

DeZURIK
COPES-VULCAN
A unit of **SPX** Corporation

**SA-35 STEAM
ATOMIZING
DESUPERHEATER**

DeZURIK/COPES-VULCAN



The SA-35 was developed to obtain a more uniform spray pattern under varying load conditions where no pressure drop in the steam header can be tolerated. Steam atomizing allows for higher turndown (up to 25:1) with varying load conditions.

Operational Features

Cooling liquid is introduced into the steam header through a stainless steel nozzle assembly, which uniquely divides one large jet of liquid into many small jets. Just prior to entrance into the main header, each jet is bombarded by a higher pressure steam jet, creating a fine mist which enters the stream flow without the need of a thermal liner inside the main header.

The SA-35 Desuperheater thus reduces the size of the liquid particles so that the droplets can be quickly and efficiently evaporated. Downstream temperatures can be controlled to within 15°F (9°C) of saturation.

The stainless steel nozzle is machined from one piece and shoulders into the nozzle head so that it becomes completely trapped after assembly of the nozzle clamp which is screwed and seal welded to the nozzle head. Hard faced overlay in the nozzle head minimizes erosion wear.

The thermal sleeve around the liquid tube insures uniform expansion with the steam tube, thereby minimizing thermal stresses due to unequal elongation of the liquid and atomizing steam tubes.

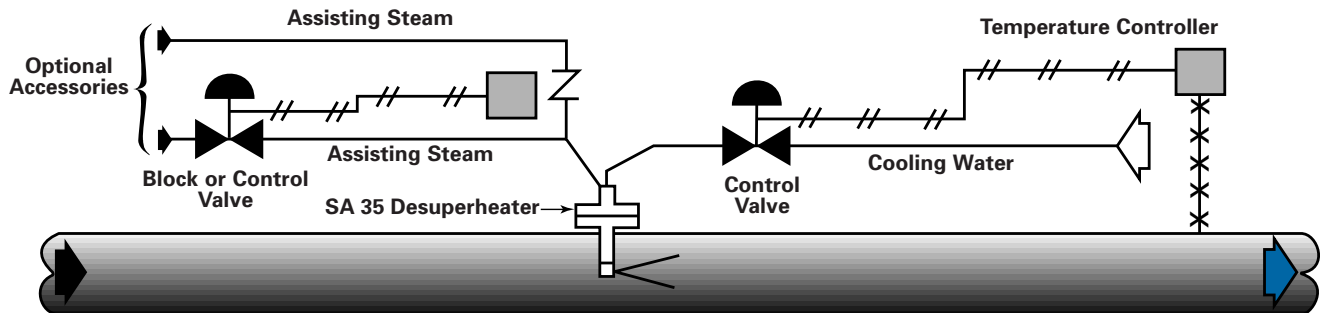
Due to its narrow silhouette, the SA-35 Desuperheater causes no appreciable restriction in the header.

This desuperheater is made in four sizes, in pressures classes up to and including class 1500. The cooling liquid is introduced through a series of small orifices which are drilled circumferentially into the nozzle. Small rectangular slots are milled ninety (90) degrees to the drilled holes. Atomizing steam passes through each of the slots and blasts each of the cooling liquid jets. Liquid pressure of only 10–40 psi (70–280 kPa) above header pressure is all that is necessary to introduce the cooling medium.

Atomizing steam flow is constant as the flow in the header decreases from maximum rate, until only atomizing steam is flowing. This results in improved atomization at low flows to offset the decreasing benefit obtained from the mixing and transporting capacity of the steam in the header at a reduced rate of flow.

This characteristic is unique, and is the reverse of most other types of desuperheaters.

Principle of Operation



Temperature impulse signal from controller actuates cooling water valve flow to desuperheater. Atomizing steam may require a pressure reducing valve and pressure controller or check valve only, depending upon atomizing steam source conditions.

Specifications

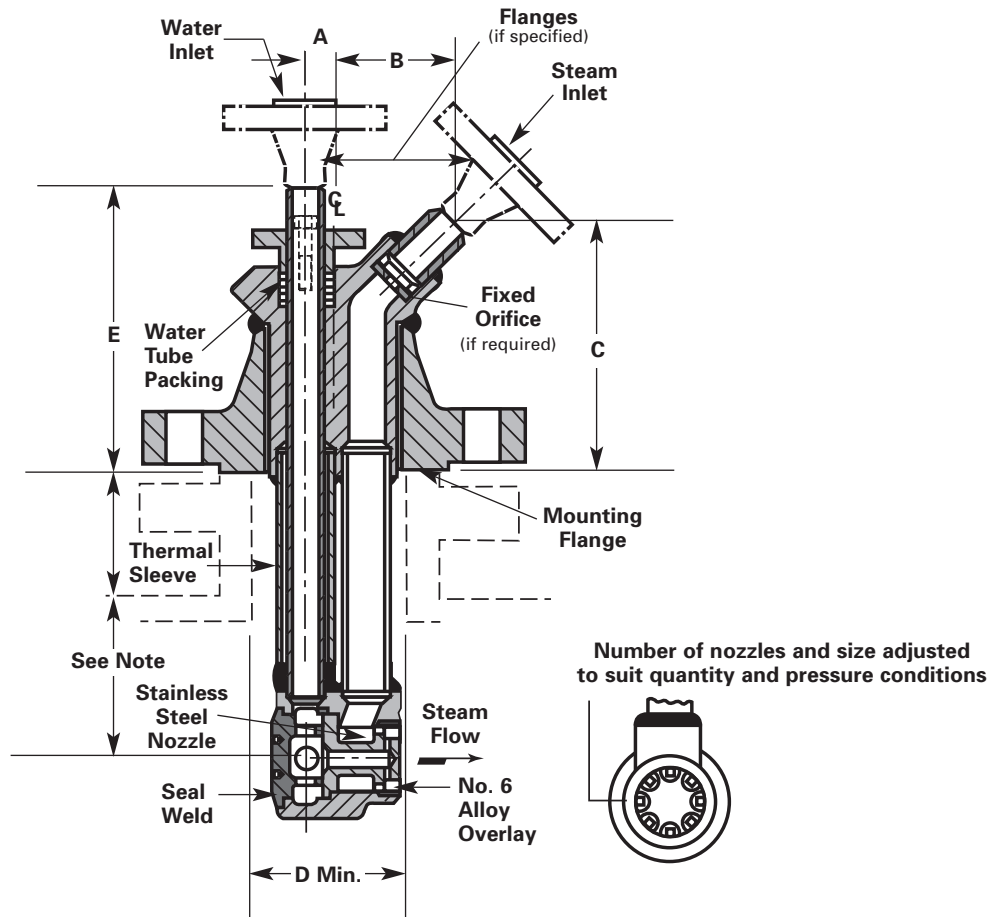
| Desuperheater Size | Dimensions (Inches) — All Header Sizes | | | | | | | | | | | | | | | | |
|--------------------|--|-------------|-------------|-------|-------|-------|-------|-------|------|---|-------------|-----|----|----------------------|----|-----|-----|
| | Mounting Flange | Water Conn. | Steam Conn. | A | B | C | | | | D | To 600 Std. | | | 900 & 1500 Std. | | | |
| | | | | | | 150 | 300 | 400 | 600 | | Min. | E | H | Conn. Pipes Schedule | C | E | H |
| 3-4 | 3 | .5 | .5 | .5 | 3.875 | 6.25 | 6.625 | - | 7 | 3 | 7 | 6 | 80 | 7 | 8 | 7 | - |
| 4-6 | 4 | .75 | 1 | .8125 | 4.25 | 6.75 | 7 | 7.5 | 8 | 4 | 9 | 6 | 80 | 8 | 10 | 7 | 160 |
| 6-8 | 6 | 1.25 | 1.5 | 1.125 | 5 | 7.875 | 8.25 | 8.75 | 9.25 | 6 | 10 | 6.5 | 80 | 10 | 11 | 8.5 | 160 |
| 8-10 | 8 | 2 | 2 | 1.375 | 6 | 8.5 | 8.875 | 9.375 | 10 | 8 | 11 | 7 | 80 | 11 | 13 | 9 | 160 |

NOTE: Any size desuperheater may be mounted on any header size larger than minimum size listed below.

Extension pipe lengths are varied to locate sprayhead at center of header up to maximum size listed. No increase is made for larger headers causing head to be slightly off center.

| Desuperheater Size | Header Size |
|--------------------|--------------------|
| 3-4 | 4-16" (100-400mm) |
| 4-6 | 6-18" (150-450mm) |
| 6-8 | 8-20" (200-500mm) |
| 8-10 | 10-24" (250-600mm) |

Dimensions



Products

Maxum™ Rotary Control Valves — Sizes 1–12" (25–300mm) for highly erosive services. Features high throttling accuracy and four flow capacity ranges.

Eccentric Plug Valves — Sizes 0.5–72" (15–1800mm) in a wide choice of materials and resilient plug facings.

HP Butterfly Valves — Sizes 2–48" (50–1200mm) for applications to 740 psi (5100 kPa), plus Intelli-Seal™ extra-tight metal, fire tested and PTFE seated models.

V-Port Ball Valves — Sizes 1–20" (25–500mm), pressures to 740 psi (5100 kPa) and temperature ratings to 1000°F (537°C). Flanged and flangeless designs.

Resilient Seated Butterfly Valves — Sizes 2–36" (50–900mm) in two styles with 175 and 225 psi (1210 and 1550 kPa) pressure ratings and wafer and lugged body styles.

AWWA Butterfly Valves — Sizes 3–120" (80–3000mm). Meets AWWA C504 standards.

3- and 4-Way Plug Valves — Sizes 3–16" (80–400mm) for shutoff and switching applications, plus a variety of body materials.

Metal Seated Full Port Ball Valves — Sizes 2–12" (50–300mm) are designed for trouble-free operation in digester blow-down applications and for handling corrosive liquids, gases and abrasive slurries.

Precision Electric Control Valves — Unmatched control accuracy provides up to 16,000 discrete repeatable throttling positions in 90° plug rotation. Accepts analog or digital signals. Sizes 4–20" (100–500mm).

Permaseal® Plug Valves — Sizes 0.5–6" (15–150mm) in ANSI Class 150 and 300 ratings. Body styles include 2-way, 3-way, jacketed, double block and bleed and flush through for corrosive and high temperature applications.

Knife Gate Valves — Rugged designs for corrosive and abrasive service on liquids, slurries and dry materials. Pressures to 150 psi (1030 kPa) and sizes 2–72" (50–1800mm).

Consistency Transmitters — Rotating sensor, AccuTrax™ blade sensor, open type and pan type chambers for pulp and paper consistency control applications.

Unival Ported Gate Valves — Sizes 2–48" (50–1200mm) for scaling, corrosive and abrasive services. Reinforced elastomer sleeve forms bubble-tight seal flush with the wall of the pipe.

Regulators and Pump Governors — FW-1, BI and D-O Flomatic regulators for direct control of boiler feedwater level. Sizes 1–3" (25–80mm). SDS-2 steam governor for use in automatic steam pressure control up to 200 psig (1380 kPa). Sizes 1.5–4" (40–100mm), pressure class ANSI 250–600.

General Service and Severe Duty Linear Control Valves — Sizes 0.5–24" (15–600mm) with pressure class ratings from ANSI 125–4500. Top Guided, Cage Guided, Balanced, Unbalanced and Tandem construction with quick-change trim. Wide variety of body styles to meet the exact application requirements. Low noise, tight shutoff, low flow and anticavitation trim options to meet the most demanding requirements. Available in straight, angle, fabricated and 3-way globe body styles. Manual, pneumatic, hydraulic or electric actuation.

Steam and Gas Desuperheaters — For line sizes from 1–36" (25–900mm) and larger. Pressure classes ANSI 150–4500. Wide range of products including Mechanical Atomizing, Spring Assisted Multiple Nozzle, Variable Annulus, Steam Atomizing, Variable Orifice and Multiple Nozzle with Integral Control Valve designs. Temperatures to 1200°F (650°C).

Steam Conditioning Equipment — Preconfigured Pressure Reducing and Desuperheating Stations (PRDS) are cast products in sizes 1x2", 2x4", 3x6", 4x8" and 6x12" (25x50, 50x100, 80x150, 100x200 and 150x300mm) angle style bodies with pressure class ratings from ANSI 600–2500. Fabricated Direct Steam Conditioning Valves (DSCV) are fabricated in pressure classes ANSI 150–4500 for sizes 8–36" (200–900mm) angle construction. Widely used in process steam and turbine bypass applications. Manual, pneumatic, hydraulic or electric actuation.

Actuators — Pneumatic Spring and Diaphragm and Piston Actuators for linear control valves. Rotary spring diaphragm, PowerRac® rack and pinion style, G-Series and Compak spring return and double acting actuators. A wide variety of manual and electric motor actuator options.

Control Accessories — Smart, Digital, Electro-Pneumatic and Pneumatic positioners. Other devices including limit switches, position transmitters, transducers, filter regulators, solenoid valves, fail in place devices, booster relays, quick release valves and other accessories available to customize equipment to meet system requirements.

Sales and Service

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DeZURIK/Copes-Vulcan reserves the right to incorporate our latest design and material changes without notice or obligation. Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing by DeZURIK/Copes-Vulcan. Certified drawings are available upon request.