

TOX D 2P



GENUINE THREE-PASS HOT WATER BOILER

OUTPUT RANGE

from 2000 to 22000 kW

WORKING TEMPERATURE

up to 110°C (safety temperature)

FUEL

natural gas, LPG, light oil, heavy oil jet burners

MODELLS

2000	2500	3000	4000	4600	6000	7000
8000	10000	13000	15000	18000	20000	22000

CERTIFICATION IN OUTPUT RANGE / Low NO_x emissions

DESCRIPTION

Hot water boiler, with 3 effective smoke passes, wet bottom, horizontal design.

The TOX D 2P series is a family of hot water boilers designed for a maximum safety pressure of up to 6 bar or higher on request. The range includes various models with an output from 2000 to 22000 kW.

General features:

The generator with 3 effective smoke passes is made up of a cylindrical furnace with a wet bottom in which the flame develops and runs through the furnace (1st smoke pass) and, at the bottom, through the inversion chamber, enters the tube bundle of the 2nd smoke pass. The fumes return to the front where they enter the tube bundle of the 3rd smoke pass.

Exiting the tube bundle, the fumes are collected in the rear smoke chamber and conveyed to the chimney.

■ **Boiler body:** the components of the boiler body, outer shell, furnace, inversion chamber, tube plates and tube bundle are made of quality steel in accordance with current regulations. The materials used are accompanied by manufacturing certificates certifying the chemical and mechanical characteristics and the controls during the production cycle and therefore their suitability for use. The inversion chamber is made with flat tube plates. The welded joints are carried out according to procedures approved by suitably qualified personnel. Once manufacturing is complete, each pressure carrying part is subjected to testing by carrying out the hydraulic test.

■ **Smoke pipes:** making up the quality steel tube bundle, are welded to the tube plates by means of qualified automatic procedures. Finally, the pipes are headed by counterbore eliminating the protrusions from the plate.

■ **Front doors:** made of steel sheet, hermetically sealed against fumes leakage, they are internally lined with refractory insulating concrete. The burner is fixed on a dedicated independent flange, with lifting eyebolts.

■ **Rear smoke chamber:** made of steel sheet, is insulated by casting of suitable material, it is complete with horizontal flanged connection for flue gas evacuation and with inspection and cleaning doors.

■ **Base:** it consists of a frame in steel profiles electro-welded to the tube plates.

■ **Insulation of the outer shell:** thermal insulation is ensured by a mineral wool mattress, 100 mm thick, externally protected by an aluminum foil (stainless steel on request).

Composition of the standard supply: ⁽¹⁾

- Plate for burner mounting, complete with sight flame (with drilling on request)
- Boiler lifting eyebolts
- Document envelope containing:
 - Installation, Use and Maintenance Manual.
 - Data sheet relating to the quality of the operating water, with the parameters that must be subjected to periodic checks, maximum and minimum limits of acceptability, frequency of checks and required interventions (information contained in the manual).

(1) The quantity and the model may vary according to the offered configuration.

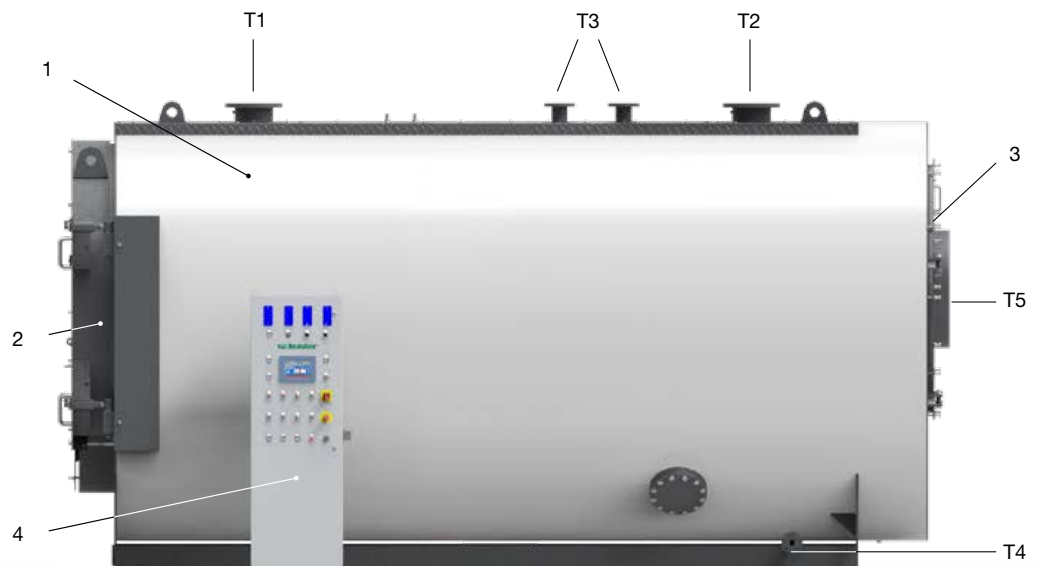
Optional components:

- Economizers for the recovery of the residual heat of the fumes leaving the boiler, available in the versions for gas or light oil.
- Condensers for the recovery of the latent heat of the fumes leaving the boiler, available only in the gas versions.

MAIN COMPONENTS

1. Boiler body
2. Front doors
3. Rear smoke chamber
4. Electric panel board

- T1. Flow
- T2. Return
- T3. Expansion vessel connection
- T4. Boiler drain
- T5. Chimney connection



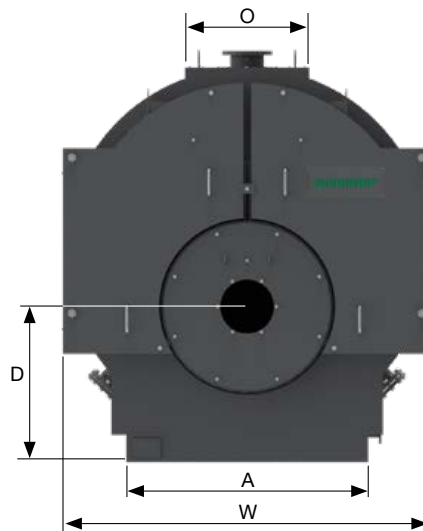
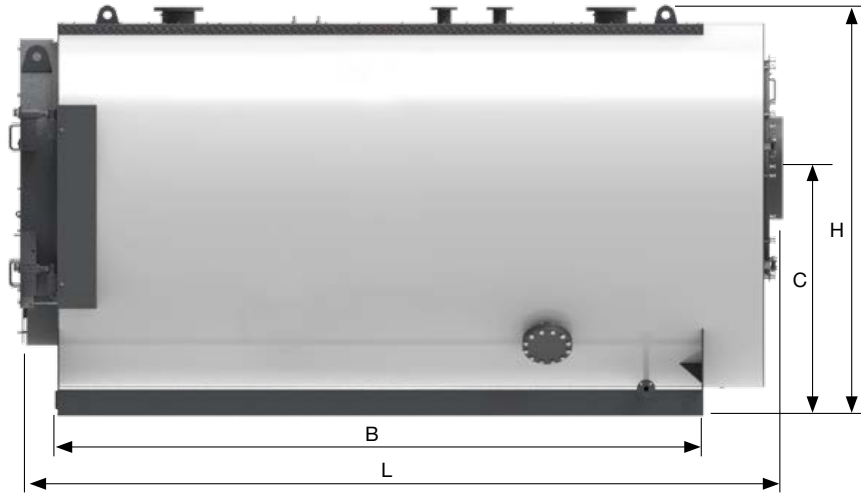
TECHNICAL DATA

TOX D 2P	Nominal output	Nominal input	Efficiency at full load	Water content	ΔP smoke side	ΔP water side	Empty weight	CONNECTIONS (\emptyset)			
	kW	kW	%	lt	mbar	mbar		T1/T2	T3	T4	T5
								\emptyset mm	\emptyset mm	\emptyset mm	\emptyset mm
2000	2000	2174	92	3600	5.5	50	5300	200	50	1"1/2	404
2500	2500	2717	92	4800	5.5	75	5600	200	65	1"1/2	404
3000	3000	3261	92	5120	6	70	7600	250	80	1"1/2	504
4000	4000	4348	92	7300	7	135	9500	250	80	1"1/2	504
4600	4600	5000	92	7650	8	170	10000	250	100	1"1/2	504
6000	6000	6522	92	12150	10	130	13000	250	100	1"1/2	604
7000	7000	7609	92	13550	11	150	15000	300	100	1"1/2	604
8000	8000	8696	92	17160	11.5	210	16900	300	125	50	704
10000	10000	10870	92	21600	12.5	190	22000	350	125	50	804
13000	13000	14130	92	23500	14	250	30000	350	125	50	904
15000	15000	16304	92	30000	16	250	35000	400	150	50	1004
18000	18000	19565	92	34000	17	250	38000	400	150	50	1104
20000	20000	21739	92	37000	19	300	40000	500	200	50	1204
22000	22000	23913	92	41950	22.5	300	43000	500	200	50	1204

PRODUCT PLUS VALUES

- **FLEXIBILITY**
thanks to the certification in output range
- **LOW EMISSIONS $NO_x < 80$ mg/kWh**
thanks to the reduction of the specific thermal load for Low NO_x version and in combination with low-emission burners (available on request)
- **EMISSIONS $NO_x < 50$ mg/kWh**
in combination with burners equipped with flue gas recirculation (FGR)
- **TWO FRONT DOORS**
tube bundles cleaning facility
- **TWO HAND HOLES**
for easier inspection
- **DOOR INTERNAL INSULATION**
in super light recyclable refractory concrete
- **BODY INSULATION**
with anti-tearing mineral wool mattress (100 mm)
- **BOARD PANEL OR ELECTRICAL CABINET**
thermo-mechanical or electronic
- **POSSIBLE COMBINATION**
with one/two stage or modulating burners, operated on gas/LPG, light oil or heavy oil
- **EASY TRANSPORTATION**
thanks to the upper lifting lugs and the strong frame side members

DIMENSIONS



TOX D 2P	W	L	H	A	B	C	D	O
	mm	mm	mm	mm	mm	mm	mm	mm
2000	2200	4073	2284	1400	3158	1784	900	800
2500	2200	4573	2284	1400	3658	1784	900	800
3000	2300	4917	2582	1400	4101	1650	1000	800
4000	2300	5088	2582	1400	3858	1982	1000	800
4600	2450	5338	2582	1400	3858	1982	1100	800
6000	2850	5983	3008	1697	4000	2346	1250	880
7000	2850	5983	3008	1697	4000	2346	1250	880
8000	2950	6024	3301	1945	5232	1996	1300	900
10000	2950	6024	3301	1945	5232	1996	1300	900
13000	3200	8148	3554	2139	6000	2708	1400	1200
15000	3300	8500	4000	2750	6200	3200	1500	1200
18000	3450	8950	4100	2800	6620	3280	1600	1200
20000	3600	9500	4200	2850	7000	3300	1700	1280
22000	3600	9800	3985	2450	7520	3300	1700	1280

The company reserves the right to modify / adapt the technical and dimensional information of the products included in this catalog, even without notice, in order to improve the quality of the products themselves.

ECONOMIZER (optional)

The economizers for the recovery of the residual heat from the smokes at the outlet of the boiler, are available as optional kits.

Average efficiency recovery: 3 to 4%, with remarkable fuel saving.

Material: Carbon steel; on request stainless steel.

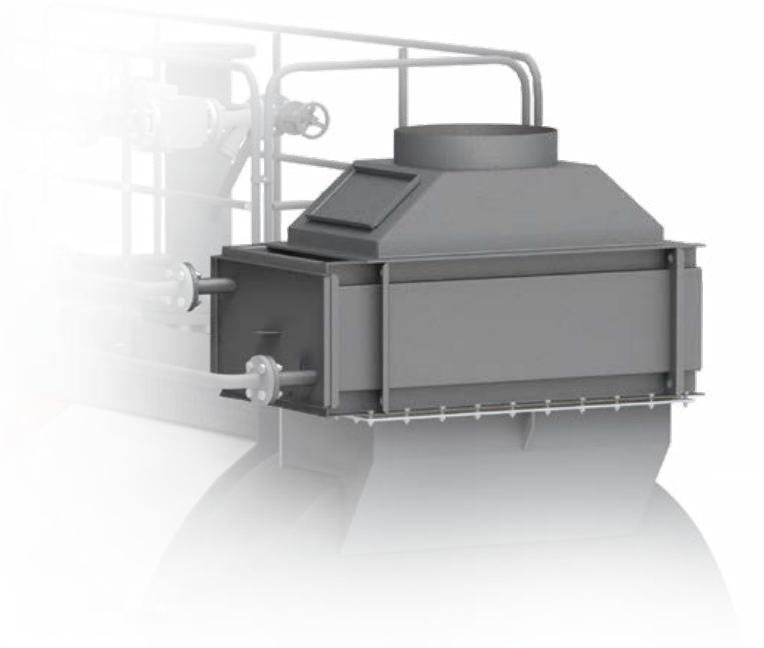
CONSTRUCTION CHARACTERISTICS OF ECONOMIZER

Heat exchanger smoke / water with exchange battery with finned pipes suitable for operation with natural gas / LPG or light oil.

- Flanged connections for water inlet and outlet
- Box for connection boiler /chimney
- Connection for condensates drain
- Smoke temperature measuring point

The economizers are available in **two versions:**

- Version for operation with gaseous fuels
- Version for operation with light oil or dual fuel (gas & oil) burners



CONDENSER (optional)

The condenser for the recovery of the residual heat from the smokes at the outlet of the boiler, are available as optional kits.

Medium efficiency recovery: 6÷8% at 100% load, return temp. 60°C

Material: stainless steel, aluminium

Steel pressurised boilers TOX with condenser reach four stars of efficiency ★★★★★

The inlet temperature at the boiler return connection must be > 55°C in any working conditions.

CONSTRUCTION CHARACTERISTICS OF CONDENSER

Heat exchanger flue/water, realized in the tube bundle made of stainless steel AISI 316 L tubes:

- Flanged connections for water inlet and outlet
- Box for connection boiler/chimney
- Connection for condensate drain
- Smoke temperature measuring point



BOARD PANELS (optional)

EM	EL MM EL MB	EL CM EL CB
<p>The standard board panel EM is equipped with:</p> <ul style="list-style-type: none"> • Series of switches • Thermometer • Safety thermostat • Two stage working thermostat 	<p>The board panels EL MM and EL MB, for high temperature working, are equipped with:</p> <ul style="list-style-type: none"> • E8 controller • Lago Basic controller for burner • Outer temp. sensor • Boiler temp. sensor • D.H.W. storage tank temperature sensor 	<p>The board panels EL CM e EL CB are equipped with:</p> <ul style="list-style-type: none"> • Lago Basic controller for burner • Boiler temperature sensor • Series of switches • Safety thermostat

For TOX boilers equipped with **MODULANTING BURNERS**

How many boilers are foreseen for the installation?	Which board panel has to be ordered?
Just ONE BOILER	1 Board panel EL MM
2 TOX in cascade	1 Board panel EL MM 1 Board panel EL CM
(n) TOX in cascade (maximum 8 boilers)	1 Board panel EL MM (n-1) Board p. EL CM

For TOX boilers equipped with **TWO STAGE BURNERS**

How many boilers are foreseen for the installation?	Which board panel has to be ordered?
Just ONE BOILER	1 Board panel EL MB
2 TOX in cascade	1 Board panel EL MB 1 Board panel EL CB
(n) TOX in cascade (max 8 boilers)	1 Board panel EL MB (n-1) Board p. EL CB

For the control of boilers in cascade and for board panel with safety thermostat at 110°C, get in touch with our pre-sale office.

ELECTRICAL CABINET BASIC_W (opzionale)

- Management of boiler safety devices with signalling on the burner start terminal board and alarms (boiler safety devices + burner block cumulative)
- Possible anti-condensation pump management
- 3Ph - 400V - 50Hz Power supply; burner power supply, transformer for auxiliary burner power supply
- Metal containment cabinet with IP54 protection rating, size H=700, L=500, D=250, held up by ground support
- Digital control instrument for controlling operating temperatures on the panel, 0-10V or 4-20 mA input for generator set-point remote control
- Built according to European standards



ELECTRICAL CABINET IML_W (opzionale)

- Control PLC, 7" touch screen display (or superior) with graphic interface, remote communication via Modbus, 0-10V or 4-20 mA input for generator set-point control, etc.
- Single, two-stage and three-stage or modulating burner control
- Boiler safety devices management with alarm signals
- Possible anti-condensation pump management
- 3Ph - 400V - 50Hz Power supply; burner power supply, transformer for auxiliary burner power supply
- Metal containment cabinet with IP54 protection rating, size H=1000, L=500, D=250, held up by ground support
- Built according to European standards



BOILER SAFETY KIT (optional)

- Instrument wood log to be mounted on the boiler flow, complete with all connections required for the on-site safety and control instrumentation and in particular:
 - pressure gauge valve with test flange
 - large dial thermometer and pressure gauge of an adequate scale
 - minimum and maximum safety pressure switch
 - manifold with siphon to position the pressure gauge and pressure switches
 - 2 manually resettable safety thermostats
- Available upon request: EC approved safety valves with adequate calibration pressure, designed to discharge the total boiler power.



ANTICONDENSATION PUMP KIT (optional)

Composed of:

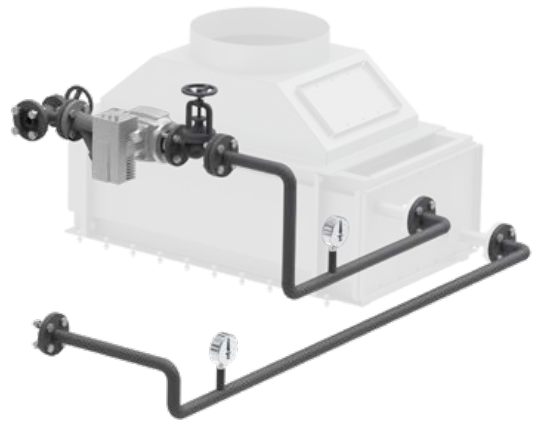
- n. 1 electric pump of the in-line type, of suitable flow rate
- n. 2 shut-off valves
- n. 1 non-return valve
- connection pipes
- power and operating logic inserted inside the boiler panel



ECONOMIZER CIRCULATION KIT (optional)

Composed of::

- n. 1 electric pump of the in-line type, of suitable flow rate
- n. 2 shut-off valves
- n. 1 non-return valve
- connection pipes
- power and operating logic inserted inside the boiler panel



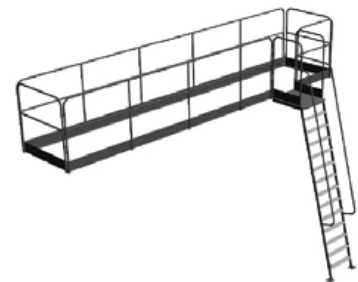
LADDER AND WALKWAY KIT (optional)

Ladder and walkway with carbon steel railing, painted with special rust-proof paint and welded by joints that ensure the correct coupling of every element.

Easy access to the boiler is guaranteed by:

- a handrail welded to the frame;
- steps with non-slip inserts.

The ladder position and handrail layout can be agreed upon at the time of order, to fit the installation site of the generator.



HIGH EFFICIENCY OPTION

Option to supply a generator with 94-95% efficiency levels.

An aluminium profile, bound by rolling, is positioned within the smoke pipes forming the tube bundle of the third flue gas pass, namely in the end section, to significantly increase efficiency. This allows you to increase the exchange surface without increasing the generator size or adding external devices, as a result of a higher pressure drops (counter pressure) of the boiler body.

