8	3/8	3/8
Suction Line O.D. – in.	3/4	3/4	7/8	7/8
Refrigerant (R410A) furnished oz.¹	136.8	155.7	196	256
Compressor Type	Two Stage Scroll			
Outdoor Coil				
Net face area – Outer Coil ft ²	17.3	19.8	28.3	28.3
Net face area – Inner Coil	-	-	-	-
Tube diameter – in.	3/8	3/8	3/8	3/8
Number of rows	1	1	1	1
Fins per inch	20	20	20	20
Outdoor Fan				
Diameter – in.	24	24	26	26
Number of blades	3	3	3	3
Motor hp	1/3	1/3	1/4	1/4
CFM	3100	3435	4600	3654
RPM	654	849	850	850
watts	90	262	255	230
Shipping weight – lbs.	198	206	264	264
Operating weight – lbs.	191	199	257	257

Electrical Data				
Line Voltage Data (Volts-Phase-Hz)	208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60
Maximum overcurrent protection (amps)²	30	40	50	60
Minimum overcurrent protection (amps)²	20	30	40	45
Minimum circuit ampacity³	20	25	31	38
Compressor				
Rated load amps	13	17	23.6	28.8
Locked rotor amps	58.3	83	104	152.9
Condenser Fan Motor				
Full load amps	2.8	2.8	1.4	1.4
Locked rotor amps	—	—	2.6	2.6

¹Refrigerant charge sufficient for 15 ft. length of refrigerant lines. For longer line set requirements see the installation instructions for information about set length and additional refrigerant charge required.

²HACR type circuit breaker or fuse.

³Refer to National Electrical Code manual to determine wire, fuse and disconnect size requirements.

Accessories

Model No.		SP1624A	SP1636A	SP1648A	SP1660A
Compressor crankcase heater		44-17402-44	44-17402-44	Factory Standard	Factory Standard
Low ambient control		RXAD-A08	RXAD-A08	RXAD-A08	RXAD-A08
Compressor sound cover		68-23427-26	68-23427-26	68-23427-25	68-23427-25
Compressor hard start kit		SK-A1	SK-A1	SK-A1	SK-A1
Low pressure control*		Factory Standard	Factory Standard	Factory Standard	Factory Standard
High pressure control*		Factory Standard	Factory Standard	Factory Standard	Factory Standard
Liquid Line Solenoid (24 VAC, 50/60 Hz)	Solenoid Valve	200RD2T3TVLC	200RD2T3TVLC	200RD3T3TVLC	200RD3T3TVLC
	Solenoid Coil	61-AMG24V	61-AMG24V	61-AMG24V	61-AMG24V
	Bi-flow kit*	KS30387	KS30387	KS30387	KS30387
Liquid Line Solenoid (120/240 VAC, 50/60 Hz)	Solenoid Valve	200RD2T3TVLC	200RD2T3TVLC	200RD3T3TVLC	200RD3T3TVLC
	Solenoid Coil	61-AMG120/240V	61-AMG120/240V	61-AMG120/240V	61-AMG120/240V
	Bi-flow kit*	KS30387	KS30387	KS30387	KS30387
Classic Top Cap w/Label		91-101123-21	91-101123-21	91-101123-21	91-101123-21
Heat Pump Riser – 6 inch		686020	686020	686020	686020

*Bi-flow kits are required when installing a liquid line solenoid on a heat pump.

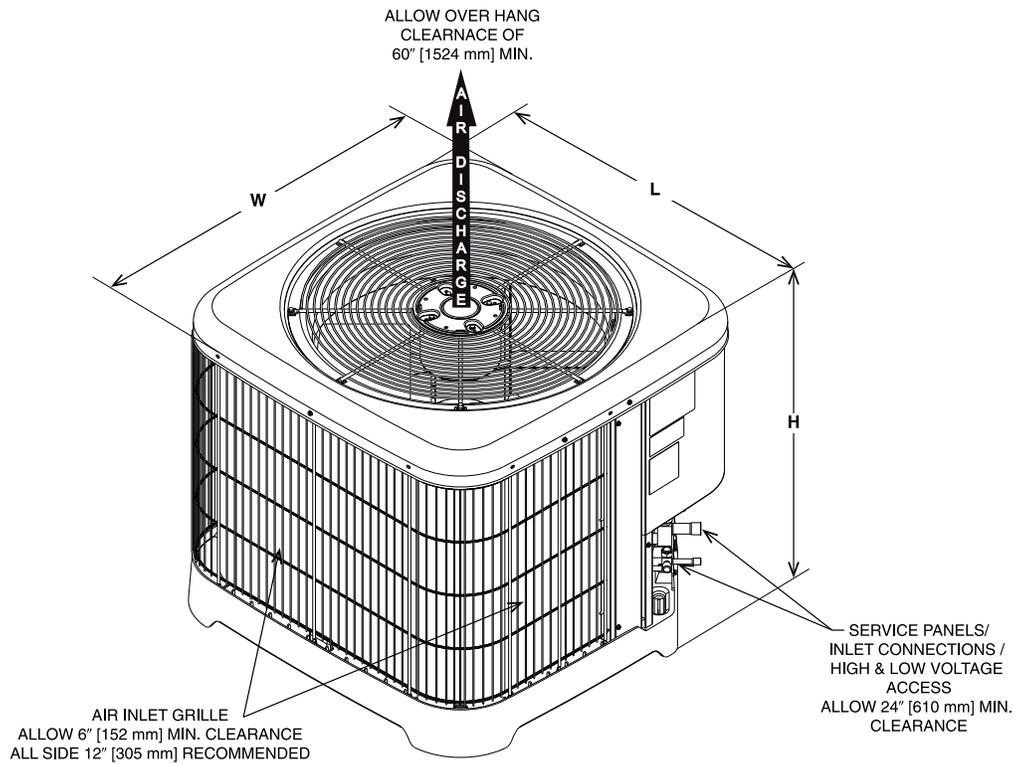
Weighted Sound Power Level (dBA)

Unit Size – Voltage, Series	Stage	Standard Rating (dBA)	TYPICAL OCTAVE BAND SPECTRUM (dBA without tone adjustment)						
			125	250	500	1000	2000	4000	8000
SP1624A	High	71	45.1	53.6	58.9	61.7	58.9	54.1	51.1
SP1636A	High	76	53.2	54	66.2	66.9	59.3	57.8	51.8
SP1648A	High	74	52	55	64.6	63.5	59.1	56.9	54.8
SP1660A	High	75	52.6	55.4	63	64	60.5	62.3	59.7

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

Unit Dimensions

MODEL NUMBER	OPERATING						SHIPPING					
	H (Height)		L (Length)		W (Width)		H (Height)		L (Length)		W (Width)	
	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm
SP1624A	31	787	33.75	857	33.75	857	33.32	846	37.64	956	37.56	954
SP1636A	35	889	33.75	857	33.75	857	38.35	974	37.64	956	37.56	954
SP1648A	45	1143	35.75	908	35.75	908	48.18	1223	39.37	999	39.64	1006
SP1660A	45	1143	35.75	908	35.75	908	48.18	1223	39.37	999	39.64	1006



[] Designates Metric Conversions

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