CALDAIE MELGARI

PIONEERS IN HEATING

BOILERS CATALOGUE

ENGLISH EDITION

OUR **COMPANY**

Choosing Caldaie Melgari means having confidence in cutting-edge products that can help reduce costs and safeguard the environment. With our vast range of generators and services, we can always guarantee our clients specific, high-efficiency solutions for all types of application.

OUR **TEAM**

Each department in our company is supported and flanked by carefully selected, highly specialized staff: Engineers and qualified technical experts, business and management consultants and accountants, maintenance technicians, burner electricians and licensed operators.

OUR **SERVICES**

- *Design, manufacture, sales and rentals*
- *Installation, inspection and start-up*
- *Assistance, maintenance and on-call service*
- *CE updating and H24 and H72 exemption,*
- *Emissions abatement, reductions in consumption and cost-saving solutions.*

Our story began in 1930 *and it's still going on for us, four generations later, as a leading company in the global market for rentals and sales of industrial thermal power plants.*

Success has been achieved thanks to healthy entrepreneurial values, the special attention we pay to clients and our supply of well-targeted, cutting-edge solutions. *Caldaie Melgari's development has been one of continuous growth, fuelled by passion, curiosity and the desire to open up into new directions.*

Being innovators is in our genetic make-up. *Right from the start, we have been researching and working to improve our steam and heat generators from all points of view – performance, efficiency, materials and technology.* **Our secret is to continually invest in innovation.**

Our company locates in an area of 37.000 square meters *and is the only enterprise in a position to offer its clients a really complete package of services and products for everything regarding heat and steam generators.*

Conquering new markets. *Already a leading company in Italy, over the past few years Caldaie Melgari has created a network of strategic partners and developed strong commercial and service links especially in Europe, North Africa and the Middle East, confirming its leadership at a global level.*


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A COMPLETE SERVICE

We design and manufacture turnkey thermal plants and we can offer short and long-term rentals, on-site repairs and maintenance programs, CE updating and H24 and H72 exemption, emissions abatement, reductions in consumption and cost-saving solutions.

A **CERTIFIED** VALUE

We have obtained several certifications, for example: ISO 9001, ISO 14001, UNI-EN 1090-1 for the execution of steel and aluminium structures, ISO 9606 et ISO 15614 for welding, UNI EN 472 et ISO 9712 for non-destructive testings, SOA Certificate for tenders and public works, Certificate of "Reliability and Efficiency for the Machinery Industry".

We guarantee our clients a complete service of support and assistance.

During the search for the product most suitable for them, we help our clients to define their needs and advise them on the most innovative, effective and affordable solutions. Where possible, we offer our support also for obtaining easy financing.

Then, following purchase, the relationship deepens: our scheduled maintenance programs help to maintain performances and consumption always at optimum levels.

The Caldaie Melgari after-sales department is prompt and efficient, with a dedicated team always available to clients who have already chosen one of our boilers.

OUR **MARKETS**

EUROPE

ITALY

NORTH AFRICA

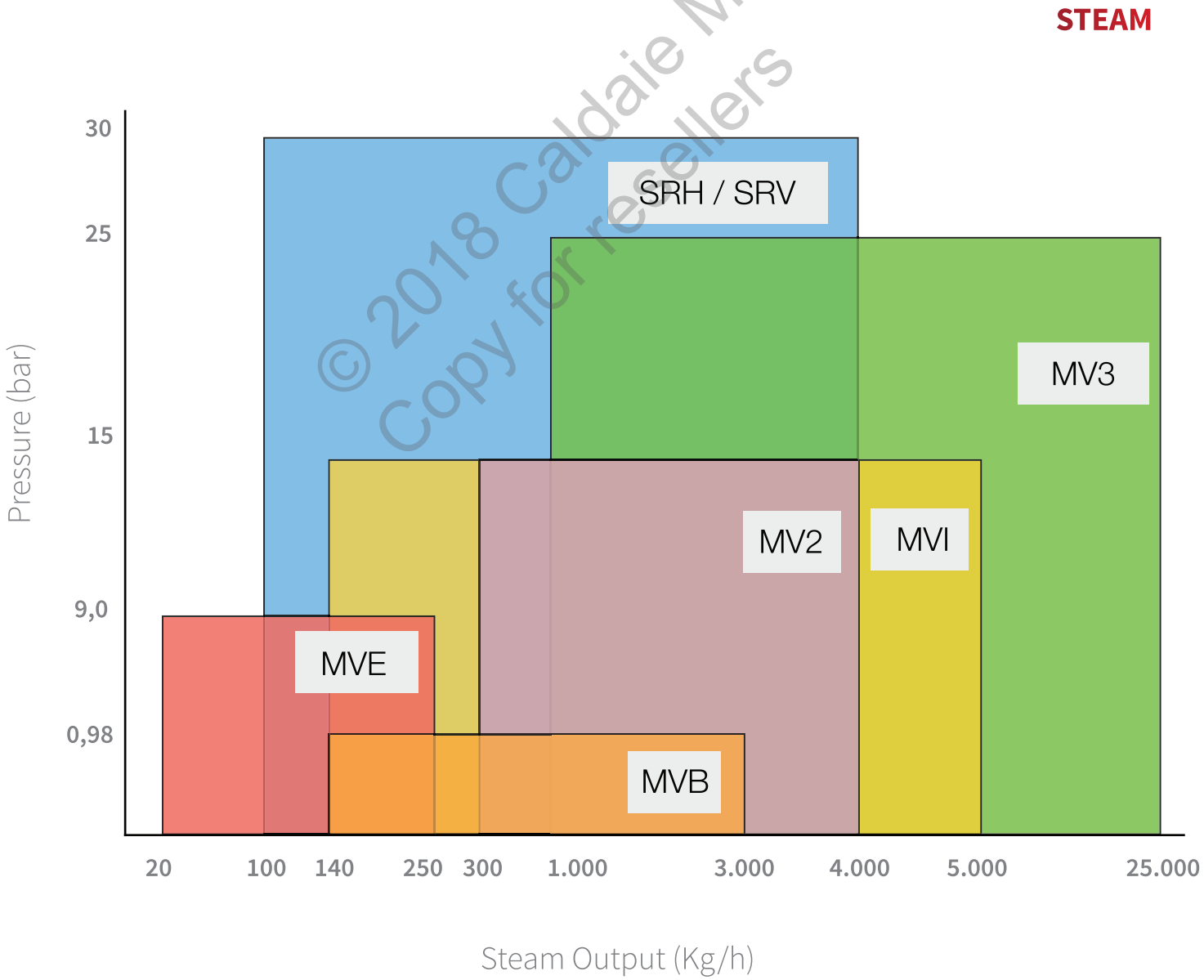
UAE - MIDDLE EAST

LATIN AMERICA

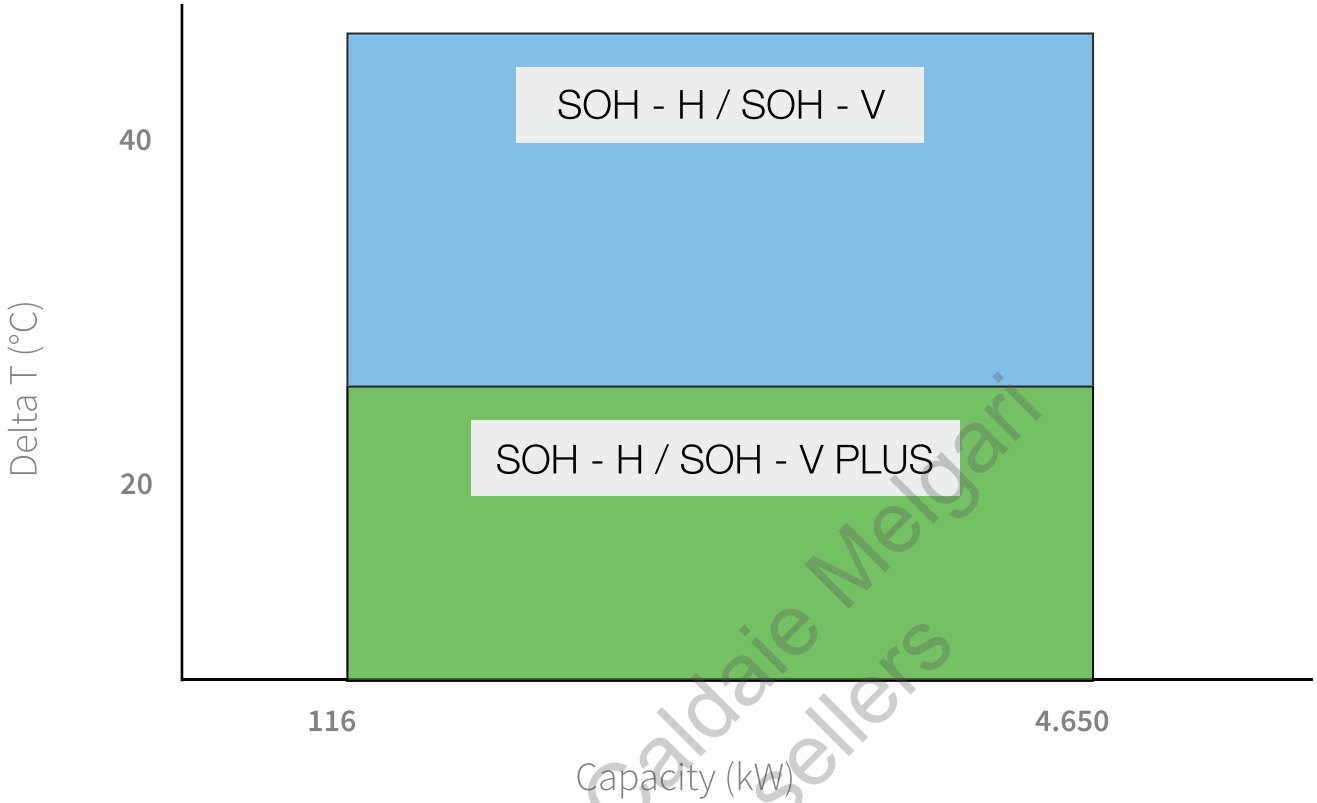
OUR GENERATORS

We are able to offer customers a wide range of boilers, which includes:

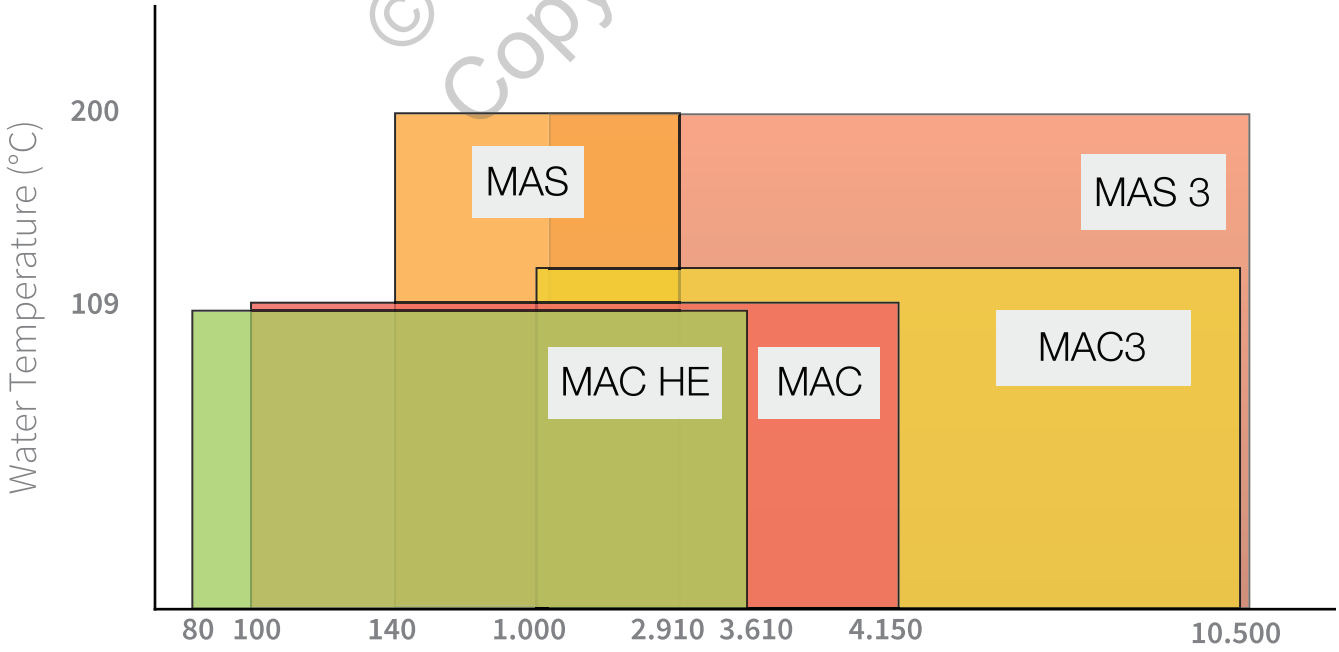
- **fire-tube** boilers
- **diathermic oil heaters**
- **flash** boilers
- **waste heat** boilers
- **containerized hot water heating** boilers
- **electric** boilers



DIATHERMIC OIL



HOT AND SUPERHEATED WATER

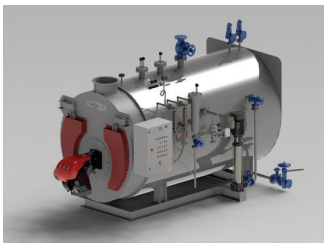


OUR **GENERATORS**

All our products are compliant with current regulations and guarantee better safety, efficiency, longevity and respect for the environment

STEAM GENERATORS

MV2



Two Pass
Smoke Tube
Boilers

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MVI

Three Pass Reverse Flame
Smoke Tube Boilers

Page 22

MVB

Low Pressure Three Pass
Reverse Flame Smoke Tube
Boilers

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MV3

Three Pass
Smoke Tube
Boilers

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SRH

Coil Type Instantaneous
Steam Boilers
(Horizontal Version)

Page 50

SRV

Coil Type Instantaneous
Steam Boilers
(Vertical Version)

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MVE

Electric
Steam Boilers

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DIATHERMIC OIL HEATERS

SOH H

Diathermic Oil Heaters
(Horizontal Version)

Page 80

SOH V

Diathermic Oil Heaters
(Vertical Version)

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HOT AND SUPERHEATED WATER BOILERS

MAC

Three Pass Reverse Flame Smoke Tube
Hot Water Boilers
(Up To 109°C)

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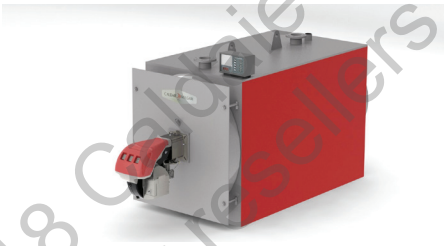
MAC HE



High Efficiency Three Pass Reverse
Flame Smoke Tube Hot Water Boilers
(Up To 109°C)

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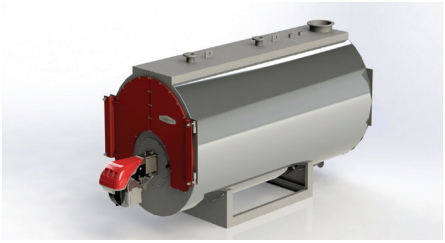
MAC 3



THREE SMOKE PASS
Hot Water Boilers
(Up To 109°C)

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MAS

Three Pass Reverse Flame Smoke Tube
Superheated Water Boilers
(Up To 192°C)

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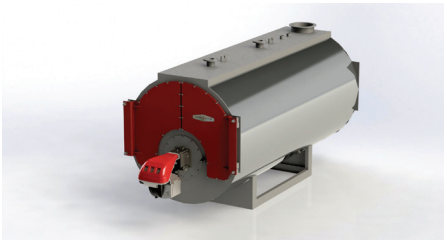
MAS 3



THREE SMOKE PASS Superheated
Water Boilers
(Up To 192°C)

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FITTINGS

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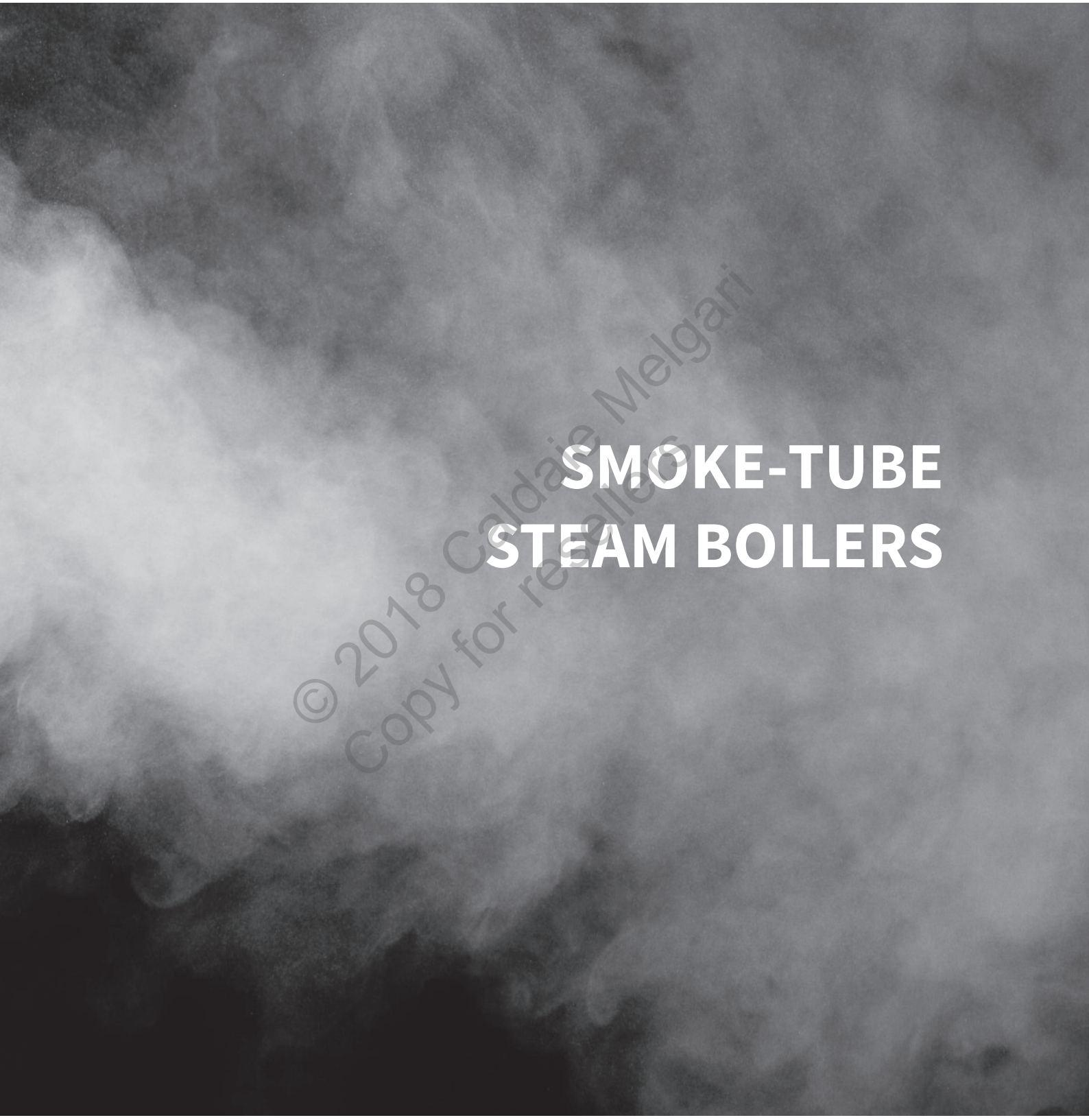
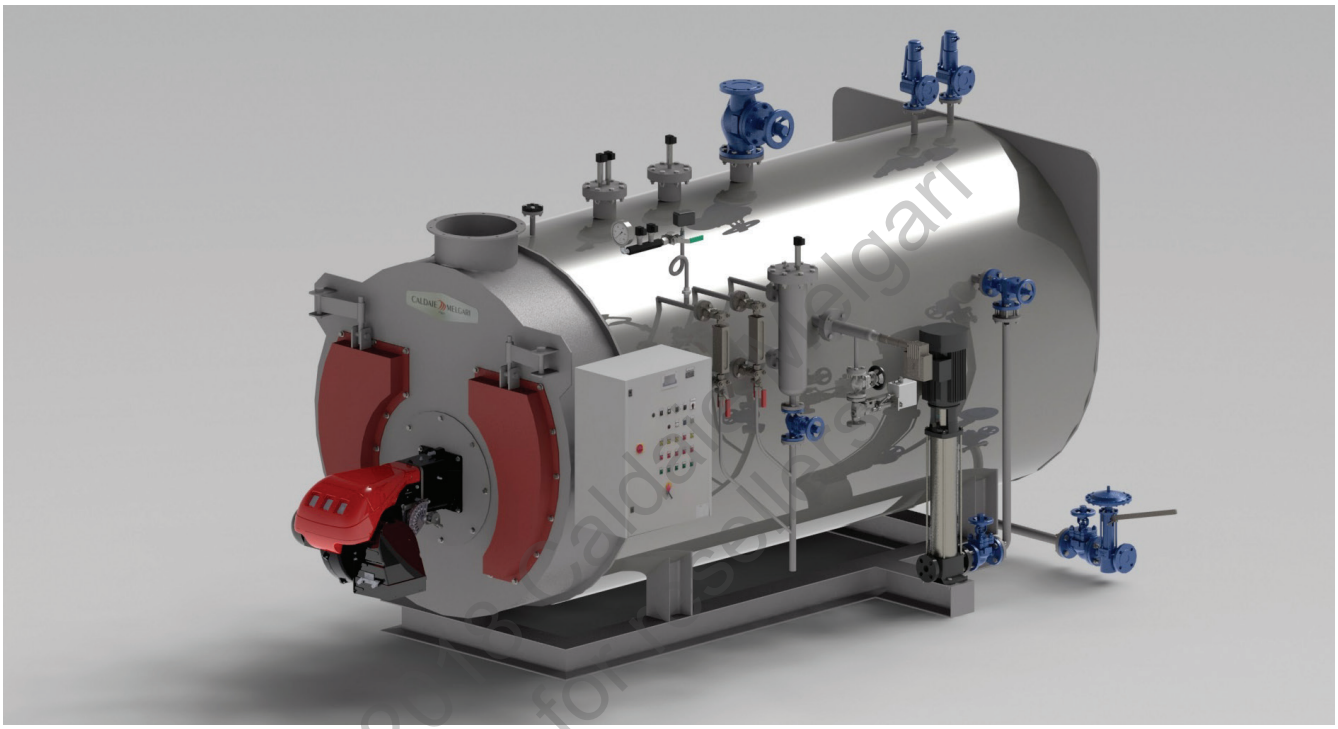


SMOKE-TUBE STEAM BOILERS

MODEL **MV2**

TWO PASS SMOKE TUBE STEAM BOILER

Steam production **from 300 kg/hr up to 4.000 kg/hr**, pressure **up to 15 bar**



MAIN FEATURES

Steam generator **Caldaie Melgari MV2** is a pressurized horizontal boiler with **two pass** and dry back. The first smoke pass takes place in the combustion chamber, while the second through the smoke tubes.

MV2 generator has been designed by our Technical Departement in accordance with the most advanced techniques, in order to **offer the maximum guarantee of reliability and durability to our Customers**.

MV2 model can be realized for the **production of saturated and superheated steam**.

MATERIALS AND CERTIFICATIONS

For pressure body construction, only certified materials are used and non-destructive controls (eg. X-rays of crosses and welds, liquid penetrant) are performed by our skilled technicians and verified by a Notified Body according to PED Directive.

The entire construction is CE marked and complies with all the requirements of PED Directive 2014/68/UE, as well as being equipped with all safety devices.

Tube sheets are manually cold drilled to maintain all the physical characteristics of the mateiral and can be plane or rimmed to ensure the absorption of thermal expansions at different work loads.

All the joints are carefully electricly welded and manufactured through manual / automatic processes.

INSULATION

Insulation of the external parts and collectors is realized with high density rock wool (coated with aluminum or stainless steel) that **ensures the containment o**f heat.

FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

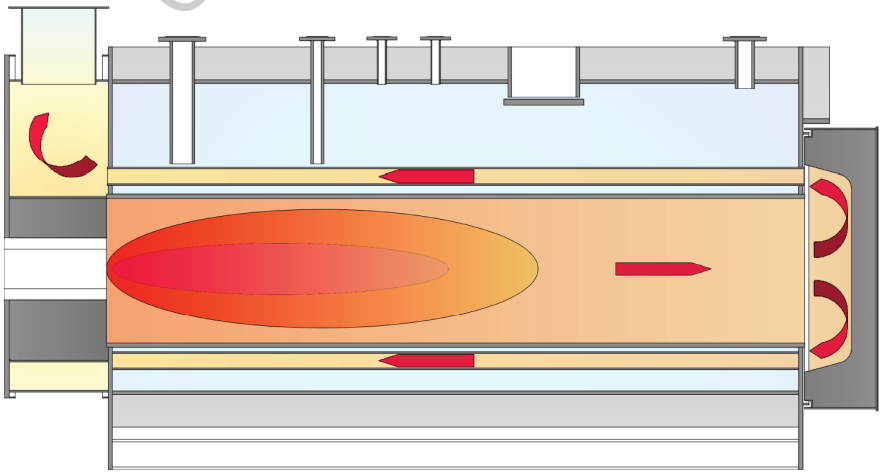
EFFICIENCY

Speed of the smokes in the tubes is so high that soot residues can't deposit, which implies a constant generator **efficiency over 90%. With integrated economizer, the efficiency is around 94%.**

BODY OF THE **BOILER**

- **Pressure vessel in high-quality steel, cylindrical and horizontal version** with shell, combustion chamber and tubesheet in steel P 275 NH. The boiler is complete with connections.
- **External body of the boiler** is equipped with a **manhole** in the upper part and a **handhole** in the lower part used for water side inspections. The boiler is complete with a door that can be used for inspections.
- **Cylindrical combustion chamber in high-quality steel with completely wet reverse chamber** (without refractory). The particular dimensions of the combustion chamber entail a perfect mixing between fuel and comburent air for a complete and efficient combustion.
- **Smoke tubes made in steel P 235 GH – EN 10216-2** welded to the plates.
- **Rear smokes chamber**, in carbon steel, completely openable with refractory material. In the rear smokes chamber, smokes convey to the chimney.
- **Front smokes chamber** in carbon steel, with refractory material and complete with openable doors for inspection of the smoke tubes and burner's plate.
- **Insulation** in high density rock wool with aluminium coating (or-upon request- stainless steel).
- **Basement made of structural steel sections** supporting the boiler assembly and its accessories.

SMOKE PASS SCHEME



The first smoke pass takes place in the combustion chamber, while the second through the smoke tubes.

MV2
ACCESSORIES & FITTINGS

Our MV2 two pass smoke tube steam boiler includes the following basic accessories:

Valves
- Steam outlet valve
- Blow down valve with interception valve

Regulation and control equipment
- Steam pressure gauge complete with a three-way cock with test flange
- Regulation pressure switches (if two-stage burner) / pressure sensors for burner modulation (if modulating burner).
- N°2 water level indicators complete with n.2 interception cocks each (the lower one is a three-way cock for drainage and purge / blow-down)

Safety devices
- Safety pressure switch
- N°2 safety valves

Electric control panel
- Varnished cabinet in IP 54 version
- Door lock master switch
- Burner and pump start-up switch
- Transformer for auxiliaries
- Fuses and indicator lights

Feeding water group includes the following components:
- N° 1 interception valve directly mounted on the boiler body.
- N° 1 check valve connected to the previous one
- N° 1 electric water pump mounted on its skid. The pump is already connected (electricly & hydraulically). Flow rate and pressure head are in compliance with standards. Upon request, a second pump as a stand-by one (emergency) can be offered.

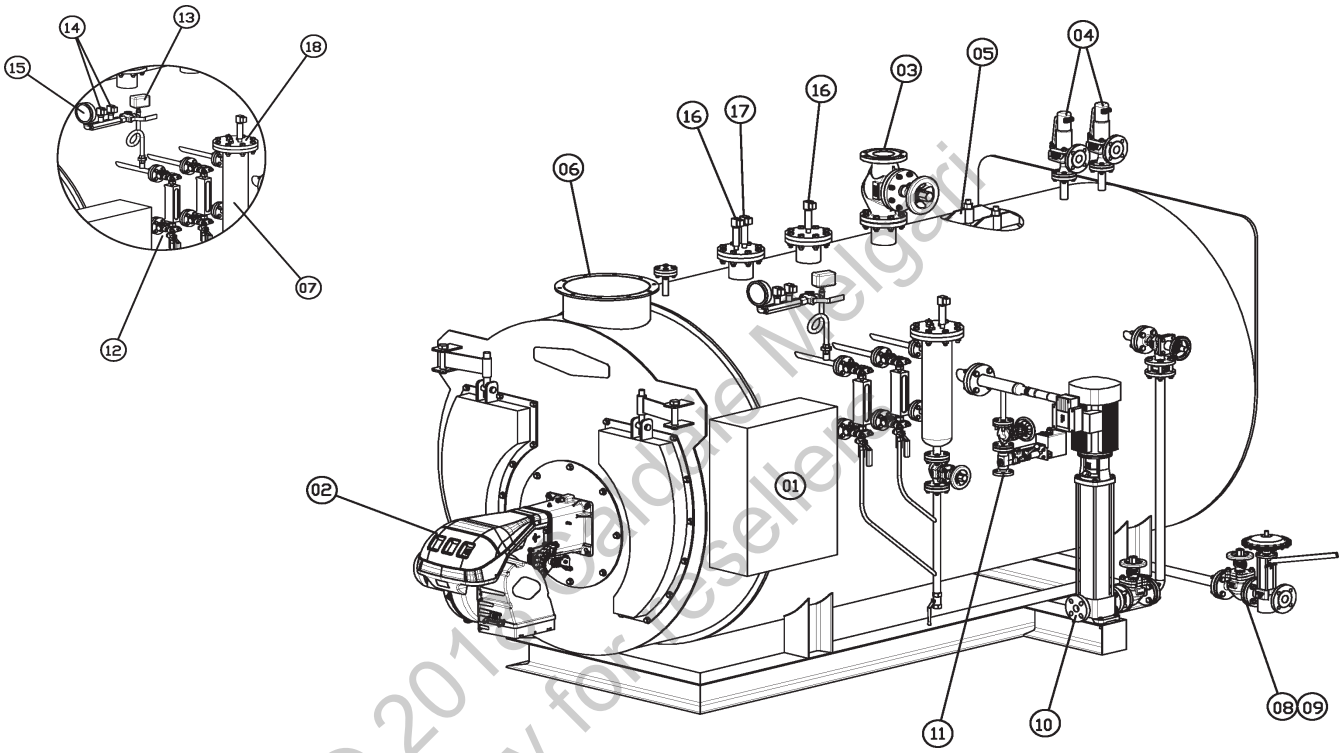
Our optional accessories kit for 24 hours licenced operator exemption includes, in addition to basic accessories, the following components:
- N° 1 Water level regulator with probes
- N° 2 Safety probes (low level)

Our optional accessories kit for 72 hours licenced operator exemption includes, in addition to basic accessories, the following components:
- N° 1 Water level regulator with probes
- N° 2 Safety probes (low level) and n° 1 Safety probe (high level)
- N° 1 Control probe for water conductivity in the boiler
- N° 1 Control probe for feeding water salinity
- N° 1 Automatic blow-down system
- A system tested for generator's shutdown after 72 hours: it includes a timer that can only be reset after the licensed operator has performed a series of specific controls.

MV2
MAIN BENEFITS

- **Heat exchange area is particularly big** in order to **mantain low specific heating loads** and to continuously **ensure high efficiency**.
- Use of **low volumetric thermal loads** in combination with low-nox burners complies with the most restrictive national and international regulations in terms of NOx and CO emissions. MV2 model can be coupled with low emission burners: **from the lowest capacity, it guarantees high environmental efficiency.**
- MV2 generator has **many doors that simplify maintenance** and **cleaning activities** as well as **periodic inspections required by law**. Scheduled maintenance is essential for your boiler because, besides preserving over time the value of the thermal plant, it prevents the risk of production stoppages.
- The **electric control panel**, positioned at eye level, allows you to **easily manage all the boiler's control systems**.
- The particular position of the tubes around the combustion chamber ensures a **fair distribution of the smokes maintaining the thermal load**. Iron turbolators (or, upon request, steel) constantly ensure high efficiency.
- **Each Caldaie Melgari boiler, before being delivered, is rigorously checked** (production features, performances, etc.). In addition to non-destructive controls, a trial is performed to ensure a high constructive and qualitative standard.
- **The steam generator is supplied ready for connection to fuel, to electric power, to discharges and water circuits** which makes the installation quick and easy.
- Upon request, **we are able to supply integrated solutions to improve generator's efficiency and reduce fuel consumptions**. The **economizer**, for example, allows to exploit the heat of the flue exhaust gases to heat feeding water, thus increasing efficiency and, at the same time, reducing fuel consumption. In most cases, the investment is paid back in less than one year. The benefits for your company are concrete: **increased efficiency of 3-4% up to 5%; reduction in emissions from 3-4% up to 5%, reduction of waste and excess consumption, heat and energy recovery** (previously dispersed in the environment).
- It is possible to provide a **modulating control of the burner and the water pump managed by PLC** (Programmable Logic Controller) and inverters.
- **The boiler can be mounted on a skid** with welded metal sections in order to allow immediate installation **or in a container** (turn-key thermal plant) with other components (eg. Water treatment system, degasser, removable discharge collection, etc.).
- Upon request, we are able to supply a **remote control system of the generator that enables remote monitoring of your boiler**: the remote control option allows you to constantly monitor your plant and allows us to become aware of any problems as they occur, in order to solve them promptly.
- Upon request, **we provide support during installation and piping**. Furthermore we can supply **spare parts** and offer **support for emergencies** (availability 24 hours).
- The **boiler can be configured according to your requests**: we can provide a wide range of **optional accessories to customize it** (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

MV2
COMPONENTS

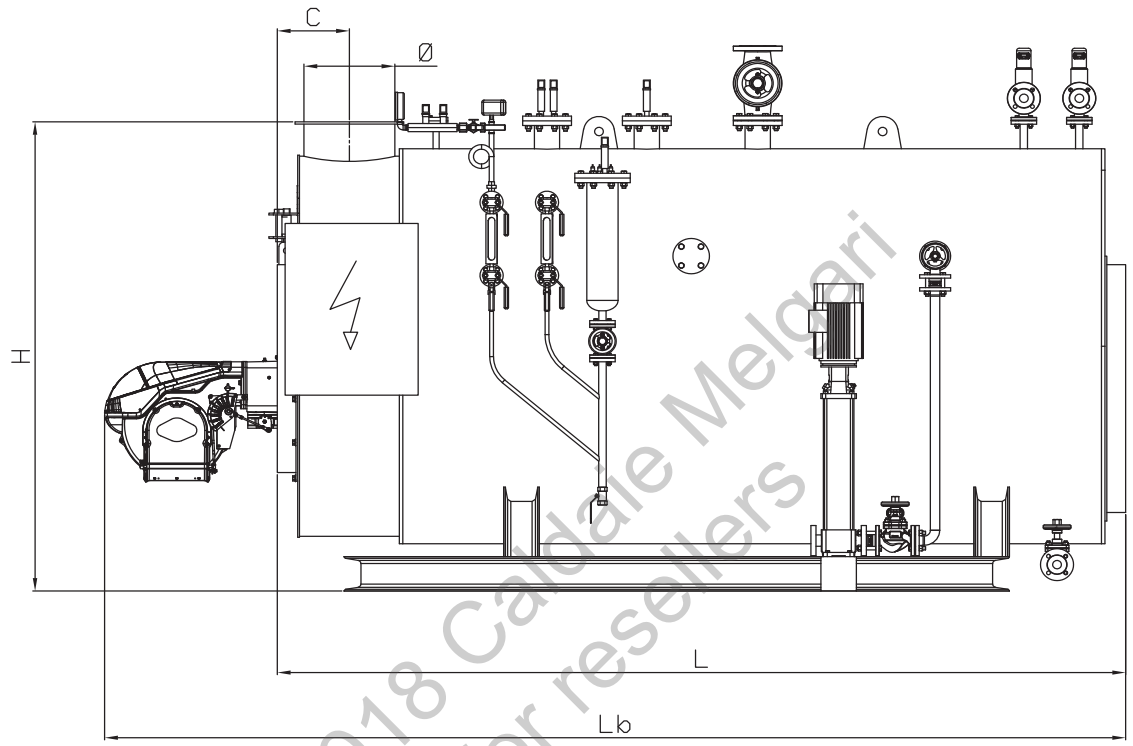


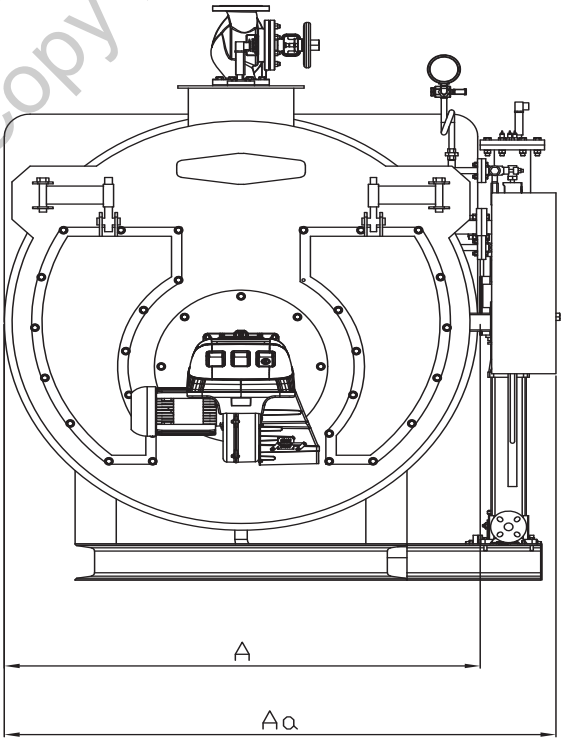
1	Electric control panel
2	Burner
3	Steam outlet
4	Safety valve(s)
5	Manhole
6	Smokes outlet
7	External vessel
8	Purge
9	Automatic blowdown (included in h72 kit)

10	Feeding water pump
11	TDS Desalting device (only available with h72 Kit)
12	Water level indicators with cocks
13	Safety pressure switch(es)
14	Regulation pressure switch(es)
15	Manometer
16	Safety probe - low level (included in h72 Kit)
17	Safety probe - high level (included in h72 Kit)
18	Water level regulation probe (optional)

MV2

DIMENSIONS





MV2 - SPECIFICATIONS

MODEL MV2		300	500	750	1.000	1.500
Nominal Capacity	kCal/h	180.000	300.000	450.000	600.000	900.000
	kW	209	349	523	698	1.047
Furnace Capacity	kCal/h	200.000	333.333	500.000	666.667	1.000.000
	kW	233	388	581	775	1.163
Steam production	kg/h	300	500	750	1.000	1.500
Efficiency (without economizer)	%	90	90	90	90	90
Efficiency (with economizer)	%	95	95	95	95	95
Combustion chamber pressure	mbar	2	3,5	3,5	5	5
Total water content	dm^3	745	860	1.250	1.430	2.570
Water content (at level)	dm^3	540	620	900	1.220	1.810
Pressure	bar	12	12	12	12	12
Hydraulic test pressure	bar	18	18	18	18	18
Natural Gas consumption	Nm^3/h	24	39	59	78	118
Natural Gas flow rate	Nm^3/h	269	449	673	897	1.346
Diesel consumption	kg/h	20	33	50	67	100
Diesel flow rate	kg/h	280	467	700	933	1.400
LPG Consumption	Nm^3/h	9	15	23	30	46
LPG flow rate	Nm^3/h	287	478	718	957	1.435
Length without burner (L)	mm	2.000	2.460	2.700	2.950	3.500
Length with burner (Lb)	mm	2.600	3.000	3.300	3.600	4.300
Width (Aa)	mm	1.630	1.630	1.670	1.700	1.950
Height (H)	mm	1.540	1.540	1.550	1.550	1.900
Chimney wheelbase (C)	mm	200	270	300	300	340
Empty weight	kg	3.495	3.495	4.000	4.500	5.000
Chimney diameter	mm	200	250	250	250	300
Steam outlet	DN	25	32	40	50	65
Purge	DN	25	25	32	32	32

Technical data are approximate and are subject to changes due to improvements in our production system

MV2 - SPECIFICATIONS

MODEL MV2		2.000	2.500	3.000	4.000
Nominal Capacity	kCal/h	1.200.000	1.500.000	1.800.000	2.400.000
	kW	1.395	1.744	2.093	2.791
Furnace Capacity	kCal/h	1.333.333	1.666.667	2.000.000	2.666.667
	kW	1.550	1.938	2.326	3.101
Steam production	kg/h	2.000	2.500	3.000	4.000
Efficiency (without economizer)	%	90	90	90	90
Efficiency (with economizer)	%	95	95	95	95
Combustion chamber pressure	mbar	7,5	7,6	9	12
Total water content	dm^3	3.100	3.410	6.300	UPON REQUEST
Water content (at level)	dm^3	2.230	2.460	4.300	UPON REQUEST
Pressure	bar	12	12	12	UPON REQUEST
Hydraulic test pressure	bar	18	18	18	UPON REQUEST
Natural Gas consumption	Nm^3/h	157	196	235	UPON REQUEST
Natural Gas flow rate	Nm^3/h	1.795	2.243	2.692	UPON REQUEST
Diesel consumption	kg/h	133	167	200	UPON REQUEST
Diesel flow rate	kg/h	1.867	2.333	2.800	UPON REQUEST
LPG Consumption	Nm^3/h	61	76	91	UPON REQUEST
LPG flow rate	Nm^3/h	1.913	2.392	2.870	UPON REQUEST
Length without burner (L)	mm	3.700	3.900	4.100	UPON REQUEST
Length with burner (Lb)	mm	4.500	4.900	5.100	UPON REQUEST
Width (Aa)	mm	2.100	2.100	2.250	UPON REQUEST
Height (H)	mm	2.050	2.050	2.200	UPON REQUEST
Chimney wheelbase (C)	mm	340	340	340	UPON REQUEST
Empty weight	kg	6.000	7.500	9.000	UPON REQUEST
Chimney diameter	mm	300	350	400	UPON REQUEST
Steam outlet	DN	65	80	100	UPON REQUEST
Purge	DN	40	40	40	UPON REQUEST

Technical data are approximate and are subject to changes due to improvements in our production system

MODEL **MVI**

THREE PASS REVERSE FLAME SMOKE TUBE STEAM BOILER

Steam production **from 140 kg/hr up to 5 000 kg/hr**, pressure **up to 15 bar**

MAIN FEATURES

Caldaie Melgari MVI model is a three smoke pass construction reverse flame steam boiler with completely wet back. The first and the second smoke pass take place in the combustion chamber, while the third in the fire tube in which turbulators are installed.

This type of generator is **ideal for all users who need a constant and continuous supply of steam**, since the large volume of water present in the boiler allows to sustain sudden changes in steam flow-rate in a short time.

MVI generator has been designed by our Technical Department according to the most advanced techniques, in order to offer the Maximum guarantee of reliability and durability to the customer.

The MVI model can be realized for the **production of saturated steam**, **hot water** and **superheated water**.

MATERIALS AND CERTIFICATIONS

For the construction of the pressure body, only certified materials are used and non-destructive controls (eg. Ultrasonic testing of the combustion chamber, X-rays of crosses and welds, penetrant liquids) are performed by our skilled technicians and verified by a Notified Body according to PED Directive.

The entire construction is CE marked and complies with all the requirements of Directive PED 2014/68/UE, as well as being equipped with all safety devices.

All the joints are carefully electricly welded and manufactured through manual / automatic processes.

INSULATION

Insulation of the external parts and collectors is realized with high density rock wool (coated with aluminum or - upon request- stainless steel) **that ensures the containment** of heat.

FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

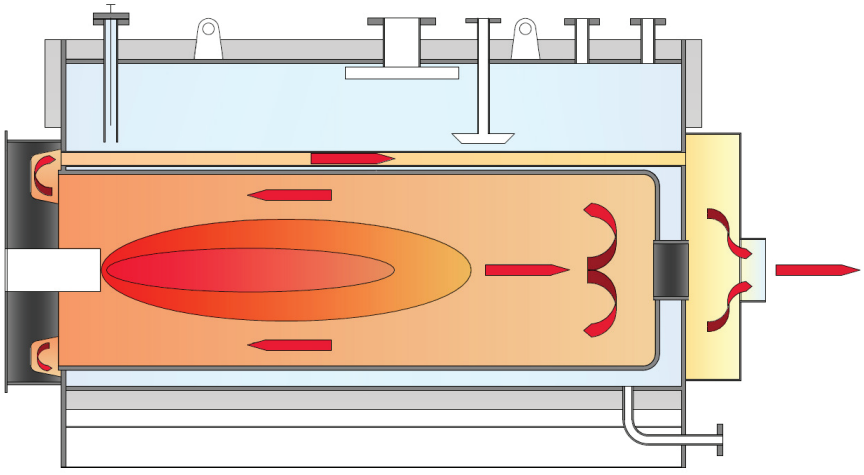
EFFICIENCY

Speed of the smokes in the tubes is so high that soot residues can't deposit, which implies a **constant generator efficiency over 90%**. **With integrated economizer, the efficiency is around 95%.**

BODY OF THE **BOILER**

- **Pressure vessel in high-quality steel**, **cylindrical and horizontal version** with shell, combustion chamber and tubesheet in steel P 275 NH. The boiler is complete with **connections**, **manhole** and **handole**.
- **Cylindrical combustion chamber in high-quality steel** with completely wet reverse chamber (without refractory). The particular dimensions of the combustion chamber entail a perfect mixing between fuel and comburent air for a complete and efficient combustion
- **Smoke tubes made in steel P 235 GH – EN 10216-2** welded to the plates
- **Rear smokes chamber**, in carbon steel, completely removable, with refractory material to convey smokes to the chimney
- **Front smokes chamber** in carbon steel, with refractory material and complete with an openable door for inspection of the smoke tubes and burner's plate.
- **Insulation in high density rock wool** with aluminium coating (or-upon request- stainless steel)
- **Basement made of structural steel sections** supporting the boiler assembly and its accessories

SMOKE PASS SCHEME



The first and the second smoke pass take place in the combustion chamber, while the third in the fire tube

MVI
ACCESSORIES & FITTINGS

Our MVI three pass reverse flame smoke tube steam boiler **includes the following basic accessories:**

Valves
- Steam outlet valve
- Blow down valve with interception valve

Regulation and control equipment
- Steam pressure gauge complete with a three-way cock with test flange
- Regulation pressure switches (if two-stage burner) / pressure sensors for burner modulation (if modulating burner).
- N°2 water level indicators complete with n.2 interception cocks each (the lower one is a three-way cock for drainage and purge / blow-down)

Safety devices
- Safety pressure switch
- N°2 safety valves

Electric control panel
- Varnished cabinet in IP 54 version
- Door lock master switch
- Burner and pump start-up switch
- Transformer for auxiliaries
- Fuses and indicator lights

Feeding water group includes the following components:
- N° 1 interception valve directly mounted on the boiler body.
- N° 1 check valve connected to the previous one
- N° 1 electric water pump mounted on its skid. The pump is already connected (electricly & hydraulically). Flow rate and pressure head are in compliance with standards. Upon request, a second pump as a stand-by one (emergency) can be offered.

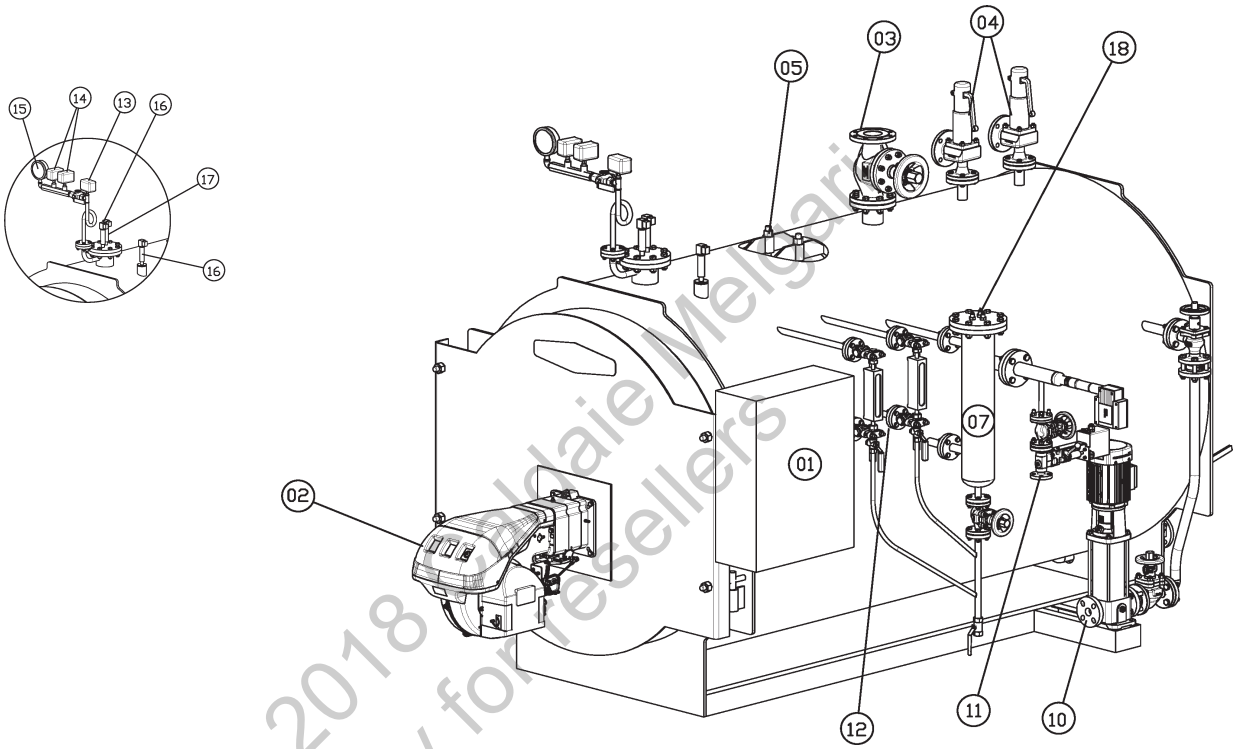
Our optional accessories kit for 24 hours licenced operator exemption includes, in addition to basic accessories, the following components:
- N° 1 Water level regulator with probes
- N° 2 Safety probes (low level)

Our optional accessories kit for 72 hours licenced operator exemption includes, in addition to basic accessories, the following components:
- N° 1 Water level regulator with probes
- N° 2 Safety probes (low level) and n° 1 Safety probe (high level)
- N° 1 Control probe for water conductivity in the boiler
- N° 1 Control probe for feeding water salinity
- N° 1 Automatic blow-down system
- A system tested for generator's shutdown after 72 hours: it includes a timer that can only be reset after the licensed operator has performed a series of specific controls.

MVI
MAIN BENEFITS

- **Heat exchange area is particularly big in order to mantain low specific heating loads** and to continuously **ensure high efficiency.**
- **The large front door simplifies maintenance and cleaning activities as well as periodic inspections required by law**. Scheduled maintenance is essential for your boiler because, besides preserving over time the value of the thermal plant, it prevents the risk of production stoppages.
- The **electric control panel**, positioned at eye level, **allows you to easily manage all the boiler's control systems**.
- The **particular position of the tubes around the combustion chamber ensures a fair distribution of the smokes maintaining the thermal load**. Iron turbolators (or, upon request, steel) constantly ensure high efficiency.
- **"Dry steam" produced by MVI generator allows reductions of the boiler returns through the steam traps in the system** and, therefore, significant **energy costs saving** for your company.
- **Each Caldaie Melgari boiler, before being delivered, is rigorously checked** (production features, performances, etc.). In addition to non-destructive controls, a trial is performed to ensure a high constructive and qualitative standard.
- The **generator is supplied ready for connection to fuel, to electric power, to discharges and water circuits** which makes the installation quick and easy.
- Upon request, **we are able to supply integrated solutions to improve generator's efficiency and reduce fuel consumptions**. The **economizer**, for example, allows to exploit the heat of the flue exhaust gases to heat feeding water, thus increasing efficiency and, at the same time, reducing fuel consumption. In most cases, the investment is paid back in less than one year. The benefits for your company are concrete: increased efficiency of 3-4% up to 5%; reduction in emissions from 3-4% up to 5%, reduction of waste and excess consumption, heat and energy recovery (previously dispersed in the environment).
- **It is possible to provide a modulating control of the burner and the water pump managed by PLC** (Programmable Logic Controller) and inverters.
- **The boiler can be mounted on a skid** with welded metal sections in order to allow immediate installation **or in a container** (turn-key thermal plant) with other components (eg. Water treatment system, air separator, removable pot drains collection, etc.) .
- **Insulation (in aluminium or- upon request- in stainless steel), extremely durable, protects the boiler from possible damages deriving from atmospheric agents**.
- Upon request, **we provide support during installation and piping.** Furthermore **we can supply spare parts and offer support for emergencies** (availability 24 hours).
- **The boiler can be configured according to your requests: we can provide a wide range of optional accessories to customize it** (eg. economizer, gangway, 2nd feed water pump, barrel for water withdrawal, water softener and salt tank, etc.).

MVI
COMPONENTS

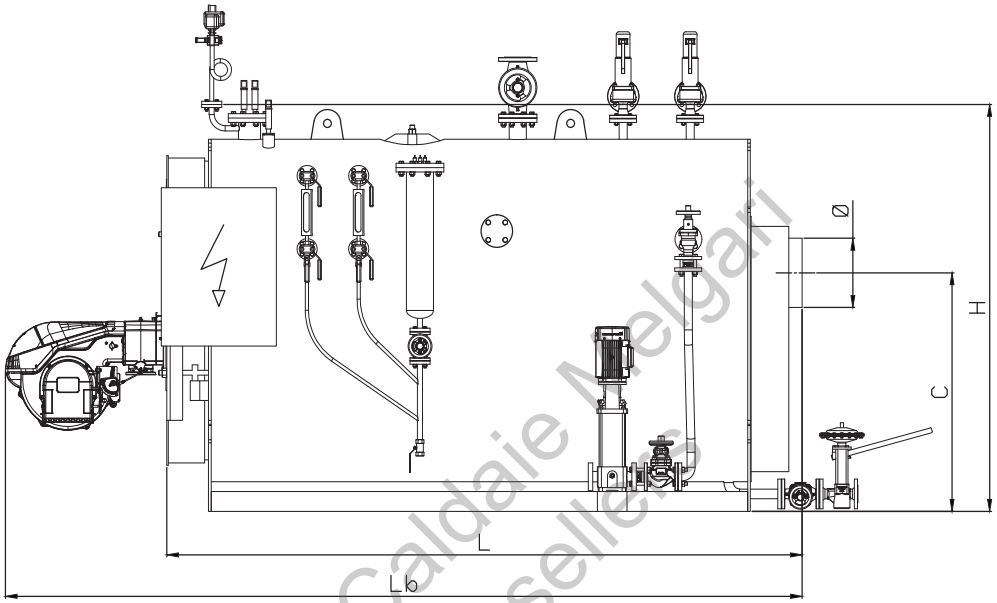


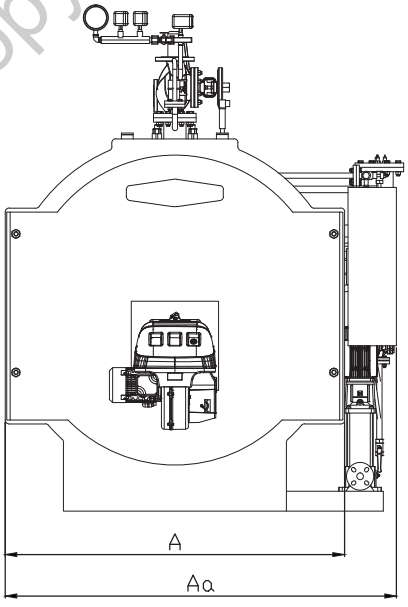
1	Electric control panel
2	Burner
3	Steam outlet
4	Safety valve(s)
5	Manhole
6	Smokes outlet
7	External vessel
8	Purge
9	Automatic blowdown (included in h72 kit)

10	Feeding water pump
11	TDS Desalting device (only available with h72 Kit)
12	Water level indicators with cocks
13	Safety pressure switch(es)
14	Regulation pressure switch(es)
15	Manometer
16	Safety probe - low level (included in h72 Kit)
17	Safety probe - high level (included in h72 Kit)
18	Water level regulation probe (optional)

MVI

DIMENSIONS





MVI - SPECIFICATIONS

MODEL MVI		140	200	300	400	500	700	800	1.000	1.250
Nominal Capacity	kCal/h	83.420	118.680	178.880	238.220	297.560	417.100	476.440	595.120	743.900
	kW	97	138	208	277	346	485	554	692	865
Furnace Capacity	kCal/h	92.880	131.580	198.660	264.880	330.240	463.540	529.760	661.340	826.460
	kW	108	153	231	308	384	539	616	769	961
Steam production	kg/h	140	200	300	400	500	700	800	1.000	1.250
Efficiency (without economizer)	%	90	90	90	90	90	90	90	90	90
Efficiency (with economizer)	%	95	95	95	95	95	95	95	95	95
Combustion chamber pressure	mbar	1,5	2,5	3,0	3,5	4,2	4,5	5,0	6,0	6,5
Total water content	dm^3	475	475	670	670	1.020	1.020	1.280	1.410	1.900
Water content (at level)	dm^3	320	320	440	440	685	685	870	960	1.280
Pressure	bar	12	12	12	12	12	12	12	12	12
Natural Gas consumption	Nm^3/h	11	15	23	31	39	55	62	78	97
Natural Gas flow rate	Nm^3/h	158	224	338	450	561	788	901	1.124	1.405
Diesel consumption	kg/h	9	13	20	26	33	46	53	66	83
Diesel flow rate	kg/h	130	184	278	371	462	649	742	926	1.157
LPG Consumption	Nm^3/h	4	6	9	12	15	21	24	30	38
LPG flow rate	Nm^3/h	131	186	281	374	466	655	748	934	1.167
Length without burner (L)	mm	1.782	1.782	2.032	2.032	2.336	2.336	2.339	2.539	2.541
Length with burner (Lb)	mm	2.080	2.080	2.330	2.330	2.690	2.940	2.990	3.290	3.390
Width min. (A)	mm	954	954	1.046	1.046	1.190	1.190	1.310	1.310	1.500
Height (H)	mm	1.334	1.334	1.426	1.426	1.570	1.570	1.690	1.690	1.880
Chimney wheelbase (C)	mm	637	637	618	618	690	690	740	740	790
Empty weight	kg	1.150	1.150	1.450	1.450	2.200	2.200	2.550	2.800	3.300
Chimney diameter	mm	200	200	250	250	250	250	250	250	300
Steam outlet	DN	25	25	32	32	40	40	50	50	65
Purge	DN	25	25	25	25	25	25	25	25	25

Technical data are approximate and are subject to changes due to improvements in our production system

MVI - SPECIFICATIONS

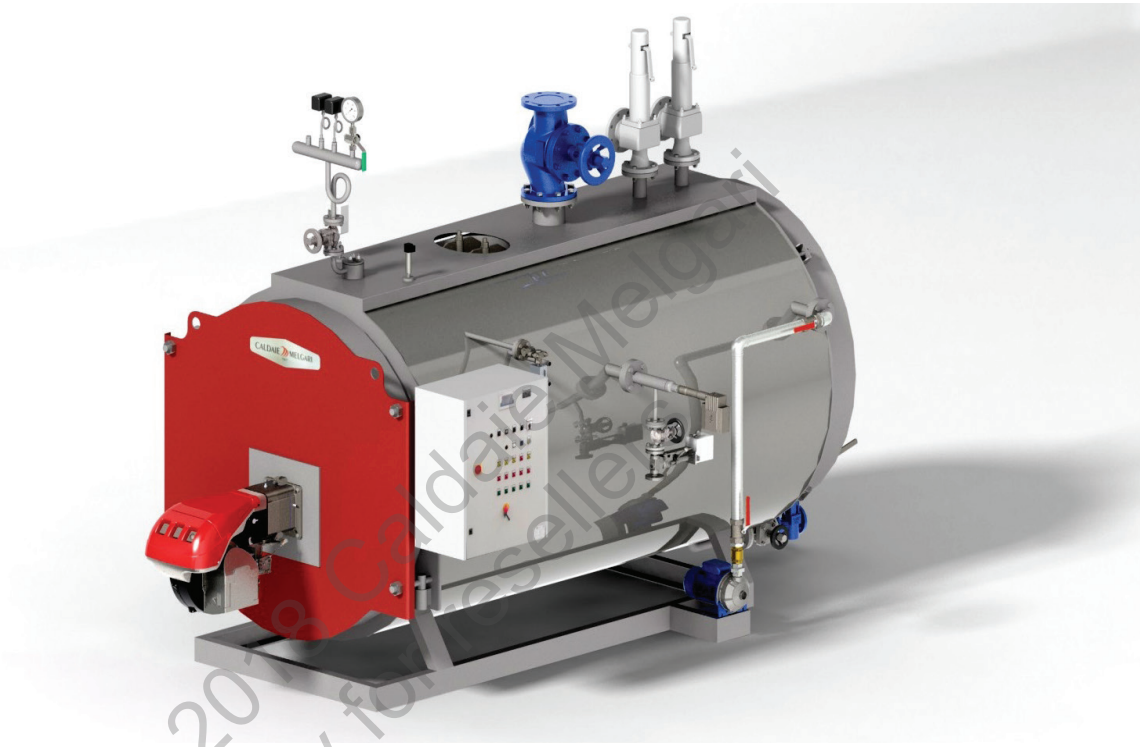
MODEL MVI		1.500	1.750	2.000	2.500	3.000	3.500	4.000	5.000
Nominal Capacity	kCal/h	892.680	1.042.320	1.191.100	1.488.660	1.786.220	2.083.780	2.381.340	2.978.180
	kW	1.038	1.212	1.385	1.731	2.077	2.423	2.769	3.463
Furnace Capacity	kCal/h	992.440	1.158.420	1.323.540	1.653.780	1.984.880	2.315.120	2.646.220	3.308.420
	kW	1.154	1.347	1.539	1.923	2.308	2.692	3.077	3.847
Steam production	kg/h	1.500	1.750	2.000	2.500	3.000	3.500	4.000	5.000
Efficiency (without economizer)	%	90	90	90	90	90	90	90	90
Efficiency (with economizer)	%	95	95	95	95	95	95	95	95
Combustion chamber pressure	mbar	6,8	7,0	7,0	8,0	8,2	9,0	10,0	10,2
Total water content	dm^3	2.120	2.330	2.650	3.540	3.960	4.340	6.050	8.000
Water content (at level)	dm^3	1.440	1.580	1.860	2.550	2.680	2.830	4.150	5.800
Pressure	bar	12	12	12	12	12	12	12	12
Natural Gas consumption	Nm^3/h	117	136	156	195	234	272	311	389
Natural Gas flow rate	Nm^3/h	1.687	1.969	2.250	2.811	3.374	3.936	4.499	5.624
Diesel consumption	kg/h	99	116	132	165	198	232	265	331
Diesel flow rate	kg/h	1.389	1.622	1.853	2.315	2.779	3.241	3.705	4.632
LPG Consumption	Nm^3/h	45	53	60	75	90	105	121	151
LPG flow rate	Nm^3/h	1.402	1.636	1.869	2.336	2.803	3.270	3.737	4.672
Length without burner (L)	mm	2.791	3.041	3.042	3.348	3.350	3.550	3.841	4.900
Length with burner (Lb)	mm	3.640	3.940	3.940	4.300	4.300	4.550	5.040	5.100
Width min. (A)	mm	1.500	1.500	1.620	1.750	1.860	1.860	2.100	2.190
Height (H)	mm	1.880	1.880	2.000	2.150	2.270	2.270	2.496	2.575
Chimney wheelbase (C)	mm	790	790	845	1.245	1.300	1.300	1.440	1.490
Empty weight	kg	3.650	3.900	4.650	5.500	6.400	6.850	8.600	12.500
Chimney diameter	mm	300	300	350	350	400	400	450	500
Steam outlet	DN	65	80	80	80	80	100	100	100
Purge	DN	25	25	40	40	40	40	40	40

Technical data are approximate and are subject to changes due to improvements in our production system

MODEL **MVB**

LOW PRESSURE THREE PASS REVERSE FLAME SMOKE TUBE STEAM BOILER

Steam production **from 140 kg/h up to 3.000 kg/h**, pressure **0,98 bar**



MAIN FEATURES

Caldaie Melgari MVB model is a low pressure three smoke pass reverse flame steam boiler with a completely wet back: the first and the second smoke pass take place in the combustion chamber, while the third in the fire tube in which the turbulators are installed.

Upon request, **MVB Model can be realized for the production of hot water, superheated water and saturated steam**.

MATERIALS AND CERTIFICATIONS

This type of generator is **ideal for all users who need a constant and continuous supply of steam**, since the large volume of water present in the boiler allows to sustain sudden changes in steam flow-rate in a short time.

MVB steam generator has been designed by our technical department according to the most advanced techniques, in order to offer the maximum guarantee of reliability and durability to the customers.

For pressure body construction, only certified materials are used: **the entire construction is CE marked and complies all the requirements of Directive PED 2014/68/UE, as well as being equipped with all safety devices.**

INSULATION

All the joints are carefully electricly welded and manufactured through manual / automatic processes.

Insulation of the external parts and collectors is realized with high density rock wool (coated with aluminum or- upon request- stainless steel) that ensures the containment of heat.

FUEL

MVB steam boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

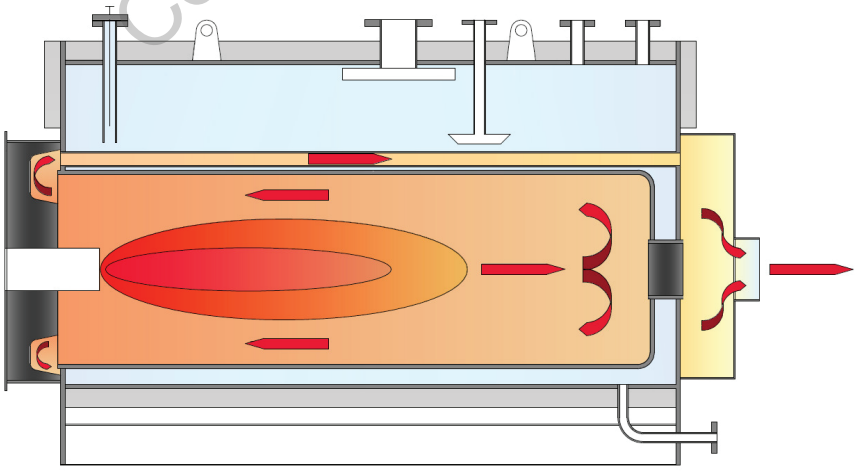
EFFICIENCY

Speed of the smokes in the tubes is so high that soot residues can't deposit, which implies a constant generator **efficiency over 90%. With integrated economizer, the efficiency is around 94%.**

BODY OF THE **BOILER**

- **Pressure vessel in high-quality steel, cylindrical and horizontal version** with shell, combustion chamber and tubesheet in steel P 275 NH. The boiler is complete with **connections**, **manhole** and **handole**.
- **Cylindrical combustion chamber in high-quality steel** with completely wet reverse chamber (without refractory). The particular dimensions of the combustion chamber entail a perfect mixing between fuel and comburent air for a complete and efficient combustion
- **Smoke tubes made in steel P 235 gh – EN 10216-2** welded to the plates
- **Rear smokes chamber**, in carbon steel, completely removable to convey smokes to the chimney.
- **Front smokes chamber** in carbon steel, with refractory material and complete with an openable door for inspection of the smoke tubes and burner's plate.
- **Insulation in high density rock wool** with aluminium or- upon request - in stainless steel .
- **Basement made of structural steel sections** supporting the boiler assembly and its accessories

SMOKE PASS SCHEME



The first and the second smoke pass take place in the combustion chamber, while the third in the fire tube in which turbulators are installed

MVB
ACCESSORIES & FITTINGS

Our MVB low pressure three pass reverse flame smoke tube boiler **includes the following basic accessories:**

Valves
- Steam outlet valve
- Blow down valve with interception valve

Regulation and control equipment
- Steam pressure gauge complete with a three-way cock with test flange
- Regulation pressure switches (if two-stage burner) / pressure sensors for burner modulation (if modulating burner).
- N°1 water level indicators complete with n.2 interception cocks each (the lower one is a three-way cock for drainage and purge / blow-down)
- N°1 couple of test cocks

Safety devices
- Safety pressure switch
- N° 1 or 2 safety valves

Electric control panel
- Varnished cabinet in IP 54 version
- Door lock master switch
- Burner and pump start-up switch
- Transformer for auxiliaries
- Fuses and indicator lights

Feeding water group includes the following components:
- N° 1 interception valve directly mounted on the boiler body.
- N° 1 check valve connected to the previous one
- N° 1 electric water pump mounted on its skid. The pump is already connected (electricly & hydraulically). Flow rate and pressure head are in compliance with standards. Upon request, a second pump as a stand-by one (emergency) can be offered.

Our optional accessories kit for 24 hours licenced operator exemption includes, in addition to basic accessories, the following components:
- N° 1 Water level regulator with probes
- N° 2 Safety probes (low level)

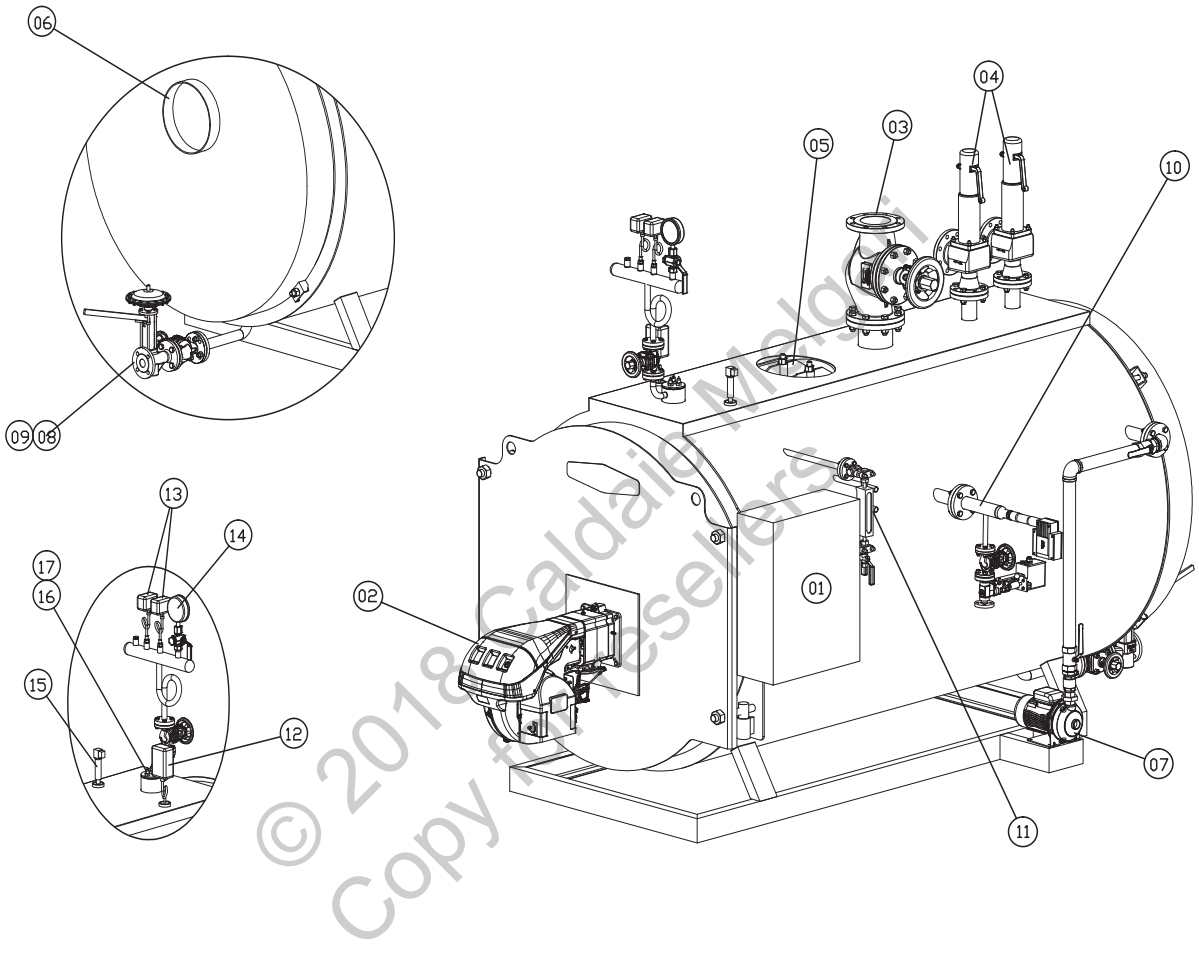
Our optional accessories kit for 72 hours licenced operator exemption includes, in addition to basic accessories, the following components:
- N° 1 Water level regulator with probes
- N° 2 Safety probes (low level) and n° 1 Safety probe (high level)
- N° 1 Control probe for water conductivity in the boiler
- N° 1 Control probe for feeding water salinity
- N° 1 Automatic blow-down system
- A system tested for generator's shutdown after 72 hours: it includes a timer that can only be reset after the licensed operator has performed a series of specific controls.

MVB
MAIN BENEFITS

- **Heat exchange area is particularly big in order to mantain low specific heating loads** and to continuously **ensure high efficiency**.
- The **large front door simplifies maintenance** and **cleaning activities** as well as **periodic inspections required by law**. Scheduled maintenance is essential for your boiler because, besides preserving over time the value of the thermal plant, it prevents the risk of production stoppages.
- The **electric control panel**, positioned at eye level, **allows you to easily manage all the boiler's control systems**.
- The particular position of the tubes around the combustion chamber ensures a **fair distribution of the smokes maintaining the thermal load.** Iron turbolators (or, upon request, steel) constantly ensure high efficiency.
- **"Dry steam"** produced by MVI generator **allows reductions of the boiler returns through the steam traps in the system** and, therefore, significant energy costs saving for your company.
- **Each Caldaie Melgari boiler, before being delivered, is rigorously checked** (production features, performances, etc.). In addition to non-destructive controls, a trial is performed to ensure a high constructive and qualitative standard.
- **The generator is supplied ready for connection to fuel, to electric power, to discharges and water circuits** which makes the installation quick and easy.
- Upon request, **we are able to supply integrated solutions to improve generator's efficiency and reduce fuel consumptions**. The economizer, for example, allows to exploit the heat of the flue exhaust gases to heat feeding water, thus increasing efficiency and, at the same time, reducing fuel consumption. In most cases, the investment is paid back in less than one year. The benefits for your company are concrete: **increased efficiency of 3-4% up to 5%; reduction in emissions from 3-4% up to 5%, reduction of waste and excess consumption, heat and energy recovery** (previously dispersed in the environment).
- It is possible to provide a **modulating control of the burner and the water pump managed by PLC** (Programmable Logic Controller) and inverters.
- **The boiler can be mounted on a skid** with welded metal sections in order to allow immediate installation **or in a container** (turn-key thermal plant) with other components (eg. Water treatment system, air separator, removable pot drains collection, etc.) .
- **Insulation (in aluminium or- upon request- in stainless steel), extremely durable, protects the boiler from possible damages deriving from atmospheric agents**.
- Upon request, **we provide support during installation and piping**. Furthermore we can supply spare parts and offer support for emergencies (availability 24 hours).
- **The boiler can be configured according to your requests**: we can provide a **wide range of optional accessories to customize it** (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

MVB

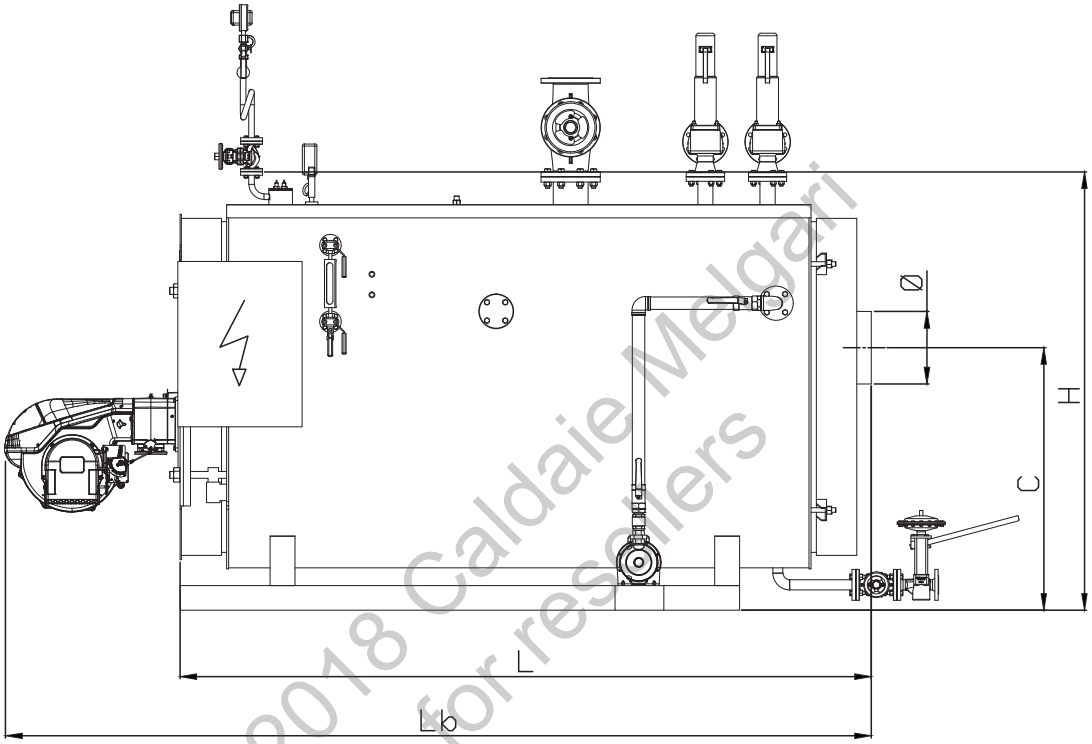
COMPONENTS

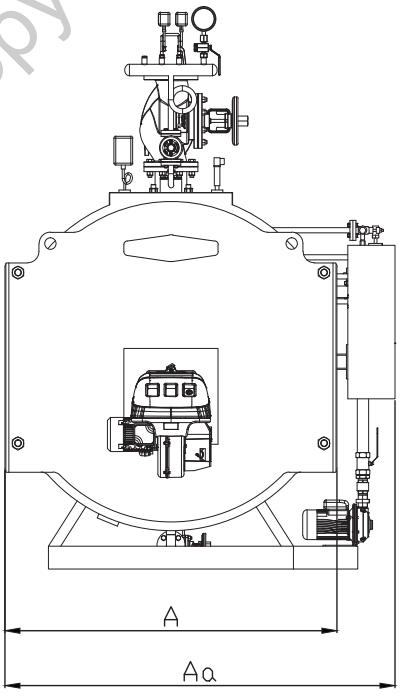


1	Electric control panel
2	Burner
3	Steam outlet
4	Safety valve(s)
5	Manhole
6	Smokes outlet
7	Feeding water pump
8	Purge
9	Automatic blowdown (included in h72 kit)
10	TDS Desalting device (only available with h72 Kit)
11	Water level indicators with cocks
12	Safety pressure switch(es)
13	Regulation pressure switch(es)
14	Manometer
15	Safety probe - low level (included in h72 Kit)
16	Safety probe - high level (included in h72 Kit)
17	Water level regulation probe (optional)

MVB

DIMENSIONS





MVB - SPECIFICATIONS

MODEL MVB		140	200	300	400	500	700	800
Nominal Capacity	kCal/h	82.138	117.340	176.010	234.680	293.350	410.690	469.360
	kW	96	136	205	273	341	478	546
Furnace Capacity	kCal/h	88.320	126.172	189.258	252.344	315.430	441.602	504.688
	kW	103	147	220	293	367	513	587
Steam production	kg/h	140	200	300	400	500	700	800
Efficiency (without economizer)	%	93	93	93	93	93	93	93
Efficiency (with economizer)	%	95	95	95	95	95	95	95
Combustion chamber pressure	mbar	1,5	2,5	3,0	3,5	4,2	4,5	5,0
Total water content	dm^3	480	480	690	690	880	1.080	1.310
Water content (at level)	dm^3	350	350	470	470	620	760	920
Pressure	bar	1	1	1	1	1	1	1
Hydraulic test pressure	bar	2	2	2	2	2	2	2
Natural Gas consumption	Nm^3/h	10	15	22	30	37	52	59
Natural Gas flow rate	Nm^3/h	119	170	255	340	425	594	679
Diesel consumption	kg/h	9	13	19	25	32	44	50
Diesel flow rate	kg/h	124	177	265	353	442	618	707
LPG Consumption	Nm^3/h	4	6	9	11	14	20	23
LPG flow rate	Nm^3/h	127	181	272	362	453	634	724
Length without burner (L)	mm	1.775	1.775	2.025	2.025	2.027	2.327	2.325
Length with burner (Lb)	mm	2.075	2.075	2.325	2.325	2.380	2.930	2.980
Largeur min (A)	mm	954	954	1.046	1.046	1.190	1.190	1.310
Largeur Max (Aa)	mm	1.450	1.450	1.540	1.540	1.690	1.690	1.810
Height (H)	mm	1.234	1.234	1.326	1.326	1.470	1.470	1.590
Chimney wheelbase (C)	mm	637	637	618	618	690	690	740
Empty weight	kg	850	850	1.220	1.220	1.470	1.650	1.820
Chimney diameter	mm	200	200	250	250	250	250	250
Steam outlet	DN	50	50	65	65	80	80	100
Purge	DN	1"	1"	1"	1"	1"	1"	1"

Technical data are approximate and are subject to changes due to improvements in our production system

MVB - SPECIFICATIONS

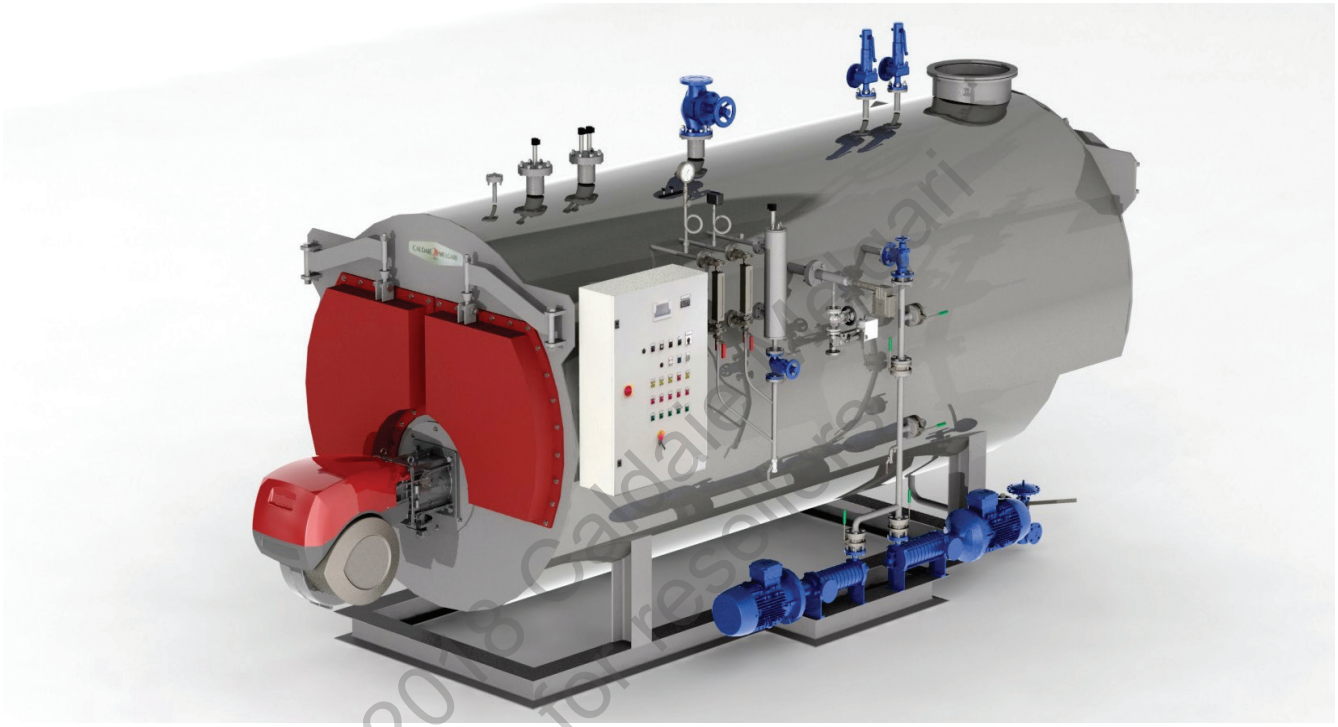
MODEL MVB		1.000	1.250	1.500	1.750	2.000	2.500	3.000
Nominal Capacity	kCal/h	586.700	733.375	880.050	1.026.725	1.173.400	1.466.750	1.760.100
	kW	682	853	1.023	1.194	1.364	1.706	2.047
Furnace Capacity	kCal/h	630.860	788.575	946.290	1.104.005	1.261.720	1.577.151	1.892.581
	kW	734	917	1.100	1.284	1.467	1.834	2.201
Steam production	kg/h	1.000	1.250	1.500	1.750	2.000	2.500	3.000
Efficiency (without economizer)	%	93	93	93	93	93	93	93
Efficiency (with economizer)	%	95	95	95	95	95	95	95
Combustion chamber pressure	mbar	6,0	6,5	6,8	7,0	7,0	8,0	8,2
Total water content	dm^3	1.460	1.950	2.200	2.450	2.720	3.540	4.120
Water content (at level)	dm^3	1.025	1.350	1.520	1.680	1.930	2.550	2.850
Pressure	bar	1	1	1	1	1	1	1
Hydraulic test pressure	bar	2	2	2	2	2	2	2
Natural Gas consumption	Nm^3/h	74	93	111	130	148	186	223
Natural Gas flow rate	Nm^3/h	849	1.061	1.274	1.486	1.698	2.123	2.547
Diesel consumption	kg/h	63	79	95	110	126	158	189
Diesel flow rate	kg/h	883	1.104	1.325	1.546	1.766	2.208	2.650
LPG Consumption	Nm^3/h	29	36	43	50	57	72	86
LPG flow rate	Nm^3/h	905	1.132	1.358	1.584	1.811	2.263	2.716
Length without burner (L)	mm	2.525	2.526	2.776	3.026	3.026	3.338	3.335
Length with burner (Lb)	mm	3.280	3.380	3.625	3.930	3.930	4.290	4.290
Largeur min (A)	mm	1.310	1.500	1.500	1.500	1.620	1.750	1.860
Largeur Max (Aa)	mm	1.810	2.000	2.000	2.000	2.120	2.250	2.360
Height (H)	mm	1.590	1.780	1.780	1.780	1.900	2.050	2.170
Chimney wheelbase (C)	mm	740	790	790	790	845	1.245	1.300
Empty weight	kg	1.970	2.230	2.530	3.150	3.470	4.650	5.150
Chimney diameter	mm	250	300	300	300	350	350	400
Steam outlet	DN	100	125	125	125	125	150	150
Purge	DN	1"	1"	1"	1"	1" 1/2	1" 1/2	1" 1/2

Technical data are approximate and are subject to changes due to improvements in our production system

MODEL **MV3**

THREE SMOKE PASS STEAM BOILER

Steam Production from **1.000 to 25.000 kg/hr**, pressure **up to 25 bar**



MAIN FEATURES

Steam generator **Caldaie Melgari MV3 is a pressure boiler with three effective smoke pass construction and a completely wet back**. It's been designed by our Technical Department according to the most advanced techniques, in order to offer the Maximum guarantee of reliability and durability to our Customers.

The first smoke pass takes place in the combustion chamber, while the second and the third take place through thick smoke tubes.

MV3 model can be realized for the production of saturated or superheated steam, hot water and superheated water.

MATERIALS AND CERTIFICATIONS

This type of generator is **ideal for those clients who require a continuous supply of steam, such as companies active in the following industries: food, chemical and pharmaceutical, textile, fertilizer, petrochemical (refineries), paper, industrial laundry, beverage, building materials, plastics, rubber, wood, etc.**

For the construction, only certified materials are used and non-destructive controls (eg. X-rays of the crossings, liquid penetrant on the corner welds) are performed by our skilled technicians and verified by a Notified Body according to PED Directive. **The entire construction is CE marked and complies with all the requirements of Directive PED 2014/68/UE , as well as being equipped with all safety devices.**

Tube sheets can be plane welded to the angle or rimmed to ensure the absorption of thermal expansions at different work loads.

All joints are carefully electricly welded and manufactured through manual / automatic process.

INSULATION

Insulation of the external parts and collectors is realized with high density rock wool (coated with aluminum

or- upon request- stainless steel) **that ensures the containment of heat.**

FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

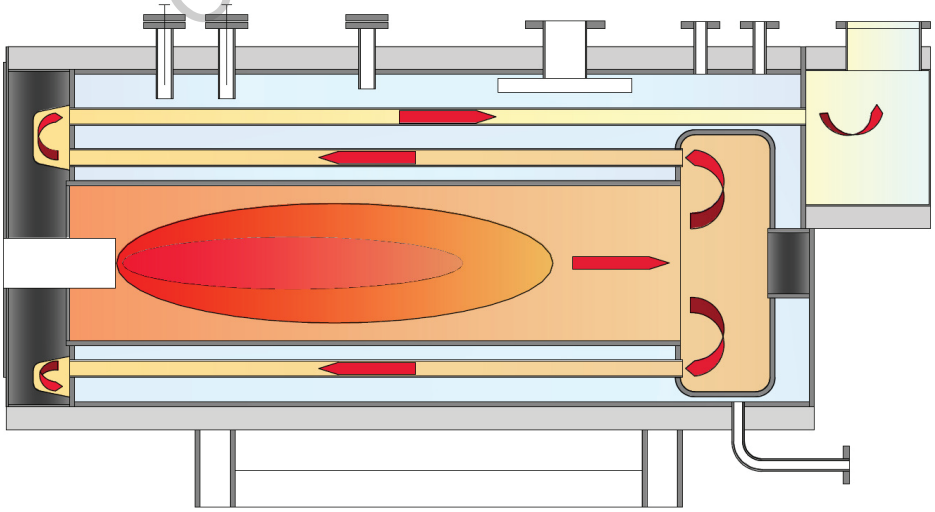
EFFICIENCY

Speed of the smokes in the tubes is so high that soot residues can't deposit, which implies a **constant generator efficiency over 90%**. **With integrated economizer, the efficiency is around 95%.**

BODY OF THE **BOILER**

- **Pressure vessel in high-quality steel, cylindrical and horizontal version** with shell, combustion chamber and tubesheet in steel P 275 NH. the boiler is complete with connections.
- **External body of the boiler** is equipped with a **manhole** and a **handhole** used for water side and internal inspections.
- **Cylindrical combustion chamber in high-quality steel** with completely wet reverse chamber (without refractory). The particular dimensions of the combustion chamber **entail a perfect mixing between fuel and comburent air** for a **complete** and **efficient combustion**.
- **Smoke tubes made in steel P 235 GH – EN 10216-2** welded to the plates.
- **Rimmed plates** (for the model with this kind of plates) allow to increase thermal load and reduce risks.
- **Rear smokes chamber**, in carbon steel, completely openable with refractory material in the rear smokes chamber, smokes convey to the chimney.
- **Front smokes chamber** in carbon steel, with refractory material and complete with openable doors for inspection of the smoke tubes and burner's plate.
- **Insulation in high density rock wool** with aluminium coating (or stainless steel, upon request).
- **Basement made of structural steel** sections supporting the boiler assembly and its accessories.

SMOKE PASS SCHEME



The first smoke pass takes place in the combustion chamber, while the second and the third take place through thick smoke tubes.

MV3
ACCESSORIES & FITTINGS

Our MV3 THREE SMOKE PASS steam boiler includes the following basic accessories:

Valves
- Steam outlet valve
- Blow down valve with interception valve

Regulation and control equipment
- Steam pressure gauge complete with a three-way cock with test flange
- Regulation pressure switches (if two-stage burner) / pressure sensors for burner modulation (if modulating burner).
- N°2 water level indicators complete with n.2 interception cocks each (the lower one is a three-way cock for drainage and purge / blow-down)

Safety devices
- Safety pressure switch
- N°2 safety valves

Electric control panel
- Varnished cabinet in IP 54 version
- Door lock master switch
- Burner and pump start-up switch
- Transformer for auxiliaries
- Fuses and indicator lights

Feeding water group includes the following components:
- N° 1 interception valve directly mounted on the boiler body.
- N° 1 check valve connected to the previous one
- N° 1 electric water pump mounted on its skid. The pump is already connected (electricly & hydraulically). Flow rate and pressure head are in compliance with standards. Upon request, a second pump as a stand-by one (emergency) can be offered.

Our optional accessories kit for 24 hours licenced operator exemption includes, in addition to basic accessories, the following components:
- N° 1 Water level regulator with probes
- N° 2 Safety probes (low level)

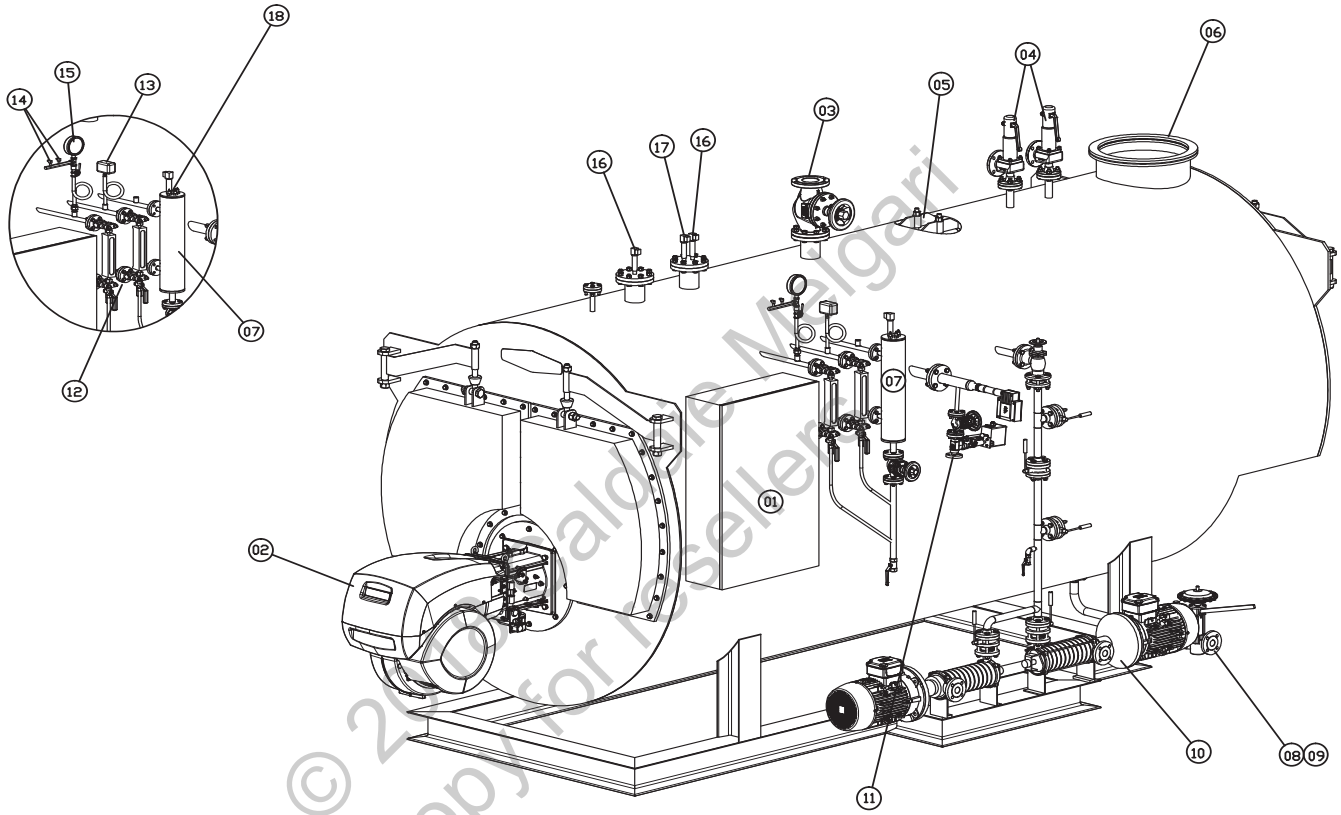
Our optional accessories kit for 72 hours licenced operator exemption includes, in addition to basic accessories, the following components:
- N° 1 Water level regulator with probes
- N° 2 Safety probes (low level) and n° 1 Safety probe (high level)
- N° 1 Control probe for water conductivity in the boiler
- N° 1 Control probe for feeding water salinity
- N° 1 Automatic blow-down system
- A system tested for generator's shutdown after 72 hours: it includes a timer that can only be reset after the licensed operator has performed a series of specific controls.

MV3
MAIN BENEFITS

- The MV3 model fascinates for its **simplicity** and the **minimization of refractory material**.
- **Heat exchange area is particularly big in order to mantain low specific heating loads** and to continuously **ensure high efficiency**.
- Use of low volumetric thermal loads in combination with low-nox burners complies with the most restrictive national and international regulations in terms of NOx and CO emissions. MV3 model can be coupled with low emission burners: from the lowest capacity, it guarantees high environmental efficiency.
- **MV3 generator has many doors that simplify maintenance and cleaning activities as well as periodic inspections required by law**. Scheduled maintenance is essential for your boiler because, besides preserving over time the value of the thermal plant, it prevents the risk of production stoppages.
- **The electric control panel, positioned at eye level, allows you to easily manage all the boiler's control systems**.
- The particular position of the tubes around the combustion chamber ensures a **fair distribution of the smokes maintaining the thermal load**. Iron turbolators (or, upon request, steel) constantly ensure high efficiency.
- **Each Caldaie Melgari boiler, before being delivered, is rigorously checked** (production features, performances, etc.). In addition to non-destructive controls, **a trial is performed to ensure a high constructive and qualitative standard**.
- The **generator** is **supplied ready for connection to fuel, to electric power, to discharges** and **water circuits** which makes the installation quick and easy.
- Upon request, **we are able to supply integrated solutions to improve generator's efficiency and reduce fuel consumptions**. The **economizer**, for example, **allows to exploit the heat of the flue exhaust gases to heat feed water, thus increasing efficiency and, at the same time, reducing fuel consumption**. In most cases, the investment is paid back in less than one year. The benefits for your company are concrete: **increased efficiency of 3-4% up to 5%**; **reduction in emissions from 3-4% up to 5%**, reduction of waste and excess consumption, heat and energy recovery (previously dispersed in the environment).
- It is possible to provide a **modulating control of the burner and the water pump managed by PLC** (Programmable Logic Controller) and inverters.
- **The boiler can be mounted on a skid** with welded metal sections in order to allow immediate installation **or in a container (turn-key thermal plant) with other components** (eg. Water treatment system, degasser, removable discharge collection, etc.).
- Upon request, we are able to supply a **remote control system of the generator** that enables remote monitoring of your boiler: the remote control option **allows you to constantly monitor your plant and allows us to become aware of any problems as they occur, in order to solve them promptly**.
- **Insulation in aluminium or- upon request- in stainless steel, extremely durable, protects the boiler from possible damages deriving from atmospheric agents**.
- Upon request, **we provide support during installation and piping**. Furthermore we can supply spare parts and offer support for emergencies (availability 24 hours).
- The boiler can be configured according to your requests: **we can provide a wide range of optional accessories to customize it** (eg. economizer, gangway, 2nd feed water pump, barrel for water withdrawal, water softener and salt tank, etc.)

MV3

COMPONENTS

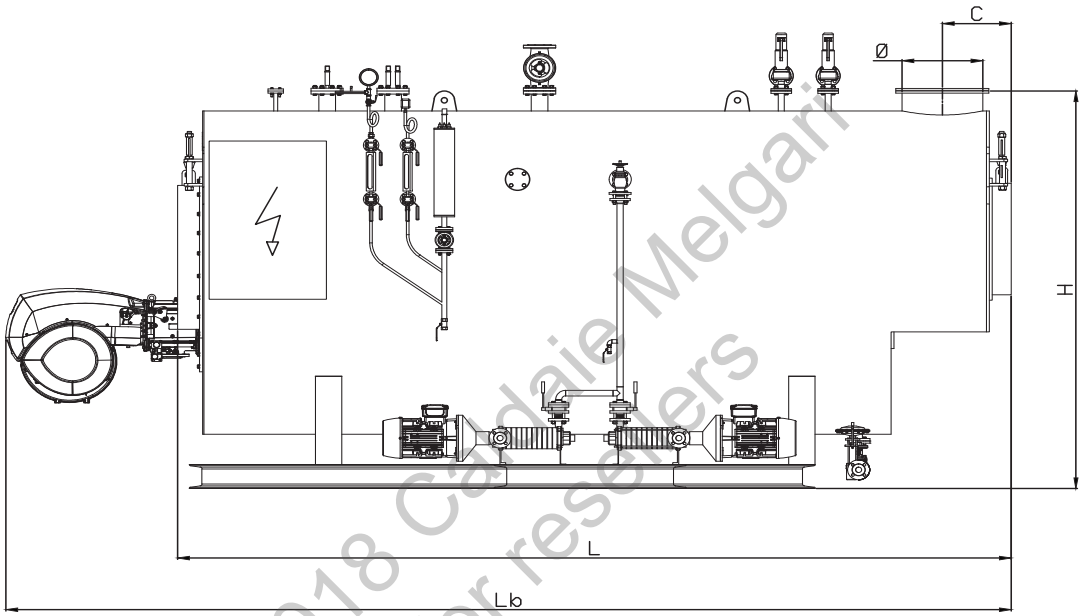


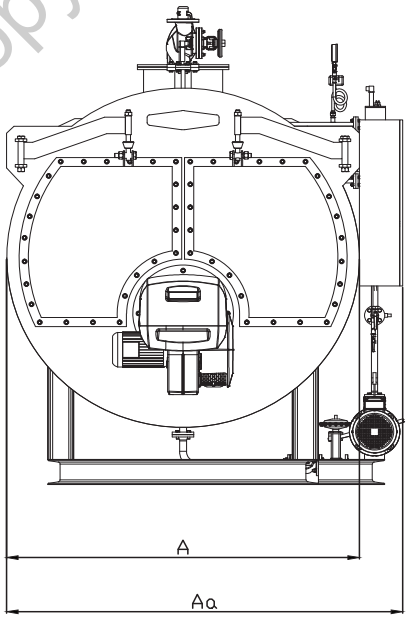
1	Electric control panel
2	Burner
3	Steam outlet
4	Safety valve(s)
5	Manhole
6	Smokes outlet
7	External vessel
8	Purge
9	Automatic blowdown (included in h72 kit)

10	Feeding water pump
11	TDS Desalting device (only available with h72 Kit)
12	Water level indicators with cocks
13	Safety pressure switch(es)
14	Regulation pressure switch(es)
15	Manometer
16	Safety probe - low level (included in h72 Kit)
17	Safety probe - high level (included in h72 Kit)
18	Water level regulation probe (optional)

MV3

DIMENSIONS





MV3 - SPECIFICATIONS

RIMMED TUBE SHEETS MODEL

MODEL MV3		1.000	2.000	2.500	3.000	4.000	5.000
Nominal Capacity	kCal/h	600.000	1.200.000	1.500.000	1.800.000	2.400.000	3.000.000
	kW	698	1.395	1.744	2.093	2.791	3.488
Furnace Capacity	kCal/h	666.667	1.333.333	1.666.667	2.000.000	2.666.667	3.333.333
	kW	775	1.550	1.938	2.326	3.101	3.876
Steam production	kg/h	1.000	2.000	2.500	3.000	4.000	5.000
Efficiency (without economizer)	%	90	90	90	90	90	90
Efficiency (with economizer)	%	95	95	95	95	95	95
Combustion chamber pressure	mbar	5,5	7,0	8,0	8,0	9,0	11,0
Steam chamber capacity	m^3	600	1.040	1.120	1.200	1.600	1.500
Heated surface	m^2	31	57	66	75	85	100
Total water content	Liters	3.100	5.720	6.160	6.600	8.700	9.300
Water content (at level)	Liters	2.500	4.680	5.040	5.400	7.100	7.800
Pressure	bar	12	12	12	12	12	12
Hydraulic test pressure	bar	18	18	18	18	18	18
Natural Gas consumption	Nm^3/h	78	157	196	235	314	392
Natural Gas flow rate	Nm^3/h	897	1.795	2.243	2.692	3.589	4.486
Diesel consumption	kg/h	86	172	215	258	344	430
Diesel flow rate	kg/h	1.204	2.408	3.010	3.612	4.816	6.020
LPG Consumption	Nm^3/h	39	78	98	118	157	196
LPG flow rate	Nm^3/h	1.234	2.468	3.085	3.703	4.937	6.171
Length without burner (L)	mm	3.320	4.300	4.600	4.900	5.050	5.470
Length with burner (Lb)	mm	4.020	5.140	5.620	6.100	6.250	6.670
Width min. (A)	mm	2.030	2.150	2.150	2.300	2.440	2.500
Hauteur max (H max)	mm	2.650	2.980	3.095	3.210	3.200	3.300
Hauteur min (H min)	mm	2.300	2.580	2.695	2.810	2.800	2.900
Chimney wheelbase (C)	mm	290	360	360	375	385	410
Empty weight	kg	6.300	7.800	9.200	10.600	13.200	14.600
Chimney diameter	mm	300	450	450	450	500	550
Steam outlet	DN	50	65	65	80	100	100
Purge	DN	40	40	40	40	40	40

Technical data are approximate and are subject to changes due to improvements in our production system

MV3 - SPECIFICATIONS

RIMMED TUBE SHEETS MODEL

TECHNICAL DATA FOR SIZES ABOVE 15.000 KG / HR (STEAM PRODUCTION) ARE AVAILABLE UPON REQUEST

MODEL MV3		6.000	8.000	10.000	12.000	15.000	25.000
Nominal Capacity	kCal/h	3.600.000	4.800.000	6.000.000	7.500.000	9.000.000	15.000.000
	kW	4.186	5.581	6.977	8.721	10.465	17.442
Furnace Capacity	kCal/h	4.000.000	5.333.333	6.666.667	8.333.333	10.000.000	16.666.667
	kW	4.651	6.202	7.752	9.690	11.628	19.380
Steam production	kg/h	6.000	8.000	10.000	12.500	15.000	25.000
Efficiency (without economizer)	%	90	90	90	90	90	90
Efficiency (with economizer)	%	95	95	95	95	95	95
Combustion chamber pressure	mbar	11,5	12,5	13,0	13,0	13,0	22
Steam chamber capacity	m^3	1.900	2.100	3.500	5.000	5.160	10.200
Heated surface	m^2	135	170	200	235	300	490
Total water content	Liters	10.500	12.000	15.500	18.800	28.340	38.700
Water content (at level)	Liters	8.600	9.900	12.000	13.800	23.180	28.500
Pressure	bar	12	12	12	12	12	12
Hydraulic test pressure	bar	18	18	18	18	18	18
Natural Gas consumption	Nm^3/h	471	627	784	980	1.176	1.961
Natural Gas flow rate	Nm^3/h	5.384	7.178	8.973	11.216	13.459	22.431
Diesel consumption	kg/h	516	688	860	1.075	1.290	2.150
Diesel flow rate	kg/h	7.224	9.632	12.040	15.050	18.060	30.100
LPG Consumption	Nm^3/h	235	313	392	490	588	979
LPG flow rate	Nm^3/h	7.405	9.873	12.342	15.427	18.513	30.854
Length without burner (L)	mm	5.620	6.500	6.920	7.760	8.020	9.000
Length with burner (Lb)	mm	6.820	7.900	8.320	9.260	9.520	11.000
Width min. (A)	mm	2.500	2.600	2.990	3.000	3.490	3.750
Hauteur max (H max)	mm	3.320	3.370	3.570	3.720	3.970	5.200
Hauteur min (H min)	mm	2.920	2.970	3.170	3.320	3.570	4.350
Chimney wheelbase (C)	mm	470	480	510	510	535	700
Empty weight	kg	16.500	18.500	22.000	26.500	31.400	45.000
Chimney diameter	mm	550	600	750	750	850	1.000
Steam outlet	DN	100	125	150	150	150	2 X 150
Purge	DN	40	40	40	40	40	2 X 40

Technical data are approximate and are subject to changes due to improvements in our production system

MV3 - SPECIFICATIONS

PLANE TUBE SHEETS MODEL*

MODEL MV3		1.000	2.000	3.000
Nominal Capacity	kCal/h	600.000	1.200.000	1.800.000
	kW	698	1.395	2.093
Furnace Capacity	kCal/h	666.667	1.333.333	2.000.000
	kW	775	1.550	2.326
Steam production	kg/h	1.000	2.000	3.000
Efficiency (without economizer)	%	90	90	90
Efficiency (with economizer)	%	95	95	95
Combustion chamber pressure	mbar	5,5	7	8
Steam chamber capacity	m^3	600	900	1.200
Heated surface	m^2	31	60	76
Total water content	Liters	3.100	5.100	7.000
Water content (at level)	Liters	2.500	4.200	5.800
Pressure	bar	12	12	12
Hydraulic test pressure	bar	18	23	18
Natural Gas consumption	Nm^3 / h	78	157	235
Natural Gas flow rate	Nm^3 / h	897	1.795	2.692
Diesel consumption	kg/h	86	172	258
Diesel flow rate	kg/h	1.204	2.408	3.612
LPG Consumption	Nm^3 / h	39	78	118
LPG flow rate	Nm^3 / h	1.234	2.468	3.703
Length without burner (L)	mm	3.320	3.800	4.880
Length with burner (Lb)	mm	4.020	4.640	6.080
Width min. (A)	mm	2.150	2.100	2.200
Hauteur max (H max)	mm	2.650	2.750	2.800
Hauteur min (H min)	mm	2.300	2.380	2.400
Chimney wheelbase (C)	mm	290	360	375
Empty weight	kg	6.300	7.800	10.600
Chimney diameter	mm	300	400	450
Steam outlet	DN	50	65	80
Purge	DN	40	40	40

Technical data are approximate and are subject to changes due to improvements in our production system

*: Plane tube sheets generator with steam production > 6 ton/h are available upon request

MV3 - SPECIFICATIONS

PLANE TUBE SHEETS MODEL*

MODEL MV3		4.000	5.000	6.000
Nominal Capacity	kCal/h	2.400.000	3.000.000	3.600.000
	kW	2.791	3.488	4.186
Furnace Capacity	kCal/h	2.666.667	3.333.333	4.000.000
	kW	3.101	3.876	4.651
Steam production	kg/h	4.000	5.000	6.000
Efficiency (without economizer)	%	90	90	90
Efficiency (with economizer)	%	95	95	95
Combustion chamber pressure	mbar	9	11	11,5
Steam chamber capacity	m^3	1.600	1.650	1.700
Heated surface	m^2	88	100	133
Total water content	Liters	9.100	9.280	10.000
Water content (at level)	Liters	7.500	7.630	8.300
Pressure	bar	12	12	12
Hydraulic test pressure	bar	18	18	18
Natural Gas consumption	Nm^3/h	314	392	471
Natural Gas flow rate	Nm^3/h	3.589	4.486	5.384
Diesel consumption	kg/h	344	430	516
Diesel flow rate	kg/h	4.816	6.020	7.224
LPG Consumption	Nm^3/h	157	196	274
LPG flow rate	Nm^3/h	4.937	6.171	7.405
Length without burner (L)	mm	5.100	5.270	5.540
Length with burner (Lb)	mm	6.300	6.470	6.740
Width min. (A)	mm	2.350	2.650	2.650
Hauteur max (H max)	mm	3.100	3.100	3.300
Hauteur min (H min)	mm	2.700	2.700	2.900
Chimney wheelbase (C)	mm	385	410	470
Empty weight	kg	13.200	14.600	16.500
Chimney diameter	mm	550	550	550
Steam outlet	DN	100	100	100
Purge	DN	40	40	40

Technical data are approximate and are subject to changes due to improvements in our production system


Caldaie Melgari

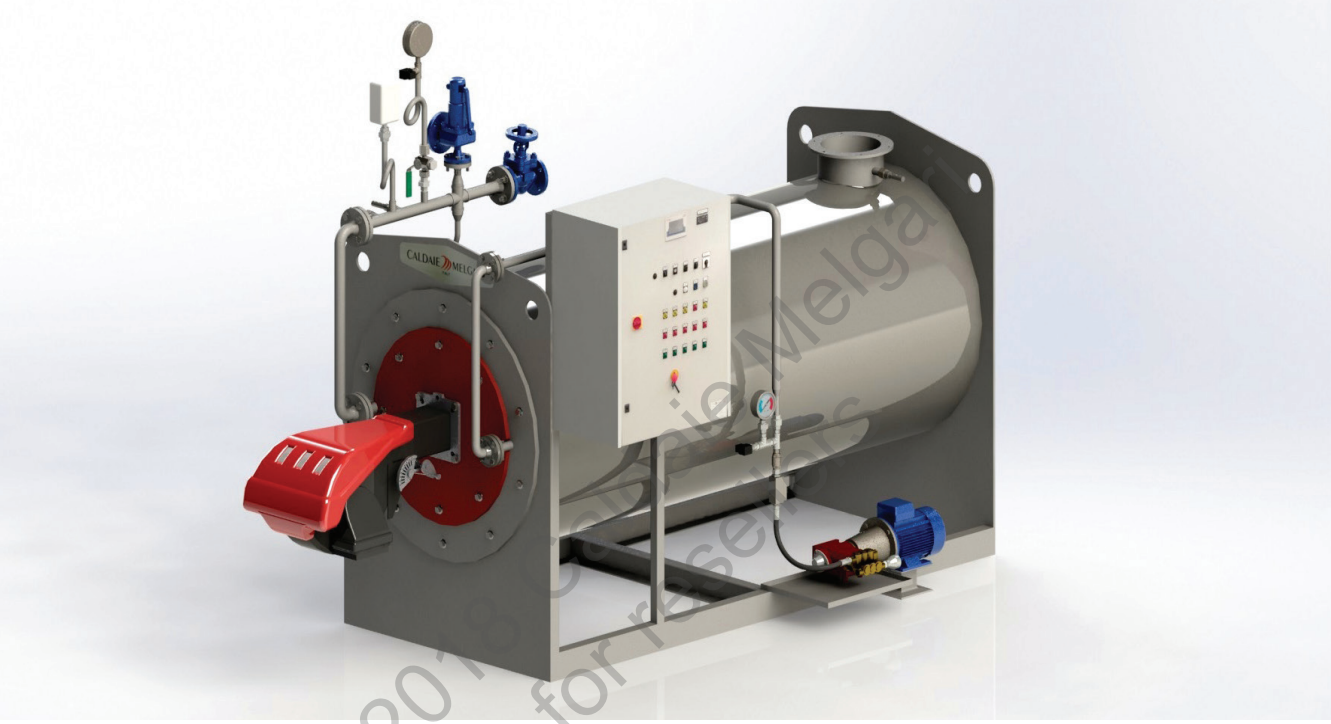
COIL TYPE INSTANTANEOUS STEAM GENERATOR

MODEL **SRH**

COIL TYPE INSTANTANEOUS STEAM BOILER

Steam production **from 100 kg/h up to 4.000 kg/h**, pressure **up to 30 bar**

Horizontal Version



>> MAIN FEATURES

Steam generator Caldaie Melgari SRH is a coil type instantaneous steam boiler in which the water is forced by one (or more) pumps and circulates into the pipe (coil) that represents the heating surface. It has been especially designed by our Technical Department according to the most advanced techniques, in order to offer the maximum guarantee of reliability and durability to our Customers.

SRH Model is a horizontal and monobloc pressurized boiler with three smoke pass construction. The tube bundle is rolled in a continous spiral. The first smoke pass takes place into the combustion chamber while the second and the third between the tube bundles.

The advantage of the SRH steam generator is to reach the required operating conditions in only a few minutes (through an integrated high efficient preheater) and to be totally safe against the water side explosion.

>> MATERIALS AND CERTIFICATIONS

The entire construction is CE marked and complies with all the requirements of Directive PED 2014/68/EU, as well as being equipped with all safety devices. All joints are accurately welded through a manual / automatic process.

>> INSULATION

Upon request, insulation of the external parts and collectors is realized with high density rock wool (coated with aluminum or- upon request- stainless steel) **that ensures the containment of heat.**

SRH steam boiler is always delivered with integrated inverter in order to mantain effective and accurate adjustment of water flow and optimize steam quality. **Furthermore, this type of boiler is often coupled to a steam accumulator.**

>> FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be

powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

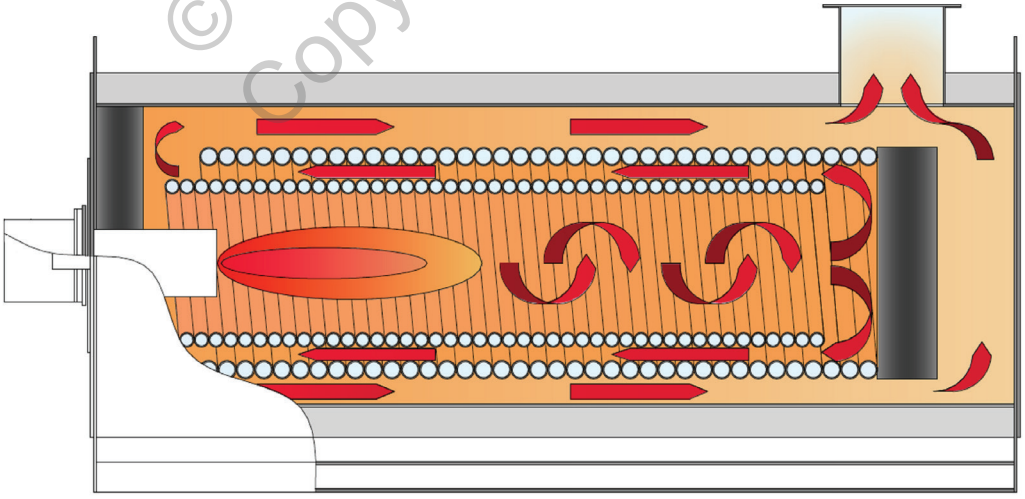
>> EFFICIENCY

Speed of the smokes in the tubes is so high that soot residues can't deposit, which implies a constant generator **efficiency over 90%**.

BODY OF THE **BOILER**

- **Cylindrical shell made of carbon steel sheet** of adequate thickness, containing the pressurized body, complete with properly reinforced heads and, upon request, circular section chimney connection.
- **Pressure body composed of single or bi-tubular coil**
- **Internal rear buffer in steel for high temperatures** coated with refractory cement for the flue gas seal between the first and the second smoke pass.
- **Openable front door**, bolted and complete with flame control indicator light and plate for burner connection, coated with refractory and insulating concrete for the smoke seal between the second and third smoke-pass. This door is also easily removable which makes easier inspection and cleaning operations, in addition to the potential dismantling of the coil that can be extracted from the boiler.
- **Openable external bolted rear door** complete with connection to the chimney coated with insulating refractory.
- **Basement made of structural steel sections** supporting the boiler assembly and its accessories.

SMOKE PASS SCHEME



The first smoke pass takes place into the combustion chamber while the second and the third between tube bundles

SRH
ACCESSORIES & FITTINGS

Our SRH coil type instantaneous steam boiler includes the following basic accessories:

Valves

- Steam outlet valve
- Start up and blow-down valve
- Check valve for feeding water pump
- Three way valve with cock and test flange (manometer connection)

Regulating and control equipment

- Steam pressure gauge
- Regulation pressure switches / pressure sensor for sburner modulating operation
- Coloured water pressure gauge in glycerin
- Electronic steam pressure indicator

Safety Devices

- Safety pressure switch
- Safety valve
- Pressure switch (anticlogging)
- Safety thermostat for high flue gas temperature
- Safety thermostat for steam temperature
- Flow switch

Electric Control Panel

- Painted electric control panel in IP 54 version
- Door lock master switch
- Burner start switch
- Pump start swich
- Transformer for auxilliaries
- Fuses
- Indicator lights and alarms

Feeding water group

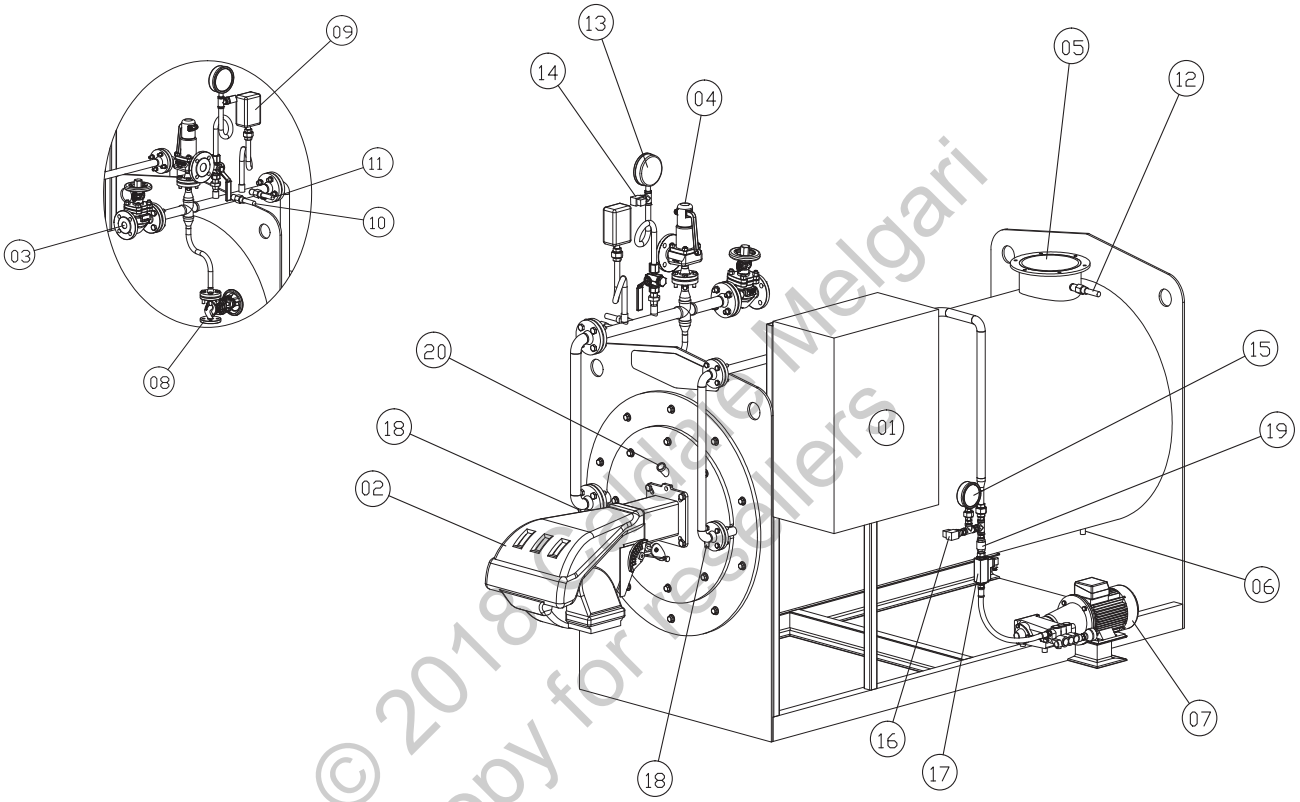
- One or more high pressure piston pumps (driven by inverter) complete with self-ventilated electric motor

SRH
MAIN BENEFITS

- **The advantage of the steam generator SRH is to reach the required operating conditions in a few minutes, guaranteeing absolute safety.** Low water content also protects your boiler in particular from the risk of water side explosion.
- **Heat exchange area is particularly big in order to mantain low specific heating loads** and to continuously ensure high efficiency.
- **Maintenance** and **cleaning activities** of SRH generator **are simplified by the horizontal construction of the boiler**. The front and rear door are also completely openable for cleaning activities and / or for the extraction of the coil.
- **The electric control panel**, positioned at eye level, **allows you to easily manage all the boiler's control systems**.
- Upon request, **we are able to supply integrated solutions to improve generator's efficiency and reduce fuel consumptions**. The economizer, for example, allows to exploit the heat of the flue exhaust gases to heat feeding water, thus increasing efficiency and, at the same time, reducing fuel consumption. In most cases, the investment is paid back in less than one year. The benefits for your company are concrete: **increased efficiency of 3-4% up to 5%**; **reduction in emissions from 3-4% up to 5%**, **reduction of waste and excess consumption**, **heat and energy recovery** (previously dispersed in the environment).
- **SRH generator is characterized by its low NOx (always lower than 80 mg / Nm3)**; under optimal conditions, the NOx emissions are around 55 mg / Nm^3. SRH model ensures, therefore, compliance with cogent national and EU regulations for emissions of NOx and CO.
- **Each Caldaie Melgari boiler, before being delivered, is rigorously checked** (production features, performances, etc.). In addition to non-destructive controls, a trial is performed to ensure a high constructive and qualitative standard.
- **The generator is supplied ready for connection to fuel, to electric power, to discharges and water circuits** which makes the installation quick and easy.
- It is possible to provide a **modulating control of the burner and the water pump managed by PLC** (Programmable Logic Controller) and inverters.
- **The boiler can be mounted on a skid** with welded metal sections in order to allow immediate installation or in a container (turn-key thermal plant) with other components (eg. Water treatment system, air separator, removable pot drains collection, etc.) .
- Upon request, w**e provide a remote control system of the generator that enables remote monitoring of your boiler:** the remote control option allows you to constantly monitor your boiler and allows us to become aware of any problems as they occur, in order to solve them promptly.
- **Insulation** (in aluminium or- upon request- in stainless steel), **extremely durable, protects the boiler from possible damages deriving from atmospheric agents**.
- Upon request, **we provide support during installation and piping**. Furthermore we can supply spare parts and offer support for emergencies (availability 24 hours).
- **The boiler can be configured according to your requests**: we can provide a wide range of optional accessories to customize it (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

SRH MONOTUBULAR

COMPONENTS

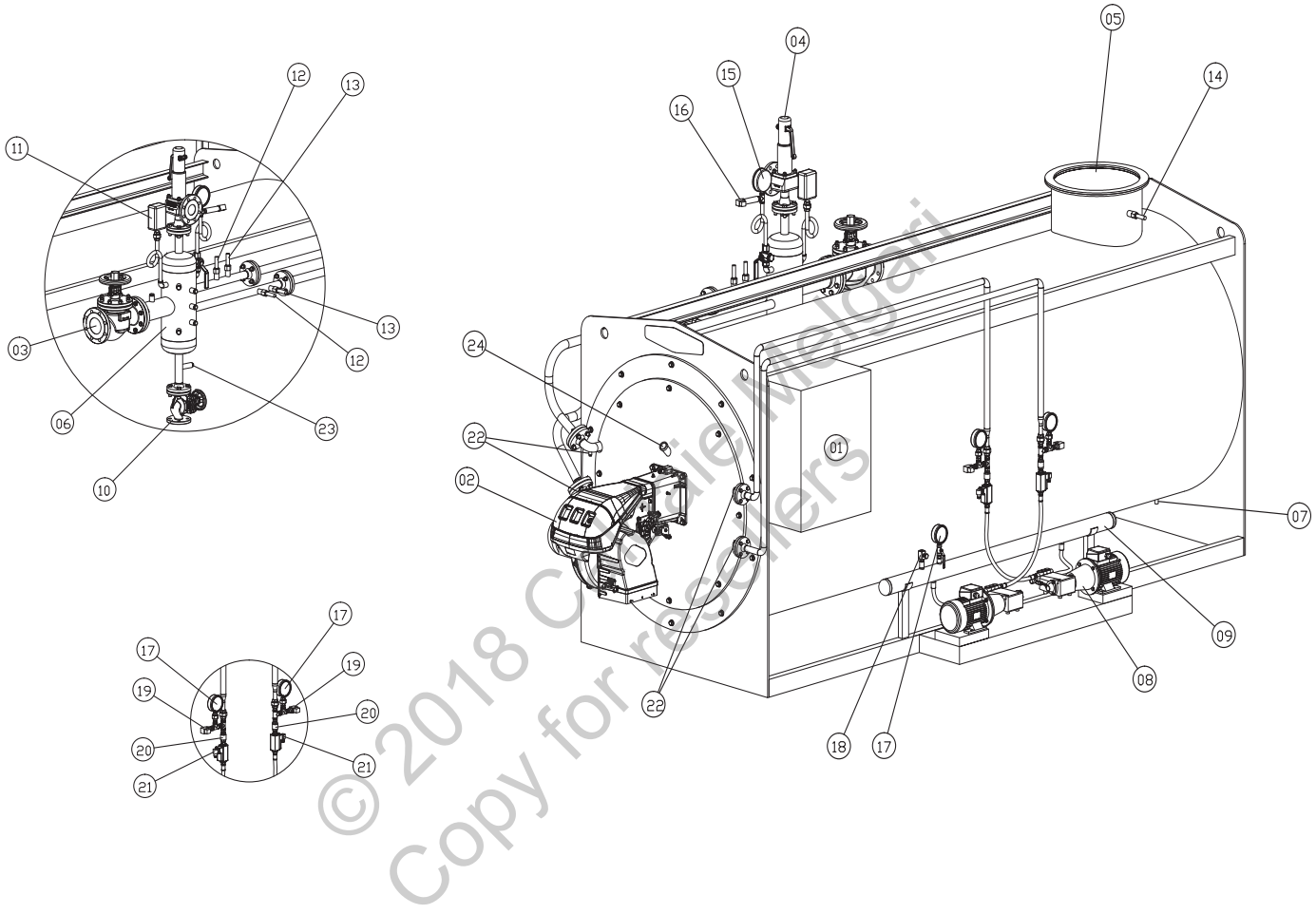


1	Electric control panel
2	Burner
3	Steam outlet
4	Safety valve(s)
5	Smokes outlet
6	Condensate drains
7	Feeding water pump
8	Start-up / Purge valve
9	Safety pressure switch
10	Safety thermostat for high temperature steam - 1

11	Safety thermostat for high temperature steam - 2
12	Safety thermostat for high temperature smokes
13	Steam manometer
14	Steam pressure transmitter
15	Manometer with pressure switch (three colours)
16	Safety pressure switch for high pressure water
17	Flow switch
18	Purge - wash up connection
19	Check valve
20	Flame guard

SRH BI-TUBULAR

COMPONENTS

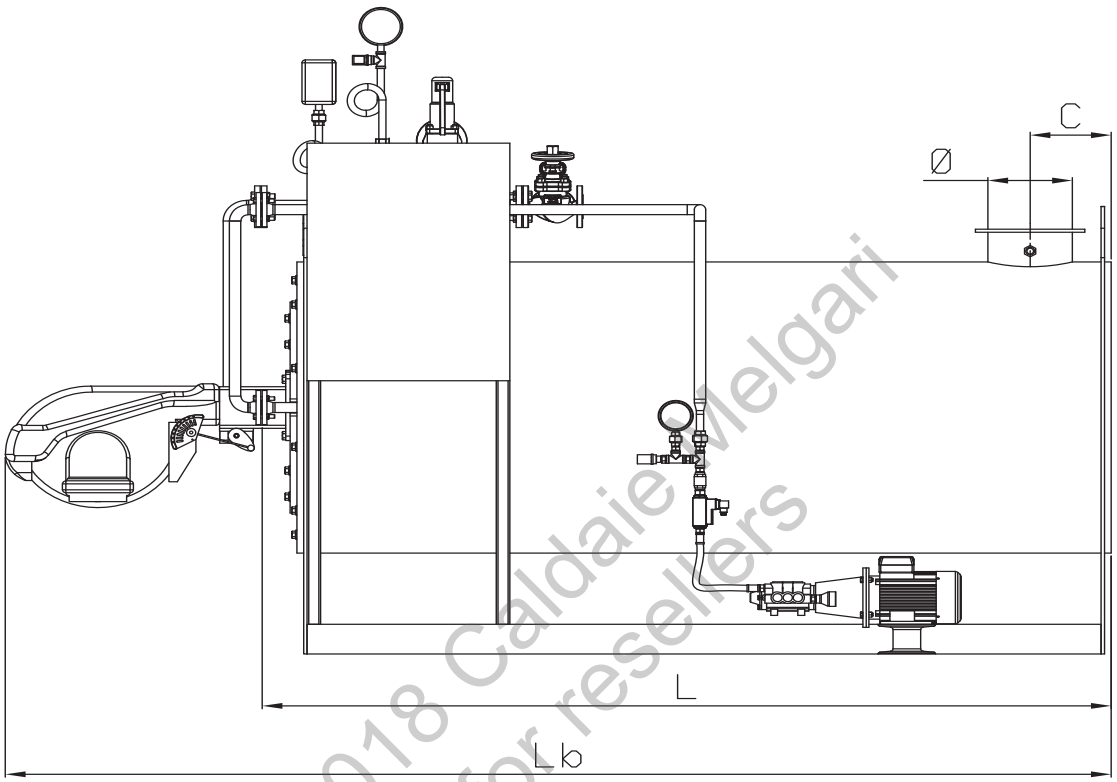


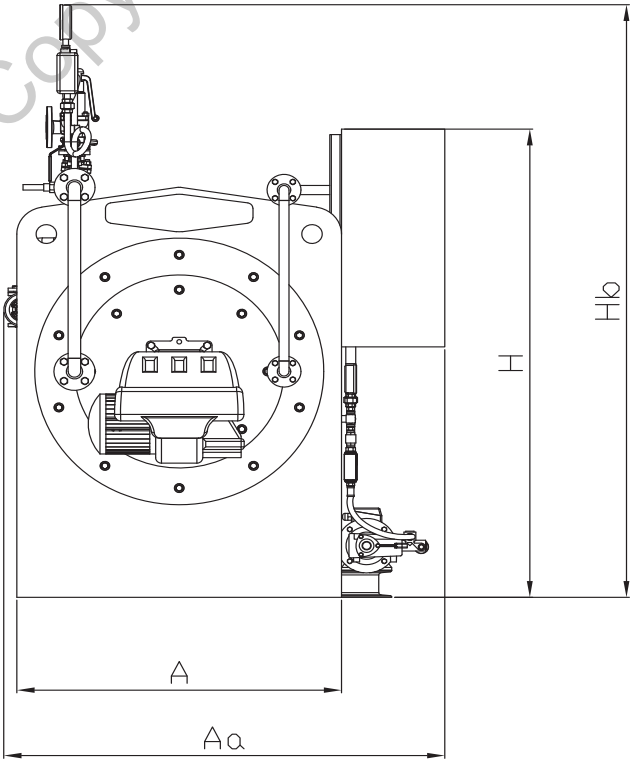
1	Electric control panel
2	Burner
3	Steam outlet
4	Safety valve
5	Smokes outlet
6	Steam collector
7	Condensate drains
8	Feeding water pump
9	Water manifold
10	Start-up / Purge valve
11	Safety pressure switch
12	Safety thermostat for high temperature steam - 1

13	Safety thermostat for high temperature steam - 2
14	Safety thermostat for high temperature smokes
15	Steam manometer
16	Steam pressure transmitter
17	Manometer with pressure switch (three colours)
18	Vent
19	Safety pressure switch for high pressure water
20	Check valve
21	Flow switch
22	Purge - wash up connection
23	Condensate drains
24	Flame guard

DIMENSIONS

SRH MONOTUBULAR





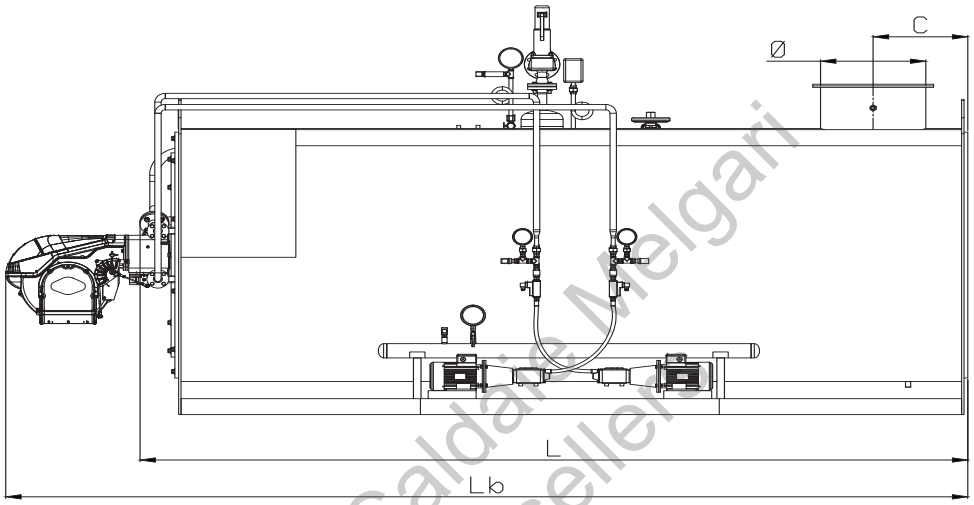
SRH - SPECIFICATIONS

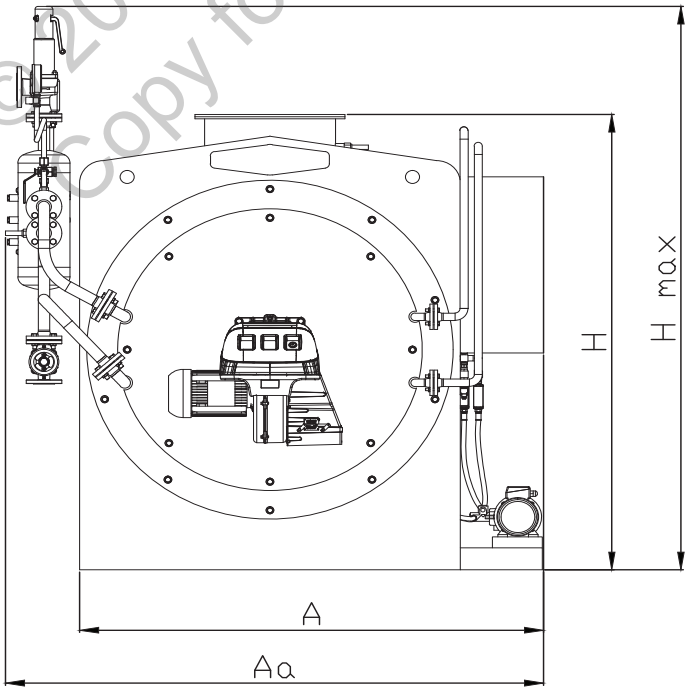
		MONOTUBULAR							
MODEL SRH		**100**	**150**	**200**	**300**	**400**	**500**	**750**	**1.000**
Nominal Capacity	kCal/h	60.000	90.000	120.000	180.000	240.000	300.000	450.000	600.000
	kW	70	105	140	209	279	349	523	698
Furnace Capacity	kCal/h	66.667	100.000	133.333	200.000	266.667	333.333	500.000	666.667
	kW	78	116	155	233	310	388	581	775
Steam production	kg/h	100	150	200	300	400	500	750	1.000
Efficiency (without economizer)	%	90	90	90	90	90	90	90	90
Efficiency (with economizer)	%	95	95	95	95	95	95	95	95
Pressure	bar	12	12	12	12	12	12	12	12
Combustion chamber pressure	mbar	1,0	1,5	2,0	2,0	3,5	3,5	3,5	4,5
Total water content	Liters	14	23	24	30	35	44	100	155
Heated surface	m^2	2,8	4,4	4,7	5,7	6,7	8,4	14,2	19,7
Natural Gas consumption	Nm^3/h	8	12	16	24	31	39	59	78
Natural Gas flow rate	Nm^3/h	90	135	179	269	359	449	673	897
Diesel consumption	kg/h	7	10	13	20	27	33	50	67
Diesel flow rate	kg/h	93	140	187	280	373	467	700	933
LPG Consumption	Nm^3/h	3	5	6	9	12	15	23	30
LPG flow rate	Nm^3/h	96	144	191	287	383	478	718	957
Plate's length	mm	1.060	1.110	1.240	1.335	1.600	1.790	2.060	2.480
Length without burner (L)	mm	1.160	1.210	1.340	1.435	1.700	1.890	2.160	2.580
Length with burner (Lb)	mm	1.340	1.410	1.540	1.845	2.180	2.430	2.900	3.320
Width (A)	mm	650	800	800	800	800	900	990	1.100
Total width (Aa)	mm	1.000	1.150	1.150	1.150	1.150	1.250	1.340	1.450
Plate's height	mm	1.169	1.314	1.314	1.314	1.314	1.404	1.470	1.497
Height (H)	mm	1.700	1.700	1.700	1.700	1.700	1.700	1.700	1.700
Height Max. (H max)	mm	1.700	1.700	1.700	1.700	1.700	1.800	1.940	1.970
Chimney wheelbase (C)	mm	130	130	180	180	180	180	220	220
Empty weight	kg	600	650	700	700	700	750	900	1.100
Chimney diameter	mm	120	120	160	160	160	160	200	250
Steam outlet	DN	15	15	20	20	25	25	32	32
Purge	DN	15	15	15	15	15	15	15	15

Technical data are approximate and are subject to changes due to improvements in our production system

DIMENSIONS

SRH BI-TUBULAR





SRH - SPECIFICATIONS

		MONOTUBULAR				BI-TUBULAR		
MODEL SRH		**1.250**	**1.500**	**1.750**	**2.000**	**2.500**	**3.000**	**4.000**
Nominal Capacity	kCal/h	750.000	900.000	1.050.000	1.200.000	1.500.000	1.800.000	2.400.000
	kW	872	1.047	1.221	1.395	1.744	2.093	2.616
Furnace Capcity	kCal/h	833.333	1.000.000	1.166.667	1.333.333	1.666.680	2.000.000	2.666.667
	kW	969	1.163	1.357	1.550	1.938	2.326	3.101
Steam production	kg/h	1.250	1.500	1.750	2.000	2.500	3.000	4.000
Efficiency (without economizer)	%	90	90	90	90	90	90	90
Efficiency (with economizer)	%	95	95	95	95	95	95	95
Pressure	bar	12	12	12	12	12	12	12
Combustion chamber pressure	mbar	6,0	7,0	8,0	8,0	8,5	9,0	9,5
Total water content	Liters	173	198	213	242	220	233	305
Heated surface	m^2	22,5	25,0	27,0	30,7	33,2	37,1	60
Natural Gas consumption	Nm^3/h	98	118	137	157	176	212	282
Natural Gas flow rate	Nm^3/h	1.122	1.346	1.570	1.795	2.019	2.423	3.230
Diesel consumption	kg/h	83	100	117	133	150	180	240
Diesel flow rate	kg/h	1.167	1.400	1.633	1.866	2.100	2.520	3.360
LPG Consumption	Nm^3/h	38	46	53	61	68	82	109
LPG flow rate	Nm^3/h	1.196	1.435	1.674	1.913	2.153	2.583	3.444
Plate's length	mm	2.680	2.640	2.840	3.185	3.400	3.750	4.130
Length without burner (L)	mm	2.780	2.740	2.940	3.285	3.520	3.870	4.240
Length with burner (Lb)	mm	3.520	3.510	4.020	4.365	4.580	4.930	5.320
Width (A)	mm	1.100	1.150	1.150	1.150	1.250	1.250	1.330
Total width (Aa)	mm	1.450	1.500	1.500	1.500	1.970	1.970	2.050
Plate's height	mm	1.496	1.496	1.496	1.496	1.672	1.692	1.778
Height (H)	mm	1.700	1.700	1.700	1.700	1.750	1.750	1.810
Height Max. (H max)	mm	1.970	2.000	2.080	2.150	2.450	2.450	2.510
Chimney wheelbase (C)	mm	220	275	275	275	435	435	485
Empty weight	kg	1.150	1.650	1.800	2.050	2.750	2.900	3.600
Chimney diameter	mm	250	350	350	350	450	450	550
Steam outlet	DN	32	40	50	65	65	80	80
Purge	DN	20	20	20	20	25	40	40

Technical data are approximate and are subject to changes due to improvements in our production system

MODEL **SRV**

COIL TYPE INSTANTANEOUS STEAM BOILER

Steam production **from 100 kg/h to 4.000 kg/h**, pressure **up to 30 bar**

Vertical Version

MAIN FEATURES

Steam generator Caldaie Melgari SRV is is a coil type instantaneous steam boiler in which the water is forced by one (or more) pumps and circulates into the pipe (coil) that represents the heating surface. It's been especially designed by our Technical Department according to the most advanced techniques, in order to offer the Maximum guarantee of reliability and durability to our Customers.

SRV Model is a vertical and monobloc pressurized boiler with three smoke pass. The tube bundle is rolled in a continous spiral. The first smoke pass takes place into the combustion chamber and the two other one are between the tube bundles.

The advantage of the SRV steam generator is to reach the required operating conditions in only a few minutes (through an integrated high efficient preheater) and to be totally safe against the water side explosion.

SRV generator is always delivered with integrated inverter in order to mantain effective and accurate adjustment of water flow and optimize steam quality. **Furthermore, this type of boiler is often coupled to a steam accumulator**.

MATERIALS AND CERTIFICATIONS

The entire construction is CE marked and complies with all the requirements of Directive PED 2014/68/UE, as well as being equipped with all safety devices.

All joints are accurately welded through a manual / automatic process.

INSULATION

Upon request, insulation of the external parts and collectors can be realized with high density rock wool (coated aluminum or- upon request- stainless steel) and **special coating paints that ensure the containment of heat**.

FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

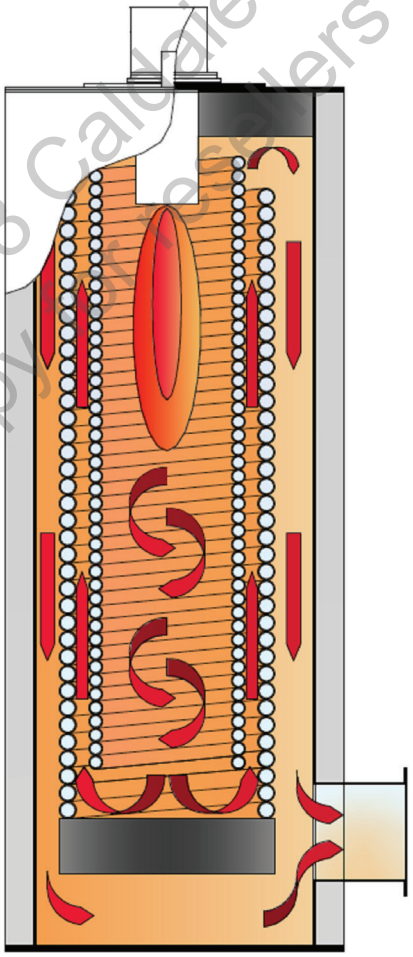
EFFICIENCY

Speed of the smokes in the tubes is so high that soot residues can't deposit, which implies a constant generator **efficiency over 90%**.

BODY OF THE **BOILER**

- **Cylindrical shell made of carbon steel sheet** of adequate thickness, containing the pressurized body, complete with properly reinforced heads and circular section chimney attachment.
- **Pressure body** composed of monotubular or bitubular coil
- **Internal rear buffer in steel for high temperatures** coated with refractory cement for the flue gas seal between the first and the second smoke pass.
- **Basement** made of structural steel sections supporting the boiler assembly and its accessories

SMOKE PASS SCHEME



The first smoke pass takes place into the combustion chamber while the second and the third between the tube bundles.

SRV
ACCESSORIES & FITTINGS

Our SRV coil type instantaneous steam boiler includes the following basic accessories:

Valves

- Steam outlet valve
- Start up and blow-down valve
- Check valve for feeding water pump
- Three way valve with cock and test flange (manometer connection)

Regulating and control equipment

- Coil water inlet manometer
- Steam outlet manometer
- Regulation pressure switches (first and second flame for two-stage burner)
- Pressure transmitter for modulating flame (modulating regulation burner)
- Electronic steam pressure indicator on control panel

Safety Devices

- Safety pressure switch
- Safety valve
- Pressure switch (anticlogging)
- Safety thermostat for high flue gas temperature
- Safety thermostat for steam temperature
- Flow switch

Electric Control Panel

- Painted electric control panel in IP 54 version
- Door lock master switch
- Burner start switch
- Pump start swich
- Transformer for auxilliaries
- Fuses
- Indicator lights and alarms

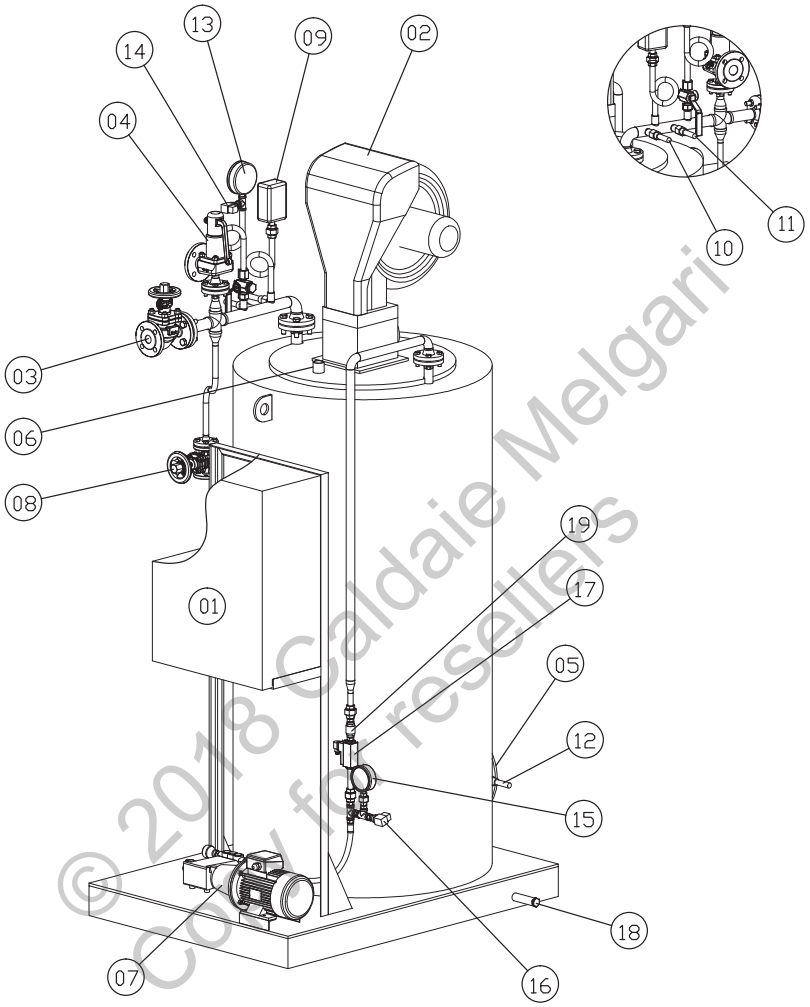
Feeding water group

- One or more high pressure piston pumps (driven by inverter) complete with self-ventilated electric motor

SRV
MAIN BENEFITS

- **The advantage of the steam generator SRV is to reach the required operating conditions in a few minutes, guaranteeing absolute safety.** Low water content also protects your boiler in particular from the risk of water side explosion.
- **Heat exchange area is particularly big in order to mantain low specific heating loads** and to continuously ensure high efficiency.
- **SRV generator is easy to place since it occupies little space**: the vertical construction facilitates, in fact, **adaptability to any type of room**.
- **The electric control panel**, positioned at eye level, **allows you to easily manage all the boiler's control systems**.
- Upon request, **we are able to supply integrated solutions to improve generator's efficiency and reduce fuel consumptions**. The economizer, for example, allows to exploit the heat of the flue exhaust gases to heat feeding water, thus increasing efficiency and, at the same time, reducing fuel consumption. In most cases, the investment is paid back in less than one year. The benefits for your company are concrete: **increased efficiency of 3-4% up to 5%**; **reduction in emissions from 3-4% up to 5%**, **reduction of waste and excess consumption**, **heat and energy recovery** (previously dispersed in the environment).
- **SRV generator is characterized by its low NOx (always lower than 80 mg / Nm3)**; under optimal conditions, the NOx emissions are around 55 mg / Nm³. SRH model ensures, therefore, compliance with cogent national and EU regulations for emissions of NOx and CO.
- **Each Caldaie Melgari boiler, before being delivered, is rigorously checked** (production features, performances, etc.). In addition to non-destructive controls, a trial is performed to ensure a high constructive and qualitative standard.
- **The generator is supplied ready for connection to fuel, to electric power, to discharges and water circuits** which makes the installation quick and easy.
- It is possible to provide a **modulating control of the burner and the water pump managed by PLC** (Programmable Logic Controller) and inverters.
- **The boiler can be mounted on a skid** with welded metal sections in order to allow immediate installation or in a container (turn-key thermal plant) with other components (eg. Water treatment system, air separator, removable pot drains collection, etc.) .
- Upon request, w**e provide a remote control system of the generator that enables remote monitoring of your boiler:** the remote control option allows you to constantly monitor your boiler and allows us to become aware of any problems as they occur, in order to solve them promptly.
- **Insulation** (in aluminium or- upon request- in stainless steel), **extremely durable, protects the boiler from possible damages deriving from atmospheric agents**.
- Upon request, **we provide support during installation and piping**. Furthermore we can supply spare parts and offer support for emergencies (availability 24 hours).
- **The boiler can be configured according to your requests**: we can provide a wide range of optional accessories to customize it (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

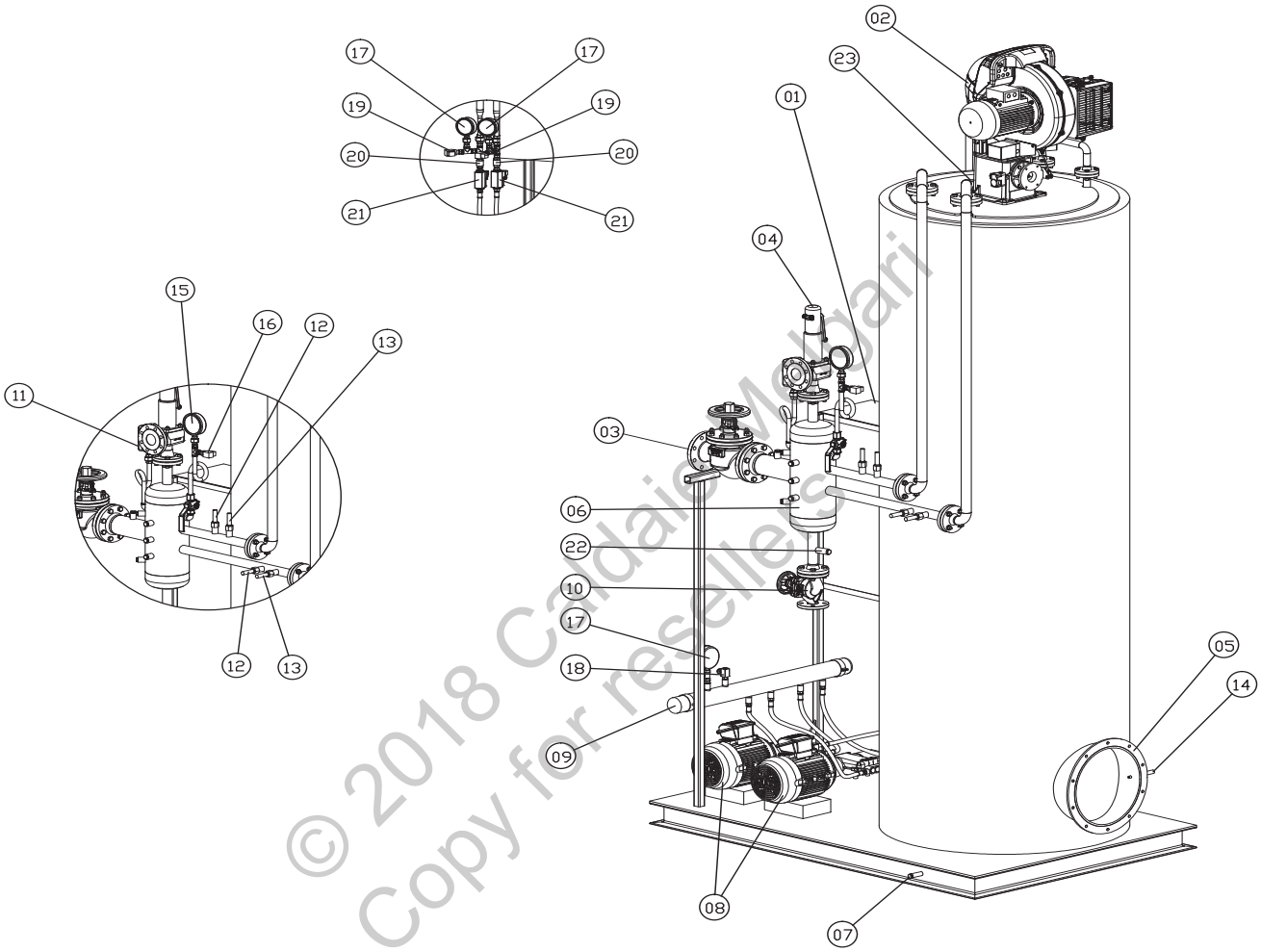
SRV MONOTUBULAR
COMPONENTS



1	Electric control panel
2	Burner
3	Steam outlet
4	Safety valve(s)
5	Smokes outlet
6	Flame guard
7	Feeding water pump
8	Start-up / Purge valve
9	Safety pressure switch
10	Safety thermostat for high temperature steam - 1

11	Safety thermostat for high temperature steam - 2
12	Safety thermostat for high temperature smokes
13	Steam manometer
14	Steam pressure transmitter
15	Manometer with pressure switch (three colours)
16	Safety pressure switch for high pressure water
17	Flow switch
18	Condensate drains
19	Check valve

SRV BI-TUBULAR
COMPONENTS

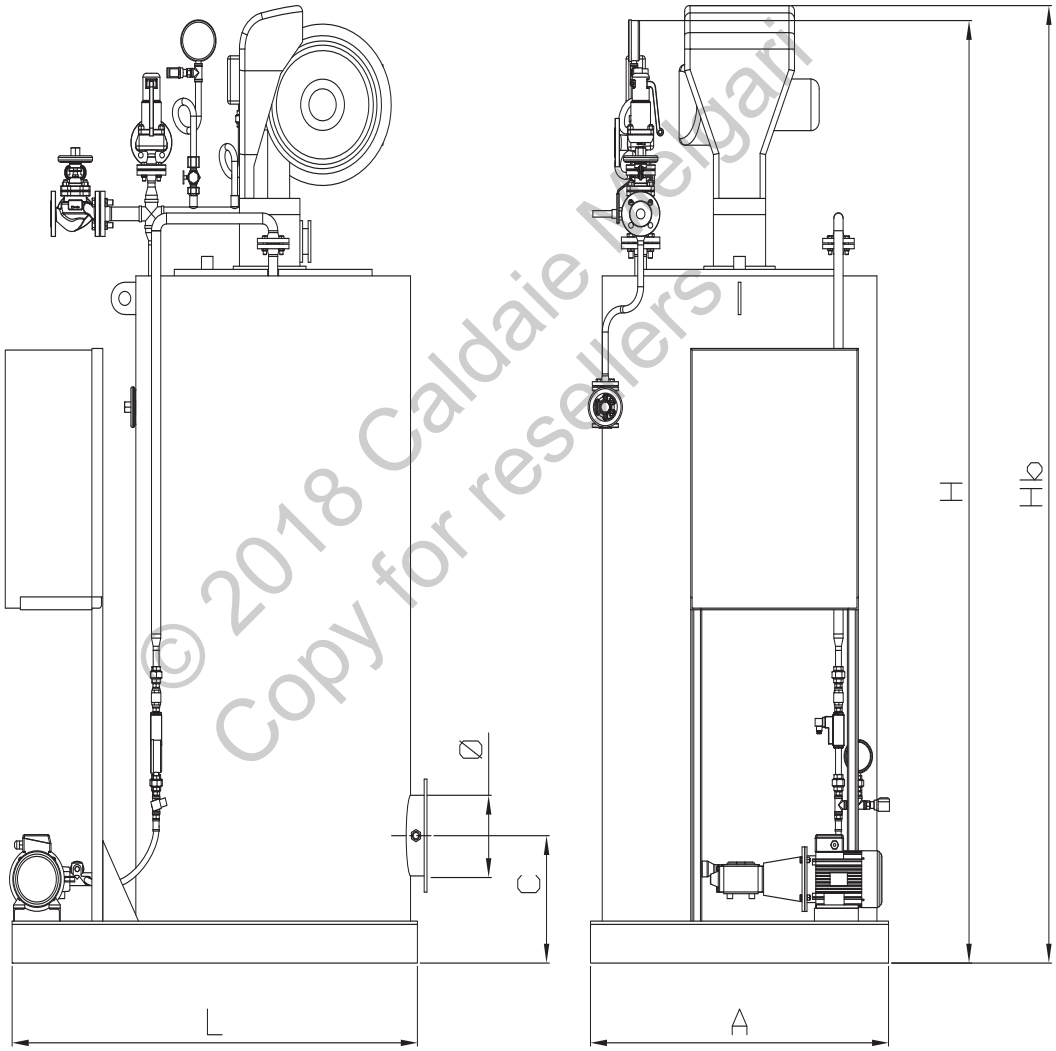


1	Electric control panel
2	Burner
3	Steam outlet
4	Safety valve
5	Smokes outlet
6	Steam collector
7	Condensate drains
8	Feeding water pump
9	Water manifold
10	Start-up / Purge valve
11	Safety pressure switch
12	Safety thermostat for high temperature steam - 1

13	Safety thermostat for high temperature steam - 2
14	Safety thermostat for high temperature smokes
15	Steam manometer
16	Steam pressure transmitter
17	Manometer with pressure switch (three colours)
18	Vent
19	Safety pressure switch for high pressure water
20	Check valve
21	Flow switch
22	Purge - wash up connection
23	Flame guard

SRV MONOTUBULAR

DIMENSIONS



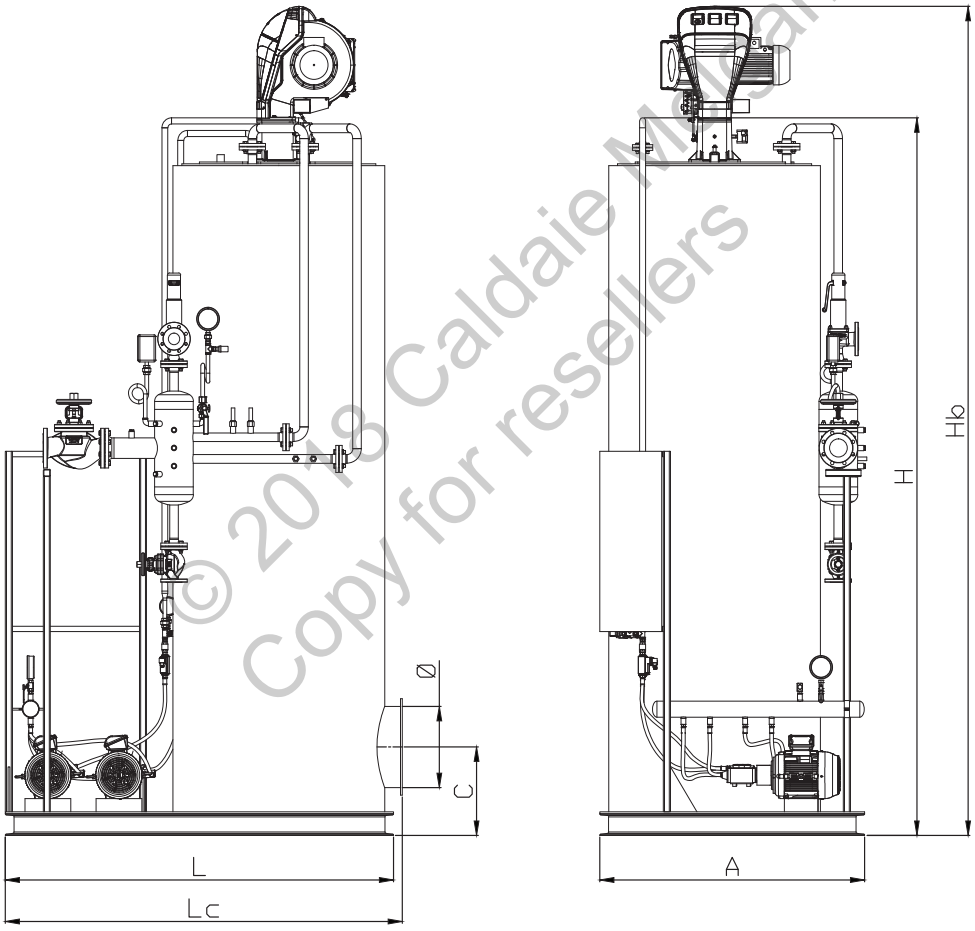
SRV - SPECIFICATIONS

		MONOTUBULAR							
MODEL SRV		**100**	**150**	**200**	**300**	**400**	**500**	**750**	**1.000**
Nominal Capacity	kCal/h	60.000	90.000	120.000	180.000	240.000	300.000	480.000	600.000
	kW	70	105	140	209	279	349	523	698
Furnace Capacity	kCal/h	66.667	100.000	133.333	200.000	266.667	333.333	533.333	666.667
	kW	78	117	155	232	310	388	581	775
Steam production	kg/h	100	150	200	300	400	500	750	1000
Efficiency (without economizer)	%	90	90	90	90	90	90	90	90
Efficiency (with economizer)	%	95	95	95	95	95	95	95	95
Pressure	bar	12	12	12	12	12	12	12	12
Combustion chamber pressure	mbar	1	1,5	2	2	3,5	3,5	3,5	4,5
Total water content	Liters	14	23	24	30	35	44	100	155
Heated surface	m^2	2,8	4,4	4,7	5,7	6,7	8,4	14,2	19,7
Natural Gas consumption	Nm^3/h	8	12	16	23	31	39	59	78
Natural Gas flow rate	Nm^3/h	90	135	179	269	359	449	672	897
Diesel consumption	kg/h	7	10	13	20	27	33	50	67
Diesel flow rate	kg/h	94	141	187	279	373	467	700	933
LPG Consumption	Nm^3/h	3	5	6	9	12	15	23	30
LPG flow rate	Nm^3/h	96	144	191	286	383	479	717	956
Length (L)	mm	1.050	1.150	1.400	1.400	1.400	1.600	1.700	1.750
Width min. (A)	mm	700	810	810	810	810	900	960	1.100
Height without economizer (H)	mm	1.540	1.590	1.790	1.990	2.015	2.040	2.515	2.990
Height with economizer (H)	mm	1.340	1.410	1.540	1.845	2.180	2.430	2.900	3.320
Chimney wheelbase (C)	mm	240	240	260	260	260	260	280	305
Empty weight	kg	600	650	700	700	700	750	900	1.100
Chimney diameter	mm	120	120	160	160	160	160	200	250
Steam outlet	DN	15	15	20	20	25	25	32	32
Purge	DN	15	15	15	15	15	15	15	15

Technical data are approximate and are subject to changes due to improvements in our production system

SRV BI-TUBULAR

DIMENSIONS



SRV - SPECIFICATIONS

		MONOTUBULAR				BI-TUBULAR		
MODEL SRV		**1.250**	**1.500**	**1.750**	**2.000**	**2.500**	**3.000**	**4.000**
Nominal Capacity	kCal/h	750.000	900.000	1.050.000	1.200.000	1.500.000	1.800.000	2.400.000
	kW	872	1.047	1.221	1.395	1.744	2.093	2.616
Furnace Capacity	kCal/h	833.333	1.000.000	1.166.667	1.333.333	1.666.680	2.000.000	2.666.667
	kW	969	1.163	1.357	1.550	1.938	2.326	3.101
Steam production	kg/h	1250	1500	1750	2000	2500	3000	4000
Efficiency (without economizer)	%	90	90	90	90	90	90	90
Efficiency (with economizer)	%	95	95	95	95	95	95	95
Pressure	bar	12	12	12	12	12	12	12
Combustion chamber pressure	mbar	6	7	8	8	8,5	9	9,5
Total water content	Liters	173	198	213	242	316	353	370
Heated surface	m^2	22,5	25,0	27,0	30,7	33,2	37,1	60
Natural Gas consumption	Nm^3/h	98	118	137	157	196	235	314
Natural Gas flow rate	Nm^3/h	1.122	1.346	1.570	1.794	2.243	2.692	3.589
Diesel consumption	kg/h	83	100	117	133	167	200	267
Diesel flow rate	kg/h	1.167	1.400	1.633	1.866	2.333	2.800	3.733
LPG Consumption	Nm^3/h	38	46	53	61	76	91	121
LPG flow rate	Nm^3/h	1.196	1.435	1.674	1.913	2.392	2.870	3.827
Length (L)	mm	1.750	1.820	1.820	1.820	2.220	2.220	2.350
Width min. (A)	mm	1.100	1.140	1.140	1.140	1.340	1.260	1.340
Height without economizer (H)	mm	3.190	3.490	3.755	4.020	4.525	4.835	5.135
Height with economizer (H)	mm	3.520	3.510	4.020	4.365	4.450	4.850	5.135
Chimney wheelbase (C)	mm	305	355	355	355	425	425	475
Empty weight	kg	1.150	1.650	1.800	2.050	2.750	2.900	3.600
Chimney diameter	mm	250	350	350	350	450	450	550
Steam outlet	DN	32	40	50	65	65	80	80
Purge	DN	20	20	20	20	25	40	40

Technical data are approximate and are subject to changes due to improvements in our production system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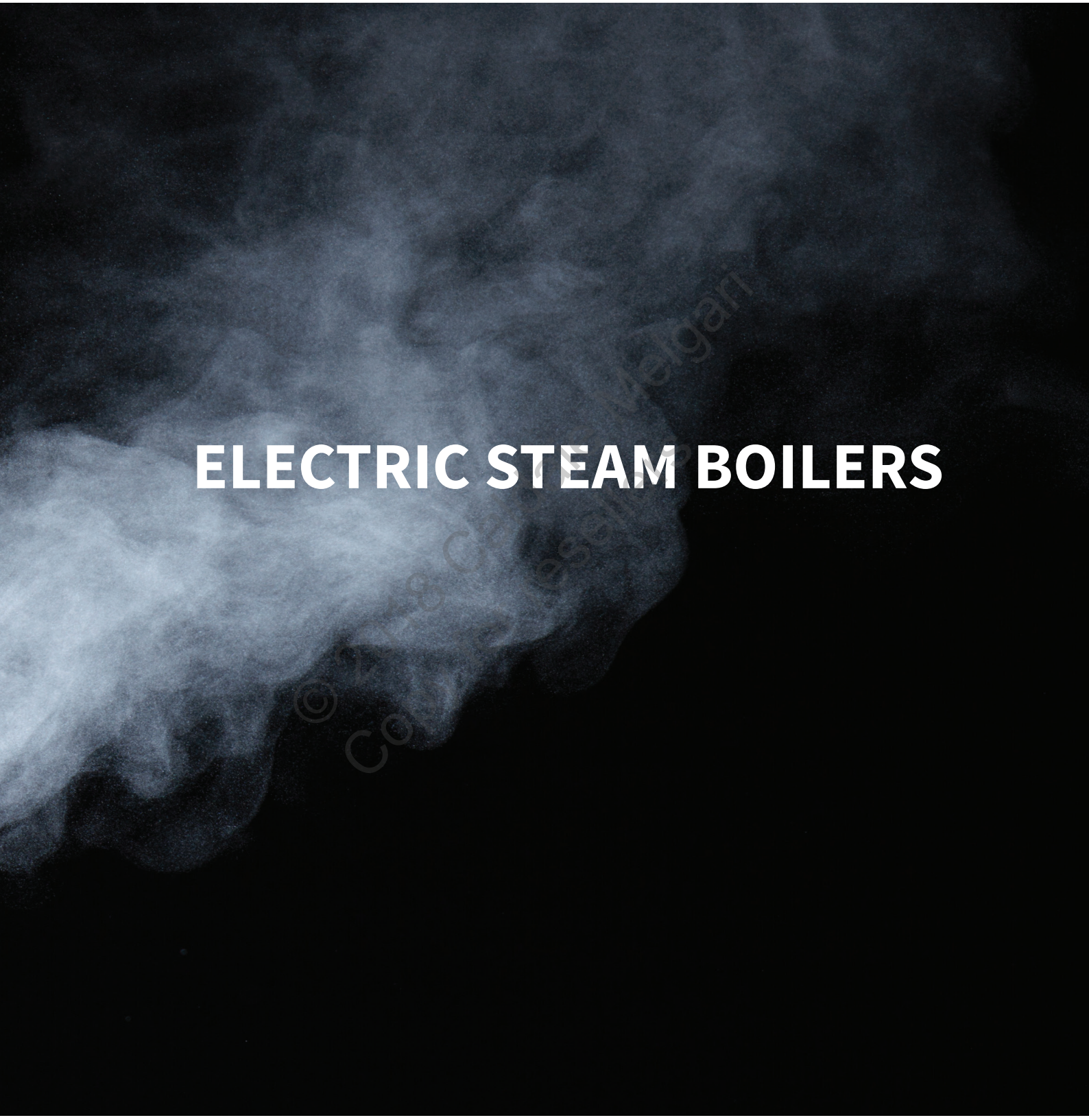
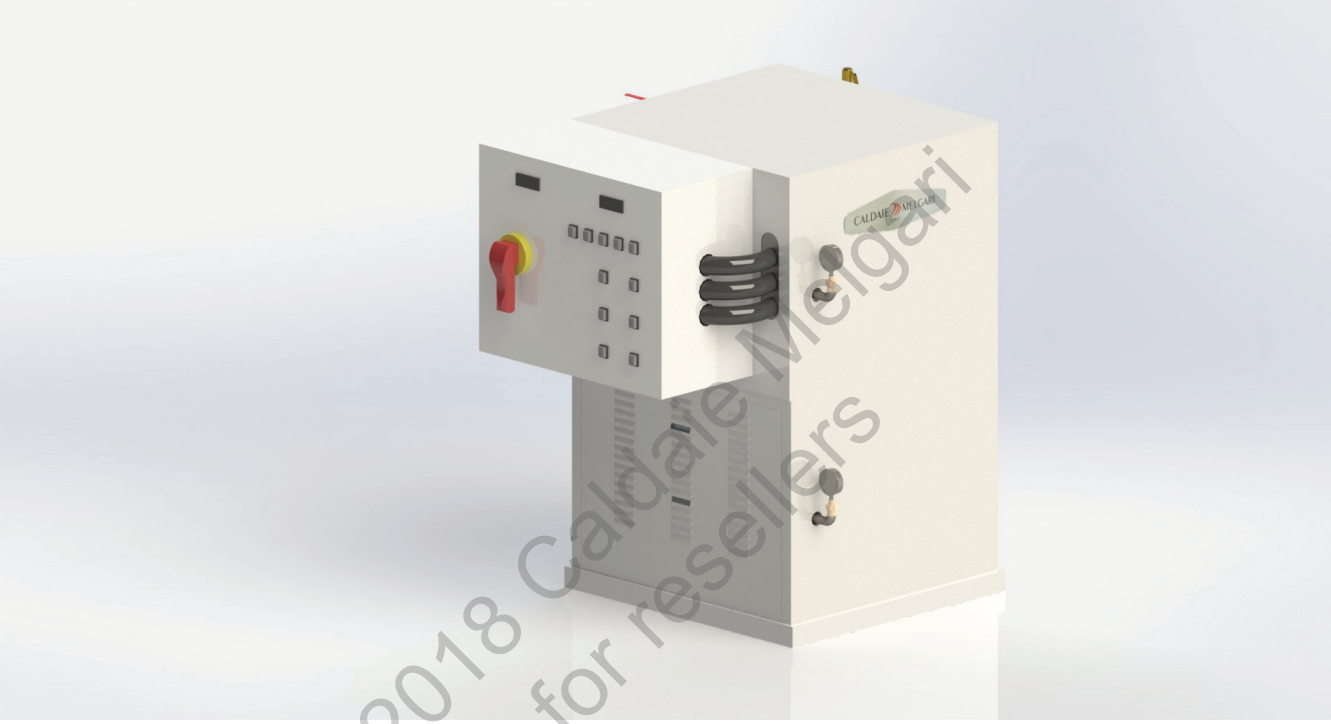


ELECTRIC STEAM BOILERS

MODEL **MVE**

ELECTRIC STEAM BOILERS

Steam production from **20 Kg/hr à 250 Kg/hr**, pressure **up to 8,5 bar.**



MAIN FEATURES

The automatic and electric steam generator Caldaie Melgari MVE is the ideal model for those Customers who need small and medium-dry steam demands ("dry and clean"), such as laundry and ironing, and in areas where it requires a high level sterilization and cleaning, such as food or chemical-pharmaceutical industries.

APPLICATIONS

MVE generator is widely used, for example, in the following applications:

- **Health and Food Disinfection**
- **Food preparation**
- **Plastic industry**
- **Wood industry**
- **Metals drying process**
- **Textile processes**

INSTALLATION

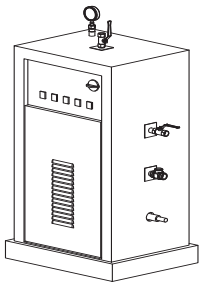
Installation of this type of boiler is also ideal **when it isn't possible to install generators complete with burner (for logistic reasons).**

The heated surface is represented by the immersed electric resistances. **This type of boiler produces "dry and clean" steam and, upon request, it can be realized with its body and all the components in contact with water in stainless steel** .

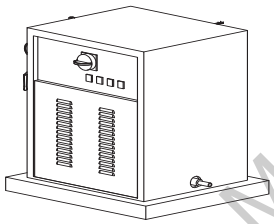
MATERIALS AND CERTIFICATIONS

The entire construction is CE marked and complies with the Directive PED 2014/68/UE as well as being equipped with all safety devices.

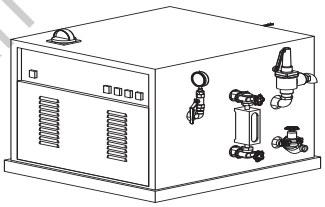
MVE - **RANGE OF PRODUCTS**



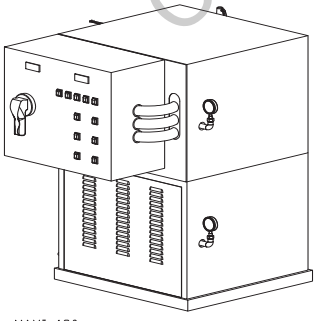
MVE 16



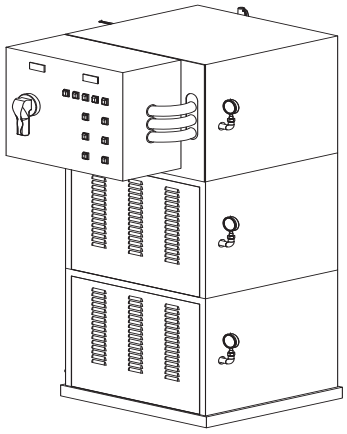
MVE 24



MVE 60

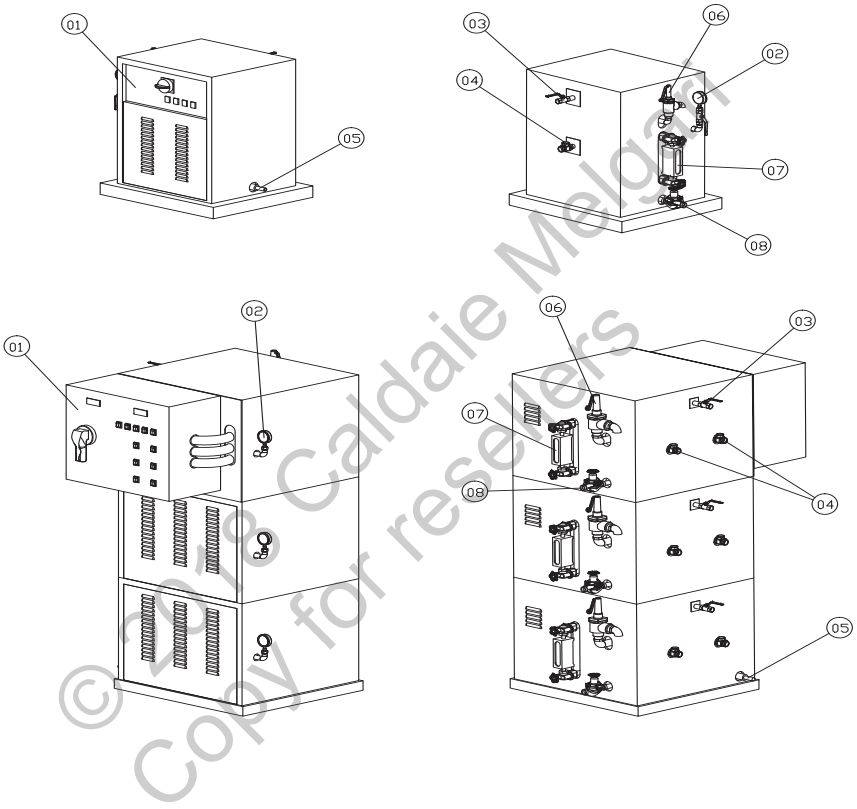


MVE120



MVE180

MVE
COMPONENTS



1	Electric control panel
2	Manometer
3	Steam connection
4	Condensate return
5	Water inlet
6	Safety valve
7	Water level indicators with cocks
8	Purge connection

MVE
MAIN BENEFITS

- **High quality at convenient prices**: MVE steam generator is designed to deliver excellent performance and give the Maximum guarantee of reliability and efficiency, at affordable prices.

- **Simple and efficient use**: the **electric control panel**, positioned at eye level, **allows you to easily manage all of the boiler control systems**.

- **MVE generator can be either directly connected to the water mains or to a stainless steel condensate recovery tank**.

- **MVE is available with a single group of resistors** (three elements) **or with two groups of independent resistors** (six items). The boiler body is built according to current PED regulations.

- **Standard configuration** of MVE model is realized with boiler body and components in contact with water in carbon steel. Upon request, **it is possible to realize only the boiler body or boiler body and components in contact with water in stainless steel AISI 304**.

- **The boiler can be mounted on a skid** with welded metal sections in order to allow immediate installation **or in a container** (turn-key thermal plant) with other components (eg. Water treatment system, air separator, removable pot drains collection, etc.) .

- **Each Caldaie Melgari boiler, before being delivered, is rigorously checked** (production features, performance, etc.). A trial is performed to ensure a high constructive and qualitative standard.

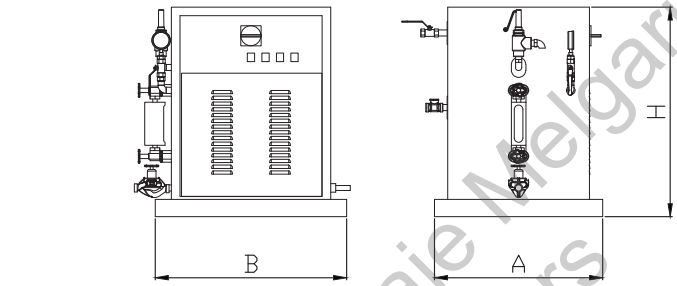
- **The boiler can be configured according to your requests**: we can provide a wide range of **optional accessories** to customize your boiler (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

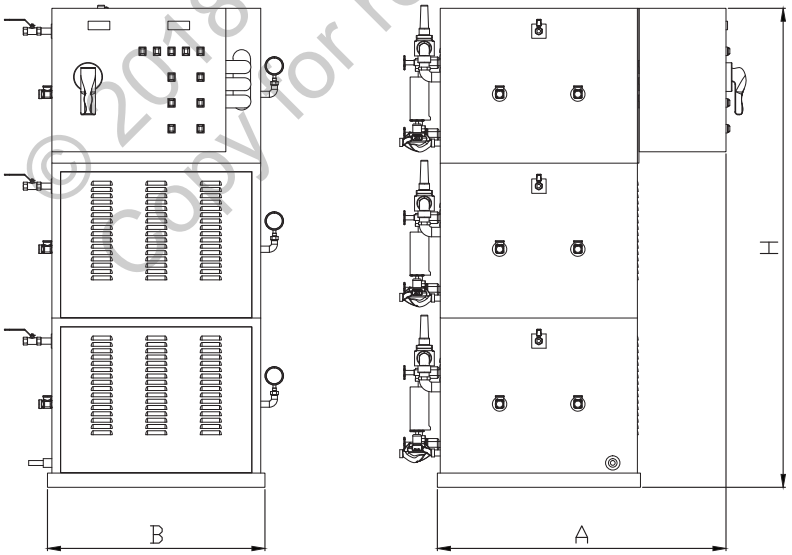
MVE - SPECIFICATIONS

MODEL MVE		16	24	60	120	180
Electric power	V - Ph - Hz	220/380 - 3 - 50/60	230/400 - 3 - 50	220/380 - 3 - 50	380/400 - 3 - 50	380/400 - 3 - 50
Steam output	kg/h	22	30	83	166	249
Water content	Liters	16	24	55	53,5 + 53,5 + 53,5	53,5 + 53,5 + 53,5
Steam pressure (max)	bar	7	7	8,5	8,5	8,5
Power engine	/	0,80 hp	0,5 kW	0,55 hp	1 hp - 0,75 kW	1 hp - 0,75 kW
Boiler resistance	kW	6-7-8-10-12-15	4 ÷ 24	20 ÷ 42	25 ÷ 60	25 ÷ 60
Niveau de bruit	dB(A)	<70	<70	<70	<70	<70
Working temperature	°C	+5 ÷ + 80°C	+5 ÷ + 80°C	+5 ÷ + 80°C	+5 ÷ + 80°C	+5 ÷ + 80°C
Humidity	%	90	90	90	90	90
Temperature accumulation	°C	-20 ÷ + 50°C	-20 ÷ + 50°C	-20 ÷ + 50°C	-20 ÷ + 50°C	-20 ÷ + 50°C
Net dimensions A - B - H	mm	650 x 450 x 1.000	580 x 660 x 765	830 x 830 x 570	980 x 1.160 x 1.150	950 x 1.160 x 1.670
Net empty weight	kg	78	78	113	243	315
Dimensions with packaging	mm	670 x 470 x 1.030	880 x 750 x 1050	900 x 900 x 780	1.400 x 1.300 x 1.050	1.240 x 1.550 x 1.900
Empty weight with packaging	kg	90	111	191	288	405

Technical data are approximate and are subject to changes due to improvements in our production system

MVE
DIMENSIONS



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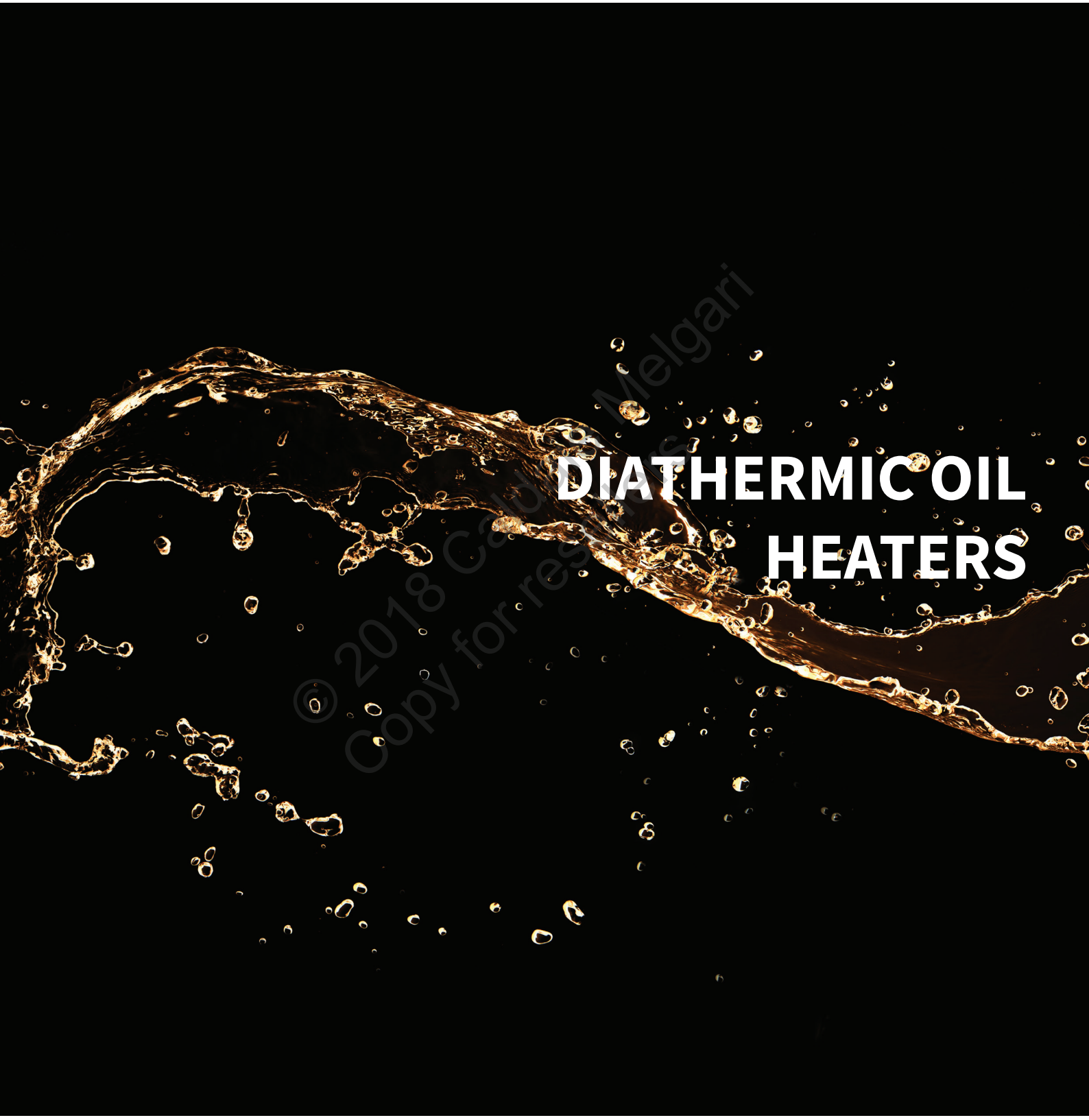
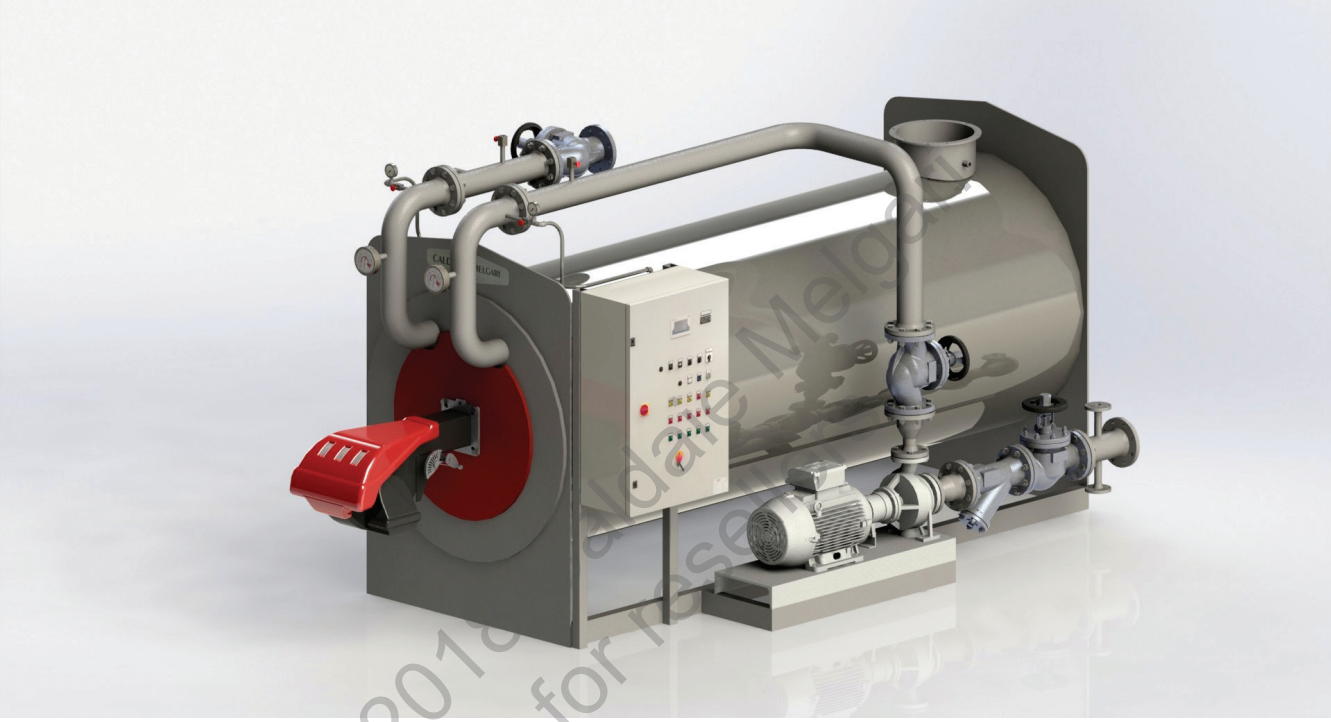


DIATHERMIC OIL HEATERS

MODEL **SOH-H**

DIATHERMIC OIL HEATER FOR TEMPERATURES UP TO 350° C

Capacity **from 116 kW up to 4.650 kW**; pressure **up to 10 bar**.
Horizontal Version



MAIN FEATURES

Caldaie Melgari SOH diathermic oil heater is a horizontal and monobloc pressurized boiler with three smoke pass construction. The tube bundle is rolled in a continous spiral. The first smoke pass takes place into the combustion chamber and the two other one are between the tube bundles.

The boiler is designed to reach high temperatures (up to 300° C) using the diathermic oil as the heat transfer fluid. Upon request, **we can realize SOH models that reach 350°C**.

This type of boiler is **ideal for companies whose industrial processes require high temperature or to produce steam hot water with great flexibility**.

The SOH Horizontal model has been designed by our technical department according to the most advanced techniques, in order to offer the maximum guarantee of reliability and durability to the customer.

MATERIALS AND CERTIFICATIONS

For pressure body construction, only certified materials are used and non-destructive controls (eg. penetrant liquids) are performed by our skilled technicians and verified by a a Notified Body according to PED Directive. **The entire construction is CE marked and complies all the requirements of Directive PED 2014/68/UE.**

Low thermal inertia, obtained through the reduced use of refractory, **ensures high protection against the risk of overheating** (also in cases of arrest of oil circulation).

INSULATION

Upon request, **insulation of the external parts and collectors is realized with high density rock wool** (coated aluminum or - upon request - stainless steel) **and special coating varnishes that ensure heat containment**.

FUEL

The boiler has been especially designed for the **combustion**

of both liquid and gaseous fuels. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

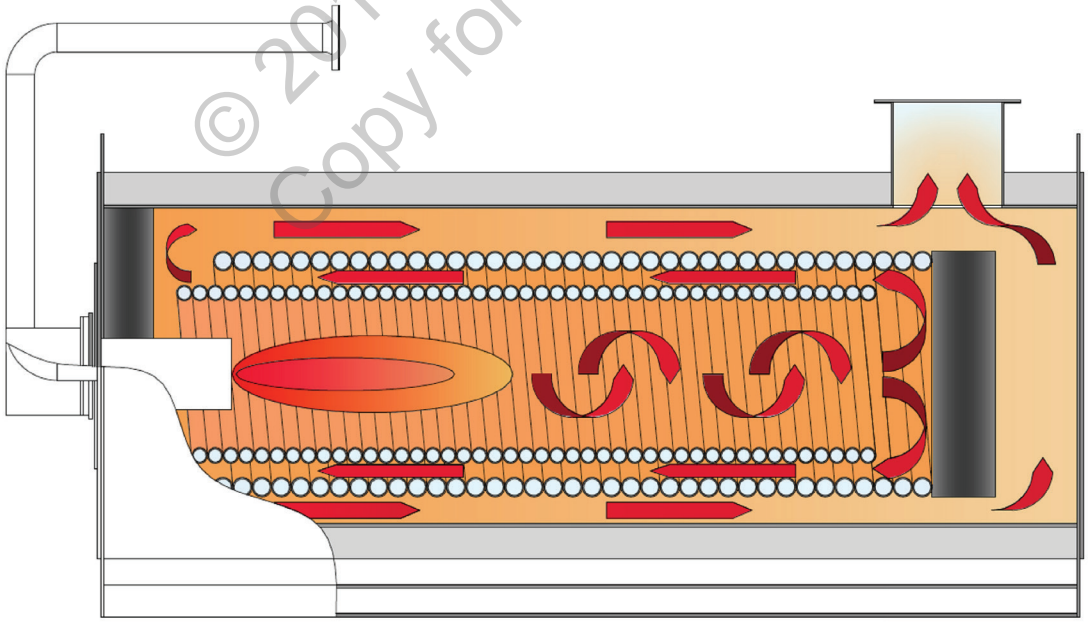
>> EFFICIENCY

Efficiency of diathermic oil heater SOH is around 87%.

BODY OF THE **BOILER**

- **Cylindrical shell in carbon steel** that contains the heating element (coil), complete with chimney.
- **Helicoidal coil** which represents the heating element and is realized with high quality tubes in ASTM 106 gr. B.
- **Front door**, **bolted** and **openable**, complete with flame guard, burner mounting plate, insulating cement to provide to the flue gas a seal between the second and third pass.
- **Manifold with flanges in PN 16** (inlet and outlet diathermic oil) with connections for installation and assembly of accessories.
- **Insulation in high density rock wool** with coating in aluminium or - upon request - stainless steel.
- **Basement made of structural steel sections** supporting the boiler assembly and its accessories.

SMOKE PASS SCHEME



The first smoke pass takes place into the combustion chamber and the two other one are between the tube bundles

SOH-H
ACCESSORIES & FITTINGS

Our SOH Horizontal Diathermic oil heater includes the following basic accessories:

•Regulation and Control equipment

- Thermostat start/stop burner
- Thermostat with lock switch of the diathermic oil circulation pump (below the set threshold temperature)
- Oil inlet and outlet manometer
- Oil inlet and outlet thermometer

Safety devices

- Safety pressure switch (diathermic oil circulation)
- N°2 safety thermostats (maximum diathermic oil temperature)
- Safety thermostat (high temperature smokes)

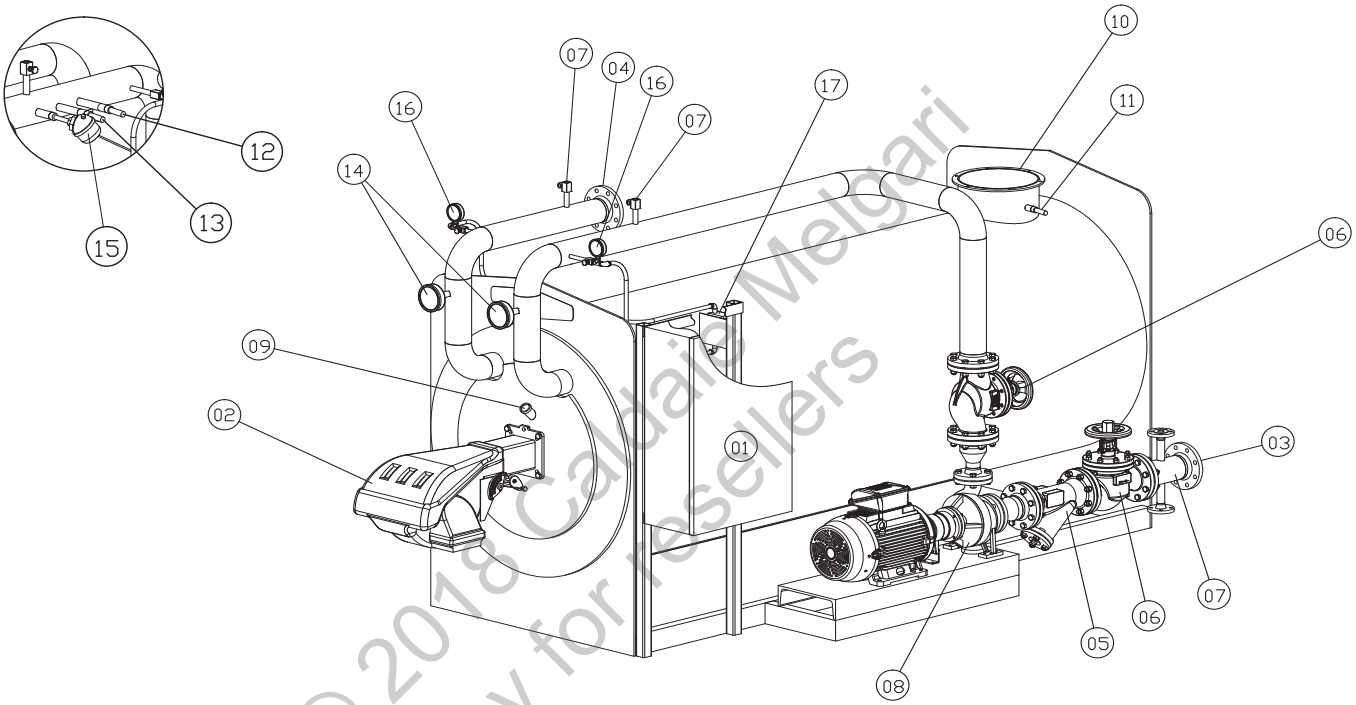
Electric control panel

- Varnished cabinet in IP 54 version
- Electronic indicator for diathermic oil outlet
- Electronic indicator for combustion smokes temperature
- Door lock master switch
- Burner start-up switch
- Diathermic oil circulation pump start-up switch
- Transformer for auxiliaries
- Fuses
- Indicator lights and alarms
- Emergency switch (the so-called “mushroom”)

SOH-H
MAIN BENEFITS

- **High quality at convenient prices**: SOH diathermic oil heater is designed to deliver **excellent performance** and give the **Maximum guarantee of reliability and efficiency**, at affordable prices.
- **This type of boiler does not require to be conducted by a licensed operator.**
- **SOH generator is designed and built with low thermal loads and high speed of the oil in order to avoid any risk of cracking** (the thermal decomposition process when the oil is subjected to overheating).
- The **electric control panel**, positioned at eye level, **allows you to easily manage all of the boiler control systems**.
- **SOH generator guarantees high overall system efficiency**, as well as high durability and low maintenance costs due to lower stresses to which each component of the boiler is subject.
- **Each Caldaie Melgari boiler, before being delivered, is rigorously checked** (production features, performance, etc.). In addition to non-destructive controls, a trial is performed to ensure a high constructive and qualitative standard.
- **The generator is supplied ready for connection to fuel**, **to electric power, to discharges and oil circuits** which makes the installation quick and easy.
- Upon request, **we provide a remote control system that allows you to constantly monitor your boiler** and allows us to promptly intervene in case of problem.
- **The boiler can be mounted on a skid** with welded metal sections in order to allow immediate installation **or in a container** (turn-key thermal plant) with other components (eg. Expansion vessel, diathermic oil storage tank, etc.).
- **Aluminium insulation or- upon request- in stainless steel**, extremely durable, **protects the boiler from possible damages deriving from atmospheric agents**.
- Upon request, **we provide support during installation and piping**, as well as supply of spare parts and support for emergencies (availability 24 hours).
- **The boiler can be configured according to your requests**: we can provide a **wide range of optional accessories to customize your boiler** (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

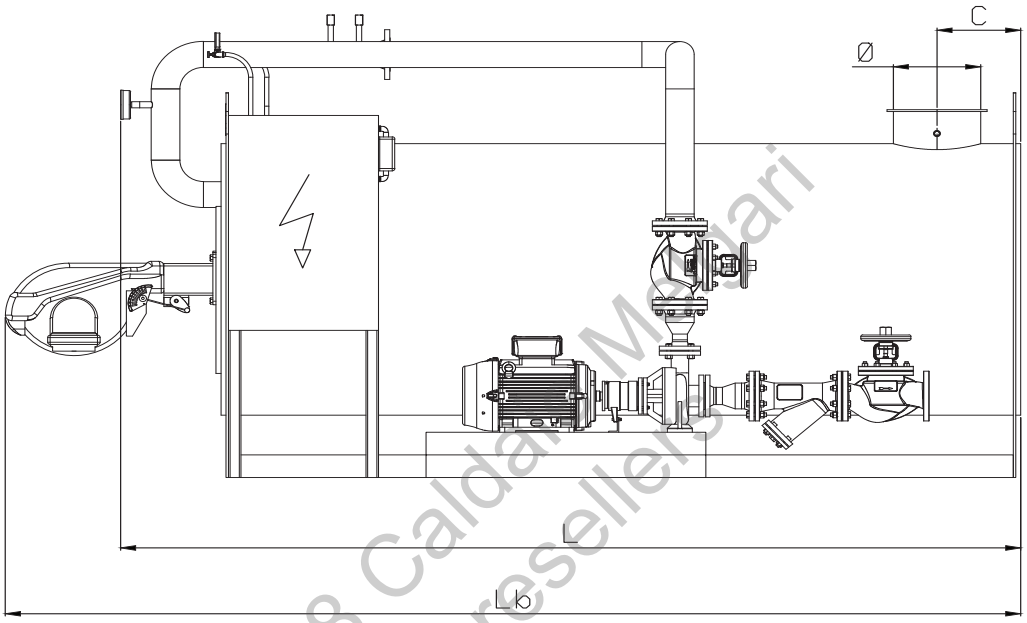
SOH-H
COMPONENTS

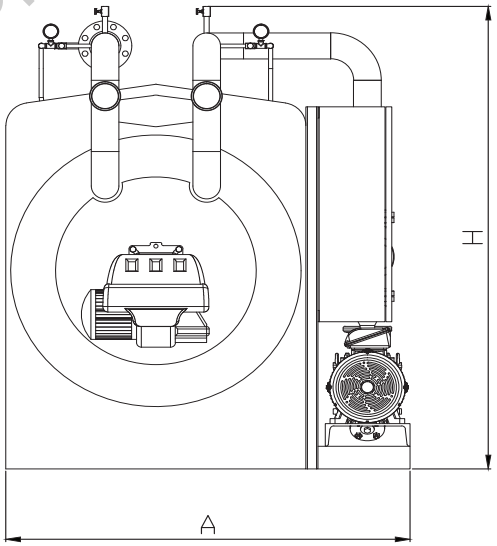


1	Electric control panel
2	Burner
3	Diathermic oil inlet (expansion vessel connection optional)
4	Diathermic oil outlet
5	Filter
6	Interception valve
7	Vent
8	Circulation pump
9	Flame guard

10	Smokes outlet
11	Safety thermostat for high temperature smokes
12	Safety thermostat for high temperature steam - 1
13	Safety thermostat for high temperature steam - 2
14	Thermometer
15	Thermoregulator probe
16	Manometer
17	Differential pressure switch

SOH-H
DIMENSIONS





SOH-H - SPECIFICATIONS

MODEL SOH HORIZONTAL		100	200	300	400	500	600	800	1.000
Nominal Capacity	kCal/h	100.000	200.000	300.000	400.000	500.000	600.000	800.000	1.000.000
	kW	116	233	349	465	582	698	930	1.163
Furnace Capacity	kCal/h	114.943	229.885	344.828	459.770	574.713	689.655	919.540	1.149.425
	kW	133	268	401	534	669	802	1.069	1.337
Efficiency (without economizer)	%	87	87	87	87	87	87	87	87
Pressure	bar	10	10	10	10	10	10	10	10
Diathermic oil content	Liters	39	85	113	118	124	205	245	400
Maximum temperature	°C	300	300	300	300	300	300	300	300
Maximum working temperature	°C	290	290	290	290	290	290	290	290
Delta T	°C	40	40	40	40	40	40	40	40
Heated surface	m^2	7	11	13	14	16	24	28	33
Combustion chamber volume	m^3	0,1	0,2	0,2	0,3	0,3	0,6	0,7	0,9
Combustion chamber pressure (oil)	mcl	20	27	28	16	28	26	16	24
Combustion chamber pressure	mbar	4	5	6	7	8	8	9	9
Natural Gas consumption	Nm^3/h	13,5	27	41	54	68	81	108	135
Natural Gas flow rate	Nm^3/h	155	309	464	619	773	928	1.238	1.547
Diesel consumption	kg/h	11,5	23	34,5	46	57,5	69	92	115
Diesel flow rate	kg/h	161	322	483	644	805	966	1.287	1.609
LPG Consumption	Nm^3/h	5	10	16	21	26	31	42	52
LPG flow rate	Nm^3/h	165	330	495	660	825	990	1.320	1.650
Length without burner (L)	mm	1.610	1.800	1.930	2.070	2.240	2.570	2.960	3.230
Length with burner (Lb)	mm	1.730	1.9400	2.290	2.450	2.730	3.270	3.650	3.920
Width min. (A)	mm	1.200	1.340	1.340	1.340	1.340	1.600	1.600	1.590
Height (H)	mm	1.350	1.600	1.600	1.700	1.700	1.850	1.850	2.070
Chimney wheelbase (C)	mm	220	230	255	255	255	255	305	305
Empty weight	kg	650	950	1.000	1.100	1.200	1.750	2.200	2.450
Chimney diameter	mm	180	200	250	250	250	250	350	350
Diathermic oil inlet	mm	32	40	50	65	65	65	80	100
Diathermic oil outlet	mm	32	40	50	65	65	65	80	100

Technical data are approximate and are subject to changes due to improvements in our production system

SOH-H - SPECIFICATIONS

MODEL SOH HORIZONTAL		1.200	1.600	2.000	2.500	3.000	4.000
Nominal Capacity	kCal/h	1.200.000	1.600.000	2.000.000	2.500.000	3.000.000	4.000.000
	kW	1.396	1.745	2.326	2.908	3.489	4.652
Furnace Capacity	kCal/h	1.379.310	1.839.080	2.298.851	2.873.563	3.448.276	4.597.701
	kW	1.605	2.006	2.674	3.343	4.010	5.347
Efficiency (without economizer)	%	87	87	87	87	87	87
Pressure	bar	10	10	10	10	10	10
Diathermic oil content	Liters	460	620	740	1.080	1.310	1.900
Maximum temperature	°C	300	300	300	300	300	300
Maximum working temperature	°C	290	290	290	290	290	290
Delta T	°C	40	40	40	40	40	40
Heated surface	m^2	34	55	65	73	85	UPON REQUEST
Combustion chamber volume	m^3	1,0	2,1	3,1	4,0	4,5	UPON REQUEST
Combustion chamber pressure (oil)	mcl	35	30	23	20	35	UPON REQUEST
Combustion chamber pressure	mbar	9	10	11	11	12	15
Natural Gas consumption	Nm^3/h	162	216	270	338	406	541
Natural Gas flow rate	Nm^3/h	1.856	2.475	3.094	3.867	4.641	6.188
Diesel consumption	kg/h	138	184	230	287	345	460
Diesel flow rate	kg/h	1.931	2.575	3.218	4.023	4.828	6.437
LPG Consumption	Nm^3/h	63	84	105	131	157	209
LPG flow rate	Nm^3/h	1.979	2.639	3.299	4.124	4.949	6.598
Length without burner (L)	mm	3.540	3.600	3.800	3.580	4.080	UPON REQUEST
Length with burner (Lb)	mm	4.230	4.330	4.830	4.600	5.100	UPON REQUEST
Width min. (A)	mm	1.590	1.950	2.160	2.350	2.350	UPON REQUEST
Height (H)	mm	2.070	2.260	2.480	2.690	2.690	UPON REQUEST
Chimney wheelbase (C)	mm	305	355	355	380	380	UPON REQUEST
Empty weight	kg	2.900	4.000	4.900	5.500	6.100	7.500
Chimney diameter	mm	350	450	450	500	500	UPON REQUEST
Diathermic oil inlet	mm	100	125	125	150	150	200
Diathermic oil outlet	mm	100	125	125	150	150	200

Technical data are approximate and are subject to changes due to improvements in our production system

MODEL **SOH-V**

DIATHERMIC OIL HEATER FOR TEMPERATURES UP TO 350° C

Capacity **from 116 kW up to 4.650 kW**; pressure **up to 10 bar**.

Vertical Version

MAIN FEATURES

Caldaie Melgari SOH – V diathermic oil heater is a vertical and monobloc pressurized boiler with three smoke pass construction. The tube bundle is rolled in a continous spiral. The first smoke pass takes place into the combustion chamber and the two other one are between the tube bundles.

The boiler is designed to reach high temperatures (up to 300° C) using the diathermic oil as the heat transfer fluid.

This type of boiler is **ideal for companies whose industrial processes require high temperature or to produce steam or hot water with great flexibility**.

SOH - V model has been designed by our technical department according to the most advanced techniques, in order to offer the Maximum guarantee of reliability and durability to the customer.

MATERIALS AND CERTIFICATIONS

For pressure body construction, only certified materials are used and non-destructive controls (eg. penetrant liquids) are performed by our skilled technicians and verified by a Notified Body according to PED Directive.

The entire construction is CE marked and complies all the requirements of Directive PED 2014/68/UE.

Low thermal inertia, obtained through the reduced use of refractory, **ensures high protection against the risk of overheating** (also in cases of arrest of oil circulation).

INSULATION

Upon request, insulation of the external parts and collectors can be realized with high density rock wool (coated aluminum or- upon request - stainless steel) and special coating paints that ensure heat containment.

FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be

powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

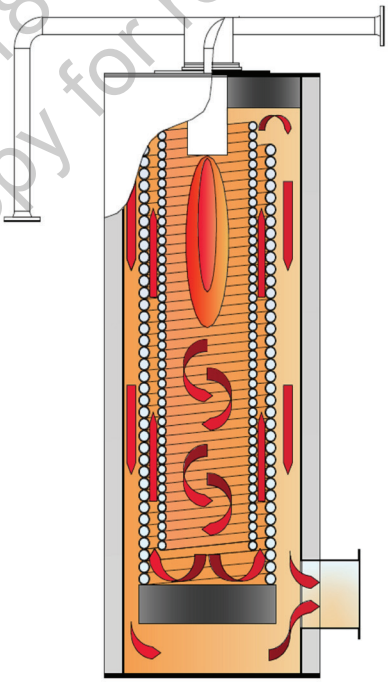
EFFICIENCY

Efficiency of SOH-V diathermic oil heater is around 87%.

BODY OF THE **BOILER**

- **Cylindrical shell in carbon steel** that contains the heating element (coil), complete with chimney.
- **Helicoidal coil** which represents the heating element and is realized with high quality tubes in ASTM 106 gr. B.
- **Upper door**, bolted and openable, complete with flame guard, burner mounting plate, insulating cement to provide to the flue gas a seal between the second and third pass.
- **Manifold with flanges in PN 16** (inlet and outlet diathermic oil) with provision of connections for installation and assembly of accessories.
- **Insulation in high density rock wool** with coating in aluminium or - upon request - stainless steel.
- **Basement made of structural steel sections** supporting the boiler assembly and its accessories.

SMOKE PASS SCHEME



The first smoke pass takes place into the combustion chamber and the two other one are between the tube bundles

SOH-V
ACCESSORIES & FITTINGS

Our SOH Vertical Diathermic oil heater includes the following basic accessories:

•Regulation and Control equipment

- Thermostat start/stop burner
- Thermostat with lock switch of the diathermic oil circulation pump (below the set threshold temperature)
- Oil inlet and outlet manometer
- Oil inlet and outlet thermometer

Safety devices

- Safety pressure switch (diathermic oil circulation)
- N°2 safety thermostats (maximum diathermic oil temperature)
- Safety thermostat (high temperature smokes)

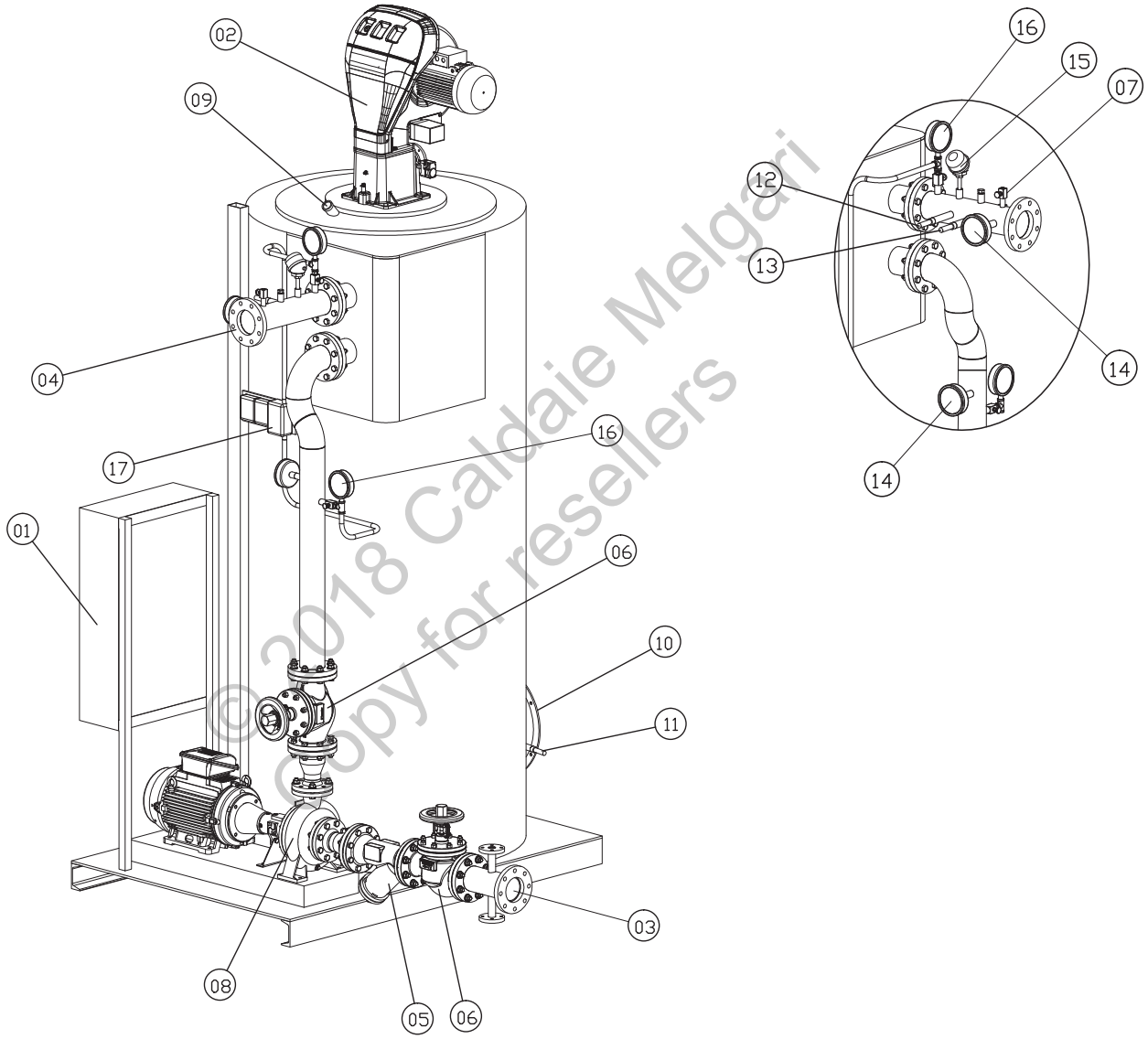
Electric control panel

- Varnished cabinet in IP 54 version
- Electronic indicator for diathermic oil outlet
- Electronic indicator for combustion smokes temperature
- Door lock master switch
- Burner start-up switch
- Diathermic oil circulation pump start-up switch
- Transformer for auxiliaries
- Fuses
- Indicator lights and alarms
- Emergency switch (the so-called “mushroom”)

SOH-V
MAIN BENEFITS

- **High quality at convenient prices**: SOH diathermic oil heater is designed to deliver **excellent performance** and give the **Maximum guarantee of reliability and efficiency**, at affordable prices.
- **This type of boiler does not require to be conducted by a licensed operator.**
- **SOH generator is designed and built with low thermal loads and high speed of the oil in order to avoid any risk of cracking** (the thermal decomposition process when the oil is subjected to overheating).
- The **electric control panel**, positioned at eye level, **allows you to easily manage all of the boiler control systems**.
- **SOH generator guarantees high overall system efficiency**, as well as high durability and low maintenance costs due to lower stresses to which each component of the boiler is subject.
- **Each Caldaie Melgari boiler, before being delivered, is rigorously checked** (production features, performance, etc.). In addition to non-destructive controls, a **trial** is performed to ensure a high constructive and qualitative standard.
- **The generator is supplied ready for connection to fuel**, **to electric power, to discharges and oil circuits** which makes the installation quick and easy.
- Upon request, **we provide a remote control system that allows you to constantly monitor your boiler** and allows us to promptly intervene in case of problem.
- **The boiler can be mounted on a skid** with welded metal sections in order to allow immediate installation **or in a container** (turn-key thermal plant) with other components (eg. Expansion vessel, diathermic oil storage tank, etc.) .
- **Aluminium insulation or- upon request- in stainless steel**, extremely durable, **protects the boiler from possible damages deriving from atmospheric agents**.
- Upon request, **we provide support during installation and piping**, as well as supply of spare parts and support for emergencies (availability 24 hours).
- **The boiler can be configured according to your requests**: we can provide a **wide range of optional accessories to customize your boiler** (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

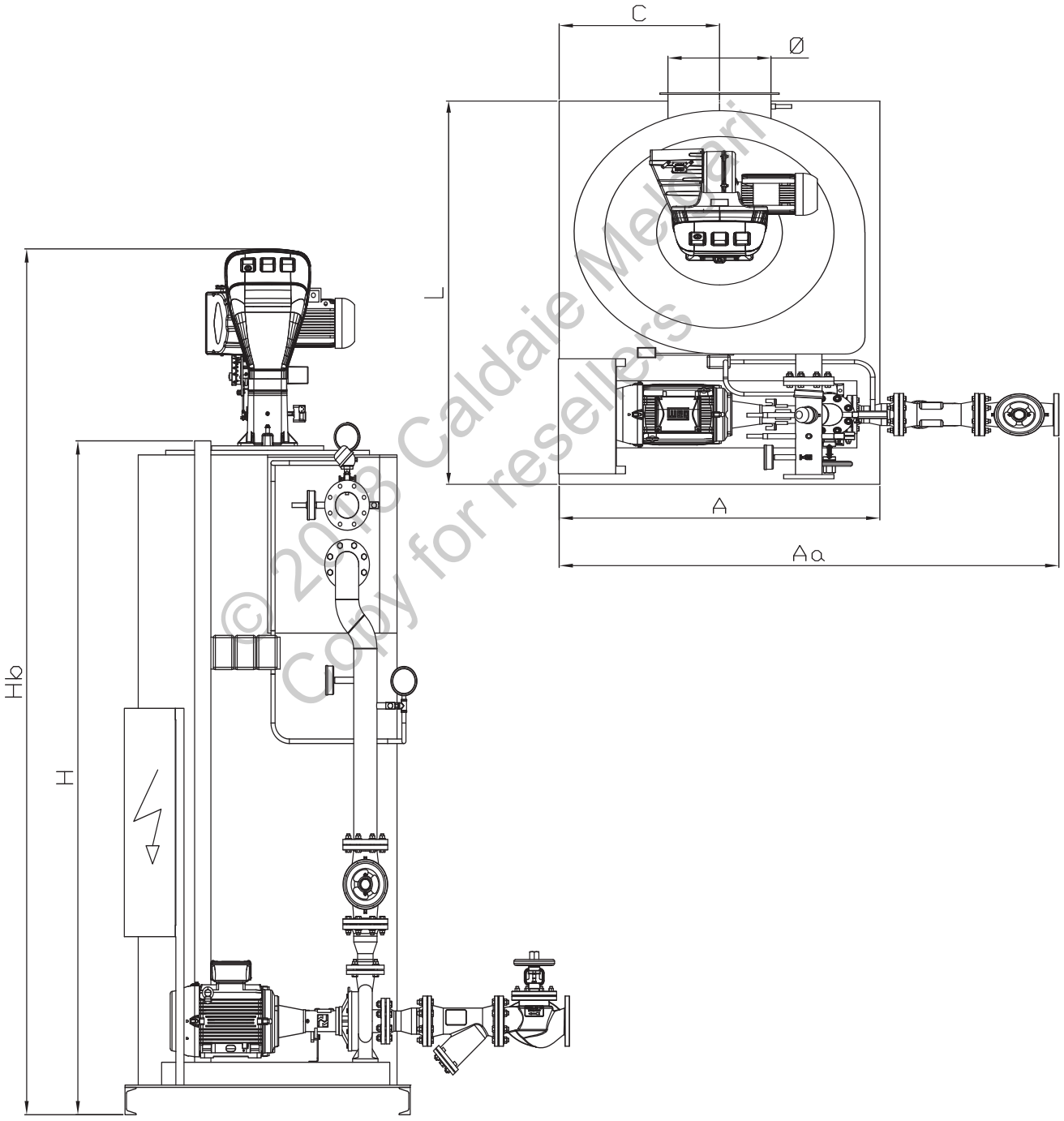
SOH-V
COMPONENTS



1	Electric control panel
2	Burner
3	Diathermic oil inlet (expansion vessel connection optional)
4	Diathermic oil outlet
5	Filter
6	Interception valve
7	Vent
8	Circulation pump
9	Flame guard

10	Smokes outlet
11	Safety thermostat for high temperature smokes
12	Safety thermostat for high temperature steam - 1
13	Safety thermostat for high temperature steam - 2
14	Thermometer
15	Thermoregulator probe
16	Manometer
17	Differential pressure switch

SOH-V
DIMENSIONS



SOH-V - SPECIFICATIONS

MODEL SOH VERTICAL		100	200	300	400	500	600	800	1.000
Nominal Capacity	kCal/h	100.000	200.000	300.000	400.000	500.000	600.000	800.000	1.000.000
	kW	116	233	349	465	581	698	930	1.163
Furnace Capacity	kCal/h	114.943	229.885	344.828	459.770	574.713	689.655	919.540	1.149.425
	kW	134	267	401	535	668	802	1.069	1.337
Efficiency (without economizer)	%	87	87	87	87	87	87	87	87
Pressure	bar	10	10	10	10	10	10	10	10
Diathermic oil content	Liters	39	85	113	118	124	205	245	400
Maximum temperature	°C	300	300	300	300	300	300	300	300
Maximum working temperature	°C	290	290	290	290	290	290	290	290
Delta T	°C	40	40	40	40	40	40	40	40
Heated surface	m^2	7	11	13	14	16	24	28	33
Combustion chamber volume	m^3	0,1	0,2	0,2	0,3	0,3	0,6	0,7	0,9
Combustion chamber pressure (oil)	mcl	20,00	27,00	28,00	16,00	28,00	26,00	16,00	24,00
Combustion chamber pressure	mbar	4	5	6	7	8	8	9	9
Natural Gas consumption	Nm^3/h	13,5	27	40,6	54,1	67,6	81,1	108,2	135,2
Natural Gas flow rate	Nm^3/h	155	309	464	619	773	928	1.238	1.547
Diesel consumption	kg/h	11,5	23	34,5	46	57,5	69	92	114,9
Diesel flow rate	kg/h	161	322	483	644	805	966	1.287	1.609
LPG Consumption	Nm^3/h	5,2	10,5	15,7	20,9	26,2	31,4	41,9	52,4
LPG flow rate	Nm^3/h	165	330	495	660	825	990	1.320	1.650
Height without burner (H)	mm	1.570	1.760	1.910	2.440	2.220	2.550	2.940	3.210
Height with burner (Hb)	mm	1.700	1.910	2.280	2.480	2.720	3.250	3.635	3.900
Width min. (A)	mm	950	1.090	1.120	1.070	1.070	1.210	1.210	1.370
Width max. (Aa)	mm	1.310	1.550	1.590	1.700	1.700	1.835	1.885	2.030
Length (L)	mm	1.610	1.750	1.780	1.730	1.730	1.870	1.870	2.030
Chimney wheelbase (C)	mm	475	545	560	535	535	605	605	685
Chimney diameter	mm	180	200	250	250	250	250	350	350
Empty weight	kg	650	950	1.000	1.100	1.200	1.750	2.200	2.450
Diathermic oil inlet	mm	32	40	50	65	65	65	80	100
Diathermic oil outlet	mm	32	40	50	65	65	65	80	100

Technical data are approximate and are subject to changes due to improvements in our production system

SOH-V - SPECIFICATIONS

MODEL SOH VERTICAL		1.200	1.600	2.000	2.500	3.000	4.000
Nominal Capacity	kCal/h	1.200.000	1.600.000	2.000.000	2.500.000	3.000.000	4.000.000
	kW	1.395	1.860	2.326	2.907	3.488	4.652
Furnace Capacity	kCal/h	1.379.310	1.839.080	2.298.851	2.873.563	3.448.276	4.597.701
	kW	1.604	2.138	2.673	3.341	4.010	5.347
Efficiency (without economizer)	%	87	87	87	87	87	87
Pressure	bar	10	10	10	10	10	10
Diathermic oil content	Liters	460	620	740	1.080	1.310	1.900
Maximum temperature	°C	300	300	300	300	300	300
Maximum working temperature	°C	290	290	290	290	290	290
Delta T	°C	40	40	40	40	40	40
Heated surface	m^2	34	55	65	73	85	UPON REQUEST
Combustion chamber volume	m^3	1,0	2,1	3,1	4,0	4,50	UPON REQUEST
Combustion chamber pressure (oil)	mcl	35,00	30,00	23,00	20,00	35,00	UPON REQUEST
Combustion chamber pressure	mbar	9	10	11	11	12	15
Natural Gas consumption	Nm^3/h	162,3	216,4	270,5	338,1	405,7	540,9
Natural Gas flow rate	Nm^3/h	1.856	2.475	3.094	3.867	4.641	6.188
Diesel consumption	kg/h	137,9	183,9	229,9	287,4	344,8	459,8
Diesel flow rate	kg/h	1.931	2.575	3.218	4.023	4.828	6.437
LPG Consumption	Nm^3/h	62,8	83,8	104,7	130,9	157,1	209,5
LPG flow rate	Nm^3/h	1.979	2.639	3.299	4.124	4.949	6.598
Height without burner (H)	mm	3.520	3.580	3.800	3.570	4.070	UPON REQUEST
Height with burner (Hb)	mm	4.210	4.310	4.830	4.610	5.150	UPON REQUEST
Width min. (A)	mm	1.370	1.620	1.830	2.040	2.040	UPON REQUEST
Width max. (Aa)	mm	2.030	2.485	2.690	3.065	3.065	UPON REQUEST
Length (L)	mm	2.030	2.380	2.590	2.800	2.800	UPON REQUEST
Chimney wheelbase (C)	mm	685	810	915	1.020	1.020	UPON REQUEST
Chimney diameter	mm	350	450	450	500	500	UPON REQUEST
Empty weight	kg	2.900	4.000	4.900	5.500	6.100	7.500
Diathermic oil inlet	mm	100	125	125	150	150	200
Diathermic oil outlet	mm	100	125	125	150	150	200

Technical data are approximate and are subject to changes due to improvements in our production system

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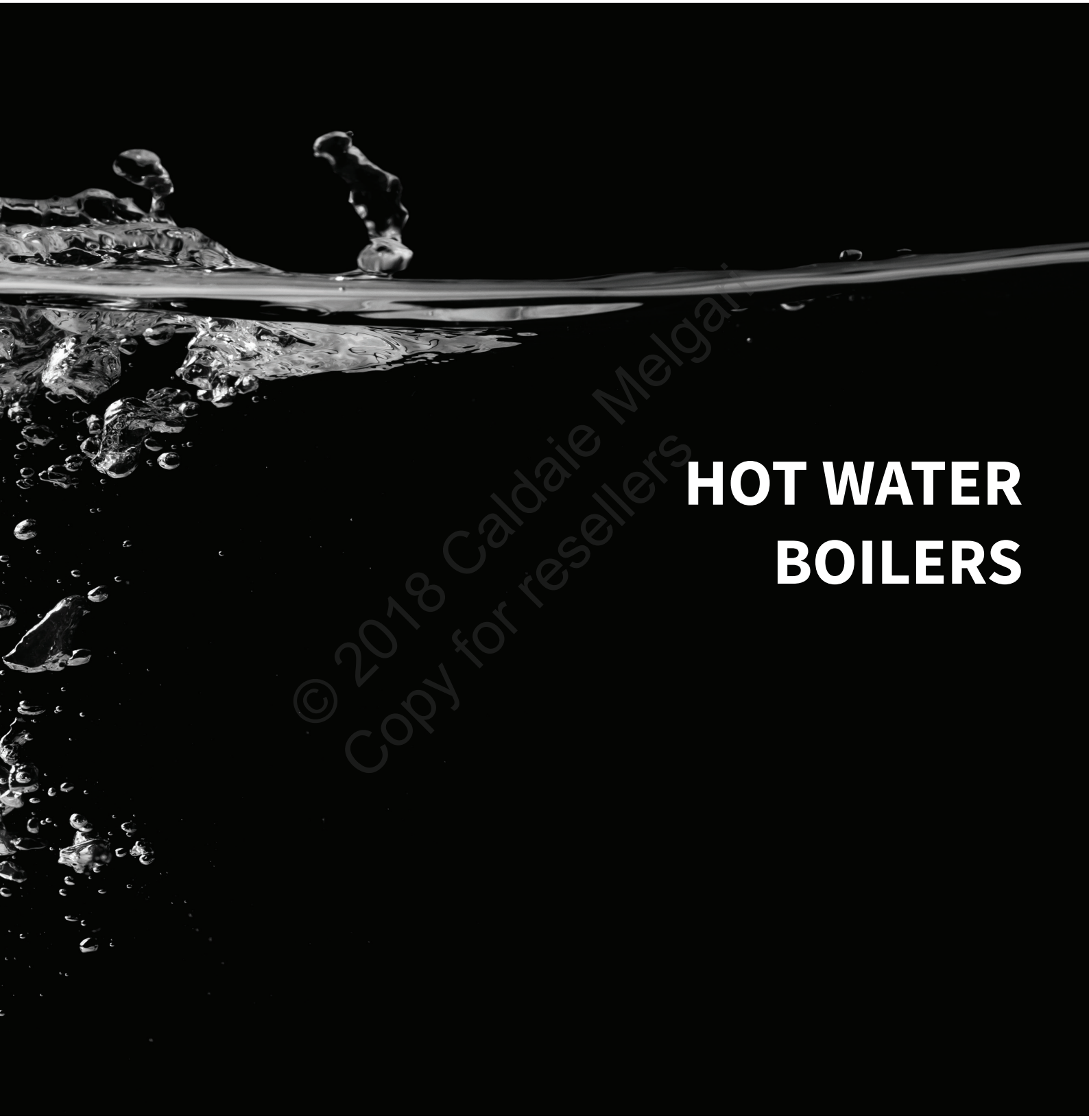


HOT WATER BOILERS

MODEL **MAC**

THREE PASS REVERSE FLAME SMOKE TUBE HOT WATER BOILERS

Water temperature **up to 109°C**
Nominal Capacity **from 93 kW to 4.150 kW**, pressure **up to 8 bar**

MAIN FEATURES

Hot water generator Caldaie Melgari MAC is a three pass reverse flame smoke tube boiler with completely wet back. Water temperature can reach up to 109°C. The first and the second smoke pass take place in the furnace, while the third through thick smoke tubes.

MAC generator has been designed by our Technical Department according to the most advanced techniques, in order to offer the Maximum guarantee of reliability and durability to our Customers.

MATERIALS AND CERTIFICATIONS

Cylindrical combustion chamber is internally and externally welded to the front plate and **smoke tubes in carbon steel are peripherally arranged with respect to it**, in order to optimize water circulation.

Smoke tubes are protrouding from the rear plate to raise the temperature of the bead of weld, thus avoiding the formation of acid condensation.

The shell is made of high-quality sheet metal and is full penetration welded and the turbulators in stainless steel ensure high efficiency.

The front smokes chamber, equipped with two hinged doors useful for cleaning activities, is made of steel and coated internally with insulating / refractory material.

The entire construction is CE marked and complies all the provisions of the **Gas Directive 2009/142/CE, Commission Regulation n° 813/2013/UE and Low Voltage Directive 2006/95/EC**, in addition to being equipped with all the safety devices.

INSULATION

Insulation of the external parts and collectors is realized with mineral wool (60mm). Furthermore, **to protect the external part of the generator, we use galvanized sheet metal panels**; however, upon request, you can get full coverage of the boiler (including plate of the front door and furnace) with pre-painted galvanized steel sheet.

FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

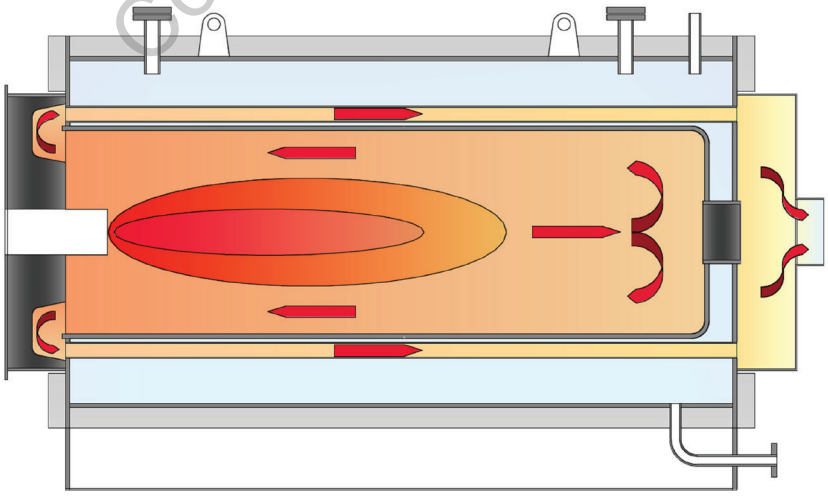
EFFICIENCY

Efficiency of MAC generatori is around 90%.

BODY OF THE **BOILER**

- **Pressure vessel in high quality steel, cylindrical and horizontal** version with shell, furnace and tubesheet in carbon steel. Pressure vessel is **complete with connections**.
- **Cylindrical furnace in high quality steel with reverse chamber completely wet without refractory**. The particular dimensions of the fire room involve a perfect mixing between the combustible and the comburent air for a complete and efficient combustion
- **Fire tube in steel P 235 GH - EN 10216 -2 welded to the plates** and arranged peripherally with respect to the combustion chamber, in order to optimize water circulation.
- **Rear smokes chamber**, in carbon steel, completely openable, with refractory material to convey the flue gas to the stack
- **Front smokes chamber** made of carbon steel, with high refractory material and complete with openable doors for inspection of the smoke tubes and burner's plate.
- **Insulation in high density rock wool** coated with aluminium (or, upon request, steel)
- **Basement made of structural steel** sections supporting the boiler assembly and its accessories

SMOKE PASS SCHEME



The first and the second smoke pass take place in the combustion chamber, while the third takes place through the smoke tubes.

MAC
ACCESSORIES & FITTINGS

Our MAC boiler can be supplied with the following control and safety accessories:

- Safety valve
- Pressure switch (Maximum)
- Pressure switch (minimum)
- Expansion vessel
- Thermometer
- Manometer
- Collection sump
- Safety thermostat
- Regulation thermostats

MAC
MAIN BENEFITS

- **Heat exchange area is particularly big in order to mantain low specific heating loads and to continuously ensure high rate.**

- **Turbolators** inside the boiler **ensure constant and high efficiency**.

- The **electric control panel**, positioned at eye level, **allows you to easily manage all of the boiler control systems**.

- **Each Caldaie Melgari boiler**, before being delivered, **is rigorously checked** (production features, performance, etc.). In addition to non-destructive controls, **a trial is performed to ensure a high constructive and qualitative standard**.

- Upon request, **we are able to supply integrated solutions to improve generator efficiency and reduce fuel consumptions**. The **economizer**, for example, allows to exploit the heat of the flue exhaust gases to heat the boiler feeding water, thus **increasing output and, at the same time, reducing fuel consumption**. In most cases, the investment is paid back in less than one year.

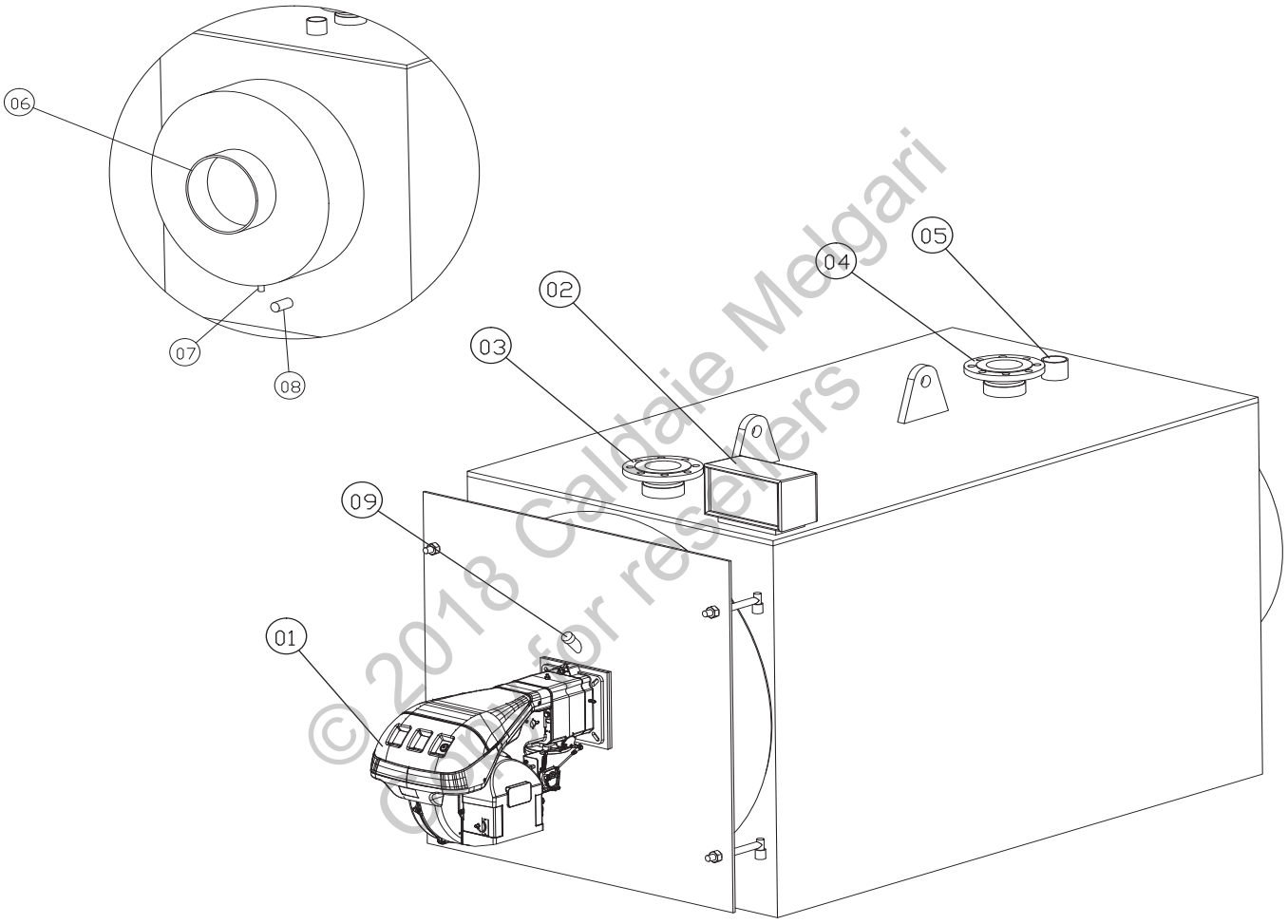
- **It is possible to provide a modulating control of the burner.**

- Upon request, **we provide a remote control system for MAC generator that enables you to constantly monitor your boiler and us to become aware of any problems as they occur, in order to solve them promptly**.

- Upon request, **we provide support during installation and piping**, as well as **supply of spare parts** and **support for emergencies (availability 24 hours)**.

- **The boiler can be configured according to your requests**: we can provide a **wide range of optional accessories** to customize your boiler (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

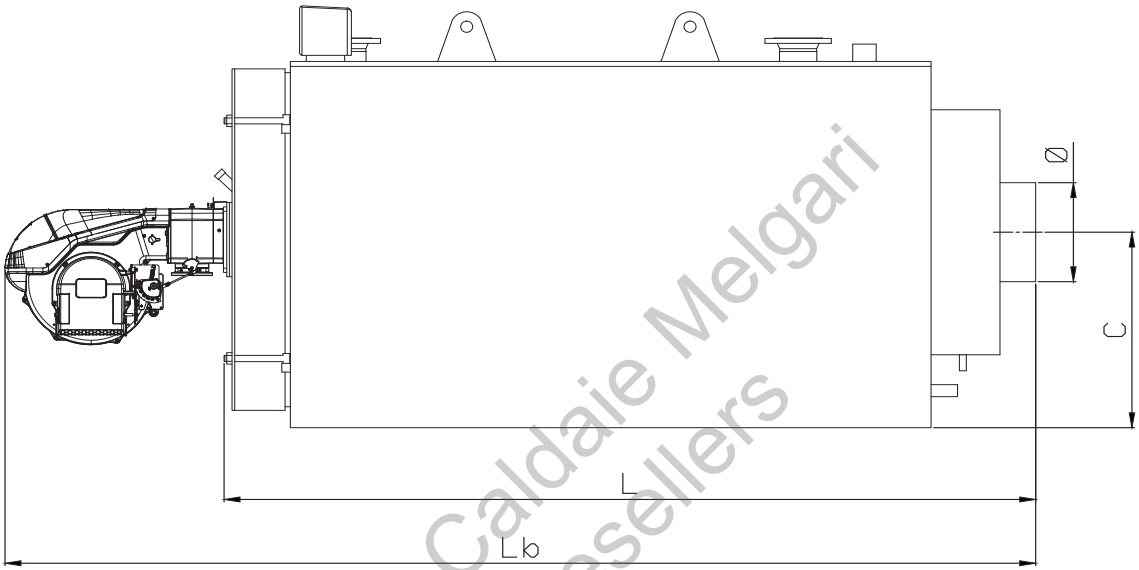
MAC
COMPONENTS

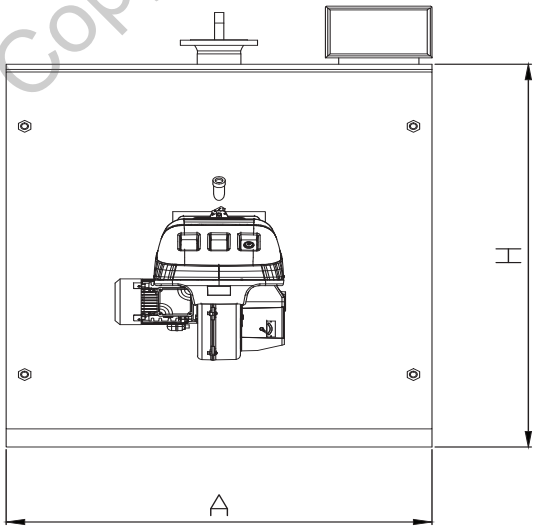


1	Burner
2	Electric control panel
3	Hot water inlet
4	Hot water outlet
5	Expansion vessel connection
6	Smokes outlet
7	Smokes condensate drains
8	Purge connection
9	Flame guard

MAC

DIMENSIONS





MAC - SPECIFICATIONS

MODEL MAC		93	105	150	190	230	290	350
Nominal Capacity	kCal	80.000	90.065	130.065	165.161	200.430	250.323	300.215
	kW	93	105	151	192	233	291	349
Furnace Capacity	kCal	88.600	99.352	143.652	181.501	221.070	275.262	330.315
	kW	103	116	167	211	257	320	384
Efficiency	%	91	91	91	91	91	91	91
Water content	Liters	119	119	155	228	228	285	276
Combustion chamber pressure	mbar	0,50	0,70	1,20	1,20	1,50	2,30	3,30
Pressure drop (water)	mbar	4,50	5,60	11,80	6,90	10,00	16,30	23,00
Pressure	bar	5	5	5	6	6	6	6
Natural Gas consumption	Nm^3/h	10	12	17	21	26	32	39
Natural Gas flow rate	Nm^3/h	156	175	253	320	390	486	583
Diesel consumption	kg/h	9	10	14	18	22	27	32
Diesel flow rate	kg/h	165	185	267	338	412	512	615
LPG Consumption	Nm^3/h	4	5	7	8	10	13	15
LPG flow rate	Nm^3/h	127	143	206	260	317	395	474
Length without burner (L)	mm	1.110	1.110	1.360	1.405	1.405	1.655	1.655
Length with burner (Lb)	mm	1.410	1.410	1.660	1.705	1.705	1.955	2.005
Width min. (A)	mm	790	790	790	940	940	940	940
Height (H)	mm	880	880	880	990	990	990	990
Chimney wheelbase (C)	mm	460	460	460	510	510	510	510
Empty weight	kg	250	270	310	460	480	540	550
Chimney diameter	mm	200	200	200	220	220	220	220
Safety valve	DN	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
Water inlet	DN	2"	2"	2"	65	65	65	65
Water outlet	DN	2"	2"	2"	65	65	65	65
Expansion	DN	1"1/4	1"1/4	1"1/4	1"1/2	1"1/2	1"1/2	1"1/2

Technical data are approximate and are subject to changes due to improvements in our production system

MAC - SPECIFICATIONS

MODEL MAC		410	465	520	580	700	820	940	1.060
Nominal Capacity	kCal	350.108	400.000	449.892	499.785	602.151	705.376	808.602	911.828
	kW	407	465	523	581	700	820	940	1.060
Furnace Capacity	kCal	386.227	439.559	496.332	547.944	663.210	773.315	883.419	994.384
	kW	449	511	577	637	771	899	1.027	1.156
Efficiency	%	91	91	91	91	91	91	91	91
Water content	Liters	329	402	402	476	697	795	733	817
Combustion chamber pressure	mbar	4,40	3,30	4,30	4,80	4,50	5,60	5,40	6,00
Pressure drop (water)	mbar	31,00	18,00	22,00	28,00	18,00	25,00	33,00	40,00
Pressure	bar	6	6	6	6	6	6	6	6
Natural Gas consumption	Nm^3/h	45	52	58	64	78	91	104	117
Natural Gas flow rate	Nm^3/h	681	776	876	967	1.170	1.364	1.559	1.754
Diesel consumption	kg/h	38	43	49	54	65	76	87	98
Diesel flow rate	kg/h	719	818	924	1.020	1.235	1.440	1.645	1.851
LPG Consumption	Nm^3/h	18	20	23	25	30	35	40	45
LPG flow rate	Nm^3/h	554	631	712	786	952	1.110	1.268	1.427
Length without burner (L)	mm	1.905	1.990	1.990	2.290	2.345	2.545	2.545	2.795
Length with burner (Lb)	mm	2.255	2.590	2.640	2.940	3.100	3.400	3.400	3.600
Width min. (A)	mm	940	1.040	1.040	1.040	1.240	1.240	1.240	1.240
Height (H)	mm	990	1.150	1.150	1.150	1.280	1.280	1.280	1.280
Chimney wheelbase (C)	mm	510	595	595	595	640	640	640	640
Empty weight	kg	610	870	890	940	1.310	1.380	1.440	1.620
Chimney diameter	mm	220	250	250	250	350	350	350	350
Safety valve	DN	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
Water inlet	DN	65	80	80	80	100	100	100	100
Water outlet	DN	65	80	80	80	100	100	100	100
Expansion	DN	1"1/2	2"	2"	2"	65	65	65	65

Technical data are approximate and are subject to changes due to improvements in our production system

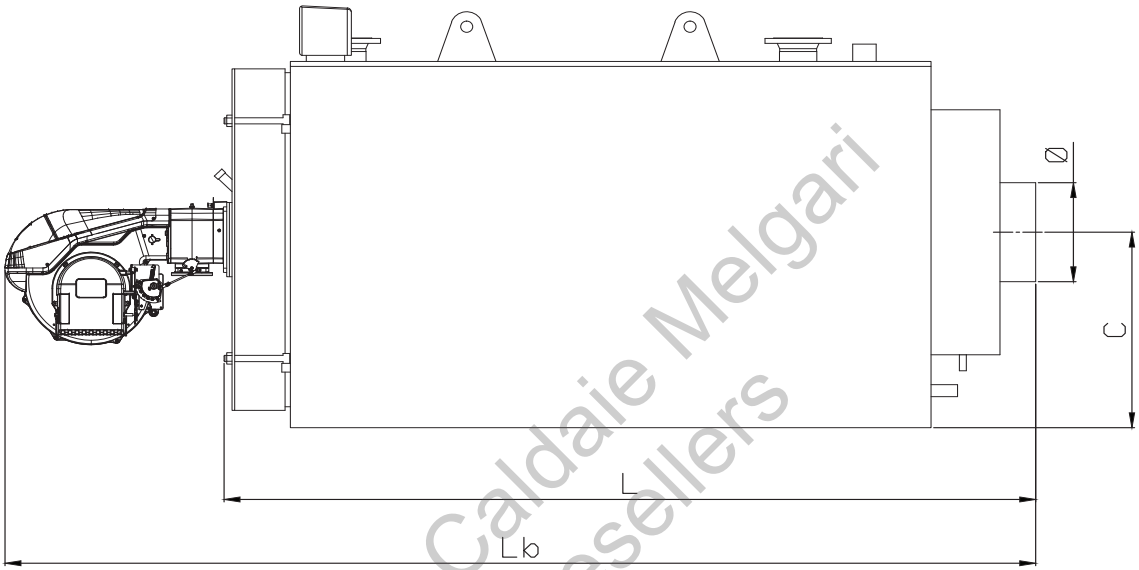
MAC - SPECIFICATIONS

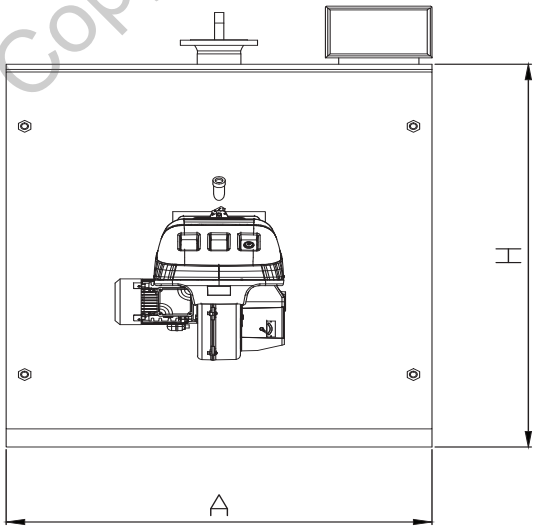
MODEL MAC		1.240	1.480	1.890	2.100	2.330	2.910	3.550	4.150
Nominal Capacity	kCal	1.066.667	1.273.118	1.625.806	1.806.452	2.004.301	2.503.226	3.053.763	3.569.892
	kW	1.240	1.480	1.890	2.100	2.330	2.910	3.550	4.150
Furnace Capacity	kCal	1.160.402	1.381.472	1.768.559	1.962.963	2.210.699	2.763.804	3.316.049	3.868.293
	kW	1.349	1.606	2.056	2.282	2.570	3.213	3.855	4.497
Efficiency	%	91	91	91	91	91	91	91	91
Water content	Liters	1.277	1.372	2.010	2.204	2.163	3.155	3.292	4.839
Combustion chamber pressure	mbar	6,50	6,80	7,00	7,20	7,20	7,50	7,80	9,00
Pressure drop (water)	mbar	36,00	54,00	45,00	68,00	70,00	64,00	90,00	120,00
Pressure	bar	6	6	6	6	6	6	6	6
Natural Gas consumption	Nm^3/h	137	163	208	231	260	325	390	455
Natural Gas flow rate	Nm^3/h	2.047	2.437	3.120	3.463	3.900	4.876	5.851	6.825
Diesel consumption	kg/h	114	135	173	192	217	271	325	379
Diesel flow rate	kg/h	2.160	2.572	3.293	3.655	4.116	5.146	6.174	7.202
LPG Consumption	Nm^3/h	53	63	81	89	101	126	151	176
LPG flow rate	Nm^3/h	1.665	1.983	2.538	2.817	3.173	3.966	4.759	5.551
Length without burner (L)	mm	2.950	3.200	3.245	3.535	3.535	3.955	4.255	4.790
Length with burner (Lb)	mm	3.850	4.100	4.200	4.350	4.750	5.170	5.470	6.300
Width min. (A)	mm	1.380	1.380	1.610	1.610	1.610	1.800	1.800	2.000
Height (H)	mm	1.500	1.500	1.800	1.800	1.800	2.000	2.000	2.210
Chimney wheelbase (C)	mm	810	810	965	965	965	1.070	1.070	1.700
Empty weight	kg	2.200	2.580	3.300	3.640	3.710	5.140	5.840	7.490
Chimney diameter	mm	400	400	450	450	450	500	500	600
Safety valve	DN	1"1/2	1"1/2	1"1/2	1"1/2	1"1/2	1"1/2	1"1/2	1"1/2
Water inlet	DN	125	125	150	150	150	200	200	200
Water outlet	DN	125	125	150	150	150	200	200	200
Expansion	DN	80	80	100	100	100	125	125	125

Technical data are approximate and are subject to changes due to improvements in our production system

MAC

DIMENSIONS



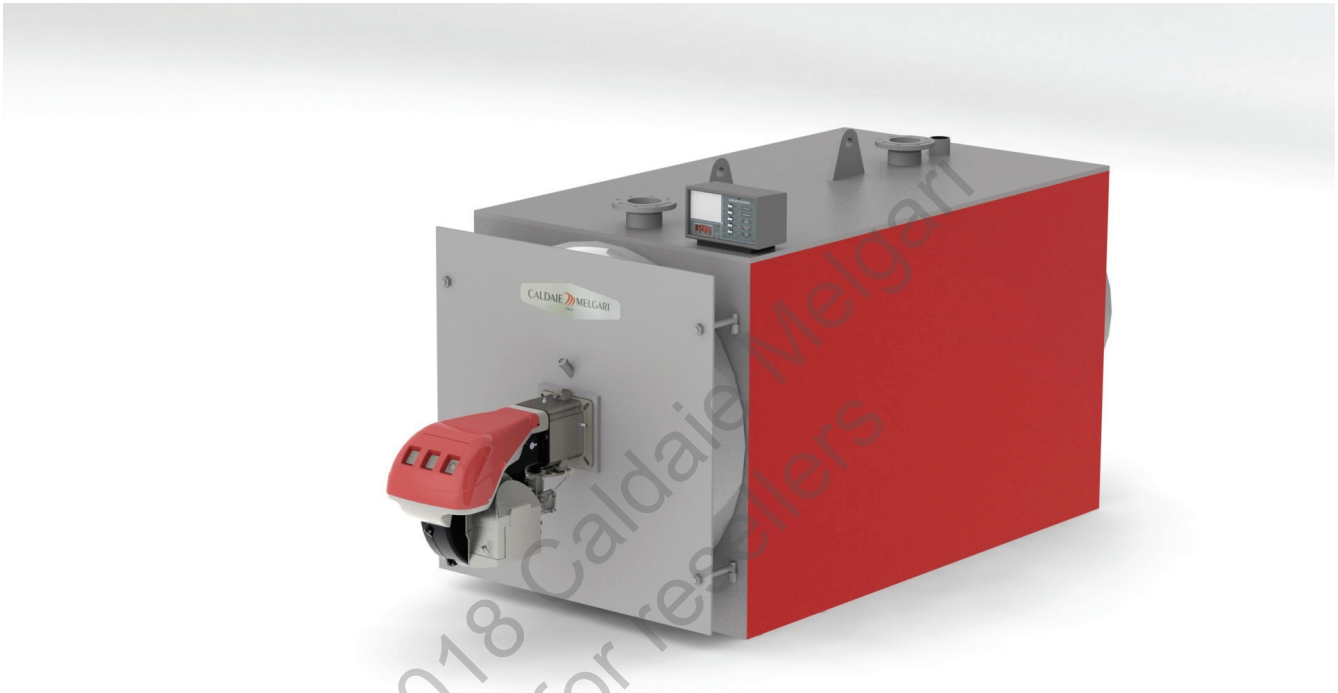


MODEL **MAC HE**

HIGH EFFICIENCY THREE PASS REVERSE FLAME SMOKE TUBE HOT WATER BOILERS

Water temperature **up to 109°C**

Nominal Capacity **from 93 kW to 4.150 kW**, pressure **up to 8 bar**



MAIN FEATURES

Hot water generator MAC High Efficiency (HE) is a three pass reverse flame smoke tube boiler with completely wet back. The first and the second smoke pass take place in the furnace, while the third through thick smoke tubes.

MAC HE generator has been designed by our technical department according to the most advanced techniques, in order to offer the Maximum guarantee of reliability and durability to the customer.

MATERIALS AND CERTIFICATIONS

The cylindrical combustion chamber is internally and externally welded to the front plate and the smoke tubes are peripherally arranged with respect to it, in order to optimize water circulation.

Smoke tubes are protrouding from the rear plate to raise the temperature of the bead of weld, thus avoiding the formation of acid condensation.

The shell is made of high quality sheet metal and is full penetration welded and the turbulators in stainless steel ensure high efficiency.

The front smokes chamber is equipped with two hinged doors useful for cleaning activities, is made of steel and coated internally with insulating / refractory material.

The entire construction is CE marked and complies all the provisions of the Gas Directive 2009/142/CE, Commission Regulation n° 813/2013/UE and Low Voltage Directive 2006/95/EC, in addition to being equipped with all the safety devices.

INSULATION

For the insulation of the external parts and collectors, we use mineral wool (60mm thickness). To protect the external part of the generator, furthermore, we use galvanized sheet metal panels; however, upon request, you can get full coverage of the boiler (including plate of the front door and furnace) with pre-painted galvanized steel sheet.

FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

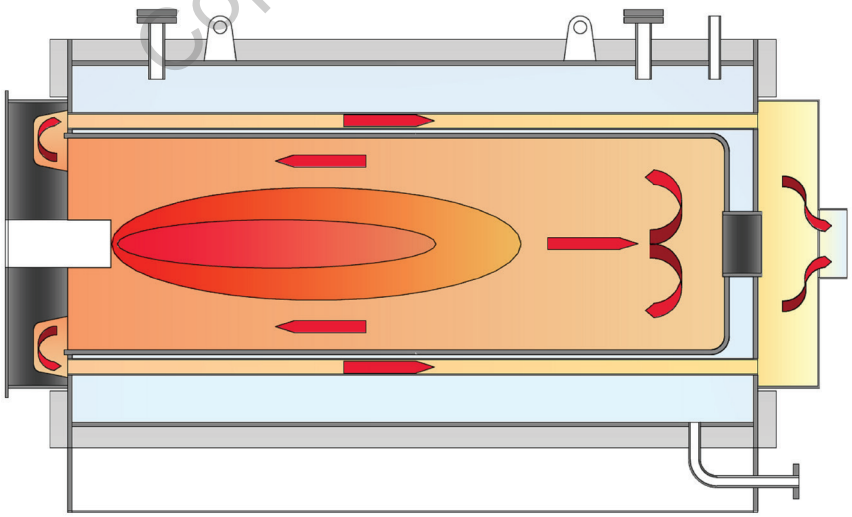
EFFICIENCY

Efficiency of MAC HE boiler is around 95,3%.

BODY OF THE **BOILER**

- **Pressure vessel in high quality steel, cylindrical and horizontal** version with shell, furnace and tubesheet in carbon steel. Furthermore, it is **complete with connections**.
- **Cylindrical furnace in high quality steel with reverse chamber completely wet without refractory**. The particular dimensions of the fire room involve a perfect mixing between the combustible and the comburent air for a **complete and efficient combustion**.
- **Fire tube in steel P 235 GH - EN 10216-2 welded to the plates** and arranged peripherally with respect to the combustion chamber, in order to optimize water circulation.
- **Rear smokes chamber**, in carbon steel, completely openable, with refractory material to convey the flue gas to the stack
- **Front smokes chamber** made of carbon steel, with high refractory material and complete with openable doors for inspection of the smoke tubes and burner's plate.
- **Insulation in high density rock wool** coated with aluminium (or, upon request, steel)
- **Basement made of structural steel** sections supporting the boiler assembly and its accessories

SMOKE PASS SCHEME



The first and the second smoke pass take place in the combustion chamber, while the third takes place through the smoke tubes.

MAC HE
ACCESSORIES & FITTINGS

Our MAC boiler can be supplied with the following control and safety accessories:

- Safety valve
- Pressure switch (Maximum)
- Pressure switch (minimum)
- Expansion vessel
- Thermometer
- Manometer
- Collection sump
- Safety thermostat
- Regulation thermostat

MAC HE
MAIN BENEFITS

- **Heat exchange area is particularly big in order to mantain low specific heating loads and to continuously ensure high rate.**

- **Turbolators** inside the boiler **ensure constant and high efficiency**.

- The **electric control panel**, positioned at eye level, **allows you to easily manage all of the boiler control systems**.

- **Each Caldaie Melgari boiler**, before being delivered, **is rigorously checked** (production features, performance, etc.). In addition to non-destructive controls, **a trial is performed to ensure a high constructive and qualitative standard**.

- Upon request, **we are able to supply integrated solutions to improve generator efficiency and reduce fuel consumptions**. The **economizer**, for example, allows to exploit the heat of the flue exhaust gases to heat the boiler feeding water, thus **increasing output and, at the same time, reducing fuel consumption**. In most cases, the investment is paid back in less than one year.

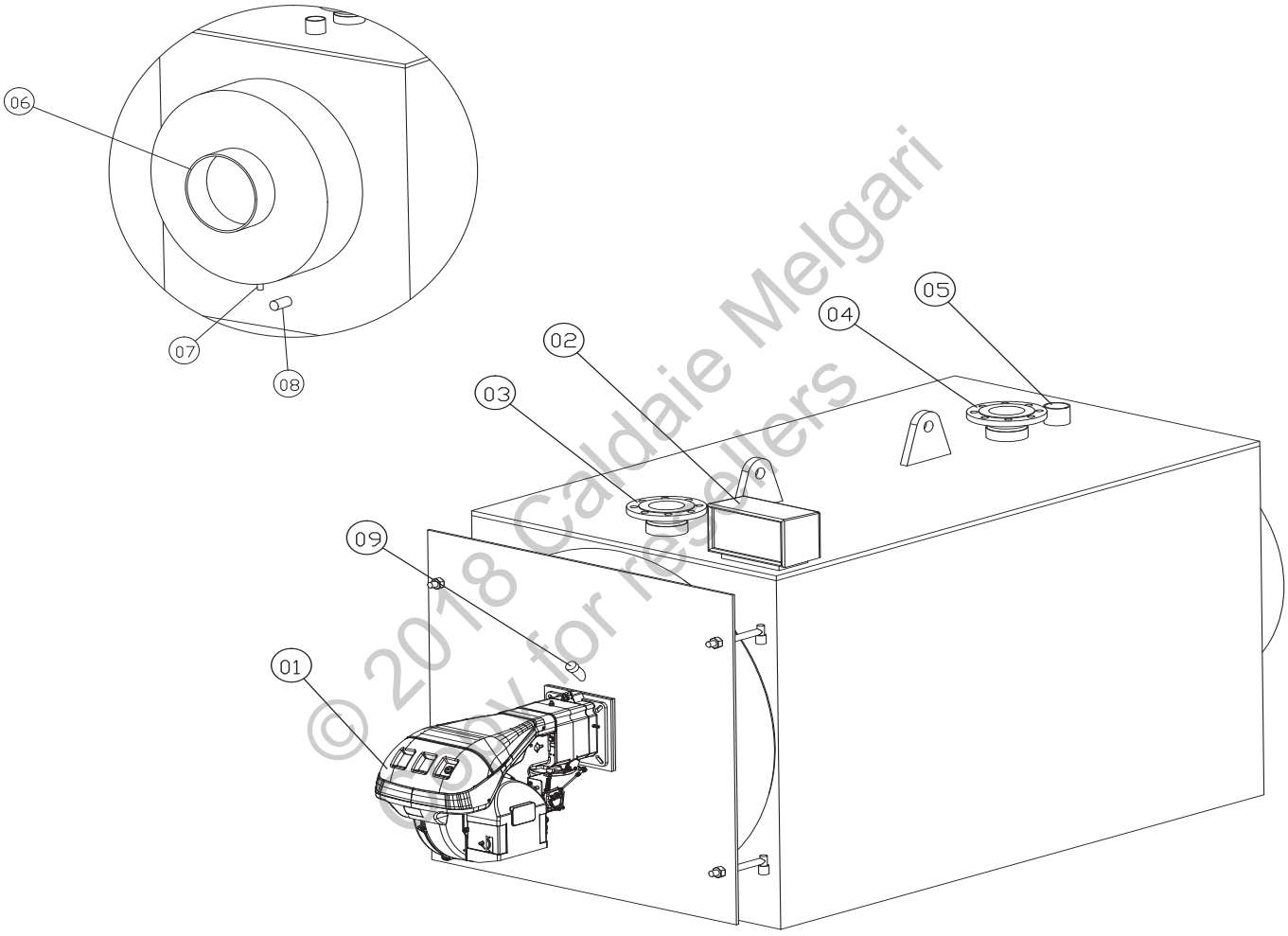
- **It is possible to provide a modulating control of the burner.**

- Upon request, **we provide a remote control system for MAC generator that enables you to constantly monitor your boiler and us to become aware of any problems as they occur, in order to solve them promptly**.

- Upon request, **we provide support during installation and piping**, as well as **supply of spare parts** and **support for emergencies (availability 24 hours)**.

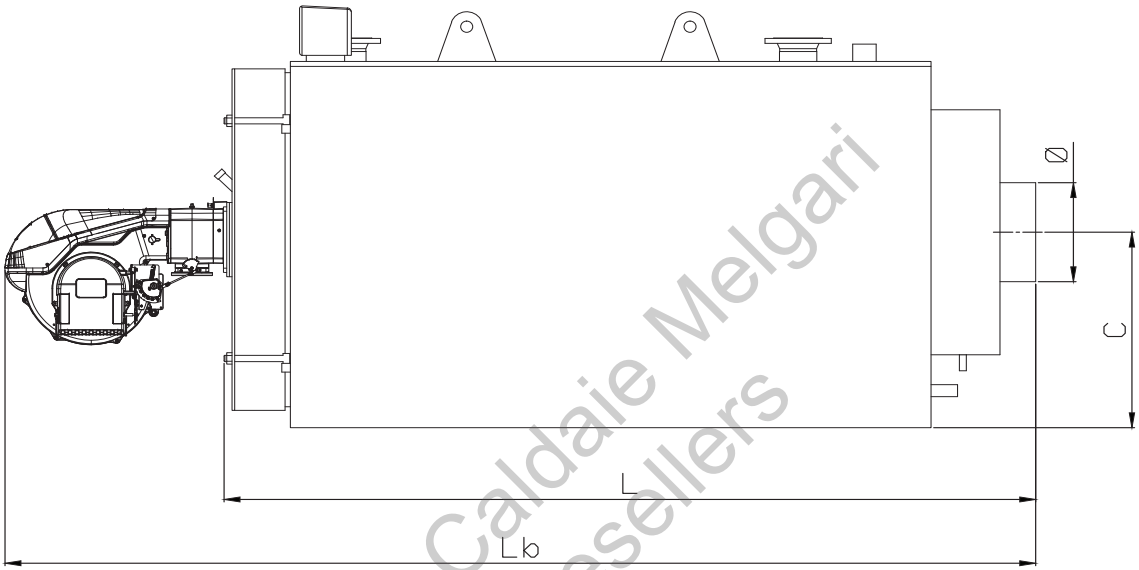
- **The boiler can be configured according to your requests**: we can provide a **wide range of optional accessories** to customize your boiler (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

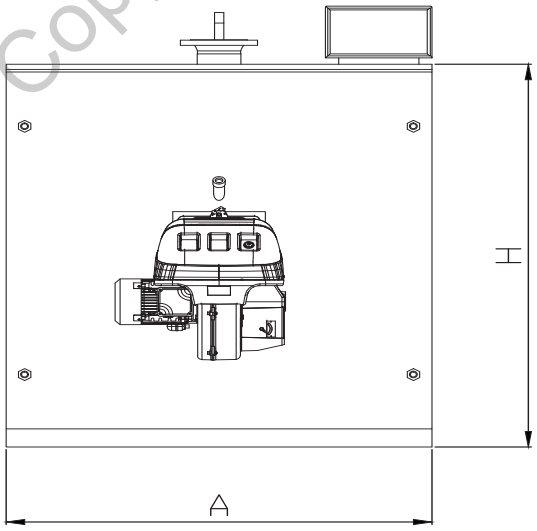
MAC HE
COMPONENTS



1	Burner
2	Electric control panel
3	Hot water inlet
4	Hot water outlet
5	Expansion vessel connection
6	Smokes outlet
7	Smokes condensate drains
8	Purge connection
9	Flame guard

MAC HE
DIMENSIONS





MAC HE - SPECIFICATIONS

MODEL MAC HIGH EFFICIENCY		80	90	130	170	200	250	300	350
Nominal Capacity	kCal	69.660	78.260	113.520	146.200	174.580	217.580	261.440	304.440
	kW	81	91	132	170	203	253	304	354
Furnace Capacity	kCal	74.132	83.162	120.400	154.456	184.040	228.760	275.200	319.920
	kW	86	97	140	180	214	266	320	372
Efficiency	%	95	95	95	95	95	95	95	95
Water content	Liters	119	119	155	228	228	285	276	329
Combustion chamber pressure	mbar	0,4	0,5	0,9	0,9	1,2	1,8	2,5	3,3
Pressure drop (water)	mbar	3,4	4,3	9,0	5,5	7,0	13,0	18,0	23,0
Pressure	bar	5	5	5	6	6	6	6	6
Natural Gas consumption	Nm^3/h	9	10	14	18	22	27	32	38
Natural Gas flow rate	Nm^3/h	100	112	162	208	248	308	371	431
Diesel consumption	kg/h	7	8	12	15	18	23	28	32
Diesel flow rate	kg/h	104	116	169	216	258	320	385	448
LPG Consumption	Nm^3/h	3	4	5	7	8	10	13	15
LPG flow rate	Nm^3/h	106	119	173	222	264	328	395	459
Length without burner (L)	mm	1.110	1.110	1.360	1.405	1.405	1.655	1.655	1.905
Length with burner (Lb)	mm	1.410	1.410	1.660	1.705	1.705	1.955	1.955	2.505
Width min. (A)	mm	790	790	790	940	940	940	940	940
Height (H)	mm	880	880	880	990	990	990	990	990
Chimney wheelbase (C)	mm	460	460	460	510	510	510	510	510
Empty weight	kg	250	270	310	460	480	540	550	610
Chimney diameter	mm	200	200	200	220	220	220	220	220
Purge	DN	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
Water inlet	DN	2"	2"	2"	65	65	65	65	65
Water outlet	DN	2"	2"	2"	65	65	65	65	65
Expansion	DN	1"1/4	1"1/4	1"1/4	1"1/2	1"1/2	1"1/2	1"1/2	1"1/2

Technical data are approximate and are subject to changes due to improvements in our production system

MAC HE - SPECIFICATIONS

MODEL MAC HIGH EFFICIENCY		400	455	505	610	715	820	920
Nominal Capacity	kCal	342.280	391.300	434.300	524.600	614.900	705.200	791.200
	kW	398	455	505	610	715	820	920
Furnace Capacity	kCal	359.480	410.220	455.800	550.400	645.000	739.600	830.760
	kW	418	477	530	640	750	860	966
Efficiency	%	95	95	95	95	95	95	95
Water content	Liters	402	402	476	697	795	733	817
Combustion chamber pressure	mbar	2,7	3,2	3,7	3,6	4,5	4,4	4,8
Pressure drop (water)	mbar	13,0	17,0	21,0	13,0	19,0	25,0	32,0
Pressure	bar	6	6	6	6	6	6	6
Natural Gas consumption	Nm^3/h	42	48	54	65	76	87	98
Natural Gas flow rate	Nm^3/h	484	553	614	741	869	996	1.119
Diesel consumption	kg/h	36	41	46	55	65	74	83
Diesel flow rate	kg/h	503	574	638	771	903	1.035	1.163
LPG Consumption	Nm^3/h	16	19	21	25	29	34	38
LPG flow rate	Nm^3/h	516	589	654	790	926	1.061	1.192
Length without burner (L)	mm	1.990	1.990	2.290	2.345	2.545	2.545	2.795
Length with burner (Lb)	mm	2.590	2.590	2.890	2.945	3.145	3.445	3.695
Width min. (A)	mm	1.040	1.040	1.040	1.240	1.240	1.240	1.240
Height (H)	mm	1.150	1.150	1.150	1.280	1.280	1.280	1.280
Chimney wheelbase (C)	mm	595	595	595	640	640	640	640
Empty weight	kg	870	890	940	1.310	1.380	1.440	1.620
Chimney diameter	mm	250	250	250	350	350	350	350
Purge	DN	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
Water inlet	DN	80	80	80	100	100	100	100
Water outlet	DN	80	80	80	100	100	100	100
Expansion	DN	2"	2"	2"	65	65	65	65

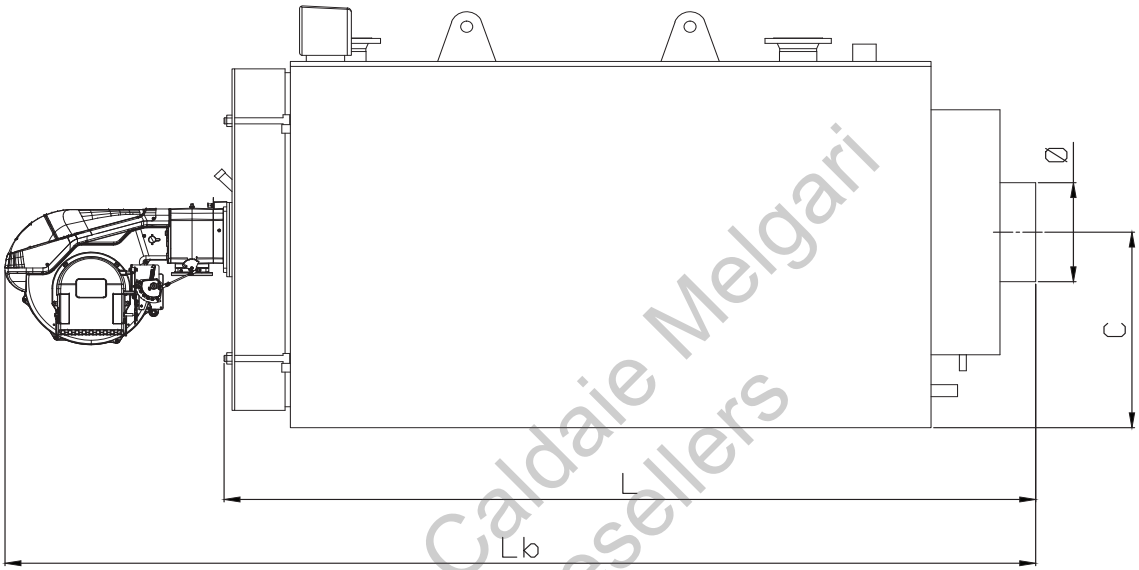
Technical data are approximate and are subject to changes due to improvements in our production system

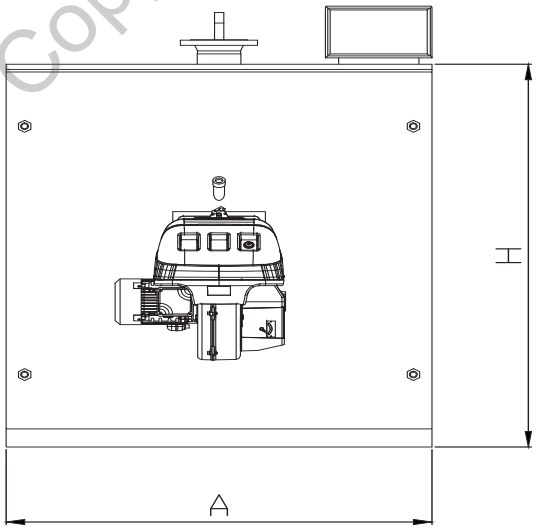
MAC HE - SPECIFICATIONS

MODEL MAC HIGH EFFICIENCY		1.100	1.300	1.645	1.850	2.050	2.580	3.100	3.610
Nominal Capacity	kCal	946.000	1.118.000	1.414.700	1.591.000	1.763.000	2.218.800	2.666.000	3.104.600
	kW	1.100	1.300	1.645	1.850	2.050	2.580	3.100	3.610
Furnace Capacity	kCal	993.300	1.173.900	1.485.220	1.670.120	1.851.580	2.329.740	2.799.300	3.260.260
	kW	1.155	1.365	1.727	1.942	2.153	2.709	3.255	3.791
Efficiency	%	95	95	95	95	95	95	95	95
Water content	Liters	1.277	1.372	2.010	2.125	2.163	3.155	3.292	4.839
Combustion chamber pressure	mbar	5,4	5,6	5,8	6	6,5	6,8	7,5	8,4
Pressure drop (water)	mbar	29,0	40,0	33,0	40,0	45,0	50,0	70,0	92,0
Pressure	bar	6	6	6	6	6	6	6	6
Natural Gas consumption	Nm^3/h	117	138	175	196	218	274	329	384
Natural Gas flow rate	Nm^3/h	1.338	1.581	2.001	2.250	2.494	3.138	3.771	4.392
Diesel consumption	kg/h	99	117	149	167	185	233	280	326
Diesel flow rate	kg/h	1.391	1.643	2.079	2.338	2.592	3.262	3.919	4.564
LPG Consumption	Nm^3/h	45	53	68	76	84	106	128	149
LPG flow rate	Nm^3/h	1.425	1.685	2.131	2.397	2.657	3.343	4.017	4.679
Length without burner (L)	mm	2.950	3.200	3.245	3.535	3.535	3.955	4.255	4.790
Length with burner (Lb)	mm	3.850	4.100	4.145	4.635	4.635	5.155	5.455	5.990
Width min. (A)	mm	1.380	1.380	1.610	1.610	1.610	1.800	1.800	2.000
Height (H)	mm	1.500	1.800	1.800	1.800	1.800	2.000	2.000	2.210
Chimney wheelbase (C)	mm	810	810	965	965	965	1.070	1.070	1.700
Empty weight	kg	2.200	2.580	3.300	3.640	3.710	5.140	5.480	7.490
Chimney diameter	mm	400	400	450	450	450	500	500	600
Purge	DN	1"1/2	1"1/2	1"1/2	1"1/2	1"1/2	1"1/2	1"1/2	1"1/2
Water inlet	DN	125	125	150	150	150	200	200	200
Water outlet	DN	125	125	150	150	150	200	200	200
Expansion	DN	80	80	100	100	100	125	125	125

Technical data are approximate and are subject to changes due to improvements in our production system

MAC HE
DIMENSIONS



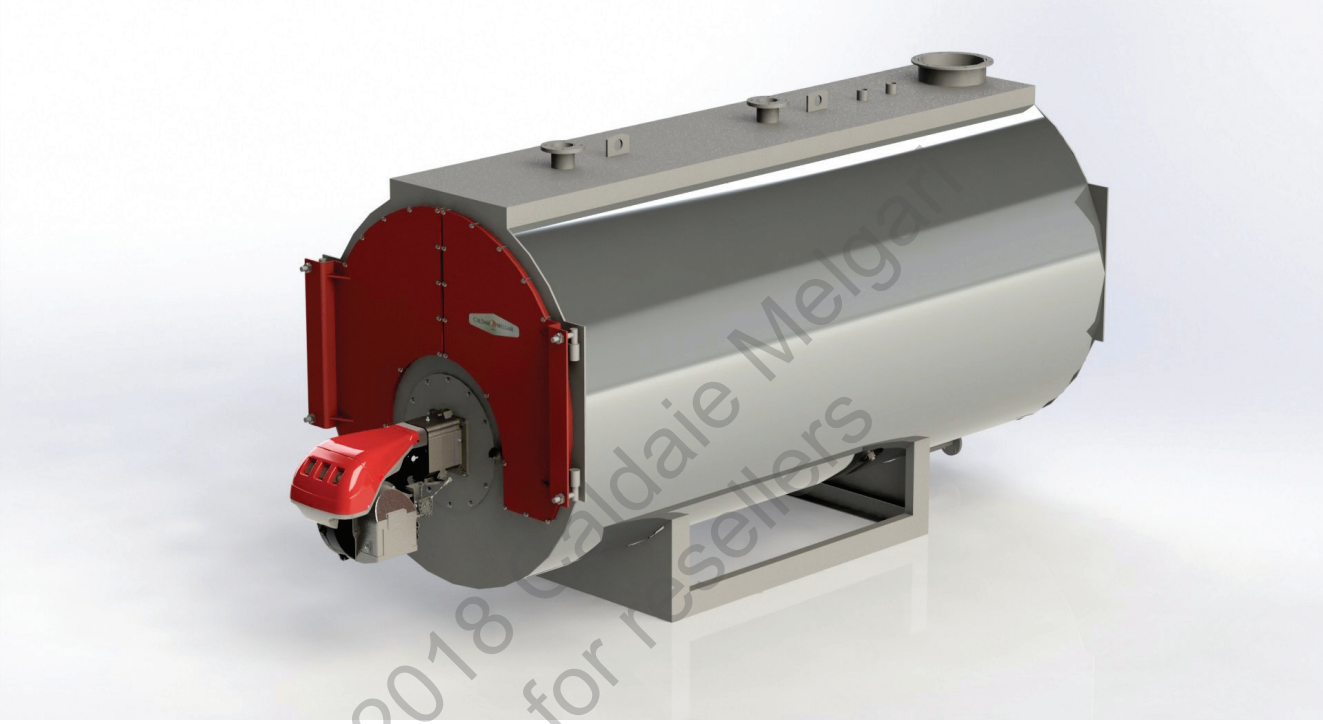


MODEL **MAC 3**

THREE SMOKE PASS HOT WATER BOILER

Water temperature **up to 109°C**

Nominal Capacity **from 1.000 kW to 10.500 kW**, pressure **up to 10 bar**



MAIN FEATURES

Hot water generator MAC 3 is a monobloc three smoke pass hot water boiler with passing flame and completely wet back.

This type of generator is **ideal for customers who need a heating system always ready to provide heat quickly**. The first smoke pass takes place in the furnace, while the second and the third take place through thick smoke tubes.

MAC 3 generator has been designed by our technical department according to the most advanced techniques, in order to offer the Maximum guarantee of reliability and durability to the customer.

MATERIALS AND CERTIFICATIONS

The large furnace, complete with a reverse chamber fully immersed in the water, is closed with flat plates (up to 4.300 model) **and with cuffed and tempered plates** (from model 5.000). The furnace, as well as the plating, is made with high quality metal sheet and Is penetration welded.

The front smokes chamber is equipped with two hinged doors useful for cleaning activities, coated internally with insulating / refractory material and provided with sealing gasket.

The entire construction is CE marked and complies all the provisions of the Gas Directive 2009/142/CE, Commission Regulation n°813/2013/UE and Low Voltage Directive 2006/95/EC, in addition to being equipped with all the safety devices.

INSULATION

For the insulation of the external parts and collectors, we use 100 mm mineral wool. To protect the external part of the generator, furthermore, we use aluminium sheet; the upper part of the generator is walkable and made of non-slip striated sheet metal.

FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard

fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

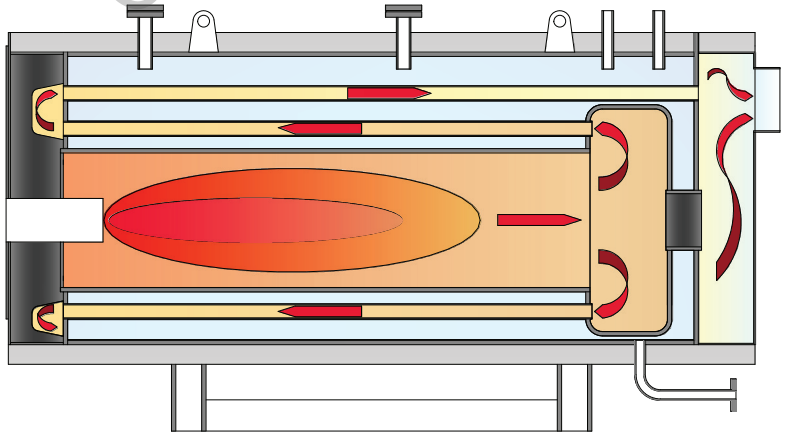
EFFICIENCY

Efficiency of our MAC 3 hot water boiler is around 93%.

BODY OF THE **BOILER**

- **Pressure vessel in high steel quality , cylindrical and horizontal** version with shell, furnace and tubesheet in carbon steel. The pressure vessel is complete with connections.
- **External body of the boiler equipped with a handhole** positioned in the lower side for water side inspections. The back is equipped with a hatch used to carry out inspections and overhauls.
- **Cylindrical furnace in high steel quality with reverse chamber** completely wet without refractory. The particular dimensions of the fire room involve a perfect mixing between the combustible and the comburent air for a complete combustion.
- **Fire tube made in steel P 235 GH – EN 10216-2** welded to the plates and arranged peripherally with respect to the combustion chamber, in order to optimize water circulation.
- **Rear smokes chamber**, in carbon steel, completely openable, with refractory material to convey the flue gas to the stack
- **Front smokes chamber** made of carbon steel, with high refractory material and complete with openable doors for inspection of the smoke tubes and burner's plate.
- **Insulation in high density rock wool** coated with aluminium (or, upon request, steel)
- **Basement made of structural steel sections** supporting the boiler assembly and its accessories

SMOKE PASS SCHEME



The first smoke pass takes place in the combustion chamber, while the second and the third take place through thick smoke tubes.

MAC 3
ACCESSORIES & FITTINGS

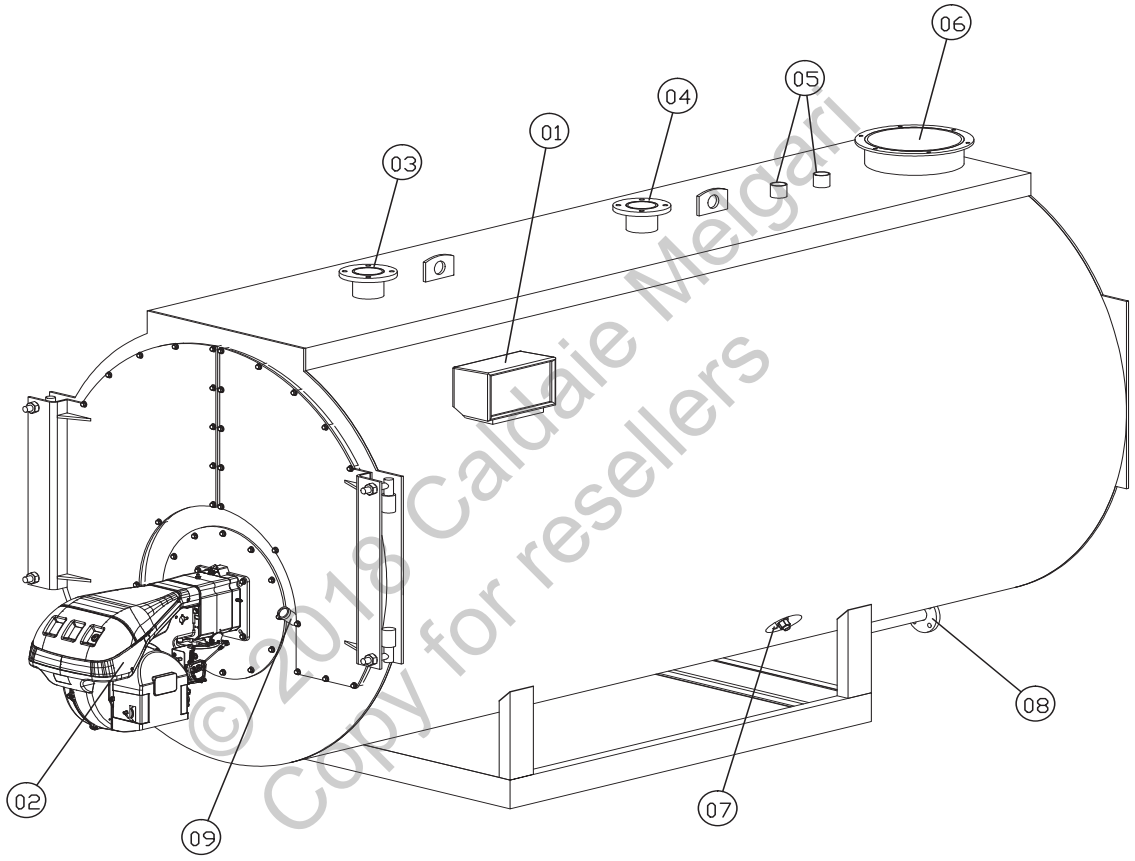
Our MAC 3 boiler can be supplied with the following control and safety accessories:

- Safety valve
- Pressure switch (Maximum)
- Pressure switch (minimum)
- Expansion vessel
- Thermometer
- Manometer
- Collection sump
- Safety thermostat
- Regulation thermostat

MAC 3
MAIN BENEFITS

- **Heat exchange area** is **particularly big** in order to **mantain low specific heating loads and** to **ensure high rate continuously**.
- **Multiple inspection doors simplify maintenance** and **cleaning activities** as well as **periodic inspections** required by law. The maintenance is essential for your boiler because, in addition to preserve over time the value of the thermal plant, it acts as a true prevention from the risk of production stoppages.
- **Three pass construction reduce the permanence of consumption gas in high temperature zones**, thus **limiting the formation of NOx**.
- The **electric control panel**, positioned at eye level, **allows you to easily manage all of the boiler control systems**.
- **Each Caldaie Melgari boiler, before being delivered, is rigorously checked** (production features, performance, etc.). In addition to non-destructive controls, **a trial is performed to ensure a high constructive and qualitative standard**.
- Upon request, **we are able to supply integrated solutions to improve generator efficiency and reduce fuel consumptions**. The economizer, for example, allows to exploit the heat of the flue exhaust gases to heat the boiler feeding water, thus increasing output and, at the same time, reducing fuel consumption. In most cases, the investment is paid back in less than one year.
- **It is possible to provide a modulating control of the burner**.
- **The boiler can be mounted on a skid** with welded metal sections in order to allow immediate installation **or in a container** (turn-key thermal plant) with other components (eg. Circulation pumps, expansion tanks, etc.) .
- Upon request, **we provide a remote control system for MAC 3 generator that enables you to constantly monitor your system and us to become aware of any problems as they occur, in order to solve them promptly**.
- The **upper part of the generator** is **walkable and realized with a striated non-slip sheet**.
- Aluminium **insulation** or- upon request- stainless steel insulation, extremely durable, **protects the boiler from possible damages deriving from atmospheric agents**.
- Upon request, **we provide support during installation and piping**, as well as supply of spare parts and support for emergencies (availability 24 hours).
- **The boiler can be configured according to your requests**: we can provide a **wide range of optional accessories to customize your boiler** (eg. economizer, gangway, circulation pump, water softener and salt tank, etc.).

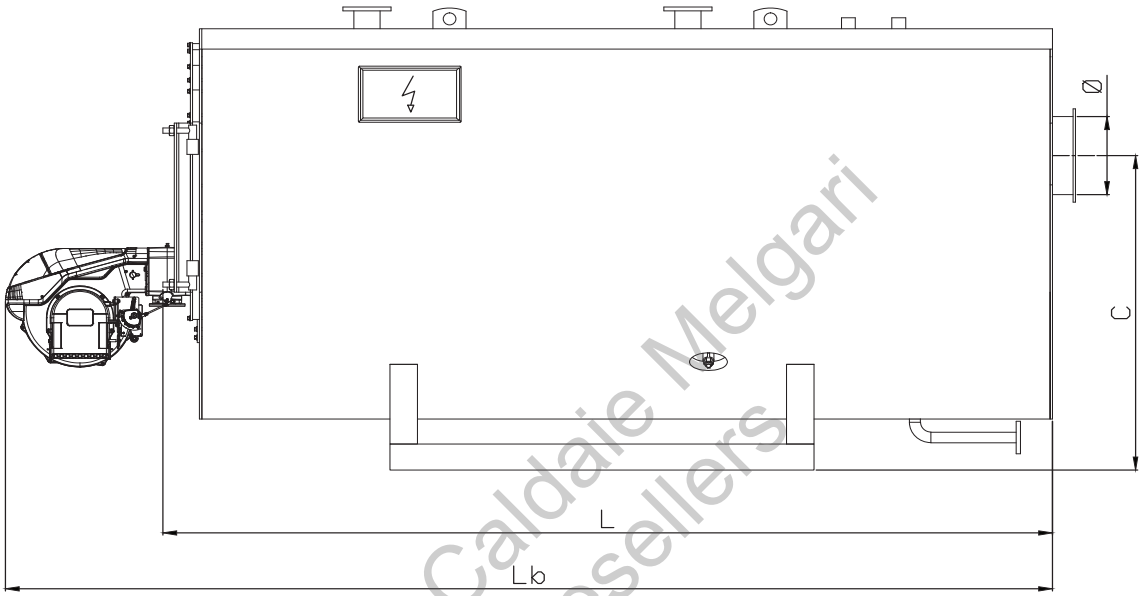
MAC 3
COMPONENTS

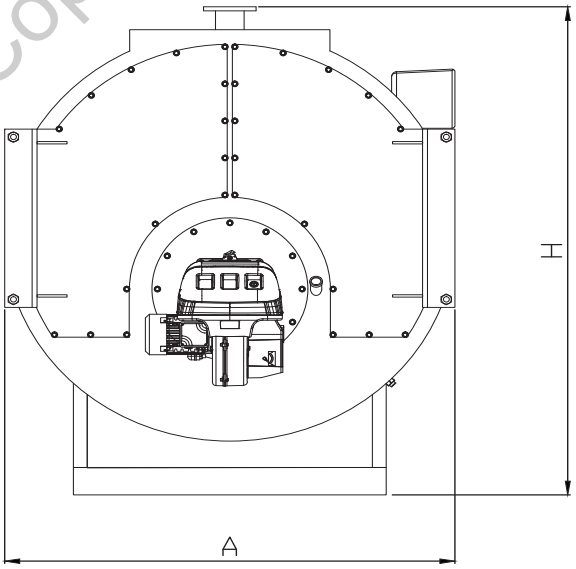


1	Burner
2	Electric control panel
3	Hot water inlet
4	Hot water outlet
5	Expansion vessel connection
6	Smokes outlet
7	Handhole
8	Purge connection
9	Flame guard

MAC 3

DIMENSIONS





MAC 3 - SPECIFICATIONS

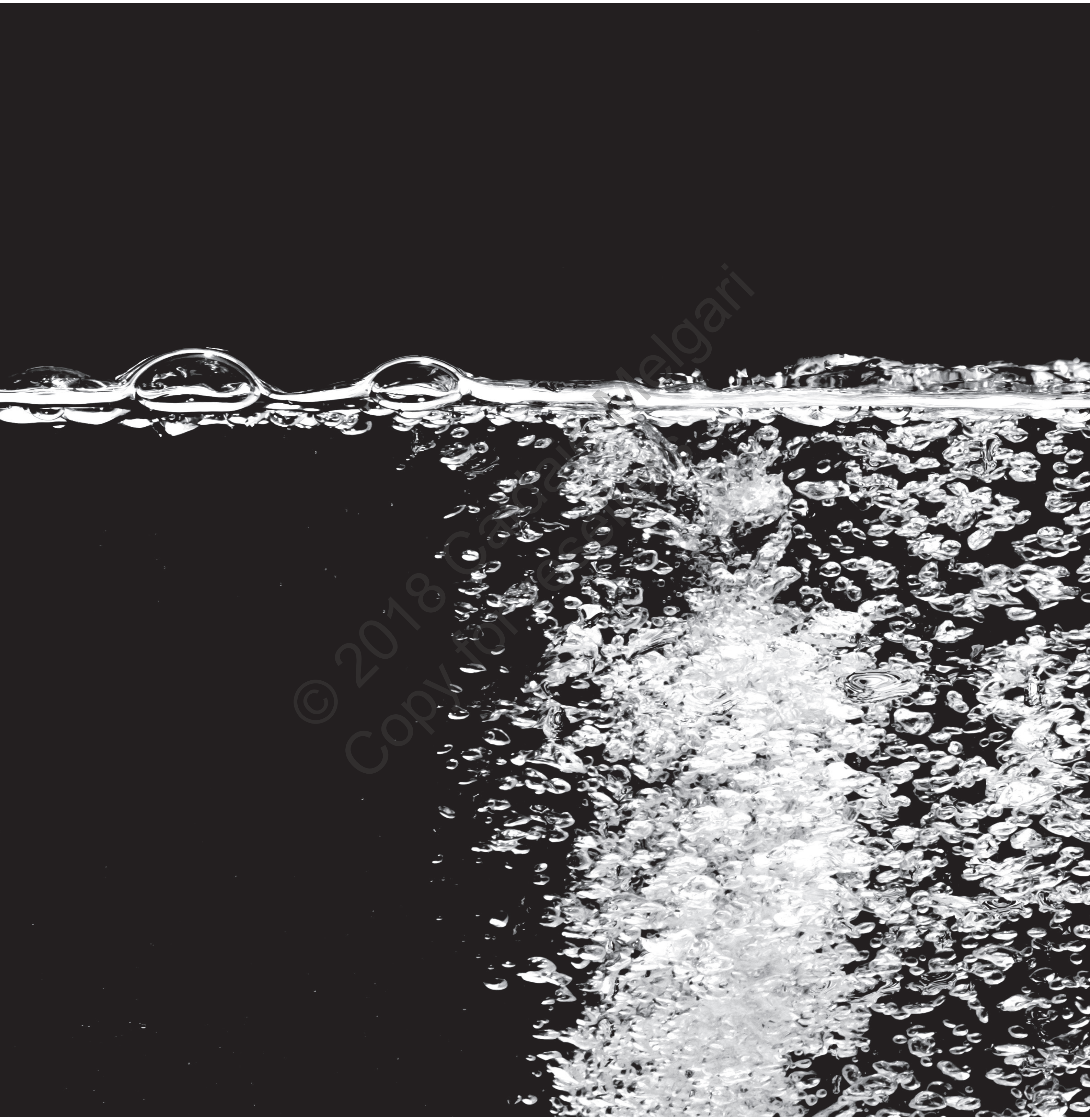
MODEL MAC 3		1.165	1.410	1.760	2.040	2.510	3.020	3.520
Nominal Capacity	kCal	1.001.900	1.212.600	1.513.600	1.754.400	2.158.600	2.597.200	3.027.200
	KW	1.165	1.410	1.760	2.040	2.510	3.020	3.520
Furnace Capacity	kCal	1.083.600	1.308.920	1.635.720	1.900.600	2.330.600	2.803.600	3.276.600
	KW	1.260	1.522	1.902	2.210	2.710	3.260	3.810
Efficiency	%	93	93	93	93	93	93	93
Combustion chamber pressure	mbar	4,5	6,6	5,3	5,6	5,6	5,5	7,7
Combustion chamber pressure	mbar	75	105	72	90	55	72	95
Water content	Liters	2.247	2.476	3.388	3.649	5.020	5.610	6.332
Natural Gas consumption	Nm^3/h	127	154	192	224	274	330	385
Natural Gas flow rate	Nm^3/h	1.460	1.763	2.203	2.560	3.139	3.777	4.414
Diesel consumption	kg/h	108	131	164	190	233	280	328
Diesel flow rate	kg/h	1.517	1.832	2.290	2.661	3.263	3.925	4.587
LPG Consumption	Nm^3/h	49	60	75	87	106	128	149
LPG flow rate	Nm^3/h	1.555	1.878	2.347	2.728	3.345	4.023	4.702
Length without burner (L)	mm	3.240	3.490	3.650	3.900	4.510	4.510	4.960
Length with burner (Lb)	mm	4.150	4.350	4.600	4.850	5.700	5.700	6.150
Width min. (A)	mm	1.580	1.580	1.800	1.800	1.930	2.050	2.050
Height (H)	mm	1.930	1.930	2.200	2.200	2.330	2.450	2.460
Chimney wheelbase (C)	mm	1.250	1.250	1.450	1.450	1.530	1.650	1.650
Empty weight (5 bar)	kg	3.320	3.550	4.700	4.950	5.700	7.110	7.650
Empty weight (6 bar)	kg	3.480	3.820	4.850	5.000	5.950	7.530	8.150
Empty weight (8 bar)	kg	3.720	3.990	5.220	5.500	6.450	8.120	8.750
Chimney diameter	mm	400	400	450	450	500	500	500
Water inlet	DN	125	125	150	150	200	200	200
Water outlet	DN	125	125	150	150	200	200	200
Expansion	DN	1"1/2	1"1/2	2"	2"	2"	2"	65
Purge	DN	40	40	40	40	40	40	40

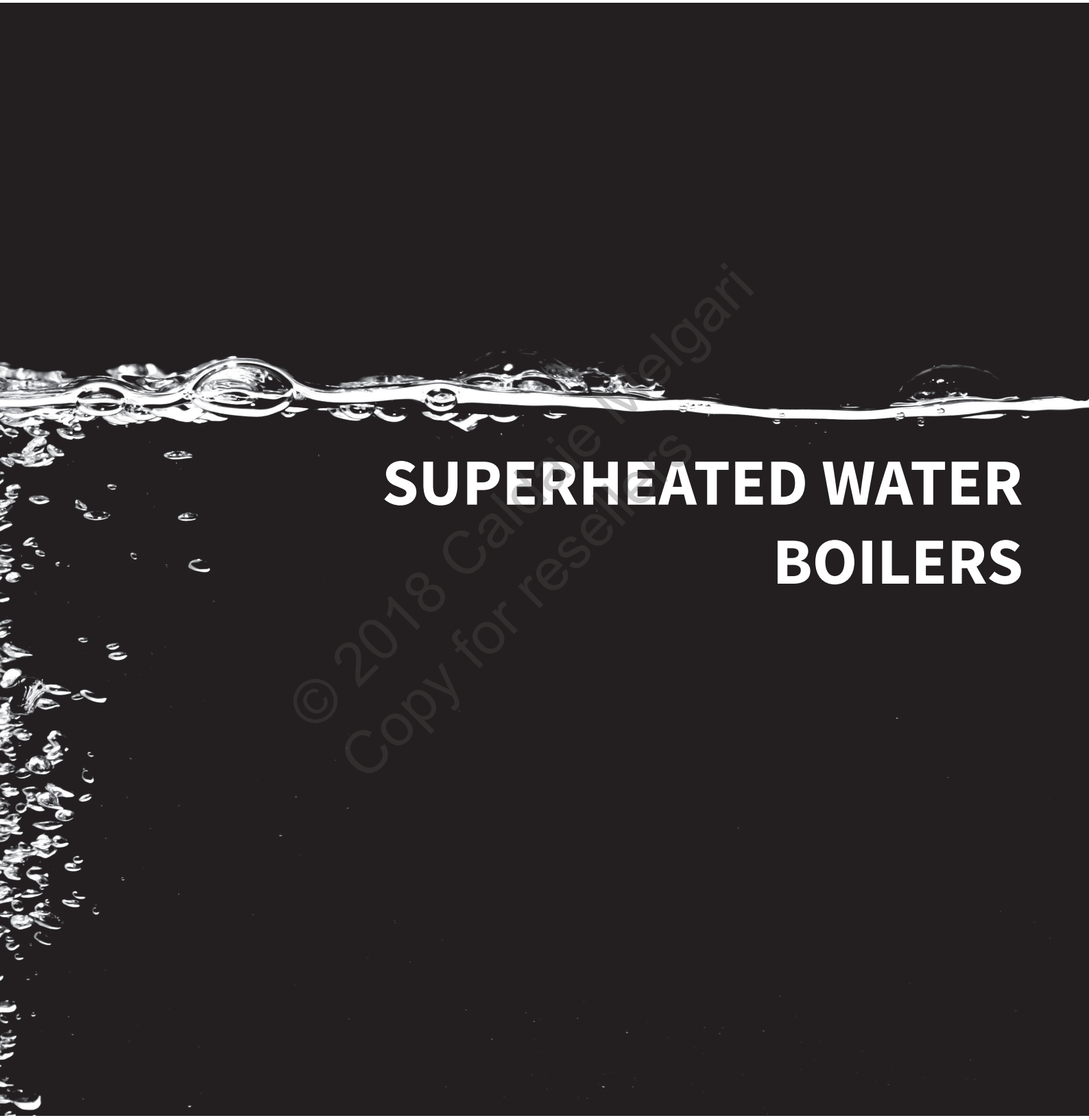
Technical data are approximate and are subject to changes due to improvements in our production system

MAC 3 - SPECIFICATIONS

MODEL MAC 3		4.090	4.680	5.030	5.830	7.020	8.760	10.560
Nominal Capacity	kCal	3.517.400	4.024.800	4.325.800	5.013.800	6.037.200	7.533.600	9.081.600
	KW	4.090	4.680	5.030	5.830	7.020	8.760	10.560
Furnace Capacity	kCal	3.801.200	4.343.000	4.687.000	5.426.600	6.527.400	8.135.600	9.804.000
	KW	4.420	5.050	5.450	6.310	7.590	9.460	11.400
Efficiency	%	93	93	93	93	93	93	93
Combustion chamber pressure	mbar	5,4	7,0	8,2	5,6	8,4	8,1	8,7
Combustion chamber pressure	mbar	130	170	180	120	150	220	180
Water content	Liters	7.793	8.561	8.561	11.984	13.227	16.952	19.733
Natural Gas consumption	Nm^3/h	447	511	551	638	768	957	1.153
Natural Gas flow rate	Nm^3/h	5.120	5.850	6.314	7.310	8.793	10.959	13.207
Diesel consumption	kg/h	380	434	469	543	653	814	980
Diesel flow rate	kg/h	5.322	6.080	6.562	7.597	9.138	11.390	13.726
LPG Consumption	Nm^3/h	173	198	214	247	297	371	447
LPG flow rate	Nm^3/h	5.455	6.233	6.726	7.788	9.367	11.675	14.070
Length without burner (L)	mm	5.100	5.500	5.500	6.070	6.570	7.020	7.320
Length with burner (Lb)	mm	6.300	7.000	7.000	7.570	8.070	8.520	8.820
Width min. (A)	mm	2.260	2.260	2.260	2.500	2.500	2.750	2.910
Height (H)	mm	2.660	2.660	2.660	2.950	2.950	3.200	3.360
Chimney wheelbase (C)	mm	1.780	1.780	1.780	1.955	1.955	2.110	2.210
Empty weight (5 bar)	kg	9.250	10.050	10.200	13.300	14.200	17.800	22.000
Empty weight (6 bar)	kg	9.700	10.050	10.200	13.800	14.660	18.250	22.600
Empty weight (8 bar)	kg	10.400	11.350	11.500	14.950	15.950	18.950	23.500
Chimney diameter	mm	600	600	600	700	700	800	900
Water inlet	DN	200	200	200	250	250	250	300
Water outlet	DN	200	200	200	250	250	250	300
Expansion	DN	65	80	80	80	100	100	100
Purge	DN	40	40	40	40	40	40	40

Technical data are approximate and are subject to changes due to improvements in our production system





SUPERHEATED WATER BOILERS

MODEL **MAS**

THREE PASS REVERSE FLAME SMOKE TUBE SUPERHEATED WATER BOILERS

Water temperature **up to 192°C**

Nominal Capacity **from 140 kW to 2.910 kW**, pressure **up to 9,8 bar**

MAIN FEATURES

Superheated water generator MAS is a three pass reverse flame smoke tube boiler with completely wet back. The first and the second smoke pass take place in the furnace, while the third through thick smoke tubes.

MAS generator has been designed by our technical department according to the most advanced techniques, in order to offer the Maximum guarantee of reliability and durability to the customer.

MATERIALS AND CERTIFICATIONS

The **cylindrical combustion chamber** is **internally and externally welded to the front plate** and the smoke tubes in carbon steel are peripherally arranged with respect to it, in order to optimize water circulation.

The **shell** is **made of high quality sheet metal and is full penetration welded and the turbulators in stainless steel ensure high efficiency.**

The front smoke chamber is equipped with two hinged doors useful for cleaning activities, is made of steel and coated internally with insulating / refractory material.

The entire construction is CE marked according to PED Directive 2014/68/UE

INSULATION

For the insulation of the external parts and collectors, we use mineral wool. To protect the external part of the generator, furthermore, **we use galvanized sheet metal panels**; however, upon request, **you can get full coverage of the boiler (including plate of the front door and furnace) with pre-painted galvanized steel sheet**.

FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

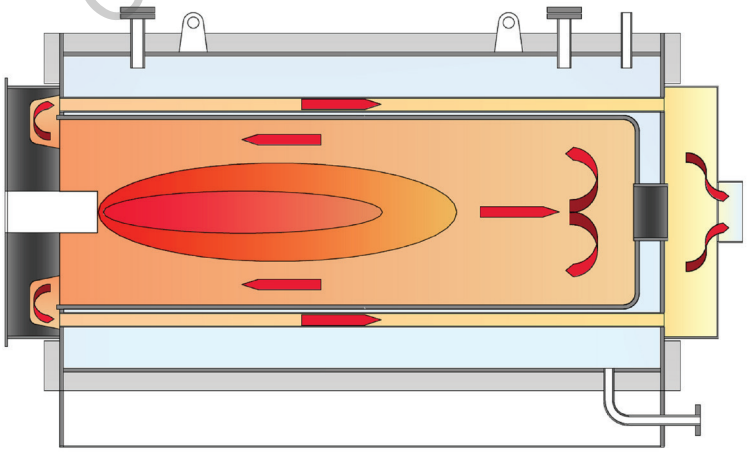
EFFICIENCY

Efficiency of our superheated water MAS boiler is around 89%.

BODY OF THE **BOILER**

- **Pressure vessel in high steel quality , cylindrical and horizontal** version with shell, furnace and tubesheet in carbon steel. The pressure vessel is complete with connections.
- **External body of the boiler** equipped with a **manhole** (positioned in the upper part) and a **handhole** (positioned in the lower one) for the inspection of water side of the generator.
- **Cylindrical furnace in high steel quality** with reverse chamber completely wet without refractory. The particular dimensions of the fire room involve a perfect mixing between the combustible and the comburent air for a complete combustion.
- **Fire tube made in steel** welded to the plates and arranged peripherally with respect to the combustion chamber, in order to optimize water circulation.
- **Rear smokes chamber**, in carbon steel, completely openable, with refractory material to convey the flue gas to the stack.
- **Front smokes chamber** made of carbon steel, with high refractory material and complete with openable doors for inspection of the smoke tubes and burner's plate.
- **Insulation in high density rock wool** coated with with pre-painted galvanized steel sheet.
- **Basement made of structural steel sections** supporting the boiler assembly and its accessories.

SMOKE PASS SCHEME



The first and the second smoke pass take place in the combustion chamber, while the third takes place through the smoke tubes.

MAS
ACCESSORIES & FITTINGS

Our MAS boiler includes the following basic control and safety accessories:

Control and regulation accessories

- N.1 exhaust system composed of a globe valve and a plug cock
- N. 1 thermometer
- N.2 service thermostats
- N.1 manometer
- N.1 complete series of turbolators

Safety accessories

- N. 2 safety valves
- N. 1 safety thermostat
- N. 2 safety pressure switches

Electric control panel

- N. 2 burner thermostats
- N.1 safety thermostat
- N. 1 general switch
- N. 1 thermometer

MAS
MAIN BENEFITS

- **Heat exchange area is particularly big in order to mantain low specific heating loads and to continuously ensure high rate.**

- **Turbolators** inside the boiler **ensure constant and high efficiency**.

- The **electric control panel**, positioned at eye level, **allows you to easily manage all of the boiler control systems**.

- **Each Caldaie Melgari boiler**, before being delivered, **is rigorously checked** (production features, performance, etc.). In addition to non-destructive controls, **a trial is performed to ensure a high constructive and qualitative standard**.

- Upon request, **we are able to supply integrated solutions to improve generator efficiency and reduce fuel consumptions**. The **economizer**, for example, allows to exploit the heat of the flue exhaust gases to heat the boiler feeding water, thus **increasing output and, at the same time, reducing fuel consumption**. In most cases, the investment is paid back in less than one year.

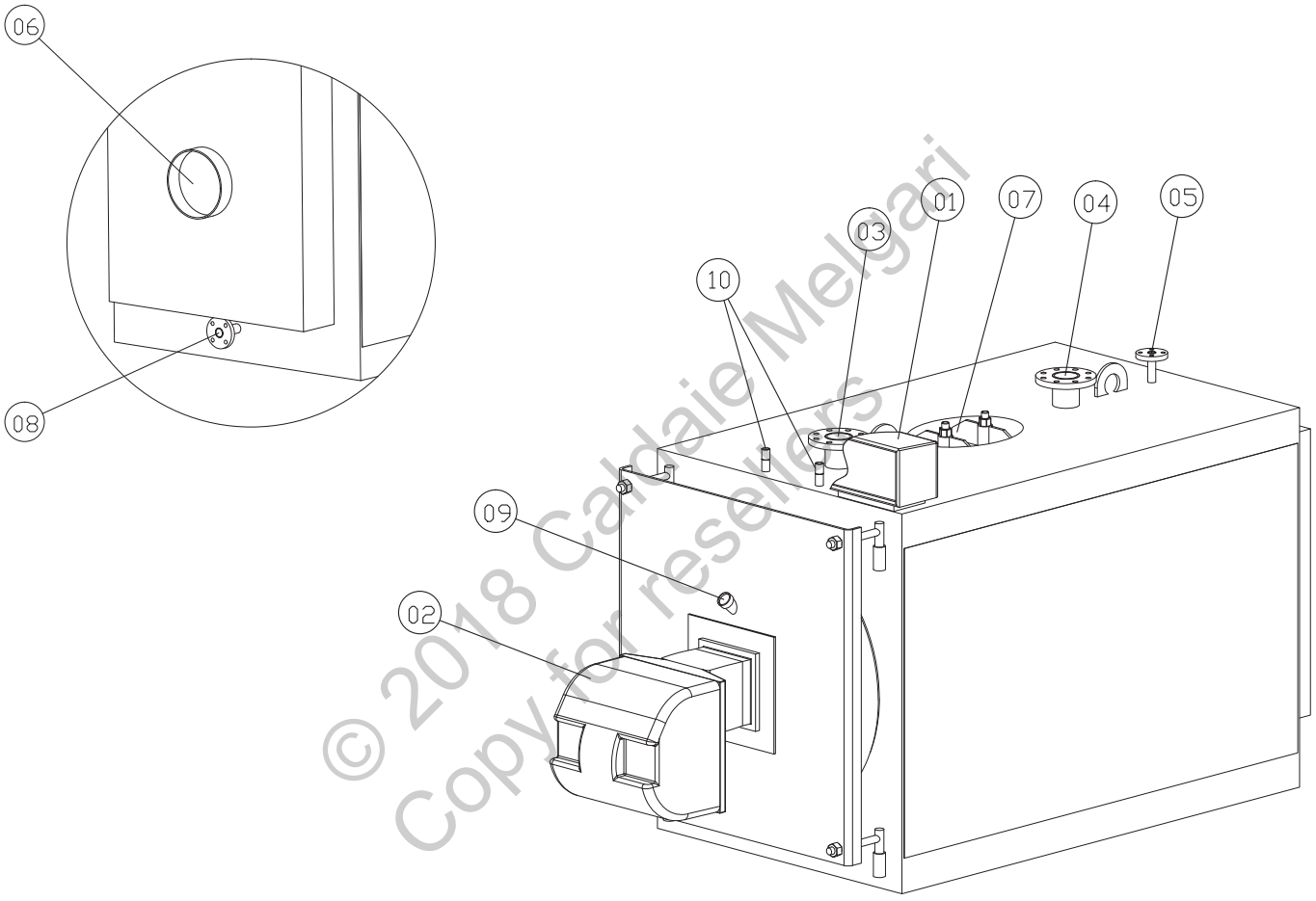
- **It is possible to provide a modulating control of the burner.**

- Upon request, **we provide a remote control system for MAC generator that enables you to constantly monitor your boiler and us to become aware of any problems as they occur, in order to solve them promptly**.

- Upon request, **we provide support during installation and piping**, as well as **supply of spare parts** and **support for emergencies (availability 24 hours)**.

- **The boiler can be configured according to your requests**: we can provide a **wide range of optional accessories** to customize your boiler (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

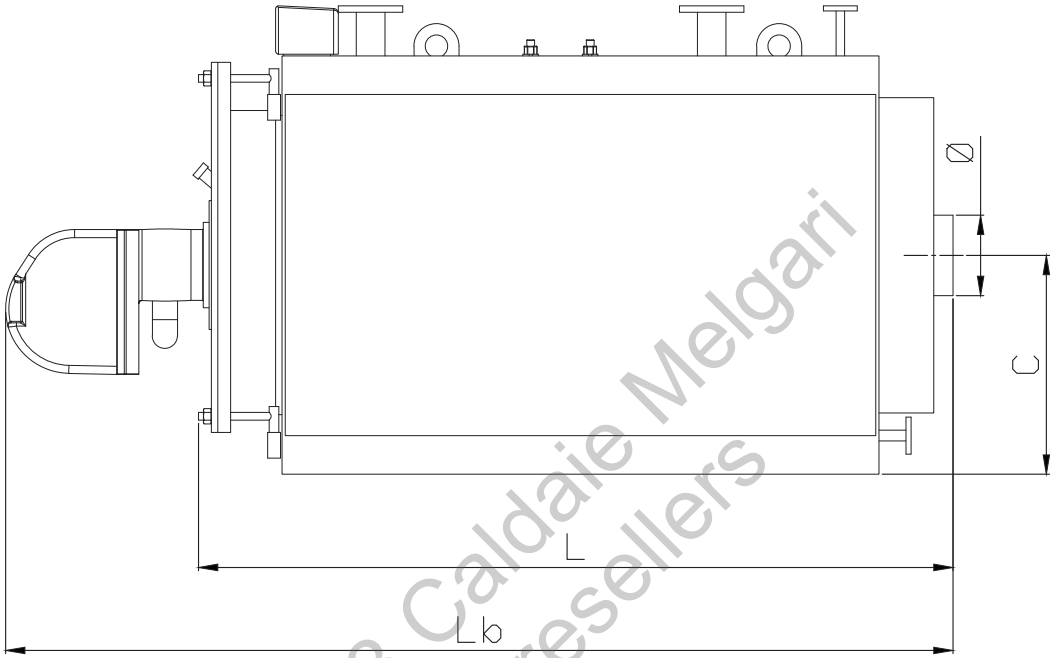
MAS
COMPONENTS

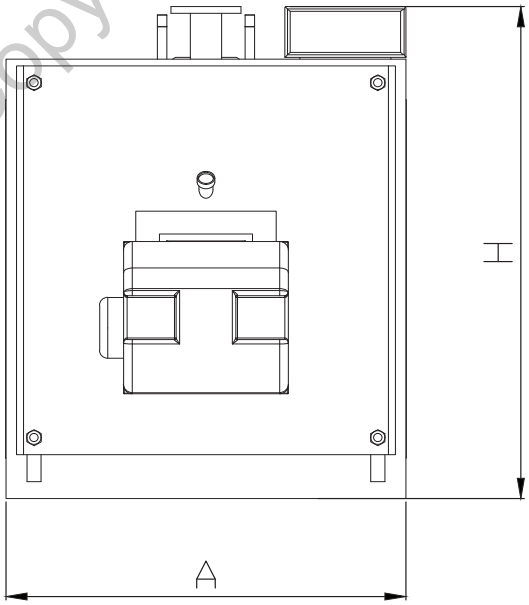


1	Burner
2	Electric control panel
3	Hot water inlet
4	Hot water outlet
5	Connexion Safety valve
6	Smokes outlet
7	Handhole
8	Purge connection
9	Flame guard
10	Instrumental connections

MAS

DIMENSIONS





MAS - SPECIFICATIONS

MODEL MAS		140	210	270	370	465	580	700
Nominal Capacity	kCal	120.400	180.600	230.480	319.920	399.900	500.090	602.000
	KW	140	210	268	372	465	582	700
Furnace Capacity	kCal	135.020	202.100	258.000	359.480	449.780	561.580	674.240
	KW	157	235	300	418	523	653	784
Efficiency	%	89	89	89	89	89	89	89
Combustion chamber pressure	mbar	2,0	2,5	3,0	4,2	4,5	5,0	6,0
Combustion chamber pressure	mbar	3,7	8,0	13,0	11,0	17,0	12,0	18,0
Water content	Liters	335	410	410	780	780	875	1.020
Pressure	bar	9,8	9,8	9,8	9,8	9,8	9,8	9,8
Natural Gas consumption	Nm^3/h	16	24	30	42	53	66	79
Natural Gas flow rate	Nm^3/h	238	357	455	634	794	991	1.190
Diesel consumption	kg/h	13	20	25	35	44	55	66
Diesel flow rate	kg/h	251	376	480	669	838	1.046	1.256
LPG Consumption	Nm^3/h	6	9	12	16	20	26	31
LPG flow rate	Nm^3/h	194	290	370	516	645	806	968
Length without burner (L)	mm	1.555	1.975	1.975	2.285	2.285	2.355	2.555
Length with burner (Lb)	mm	1.855	2.275	2.275	2.585	2.585	2.955	3.155
Width min. (A)	mm	950	950	950	1.140	1.140	1.210	1.230
Height (H)	mm	1.235	1.225	1.225	1.430	1.430	1.510	1.530
Empty weight	kg	1.160	1.560	1.560	1.850	1.850	1.970	2.550
Chimney wheelbase (C)	mm	580	580	580	680	680	725	735
Chimney diameter	mm	220	220	220	250	250	250	250
Purge	DN	25	25	25	25	25	25	25
Water inlet	DN	65	65	65	80	80	100	100
Water outlet	DN	65	65	65	80	80	100	100
Expansion	DN	25	25	25	25	25	32	32

Technical data are approximate and are subject to changes due to improvements in our production system

MAS - SPECIFICATIONS

MODEL MAS		930	1.165	1.400	1.745	2.035	2.325	2.910
Nominal Capacity	kCal	799.800	1.000.180	1.200.560	1.500.700	1.750.100	1.999.500	2.500.020
	KW	930	1.163	1.396	1.745	2.035	2.325	2.907
Furnace Capacity	kCal	899.560	1.124.020	1.348.480	1.685.600	1.966.820	2.247.180	2.809.620
	KW	1.046	1.307	1.568	1.960	2.287	2.613	3.267
Efficiency	%	89	89	89	89	89	89	89
Combustion chamber pressure	mbar	6,5	7,0	7,0	8,0	8,2	9,0	9,5
Combustion chamber pressure	mbar	20,0	30,0	24,0	37,0	30,0	40,0	45,0
Water content	Liters	1.189	1.485	1.696	2.455	2.750	3.100	4.200
Pressure	bar	9,8	9,8	9,8	9,8	9,8	9,8	9,8
Natural Gas consumption	Nm^3/h	106	132	159	198	231	264	331
Natural Gas flow rate	Nm^3/h	1.587	1.984	2.380	2.975	3.471	3.966	4.958
Diesel consumption	kg/h	88	110	132	165	193	220	276
Diesel flow rate	kg/h	1.675	2.093	2.511	3.139	3.663	4.185	5.232
LPG Consumption	Nm^3/h	41	51	61	77	90	102	128
LPG flow rate	Nm^3/h	1.291	1.613	1.935	2.419	2.823	3.225	4.032
Length without burner (L)	mm	2.640	3.140	3.070	3.360	3.400	3.600	4.210
Length with burner (Lb)	mm	3.240	4.040	3.970	4.260	4.500	4.700	5.310
Width min. (A)	mm	1.350	1.350	1.460	1.640	1.740	1.780	1.890
Height (H)	mm	1.670	1.670	1.770	1.940	2.020	2.080	2.190
Empty weight	kg	2.800	3.500	4.200	5.140	5.800	6.300	8.400
Chimney wheelbase (C)	mm	805	805	835	950	1.007	1.020	1.075
Chimney diameter	mm	350	350	400	450	450	500	500
Purge	DN	25	25	40	40	40	40	40
Water inlet	DN	125	125	150	150	200	200	200
Water outlet	DN	125	125	150	150	200	200	200
Expansion	DN	40	40	50	50	80	80	100

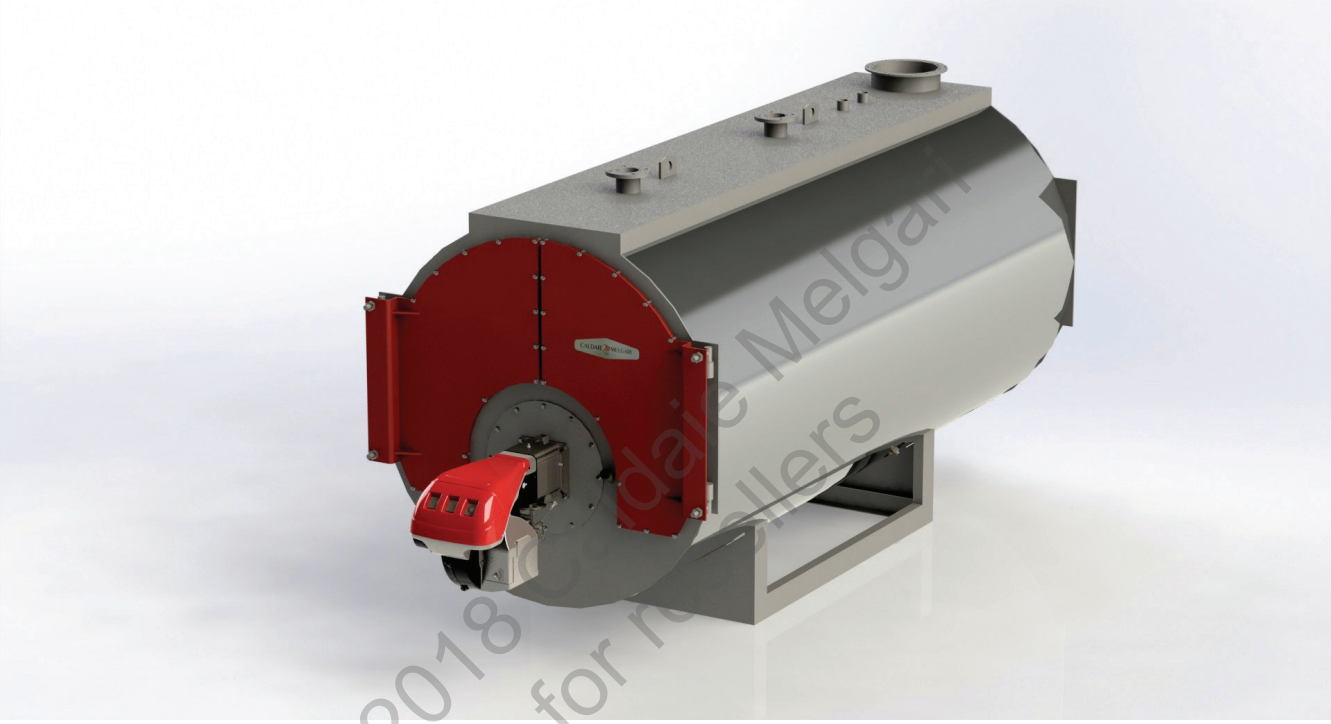
Technical data are approximate and are subject to changes due to improvements in our production system

MODEL **MAS3**

THREE EFFECTIVE SMOKE PASS CONSTRUCTION SUPERHEATED WATER BOILERS

Water temperature **up to 192°C**

Nominal Capacity **from1.175 kW to 10.105 kW**, pressure **up to 9,8 bar**



MAIN FEATURES

Superheated water generator MAS 3 is a three effective smoke pass construction boiler, pressurized type with reversed welted plates. The first smoke pass takes place in the furnace, while the second and the third through thick smoke tubes.

MAS 3 generator has been designed by our technical department according to the most advanced techniques, in order to offer the Maximum guarantee of reliability and durability to the customer.

MATERIALS AND CERTIFICATIONS

The large furnace, complete with a reverse chamber fully immersed in the water, is closed with flat plates or **with cuffed and tempered plates**. The furnace, as well as the plating, is made with high quality metal sheet and Is penetration welded.

The front smokes chamber is equipped with two hinged doors useful for cleaning activities, coated internally with insulating / refractory material and provided with sealing gasket.

The entire construction is CE marked and complies all the provisions of the Gas Directive 2009/142/CE, Commission Regulation n°813/2013/UE and Low Voltage Directive 2006/95/EC, in addition to being equipped with all the safety devices.

INSULATION

For the insulation of the external parts and collectors, we use 100 mm mineral wool. To protect the external part of the generator, furthermore, we use aluminium sheet; the upper part of the generator is walkable and made of non-slip striated sheet metal.

FUEL

The boiler has been especially designed for the **combustion of both liquid and gaseous fuels**. In addition to standard fuels (**Natural Gas**, **Diesel**, **LPG**), our generators can be

powered by **biogas**, **biomethane**, **kerosene** or **naphtha**.

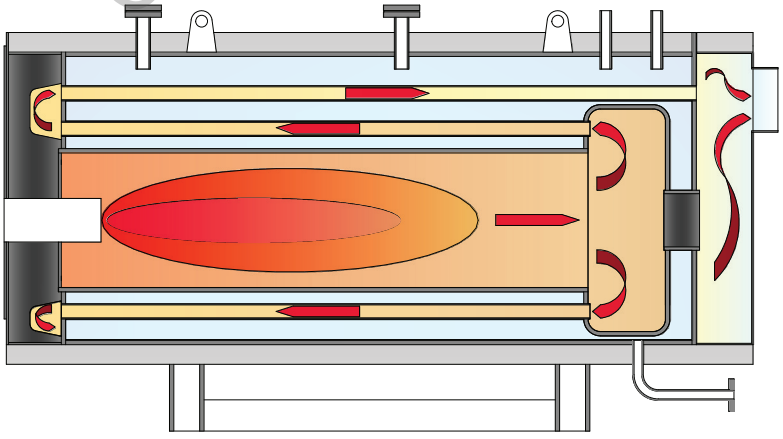
EFFICIENCY

Efficiency of our MAS 3 superheated water boiler is around 92%.

BODY OF THE **BOILER**

- **Pressure vessel in high steel quality , cylindrical and horizontal** version with shell, furnace and tubesheet in carbon steel. The pressure vessel is complete with connections.
- **External body of the boiler equipped with a handhole** positioned in the lower side for water side inspections. The back part of the vessel is equipped with a door used to carry out inspections and overhauls.
- **Cylindrical furnace in high steel quality with reverse chamber** completely wet without refractory. The particular dimensions of the fire room involve a perfect mixing between the combustible and the comburent air for a complete combustion.
- **Fire tube made in steel P 235 GH – EN 10216-2** welded to the plates and arranged peripherally with respect to the combustion chamber, in order to optimize water circulation.
- **Rear smokes chamber**, in carbon steel, completely openable, with refractory material to convey the flue gas to the stack
- **Front smokes chamber** made of carbon steel, with high refractory material and complete with openable doors for inspection of the smoke tubes and burner's plate.
- **Insulation in high density rock wool** coated with aluminium (or, upon request, steel)
- **Basement made of structural steel sections** supporting the boiler assembly and its accessories

SMOKE PASS SCHEME



The first smoke pass takes place in the combustion chamber, while the second and the third take place through thick smoke tubes.

MAS 3
ACCESSORIES & FITTINGS

Our MAS 3 boiler can be supplied with the following control and safety accessories:

- n. 02 safety valves
- Discharge unit
- Dial thermometer
- Safety pressure switch (manual resetting)
- Manometer

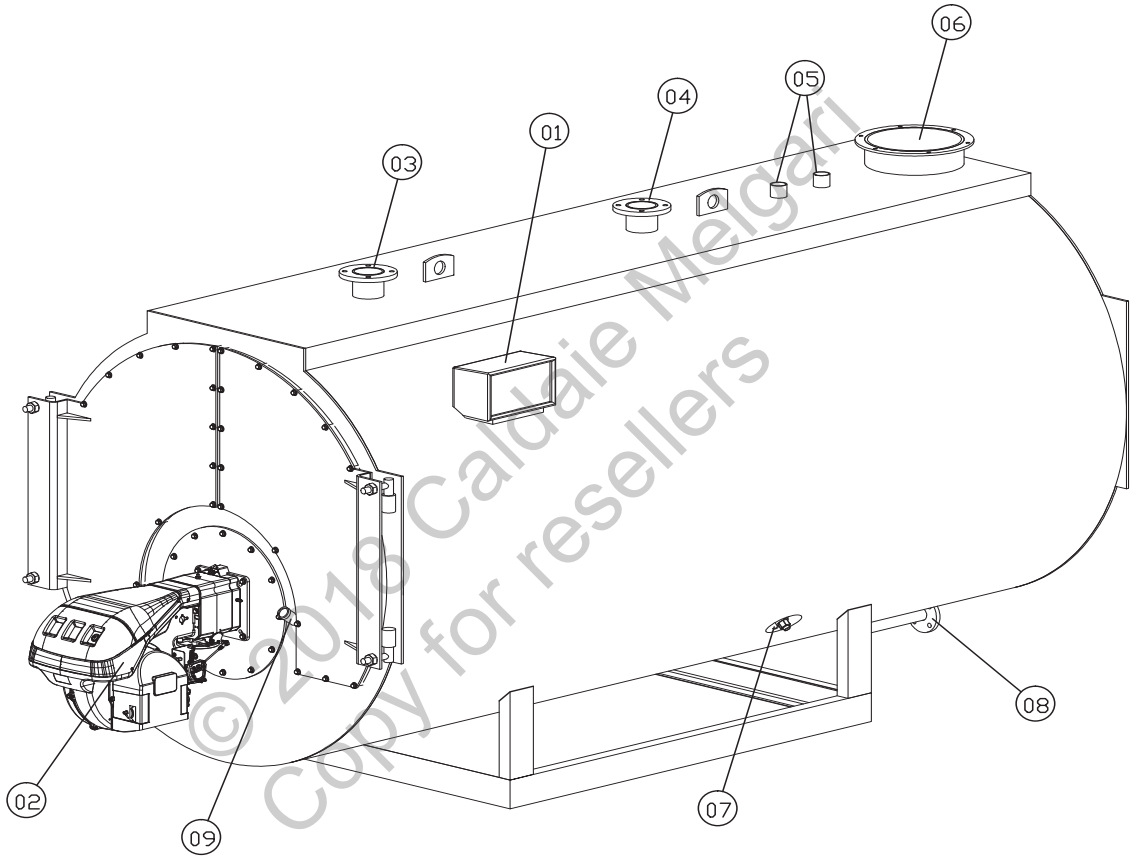
Electric control panel

- n. 02 thermostats
- n. 01 thermometer

MAS 3
MAIN BENEFITS

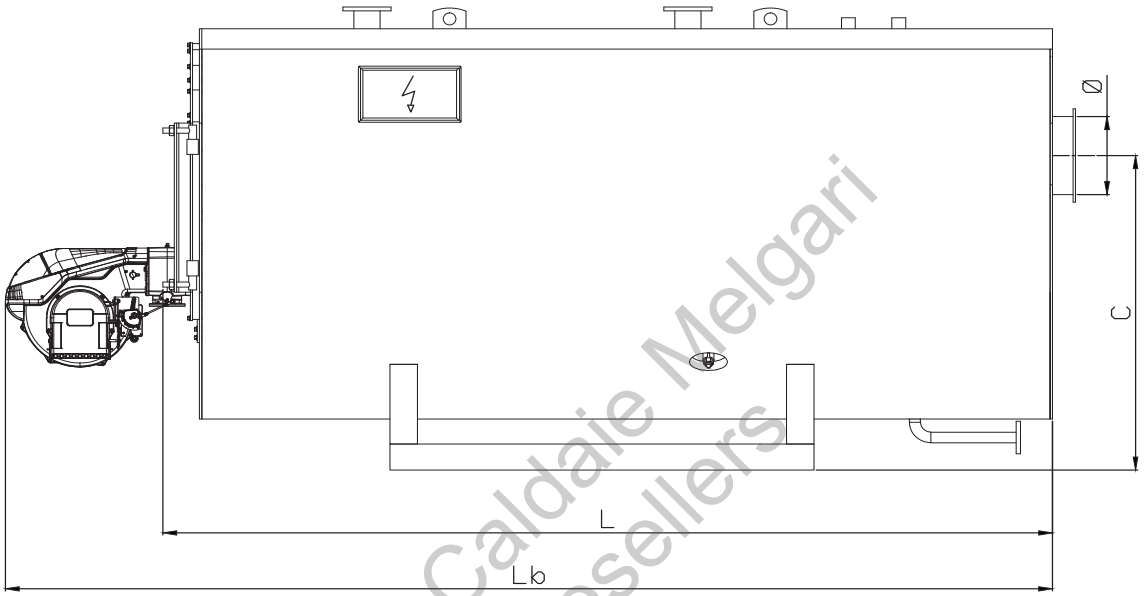
- **Heat exchange area is particularly big in order to mantain low specific heating loads and to continuously ensure high rate.**
- **Turbolators** inside the boiler **ensure constant and high efficiency**.
- The **electric control panel**, positioned at eye level, **allows you to easily manage all of the boiler control systems**.
- **Each Caldaie Melgari boiler**, before being delivered, **is rigorously checked** (production features, performance, etc.). In addition to non-destructive controls, **a trial is performed to ensure a high constructive and qualitative standard**.
- Upon request, **we are able to supply integrated solutions to improve generator efficiency and reduce fuel consumptions**. The **economizer**, for example, allows to exploit the heat of the flue exhaust gases to heat the boiler feeding water, thus **increasing output and, at the same time, reducing fuel consumption**. In most cases, the investment is paid back in less than one year.
- **It is possible to provide a modulating control of the burner.**
- Upon request, **we provide a remote control system for MAS 3 generator that enables you to constantly monitor your boiler and us to become aware of any problems as they occur, in order to solve them promptly**.
- Upon request, **we provide support during installation and piping**, as well as **supply of spare parts** and **support for emergencies (availability 24 hours)**.
- **The boiler can be configured according to your requests**: we can provide a **wide range of optional accessories** to customize your boiler (eg. economizer, gangway, 2nd feeding water pump, barrel for water withdrawal, water softener and salt tank, etc.).

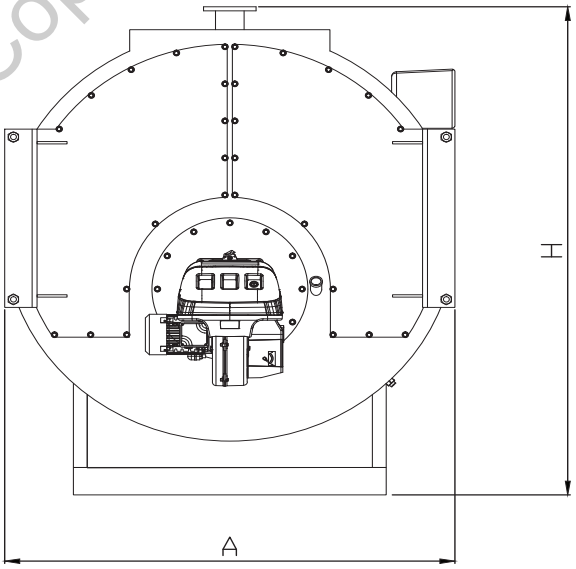
MAS 3
COMPONENTS



1	Burner
2	Electric control panel
3	Hot water inlet
4	Hot water outlet
5	Expansion vessel connection
6	Smokes outlet
7	Handhole
8	Purge connection
9	Flame guard

MAS 3
DIMENSIONS





MAS 3 - SPECIFICATIONS

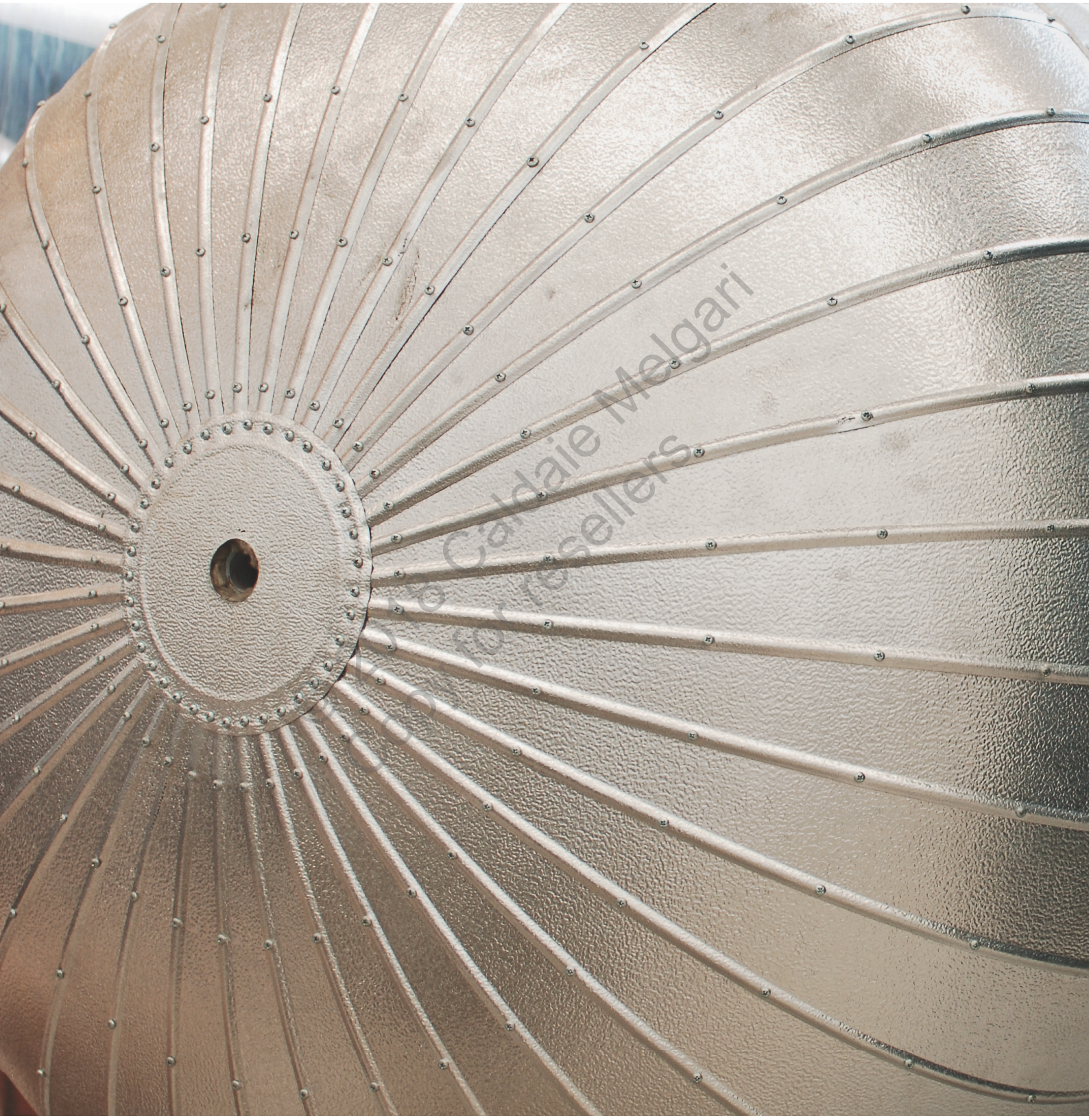
MODEL MAS 3		1.175	1.410	1.765	2.350	2.940	3.525
Nominal Capacity	kCal	1.010.000	1.212.000	1.515.000	2.020.000	2.525.000	3.030.000
	KW	1.175	1.410	1.762	2.349	2.937	3.524
Furnace Capacity	kCal	1.121.000	1.346.000	1.684.000	2.220.000	2.806.000	3.363.000
	KW	1.304	1.566	1.957	2.582	3.263	3.912
Efficiency	%	92	92	92	92	92	92
Combustion chamber pressure	mbar	5,6	6,7	5,4	3,5	6	7,5
Pressure drop (water)	mbar	4,5	3	4,5	5,5	6	4,5
Water content	Liters	2.899	3.636	4.020	8.333	9.292	10.949
Pressure	bar	9,8	9,8	9,8	9,8	9,8	9,8
Natural Gas consumption	Nm^3/h	131,9	158,4	198,1	261,2	330,1	395,6
Natural Gas flow rate	Nm^3/h	1.510,1	1.813,1	2.268,4	2.990,5	3.779,8	4.530,2
Diesel consumption	kg/h	112,1	134,6	168,4	222,0	280,6	336,3
Diesel flow rate	kg/h	1.569,4	1.884,4	2.357,6	3.108,0	3.928,4	4.708,2
LPG Consumption	Nm^3/h	51,1	61,3	76,7	101,1	127,8	153,2
LPG flow rate	Nm^3/h	1.608,7	1.931,6	2.416,7	3.185,9	4.026,8	4.826,2
Length without burner (L)	mm	3.640	3.940	3.940	5.020	5.425	5.355
Width (A)	mm	1.680	1.680	1.870	2.185	2.185	2.435
Height (H)	mm	2.175	2.175	2.365	2.680	2.680	2.930
Empty weight	kg	6200	6900	7500	9300	10750	14450
Chimney diameter	mm	350	350	400	450	450	550
Purge	DN	25	40	40	40	40	40
Water inlet	DN	125	150	150	150	200	200
Water outlet	DN	125	150	150	150	200	200

Technical data are approximate and are subject to changes due to improvements in our production system

MAS 3 - SPECIFICATIONS

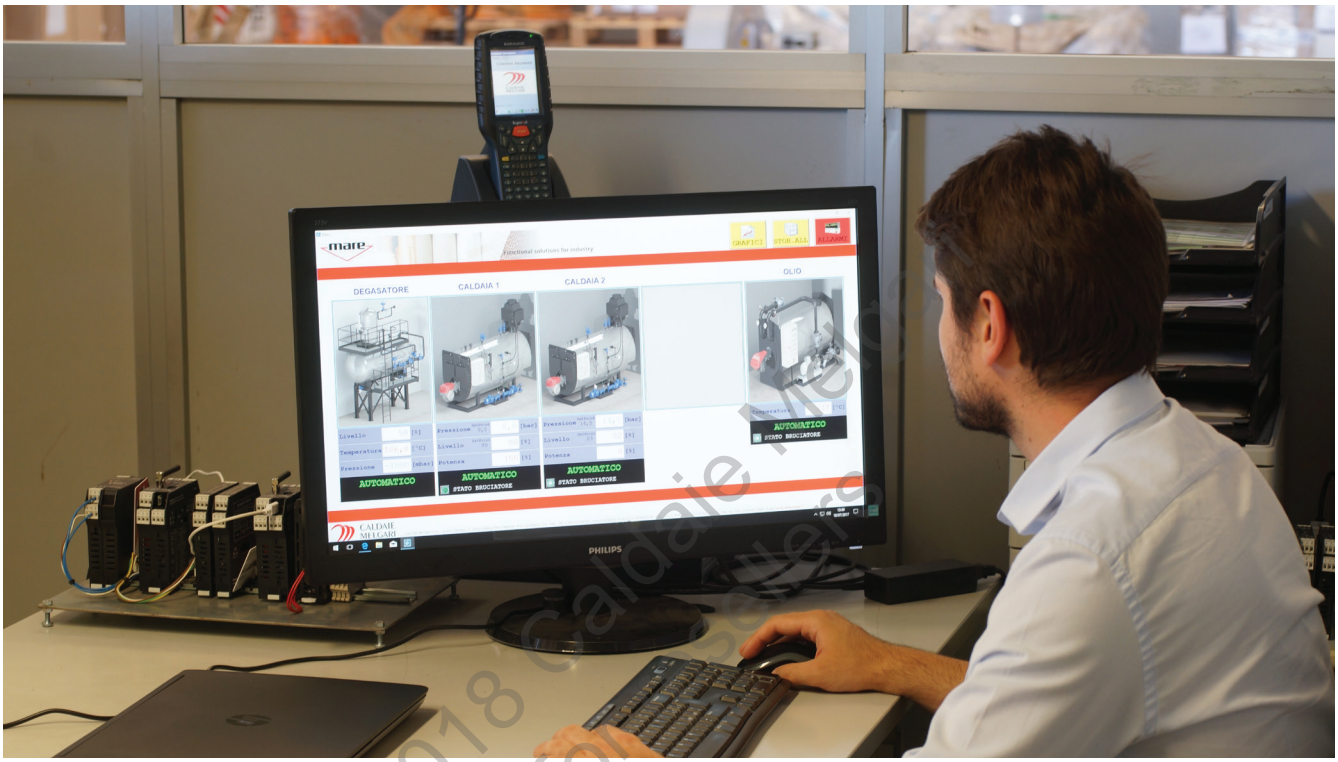
MODEL MAS 3		4.700	5.875	7.050	8.460	10.105
Nominal Capacity	kCal	4.040.000	5.050.000	6.060.000	7.272.000	8.686.000
	KW	4.699	5.873	7.048	8.458	10.102
Furnace Capacity	kCal	4.484.000	5.612.000	6.734.000	8.080.000	9.652.000
	KW	5.216	6.527	7.832	9.397	11.225
Efficiency	%	92	92	92	92	92
Combustion chamber pressure	mbar	7	5,8	10	10	11
Pressure drop (water)	mbar	7	8	12	10	10
Water content	Liters	11.514	12.646	13.332	16.968	19.897
Pressure	bar	9,8	9,8	9,8	9,8	9,8
Natural Gas consumption	Nm^3/h	527,5	660,2	792,2	950,6	1.135,5
Natural Gas flow rate	Nm^3/h	6.040,2	7.559,7	9.071,1	10.884,2	13.001,8
Diesel consumption	kg/h	448,4	561,2	673,4	808,0	965,2
Diesel flow rate	kg/h	6.277,6	7.856,8	9.427,6	11.312,0	13.512,8
LPG Consumption	Nm^3/h	204,3	255,7	306,8	368,1	439,7
LPG flow rate	Nm^3/h	6.434,9	8.053,7	9.663,8	11.595,4	13.851,4
Length without burner (L)	mm	5.830	6.435	6.940	7.395	7.575
Width (A)	mm	2.495	2.525	2.525	2.740	2.930
Height (H)	mm	3.020	3.030	3.030	3.245	3.630
Empty weight	kg	15150	17800	19400	24600	28700
Chimney diameter	mm	600	700	700	800	900
Purge	DN	40	40	40	40	40
Water inlet	DN	200	250	250	250	300
Water outlet	DN	200	250	250	250	300

Technical data are approximate and are subject to changes due to improvements in our production system



ACCESSORIES

REMOTE CONTROL SYSTEM



In Caldaie Melgari we know how important it is to carry on a **continuous process of innovation and improvement**. We always want to make better, it's our main goal: **we strive to guarantee the customer an increasingly efficient service**.

That's why, **thanks to R & D investments**, we have designed and implemented **remote control systems of the generators that allow our customers and our technicians to monitor the boilers**.

The values of the parameters that control the process and the states of the equipment are transmitted directly on field via sensors and interface modules. **Data are read, processed and made available through an intuitive human-machine interface (HMI)** made of touch-screen panels that, connected to corporate network, can be reached by PC or Tablet on the company or at home (via VPN). In this way, **you will be able to get all the information you need on your thermal plant anywhere and anytime**.

Why you should choose Caldaie Melgari remote control system? Because **it allows you to constantly monitor the plant and allows us to check the causes of possible problems as soon as they occur**, thus promptly intervening and avoiding production stops.

We can offer three different packages:

- **PREMIUM**
- **EVOLUTION**
- **EXTREME**

PREMIUM PACKAGE

This remote control system is **ideal for small and medium-sized generators**.

It allows you to check the main functions of the generator by using "SMART" equipments and being warned if there are any malfunctions and / or simple switch-on / shutdown operations, etc.

For the correct operation, our equipment needs a GSM card with Voice / Data function.
The system can also be installed on pre-existing systems: the control panel of the plant, although limiting, can be electromechanical, but for maximum benefit it is recommended to install it on PLC-controlled panels.

Depending on the type of card installed, **the system can provide additional functions**, such as **number of operating hours**, **electrical and / or thermal consumption**, **performance data**, or implement GPS function, data logger, etc. Control is always performed through the use of client smartphones / tablets. It is also possible, if required, to archive data on the client's remote server (s) and / or the manufacturer by allowing mail / file to be sent. This allows you to create an archive and track the operating mode of the plant over time and establish the most efficient maintenance / repair intervention.

Alarms can also be sent simultaneously to different phones depending on the type of alarm. Access to data and its command is encoded with multi-stage password during installation phase, so you can have users accessing only part of the alarms, or some of them, while others may also give instructions to the generator.

EVOLUTION PACKAGE

This remote control system is **ideal for medium and large-sized generators**.

Typically, these systems are controlled by PLC with an active Ethernet door, by a HMI panel and by a supervisory system installed at the Client's plant. The PLC + HMI system communicates with the supervisory system through the corporate Ethernet network. External network communication is performed through:

- GSM card;
- Wi-Fi network;
- Cable ethernet network;
- Fiber ethernet network;
- VPN encrypted tunnel between the Customer and Caldaie Melgari which limits and allows-only to authorized devices- access to data.

This system allows you to perform the following **advanced functions**:

- **Check all operating conditions of the system**;
- **Check all system's variables**;
- In the event of a breakdown / damage, the system can be remotely seen: **it is possible to guide / facilitate the repair that the on-site technician is carrying out or make modifications to the program**, if possible, to allow the system to restart while the repair intervention is being organized;
- **Record operating data**;
- Change the operating program or partly re-program it or upgrade it to newer versions without the help of an operator on field or a programmed PC;
- **Enable a custom maintenance program** (that considers the alarms that occur);
- If you choose Wi-Fi option, limited to the same PLC network, you can view and set up data using a dedicated

application available for Apple Store and Google Play, installed and configured by Caldaie Melgari S.r.l.

The **supervisory program** requires at least:

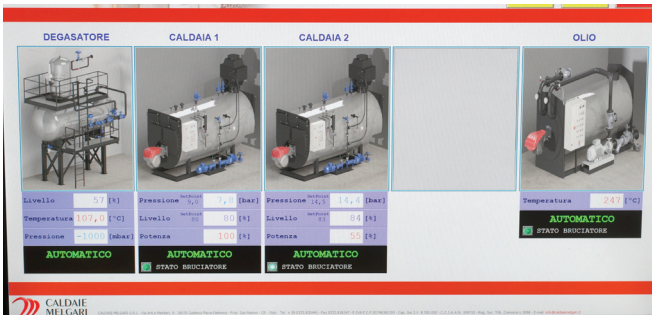
- Microsoft Windows 7.2 operating system (or later versions);
- PC Pentium II 600 or higher;
- 512 MB of RAM memory;
- 650Mb free on hard-disk;
- 1 Cd Rom;
- 1 token (non-transportable)

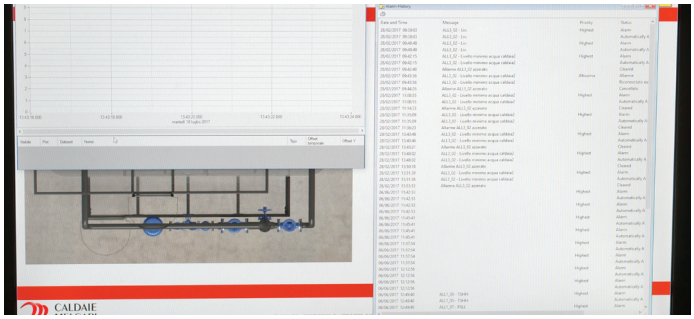
System security and operation are prerogatives of customer's plants. If remote control is not activated, it is not possible to remotely control, repair, upgrade the system or, also, indicate the type of breakdown/damage to the customer (fundamentally, Caldaie Melgari S.r.l. can not help the customer). Upon request, it is possible to agree the transfer of information to the customer server which will independently manage the use and flow of these data.

Important: Security procedures are complied in our systems, so connection and variation will only be possible if the customer, by turning a hardware key, authorizes the connection. Furthermore, once you have purchased the system / license, you no longer need to renew it (as, for example, happens with Microsoft programs). Just in case the customer asks for a maintenance / upgrade agreement, we will apply a fee (based on its requests).

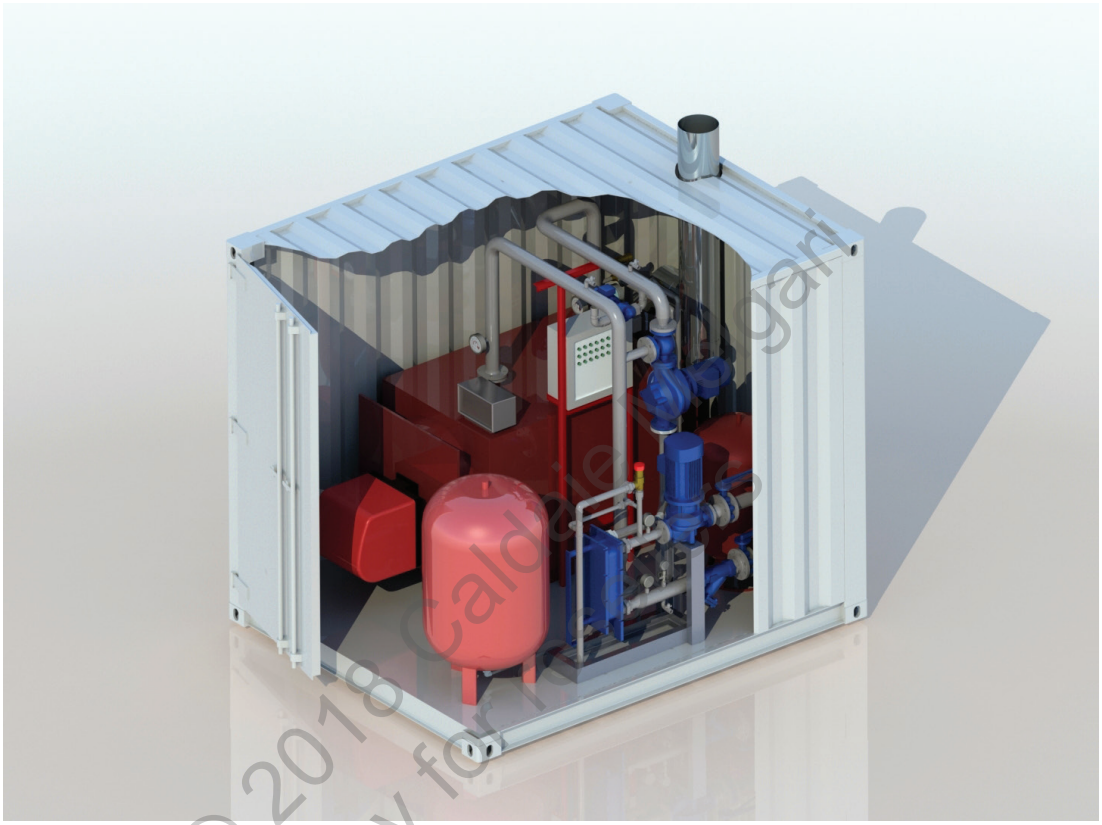
EXTREME PACKAGE

Everything included in the EVOLUTION package, plus an Apple iPad configured with a special App that allows faster connection to remotely connect to the boiler and access all the information and functions provided by the EVOLUTION package.





TURN-KEY SOLUTIONS
FOR STEAM AND HEATING

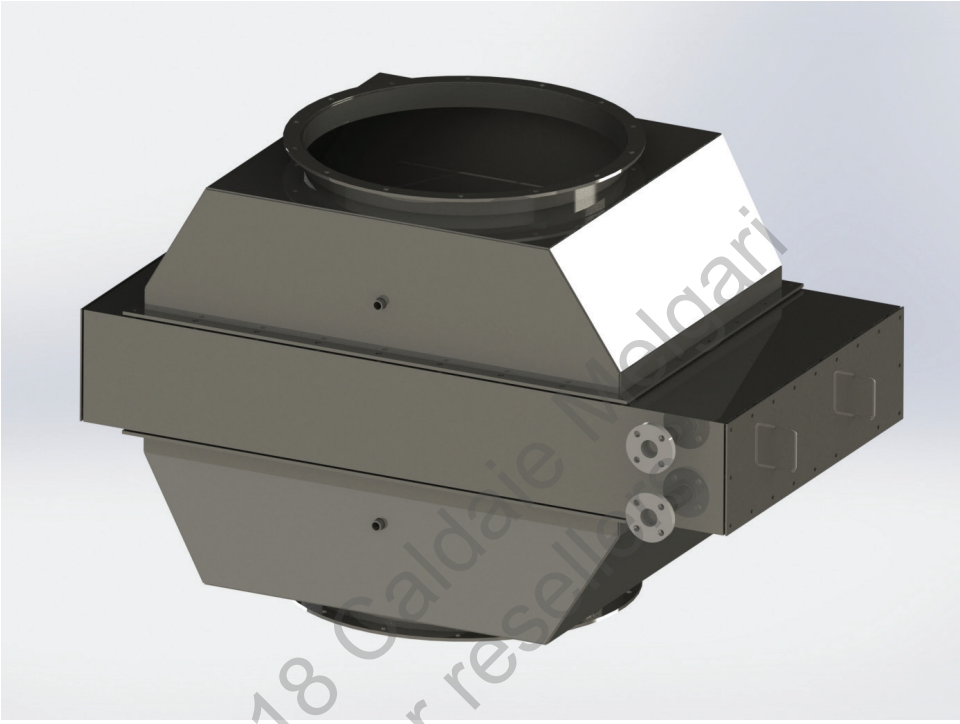


Caldaie Melgari is able to offer a **mobile thermal power plant** (turn-key) complete with all the necessary accessories and **especially designed for outdoor installation and operation** in accordance with the V.V.F directive, both with liquid and gaseous fuels. This solution is **ideal for all those companies that have difficulties in installing a thermal power plant inside their production facilities**.

Our turn-key solutions are designed based on customer's requirements. Below you can find an example of the **accessories** the mobile plant can be made of:

- Basement and self-supporting carbon steel structure varnished with double hand anti-rust product
- Lifting eyebolts
- Planking level in striped metal sheet
- Upper plug
- Access door with single or double shutter
- Aeration openings with grids (rain cover profile)
- CTM billboards as required by EN 7010
- Possibility of coating in fire-resistant class A1 fireproof panels
- Electrical control panel for complete control of: switch, magnetothermal protection, commands and front panel luminous signals.
- Emergency button

ECONOMIZER



Upon request, **we are able to supply integrated solutions to improve generator's efficiency** and **reduce fuel consumptions**. The economizer, for example, allows to **exploit the heat of the flue exhaust gases to heat feeding water**, thus **increasing efficiency** and, at the same time, **reducing fuel consumption**.

It can be realized with carbon steel or stainless steel, depending on customer's requirements.

By way of example (but not limited to), the installation of an economizer is appropriate for generators fueled with natural gas, diesel or LPG in the following cases:

- Generators in which smokes reach temperatures above 200° C;
- Generators with continuous operation or working for many hours (more than 2.000 hours per year). Boiler's operating period (annual) has a significant influence on the Return of the Investment (ROI): the more they are, the lower the payback period is.

Benefits for your company are concrete:

- **increased efficiency of 3-4% up to 7%** (depending on smokes temperature and fluid to be heated);
- **reduction in emissions from 3-4% up to 7%**,
- **reduction of waste and excess consumption**, heat and energy recovery (previously dispersed in the environment).

SAMPLING COOLER

Often, **lifetime of a steam generator is directly influenced by the quality of the feeding water**.

In order to make samples of steam and hot water used to carry out the appropriate chemical tests (often mandatory), Caldaie Melgari provides a **cooler in which the fluid is condensed to lower its temperature**.

Normally, the sampling cooler is realized for the following **circuits**:

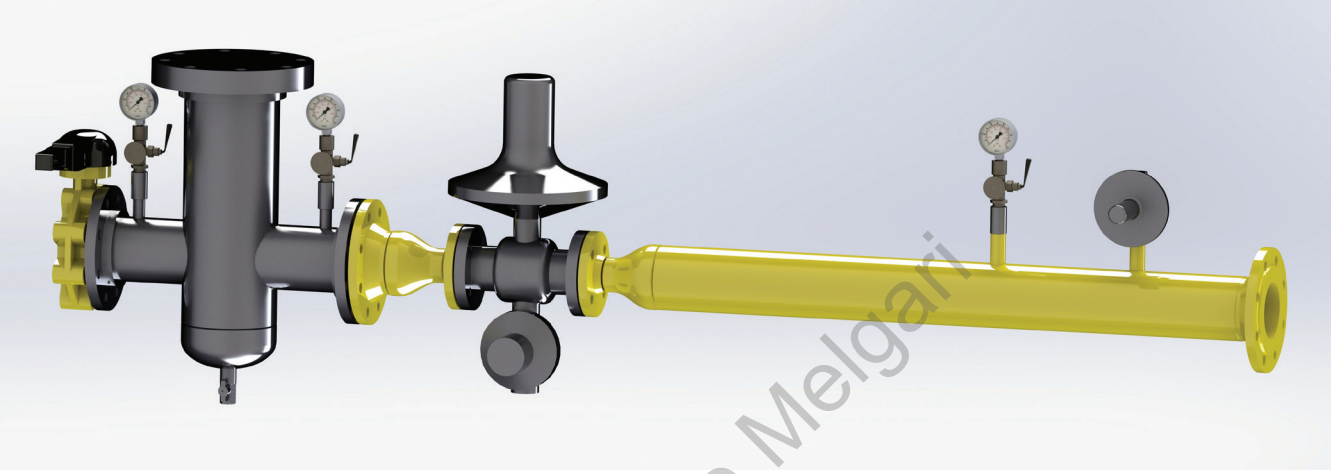
- Feeding water;
- Boiler water;
- Steam

DIATHERMIC OIL CIRCULATION PUMP

Diathermic oil circulation group includes the following **components**:

- **Mechanical seal pump** coupled to an electrical engine positioned on the basement
- **Bellows-sealed valves** mounted on suction side and delivery side of the pump
- **Check valve** in pump delivery
- **"Y" filter in steel** (complete with basket for collecting impurities) mounted on suction side of the pump
- **Manometer** for pump's operation control

GAS PRESSURE REDUCING STATIONS



Usually, gas used to feed the burner of our generators must be brought to the **correct operating pressure** to **ensure the optimum operation** of both the boiler and the burner. To do this, Caldaie Melgari supplies a group of valves, sized according to network pressure and to the specific requirements of the burner itself.

Our **gas pressure reduction groups usually include**:

- Manual interception valve
- Gas filter
- Inlet Manometer
- Outlet Manometer
- Pressure reducer
- Locking device for high pressure
- Overflow valve

BLOWDOWN RECOVERY TANK

We are able to supply a cylindrical tank in vertical version that allows to **lower boiler's discharges pressure**, entirely realized in carbon steel and complete with support legs and connections.

Accessories included are, among others, the following ones:

- Manual interception valve for blow-down
- Automatic cooling system with solenoid valve
- Immersion thermometer

MODULATING LEVEL ADJUSTMENT SYSTEM

Usually, water replenishment is a process that can cause fluctuations in boiler steam pressure. **In all those processes where it is important to ensure precise pressure regulation**, Caldaie Melgari can provide a **modulating level adjustment system** that **neutralizes the undesirable pressure variations** described above.

The modulating level adjustement system is **fully integrated into the control and monitoring system of our boilers** and includes:

- n° 1 modulating valve with electro-pneumatic positioner
- n° 2 manual valves for interception of modulating valve in case of maintenance
- n° 1 manual by-pass valve to hydraulically exclude the system
- n° 1 continuous level probe able to assess boiler's level within the operating parameters
- n° 1 regulator (electronic or implemented on a PID type PLC that reads the level and adjusts the opening of the modulating valve)

FEEDING WATER PUMP
(AUXILIARY)

Auxiliary feeding water pump is useful in all cases where the Client wants to **minimize the risk of production downtime**.

Auxiliary **feeding water pump is installed in parallel to the main one** so that it is **completely interchangeable**. The main pump is equipped with manual interception valves for exclusion.

Furthermore, thanks to a front-panel selector, the operator can choose from time to time which one of the two pumps has to work, putting the other one in standby mode.

CONDENSATE RECOVERY TANK

Condensate recovery and **storage of re-integrating water tank** is a **cylindrical type in vertical or horizontal version**, built using steel materials. The tank is complete with supporting legs, inspection hatch (placed at the top) and connections.

Accessories are, among others, the following ones:

- Solenoid valve for water loading
- Pressure switch / level probes for opening / closing solenoid valve
- Glass level indicator complete with interception cocks
- Discharging tank valve
- Water inlet / outlet valve
- “Y” water outlet filter
- Overflow pipe
- Electrical panel

DIATHERMIC OIL
STORAGE TANK

Single or double-walled, **atmospheric and cylindrical tank** in horizontal version, entirely realized in carbon steel to allow of the diathermic oil storage in case of emptying of the system for repair or maintenance activities. We are able to offer **two different types of tanks**:

- **buried**
- **outdoor**: it undergoes a special external treatment with catramine.

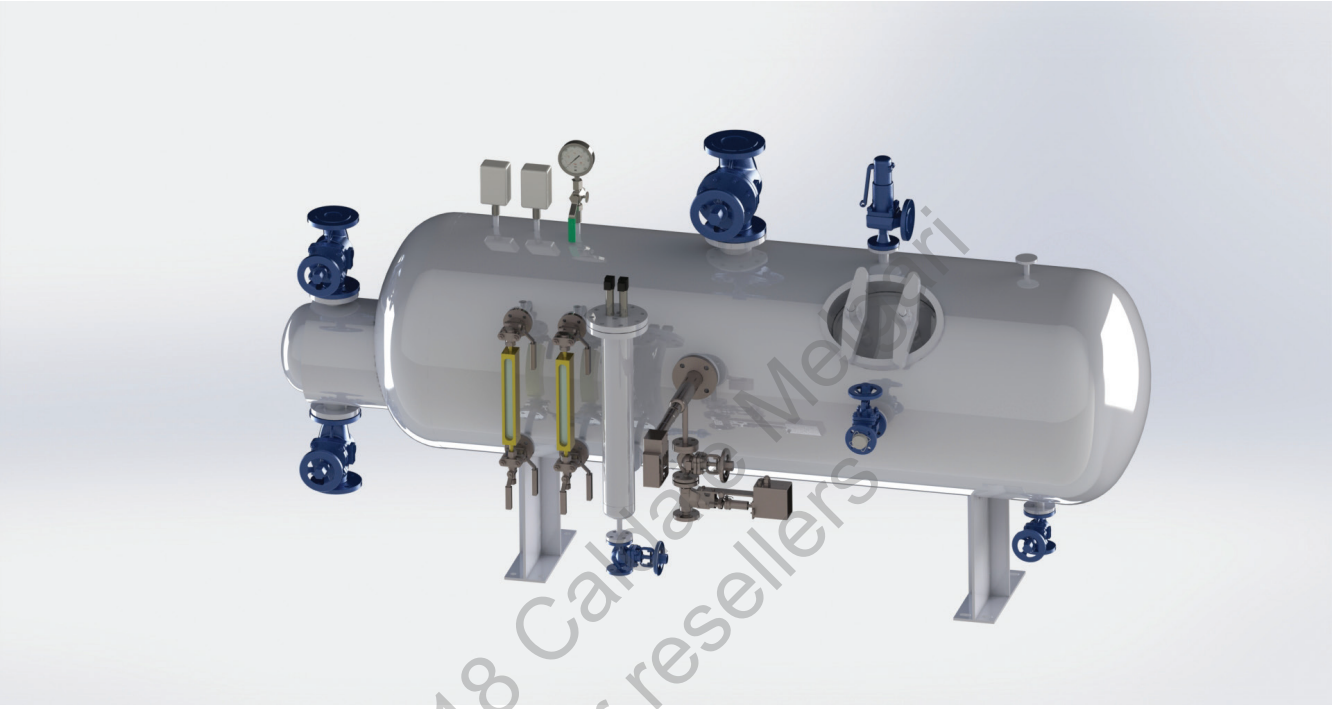
Both types are complete with a hatch located on the top.

We can offer the following **basic accessories**:

- Bottom valve
- Connections
- Suddle support (only for outdoor type)

Upon request, it is possible to equip the diathermic oil storage tank with a containment basin (for outdoor type only) and a protective roof.

THERMAL OIL - STEAM
EVAPORATOR



It is an **indirect horizontal and cylindrical steam generator**, **realized in accordance with PED Directive 2014/68/UE**, entirely using carbon steel materials. Tube bundle can be fixed with welded pipes to either the tubular or extractable plates made of a U-shaped coil with curved tubes welded to a tubular plate.

The **large evaporating surface** and the **generously sized steam chamber guarantee an excellent steam quality**.

Oil-steam evaporator is realized **complete with internal shell and tube bundle**, **support legs**, **basement and protection in steel** (the insulation is realized with rock-wool).

We can equip the evaporator with the following **accessories**:

- Feeding water pump
- Interception manual valves
- Three-ways valve for diathermatic oil flow control
- Visual level indicators complete with intercept taps
- Control and safety switches
- Safety valves
- Manometer
- Electrical control panel
- Electrical system (on-board)

PRESSURIZED EXPANSION VESSEL

FOR HOT WATER, SUPERHEATED WATER AND DIATHERMIC OIL

Caldaie Melgari **pressurized expansion vessel** is a cylindrical vertical-type system realized using carbon steel material **in accordance with PED Directive 2014/68/UE**: it is used in **hot-water**, **super heated-water** and **diathermic oil closed loop systems** to **absorb the increasing volume of the fluid contained** and, at the same time, **ensure the necessary pressurization**.

Cushion gas can be realized with compressed air or nitrogen: in the first case, a compressor will be used, while in the latter case cylinders will be used.

The **expansion vessel** is **complete with**:

- Support legs;
- Inspection hatch;
- Connections.

Among others, we are able to supply the following **basic accessories**:

- CE marked safety valve
- Level indicator
- Manometer with three-way cock
- Minimum / maximum level probe or safety level switch
- Safety pressure switch
- Command pressure switch for compressor / solenoid valve (for air or nitrogen cushion)
- Valve for expansion vessel

ATMOSPHERIC PRESSURE EXPANSION VESSEL

FOR HOT WATER, SUPERHEATED WATER AND DIATHERMIC OIL

Atmospheric pressure expansion vessel is a **cylindrical vertical-type system** realized using carbon steel material and used in **hot-water**, **super heated-water** and **diathermic oil open circuit systems** to **absorb the increasing volume of the fluid contained in it**.

This type of expansion vessel is **complete with**:

- Support legs;
- Inspection hatch;
- Connections.

Among others, We are able to supply the following **basic accessories**:

- CE marked safety valve
- Manometer with three-way cock
- Safety level switch
- Purge valve for expansion vessel

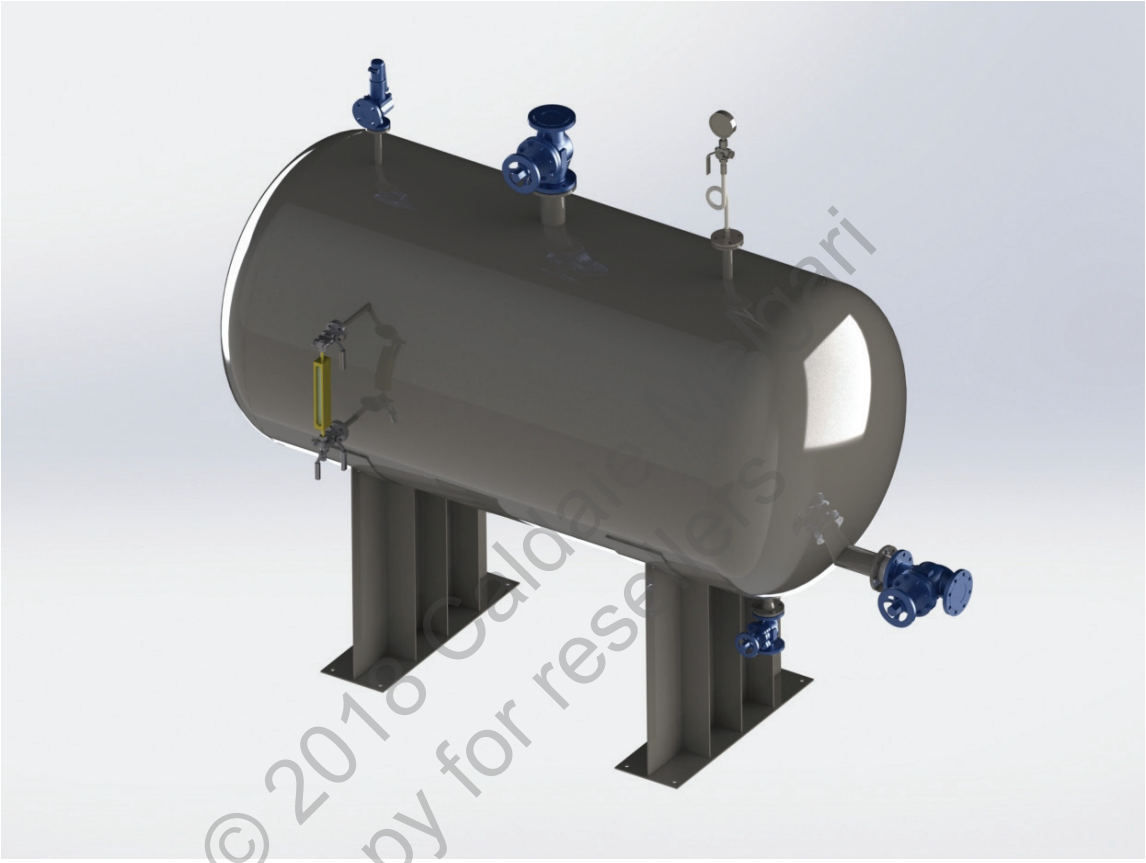
DISTRIBUTION MANIFOLD

In thermal power plants, distribution manifolds are used to **distribute fluids in the different utilities**.

They are **manufactured in accordance with PED Directive 2014/68/UE** using high quality carbon steel or - upon request - stainless steel tubes. They are provided with flanged connections (number and size according to customer's specifications). **Steam manifolds are equipped with a condensate recovery tank**. External refinishing is varnished, insulated with mineral wool and protected with aluminum or stainless steel sheet.

Upon customer's request, seatings and stand for bearing and anchorage are provided, manual interception valves to be installed on the gates and condensate recovery system.

STEAM ACCUMULATOR



Steam accumulator consists of a **tank (in horizontal or vertical version) realized with painted carbon steel sheet** complete with rounded bottom and mineral rock-wool insulation and protected with metallic refinishings properly sealed against bad weather.

Steam accumulator- built in accordance with PED Directive 2014/68/UE is **complete with suddle supports and basement**, **flanged manhole for internal inspection** and **all the necessary connections**.

They are **usually installed in applications that require high instantaneous steam flow rates or with instaneous steam generators**.

Accessories included are:

- Manual inlet and outlet steam interception valves
- Exhaust valve
- Steel level indicator, complete with interception and discharge cocks
- Manometer complete with interception tap, testing flange and anticondensation burr
- Automatic condensate blowdown

THERMOPHYSICAL PRESSURIZED DEGASSER

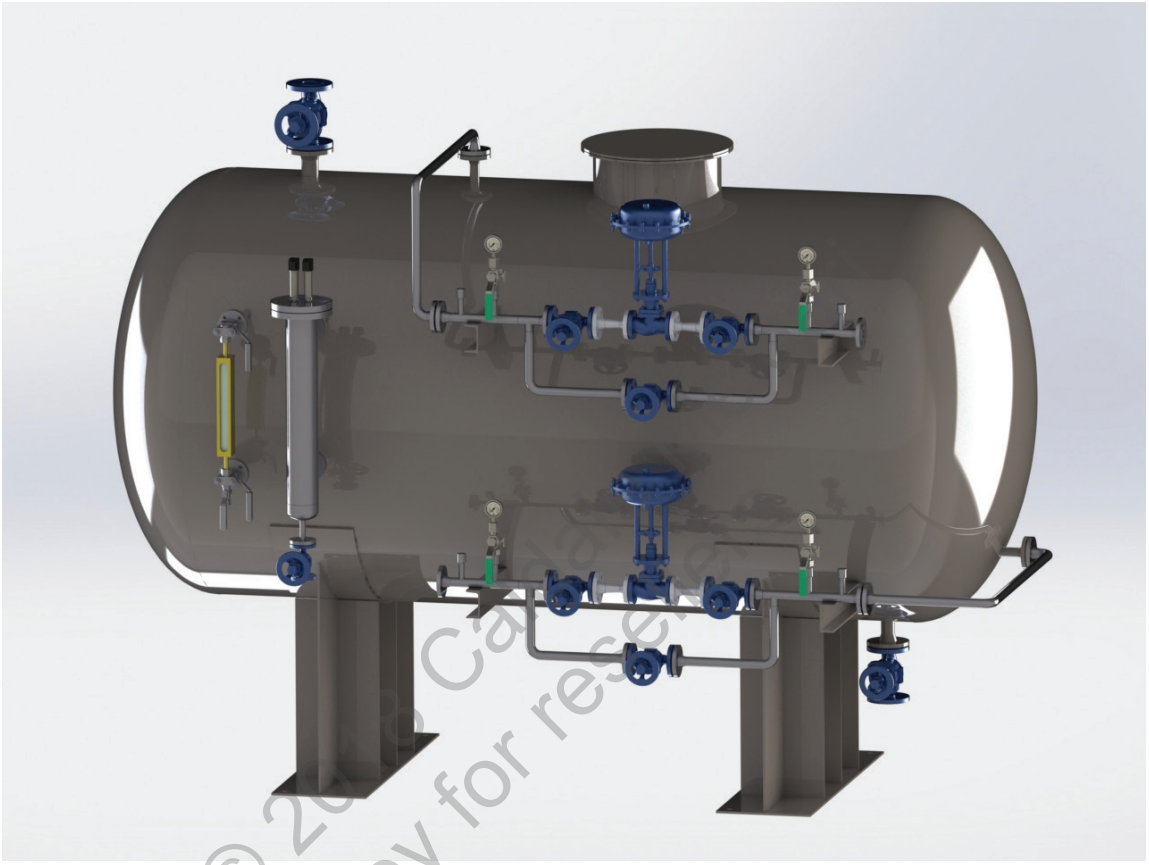
Caldaie Melgari **thermophysical / pressurized degasser** is a type of **heat exchanger** in which **degassing is obtained by steam stripping and preheating of the water** contained in the main body **through a steam lance**. This allows the **elimination of oxygen and carbon dioxide present in the feeding water**, which could cause serious corrosion phenomena in the generators with production of oxide deposits.

Thermophysical degasser is **realized in accordance with PED Directive 2014/68/UE** and consists of a horizontal cylindrical tank with rounded bottoms and a degassing turret placed at the top connected to the tank by flanged coupling (carbon steel or stainless steel execution). The degasser is complete with suddle supports, solid basement and mineral wool insulation protected by metal refinishings.

The **accessories** we can provide with the thermophysical degasser are the following ones:

- Water adjustment unit
- Steam adjustment unit
- Regulation and control accessories
- Thermometer
- General electrical control panel

ATMOSPHERIC DEGASSER



Caldaie Melgari **atmospheric degasser** is a type of **heat exchanger in which degassing is obtained by steam stripping and preheating of the water contained in the main body through a steam lance**. This allows the elimination of oxygen and carbon dioxide present in the feeding water, which could cause serious corrosion phenomena in the generators. In particular, dissolved oxygen in steam generator's feeding water causes severe corrosion by producing oxide deposits.

Atmospheric degasser consists of a **horizontal cylindrical tank with rounded bottoms** (in carbon or stainless steel, based on customer's requirements) and is **complete with suddle supports**, **solid basement** and **mineral wool insulation** protected by metal refinishings.

The **accessories** we can provide with the atmospheric degasser are the following ones:

- Water adjustment unit
- Steam adjustment unit
- Regulation and control accessories
- Thermometer
- General electrical control panel

LADDER AND GANGWAY

Usually, our smoke-tubes boilers are designed and realized with all the control and safety accessories installed on the top.

In order to allow **easy and safe access by the personnel responsible for controlling and maintaining the generator** (especially in the case of generators of large size) Caldaie Melgari is able to create a metal structure that is integrated with the boiler body, with a convenient access ladder to **reach any part of the boiler**.

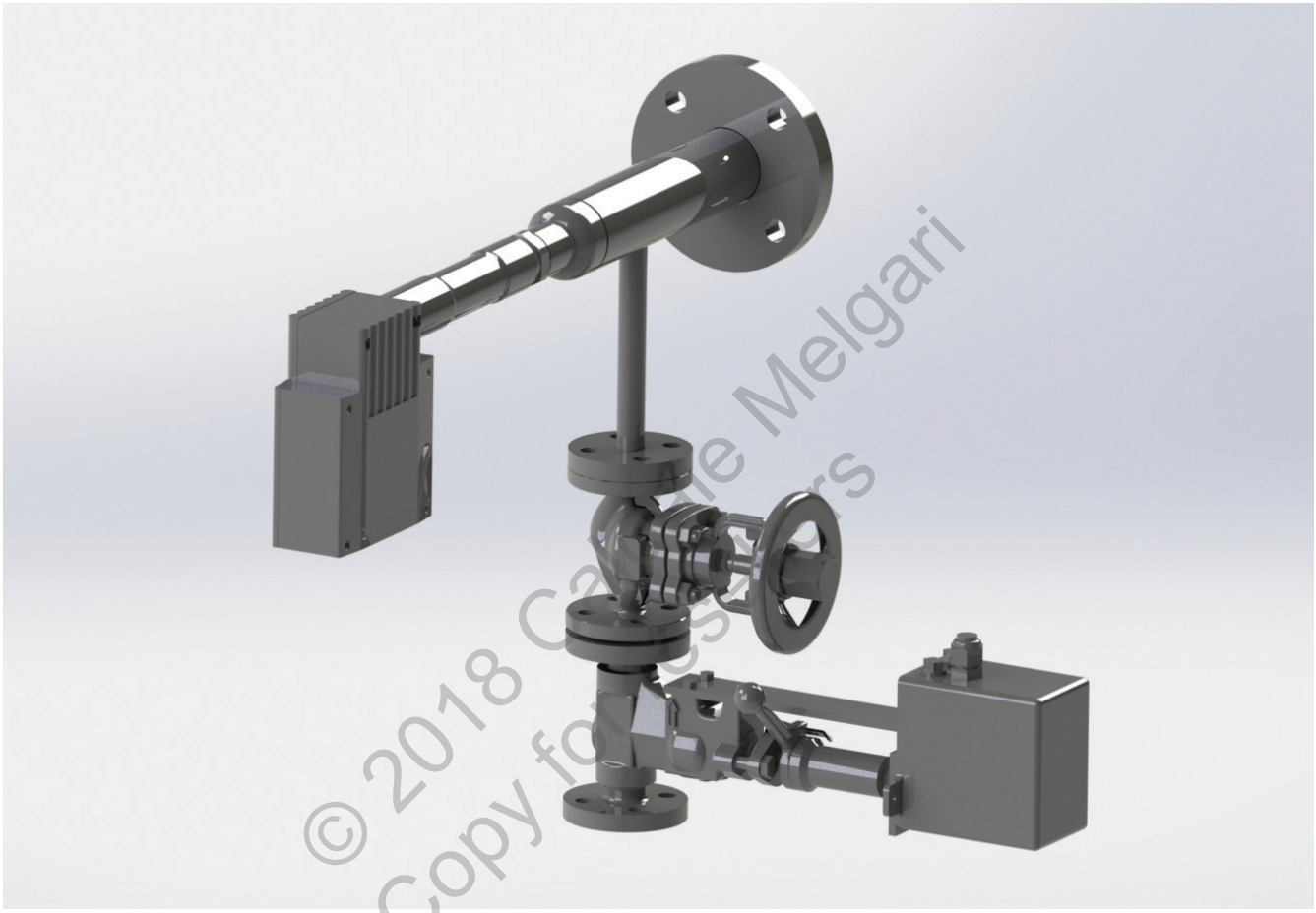
Ladder and gangway are made in accordance with all applicable safety regulations.

AUTOMATIC BLOWDOWN SYSTMEM

Automatic blowdown system consists of a **blowdown valve** which **eliminates non-soluble oxide and limestone particles** - usually called "sludges"- which are generated on the bottom of the generators causing annoying damage to the plant as well as loss of heat.

The opening of this valve is controlled by a timer installed on the electrical control panel. Opening time of the valve and the frequency of the discharges must be set by the user following a laboratory check on boiler water's quality.

SALINITY
CONTROL SYSTEM (TDS)



TDS control system **limits the level of salts and minerals dissolved in boiler water** within the values allowed by manufacturer, thus **avoiding the risk of dragging due to excessive salinity levels** and **minimizing the amount of discharges required** (and related costs).

It is made of a **probe** located **inside the boiler** that **ensures continuous control over the concentration of salts by detecting conductivity**. This probe controls the opening of a blowdown valve installed on a generator's stub pipe located just below the evaporation surface.

Measurement carried out with this probe involves automatic temperature compensation. **If conductivity value is below the set point, blowdown valve remains closed**; **if the value is higher, blowdown valve opens**. Then, boiler water is reintegrated from feeding system with clean water: in this way, conductivity values return to an acceptable threshold allowing blowdown valve to close again.

24 HOURS EXEMPTION KIT

STEAM

Over the years, Caldaie Melgari has developed a system that allows **exemption from continuous human presence (licensed operator) up to a maximum of 24 hours**. The system consists of a series of **special accessories** that can self-check up through proven diagnostic systems.

24 hours exemption accessories kit is recommended on all our models (in particular, smokes tube steam boilers) as licensed operators have just to carry out start-up and switching-off operations and, then, they can safely leave the generator in operation while being employed in other tasks.

The **kit includes the following accessories mounted and tested in our factory**:

- **n. 2 CE marked level switches** (minimum)
- **n. 1 Level switch** (maximum)
- **n. 1 CE marked safety pressure switch**

The above accessories are also connected to intrinsic safety modules in order to complete safety chain.

Relevant regulations are UNI EN 12953/6:2005, UNI EN 12953/8:2003, UNI EN 12953/10:2005, EN ISO 4126-1:2004, TRD 604 and UNI TS 11325/3:2010.

24 HOURS EXEMPTION KIT

SUPERHEATED WATER

Over the years, Caldaie Melgari has developed a system that allows **exemption from continuous human presence (licensed operator) up to a maximum of 24 hours**. The system consists of a series of **special accessories** that can self-check up through proven diagnostic systems.

24 hours exemption accessories kit is recommended on all our superheated water models as licensed operators have just to carry out start-up and switching-off operations and, then, they can safely leave the generator in operation while being employed in other tasks.

The **kit includes the following accessories mounted and tested in our factory**:

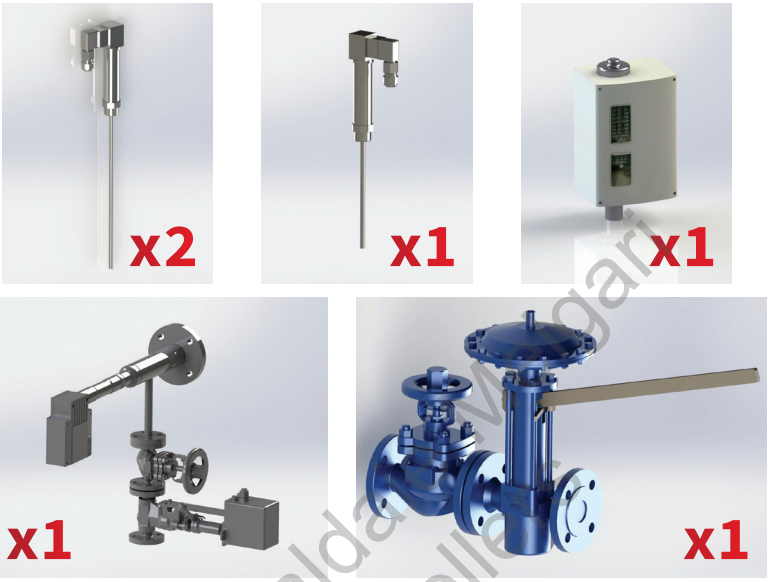
- **n. 2 CE marked level switches** (minimum)
- **n. 1 Level switch** (maximum)
- **n. 1 CE marked safety pressure switch**
- **n. 2 CE marked safety thermostats**

The above accessories are also connected to intrinsic safety modules in order to complete safety chain. In case pressure, temperature and level limits exceed, the system detects an alarm and the burner stops. If the generator is connected to an expansion vessel, safety accessories of the vessel have to be CE marked and connected to the same safety chain.

Relevant regulations are UNI EN 12953/6:2005, UNI EN 12953/8:2003, UNI EN 12953/10:2005, EN ISO 4126-1:2004, TRD 604 and UNI TS 11325/3:2010.

72 HOURS EXEMPTION KIT

STEAM



Over the years, **Caldaie Melgari has developed a system that allows exemption from continuous human presence (licensed operator) up to a maximum of 72 hours**. The system consists of a series of **special accessories** that can self-check up through proven diagnostic systems.

72 hours exemption accessories kit is recommended on all our models (i.e. smokes tube steam boilers), in particular in case of 24 hours 7/7 days operation as licensed operators have just to carry out start-up and switching-off operations and, then, they can safely leave the generator in operation for 72 hours (also during the week end) while being employed in other tasks.

The **kit includes the following accessories mounted and tested in our factory**:

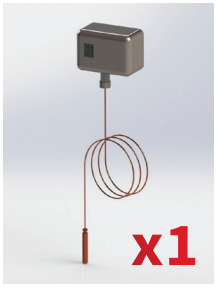
- **n. 2 CE marked level switches** (minimum)
- **n. 1 Level switch** (maximum)
- **n. 1 CE marked safety pressure switch**
- **n. 1 kit for continous control monitoring of boiler water conductivity**
- **n. 1 kit for continous control monitoring of feeding water conductivity**
- **n. 1 Automatic blow-down system**

The above accessories are also connected to intrinsic safety modules in order to complete safety chain. In case pressure, temperature and level limits exceed, the system detects an alarm and the burner stops. Surface purge valve automatically discharges a part of the water to lower conductivity value exspecially when set values are exceeded.

Relevant regulations are UNI EN 12953/6:2005, UNI EN 12953/8:2003, UNI EN 12953/10:2005, EN ISO 4126-1:2004, TRD 604 and UNI TS 11325/3:2010.

72 HOURS EXEMPTION KIT

SUPERHEATED WATER



Over the years, **Caldaie Melgari has developed a system that allows exemption from continuous human presence (licensed operator) up to a maximum of 72 hours**. The system consists of a series of **special accessories** that can self-check up through proven diagnostic systems.

72 hours exemption accessories kit is recommended on all our superheated water models, in particular in case of 24 hours 7/7 days operation as licensed operators have just to carry out start-up and switching-off operations and, then, they can safely leave the generator in operation for 72 hours (also during the week end) while being employed in other tasks.

The **kit includes the following accessories mounted and tested in our factory**:

- **n. 2 CE marked level switches** (minimum)
- **n. 1 Level switch** (maximum)
- **n. 1 CE marked safety pressure switch**
- **n. 2 CE marked safety thermostats**
- **n. 1 Automatic blow-down system**

The above accessories are also connected to intrinsic safety modules in order to complete safety chain. In case pressure, temperature and level limits exceed, the system detects an alarm and the burner stops. If the generator is connected to an expansion vessel, safety accessories of the vessel have to be CE marked and connected to the same safety chain.

Relevant regulations are UNI EN 12953/6:2005, UNI EN 12953/8:2003, UNI EN 12953/10:2005, EN ISO 4126-1:2004, TRD 604 and UNI TS 11325/3:2010.

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