

# TVP 500

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## Steam production and supply



**The steam production and supply unit is delivered complete with instrumentation and with technical documentation and instructions. The unit is designed for various levels in the field of energy engineering process control.**

## *Suggested applications*

### ⇒ **Practical exercises on real elements of steam production and supply**

- Study of a complete plant for production and supply of steam
- Pre control, start up and adjustment
- Plant operating procedure
- Process parameters optimization
- identification of all components
- study of steam technologies (separator, steam traps, reducing valves, control valves...)
- Comparison of various technologies
- Preventive maintenance water quality check up
- Study of heat exchanges
- Study of the steam cycle
- Safety concepts about a process plant

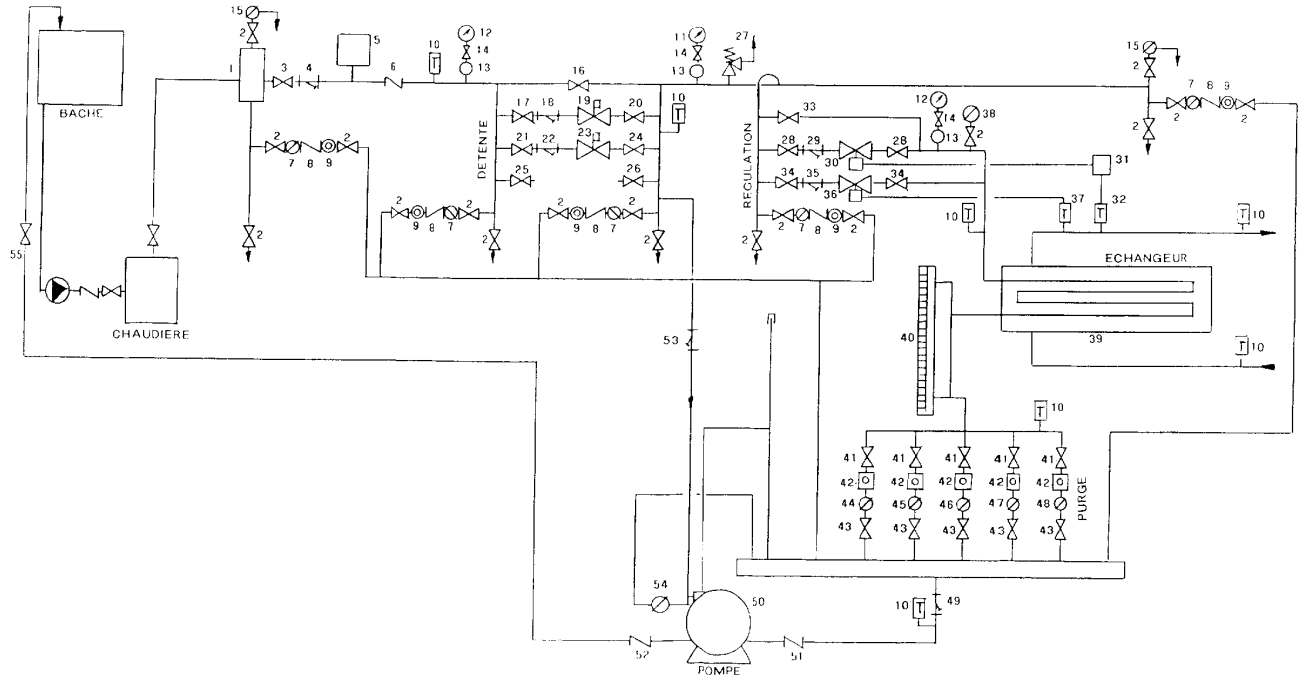
### ⇒ **Instrumentation**

- Balance, efficiency, power
- Measure of pressure, flows, levels et temperatures
- Gas analyze for exhausts
- Numeric controller for the water temperature
- Water treatment control

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## Description



- |       |  |    |  |
|-------|--|----|--|
| 1     | flange steel separator                   | 30 | temperature control valve 220 V 50 Hz DN 15                |
| 2     | Ball valve                               | 31 | Electric controller- output 4-20 mA - input Pt 100 Ω       |
| 3     | Ball valve                               | 32 | 1/2" Pt 100 probe – 3 wires                                |
| 4     | flange cast iron filter                  | 33 | piston by pass valve                                       |
| 6     | check valve                              | 34 | piston valve   |
| 7     | Thermodynamic steam trap                 | 35 | iron filter  |
| 8     | check valve                              | 36 | iron thermostatic valve                                    |
| 9     | Glass sight flow indicator               | 37 | Capillary thermostat 2 metres – stainless steel finger bar |
| 10    | Thermometer                              | 38 | vacuum breaker   |
| 11-12 | Manometer                                | 39 | tubular heat exchanger                                     |
| 13    | steel bend for manometer                 | 40 | magnetic level gauge                                       |
| 14    | Steel valve for 1/2" manometer           | 41 | valve  |
| 15    | air trap                                 | 42 | Flow detector  |
| 16    | piston by pass valve                     | 43 | check valve  |
| 17    | stop valve                               | 44 | Inverted bucket steam trap                                 |
| 18    | iron filter                              | 45 | thermodynamic steam trap                                   |
| 19    | Pilote operated reducing valve           | 46 | Balanced pressure steam trap                               |
| 20    | valve                                    | 47 | bimetallic steam trap                                      |
| 21    | piston valve                             | 48 | Ball float steam trap                                      |
| 22    | iron filter                              | 49 | filter   |
| 23    | direct acting independent reducing valve | 50 | Condensate return pump                                     |
| 24    | piston valve                             | 51 | inlet check valve for pump                                 |
| 25    | iron piston valve                        | 52 | outlet check valve for pump                                |
| 26    | iron piston valve                        | 53 | filter   |
| 27    | Safety valve                             | 54 | Steam trap   |
| 28    | valve                                    | 55 | valve  |
| 29    | iron filter                              |    |  |

## Description des éléments

### Steam boiler:

Steam flow : 250kg/h

Working pressure : 9 bars

Burner feeding : Natural gas or fuel (on demand)

Working mode : permanent presence

The boiler come with :

- pressure manometer
- two level glass sights
- safety valve
- draining valve
- check valve and feeding valve on the water circuit
- electric cabinet with audible alarm
- water level controller
- pressure controller

Dimensions : 2032x1561x1694mm

Working weight : 1700Kgs

### Utilities skid :

It comes with :

- electric cabinet supplying power to all the elements
- water feeding line with a water meter, a backflow preventer, a filter, a manometer, a pressure reducer and all necessary
- a volumetric softener with salt tank
- some valves for samples
- water tank (250L) made of stainless steel with lateral level sight
- a dosing pump

### Steam supply :

It comes with

#### *Steam feeding :*

- it is connected to the boiler outlet
- it includes a water separator
- it includes a Y filter
- it includes a vortex flow meter (steam flow)
- it includes pressure and temperature measurements
- condensates are pumped back to the water tank

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## *Reducing valves:*

- the line allows to test two different reducing valves
- each reducing valve has a stop valve before and after and a Y shaped filter
- two different technologies are used (pilot operated pressure reducing valve and direct acting reducing valve)
- a third line with a valve allows to bypass reducing valves

## *Control valves :*

- the line allows to test two different control valves
- valves control the steam flow, depending from the water temperature at the outlet of the exchanger
- each control valve has a stop valve before and after and a Y shaped filter
- there is an electric actuator and a mechanical actuator
- a third line with a valve allows to bypass control valves

## *Steam condenser :*

- the exchanger is tubular type and is cooled with water
- the cooling power is designed to fit with the maximal steam flow generated by the boiler (about 130KW)
- it is equipped with temperature sensors on the different circuits
- it is equipped with a water flowmeter
- it includes a vacuum breaker to avoid degradation when the steam condensates
- condensates go to steam traps

## *Steam traps :*

- the line includes five steam traps
- each steam trap consists in a different technologie (thermodynamic, inverted bucket, bimetallic, ball float and balanced pressure)
- each steam trap is equipped with a sight glass and stop valve
- condensates go back to the water tank

## *Water cooling circuit :*

- Cooling unit outside
- the cooling circuit includes a centrifugal pump
- Cooling unit :
- Average power : 140KW
- local electric cabinet with emergency stop
- fans are controlled by a temperature switch
- the structure is corrosion resistant
- fans are protected
- stop valves on the outlet and inlet
- drain valve

## *Others characteristics :*

- the equipment include a pump (operated by steam) for condensate return
- the equipment also include a blowdown tank.
- the equipment will be fitted to laboratory

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## *Dimensions (standard)*

length : 6 m  
width : 5 m  
height : 2,3 m  
weight : 3,2 t

## *Utilities*

Water : 3 bars – 30L/min  
Natural gas : 300mbar or Fuel (250L)  
Electricity : 400VAC threephased+neutral+earth-32A  
Smoke exhaust : 125 mm chimney  
Water drain on the floor

Utilities must be placed at 3 meters from the equipment (maximum)



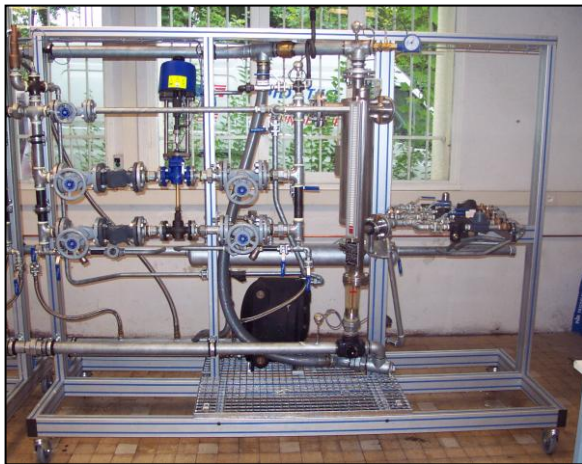
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Chaudière vapeur



Ligne d'essai de détendeurs



Ligne d'essai de vannes de régulation et condenseur



Aérotherme de dissipation



Ligne d'essai de purgeurs



Skid d'utilité

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