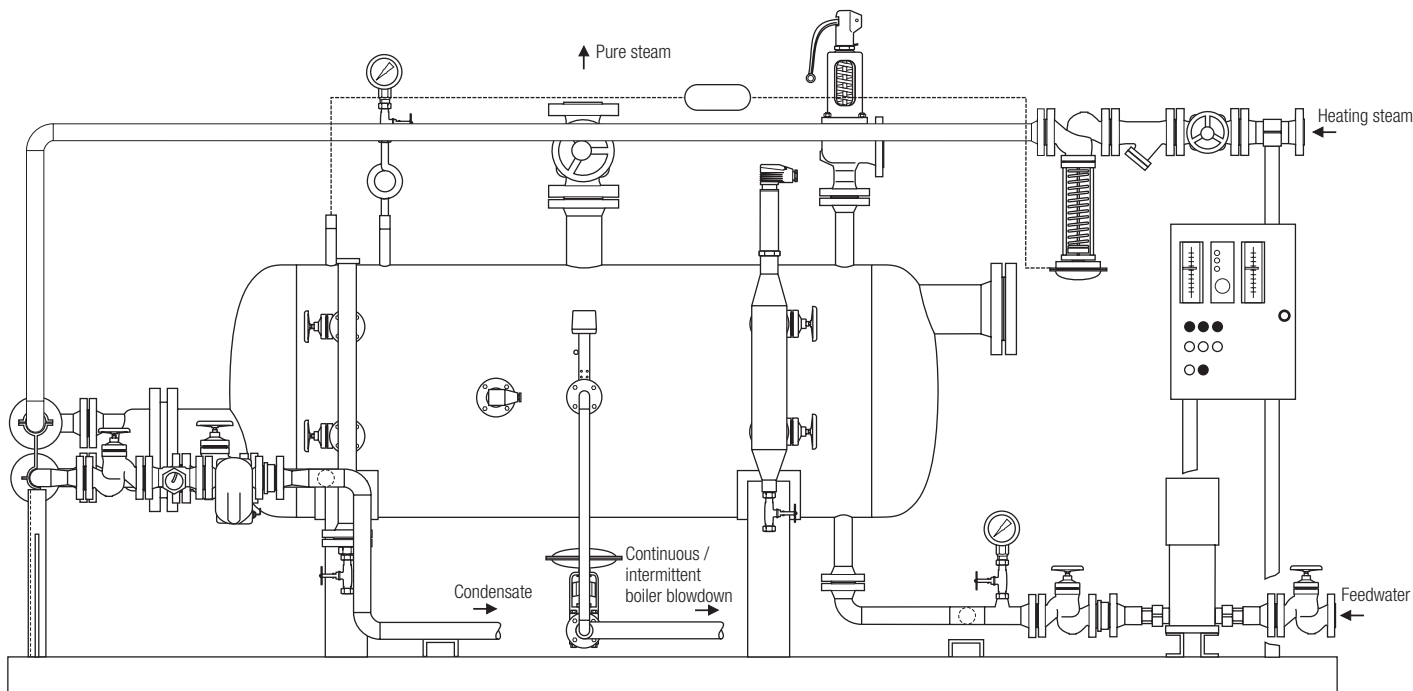


## Steam Regenerator Pure Steam Generator



### Description

Steam regenerators produce saturated steam from steam or hot water for a secondary steam system.

They are mainly used for generating pure steam that must not contain any harmful substances such as hydrazine.

Steam generators / regenerators are used in sterilisation units in hospitals, steaming and drying chambers in the foodstuff industry, steam heating systems for the production of distillates and many other fields of applications.

### Design

GESTRA Steam Generators / Regenerators are normally of the horizontal type and mounted on a base frame when supplied. According to the requirements made on steam quality these units can be made from steel or stainless steel. The units are designed, sized and manufactured in compliance with PED 97/23/EC and Bulletin AD 2000.

### Limiting conditions

|                     |                 |      |
|---------------------|-----------------|------|
| Service pressure    | primary [bar]   | 28   |
| Service temperature | primary [°C]    | 250  |
| Service pressure    | secondary [bar] | 12   |
| Service temperature | secondary [°C]  | 200  |
| Capacity range      | [kW]            | 5000 |
| Feedwater quality   | [µS/cm]         | *)   |

\*) If used as secondary steam generator, feedwater quality according to TRD.

If used as pure steam generator, feedwater quality according to EN 285.

Units for higher pressures, temperatures and capacities available on request.

### Supply options

1. Steam regenerator without accessories.
2. Steam regenerator with all accessories (supplied but not mounted).
3. Steam regenerator equipped with all accessories, completely mounted on a base frame.

Dimensions and weights

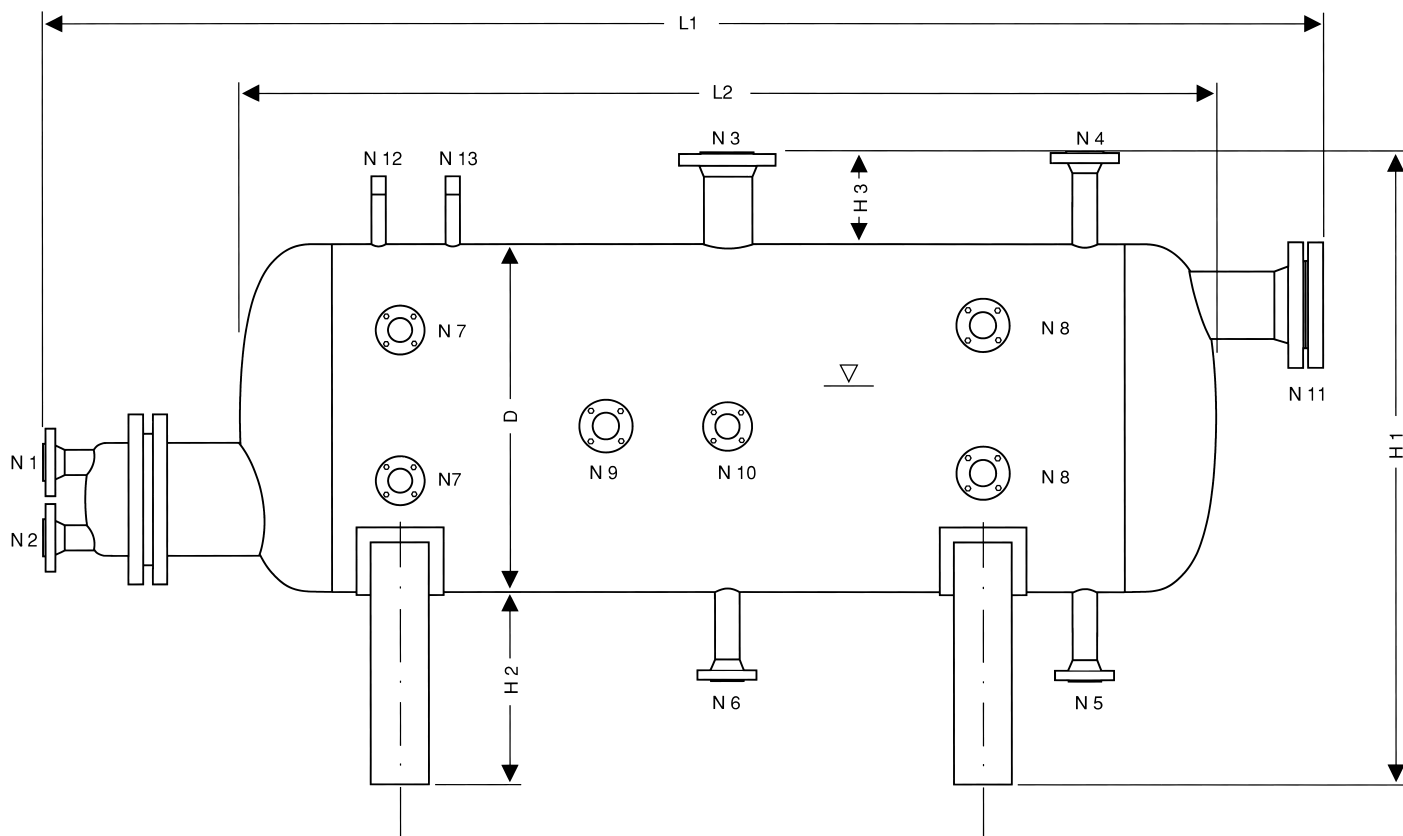
|                                          |                |                                                  |      |      |      |      |      |      |      |      |      |      |                                      |
|------------------------------------------|----------------|--------------------------------------------------|------|------|------|------|------|------|------|------|------|------|--------------------------------------|
| GESTRA Steam Regenerator type GDE / GRDE |                | 4                                                | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   |                                      |
| Capacity [kW] *)                         |                | according to operational data and heating medium |      |      |      |      |      |      |      |      |      |      |                                      |
| Dimensions [mm]                          | D              | 400                                              | 450  | 500  | 600  | 700  | 800  | 900  | 1000 | 1100 | 1200 | 1300 | larger steam regenerators on request |
|                                          | L 1 *) approx. | 2300                                             | 2300 | 2800 | 2500 | 3000 | 3500 | 4000 | 4500 | 4500 | 4800 | 4800 |                                      |
|                                          | L 2 *) approx. | 1800                                             | 1800 | 2300 | 2000 | 2500 | 3000 | 3500 | 4000 | 4000 | 4200 | 4200 |                                      |
|                                          | H 1 approx.    | 1056                                             | 1120 | 1158 | 1260 | 1360 | 1450 | 1550 | 1650 | 1750 | 1850 | 1950 |                                      |
|                                          | H 2            | 500                                              | 500  | 500  | 500  | 500  | 500  | 500  | 500  | 500  | 500  | 500  |                                      |
|                                          | H 3            | 150                                              | 150  | 150  | 150  | 150  | 150  | 150  | 150  | 150  | 150  | 150  |                                      |
| Standpipe dimensions [mm]                | N 1 *)         |                                                  |      |      |      |      |      |      |      |      |      |      |                                      |
|                                          | 2 *)           |                                                  |      |      |      |      |      |      |      |      |      |      |                                      |
|                                          | 3 *)           |                                                  |      |      |      |      |      |      |      |      |      |      |                                      |
|                                          | 4 *)           |                                                  |      |      |      |      |      |      |      |      |      |      |                                      |
|                                          | 5 *)           |                                                  |      |      |      |      |      |      |      |      |      |      |                                      |
|                                          | 6              | 20                                               | 20   | 20   | 20   | 20   | 20   | 20   | 25   | 25   | 25   | 25   |                                      |
|                                          | 7              | 20                                               | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   |                                      |
|                                          | 8              | 20                                               | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   |                                      |
|                                          | 9              | 20                                               | 20   | 20   | 20   | 20   | 20   | 20   | 25   | 25   | 25   | 25   |                                      |
|                                          | 10             | 15                                               | 15   | 15   | 20   | 20   | 20   | 20   | 25   | 25   | 25   | 25   |                                      |
|                                          | 11             | 100                                              | 100  | 100  | 125  | 125  | 125  | 125  | 150  | 150  | 150  | 150  |                                      |
|                                          | 12             | G ½                                              |      |      |      |      |      |      |      |      |      |      |                                      |
|                                          | 13             | G ½                                              |      |      |      |      |      |      |      |      |      |      |                                      |
| Approx. weight [kg]                      |                | 450                                              | 700  | 800  | 900  | 1000 | 1100 | 1300 | 1500 | 1800 | 2200 | 2400 |                                      |

Connecting standpipes (if not stated otherwise) provided with flanges PN 16 or PN 40, EN 1092-1

Boiler saddle if body diameter exceeds 600 mm

\*) Thermal capacity, connecting standpipe, overall length and weight are established according to the operational data and the heating medium

## GESTRA Steam Regenerator type GDE / GRDE



### Connections

|      |                                             |
|------|---------------------------------------------|
| N 1  | Heating steam (hot water or thermal oil IN) |
| N 2  | Condensate (hot water or thermal oil OUT)   |
| N 3  | Steam outlet *)                             |
| N 4  | Safety valve                                |
| N 5  | Feedwater inlet                             |
| N 6  | Draining / Intermittent blowdown            |
| N 7  | Level indicator                             |
| N 8  | Level control                               |
| N 9  | Conductivity electrode                      |
| N 10 | Continuous boiler blowdown                  |
| N 11 | Inspection hole                             |
| N 12 | Sensing line (for pressure regulator)       |
| N 13 | Pressure gauge                              |

\*) Steam outlet (provided with steam dome if requested)

## Steam regenerator Pure steam generator

### Steam regenerator unit, consisting of:

- ➊ Steam regenerator GDE/GRDE
  - ➋ Pressure-reducing valve 5801
  - ➌ Strainer GSF
  - ➍ Shut-off valve GAV
  - ➎ Float trap UNA
  - ➏ Vaposcope VK
  - ➐ Non-return valve RK
  - ➑ Shut-off valve GAV
  - ➒ Pressure gauge assembly
  - ➓ Magnetically operated liquid level gauge
  - ➔ Full-lift spring-loaded safety valve
  - ➕ Shut-off valve GAV
- 
- ➑ Level electrode NRG
  - ➒ Level pot
  - ➓ Shut-off valve GAV
  - ➔ Amplifier NRS
  - ➕ Strainer GSF
  - ➑ Shut-off valve GAV
  - ➒ Non-return valve RK
  - ➓ Feedwater pump
  - ➔ Non-return valve RK
  - ➕ Shut-off valve GAV
  - ➑ Shut-off valve GAV with regulating cone
  - ➒ Pressure gauge assembly
  - ➓ Pump control NRSP
- 
- ➓ Programme-controlled blowdown equipment TA
  - ➔ Rapid-action intermittent blowdown valve MPA
  - ➕ Non-return valve RK
  - ➑ Conductivity electrode LRG
  - ➒ Continuous blowdown controller LRR
  - ➓ Continuous blowdown valve BAE
  - ➔ Non-return valve RK

Supply in accordance with our general terms of business.

### Description

The GESTRA steam regenerator as the horizontal version consists of a cylindrical vessel, in which a heating tube bundle with front head is installed in the lower part through a standpipe. The feedwater level in the vessel reaches 5 – 15 cm above the tube bundle.

The heating medium (steam or hot water) flows through a control valve into the tube bundle, where it transfers its thermal energy to the water surrounding the tube bundle. The amount of water evaporated depends on the amount of heat transferred. The steam is extracted after passing through a steam separator that separates the water from steam. The required steam pressure is adjusted by means of a mechanical control system (position according to design). If high accuracy of the steam pressure is of prime importance an electrical or pneumatic control system can be implemented.

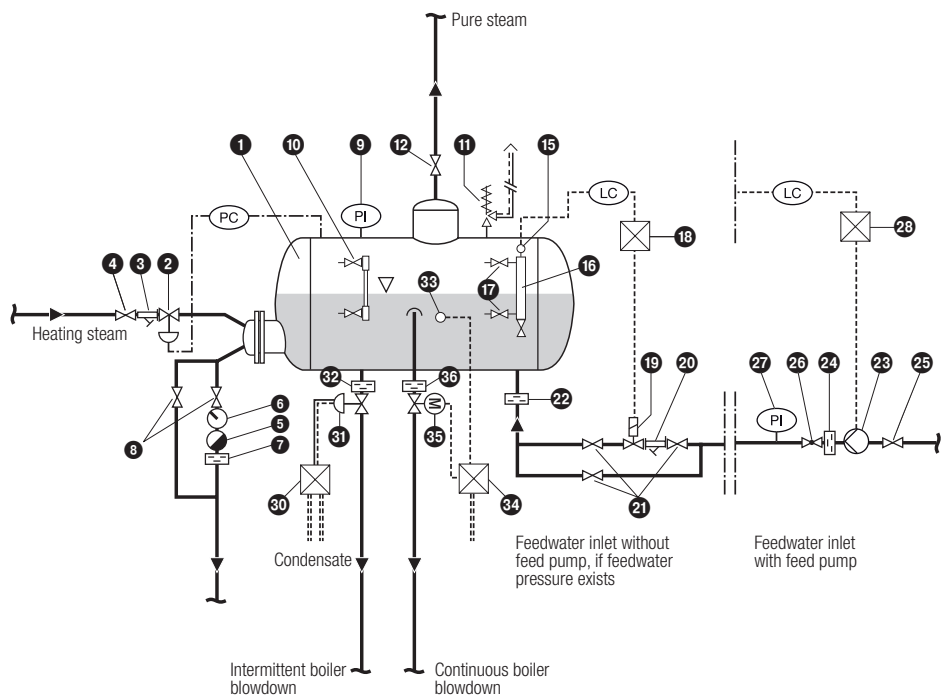
On the secondary side, the steam regenerator is protected against excessively high pressure by a safety valve.

The condensate formed in the tube bundle is discharged by a float trap.

Feedwater is made up by the feedwater supply control. The feed pumps are protected against running dry by a level electrode (installed in the feedwater tank) used in conjunction with an amplifier.

As a result of the continuous evaporation process the salt and impurity concentrations in the water increase. They might lead to foaming and priming of the steam regenerator and even settle as sludge deposits on the bottom of the tank and cause corrosion. To avoid this the steam regenerators are provided with automatically or manually operated continuous and intermittent blowdown valves.

### Schematic representation of steam regenerator unit



For more detailed specification texts for steam regenerator units see folder "GESTRA Specification Texts".

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