

**STEAM JET HEATERS****For installation in pipelines****GER type**

The Giudici Steam Jet Heater for liquids type GER to be installed in pipeline, is a static mixer of steam and water or other liquids.

Both the sensible and latent heat of the steam is fully dissipated within the liquid, making Giudici instantaneous jet heater very efficient. Depending on its enthalpy and the water outlet temperature, each kg of steam releases about 550-650 kcal.

In general, the maximum temperature of the heated liquid must be at least 10 ° C below the saturation temperature of the liquid (beyond this temperature flashing can cause vibration and noise).

Conceived to connect directly to the water and steam line, the heater mixes cold water and steam, instantly raising the temperature of the liquid to the required values.

The heater consists of a body and an interchangeable condensing nozzle.

The inline flow of the liquid allows the handling of dense fluids or liquids with suspended solids.

The flow rate of the liquid to be heated must be constant in order to allow the correct sizing of the temperature regulation system.

This kind of heater are designed to combine the two streams, silently and instantaneously to prevent undue noise and wear normally associated with steam collapse.

The fluid to be heated is usually water; otherwise the density and heat capacity of the fluid must be considered.

## Mode of operation

Pressurized cold liquid is introduced to the inline steam heater and is immediately accelerated to the combining nozzle, resulting in a local pressure drop.

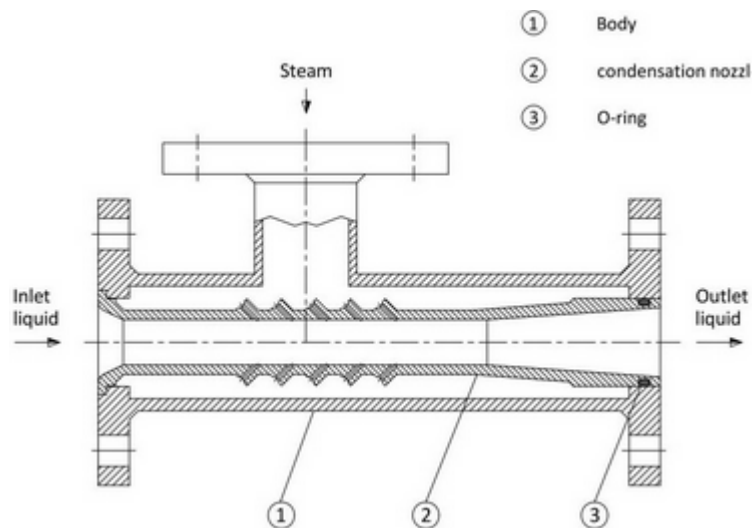
Pressurized steam enters in the heater and is discharged into the liquid at high velocity, via a number of jets around the combining cone, dividing into finer bubbles to provide better heating.

The condensation nozzle consists in principle, a cylinder with holes bored in it to allow steam to pass through.

The steam pressure at the inlet flange of the inline heater must be adequate to overcome the liquid pressure to avoid that liquid enters the steam line causing noise and vibrations.

The liquid pressure drop only occurs when no steam is flowing, on start up or when no heating is required.

During normal operation, the pressure drop is recovered by boost effect of the steam that push liquid and by venturi effect of the diffuser.



## Application

Inline GER heaters are used in all those processes in which the condensation of water vapor in the liquid to be heated is possible.

Common uses are in the food industry (pre-heating of juices and milk to be pasteurized, brewery), chemical (reactor jacket water heating), pharmaceuticals, paper pulp, slurry heating, and wherever large flow rates of hot process water are required (laundries, tanneries, industrial washing in general).

## Construction

Usual construction is completely stainless steel (AISI 304 or AISI 316)

Inline heater may be coated with Teflon (in this case condensation nozzle is in PTFE) or made of corrosion resistant metal (titanium, monel, Hastelloy) for handling the heating of the specific fluid.

Inline mixer can be supplied with any type of connections, flanged screwed or clamped.

On request, the appliance can be supplied complete with connections for any drainage.



## Installation

Inline steam heater GER type can be installed in both horizontal and vertical pipes, as the assembly does not affect their operation.

The steam pipe connected to the inline heater should be horizontal or flowing down if vertical.

A vertical steam line with upward flow is not recommend.

The steam valve shall be provided for directly at the steam connection.



## Start up

Open the valve at the outlet hot liquid and, subsequently, open the valve upstream of the mixer; check that the liquid flow rate corresponds to the design data.

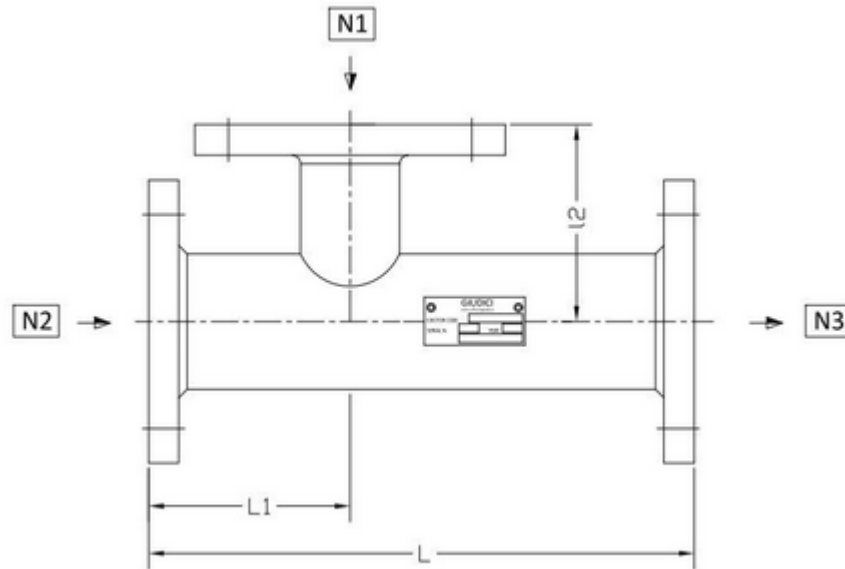
Slowly open the steam supply valve until the defined pressure is reached.

Check that the liquid outlet temperature is fully operational.

Any temperature regulator will automatically adjust the flow of steam.

To stop operating it is necessary to first close the steam valve, then the incoming water valve, at the end the outlet one.

**Overall dimensions and performance chart**



Mod.	Steam flow rate (Kg/h)	Liquid flow rate (m <sup>3</sup> /h)	Connections EN 1092-1		Dimensions (mm)			Weight (kg)
			DN N1	DN N2-N3	L	L1	L2	
GER11	200	3.0	25	25	230	70	80	6.0
GER22	335	5.0	32	32	260	100	100	10.0
GER33	540	8.0	40	40	300	110	115	12.0
GER44	810	12.0	50	50	325	115	120	15.0
GER55	1350	20.0	65	65	360	120	125	26.0
GER66	2150	32.0	80	80	440	130	135	35.0
GER77	3630	54.0	100	100	500	150	140	40.0

The indicated flow rates are calculated for liquid heating from 20 ° C to 60 ° C, with saturated steam at 3 bar g. and water at 1 bar g.

In the event that the operating data are different from the values mentioned above, we invite you to specify the following data:

- characteristics of the liquid to be heated (type, pressure, flow rate and temperature)
- pressure of the steam and output temperature requested

Request the specific form for operating data to be returned to us filled in.