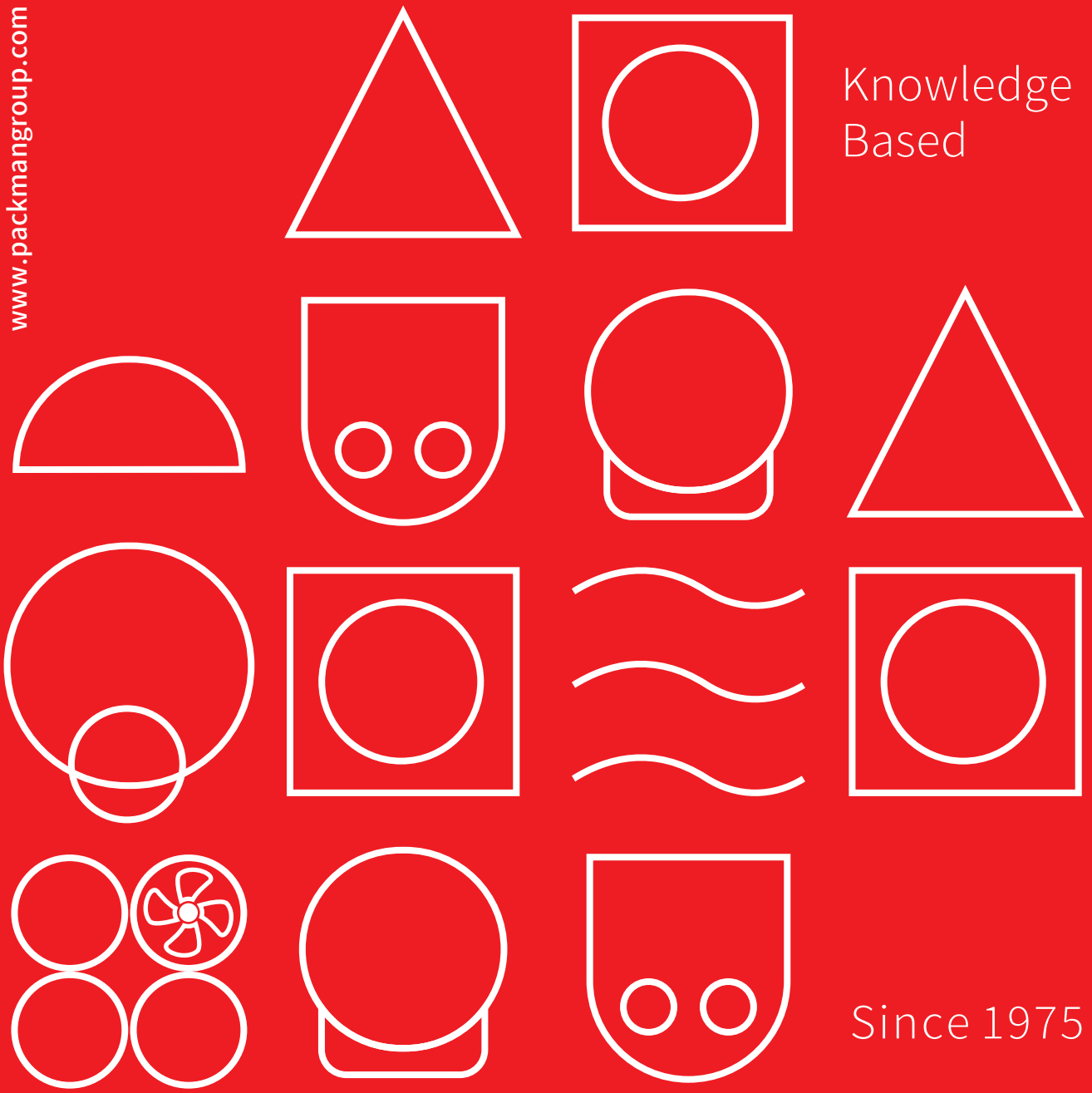


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Knowledge
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PACKMAN
Industrial Group

 Hydraulic Separator
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Hydraulic Separator

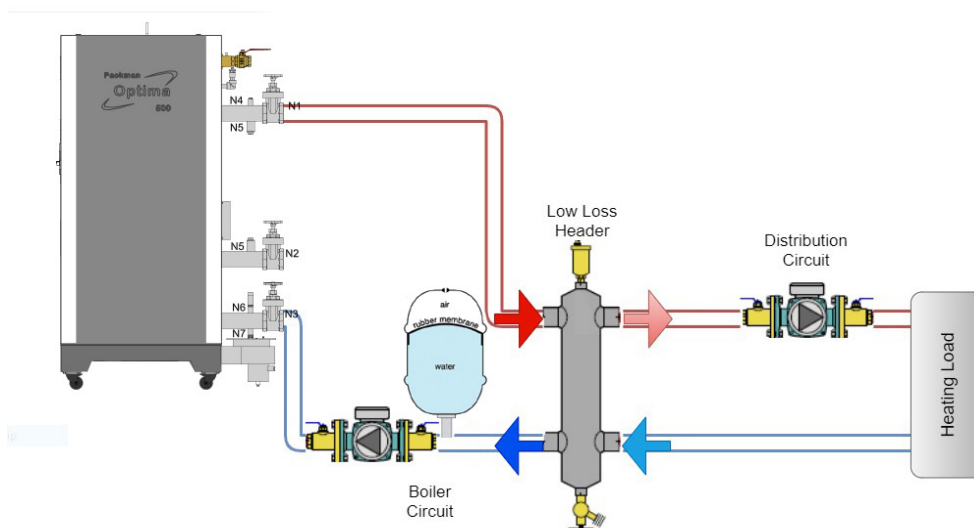




Product Description

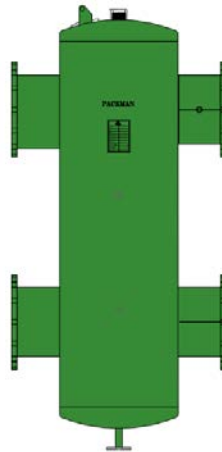
Using a Hydraulic Separator makes the water circulation path in the boiler (primary circuit) and circulation path on the consumer side (secondary circuit) separated hydraulically. Finally, this condition causes stability in the system and also creates a hydraulic structure that can play an influential role to release the air trapped in the design and to remove any debris collected at the bottom of the vessel.

In fact, for the proper operation of the boiler, to ventilate and prevent thermal load fluctuations of the system is recommended to use the method of the primary and secondary circuits with Hydraulic Separators in the design of systems.



In order to prevent noise and corrosion in the body and nozzles, the fluid velocity must be controlled.

Also, the low velocity of the fluid in the Hydraulic Separator, it makes possible that the accumulation of sediments in the lower part, which is why the Hydraulic Separator should be vertical and have a drain valve.

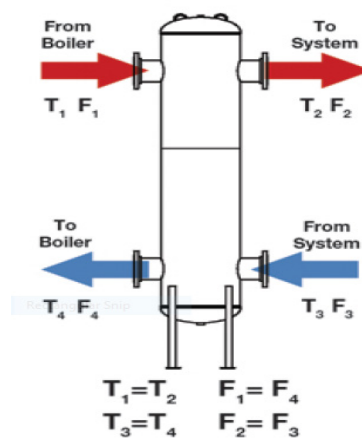


Specifications of Valves And Fittings	
Equip	Specification
Pressure Gauge	Filling with Glycerin Diameter=10 cm, Nominal Pressure Range: 0-10 bar & 0-20 bar
Temperature Transmitter	Operating Temperature: 0-100 °C 4-20 mA Sensor PT100

Based on the functional conditions of the consumer side and the boiler side, it may be mentioned in three modes as below:

1-Equal Flow

Flow Rate of Boiler and system (consumer Side) is equal.

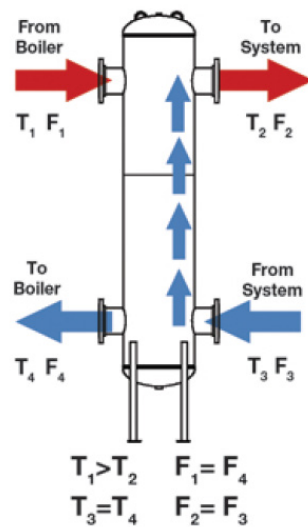


2- Greater Secondary Flow

In this case, the flow rate on the consumer side is greater than the flow rate



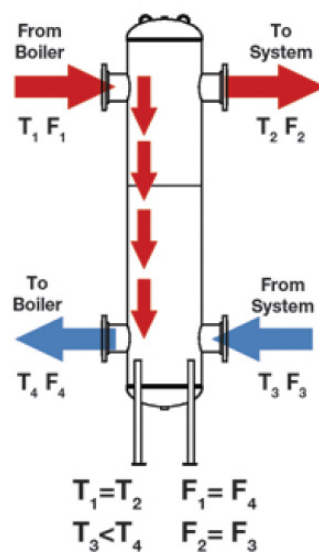
on the boiler side. In fact, in this case, the temperature of the return water from the system is lower and this temperature is mixed in the Hydraulic Separator body and as a result, the temperature of the water entering the system decreases.



3- Greater Primary Flow

In this case, the flow rate on the consumer side is lower than the flow rate on the boiler side.

Actually, System demand is less than boiler output, and in the Hydraulic Separator body, Water flow with higher temperature is mixed, and as a result, the temperature of the water returning to the boiler increases.





Formulas to determine temperature

$$T_2 = ((F_3 - F_1) T_3 + F_1 T_1) / F_3$$

$$T_4 = ((F_1 - F_2) T_1 + F_3 T_3) / F_1$$

Calculation

As shown in the figure, two primary and secondary circuits are connected to the Hydraulic Separator. For the sizing of the Hydraulic Separator, the temperature difference of any side that leads to a larger sizing is used as the calculation criterion. Usually, the temperature difference of the consumer side (secondary circuit) causes a larger size.

Circulating water flow is calculated

$Q = \dot{m} c \Delta T$ Q : Thermal capacity

$$\dot{m} (\text{kg/hr}) = \frac{Q (\text{kcal})}{\text{hr}} / \frac{C (\text{kcal})}{\text{kg} \cdot \text{C}} \Delta T (\text{C})$$

Therefore, the flow of water circulating in the circuit is calculated by the following method:

$$\dot{m} (\text{m}^3/\text{hr}) = \frac{Q (\text{kcal})}{\text{hr}} / \frac{C (\text{kcal})}{\text{kg} \cdot \text{C}} \Delta T (\text{C}) * 1000$$

Benefits and Functions of using Hydraulic Separator

- Creating hydraulic balance in primary and secondary circuits
- Separates and vents air from the system.
- Separation and collection of impurities in the primary and secondary circuits

Benefits and Functions of using Hydraulic Separator		
Head	Shell	Item
Up to 16" Body size	SA 53	ASTMA234 GR.WBP
More than 16" Body size	SA 36	SA36



Welding conditions

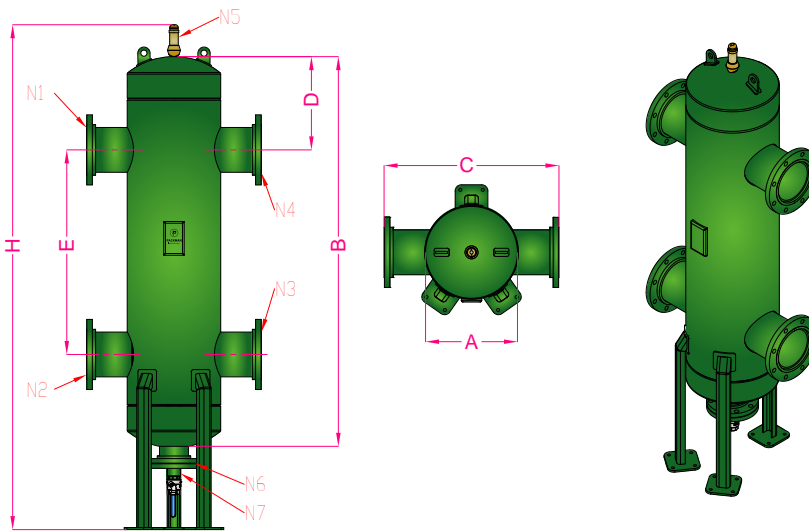
Welding equipment is used from Sweden's ISAB brand. Welding Hydraulic Separator components with the use of penetration welding methods including root pass welding steps, protective gas method Argon, filler pass, and face pass are performed using an electric arc method using an electrode EW7018.

Design standard

The ASME Sec VIII, Div.1 standard is used in the construction of the hydraulic separator Vessel Heads type, are tori spherical, this type of head compared to other shapes of the same thickness has a longer life and higher-pressure resistance.

The production price of each kilo of this lens can reach twice the price of normal lenses in the market.

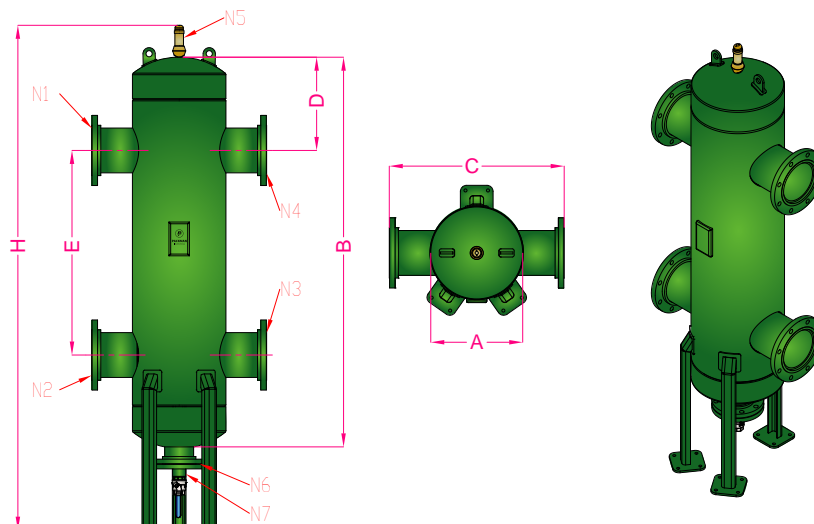




Hydraulic Separator Is Designed based on Higher Flow Rate. The Consumer Flow Rate Is Always Greater than or Equal to the Producer Flow Rate.

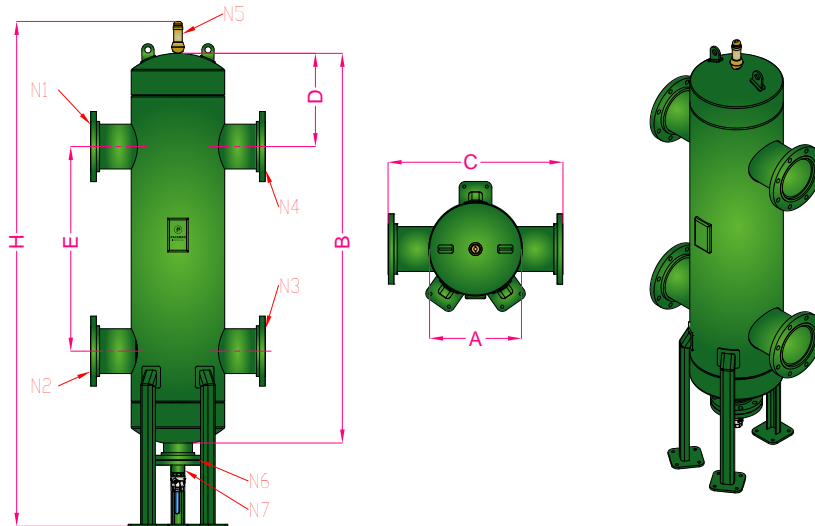
Model	Unit	PLL-2-6	PLL-21/2-8	PLL-3-10
Technical Data				
Design Standard	-	ASME SEC. VIII DIV.1		
Design Temperature	°C	5-100		
Flow Rate	m ³ /hr	5.7-8.6	8.6-17.2	17.2-34.4
Flow Rate	gpm	25-38	38-76	76-151
Heating Load	kW	100-150	150-300	300-600
Heating Load	kcal/hr	86,000-129,000	129,000-258,000	258,000-516,000
Cooling Load *	Btu/hr	341,000-512,000	512,000-1,024,000	1,024,000-2,048,000
Connection Size				
Primary Inlet /Outlet (N1,N2)	in	2	2 1/2	3
Secondary Inlet/Outlet (N3,N4)	in	2	2 1/2	3
Vent (N5)	in	1/2	1/2	1
HandHole (N6)	in	6	4	4
Drain (N7)	in	1	1	1 1/2
Material				
Shell	-	Carbon Steel/Stainless Steel/Galvanized Steel Based on Client Request		
Head	-	Carbon Steel/Stainless Steel/Galvanized Steel Based on Client Request		
Dimension				
A	in	6	8	10
B	mm	750	990	1240
C	mm	350	470	515
D	mm	190	270	340
E	mm	345	460	575
H	mm	1145	1545	1820

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Model	Unit	PLL-4-12	PLL-5-14	PLL-6-14
Technical Data				
Design Standard	-	ASME SEC. VIII DIV.1		
Design Temperature	°C	5-100		
Flow Rate	m ³ /hr	34.4-57.3	57.3-86.6	86.6-114.6
Flow Rate	gpm	151-252	252-381	381-505
Heating Load	kW	600-1,000	1,000-1,500	1,500-2,000
Heating Load	kcal/hr	516,000-860,000	860,000-1,290,000	1,290,000-1,720,000
Cooling Load *	Btu/hr	2,048,000-3,413,000	3,413,000-5,119,000	5,119,000-6,826,000
Connection Size				
Primary Inlet/Outlet (N1,N2)	in	4	5	6
Secondary Inlet/Outlet (N3,N4)	in	4	5	6
Vent (N5)	in	1	1	1
HandHole (N6)	in	5	5	5
Drain (N7)	in	11/2	11/2	11/2
Material				
Shell	-	Carbon Steel/Stainless Steel/Galvanized Steel Based on Client Request		
Head	-	Carbon Steel/Stainless Steel/Galvanized Steel Based on Client Request		
Dimension				
A	in	12	14	14
B	mm	1300	1530	1530
C	mm	635	695	695
D	mm	315	365	350
E	mm	690	810	830
H	mm	1910	2100	2100

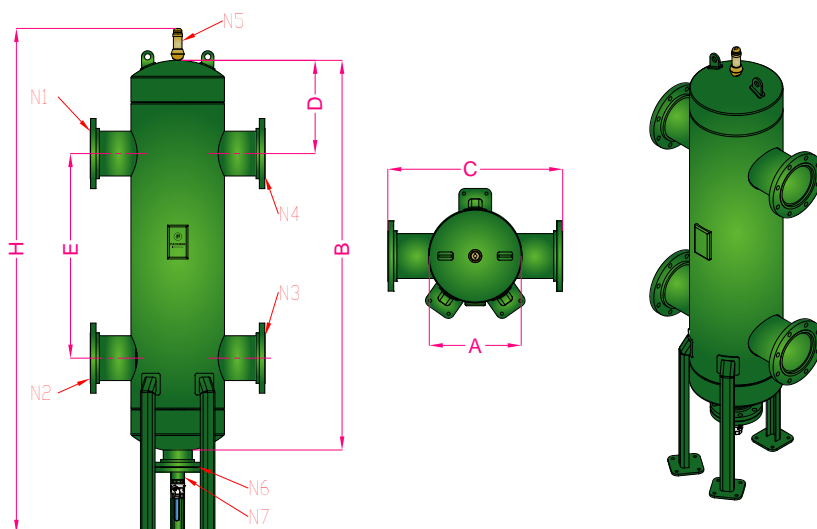
•The Term “Cooling Load” Refers to Using Hydraulic Separator for Cooling System (Chiller & Fancoil)



Model	Unit	PLL-8-16	PLL-8-18	PLL-10-20
Technical Data				
Design Standard	-	ASME SEC. VIII DIV.1		
Design Temperature	°C	5-100		
Flow Rate	m ³ /hr	114.6-172	172-229.3	229.3-286.6
Flow Rate	gpm	505-757	757-1010	1010-1262
Heating Load	kW	2,000-3,000	3,000-4,000	4,000-5,000
Heating Load	kcal/hr	1,720,000-2,580,000	2,580,000-3,440,000	3,440,000-4,300,000
Cooling Load *	Btu/hr	6,826,000-11,310,000	11,310,000-13,561,000	13,561,000-17,064,000
Connection Size				
Primary Inlet/Outlet (N1,N2)	in	8	8	10
Secondary Inlet/Outlet (N3,N4)	in	8	8	10
Vent (N5)	in	1	1	1
HandHole (N6)	in	5	5	8
Drain (N7)	in	2	2	2
Material				
Shell	-	Carbon Steel/Stainless Steel/Galvanized Steel Based on Client Request		
Head	-	Carbon Steel/Stainless Steel/Galvanized Steel Based on Client Request		
Dimension				
A	in	16	18	20
B	mm	1850	1905	2180
C	mm	775	855	890
D	mm	425	455	510
E	mm	1010	1000	1180
H	mm	2450	2470	2765

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10 • The Term "Cooling Load" Refer to Using Hydraulic Separator for Cooling System (Chiller & Fancoil)



Model	Unit	PLL-10-22	PLL-12-24	PLL-14-28
Technical Data				
Design Standard	-	ASME SEC. VIII DIV.1		
Design Temperature	°C	5-100		
Flow Rate	m ³ /hr	286.6-344	344-401.3	401.3-573.3
Flow Rate	gpm	1262-1515	1515-1767	1767-2524
Heating Load	kW	5,000-6,000	6,000-7,000	7,000-10,000
Heating Load	kcal/hr	4,300,000-5,160,000	5,160,000-6,020,000	6,020,000-8,600,000
Cooling Load *	Btu/hr	17,064,000-20,477,000	20,477,000-23,890,000	23,890,000-34,128,000
Connection Size				
Primary Inlet/Outlet (N1,N2)	in	10	12	14
Secondary Inlet/Outlet (N3,N4)	in	10	12	14
Vent (N5)	in	1	1	1
HandHole (N6)	in	8	8	8
Drain (N7)	in	2	2	2
Material				
Shell	-	Carbon Steel/Stainless Steel/Galvanized Steel Based on Client Request		
Head	-	Carbon Steel/Stainless Steel/Galvanized Steel Based on Client Request		
Dimension				
A	in	22	24	28
B	mm	2335	2500	2940
C	mm	960	1000	1130
D	mm	535	570	590
E	mm	1280	1370	1770
H	mm	2915	3085	3530

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• The Term “Cooling Load” Refer to Using Hydraulic Separator for Cooling System (Chiller & Fancoil)

PACKMAN GROUP

History

The Packman Company was founded in February 1975, and was soon afterwards registered in companies Registration Office. In early years the Packman construction and service branch focused on building installations. Different mega power plants were built by cooperating with Brown Boveri and Asseck companies in 1976.

The company started its official activities in construction of High-Pressure Vessels such as Hot-Water Boilers, Steam Boilers, Storage Tanks, Softeners and Heat Exchangers from 1984.

Packman Company is one of the first companies which supplied the high quality and standard hot water boilers to the customers.

Packman has exported its products to countries such as Uzbekistan, United Arab Emirates and other countries in the Middle East. It is one of the largest producers of hot-water and steam boilers in the Middle East.

Now we are proud to announce that the Packman industrial group has five major sub-brands that have product titles in all field of HVAC equipment and engineering services, and we do not know this success except with the help and support of our customers.

1. Construction Services Industry Association
2. Industry Association
3. Construction Companies' Syndicate
4. Technical Department Association
5. Mechanical Engineering Association
6. Engineering Standard Association

Departements:

Sales Deps:

- ∩ Power Plant & Petrochemical
- ∩ Industrial
- ∩ Hospitally Service
- ∩ Commercial & Residential
- ∩ Sport Complex & Pool

Technical Deps:

- ≡ Manufacturing R&D
- ≡ Innovation Center
- ≡ EPC Execute Unit
- ≡ Product Develop Unit
- ≡ Sales Engineering Dep.

Others:

- ≈ After Sales Service
- ≈ Project Control
- ≈ Financial Office
- ≈ Commercial Office
- ≈ Marketing Department



PACKMAN GROUP Brands



PACKMAN
Industrial Group

Designer & manufacturer of Condensing, Hot Water, Steam, Hot Oil & Waste Heat Boilers, Heat Exchangers, Autoclave Pressure & Storage Vessels & etc



GREENMAN
Green mindset, green future

Engineering & Designing Commercial Greenhouse Plant, CO2 Dosing System, Flue gas Condenser & Special HVAC Systems, Sustainable Agriculture & etc



ROMAN
Water solution

Designer & manufacturer Reverse Osmosis Plant & Package, Water Treatment, Softener & Filters and Chemical Dosing Systems & etc



RAADMAN
a look to the future

Designer & manufacturer of Industrial Mono & Dual Block Gas, LPG, Light & Heavy Oil Burners, Premixed & Postmixed Burners, Watertube burners, Process burners, Special application burners & Combustion Solutions & etc



CHILLMAN
Coolest hvac around

Designer & manufacturer of Air & Water Cooled Chillers, Air Handling Units, Fancoil, HVAC Equipment, Cold Storage Room & etc



1. Isfahan Factory



2. Vilashahr Factory



3. Parand Factory



4. Parand (2) Factory



5. Bonyad Factory

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