

GESTRA Steam Systems

Product Range C

Desuperheater Injection Cooler EK (Spray-Type Attenuator)

EK

Description

The GESTRA injection cooler EK is a water spray desuperheater that reduces the temperature of superheated steam. It consists of three components:

- Inlet module for creating a turbulent flow pattern
- Cooling module with annular water-spray nozzles
- Cooling leg module with thermal jacket for preventing cracks caused by thermal shock, integral flow rectifier and excess water separator

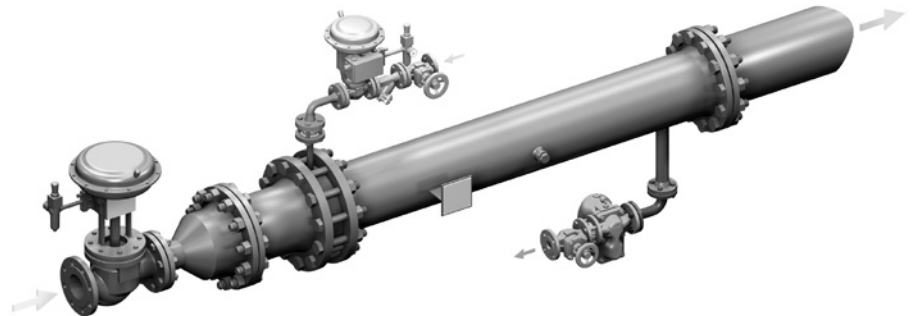
The GESTRA injection cooler is basically designed as a complete system, but individual components are also available for installations with favourable operating parameters.

To ensure correct sizing of the injection cooling system we need to know all relevant operating parameters.

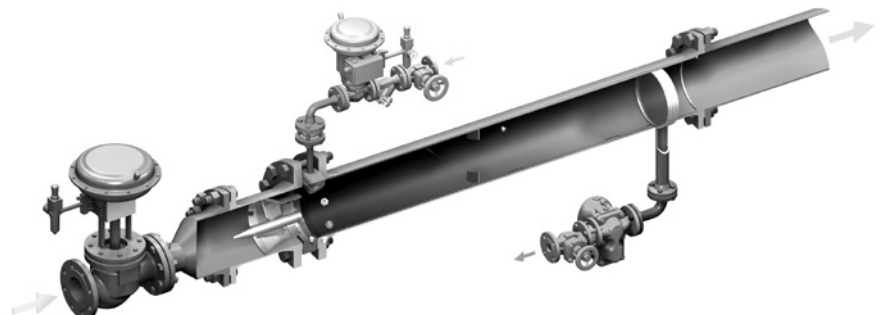
Function

Superheated steam is passed through the control valve and into the desuperheater. First the steam flows into the inlet module (confuser) equipped with a guiding device, where it is accelerated and set in swirling and twisting motion. The cooling water (usually condensate or completely demineralised make-up water) is atomised into a fine mist of droplets by injecting it through a special nozzle ring and/or nozzle body directly into the swirling steam flow. As the cooling water evaporates in the cooling leg it absorbs thermal energy from the superheated steam. Any excess cooling water that has not been evaporated is collected in the separator and discharged by a steam trap (optional extra). The cooling leg module is provided with a thermal jacket for preventing cracks due to thermal stress.

The turndown ratio of the injection cooler EK is 5:1, in special cases 10:1. By using the GESTRA injection cooler EK superheated steam can be cooled down to 5 K above saturated steam temperature.



Injection cooler EK with accessories



Injection cooler EK, sectional view

Design

Injection cooler EK:

Made from steel grade P235GH, P265GH or 16Mo3,
Injection cooler, horizontal design, for installation in
horizontal steam pipes

Inlet module with guiding device,

Cooling module (nozzle ring and/or nozzle body),

Cooling leg module with thermal jacket, separator for
excess water, flow rectifier and connection for steam trap

Complete injection cooling system EK or individual modules
with basic coating, ready for installation, without installa-
tion and without support frame

Accessories (steam traps & valves, sensors and control
equipment) available at extra charge.

Other designs and special versions available on request.

Technical Data

Service pressure / service temperature

25 bar / 400 °C

21 bar / 470 °C

Capacity / steam mass flow

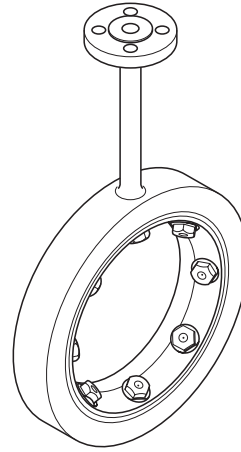
0.5 t/h up to 100 t/h

Turndown ratio 1:5, in special cases 1:10

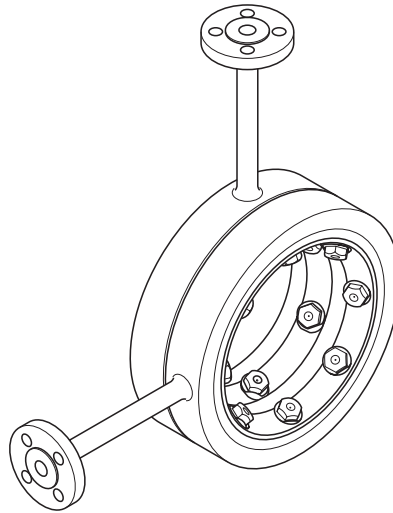
Higher pressures, temperatures, mass flows and turndown
ratios on request.

Technical Data

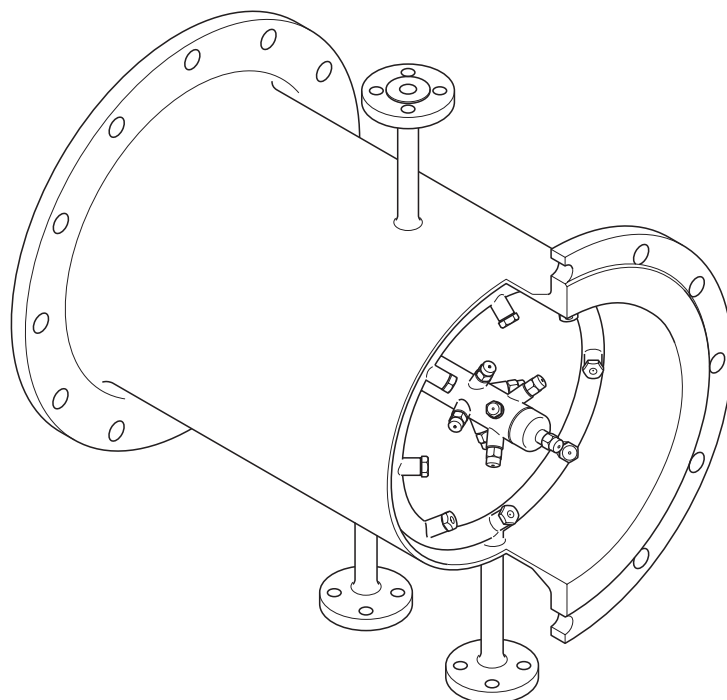
Injection cooler EK



Nozzle ring: single-stage cooling

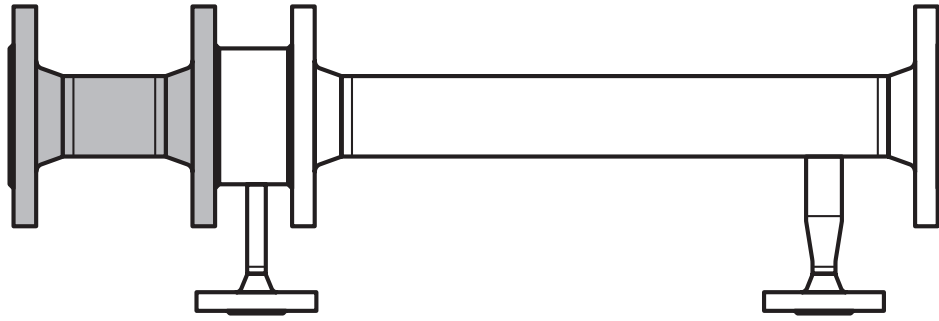


Nozzle ring: two-stage cooling

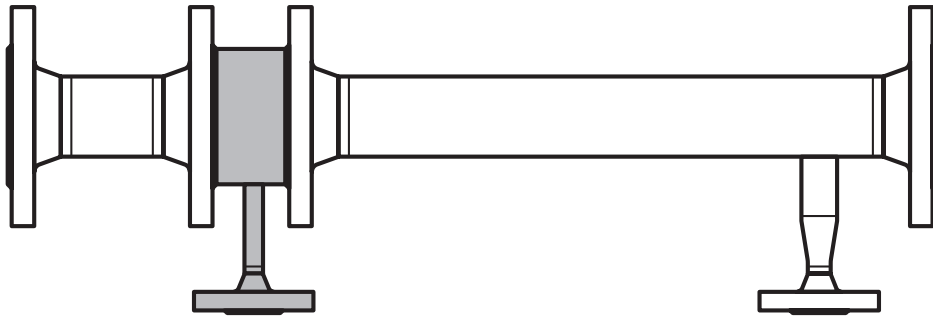


Nozzle ring and nozzle body: three-stage cooling

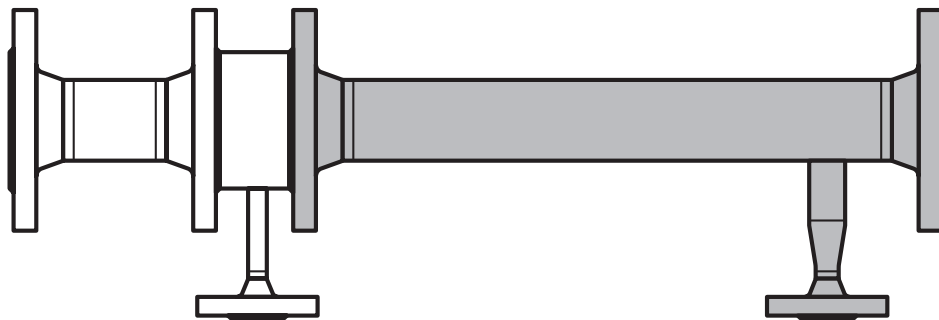
Schematic representation
Injection cooler EK



Inlet module with integrated guiding device



Cooling module: Design with single or double nozzle ring or double nozzle ring with nozzle body



Cooling leg module with thermal jacket for preventing cracks caused by thermal shock, integral flow rectifier and excess water separator

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Important Notes

The quality of the cooling water must be at least like that of condensate! Cooling water temperature at inlet $\geq 100^\circ\text{C}$. Desuperheater made from stainless steel: The chloride content of the make-up water and the return condensate must not exceed 50 mg/l (conductivity 250 $\mu\text{S/cm}$).

Order & Enquiry Specification

GESTRA Desuperheater
System: Injection cooler EK

Superheated steam flowrate

Steam pressure upstream of desuperheater / reducer valve

Steam temperature upstream of desuperheater / reducer valve

Steam pressure downstream of desuperheater

Steam temperature downstream of desuperheater

Cooling water temperature

Cooling water pressure

Steam pressure control mechanical / electric / pneumatic

Cooling water supply via control valve / control valve and pump

Material of desuperheater

Completely equipped with accessories yes / no

Partly equipped

Special version yes / no

Please enter data or delete if not applicable.

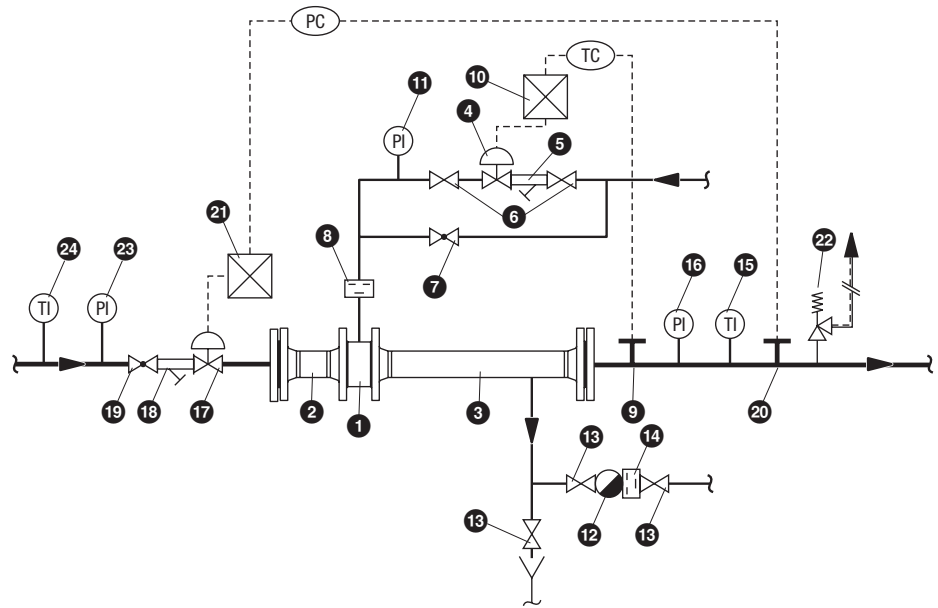
Refer to the folder "GESTRA Specification Texts" for more detailed specification.

PED (Pressure Equipment Directive)

The equipment meets the requirements of the Pressure Equipment Directive 97/23/EC and the AD 2000 Bulletins in compliance with the conformity assessment. For applications with fluids of group 1 and 2. With CE marking (apart from equipment according to section 3.3 that is excluded from the scope of this directive). For more information please refer to our PED Declaration of Conformity.

Supply in accordance with our general terms of business.

Schematic arrangement



Key

- | | |
|--|---|
| 1 Cooling module | 13 Shut-off valve GAV |
| 2 Inlet module | 14 Non-return valve RK... |
| 3 Cooling leg module | 15 Machine thermometer |
| 4 Control valve for cooling water | 16 Pressure gauge unit |
| 5 Strainer GSF.. | 17 Control valve |
| 6 Shut-off valve GAV | 18 Strainer GSF.. |
| 7 Shut-off valve GAV... with throttling cone | 19 Shut-off valve GAV... with throttling cone |
| 8 Non-return valve RK... | 20 Pressure gauge measuring transducer |
| 9 Temperature sensor | 21 Universal controller |
| 10 Universal controller | 22 Safety valve GSV.. |
| 11 Pressure gauge unit | 23 Pressure gauge unit |
| 12 Ball float trap UNA... | 24 Machine thermometer |

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