



## A step toward more efficient air conditioning

### Meeting market needs

The air conditioning market is continuously adapting to ever-increasing demand. Key factors are rising environmental concern and the increasing number of people all over the world seeking to improve their living conditions. To achieve sufficient cooling capacity and high efficiency at the same time, two aspects must be taken into consideration during the design phase:

- Continuous circulation of water in cooling systems means a lot of energy is used for pumping. In particular, if the system pressure drop is high, the system's overall efficiency will decrease.
- High efficiency demands tight temperature approaches in the heat exchangers.

### A shift in technology

Shell and Tube and coaxial technologies have been used for air conditioning for decades, but they are very space-consuming. BPHE technology offers substantially smaller and more compact units without compromising efficiency, making it possible to surpass the efficiency offered by traditional technologies while saving a substantial amount of space. The modular approach allows for quick and easy installation, simplified retro-fits, and system expansion if necessary.

### Smarter solutions with increased efficiency

We are meeting this demand by increasing efficiency across our product portfolio. With our range of asymmetric BPHEs, you can make your air conditioning system smarter and more efficient, substantially decreasing the lifecycle cost.



### Challenge efficiency

At SWEP, we believe our future rests on giving more energy than we take – from our planet and our people. That's why we pour our energy into leading the conversion to sustainable energy usage in heat transfer. Over three decades, the SWEP brand has become synonymous with challenging efficiency.

SWEP is a world-leading supplier of brazed plate heat exchangers for HVAC and industrial applications. With over 1,000 dedicated employees, carefully selected business partners, global presence with production, sales and heartfelt service, we bring a level of expertise and customer intimacy that's redefining competitive edge for a more sustainable future. SWEP is part of Dover Corporation, a multi-billion-dollar, diversified manufacturer of a wide range of proprietary products and components for industrial and commercial use.

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Brazed plate heat exchangers  
for air conditioning applications

# A complete range of BPHEs for air conditioning applications



SWEP offers a wide range of highly efficient, compact, and versatile heat exchanger solutions for air conditioning systems. As a world-leading supplier of brazed plate heat exchangers (BPHEs) and related services and expertise, we are constantly developing and extending our air conditioning solutions.

## Our asymmetric solutions

### Decreasing the water pressure drop

AsyMatrix® is our innovative asymmetric plate design technology for BPHEs. The asymmetric channel configuration smartly combines maximum heat transfer on the refrigerant side with lower pressure drop on the secondary side. The increased energy efficiency and better use of the structural material compared with conventional heat exchangers delivers a more sustainable solution in suitable applications. AsyMatrix® for evaporators and condensers results in high thermal performance, lower pressure drop on the water side, and a reduced refrigerant charge. This makes a major contribution to more environmentally friendly air conditioning solutions.

### AsyMatrix®

The performance of an AsyMatrix® BPHE is not limited by the pressure drop, so fewer plates can be used. The

technology reduces the hold-up volume of the refrigerant circuit by up to 30% and requires a smaller charge, which saves money on refrigerant and helps manufacturers comply with European environmental legislation. The narrow refrigerant channels increase heat transfer and efficiency. At the same time, the secondary circuit has a lower pressure drop, which means less load on the secondary fluid pump and an improved EER.

AsyMatrix® features a multitude of benefits, including:

- Higher capacity
- Higher performance
- Less pump energy
- Smaller footprint



## Our design solutions

### Decreasing the temperature approach

The most important key to increasing efficiency in a chiller is to reduce the temperature approach. To put it simply, the temperature approach in an evaporator is defined as the difference between the leaving water temperature and the evaporation temperature.

In a condenser, the temperature approach is the difference between the condensing temperature and the leaving water temperature. The closer the temperatures, the more efficient the chiller. For example, if the evaporation temperature is increased by 1K, it will contribute to a 3% higher EER for the chiller. Similarly, if the condensing temperature is decreased by 1K, it will contribute to a 1% higher EER for the chiller.

### State-of-the-art refrigerant distribution

We recognize the importance of a robust and stable refrigerant distribution system in an evaporator. Over the years, we have developed a flexible distribution system that can be easily adjusted according to the customer's needs.

We have validated S, V, P, F, and FX distribution rings, which, adjusted to the refrigerant used and the temperature approach needed, deliver at full and part load with the correct pressure drop to ensure optimal refrigerant distribution in the plate package.



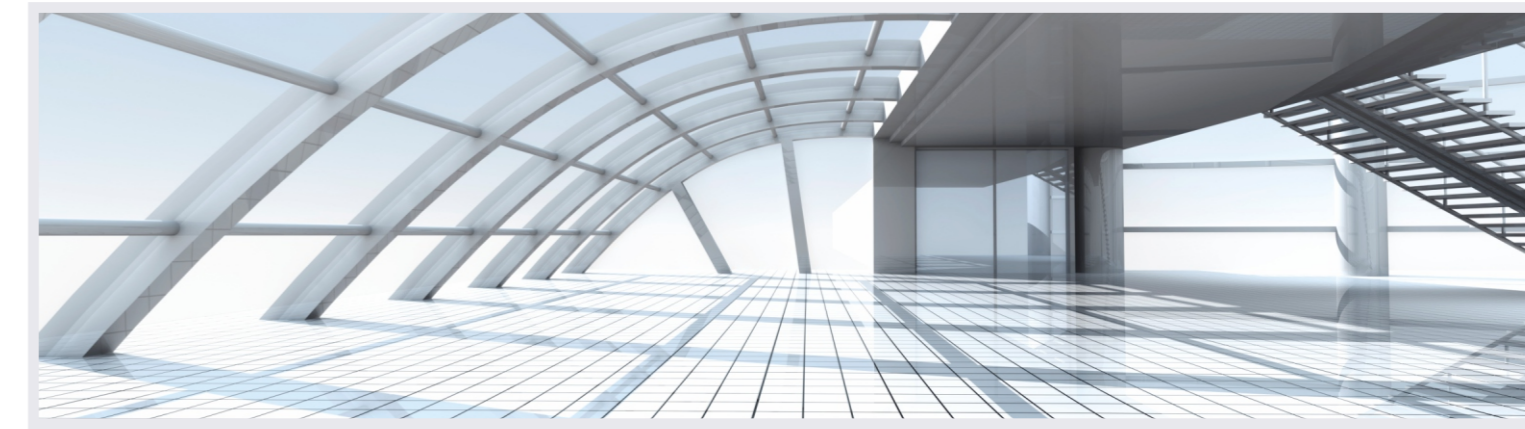
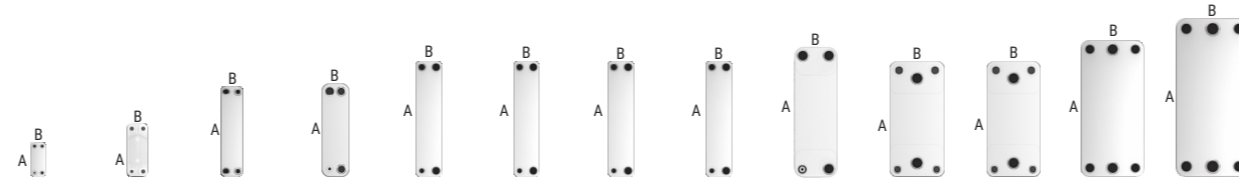
## A wide range of BPHEs

SWEP offers highly efficient dedicated ranges for R410A, R454B, R32 and R134a, R513A, R1234ze. These ranges have been thoroughly tested and verified in SWEP's laboratory. Combining the asymmetric solutions and design solutions, SWEP is able to offer a wide range of heat exchanger solutions for vapor-compression chillers:

- Evaporators
- Condensers
- Economizers
- Heat recovery (de-superheaters)
- Circuit breakers

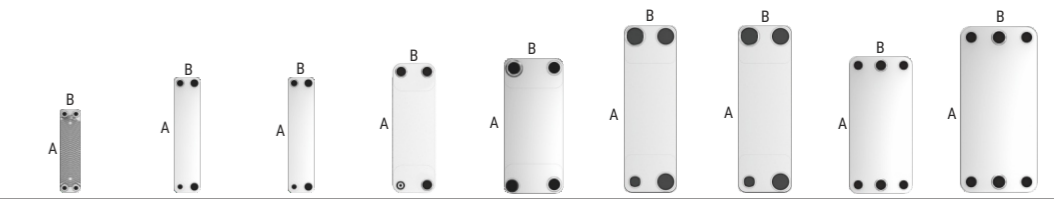
## R410A R454B R32

BPHE Model	3	X4T	8T	20	80	80AS	85	85AS	250AS	D300	D310	D400	D650	
A (mm) (in)	119,4 4.7	192,6 7.58	317 12.48	324 12.76	526 20.71	526 20.71	526 20.71	526 20.71	620 24.41	525 20.67	525 20.67	694 27.32	744,6 29.31	
B (mm) (in)	54,4 2.14	75 2.95	76 2.99	94 3.7	119 4.69	119 4.69	119 4.69	119 4.69	202 7.95	243 9.57	243 9.57	304 11.97	365,6 14.39	
Refrigerant circuit setup	Single	Single	Single	Single	Single	Single	Single	Single	Single	True Dual	True Dual	True Dual	True Dual	
Standard water connection size (in)	1/2"	3/4"	3/4"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	3"	2 1/2"	2 1/2"	3"	4"	
Evaporator distributor types	–	–	–	Q	P, F, V, Q	P, F, Q	F, Q	F, Q	P, F, V	DP, DF, DV	DP, DFX	DP, DS, DV, DFX	DFX, DV, DFY	
Max number of plates (NoP)	60	100	60	140	140	140	160	160	300	346	350	282	346	
<b>Typical application and capacity</b>														
Economizer	kW Rton	1.0 → 4.0 0.3 → 1.1	2.0 → 8.0 0.6 → 2.3	2.0 → 9.0 0.6 → 2.6	15 → 85 4.3 → 25	15 → 100 4.3 → 28								
Evaporator	kW Rton			1.0 → 6.0 0.3 → 1.7	5.0 → 20.0 1.4 → 6	10 → 80 2.8 → 23	10 → 80 2.8 → 23	10 → 80 2.8 → 23	10 → 80 2.8 → 23	70 → 280 20 → 80	50 → 250 14 → 70	70 → 280 20 → 80	100 → 400 28 → 115	200 → 700 60 → 200
Condenser	kW Rton			4.0 → 11.0 1.1 → 3.1	5.0 → 30.0 1.4 → 8.5	10 → 90 2.8 → 26	10 → 90 2.8 → 26	10 → 90 2.8 → 26	10 → 90 2.8 → 26	70 → 350 20 → 100	60 → 320 17 → 90	70 → 320 20 → 90	100 → 450 28 → 128	200 → 800 60 → 230



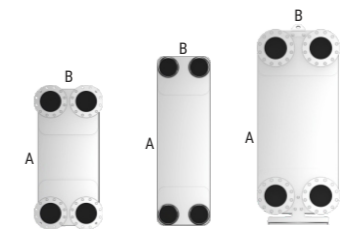
## R134a R513A R1234ze

BPHE Model	X8T	80	80AS	250AS	400T	500TM	500TH	D400	D500
A (mm) (in)	315 12.4	526 20.71	526 20.71	620 24.41	694 27.32	979 38.54	979 38.54	694 27.32	980 38.58
B (mm) (in)	73 2.87	119 4.69	119 4.69	202 7.95	304 11.97	304 11.97	304 11.97	304 11.97	304 11.97
Refrigerant circuit setup	Single	Single	Single	Single	Single	Single	Single	True Dual	True Dual
Standard water connection size (in)	3/4"	1 1/4"	1 1/4"	3"	3"	4"	4"	3"	3"
Evaporator distributor types	–	V, P, F, Q	P, F, Q	P, F	V, P, S, VH	S, VH	S, VH, VE	DV, DP, DFX	DS
Max number of plates (NoP)	60	140	140	300	280	420	420	282	298
<b>Typical application and capacity</b>									
Economizer	kW Rton	2.0 → 8.0 0.6 → 2.3	10 → 75 2.8 → 22	10 → 75 2.8 → 22	70 → 250 20 → 70	200 → 400 57 → 114	300 → 600 86 → 173		
Evaporator	kW Rton		8.0 → 45 2.3 → 13	8.0 → 45 2.3 → 13	40 → 160 11 → 45	100 → 280 28 → 80	200 → 450 57 → 128	200 → 450 57 → 128	150 → 450 43 → 128
Condenser	kW Rton		10 → 75 2.8 → 21	10 → 90 2.8 → 26	70 → 300 20 → 86	150 → 450 43 → 128	250 → 650 71 → 186	250 → 650 71 → 186	70 → 450 20 → 128



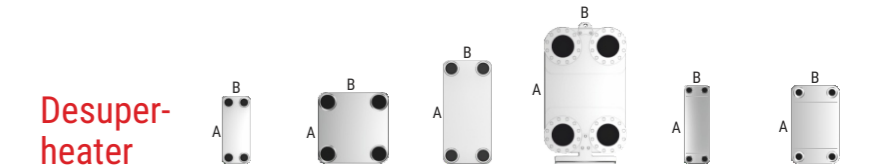
## Circuit breaker

BPHE Model	427	439	649	
A (mm) (in)	694 27.32	979 38.54	1232 48.5	
B (mm) (in)	304 11.97	304 11.97	537 21.14	
Circuit setup	Single	Single	Single	
Standard water connection size (in)	4"	4"	6"	
Evaporator distributor types	V	V	–	
Max number of plates (NoP)	420	420	420	
<b>Typical application and capacity</b>				
Evaporator	kW Rton	70 → 350 20 → 100	200 → 800 57 → 230	600 → 1600 170 → 450



## Desuperheater

BPHE Model	12	60	320	633	16DW*	35TDW*
A (mm) (in)	287 11.3	374 14.72	525 20.67	830 32.68	377 14.84	393 15.47
B (mm) (in)	117 4.60	364 14.33	243 9.57	537 21.14	119,5 4.7	243 9.57
Refrigerant circuit setup	Single	Single	Single	Single	Single	Single
Standard water connection size (in)	1 1/4"	2" 3"	3"	6"	1"	2 1/2"
Evaporator distributor types	–	–	–	–	–	V
Max number of plates (NoP)	140	300	200	344	140	260
<b>Typical application and capacity</b>						
Evaporator	kW Rton	10 → 90 2.8 → 25.6	50 → 250 14 → 70	20 → 150 6.0 → 40	200 → 800 57 → 230	10 → 80 2.8 → 22.7
						20 → 150 6.0 → 40



\* Double wall