

판형열교환기

PLATE HEAT EXCHANGER



한국에너지
www.koreaenergy.org

판형열교환기의 구조 및 원리

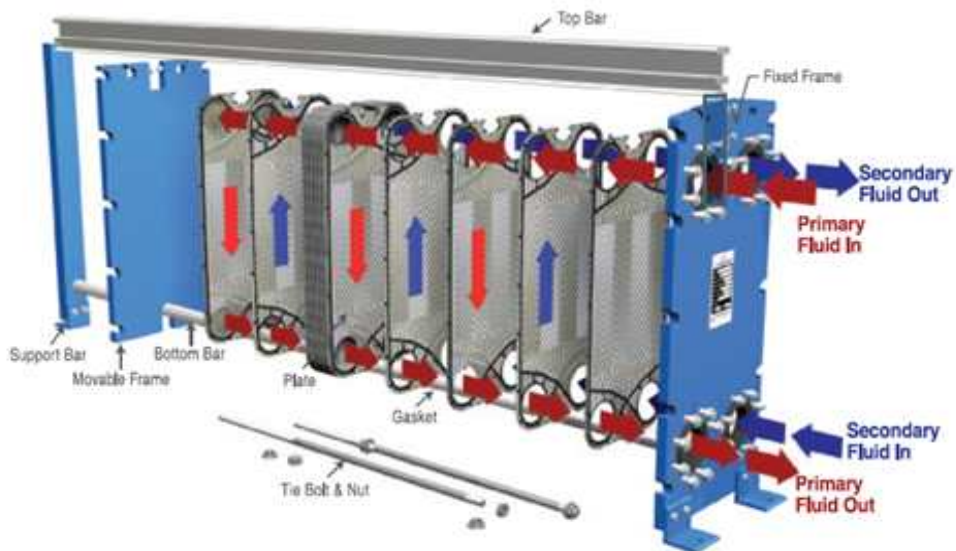
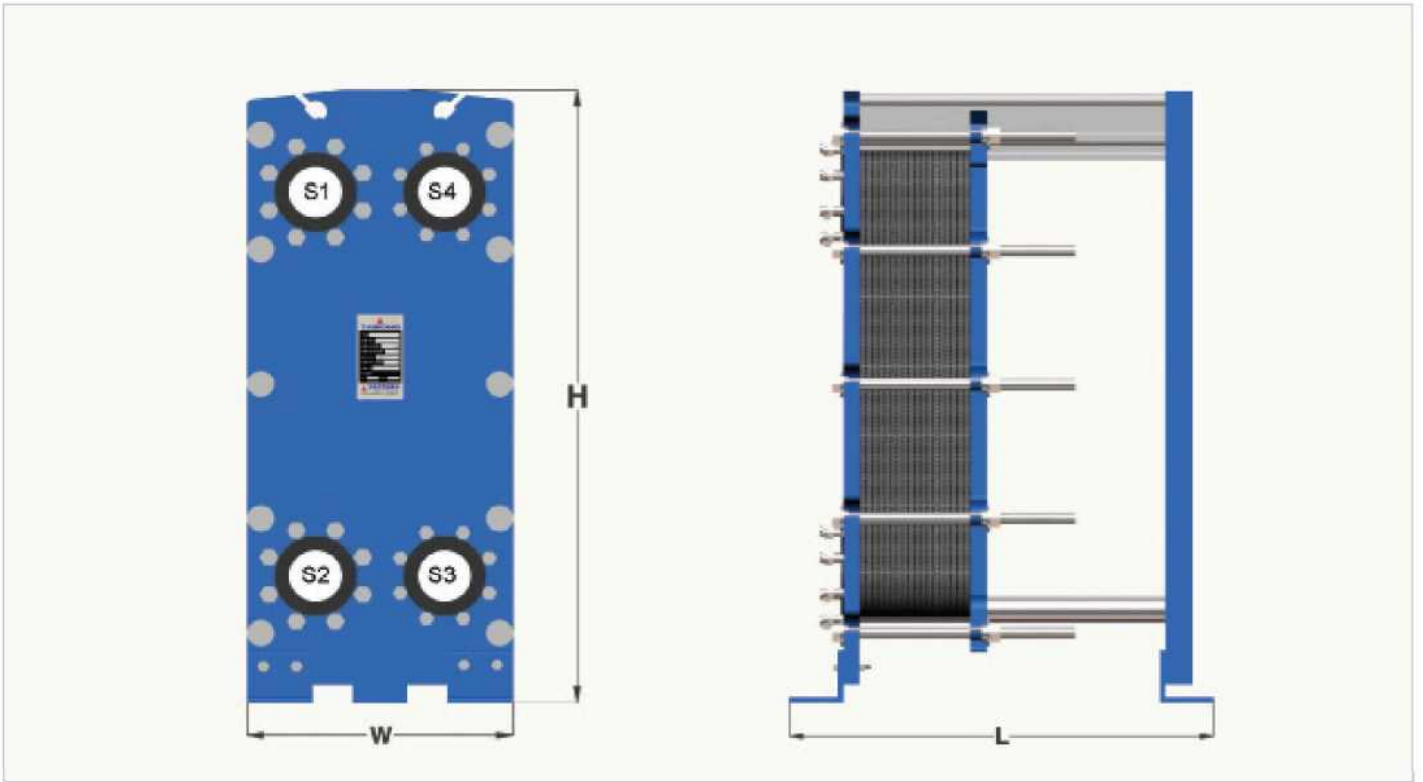


Fig.1 판형열교환기의 일반구조 (General Structure)

- 판형열교환기는 Stainless Steel, Titanium, Hastelloy, SMO254, G30 등과 같은 금속판을 유체의 난류 형성을 극대화하여 설계된 금형과 고압 프레스로 성형하여 제작한 전열판(Plate)과 유체의 흐름과 밀봉을 위하여 설계된 가스켓(Gasket)을 Thermal Design에 따라 산출된 매수 만큼 양단의 후레임(Frame) 사이에 적층하고 조임볼트(Tightening Bolt)로 압착하면 2개의 유체가 전열판 면에 강한 난류를 형성하여 높은 열전달계수를 실현하는 유로가 형성된다.
- 상부연결봉(Top Bar)과 하부연결봉(Bottom Bar)은 지지기둥(Supporting Bar)과 프레임(Frame)에 연결되어 판형열교환기가 직립하는 구조체 역할과 전열판 조립의 가이드 역할을 한다.



모 델	전열면적 (m ² / 매)	노즐구경 (표준)	최대적용유량 (m ³ /hr)	제품치수		
				폭(W)	높이(H)	길이(L)
JGP-TX05	0.0152	3/4"(20A)	3	128	270	70 ~ 320
JGP-TX07	0.034	1½"(40A)	10	192	466	330 ~ 510
JGP-TX3	GD	0.090	2½"(65A)	346	775	517 ~ 1680
	AN	0.170			1145	
	AX	0.250			1515	
JGP-TX4	GD	0.101	4"(100A)	495	874	780 ~ 1780
	AP	0.228			1151	
	AN(W)	0.348			1428	
	AX	0.467			1705	
JGP-TX8	GD	0.370	8"(200A)	740	1503	1390 ~ 3350
	AN	0.680			1987	
JGP-TX9	GD	0.270	8"(200A)	740	1340	1150 ~ 2770
	AP	0.470			1663	
	AN	0.680			1987	
	AX	0.890			2310	
JGP-TX14	GD	0.840	12"(300A)	1012	1922	1360 ~ 3560
	AP	1.280			2338	
	AN	1.620			2754	
JGP-TX16	GD	1.200	18"(450A)	1400	2562	2130 ~ 5030
	AN	3.060			3966	
JGP-TX20	GD	1.080	20"(500A)	1420	2488	2130 ~ 5030
	AP	2.070			3226	

GPHE LINE UP

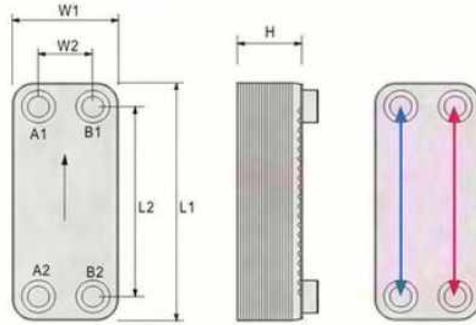
MODEL	JGP30	JGP60B/M	JGP60S	JGP100B/M	JGPTL100
Height, h(mm)	480	920	680	1045	1908
Width, w(mm)	180	320	400	454	480
Min standard length, l(mm)	400	500	530	700	850
Max standard length, l(mm)	650	1500	1430	2300	2350
Vertical port distance, vc(mm)	357	640	380	719	1338
Horizontal port distant, hc(mm)	60	140	203	225	225
Max temperature (c)	180	180	180	180	180
Max pressure (barg)	16	16	16	16	16
Connection size	DN32/1 1/4"	DN50/2"	160DN65/22/1"	DN100/4"	DN100/4"
Max. flow rate (kg/s)	4	15	20	50	50

MODEL	JGP150B/M	JGP200S	JGP200M	JGP250M	JGP300M
Height, h(mm)	1815	1420	2200	1045	2882
Width, w(mm)	610	760	780	2680	1150
Min standard length, l(mm)	1150	900	1250	910	1650
Max standard length, l(mm)	3250	1700	3350	3350	5200
Vertical port distance, vc(mm)	1294	698	698	1939	1842
Horizontal port distant, hc(mm)	298	636	353	439	595
Max temperature (c)	180	180	180	180	180
Max pressure (barg)	10/16	10/16	10/16	10/16	10/16
Connection size	DN150/6"	DN200/8"	DN200/8"	DN250/10"	DN300/12"
Max. flow rate (kg/s)	80	190	225	250	497

JBP200 Series



- HVAC
- Water
- Semiconductor Evaporator
- Heat Pump
- Steam
- Condenser
- Boiler
- Fuel Cell
- Sub-Coller
- Oil Cooler



BPHE 설계 조건

형식	유체	입구측 온도조건	출구측 온도조건
1차측	WATER	80℃	45℃
2차측	WATER	15℃	40℃
1차측	STEAM	133℃	133℃
2차측	WATER	15℃	40℃

JBP200				
L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm)
193	154	83	42	8+(n×2.35)

N : number of plate

R410a & Water Condenser

JBP200	CONDENSER (Kcal/h)	RT	KW	Heat Transfer Area / plate (m ²)	Total Heat transfer Area / plate (m ²)	Volume Channel (Liter)	Total Volume (Liter)	Test Pressure (Mpa)	Design Pressure (Mpa)	Design Temperature(°C)	Weight (Kg)	Connection Size(A)
JBP200 9 (F)	605	0.2	0.70	0.014	0.098	0.031	0.250	4.5	3.0	200	1.03+n×0.55	20
JBP200 17 (F)	1,512	0.5	1.75	0.014	0.210	0.031	0.500	4.5	3.0	200	1.03+n×0.55	20
JBP200 33 (F)	3,024	1	3.51	0.014	0.434	0.031	1.000	4.5	3.0	200	1.03+n×0.55	20
JBP200 41 (F)	4,536	1.5	5.27	0.014	0.546	0.031	1.249	4.5	3.0	200	1.03+n×0.55	20

Max. Flow Rate[m³/hr] : 4

R410a & Water Evaporator

JBP200	EVAPORATOR(Kcal/hr)	RT	KW	Heat Transfer Area / plate (m ²)	Total Heat transfer Area / plate (m ²)	Volume Channel (Liter)	Total Volume (Liter)	Test Pressure (Mpa)	Design Pressure (Mpa)	Design Temperature(°C)	Weight (Kg)	Connection Size(A)
JBP200 15 (F)	605	0.2	0.7	0.014	0.182	0.031	0.437	4.5	3.0	200	1.03+n×0.55	20
JBP200 23 (F)	1,512	0.5	1.76	0.014	0.294	0.031	0.687	4.5	3.0	200	1.03+n×0.55	20
JBP200 41 (F)	3,024	1	3.52	0.014	0.546	0.031	1.249	4.5	3.0	200	1.03+n×0.55	20

Water / Steam & Water

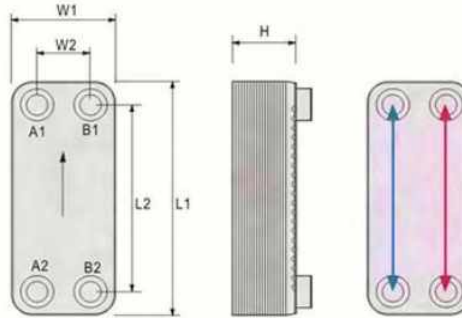
JBP200	Kcal/h	STEAM	EVAPORATOR	CONDENSER	Heat Transfer Area / plate (m ²)	Total Heat transfer Area / plate (m ²)	Volume Channel (Liter)	Total Volume (Liter)	Test Pressure (Mpa)	Design Pressure (Mpa)	Design Temperature(°C)	Weight (Kg)	Connection Size(A)
JBP200 9 (F)		10,000			0.015	0.105	0.031	0.250	4.5	3.0	200	1.03+n×0.55	20
JBP200 11 (F)	10,000				0.015	0.135	0.031	0.312	4.5	3.0	200	1.03+n×0.55	20
JBP200 15 (F)		20,000			0.015	0.195	0.031	0.437	4.5	3.0	200	1.03+n×0.55	20
JBP200 17 (F)	20,000		0.5HP		0.015	0.225	0.031	0.500	4.5	3.0	200	1.03+n×0.55	20
JBP200 19 (F)		30,000		0.5HP	0.015	0.255	0.031	0.562	4.5	3.0	200	1.0341)×0.55	20
JBP200 23 (F)	30,000				0.015	0.315	0.031	0.687	4.5	3.0	200	1.03+n×0.55	20

Max. Flow Rate[m³/hr] : 4

JBP300 Series



- HVAC
- Heat Pump
- CHILLER
- Boiler
- Oil Cooler
- Water
- Steam
- Fuel Cell
- Semiconductor
- Evaporator
- Condenser



BPHE 설계 조건

형식	유체	입구측 온도조건	출구측 온도조건
1차측	R410	85℃	50℃
2차측	WATER	40℃	45℃
1차측	R410	3℃	8℃
2차측	WATER	12℃	7℃

JBP300				
L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm)
285	230	105	50	14+(n×2.25)

N : number of plate

R410a & Water Condenser

JBP300	CONDENSER (Kcal/hr)	RT	KW	Heat Transfer Area / plate (m ²)	Total Heat transfer Area / plate (m ²)	Volume Channel (Liter)	Total Volume (Liter)	Test Pressure (Mpa)	Design Pressure (Mpa)	Design Temperature (°C)	Weight (Kg)	Connection Size(A)
JBP300 17 (F)	3,024	01	3.51	0.026	0.390	0.055	0.886	4.5	3.0	200	1.22, Nx0.091	25
JBP300 21 (F)	4,536	1.5	5.27	0.026	0.494	0.055	1.107	4.5	3.0	200	1.22+NX0.091	25
JBP300 27 (F)	6,048	2	7.03	0.026	0.650	0.055	1.439	4.5	3.0	200	1.22+NX0.091	25
JBP300 37 (F)	7,560	2.5	8.79	0.026	0.910	0.055	1.993	4.5	3.0	200	1.22+NX0.091	25
JBP300 45 (F)	9,072	3	10.54	0.026	1.118	0.055	2.436	4.5	3.0	200	1.22+NX0.091	25

Max. Flow Rate[m³/hr] : 9

R410a & Water Evaporator

JBP300	EVAPORATOR (Kcal/hr)	RT	KW	Heat Transfer Area / plate (m ²)	Total Heat transfer Area / plate (m ²)	Volume Channel (Liter)	Total Volume (Liter)	Test Pressure (Mpa)	Design Pressure (Mpa)	Design Temperature (°C)	Weight (Kg)	Connection Size(A)
JBP300 13 (F)	1,512	0.5	1.76	0.026	0.286	0.055	0.664	4.5	3.0	200	1.22+NX0.091	25
JBP300 15 (F)	3,024	1	3.52	0.026	0.494	0.055	1.107	4.5	3.0	200	1.22+NX0.091	25
JBP300 19 (F)	4,536	1.5	5.27	0.026	0.702	0.055	1.550	4.5	3.0	200	1.22+NX0.091	25
JBP300 21 (F)	6,048	2	7.03	0.026	0.910	0.055	1.993	4.5	3.0	200	1.22+NX0.091	25
JBP300 23 (F)	7,560	2.5	8.79	0.026	1.014	0.055	2.214	4.5	3.0	200	1.22+NX0.091	25
JBP300 25 (F)	9,072	3	10.55	0.026	1.118	0.055	2.436	4.5	3.0	200	1.22+NX0.091	25

Water / Steam & Water

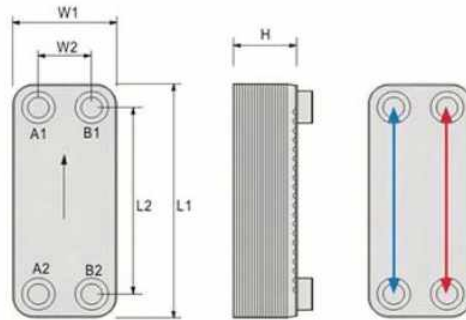
JBP300	Kcal/h	STEAM	EVAPORATOR	CONDENSER	Heat Transfer Area / plate (m ²)	Total Heat transfer Area / plate (m ²)	Volume Channel (Liter)	Total Volume (Liter)	Test Pressure (Mpa)	Design Pressure (Mpa)	Design Temperature (°C)	Weight (Kg)	Connection Size(A)
JBP300 13 (F)			1HP		0.028	0.308	0.055	0.664	4.5	3.0	200	1.22+NX0.091	25
JBP300 15 (F)	40,000	50,000		1HP	0.028	0.364	0.055	0.775	4.5	3.0	200	1.22+NX0.091	25
JBP300 19 (F)	50,000	60,000			0.028	0.476	0.055	0.997	4.5	3.0	200	1.22+NX0.091	25
JBP300 21 (F)			2HP		0.028	0.532	0.055	1.107	4.5	3.0	200	1.22+NX0.091	25
JBP300 23 (F)	60,000	70,000			0.028	0.588	0.055	1.218	4.5	3.0	200	1.22+NX0.091	25
JBP300 25 (F)	80,000				0.028	0.644	0.055	1.329	4.5	3.0	200	1.22+NX0.091	25
JBP300 27 (F)	70,000		3HP		0.028	0.700	0.055	1.439	4.5	3.0	200	1.22+NX0.091	25
JBP300 29 (F)	100,000				0.028	0.756	0.055	1.550	4.5	3.0	200	1.22+NX0.091	25

Max. Flow Rate[m³/hr] : 9

JBP500 Series



- HVAC
- Heat Pump
- Chiller
- Boiler
- Oil Cooler
- Water
- Steam
- Sub-Coller
- Evaporator
- Condenser



BPHE 설계 조건

형식	유체	입구측 온도조건	출구측 온도조건
1차측	WATER	80℃	45℃
2차측	WATER	15℃	40℃
1차측	STEAM	133℃	133℃
2차측	WATER	15℃	40℃

JBP500				
L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm)
503	450	123	70	$19 + \{(n-3) \times 2.25\}$

N : number of plate

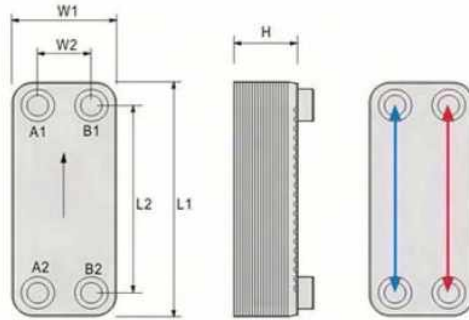
Water / Steam & Water

JBP500	Kcal/h	STEAM	EVAPORATOR	Heat Transfer Area / plate (m ²)	Total Heat transfer Area / plate (m ²)	Volume Channel (Liter)	Total Volume (Liter)	Test Pressure (Mpa)	Design Pressure (Mpa)	Design Temperature (°C)	Weight (Kg)	Connection Size (A)
JBP500	15 (F)	100,000		0.056	0.728	0.114	1.602	4.5	3.0	200	2.72+N×0.551	32
JBP500	19 (F)	100,000		0.056	0.952	0.114	2.060	4.5	3.0	200	2.72+N×0.551	32
JBP500	23 (F)	150,000		0.056	1.176	0.114	2.518	4.5	3.0	200	2.72+N×0.551	32
JBP500	27 (F)	150,000		0.056	1.400	0.114	2.976	4.5	3.0	200	2.72+N×0.551	32
JBP500	29 (F)	200,000	5HP	0.056	1.512	0.114	3.205	4.5	3.0	200	2.72+N×0.551	32

Max. Flow Rate [m³/hr] : 16

JBP-600 Series

- HVAC
- Chiller
- Sub Coller



BPHE 설계 조건

형식	유체	입구측 온도조건	출구측 온도조건
1차측	WATER	80℃	45℃
2차측	WATER	15℃	40℃
1차측	STEAM	133℃	133℃
2차측	WATER	15℃	40℃

JBP600				
L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm)
480	396	230	146	16+(n×2.45)

N : number of plate

Water / Steam & Water

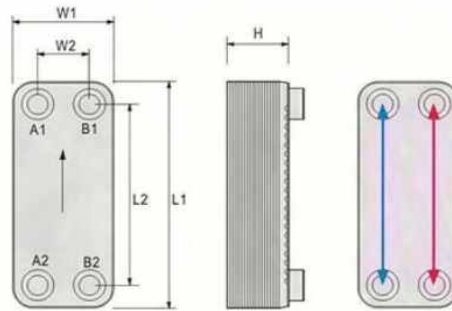
JBP600	WATER (Kcal/hr)	STEAM (Kcal/hr)	Heat Transfer Area / plate (m ²)	Total Heat Transfer Area (m ²)	Volume Channel (Liter)	Total Volume (Liter)	Test Pressure (Mpa)	Design Pressure (Mpa)	Design Temperature (°C)	Weight (Kg)	Connection Size(A)
JBP600 19 (F)		200,000	0.101	1.717	0.226	4.074	4.5	3.0	200	5.67+N×0.42	50
JBP600 23 (F)	200,000		0.101	2.121	0.226	4.979	4.5	3.0	200	5.67+N×0.42	50
JBP600 27 (F)	250,000	300,000	0.101	2.525	0.226	5.884	4.5	3.0	200	5.67+N×0.42	50
JBP600 33 (F)	300,000		0.101	3.131	0.226	7.242	4.5	3.0	200	5.67+N×0.42	50
JBP600 37 (F)	350,000	400,000	0.101	3.535	0.226	8.148	4.5	3.0	200	5.67+N×0.42	50
JBP600 45 (F)	400,000		0.101	4.343	0.226	9.958	4.5	3.0	200	5.67+N×0.42	50
JBP600 47 (F)		500,000	0.101	4.545	0.226	10.411	4.5	3.0	200	5.67+N×0.42	50
JBP600 51 (F)	450,000		0.101	4.949	0.226	11.316	4.5	3.0	200	5.67+N×0.42	50
JBP600 57 (F)	500,000	600,000	0.101	5.555	0.226	12.674	4.5	3.0	200	5.67+N×0.42	50
JBP600 61 (F)	550,000		0.101	5.959	0.226	13.579	4.5	3.0	200	5.67+N×0.42	50
JBP600 67 (F)	600,000	700,000	0.101	6.565	0.226	14.937	4.5	3.0	200	5.67+N×0.42	50
JBP600 73 (F)	650,000		0.101	7.171	0.226	16.295	4.5	3.0	200	5.67+N×0.42	50
JBP600 79 (F)	700,000		0.101	7.777	0.226	17.653	4.5	3.0	200	5.67+N×0.42	50
JBP600 85 (F)	750,000		0.101	8.383	0.226	19.011	4.5	3.0	200	5.67+N×0.42	50
JBP600 91 (F)	800,000		0.101	8.989	0.226	20.369	4.5	3.0	200	5.67+N×0.42	50
JBP600 113 (F)	1,000,000		0.101	11.211	0.226	25.348	4.5	3.0	200	5.67+N×0.42	50

Max. Flow Rate[m³/hr] : 43

JBP800 Series



- Boiler
- Oil Cooler
- Water
- Steam



BPHE 설계 조건

형식	유체	입구측 온도조건	출구측 온도조건
1차측	WATER	80℃	45℃
2차측	WATER	15℃	40℃
1차측	STEAM	133℃	133℃
2차측	WATER	15℃	40℃

JBP800				
L1 (mm)	L2 (mm)	W1 (mm)	W2 (mm)	H (mm)
570	475	280	185	16.5+(nx2.42)

N : number of plate

Water / Steam & Water

JBP800	WATER (Kcal/2hr)	STEAM (Kcal/hr)	Heat Transfer Area / plate (m ²)	Total Heat transfer Area / (m ²)	Volume Channel (Liter)	Total Volume (Liter)	Test Pressure (Mpa)	Design Pressure (Mpa)	Design Temperature (°C)	Weight (Kg)	Connection Size(A)
JBP800 23 (F)	300,000		0.144	3.024	0.327	7.198	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 25 (F)		400,000	0.144	3.312	0.327	7.852	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 31 (F)	400,000		0.144	4.176	0.327	9.815	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 33 (F)		500,000	0.144	4.464	0.327	10.470	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 39 (F)	500,000	600,000	0.144	5.328	0.327	12.433	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 47 (F)	600,000		0.144	6.480	0.327	15.050	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 53 (F)		800,000	0.144	7.344	0.327	17.013	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 63 (F)	800,000		0.144	8.784	0.327	20.285	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 67 (F)		1,000,000	0.144	9.360	0.327	21.594	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 73 (F)	850,000		0.144	10.224	0.327	23.557	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 79 (F)	1,000,000		0.144	11.088	0.327	25.520	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 81 (F)		1,200,000	0.144	11.376	0.327	26.174	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 93 (F)	1,200,000		0.144	13.104	0.327	30.101	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 101 (F)		1,500,000	0.144	14.256	0.327	32.718	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 121 (F)	1,800,000		0.144	17.136	0.327	39.262	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 135 (F)		2,000,000	0.144	19.152	0.327	43.842	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 139 (F)	1,800,000		0.144	19.728	0.327	45.151	4.5	3.0	200	7.47*(nx0.394)	50
JBP800 153 (F)	2,000,000		0.144	21.744	0.327	49.731	4.5	3.0	200	7.47*(nx0.394)	50

Max. Flow Rate[m³/hr] : 43