

# TRYPASS'



HIGH PRESSURE PACKAGED STEAM BOILER, GENUINE THREE-PASS FIRE TUBE  
HIGH PERFORMANCE - PLATES COMPLETELY RE-EDGED

OUTPUT RANGE

from 1328 kW (2000 kg/h) to 16607 kW (25000 kg/h)

FUEL

gas, light oil

DESIGN PRESSURE

12 bar (higher pressure on request)

MODELS

2000	2500	3000	3500	4000	5000	6000	7000
8000	10000	12000	15000	18000	20000	25000	-

## DESCRIPTION

**High pressure, monobloc, steam generator, with 3 effective smoke passes, with wet bottom, horizontal, efficiency 90%, up to 96% for version EC**

It is designed for a maximum safety pressure up to 12 bar (or higher on request). The range includes various models with steam production from 2000 to 22000 kg / h. According to current legislation, the TRYPASS' family of high-pressure steam generators has been subjected to a conformity assessment by a Notified Body. Compliance with the Essential Safety Requirements of the PED Directive 2014/68 / EU of the pressurized body is evidenced by the CE P.E.D. marking.

### General features:

The 3 effective smoke passes generator consists of a horizontal cylindrical furnace with a wet bottom in which the flame develops. The fumes then enter the first tube bundle at the rear inversion chamber and are conveyed towards the front tube plate. From the front chamber the fumes pass into the second tube bundle and exit through the rear smoke chamber.

The steam generator is sized to ensure low thermal loads and low polluting emissions.

■ **Boiler body:** designed in compliance with the EN 12953-3:2016 standard, it consists of a cylindrical outer shell, smooth furnace, bowling hoop or fox depending on the power (on request all models can be made in fox version), inversion chamber and tube plates completely re-edged and butt-welded, in quality steel, in compliance with current technical standards. The body is equipped with 2 still pipes diam. 100 mm for housing all safety and control devices. 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 welds are carried out according to procedures approved by suitably qualified personnel and subjected, in accordance with an internal "Manufacturing and Control" plan to Non-Destructive Testing. Upon completion of manufacturing, each pressurized body is subjected to testing by carrying out the hydraulic test in accordance with requirement 7.4 - Annex 7 of Directive PED 2014/68 / EU.

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

■ **Rear reversing chamber:** built in welded steel sheet, completely wet, equipped with fixing rods.

■ **Front smoke-chamber:** built in welded steel sheet covered on the front with a layer of insulating and refractory material. It is equipped with two doors, mounted on hinges, that allow quick opening.

■ **Rear smoke-chamber:** built in welded steel sheet, internally covered with a layer of insulating material. It is equipped with two inspection and pipe cleaning doors, mounted on hinges that allow quick opening, a horizontal axis flue connection (vertical on request), with a diameter suitable for the power of the generator and a self-cleaning flame sight glass for the control of the correctness of combustion in operation. Prepared for connection to an external economizer (EC versions).

■ **Basement:** it consists of a frame in boxed electro-welded steel sections, provided with support saddles for the outer shell of the body under pressure, and equipped with a system that allows to compensate for thermal expansion.

■ **Service walkway:** located in the upper part of the generator, it

consists of a steel section frame, covered with checkered plate on the walkway floor and completed (on request) by a parapet with handrail and an access ladder, compliant with the EN ISO 14122 standard.

■ **Outer shell Insulation:** the thermal insulation of the outer shell is obtained with a 100 mm thick rock wool mattress, bonded with high density thermosetting resins, supported and externally protected by a 10/10 mm thick painted sheet metal casing.

### Composition of standard supply: <sup>(1)</sup>

- n. 1 started flow steam outlet shut-off valve
- n. 2 spring-loaded safety valves
- n. 2 reflective level indicators, flanged connections, shut-off and drain valves
- n. 1 large dial pressure gauge with 3-way tap for calibration
- n. 1 safety pressure switch with manual reset, CE PED approved
- n. 1 limit pressure switch
- n. 1 regulation pressure switch for two-stage burner (high / low flame) or probe for modulating burners
- n. 2 low water level safety probes, with self-diagnosis, with manual reset on the control panel, CE certified
- n. 2 water level probes for ON-OFF pumps
- n. 1 vertical centrifugal electric pump for water loading. Water loading line circuit with pipes, disc check valve and started flow shut-off valve downstream of the pump.
- n. 1 water drain / sludge discharge unit with quick opening manual valve
- Manhole 420x320 mm with cover and steel forged brackets and 1 or 2 (depending on the models) flanged inspection ports in the lower part of the shell
- Moisture separator on the main steam outlet, for high titre steam without dripping
- Burner supporting flange with fixing holes and dimensions suitable for the burner to be installed
- Control panel for automatic operation, IP54 400V - 3 + N - 50Hz
- Standard documentation supplied <sup>(2)</sup>:
  - EC declaration of conformity of:
    - pressure equipment (boiler body)
    - pressure equipment safety valve(s).
    - pressure equipment safety pressure switch
    - pressure equipment minimum level safety probes
  - electrical panel (if supplied)
  - feed pump/s (if supplied)
  - economizer (if provided)
  - economizer safety valve (if supplied)
  - warranty
  - manufacturer's declaration concerning the operation of the pressure equipment
  - installation, use and maintenance manual for the boiler and any accessories provided
  - drawing of the steam generator completely equipped
  - wiring diagram of the electrical panel (if supplied)

(1) Quantities, types or models may vary according to the offered configuration.

(2) The above documentation will be provided in electronic format, except for the use and maintenance manual which will be supplied in paper format together with the equipment

## OPTIONAL ACCESSORIES AND SPECIAL VERSIONS

### Options:

- "Second boiler water feed pump" kit
- "Feed water inlet filter" kit
- "External economizer" kit and modulating power supply unit: external economizer, removable from the side (instrumentation side), equipped with connection pipes and downstream thermometer, pressure gauges upstream and downstream of the economizer, upstream thermometer, wafer type shut-off and by-pass ball valves, safety valve
- "Second stage external economizer" kit for industrial process water pre-heating
- "Maximum level safety" kit
- "TDS" kit
- "Automatic bottom drain" kit

- Burner plate drilled according to customer requirements
- Burner
- Ladder and walkway

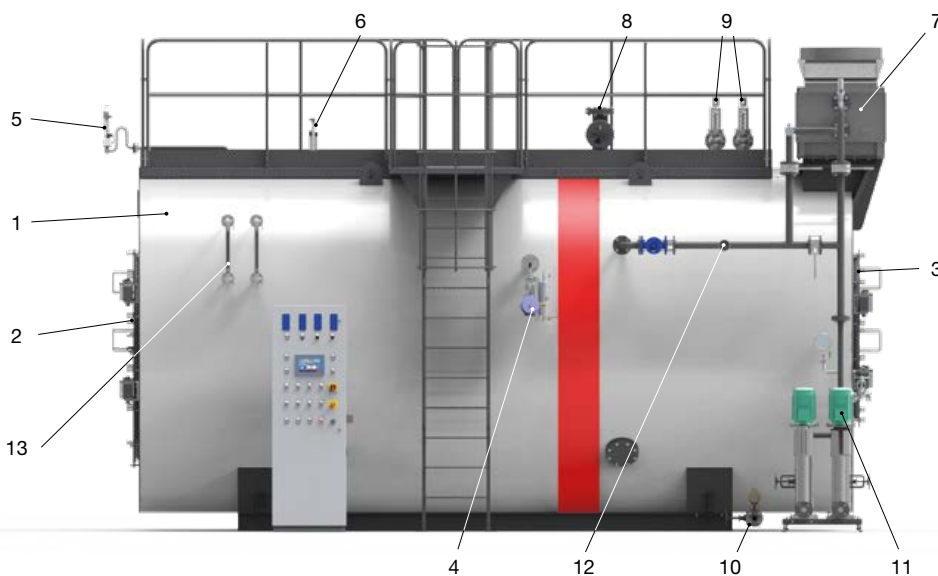
### Special versions for all models

#### TRYPASS' 24 hr / 72 hr

- equipped with dedicated electrical panel to obtain certification to operate "without continuous supervision" up to a maximum of 24 hours
- equipped with dedicated electrical panel and "72 hr KIT" to obtain certification to operate "without continuous supervision" up to a maximum of 72 hours

## MAIN COMPONENTS

1. Boiler body
2. Front doors
3. Rear doors
4. TDS - Salinity control group (optional)
5. Instruments assembly
6. Level safety sensors
7. First and second stage economizers (optionals)
8. Steam valve
9. Safety valves
10. BBD automatic bottom drain (optional)
11. Pump feeding group
12. Water inlet thermometer
13. Level gauge



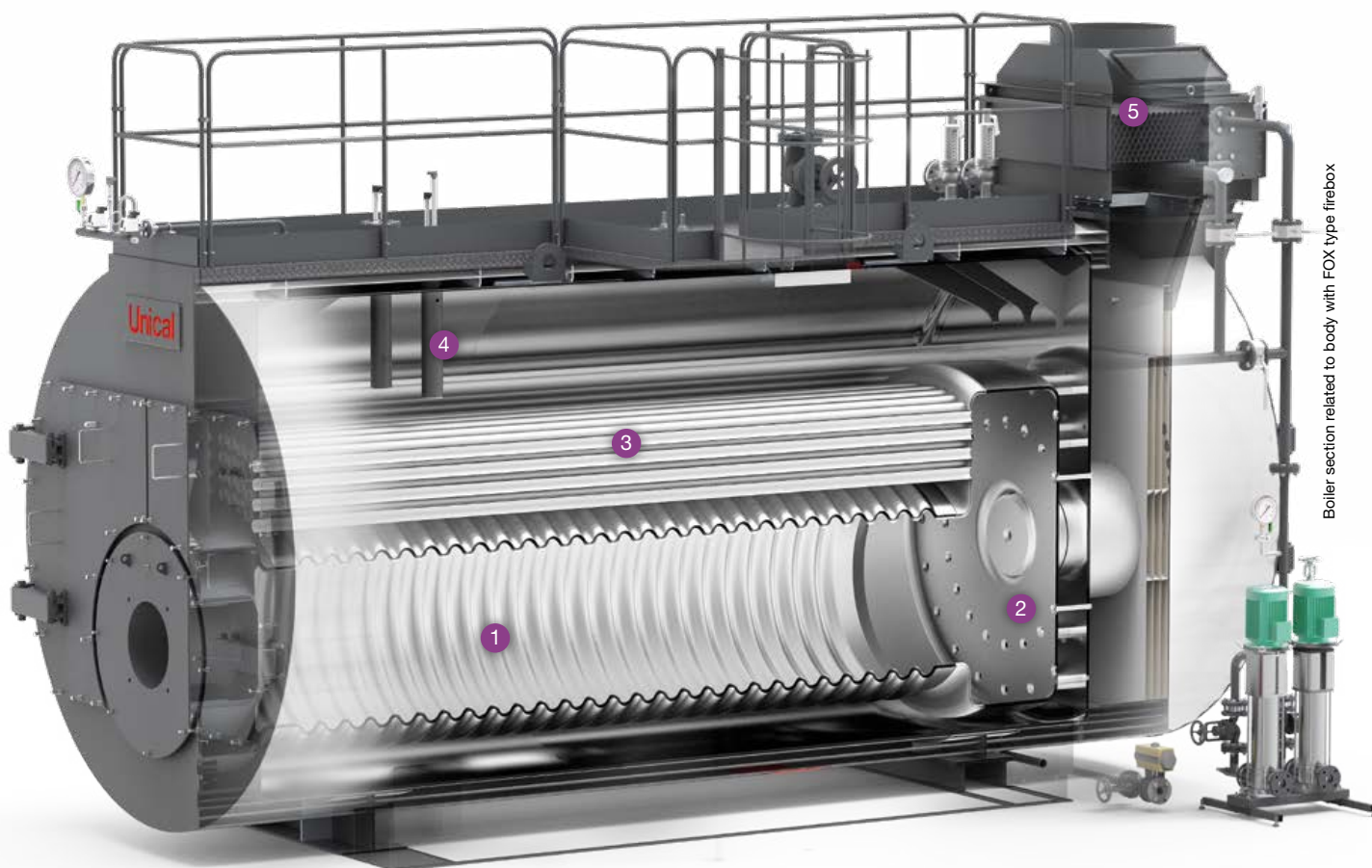
## TECHNICAL DATA

Model	Steam production*	Nominal output	Furnace power	$\Delta P$ smoke side	Water content at level	Total volume	Min buffer length
	kg/h	kW	kW	mbar	l	l	mm
2000	2000	1328	1476	6	6130	7140	410
2500	2500	1660	1845	5	6130	7140	410
3000	3000	1992	2214	5.5	6780	7950	410
3500	3500	2325	2583	5	7450	8740	410
4000	4000	2657	2952	6	9220	10690	410
5000	5000	3321	3690	6.5	10180	11800	410
6000	6000	3985	4428	7	12880	15370	410
7000	7000	4649	5166	8.5	13715	16360	410
8000	8000	5313	5905	7	16630	20850	410
10000	10000	6643	7381	8	18100	22640	410
12000	12000	7971	8857	8.5	19500	22640	410
15000	15000	9964	11071	12.5	24300	28210	410
18000	18000	11957	13286	10			
20000	20000	13286	14762	13.5		on request	
25000	25000	16607	18452	12			

\*with feeding water temperature = 95°C and pressure = 12 bar

## PRODUCT PLUS VALUES

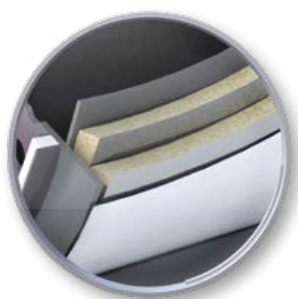
- **EXCELLENT EFFICIENCY**  
thanks to the three real smoke passes
- **LOW NO<sub>x</sub> EMISSIONS < 80 mg/kWh**  
thanks to the 3 actual smoke passes and the combination with low NO<sub>x</sub> emission burners (available on request)
- **EFFICIENT THERMAL INSULATION**  
given by:
  - high total thickness, made by joining two rock wool layers with aluminium foil
  - insulation between the casing and the hot parts of the boiler body for thermal bridges elimination
- **CLEANING DOORS**  
front and rear doors for inspection and cleaning of the tubes
- **UPPER SERVICE WALKWAY**
- **ELECTRIC PANEL BOARD**  
electromechanical and electronic, expandable with options
- **POSSIBLE COMBINATION**  
with one, two, three stage or modulating burners
- **IMPLEMENTABLE FUNCTIONS**  
boiler and board panel designed for the integration of optional kits, also with boiler already installed



Boiler section related to body with FOX type firebox



IML electric panel board  
(floor standing version)

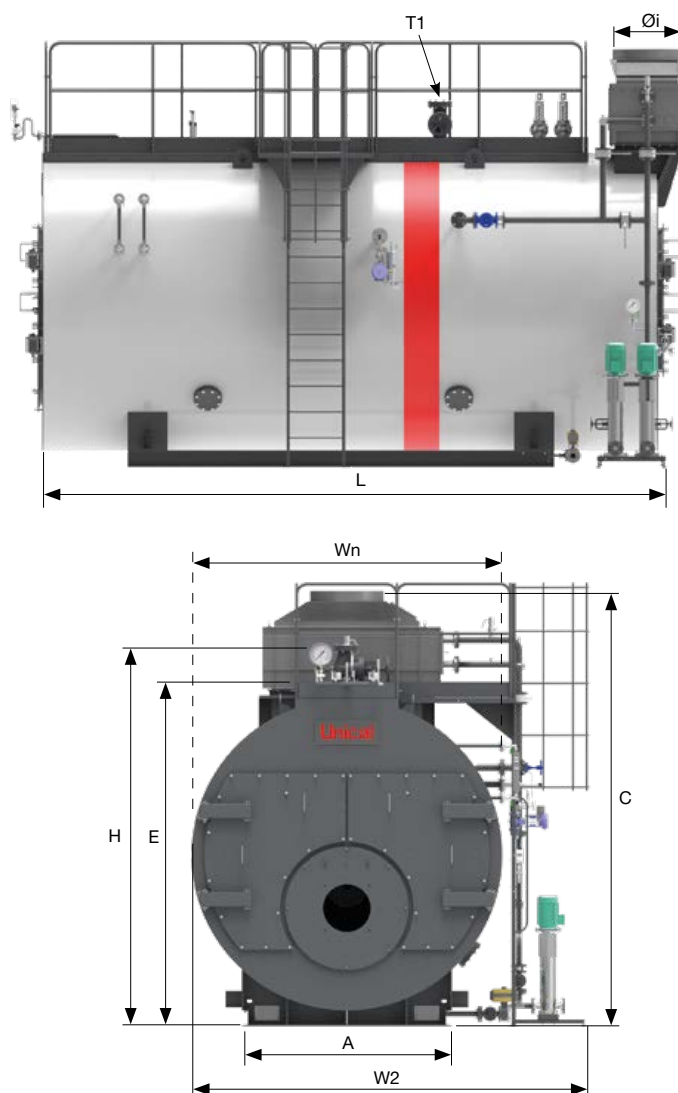


Very thick high  
quality insulation

- 1 Furnace (FOX type)
- 2 Inversion chamber
- 3 Tube bundles
- 4 Still water pipe
- 5 Economizer tube bundle (optional)



## DIMENSIONS



Model	Wn	W2	L	H	A	C	E	Øi	T1	Empty Weight	Total weight
	mm	mm	mm	mm	mm	mm	mm	mm	DN	kg	kg
2000	2250	2920	4120	2900	1440	3400	2600	401	65	9000	15130
2500	2250	2920	4120	2900	1440	3400	2600	401	80	9000	15130
3000	2250	2920	4600	2900	1440	3400	2600	451	80	10600	17380
3500	2250	2920	4950	2900	1440	3400	2600	451	80	12700	20150
4000	2450	3020	5000	3050	1570	3490	2690	501	100	15500	24720
5000	2450	3020	5320	3050	1570	3490	2690	501	125	16000	26180
6000	2700	3320	5730	3400	1725	3850	2950	551	125	17000	29880
7000	2700	3320	6030	3400	1755	3850	2950	651	125	19000	32715
8000	2995	3380	6210	3595	1755	4010	3110	701	125	23000	39630
10000	2995	3380	6610	3595	1755	4010	3110	701	150	24000	42100
12000	3175	3965	6850	3835	2000	4250	3350	801	150	31000	50500
15000	3175	3965	8200	3835	2000	4250	3350	801	200	38000	62300
18000	3400	4270	9000	4350	2300	4650	3750	951	200	44000	-
20000	3400	4270	9400	4350	2300	4650	3750	951	200	52000	-
25000	3600	4500	9900	4550	2500	4850	3950	1001	300	61000	-

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.