

MDA-14**Steam Desuperheater with integrated water control valve**

- Simple design – only one moving part.
- Requires no external water control valve.
- Tight shut off – single seat design.
- Fits steampipes 50 – 100 mm / 2" - 4".
- Simple mounting between standard flanges.
- Good accuracy temperature control of the steam down to 8°C / 15°F above saturation.
- Particularly suitable when small cooling water quantities are required.

General

The BTG Steam Desuperheater MDA-14 is a self-contained unit complete with its own actuator. It is designed for the attenuation of steam in pipe lines of small dimensions and where small quantities of cooling water are required.

Its design is to a very large degree identical to the BTG MDA-V Steam Desuperheater. It will – with good accuracy – allow control of the steam temperature down to 8°C / 15°F above saturation.

Design

The MDA-14 is a combination of a spray water valve and an injection nozzle. It is available in pressure classes up to DIN PN 250, ANSI 1500. The unit is usually delivered for installation between standard flanges, however butt-welds are available as an option.

The built-in water valve is of single seat design and has a tight shut off – to Class V, ANSI B16.104.

The differential pressure steam / water should not be higher than 25 bar / 375 psi – this to avoid nozzle erosion and not less than 5 bar / 75 psi to ensure a good controllability. 10 bar / 150 psi is a suitable difference.

For large pressure differentials – up to 40 bar / 600 psi a special design with stellite seat and plug is available.

A pneumatic actuator positions the one-piece stem / control plug assembly according to the required cooling water flow.

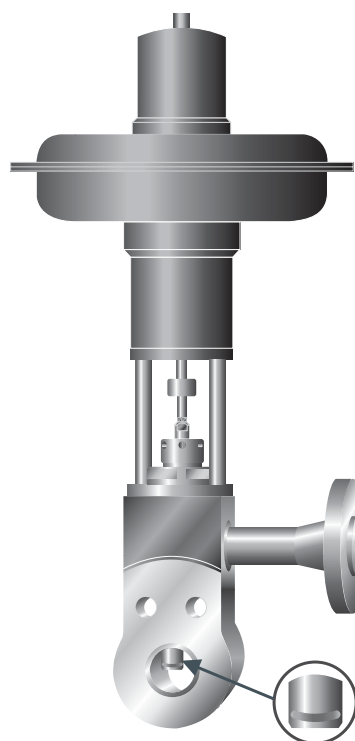


Fig 1 BTG Steam Desuperheater MDA-14 with integrated water control valve

Technical data

Type	MDA-14 Steam Desuperheater
Made by	BTG
Water Capacity	See graph
Rangeability	25:1
Pressure class	DIN, PN 16-250, ANSI 150-1500



We Solve Control Valve Problems



SULZER Valves



Pressure drop water / steam	5 - 25 bar / 75 - 375 psi 40 bar / 600 psi with stellited seat and plug.
Steam velocity	For good evaporation 8 - 12 m/s (26 - 39 fps) but min. 6 m/s (20 fps).
Material	
-Body	SS 1430 or SS 2216 (approx. equivalent to DIN H II / ASTM A 285 Gr.C or DIN 13CrMo44 / ASTM A 182-F12)
-Nozzle (water)	SS 2303-03 (approx. equivalent to DIN X20Cr13 / ASTM AISI 420)
-Stem/plug	SS 2303-03, nitrided
-Guide bush	SS 2303-03, nitrided
-Gland packing	Grafoil
-Gland bush	SS 2940, nitrided (approx. equivalent to DIN 34CrA1Mo5 / ASTM AISI 420)
-Gland nut	SS 2303-03

Main Applications

The range of possible applications for the BTG MDA-14 is very wide. The great majority are however found in the following standard industrial installations.

- Power plants which beside the large flow sector also supply process steam to auxiliaries, heating systems, soot blowers etc.
- Reduction of the temperature of superheated steam or gas where excess temperature will harm the product.
- Wherever balancing or make-up steam is required in low flow systems in refiners and processing plants.

Dimensioning of MDA-14

The required cooling water flow and the most suitable size for an MDA-14 is normally calculated by BTG. For this purpose we need the data listed under Quotation and order specification found on page 4.

Table1: Nozzle sizes, max water quantity and K_v - / C_v -values

Nozzle size	A0	A	B	C
Q_{max} l/h	375	750	1500	3000
Q_{max} US gal/h	99	198	396	792
Contr. plug K_v	0.07	0.14	0.26	0.53
Contr. plug C_v	0.08	0.16	0.30	0.61

Function

The flute configuration of the plug together with the venturi design – with a sharp edge on the steam entry side – guarantees a high steam velocity at the point of water injection. This will assist in the atomization of the water into very small droplets that quickly will evaporate.

The vortex created when the steam leaves the edge of the desuperheater nozzle will carry the water droplets some distance downstream the nozzle. This will ensure a good and fast evaporation of the injected water without risk of water impingement on the pipe wall.

The rangeability depends on the velocity of the steam. If e.g. the steam velocity is 90 m/s (295 fps) you can achieve a turn down ratio of 15:1 as absolute min. velocity accepted is 6 m/s (20 fps).

Dimensions

DN-size		A		B		C		D		E		F	
mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
50	2	162	6.4	115	4.5	170	6.7	60	2.4	130	5.1	56	2.2
65	1.5	177	7.0	130	5.1	175	6.9	60	2.4	110	4.3	56	2.2
80	3	187	7.4	140	5.5	190	7.5	60	2.4	110	4.3	56	2.2
100	4	217	8.6	170	6.7	190	7.5	80	3.2	140	5.5	75	3.0

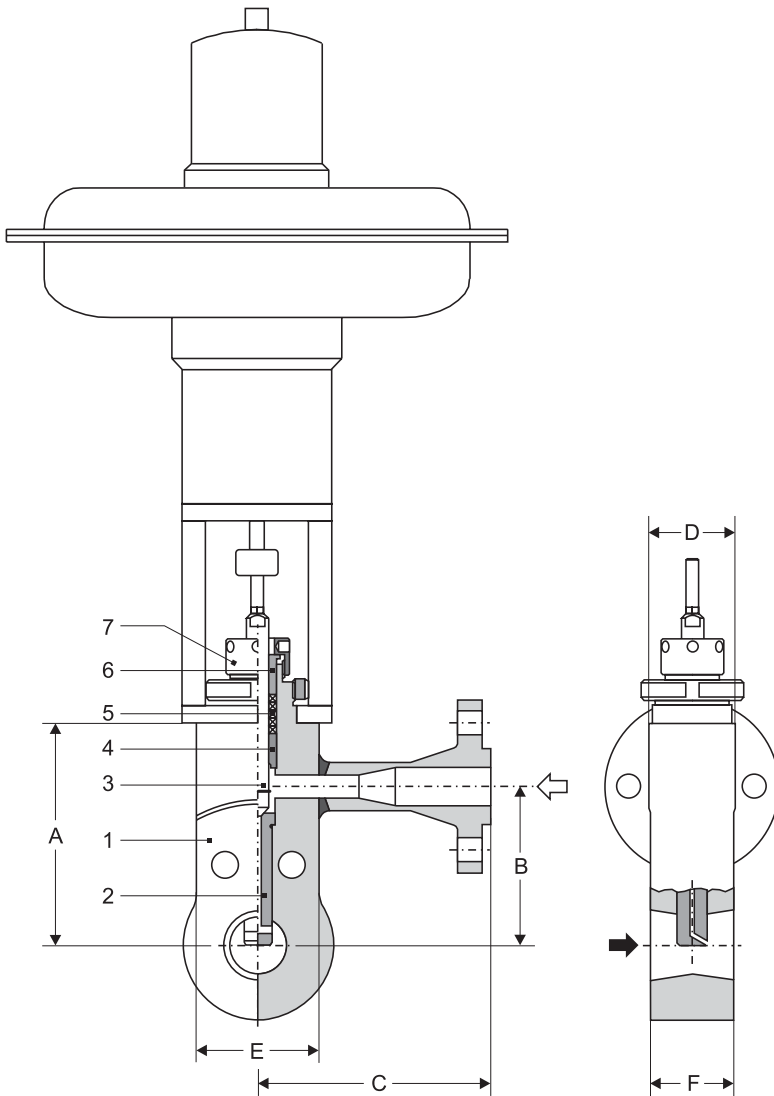


Fig 3 MDA-14 – Main Dimensions

- 1 Body
- 2 Nozzle/Seat
- 3 Stem/Plug
- 4 Seat
- 5 Stem packing
- 6 Gland bushing
- 7 Gland nut

Add dimension for actuator

Other BTG Steam Desuperheaters

DA-4 – Datasheet no. D526.01

Steam desuperheater with mechanical atomization and integrated control of the spray water. Max. Δp 40 bar / 600 psi over the nozzle. Mounted 45° to the steam pipe.

DA-46 – Datasheet no. D526.02

Steam desuperheater with mechanical atomization and integrated control of the spray water. High Δp , 40-80 bar / 600-1200 psi over the nozzle. Mounted 45° to the steam pipe.

DA-90 – Datasheet no. D526.05

Steam desuperheater with mechanical atomization and integrated control of the spray water. Max. Δp 40 bar / 600 psi (nozzle 60) or max. Δp 80 bar / 1200 psi (nozzle size 61). Mounted 90° to the steam pipe.

DA-90 SE – Datasheet no. D526.06

Steam assisted desuperheater used when steam load varies heavily or when steam flow velocity is low. Very suitable for pipes of small dimensions.

DA-O – Datasheet no. D526.08

Steam desuperheater with variable area spray nozzle – specially suitable for applications where flashing can occur.

DA-M – Datasheet no. 526.07

Steam desuperheater with a multiple of variable area spray nozzles for large spray water flows. Specially suitable for pipes of large dimensions. Capacity – unlimited, depends on size and number of orifices.

MDA-V – Mini – Datasheet no. D526.10

Small desuperheater of venturi type.

DA-11 – Datasheet no. D526.13

Steam assisted desuperheater used when steam load varies heavily or when steam flow velocity is low. Very suitable for medium size pipes.

IRP – Datasheet no D526.04

Pipe insert for Desuperheaters type DA-4, DA-90, DA-11 and DA-O

Quotation and order specification

To enable us to provide you with a complete quotation and a correct delivery time we like to have the following data.

Main Steam

-Steam flow (kg/h)	=	q_1
-Pressure in steam pipe (bar a)	=	p_1
-Temperature (° C) - uncontr.	=	t_1
-Temperature (° C) - contr.	=	t_2
Steam pipe diameter (mm)	=	DN

Available cooling water

-Temperature (° C)	=	t_3
-Pressure (bar a)	=	p_3

CCI reserves the right to make technical improvements.

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