

Paraflow Plate Heat Exchanger

POWER INDUSTRY APPLICATIONS



APV plate heat exchangers offer the most cost-effective solutions for heat transfer applications in the power industry that historically were served by shell and tube technology. Plate heat exchangers play an increasingly important role in helping power producers meet stringent water environmental and energy conservation regulations. Advances in PHE technology have helped it supplant the shell and tube as the technology of choice in this demanding industry.

Finding innovative ways to help the world meet its ever growing demand for power is a key focus for SPX. SPX provides creative solutions that serve global energy markets in a myriad of ways. Our ideas are helping build more efficient power plants and renovate older existing facilities.

SPX offers an extensive portfolio of plate heat exchanges covering many power station applications. Regularly SPX heat exchangers replace older technology products due to the simplicity of installation and their high performance thermal characteristics. Whether recovering waste heat or isolating the cooling system from the cooling source, SPX has the application knowledge and product to improve efficiency and performance.

APV Paraflow Plate Heat Exchangers For Power Industry Applications

POWERFUL BENEFITS

- Protects equipment from damage caused by contaminants
- Highly efficient heat recovery
- Flow rates up to 20,000 GPM (75,708 LPM)
- Simplifies maintenance, saving time and money
- Modular design facilitates flexibility for reconfiguration
- Compact design saves space

EFFICIENT, COMPACT AND COST EFFECTIVE

Efficiency

- High thermal efficiency saves money through reduction in required heat transfer area
- Low liquid hold-up improves start-up time and reduces operating fluid costs
- Achieves up to 97% heat recovery

Maintenance

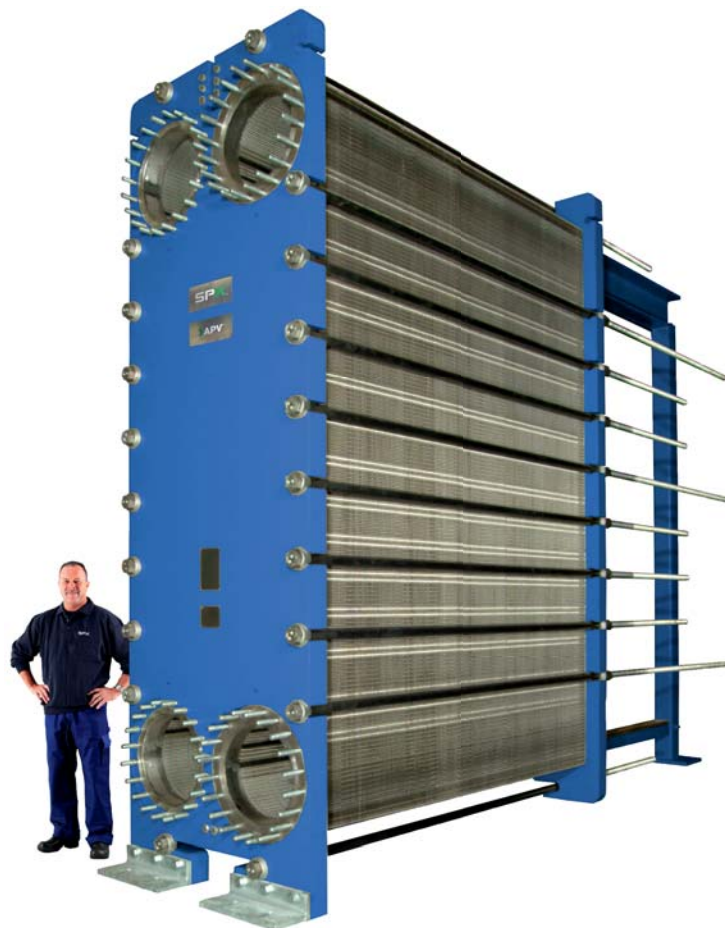
- Eliminates complicated maintenance such as x-ray, ultrasonic and other non-destructive test procedures
- 100% corrosion resistant material reduces inspection and maintenance while ensuring reliable operation
- No moving parts minimizes vibration, ensures reliable operation and reduces maintenance

Cost

- Lower capital costs when compared to traditional shell and tube
- Efficient design reduces weight
- Life cycle cost reduction
- Reduced fouling leads to higher thermal efficiency, and minimizes maintenance and operating costs
- Lower fluid velocity maximizes plate life and reduces maintenance

Typical Power Industry Applications

As a world-leading supplier in the energy sector of both traditional and alternative energy sources, SPX has devoted itself to developing products and systems that improve energy efficiency. SPX engineers rely on their extensive experience in the power industry to deliver solutions customized to your specific application.



Conventional Power Generation Stations

Coal
Oil
Fossil Fuels
Natural Gas



Nuclear Power Plants

Non-Nuclear
Nuclear Island



Peak Load Stations

Combined Heat & Power Stations

Co-Generation



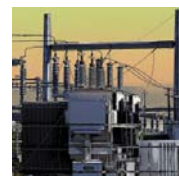
Incineration Plants

Waste-to-Energy



Renewable Energy

Geothermal
Hydro-Electric
Solar



District Heating

Process Knowledge Serving a Wide Range of Applications for Electric Power Generation

POWER GENERATION STATIONS

Heat is produced and transformed into electric energy using different methods. Depending on the source of fuels used to produce the heat and the layout scheme of the power plant, thermal power stations can be split (for the most part) into the following types:

- Conventional power stations using coal, oil, fossil fuels, or natural gas
- Nuclear power stations
- Peak load and other types of electric energy producing power plants:
 - Diesel power
 - Gas turbines
 - Combined cycle power stations (gas turbines + thermal power section in combination)
 - Generation or co-generation
 - Incineration plants
 - Geothermal power stations
 - Hydroelectric power
 - Wind power

PLATE HEAT EXCHANGER DUTIES

Conventional Thermal Power Plants

Plant auxiliary cooling requirements contain a number of thermal applications ideal for plate heat exchangers (PHE).

- Most applications are related to removal of excess frictional heat from various components in the auxiliary system
- Needs are primarily liquid to liquid duties, water to water, glycol to water or oil to water
- Design pressures in the auxiliary system are seldom above 150 PSIG
- Typical application design temperatures are usually between 120°F (49°C) and 212°F (100°C)

Auxiliary Cooling Duties

- Central cooling
- Vacuum pump cooling
- Generator cooling
- Feed water pump (lube oil cooling)
- Seal water cooling
- Turbine cooling (lube oil cooling)
- Drainage cooling (heat recovery)
- Air compressor cooling
- Emergency diesel cooling
- Condensate cooling (regenerative heat recovery)
- Plant and office heating

Hydro Power Stations

Lubrication oil cooling for the turbine and generator are usually the only applications in a hydroelectric plant.

Nuclear Power Plants

Cooling requirements in a nuclear power plant can be divided into two main areas: non-nuclear and nuclear island.

Non-Nuclear Area

The major part of the heat exchanger duties in the non-nuclear area are the same for the auxiliaries in a conventional power plant. PHEs are used in the area where the production of electric energy starts (from the turbine, to the distribution of the electricity, to the grid).

Nuclear Island

The nuclear island contains all the systems involved with the reactor for production of steam and the safety systems for the reactor. The PHE duties in the nuclear island are related to the safety circuits or to the cooling of excess heat. The heat exchangers installed in safety circuits are stand-by units. Other than test runs performed on a scheduled basis, these systems are just taken into operation in case of an emergency. Types of emergency cooling systems vary, depending on the type of reactors.

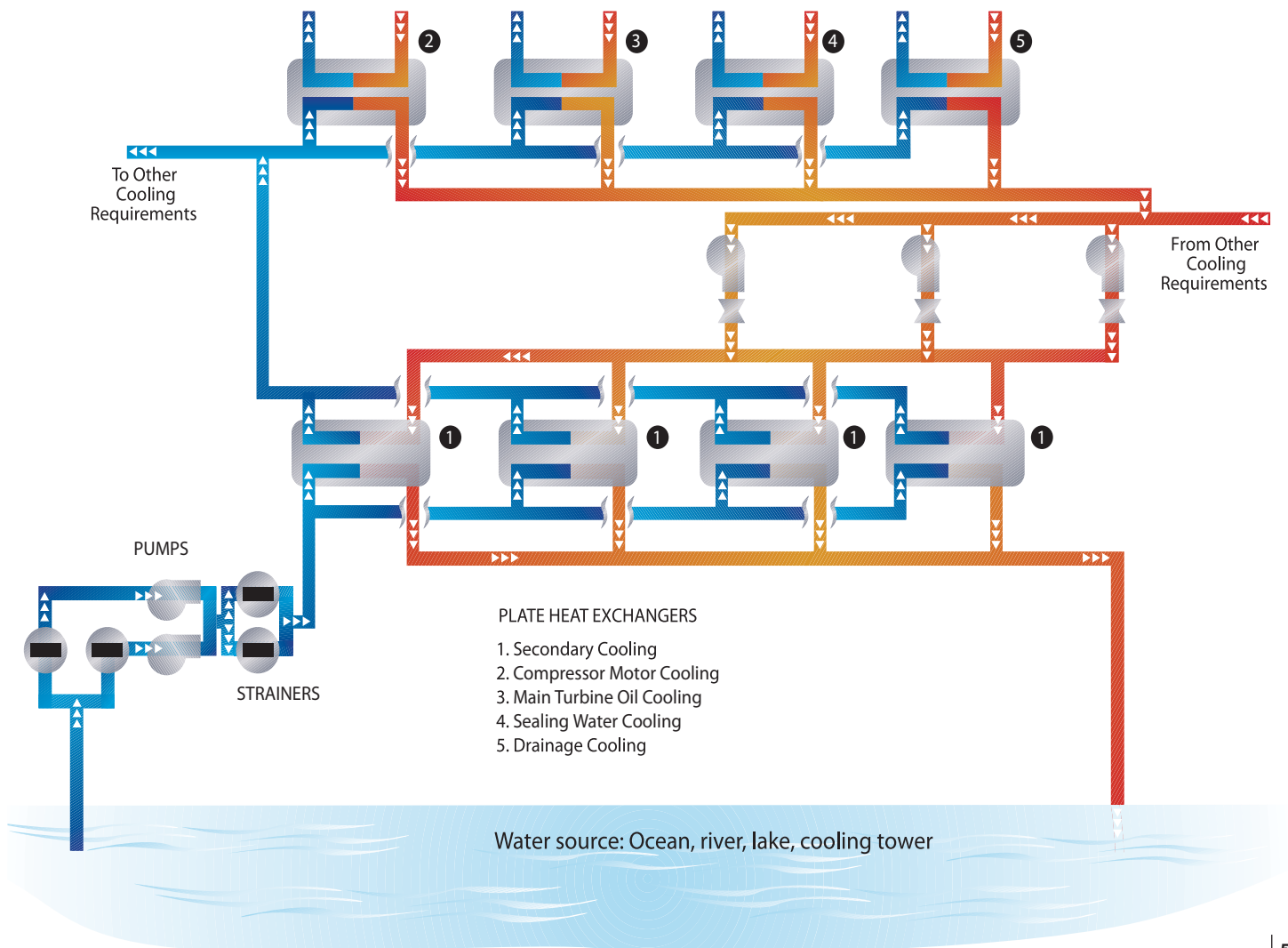
Cooling Applications

- Seal water for steam turbines
- Turbine lubricating oils
- High-quality water used in stator cooling passages
- Gland sealing oils
- Transformer oils
- Spent fuel element pond water
- Neutron shield
- Energy stand by
- Closed loop cooling using sea, river or cooling towers
- Pressure vessel cooling

Energy Recovery Applications

- Boiler house feed water
- Blow-down heat and water
- Geothermal applications
- Pre-heater and/or coolers for scrubber systems

Typical Auxiliary Cooling Duties For APV Paraflow Plate Heat Exchangers



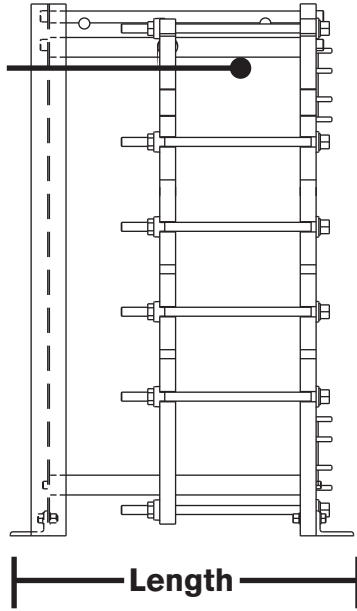
A Wide Range of Plate Heat Exchangers for Power Generation Applications

MODEL TYPE	CONNECTION DIAMETER	MAXIMUM US GPM LPM	G GASKETED	W WELDED PLATE PAIR	D DUO-SAFETY	STANDARD FRAME LENGTH**		MAXIMUM SURFACE AREA FT ² M ²
						MINIMUM	MAXIMUM	
APV - SR1	1.5 38.1	125 473.18	X			17 431.8	31 787.4	150 13.94
APV - SR2	2 50.8	200 757.08	X	X	X	20 508	59 1498.6	650 60.39
APV - N35	3 76.2	460 1,741.29	X		X	16 406.4	98 2489.2	1900 176.52
APV - Q030	4 101.6	800 3,028.33	X			40 1016	104 2641.6	1550 144.00
APV - Q055	4 101.6	800 3,028.33	X			40 1016	104 2641.6	2850 264.77
APV - Q080	4 101.6	800 3,028.33	X			40 1016	104 2641.6	4200 390.19
APV - SR6GH	4 101.6	800 3,028.33	X		X	40 1016	104 2641.6	1450 134.71
APV - SR6GL	4 101.6	800 3,028.33	X		X	40 1016	104 2641.6	2400 222.97
APV - SR6AG	4 101.6	800 3,028.33	X			40 1016	104 2641.6	4000 371.61
APV - SR6AA	4 101.6	800 3,028.33	X			40 1016	104 2641.6	4450 413.42
APV - LR4	4 101.6	800 3,028.33		X		24 609.6	66 1676.4	1250 116.13
APV - R5*	4 101.6	800 3,028.33	X			37 939.8	220 5588	3950 366.97
APV - ER5*	4 101.6	800 3,028.33	X			37 939.8	220 5588	4000 371.61
APV - L039	6 152.4	1800 6,813.74	X			41 1041.4	134 3403.6	3050 283.35
APV - L080	6 152.4	1800 6,813.74	X			41 1041.4	134 3403.6	2300 213.68
APV - SR9*	8 203.2	3100 11,734.78	X			46 1168.4	136 3454.4	3200 297.29
APV - J060	8 203.2	3100 11,734.78	X			39 990.6	136 3454.4	3950 366.97
APV - J092	8 203.2	3100 11,734.78	X			39 990.6	136 3454.4	6250 580.64
APV - J185	8 203.2	3100 11,734.78	X			39 990.6	136 3454.4	13800 1,282.06
APV - TR9GN	8 203.2	3100 11,734.78	X	X		46 1168.4	110 2794	5050 469.16
APV - TR9AV	8 203.2	3100 11,734.78	X	X		46 1168.4	110 2794	6700 622.45
APV - TR9AL	8 203.2	3100 11,734.78	X	X		46 1168.4	110 2794	8700 808.26
APV - B063	12 304.8	7000 26,497.88	X	X		46 1168.4	197 5003.8	6100 566.71
APV - B110	12 304.8	7000 26,497.88	X	X		46 1168.4	197 5003.8	10650 989.42
APV - B134	12 304.8	7000 26,497.88	X	X		46 1168.4	197 5003.8	12850 1,193.80
APV - B158	12 304.8	7000 26,497.88	X	X		46 1168.4	197 5003.8	15050 1,398.19
APV - B205	12 304.8	7000 26,497.88	X	X		46 1168.4	197 5003.8	15850 1,472.51
APV - Z155	16 406.4	11,000 41,639.53	X			147 3733.8	265 6731	12050 1,119.48
APV - Z195	16 406.4	11,000 41,639.53	X			147 3733.8	265 6731	15150 1,407.48
APV - Z230	16 406.4	11,000 41,639.53	X			147 3733.8	265 6731	18250 1,695.48
APV - Z270	16 406.4	11,000 41,639.53	X			147 3733.8	265 6731	21250 1,974.19
APV - Z310	16 406.4	11,000 41,639.53	X			147 3733.8	265 6731	24200 2,248.25
APV - Z350	16 406.4	11,000 41,639.53	X			147 3733.8	246 6248.4	24550 2,280.77
APV - Z390	16 406.4	11,000 41,639.53	X			147 3733.8	246 6248.4	27300 2,536.25
APV - Z430	16 406.4	11,000 41,639.53	X			137 3479.8	236 5994.4	29750 2,763.87
APV - S190	20 508	20,000 75,708.24	X			156 3962.4	250 6350	17000 1,579.35
APV - S280	20 508	20,000 75,708.24	X			156 3962.4	250 6350	25050 2,327.22
APV - S330	20 508	20,000 75,708.24	X			156 3962.4	250 6350	29400 2,731.35
APV - S380	20 508	20,000 75,708.24	X			156 3962.4	250 6350	33900 3,149.41

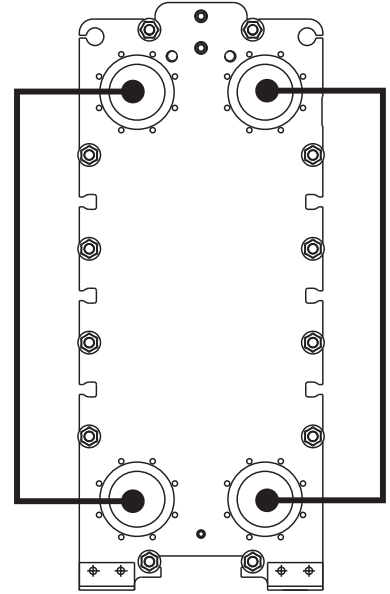
Inches
millimeters

* Wide Gap
** 150# ASME Frame Design as Basis

PLATE PACK



CONNECTIONS



Start Benefiting Today

APV plate heat exchangers reduce maintenance and operating expenses while minimizing downtime, delivering the benefits you need to improve the profitability of your process. SPX's knowledgeable engineers will work with you every step of the way from system design to implementation and beyond, to ensure you get the optimal performance from your system. To learn more about how SPX can help improve your profitability, [call us today at 1-800-207-2708](tel:1-800-207-2708).

APV Paraflow Plate Heat Exchanger

**POWER INDUSTRY
APPLICATIONS**



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