VariCool

Variable Nozzle Desuperheaters

Integrated Cooling Water Valve

- No additional cooling water valve
- Excellent control: Integrated Logix 500si family responds to signal changes as low as 0.2%
- Total cooling water differential pressure is available at every load for optimal atomization.
- Class IV shut-off available
- Lower maintenance costs: No additional valve to service, lightweight integrated positioner/actuator/yoke design, easy installation with one-button calibration (under two minutes), small footprint.

APPLICATION

HIGH TURNDOWN

HIGH DIFFERENTIAL PRESSURE

HIGH VARIATIONS OF FLOW RATES

BENEFITS

Integrated Control Package

- **No cooling valve required**
- **Compact modular design**
- **Simple installation**
- **One-button calibration**
- **Quick-change trim**

Tight Process Control

- **Highest rangeability**
- **Patented nozzle design**
- **Ultra-fine atomization at all Δp**

Proven Technology

- **Large global installed base**
- **Utilizes standard control valve components**
- **Same world-class sales, service and support group you use for control valves**

Contact Flowserve for more information about *VaporCool* and *VariCool*
PHONE 801 489 8611 FACSIMILE 801 489 3719 WEB www.flowserve.com

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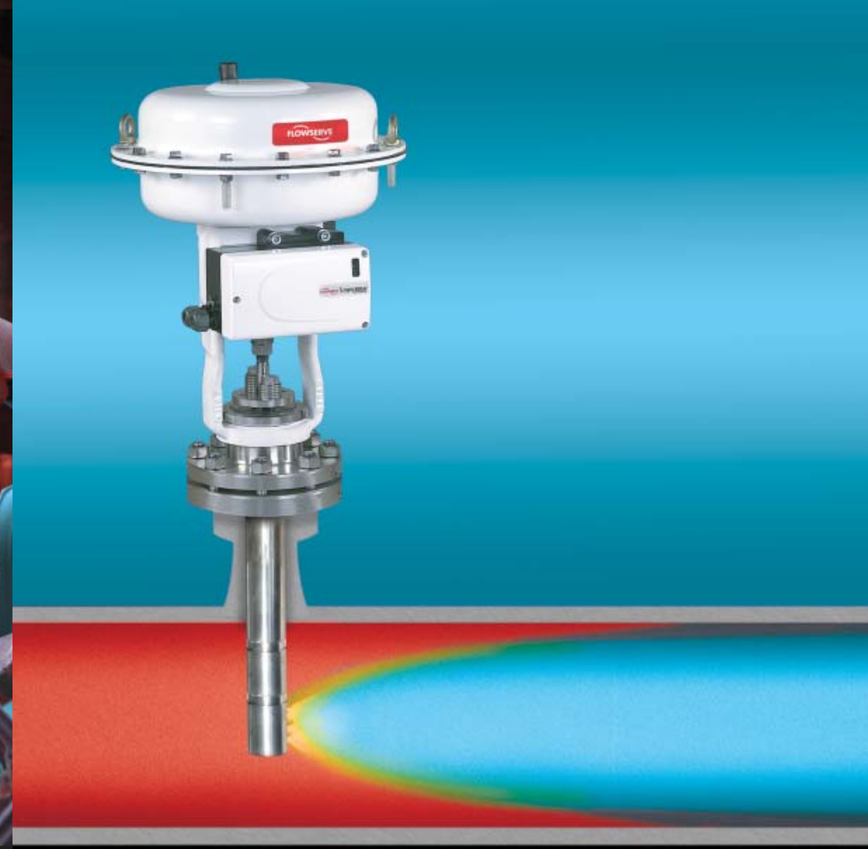


FLOWSERVE

Flow Control Division

VaporCool

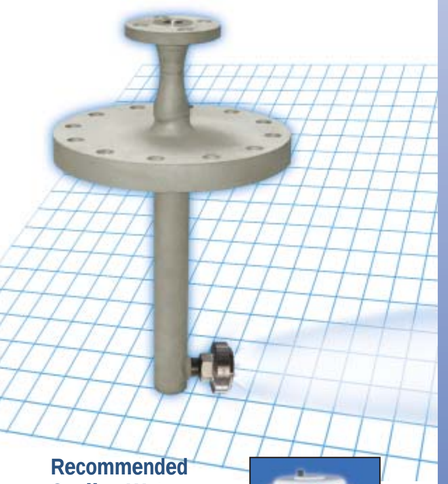
Fixed Nozzle Desuperheaters

VariCool

Variable Nozzle Desuperheaters

VaporCool

Fixed Nozzle Desuperheaters



APPLICATION

MODERATE TURNDOWN

LOW DIFFERENTIAL PRESSURE

HIGH COOLING WATER FLOW RATES

BENEFITS

Complete Atomization

- **Optimized for each application**
- **Lowest ∆p atomization available**
- **Multiple small spray nozzles**

Simple Design

- **No Moving Parts**
- **Quick-change multi-nozzle spray head**

All components from one supplier

- **Perfectly matched components**

Proven Technology

- **Large global installed base**
- **Years of desuperheating expertise**
- **Same world-class sales, service and support group you use for control valves**

Recommended Cooling Water Valves

ANSI Class 150-300: FlowTop

- Highest Cv available (save a valve size)
- Precise Control (0.2% signal change)
- One-button calibration (easy installation)
- TUV "No Maintenance" certified for up to five years

FLOWTOP

ANSI Class 150-4500: Mark 1

- Severe service trim available
- Precise Control (0.2% signal change)
- One-button calibration
- Industry's leading service life

MARK 1

FLOWSERVE
Flow Control Division
Desuperheater Solutions

VaporCool

Fixed Nozzle Desuperheaters

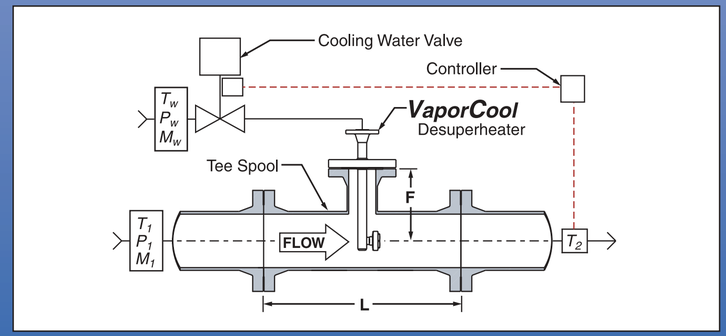
The ***VaporCool*** desuperheater cools process steam by injecting atomized cooling liquid directly into the steam.

Temperature reduction occurs as the atomized cooling liquid rapidly vaporizes into the process steam.

Tight temperature control is maintained by optimizing the temperature, velocity, geometry, and droplet size of the cooling mist to facilitate quick mixture with the process steam and to ensure complete vaporization.

Accurate control of varying process conditionsis achieved through precise throttling of the cooling liquid control valve in response to feedback from a controller and downstream temperature sensor.

Product specifications	*VaporCool*	*VariCool*
Pressure class:	150-2500	150-2500
Minimum ∆p:	40 psi	115 psi
Maximum ∆p:	1305 psi	
Minimum steam velocity:	40 ft/s	30 ft/s
Maximum steam velocity:	350 ft/s	200 ft/s
Maximum temperature:	986 °F	986°F
Mounting flange size:	3" to 12"	3" or 4"
Cooling water flange size:	0.5" - 4"	1" or 1.5"
Cv range:	0.06 - 20	0.15-7.37
Maximum rangability:	1:5	1:23
Maximum shut-off class:	V	IV
Size range:	Accommodates 4" to 48" diameter pipe	Accommodates 6" to 40" diameter pipe
End connections:	Flanged	Flanged
Body materials:	SS or CS	SS or CS
Available options:	T-spool with optional thermo shock pipe, steam trap, custom engineering	



FLOWSERVE
Flow Control Division
Desuperheater Solutions

VariCool

Variable Nozzle Desuperheaters

The ***VariCool*** desuperheater integrates the precision of a control valve into a desuperheater to attain maximum rangeability, responsiveness and control.

The multi-stage design of the piston tube allows the ***VariCool*** to manage a wide spectrum of differential pressures as it directly injects atomized cooling liquid to cool process steam.

Temperature reduction occurs as the atomized cooling liquid rapidly vaporizes into the process steam.

The patented, perforated, flow-to-close plug and the patented nozzle design maintain accurate control of varying process conditions through precise throttling of the cooling liquid control valve in response to feedback from a controller and downstream temperature sensor.