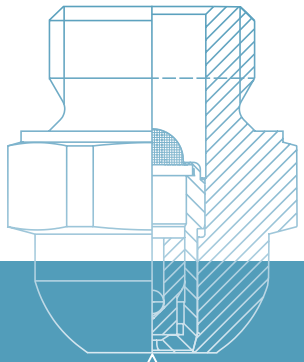
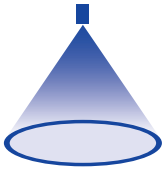
HOLLOW CONE NOZZLES

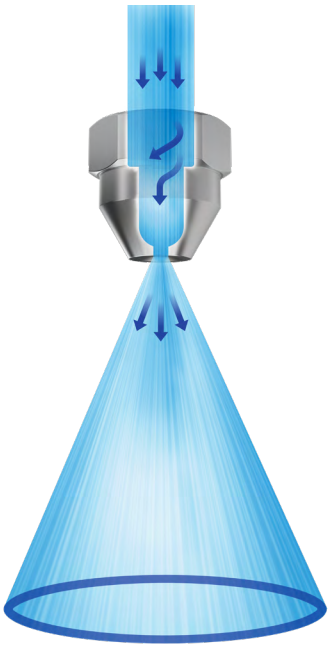


HOLLOW CONE NOZZLES
OVERVIEW OF TYPES



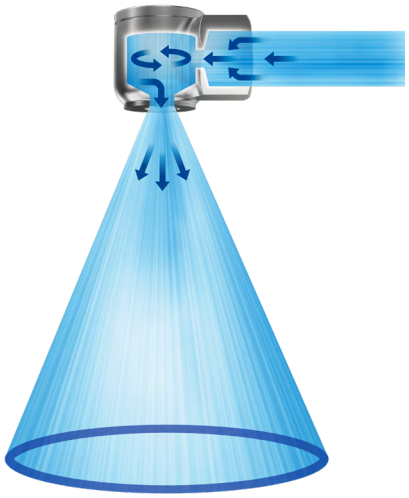
Hollow cone nozzles are used wherever fine droplets are required. A distinction is made between axial-flow hollow cone nozzles and tangential-flow hollow cone nozzles. Axial-flow hollow cone nozzles are mainly used for cooling, humidification and disinfecting, whilst tangential-flow hollow cone nozzles are traditionally used for humidification of air, dust control, sprinkling and foaming.

Axial-flow hollow cone nozzles



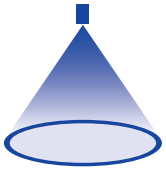
- High and controlled degree of atomization due to integrated swirl insert
- Narrow droplet spectrum
- Uniform atomization
- Large droplet surface area for mass transfer processes

Tangential-flow hollow cone nozzles



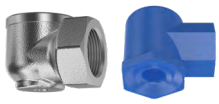
- Liquid rotation without swirl insert
- Maximum free passage making less susceptible to clogging
- Large free cross sections
- Operational reliability
- Coarse droplets that are larger than axial-flow hollow cone nozzles

HOLLOW CONE NOZZLES
OVERVIEW OF SERIES

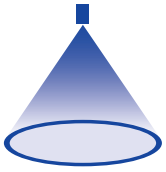


		Axial-flow hollow cone nozzles			
					
Series		**220**	**226**	**214/216**	**2TR**
Information on page		66	67	68	69
Flow rate at p = 2 bar	**Very low** < 0.5 l/min	● (at p = 5 bar)	● (at p = 5 bar)	● (at p = 5 bar)	● (at p = 5 bar)
	Low 0.5 l/min–2.0 l/min			● (at p = 5 bar)	● (at p = 5 bar)
	Medium 2.0 l/min–10.0 l/min			● (at p = 5 bar)	
	High 10.0 l/min–50.0 l/min			● (at p = 5 bar)	
	Very high > 50.0 l/min				
Spray angle	**Small** 45°				
	Medium 55°–95°	●	●	●	●
	Large 130°				
Nozzle material	**Stainless steel**	●	●	●	
	Brass			●	
	Plastic				●
Nozzle connection		1/4 BSPP	Assembly with retaining nut 3/8 BSPP	1/8 BSPP 3/8 BSPP	Assembly with retaining nut 3/8 BSPP

Tangential-flow hollow cone nozzles

					
302	**302 with bayonet quick-release system**	**308**	**304/306/307**	**350**	**373 Ramp Bottom**
70/71	66	74	75	76	77
●	●				
●	●	●		●	
●		●	●	●	
●			●		
					●
	●				
●	●	●	●		●
●	●		●	●	
●			●		●
●		●	●		
●	●			●	
3/8 BSPP	Assembly with bayonet quick-release system	3/8 BSPP	1/2 BSPP 3/4 BSPP	3/8 BSPP quick-release system	1 BSPP 1 1/4 BSPP 1 1/2 BSPP

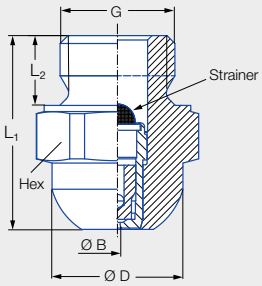
Axial-flow hollow cone nozzles
Series 220



Features:
- Extremely fine, fog-like atomization

Applications:
- Humidification
- Cooling
- Disinfection
- Chemical engineering
- Adiabatic cooling

Series 220



Code	G	Dimensions [mm]				Weight [g]
		L_1	L_2	Ø D	Hex	
AC	1/4 BSPP	22.0	8.0	15.0	17	27.0

Spray angle	Ordering no.				Bore diameter B [mm]	Narrowest free cross section Ø [mm]	Strainer insert mesh size [mm]	V̇ water [l/min] p [bar]							Spray diameter D [mm] (at p = 5 bar)
	Type	Mat. no. 1Y Stainless steel 316L	Mat. no. 11 Stainless steel 430F	Code 1/4 BSPP				2.0	3.0	**5.0**	7.0	10.0	20.0	50.0	100.0	H = 250 [mm]
60°	**220.004**	●	●	**AC**	0.10	0.10	0.04	–	–	**0.013**	0.015	0.018	0.026	0.041	0.058	120
	220.014	●	●	**AC**	0.15	0.15	0.04	–	0.015	**0.019**	0.022	0.027	0.038	0.060	0.085	140
	220.054	●	●	**AC**	0.20	0.15	0.04	0.017	0.021	**0.027**	0.032	0.038	0.054	0.085	0.121	160
80°	**220.085**	●	●	**AC**	0.25	0.25	0.10	0.025	0.031	**0.040**	0.047	0.057	0.080	0.126	0.179	190
	220.125	●	●	**AC**	0.35	0.35	0.10	0.039	0.048	**0.062**	0.073	0.088	0.124	0.196	0.277	230
	220.145	●	●	**AC**	0.40	0.40	0.10	0.052	0.064	**0.082**	0.097	0.116	0.164	0.259	0.367	250
	220.165	●	●	**AC**	0.45	0.45	0.10	0.065	0.080	**0.103**	0.122	0.146	0.206	0.326	0.461	260
	220.185	●	●	**AC**	0.55	0.35	0.20	0.082	0.101	**0.130**	0.154	0.184	0.260	0.411	0.581	270
	220.205	●	●	**AC**	0.60	0.35	0.20	0.106	0.130	**0.168**	0.199	0.238	0.336	0.531	0.751	280
	220.245	●	●	**AC**	0.70	0.50	0.20	0.165	0.202	**0.261**	0.309	0.369	0.522	0.825	1.167	290
	220.285	●	●	**AC**	0.90	0.55	0.20	0.247	0.302	**0.390**	0.461	0.552	0.780	1.233	1.744	300

Mat. no.	Housing	Nozzle insert	Strainer
1Y	Stainless steel 316L	Stainless steel 316L	Stainless steel 316L
11	Stainless steel 430F	Stainless steel 430F	Stainless steel 316L

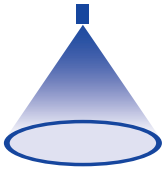
The supplied and integrated strainer insert prevents clogging of the nozzle, thereby ensuring a long service life.

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type 220.004	+	Material no. 1Y	+	Code AC	=	Ordering no. 220.004.1Y.AC

Assembly accessories can be found in Chapter 9 “Accessories”.

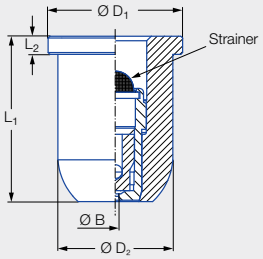
Axial-flow hollow cone nozzles
Series 226



Features:
- Extremely fine, fog-like atomization
- Assembly with retaining nut

Applications:
- Humidification
- Cooling
- Disinfection
- Chemical engineering
- Adiabatic cooling

Series 226



Code	Dimensions [mm]				Weight [g]
	L_1	L_2	Ø D_1	Ø D_2	
Assembly with retaining nut 3/8 BSPP	18.00	2.00	14.80	12.65	20.00

Spray angle	Ordering no. Type	Mat. no. 16 Stainless steel 303	Bore diameter B [mm]	Narrowest free cross section Ø [mm]	Strainer insert mesh size [mm]	V̇ water [l/min] p [bar] 2.0	3.0	**5.0**	7.0	10.0	20.0	50.0	100.0	Spray diameter D [mm] (at p = 5 bar) H = 250 [mm]
60°	**226.004**	●	0.10	0.10	0.04	–	–	**0.013**	0.015	0.018	0.026	0.041	0.058	120
	226.014	●	0.15	0.15	0.04	–	0.015	**0.019**	0.022	0.027	0.038	0.060	0.085	140
	226.054	●	0.20	0.15	0.04	0.017	0.021	**0.027**	0.032	0.038	0.054	0.085	0.121	160
80°	**226.085**	●	0.25	0.25	0.10	0.025	0.031	**0.040**	0.047	0.057	0.080	0.126	0.179	190
	226.125	●	0.35	0.35	0.10	0.039	0.048	**0.062**	0.073	0.088	0.124	0.196	0.277	230
	226.145	●	0.40	0.40	0.10	0.052	0.064	**0.082**	0.097	0.116	0.164	0.259	0.367	250
	226.165	●	0.45	0.45	0.10	0.065	0.080	**0.103**	0.122	0.146	0.206	0.326	0.461	260
	226.185	●	0.55	0.35	0.20	0.082	0.101	**0.130**	0.154	0.184	0.260	0.411	0.581	270
	226.205	●	0.60	0.35	0.20	0.106	0.130	**0.168**	0.199	0.238	0.336	0.531	0.751	280
	226.245	●	0.70	0.50	0.20	0.165	0.202	**0.261**	0.309	0.369	0.522	0.825	1.167	290
	226.285	●	0.90	0.55	0.20	0.247	0.302	**0.390**	0.461	0.552	0.780	1.233	1.744	300

Mat. no.	Housing	Nozzle insert	Strainer
16	Stainless steel 303	Stainless steel 430F	Stainless steel 316L

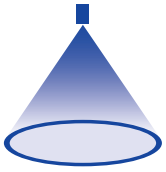
The supplied and integrated strainer insert prevents clogging of the nozzle, thereby ensuring a long service life.

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering	Type	+	Material no.	=	Ordering no.
example:	226.004	+	16	=	226.004.16

Assembly accessories can be found in Chapter 9 “Accessories”.

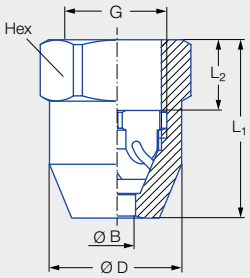
Axial-flow hollow cone nozzles
Series 214/216



Features:
- Fine, uniform atomization

Applications:
- Cooling
- Gas washing
- Dust control
- Sprinkling
- Adiabatic cooling

Series 214/216



Series	G	Dimensions [mm]				Weight [g] (Brass)
		L_1	L_2	Ø D	Hex	
214	1/8 BSPP	18.0	6.0	16.0	17	27.0
216	3/8 BSPP	29.0	12.0	21.3	22	60.0

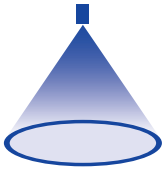
Spray angle	**Ordering no.** Type	Mat. no. **17** Stainless steel 316Ti	Mat. no. **30** Brass	Bore diameter B [mm]	Narrowest free cross section Ø [mm]	**V̇ water [l/min]** **p [bar]** 0.5	1.0	2.0	3.0	**5.0**	10.0	20.0	Spray diameter D [mm] (at p = 5 bar) H =250 [mm]
60°	**214.184**	●	●	0.50	0.50	–	–	0.08	0.10	**0.13**	0.18	0.25	120
	216.324	●	●	1.00	1.00	–	0.28	0.40	0.49	**0.63**	0.89	1.26	190
	216.364	●	●	1.40	1.40	–	0.45	0.63	0.77	**1.00**	1.41	1.99	220
	216.404	●	●	2.00	2.00	–	0.71	1.00	1.22	**1.58**	2.24	3.16	240
80°	**214.245**	●	●	1.00	0.50	–	–	0.16	0.20	**0.25**	0.36	0.51	240
	214.305	●	●	1.80	0.50	–	0.23	0.32	0.39	**0.51**	0.72	1.01	320
90°	**216.496**	●	●	3.00	2.00	–	1.20	1.70	2.08	**2.69**	3.80	5.38	430
	216.566	●	●	4.00	2.00	–	1.77	2.50	3.06	**3.95**	5.59	7.91	430
	216.646	●	●	3.50	2.00	2.00	2.83	4.00	4.90	**6.32**	8.94	12.65	440
	216.686	●	●	4.00	2.00	2.50	3.54	5.00	6.12	**7.91**	11.18	15.81	450
	216.726	●	●	5.00	2.00	3.15	4.45	6.30	7.72	**9.96**	14.09	19.92	460
	216.776	●	●	6.00	2.00	4.30	6.00	8.50	10.40	**13.40**	19.00	26.90	470

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type 214.184	+	Material no. 17	=	Ordering no. 214.184.17

Assembly accessories can be found in Chapter 9 “Accessories”.

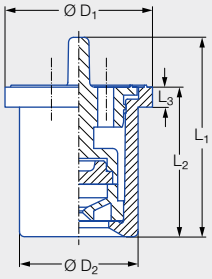
Axial-flow hollow cone nozzles
Series 2TR



Features:
- Fine, uniform atomization
- Assembly with retaining nut

Applications:
- Sprinkling
- Adiabatic cooling
- Cooling
- Humidification of air

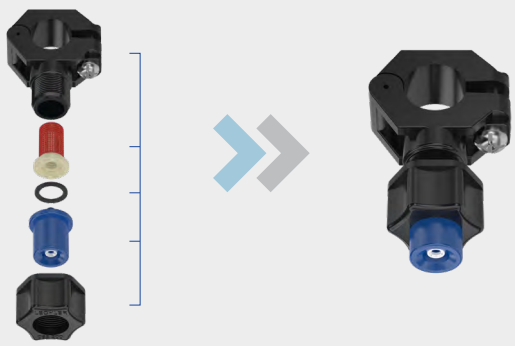
Series 2TR



Code	Dimensions [mm]					Weight [g]
	L_1	L_2	L_3	Ø D_1	Ø D_2	
Assembly with retaining nut 3/8 BSPP	20.0	15.0	2.0	14.8	11.9	3.0

Spray angle	Ordering no. Type	Mat. no. C8 Housing: POM Insert: Ceramic	Color	Bore diameter B [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min] p [bar] 1.0	2.0	3.0	**5.0**	7.0	10.0	Spray diameter D [mm] (at p = 5 bar) H = 250 [mm]
80°	**2TR.245**	●	Purple	0.65	0.55	–	0.16	0.20	**0.25**	0.30	0.36	220
	2TR.275	●	Black	0.80	0.70	0.16	0.22	0.27	**0.35**	0.41	0.49	260
	2TR.305	●	Orange	0.90	0.80	0.23	0.32	0.39	**0.51**	0.60	0.72	320
	2TR.345	●	Green	1.10	0.90	0.34	0.48	0.59	**0.76**	0.90	1.07	420
	2TR.365	●	Yellow	1.40	0.95	0.46	0.65	0.80	**1.03**	1.22	1.45	490
	2TR.405	●	Blue	1.70	1.10	0.69	0.97	1.19	**1.53**	1.81	2.17	530
	2TR.445	●	Red	2.00	1.20	0.89	1.26	1.55	**2.02**	2.37	2.83	550
	2TR.485	●	Brown	2.20	1.30	1.11	1.57	1.94	**2.50**	2.96	3.54	560

Assembly example

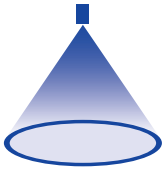


Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type 2TR.245	+	Material no. C8	=	Ordering no. 2TR.245.C8

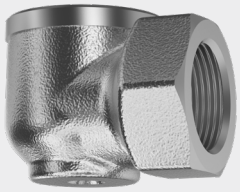
Assembly accessories can be found in Chapter 9 “Accessories”.

Tangential-flow hollow cone nozzles, stainless steel/brass version
Series 302

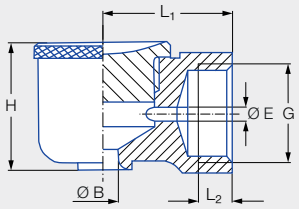


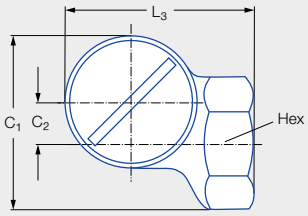
Features:
- Uniform atomization
- Non-clogging nozzle without swirl insert

Applications:
- Humidification of air
- Dust control
- Sprinkling
- Foam control
- Adiabatic cooling



Series 302





G	Dimensions [mm]							Weight [g] (Brass)
	C_1	C_2	H	L_1	L_2	L_3	Hex	
3/8 BSPP	34.0	8.0	23.0	23.0	6.5	36.0	22	90.0

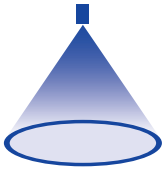
Spray angle	Ordering no. Type	Mat. no. 1Y Stainless steel 316L	Mat. no. 30 Brass	Bore diameter B [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min] p [bar] 0.5	1.0	**2.0**	3.0	5.0	7.0	10.0	Spray diameter D [mm] (at p = 2 bar) H = 250 [mm]	H = 500 [mm]
60°	302.364		●	1.50	1.50	0.32	0.45	**0.63**	0.77	1.00	1.18	1.41	280	420
	302.464	●	●	2.00	2.00	0.70	0.99	**1.40**	1.71	2.21	2.62	3.13	280	460
80°	302.545	●	●	4.90	2.30	1.12	1.58	**2.24**	2.74	3.54	4.19	5.01	360	660
90°	302.606	●	●	4.60	4.00	1.58	2.23	**3.15**	3.86	4.98	5.89	7.04	470	810
130°	302.368	●	●	3.00	1.00	0.32	0.45	**0.63**	0.77	1.00	1.18	1.41	660	1,080
	302.468	●	●	5.00	1.70	0.70	0.99	**1.40**	1.71	2.21	2.62	3.13	810	1,370
	302.548		●	5.00	2.50	1.12	1.58	**2.24**	2.74	3.54	4.19	5.01	960	1,640
	302.608	●	●	5.00	3.50	1.58	2.23	**3.15**	3.86	4.98	5.89	7.04	1,060	1,800
	302.668		●	7.50	3.60	2.25	3.18	**4.50**	5.51	7.12	8.42	10.06	1,120	1,950
	302.748	●	●	7.50	4.80	3.55	5.02	**7.10**	8.70	11.23	13.28	15.88	1,160	2,150

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type 302.364	+	Material no. 30	=	Ordering no. 302.364.30

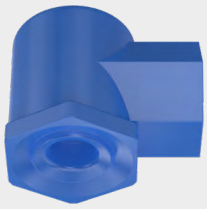
Assembly accessories can be found in Chapter 9 “Accessories”.

Tangential-flow hollow cone nozzles, plastic version
Series 302

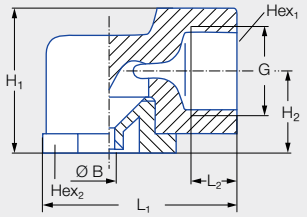


Features:
- Uniform atomization
- Non-clogging nozzle without swirl insert

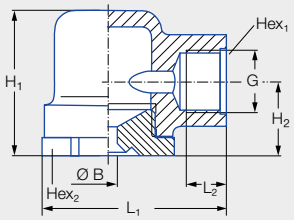
Applications:
- Humidification of air
- Dust control
- Sprinkling
- Foam control
- Adiabatic cooling



Series 302



Type 302.32x–302.48x



Type 302.52x–302.96x

Type	G	Dimensions [mm]						Weight [g]	p_{max} [bar]
		H_1	H_2	L_1	L_2	Hex_1	Hex_2		
302.32x–302.48x	3/8 BSPP	27.5	16.5	43.5	10.0	22	22	13.0	5.0
302.52x–302.96x	3/8 BSPP	34.0	18.5	37.0	10.0	22	22	18.0	5.0

Spray angle	Ordering no. Type	Mat. no. 51 PA	5E PVDF	53 PP	Bore diameter B [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min] p [bar] 0.5	1.0	**2.0**	3.0	5.0	Spray diameter D [mm] (at p = 2 bar) H = 250 [mm]	H = 500 [mm]
60°	302.364	●		●	1.30	1.30	0.32	0.45	**0.63**	0.77	1.00	320	600
	302.464	●		●	1.95	1.95	0.70	0.99	**1.40**	1.71	2.21	330	620
90°	302.326	●	●		1.05	1.05	0.20	0.28	**0.40**	0.49	0.63	470	770
	302.366	●	●		1.30	1.30	0.32	0.45	**0.63**	0.77	1.00	480	790
	302.406	●	●	●	1.55	1.55	0.50	0.71	**1.00**	1.22	1.58	490	810
	302.486	●		●	2.10	2.10	0.80	1.13	**1.60**	1.96	2.53	510	850
	302.526	●		●	5.00	2.00	1.00	1.41	**2.00**	2.45	3.16	520	870
	302.566	●		●	5.00	2.40	1.25	1.77	**2.50**	3.06	3.95	520	900
	302.606	●		●	5.00	3.20	1.58	2.23	**3.15**	3.86	4.98	530	940
	302.686	●			7.50	3.40	2.50	3.54	**5.00**	6.12	7.91	540	1,010
	302.766	●			9.00	4.30	4.00	5.66	**8.00**	9.80	12.65	540	1,040
	302.846	●		●	11.00	5.20	6.25	8.84	**12.50**	15.31	19.67	540	1,050
	302.886	●	●	●	11.00	6.40	8.00	11.31	**16.00**	19.60	25.30	540	1,050
	302.966	●			11.00	8.60	12.50	17.68	**25.00**	30.62	39.53	540	1,050

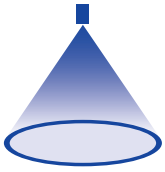
Spray angle	Ordering no.				Bore diameter B [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]					Spray diameter D [mm] (at p = 2 bar)	
	Type	Mat. no.					p [bar]						
		51	5E	53									
		PA	PVDF	PP			0.5	1.0	**2.0**	3.0	5.0	H = 250 [mm]	H = 500 [mm]
130°	**302.328**		●		1.35	0.80	0.20	0.28	**0.40**	0.49	0.63	640	930
	302.368	●	●		1.85	1.10	0.32	0.45	**0.63**	0.77	1.00	660	1,010
	302.408	●	●		3.65	1.30	0.50	0.71	**1.00**	1.22	1.58	680	1,110
	302.488	●		●	5.20	1.60	0.80	1.13	**1.60**	1.96	2.53	720	1,250
	302.528	●			5.00	2.00	1.00	1.41	**2.00**	2.45	3.16	750	1,330
	302.568	●			5.00	2.40	1.25	1.77	**2.50**	3.06	3.95	780	1,410
	302.608	●	●	●	5.00	3.20	1.58	2.23	**3.15**	3.86	4.98	820	1,500
	302.648	●			7.50	3.00	2.00	2.83	**4.00**	4.90	6.32	860	1,590
	302.688	●			7.50	3.40	2.50	3.54	**5.00**	6.12	7.91	900	1,650
	302.728	●			7.50	4.10	3.15	4.45	**6.30**	7.72	9.96	920	1,700
	302.768	●			9.00	4.30	4.00	5.66	**8.00**	9.80	12.65	940	1,730
	302.848	●			11.00	5.20	6.25	8.84	**12.50**	15.31	19.76	960	1,760
	302.888	●		●	11.00	6.40	8.00	11.31	**16.00**	19.60	25.30	970	1,780
	302.968	●	●		11.00	8.60	12.50	17.68	**25.00**	30.62	39.53	1000	1,800

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type 302.328	+	Material no. 5E	=	Ordering no. 302.328.5E

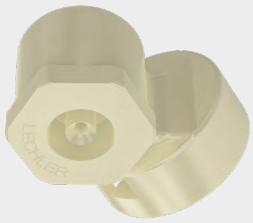
Assembly accessories can be found in Chapter 9 “Accessories”.

Tangential-flow hollow cone nozzles, plastic version with bayonet quick-release system
Series 302

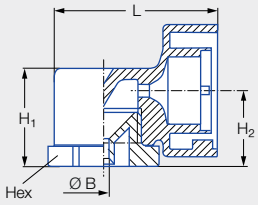


Features:
- Uniform atomization
- Non-clogging nozzle without swirl insert
- Quick and secure assembly thanks to bayonet quick-release system
- Setting of spray direction

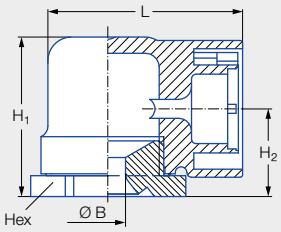
Applications:
- Humidification of air
- Dust control
- Sprinkling
- Foam control
- Adiabatic cooling



Series 302



Type 302.32x–302.54x



Type 302.606.51.KB

Type	Code	Dimensions [mm]				Weight [g]	p_{max} [bar]
		H_1	H_2	L	Hex		
302.32x–302.54x	**KB**	21.8	16.8	36.0	22	12.0	5.0
302.606.51.KB	**KB**	34.0	19.0	42.0	30	19.0	5.0

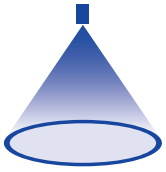
Spray angle	Ordering no.				Bore diameter B [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min] p [bar]					Spray diameter D [mm] (at p = 2 bar)	
	Type	Mat. no. 51 PA	Mat. no. 56 POM	Code Bayonet quick-release system			0.5	1.0	**2.0**	3.0	5.0	H = 250 [mm]	H = 500 [mm]
45°	**302.503**	●		**KB**	2.05	2.05	0.90	1.27	**1.80**	2.20	2.85	210	430
60°	**302.464**		●	**KB**	1.95	1.95	0.70	0.99	**1.40**	1.71	2.21	290	540
80°	**302.545**		●	**KB**	2.30	2.30	1.12	1.58	**2.24**	2.74	3.54	450	810
90°	**302.326**	●	●	**KB**	1.05	1.05	0.20	0.28	**0.40**	0.49	0.63	400	720
	302.406	●	●	**KB**	1.55	1.55	0.50	0.71	**1.00**	1.22	1.58	400	740
	302.486	●		**KB**	2.10	2.10	0.80	1.13	**1.60**	1.96	2.53	450	800
	302.606	●		**KB**	5.00	3.20	1.58	2.23	**3.15**	3.86	4.98	530	1,000
	302.686		●	**KB**	7.50	3.40	2.50	3.54	**5.00**	6.13	7.91	540	1,010
130°	**302.368**		●	**KB**	1.30	1.30	0.32	0.45	**0.63**	0.77	1.00	660	1,100
	302.408	●	●	**KB**	2.00	2.00	0.50	0.71	**1.00**	1.22	1.58	680	1,200
	302.468	●		**KB**	2.40	2.40	0.70	0.99	**1.40**	1.71	2.21	680	1,250
	302.488	●		**KB**	2.75	2.75	0.80	1.13	**1.60**	1.96	2.53	720	1,300

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type	+	Material no.	+	Code	=	Ordering no.
	302.503	+	51	+	KB	=	302.503.51.KB

Assembly accessories can be found in Chapter 9 “Accessories”.

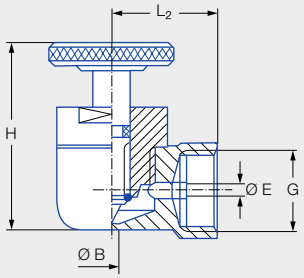
Tangential-flow hollow cone nozzles
Series 308

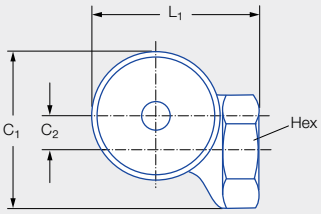


Features:
- Uniform atomization
- Non-clogging nozzle without swirl insert
- Adjustable flow rate

Applications:
- Humidification of air in air washers
- Dust control
- Spraying onto filters
- Foam control
- Cooling

Series 308





G	Dimensions [mm]						Weight [g]
	C_1	C_2	H	L_1	L_2	Hex	
3/8 BSPP	34.0	8.0	40.0	36.0	23.0	22	150.0

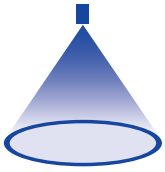
Spray angle	Ordering no.		Bore diameter B [mm]	Narrowest free cross section Ø [mm]	$\dot{V}_{max}$ water [l/min]						Spray diameter D [mm] (at p = 2 bar)	
	Type	Mat. no. 30			p [bar]							
		Brass			0.3	0.5	1.0	**2.0**	5.0	10.0	H = 250 [mm]	H = 500 [mm]
90°	**308.466**	●	2.00	2.00	0.54	0.70	1.00	**1.40**	2.21	3.13	440	830
	308.606	●	4.00	4.00	1.22	1.58	2.23	**3.15**	4.98	7.04	460	850

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering	Type	+	Material no.	=	Ordering no.
example:	308.466	+	30	=	308.466.30

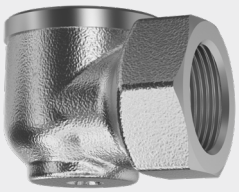
Assembly accessories can be found in Chapter 9 “Accessories”.

Tangential-flow hollow cone nozzles
Series 304/306/307

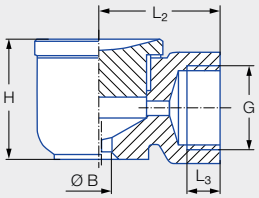


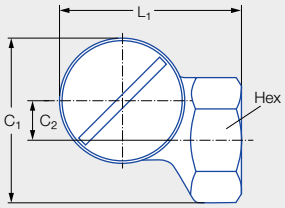
Features:
- Uniform atomization
- Non-clogging nozzle without swirl insert

Applications:
- Storage tank cooling
- Foam control
- Dust control
- Surface spraying
- Absorption



Series 304/306/307





Series	G	Dimensions [mm]							Weight [g] (Brass)
		C_1	C_2	H	L_1	L_2	L_3	Hex	
304	1/2 BSPP	43.0	11.0	33.0	46.0	30.0	11.0	27	205.0
306/307	3/4 BSPP	54.0	13.0	43.0	60.0	40.0	13.0	36	410.0

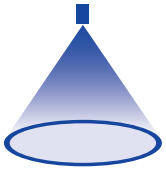
Spray angle	**Ordering no.** Type	Mat. no. **1Y** Stainless steel 316L	Mat. no. **30** Brass	Bore diameter B [mm]	Narrowest free cross section Ø [mm]	G ISO 228	**V̇ water [l/min]** **p [bar]** 0.5	1.0	**2.0**	3.0	5.0	7.0	10.0	Spray diameter D [mm] (at p = 2 bar) H = 250 [mm]	H = 500 [mm]
90°	**304.706**	●	●	5.10	5.10	1/2	2.80	3.96	**5.60**	6.86	8.85	10.48	12.52	500	1,000
	304.796	●	●	8.90	6.00	1/2	4.75	6.72	**9.50**	11.64	15.02	17.77	21.24	500	1,000
	306.906	●	●	9.00	9.00	3/4	9.00	12.73	**18.00**	22.05	28.46	33.67	40.25	550	1,050
	306.976	●	●	13.50	10.00	3/4	13.25	18.74	**26.50**	32.46	41.90	49.58	59.26	550	1,050
130°	**304.818**		●	12.00	5.00	1/2	5.30	7.50	**10.60**	12.98	16.76	19.83	23.70	1,200	2,100
	304.898	●	●	12.00	7.00	1/2	8.50	12.02	**17.00**	20.82	26.88	31.80	38.01	1,250	2,200
	306.978		●	19.00	7.30	3/4	13.25	18.74	**26.50**	32.46	41.90	49.58	59.26	1,300	2,350
	307.018	●	●	19.00	8.60	3/4	16.75	23.69	**33.50**	41.03	52.97	62.67	74.91	1,300	2,350

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

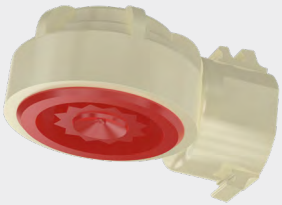
Ordering example:	Type	+	Material no.	=	Ordering no.
	304.706	+	1Y	=	307.706.1Y

Assembly accessories can be found in Chapter 9 “Accessories”.

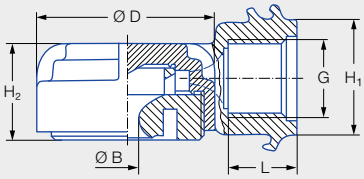
Tangential-flow hollow cone nozzles
Series 350



Features:
- High performance nozzle for humidification of air
- Very narrow droplet spectrum
- Extremely uniform liquid distribution over the entire spray pattern
- Quick-release clamp unit available for pipe mounting



Series 350

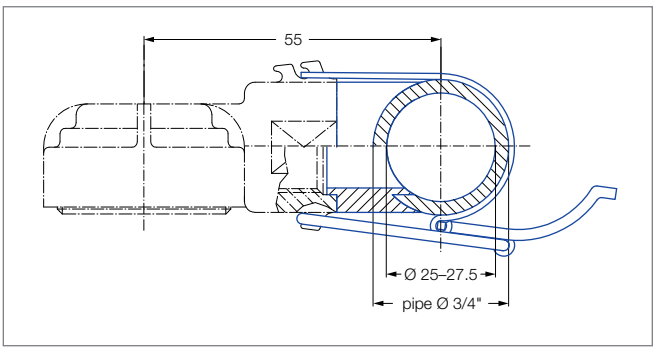


Applications:
- Foam control
- Dust control
- Surface spraying
- Absorption

G	Dimensions [mm]				Weight [g]	p_{max} [bar]
	H_1	H_2	L	Ø D		
3/8 BSPP	24.0	20.0	14.0	37.0	37.0	20.0

Spray angle	Ordering no. Type	Mat. no. 56 POM	Bore diameter B [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min] p [bar] 0.5	1.0	**2.0**	3.0	5.0	7.0	10.0	Spray diameter D [mm] (at p = 2 bar) H = 250 [mm]	H = 500 [mm]
130°	**350.368**	●	1.55	0.70	0.32	0.45	**0.63**	0.77	1.00	1.18	1.41	950	1,250
	350.608	●	5.00	1.40	1.58	2.23	**3.15**	3.86	4.98	5.89	7.04	990	1,950

Accessories:



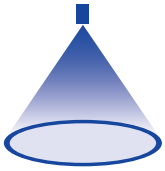
Recommended bore diameter 18 mm.
Quick-release clamp unit: Ordering no. 035.030.15.05.00.0.
Consisting of: Stainless steel clamp, polyurethane gasket.

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type 350.368	+	Material no. 56	=	Ordering no. 350.368.56

Assembly accessories can be found in Chapter 9 "Accessories".

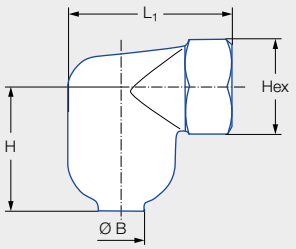
Eccentric hollow cone nozzles
Series 373 Ramp Bottom

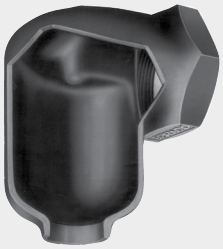


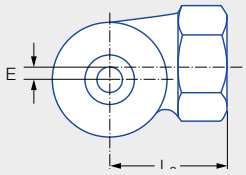
Features:
- Fine, uniform atomization even at low pressure
- Patented swirl chamber with built-in ramp extends service life

Applications:
- Gas cooling
- Water recooling
- Dust control

Series 373







Code	G	Dimensions [mm]					Weight [g]
		H	L_1	L_2	E	Hex	
AN	1 BSPP	52.0	67.0	45.0	6.3	41	285.0
AQ	1 1/4 BSPP	65.0	77.0	51.0	7.9	48	570.0
AS	1 1/2 BSPP	81.0	97.0	65.0	7.9	58	900.0

Spray angle	**Ordering no.**					Bore diameter B [mm]	**V̇ water [l/min]**						Spray diameter D [mm] (at p = 2 bar)	
	Type	Mat. no.	Code				**p [bar]**							
		17												
		Stainless steel 316	1 BSPP	1 1/4 BSPP	1 1/2 BSPP		0.3	0.5	1.0	**2.0**	5.0	10.0	H = 500 [mm]	H = 1,000 [mm]
80°	**373.115**	●	**AN**			11.40	24.40	31.50	44.55	**63.00**	99.61	140.87	670	1,200
	373.175	●	**AN**			12.90	30.98	40.00	56.57	**80.00**	126.49	178.89	800	1,450
	373.235	●		**AQ**		16.20	45.70	59.00	83.44	**118.00**	186.57	263.86	750	1,300
	373.285	●		**AQ**		20.50	61.97	80.00	113.14	**160.00**	252.98	357.77	800	1,350
	373.325	●			**AS**	22.20	77.46	100.00	141.42	**200.00**	316.23	447.21	900	1,500
	373.365	●			**AS**	23.60	87.92	113.50	160.51	**227.00**	358.92	507.59	830	1,400

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type	+	Material no.	+	Code	=	Ordering no.
	373.115	+	17	+	AN	=	373.115.17.AN

Assembly accessories can be found in Chapter 9 "Accessories".