## Process Automation

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DA-O Steam Desuperheater with Variable Section Spray Nozzle



Breakthrough engineering for a better world



## DA-O

# Steam Desuperheater with Variable Section Spray Nozzle

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, guickly 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

#### Installation of DA-O

Select the installation point carefully. This is especially important in cases here 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.

#### **Product specification**

Capacity 3 different nozzle sizes with two alternative springs are available

Pressure class Materials - Nozzle body DIN PN 16 - 320 X40Cr13 (Werkstoff ANSI / BS 150 - 2500.

Nozzle size OP-20 OP-28 OP-40

Required differential pressure steam/water Min 2.5 bar / 36 psi Max 30 bar / 435 psi.

Configurations Angle connection Straight connection.

Turndown (Water) Limited only by turndown of selected water control valve

### No. 1.4034, AISI - 422 1.4922).

Design code EN 12516-2 / PED ASME B16.34 / B31.1.

#### X20CrMoV121 (Werkstoff No. 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.

#### Nozzle size

Nozzle size	Steam connection		Min IDD		Water connection	
	mm	in	mm	in	mm	in
20	100	4	85	3.35	25	1
28	100	4	85	3.35	25	1
28	100	4	85	3.35	25	1
40	125	5	105	4.13	25	1
40	125	5	105	4.13	25	1



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.



regardless of cooling water temperature.



- 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.



V<sub>z</sub>= Specific volume at actual water pressure and temperature (m<sup>3</sup>/

1000= Specific gravity of cooling water at 15 °C /59°F and 1 bar / 14.5 psi (kg/m<sup>3</sup>).

А		В		Pressure cla	Pressure class	
mm	in	mm	in	DIN	ANSI	
175	6.9	175	6.9	PN10-320	150-2500	
175	6.9	175	6.9	PN10-320	150-900	
175	6.9	175	6.9	PN320	1500-2500	
175	6.9	175	6.9	PN10-250	150-900	
175	6.9	175	6.9	PN320	1500-2500	



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### IMI CCI

CCI Valve Technology AB P O Box 603 661 29 Säffle Sweden Visit address Industrigatan 7 661 31 Säffle

www.imiplc.com/process-automation

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