

Type DKV

Desuperheater to control the temperature of superheated steam or gas



> Type DKV, front view



> Type DKV sectional view

Product features

- The spray water cooler (lance design) works with controlled nozzle technology for extremely effective steam cooling
- Spray head with integrated high-performance nozzles.
Selectable control characteristics for precise temperature control
- A large water vapour pressure difference Δp is permitted
- Excellent pressure atomization
- Tight shut-off, no leakage in closed position
- High control accuracy over the entire control range
- Tightly closing metallic seat. No leakage in closed position and thus no emptying of the cooling water lines possible.
- Contains the pressure injection nozzle, no additional control valves required
- High operational reliability through the use of simple components, minimal wear and tear
- Excellent control accuracy over the entire control range

Applications

For steam cooling in power plant applications and for general gas cooling applications with water injection

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Technical data

Nominal diameter	DN 150–1200 / NPS 6–24
Pressure class	PN 15–250 / Class 150–1500
Temperature (max.)	650 °C / 1200 °F
Housing material	1.0460 / A105 1.5415 1.7335 / A182F12Cl.2 1.7383 / A182F22Cl.3 1.4903 / A182F91
Housing type	Forged
Media	Superheated steam, gas
Flanges	EN 1092-1, ASME B16.5, ISO 7005, JIS, JPI
Actuators	Electric, pneumatic, hydraulic, handwheel (for manual operation)
Number of stages (max.)	1
Number of controlled stages (max.)	1
Operating range (max.)	1:100

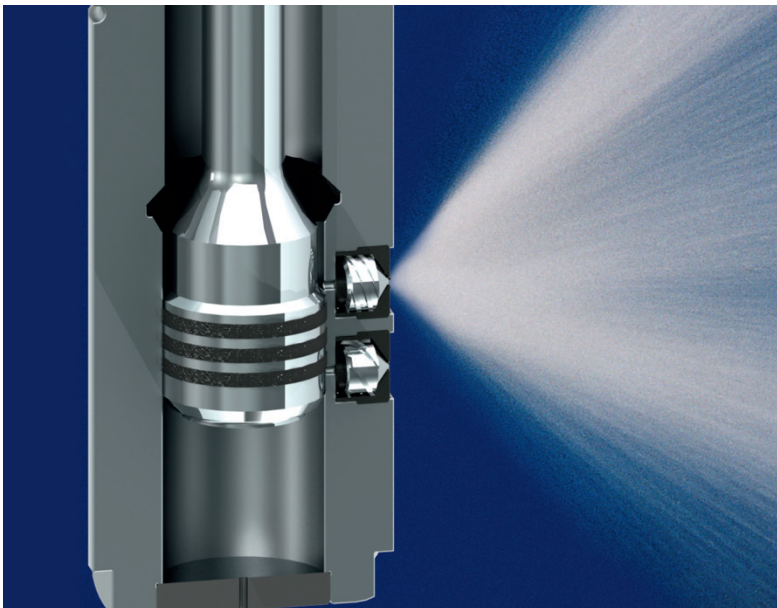
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Function

Desuperheating (cooling) the steam can simply be achieved by injecting water into the steam flow. When injected, the water is evaporated by means of the desuperheater nozzles. Thereby the water absorbs heat and consequently the temperature of steam is reduced. The desuperheater type DKV is designed so that even at low injection water quantities an efficient spray of very fine droplets (mist) is obtained.

The nozzles in the sprayhead are designed to give the injection water a high velocity and a radial rotating movement under all conditions. This achieves a very fine atomization and consequently a rapid evaporation of the water.



> Fine atomization by the desuperheater even with the smallest amount of water

The temperature sensor sends a control signal to the actuator, bringing the control spool into a stroke position corresponding to the characteristic curve. The cooling fluid is now admitted to the injection nozzle and is accelerated at the nozzle insert.

In the nozzle chamber, the cooling medium is accelerated and rotated by means of a swirl insert, so that a spray of the finest atomization is produced when it exits into the steam line. Our high quality atomization of the cooling liquid is the basis

of a good mixing from cooling fluid and steam at all load conditions. The position of the valve seat, just before the spray head, provides a tight shut-off in the closed position, so that dripping is prevented (the piston is lapped into the seat!). The small number of moving parts results in a reliable operation of the valve.

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Installation

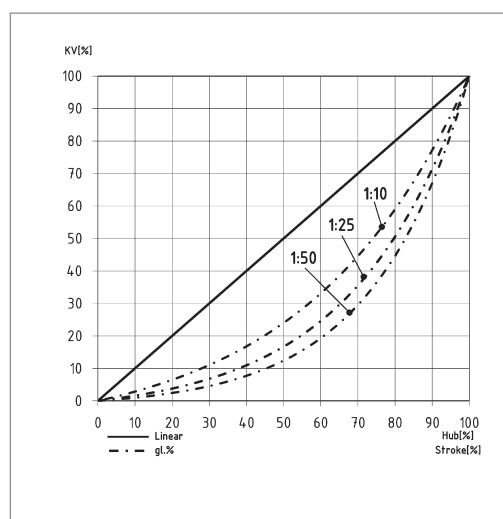
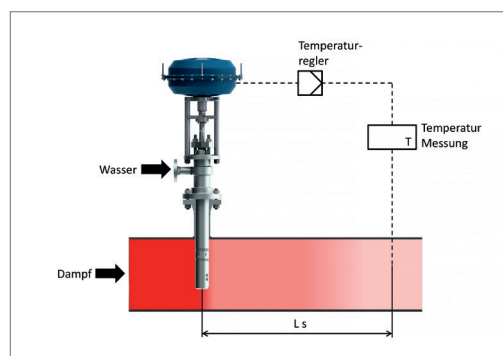
The DKV can be installed on a stub on the steam pipe. A minimum height between the flange and the steam line must be taken into account. Water is injected in the same direction as the steam flow. The superheated steam cooler can be installed vertically and horizontally. Relative to the position

of the water injection flange, the direction of spraying can be set in the flow direction of the steam.

We recommend installing a hat shaped sieve in front of the radiator with a mesh of 0.1 mm and a wire diameter of 0.063 mm.

Instrumentation

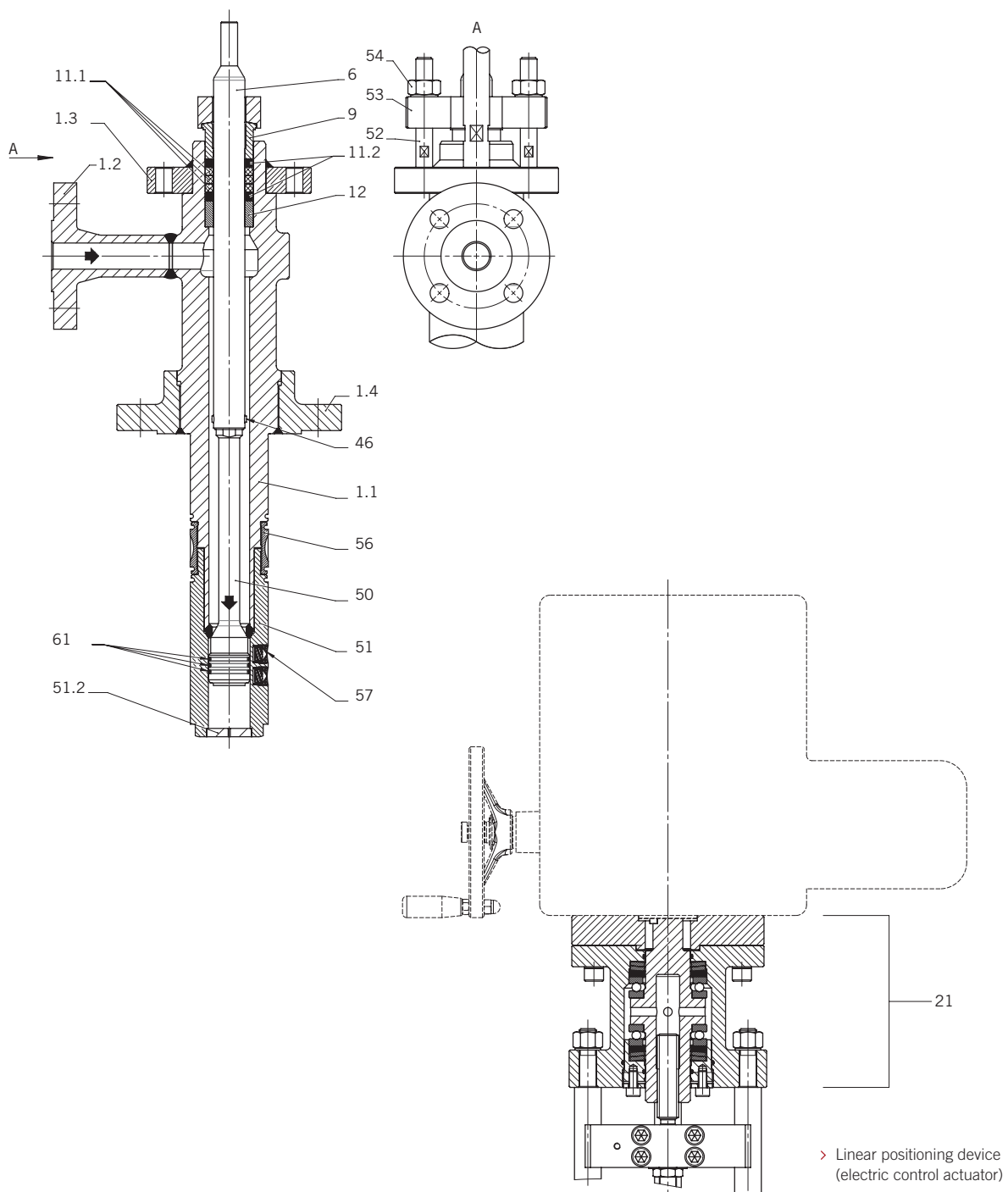
A temperature sensing element transmits the steam temperature to a temperature controller. This controller sends a signal (electric or pneumatic) to the actuator, which results in an upward or downward repositioning of the desuperheater stem and control piston. Thus the injection water quantity and subsequently the steam temperature are controlled.



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Sectional drawing



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Parts list

Pos.	Item	Material
1	Housing cpl.	*
1.1	Housing	*
1.2	Flange	*
1.3	Flange	*
1.4	Flange	*
6	Valve spindle	1.4057
9	Packing follower	1.4122
11.1	Packing	Grafit
11.2	Packing	Grafit
12	Bottom ring	1.4122
20	Spacer bolt	1.1181
21	Gearbox control	1.0460
46	Pin	1.4301
50	Control piston	1.4122
51	Spray head	1.4006
51.2	Insert	1.4006
52	Stud bolt	**
53	Grand plate	*
54	Hexagon nut	**
56	Clamping nut	1.4006
57	Spray nozzle	1.4301/1.4313
61	Piston ring	**

* See table "Technical data"

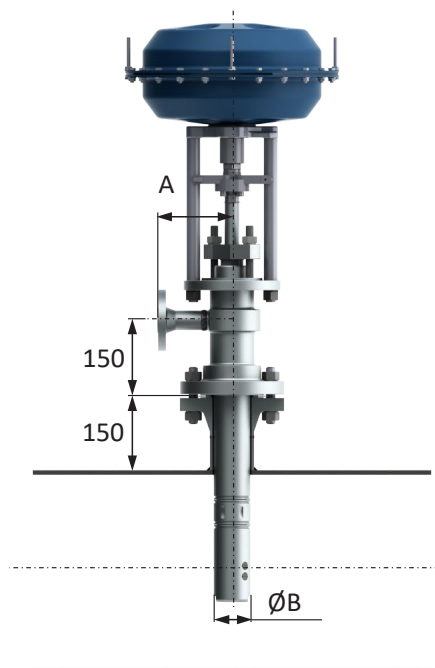
** Depending on customer requirements

Parts list as an example of the standard configuration

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Dimensions



DN / NPS	PN / CLASS				
	63 / 300	100 / 600	160 / 900	250 / 1500	400 / 2500
≤40 / 1½	A = 150		A = 175		A = 250
>40 / 1½	A = 175		A = 225		A = 300