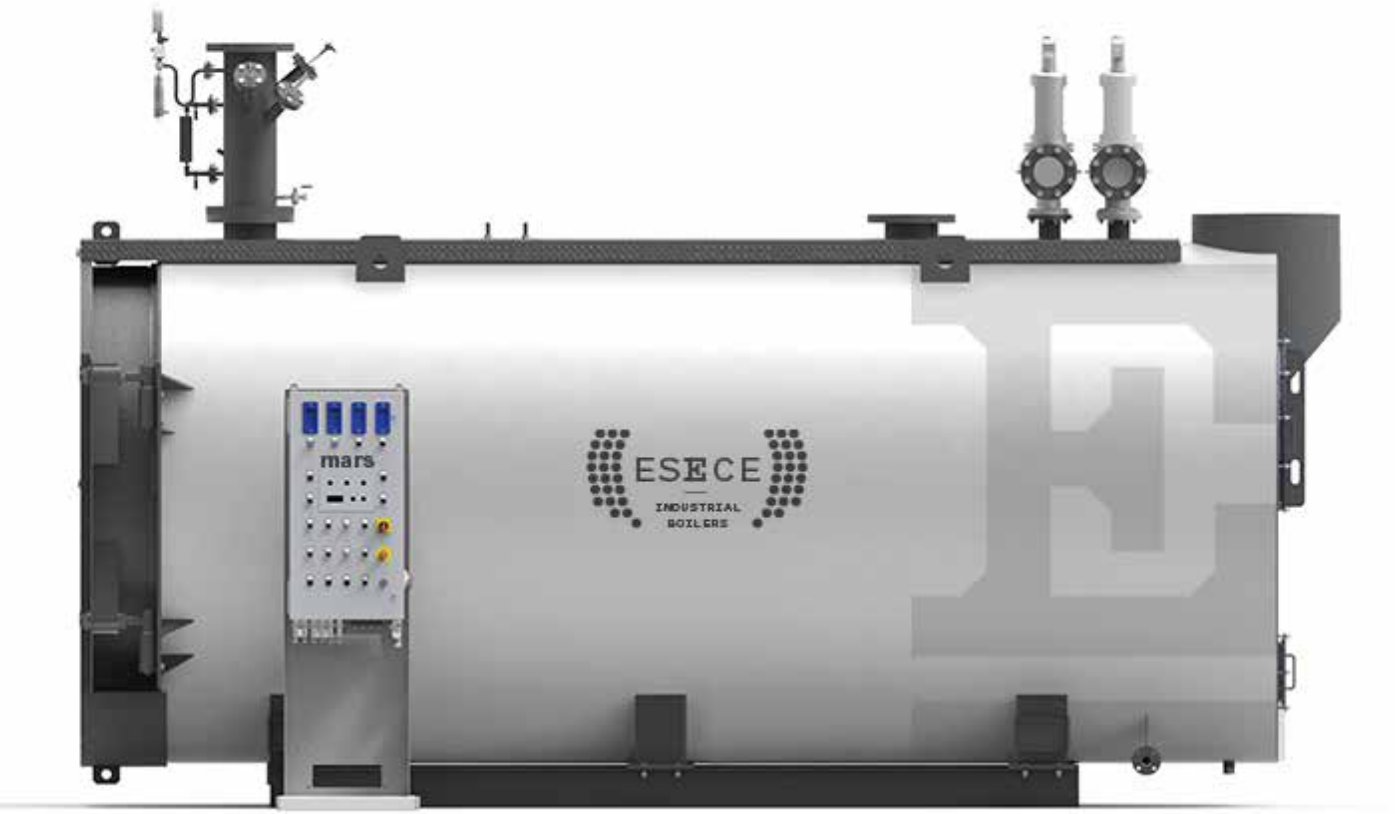
mars

ESECE
INDUSTRIAL BOILERS



HIGH PRESSURE PACKAGED SUPERHEATED BOILER, GENUINE THREE PASS FIRE TUBE, HIGH PERFORMANCES, 91% EFFICIENCY							
OUTPUT RANGE	from 870 to 10000 kW						
WORKING PRESSURE	9.8 bar (higher pressure on request)						
WORKING TEMPERATURE	183,2°C						
MODELS	870	1160	1400	1800	2300	2900	3500
	4000	4650	5800	7000	8300	10000	-

DESCRIPTION

High pressure packaged superheated boiler, genuine three-pass fire tube, horizontal, 91% efficiency [1].

MARS is a family of packaged smoke tube superheated boilers, genuine three-pass, and wet back. Standard safety pressure up to 10 bar (higher pressure available on request) and output from 870 to 10000 kW. It can be operated with liquid or gaseous fuels. Every model is complete with regulations and safety accessories for automatic operation and easy commissioning.
In compliance to the current laws, each superheated boiler undergoes a conformity assessment, carried out by a Notified Body.
The conformance to the essential safety requirements demanded by the European Pressure Equipment Directive 2014/68/UE (PED) is guaranteed by the CE mark.

Design features:

By means of the three-pass design the smoke gases in the combustion chamber are diverted to the front through the first set of fire tubes by the reversing chamber; then reversed again by the frontal smoke box to the second smoke tube sections and discharged through the chimney connection. The appliance is designed to ensure low heating loads in the combustion chamber, low superficial loads and low NOx emissions (with Low NOx burners).

- **Boiler body:** is made of a cylindrical shell and a wet back furnace, dished and butt welded tube plates, made of high quality steel. All the materials have certificates attesting their chemical and mechanical characteristics, the controls are carried out during each production stage, and, theirs suitability for use as well. The welding seams are carried out by qualified personnel in compliance to certified procedures and are subjected to Non Destructive Tests, in accordance to an internal “Manufacturing and Control” program. Once the boilers have been manufactured they are subjected to hydraulic testing in accordance to the requirement 7.4 – Annex I, laid down in the Directive 2014/68/UE (PED).
- **Smoke tubes:** made of high quality steel, are welded to tube plates, and are without helical turbulators.
- **Reversing chamber:** is built in welded steel plate, completely water-cooled, and connected to the rear smoke-box with supports and manhole.
- **Front door:** is built in welded steel plate, completely cladded internally with a layer of insulation material and with a layer of high density refractory material. One or two doors are present according the boiler’s capacity, for cleaning and inspection. Close to the burner hole is present a self-cleaning sight glass for combustion control during boiler operation.
- **Rear smoke-box:** is built in welded steel plate, completely cladded internally with a layer of insulation material and with a layer of high density refractory material. Two doors for cleaning and inspection are fitted with hinges to be quickly opened. Complete with an horizontal chimney connection with a diameter sized to the boiler’s output, and a self-cleaning sight glass for combustion control. The rear smoke-box can be accessorized with and external economizer.
- **Basement:** is built with a steel frame, welded to the tube plates and closed with steel plates.
- **Walkway:** positioned on the top part of the boiler, is made of steel, covered with chequered plate and completed; on request with handrail and access ladder.
- **Insulation:** the shell is thermally insulated with a 100 mm rock wool cladding binded with high density, thick thermosetting resins, suitably supported and covered externally in 10/10 thick enamelled aluminum.

Standard equipment: [2]

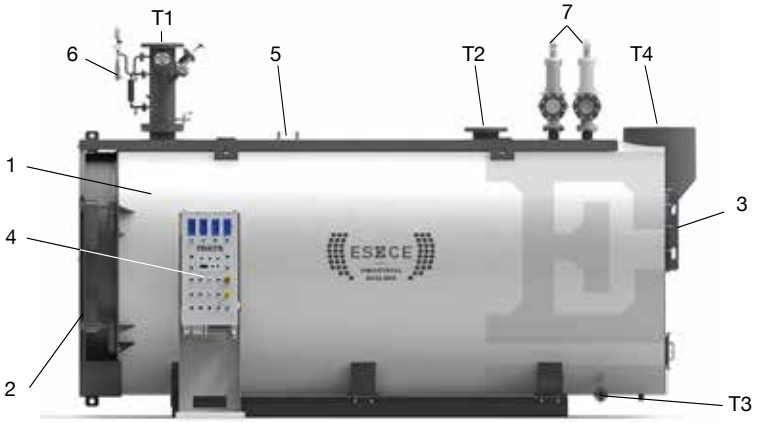
- Control board panel complete with:
  - n. 2 spring loaded safety valves.
  - n. 1 manual draining group.
  - n. 1 large dial thermometer.
  - n. 1 large manometer with 3 way cock for calibration.
  - n. 2 working thermostats.
  - n. 1 safety pressure switch with manual reset onto the board panel, CE PED certified.
  - n. 1 safety thermostat with manual reset, CE PED certified.
- Blind burner plate.
- Lifting lugs.
- Document folder enclosing:
  - Manufacturer's Declaration of Conformity in compliance with the Annex VII of the European Directive 2014/68/UE (PED)
  - Installation, operation and service manuals.
  - Certificates of safety components.
  - Control board’s electric schemes and related Declaration of Conformity.
  - Water characteristics: requirements concerning the quality of water supply, the water in the boiler, frequency and type of sample tests to do.

(1) This value may change according working pressure and load conditions.
(2) The quantity and the model may vary according to the configuration.

MAIN COMPONENTS

1. Boiler body
2. Front door
3. Rear smoke chamber
4. Board panel
5. Inspection with man hole
6. Safety devices kit
7. Safety valves

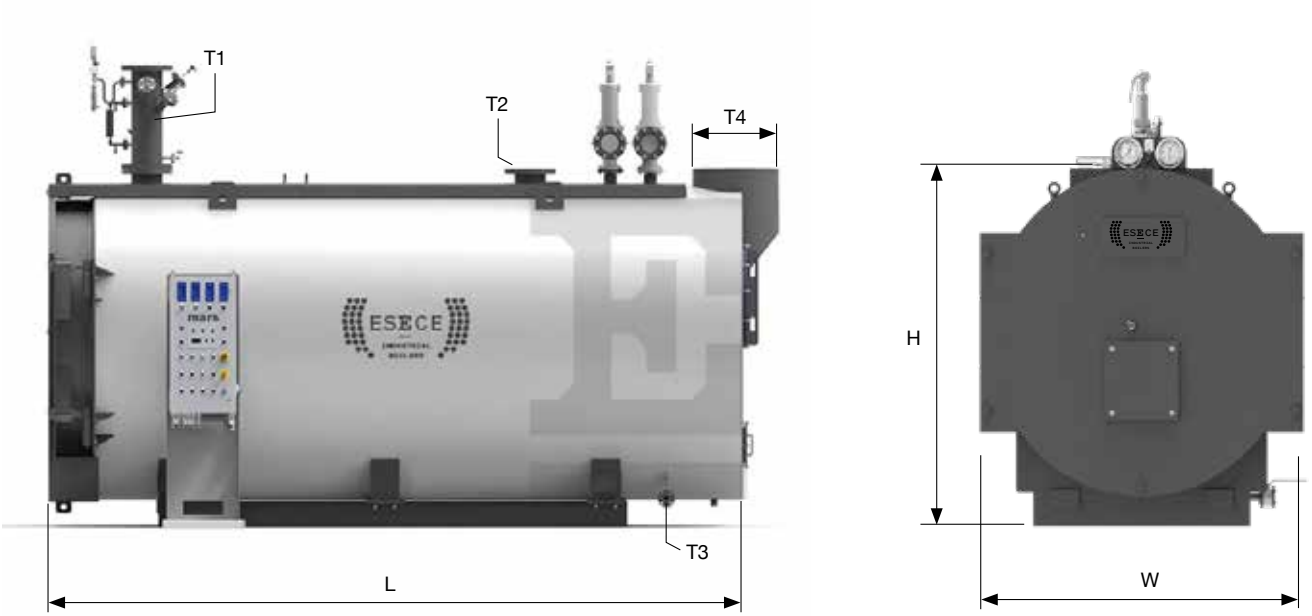
T1. Flow
T2. Return
T3. Boiler drain
T4. Chimney connection



TECHNICAL DATA

Model	Nominal output	Nominal input	ΔP smoke side	Water content	Burner plate drilling	Burner head tube Min/max length	Empty weight
	kW	kW	mbar	l	mm	mm	kg
870	870	960	3.0	2800	According to burner manufacturer	According to burner manufacturer	4150
1160	1160	1280	5.6	2870			6100
1400	1395	1550	6.7	3600			6800
1800	1750	1940	5.4	4950			7400
2300	2300	2550	3.5	5850			9200
2900	2900	3220	6.0	6545			11000
3500	3500	3880	7.5	8200			12300
4000	4000	4440	7.2	9175			13000
4650	4650	5160	7.0	11000			15000
5800	5800	6440	5.8	12520			17600
7000	7000	7740	10.0	14700			19200
8300	8300	9220	10.0	16800			22000
10000	10000	11100	11.0	20100			26000

DIMENSIONS



Model	W	L	H	T1/T2	T3	T4
	mm	mm	mm	DN	DN	Øi mm
870	1480	3500	1800	100	25	302
1160	1660	3600	2150	125	25	352
1400	1800	3700	2150	150	40	352
1800	2130	3885	2400	150	40	402
2300	2180	4270	2450	150	40	452
2900	2255	4520	2535	200	40	452
3500	2425	5080	2795	200	40	552
4000	2425	5320	2795	200	40	602
4650	2520	5770	2890	200	40	602
5800	2670	6370	3000	250	40	702
7000	2670	6870	3000	250	40	702
8300	2830	7320	3210	250	40	802
10000	3030	7590	3345	300	40	902

PRODUCT PLUS VALUES

- **FRONT AND REAR DOOR**
  placed on both sides to get access to the tube bundles. They can be opened without the removal of the burner and the chimney for an easy service
- **LOW EMISSIONS NO_x < 70 mg/kWh**
  thanks to the reduction of the specific thermal load (according to the versions)
- **WET BACK FURNACE**
- **POSSIBLE COMBINATION**
  with one /two stage or modulating burners, operated with natural gas, LPG, light oil or heavy oil
- **EASY TRANSPORTATION**
  thanks to the upper hooks and the strong frame side members
- **DELIVERY**
  Is complete with board panel "FLAT_SH", safety and control devices

STANDARD-PRODUCTION EQUIPMENT

- Rock wool insulation covered with an aluminium foil
- Board panel for two stage operation burner
- N. 2 spring actuated safety valves
- Draining group with quick lever operated desludging valve
- N. 1 dial type thermometer
- N. 1 dial type manometer with 3 way cock for calibration purposes
- N. 2 working thermostats
- N. 1 manual reset safety pressure switch

BOARD PANELS (optional)

IMC_SH

- Single and two-stage burner control
- Possible 24/72 h exemption
- No. 1 low level safety PED level switch (optional)
- Terminal board on quick coupling connectors
- Expansion with optional kits
- IP55 Protection rating

IML_SH

- Control PLC
- 7” touch screen display with graphic interface
- Single and two-stage, three-stage, modulating burner control
- Possible 24/72 h exemption
- No. 1 low level safety PED level switch (optional)
- Terminal board on quick coupling connectors
- Expansion with optional kits
- IP55 Protection rating

OPTIONAL EQUIPMENT

24 h EXEMPTION KIT

Set of accessories to obtain the partial exemption of the burner (24 h) according to L.D. 25 February 2000 no.93, MD 1 December 2004, no.329, UNI/T S 11325-3:2010.
Consisting of:
- 24h exemption control panel including a timer and preset for a 24h exemption reset procedure
- Instrument/safety device wood log to be mounted on the boiler flow, with all equipment required and namely:
- 1 pressure gauge with a pressure gauge valve
- 1 large dial thermometer with a limit indication
- 1 maximum and minimum safety pressure switch
- 1 reflection level indicator with shut-off valves
- 1 fail-safe minimum level safety probe
- 2 fail-safe self-controlled temperature switch units (PT100), TRD604 CAT. IV.

72 h EXEMPTION KIT

Set of accessories to obtain the partial exemption of the burner (72 h) according to L.D. 25 February 2000 no.93, MD 1 December 2004, no.329, UNI/T S 11325-3:2010.
Consisting of:
- Control panel for up to a 72h exemption, including a timer and preset for a 72h exemption reset procedure
- Instrument/safety device wood log to be mounted on the boiler flow, with all equipment required and namely:
- 1 pressure gauge with a pressure gauge valve
- 1 large dial thermometer with a limit indication
- 1 maximum and minimum safety pressure switch
- 1 reflection level indicator with shut-off valves
- 1 fail-safe minimum level safety probe
- 2 fail-safe self-controlled temperature switch units (PT100), TRD604 CAT. IV.
- 1 kit of safety accessories for the expansion vessel consisting of a minimum pressure switch and fail-safe minimum level safety probe