STAINLESS STEEL CONSTRUCTION

Features

- **Short Lead Time**
- **Stacked Plate**
- **Stainless Steel**
- **Copper Brazed (Nickel option)**
- **Oil to Water Applications**
- **High Performance**
- **Compact Design**
- **SAE Connections**
- Corrosion Resistant Type 316 Stainless Steel Plates
- Mounting Studs Standard (except 8x3 plates)
- SAE Oil Connections, NPT Water Connections
- Optional Foot Mounting Bracket (except 8x3 plates)

Ratings

Maximum Working Pressure 450 psi (31 BAR)

Test Pressure 650 psi (44 BAR)

Minimum Working Temperature -320°F (-19°C)

Maximum Working Temperature 437°F (225°C)

Materials

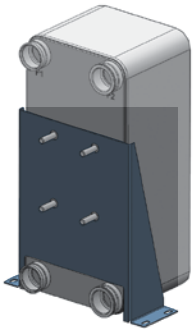
Plate Material - Fluid Contact 316 Stainless Steel

Braze Material Copper

Connectors 316 Stainless Steel

Stud Bolts 304 Stainless Steel

Foot Mounting Bracket Carbon Steel



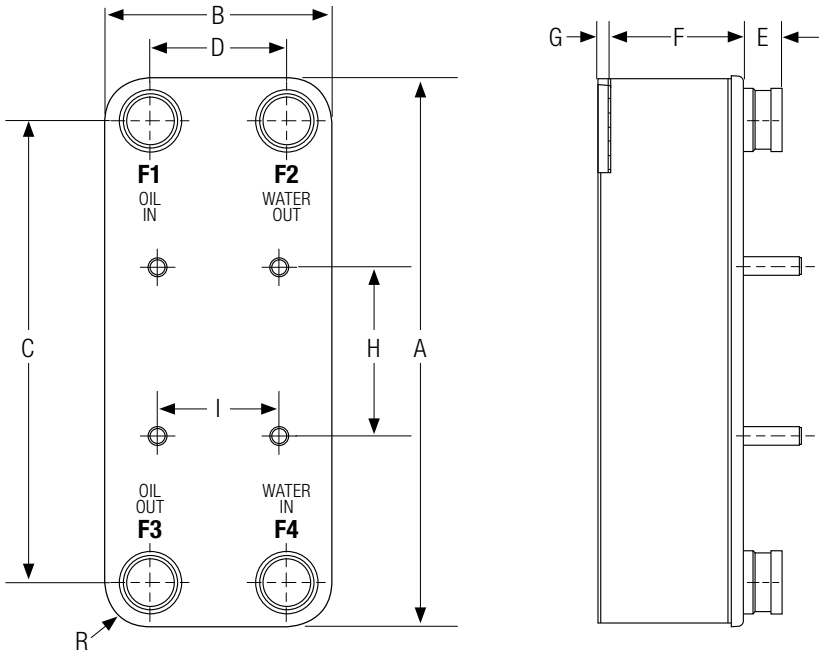
Optional Foot Mounting Brackets - see page 149

How to Order

BPSW	–		–			
Model Series BPSW		**Number of Plates**		**Plate Size**		**Option** Foot Mounting Brackets *(ordered as a separate item)*

Part No.	Plate Size
56839	12x5
56840	20x5
56841	15x5
56842	15x10
56843	20x10
56844	28x10

Dimensions

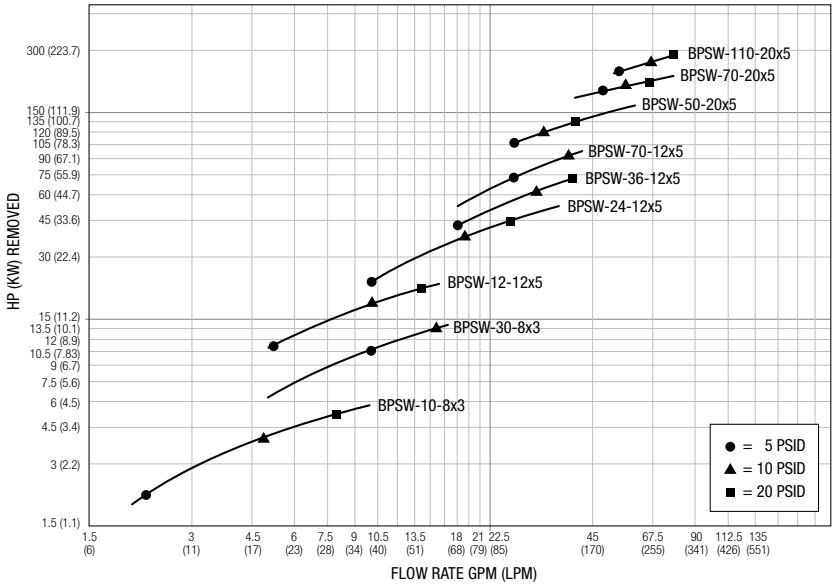


Model	A	B	C	D	E	G	F	F3, F1	F2, F4	H	I	Stud Bolt		R	Net Wt. lb (kg)
												Thread	Length		
BPSW-10-8x3	7.6 (193)	3 (76)	6.06 (154)	1.57 (40)	0.79 (20)	0.28 (7)	1.04 (26)	#10 SAE	3/4" NPT	NA	NA	NA	NA	0.70 (18)	2.1 (0.9)
BPSW-30-8x3	7.6 (193)	3 (76)	6.06 (154)	1.57 (40)	0.79 (20)	0.28 (7)	2.80 (71)	#10 SAE	3/4" NPT	NA	NA	NA	NA	0.70 (18)	4.0 (1.8)
BPSW-12-12x5	11.4 (290)	4.69 (119)	9.57 (243)	2.83 (72)	1.78 (45)	0.24 (6))	1.21 (31)	#12 SAE	3/4" NPT	5.51 (140)	2.36 (60)	M8	0.76 (19)	0.9 (23)	5.6 (2.5)
BPSW-24-12x5	11.4 (290)	4.69 (119)	9.57 (243)	2.83 (72)	1.78 (45)	0.24 (6)	2.27 (58)	#12 SAE	3/4" NPT	5.51 (140)	2.36 (60)	M8	0.76 (19)	0.9 (23)	8.1 (3.7)
BPSW-36-12x5	11.4 (290)	4.69 (119)	9.57 (243)	2.83 (72)	1.78 (45)	0.24 (6)	3.33 (84)	#20 SAE	1-1/4" NPT	5.51 (140)	2.36 (60)	M8	0.76 (19)	0.9 (23)	10.7 (4.9)
BPSW-70-12x5	11.4 (290)	4.69 (119)	9.57 (243)	2.83 (72)	1.78 (45)	0.24 (6))	6.32 (160)	#20 SAE	1-1/4" NPT	5.51 (140)	2.36 (60)	M8	0.76 (19)	0.9 (23)	17.9 (8.1)
BPSW-50-20x5	20.7 (526)	4.69 (119)	18.5 (470)	2.48 (63)	1.07 (27)	0.24 (6)	4.56 (116)	#20 SAE	1-1/4" NPT	8.86 (225)	2.36 (60)	M8	1.19 (30)	0.90 (23)	23.0 (10.5)
BPSW-70-20x5	20.7 (526)	4.69 (119)	18.5 (470)	2.48 (63)	1.07 (27)	0.24 (6)	6.32 (160)	#20 SAE	1-1/4" NPT	8.86 (225)	2.36 (60)	M8	1.19 (30)	0.90 (23)	30.3 (13.8)
BPSW-110-20x5	20.7 (526)	4.69 (119)	18.5 (470)	2.48 (63)	1.07 (27)	0.24 (6)	9.84 (250)	#20 SAE	1-1/4" NPT	8.86 (225)	2.36 (60)	M8	1.19 (30)	0.90 (23)	44.7 (20.3)
BPSW-50-15x5	14.8 (376)	4.69 (119)	12.6 (320)	2.48 (63)	1.07 (27)	0.24 (6)	4.56 (116)	#20 SAE	1-1/4" NPT	8.86 (225)	2.36 (60)	M8	0.79 (20)	0.90 (23)	17.0 (7.7)
BPSW-90-15x5	14.8 (376)	4.69 (119)	12.6 (320)	2.48 (63)	1.07 (27)	0.24 (6)	8.08 (205)	#20 SAE	1-1/4" NPT	8.86 (225)	2.36 (60)	M8	0.79 (20)	0.90 (23)	27.6 (12.5)
BPSW-130-15x10	15.5 (394)	9.57 (243)	12.76 (324)	6.85 (174)	1.07 (27)	0.12 (3)	12.28 (312)	#24 SAE	1-1/2" NPT	5.51 (140)	3.94 (100)	M12	0.75 (19)	1.38 (35)	112.9 (51.2)
BPSW-200-15x10	15.5 (394)	9.57 (243)	12.76 (324)	6.85 (174)	1.07 (27)	0.12 (3)	18.72 (475)	#24 SAE	1-1/2" NPT	5.51 (140)	3.94 (100)	M12	0.75 (19)	1.38 (35)	165.3 (75.1)
BPSW-24-20x10	20.7 (526)	9.57 (243)	17.95 (456)	6.85 (174)	1.07 (27)	0.16 (4)	2.55 (65)	#24 SAE	1-1/2" NPT	5.51 (140)	3.94 (100)	M12	1.53 (39)	1.38 (35)	44.0 (20.0)
BPSW-50-20x10	20.7 (526)	9.57 (243)	17.95 (456)	6.85 (174)	1.07 (27)	0.16 (4)	4.89 (124)	#24 SAE	1-1/2" NPT	5.51 (140)	3.94 (100)	M12	1.53 (39)	1.38 (35)	67.2 (30.5)
BPSW-80-20x10	20.7 (526)	9.57 (243)	17.95 (456)	6.85 (174)	1.07 (27)	0.16 (4)	7.59 (193)	#24 SAE	1-1/2" NPT	5.51 (140)	3.94 (100)	M12	1.53 (39)	1.38 (35)	93.9 (42.6)
BPSW-90-28x10	27.3 (693)	9.57 (243)	23.54 (598)	5.83 (148)	2.13 (54)	0.04 (1)	8.73 (222)	2-1/2" SAE FLG	2-1/2" NPT	12.13 (308)	3.94 (100)	M12	1.53 (39)	1.89 (48)	148.2 (67.3)
BPSW-130-28x10	27.3 (693)	9.57 (243)	23.54 (598)	5.83 (148)	2.13 (54)	0.04 (1)	13.11 (333)	2-1/2" SAE FLG	2-1/2" NPT	12.13 (308)	3.94 (100)	M12	1.53 (39)	1.89 (48)	198.2 (90.0)

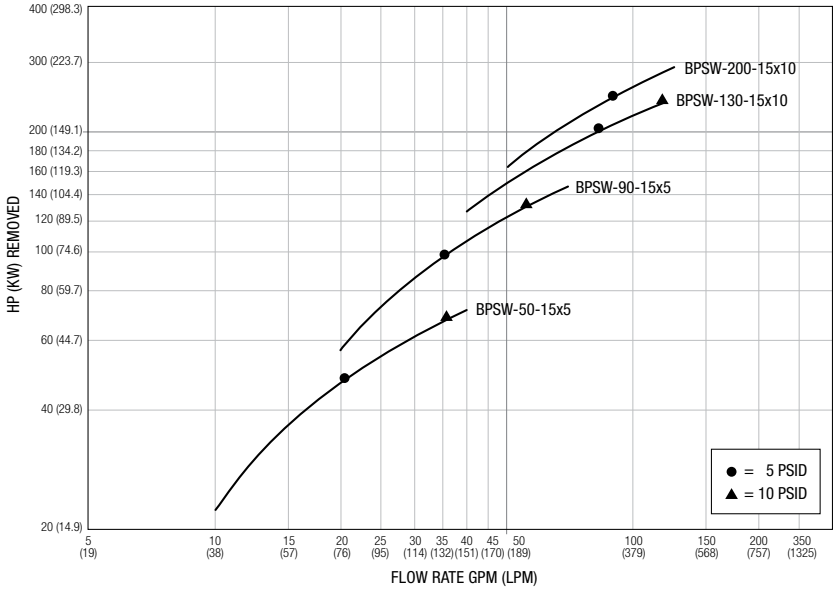
All dimensions are inches (millimeters), unless noted otherwise.
Note: We reserve the right to make reasonable design changes without notice.

Performance Curves

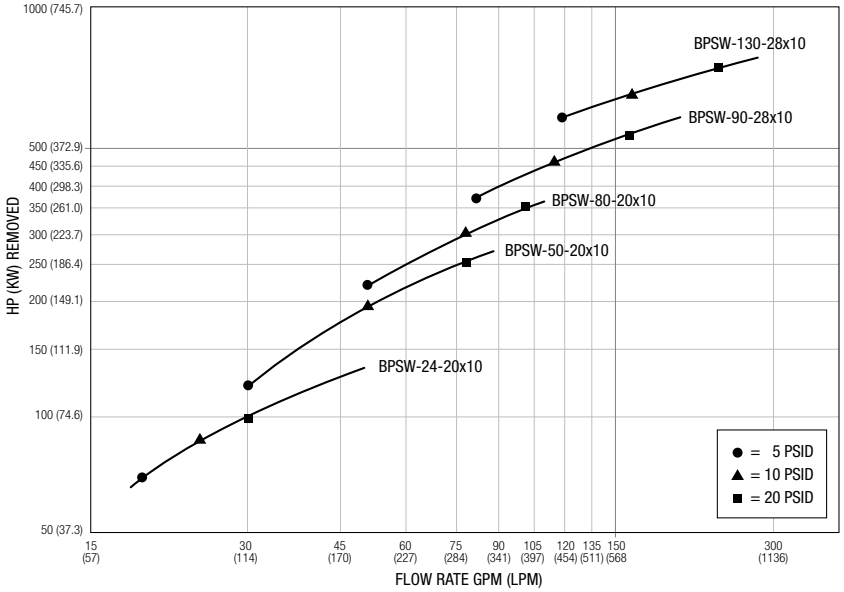
Low Flow



Medium Flow

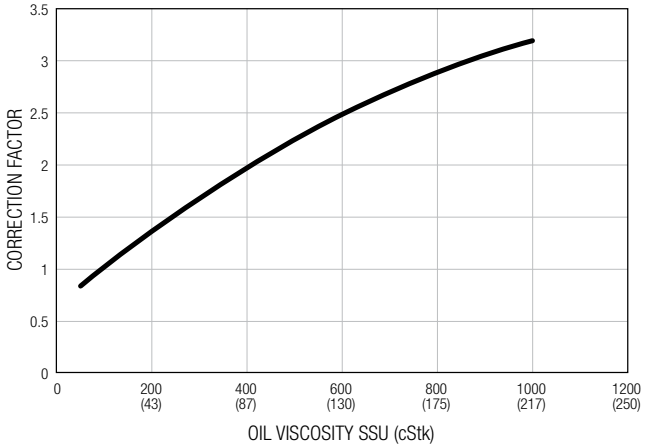


High Flow

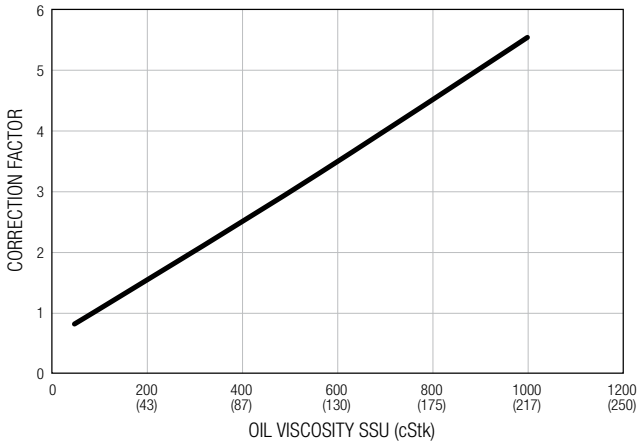


Selection Procedure

Performance Correction



Pressure Drop Correction



	Model	Oil Conn (Female)	Water Conn (Female)
SMALL FLOW	BPSW-10-8x3	#10 SAE	¾" NPT
	BPSW-30-8x3	#10 SAE	¾" NPT
	BPSW-12-12x5	# 12 SAE	¾" NPT
	BPSW-24-12x5	# 12 SAE	¾" NPT
	BPSW-36-12x5	#20 SAE	1¼" NPT
	BPSW-70-12x5	#20 SAE	1¼" NPT
	BPSW-50-20x5	#20 SAE	1¼" NPT
	BPSW-70-20x5	#20 SAE	1¼" NPT
	BPSW-110-20x5	#20 SAE	1¼" NPT
MEDIUM FLOW	BPSW-50-15x5	#20 SAE	1¼" NPT
	BPSW-90-15x5	#20 SAE	1¼" NPT
	BPSW-130-15x10	#24 SAE	1½" NPT
	BPSW-200-15x10	#24 SAE	1½" NPT
LARGE FLOW	BPSW-24-20x10	#24 SAE	1½" NPT
	BPSW-50-20x10	#24 SAE	1½" NPT
	BPSW-80-20x10	#24 SAE	1½" NPT
	BPSW-90-28x10	2½" SAE FLG	2½" NPT
	BPSW-130-28x10	2½" SAE FLG	2½" NPT

Performance Curves are based on 100SSU (21.7 cSt) oil at 40°F (22°C) approach temperature (125°F (52°C) oil leaving cooler, 85°F (29°C) water entering cooler), 2:1 oil: water ratio.

Step 1 **Determine Curve Horsepower Heat to be Removed.**

$$\text{HP (KW) heat load} \times \frac{40\ (22)}{\text{Oil leaving cooler °F (°C) minus water entering cooler °F (°C)}} \times \text{Performance correction multiplier} = \text{Curve HP (KW) heat to be removed}$$

Step 2 **Determine Actual Oil Pressure Drop.** Pressure drop shown on curve x Pressure drop correction multiplier = Actual pressure drop.

Oil Temperature

Oil coolers can be selected by using entering or leaving oil temperatures.

Typical operating temperature ranges are:

Hydraulic Motor Oil	110°F - 130°F (43°C - 54°C)
Hydrostatic Drive Oil	130°F - 180°F (54°C - 82°C)
Lube Oil Circuits	110°F - 130°F (43°C - 54°C)
Automatic Transmission Fluid	200°F - 300°F (93°C - 149°C)

Desired Reservoir Temperature

Return Line Cooling: Desired temperature is the oil temperature leaving the cooler. This will be the same temperature that will be found in the reservoir.

Off-Line Recirculation Cooling Loop: Desired temperature is the temperature entering the cooler. In this case, the oil temperature change must be determined so that the actual oil leaving temperature can be found. Calculate the oil temperature change (Oil △T) with this formula:

Oil △T=(BTU's/Hr.)/GPM Oil Flow x 210). (Oil △C=KW/LPM Oil Flow x .029)

To calculate the oil leaving temperature from the cooler, use this formula:

Oil Leaving Temperature = Oil Entering Temperature - Oil △T.

This formula may also be used in any application where the only temperature available is the entering oil temperature.

Oil Pressure Drop: Most systems can tolerate a pressure drop through the heat exchanger of 20 to 30 PSI. Excessive pressure drop should be avoided. Care should be taken to limit pressure drop to 5 PSI or less for case drain applications where high back pressure may damage the pump shaft seals.