

## Type code

Type code		Ordering example		
1	Series	DA4S	Steam desuperheater	DA4S
2	Nozzle size	A	Kv/Cv = 0.22/0.25	C
		B	Kv/Cv = 0.6/0.69	
		C	Kv/Cv = 1.6/1.8	
		D	Kv/Cv = 3.0/3.4	
		E	Kv/Cv = 4.7/5.4	
3	Pressure class	CL1500	ANSI 1500	CL 1500
4	Actuator	MSDIII 290RA	Effective diaphragm size = 290mm	MSDIII 290RA
5	Handwheel	(blank)	No handwheel	HW
		HW	Handwheel	

## Painting

Part	Procedure	Description/standard	DFT	Colour
Desuperheater	Cleaning	Blast cleaning Sa 2 ½ (ISO 8501-1:2007)		
	Top coat	Jotun: Solvalitt Alu Corrosion class ISO 12944-5 C3 (C4 at high temperatures)	2x20 µm	Aluminium
Actuator	Cleaning	Blast cleaning to Sa 2 ½ (ISO 8501-1:2007)		
	Primer	NOROO: RF-6800B	15 µm	Black
	Top coat	KCC: PX 7576	65 µm	Blue

## Quality control plan

Process / activity	Procedure / standard			
	PED / EN 12516-2	ASME B16/34	PED / ASME B16.34	
Design / manufacture	Design code	EN 12516-2 (Directive 97/23/EC)	ASME B16.34	ASME B16.34
	Mechanical properties / chemical analysis (pressurised materials)	EN		ASTM (ASME II)
	Welding procedure qualification	EN 15614-1 / EN 288-3	ASME IX	ASME IX
	PWHT	According to internal WPS		
NDT	RT examination	EN ISO 10675-1	PRI 355 (ASME VIII (ASME B16.34 2.1.6))	PRI 355 (ASME VIII (ASME B16.34 2.1.6))
	UT examination (on welds not accessible for RT)	EN ISO 11666	PRI 355 (ASME VIII (ASME B16.34 2.1.6))	PRI 355 (ASME VIII (ASME B16.34 2.1.6))
	MT examination (on welds not accessible for RT or UT)	EN ISO 23278	PRI 355 (ASME VIII (ASME B16.34 2.1.6))	PRI 355 (ASME VIII (ASME B16.34 2.1.6))
Assembly / testing	Hydrostatic pressure test			
	Seat leakage test			
	Functional test	According to internal procedures		
	Visual and dimensional check			
	Painting and preservation			
	Documentation	Quality control plan		
	Affixing of CE-mark	Directive 97/23/EC	N/A	Directive 97/23/EC
	Declaration of conformity	Directive 97/23/EC	N/A	Directive 97/23/EC
Final inspection	According to internal procedures			

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# DA4S



  
Engineering  
*GREAT* Solutions

**Steam Desuperheater with  
Mechanical Water Atomisation and  
Integrated Spraywater Control**

# DA4S

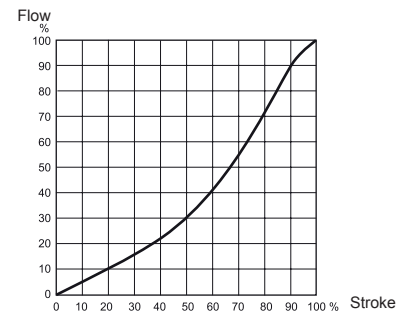
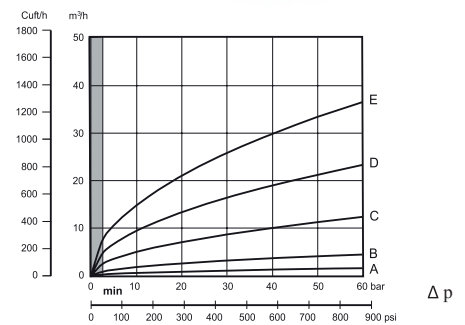
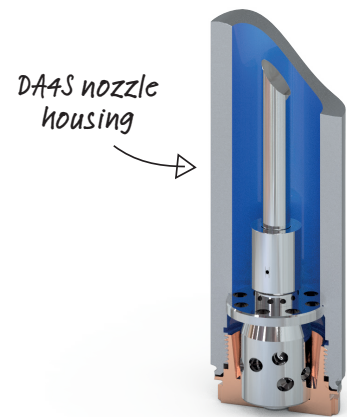
The IMI CCI Steam Desuperheater DA-4 is a combination of an injection nozzle and a control valve. It is inserted in a steam line of minimum diameter DN 150 mm/6". The nozzle is inserted in the steam pipe through a flanged pipe stud that is welded to the steam pipe.

## Key features

The cooling water from the water pipe enters the area between the front part of the inlet pipe and the injection nozzle.

The control plug is guided in the injection nozzle. The injection nozzle and the sealing surfaces of the control plug are lapped together to ensure tight shut-off. When the plug is in the closed position all water admission holes in the injection cage will also be closed. As the plug lifts from the injection nozzle seat, it simultaneously opens up a number of water admission holes in the injection cage. The number of free ports will therefore be directly related to the lift of the plug.

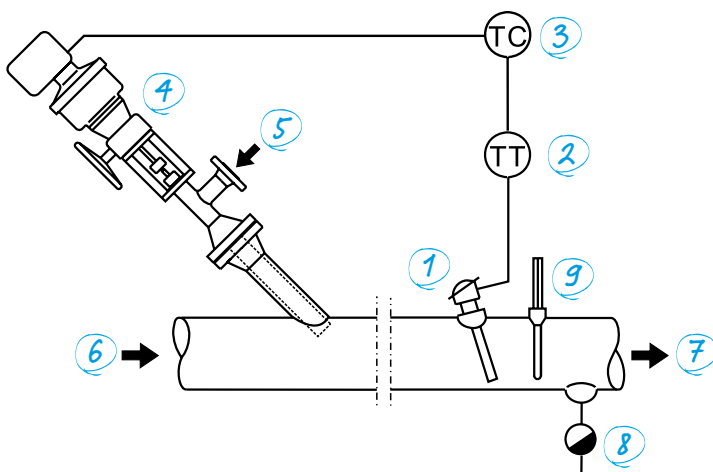
The inlet or admission holes in the injection cage are arranged so that, from the control point of view, a good characteristic is obtained. The cooling water that enters the injection cage through the tangentially positioned admission holes, is induced into a fast rotation around the tip of the plug, it is subsequently ejected through the nozzle as a rapidly evaporating coneshaped mist. The quantity of injected cooling water depends on the number and size of the ports that are opened up by the control plug. The signal from the temperature transmitter located downstream of the desuperheater controls the position of the plug via the actuator.



## Benefits

- > Injection nozzle with variable geometry
- > High rangeability, 40:1 (water) and high steam cooling efficiency
- > Combined control valve and injection nozzle in one unit
- > Tight shut-off
- > High reliability and resistance against wear – only one moving part – the stem and control plug. Hard-faced control plug and injection nozzle with inner parts of high quality alloy steel.
- > Simple installation – in vertical, horizontal or sloping pipes – min size, DN 150 mm/6".

## Installation example



1. Temperature sensor
2. Temperature transmitter
3. PID temperature controller
4. DA-4 Steam Desuperheater
5. Spray water inlet
6. Superheated steam
7. Desuperheated steam
8. Condensate trap / drain
9. Control thermometer

## Product specification

### Capacity

7 different injection nozzle sizes: A, B, C, D, E, EO and F with following max. Kv/Cv-values:

A = 0.22/0.25, B = 0.6/0.69, C = 1.6/1.8, D = 3.0/3.4, E = 4.7/5.4, EO = 6.4/7.4, F = 9.7/11.2

### Control characteristic (Integrated control valve)

Almost equal percentage (logarithmic)

### Control range (Water)

40:1

### Pressure class

DIN PN 16 - 400

ANSI 150 - 2500

### Max steam temperature

550°C (1022°F)

### Materials

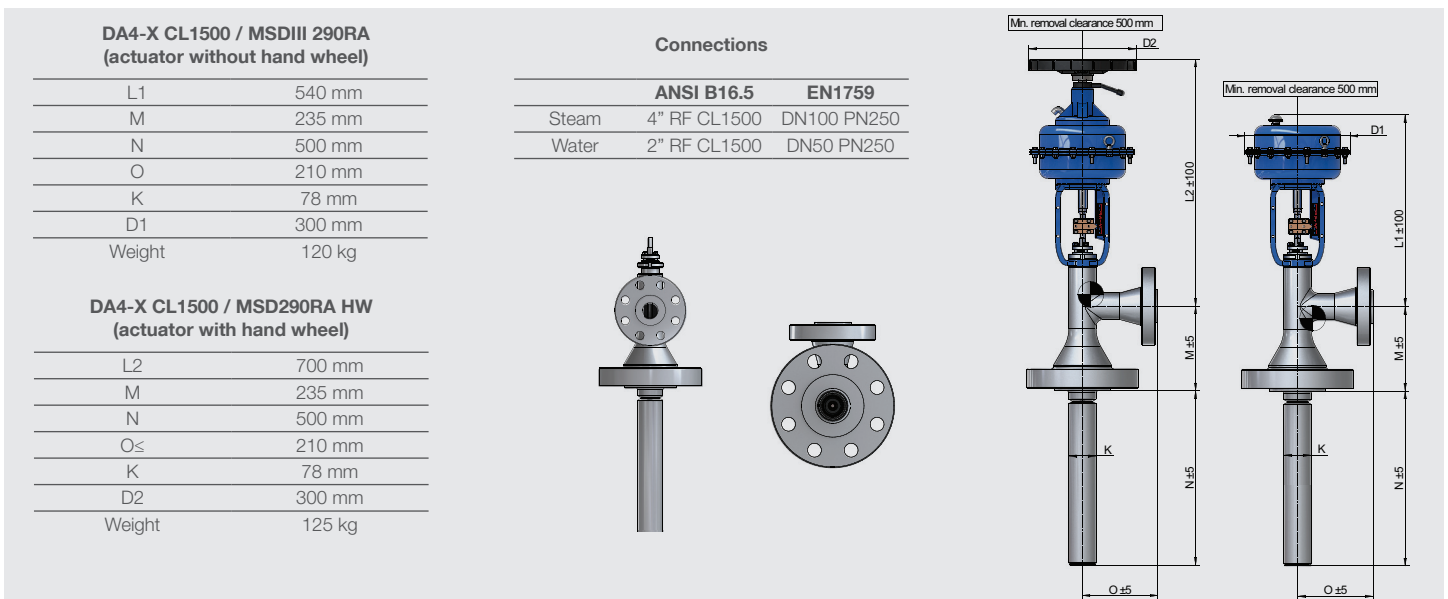
Housing	Low alloy steel CS17CrMo55, ~ equiv. to ASTM A217WC6
Plug	Stainless steel X20Cr13, ~ equiv. to AISI 420, surface hardened
Atomiser	Stainless steel X20Cr13, ~ equiv. to AISI 420, surface hardened
Nozzle head	Steel X90 CrMoV 18, ~equiv. to ASTM 440B.
Stuffing box packing	Graphite

### Other options

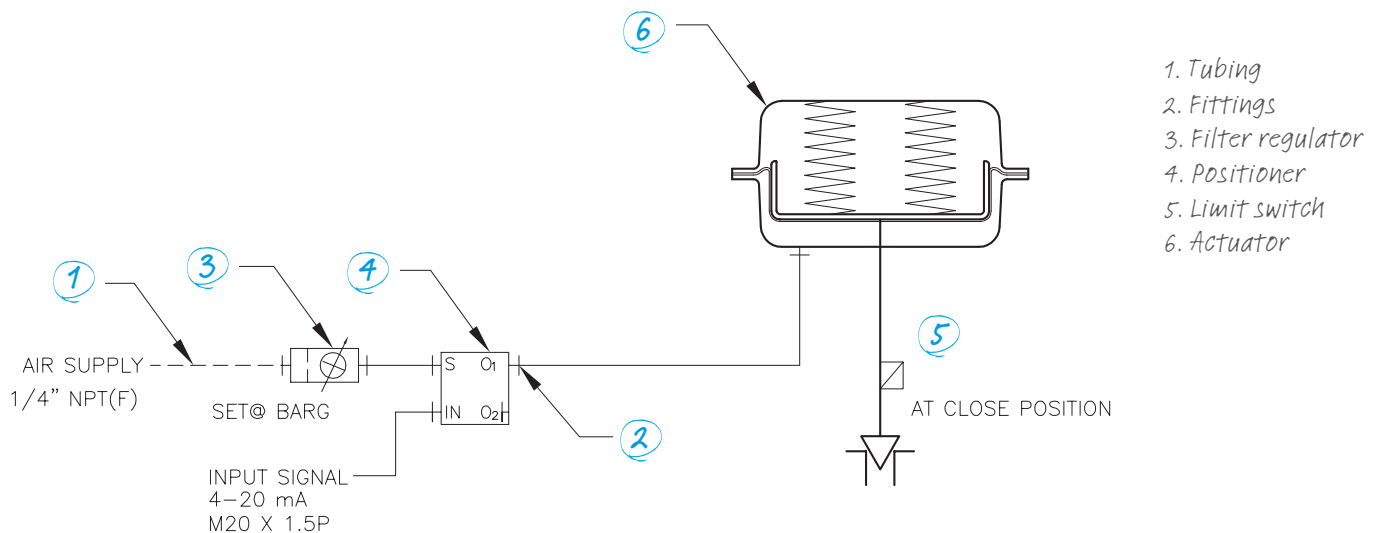
The DA4S is a standardised product, with options limited to what is described within this document. If customised adaptations (e.g. but not limited to accessories, painting, materials, etc.) are desired, IMI CCI recommends the DA4.

Note that any price quoted for the DA4S assumes strict adherence to the specifications described within this document.

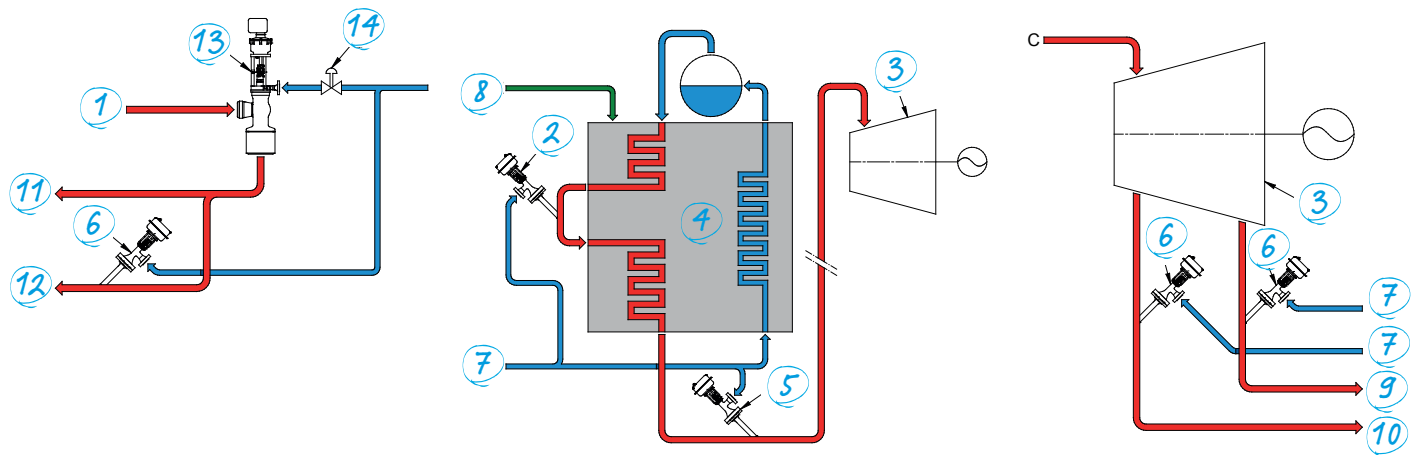
## Dimensions



## Pneumatic schematic



## Applications







1. Main steam line
2. DA-4 interstage attemperator
3. Steam turbine
4. Heat Recovery Steam Generator
5. DA-4 Final stage attemperator

6. DA-4 process steam desuperheater
7. Feed water
8. Fuel
9. Exhaust process steam
10. Extraction process steam

11. Process steam
12. Process steam
13. VST-SE steam conditioning valve
14. Spray water control / stop valve

## Accessories

Actuator	Type	Pneumatic spring diaphragm actuator	
	Air supply	5,0 barg	
	Diaphragm port	1/4" NPT	
	Effective diaphragm size	250 or 290	
	Manual override	Top mounted (optional)	
	Tubing material	316L SS	
	Stroke speed	≤ 15 seconds	
Positioner	Type	SMART C330. Linear, single acting with built-in position transmitter	
	Input signal	4-20 mA DC (min: 3.2 mA) increase signal to open	
	Feedback signal	4-20 mA DC, HART	
	Housing material	Aluminum Diecasting	
	Protection class	IP 66	
	Ambient temperature	-30 to +85 °C	
	Features	LCD display for positioner condition readout. Simple auto calibration. Field adjustable PID parameters. Split range available.	
Limit switch	Type	Heavy duty limit switch, Non plug-in double pole A corrosionresistant steel roller and plunger that is adjus to 90° angles. 1x Installed for closed position.	
	Housing material	Zinc die-cast with an electrostatic epoxy coating	
	Protection class	IP65	
	Operating temperature	-12 °C to +121 °C	
Air-filter regulator	Type	Manual drain type	
	Housing material	Aluminum diecasting	
	Ambient temperature	-20 to +40 °C	
	Min. filtering size	5 microns	
	Guage range	0 - 10 bar	
	Handwheel	Optional, mounted on top of actuator	