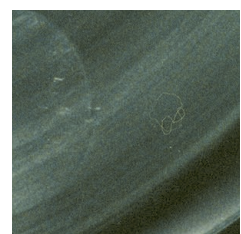
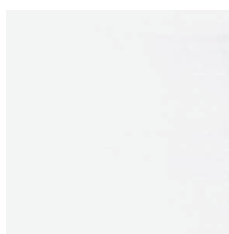
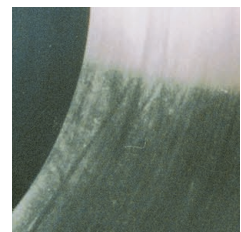
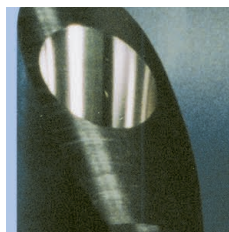
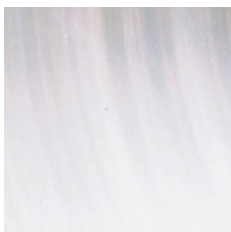


KIEKENS DESUPERHEATERS





Venturi desuperheater, flanged pattern connections, seen against the steam outlet side, water inlet from below.

Kiekens-DSH has been active in the world of steam management for over 60 years and serves clients in a wide range of markets in more than 100 countries.

Specialized in designing and manufacturing steam and gas desuperheaters for chemical, petrochemical and power plants, Kiekens-DSH ranks among the world's leading suppliers of this type of equipment. Since the late fifties, Kiekens-DSH has built, installed and commissioned thousands desuperheaters in more than 100 countries. With some success. Not one single claim has ever been made against the guarantees the company has given.

The process of desuperheating

The most practical way of reducing the superheat value of steam is by direct addition of water. To ensure temperature stability of the conditioned steam and to prevent thermal shock in downstream lines, the cooling water should ideally be fully atomized. There should also be a correct mix of steam and water. Desuperheating can be accomplished with different types of equipment, each having its own specific technology. The application usually defines the requirement of desuperheater type.

Kiekens-DSH has three basic types of desuperheaters:

- The fully custom-designed VENTURI style desuperheater.
- The partly customized MULTI NOZZLE SPRAY desuperheater with integrated water injection control valve.
- The partly customized QUENCH desuperheater.

Long experience with both standard and special designs means Kiekens-DSH can offer the optimum technical solution for any particular problem.





Many ethylene plants use the Kiekens-DSH Venturi desuperheater.



Venturi desuperheater with welded joints, seen against steam inlet side, water inlet from below



The streamlined shaped spray nozzle, the everlasting 'hardware' of any Venturi style desuperheater.

The Kiekens-DSH Venturi style desuperheater

In the Kiekens-DSH Venturi desuperheater, cooling water enters through a special streamlined spray nozzle. On the surface of this special spray nozzle a thin film of water will be created. The dynamic energy of the steam flow breaks the surface tension of the film, creating a conical shaped spray of atomized water. Ideal mixing is achieved by high steam flow turbulence, caused by the interaction of the venturi effect and the special shaped spray nozzle. Fast and total evaporation of the cooling water is now accomplished which means that rapid adjustments are possible, and also avoiding the need for any protective liners in downstream piping.

Construction

The body of a Venturi desuperheater can be made of various kinds of forged steel. From carbon, light/high alloyed and stainless steel to special materials. The Spray nozzle and matching parts are made of stainless steel.

According to specific requirements, the Kiekens-DSH Venturi desuperheater can be installed into a piping systems with either flanged connections or welded joints. All structures are made according to ANSI, BS, DIN, JIS, or any other accepted international standards as specified by client.

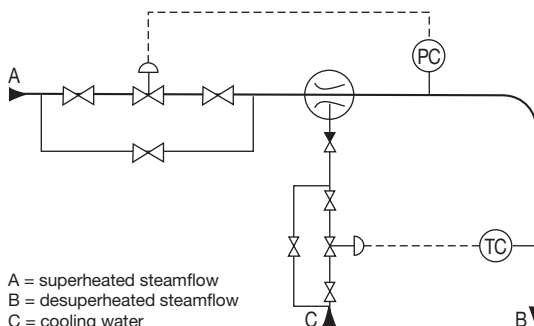


Diagram of installation complete with bypass and block valves in the steam- and waterline.

Advantages

Custom design:

For any line size, standard or capacity range.

Simple installation:

In any position. Short straight pipe runs. Limited control loops.

Easy maintenance:

No moving parts, no pipe liners and no welding in the construction. Large spray aperture avoids the spray nozzle becoming choked.

Energy saving:

No need for water supply pressure significantly higher than operational steam pressure and no need for atomizing steam.

Large desuperheating range:

It is possible to handle extremely large differences in enthalpy between inlet and outlet steam flows.

The A.T.-TEMP Multi Nozzle Spray type desuperheater

The A.T.-TEMP desuperheater valve regulates the amount of injection water by varying the number of injection nozzles in operation. This means the water pressure remains constant, and an excellent and near uniform spray quality is achieved across the entire operation range. Control of nozzle opening is achieved by the positioning of a piston that is operated directly by an actuator mounted on the valve. This simple design means no separate water injection control valve is necessary.

Heavy Duty:

Fully forged body construction.

Standard Duty:

Welded body construction.

Multiple nozzle heads

The A.T.-TEMP desuperheater can be equipped with a variety of spray heads. The uniform body threading accepts spray cylinder heads with a wide range of Kv (Cv) values. Standard configurations have either 6 or 9 equally sized spray nozzles, but combinations are available- the so called 'mixed' spray heads. This feature enables the A.T.-TEMP desuperheater to be customized to specific requirements.

Advantages

No steam side pressure drop:

A negligible steam side pressure drop makes this type suitable for those applications where steam side pressure drop is limited, as in turbine exhausts.

No need for a separate water control valve:

Due to an integrated and directly actuated water injection control valve no separate valve is required.

High- tech nozzles:

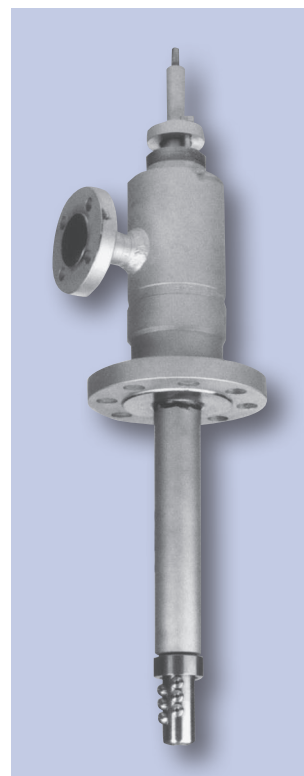
The spray nozzles, equipped with a special designed swirl disk, are constructed using the most up to date technology available, resulting in a fine symmetrical hollow cone spray.

Reliability:

Injection spray nozzles are sealed by a vacuum brazing process, maintaining the integrity of these components under the most extreme conditions.

A.T. - TEMP Standard Capacity Range

6A	Kv = 0.065	9A	Kv = 0.097
6B	Kv = 0.137	9B	Kv = 0.205
6C	Kv = 0.263	9C	Kv = 0.395
6D	Kv = 0.505	9D	Kv = 0.758
6DX	Kv = 1.000	9DX	Kv = 1.500
6E	Kv = 1.640	9E	Kv = 2.460
6F	Kv = 2.450	9F	Kv = 3.680
6G	Kv = 5.200	9G	Kv = 7.800
6H	Kv = 8.100	9H	Kv = 12.150
6K	Kv = 11.570	9K	Kv = 17.440



Heavy Duty, fully forged body construction

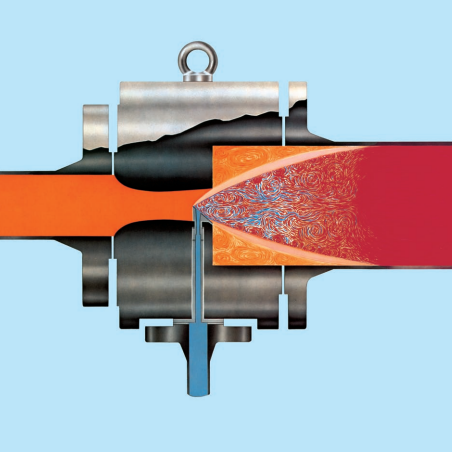


Multiple nozzle head

Standard Duty, welded body construction







Artists impression of the atomizing process into a venturi style desuperheater



A venturi style desuperheater for extreme difficult applications with 'trumpet' inlet.

Special designs also available

For extremely difficult applications:

A venturi style desuperheater for very large differences between inlet and outlet steam temperatures. The special 'trumpet' design of the venturi inlet enables the body material to adjust to material stresses in any direction.

For very simple applications:

A so-called 'Quench' type desuperheater, based upon technology of the spray head of the A.T.-TEMP desuperheater, is a perfect solution for desuperheating problems below 300 degrees Celsius, and with a maximum injection water turndown requirement of approximately 4:1.

For very low steam flow conditions:

The A.T.S.A.-TEMP desuperheater uses steam assistance for enhanced atomisation of the injected cooling water. Steam assistance is mainly required at low flow conditions, when low velocities can lead to insufficient absorption of the injected cooling water.

Please do not hesitate to consult us for all your GAS DESUPERHEATING applications, including those in cryogenic and extremely high temperature environments.



A steam assist desuperheater using atomising steam for low steam flow velocities.



A quench type desuperheater for very simple applications.



KIEKENS
DESUPERHEATERS

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