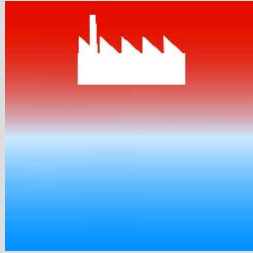


05-0110



# INDUSTRIAL GENERATORS

steam or MTHW  
97/23/CE - P.E.D. certified



# INDUSTRIAL GENERATORS **SILE**

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## TECHNIQUE, COMPETENCE, EXPERIENCE FOR INDUSTRY

The steam and MTHW production cost is a decisive factor for the production processes' economy that require high heat consumption. It is therefore very important the use of industrial generators with high efficiency, reliability and long life characteristics.

Sile meet this requirement planning and manufacturing package pressurized generators with very high efficiencies thanks to the rational utilization of the combustion and to the larger dimensioning which grant the generator's long life and reliability.

They can connect to gas, light oil and heavy oil fuels burners.



## The range

The Sile industrial generators' range foresees versions:

- n **reverse flame with three smoke runs, two of them in the furnace**; represents the best solution considering quality-price.
  - **VMB** low pressure steam generators (1 bar)
  - **VMA** medium pressure steam generators (8 bar)
  - **SMB** MTHW generators 5 bar - 120°C
  
- n **three real smoke runs, one of them in the smooth tubes** without turbolators, pass through flame and wet bottom. This manufacturing way as well as the studied designs by Sile, offers the maximum reliability, long life and performances, being always recommended to the firms that want to take the maximum advantage from their investments.
  - **PVM B.P.** low pressure steam generators (1 bar)
  - **PVM M.P.** medium pressure steam generators (8-12 bar)
  - **PAS-M** MTHW generators 5 bar - 120°C

## Fundamental aspects and advantages


- **Low heat load.** Sile generators have large heat exchange surfaces. Considering this advantage, the generators are never extremely stressed. The unit surface heat load and the furnace heat load are very low assuring high efficiencies constant in time and high reliability. For each model it is indicated in label the heat exchange surface.
- **High steam quality.** Thanks to the large generator's dimensioning, the volume and the stretch of steam water are big assuring high steam takings without water drops' drag. The produced steam always is high quality thanks to the specific laminating device that, drying it before the first outlet, assures an high level with a saturation point near to the unit. The steam production actually "dry" enables the best working of the whole steam net and users with high working economy reducing the boiler's condensate return.
- **Inspectionability.** All the steam generators are easily inspectionable both on the front and on the back. In three smoke runs version, the smooth tubes without turbolators dimensioned to keep high the gas of combustion, favours the the self cleaning reducing to the minimum the maintenance interventions.
- **High efficiency.** All the generators assure a very high and constant combustion efficiency with any combustion type thanks to the large furnace's dimensions that enables a perfect combustion, to the back reverse fire chamber entirely wet and to the boiler's body insulation.

## Quality construction

All the generators' manufacturing is done according to quality standards as per norm ISO 9001 and following the mostly advanced technologies with full penetrating weldings, expanded tubes to the tubes' plates for the three real smoke runs models, X-ray tests, weldings and final tests.

All the generators are tested in factory by I.S.P.E.S.L. – 0100 and certified CE according to the European Directory 97/23/CE-PED both for components and working assembly hot tested.

## Sile Package

Symbol  indicates the package Sile products: "plug and play", that is ready for use, for a simple installation, because complete of the main accessories..



# VMB 1 bar - 120°C

**LOW PRESSURE STEAM GENERATORS PACKAGE, HORIZONTAL SEMIFIXED TYPE, WITH REVERSE FLAME FURNACE.**

Pessurized steam generators with three real smoke runs, two of them in the furnace, smooth tubes with stainless steel turbolators.

Tested in production by I.S.P.E.S.L. 0100 as "ASSEMBLY" approved according the European Directive 97/23 CE-PED.

Working with gas, light oil, heavy oil. Complete of all the accessories (burner excluded) ready for working.

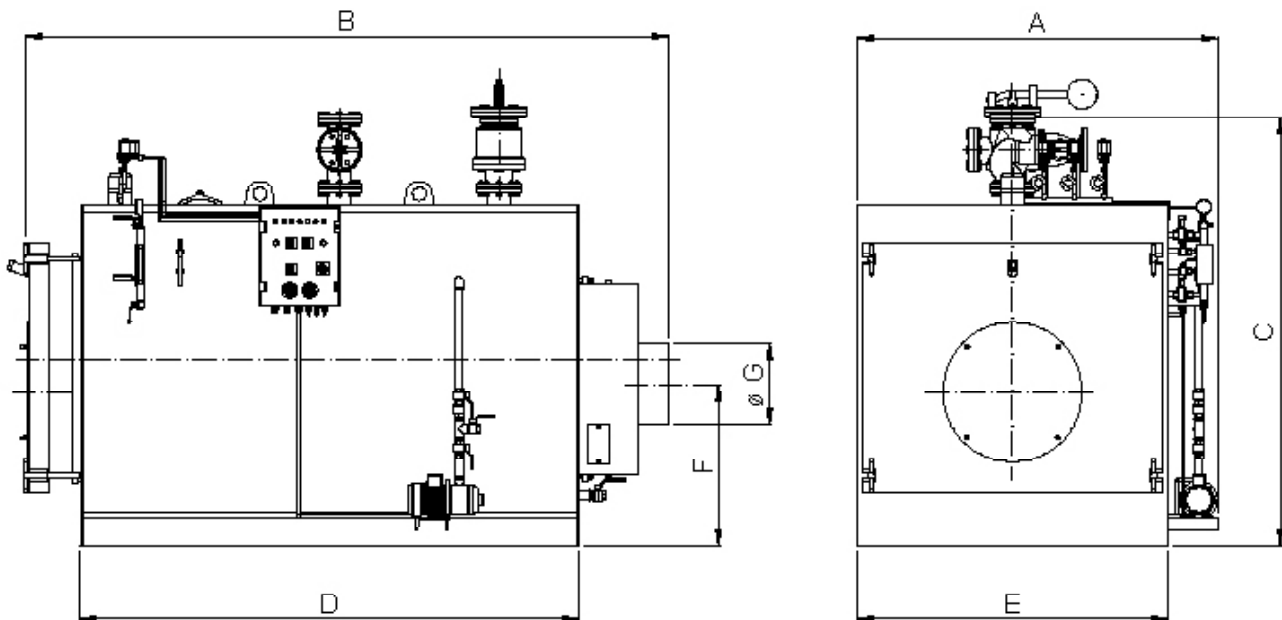
Pressure 1 bar - - Pressure 0,98 bar

Working temperature 120°C.

Excluded by I.S.P.E.S.L. control of start up.



### Dimensions and characteristics

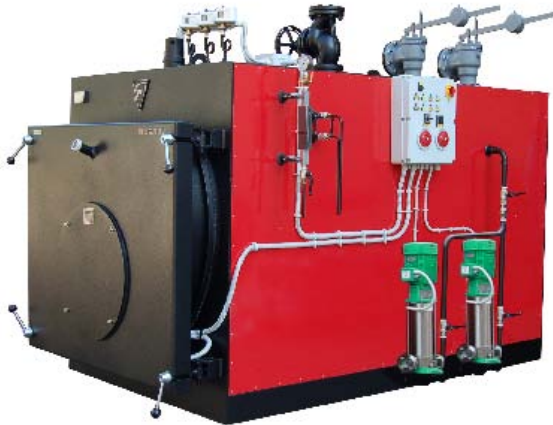


Model	Surface m <sup>2</sup>	Flow rate kW	Power output kW	Pression in combustion chamber mbar ±20%		Steam production with feed water at 80 °C kg/h	Total capacity l	Capacity at min. level l	Dimensions with accessories mm							Connections	
				light oil heavy oil	natural gas				A	B	C	D	E	F	G	Steam taking DN	Drain Ø
◆○★ VMB 100	8	115	103	1.0	0.8	157	760	560	1420	2000	1600	1500	1170	675	250	65	1"1/2
○★ VMB 170	8	195	174	2.0	1.6	265	760	560	1420	2000	1600	1500	1170	675	250	65	1"1/2
○★ VMB 260	9	292	262	2.8	2.2	399	840	610	1420	2140	1600	1650	1170	675	250	65	1"1/2
○★ VMB 370	9	415	366	3.5	2.8	557	840	610	1420	2140	1600	1650	1170	675	250	65	1"1/2
○★ VMB 500	16	560	502	3.0	2.4	764	1270	940	1560	2640	1700	2050	1310	750	300	65	1"1/2
○★ VMB 650	16	709	635	4.2	3.4	996	1270	940	1560	2640	1700	2050	1310	750	300	65	1"1/2
○★ VMB 750	16	838	750	5.2	4.2	1141	1270	940	1560	2640	1700	2050	1310	750	300	65	1"1/2
○★ VMB 1000	32	1116	1000	5.5	4.4	1522	2360	1860	1810	3210	2140	2500	1560	810	400	100	1"1/2
○★ VMB 1200	32	1376	1232	6.5	5.2	1875	2360	1860	1810	3210	2140	2500	1560	810	400	100	1"1/2
○★ VMB 1400	32	1586	1395	7.0	5.6	2000	2360	1860	1810	3210	2140	2500	1560	810	400	100	1"1/2

◆ V.V.F. exempt

○ I.S.P.E.S.L. approval required in Italy

★ Exempt by certified operator.



# M VMA 8 bar - 175,4°C

## MEDIUM PRESSURE STEAM GENERATORS PACKAGE, SEMIFIXED HORIZONTAL TYPE, WITH REVERSE FLAME FURNACE

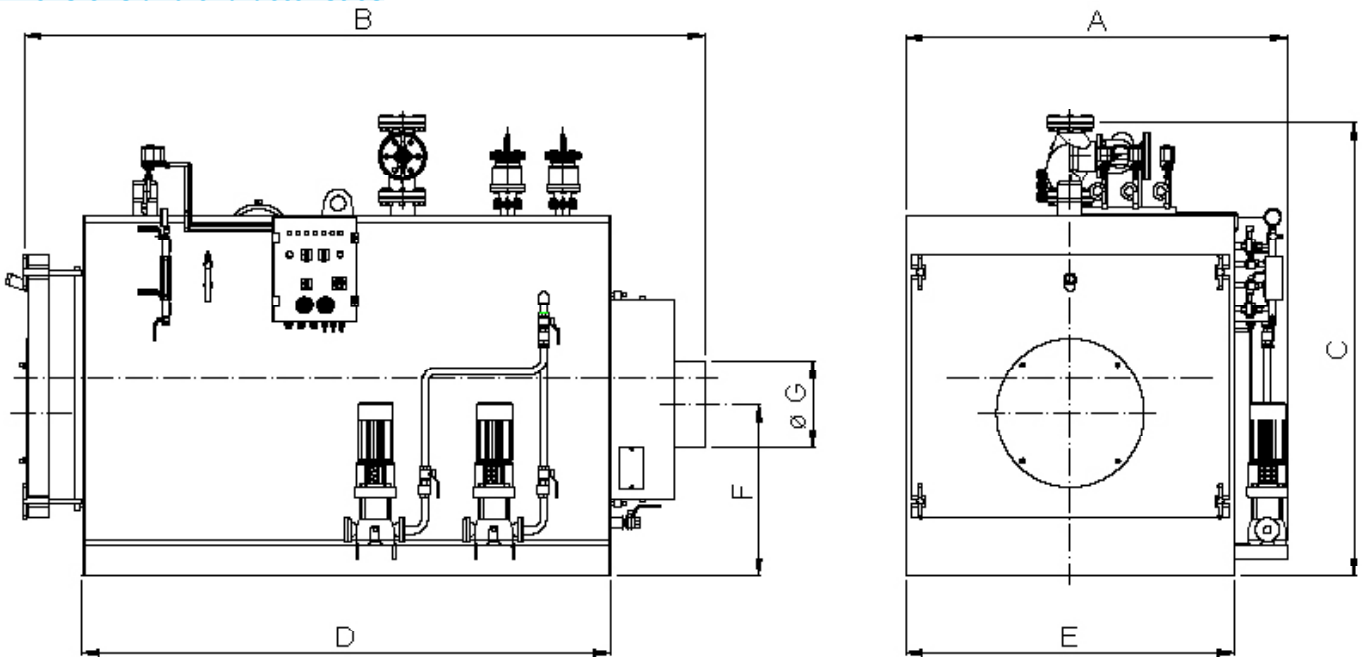
Pressurized steam generators with three real smoke runs, two of them in the furnace, smooth tubes with stainless steel turbolators.

Tested in production by I.S.P.E.S.L. 0100 as "ASSEMBLY" approved according the European Directive 97/23 CE-PED.

Working with gas, light oil, heavy oil. Complete of all the accessories (burner excluded) ready for working.

Pressure 8 bar - Working temperature 175,4°C.

### Dimensions and characteristics



Model	Surface m <sup>2</sup>	Flow rate kW	Power output kW	Pressure in combustion chamber mbar ±20%		Steam production with feed water at 80 °C kg/h	Total capacity l	Capacity at min. level l	Dimensions with accessories mm							Connections	
				heavy oil, diesel oil	natural gas				A	B	C	D	E	F	G	Steam taking DN	Drain DN
○□ VMA 230	8	262	235	3,5	2,8	347	840	610	1500	2140	1600	1650	1170	675	250	40	32
○□ VMA 300	8	350	308	4,2	3,4	455	840	610	1500	2140	1600	1650	1170	675	250	40	32
○□ VMA 500	15	558	502	3,8	3,0	742	1270	940	1650	2640	1700	2050	1310	750	300	50	32
○□ VMA 630	15	727	639	4,5	3,6	945	1270	940	1650	2640	1700	2050	1310	750	300	50	32
○□ VMA 750	15	852	767	5,0	4,0	1134	2360	1860	1900	3210	2140	2050	1310	750	400	65	40
○□ VMA 900	30	1023	921	5,5	4,4	1360	2360	1860	1900	3210	2140	2500	1560	810	400	65	40
○□ VMA 1050	30	1190	1047	6,2	5,0	1546	2360	1860	1900	3210	2140	2500	1560	810	400	65	40
○□ VMA 1200	30	1387	1221	7,0	5,6	1804	2360	1860	1900	3210	2140	2500	1560	810	400	65	40

○ I.S.P.E.S.L. approval required in Italy.  
 □ Exempt by certified operator.



### **M** PVM B.P. 1 bar - 120°C

**LOW PRESSURE STEAM GENERATORS PACKAGE, SEMIFIXED HORIZONTAL TYPE, WITH THREE REAL SMOKE RUNS**

Pressurized steam generators with three real smoke runs, two of them in the smooth tubes.

Tested by I.S.P.E.S.L. 0100 as "ASSEMBLY" approved according the European Directive 97/23 CE-PED.

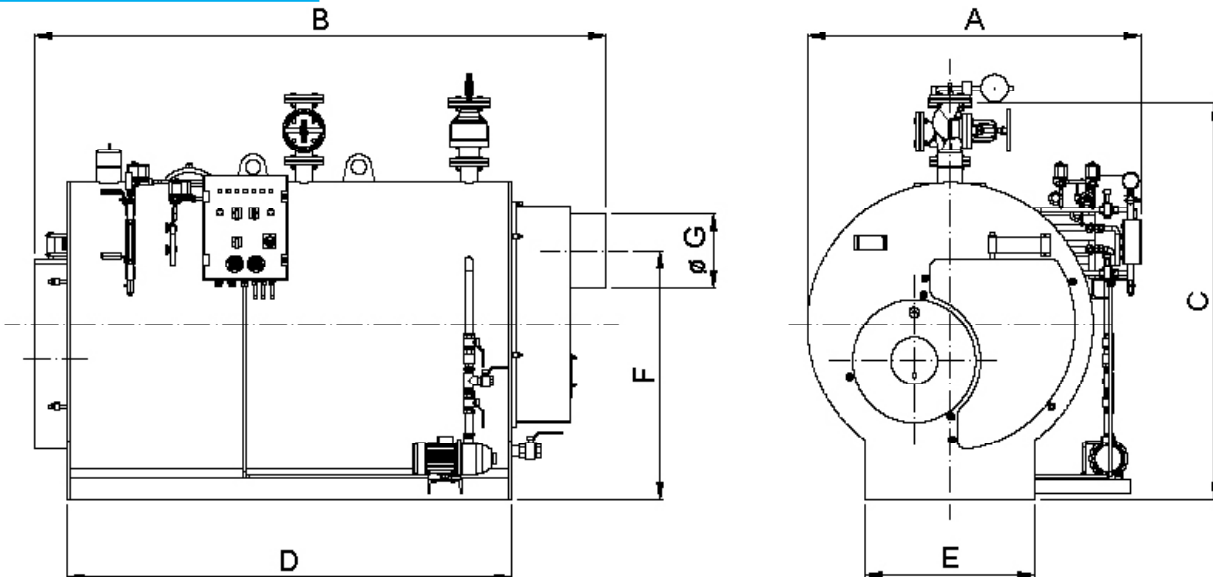
Working with gas, light oil, heavy oil. Complete of all the accessories (burner excluded) ready for working.

Pressure 1 bar - Working pressure 0,98 bar

Working temperature 120°C.

Exempt by I.S.P.E.S.L. test for start up.

#### Dimensions and characteristics



Model	Surface m <sup>2</sup>	Flow rate kW	Power output kW	Pressure in combustion chamber mbar ±20%		Steam production with feed water at 80 °C kg/h	Total capacity l	Capacity at min. level l	Dimensions with accessories mm							Connections	
				light oil, heavy oil	natural gas				A	B	C	D	E	F	G	Steam taking DN	Drain Ø
◆○★ PVM 10	9	115	103	0.5	0.4	157	860	700	1400	2030	1650	1500	700	1035	250	65	1"1/2
○★ PVM 15	9	195	174	0.8	0.6	265	860	700	1400	2030	1650	1500	700	1035	250	65	1"1/2
○★ PVM 22	9	277	244	1.6	1.3	371	860	700	1400	2030	1650	1500	700	1035	250	65	1"1/2
○★ PVM 28	10	331	296	2.8	2.2	450	995	870	1400	2430	1650	1900	700	1035	250	65	1"1/2
○★ PVM 35	10	415	366	3.5	2.8	557	995	870	1400	2430	1650	1900	700	1035	250	65	1"1/2
○★ PVM 50	22	581	521	2.8	2.2	792	1765	1445	1500	2700	2100	2100	800	1170	350	65	1"1/2
○★ PVM 60	22	697	622	3.6	2.9	945	1765	1445	1500	2700	2100	2100	800	1170	350	65	1"1/2
○★ PVM 72	22	837	738	5.0	4.0	1127	1765	1445	1500	2700	2100	2100	800	1170	350	65	1"1/2
○★ PVM 95	41	1104	988	4.5	3.6	1502	3160	2650	1750	3430	2200	2800	900	1360	450	100	1"1/2
○★ PVM 120	41	1378	1232	6.0	4.8	1875	3160	2650	1750	3430	2200	2800	900	1360	450	100	1"1/2
○★ PVM 136	41	1586	1395	6.5	5.2	2000	3160	2650	1750	3430	2200	2800	900	1360	450	100	1"1/2
○□ PVM 165	59	1919	1688	7.0	5.6	2578	5100	4300	1850	4030	2200	3250	900	1300	550	125	DN 40
○□ PVM 200	68	2384	2093	7.5	6.0	3000	5850	4500	2360	4560	2640	2150	1150	1690	550	125	DN 50
○ PVM 230	73	2643	2326	8.0	6.4	3552	6000	4600	2360	4760	2720	2250	1150	1690	550	150	DN 50
○ PVM 290	94	3302	2907	9.0	7.2	4440	6800	6800	2530	5460	2900	2500	1250	1800	650	150	DN 50
○ PVM 340	110	3953	3488	10.0	8.0	5327	10800	8350	2680	6250	3080	3350	1250	1875	650	200	DN 50

- ◆ V.V.F. exempt
- I.S.P.E.S.L. approval required in Italy.
- ★ Exempt by certified operator.
- Exempt by continuous presence of certified operator.



# PVM M.P. 8 bar - 175,4°C 12 bar - 191,5°C



### MEDIUM PRESSURE STEAM GENERATORS PACKAGE, SEMIFIED HORIZONTAL TYPE, WITH THREE REAL SMOKE RUNS

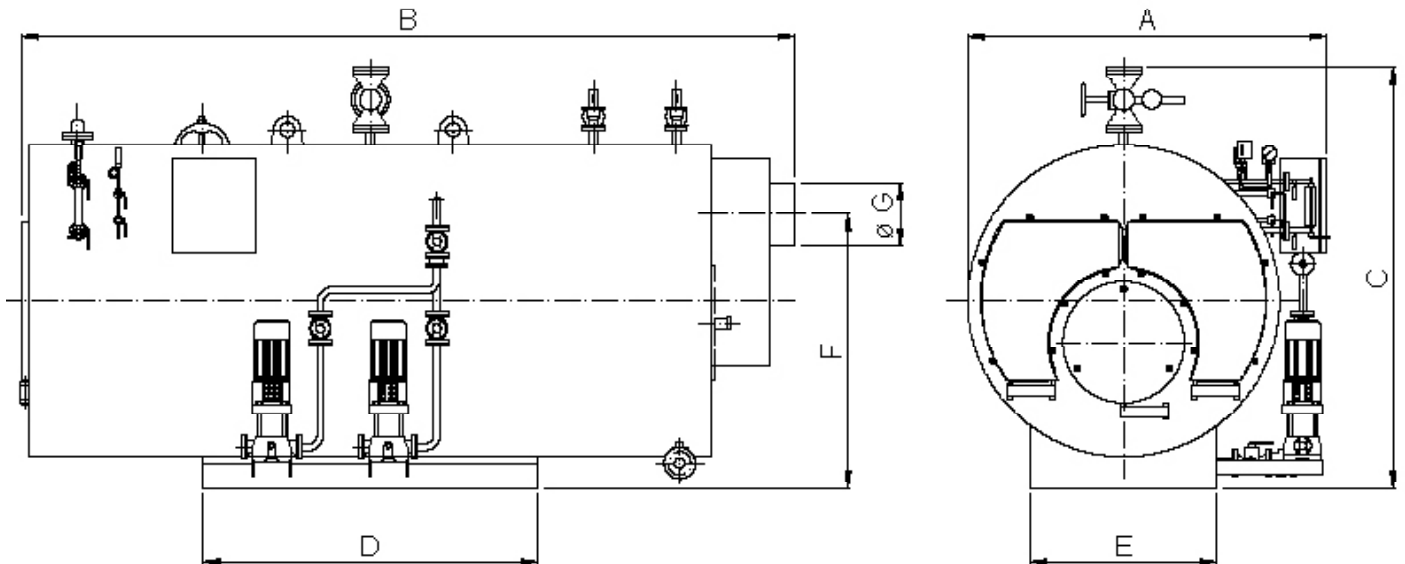
Pressurized steam generators with three real smoke runs, two of them in the smooth tubes.

Tested by I.S.P.E.S.L. 0100 as "ASSEMBLY" approved according the European Directive 97/23 CE-PED.

Working with gas, light oil, heavy oil. Complete of all the accessories (burner excluded) ready for working.

Pressure 8 - 12 bar - Working temperature 175,4 - 191,5 °C.

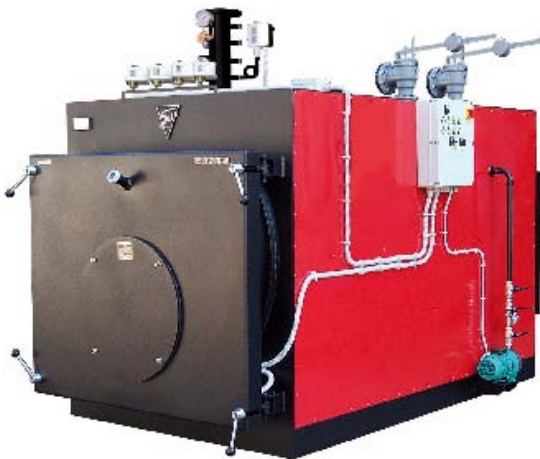
### Dimensions and characteristics



Model	Superficie m <sup>2</sup>	Flow rate kW	Power output kW	Pressure in combustion chamber mbar ±20%		Steam production with feed water at 80 °C kg/h	Total capacity l	Capacity at min. level l	Dimensions with accessories mm							Connections		
				Gasolio Olio comb.le	Gas Metano				A	B	C	D	E	F	G	Steam taking 8 bar DN	Steam taking 12 bar DN	Drain DN
○ □ PVM 25	11	317	279	2.5	1.8	412	1400	1100	1530	2380	1700	1850	700	1150	250	40	32	32
○ □ PVM 32	12	371	325	3.3	2.2	480	1550	1250	1530	2580	1700	2050	700	1150	250	40	32	32
○ □ PVM 36	13,5	462	407	3.8	2.6	601	1750	1400	1530	2830	1700	2300	700	1150	250	40	32	32
○ □ PVM 46	17	555	488	4.5	3.0	721	2400	1900	1800	2840	2020	1350	900	1320	300	50	40	32
○ □ PVM 54	19	634	558	6.0	4.0	824	2750	2170	1800	3140	2020	1450	900	1320	300	50	40	32
○ □ PVM 74	25	860	756	6.0	4.0	1117	3400	2700	1800	3740	2020	1600	900	1320	300	50	40	32
○ □ PVM 95	37	1104	988	4.5	3.0	1459	3500	2750	2200	3000	2550	1650	1150	1740	450	65	50	40
○ □ PVM 120	41	1378	1232	6.0	4.0	1820	3850	3050	2200	3200	2550	1750	1150	1740	450	65	50	40
○ □ PVM 136	45	1586	1395	6.5	4.3	2060	4250	3350	2200	3450	2550	2000	1150	1740	450	65	50	40
○ □ PVM 170	59	1983	1744	7.0	4.7	2576	6400	5050	2450	4400	2550	2460	1150	1650	550	80	80	50
○ □ PVM 200	70	2318	2040	7.5	5.0	3000	7000	5500	2450	4700	2550	2760	1150	1650	550	100	80	50
○ PVM 230	78	2643	2326	8.0	5.3	3435	7500	5900	2450	4950	2550	3010	1150	1650	550	100	80	50
○ PVM 290	98	3302	2907	9.0	6.0	4293	11600	8700	2650	5380	2850	2750	1250	1950	650	100	80	50
○ PVM 340	115	3953	3488	10.0	6.6	5151	13500	10100	2650	6080	2850	3350	1250	1950	650	125	100	50

○ I.S.P.E.S.L. approval required in Italy.

□ Exempt by continuous presence of certified operator.



### M SMB 5 bar - 120°C

MTHW GENERATORS, PACKAGE, SEMIFIXED HORIZONTAL TYPE, WITH FURNACE AT REVERSE FLAME.

Pressurized steam generators with three smoke runs, two of them in the furnace, smooth tubes with stainless steel turbolatoris.

Tested by I.S.P.E.S.L. 0100 as "ASSEMBLY" approved according the European Directive 97/23 CE-PED.

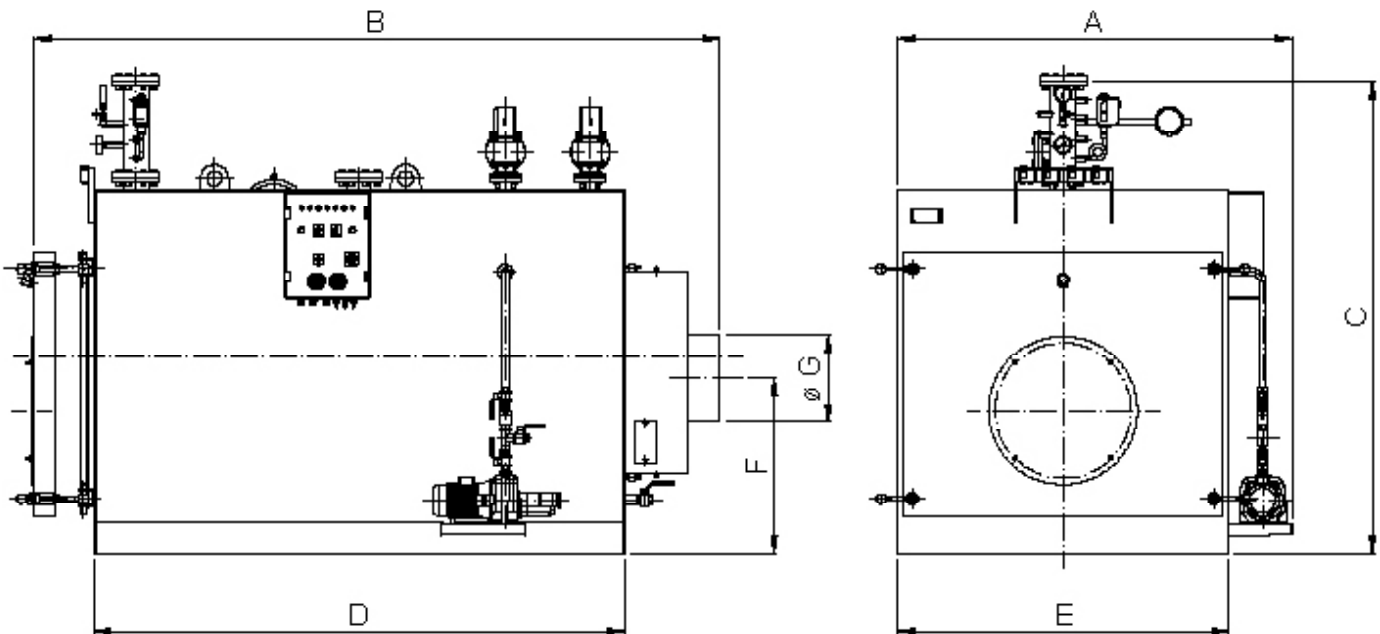
Working with gas, light oil, heavy oil. Complete of all the accessories (burner excluded) for automatic working.

Pressure 5 bar - Working temperature 120°C.

Eempt by I.S.P.E.S.L. test for start up.

TO BE COMBINED WITH EXPANSION TANKS AT 5 bar - 120 °C

#### Dimensions and characteristics



Model	Surface m <sup>2</sup>	Flow rate kW	Power output kW	Pressure in combustion chamber mbar ±20%		Total capacity l	Load loss hydraulic circuit with Δt=20°C mbar	Dimensions with accessories mm							Connectios	
				light oil, heavy oil	natural gas			A	B	C	D	E	F	G	takings overheat.wat DN	Drain Ø
◆○★ SMB 100	8	115	103	1.0	0.8	760	1.0	1420	2000	1600	1500	1170	675	250	80	1"1/2
○★ SMB 170	8	195	174	2.0	1.6	760	2.0	1420	2000	1600	1500	1170	675	250	80	1"1/2
○★ SMB 260	9	292	262	2.8	2.2	840	3.0	1420	2140	1600	1650	1170	675	250	80	1"1/2
○★ SMB 370	9	415	366	3.5	2.8	840	4.0	1420	2140	1600	1650	1170	675	250	80	1"1/2
○★ SMB 500	16	560	502	3.0	2.4	1270	4.5	1560	2640	1700	2050	1310	750	300	80	1"1/2
○★ SMB 650	16	709	635	4.2	3.4	1270	6.0	1560	2640	1700	2050	1310	750	300	80	1"1/2
○★ SMB 750	16	838	750	5.2	4.2	1270	7.5	1560	2640	1700	2050	1310	750	300	80	1"1/2
○★ SMB 1000	32	1116	1000	5.5	4.4	2360	12.0	1810	3210	2140	2500	1560	810	400	100	1"1/2
○★ SMB 1200	32	1376	1232	6.5	5.2	2360	13.0	1810	3210	2140	2500	1560	810	400	100	1"1/2
○★ SMB 1400	32	1586	1395	7.0	5.6	2360	14.0	1810	3210	2140	2500	1560	810	400	100	1"1/2

- ◆ V.V.F. exempt.
- I.S.P.E.S.L. approval required in Italy.
- ★ Exempt by certified operator.



# PAS-M 5 bar - 120°C

MTHW GENERATORS, **PACKAGE**, SEMIFIXED HORIZONTAL TYPE, WITH THREE REAL SMOKE RUNS.

Pressurized generators with three real smoke runs, two of them in the smooth tubes.

Tested by I.S.P.E.S.L. 0100 as "ASSEMBLY" approved according the European Directive 97/23 CE-PED.

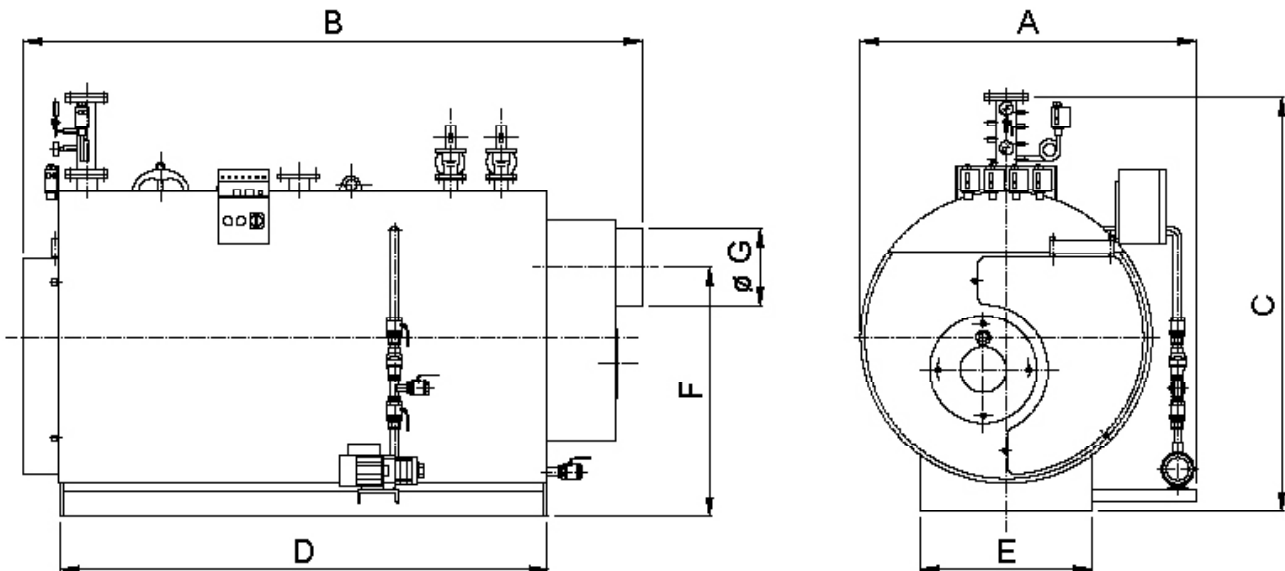
Working with gas, light oil, heavy oil. Complete of all the accessories (burner excluded) ready for working.

Pressure 5 bar - Working temperature 120°C.

TO BE COMBINED WITH EXPANSION TANKS AT 5 bar - 120 °C

☞ On request offers for overheated generators with 8 bar working pressure (working temperature 175,4 °C)

### Dimensions and characteristics



Model	Surface m <sup>2</sup>	Flow rate kW	Power output kW	Pressure of combustion chamber mbar ±20%		Total capacity l	Load loss hydraulic circuit with Δt=20°C mbar	Dimensions with accessories mm							Connections	
				light oil, heavy oil	natural gas			A	B	C	D	E	F	G	takings overheat.wat. DN	Drain Ø
◆○★ PAS-M 10	9	115	103	0.5	0.4	860	1.0	1350	2030	1850	1500	700	1035	250	80	1"1/4
○★ PAS-M 15	9	195	174	0.8	0.6	860	2.0	1350	2030	1850	1500	700	1035	250	80	1"1/4
○★ PAS-M 22	9	277	244	1.6	1.3	860	3.0	1350	2030	1850	1500	700	1035	250	80	1"1/4
○★ PAS-M 28	10	331	296	2.8	2.2	995	4.0	1350	2430	1850	1900	700	1035	250	80	1"1/4
○★ PAS-M 35	10	415	366	3.5	2.8	995	4.5	1350	2430	1850	1900	700	1035	250	80	1"1/4
○★ PAS-M 50	22	581	521	2.8	2.2	1765	6.0	1550	2700	2100	2100	800	1170	350	80	1"1/4
○★ PAS-M 60	22	697	622	3.6	2.9	1765	7.5	1550	2700	2100	2100	800	1170	350	80	1"1/4
○★ PAS-M 72	22	837	738	5.0	4.0	1765	9.0	1550	2700	2100	2100	800	1170	350	80	1"1/4
○★ PAS-M 95	41	1104	988	4.5	3.6	3160	10.0	1800	3430	2300	2800	900	1350	450	100	1"1/2
○★ PAS-M 120	41	1378	1232	6.0	4.8	3160	12.0	1800	3430	2300	2800	900	1350	450	100	1"1/2
○★ PAS-M 136	41	1586	1395	6.5	5.2	3160	13.0	1800	3430	2300	2800	900	1350	450	100	1"1/2
○□ PAS-M 165	59	1919	1688	7.0	5.6	5100	15.5	1800	3960	2300	3250	900	1300	550	150	DN40
○□ PAS-M 200	68	2384	2093	7.5	6.0	5400	17.5	1800	4450	2300	2300	1000	1515	550	150	DN50
○ PAS-M 230	73	2643	2326	8.0	6.4	5600	18.5	1970	4600	2460	2400	1250	1740	550	200	DN50
○ PAS-M 290	94	3302	2907	9.0	7.2	7800	19.5	2100	5300	2550	2500	1250	1860	650	200	DN50
○ PAS-M 340	110	3953	3488	10.0	8.0	9400	22.5	2100	5600	2550	2700	1250	1860	650	200	DN50

- ◆ V.V.F. exempt
- I.S.P.E.S.L. approval required in Italy.
- ★ Exempt by certified operator.
- Exempt by continuous presence of certified operator.

## PACKAGE EXPANSION TANKS **M**

### 5 bar - 120°C

(for MTHW)

(for expansion tanks' characteristics see SILE brochure n°36-0709)

Package vertical expansion tanks with constant pressure and variable volume manufactured according to the Europea norm 97/23/CE-PED and tested by 0100 I.S.P.E.S.L.

○ approved as ASSEMBLY.

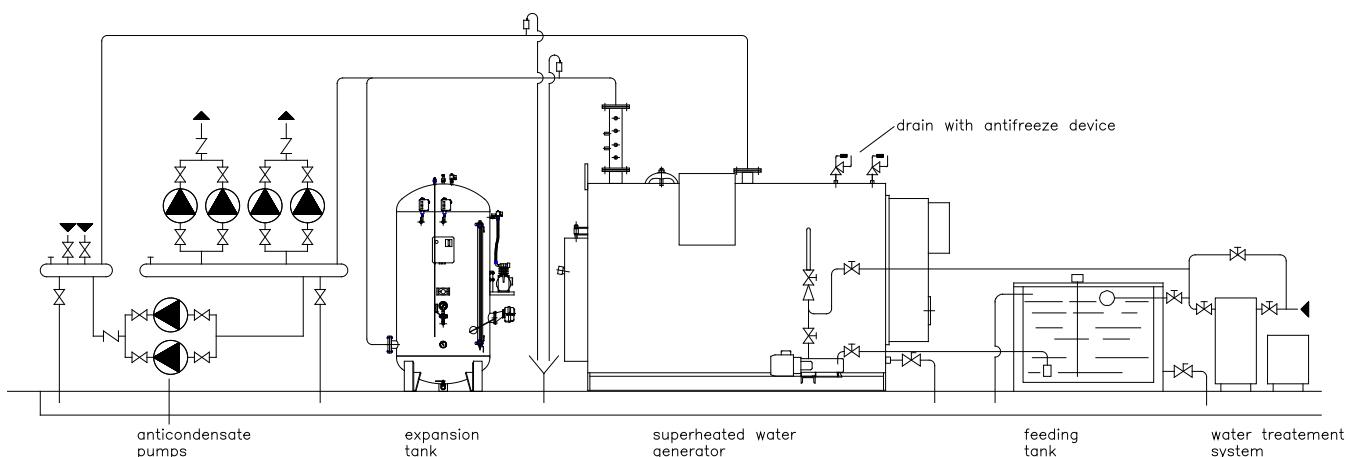
The expansion tanks are combined with the MTHW generators SMB and PAS-M types and the dimensioning of the net expansion capacity is calculated by the installation's designer.

Complete of all the accessories for the automatic working



Model liters	Pressure bar	Expansion connection Ø	Net expansion capacity litri	Dimensions mm	
				Ø	H
300	5	1" 1/2	165	550	1490
500	5	1" 1/2	305	650	1780
800	5	2"	500	800	1930
1000	5	2"	640	800	2280
1500	5	2" 1/2	890	1000	2250
2000	5	2" 1/2	1200	1100	2510
3000	5	DN 100	1670	1300	2710
4000	5	DN 100	2810	1300	3410
5000	5	DN 100	3570	1400	3670

### Indicative diagram of hydraulic connection for overheated water



## CONDENSATE STORAGE TANK

Condensate vertical and horizontal storage tanks, in hot bain galvanized steel, for steam installations.

Atmospheric working pressure.

### Dimensions and characteristics

Tank model	Capacity l.	Dimensions mm	
		Ø	H
<b>RC 1000</b>	1000	800	2230
<b>RC 2000</b>	2000	1100	2400
<b>RC 3000</b>	3000	1300	2600
<b>RC 5000</b>	5000	1600	2900

N.B.: on request different capacities



## STEAM STORAGE TANKS

Horizontal steam storage steel tanks, externally anti-rust enamelled. Mineral wool insulation and external aluminium jacket. Complete of accessories

Manufactured according to the European norm 97/23/CE-PED and checked by I.S.P.E.S.L. 0100.

○ approved as **ASSEMBLY**



## STEAM COLLECTORS

Horizontal steel externally anti-rust enamelled steam collectors.

I.S.P.E.S.L. approved according to European norm 97/23/CE. - P.E.D.

Production on request.



# Safety devices



The steam generators and MTHW package units (ASSEMBLY) are complete of all the accessories required by norms and supplied completely assembled and wired.

The main board enables the steam generators' automatic working thanks to devices for the pressure and level check.



## Lever safety valves

All the Sile generators are equipped with lever safety valve with counterweight



## Pressure switch

All the Sile generators are equipped with safety pressure switches with manual reset and pressure controls



## Pumps of feed water

All the Sile generators are equipped with feed water electric pumps suitable also for the condensate re-use.



# KIT 24 - 72

FOR MEDIUM PRESSURE STEAM GENERATORS



The **KIT 24 and 72 hours** enable the medium pressure steam generators' working (8-12 bar) without the supervision of the certified operator for 24 or 72 hours obtaining in this way partially exempting the continuous supervision.

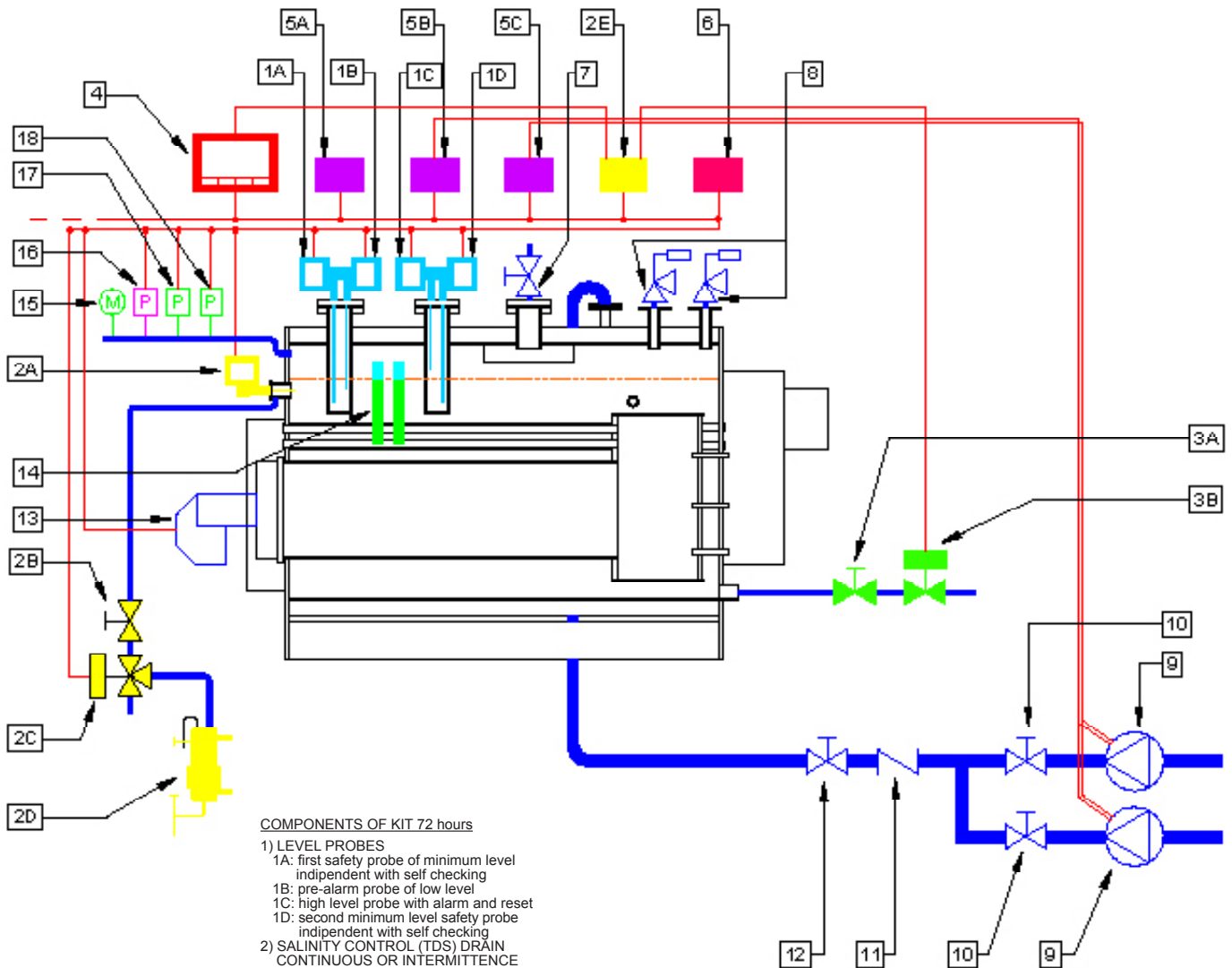
The KIT 24-72 hours consists of safety and tests devices, mounted on the generator and tested in production, in addition to the standard equipment of the steam generator.

The system is CE approved as ASSEMBLY according to European norm 97/23 CE-PED by I.S.P.E.S.L.

## Main components of a KIT 72



## Application diagram of KIT 72 hours



### COMPONENTS OF KIT 72 hours

- 1) LEVEL PROBES
  - 1A: first safety probe of minimum level independent with self checking
  - 1B: pre-alarm probe of low level
  - 1C: high level probe with alarm and reset
  - 1D: second minimum level safety probe independent with self checking
- 2) SALINITY CONTROL (TDS) DRAIN CONTINUOUS OR INTERMITTENCE
  - 2A: conductivity probe
  - 2B: interception probe
  - 2C: powered valve
  - 2D: water sample refrigerator
  - 2E: continuous salinity meter with timer for mud drain
- 3) AUTOMATIC DEVICE FOR MUD'S DRAIN
  - 3A: interception valve
  - 3B: drain valve powered with timer
- 4) DATA ACQUISITION SYSTEM FOR SUPERVISION WITH REMOTE CONNECTION
- 5) ELECTRONIC LEVEL REGULATORS
  - 5A: minimum level safety regulator self-checking
  - 5B: pre-alarm low level regulator
  - 5C: high level regulator with alarm and reset
- 6) CONTROL DEVICE WITH DISPLAY

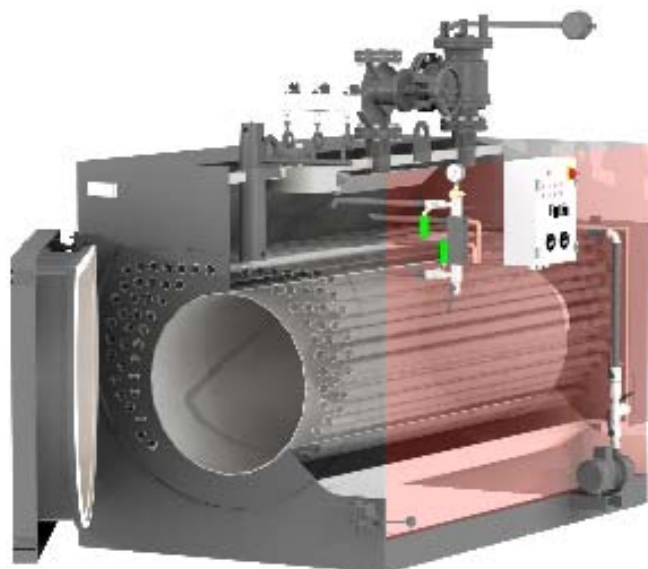
### STANDARD COMPONENTS

- 7) Steam valve
- 8) N<sup>2</sup> lever safety valves with drain
- 9) N<sup>2</sup> feeding pumps with manual adjustment
- 10) Pumps' interception valves
- 11) Non return valve
- 12) Feeding interception valve
- 13) Burner (not supplied)
- 14) Double level indicator
- 15) Manometer
- 16) Safety pressure switch of max. pressure and reset
- 17) Pressure switch of burner's working
- 18) Pressure switch of burner's modulating

The Sile industrial generators' range consists of models with three real smoke runs (one in the furnace and two in the smooth tubes without turbolators) with power output of 3488 kW and of models with reverse flame, two of them in the furnace with power output until 1400 kW.

They are two different construction ways.

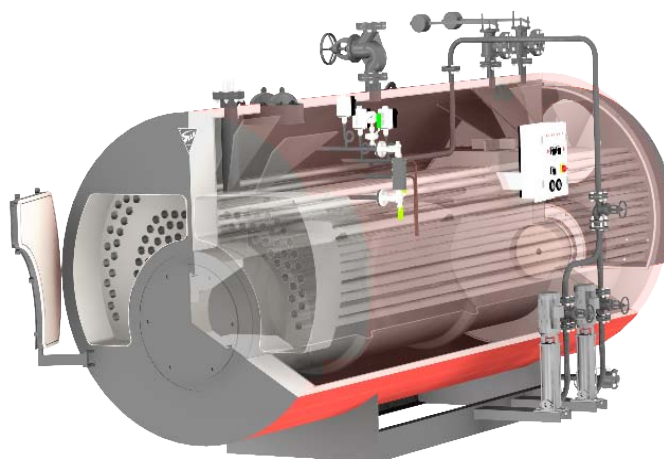
In the reverse flame models the smokes reverse their way in the furnace routing it twice.



**REVERSE FLAME GENERATORS**

In the three real smoke runs generators, smokes, after having been in the furnace, reverse their way in a reverse chamber inside the generator, refrigerated by water, routing two rows of tubes, one above the other.

Inconvenients due to refractory are in this way avoided (often maintenance) and heat losses are reduced both by irradiation and by convection thanks to reverse wet chamber..



**THREE REAL SMOKES GENERATORS**

## Feedwater's characteristics

For automatic working generators I.S.P.E.S.L. certification currently foresees the here below listed feedwater and generator's characteristics:

- total feedwater hardness not over 0,5°French.
- total water salinity in the generator not over 3500 p.p.m.
- alkaline water in the generator not over 1000 p.p.m. like  $\text{CaCO}_3$ .

It is therefore necessary to make water analysis and, according to the results, foresee the water adequate treatment.

Many generator's problems are caused by residual and corrosion due to the use of water with chemical characteristics not adequate. Before adding chemical additives to the water's generator get information about the residue forming and how to eliminate them. In any case I.S.P.E.S.L. norm 30/81 n. 20340 dated 6.6.81, valid for any steam generator has to be respected.



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