

Knowledge  
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Since 1975



**PACKMAN**  
Industrial Group

 Three Pass Hot Water Boiler  
powered by PACKMAN industrial group



# Three Pass Hot Water Boiler

[www.pakmanigroup.com](http://www.pakmanigroup.com)



## Product Description

Packman's Three Pass Boilers are fabricated in workshops equipped with most modern machines. Materials and workmanship are under a permanent quality control to construct reliable elements and groups.

Reliable to make sure that you can receive a highly efficient performance from your PACKMAN boiler, even after a number of years. Bellow are the advantages of packman's three pass boilers:

- The boilers are adjusted to the plant by heating circuit environment and construction conditions.
- Adaptability of the thermal layout to fuel, medium and operation
- Adjustability of the boiler to the plant with regard to heating, environmental and constructional conditions.
- Selection of dimensions and materials according to thermal stress and charge.
- Designed with the greatest possible elasticity to tolerate thermal stresses.
- Possible higher heating efficiency by cooling the flue gas touched surfaces with water and reducing the radiation heat losses.
- Highly economical operation made possible by optimum controllability.

### Three-pass Boiler

The three pass boiler is robust and economical. The furnace is formed with fire tubes.

flue gases pass through the furnace & are directed to the top smoke tubes where they are cooled down. Most of the large water capacity boilers are made of this type, it's been proven that three pass boilers are the most economical. Because of its structure three pass boiler is compatible with both liquid and gaseous fuels, or even coal and wood combustion.

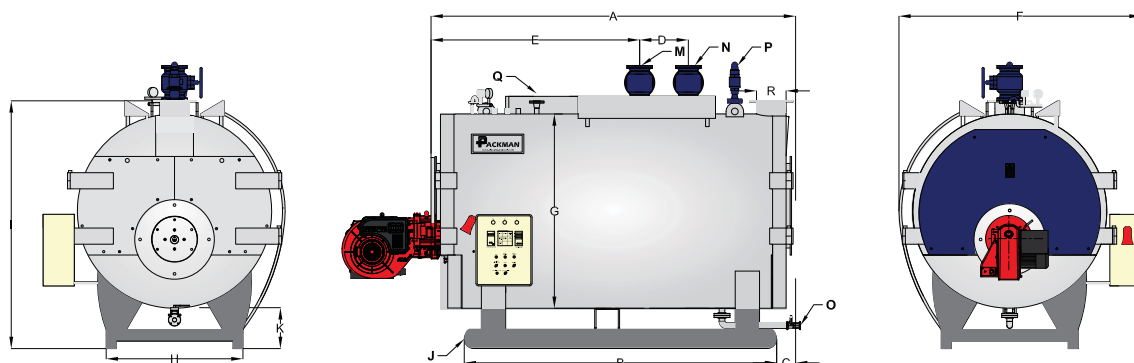
- Fire tubes: In a three pass boiler the combustion chamber is formed with fire tubes. The chosen diameter guarantees the desired flame. Based on the diameter and working pressure, it is decided to employ either plane fire tubes or spiral ones.
- Boiler supports & skids: For boilers stand on supports. Most of the units are delivered with skids; So there is no need for special foundations or installation processes. Also all necessary accessories for operation, such as oil or gas firing



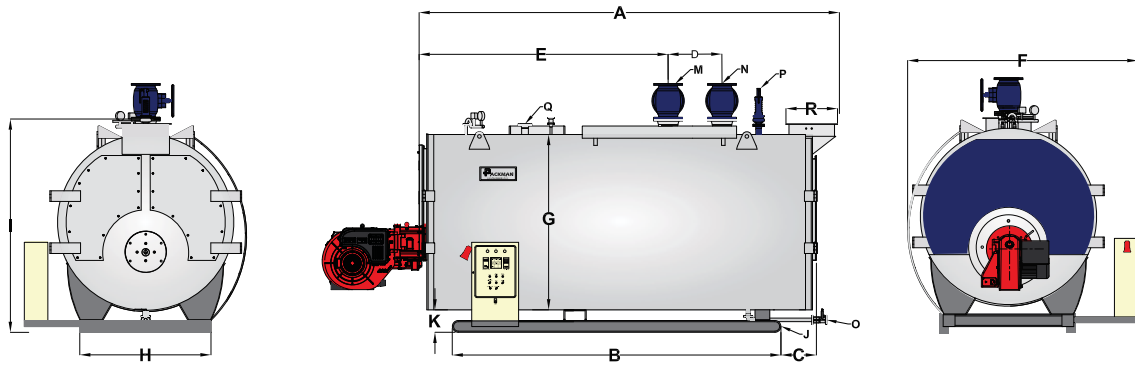


equipment, combustion air fan, oil pre heater, control panel or switchboard and feeding device, can be mounted on a skid.

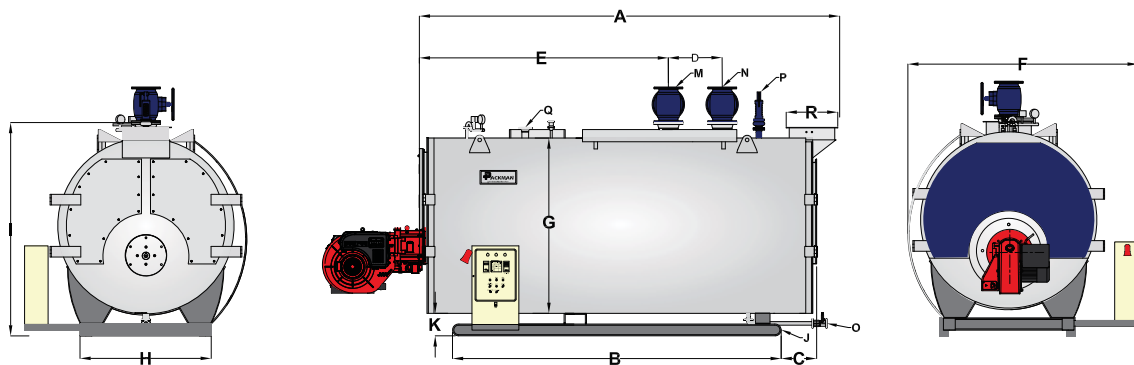
- **Boiler's insulation:** The cylindrical part of the boiler contains water, steam and the heating surfaces. From outside, the boiler is covered with a highly effective insulation as well as a cladding of stainless steel sheets (at both sides). All connections and nozzles including, mountings, fittings, control instrument nozzles, service platforms, flue gas reversing chambers and flue gas duct are mounted or contained in the boiler's cylindrical part. man-holes and hand-holes that are provided on the boiler's body as well, allow inspection at the water side and heating surfaces.
- **Smoke tubes:** The second and third boiler's passes are formed by thick-walled smoke tubes which are welded into the end plates. The tubes are easily accessible and can be cleaned without difficulty. The arrangement of the smoke tubes is according to the required specifications of ascending flue passes in order to prevent the formation of residual-or lingering gases.
- **Rear reversing chamber:** Packman's three pass fire tube boilers have an interior flue gas reversing chamber, situated in the water space. Here the direction of the flue gases, coming out of the fire tube is changed and they are distributed to the smoke tubes of the second pass. The all over cooling of the reversing chamber in the boiler's water contributes to an optimum heat utilization. The exterior of this reversing chamber is formed of tightly welded tube walls; Which is water cooled (Wet Back) and absolutely gas tight. Access openings allow a flue gas side inspection of the interior and exterior reversing chambers.
- **Front reversing chamber:** Inside of a tightly welded and insulated chamber made of steel sheets the flue gases pass from the second to the third pass. The reversing chamber is equipped with large doors, allowing free access to the smoke tubes for the purpose of easy maintenance and cleaning. High quality sealing materials guarantee that the doors seal the gas tightly. Specific explanations on three-pass boiler with wood or coal fuels and their special constructions can be sent upon request. In addition our engineers and other representatives are always at your service for further information and assistance.



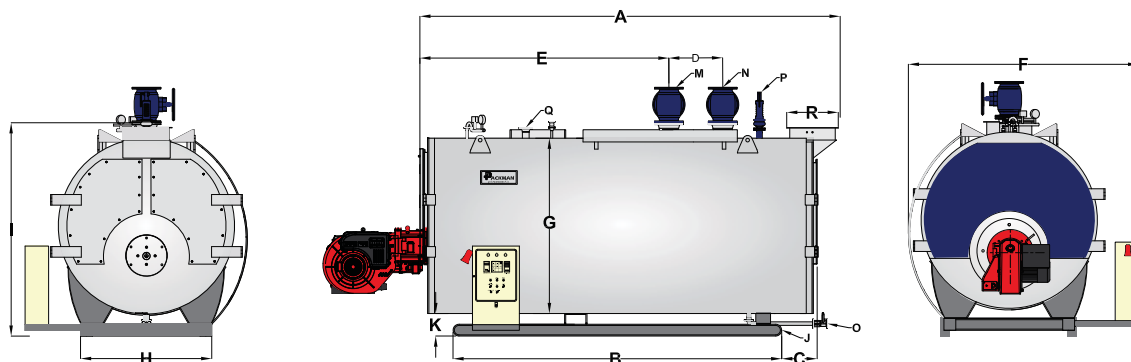
Model	Unit	PHWBN-350	PHWBN-500	PHWBN-700	PHWBN-800
<b>Technical Data</b>					
Thermal Capacity	kW	350	500	700	800
Thermal Capacity	kcal/hr	300,000	430,000	620,000	690,000
Working Pressure	bar	up to 30 bar			
Heating Surface	m <sup>2</sup>	16	17	26	27
Pressure Drop in Combustion Chamber	mbar	2.2	3.5	2.5	3.8
Design Standard	—	BS/EN 12953			
Max Gas Consumption @Sea Level	m <sup>3</sup> /hr	35	50	70	80
Max Fuel Oil Consumption @Sea Level	liter/hr	32	45	63	72
Max Heavy Fuel Oil Consumption @Sea Level	liter/hr	29	42	58	67
<b>Connectoins Size</b>					
Water Outlet (N)	in	3	4	4	4
Water Inlet (M)	in	3	4	4	4
Safety Valve @ 10 bar Working Pressure (P)	in	1	1	1	1
Expansion Valve (Q)	in	1	1 1/4	1 1/4	1 1/4
Venting Valve	in	1	1	1	1
Drain Valve (O)	in	1 1/4	1 1/4	1 1/2	1 1/2
Stack I.D. (R)	mm	203	254	305	305
<b>Boiler Dimensions</b>					
Length (A)	mm	2,750	3,200	3,400	3,500
Skid (B)	mm	2,300	2,700	2,700	2,700
Boiler Front to Water Outlet Flange (D)	mm	300	400	400	400
Boiler Front to Water Return Flange (E)	mm	1,700	2,000	2,200	2,320
Width (F)	mm	1,800	1,800	1,900	1,900
Boiler Outer Diameter (G)	mm	1,360	1,360	1,450	1,450
External Skid Width (H)	mm	900	900	1,050	1,050
Water Outlet Flange to Ground (I)	mm	1,850	1,850	1,920	1,920
Min Front Clearance	mm	2,400	2,800	3,000	3,150
Min Rear Clearance	mm	1,000	1,000	1,000	1,000
Min Side Clearance	mm	700	700	900	900
Min Boiler Room Length	mm	6,500	7,000	7,300	7,500
<b>Weight</b>					
Shipping Weight @ 10 bar Working Pressure	kg	2,450	2,700	3,350	3,450
Service Weight @ 10 bar Working Pressure	kg	3,850	4,190	5,090	5,270



Model	Unit	PHWBN-1000	PHWBN-1250	PHWBN-1500	PHWBN-1750	PHWBN-2000
<b>Technical Data</b>						
Thermal Capacity	kW	1,000	1,250	1,500	1,750	2,000
Thermal Capacity	kcal/hr	860,000	1,070,000	1,290,000	1,500,000	1,720,000
Working Pressure	bar	up to 30 bar				
Heating Surface	m <sup>2</sup>	30	34	44	48	75
Pressure Drop in Combustion Chamber	mbar	3.9	5.9	4.1	6.1	4.2
Design Standard	–	BS/EN 12953				
Max Gas Consumption @Sea Level	m <sup>3</sup> /hr	100	125	150	175	200
Max Fuel Oil Consumption @Sea Level	liter/hr	92	115	138	161	184
Max Heavy Fuel Oil Consumption @Sea Level	liter/hr	88	110	132	154	176
<b>Connectoins Size</b>						
Water Outlet (N)	in	4	5	5	6	6
Water Inlet (M)	in	4	5	5	6	6
Safety Valve @ 10 bar Working Pressure (P)	in	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2
Expansion Valve (Q)	in	1 1/2	1 1/2	1 1/2	2	2
Venting Valve	in	1	1	1	1	1
Drain Valve (O)	in	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Stack I.D. (R)	mm	360	360	410	400	400
<b>Boiler Dimensions</b>						
Length (A)	mm	3,520	3,880	3,920	4,270	4,730
Skid (B)	mm	2,600	2,700	2,700	3,000	3,700
Boiler Front to Water Outlet Flange (D)	mm	450	450	450	450	550
Boiler Front to Water Return Flange (E)	mm	2,140	2,350	2,320	2,690	3,080
Width (F)	mm	2,100	2,100	2,250	2,250	2,410
Boiler Outer Diameter (G)	mm	1,540	1,540	1,700	1,700	1,860
External Skid Width (H)	mm	1,000	1,000	1,120	1,120	1,240
Water Outlet Flange to Ground (I)	mm	2,010	2,010	2,190	2,190	2,350
Min Front Clearance	mm	3,300	3,700	3,600	4,000	3,900
Min Rear Clearance	mm	1,000	1,000	1,000	1,000	1,000
Min Side Clearance	mm	600	600	600	600	600
Min Boiler Room Length	mm	7,850	8,600	8,550	9,300	9,650
<b>Weight</b>						
Shipping Weight @ 10 bar Working Pressure	kg	3,900	4,300	5,000	5,500	7,200
Service Weight @ 10 bar Working Pressure	kg	6,060	6,790	7,560	8,990	11,900



Model	Unit	PHWBN-2500	PHWBN-3000	PHWBN-3500	PHWBN-4000	PHWBN-5000
<b>Technical Data</b>						
Thermal Capacity	kW	2,500	3,000	3,500	4,000	5,000
Thermal Capacity	kcal/hr	2,150,000	2,580,000	3,010,000	3,440,000	4,300,000
Working Pressure	bar	up to 30 bar				
Heating Surface	m <sup>2</sup>	82	100	110	130	150
Pressure Drop in Combustion Chamber	mbar	6.7	5.1	6.3	5.9	6.5
Design Standard	—	BS/EN 12953				
Max Gas Consumption @Sea Level	m <sup>3</sup> /hr	250	300	350	400	500
Max Fuel Oil Consumption @Sea Level	liter/hr	230	276	322	368	460
Max Heavy Fuel Oil Consumption @Sea Level	liter/hr	220	264	308	352	440
<b>Connectoins Size</b>						
Water Outlet (N)	in	6	8	8	8	10
Water Inlet (M)	in	6	8	8	8	10
Safety Valve @ 10 bar Working Pressure (P)	in	1 1/2	2	2 1/2	3	3
Expansion Valve (Q)	in	2	2	2	2	2
Venting Valve	in	1	1	1	1	1
Drain Valve (O)	in	1 1/2	1 1/2	1 1/2	2	2
Stack I.D. (R)	mm	400	510	510	510	610
<b>Boiler Dimensions</b>						
Length (A)	mm	5,140	5,170	5,490	5,490	5,720
Skid (B)	mm	4,000	4,000	4,000	4,000	4,000
Boiler Front to Water Outlet Flange (D)	mm	550	540	570	540	700
Boiler Front to Water Return Flange (E)	mm	3,520	3,470	3,640	3,640	3,840
Width (F)	mm	2,410	2,630	2,730	2,850	3,000
Boiler Outer Diameter (G)	mm	1,860	2,080	2,080	2,190	2,340
External Skid Width (H)	mm	1,240	1,400	1,400	1,500	1,600
Water Outlet Flange to Ground (I)	mm	2,350	2,570	2,570	2,700	2,860
Min Front Clearance	mm	4,300	4,300	4,500	4,500	4,560
Min Rear Clearance	mm	1,000	1,100	1,100	1,200	1,300
Min Side Clearance	mm	600	900	900	1,200	1,200
Min Boiler Room Length	mm	10,450	10,600	11,100	11,200	11,600
<b>Weight</b>						
Shipping Weight @ 10 bar Working Pressure	kg	7,500	8,600	9,600	12,500	13,000
Service Weight @ 10 bar Working Pressure	kg	12,730	14,890	16,470	20,190	21,950



Model	Unit	PHWBN-6000	PHWBN-7000	PHWBN-8000	PHWBN-9000	PHWBN-10000
<b>Technical Data</b>						
Thermal Capacity	kW	6,000	7,000	8,000	9,000	10,000
Thermal Capacity	kcal/hr	5,160,000	6,020,000	6,880,000	7,740,000	8,600,000
Working Pressure	bar	up to 30 bar				
Heating Surface	m <sup>2</sup>	183	220	260	290	330
Pressure Drop in Combustion Chamber	mbar	6.8	7.5	7.8	8.1	8.5
Design Standard	—	BS/EN 12953				
Max Gas Consumption @Sea Level	m <sup>3</sup> /hr	600	700	800	900	1,000
Max Fuel Oil Consumption @Sea Level	liter/hr	552	644	745	828	932
Max Heavy Fuel Oil Consumption @Sea Level	liter/hr	528	616	703	792	880
<b>Connectoins Size</b>						
Water Outlet (N)	in	10	10	10	10	12
Water Inlet (M)	in	10	10	10	10	12
Safety Valve @ 10 bar Working Pressure (P)	in	3	3	3	3	3
Expansion Valve (Q)	in	2	3	3	3	3
Venting Valve	in	1	1	1	1	1
Drain Valve (O)	in	2	2	2	2	2
Stack I.D. (R)	mm	610	610	610	760	760
<b>Boiler Dimensions</b>						
Length (A)	mm	6,070	6,260	6,670	6,760	7,000
Skid (B)	mm	4,800	5,000	5,000	5,000	5,500
Boiler Front to Water Outlet Flange (D)	mm	700	650	1,000	910	800
Boiler Front to Water Return Flange (E)	mm	4,230	4,550	4,000	3,990	4,620
Width (F)	mm	3,200	3,330	3,700	3,680	3,900
Boiler Outer Diameter (G)	mm	2,550	2,680	2,740	3,030	3,250
External Skid Width (H)	mm	1,770	1,850	2,000	2,150	2,300
Water Outlet Flange to Ground (I)	mm	3,080	3,210	3,400	3,580	3,780
Min Front Clearance	mm	4,900	5,100	5,200	5,300	5,800
Min Rear Clearance	mm	1,400	1,500	1,500	1,600	1,800
Min Side Clearance	mm	1,200	1,200	1,200	1,500	1,500
Min Boiler Room Length	mm	12,400	12,900	13,100	13,700	14,600
<b>Weight</b>						
Shipping Weight @ 10 bar Working Pressure	kg	16,500	18,400	22,000	23,700	29,500
Service Weight @ 10 bar Working Pressure	kg	28,390	32,190	38,365	42,640	50,500



# 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
- ⌒ Hospitality 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, Water tube  
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

# SOME OF Certificates are



# Knowledge Based



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