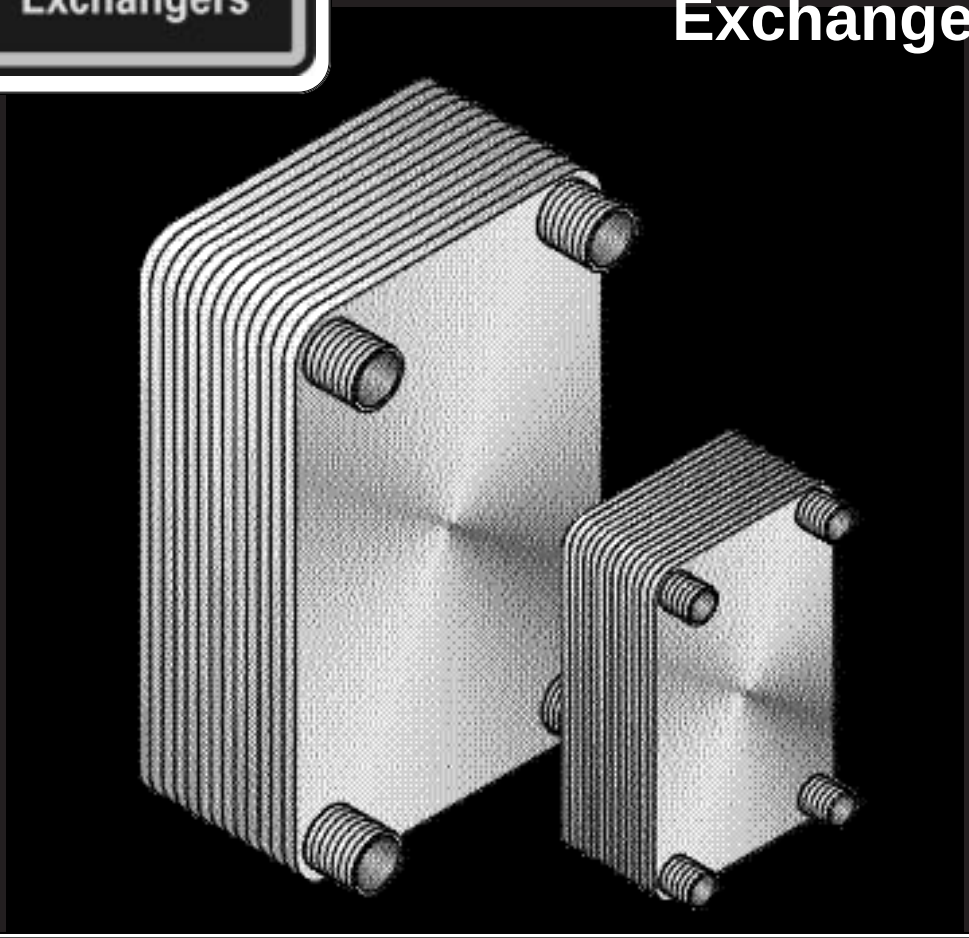
WEIL-McLAIN

Heat Exchangers

WMBP Series

Brazed Plate Heat Exchangers



PRODUCT INFORMATION - APPLICATIONS INSTALLATION - MAINTENANCE

WARNING Before proceeding with installation and operation, read entire manual carefully. Failure to do so can cause injury, death or substantial property damage.

WARNING WMBP heat exchangers are not compatible with steam applications nor ammonia (NH_3). Such misuses of the product could result in severe personal injury, death or substantial property damage.

NOTICE When receiving WMBP's, any claims for damage or shortage in shipment must be filed immediately against the transportation company by the consignee.

636-000-042/0997GCC

HAZARD DEFINITIONS

The following terms are used to bring attention to the presence of hazards of various risk levels or to important information concerning product life.

DANGER Indicates presence of hazards that will cause severe personal injury, death or substantial property damage if ignored.

WARNING Indicates presence of hazards that can cause severe personal injury, death or substantial property damage if ignored.

CAUTION Indicates presence of hazards that will or can cause minor personal injury or property damage if ignored.

NOTICE Indicates special instructions on installation, operation, or maintenance that are important but not related to personal injury hazards.Read all instructions before installing. Failure to follow all instructions in proper order can cause severe personal injury, death or substantial property damage.

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Description

Weil-McLain WMBP brazed plate heat exchangers are designed with up to 150 pattern - embossed plates of acid resistant stainless steel. The plates are brazed together, with every second plate inverted to create contact points between all the plates. When these points are vacuum brazed together a compact and pressure resistant heat exchanger is formed in which virtually all material is utilized for heat transfer.

High Efficiency

The design of the plates creates two separate channels for a counter flow movement. This complex channel system results in high turbulence and thereby high heat transfer characteristics.

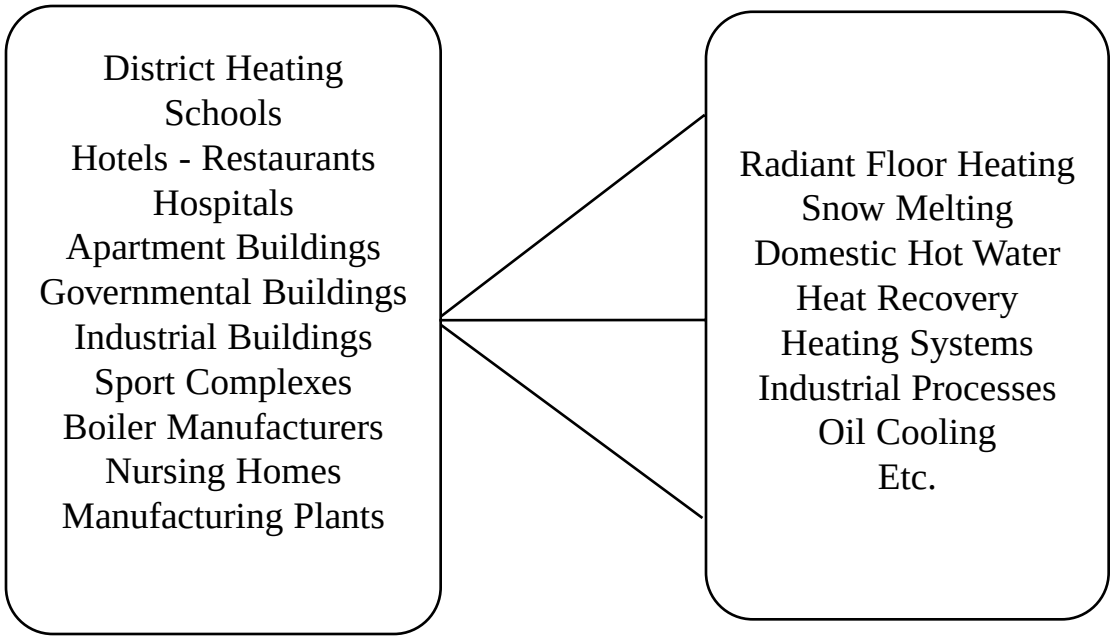
Non Corrosive

The plates are made of stainless, acid resistant steel, with 99.9% pure copper and are brazed, which ensures a very high resistance to corrosion.

Self Cleaning

The WMBP heat exchanger operates with a turbulent flow, even at low velocities, creating a self cleaning, self descaling design that resists scaling.

Applications



Technical Data

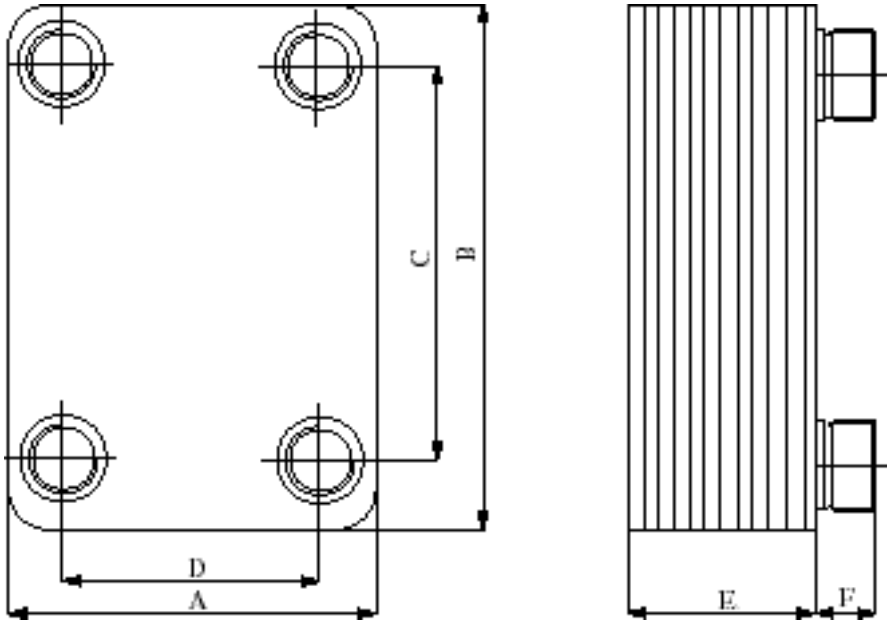


Fig.: 1

TYPE	DIMENSIONS (Inches)					Max. No. of Plates	Surface per Plate (Sq. Ft.)	Max. Flow Rate (Gpm)	Weight Empty (Lbs)
	A	B	C	D	E				
WMBP-1E*	2.88	8	6.56	1.63	0.313+(0.09xN)	30	0.13	20	1.65+(0.11xN)
WMBP-2	3.28	8.81	7.19	1.63	0.313+(0.09xN)	50	0.15	20	2.42+(0.13xN)
WMBP-22	3.28	12.5	11	1.69	0.313+(0.09xN)	30	0.24	20	3.14+(0.18xN)
WMBP-3	4.66	6.5	4.75	2.88	0.313+(0.09xN)	50	0.16	50	2.64+(0.13xN)
WMBP-4	4.66	12.81	11.06	2.88	0.313+(0.09xN)	100	0.32	50	3.52+(0.26xN)
WMBP-5	4.66	20.38	18.81	2.88	0.313+(0.09xN)	100	0.53	50	4.4+(0.53xN)
WMBP-7	10.34	20.63	18.13	7.88	0.313+(0.09xN)	150	1.46	175	12.1+(1.32xN)

Operating Conditions:

Max. working pressure : 450 psig
Max. working temperature : 365º F
Min. working temperature :-320º F

N= Number of Plates

* The maximum working pressure for the WMBP-1E series is 150 psig.

Standard Connections

TYPE	SIZE	F (Inches)
WMBP-1E	3/4" NPT	0.75
WMBP-2	3/4" NPT	0.75
WMBP-22	3/4" NPT	0.75
WMBP-3	1" NPT	0.75
WMBP-4	1" NPT	0.75
WMBP-5	1" NPT	0.75
WMBP-7	2" NPT	2.5

Computerized Sizing

With our computer program we will select the optimum heat exchanger for your particular applications. Please fax this selection sheet back to our Engineering Department. You may request a copy of our software package, courtesy of Weil-McLain. Contact us at: Phone (219) 879-6561 or Fax (219) 877-0556

WEIL-McLAIN

Date: _____
Name: _____
Company: _____
Fax#: _____
Job ref.: _____
Application: _____

Fax Back Selection

Submit this information to Weil-McLain for computerized sizing assistance. Our program will select the optimum heat exchanger for your particular application.

	Hot Side	Cold Side
Media	Water Glycol ? ☐ % ☐	Water Glycol ? ☐ % ☐
Flow Rate	_____ GPM	_____ GPM
Temp. In	_____ DEG F	_____ DEG F
Temp. Out	_____ DEG F	_____ DEG F
Max Pressure Drop	_____ PSI	_____ PSI
Capacity	_____	Btu/h

WMBP Brazed Plate Heat Exchanger Design Data

OUR SELECTION: Type of Heat Exchanger: _____

	Hot Side	Cold Side
Media	Water Glycol ☐ %	Water Glycol ☐ %
Flow Rate	_____ GPM	_____ GPM
Temp. In	_____ DEG F	_____ DEG F
Temp. Out	_____ DEG F	_____ DEG F
Max Pressure Drop	_____ PSI	_____ PSI
Capacity	_____	Btu/h

Connections [inch] Trade Price $: _____

NPT: _____
Solder: _____

Empty weight [lb]: _____ Availability: _____

Comments: _____

For Typical Floor Heating Applications

Model	Btu/Hr Supplied	Boiler Side (180°F In/160°F Out)		Radiant Side (100°F In/120°F Out)	
		Flow Rate GPM	Pressure Drop PSI	Flow Rate GPM	Pressure Drop PSI
WMBP1-14E	25,000	2.6	0.5	2.5	0.4
WMBP1-14E	30,000	3.1	0.8	3	0.6
WMBP1-14E	35,000	3.6	1.1	3.5	0.9
WMBP1-14E	40,000	4.1	1.4	4	1.1
WMBP1-14E	45,000	4.6	1.8	4.5	1.4
WMBP1-14E	50,000	5.2	2.3	5	1.7
WMBP1-14E	55,000	5.7	2.8	5.5	2.1
WMBP1-14E	60,000	6.2	3.4	6	2.5
WMBP1-14E	65,000	6.7	4	6.5	2.9
WMBP1-14E	70,000	7.2	4.6	7	3.4
WMBP3-20	100,000	10.3	1.6	10.1	1.3
WMBP3-20	125,000	12.9	2.6	12.6	2.1
WMBP3-20	150,000	15.5	3.8	15.2	3
WMBP3-20	175,000	18.8	5.2	17.7	4.1
WMBP3-20	200,000	20.6	6.9	20.2	5.5
WMBP3-20	225,000	23.2	8.8	22.7	7

For Typical Snow Melt Applications

Model	Btu/Hr Supplied	Boiler Side (180°F In/160°F Out)		Snow Melt Side - 30% Glycol (100°F In/130°F Out)	
		Flow Rate GPM	Pressure Drop PSI	Flow Rate GPM	Pressure Drop PSI
WMBP1-14E	25,000	2.5	1.8	1.7	0.3
WMBP1-14E	30,000	3.1	2.0	2.1	0.4
WMBP1-14E	35,000	3.6	2.1	2.4	0.6
WMBP1-14E	40,000	4.0	2.1	2.8	0.7
WMBP1-14E	45,000	5.8	2.2	3.1	0.9
WMBP1-14E	50,000	6.1	2.2	3.4	1.1
WMBP1-14E	60,000	8.0	2.2	4.1	0.8
WMBP1-14E	70,000	9.5	2.2	4.8	1.1
WMBP1-30E	80,000	8.2	2.2	5.5	1.5
WMBP3-20	90,000	9.2	2.2	6.2	1.1
WMBP3-20	100,000	10.3	2.2	6.9	1.1
WMBP3-20	125,000	12.8	2.4	8.5	2.3
WMBP3-20	150,000	15.4	2.4	10.4	2.1
WMBP3-40	175,000	18.0	2.2	12.1	2.1
WMBP3-40	200,000	20.5	2.3	13.8	2.1
WMBP3-40	225,000	23.1	2.2	15.6	2.1
WMBP3-40	250,000	25.7	2.2	17.4	2.1
WMBP3-40	275,000	28.3	2.2	19.1	2.1
WMBP7-24	300,000	30.1	2.2	20.1	2.1
WMBP7-30	350,000	36.8	2.3	23.6	2.2
WMBP7-40	400,000	42.0	2.3	27.0	2.2
WMBP7-40	450,000	47.3	2.5	30.4	2.5
WMBP7-40	500,000	52.5	2.5	33.8	2.5

For Domestic Hot Water

Model	Btu/Hr Input	Boiler Side (200°F Supply Temp)		Domestic Side (For 90°F Temp Rise) (50°F In/140°F Out)		Domestic Performance GPH @ 90°F Temp Rise With 50 Gallon Storage Tank	
		Flow Rate GPM	Pressure Drop PSI	Flow Rate GPM	Pressure Drop PSI	1st Hour	Continuous Flow
WMBP1-14E	40,000	1.7	0.2	0.8	0.1	86	48
WMBP1-14E	45,000	1.9	0.3	1	0.1	98	60
WMBP1-14E	50,000	2.1	0.3	1.1	0.1	104	66
WMBP1-14E	55,000	2.3	0.4	1.2	0.1	110	72
WMBP1-14E	60,000	2.5	0.5	1.3	0.1	116	78
WMBP1-14E	70,000	2.9	0.7	1.5	0.1	128	90
WMBP1-14E	75,000	3.1	0.8	1.7	0.1	140	102
WMBP1-14E	80,000	3.3	0.9	1.8	0.2	146	108
WMBP1-14E	90,000	3.7	1.2	2	0.2	158	120
WMBP1-14E	100,000	4.2	1.4	2.2	0.2	170	132
WMBP1-14E	110,000	4.6	1.8	2.4	0.3	182	144
WMBP1-14E	120,000	5	2.1	2.6	0.4	194	156
WMBP1-14E	130,000	5.4	2.4	2.9	0.4	212	174
WMBP4-14	150,000	4.1	2.3	3.3	0.6	236	198
WMBP4-14	200,000	5.1	4.2	4.4	1.2	302	264
WMBP4-14	250,000	6.1	6.7	5.6	1.9	374	336
WMBP4-30	300,000	6.1	0.5	6.7	0.5	440	402
WMBP4-30	350,000	7.2	0.6	7.8	0.7	506	468
WMBP4-30	400,000	8.2	0.8	8.9	0.9	572	534
WMBP4-30	450,000	9.2	1.1	10	1.1	638	600
WMBP4-30	500,000	10.2	1.3	11.1	1.4	704	666

High Performance

The WMBP compact size and light weight will reduce the time required to heat the tap water by 50% over conventional heat exchangers.

General Information

WMBP heat exchangers should be installed in such a way that there is sufficient free space around each unit to perform maintenance work.

Mounting Position

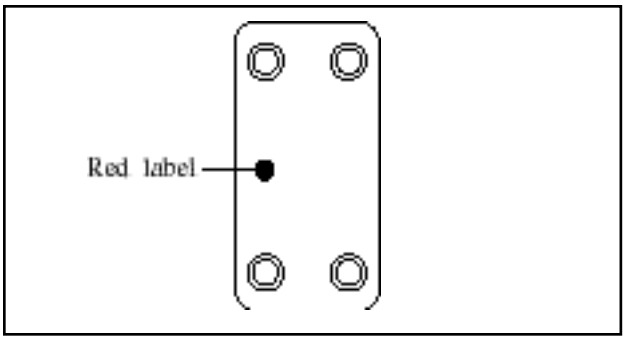


Fig. 2

For heating applications the plate heat exchanger can be installed in any position. The primary side is identified by a red label.

WARNING Support the heat exchanger by a bracket. Do not support the WMBP unit by the fittings. Support all items independently. Provide vibration isolation between the heat exchanger and the mounting brackets. Failure to properly support the heat exchanger can result in severe personal injury, death or substantial property damage.

WARNING WMBP heat exchangers may have some sharp edges. Handle the unit with care to avoid the risk of severe personal injury, death or substantial property damage.

Piping Connections

All piping connections to WMBP heat exchangers are male NPT.

Alway connect the primary piping to the red dot side of the WMBP heat exchanger. Make sure the piping is arranged for counterflow as shown in Figures 3 and 4 for normal heating applications. See Figure 5 for special piping to meet double wall requirements when necessary.

Flush the piping circuits thoroughly before connecting the heat exchanger to prevent blockage from debris in the piping.

Provide shut off valves and any other devices required for operation and safety. In addition we recommend an air vent on the top and a drain valve at the lower connection.

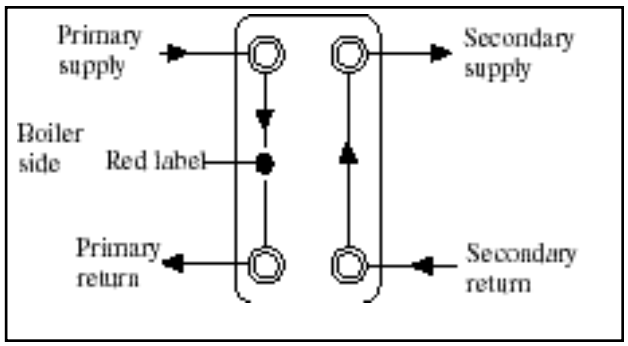


Fig. 3 Typical Heating Application

Connect the piping in counterflow as shown, with the primary piping on the side of the red dot.

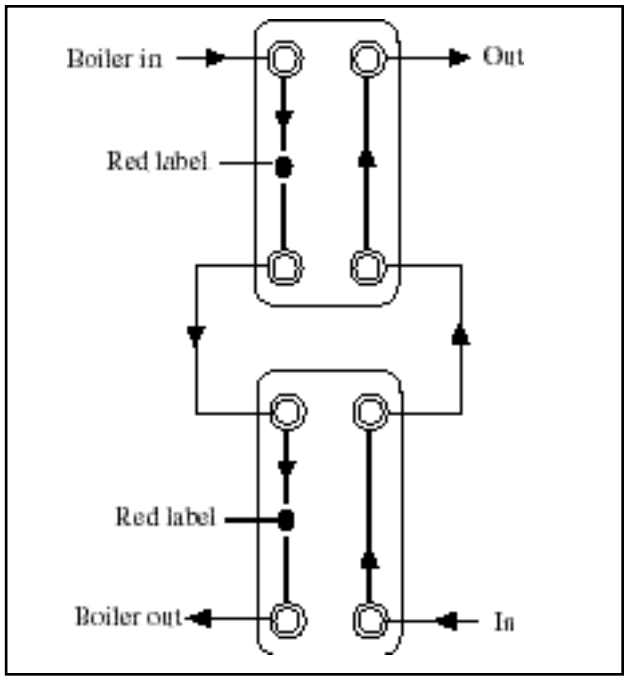


Fig. 4 Typical Series Piping Arrangement

Use series piping when needed to increase the thermal length.

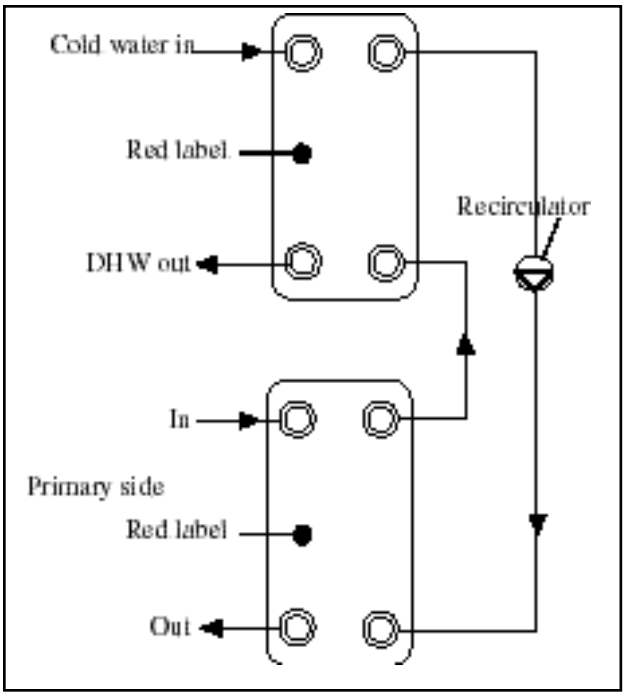


Fig.. 5 Typical Double Wall Piping
This piping arrangement can be used to provide double wall heat exchange. The recirculation loop provides isolation between the two exchangers.

Vent the Air During Filling

Vent the heat exchanger(s) during filling to eliminate any trapped air to assure proper performance and longevity of the heat exchanger.

Shutting Down the Heat Exchanger

Shut down both sides of the piping system slowly and at the same time. If this isn't possible, shut the hot side down first.

Drain and clean the heat exchanger if it will be shut down for a long time. This is very important where there is a risk of freezing or where the water is particularly corrosive.

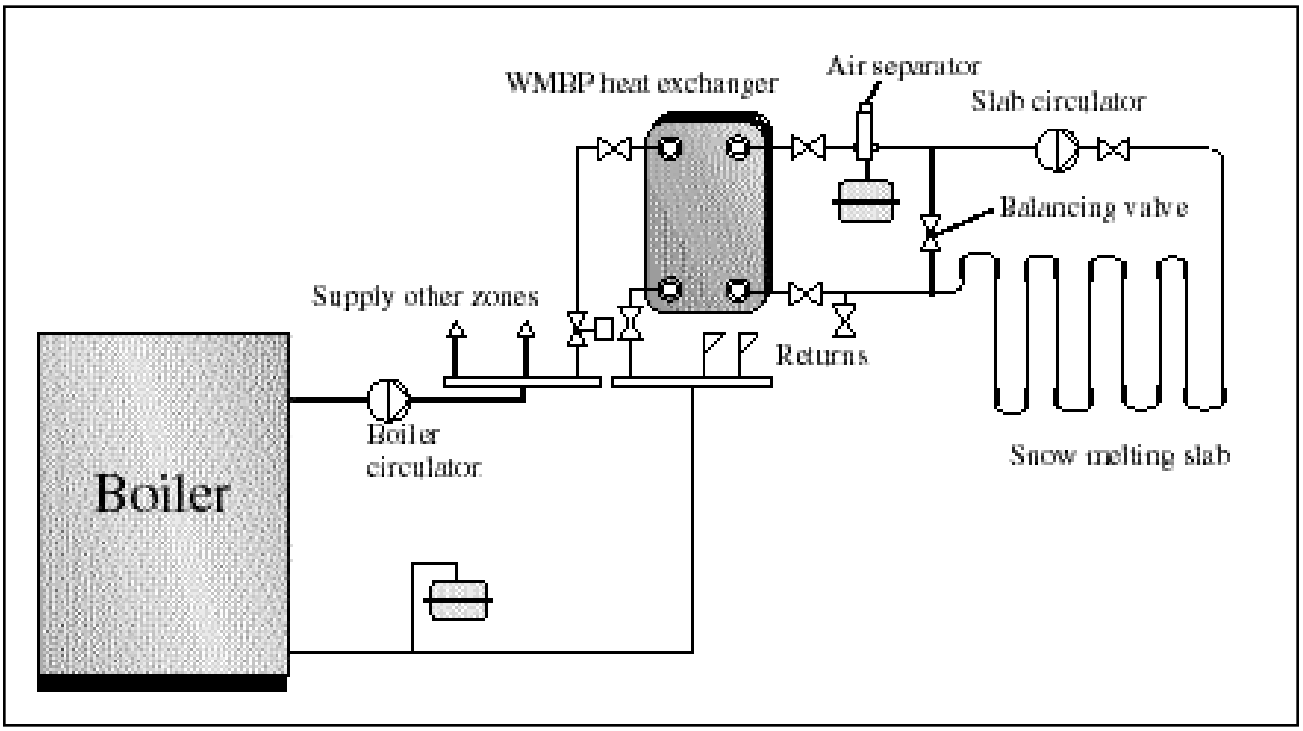


Fig.. 6 Typical Snow Melting Applicationl

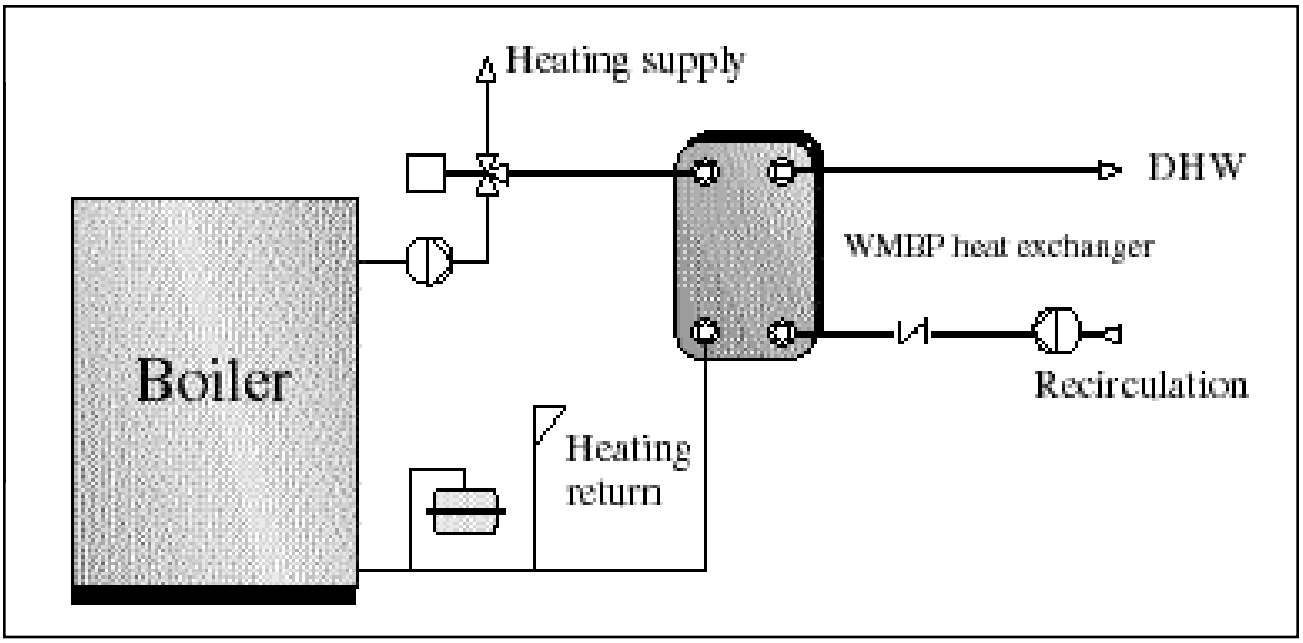


Fig.. 6 Typical Instantaneous Domestic Water Heating Application

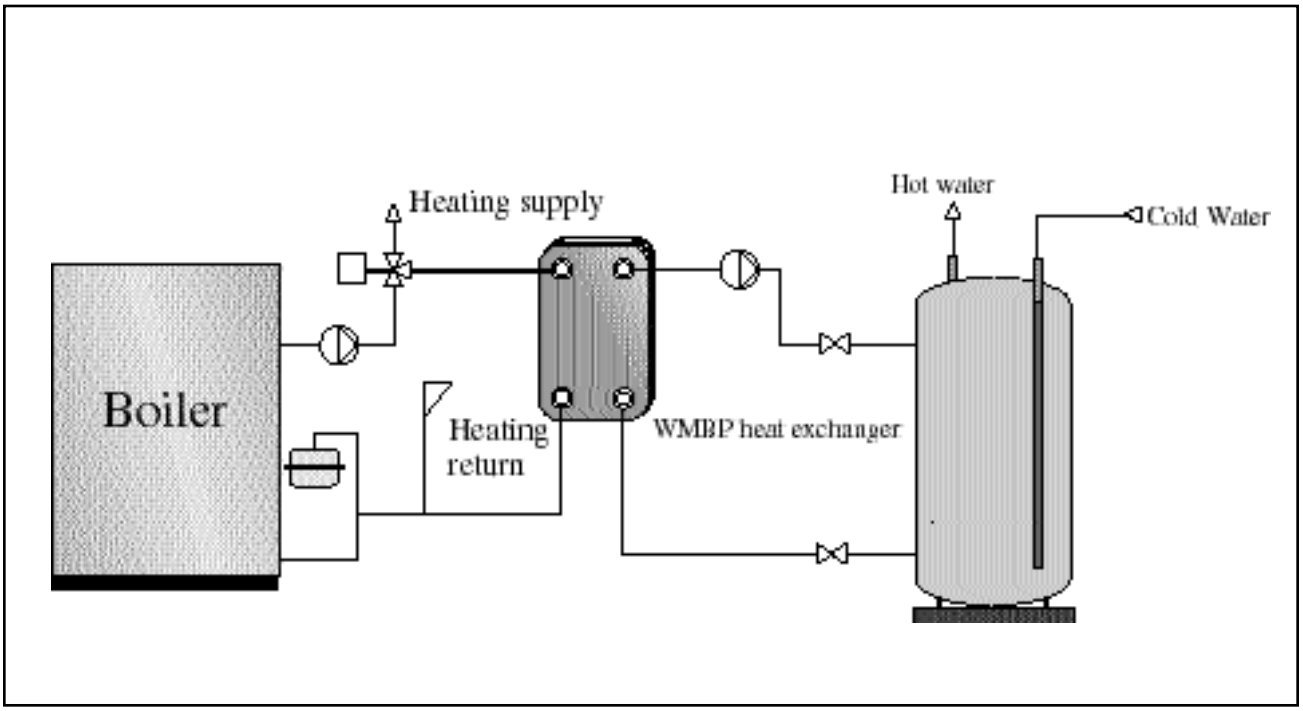


Fig.. 6 Typical Domestic Water Heating Application Using a Storage Tank

Fouling/Cleaning

Different factors may effect fouling, ie: fluid velocity, temperature, turbulence, flow distribution, surface finish and water quality.

Types of fouling

Scaling:

Deposits of calcium on the heat transfer surface, increases with temperature higher than 160ºF, and concentration and pH.
A turbulent flow and lower temperature may help reduce the deposit.

Particles:

Solids in suspension in the heat transfer fluids. Such fouling can be influenced by velocity and fluid flow, roughness of the heat transfer surface and dimensions of the particles.

Proper maintenance and adequate treatment of the water should reduce the risk of fouling. Strainers, properly sized and located, should be provided. A mesh size of 16-20 mesh will retain any particle above 1mm.

Cleaning:

Clean the heat exchanger periodically if water quality is poor or hardness is high. Flush strainer, clean filters and back flush periodically.

A light solution (5% concentration) of phosphoric acid or any other acid which will not attack copper or stainless steel should be used to flush the unit.

WARNING Use extreme caution when handling acid or other corrosive chemicals to avoid risk of severe injury, death or substantial property damage.

NOTE

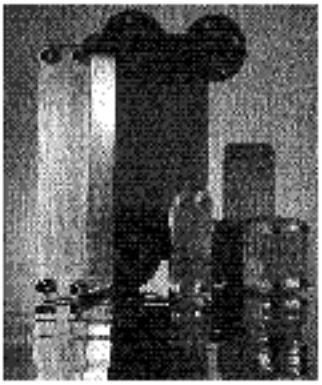
Weil-McLain reserves the right to make any changes in details of design, construction, arrangement or materials as shall in its judgment create an improvement.

Made in Germany by WTT

WMBP Brazed Plate Heat Exchanger

JOB: _____	Date: _____
ENGINEER: _____	Submitted by: _____
CONTRACTOR: _____	Approved by: _____

WMBP Brazed Plate Heat Exchangers consist of as many as 150 pattern-embossed stainless steel plates. The plates are brazed together, with every second plate turned around 180° to create flow channels with two fluids in counterflow. The design of the plates creates a high turbulence resulting in outstanding heat transfer. This makes the WMBP a highly efficient heat exchanger which utilizes all of its material in the heat transfer process.



MATERIALS		**OPERATING CONDITIONS:**	
Plates	: AISI 316 Stainless Steel	Max. working pressure *	: 450 psig
Brazing Material	: Copper 99.9%	Max. working temperature	: 365 °F
Connections	: Stainless steel NPT threaded or soldered	Min. working temperature	: -320 °F

OPERATING DATA

		SIDE 1	SIDE 2
Fluid	(water, glycol/water, etc.)	_____	_____
Concentration	(%)	_____	_____
Inlet Temperature	(F)	_____	_____
Outlet Temperature	(F)	_____	_____
Pressure Drop	(psig)	_____	_____
Flow Rate	(gpm)	_____	_____
Capacity	(1000 x Btu/hr)	_____	_____
Fouling Factor	_____		

Model of Weil-McLain WMBP Exchanger _____ No. of Plates: _____

* The WMBP-1E series has a maximum working pressure of 150 psig.

WEIL-McLAIN
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