



## PERMAK Steam Generating Systems

High Efficient Steam Generators  
(Gas, Oil or Electric Heated.)

Clean (Pure) Steam Generators  
(Tube or Plate Type.)

Energy Saving Systems  
(Economizers, Heat Exchangers, Heat Recovery Devices.)

Auxiliary Equipments  
(Feed Water Tanks, Water Treatment/Softening Systems.)

**PERMAK**  
Enerji ve Buhar

Permak Enerji A.Ş.  
PERMAK Group of Companies

[www.permakenerji.com.tr](http://www.permakenerji.com.tr)



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# PERMAK

Leader in steam  
generating technology.

## PERMAK High Efficient Steam Generators designed in High Safety Standarts,

- High Quality, High Efficient and reliable Steam Production,
- Quality Assurance with 40 years experience on Steam Systems,
- 100% Operation Safety proper to International Norms,
- Highest Operational Efficiency Level in sector,
- Lowest Emmission level on it's range,
- Professional After Sales Service Organisation,
- Wide Capacity Range for fulfill all capacity demands,
- Full Modulated Operation just for production of necessity level,
- Advance Design does not need use of any Degassing nor Surface Blowdown,
- Double Jacketted Outer Body Insulation also provides pre heating of Combustion Air,
- Special Burner Design with Powerfull External Fan and special Prolonged Barrel,
- Full Electronic System with Advanced PLC Device controls all parameters of process,
- Very Short Steam Production Time in cold zone,
- Complete Package System consisting of Burner Group, Pumps, Safety Devices and Control Armatures.
- TÜV, TSEK & ISO Quality Certificates.

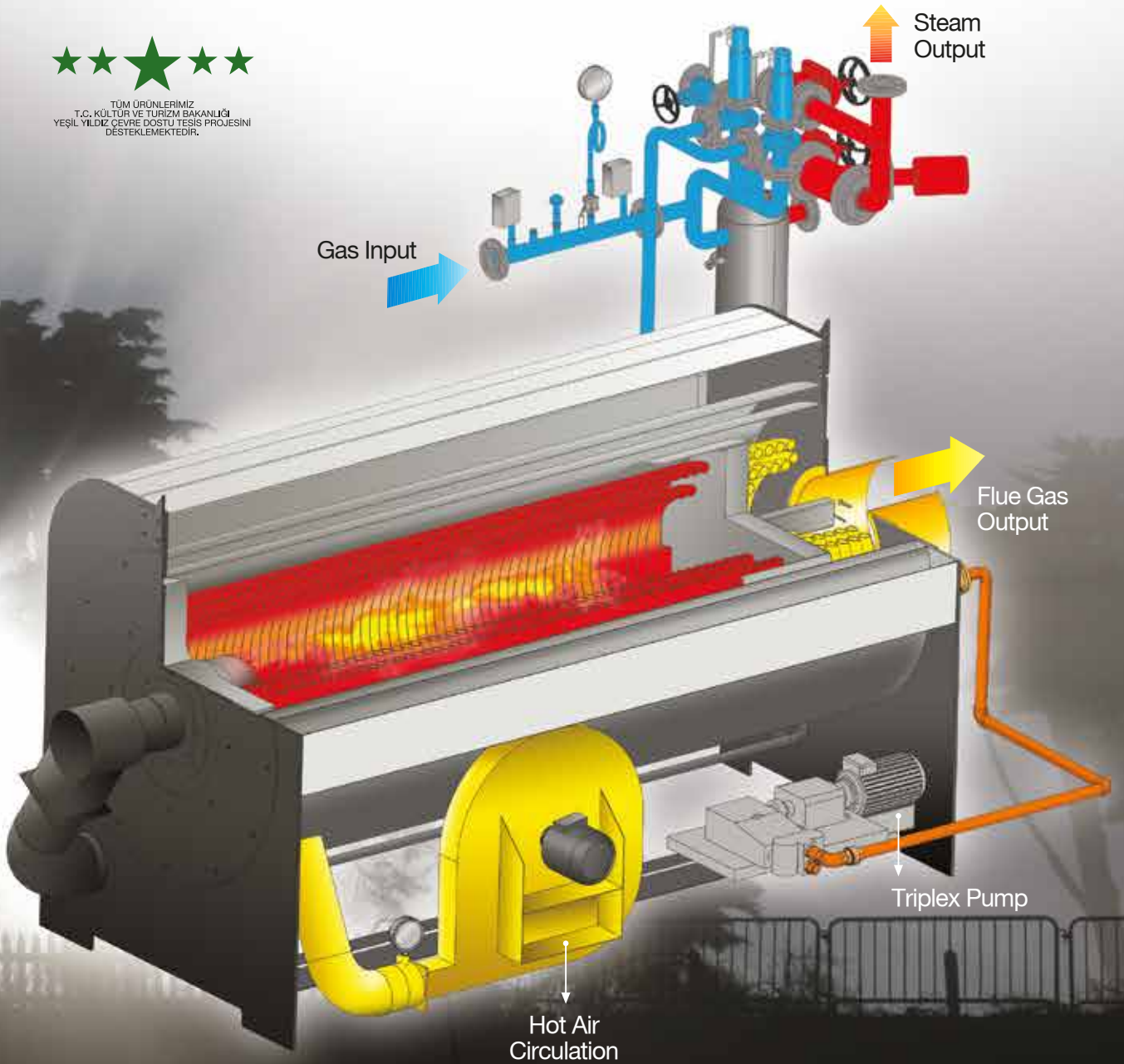
Some of the enterprises that prefer PERMAK Assurance



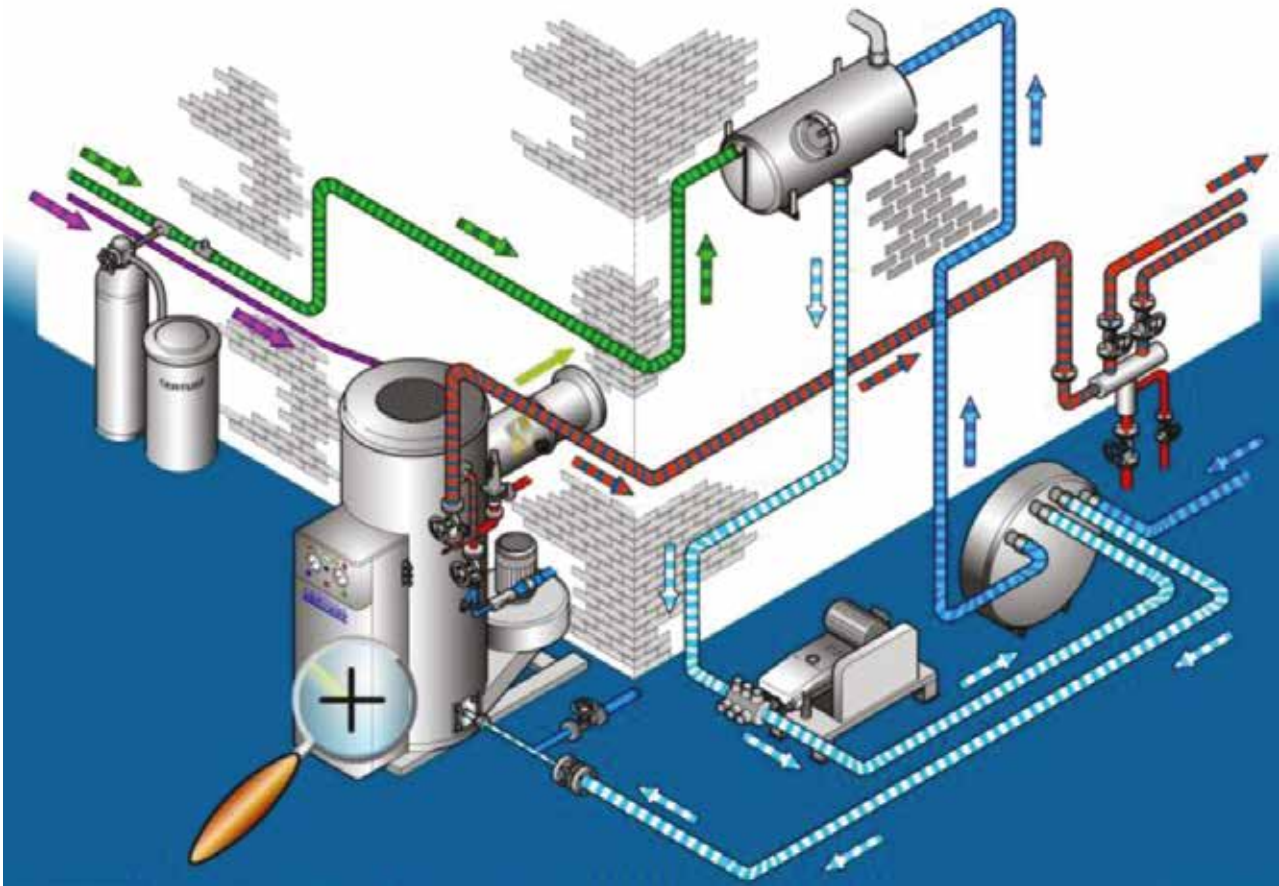
PERMAK successfully executes the after sales services of Steam Generators on worldwide. Authorised Technical Service Team in Permak Structure provides all training, repair and maintenance works of customers.



TÜM ÜRÜNLERİMİZ  
T.C. KÜLTÜR VE TURİZM BAKANLIĞI  
YEŞİL YILDIZ ÇEVRE DOSTU TESİS PROJESİNİ  
DESTEKLEMEKTEDİR.



# PERMAK Steam Generators



**High Quality Steam Production and Efficient Operation.** Permak Steam Generators are designed with high level Engineering Works under control of TÜV. Therefore, units provide high quality saturated steam in highest efficiency level. Additionally, design of Steam and Condensate Lines, Treatment of Water Supply are very important points for correct operation. Besides of Package Systems/Solutions, Permak Project Team may create most suitable system to a customer demand.

**Flexibility of Permak Steam Generating Systems.** Permak Steam Generators have very wide usage range on different sectors. We analysis the customer demands and prepare most suitable system. Our experiences at more than thousand references in various sectors give directions to our works.

**Operational Efficiency and Energy Savings.** Environmental Impacts and Energy Costs are most important key factors on worldwide. We designed our Steam Generators according to this policy and in result, we succesfully reached to highest efficiency level with minimum air pollution.

**Easy Usage with Ergonomic Control Systems.** Permak Steam Generators are produced with easy operation advantage. Control and Indication Systems are added for prevent of any damages to any person. Digital Indicator also protects the Steam Generator by showing all external faults.



## PERMAK H Serie High Capacity Steam Generators Jeneratörleri

- Full Safety Planning for production of High Pressure Steam suitable to International Norms (97/23EC Category III, IV.)
- Low Water Content Spiral Coil Design for minimizing of damages in case on any explosion.
- Heavy Duty, Strong Body Construction for long life operation.
- Advanced PLC Control Module for full automatic operation with fault indications.
- Auto Start and Auto Blow Down Functions with Pneumatic/Solenoid Control Valves.
- Separate Electric Panel collecting all control and measurement armatures inside of it.
- Full Modulated Operation controls the burner, fan, pump and steam valve.
- Proportional Steam Control Valve prevents over steam flow for continuously stable and saturated steam production.
- Electronic Fault Indication Device controls all outer problems for protect of unit. (Water Failure, Chimney Occlusion, Over Temperature, Over Pressure etc.)
- Beck type Burner Assembly for high efficient (>92%) operation with full combustion feature.
- Double Jacketed Outer Body Construction for pre heating of combustion air that provides energy savings (~1,6-1,9%) and less heat radiation to area.
- Triplex Piston type Feed Water Pump for high pressure (up to 30 bar) operation.
- Horizontal and Double Coil Design for better heat distribution and for easy replacement of any coils.
- TÜV, TSE/TSEK and ISO Quality certificates.
- Pre Piped Package system option for easy installation process on job side.



H Serie Steam Generators		H2000	H2500	H3000	H3500	H4000
Steam Capacity (Tw:100°C)	kg/sa.	2.000	2.500	3.000	3.500	4.000
Steam Heat Power	kcal/sa.	1.160.000	1.450.000	1.740.000	2.030.000	2.320.000
Steam Heat Power	kWh.	1.349	1.686	2.023	2.360	2.698
Steam Pressure	bar.	04-10 (12)	04-10 (12)	04-10 (12)	04-10 (12)	04-10 (12)
Burner Power	kW.	1.500-2100	1.875-2100	2.250-2750	2.625-2.750	3.000-3200
Oil Consumption (NG-LNG-LPG)	kWh.	1.480	1.850	2.220	2.590	2.960
Unit Water Volume	lt.	240,0	300,0	360,0	420,0	480,0
Unit Coil Surface	m <sup>2</sup>	32,0	40,0	48,0	56,0	64,0
Steam Connection	mm.	DN65	DN65	DN80	DN100	DN100
Exhaust Connection	mm.	ø500	ø500	ø600	ø600	ø600
Fuel Connection (NG:300 mbar.)	inch.	R2"	R2"	R2 1/2"	R2 1/2"	R3"
Electr.Conn. 380-400/50/3	kW.	15,0	18,0	21,0	24,0	27,0
Unit Weight (-)	kg.	2.400	2.900	3.400	3.950	4.450
Unit Dimensions 8w*d*h)	cm.	150x290x180	165x320x180	180x400x200	180x440x200	210x450x220

# PERMAK Steam Generators

## PERMAK U Serie Medium Capacity Steam Generators



- Full Safety Planning for production of High Pressure Steam suitable to International Norms (97/23EC Category III, IV.)
- Low Water Content Spiral Coil Design for minimizing of damages in case on any explosion.
- Heavy Duty, Strong Body Construction for long life operation.
- Advanced PLC Control Module for full automatic operation with fault indications.
- Separate Electric Panel collecting all control and measurement armatures inside of it.
- Full Modulated Operation controls the burner, fan, pump and steam valve.
- Electronic Fault Indication Device controls all outer problems for protect of unit. (Water Failure, Chimney Occlusion, Over Temperature, Over Pressure etc.)
- Beck type Burner Assembly for high efficient (>92%) operation with full combustion feature.
- Double Jacketed Outer Body Construction for pre heating of combustion air that provides energy savings (~1,6-1,9%) and less heat radiation to area.
- Triplex Piston type Feed Water Pump for high pressure (up to 30 bar) operation.
- Vertical and Double Coil Design for better heat distribution and for easy replacement of any coils.
- TÜV, TSE/TSEK and ISO Quality certificates.
- Pre Piped Package system option for easy installation process on job side.
- Auto Start and Auto Blow Down Function options with Pneumatic/Solenoid Control Valves.

U Serie Steam Generators		U700	U850	U1000	U1300	U1500	U1800	U2000
Steam Capacity (Tw:100°C)	kg/h.	750	960	1.200	1.500	1.500	1.800	2.000
Steam Heat Power	kWh.	492	629	787	984	984	1.180	1,312
Steam Heat Power	kcal/sa.	423,000	541,000	677,000	846,000	846,000	1,015,000	1,128,000
Steam Pressure Std.	bar.	08-14-22-29		08-14-22-29		08-14-22-29		
Steam Pressure Max.	bar.	10-16-25-32		10-16-25-32		10-16-25-32		
Unit Water Volume	lt.	103,5		155,7		218,0		
Unit Coil Surface	m <sup>2</sup> .	16,4	16,6	23,7	23,7	30,4	30,4	30,4
Burner Power	kW.	547	699	874	1,093	1,093	1,311	1,457
TC Modulation	%	50-100	50-100	50-100	50-100	50-100	50-100	50-100
Electr.Conn. 380-400/50/3	kW.	6.80		9.20		13.20		
Steam Connection	mm.	DN50		DN50		DN65		
Exhaust Connection	mm.	ø300		ø350		ø500		
Body Diameter	mm.	ø870		ø1.000		ø1.100		
Unit Weight (-)	kg.	1.100		1.500		2.300		
Unit Dimensions 8w*d*h)	mm.	1160x1870x2290		1260x2125x2535		1380x2310x2675		

## PERMAK M Serie Smoke Pipe Steam Generators



- Full Safety Planning for production of Medium Pressure Steam suitable to International Norms.
- Low Water Content Design for minimizing of damages in case on any explosion.
- Heavy Duty, Strong Body Construction for long life operation.
- Special smoke pipe type (no coils) design provides easy operation and less maintenance.
- Advanced PLC Control Module for full automatic operation with fault indications.
- Separate Electric Panel collecting all control and measurement armatures inside of it.
- Electronic Fault Indication Device controls all outer problems for protect of unit. (Water Failure, Chimney Occlusion, Over Temperature, Over Pressure etc.)
- Beck type Burner Assembly for high efficient (>92%) operation with full combustion feature.
- Full isolated Outer Body for minimum level heat radiation to area.
- Industrial type double Peristaltic Water Pump for medium pressure (up to 8 bar) operation.
- TÜV, TSE/TSEK and ISO Quality certificates.
- Pre Piped Package system option for easy installation process on job side.
- Auto Start and Auto Blow Down Function options with Pneumatic/Solenoid Control Valves.

M Serie Steam Generators		M150	M300	M600	M1000
Steam Capacity (Tw:100°C)	kg/sa.	150	300	600	1000
Steam Heat Power	kcal/sa.	87.000	174.000	348.000	580.000
Steam Heat Power	kWh.	101	202	405	674
Steam Pressure	bar.	6,0-8,0	6,0-8,0	6,0-8,0	6,0-8,0
Burner Power	kW.	112-140	225-280	450-950	750-950
Oil Consumption (NG-LNG-LPG)	kWh.	111	222	445	740
Unit Water Volume	lt.	90	180	360	600
Steam Connection	inch.	R1"	R1 <sup>1</sup> / <sub>2</sub> "	R2"	R2 <sup>1</sup> / <sub>2</sub> "
Exhaust Connection	mm.	ø200	ø250	ø250	ø300
Fuel Connection (NG:300 mbar.)	inch.	R <sup>1</sup> / <sub>2</sub> "	R <sup>3</sup> / <sub>4</sub> "	R1"	R1 <sup>1</sup> / <sub>4</sub> "
Electr.Conn. 380-400/50/3	kW.	1,50	1,50	2,50	3,00
Unit Weight (~)	kg.	475	650	900	1.225
Unit Body Size	cm.	□ 70x70	□ 85x85	□ 95x95	□ 120x120
Unit Dimensions (w*d*h)	cm.	85x125x190	100x150x225	120x170x225	140x180x260





# PERMAK Container Type Steam Generators

Permak production programme also consist of package solutions for specific projects. These Systems are mounting to a Container or to a Platform with all pre-Piping Works, ready to use.

### System Components:

- Steam Generator (Single or Double),
- Feed Water Pump Group,
- Feed Water (Condensate) Tank w/ pre Heating Device,
- Auto Water Softener,
- Steam Separator (Dryer)
- Pre Piping with all necessary Armatures.

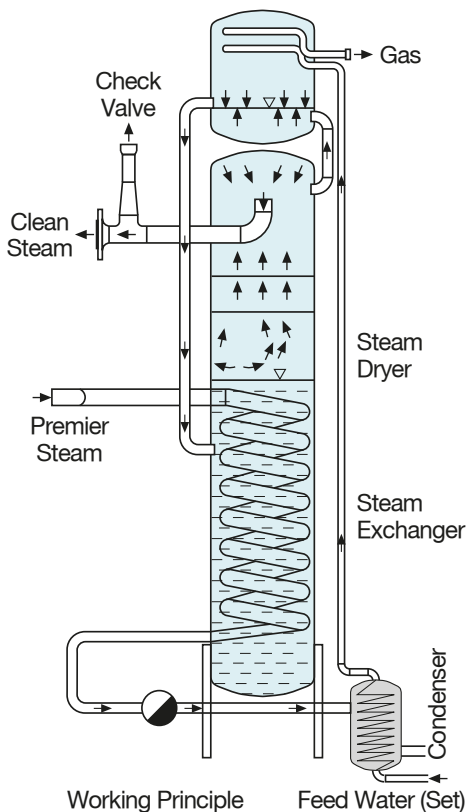
### Optional Components:

- Exhaust Gas Economizer,
- Flash Steam Tube Heat Exchanger,
- Electronic Dosing Unit,
- Auto Water Softener,
- Blow Down Cooling Mixer,
- Thermotimat Auto Start and Auto Drain System.



# PERMAK Clean (Pure) Steam Generators

### Degazor Gas Separator



Clean Steam is necessary for Sterilization, Vacuuming, Moisturing and Heating Processes and basically use in Food, Pharmacy, Cosmetic, Hospital Sectors. Hygienic Norms and PED Regulations of these processes are just provide by use of Seconder type Clean Steam Generators.



### Specifications:

- Complete High Grade Stainless Steel (316L/1715) material Construction,
- Tube or Plate type Heat Exchanger,
- Wide (150-4,000 kg/h-unit) Capacity Range,
- Spiral Heat Exchanger,
- Pump Feeding Station,
- Clean Steam production Module,
- Degassing (Gas Extraction) Module,
- Steam Dryer Chamber,
- Automatic operated Blow Down Module,
- Heat Isolation w/Alu Cover.

# PERMAK Steam Generators

## PERMAK Flash Steam Heat Exchangers

Permak Flash Steam Heat Exchangers are designed for heat recovery from condensate lines. When Condensate Lines return to Condensate Tank in high temperature, approx. 5-7% of it will be vaporised and heat content will be lost. Heat exchangers will recover this energy for Pre Heating of Feed Water or for producing of Hot Water.

### Advantages:

- Unit increases the Feed Water Temperature (from 90-95°C to 110-115°C) and provides Energy Savings between 4-13%.
- This energy saving is provided directly from fuel consumption without any Water Heating Systems.
- Unit prevents the Vaporising in Condensate Tanks.
- Unit provides better performance of Feed Water Pump.
- Increase of Savings will be available by using over heats of condensate lines (steam dryer, blow down flow etc.)
- Unit can easily install in front of Feed Water Tank by connection to Pump line.

## Permak Exhaust Gas Economizers

Permak Economizers are designed for recover of energy on high temperature Exhaust Gases of Steam Generators.

### Advantages:

- Unit provides 5-8% Energy Saving with reducing of Exhaust Gas Temperature down to 130-160°C.
- It's possible to use of this energy for Pre Heating of Feed Water or for Hot Water Production.
- Economizers are designed with minimum counter pressure. Therefore, suitable for all type of Permak Generators.
- Unit can easily install between Exhaust Gas Outlet of Generator and Chimney.
- Optional By-Pass Device is necessary for protection of Economizer Coils when heat does not recover.



## PERMAK Package Water Feeding Stations

Permak CVE Package Water Stations are usefull for any specific projects if space and time is limited. Systems will be delivered as completely pre piped and therefore, systems will need minimum work on job side.

### System Components:

- Feed Water Tank w/ Pre Heating Device,
- Feed Water Pump with Pre Pressure Pump and Sensitive Filtering Devices,
- Auto Water Softener,
- Steam Separator (Dryer)
- Pre Piping with all necessary Armatures.

### Advantages:

- Unit minimizes the Piping Works on Job Side. System will need just Feed Water, Fuel and Exhaust connections.
- Unit will have correct and levelled Piping Installation which provides space saving at Installation Area.
- System will provide saving from time with advantage of Immediate Start-Up of Unit.
- Unit can easily disassemble and install to any other area. This is big advantage for temporary processes.



## PERMAK Automation Units

Permak Automation Units provides full automatic operation of steam generator Systems without any action of a personnel.

### Advantages:

- Unit automatically realize the First Start & Last Blow Down operations without any stuff.
- Weekly Programming of Unit is available. Number of Shifts, Weekends, Hollidays can correctly set.
- Unit eliminates the use of Quality Stuff.
- Unit prevents any problem which is caused by any personnel faults.



## Permak Technical Service



Analysis & Projecting,  
Feasibility Studies, Design,  
Layout, Plumbing.

### Permak Service Scope:

- Repair/ Maintenance Services,
- Protective Maintenance (Periodical) Services,
- Spare Parts Supply Services.

### Our Customer Groups:

- Hotels, Hospitals,
- Food Sector (Beverage, Beer, Sweet Production etc.)
- Textile, Leather Production and Treatment Plants,
- Sterilization Systems,
- Hygienic Heating and Moisturing Systems,
- Industrial & Commercial Laundries,
- Dry Cleaning Shops,
- Heating and Hot Water Processes,
- Metal Surface Cleaning Devices,
- Marine Sector / Ships / Shipyards,
- Any Industrial Applications.

**PERMAK**  
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