D400 series

Nozzle Spray Desuperheater Station

D400 Series

The KCL Valve Pipeline Desuperheater Systems provide a convenient method of reducing superheated steam or other vapours to temperatures approaching saturation. The super heated fluid passes through a section of pipe into which is fitted the D400 series nozzle protrudes into the flow path. The nozzle introduces coolant flow in the same direction as the super heated fluid.

Standard Specification

Straight way & Angle body Cage Guided style

	D410S	D410M	D420
Turndown Ratio	25:1	25:1	5:1
Type of Atomizing	Velocity	Velocity	Mechanical
Minimum Outlet Temperature	Sat. + 6℃	Sat. + 6℃	Sat. ± 8℃
Mounting Orientation	Horizontal	Horizontal	Horizontal
ANSI Pressure Class	Max. 600Lbs	Max. 2500Lbs	Max. 2500Lbs
Main Header Size	6" ~ 36"	6" ~ 36"	1" ~ 4"
Ste.End Connections	Flanged or Welding	Flanged or Welding	Flanged or Welding
Velocity Limits	8~100m/sec~	8~100m/sec~	up to 12~100m/sec
Pressure Drop	3 psi nominal	3~5 psi nominal	Negligible
Required Coolant Pressure Steam Line Pressure	Min. 5barG	Min. 5barG	Min. 5barG
Required Coolant Pressure Steam Line Pressure	Min. 5barG	Min. 5barG	Min. 5barG
Distance to Temperature Sensor (DTS)	12m	12m	12m
Min. Straight Pipe Distance (Upstream)	7m	7m	7m

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Performance

- High efficiency atomization.
- High rangeability variable area spray unit.
- Accurate and repeatable control of fluid temperature to within 6C deg providing appropriate installation and instrumentation are uesd.
- High spray water Pressure capability.

Design

- Wide variation of design options.
- Wide range of available nozzle sizes.
- Erosion resistant materials of construction.
- Minimum number of components.
- Ease of installation.
- Fully rationalized.
- Wide range of actuating mechanism available.
- Excellent swired discharge nozzle.

D410S Variable Spray Nozzle

D410M Multiple Variable Spray Nozzle

D420 Variable Nozzle

D410SM Multiple Variable Spray Nozzle

Technical Data

Section of equipment the selection of optimum equipment and appropriate piping plan are necessary for realization of excellent temperature control. Direction for the selection of equipment and precautions for the piping plan are given in the following paragragh.

1. Desuperheater when selecting a desuperheater, it is necessary to know the type of equipmnet for which the desuperheated steam is used. Particularly, it is important to know the operation conditions such as the range or load fluctuation of the downstream equipment and the allowable range of drain.
It is also necessary to predict the cooling water condition, auxiliary steam condition, adn the transient conditions at start and stop of the plant. thus, when designing a new plant, the planner. It is desirable that the selection of the desuperheater and the composition of the control loop be determined through detailed discussion with the maker.

2. Control range required for the valve
In order to achieve a stable temperature control, the plan must be worked out so that the cooling water control valve can be smoothly operated over the entire range of load. The valve is required not only to control the cooling water needed during high load operation but also to sufficiently control the minimum volume of water during low load operation which is calculated through the enthalpy method. Generally, the steam temperature at the inlet of desuperheater tends to decrease with decrease in load, and the turn-down ratio required for the cooling water control valve (ratio of minimum controllable value Cv and maximum value Cv) is considerably greater than the turn-down ration of desuperheater.