



EKİN ENDÜSTRİYEL
Isıtma-Soğutma San. Tic. Ltd. Şti.

Brazed Heat Exchangers





Brazed Heat Exchanger

Brazed Heat Exchangers



MIT Brazed Heat Exchangers

MIT Brazed Heat Exchangers are used in both cooling units and heating applications. In cooling units they are used as evaporators and condensers. On the other hand in heating applications, they serve sudden heating in specific tasks.

MIT present best suitable solutions with heat exchangers having high quality compounds and wide variety. Capacity and connections can be produced in desired ways for specific applications. MIT Brazed Heat Exchangers save you more place with the help of their compact design.

Capacity Table

PHE information	MB-01	MB-02	MB-03	MB-04	MB-05
Cooling capacity/ heat load (kW)	0.5-4	0.5-5	0.5-5	2-10	5-15
Heat Transfer area (m ²)	(n-2)x0.012	(n-2)x0.014	(n-2)x0.014	(n-2)x0.022	(n-2)x0.026
Design temperature (°C)	-196-200	-196-200	-196-200	-196-200	-196-200
Standart design pressure (bar)	10	10	10	10	30
High design pressure (bar)	30	40	30	30	45
Test pressure (bar)	15/45	15/60	15/45	15/45	45/67/5
Distribution					
Double loop					
Channel pattern	H	H,L,M	H	H,L,M	H,L,M
Max. plate number	50	60	50	60	150
(height/width) (mm)	186/72	207/77	193/83	314/72	311/111
Empty weight (n = plate number) (kg)	0.6+0.044xn	0.7+0.06xn	0.4+0.06xn	1.1+0.09xn	1.2+0.13xn
Max. brazed connection dimensions	7/8"	7/8"	7/8"	7/8"	13/8"
Max. threaded connection dimensions	3/4"	3/4"	3/4"	3/4"	11/4"
Standart Plate Material	AISI316L	AISI316L	AISI316L	AISI316L	AISI316L
Braze Material	Copper or Nickel	Copper or Nickel	Copper	Copper or Nickel	Copper or Nickel



MB -06	MB -07	MB -08	MB -09	MB-10	MB -11	MB-12
3-30	30-80	10-60	30-200	60-200	150-450	150-500
(n-2)x0,030	(n-2)x0,048	(n-2)x0,050	(n-2)x0,095	(n-2)x0,113	(n-2)x0,21	(n-2)x0,26
-196-200	-196-200	-196-200	-196-200	-196-200	-196-200	-196-200
30	30	30	30	30	30	25
45	40	45	45	40	40	
45/675	45/60	45/675	45/675	45/60	45/60	375
Q	Q	Q	Q	Q	Q	
	D			D	D	
H	H	H,L,M	H,L,M	H	H	H
150	118	150	250	198	250	250
325/95	390/195	527/111	615/188	490/250	739/322	798/363
1+0,09xn	1,8+0,23xn	1,8+0,23xn	4,6+0,41xn	6,5+0,38xn	13+0,8xn	135+0,97xn
13/8"	15/8"	15/8"	21/8"	25/8"	31/8"	4"
11/4"	11/2"	11/4"	2"	21/2"	31/8"clamp	4"clamp
AISI316L	AISI316L	AISI316L	AISI316L	AISI316L	AISI316L	AISI316L
Copper	Copper	Copper or Nickel	Copper or Nickel	Copper	Copper	Copper

MIT Brazed Plate Heat Exchangers



MIT Brazed plate heat exchangers are designed for cooling, ventilation and heating processes and are used for long years safely.


Main Data:


- Min. temperature: -196 °C
- Max. temperature: +200 °C
- Design Pressure: -45 bar
- Available for standart and high pressure
- Cooling capacity/ heat load: -450 kW
- Connection Size: Threaded, welded
- Copper or nickel brazing

Approvals:

- CE certificate according (PED) 97/23/EC
- UL
- ISO 9001:2000

MIT Brazed Plate Heat Exchangers

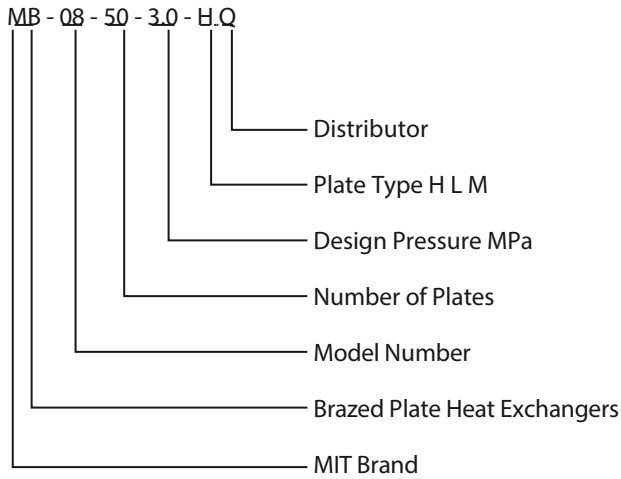
						
Model	MB - 01	MB - 02	MB - 04	MB - 05	MB - 06	
Width (mm)	72	77	72	111	95	
Height (mm)	186	207	314	311	325	
Length (mm)	7+23n	7+23n	7+23n	9+24n	9+15n	
Horizontal Port Distance (mm)	40	42	42	50	39	
Vertical Port Distance (mm)	154	172	278	250	269	
Max. Working Pressure (bar)	30	30	30	30	30	
Test Pressure (bar)	45	45	45	45	45	
Weight (kg)	0.6+0.044n	0.7+0.06n	1.1+0.09n	1.2+0.013n	1+0.09n	

						
Model	MB - 07	MB - 08	MB - 09	MB - 11	MB - 12	
Width (mm)	195	111	192	322	363	
Height (mm)	390	527	617	739	798	
Length (mm)	10+2n	9+24n	10+24n	13+28n	13+28n	
Horizontal Port Distance (mm)	120	50	92	232	188	
Vertical Port Distance (mm)	296	466	519	599	608	
Max. Working Pressure (bar)	30	30	30	30	30	
Test Pressure (bar)	45	45	45	45	45	
Weight (kg)	1.8+0.23n	1.8+0.23n	4.6+0.41n	13+0.8n	13.5+0.97	

Materials	
Plate Material	AISI 304 / 316
Connection Material	AISI 304
Brazing Material	Brazing Material: Copper (Standard) or stainless

Model	Standart Connections	Optional Connections	Max. Thread Connection Diameter	Max. Solder Connection Diameter
MB - 01	Thread	Solder	3/4"	7/8"
MB - 02	Thread	Solder	3/4"	7/8"
MB - 04	Thread	Solder	3/4"	7/8"
MB - 05	Thread	Solder	1 1/4"	1 3/8"
MB - 06	Thread	Solder	1 1/4"	1 3/8"
MB - 07	Solder	Thread	1 1/2"	1 5/8"
MB - 08	Thread	Solder	1 1/2"	1 5/8"
MB - 09	Thread	Solder	2"	2 1/8"
MB - 11	Victaulic	Solder	3 1/8"	3 1/8"
MB - 12	Victaulic	Solder	4"	4"

Expression of Brazed Plates



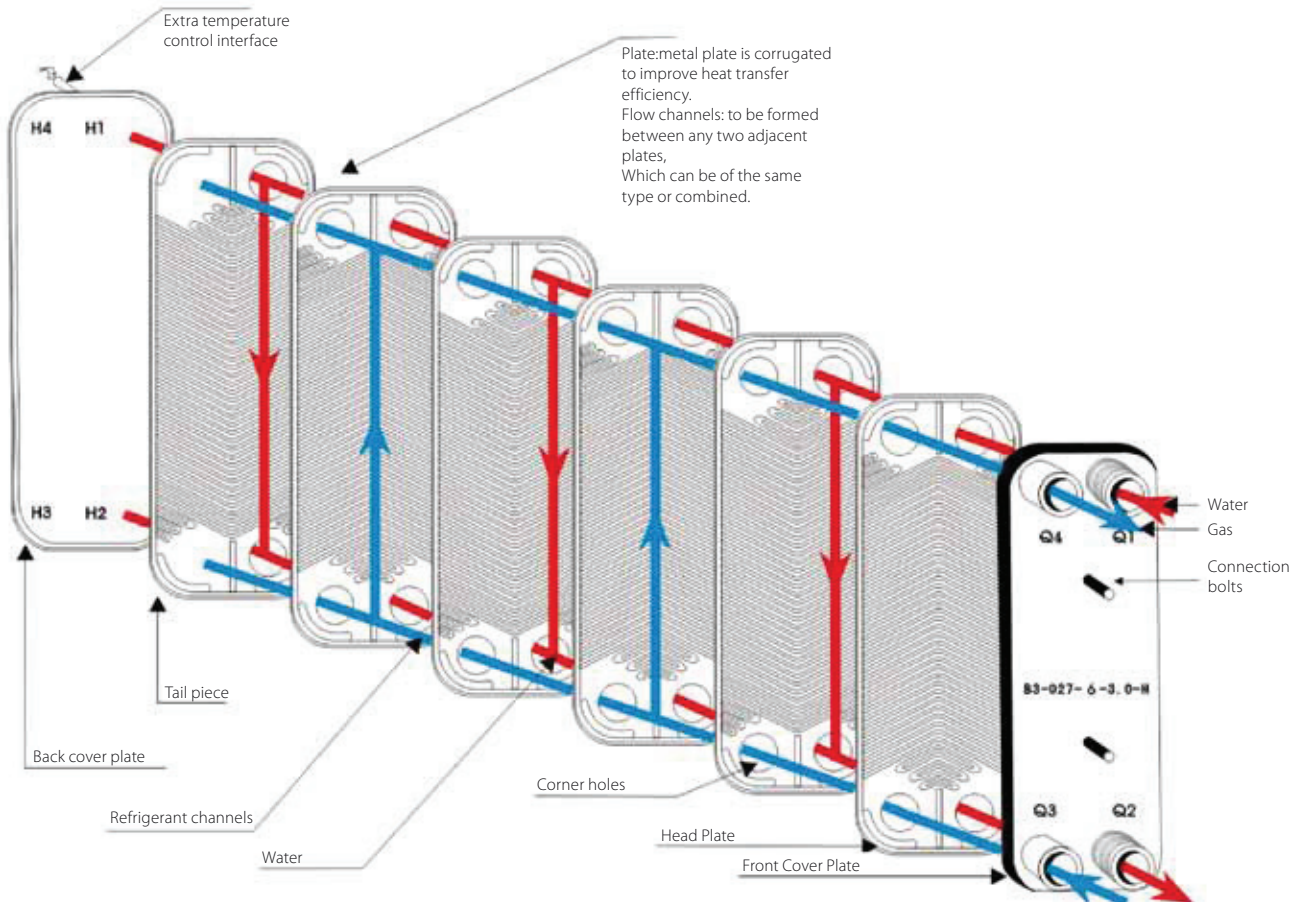
MIT Brazed Plate Heat Exchangers can be designed with plates having different heat transfer characteristics.

The H Type plate obtuse angles which result in higher heat transfer efficiency by increasing the turbulence of the fluid.

The L Type plate has acute angles. This reduces the pressure drop and leads to reduced turbulence and lower heat transfer efficiency.

The M type plate is a combination of L and H plates. This solution can be used for applications, where the temperature change on one side of the BPHE is much larger than on the other.

The Structure of Brazed Plate Heat Exchanger

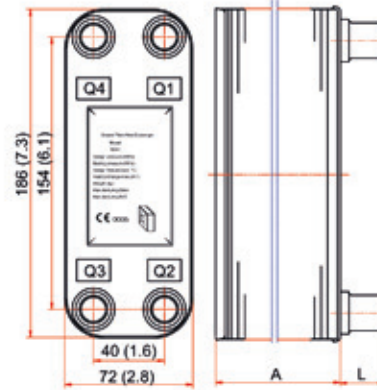


Brazed Plate Heat Exchanger MB - 01

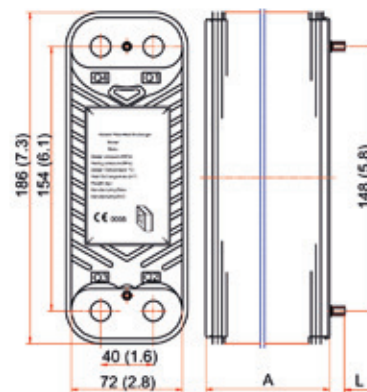


MB - 01 can be copper-brazed or nickel-brazed plate heat exchanger. The material of plate can be 304, 316L or SM0254.

Flat front/back cover plate



Corrugated front and back cover plate



Parallel flow

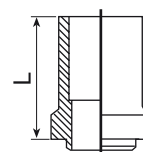
Brazed Plate Heat Exchanger MB - 01

Plate Number	A (mm)	Weight (kg)	Volume Q1 Q2 side / Q3 Q4 side	Heat exchanger area (m ²)
n	7+23n	0.6+0.044n	0.018x1/2n / 0.018 x 1/2 (n-2)	(n-2) 0.012

Parameters

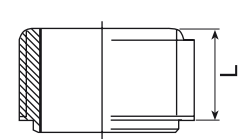
Design Pressure	10 bar (A type) 30 bar (B type)
Test Pressure	15 bar (A type) 45 bar (B type)
Design Temperature	-196 ~ +200°C
Plate Type	H
Heat Load	~4 KW
Number of max. plates	50

Welded Connection



Maximum Connection 7/8"

Threaded connection



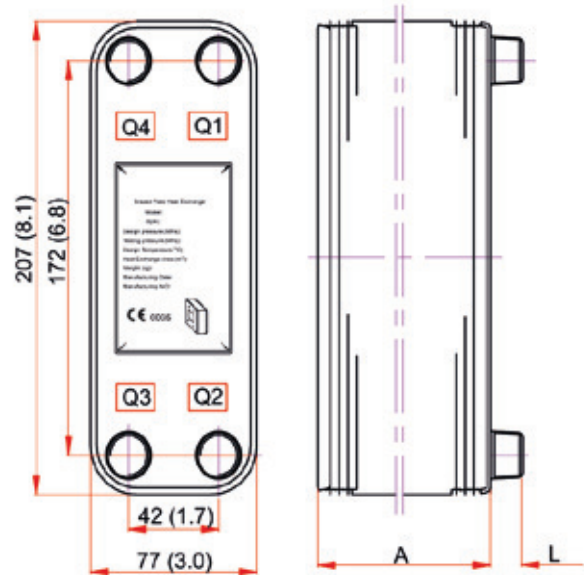
Maximum Connection 3/4"

Ekin Industrial provides exchangers with various threaded and welded connection.

Brazed Plate Heat Exchanger MB - 02



MB - 02 can be copper-brazed or nickel-brazed plate heat exchanger. The material of plate can be 304, 316L or SM0254.



Parallel flow

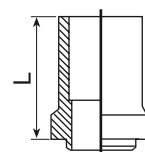
Brazed Plate Heat Exchanger MB - 02

Plate Number	A (mm)	Weight (kg)	Volume Q1 Q2 side / Q3 Q4 side	Heat exchanger area (m2)
n	7+23n	0.7+0.06n	0.02x1/2n / 0.02 x 1/2 (n-2)	(n-2) 0.012

Parameters

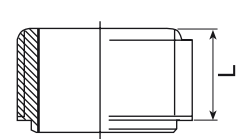
Design Pressure	10 bar (A type) 30 bar (B type)
Test Pressure	15 bar (A type) 45 bar (B type)
Design Temperature	-196 ~ +200°C
Plate Type	H. L. M.
Heat Load	~5 KW
Number of max. plates	50

Welded Connection



Maximum Connection 7/8"

Threaded connection



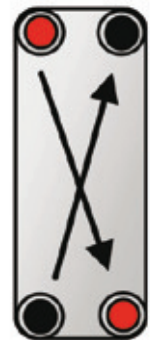
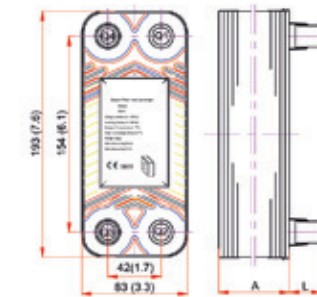
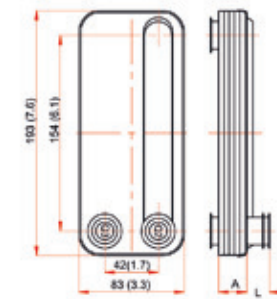
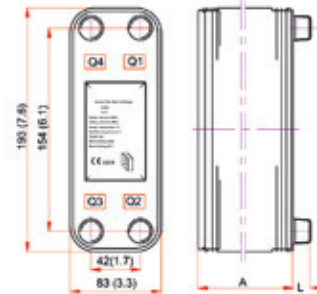
Maximum Connection 3/4"

Ekin Industrial provides exchangers with various threaded and welded connection.

Brazed Plate Heat Exchanger MB - 03



MB - 03 can be copper-brazed or nickel-brazed plate heat exchanger. The material of plate can be 304, 316L or SM0254.



Diagonal flow

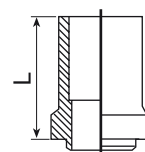
Brazed Plate Heat Exchanger MB - 03

Plate Number	A (mm)	Weight (kg)	Volume Q1 Q2 side / Q3 Q4 side	Heat exchanger area (m2)
n	7+23n	0.4+0.06n	0.022x1/2n / 0.022 x 1/2 (n-2)	(n-2) 0.014

Parameters

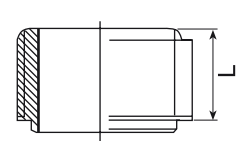
Design Pressure	10 bar (A type) 30 bar (B type)
Test Pressure	15 bar (A type) 45 bar (B type)
Design Temperature	-196 ~ +200°C
Plate Type	H
Heat Load	~5 KW
Plate Number	60

Welded Connection



Maximum Connection 7/8"

Threaded connection



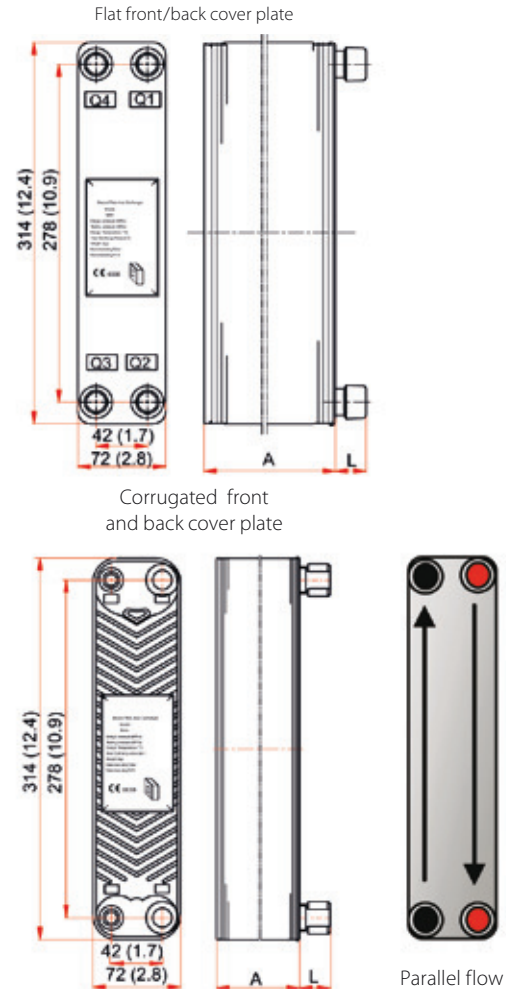
Maximum Connection 3/4"

Ekin Industrial provides exchangers with various threaded and welded connection.

Brazed Plate Heat Exchanger MB - 04



MB - 04 can be copper-brazed or nickel-brazed plate heat exchanger. The material of plate can be 304, 316L or SM0254.



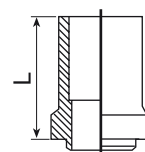
Brazed Plate Heat Exchanger MB - 04

Plate Number	A (mm)	Weight (kg)	Volume (L) Q1 Q2 side / Q3 Q4 side	Heat exchanger area (m2)
n	7+23n	1.1+0.09n	0.04x1/2n / 0.04 x 1/2 (n-2)	(n-2) 0.022

Parameters

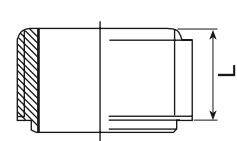
Design Pressure	10 bar (A type) 30 bar (B type)
Test Pressure	15 bar (A type) 45 bar (B type)
Design Temperature	-196 ~ +200°C
Plate Type	H. L. M.
Heat Load	2-10 KW
Number of max. plates	60

Welded Connection



Maximum Connection 7/8"

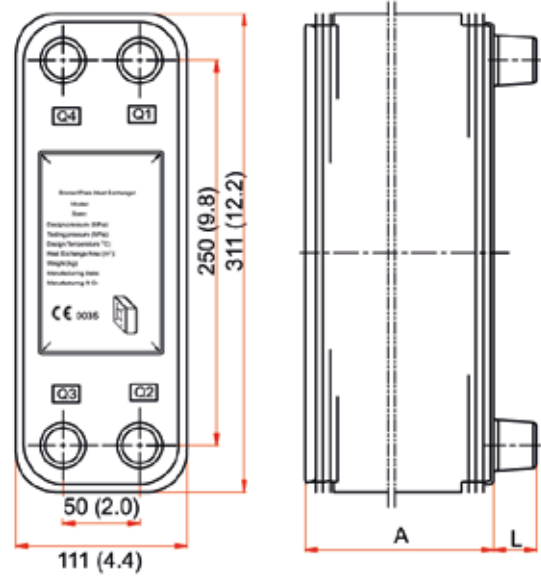
Threaded connection



Maximum Connection 3/4"

Ekin Industrial provides exchangers with various threaded and welded connection.

Brazed Plate Heat Exchanger MB - 05



Parallel flow

MB - 05 can be copper-brazed or nickel-brazed plate heat exchanger. The material of plate can be 304, 316L or SM0254.

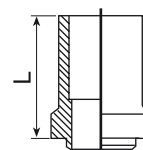
Brazed Plate Heat Exchanger MB - 05

Plate Number	A (mm)	Weight (kg)	Volume (L) Q1 Q2 side / Q3 Q4 side	Heat exchanger area (m2)
n	9+24n	1.2+0.13n	0.05x1/2n / 0.05 x 1/2 (n-2)	(n-2) 0.026

Parameters

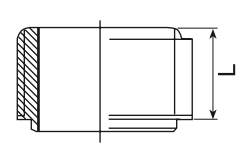
Design Pressure	30 bar (A type) 40 bar (B type)
Test Pressure	45 bar (A type) 60 bar (B type)
Design Temperature	-196 ~ +200°C
Plate Type	H. L. M.
Heat Load	4~25 KW
Number of max. plates	150

Welded Connection



Maximum Connection 1"3/8

Threaded connection



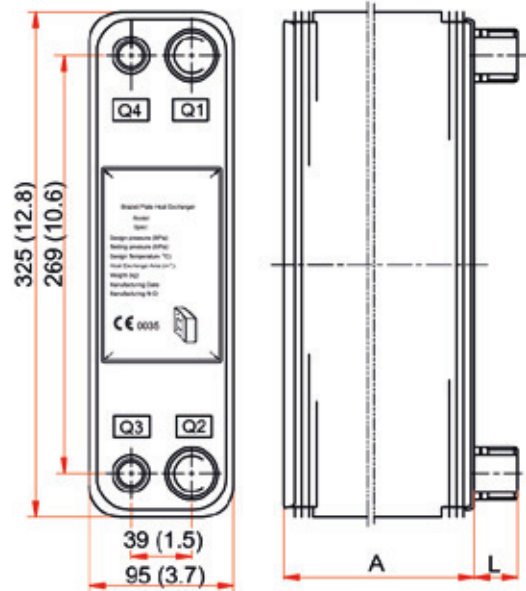
Maximum Connection 1"1/4

Ekin Industrial provides exchangers with various threaded and welded connection.

Brazed Plate Heat Exchanger MB - 06



MB - 06 can be copper-brazed or nickel-brazed plate heat exchanger. The material of plate can be 316L or SM0254.



Parallel flow

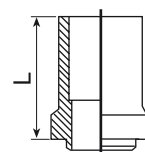
Brazed Plate Heat Exchanger MB - 06

Plate Number	A (mm)	Weight (kg)	Volume (L) Q1 Q2 side / Q3 Q4 side	Heat exchanger area (m2)
n	9+15n	1.0+0.09n	0.28x1/2n / 0.28 x 1/2 (n-2)	(n-2) 0.030

Parameters

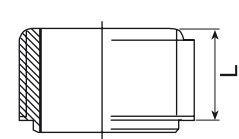
Design Pressure	30 bar (A type) 40 bar (B type)
Test Pressure	48 bar (A type) 60 bar (B type)
Design Temperature	-196 ~ +200°C
Plate Type	H
Heat Load	3~30 KW
Number of max. plates	150

Welded Connection



Maximum Connection 1"3/8

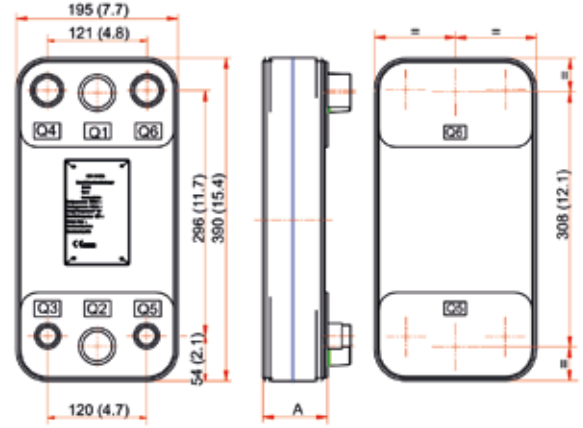
Threaded connection



Maximum Connection 1"1/4

Ekin Industrial provides exchangers with various threaded and welded connection.

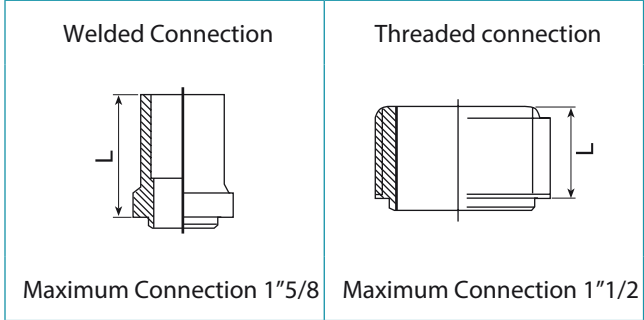
Brazed Plate Heat Exchanger MB - 07



Brazed Plate Heat Exchanger MB - 07

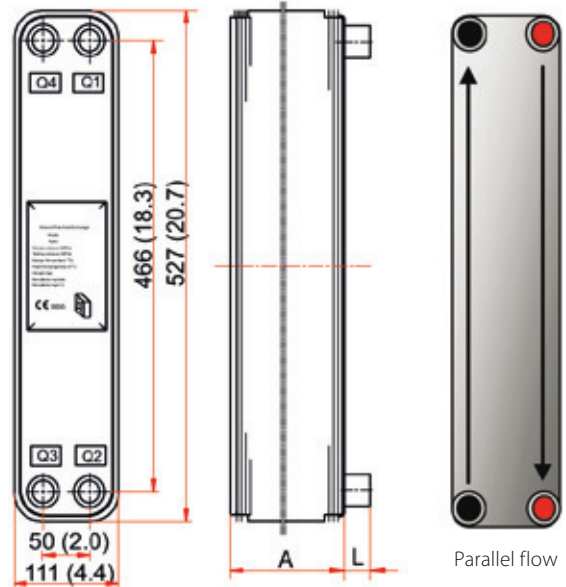
Plate Number	A (mm)	Weight (kg)	Volume (L) Q1 Q2 side / Q3 Q6=Q4 Q5 side	Heat exchanger area (m ²)
n	10+2n	1.8+0.23n	0.094x1/2n / 0.094 x 1/4 (n-2)	(n-2) 0.048

Parameters	
Design Pressure	30 bar
Test Pressure	45 bar
Design Temperature	-196 ~ +200°C
Plate Type	H
Heat Load	30-80 KW
Number of max. plates	118



Ekin Industrial provides exchangers with various threaded and welded connection.

Brazed Plate Heat Exchanger MB - 08



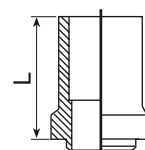
Brazed Plate Heat Exchanger MB - 08

Plate Number	A (mm)	Weight (kg)	Volume (L) Q1 Q2 side / Q3 Q4 side	Heat exchanger area (m ²)
n	9+24n	1.8+0.23n	0.094x1/2n / 0.094 x 1/2 (n-2)	(n-2) 0.050

Parameters

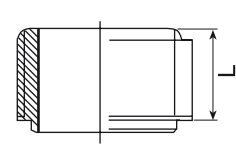
Design Pressure	30 bar (A type) 40 bar (B type)
Test Pressure	45 bar (A type) 60 bar (B type)
Design Temperature	-196 ~ +200°C
Plate Type	H. L. M.
Heat Load	10-60 KW
Number of max. plates	150

Welded Connection



Maximum Connection 1"5/8

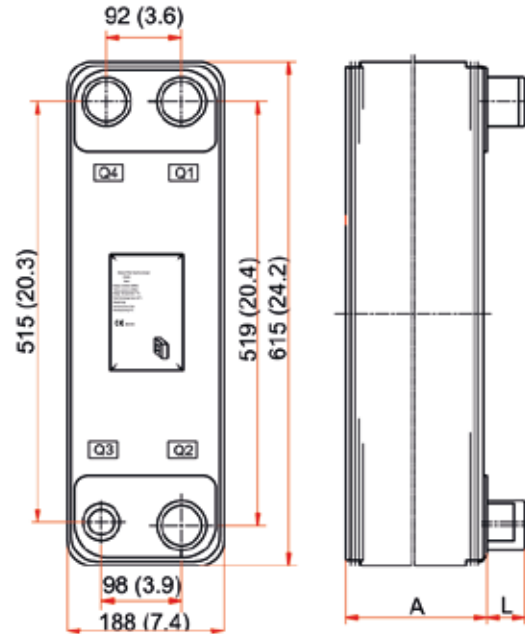
Threaded connection



Maximum Connection 1"1/2

Ekin Industrial provides exchangers with various threaded and welded connection.

Brazed Plate Heat Exchanger MB - 09



Parallel flow

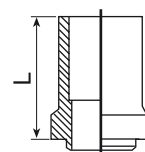
Brazed Plate Heat Exchanger MB - 09

Plate Number	A (mm)	Weight (kg)	Volume (L) Q1 Q2 side / Q3 Q4 side	Heat exchanger area (m2)
n	10+24n	4.6+0.41n	0.25x1/2n / 0.25 x 1/2 (n-2)	(n-2) 0.095

Parameters

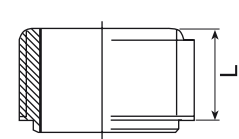
Design Pressure	30 bar (A type) 32 bar (B type)
Test Pressure	45 bar (A type) 48 bar (B type)
Design Temperature	-196 ~ +200°C
Plate Type	H. L. M.
Heat Load	30-200 KW
Number of max. plates	200

Welded Connection



Maximum Connection 2"1/8

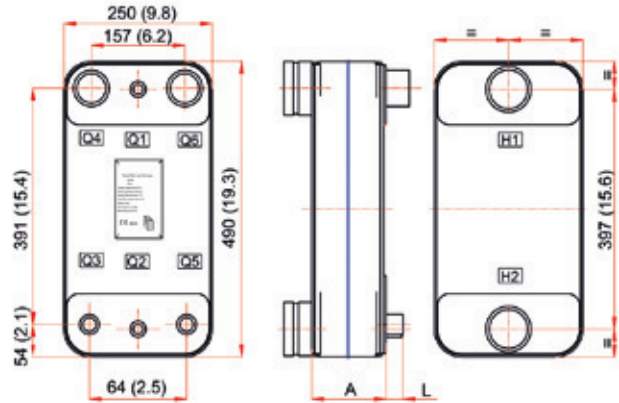
Threaded connection



Maximum Connection 2"

Ekin Industrial provides exchangers with various threaded and welded connection.

Brazed Plate Heat Exchanger MB - 10



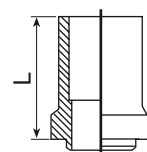
Brazed Plate Heat Exchanger MB - 10

Plate Number	A (mm)	Weight (kg)	Volume (L) Q1 Q2 side / Q3 Q6=Q4 Q5 side	Heat exchanger area (m2)
n	76+23n	6.5+0.386n	0.16x1/2n / 0.16 x 1/4 (n-2)	(n-2) 0.113

Parameters

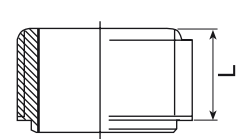
Liquid side design pressure	25 bar
Cooler side design pressure	34.5 bar
Liquid side testing pressure	37.5 bar
Cooler side test pressure	52 bar
Design Temperature	-198 ~ +200°C
Plate Type	H
Heat Load	60-200 KW
Number of max. plates	198

Welded Connection



Maximum Connection 2"5/8

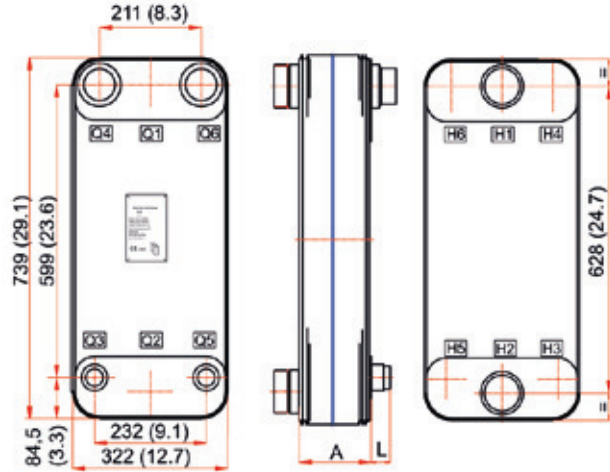
Threaded connection



Maximum Connection 2"1/2

Ekin Industrial provides exchangers with various threaded and welded connection.

Brazed Plate Heat Exchanger MB - 11



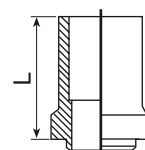
Brazed Plate Heat Exchanger MB - 11

Plate Number	A (mm)	Weight (kg)	Volume (L) Q1 Q2 side / Q3 Q6=Q4 Q5 side	Heat exchanger area (m2)
n	13+28n	13+0.8n	0.4x1/2n / 0.4 x 1/4 (n-2)	(n-2) 0.210

Parameters

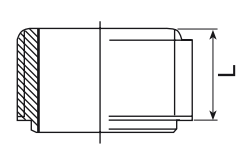
Liquid side design pressure	25 bar
Cooler side design pressure	30 bar
Liquid side testing pressure	37.5 bar
Cooler side test pressure	45 bar
Design Temperature	-196 ~ +200°C
Plate Type	H
Heat Load	150-450 KW
Number of max. plates	250

Welded Connection



Maximum Connection 3"1/8

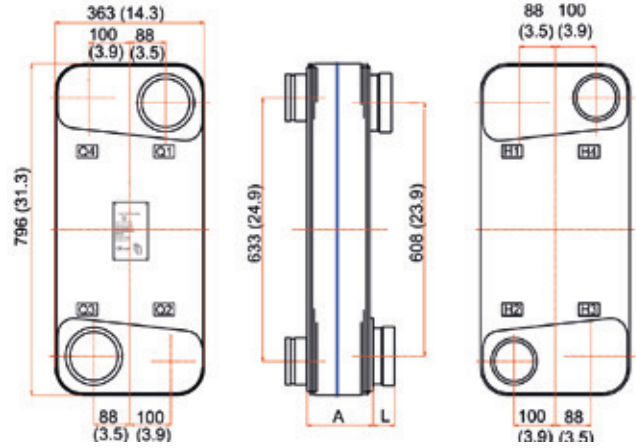
Threaded connection



Maximum Connection 3"1/8

Ekin Industrial provides exchangers with various threaded and welded connection.

Brazed Plate Heat Exchanger MB - 12



Diagonal flow

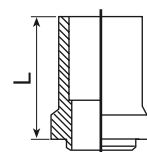
Brazed Plate Heat Exchanger MB - 12

Plate Number	A (mm)	Weight (kg)	Volume (L) Q1 Q2 side / Q3 Q6=Q4 Q5 side	Heat exchanger area (m ²)
n	13+28n	135+0.97n	0.6x1/2n / 0.6 x 1/4 (n-2)	(n-2) 0.260

Parameters

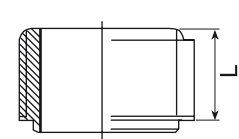
Liquid side design pressure	25 bar
Liquid side testing pressure	37.5 bar
Design Temperature	-196 ~ +200°C
Plate Type	H
Heat Load	150-450 KW
Number of max. plates	250

Welded Connection



Maximum Connection 4"

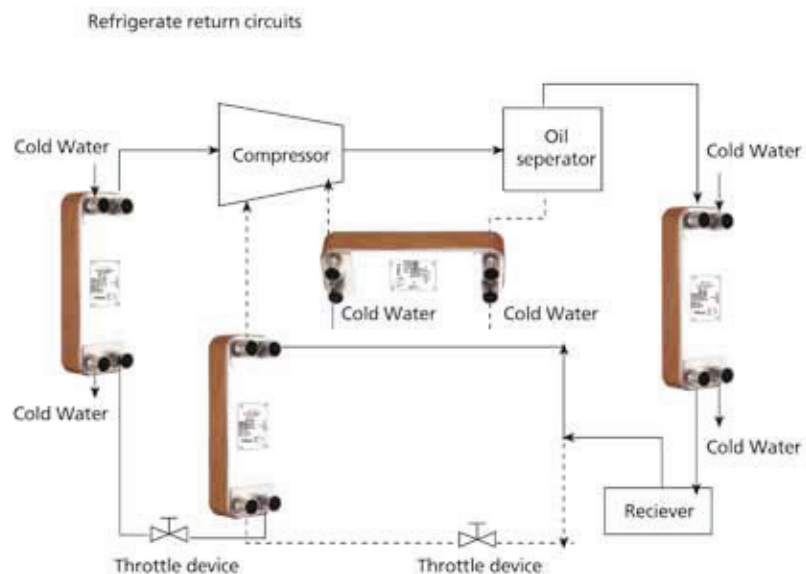
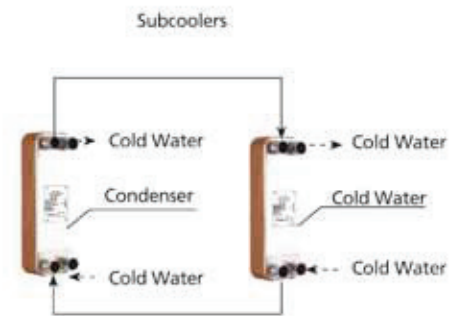
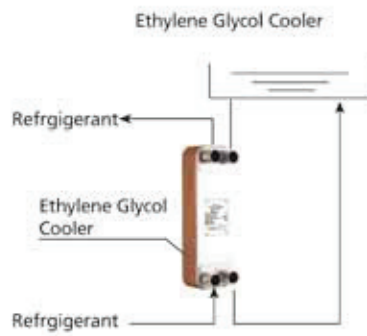
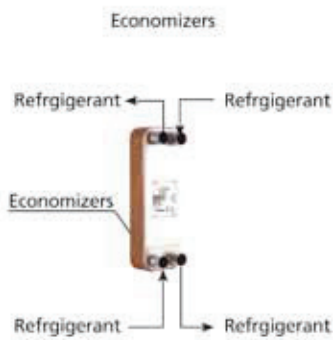
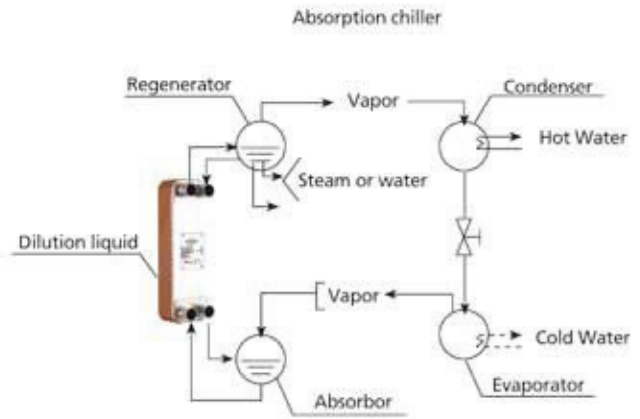
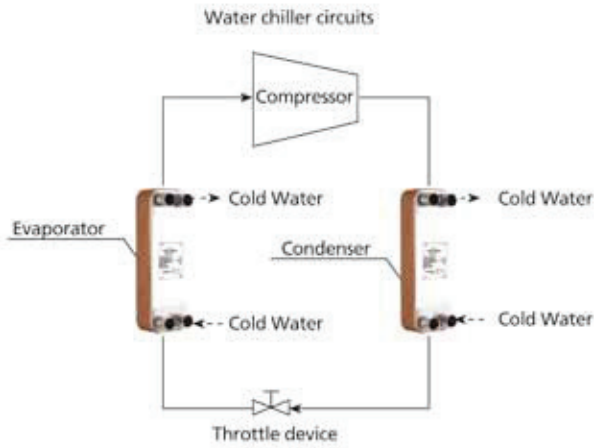
Threaded connection



Maximum Connection 4"

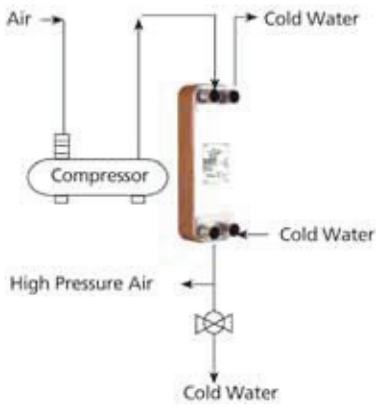
Ekin Industrial provides exchangers with various threaded and welded connection.

Cooling

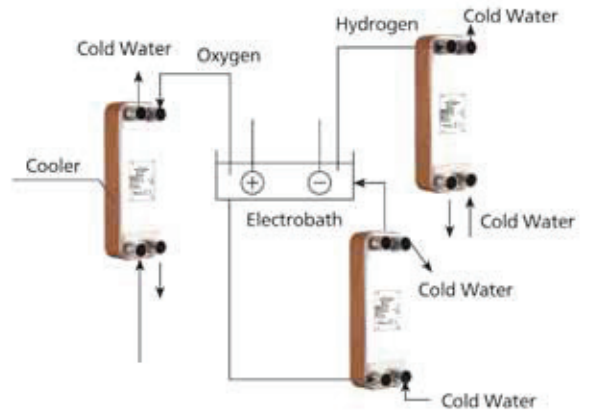
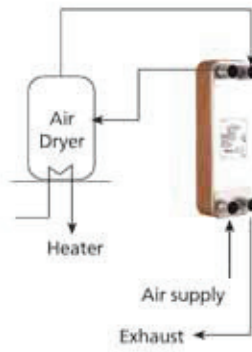


Cooling

Air Dryers for Compressed Air

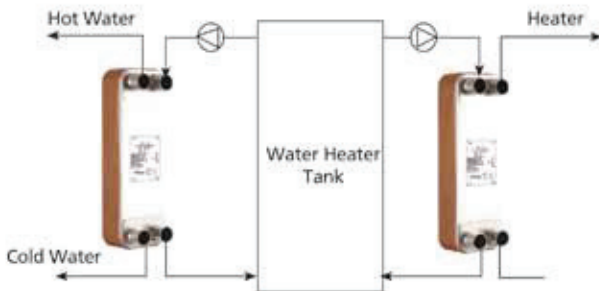


Hot circulation dryer circuit

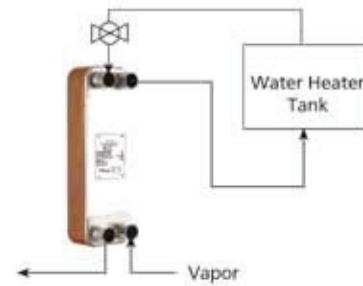


Heating

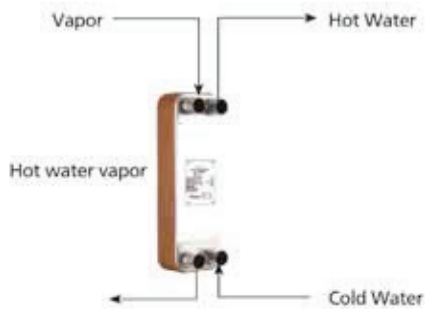
Hot water or heating system



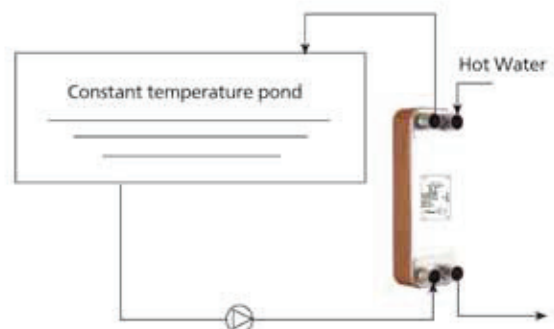
Hot water supply by water heater tank



Hot water supply by vapor heater



District heating



Brazed Plate Heat Exchanger

MB Series Brazed Plate Heat Exchanger



Description

Heat exchangers are used to exchange heat between two fluids. Plate heat exchangers are high performance components and provide a high level of efficiency combined with compact dimensions and low weight. Their efficiency reduces the amount of cooling water required for heat transfer which results in low operating costs.

Features

Plates and connections are manufactured from stainless steel to AISI 316, 1.4401, vacuum-brazed with copper. The special moulding of the plates produces the turbulent flow necessary for effective heat transfer and provides the plate heat exchanger with a high level of mechanical strength.

Operating Details

Medium:

- Water glycol (coolants)
- HFC operating fluids
- Water
- Oil

Contamination:

The quantity of particles in suspension should be less than 10 mg/l. Particle size < 0.6 mm. (spherical). Thread-like particles cause a rapid rise in pressure drops.

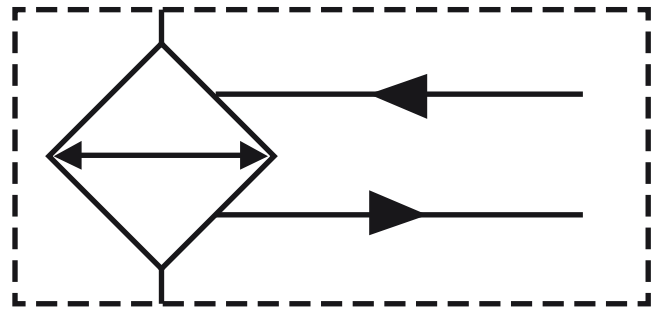
Temperature Range:

- 50°C to 437°F (10° to 225°C)
(freezing point and boiling point must be taken into consideration!)

Pressure:

- max. 49 psi (3 bar) (static) up to 257°F (125°C)
- max. 435 psi (30 bar) (static) up to 437°F (225°C)
- test pressure: 650 psi

Hydraulic Symbol



AIB cooler element bypass option for high viscosity applications.

Corrosion

The following limits refer to a pH value of 7

- free chlorine, CL₂ < 0.5 ppm
- chloride ions CL
< 700 ppm at 20°C
< 200 ppm at 50°C

Other limits

- pH 7 - 10
- Sulphate SO₄²⁻ < 100 ppm
- [HCO₃⁻] / [SO₄²⁻] > 1
- ammonia, NH₃ < 10 ppm
- free CO < 10 ppm

The following ions are not corrosive under normal conditions: phosphate, nitrate, nitrite, iron, manganese, sodium and potassium.

Applications



Agricultural



Automotive



Construction



Gearboxes



Industrial



Elevators



Commercial
Municipal



Power Generation



Pulp&Paper



Railways



Shipbuilding



Steel& Heavy
Industry

Brazed Plate Heat Exchanger

MB Series Brazed Plate Heat Exchanger

Model Code

											MB-05	10	C1
Series													
	MB-05												
	MB-08												
	MB-09												
Number of Plates													
	10	20	30	40	50	60	70	80	100	120			
MB-05	x	x	x	x	x	x	x		x	x			
MB-08	x	x	x	x	x	x		x					
MB-09		x	x	x	x	x		x	x				
Connections													
C1	=	1"	NPT Male x 4										MB-05
C1	=	1"	NPT Male x 4										MB-08
C2	=	2"	NPT Male x 4										MB-09

Pipes must be connected so that the connections are stress free.

Linear expansion and vibrations from the pipes to the heat exchanger must be avoided.

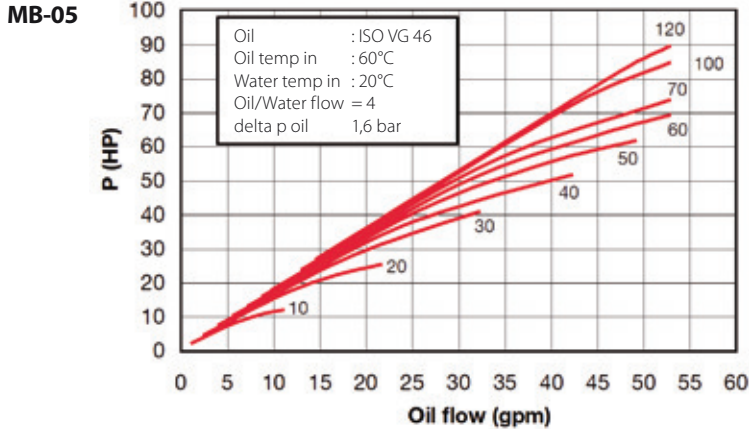
Pressure drop across heat exchanger

This table is based on an ISO VG45 oil at 130°F and shows the pump flows with the 1,800 RPM motors. If other grades of oil are to be used, consult the sizing software. When using the 72 psi clogging indicator the pressure drop should not exceed 15 psi max. across the heat exchanger. When using the 29 psi clogging indicator the pressure drop should not exceed 30 psi max. across the heat exchanger.

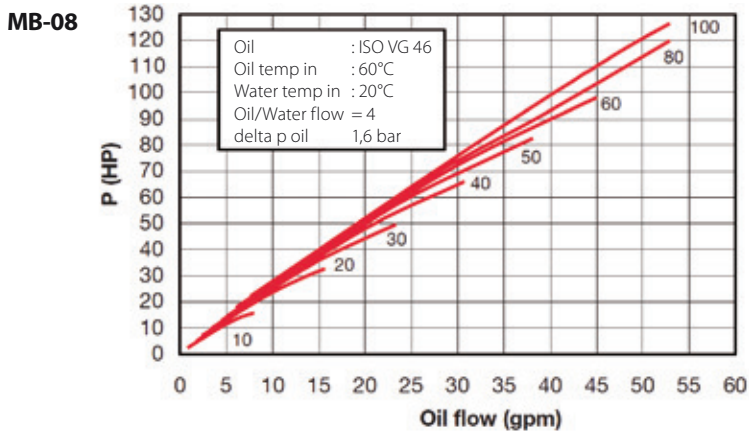
Heat Exchanger Size	Pump 3.5 1.6 gpm (6.3 l/min)	Pump 7.33 7.33 gpm (12.6 l/min)	Pump 10.475 10.475 gpm (18 l/min)	Pump 15.7 15.7 gpm (18 l/min)	Pump 20.95 20.95 gpm (18 l/min)	Pump 20.95 20.95 gpm (18 l/min)	Pump 30.145 30.145 gpm (55 l/min)	Pump 40.185 40.185 gpm (70 l/min)	Pump 50.235 50.235 gpm (90 l/min)	Pump 70.34 70.34 gpm (130 l/min)	Pump 100.475 100.475 gpm (180 l/min)
MB-05	3	5	8	-	-	-	-	-	-	-	-
MB-05	1	2	3	5	7	7	13.66	-	-	-	-
MB-05	-	-	-	2	3	3	735	9.85	134	-	-
MB-05	-	-	-	-	-	-	5.65	754	1027	1619	-
MB-05	-	-	-	-	-	-	4.1	5.2	7	11.1	168
MB-05	-	-	-	-	-	-	3	3.8	4.9	76	1166
MB-05	-	-	-	-	-	-	2.55	3.25	4.2	6.35	9.8
MB-08	4	9	15	-	-	-	-	-	-	-	-
MB-08	2	3.3	5	9	13	13	-	-	-	-	-
MB-08	-	-	-	4	5	5	1325	178	-	-	-
MB-08	-	-	-	-	-	-	8.15	10.8	14.75	-	-
MB-08	-	-	-	-	-	-	5.95	7.75	10.5	16.6	-

Brazed Plate Heat Exchanger

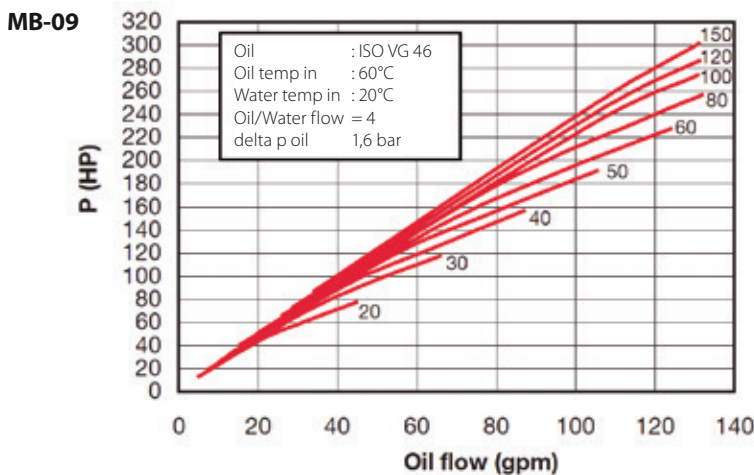
MB Series Technical Data



Number of plates (N)	H=10 + Nx2.4	lbs
10	34	2.5
20	58	3.8
30	82	5.1
40	106	6.3
50	130	7.7
60	154	9
70	178	10.3
100	250	14.2
120	298	16.8



Number of plates (N)	H=10 + Nx2.4	lbs
10	34	4.2
20	58	6.5
30	82	8.8
40	106	11
50	130	13.5
60	154	16.1
80	202	20.2



Number of plates (N)	H=10 + Nx2.85 (mm)	lbs
20	67	15.7
30	95.5	20.2
40	124	24.5
50	152.5	29
60	181	33.4
80	238	42
100	295	51

The cooling capacity is also dependent on the viscosity class. At a lower viscosity class the cooling capacity increases, at a higher viscosity class it decreases. In order to make an accurate calculation, the following details are required:

- type of oil
- permissible tank temperature
- required outlet temperature of the oil or necessary cooling capacity
- inlet temperature of the water and maximum water quantity.

Selection Program

The cooler selection program calculates the correct heat exchanger in the case of non-standard operating data. Please contact our technical sales department.