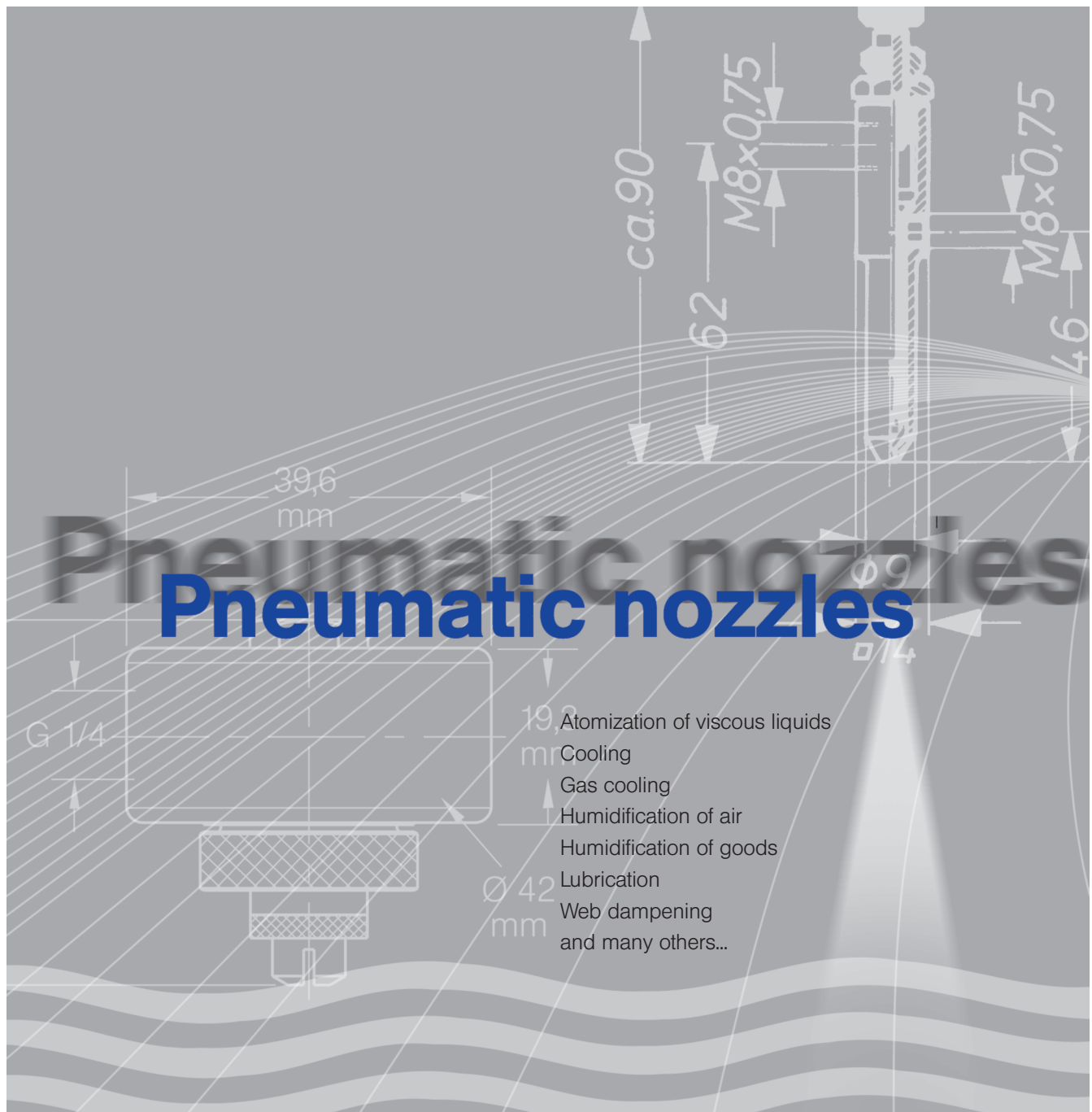


ENGINEERING
YOUR SPRAY SOLUTION



Pneumatic
atomizing
nozzles





Pneumatic atomizing nozzles

Pneumatic atomizing nozzles are available in various designs to comply with specific spray and flow requirements:

- self-aspiration (siphon principle)
- supply of liquid from a vessel located at a higher level (gravity principle)
- supply of liquid under pressure (pressure principle)
- mixing of fluids inside or outside the nozzle
- full cone or flat fan spray pattern

For many applications, adjustability of liquid flow and, thereby, of the droplet size, is possible with the aid of manually operated accessory components.

A **pneumatically controlled piston** (series 136) or magnetic valve (series 166) allows to perform automatic or intermittent operations. A number of special customized designs complete the nozzle range.



We can also supply complete modular nozzle lances on request.

We would be happy to send you detailed product information.

Criteria for selecting pneumatic atomizing nozzles

1. Spray pattern

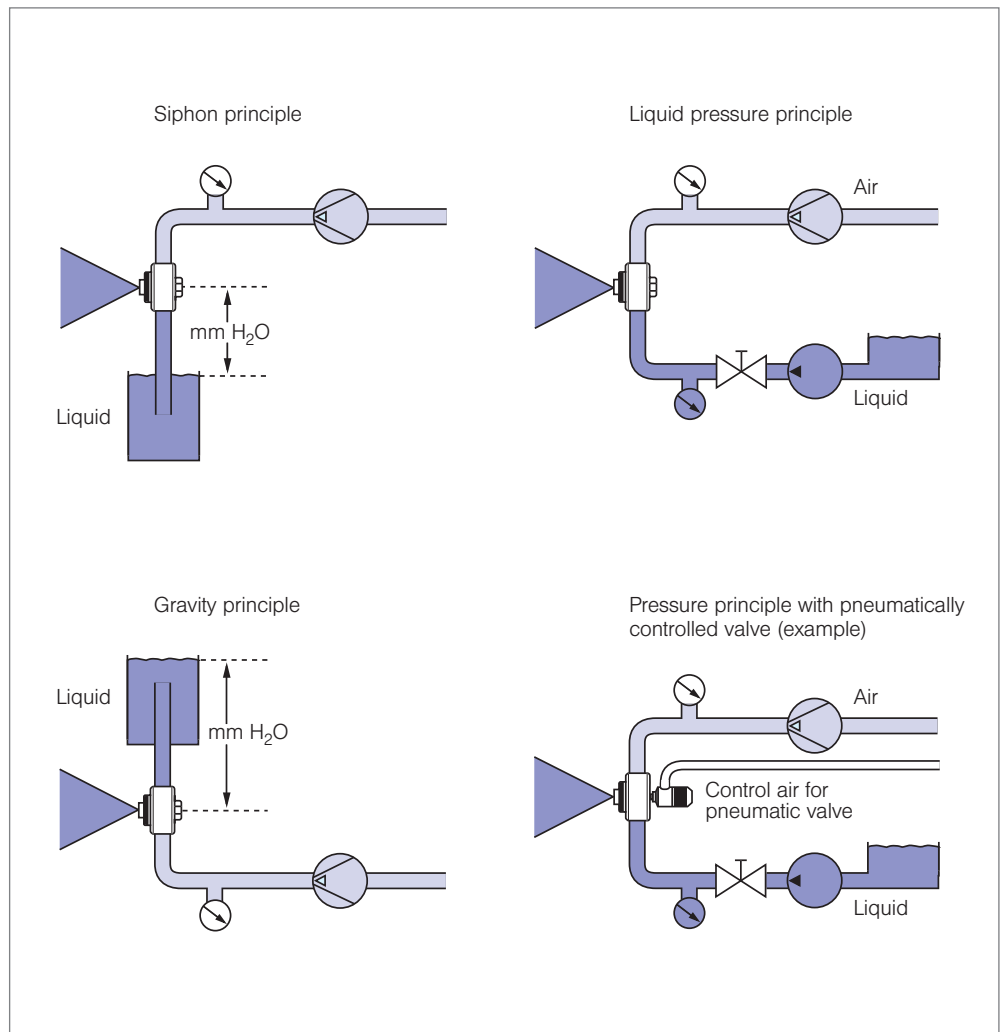
Pneumatic flat fan atomizing nozzles should be chosen for humidifying and cooling of goods, for web dampening and for a number of painting tasks; in short, wherever a broad linear impact is required. **Pneumatic full cone atomizing nozzles**, however, should be used, when a compact, circular impact or a major reach is required, e.g. for direct air humidifying, for gas cooling or for chemical process applications.

2. Mode of liquid supply

Whenever liquid can be supplied under pressure, it is recommended to use nozzles functioning by the **liquid pressure principle**. Use of pneumatic atomizing nozzles operating to the **siphon or the gravity principle** is recommended when liquid is to be sprayed in small quantities, e.g. for spraying of disinfectants.

3. Mixing of fluids

The supply of air or gas provides an additional breaking up of the liquid flow into finest drop particles. This supply and mixing can either take place inside or outside the nozzle. **Inside mixing** should be preferred, when water, low viscosity liquids or liquids without solid matter are to be atomized. **Outside mixing** is particularly suited for atomizing viscous liquids which are prone to impurities and therefore tend to cause clogging of the nozzle. Low liquid pressures are used with this type of nozzle due to its design.





Pneumatic atomizing nozzles

Series 136

Spray pattern	Mode of liquid supply	Mixing of fluids		Series		$\dot{V}_{\text{Water}}$ [l/h]	Application	Page
Full cone 	Pressure principle	Inside		136.1	20°	0.40 – 93.20	Humidification of air, cooling.	1.7
Full cone 	Pressure principle	Inside		136.2	60°	0.40 – 132.90	Humidification of air, cooling.	1.9
Full cone 	Siphon or gravity principle	Outside		136.3	20°	0.30 – 66.70	Chemical industry, cooling, spraying of viscous liquids.	1.10
Flat fan 	Pressure principle	Inside		136.4	45° 60° 80°	0.10 – 76.10	Web dampening, humidification of goods, cooling.	1.13
Flat fan 	Siphon or gravity principle	Inside		136.5	60°	0.80 – 3.20	Web dampening, humidification of goods, cooling.	1.15



Pneumatic atomizing nozzles

Series 136

Spray pattern	Mode of liquid supply	Mixing of fluids	Series		$\dot{V}$ Water [l/h]	Application	Page
Flat fan 	Pressure principle	Outside	136.6	45° 60°	1.70 – 102.10	Web dampening, humidification of goods, atomization of viscous fluids.	1.17
							



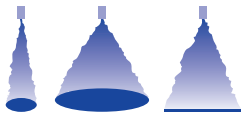
Pneumatic atomizing nozzles

Series 166

Spray pattern	Mode of liquid supply	Mixing of fluids		Series		$\dot{V}$ Water [l/h]	Application	Page
Full cone 	Pressure principle	Inside		166.1	20°	0.40 – 93.20	Humidification of air, cooling. Version with magnetic valve.	1.21
Full cone 	Pressure principle	Inside		166.2	60°	0.40 – 132.90	Humidification of air, cooling. Version with magnetic valve.	1.23
Flat fan 	Pressure principle	Inside		166.4	45° 60° 80°	0.10 – 76.10	Web dampening, humidification of goods, cooling. Version with magnetic valve.	1.24
Flat fan 	Pressure principle	Outside		166.6	45° 60°	1.70 – 102.10	Web dampening, humidification of goods, atomization of viscous fluids. Version with magnetic valve.	1.26

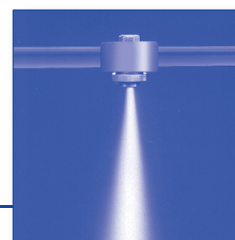


Pneumatic atomizing nozzles

Spray pattern	Mode of liquid supply	Mixing of fluids	Series		$\dot{V}$ Water [l/h]	Application	Page
Full cone 	Siphon or gravity principle	Inside	140	20° – 30°	4.50 – 12.00	Lubrication, cooling, humidification of air.	1.30
Solid stream Full cone Flat fan 	Pressure principle	Outside	176 ViscoMist™	variable	7.80 – 307.00 [l/h]	Coating processes, moistening, lubrication, glazing, disinfection,	1.31
Full cone 	Pressure principle	Inside	170	15°	8.50 – 290.00 [l/min]	Gas cooling, flue gas desulphurisation, exhaust gas conditioning, dust control.	On request.
Full cone 	Pressure principle	Outside	150	20° – 30°	0.15 – 63.00 [l/min]	Chemical process engineering, cooling, atomizing of viscous liquids.	On request.



Pneumatic atomizing nozzles, Full cone, pressure principle, internal mixing Series 136.1

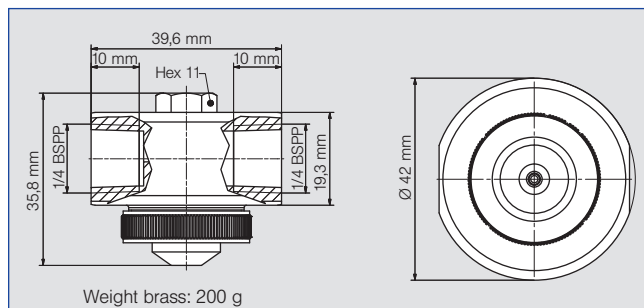


Fine full cone atomization and fogging with air or gas. Liquid pressure principle. Internal mixing of fluids.

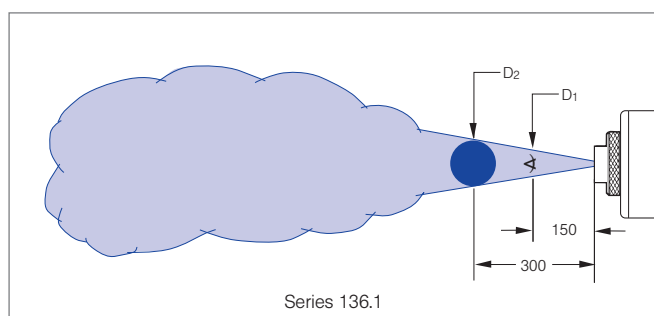
Applications:
Humidification of air, cooling.



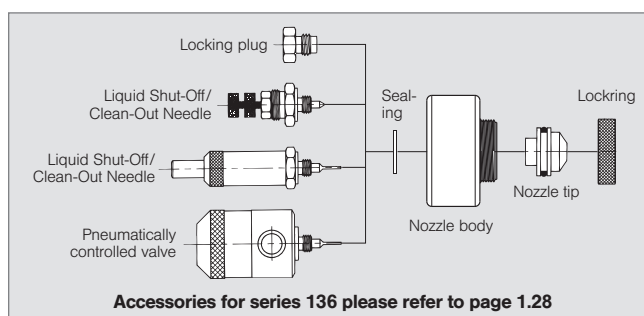
Series 136.1



Weight brass: 200 g



Series 136.1



Accessories for series 136 please refer to page 1.28

Spray angle	Ordering no.			E Ø [mm]	Liquid pressure p [bar]												Spray dimensions						
	Type	Mat. no.			0.7			1.5			3.0			4.0			p [bar]	p Water [bar]	D ₁ [mm]	D ₂ [mm]			
		1Y	35		p [bar]	V Water [l/h]	V _n Air [m³/h]	p [bar]	V Water [l/h]	V _n Air [m³/h]	p [bar]	V Water [l/h]	V _n Air [m³/h]	p [bar]	V Water [l/h]	V _n Air [m³/h]							
		316L SS	Brass plated																				
20°	136. 115. xx. A2	○	○	0.50	0.40	5.90	0.30	1.40	5.80	0.80	2.40	9.10	1.10	3.00	11.00	1.20	0.80	0.70	60	100			
0.80					3.80	0.60	1.80	4.10	1.00	2.80	7.50	1.20	3.40	9.60	1.40	1.80	1.50	60	95				
1.20					1.70	0.90	2.20	2.20	1.40	3.20	5.90	1.50	3.80	8.20	1.60	2.60	2.00	60	100				
-					-	-	2.60	1.20	1.70	3.60	4.40	1.80	4.20	6.80	1.90	3.20	3.00	55	95				
-					-	-	-	-	-	4.00	2.90	2.10	4.60	5.50	2.20	4.40	4.00	55	100				
-					-	-	-	-	-	4.40	2.00	2.50	5.00	4.10	2.50								
-					-	-	-	-	-	4.80	1.10	2.80	5.40	2.90	2.80								
-					-	-	-	-	-	5.20	0.40	3.00	5.80	2.10	3.10								
136. 125. xx. A2					○	○	0.50	0.80	4.70	1.50	1.20	7.00	1.80	2.80	9.10	3.30	3.40	10.60	3.90	1.40	0.70	55	90
								1.20	4.40	1.90	1.60	6.60	2.20	3.20	8.70	3.70	3.80	10.30	4.30	2.20	1.50	55	95
	1.60	4.00	2.30	2.00				6.20	2.60	3.60	8.40	4.10	4.20	9.90	4.60	2.80	2.00	55	100				
	2.00	3.50	2.60	2.40				5.80	3.00	4.00	8.00	4.50	4.60	9.60	5.00	3.40	3.00	60	100				
	2.40	3.00	3.00	2.80				5.40	3.40	4.40	7.70	4.80	5.00	9.30	5.40	4.20	4.00	60	100				
	2.80	2.70	3.20	3.20				4.90	3.70	4.80	7.30	5.20	5.40	8.90	5.80								
	3.20	2.00	3.70	3.60				4.40	4.10	5.20	7.00	5.60	5.80	8.60	6.10								
	3.60	1.60	4.10	4.00				3.90	4.50	5.60	6.60	5.90	-	-	-								
	4.00	1.30	4.50	4.40				3.50	4.80	6.00	6.20	6.30	-	-	-								
	4.40	1.00	4.90	4.80				3.10	5.20	-	-	-	-	-	-								
	4.80	0.60	5.20	5.20				2.70	5.60	-	-	-	-	-	-								
	-	-	-	5.60				2.30	5.90	-	-	-	-	-	-								
	-	-	-	6.00				1.90	6.30	-	-	-	-	-	-								

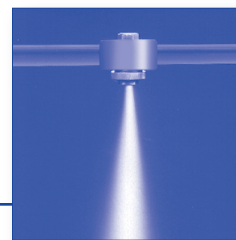
E = narrowest free cross section (water)

Continued on next page.

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 136. 115. xx. A2 + 1Y = 136. 115. 1Y. A2



Pneumatic atomizing nozzles, Full cone, pressure principle, internal mixing Series 136.1



Spray angle	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions				
	Type	Mat. no.		0.7			1.5			3.0			4.0			p Air [bar]	p Water [bar]	D ₁ [mm]	D ₂ [mm]	
		1Y		35	p Air [bar]	V̇ Water [l/h]	V̇n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇n Air [m³/h]	p Air [bar]	V̇ Water [l/h]					V̇n Air [m³/h]
		316L SS		Brass plated																
20°	136. 134. xx. A2	○	○	0.7	1.20	13.20	2.70	2.00	19.40	3.90	3.00	28.30	5.20	3.80	32.60	6.20	1.80	0.70	55	95
1.60					12.40	3.30	2.40	18.10	4.40	3.40	27.50	5.70	4.20	32.00	6.80	2.80	1.50	60	105	
2.00					11.80	3.90	2.80	17.30	4.90	3.80	26.70	6.30	4.60	31.30	7.30	3.80	2.00	60	105	
2.40					11.40	4.40	3.20	16.70	5.50	4.20	25.90	6.80	5.00	30.60	7.80	5.20	3.00	65	110	
2.80					11.10	4.90	3.60	16.10	6.00	4.60	25.00	7.30	5.40	29.90	8.40	6.00	4.00	65	110	
3.20					10.80	5.50	4.00	15.60	6.50	5.00	24.20	7.80	5.80	29.30	8.90					
3.60					10.60	6.00	4.40	15.20	7.00	5.40	23.60	8.40	-	-	-					
4.00					10.40	6.50	4.80	15.00	7.60	5.80	23.10	8.90	-	-	-	-				
4.40					10.10	7.00	5.20	14.60	8.10	-	-	-	-	-	-	-				
4.80					9.90	7.60	5.60	14.10	8.60	-	-	-	-	-	-	-				
5.20					9.50	8.10	6.00	13.80	9.10	-	-	-	-	-	-	-				
5.60					9.00	8.60	-	-	-	-	-	-	-	-	-	-				
6.00					8.50	9.20	-	-	-	-	-	-	-	-	-	-				
	136. 142. xx. A2	○	○	2.5	1.40	24.20	5.10	1.60	53.40	4.70	3.20	70.80	8.00	3.80	93.20	9.20	0.80	0.70	60	100
1.80					20.40	6.30	2.00	42.60	5.90	3.60	62.50	9.20	4.20	83.10	10.10	1.60	1.50	65	105	
2.20					20.00	7.20	2.40	35.30	7.20	4.00	55.70	10.60	4.60	75.30	11.30	3.00	2.00	60	105	
2.60					19.30	8.20	2.80	30.40	8.40	4.40	49.30	11.70	5.00	69.00	12.50	4.00	3.00	65	110	
3.00					17.60	9.30	3.20	28.60	9.50	4.80	44.60	12.90	5.40	63.40	13.70	6.00	4.00	65	110	
3.40					16.50	10.40	3.60	28.20	10.50	5.20	41.90	14.10	5.80	57.50	14.90					
3.80					17.00	11.40	4.00	27.30	11.50	5.60	40.40	15.10	-	-	-					
4.20					16.30	12.40	4.40	25.90	12.50	6.00	39.70	16.10	-	-	-					
4.60					15.10	13.30	4.80	24.30	13.50	-	-	-	-	-	-					
5.00					14.00	14.30	5.20	22.30	14.60	-	-	-	-	-	-					
5.40					13.10	15.30	5.60	21.80	15.70	-	-	-	-	-	-					
5.80					12.40	16.20	6.00	21.40	16.70	-	-	-	-	-	-					

E = narrowest free cross section (water)

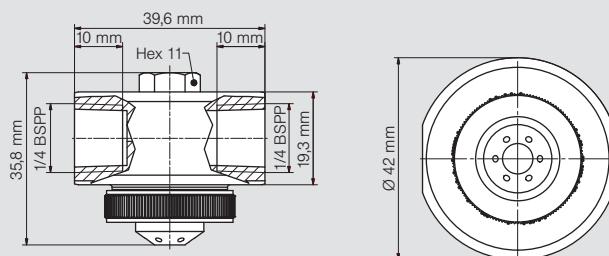
Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 136. 134. xx. A2 + 1Y = **136. 134. 1Y. A2**



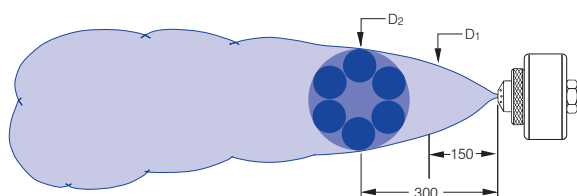
Applications:
Humidification of air, cooling.



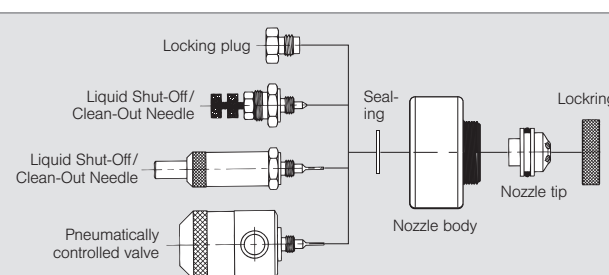
Series 136.2



Weight brass: 200 g



Series 136.2



Accessories for series 136 please refer to page 1.28

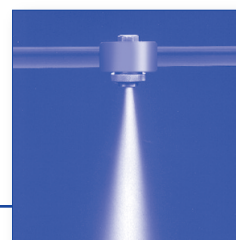
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E = narrowest free cross section (water)

Example	Type	+	Material no. (xx)	=	Ordering no.
for ordering:	136. 215. xx. A2	+	1Y	=	136. 215. 1Y. A2



Pneumatic atomizing nozzles, Full cone, siphon principle, external mixing Series 136.3



Particularly fine full cone atomization with air or gas. Siphon principle or gravity principle.

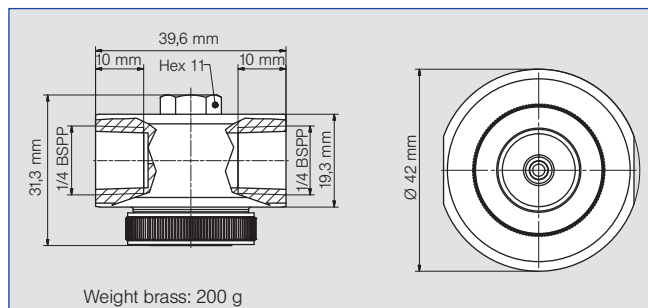
External mixing of fluids.

Applications:

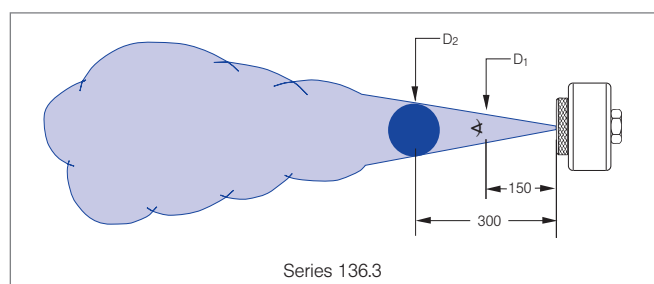
Chemical industry, cooling, atomization of viscous liquids.



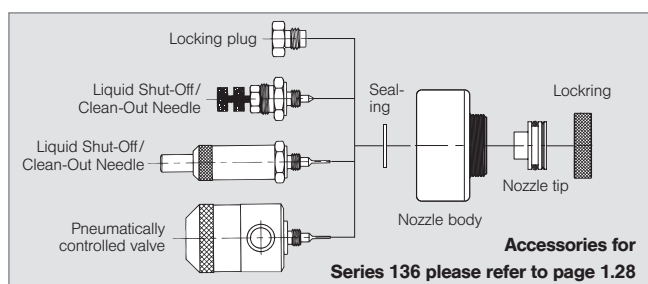
Series 136.3



Weight brass: 200 g



Series 136.3



Spray angle	Ordering no.		E Ø [mm]	Air		Water $\dot{V}$ [l/h]									Spray dimensions			
	Type	Mat. no.				Water column [mm H ₂ O]			Aspiration height [mm H ₂ O]					p_{Air}	Aspiration- height [mm WS]	D ₁ [mm]	D ₂ [mm]	
		1Y																35
		316L SS	Brass plated		p	$\dot{V}_n$												
					[bar]	[m ³ /h]	150	300	450	100	200	300	600	900	[bar]			
20°	136. 316. xx. A2	○	○	0.4	0.6	0.70	-	1.38	1.32	-	-	-	-	-	1.40	300	60	110
					0.8	0.90	1.29	1.44	1.38	-	-	-	-	-	3.20	300	60	120
					1.20	1.10	1.47	1.62	1.53	1.02	0.84	-	-	-	4.80	300	80	135
					1.40	1.20	1.50	1.68	1.62	1.14	0.96	0.66	-	-	6.00	300	70	120
					1.80	1.40	1.62	1.80	1.71	1.26	1.11	0.90	-	-				
					2.00	1.60	1.68	1.86	1.77	1.32	1.17	0.96	-	-				
					2.40	1.80	1.74	1.92	1.86	1.44	1.32	1.14	0.51	-				
					2.60	1.90	1.80	1.98	1.89	1.50	1.32	1.20	0.63	-				
					3.00	2.10	1.92	2.07	1.95	1.59	1.44	1.29	0.84	0.39				
					3.20	2.20	1.95	2.10	1.98	1.65	1.50	1.35	0.96	0.48				
					3.60	2.40	2.07	2.19	2.10	1.80	1.65	1.50	1.14	0.72				
					3.80	2.60	2.13	2.25	2.16	1.83	1.71	1.59	1.23	0.81				
					4.20	2.80	2.22	2.37	2.28	1.95	1.80	1.68	1.38	1.08				
					4.40	2.90	2.25	2.40	2.34	1.98	1.89	1.77	1.44	1.14				
					4.80	3.10	2.25	2.34	2.28	1.92	1.86	1.77	1.50	1.14				
					5.00	3.20	2.25	2.31	2.22	1.89	1.83	1.71	1.41	0.84				
					5.40	3.40	2.13	2.25	2.16	1.80	1.68	1.56	1.05	0.30				
					5.60	3.60	2.07	2.19	2.10	1.74	1.65	1.44	0.72	-				
					6.00	3.80	1.98	2.10	1.95	1.56	1.50	1.26	-	-				

E = narrowest free cross section (water)

Continued on next page.

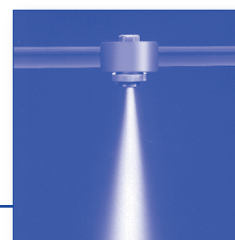
Operational information:

Liquid flow of pneumatic atomizing nozzles with external mixing can be turned down to 0 with air pressure remaining constant.

Example Type + Material no. (xx) = Ordering no.
for ordering: 136. 316. xx. A2 + 1Y = 136. 316. 1Y. A2



Pneumatic atomizing nozzles, Full cone, siphon principle, external mixing Series 136.3



 Spray angle	Ordering no.		E Ø [mm]	Air		Water $\dot{V}$ [l/h]										Spray dimensions			
	Type	Mat. no.				Water column [mm H ₂ O]			Aspiration height [mm H ₂ O]					p_{Air}	Aspira- tion- height [mm WS]	D ₁ [mm]	D ₂ [mm]		
		1Y																35	
				316L SS	Brass plated	p [bar]	$\dot{V}_n$ [m ³ /h]	150	300	450	100	200	300	600	900	[bar]			
20°	136. 324. xx. A2	○	○	0.7	0.80	0.90	-	-	-	2.49	1.71	-	-	-	1.20	300	60	115	
					1.20	1.10	-	-	-	3.12	2.53	1.86	-	-	3.20	300	65	125	
					1.40	1.20	-	-	-	3.36	2.78	2.22	-	-	4.80	300	70	135	
					1.80	1.50	-	-	-	3.75	3.22	2.67	-	-	6.00	300	80	135	
					2.00	1.60	-	-	-	3.96	3.39	2.85	0.66	-					
					2.40	1.80	-	-	-	4.29	3.73	3.21	1.41	-					
					2.60	1.90	-	-	-	4.41	3.91	3.39	1.68	-					
					3.00	2.10	5.43	-	-	4.71	4.18	3.75	2.07	-					
					3.20	2.20	5.55	-	-	4.80	4.31	3.90	2.25	-					
					3.60	2.40	5.82	-	-	5.07	4.56	4.20	2.61	-					
					3.80	2.60	6.03	-	-	5.22	4.72	4.38	2.88	2.10					
					4.20	2.80	6.30	6.66	-	5.64	5.15	4.71	3.21	2.85					
					4.40	2.90	6.36	6.72	7.05	5.88	5.38	4.92	3.60	2.97					
					4.80	3.10	6.27	6.57	6.84	5.97	5.47	5.22	3.93	1.93					
					5.00	3.20	6.12	6.42	6.75	5.88	5.36	5.10	4.05	-					
					5.40	3.40	5.82	6.12	6.48	5.49	5.03	4.71	3.81	-					
	5.60	3.50	5.67	5.97	6.30	5.22	4.84	4.53	3.63	-									
	6.00	3.80	5.31	5.58	6.00	4.80	4.48	4.08	1.92	-									
	136. 334. xx. A2	○	○	0.7	0.60	1.20	-	-	-	2.19	-	-	-	-					0.80
					0.80	1.40	-	-	-	2.64	2.28	1.44	-	-	3.20	300	65	115	
					1.20	1.80	-	-	-	3.39	3.00	2.73	0.78	-	4.80	300	70	115	
					1.40	2.00	-	-	-	3.69	3.33	3.06	1.11	-	6.00	300	75	120	
					1.80	2.30	5.19	-	-	4.20	3.87	3.51	2.16	-					
					2.00	2.50	5.43	5.97	6.42	4.47	4.08	3.78	2.58	0.84					
					2.40	2.80	5.79	6.27	6.72	4.86	4.53	4.20	3.30	1.44					
					2.60	3.00	6.00	6.48	6.90	4.98	4.68	4.41	3.57	1.77					
					3.00	3.40	6.30	6.75	7.14	5.37	5.07	4.71	3.87	2.31					
					3.20	3.50	6.42	6.90	7.29	5.52	5.19	4.89	4.02	2.52					
					3.60	3.90	6.75	7.17	7.59	5.82	5.55	5.19	4.29	3.42					
					3.80	4.00	6.87	7.32	7.80	6.03	5.73	5.37	4.47	3.81					
					4.20	4.40	7.29	7.80	8.34	6.39	6.09	5.79	4.83	4.17					
					4.40	4.60	7.62	8.16	8.73	6.69	6.39	6.09	5.13	4.38					
4.80					4.90	8.37	8.85	9.21	7.32	6.99	6.69	5.76	4.86						
5.00					5.10	8.52	8.85	9.15	7.71	7.32	7.05	6.06	5.19						
5.40	5.40	8.34	8.64	8.88	7.71	7.53	7.29	6.48	5.67										
5.60	5.60	8.19	8.49	8.76	7.59	7.41	7.20	6.45	5.73										
6.00	5.90	7.86	8.16	8.43	7.26	7.05	6.84	6.15	5.64										

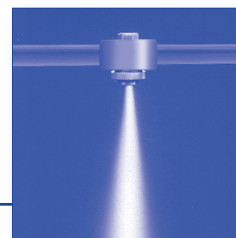
E = narrowest free cross section (water)

Continued on next page.

Example **Type** **+** **Material no. (xx)** **=** **Ordering no.**
for ordering: **136. 324. xx. A2** **+** **1Y** **=** **136. 324. 1Y. A2**



Pneumatic atomizing nozzles, Full cone, siphon principle, external mixing Series 136.3



Spray angle	Ordering no.			E Ø [mm]	Air		Water $\dot{V}$ [l/h]								Spray dimensions			
	Type	Mat. no.					Water column [mm H ₂ O]			Aspiration height [mm H ₂ O]					p_{Air}	Aspirati- on- height [mm WS]	D ₁ [mm]	D ₂ [mm]
		1Y	35															
			316L SS		Brass plated	p [bar]	$\dot{V}_n$ [m ³ /h]	150	300	450	100	200	300	600	900	[bar]		
20°	136. 342. xx. A2	○	○	1.5	1.40	3.60	-	-	-	8.82	-	-	3.93	-	1.80	300	70	120
					1.80	4.20	-	-	-	9.45	8.49	7.5	5.22	3.39	3.00	300	70	120
					2.00	4.50	11.97	-	-	9.75	8.91	7.95	5.76	4.05	4.20	300	70	120
					2.40	5.20	12.18	-	-	10.26	9.51	8.73	6.75	5.19	6.00	300	70	120
					2.60	5.50	12.27	13.32	-	10.47	9.75	9.03	7.14	5.58				
					3.00	6.10	12.27	13.23	14.16	10.65	10.05	9.42	7.74	6.39				
					3.20	6.40	12.30	13.17	14.07	10.74	10.23	9.63	8.13	6.81				
					3.60	7.00	12.42	13.20	14.07	11.01	10.53	10.05	8.85	7.86				
					3.80	7.30	12.54	13.26	14.10	11.28	10.86	10.44	9.30	8.46				
					4.20	8.00	13.17	13.83	14.49	12.12	11.76	11.40	10.41	9.69				
					4.40	8.30	13.53	14.13	14.73	12.48	12.15	11.76	10.80	10.08				
					4.80	8.90	13.98	14.52	15.15	12.99	12.63	12.18	11.19	10.29				
					5.00	9.20	14.04	14.52	15.15	13.05	12.66	12.30	11.16	10.11				
					5.40	9.80	13.74	14.31	14.94	12.66	12.24	11.79	10.62	9.21				
					5.60	10.10	13.35	14.04	14.64	12.27	11.82	11.37	10.08	8.52				
					6.00	10.80	12.21	12.90	-	10.98	10.50	10.17	8.70	7.05				
	136. 351. xx. A2	○	○	2.5	3.20	11.50	-	-	-	-	38.92	-	-	-	3.80	300	95	135
					3.60	12.50	-	-	-	45.73	41.94	-	33.17	-	4.60	300	95	145
					3.80	13.10	-	-	-	47.81	45.14	42.29	35.36	-	5.40	300	100	150
					4.20	14.20	-	-	-	51.61	49.07	46.46	39.58	29.94	6.00	300	95	150
					4.40	14.80	-	-	-	53.10	50.87	48.30	41.59	31.59				
					4.80	15.90	-	63.39	-	55.30	53.40	51.26	45.06	34.68				
					5.00	16.50	-	63.75	66.69	56.05	54.15	52.18	46.29	35.88				
					5.40	17.60	61.12	64.17	66.72	56.71	55.04	53.17	47.62	37.83				
					5.60	18.10	60.93	63.87	66.48	56.66	55.04	53.22	47.68	38.43				
					6.00	19.20	59.89	62.88	65.43	55.69	53.98	52.11	45.78	37.05				

E = narrowest free cross section (water)

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 136. 342. xx. A2 + 1Y = 136. 342. 1Y. A2

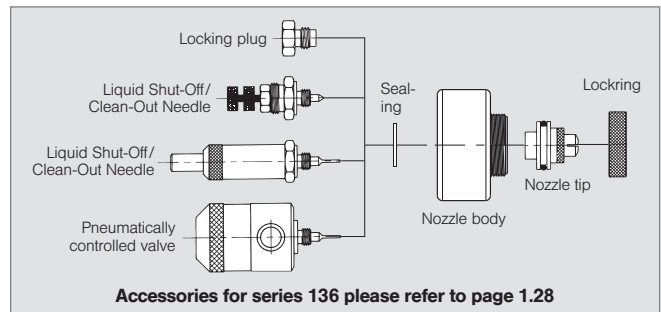
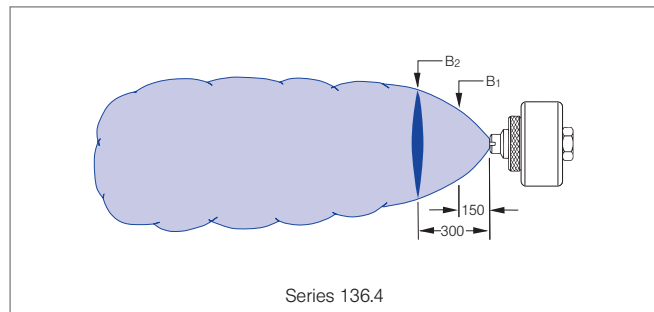
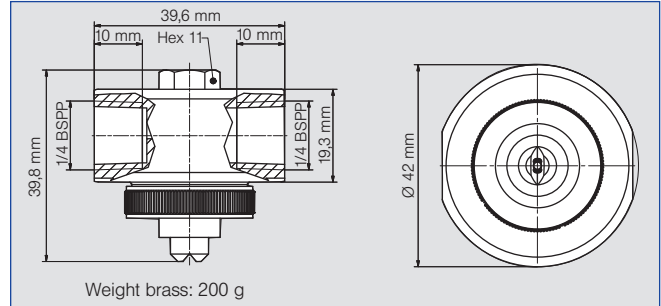


Pneumatic atomizing nozzles, Flat fan, pressure principle, internal mixing Series 136.4



Particularly fine flat fan atomization with air or gas.
Pressure principle.
Internal mixing of fluids.

Applications:
Web dampening, cooling,
humidification of goods.



Spray angle	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions				
	Type	Mat. no.		0.7			1.5			3.0			4.0			p Air [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]	
		1Y		35	p Air [bar]	ṡ Water [l/h]	ṡ _n Air [m³/h]	p Air [bar]	ṡ Water [l/h]	ṡ _n Air [m³/h]	p Air [bar]	ṡ Water [l/h]	ṡ _n Air [m³/h]							
		316L SS		Brass plated																
45°	136. 414. xx. A2	○	○	0.7	1.00	7.70	1.30	1.40	14.30	1.50	2.20	22.40	2.00	3.00	25.10	2.50	1.40	0.70	85	125
1.20					6.00	1.50	1.60	13.00	1.60	2.60	20.00	2.30	3.40	23.00	2.80	2.40	1.50	100	145	
1.40					4.20	1.70	1.80	11.60	1.80	3.00	17.70	2.60	3.80	20.90	3.10	3.20	2.00	105	155	
1.60					2.70	1.90	2.00	10.20	2.00	3.40	15.50	3.00	4.20	18.90	3.50	3.80	3.00	120	170	
1.80					1.30	2.10	2.20	8.90	2.20	3.80	13.30	3.40	4.60	16.90	3.80	4.60	4.00	130	210	
-					-	-	2.40	7.40	2.40	4.20	11.00	3.70	5.00	14.90	4.20					
-					-	-	2.60	5.90	2.60	4.60	8.80	4.10	5.40	12.80	4.60					
-					-	-	2.80	4.60	2.80	5.00	6.60	4.50	5.80	10.80	5.00					
-					-	-	3.00	3.20	3.00	5.40	4.30	4.90	6.00	9.80	5.20					
-					-	-	3.20	2.10	3.20	5.80	2.50	5.30	-	-	-					
-					-	-	3.40	1.10	3.40	6.00	1.60	5.50	-	-	-					
136. 443. xx. A2					○	○	1.0	1.20	13.90	1.50	1.60	26.60	1.60	3.00	37.10	2.60	3.60	45.60	2.90	1.20
	1.40	11.90	1.70	1.80				24.30	1.80	3.40	33.10	3.00	4.00	41.90	3.30	2.00	1.50	115	190	
	1.60	9.50	1.90	2.00				22.00	2.00	3.80	29.50	3.40	4.40	38.30	3.70	2.80	2.00	145	190	
	1.80	7.80	2.10	2.20				19.90	2.20	4.20	26.20	3.80	4.80	35.00	4.00	3.80	3.00	150	210	
	-	-	-	2.40				18.00	2.40	4.60	23.00	4.20	5.20	31.80	4.50	4.80	4.00	160	230	
	-	-	-	2.60				16.20	2.60	5.00	20.20	4.60	5.60	29.00	4.90					
	-	-	-	2.80				14.40	2.80	5.40	17.60	4.90	6.00	26.20	5.20					
	-	-	-	3.00				12.80	3.00	5.80	14.90	5.30	-	-	-					
	-	-	-	3.20				11.30	3.20	6.00	14.10	5.50	-	-	-					
	-	-	-	3.40				9.90	3.40	-	-	-	-	-	-					
	-	-	-	3.60				8.80	3.60	-	-	-	-	-	-					

E = narrowest free cross section (water)

Continued on next page.

Example Type + Material no. (xx) = Ordering no.
for ordering: 136. 414. xx. A2 + 1Y = 136. 414. 1Y. A2



Pneumatic atomizing nozzles, Flat fan, pressure principle, internal mixing Series 136.4



Spray angle	Ordering no.				E Ø [mm]	Liquid pressure p [bar]												Spray dimensions					
	Type	Mat. no.		1Y 316L SS		35 Brass plated	0.7			1.5			3.0			4.0			p Air [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]	
						p Air	V̇ Water	V̇n Air	p Air	V̇ Water	V̇n Air	p Air	V̇ Water	V̇n Air	p Air	V̇ Water	V̇n Air	p Air	p Water				
45°	136. 462. xx. A2	○	○	1.5	1.20	19.00	2.60	2.00	22.00	2.00	3.00	61.80	4.00	3.80	76.10	4.60	1.20	0.70	120	140			
					1.60	12.20	3.40	2.40	18.00	2.40	3.40	51.90	4.80	4.00	70.40	5.10	2.40	1.50	120	170			
					2.00	9.40	4.10	2.80	14.40	2.80	3.80	44.60	5.80	4.20	65.60	5.50	3.20	2.00	120	175			
					2.40	7.10	4.80	3.20	11.30	3.20	4.20	39.00	6.60	4.40	61.30	5.90	3.80	3.00	140	205			
					2.80	5.70	5.40	3.60	8.80	3.60	4.60	33.40	7.40	4.60	57.30	6.40	6.00	4.00	145	205			
					3.20	5.00	6.00	4.00	8.10	3.90	5.00	29.40	8.10	4.80	54.10	6.70							
					3.60	3.60	6.60	4.40	6.20	4.30	5.40	25.50	8.90	5.00	51.30	7.20							
					4.00	3.20	7.20	4.80	4.60	4.60	5.80	22.00	9.60	5.20	49.30	7.70							
					4.40	2.20	7.80	5.20	3.20	4.90	6.00	20.60	9.90	5.40	46.50	8.20							
					-	-	-	5.60	1.60	5.30	-	-	-	5.60	43.70	8.60							
					-	-	-	5.80	0.80	5.40	-	-	-	5.80	41.30	8.90							
					-	-	-	-	-	-	-	-	-	6.00	39.00	9.30							
60°	136. 425. xx. A2	○	○	0.5	0.80	6.50	1.20	1.40	9.40	1.70	2.40	13.20	2.50	2.40	16.10	2.50	1.20	0.70	155	195			
					1.20	5.50	1.60	1.80	8.70	2.10	2.60	12.90	2.70	2.80	15.50	2.90	2.20	1.50	165	255			
					1.60	4.70	1.90	2.20	7.90	2.40	3.00	12.30	3.00	3.20	15.00	3.20	3.00	2.00	170	265			
					2.00	4.00	2.30	2.60	7.20	2.70	3.40	11.80	3.40	3.60	14.50	3.50	3.40	3.00	200	330			
					2.40	3.20	2.60	3.00	6.40	3.10	3.80	11.10	3.70	4.00	13.90	3.80	5.60	4.00	200	330			
					2.80	2.60	2.90	3.40	5.70	3.40	4.20	10.40	4.00	4.40	13.40	4.10							
					3.00	2.20	3.10	3.80	5.10	3.70	4.60	9.80	4.30	4.80	12.80	4.50							
					-	-	-	4.00	4.80	3.90	5.00	9.20	4.60	5.20	12.20	4.80							
					-	-	-	4.40	4.20	4.20	5.40	8.60	5.00	5.60	11.70	5.10							
					-	-	-	4.80	3.60	4.50	5.80	8.10	5.30	6.00	11.20	5.40							
					-	-	-	5.20	2.80	4.80	6.00	7.80	5.40	-	-	-							
					-	-	-	5.60	2.20	5.10	-	-	-	-	-	-							
					-	-	-	6.00	1.60	5.50	-	-	-	-	-	-							
	136. 452. xx. A2	○	○	1.5	1.00	18.80	3.90	1.80	31.00	5.30	3.20	50.10	7.70	3.80	70.70	8.20	1.00	0.70	130	185			
					1.40	8.60	5.70	2.00	25.40	6.30	3.60	39.50	9.40	4.20	58.60	9.60	1.80	1.50	150	240			
					1.80	7.40	7.00	2.20	20.10	7.20	4.00	31.30	11.20	4.60	48.60	11.20	2.60	2.00	155	245			
					2.20	4.10	8.40	2.40	15.50	8.00	4.40	24.00	12.90	5.00	41.20	13.10	3.60	3.00	175	280			
					2.60	1.00	9.80	2.60	12.40	8.90	4.80	17.70	14.50	5.40	33.60	14.80	5.00	4.00	180	285			
					2.80	0.10	10.30	2.80	10.40	9.60	5.20	13.40	16.00	5.80	27.50	16.40							
					-	-	-	-	-	-	5.60	10.60	17.50	6.00	24.40	17.20							
					-	-	-	-	-	-	6.00	8.60	18.80	-	-	-							
80°	136. 433. xx. A2	○	○	0.4	1.00	11.60	2.00	1.80	18.30	2.80	3.00	31.00	3.70	3.80	37.50	4.40	1.40	0.70	150	210			
					1.20	8.10	2.40	2.00	15.30	3.20	3.40	25.40	4.40	4.20	32.40	5.00	2.20	1.50	185	255			
					1.40	5.30	2.80	2.20	12.20	3.60	3.80	20.60	5.10	4.60	27.70	5.70	3.00	2.00	205	300			
					1.60	3.70	3.20	2.40	9.80	4.00	4.20	16.30	5.90	5.00	23.40	6.50	3.80	4.00	300	485			
					-	-	-	2.60	7.60	4.30	4.60	12.50	6.60	5.40	19.40	7.20	5.20	4.00	260	395			
					-	-	-	2.80	5.90	4.70	5.00	9.30	7.30	5.80	15.90	7.90							
					-	-	-	3.00	4.40	5.00	5.40	6.50	8.00	6.00	14.20	8.30							
					-	-	-	-	-	-	-	-	-	-	-	-							
					-	-	-	-	-	-	-	-	-	-	-	-							

E = narrowest free cross section (water)

Example Type + Material no. (xx) = Ordering no.
for ordering: 136. 462. xx. A2 + 1Y = 136. 462. 1Y. A2



Pneumatic atomizing nozzles, Flat fan, siphon principle, internal mixing Series 136.5



Particularly fine flat fan atomization with air or gas.
Siphon principle or gravity principle.

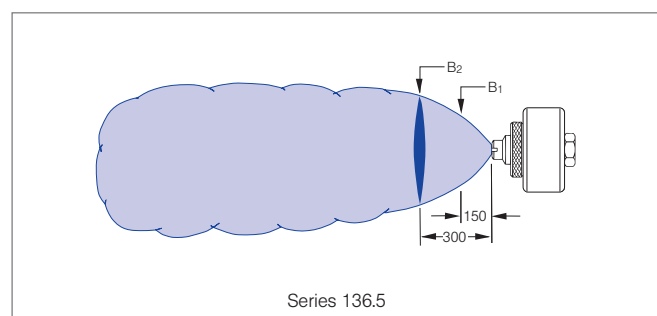
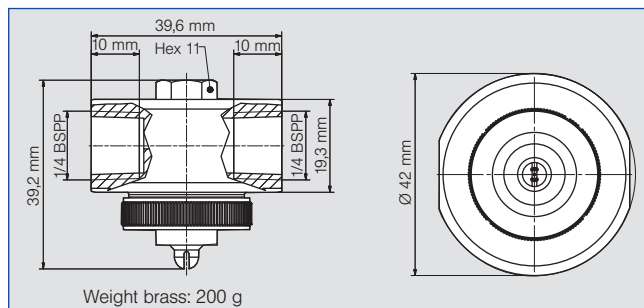
Internal mixing of fluids.

Applications:

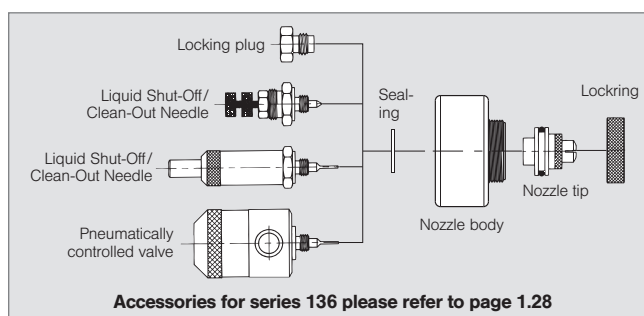
Web dampening, cooling, humidification of goods.



Series 136.5



Series 136.5



Accessories for series 136 please refer to page 1.28

Spray angle	Ordering no.			E Ø [mm]	Air		Water $\dot{V}$ [l/h]										Spray dimensions			
	Type	Mat. no.					Water column [mm H ₂ O]			Aspiration height [mm H ₂ O]					p_{Air} [bar]	Aspiration- height [mm WS]	Spray width B ₁ [mm]	Spray width B ₂ [mm]		
		1Y	35																	
		316L SS	Brass plated		p [bar]	$\dot{V}_n$ [m ³ /h]	150	300	450	100	200	300	600	900						
60°	136. 516. xx. A2	○	○	0.4	0.80	1.80	-	-	-	1.62	1.53	-	1.17	0.88	1.00	300	130	165		
1.20					2.20	1.89	2.13	2.19	1.80	1.77	1.68	1.41	1.16	3.00	300	150	200			
1.40					2.50	1.95	2.16	2.25	1.86	1.80	1.68	1.47	1.21	4.60	300	170	225			
1.80					2.90	1.98	2.22	2.34	1.89	1.86	1.77	1.53	1.26	6.00	300	180	240			
2.00					3.10	1.95	2.19	2.31	1.89	1.80	1.68	1.50	1.26							
2.40					3.50	1.89	2.25	2.25	1.83	1.71	1.68	1.47	1.22							
2.60					3.70	1.83	2.25	2.25	1.74	1.71	1.59	1.44	1.18							
3.00					4.20	1.74	2.01	2.22	1.71	1.62	1.56	1.44	1.28							
3.20					4.40	1.71	1.92	2.16	1.65	1.62	1.59	1.59	1.38							
3.60					4.80	1.74	1.83	2.10	1.80	1.77	1.74	1.68	1.47							
3.80					5.00	1.92	1.80	2.10	1.86	1.86	1.80	1.71	1.49							
4.20					5.50	1.98	2.04	2.19	1.92	1.83	1.83	1.68	1.70							
4.40					5.70	1.95	2.04	2.19	1.89	1.86	1.80	1.74	1.77							
4.80					6.10	2.01	2.04	2.16	2.01	2.01	2.04	2.04	1.98							
5.00					6.30	2.10	2.13	2.22	2.19	2.19	2.16	2.10	1.93							
5.40					6.80	2.31	2.34	2.28	2.25	2.22	2.16	2.04	1.86							
5.60					7.00	2.31	2.28	2.25	2.19	2.16	2.10	2.01	1.80							
6.00					7.40	2.22	2.22	2.22	2.10	2.10	2.04	1.92	1.79							

E = narrowest free cross section (water)

Continued on next page.

Operational information:

Liquid flow of pneumatic atomizing nozzles with external mixing can be turned down to 0 with air pressure remaining constant.

Example Type + Material no. (xx) = Ordering no.
for ordering: 136. 516. xx. A2 + 1Y = 136. 516. 1Y. A2



Pneumatic atomizing nozzles, Flat fan, siphon principle, internal mixing Series 136.5



Spray angle	Ordering no.			E Ø [mm]	Air		Water $\dot{V}$ [l/h]								Spray dimensions			
	Type	Mat. no.					Water column [mm H ₂ O]			Aspiration height [mm H ₂ O]					p_{Air} [bar]	Aspira- tion- height [mm WS]	B ₁ [mm]	B ₂ [mm]
		1Y	35															
		316L SS	Brass plated															
				p [bar]	$\dot{V}_n$ [m ³ /h]	150	300	450	100	200	300	600	900					
60°	136. 525. xx. A2	○	○	0.5	0.60	1.60	-	-	-	2.00	-	-	-	-	1.00	300	155	240
					0.80	1.90	-	-	-	2.21	2.10	1.98	-	-	3.00	300	200	295
					1.20	2.30	2.75	2.84	-	2.53	2.39	2.33	2.04	1.69	4.60	300	215	325
					1.40	2.60	2.84	2.90	3.05	2.63	2.51	2.42	2.14	1.82	6.00	300	250	400
					1.80	3.00	2.96	3.01	3.16	2.78	2.64	2.56	2.20	1.88				
					2.00	3.30	2.94	3.02	3.16	2.73	2.69	2.58	2.18	1.82				
					2.40	3.70	2.87	2.97	3.10	2.59	2.50	2.38	2.01	1.68				
					2.60	3.90	2.82	2.86	3.04	2.49	2.46	2.29	1.91	1.62				
					3.00	4.40	2.59	2.71	2.85	2.23	2.11	2.04	1.73	1.72				
					3.20	4.60	2.48	2.51	2.71	2.09	1.96	1.91	1.74	1.87				
					3.60	5.10	2.37	2.31	2.51	2.25	2.18	2.19	1.98	1.90				
					3.80	5.30	2.34	2.37	2.52	2.22	2.23	2.15	1.99	1.85				
					4.20	5.70	2.35	2.35	2.43	2.20	2.13	2.11	1.94	1.82				
					4.40	6.00	2.30	2.32	2.44	2.20	2.07	2.05	1.96	1.83				
					4.80	6.40	2.25	2.24	2.41	2.12	2.03	2.08	1.90	2.12				
					5.00	6.60	2.20	2.21	2.37	2.09	2.03	1.98	2.25	2.27				
					5.40	7.10	2.52	2.23	2.36	2.60	2.55	2.49	2.26	2.08				
					5.60	7.30	2.50	2.45	2.58	2.57	2.54	2.39	2.16	2.02				
					6.00	7.80	2.57	2.61	2.76	2.37	2.40	2.18	1.94	1.80				

E = narrowest free cross section (water)

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 136. 525. xx. A2 + 1Y = 136. 525. 1Y. A2



Pneumatic atomizing nozzles, Flat fan, pressure principle, external mixing Series 136.6

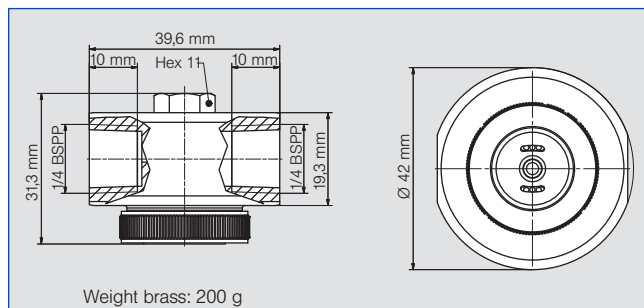


**Fine flat fan atomization
with the aid of air or gas.
Liquid pressure principle.
External mixing of fluids.**

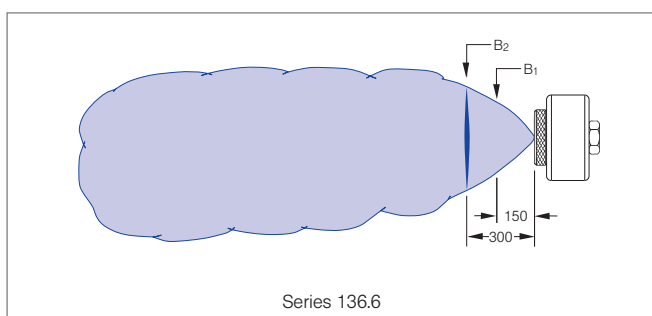
Applications:
Web dampening, cooling,
humidification of goods,
atomization of viscous liquids.



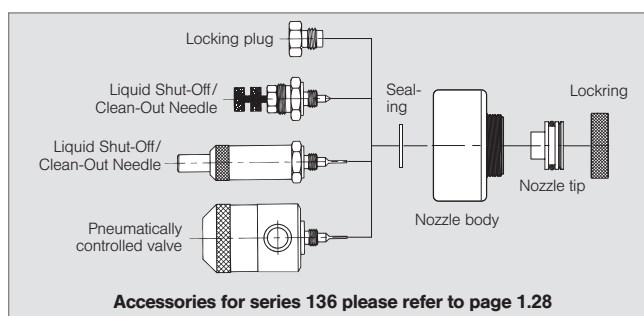
Series 136.6



Weight brass: 200 g



Series 136.6



Accessories for series 136 please refer to page 1.28

Spray angle	Ordering no.			E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat. no.			0.07			0.15			0.30			0.35			p [bar]	p [bar]	B ₁ [mm]	B ₂ [mm]
		1Y	35		p [bar]	V̇ [l/h]	V̇ _n [m³/h]	p [bar]	V̇ [l/h]	V̇ _n [m³/h]	p [bar]	V̇ [l/h]	V̇ _n [m³/h]	p [bar]	V̇ [l/h]	V̇ _n [m³/h]				
		316L SS	Brass plated																	
45°	136. 616. xx. A2	○	○	0.4	0.80	1.68	2.50	0.80	2.43	2.40	0.80	3.42	2.50	1.00	3.69	2.80	1.40	0.07	80	115
1.20					1.80	3.10	1.00	2.46	2.90	1.20	3.48	3.10	1.40	3.81	3.40	2.20	0.15	90	130	
1.60					1.92	3.70	1.40	2.58	3.60	1.60	3.51	3.70	1.80	3.87	4.00	3.20	0.20	90	135	
2.00					2.10	4.30	1.80	2.61	4.20	2.00	3.63	4.30	2.20	3.84	4.60	4.00	0.30	95	145	
2.40					2.07	4.90	2.20	2.76	4.80	2.40	3.63	4.90	2.60	3.90	5.20	5.00	0.35	100	145	
2.80					2.19	5.50	2.60	2.73	5.40	2.80	3.63	5.50	3.00	3.93	5.80					
3.20					2.19	6.10	3.00	2.73	6.00	3.20	3.63	6.10	3.40	3.90	6.40					
3.60					2.22	6.70	3.60	2.76	6.70	3.60	3.66	6.70	3.80	3.93	7.00					
4.00					2.22	7.30	4.00	2.76	7.30	4.00	3.69	7.30	4.20	3.96	7.60					
4.40					2.22	7.90	4.40	2.76	7.90	4.40	3.69	7.90	4.60	3.93	8.20					
4.80					2.22	8.50	4.80	2.76	8.50	4.80	3.69	8.40	5.00	3.93	8.80					
5.20					2.22	9.10	5.20	2.76	9.10	5.20	3.66	9.10	5.40	3.93	9.40					
5.60					2.22	9.60	5.60	2.76	9.70	5.60	3.66	9.60	5.80	3.87	10.00					
6.00	2.22	10.20	6.00	2.73	10.20	6.00	3.66	10.20	6.00	3.87	10.20									
	136. 635. xx. A2	○	○	0.5	0.80	2.37	2.50	0.80	3.45	2.40	0.80	4.80	2.40	1.00	5.34	2.80	1.40	0.07	85	120
1.20					2.61	3.10	1.20	3.54	3.10	1.20	5.10	3.10	1.40	5.37	3.40	2.20	0.15	95	130	
1.60					2.85	3.70	1.60	3.66	3.70	1.60	5.01	3.70	1.80	5.46	4.00	3.20	0.20	95	135	
2.00					3.03	4.30	2.00	3.72	4.30	2.10	5.10	4.30	2.20	5.46	4.60	4.00	0.30	100	140	
2.40					3.12	4.90	2.40	3.90	4.90	2.40	5.13	4.90	2.60	5.58	5.20	5.00	0.35	100	145	
2.80					3.15	5.50	2.80	3.87	5.50	2.80	5.16	5.50	3.00	5.58	5.80					
3.20					3.21	6.10	3.20	3.96	6.10	3.20	5.22	6.10	3.40	5.58	6.40					
3.60					3.18	6.70	3.60	3.96	6.70	3.60	5.25	6.70	3.80	5.58	7.00					
4.00					3.21	7.30	4.00	3.96	7.20	4.00	5.22	7.30	4.20	5.58	7.60					
4.40					3.21	7.90	4.40	3.96	7.90	4.40	5.22	7.90	4.60	5.58	8.10					
4.80					3.21	8.40	4.80	3.96	8.40	4.80	5.22	8.40	5.00	5.58	8.70					
5.20					3.21	9.00	5.20	3.96	9.00	5.20	5.22	9.00	5.40	5.58	9.30					
5.60					3.12	9.60	5.60	3.90	9.60	5.60	5.22	9.60	5.80	5.58	9.90					
6.00	3.18	10.20	6.00	3.84	10.20	6.00	5.16	10.20	6.00	5.58	10.20									



Pneumatic atomizing nozzles, Flat fan, pressure principle, external mixing Series 136.6



Spray angle	Ordering no.			E Ø [mm]	Liquid pressure p [bar]												Spray dimensions							
	Type	Mat. no.			0.07			0.15			0.30			0.35			p [bar]	p [bar]	B ₁ [mm]	B ₂ [mm]				
		1Y	35		p [bar]	V [l/h]	V̇ _n [m³/h]	p [bar]	V [l/h]	V̇ _n [m³/h]	p [bar]	V [l/h]	V̇ _n [m³/h]	p [bar]	V [l/h]	V̇ _n [m³/h]								
		316L SS	Brass plated																					
45°	136. 654. xx. A2	○	○	0.7	0.80	5.25	2.40	0.80	7.29	2.40	1.20	10.11	3.10	1.60	11.07	3.70	1.40	0.07	95	135				
1.20					5.64	3.10	1.20	7.44	3.10	1.60	10.23	3.70	2.00	11.22	4.30	2.20	0.15	100	150					
1.60					5.79	3.70	1.60	7.62	3.70	2.00	10.38	4.30	2.40	11.28	4.90	3.20	0.20	105	160					
2.00					6.18	4.30	2.00	7.86	4.30	2.40	10.47	4.90	2.80	11.31	5.50	4.00	0.30	105	160					
2.40					6.24	4.90	2.40	7.92	4.90	2.80	10.59	5.50	3.20	11.43	6.10	5.00	0.35	105	160					
2.80					6.27	5.50	2.80	8.04	5.50	3.20	10.59	6.10	3.60	11.46	6.60									
3.20					6.39	6.10	3.20	8.13	6.10	3.60	10.62	6.70	4.00	11.43	7.20									
3.60					6.42	6.60	3.60	8.13	6.70	4.00	10.62	7.20	4.40	11.37	7.80									
4.00					6.45	7.20	4.00	8.13	7.20	4.40	10.62	7.80	4.80	11.37	8.40									
4.40					6.42	7.80	4.40	8.07	7.80	4.80	10.59	8.40	5.20	11.34	9.00									
4.80					6.30	8.40	4.80	8.04	8.40	5.20	10.56	9.00	5.60	11.22	9.60									
5.20					6.24	9.00	5.20	7.86	9.00	5.60	10.50	9.60	6.00	11.16	10.10									
5.60					6.09	9.60	5.60	7.83	9.60	6.00	10.35	10.20	-	-	-									
6.00					5.85	10.20	6.00	7.59	10.20	-	-	-	-	-	-									
60°					136. 626. xx. A2	○	○	0.4	0.80	1.83	2.80	0.80	2.49	2.80	0.80	3.48	2.80	0.80	3.78	2.80	1.60	0.07	85	135
									1.20	1.98	3.60	1.20	2.58	3.50	1.20	3.60	3.50	1.20	3.87	3.60	2.40	0.15	90	140
	1.60	2.10	4.30	1.60					2.70	4.20	1.60	3.66	4.30	1.60	3.90	4.20	3.20	0.20	90	140				
	2.00	2.16	4.90	2.00					2.82	4.90	2.00	3.69	4.90	2.00	3.96	4.90	4.00	0.30	100	145				
	2.40	2.25	5.60	2.40					2.85	5.60	2.40	3.69	5.60	2.40	3.96	5.60	5.20	0.35	105	150				
	2.80	2.34	6.30	2.80					2.88	6.30	2.80	3.72	6.30	2.80	4.02	6.30								
	3.20	2.31	7.00	3.20					2.88	7.00	3.20	3.78	7.00	3.20	3.99	7.00								
	3.60	2.34	7.60	3.60					2.88	7.70	3.60	3.78	7.60	3.60	4.02	7.70								
	4.00	2.40	8.40	4.00					2.94	8.40	4.00	3.81	8.30	4.00	4.05	8.30								
	4.40	2.40	9.00	4.40					2.91	9.00	4.40	3.81	9.00	4.40	4.02	9.00								
	4.80	2.40	9.70	4.80					2.97	9.70	4.80	3.81	9.70	4.80	4.08	9.70								
	5.20	2.43	10.40	5.20					2.97	10.40	5.20	3.81	10.40	5.20	4.05	10.40								
	5.60	2.43	11.20	5.60					2.97	11.10	5.60	3.81	11.10	5.60	4.05	11.00								
	6.00	2.43	11.80	6.00					2.97	11.80	6.00	3.81	11.80	6.00	4.05	11.80								
	136. 645. xx. A2	○	○	0.5					0.80	2.73	2.80	0.80	3.69	2.80	1.00	5.16	3.20	1.00	5.55	3.10	1.60	0.07	100	140
									1.20	2.82	3.50	1.20	3.87	3.50	1.40	5.31	3.90	1.40	5.64	3.90	2.40	0.15	110	150
					1.60	3.09	4.20	1.60	3.99	4.20	1.80	5.37	4.60	1.80	5.67	4.60	3.20	0.20	115	155				
					2.00	3.27	4.90	2.00	4.11	4.90	2.20	5.37	5.20	2.20	5.76	5.20	4.00	0.30	125	160				
					2.40	3.36	5.60	2.40	4.17	5.60	2.60	5.43	5.90	2.60	5.82	5.90	5.20	0.35	130	165				
					2.80	3.39	6.20	2.80	4.20	6.30	3.00	5.49	6.60	3.00	5.82	6.60								
					3.20	3.45	7.00	3.20	4.26	7.00	3.40	5.49	7.20	3.40	5.88	7.30								
					3.60	3.48	7.60	3.60	4.29	7.60	3.80	5.55	8.00	3.80	5.88	8.00								
					4.00	3.51	8.30	4.00	4.32	8.30	4.20	5.55	8.60	4.20	5.88	8.70								
					4.40	3.54	9.00	4.40	4.35	9.00	4.60	5.58	9.30	4.60	5.94	9.30								

E = narrowest free cross section (water)

Continued on next page.

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: **136. 654 xx. A2** + **1Y** = **136. 654. 1Y. A2**



Pneumatic atomizing nozzles, Flat fan, pressure principle, external mixing Series 136.6



Spray angle	Ordering no.			E Ø [mm]	Liquid pressure p [bar]												Spray dimensions							
	Type	Mat. no.			0.07			0.15			0.30			0.35			p [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]				
		1Y	35		p [bar]	V [l/h]	V _n [m³/h]	p [bar]	V [l/h]	V _n [m³/h]	p [bar]	V [l/h]	V _n [m³/h]	p [bar]	V [l/h]	V _n [m³/h]								
		316L SS	Brass plated																					
60°	136. 664. xx. A2	○	○	0.7	0.80	5.46	2.80	1.00	7.68	3.20	1.00	10.50	3.20	1.00	11.28	3.20	1.60	0.07	110	140				
					1.20	5.91	3.50	1.40	7.95	3.90	1.40	10.71	3.90	1.40	11.52	3.90	2.40	0.15	130	160				
					1.60	6.15	4.20	1.80	8.13	4.60	1.80	10.83	4.60	1.80	11.58	4.50	3.20	0.20	140	170				
					2.00	6.42	4.90	2.20	8.34	5.30	2.20	11.01	5.30	2.20	11.70	5.20	4.00	0.30	150	180				
					2.40	6.63	5.60	2.60	8.46	5.90	2.60	11.07	5.90	2.60	11.79	5.90	5.20	0.35	155	200				
					2.80	6.75	6.30	3.00	8.58	6.60	3.00	11.16	6.60	3.00	11.88	6.60								
					3.20	6.93	6.90	3.40	8.67	7.30	3.40	11.19	7.30	3.40	11.94	7.30								
					3.60	6.99	7.60	3.80	8.73	8.00	3.80	11.25	8.00	3.80	12.00	8.00								
					4.00	7.05	8.30	4.20	8.76	8.70	4.20	11.28	8.60	4.20	12.03	8.70								
					4.40	7.11	9.00	4.60	8.82	9.30	4.60	11.34	9.40	4.60	12.06	9.40								
					4.80	7.11	9.70	5.00	8.82	10.10	5.00	11.37	10.00	5.00	12.06	10.10								
					5.20	7.17	10.40	5.40	8.82	10.70	5.40	11.37	10.70	5.40	12.09	10.70								
					5.60	7.11	11.10	5.80	8.85	11.40	5.80	11.40	11.40	5.80	12.12	11.40								
					6.00	7.20	11.80	6.00	8.85	11.80	6.00	11.40	11.70	6.00	12.15	11.80								
					136. 673. xx. A2	○	○	1.0	0.60	13.89	5.60	1.00	18.51	7.60	1.60	24.81	10.20	2.00	26.61	11.80	1.60	0.07	115	160
									1.00	14.28	7.60	1.40	18.51	9.30	2.00	24.66	11.70	2.40	26.31	13.50	2.40	0.15	120	160
	1.40	14.28	9.40	1.80					18.33	11.00	2.40	24.42	13.30	2.80	25.65	15.10	3.20	0.20	120	160				
	1.80	14.10	11.00	2.20					17.91	12.70	2.80	23.52	15.10	3.20	24.57	16.60	4.00	0.30	120	165				
	2.20	13.68	12.60	2.60					17.37	14.20	3.20	22.47	16.60	3.60	23.28	18.30	5.20	0.35	120	170				
	2.60	13.62	14.20	3.00					16.65	15.90	3.60	21.30	18.40	4.00	21.93	19.90								
	3.00	13.29	18.90	3.40					15.93	17.30	4.00	20.10	19.80	4.40	20.34	21.50								
	3.40	12.87	17.40	3.80					15.06	19.00	4.40	18.78	21.50	4.80	19.20	23.10								
	3.80	12.57	19.10	4.20					14.58	20.80	4.80	17.52	23.20	5.20	18.06	24.70								
	4.20	12.18	20.80	4.60					13.83	22.30	5.20	16.71	24.80	5.60	17.01	26.30								
	4.60	11.79	22.40	5.00					13.08	24.00	5.60	15.63	26.40	6.00	15.87	28.00								
	5.00	10.95	24.00	5.40					12.30	25.60	5.80	15.12	27.30	-	-	-								
	5.40	10.44	25.60	5.80					11.52	27.20	6.00	14.76	28.00	-	-	-								
	5.80	9.57	27.20	6.00					11.04	28.10	-	-	-	-	-	-								
	6.00	8.97	28.10	-					-	-	-	-	-	-	-	-								
	136. 682. xx. A2	○	○	1.5					1.00	22.41	7.50	1.40	28.95	9.30	1.80	41.22	11.10	2.00	44.04	11.80	1.60	0.07	110	155
					1.40	20.19	9.30	1.80	26.07	10.90	2.20	34.92	12.60	2.40	39.09	13.40	2.40	0.15	120	155				
					1.80	18.75	11.00	2.20	23.94	12.50	2.60	33.18	14.20	2.80	35.16	15.10	3.20	0.20	120	160				
					2.20	17.88	12.50	2.60	22.23	14.30	3.00	30.45	15.90	3.20	32.22	16.70	4.00	0.30	120	165				
					2.60	17.10	14.20	3.00	21.12	15.90	3.40	28.29	17.50	3.60	30.18	18.30	5.20	0.35	120	175				
					3.00	16.47	15.90	3.40	20.10	17.50	3.80	26.64	19.10	4.00	28.32	19.90								
					3.40	16.08	17.50	3.80	19.44	19.10	4.20	25.35	20.70	4.40	26.94	21.50								
					3.80	15.90	19.10	4.20	18.99	20.70	4.60	24.24	22.30	4.80	25.59	23.10								
					4.20	15.90	20.70	4.60	18.45	22.30	5.00	23.13	24.00	5.20	24.36	24.80								
					4.60	15.81	22.30	5.00	18.18	24.00	5.40	22.14	25.50	5.60	23.28	26.40								
					5.00	15.21	23.90	5.40	17.25	25.40	5.80	21.12	27.20	6.00	22.17	28.00								
					5.40	13.92	25.50	5.80	15.72	27.20	6.00	20.67	28.00	-	-	-								
					5.80	12.09	27.20	6.00	14.91	28.00	-	-	-	-	-	-								
					6.00	11.07	28.00	-	-	-	-	-	-	-	-	-								

E = narrowest free cross section (water)

Continued on next page.

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 136. 664 xx. A2 + 1Y = 136. 664. 1Y. A2



Pneumatic atomizing nozzles, Flat fan, pressure principle, external mixing Series 136.6



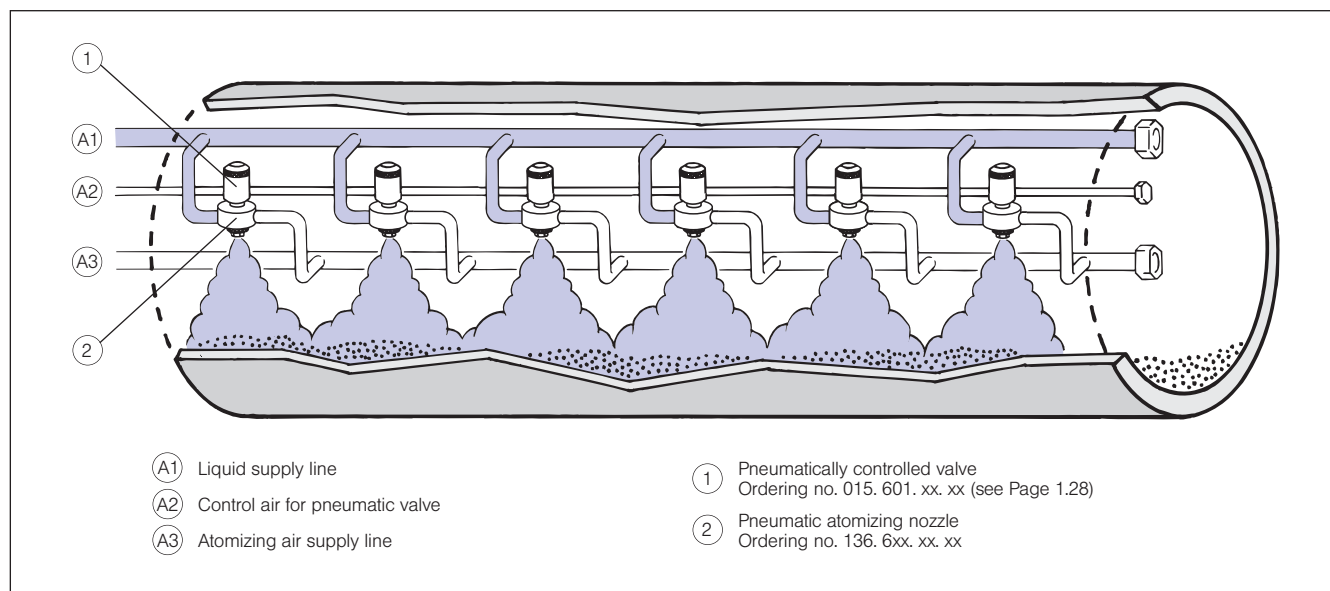
Spray angle	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions				
	Type	Mat. no.		0.07			0.15			0.30			0.35			p Air [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]	
		1Y		35	p Air [bar]	V Water [l/h]	V _n Air [m³/h]	p Air [bar]	V Water [l/h]	V _n Air [m³/h]	p Air [bar]	V Water [l/h]	V _n Air [m³/h]							
		316L SS		Brass plated																
60°	136. 691. xx. A2	○	○	2.5	1.40	52.00	13.80	2.00	67.30	17.50	2.60	92.30	21.20	2.60	102.10	21.20	1.60	0.07	150	200
1.80		50.00	16.30		2.40	64.60	20.10	3.00	87.70	23.60	3.00	97.20	23.70	2.40	0.15	160	205			
2.20		48.60	18.80		2.80	62.00	22.50	3.40	84.30	26.00	3.40	92.50	26.10	3.20	0.20	160	205			
2.60		47.50	21.30		3.20	60.40	24.90	3.80	80.70	28.50	3.80	88.40	28.50	4.00	0.30	160	210			
3.00		46.50	23.70		3.60	58.00	27.30	4.20	77.00	30.90	4.20	85.20	31.00	5.20	0.35	150	210			
3.40		45.40	26.10		4.00	56.20	29.80	4.60	74.40	33.40	4.60	81.30	33.40							
3.80		44.40	28.60		4.40	54.20	32.10	5.00	71.10	35.90	5.00	78.20	35.80							
4.20		42.90	31.00		4.80	52.40	34.70	5.40	68.10	38.30	5.40	74.30	38.20							
4.60		41.50	33.40		5.20	49.90	37.10	5.80	64.30	40.80	5.80	71.10	40.70							
5.00		39.90	35.80		5.60	48.10	39.50	6.00	63.20	42.00	6.00	68.90	41.90							
5.40		38.90	38.30		6.00	46.40	42.00	-	-	-	-	-	-	-						
5.60		38.50	39.40		-	-	-	-	-	-	-	-	-	-						

E = narrowest free cross section (water)

Operational information:

Liquid flow of pneumatic atomizing nozzles with external mixing can be turned down to 0 with air pressure remaining constant.

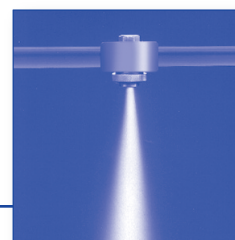
Example **Type** **+ Material no. (xx)** **= Ordering no.**
for ordering: 136. 691 xx. A2 + 1Y = 136. 691. 1Y. A2



Cereal dampening in a mixing drum



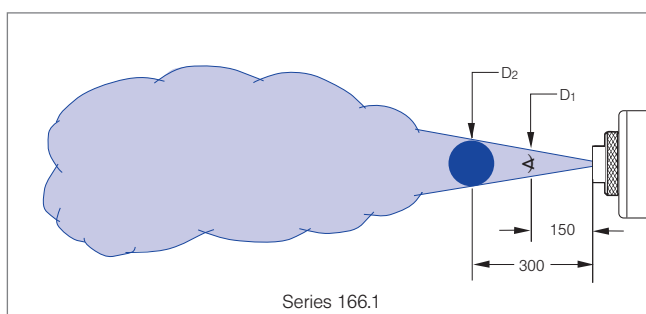
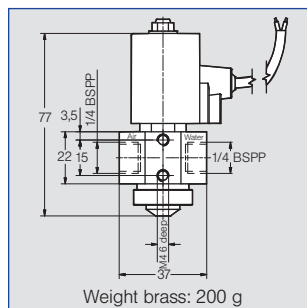
Pneumatic atomizing nozzles, Full cone, pressure principle, internal mixing Series 166.1



Version with magnetic valve.
Fine full cone atomization
and fogging with air or gas.
Liquid pressure principle.
Internal mixing of fluids.
Applications:
Humidification of air, cooling.

Technical Data:

- Service pressure: 0-6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency:
ca. 500/min
- Protective system: IP 67
- Ambient temperature:
10°C / +50°C
- Cable length: 1.000 mm
- Material of gasket: EPDM



Accessories for series 166
please refer to page 1.29

Spray angle 	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat. no.		0.7			1.5			3.0			4.0			p Air [bar]	p Water [bar]	D ₁ [mm]	D ₂ [mm]
		16		p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]				
20°	166. 115. xx. A2	○	0.50	0.40	5.90	0.30	1.40	5.80	0.80	2.40	9.10	1.10	3.00	11.00	1.20	0.80	0.70	60	100
				0.80	3.80	0.60	1.80	4.10	1.00	2.80	7.50	1.20	3.40	9.60	1.40	1.80	1.50	60	95
				1.20	1.70	0.90	2.20	2.20	1.40	3.20	5.90	1.50	3.80	8.20	1.60	2.60	2.00	60	100
				-	-	-	2.60	1.20	1.70	3.60	4.40	1.80	4.20	6.80	1.90	3.20	3.00	55	95
				-	-	-	-	-	-	4.00	2.90	2.10	4.60	5.50	2.20	4.40	4.00	55	100
				-	-	-	-	-	-	4.40	2.00	2.50	5.00	4.10	2.50				
				-	-	-	-	-	-	4.80	1.10	2.80	5.40	2.90	2.80				
				-	-	-	-	-	-	5.20	0.40	3.00	5.80	2.10	3.10				
	166. 125. xx. A2	○	0.50	0.80	4.70	1.50	1.20	7.00	1.80	2.80	9.10	3.30	3.40	10.60	3.90	1.40	0.70	55	90
				1.20	4.40	1.90	1.60	6.60	2.20	3.20	8.70	3.70	3.80	10.30	4.30	2.20	1.50	55	95
				1.60	4.00	2.30	2.00	6.20	2.60	3.60	8.40	4.10	4.20	9.90	4.60	2.80	2.00	55	100
				2.00	3.50	2.60	2.40	5.80	3.00	4.00	8.00	4.50	4.60	9.60	5.00	3.40	3.00	60	100
				2.40	3.00	3.00	2.80	5.40	3.40	4.40	7.70	4.80	5.00	9.30	5.40	4.20	4.00	60	100
				2.80	2.70	3.20	3.20	4.90	3.70	4.80	7.30	5.20	5.40	8.90	5.80				
				3.20	2.00	3.70	3.60	4.40	4.10	5.20	7.00	5.60	5.80	8.60	6.10				
				3.60	1.60	4.10	4.00	3.90	4.50	5.60	6.60	5.90	-	-	-				
				4.00	1.30	4.50	4.40	3.50	4.80	6.00	6.20	6.30	-	-	-	-	-	-	-
				4.40	1.00	4.90	4.80	3.10	5.20	-	-	-	-	-	-	-	-	-	-
				4.80	0.60	5.20	5.20	2.70	5.60	-	-	-	-	-	-	-	-	-	-
				-	-	-	5.60	2.30	5.90	-	-	-	-	-	-	-	-	-	-
				-	-	-	6.00	1.90	6.30	-	-	-	-	-	-	-	-	-	-

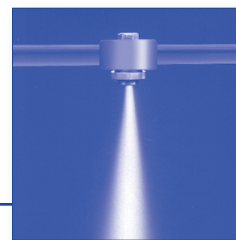
E = narrowest free cross section (water)

Continued on next page.

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 166. 115. xx. A2 + 16 = 166. 115. 16. A2



Pneumatic atomizing nozzles, Full cone, pressure principle, internal mixing Series 166.1



Spray angle ✕	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat. no.		0.7			1.5			3.0			4.0			p Air [bar]	p Water [bar]	D ₁ [mm]	D ₂ [mm]
		16		p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]				
20°	166. 134. xx. A2	○	0.7	1.20	13.20	2.70	2.00	19.40	3.90	3.00	28.30	5.20	3.80	32.60	6.20	1.80	0.70	55	95
				1.60	12.40	3.30	2.40	18.10	4.40	3.40	27.50	5.70	4.20	32.00	6.80	2.80	1.50	60	105
				2.00	11.80	3.90	2.80	17.30	4.90	3.80	26.70	6.30	4.60	31.30	7.30	3.80	2.00	60	105
				2.40	11.40	4.40	3.20	16.70	5.50	4.20	25.90	6.80	5.00	30.60	7.80	5.20	3.00	65	110
				2.80	11.10	4.90	3.60	16.10	6.00	4.60	25.00	7.30	5.40	29.90	8.40	6.00	4.00	65	110
				3.20	10.80	5.50	4.00	15.60	6.50	5.00	24.20	7.80	5.80	29.30	8.90				
				3.60	10.60	6.00	4.40	15.20	7.00	5.40	23.60	8.40	-	-	-				
				4.00	10.40	6.50	4.80	15.00	7.60	5.80	23.10	8.90	-	-	-				
				4.40	10.10	7.00	5.20	14.60	8.10	-	-	-	-	-	-				
				4.80	9.90	7.60	5.60	14.10	8.60	-	-	-	-	-	-				
				5.20	9.50	8.10	6.00	13.80	9.10	-	-	-	-	-	-				
				5.60	9.00	8.60	-	-	-	-	-	-	-	-	-				
				6.00	8.50	9.20	-	-	-	-	-	-	-	-	-				
	166. 142. xx. A2	○	2.5	1.40	24.20	5.10	1.60	53.40	4.70	3.20	70.80	8.00	3.80	93.20	9.20	0.80	0.70	60	100
				1.80	20.40	6.30	2.00	42.60	5.90	3.60	62.50	9.20	4.20	83.10	10.10	1.60	1.50	65	105
				2.20	20.00	7.20	2.40	35.30	7.20	4.00	55.70	10.60	4.60	75.30	11.30	3.00	2.00	60	105
				2.60	19.30	8.20	2.80	30.40	8.40	4.40	49.30	11.70	5.00	69.00	12.50	4.00	3.00	65	110
				3.00	17.60	9.30	3.20	28.60	9.50	4.80	44.60	12.90	5.40	63.40	13.70	6.00	4.00	65	110
				3.40	16.50	10.40	3.60	28.20	10.50	5.20	41.90	14.10	5.80	57.50	14.90				
				3.80	17.00	11.40	4.00	27.30	11.50	5.60	40.40	15.10	-	-	-				
				4.20	16.30	12.40	4.40	25.90	12.50	6.00	39.70	16.10	-	-	-				
				4.60	15.10	13.30	4.80	24.30	13.50	-	-	-	-	-	-				
				5.00	14.00	14.30	5.20	22.30	14.60	-	-	-	-	-	-				
				5.40	13.10	15.30	5.60	21.80	15.70	-	-	-	-	-	-				
				5.80	12.40	16.20	6.00	21.40	16.70	-	-	-	-	-	-				

E = narrowest free cross section (water)

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 166. 134. xx. A2 + 16 = 166. 134. 16. A2



Pneumatic atomizing nozzles, Full cone, pressure principle, internal mixing Series 166.2



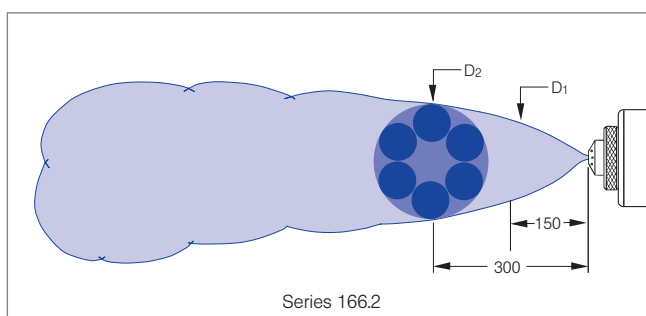
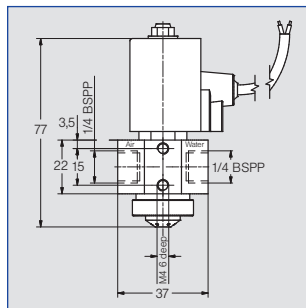
Version with magnetic valve.
Fine full cone atomization
and fogging with air or gas.
Especially wide spray angle
of 60°.

Pressure principle.
Internal mixing of fluids.

Applications:
Humidification of air, cooling.

Technical Datas:

- Service pressure: 0-6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency:
ca. 500/min
- Protective System: IP 67
- Ambient temperature:
10°C / +50°C
- Material of gasket: EPDM



Accessories for series 166
please refer to page 1.29

 Spray angle	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat. no.		0.7			1.5			3.0			4.0			p [bar]	p [bar]	D ₁ [mm]	D ₂ [mm]
		16		p [bar]	V̇ [l/h]	V̇ _n [m³/h]	p [bar]	V̇ [l/h]	V̇ _n [m³/h]	p [bar]	V̇ [l/h]	V̇ _n [m³/h]	p [bar]	V̇ [l/h]	V̇ _n [m³/h]				
60°	166. 215. xx. A2	○	0.5	1.00	3.00	1.30	1.60	5.80	1.70	2.80	8.50	2.40	3.80	9.40	3.10	1.00	0.70	200	330
				1.20	1.80	1.50	1.80	4.90	1.90	3.20	7.20	2.80	4.20	8.20	3.50	1.60	1.50	230	380
				1.40	0.70	1.80	2.00	3.80	2.10	3.60	5.70	3.20	4.60	6.90	3.90	2.40	2.00	230	385
				-	-	-	2.20	2.80	2.30	4.00	4.00	3.60	5.00	5.40	4.20	3.20	3.00	245	390
				-	-	-	2.40	1.70	2.50	4.40	2.20	4.10	5.40	3.80	4.70	4.20	4.00	250	410
				-	-	-	2.60	0.80	2.80	4.80	0.80	4.50	5.80	2.30	5.20	-	-	-	-
				-	-	-	-	-	-	5.00	0.40	4.60	6.00	1.40	5.60	-	-	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	166. 222. xx. A2	○	1.0	0.80	17.50	2.80	1.60	25.90	4.00	3.00	40.40	5.80	3.80	54.90	6.40	0.80	0.70	250	450
				1.00	6.00	4.30	1.80	14.70	5.30	3.20	31.50	6.90	4.00	45.60	7.30	1.60	1.50	245	465
				-	-	-	2.00	6.70	6.70	3.40	22.20	8.20	4.20	37.60	8.50	2.30	2.00	245	465
				-	-	-	2.20	1.90	8.10	3.60	14.60	9.50	4.40	29.60	9.70	3.20	3.00	250	465
				-	-	-	-	-	-	3.80	8.50	11.00	4.60	21.60	11.20	4.20	4.00	245	465
				-	-	-	-	-	-	4.00	4.50	12.30	4.80	15.30	12.40	-	-	-	-
				-	-	-	-	-	-	-	-	-	5.00	9.70	13.80	-	-	-	-
				-	-	-	-	-	-	-	-	-	5.20	6.00	15.20	-	-	-	-
	166. 231. xx. A2	○	1.4	1.60	25.60	5.10	2.60	44.20	7.00	3.60	93.70	7.90	4.20	132.90	7.30	2.00	0.70	235	380
				2.00	17.80	6.20	3.00	33.00	8.20	4.00	78.30	9.30	4.60	117.20	9.00	2.60	1.50	245	415
				2.40	11.30	7.20	3.40	24.70	9.20	4.40	65.80	10.60	5.00	101.10	10.40	2.40	2.00	255	420
				2.80	6.90	8.10	3.80	18.10	10.20	4.80	54.90	11.90	5.40	87.90	11.80	3.60	3.00	255	425
				-	-	-	4.20	13.20	11.20	5.20	45.60	13.00	5.80	76.60	13.20	4.20	4.00	265	430
				-	-	-	4.60	9.30	12.00	5.60	38.00	14.10	6.00	71.20	13.80	-	-	-	-
				-	-	-	-	-	-	6.00	36.10	14.40	-	-	-	-	-	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

E = narrowest free cross section (water)

Example **Type** **+ Material no. (xx)** **= Ordering no.**
for ordering: 166. 215. xx. A2 + 16 = 166. 215. 16. A2



Pneumatic atomizing nozzles, Flat fan, pressure principle, internal mixing Series 166.4



Version with magnetic valve.
Particularly fine flat fan atomization with air or gas.
Siphon principle. Internal mixing of fluids.

Applications:

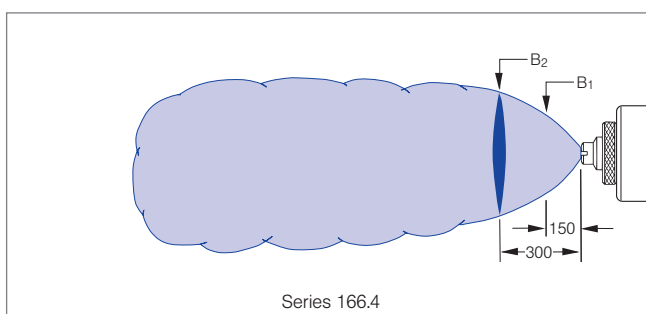
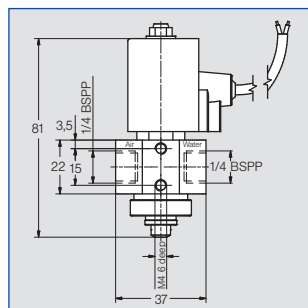
Web dampening, cooling,
humidification of goods.

Technical Data:

- Service pressure: 0-6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency: ca. 500/min
- Protective system: IP 67
- Ambient temperature: 10°C / +50°C
- Cable length: 1.000 mm
- Material of gasket: EPDM



Series 166.4



Series 166.4

Accessories for series 166
please refer to page 1.29

Spray angle	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat. no.		0.7			1.5			3.0			4.0			p [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]
		16		p [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]				
45°	166. 414. xx. A2	○	0.7	1.00	7.70	1.30	1.40	14.30	1.50	2.20	22.40	2.00	3.00	25.10	2.50	1.40	0.70	85	125
				1.20	6.00	1.50	1.60	13.00	1.60	2.60	20.00	2.30	3.40	23.00	2.80	2.40	1.50	100	145
				1.40	4.20	1.70	1.80	11.60	1.80	3.00	17.70	2.60	3.80	20.90	3.10	3.20	2.00	105	155
				1.60	2.70	1.90	2.00	10.20	2.00	3.40	15.50	3.00	4.20	18.90	3.50	3.80	3.00	120	170
				1.80	1.30	2.10	2.20	8.90	2.20	3.80	13.30	3.40	4.60	16.90	3.80	4.60	4.00	130	210
				-	-	-	2.40	7.40	2.40	4.20	11.00	3.70	5.00	14.90	4.20				
				-	-	-	2.60	5.90	2.60	4.60	8.80	4.10	5.40	12.80	4.60				
				-	-	-	2.80	4.60	2.80	5.00	6.60	4.50	5.80	10.80	5.00				
				-	-	-	3.00	3.20	3.00	5.40	4.30	4.90	6.00	9.80	5.20				
				-	-	-	3.20	2.10	3.20	5.80	2.50	5.30	-	-	-				
				-	-	-	3.40	1.10	3.40	6.00	1.60	5.50	-	-	-				
	166. 462. xx. A2	○	1.5	1.20	19.00	2.60	2.00	22.00	2.00	3.00	61.80	4.00	3.80	76.10	4.60	1.20	0.70	120	140
				1.60	12.20	3.40	2.40	18.00	2.40	3.40	51.90	4.80	4.00	70.40	5.10	2.40	1.50	120	170
				2.00	9.40	4.10	2.80	14.40	2.80	3.80	44.60	5.80	4.20	65.60	5.50	3.20	2.00	120	175
				2.40	7.10	4.80	3.20	11.30	3.20	4.20	39.00	6.60	4.40	61.30	5.90	3.80	3.00	140	205
				2.80	5.70	5.40	3.60	8.80	3.60	4.60	33.40	7.40	4.60	57.30	6.40	6.00	4.00	145	205
				3.20	5.00	6.00	4.00	8.10	3.90	5.00	29.40	8.10	4.80	54.10	6.70				
				3.60	3.60	6.60	4.40	6.20	4.30	5.40	25.50	8.90	5.00	51.30	7.20				
				4.00	3.20	7.20	4.80	4.60	4.60	5.80	22.00	9.60	5.20	49.30	7.70				
				4.40	2.20	7.80	5.20	3.20	4.90	6.00	20.60	9.90	5.40	46.50	8.20				
				-	-	-	5.60	1.60	5.30	-	-	-	5.60	43.70	8.60				
				-	-	-	5.80	0.80	5.40	-	-	-	5.80	41.30	8.90				
				-	-	-	-	-	-	-	-	-	6.00	39.00	9.30				

E = narrowest free cross section (water)

Continued on next page.

Example **Type** **+ Material no. (xx)** **= Ordering no.**
for ordering: 166. 414. xx. A2 + 16 = 166. 414. 16. A2



Pneumatic atomizing nozzles, Flat fan, pressure principle, internal mixing Series 166.4



 Spray angle	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat. no.		0.7			1.5			3.0			4.0			p [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]
		16		p [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]				
60°	166. 425. xx. A2	○	0.5	080	6.50	1.20	1.40	9.40	1.70	2.40	13.20	2.50	2.40	16.10	2.50	1.20	0.70	155	195
				1.20	5.50	1.60	1.80	8.70	2.10	2.60	12.90	2.70	2.80	15.50	2.90	2.20	1.50	165	255
				1.60	4.70	1.90	2.20	7.90	2.40	3.00	12.30	3.00	3.20	15.00	3.20	3.00	2.00	170	265
				2.00	4.00	2.30	2.60	7.20	2.70	3.40	11.80	3.40	3.60	14.50	3.50	3.40	3.00	200	330
				2.40	3.20	2.60	3.00	6.40	3.10	3.80	11.10	3.70	4.00	13.90	3.80	5.60	4.00	200	330
				2.80	2.60	2.90	3.40	5.70	3.40	4.20	10.40	4.00	4.40	13.40	4.10				
				3.00	2.20	3.10	3.80	5.10	3.70	4.60	9.80	4.30	4.80	12.80	4.50				
				-	-	-	4.00	4.80	3.90	5.00	9.20	4.60	5.20	12.20	4.80				
				-	-	-	4.40	4.20	4.20	5.40	8.60	5.00	5.60	11.70	5.10				
				-	-	-	4.80	3.60	4.50	5.80	8.10	5.30	6.00	11.20	5.40				
				-	-	-	5.20	2.80	4.80	6.00	7.80	5.40	-	-	-				
				-	-	-	5.60	2.20	5.10	-	-	-	-	-	-				
				-	-	-	6.00	1.60	5.50	-	-	-	-	-	-				
	166. 452. xx. A2	○	1.5	1.00	18.80	3.90	1.80	31.00	5.30	3.20	50.10	7.70	3.80	70.70	8.20	1.00	0.70	130	185
				1.40	8.60	5.70	2.00	25.40	6.30	3.60	39.50	9.40	4.20	58.60	9.60	1.80	1.50	150	240
				1.80	7.40	7.00	2.20	20.10	7.20	4.00	31.30	11.20	4.60	48.60	11.20	2.60	2.00	155	245
				2.20	4.10	8.40	2.40	15.50	8.00	4.40	24.00	12.90	5.00	41.20	13.10	3.60	3.00	175	280
				2.60	1.00	9.80	2.60	12.40	8.90	4.80	17.70	14.50	5.40	33.60	14.80	5.00	4.00	180	285
				2.80	0.10	10.30	2.80	10.40	9.60	5.20	13.40	16.00	5.80	27.50	16.40				
				-	-	-	-	-	-	5.60	10.60	17.50	6.00	24.40	17.20				
				-	-	-	-	-	-	6.00	8.60	18.80	-	-	-				
				-	-	-	-	-	-	-	-	-	-	-	-				
				80°	166. 433. xx. A2	○	0.4	1.00	11.60	2.00	1.80	18.30	2.80	3.00	31.00	3.70	3.80	37.50	4.40
1.20	8.10	2.40	2.00					15.30	3.20	3.40	25.40	4.40	4.20	32.40	5.00	2.20	1.50	185	255
1.40	5.30	2.80	2.20					12.20	3.60	3.80	20.60	5.10	4.60	27.70	5.70	3.00	2.00	205	300
1.60	3.70	3.20	2.40					9.80	4.00	4.20	16.30	5.90	5.00	23.40	6.50	3.80	4.00	300	485
-	-	-	2.60					7.60	4.30	4.60	12.50	6.60	5.40	19.40	7.20	5.20	4.00	260	395
-	-	-	2.80					5.90	4.70	5.00	9.30	7.30	5.80	15.90	7.90				
-	-	-	3.00					4.40	5.00	5.40	6.50	8.00	6.00	14.20	8.30				
-	-	-	-					-	-	-	-	-	-	-	-				

E = narrowest free cross section (water)

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 166. 425. xx. A2 + 16 = 166. 425. 16. A2



Pneumatic atomizing nozzles, Flat fan, pressure principle, external mixing Series 166.6



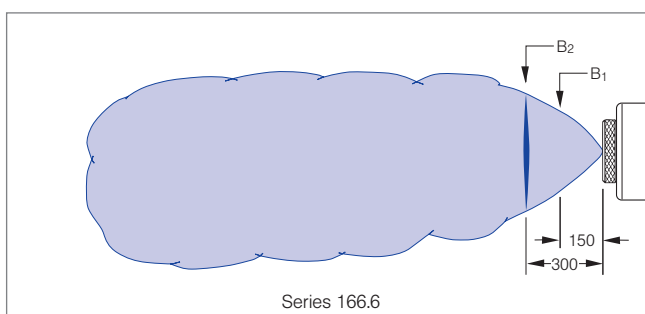
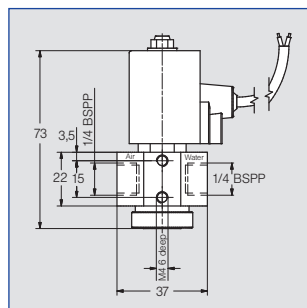
Version with magnetic valve.
Fine flat fan atomization
with the aid of air or gas.
Liquid pressure principle.
External mixing of fluids.

Applications:

Web dampening, cooling,
humidification of goods,
atomization of viscous liquids.

Technical Data:

- Service pressure: 0-6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency:
ca. 500/min
- Protective system: IP 67
- Ambient temperature:
10°C / +50°C
- Cable length: 1.000 mm
- Material of gasket: EPDM



Accessories for series 166
please refer to page 1.29

Spray angle	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat- no.		0.07			0.15			0.30			0.35			p [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]
		16		p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]				
45°	166. 616. xx. A2	○	0.4	0.80	1.68	2.50	0.80	2.43	2.40	0.80	3.42	2.50	1.00	3.69	2.80	1.40	0.07	80	115
				1.20	1.80	3.10	1.00	2.46	2.90	1.20	3.48	3.10	1.40	3.81	3.40	2.20	0.15	90	130
				1.60	1.92	3.70	1.40	2.58	3.60	1.60	3.51	3.70	1.80	3.87	4.00	3.20	0.20	90	135
				2.00	2.10	4.30	1.80	2.61	4.20	2.00	3.63	4.30	2.20	3.84	4.60	4.00	0.30	95	145
				2.40	2.07	4.90	2.20	2.76	4.80	2.40	3.63	4.90	2.60	3.90	5.20	5.00	0.35	100	145
				2.80	2.19	5.50	2.60	2.73	5.40	2.80	3.63	5.50	3.00	3.93	5.80				
				3.20	2.19	6.10	3.00	2.73	6.00	3.20	3.63	6.10	3.40	3.90	6.40				
				3.60	2.22	6.70	3.60	2.76	6.70	3.60	3.66	6.70	3.80	3.93	7.00				
				4.00	2.22	7.30	4.00	2.76	7.30	4.00	3.69	7.30	4.20	3.96	7.60				
				4.40	2.22	7.90	4.40	2.76	7.90	4.40	3.69	7.90	4.60	3.93	8.20				
				4.80	2.22	8.50	4.80	2.76	8.50	4.80	3.69	8.40	5.00	3.93	8.80				
				5.20	2.22	9.10	5.20	2.76	9.10	5.20	3.66	9.10	5.40	3.93	9.40				
				5.60	2.22	9.60	5.60	2.76	9.70	5.60	3.66	9.60	5.80	3.87	10.00				
				6.00	2.22	10.20	6.00	2.73	10.20	6.00	3.66	10.20	6.00	3.87	10.20				
	166. 654. xx. A2	○	0.7	0.80	5.25	2.40	0.80	7.29	2.40	1.20	10.11	3.10	1.60	11.07	3.70	1.40	0.07	95	135
				1.20	5.64	3.10	1.20	7.44	3.10	1.60	10.23	3.70	2.00	11.22	4.30	2.20	0.15	100	150
				1.60	5.79	3.70	1.60	7.62	3.70	2.00	10.38	4.30	2.40	11.28	4.90	3.20	0.20	105	160
				2.00	6.18	4.30	2.00	7.86	4.30	2.40	10.47	4.90	2.80	11.31	5.50	4.00	0.30	105	160
				2.40	6.24	4.90	2.40	7.92	4.90	2.80	10.59	5.50	3.20	11.43	6.10	5.00	0.35	105	160
				2.80	6.27	5.50	2.80	8.04	5.50	3.20	10.59	6.10	3.60	11.46	6.60				
				3.20	6.39	6.10	3.20	8.13	6.10	3.60	10.62	6.70	4.00	11.43	7.20				
				3.60	6.42	6.60	3.60	8.13	6.70	4.00	10.62	7.20	4.40	11.37	7.80				
				4.00	6.45	7.20	4.00	8.13	7.20	4.40	10.62	7.80	4.80	11.37	8.40				
				4.40	6.42	7.80	4.40	8.07	7.80	4.80	10.59	8.40	5.20	11.34	9.00				
				4.80	6.30	8.40	4.80	8.04	8.40	5.20	10.56	9.00	5.60	11.22	9.60				
				5.20	6.24	9.00	5.20	7.86	9.00	5.60	10.50	9.60	6.00	11.16	10.10				
				5.60	6.09	9.60	5.60	7.83	9.60	6.00	10.35	10.20	-	-	-				
				6.00	5.85	10.20	6.00	7.59	10.20	-	-	-	-	-	-				



Pneumatic atomizing nozzles, Flat fan, pressure principle, external mixing Series 166.6



 Spray angle	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat. no.		0.07			0.15			0.30			0.35			p [bar]	p [bar]	B ₁ [mm]	B ₂ [mm]
				p [bar]	V Water [l/h]	V̇ _n [m³/h]	p [bar]	V Water [l/h]	V̇ _n [m³/h]	p [bar]	V Water [l/h]	V̇ _n [m³/h]	p [bar]	V Water [l/h]	V̇ _n [m³/h]				
	303 SS																		
60°	166. 626. xx. A2	○	0.4	0.80	1.83	2.80	0.80	2.49	2.80	0.80	3.48	2.80	0.80	3.78	2.80	1.60	0.07	85	135
				1.20	1.98	3.60	1.20	2.58	3.50	1.20	3.60	3.50	1.20	3.87	3.60	2.40	0.15	90	140
				1.60	2.10	4.30	1.60	2.70	4.20	1.60	3.66	4.30	1.60	3.90	4.20	3.20	0.20	90	140
				2.00	2.16	4.90	2.00	2.82	4.90	2.00	3.69	4.90	2.00	3.96	4.90	4.00	0.30	100	145
				2.40	2.25	5.60	2.40	2.85	5.60	2.40	3.69	5.60	2.40	3.96	5.60	5.20	0.35	105	150
				2.80	2.34	6.30	2.80	2.88	6.30	2.80	3.72	6.30	2.80	4.02	6.30				
				3.20	2.31	7.00	3.20	2.88	7.00	3.20	3.78	7.00	3.20	3.99	7.00				
				3.60	2.34	7.60	3.60	2.88	7.70	3.60	3.78	7.60	3.60	4.02	7.70				
				4.00	2.40	8.40	4.00	2.94	8.40	4.00	3.81	8.30	4.00	4.05	8.30				
				4.40	2.40	9.00	4.40	2.91	9.00	4.40	3.81	9.00	4.40	4.02	9.00				
				4.80	2.40	9.70	4.80	2.97	9.70	4.80	3.81	9.70	4.80	4.08	9.70				
				5.20	2.43	10.40	5.20	2.97	10.40	5.20	3.81	10.40	5.20	4.05	10.40				
				5.60	2.43	11.20	5.60	2.97	11.10	5.60	3.81	11.10	5.60	4.05	11.00				
				6.00	2.43	11.80	6.00	2.97	11.80	6.00	3.81	11.80	6.00	4.05	11.80				
	166. 682. xx. A2	○	1.5	1.00	22.41	7.50	1.40	28.95	9.30	1.80	41.22	11.10	2.00	44.04	11.80	1.60	0.07	110	155
				1.40	20.19	9.30	1.80	26.07	10.90	2.20	34.92	12.60	2.40	39.09	13.40	2.40	0.15	120	155
				1.80	18.75	11.00	2.20	23.94	12.50	2.60	33.18	14.20	2.80	35.16	15.10	3.20	0.20	120	160
				2.20	17.88	12.50	2.60	22.23	14.30	3.00	30.45	15.90	3.20	32.22	16.70	4.00	0.30	120	165
				2.60	17.10	14.20	3.00	21.12	15.90	3.40	28.29	17.50	3.60	30.18	18.30	5.20	0.35	120	175
				3.00	16.47	15.90	3.40	20.10	17.50	3.80	26.64	19.10	4.00	28.32	19.90				
				3.40	16.08	17.50	3.80	19.44	19.10	4.20	25.35	20.70	4.40	26.94	21.50				
				3.80	15.90	19.10	4.20	18.99	20.70	4.60	24.24	22.30	4.80	25.59	23.10				
				4.20	15.90	20.70	4.60	18.45	22.30	5.00	23.13	24.00	5.20	24.36	24.80				
				4.60	15.81	22.30	5.00	18.18	24.00	5.40	22.14	25.50	5.60	23.28	26.40				
				5.00	15.21	23.90	5.40	17.25	25.40	5.80	21.12	27.20	6.00	22.17	28.00				
				5.40	13.92	25.50	5.80	15.72	27.20	6.00	20.67	28.00	-	-	-				
				5.80	12.09	27.20	6.00	14.91	28.00	-	-	-	-	-	-				
				6.00	11.07	28.00	-	-	-	-	-	-	-	-	-				
	166. 691. xx. A2	○	2.5	1.40	52.00	13.80	2.00	67.30	17.50	2.60	92.30	21.20	2.60	102.10	21.20	1.60	0.07	150	200
				1.80	50.00	16.30	2.40	64.60	20.10	3.00	87.70	23.60	3.00	97.20	23.70	2.40	0.15	160	205
				2.20	48.60	18.80	2.80	62.00	22.50	3.40	84.30	26.00	3.40	92.50	26.10	3.20	0.20	160	205
				2.60	47.50	21.30	3.20	60.40	24.90	3.80	80.70	28.50	3.80	88.40	28.50	4.00	0.30	160	210
				3.00	46.50	23.70	3.60	58.00	27.30	4.20	77.00	30.90	4.20	85.20	31.00	5.20	0.35	150	210
				3.40	45.40	26.10	4.00	56.20	29.80	4.60	74.40	33.40	4.60	81.30	33.40				
				3.80	44.40	28.60	4.40	54.20	32.10	5.00	71.10	35.90	5.00	78.20	35.80				
				4.20	42.90	31.00	4.80	52.40	34.70	5.40	68.10	38.30	5.40	74.30	38.20				
				4.60	41.50	33.40	5.20	49.90	37.10	5.80	64.30	40.80	5.80	71.10	40.70				
				5.00	39.90	35.80	5.60	48.10	39.50	6.00	63.20	42.00	6.00	68.90	41.90				
				5.40	38.90	38.30	6.00	46.40	42.00	-	-	-	-	-	-				
				5.60	38.50	39.40	-	-	-	-	-	-	-	-	-				

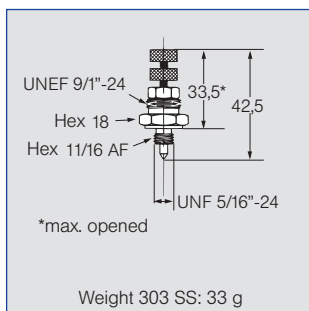
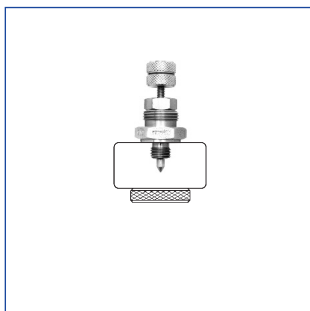
E = narrowest free cross section (water)

Example Type + Material no. (xx) = Ordering no.
for ordering: 166. 654. xx. A2 + 16 = 166. 654. 16. A2



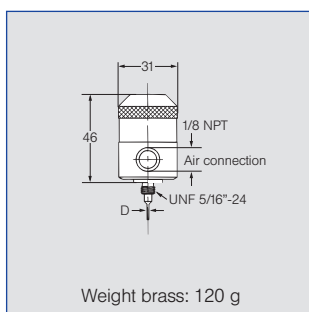
Accessories for pneumatic atomizing nozzles Series 136.1 - 136.6

Regulating device and shutting-off needle:



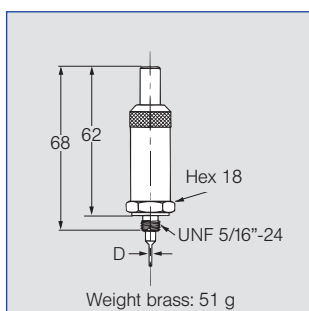
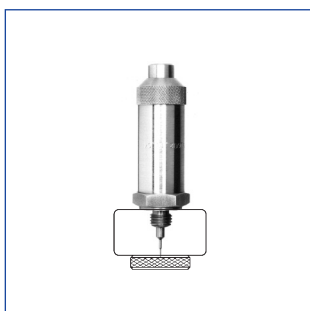
Ordering no.		For all nozzles of the series 136
Type	Mat. no.	
	16 303 SS	
015. 600	●	

Pneumatically controlled valve. Opening pressure 2.1 bar, max. 180 cycles/min.



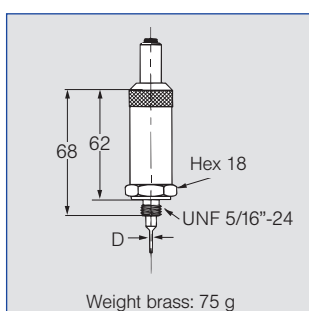
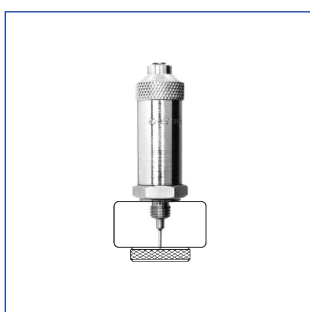
Ordering no.		For nozzles	Needle diameter D [mm]
Type	Mat. no.		
	16 35 303 SS Brass plated		
013. 601. xx. 10	● ●	136. xx1	2.1
013. 602. xx. 10	● ●	136. xx2	1.2
013. 603. xx. 10	● ●	136. xx3	0.8
013. 604. xx. 10	● ●	136. xx4	0.6
013. 605. xx. 10	● ●	136. xx5	0.4
013. 606. xx. 10	● ●	136. xx6	0.3

Quick-cleaning device



Ordering no.		For nozzles	Needle diameter D [mm]
Type	Mat. no.		
	16 35 303 SS Brass plated		
013. 601. xx. 20	● ●	136. xx1	2.1
013. 602. xx. 20	● ●	136. xx2	1.2
013. 603. xx. 20	● ●	136. xx3	0.8
013. 604. xx. 20	● ●	136. xx4	0.6
013. 605. xx. 20	● ●	136. xx5	0.4
013. 606. xx. 20	● ●	136. xx6	0.3

Regulating device with quick-cleaning needle

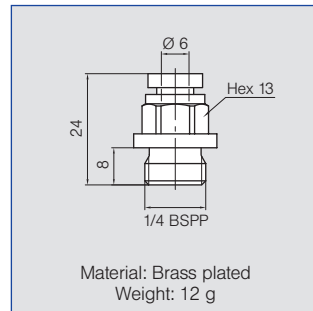


Ordering no.		For nozzles	Needle diameter D [mm]
Type	Mat. no.		
	16 35 303 SS Brass plated		
013. 601. xx. 30	● ●	136. xx1	2.1
013. 602. xx. 30	● ●	136. xx2	1.2
013. 603. xx. 30	● ●	136. xx3	0.8
013. 604. xx. 30	● ●	136. xx4	0.6
013. 605. xx. 30	● ●	136. xx5	0.4
013. 606. xx. 30	● ●	136. xx6	0.3



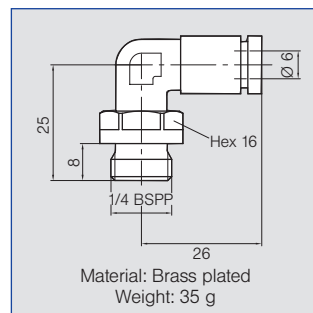
Accessories for pneumatic atomizing nozzles Series 136 und 166

Screwed connection for hose diameter 6 mm



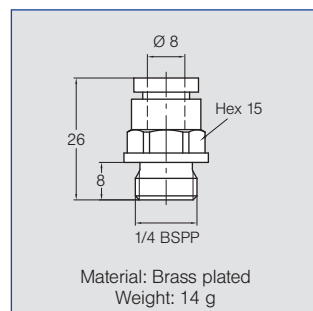
Ordering no.	For all nozzles of the series 136 and 166
095. 016. 35. 11. 79. 0	

Angled screwed connection for hose diameter 6 mm



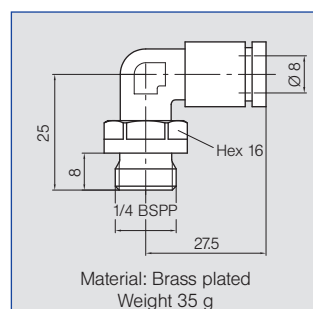
Ordering no.	For all nozzles of the series 136 and 166
095. 016. 35. 13. 13. 0	

Screwed connection for hose diameter 8 mm



Ordering no.	For all nozzles of the series 136 and 166
095. 016. 35. 11. 80. 0	

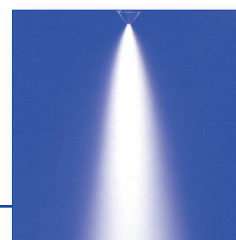
Angled screwed connection for hose diameter 8 mm



Ordering no.	For all nozzles of the series 136 and 166
095. 016. 35. 13. 14. 0	

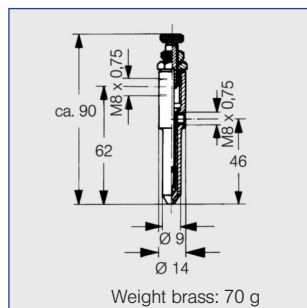


Pneumatic atomizing nozzles, Full cone, siphon principle, internal mixing Series 140



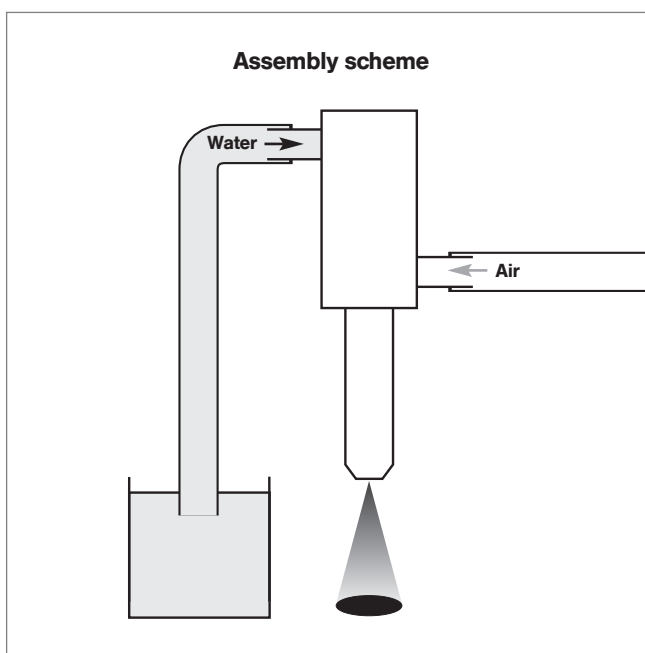
Particularly fine full cone atomization. Siphon principle. Internal mixing of fluids. Integrated regulating device.

Applications:
Lubrication, cooling, humidification of air.



 Spray angle	Ordering no.	E Ø [mm]		H _s Aspiration- height	$\dot{V}$ W = Liquid $\dot{V}_n$ L = Air							
		Water	Air		[mm WS]	p [bar] Air pressure						
				0.5		1.0		2.0		3.0		
				W [l/h]		L [m³/h]	W [l/h]	L [m³/h]	W [l/h]	L [m³/h]	W [l/h]	L [m³/h]
20°-30°	140. 252. 30. 01	0.50	0.75	500 200	- 4.50	- 2.50	4.50 7.00	4.00 4.00	8.00 10.00	6.00 6.00	10.50 12.00	8.00 8.00

E = narrowest free cross section (water)



Accessories:

Gasket

014. 040. 72

7.8 x 12 x 1 (EWP 210)

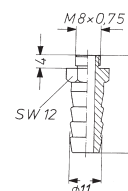


Nipple

014. 010. 30. 04

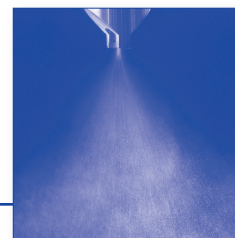
(Material brass)

Weight: 17 g





Pneumatic atomizing nozzles, for atomizing viscous media Series 176 ViscoMist™



The ViscoMist™ series offers independent regulation of both atomizing air and fan air, which provides the user with infinite control over the viscous fluid's spray pattern and droplet size.

The ViscoMist™ nozzle features a standard 'Liquid Shut-Off/ Clean-Out Needle' function. This design element activates and deactivates the liquid supply, while simultaneously removing excess fluid from the fluid nozzle preventing clogging. This feature is especially vital when the viscous liquids are being applied in continuous process environments.

The modular design of the ViscoMist™ allows maximum flexibility to meet the exact spray requirements.

Interchangeable air caps and various flow capacities are available to suit any spraying application needs.



One nozzle – three spray characters

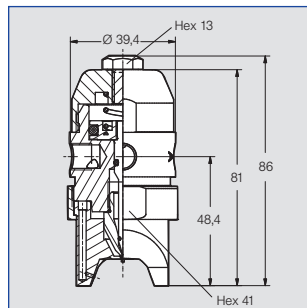
- - Solid stream
- Full cone
- Flat fan
- Independent regulation of liquid, atomizing air and fan air
- Fluid circulation possible (Nozzle body with 5 connections)

Atomizing air / Fan air / Signal air

The atomizing air causes the liquid to atomize at the nozzle orifice. The spray character can be adjusted with the fan air to suit the application. The signal air activates the nozzle.

Outside mixing to spray viscous liquids, for example:

- Coating
- Moisturising
- Lubrication
- Glazing
- Sanitising



Fluid cap options Ø 0.38 mm to 2.54 mm

Valve position
Normally closed, fail-safe with loss of air

Signal air pressure
Min. 2 bar
Max. 3 bar

Cycles per minute (short term):
180 cycles / min

Material
1Y (316L SS)

Ports
01 (1/8" NPT (F))
11 (1/8" BSPP (F))



Flow rate range

- Water: 7.8 to 307 l/h, at 2 bar
- Air: 7.5 to 28.4 m³/h i.N., at 2 bar

Further information and ordering data on request.

Nozzle body configurations

