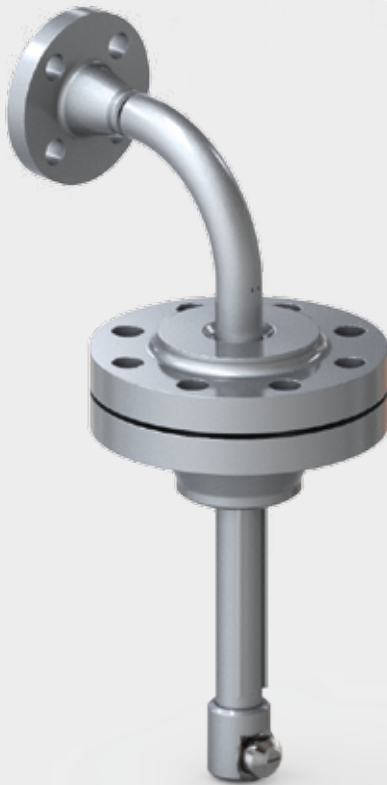



DA-O




*Engineering
GREAT Solutions*

**Steam Desuperheater with Variable
Section Spray Nozzle**

DA-O

The steam desuperheater DA-O provides reliable steam temperature control. The connection to the steam pipe as well as the spray water pipe are both flanged to facilitate service access.

The DA-O is used for desuperheating of steam in small and medium sized pipes and is especially useful when the cooling water temperature is close to saturation.

Key features

The DA-O injection nozzle is screwed onto the body and secured by a lock washer

- > The nozzle itself has a spring loaded plug which extends as the pressure in the nozzle holder increases. The amount of water being injected by each nozzle is determined by a number of factors, including the diameter of the nozzle body opening, adjustment of the spring, and the pressure differential between the steam inside the desuperheater and the water pipeline.
- > The cooling water enters the inner nozzle chamber through a number of water channels. Water is rotated around the nozzle plug thanks to the special

arrangement of the water channels. The plug and the seat are designed to create maximum water velocity at the nozzle edge point. The high velocity of the water when it leaves the nozzle guarantees fine atomisation, quickly evaporating the spray water.

- > In order to maintain a constant pressure inside the injection nozzle, the latter is preloaded by a spring calibrated in function of the water/steam differential pressure.



Maintains constant water atomisation in any flow condition

Benefits

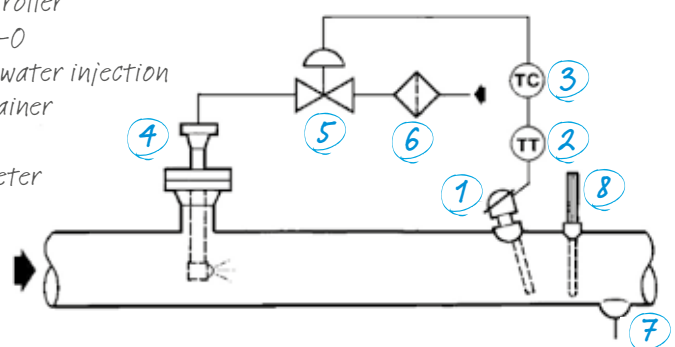
- > Maintains a constant water atomisation at any flow condition
- > Flanged connections facilitate service access during maintenance
- > Reliable steam temperature control
- > "Flash-proof" – The design prevents water from atomising inside the nozzle regardless of cooling water temperature

Installation of DA-O

Select the installation point carefully. This is especially important in cases where the steam velocity is low and the steam temperature is close to saturation. It is equally important to install the temperature sensor where it, in a representative manner, can sense the temperature that shall be controlled.

See II500.10 for desuperheater installation.

1. Temperature sensor
2. Temperature transmitter
3. Temperature controller
4. Desuperheater DA-O
5. Control valve for water injection
6. Cooling water strainer
7. Drain
8. Control thermometer



Product specification

Capacity

3 different nozzle sizes with two alternative springs are available

Nozzle size

OP-20
OP-28
OP-40

Turndown (Water)

Limited only by turndown of selected water control valve

Turndown (Steam)

Depends on steam velocity at full flow

Pressure class

DIN PN 16 - 320
ANSI / BS 150 - 2500

Required differential pressure steam/water

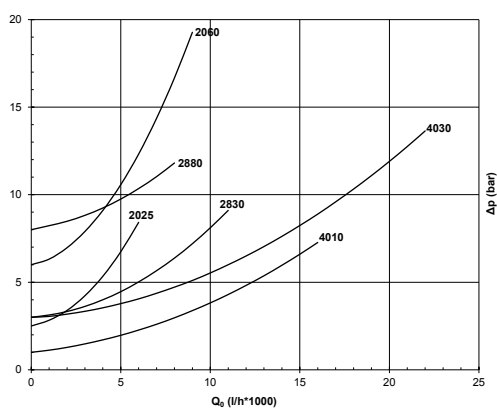
Min 2.5 bar / 36 psi
Max 30 bar / 435 psi

Configurations

Angle connection
Straight connection

Materials

Nozzle body	X40Cr13 (Werkstoff No. 1.4034, AISI 420)
Plug	X20CrMoV12 1 (Werkstoff No. 1.4922)
Spring	Heat resistant steel
Adjustment nut	X20Cr13 (Werkstoff No. 1.4021, AISI 420)
Water flange	13CrMo44 or Carbon Steel
Water pipe and steam flange	13CrMo44



$$Q_0 = Q_3 \sqrt{V_3 \times 1000}$$

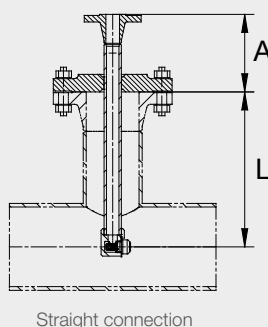
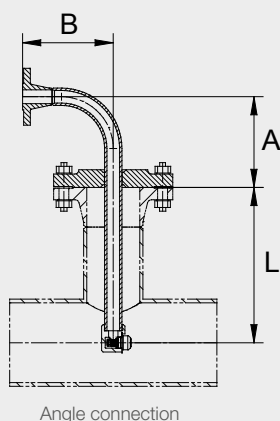
Q_3 = Required cooling water mass flow (kg / h)

V_3 = Specific volume at actual water pressure and temperature (m³ / h)

1000 = Specific gravity of cooling water at 15°C / 59°F and 1 bar / 14.5 psi (kg/m³)

Nozzle size

Nozzle size	Steam connection		Min IDD		Water connection		A		B		Pressure class	
	mm	in	mm	in	mm	in	mm	in	mm	in	DIN	ANSI
20	100	4	85	3.35	25	1	175	6.9	175	6.9	PN10-320	150-2500
28	100	4	85	3.35	25	1	175	6.9	175	6.9	PN10-320	150-900
28	100	4	85	3.35	25	1	175	6.9	175	6.9	PN320	1500-2500
40	125	5	105	4.13	25	1	175	6.9	175	6.9	PN10-250	150-900
40	125	5	105	4.13	25	1	175	6.9	175	6.9	PN320	1500-2500



Note! Dimension L (fig 5) depends on the size of the steam pipe. The DA-O shall be installed in the steam pipe via a pipe stud welded to the steam pipe. The pipe stud is normally not included in the delivery from BTG.

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