

AB SP-3600K

AB SP-3600K Shell and Tube Heat Exchanger User Manual

Model: SP-3600K

1. INTRODUCTION AND OVERVIEW

This manual provides essential information for the safe and efficient installation, operation, and maintenance of your AB SP-3600K Shell and Tube Heat Exchanger. This unit is designed for various heating applications, including pools, spas, hot tubs, hydronic heating, steam heating, district heating, heat recovery, thermal power stations, industrial processes, desalination, and water treatment.

The AB SP-3600K heat exchanger is constructed from high-grade 316L stainless steel, offering excellent corrosion resistance and durability for demanding environments.





Image 1.1: AB SP-3600K Shell and Tube Heat Exchanger. This image displays the exterior of the heat exchanger unit, highlighting its robust stainless steel construction and port configuration.

2. FEATURES

- **High-Grade Material:** Constructed entirely from 316L stainless steel for superior corrosion resistance, suitable for chemically treated water in pools, spas, and hot tubs.
- **Efficient Heat Transfer:** Features spiral-twisted corrugated tubes that enhance heat transfer efficiency and save energy.
- **High Flow Rate:** Designed with large aperture pipes to ensure a high flow rate, optimizing performance.
- **Easy Installation:** Equipped with standard NPT threads for straightforward connection to existing plumbing systems.
- **Versatile Applications:** Suitable for a wide range of heating needs, including pool/spa/hot tub heating, hydronic heating, steam heating, district heating, heat recovery, and industrial processes.



Image 2.1: Product Detail. This image provides a cutaway view of the heat exchanger, illustrating the internal spiral-twisted corrugated tubes, heating medium inlet/outlet, tube sheet, and fine manual welding, all contributing to efficient heat transfer.

2.1. 316L Stainless Steel Corrosion Resistance

The 316L stainless steel construction resists pitting corrosion from high chloride levels, up to 300 PPM at 140°F (60°C), making it ideal for fresh water and saltwater pools. For extreme saltwater environments, titanium heat exchangers are recommended.

Heat Exchange Process

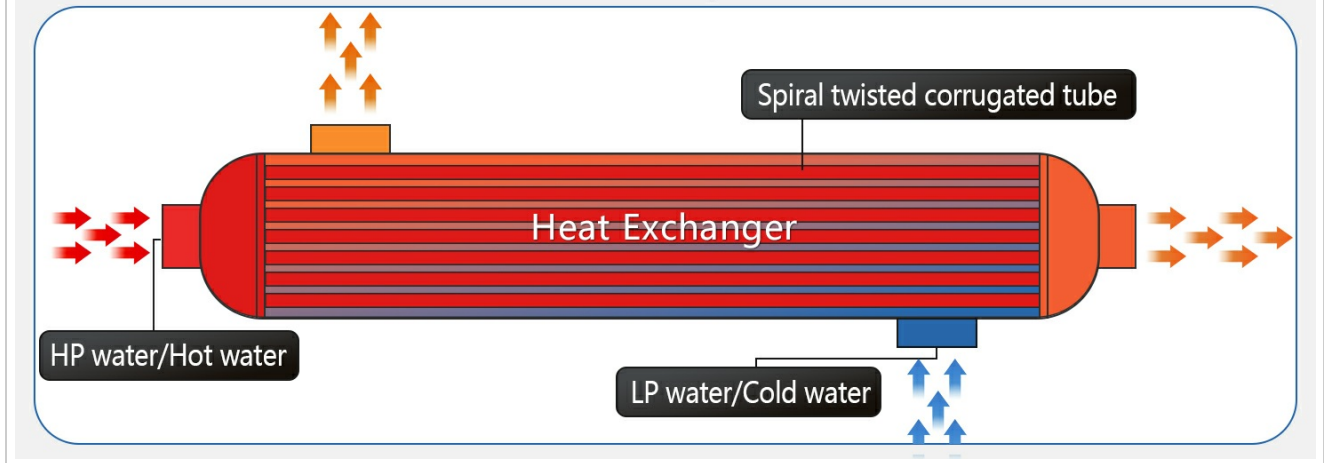


Image 2.2: 316L Stainless Steel Chloride Resistance. This graph illustrates the maximum chloride concentration (PPM) that 316L stainless steel can withstand at various temperatures (°F) before pitting corrosion may occur.

3. SPECIFICATIONS

The AB SP-3600K heat exchanger has a nominal capacity of 3600 kBtu/hr. Specific dimensions and port sizes are detailed below.

Product Specifications



Image 3.1: Product Dimensions. This image shows the overall length of the heat exchanger (51 inches) and the port sizes: Shell Side 4" NPT and Tube Side 2 1/2" NPT.

3.1. Performance Data (Model SP-3600K)

Table 3.1: Heat Exchanger Performance Data

Model No.	Normal Capacity (kBtu/hr)	Pool Capacity (gallons @ 1°F)	Hot Water Flow (USGPM)	Hot Water Pressure drop (psig)	Cold Water Flow (USGPM)	Cold Water Pressure drop (psig)	Heat Transfer Area (ft ²)	Shell (pool) side	Tube (hot) side	Pool Vol. (USGAL)
SP-3600K	3600	316800	98.13	3.2	672.19	5.70	69.107	4"	2 1/2"	31800

Note 1: Nominal values are based on a 140°F temperature difference between incoming heating and heated water.

Note 2: All above capacity data are based on stainless steel 316L, 304, or titanium heat exchanger tube bundles.

Model No.	Normal Capacity	Pool Capacity (gallons @1°F/hr)	Hot Water		Cold Water		Heat Transfer Area	Shell (pool) side	Tube (Hot) side	Pool Vol. USGAL
			Flow	Pressure drop	Flow	Pressure drop				
	Kbtu/hr		USGPM	psig	USGPM	psig	Ft ²			
SP - 55K	55	4700	7.49	0.85	48.84	1.03	1.636	1"	3/4"	4000
SP - 55K	55	4700	7.49	0.85	48.84	1.03	1.636	1 1/2"	1"	4000
SP - 85K	85	7300	8.27	1.02	56.22	1.28	2.702	1"	3/4"	8000
SP - 85K	85	7300	8.27	1.02	56.22	1.28	2.702	1 1/2"	1"	8000
SP - 155K	155	13300	8.46	1.10	62.66	1.58	3.552	1 1/2"	1"	12000
SP - 210K	210	18000	9.13	0.38	63.94	1.06	4.769	1 1/2"	1 1/2"	18000
SP - 300K	300	25800	11.16	0.56	86.11	1.63	6.889	2"	1 1/2"	24000
SP - 360K	360	31500	12.63	0.85	94.70	2.40	9.128	2"	1 1/2"	32000
SP - 600K	600	52500	17.44	1.22	114.16	3.07	16.695	2 1/2"	2"	53000
SP - 1200K	1200	105600	30.19	2.21	224.06	4.05	21.582	2 1/2"	2"	106000
SP - 2400K	2400	211200	70.65	2.87	448.13	5.30	45.963	4"	2"	212000
SP - 3000K	3000	264000	90.58	3	560.16	5.90	54.575	4"	2 1/2"	265000
SP - 3600K	3600	316800	98.13	3.2	672.19	5.70	69.107	4"	2 1/2"	318000
SP - 4500K	4500	39600	135.87	3.1	840.24	5.90	90.635	4"	2 1/2"	397500
SP - 6000K	6000	526800	180	4.32	1120.80	6.2	114.575	4"	2 1/2"	475500

Note: 1.Nominal value are based on 140°F temperature difference between incoming heating and heated water;
2.All above capacity are based on stainless steel 316L, 304 or titanium heat exchanger tube bundle.

Fluid	Factor
Water	100%
Ethylene Glycol	92%
Ethylene Glycol	85%
Propylene Glycol	94%
Propylene Glycol	89%
Oil SAE10	50%
Oil ISO VG22	45%



Image 3.2: Detailed Specification Table. This table provides comprehensive performance data for various heat exchanger models, including normal capacity, pool capacity, flow rates, pressure drops, heat transfer area, and port sizes.

3.2. Fluid Correction Factors

Table 3.2: Fluid Correction Factors

Fluid	Factor
Water	100%
Ethylene Glycol	92%
Propylene Glycol	94%
Oil SAE10	50%
Oil ISO VG22	45%

3.3. Model vs. Maximum Pool Volume

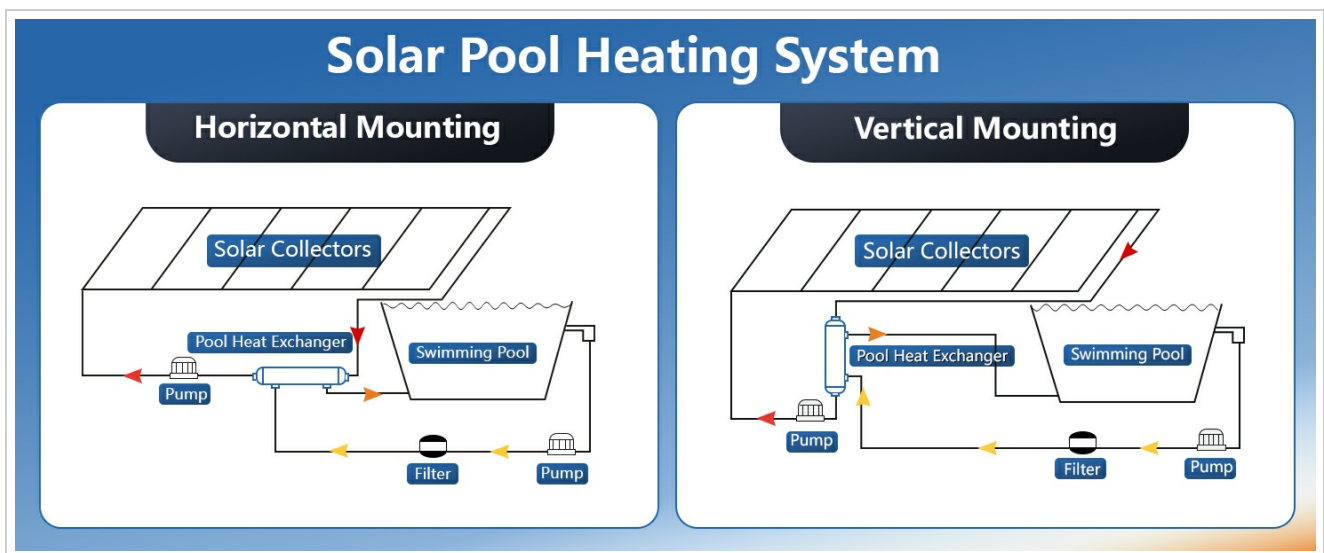


Image 3.3: Model vs. Maximum Pool Volume. This bar chart illustrates the maximum pool volume (in gallons) that each heat exchanger model can effectively heat, providing a visual guide for selection.

4. INSTALLATION

Proper installation is crucial for the optimal performance and longevity of your heat exchanger. Refer to the diagrams below for typical installation configurations.

4.1. Pool Heat Exchange System Diagram

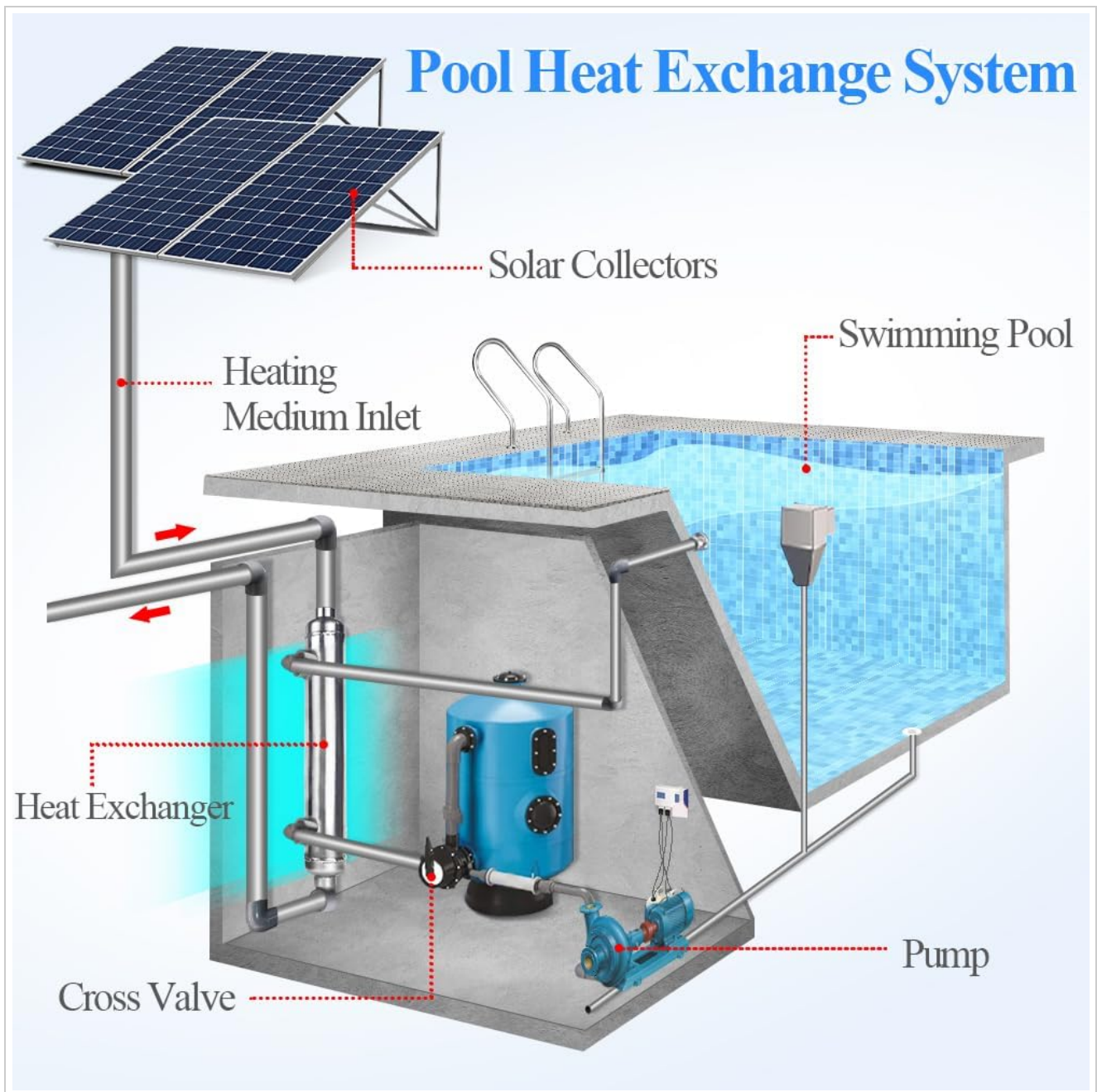


Image 4.1: Pool Heat Exchange System. This diagram illustrates the integration of the heat exchanger within a complete pool heating system, showing connections to solar collectors, pump, and the swimming pool.

4.2. Solar Pool Heating System Mounting Options



Image 4.2: Solar Pool Heating System. This image shows a residential building with solar panels connected to a pool, illustrating a typical solar pool heating setup.



Image 4.3: Floor Heating & Snow Melting Application. This image depicts a house with a snow-covered driveway, suggesting the use of the heat exchanger for floor heating and snow melting systems.

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Video 4.1: Pool Heat Exchanger Installation and Operation. This video demonstrates the installation process and illustrates how the heat exchanger functions within a pool heating system, showing the flow of hot and cold water and the heat exchange process.

5. OPERATION

The shell and tube heat exchanger operates by transferring heat from a hot fluid (e.g., boiler water) to a colder fluid (e.g., pool water) without direct contact between the two fluids. This process occurs as the fluids flow through separate paths within the exchanger.

5.1. Heat Exchange Process

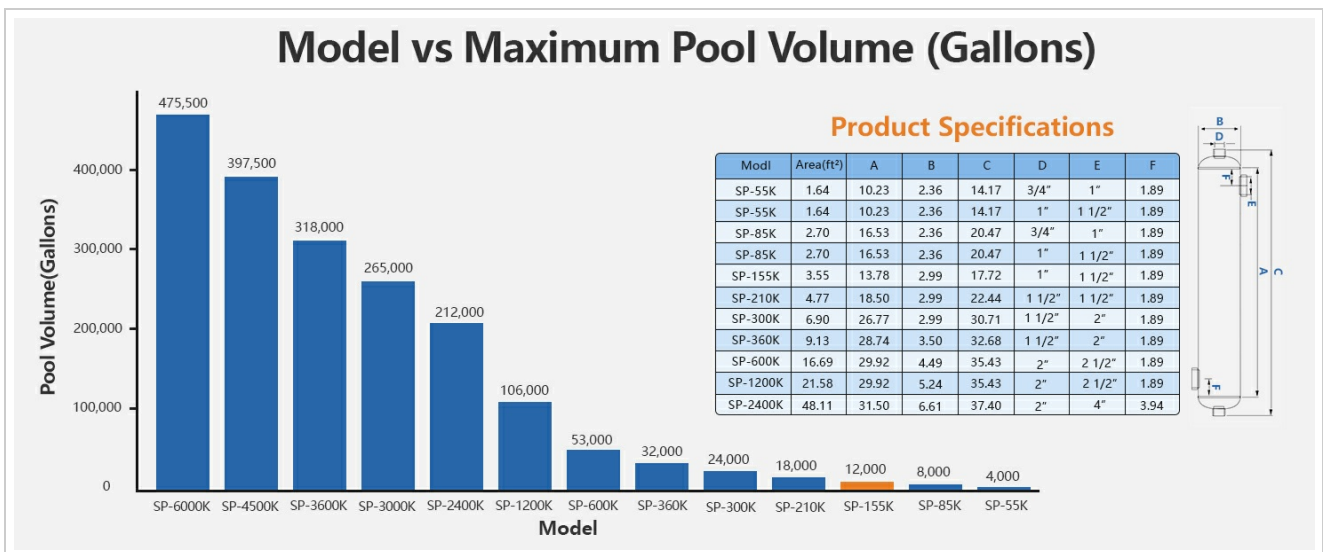


Image 5.1: Heat Exchange Process. This diagram visually explains how hot water (HP water) flows through the tubes, transferring heat to the colder water (LP water) flowing around the tubes within the shell, facilitated by the spiral twisted corrugated tubes.

6. MAINTENANCE

Regular maintenance ensures the longevity and efficiency of your heat exchanger. Follow these general guidelines:

- **Regular Inspection:** Periodically inspect the heat exchanger for any signs of leaks, corrosion, or damage to the ports and shell.
- **Cleaning:** Depending on water quality, internal cleaning may be required to remove scale or debris that can reduce heat transfer efficiency. Consult a professional for chemical cleaning procedures if necessary.

- **Pressure Checks:** Monitor system pressure to ensure it remains within recommended operating limits.
- **Winterization:** In colder climates, ensure the heat exchanger is properly drained and winterized to prevent freezing and damage.

7. TROUBLESHOOTING

If you encounter issues with your heat exchanger, consider the following common problems and solutions:

- **Reduced Heating Efficiency:**
 - Check for proper flow rates of both hot and cold fluids.
 - Inspect for scale buildup or fouling inside the heat exchanger, which may require cleaning.
 - Verify that the heat source is operating correctly and providing adequate temperature.
- **Leaks:**
 - Inspect all connections and fittings for tightness.
 - Check for visible cracks or damage to the shell or ports.
- **Unusual Noises:**
 - Ensure proper fluid circulation and eliminate air pockets in the system.
 - Check for loose components or vibrations in the piping.

For persistent issues, contact a qualified technician or the manufacturer's support.

8. WARRANTY

The AB SP-3600K Shell and Tube Heat Exchanger comes with a **1-year warranty** covering manufacturer defects. Please retain your proof of purchase for warranty claims.

9. SUPPORT

For technical assistance, spare parts, or warranty inquiries, please contact AB customer support through the vendor's official channels or refer to the contact information provided with your purchase documentation.

