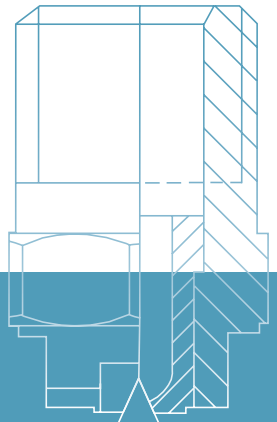
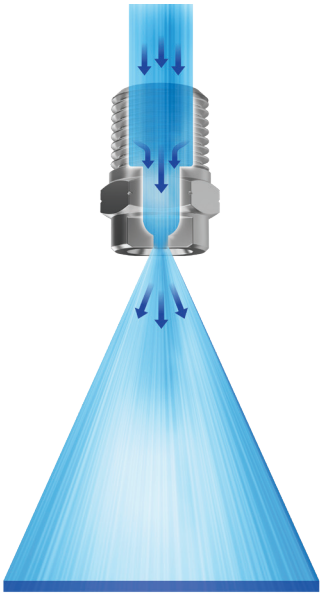
FLAT FAN NOZZLES



FLAT FAN NOZZLES
OVERVIEW OF TYPES

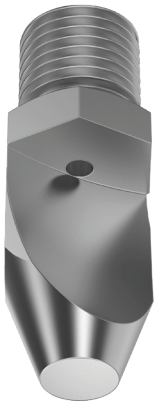
Lechler flat fan nozzles produce intensive, uniform water jet. Flat fan nozzles are generally used in cleaning processes and throughout many areas of surface treatment. Numerous designs – including tongue-type nozzles for special applications – and extensive assembly accessories enable easy installation as well as quick nozzle changeovers.

Standard flat fan nozzles



- Particularly high-energy spray with spray angles of up to 60°
- Parabolic liquid distribution
- Unaffected by transient pressures
- Simple and cost-saving assembling options

Tongue-type nozzles



- Special design in which a solid stream is diverted by a deflector plate
- Powerful, sharply delimited spray
- Shape of the deflector plate determines the spray angle
- Clog resistant due to large free cross-sections

International nozzle code

Flat fan nozzles designations are governed by international standards. The first two digits specify the spray angle in degrees, the others the flow rate in US gallons per minute at 40 psi. Our high pressure flat fan nozzles (series 602/608/652/6FH) are specified with this international nozzle code.

Spray angle in degrees ← 60 02 → **Flow rate in US gal/min at 40 psi**

Conversion: Value · 3.22 = flow rate in l/min at 2 bar
example: 0.2 gal/min at 40 psi = 0.644 l/min at 2 bar

Good to know

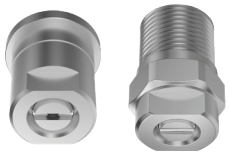
Information on the arrangement of several flat fan nozzles can be found in Chapter “Planning Aids” on Page 255.

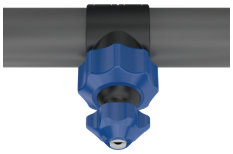
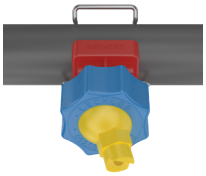
FLAT FAN NOZZLES
OVERVIEW OF SERIES

		Standard flat fan nozzles				
						
Series		**632/633**	**610**	**612**	**616/617**	**652**
Information on page		108	111	113	116	118
Pressure range	**Low pressure**	●	●	●	●	●
	High pressure					
Flow rate at p = 5 bar	**Low** < 4 l/min	●	●	●		●
	Medium 4 l/min–16 l/min	●	●	●	●	●
	High 16 l/min–50 l/min	●		●	●	●
	Very high > 50 l/min				●	
Spray angle	**Small** 20°–45°	●	●	●	●	●
	Medium 60°–90°	●	●	●	●	●
	Large 120°–140°	●	●	●	●	●
Nozzle material	**Stainless steel**	●	●	●	●	●
	Brass	●	●	●	●	●
	Plastic	●				●
Nozzle connection		1/8 BSPT 1/4 BSPT 3/8 BSPT 1/2 BSPT	1/8 BSPP	1/4 BSPP	3/4 BSPP	Assembly with retaining nut 3/8 BSPP

		Standard flat fan nozzles			
					
Series		**652 Belt lubrication nozzle**	**612.xxx.5E.03 Press-in nozzle**	**656/657**	**660**
Information on page		121	122	123	125
Pressure range	**Low pressure**	●	●	●	●
	High pressure				
Flow rate at p = 5 bar	**Low** < 4 l/min	● (at p = 3 bar)	● (at p = 2 bar)		●
	Medium 4 l/min–16 l/min			●	●
	High 16 l/min–50 l/min			●	
	Very high > 50 l/min			●	
Spray angle	**Small** 20°–45°			●	●
	Medium 60°–90°	●	●	●	●
	Large 120°–140°	●	●	●	●
Nozzle material	**Stainless steel**	●		●	●
	Brass			●	●
	Plastic	●	●		
Nozzle connection		Assembly with retaining nut 3/8 BSPP	For pressing into pipes	Assembly with retaining nut 3/4 BSPP	Assembly with retaining nut 3/8 BSPP and dovetail guide

		Tongue-type nozzles		
				
664/665	**646**	**688/689**	**686**	**684**
127	129	131	132	134
●	●	●	●	●
	●		● (at p = 2 bar)	● (at p = 2 bar)
●	●	● (at p = 2 bar)	● (at p = 2 bar)	● (at p = 2 bar)
●		● (at p = 2 bar)	● (at p = 2 bar)	
●				
●	●	●		
●	●		●	
●	●		●	●
●		●	●	
●			●	
	●	●	●	●
Assembly with retaining nut 3/4 BSPP and dovetail guide	Assembly with bayonet quick-release system	3/8 BSPT 3/4 BSPP	1/8 BSPT 1/4 BSPT 3/8 BSPT 1/2 BSPT	Assembly with retaining nut 3/8 BSPP

		Standard flat fan nozzles			
					
Series		**602**	**608**	**652**	**6FH with spray stabiliser**
Information on page		135	136	137	138
Pressure range	**Low pressure**				
	High pressure	●	●	●	●
Flow rate at p = 5 bar	**Low** < 4 l/min				
	Medium 4 l/min–16 l/min	● (at p = 80 bar)	● (at p = 80 bar)	● (at p = 80 bar)	● (at p = 80 bar)
	High 16 l/min–50 l/min	● (at p = 80 bar)	● (at p = 80 bar)	● (at p = 80 bar)	● (at p = 80 bar)
	Very high > 50 l/min	● (at p = 80 bar)		● (at p = 80 bar)	● (at p = 80 bar)
Spray angle	**Small** 20°–45°	●	●	●	●
	Medium 60°–90°	●	●	●	●
	Large 120°–140°				
Nozzle material	**Stainless steel**	●	●	●	●
	Brass				
	Plastic				
Nozzle connection		1/4 BSPT 1/4 NPT	1/8 BSPT 1/8 NPT	Assembly with retaining nut 3/8 BSPP	1/8 BSPT 1/8 NPT 1/4 BSPT 1/4 NPT Assembly with retaining nut 3/8 BSPP

Swivelling nozzles	Nozzle systems for surface treatment		Descaling nozzles
			
676	**676/677 MEMOSPRAY**	**676 Easy-Clip**	**SCALEMASTER**
140	142	146	Upon request
●	●	●	
●			
●	● (at p = 2 bar)	● (at p = 2 bar)	
	● (at p = 2 bar)	● (at p = 2 bar)	
●	●		
●	●	●	
●	●		
●	●		
●			
	●	●	
Assembly with retaining nut Welded nipple Threaded nipple Threaded socket	Eyelet clamps for following pipe sizes: 1" 1 1/4" 1 1/2" 2"	Eyelet clamps for following pipe sizes: 1" 1 1/4" 1 1/2" 2"	

Low pressure flat fan nozzles
Series 632/633

Features:
- Uniform, parabolic liquid distribution
- Stable spray angle
- Tapered, self-sealing thread

Applications:
- Spray cleaning
- Surface cleaning
- Strainer insert cleaning
- Coating processes
- Belt cleaning
- Lubrication processes

Series 632/633

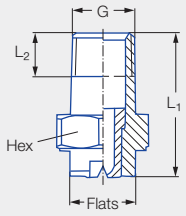


Figure 1

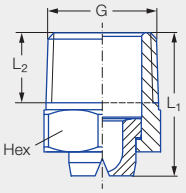


Figure 2

Code	Figure	G	Dimensions [mm]				Weight [g] (Brass)
			L_1	L_2	Hex	Flats	
CA	1	1/8 BSPT	22.0	6.5	14	10	17.0
CC	1	1/4 BSPT	22.0	9.7	14	10	20.0
CE	2	3/8 BSPT	22.0	10.1	17	–	30.0
CG	2	1/2 BSPT	27.0	13.2	22	–	40.0

Spray angle	Ordering no.									Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]							Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no.				Code						p [bar]								
		16[1]	17[2]	30	5E														H = 250 [mm]	H = 500 [mm]
		Stainless steel 303/ Stainless steel 304	Stainless steel 316Ti/ Stainless steel 316L	Brass	PVDF	1/8 BSPT	1/4 BSPT	3/8 BSPT	1/2 BSPT			0.5	1.0	2.0	3.0	**5.0**	7.0	10.0		
20°	**632.301**	●	●	●	●	**CA**	**CC**			0.70	0.60	0.16*	0.23*	0.32	0.39	**0.51**	0.60	0.72	85	160
	632.361	●	●	●	●	**CA**	**CC**			1.00	0.80	0.31*	0.44*	0.63	0.77	**1.00**	1.18	1.40	85	160
	632.441	●	●	●	●	**CA**	**CC**			1.35	1.10	0.62*	0.88	1.25	1.53	**1.98**	2.34	2.80	85	160
	632.481	●	●	●	●	**CA**	**CC**			1.50	1.20	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	85	160
30°	**632.302**	●	●	●	●	**CA**	**CC**			0.60	0.50	0.16*	0.23*	0.32	0.39	**0.51**	0.60	0.72	120	220
	632.362	●	●	●	●	**CA**	**CC**			1.00	0.70	0.31*	0.44*	0.63	0.77	**1.00**	1.18	1.40	120	220
	632.402	●	●	●	●	**CA**	**CC**			1.20	0.90	0.50*	0.71	1.00	1.23	**1.58**	1.87	2.24	120	230
	632.482	●	●	●	●	**CA**	**CC**			1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	130	230
	632.562	●	●	●	●	**CA**	**CC**			2.00	1.50	1.25	1.77	2.50	3.06	**3.95**	4.68	5.59	130	240
	632.642	●	●	●			**CC**			2.50	1.80	2.00	2.83	4.00	4.90	**6.33**	7.48	8.94	140	250
	632.722	●	●	●			**CC**			3.00	2.40	3.15	4.46	6.30	7.72	**9.96**	11.79	14.09	140	260
	632.762	●	●	●			**CC**			3.50	2.70	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	140	260
	632.802	●	●	●			**CC**			4.00	3.10	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	140	260

Spray angle	Ordering no.									Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]							Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no.				Code						p [bar]								
		16[1]	17[2]	30	5E															
		Stainless steel 303/ Stainless steel 304	Stainless steel 316Ti/ Stainless steel 316L	Brass	PVDF	1/8 BSPT	1/4 BSPT	3/8 BSPT	1/2 BSPT			0.5	1.0	2.0	3.0	**5.0**	7.0	10.0	H = 250 [mm]	H = 500 [mm]
45°	**632.303**	●	●	●		CA	CC			0.70	0.50	0.16*	0.23*	0.32	0.39	**0.51**	0.60	0.72	170	330
	632.363	●	●	●	●	CA	CC			1.00	0.60	0.31*	0.44*	0.63	0.77	**1.00**	1.18	1.40	190	350
	632.403	●	●	●	●	CA	CC			1.20	0.90	0.50*	0.71	1.00	1.23	**1.58**	1.87	2.24	200	370
	632.483	●	●	●	●	CA	CC			1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	200	390
	632.563	●	●	●	●	CA	CC			2.00	1.40	1.25	1.77	2.50	3.06	**3.95**	4.68	5.59	210	410
	632.643	●	●	●	●	CA	CC			2.50	1.80	2.00	2.83	4.00	4.90	**6.33**	7.48	8.94	220	410
	632.673	●	●	●			CC	CE		2.70	2.00	2.37	3.36	4.75	5.82	**7.51**	8.89	10.62	220	420
	632.723	●	●	●			CC	CE		3.00	2.40	3.15	4.46	6.30	7.72	**9.96**	11.79	14.09	220	420
	632.763	●	●	●			CC	CE		3.50	2.60	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	220	420
	632.803	●	●	●			CC	CE	CG	4.00	3.00	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	220	420
	632.843	●	●[3]	●			CC		CG	4.50	3.40	6.25	8.84	12.50	15.31	**19.76**	23.38	27.94	220	420
	632.883	●	●	●					CG	5.00	3.80	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	220	420
	632.923	●	●	●					CG	5.50	4.20	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	220	430
	632.963	●	●	●					CG	6.00	4.40	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	220	430
60°	**632.304**	●	●	●	●	CA	CC			0.70	0.40	0.16*	0.23*	0.32	0.39	**0.51**	0.60	0.72	260	480
	632.334	●	●	●	●	CA	CC			0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	0.84	1.00	260	490
	632.364	●	●	●	●	CA	CC			1.00	0.60	0.31*	0.44*	0.63	0.77	**1.00**	1.18	1.40	260	500
	632.404	●	●	●	●	CA	CC			1.20	0.80	0.50*	0.71	1.00	1.23	**1.58**	1.87	2.24	260	510
	632.444	●	●	●	●	CA	CC			1.35	0.90	0.62*	0.88	1.25	1.53	**1.98**	2.34	2.80	260	510
	632.484	●	●	●	●	CA	CC			1.50	1.00	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	260	520
	632.514	●	●	●	●	CA	CC			1.65	1.10	0.95*	1.34	1.90	2.32	**3.00**	3.55	4.24	270	520
	632.564	●	●	●	●	CA	CC			2.00	1.30	1.25	1.77	2.50	3.06	**3.95**	4.68	5.59	270	530
	632.604	●	●	●	●	CA	CC			2.20	1.50	1.57	2.23	3.15	3.86	**4.98**	5.89	7.04	270	540
	632.644	●	●	●	●[4]		CC	CE		2.50	1.60	2.00	2.83	4.00	4.90	**6.33**	7.48	8.94	270	540
	632.674	●	●	●	●[4]		CC	CE		2.70	1.80	2.37	3.36	4.75	5.82	**7.51**	8.89	10.62	270	550
	632.724	●	●	●	●[4]		CC	CE		3.00	2.10	3.15	4.46	6.30	7.72	**9.96**	11.79	14.09	280	560
	632.764	●	●	●			CC	CE		3.50	2.30	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	280	570
	632.804	●	●[3]	●	●[4]		CC		CG	4.00	2.60	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	290	580
	632.844	●	●[3]	●	●[4]		CC		CG	4.50	3.00	6.25	8.84	12.50	15.31	**19.76**	23.38	27.94	290	580
	632.884	●	●[3]	●	●[4]		CC		CG	5.00	3.40	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	290	580
	632.924	●	●	●					CG	5.50	4.10	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	290	580
	632.964	●	●	●					CG	6.00	4.20	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	290	580
	633.004	●	●						CG	7.00	4.80	15.75	22.27	31.50	38.57	**49.80**	58.92	70.43	290	580
	633.044	●	●	●					CG	8.00	5.50	20.00	28.29	40.00	48.99	**63.25**	74.84	89.45	290	580
	633.084	●	●	●					CG	9.00	6.80	25.00	35.36	50.00	61.24	**79.06**	93.55	111.81	290	580
75°	**632.145**	●		●		CA	CC			0.20	0.12	–	0.04*	0.05	0.06	**0.08**	0.09	0.11	380	690
	632.165	●		●		CA	CC			0.20	0.14	–	0.04*	0.06	0.08	**0.10**	0.12	0.14	380	690
	632.185	●		●		CA	CC			0.20	0.16	–	0.06*	0.08	0.10	**0.13**	0.15	0.18	380	690
	632.215	●		●		CA	CC			0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.21	0.25	380	690
	632.245	●		●		CA	CC			0.50	0.30	–	0.12*	0.16	0.20	**0.26**	0.31	0.37	380	690
	632.275	●		●		CA	CC			0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.41	0.49	380	690

Spray angle	Ordering no.									Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]							Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no.				Code						p [bar]								
		16[1]	17[2]	30	5E														H = 250 [mm]	H = 500 [mm]
		Stainless steel 303/ Stainless steel 304	Stainless steel 316Ti/ Stainless steel 316L	Brass	PVDF	1/8 BSPT	1/4 BSPT	3/8 BSPT	1/2 BSPT			0.5	1.0	2.0	3.0	**5.0**	7.0	10.0		
90°	**632.216**	●		●		CA	CC			0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.21	0.25	420	780
	632.276	●		●		CA	CC			0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.41	0.49	430	790
	632.306	●	●	●	●	CA	CC			0.70	0.40	0.16*	0.23*	0.32	0.39	**0.51**	0.60	0.72	440	800
	632.336	●	●	●	●	CA	CC			0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	0.84	1.00	440	820
	632.366	●	●	●	●	CA	CC			1.00	0.50	0.31*	0.44*	0.63	0.77	**1.00**	1.18	1.40	450	830
	632.406	●	●	●	●	CA	CC			1.20	0.70	0.50*	0.71	1.00	1.23	**1.58**	1.87	2.24	450	840
	632.446	●	●	●	●	CA	CC			1.35	0.80	0.62*	0.88	1.25	1.53	**1.98**	2.34	2.80	460	860
	632.486	●	●	●	●	CA	CC			1.50	0.80	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	470	870
	632.516	●	●	●	●	CA	CC			1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	3.55	4.24	480	880
	632.566	●	●	●	●	CA	CC			2.00	1.10	1.25	1.77	2.50	3.06	**3.95**	4.68	5.59	490	900
	632.606	●	●	●	●	CA	CC			2.20	1.20	1.57	2.23	3.15	3.86	**4.98**	5.89	7.04	500	910
	632.646	●	●	●	●[4]		CC	CE		2.50	1.30	2.00	2.83	4.00	4.90	**6.33**	7.48	8.94	510	930
	632.676	●	●	●	●[4]		CC	CE		2.70	1.40	2.37	3.36	4.75	5.82	**7.51**	8.89	10.62	510	950
	632.726	●	●	●	●[4]		CC	CE		3.00	1.70	3.15	4.46	6.30	7.72	**9.96**	11.79	14.09	520	980
	632.766	●	●	●	●[4]		CC	CE		3.50	1.90	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	530	1,000
	632.806	●	●[3]	●	●[4]		CC		CG	4.00	2.40	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	530	1,030
	632.846	●	●[3]	●	●[4]		CC		CG	4.50	2.40	6.25	8.84	12.50	15.31	**19.76**	23.38	27.94	540	1,050
	632.886	●	●[3]	●	●[4]		CC		CG	5.00	3.10	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	540	1,060
	632.926	●	●	●					CG	5.50	3.60	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	540	1,070
	632.966	●	●	●					CG	6.00	3.90	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	540	1,070
120°	**632.187**	●		●		CA	CC			0.35	0.20	–	0.06*	0.08	0.10	**0.13**	0.15	0.18	630	1,060
	632.217	●		●		CA	CC			0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.21	0.25	650	1,080
	632.247	●		●		CA	CC			0.50	0.20	–	0.12*	0.16	0.20	**0.26**	0.31	0.37	660	1,100
	632.277	●		●		CA	CC			0.60	0.30	–	0.16*	0.22	0.27	**0.35**	0.41	0.49	670	1,150
	632.307	●	●	●	●	CA	CC			0.70	0.30	0.16*	0.23*	0.32	0.39	**0.51**	0.60	0.72	710	1,240
	632.337	●	●	●	●	CA	CC			0.90	0.40	0.22*	0.32*	0.45	0.55	**0.71**	0.84	1.00	740	1,350
	632.367	●	●	●	●	CA	CC			1.00	0.50	0.31*	0.44*	0.63	0.77	**1.00**	1.18	1.40	800	1,430
	632.407	●	●	●	●	CA	CC			1.20	0.60	0.50*	0.71	1.00	1.23	**1.58**	1.87	2.24	830	1,480
	632.447	●	●	●	●	CA	CC			1.35	0.60	0.62*	0.88	1.25	1.53	**1.98**	2.34	2.80	840	1,520
	632.487	●	●	●	●	CA	CC			1.50	0.60	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	850	1,540
	632.517	●	●	●	●	CA	CC			1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	3.55	4.24	850	1,560
	632.567	●	●	●	●	CA	CC			2.00	0.90	1.25	1.77	2.50	3.06	**3.95**	4.68	5.59	870	1,590
	632.607	●	●	●	●	CA	CC			2.20	1.10	1.57	2.23	3.15	3.86	**4.98**	5.89	7.04	870	1,620
	632.647	●	●	●			CC	CE		2.50	1.30	2.00	2.83	4.00	4.90	**6.33**	7.48	8.94	880	1,640
	632.677	●	●	●	●[4]		CC	CE		2.70	1.40	2.37	3.36	4.75	5.82	**7.51**	8.89	10.62	890	1,660
	632.727	●	●	●	●[4]		CC	CE		3.00	1.60	3.15	4.46	6.30	7.72	**9.96**	11.79	14.09	890	1,680
	632.767	●	●	●	●[4]		CC	CE		3.50	1.70	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	900	1,700
	632.807	●	●[3]	●			CC		CG	4.00	2.00	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	900	1,710
	632.847	●[3]	●[3]	●[3]	●[4]		CC		CG	4.50	2.30	6.25	8.84	12.50	15.31	**19.76**	23.38	27.94	900	1,710
	632.887	●	●	●					CG	5.00	2.60	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	910	1,710
	632.927	●	●	●					CG	5.50	2.90	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	910	1,710

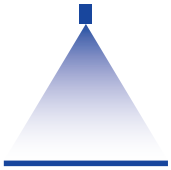
* Differing spray pattern.
[1] We reserve the right to supply material 303 or 304 under material no. 16.
[2] We reserve the right to supply material 316Ti or 316L under material no. 17.
[3] Only available with Code CG.
[4] Only available with Code CC.

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.
	632.216	+	16	+	CA	=	632.216.16.CA

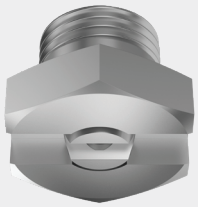
Assembly accessories can be found in Chapter 9 “Accessories”.

Low pressure flat fan nozzles
Series 610

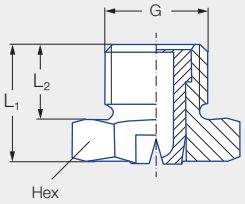


Features:
- Uniform, parabolic liquid distribution
- Stable spray angle
- Compact design for narrow installation conditions

Applications:
- Spray cleaning
- Surface cleaning
- Strainer insert cleaning
- Coating processes
- Belt cleaning
- Lubrication processes



Series 610



G	Dimensions [mm]			Weight [g]
	L_1	L_2	Hex	Brass
1/8 BSPP	11.0	7.0	14	10.0

Spray angle	Ordering no.			Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]							Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 30 Brass			p [bar] 0.5	1.0	2.0	3.0	**5.0**	7.0	10.0	H = 250 [mm]	H = 500 [mm]
20°	**610.301**	●	●	0.70	0.60	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	85	160
	610.361	●	●	1.00	0.80	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	85	160
	610.441	●	●	1.35	1.10	0.63*	0.89	1.25	1.53	**1.98**	2.34	2.80	85	160
	610.481	●	●	1.50	1.20	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	85	160
30°	**610.302**	●	●	0.70	0.50	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	120	220
	610.362	●	●	1.00	0.70	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	120	220
	610.402	●	●	1.20	0.90	0.50*	0.71	1.00	1.22	**1.58**	1.87	2.23	120	230
	610.482	●	●	1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	130	230
	610.562	●	●	2.00	1.50	1.25	1.77	2.50	3.06	**3.95**	4.67	5.59	130	240
45°	**610.303**	●	●	0.70	0.50	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	170	330
	610.363	●	●	1.00	0.60	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	190	350
	610.403	●	●	1.20	0.90	0.50*	0.71	1.00	1.22	**1.58**	1.87	2.23	200	370
	610.483	●	●	1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	200	390
	610.563	●	●	2.00	1.40	1.25	1.77	2.50	3.06	**3.95**	4.67	5.59	210	410
	610.643	●	●	2.20	1.80	2.00	2.83	4.00	4.90	**6.33**	7.49	8.95	220	410

Spray angle	Ordering no.			Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]							Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 30 Brass			p [bar] 0.5	1.0	2.0	3.0	**5.0**	7.0	10.0	H = 250 [mm]	H = 500 [mm]
60°	**610.304**	●	●	0.70	0.40	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	260	480
	610.334	●	●	0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	0.84	1.00	260	490
	610.364	●	●	1.00	0.60	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	260	500
	610.404	●	●	1.20	0.80	0.50*	0.71	1.00	1.22	**1.58**	1.87	2.23	260	510
	610.444	●	●	1.35	0.90	0.63*	0.89	1.25	1.53	**1.98**	2.34	2.80	260	510
	610.484	●	●	1.50	1.00	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	260	520
	610.514	●	●	1.65	1.10	0.95*	1.34	1.90	2.32	**3.00**	3.55	4.24	270	520
	610.564	●	●	2.00	1.30	1.25	1.77	2.50	3.06	**3.95**	4.67	5.59	270	530
	610.604	●	●	2.20	1.50	1.57	2.23	3.15	3.86	**4.98**	5.89	7.04	270	540
75°	**610.145**	●	●	0.20	0.12	–	0.04*	0.05	0.06	**0.08**	0.09	0.11	380	690
	610.165	●	●	0.20	0.14	–	0.05*	0.06	0.08	**0.10**	0.12	0.14	380	690
	610.185	●	●	0.20	0.16	–	0.06*	0.08	0.10	**0.13**	0.15	0.18	380	690
	610.215	●	●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.21	0.25	380	690
	610.245	●	●	0.50	0.30	–	0.12*	0.16	0.20	**0.26**	0.31	0.37	380	690
	610.275	●	●	0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.41	0.49	380	690
90°	**610.216**	●	●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.21	0.25	420	780
	610.276	●	●	0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.41	0.49	430	790
	610.306	●	●	0.70	0.40	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	440	800
	610.336	●	●	0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	0.84	1.00	440	820
	610.366	●	●	1.00	0.50	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	450	830
	610.406	●	●	1.20	0.70	0.50*	0.71	1.00	1.22	**1.58**	1.87	2.23	450	840
	610.446	●	●	1.35	0.80	0.63*	0.89	1.25	1.53	**1.98**	2.34	2.80	460	860
	610.486	●	●	1.50	0.80	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	470	870
	610.516	●	●	1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	3.55	4.24	480	880
	610.566	●	●	2.00	1.10	1.25	1.77	2.50	3.06	**3.95**	4.67	5.59	490	900
	610.606	●	●	2.20	1.20	1.57	2.23	3.15	3.86	**4.98**	5.89	7.04	500	910
120°	**610.187**	●	●	0.35	0.20	–	0.06*	0.08	0.10	**0.13**	0.15	0.18	630	1,060
	610.217	●	●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.21	0.25	650	1,080
	610.247	●	●	0.50	0.20	–	0.12*	0.16	0.20	**0.26**	0.31	0.37	660	1,100
	610.277	●	●	0.60	0.30	–	0.16*	0.22	0.27	**0.35**	0.41	0.49	670	1,150
	610.307	●	●	0.70	0.30	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	710	1,240
	610.337	●	●	0.90	0.40	0.22*	0.32*	0.45	0.55	**0.71**	0.84	1.00	740	1,350
	610.367	●	●	1.00	0.50	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	800	1,430
	610.407	●	●	1.20	0.60	0.50*	0.71	1.00	1.22	**1.58**	1.87	2.23	830	1,480
	610.447	●	●	1.35	0.60	0.63*	0.89	1.25	1.53	**1.98**	2.34	2.80	840	1,520
	610.487	●	●	1.50	0.60	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	850	1,540
	610.517	●	●	1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	3.55	4.24	850	1,560
	610.567	●	●	2.00	0.90	1.25	1.77	2.50	3.06	**3.95**	4.67	5.59	870	1,590
	610.607	●	●	2.20	1.10	1.57	2.23	3.15	3.86	**4.98**	5.89	7.04	870	1,620

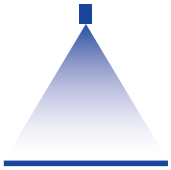
* Differing spray pattern.

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

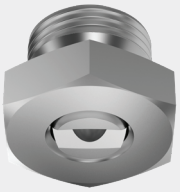
Ordering example:	Type 610.304	+	Material no. 16	=	Ordering no. 610.304.16

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

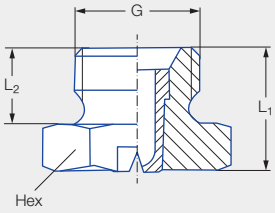
Low pressure flat fan nozzles
Series 612



Features:
- Uniform, parabolic liquid distribution
- Stable spray angle
- Compact design for narrow installation conditions



Series 612



Applications:
- Spray cleaning
- Surface cleaning
- Strainer insert cleaning
- Coating processes
- Belt cleaning
- Lubrication processes

G	Dimensions [mm]			Weight [g] Brass
	L_1	L_2	Hex	
1/4 BSPP	13.0	8.0	17	14.0

Spray angle	Ordering no. Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass	Equivalent bore diameter A [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 width B [mm] (at p = 5 bar) H = 250 [mm]	H = 500 [mm]
20°	**612.301**	●	●	●	0.70	0.60	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	85	160
	612.361	●	●	●	1.00	0.80	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	85	160
	612.441	●	●	●	1.30	1.10	0.63*	0.89	1.25	1.53	**1.98**	2.34	2.80	85	160
	612.481	●	●	●	1.50	1.20	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	85	160
30°	**612.302**	●	●	●	0.60	0.50	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	120	220
	612.362	●	●	●	1.00	0.70	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	120	220
	612.402	●	●	●	1.20	0.90	0.50*	0.71	1.00	1.22	**1.58**	1.87	2.23	120	230
	612.482	●	●	●	1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	130	230
	612.562	●	●	●	2.00	1.50	1.25	1.77	2.50	3.06	**3.95**	4.67	5.59	130	240
	612.642	●	●	●	2.50	1.80	2.00	2.83	4.00	4.90	**6.33**	7.49	8.95	140	250
	612.722	●	●	●	3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	140	260
	612.762	●	●	●	3.50	2.70	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	140	260
	612.802	●	●	●	4.00	3.10	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	140	260
45°	**612.303**	●	●	●	0.70	0.50	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	170	330
	612.363	●	●	●	1.00	0.60	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	190	350
	612.403	●	●	●	1.20	0.90	0.50*	0.71	1.00	1.22	**1.58**	1.87	2.23	200	370
	612.483	●	●	●	1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	200	390
	612.563	●	●	●	2.00	1.40	1.25	1.77	2.50	3.06	**3.95**	4.67	5.59	210	410
	612.643	●	●	●	2.50	1.80	2.00	2.83	4.00	4.90	**6.33**	7.49	8.95	220	410
	612.723	●	●	●	3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	220	420
	612.763	●	●	●	3.50	2.60	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	220	420
	612.803	●	●	●	4.00	3.00	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	220	420

Spray angle	Ordering no.				Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]							Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass			p [bar] 0.5	1.0	2.0	3.0	**5.0**	7.0	10.0	H = 250 [mm]	H = 500 [mm]
60°	**612.304**	●	●	●	0.70	0.40	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	260	480
	612.334	●	●	●	0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	0.84	1.00	260	490
	612.364	●	●	●	1.00	0.60	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	260	500
	612.404	●	●	●	1.20	0.80	0.50*	0.71	1.00	1.22	**1.58**	1.87	2.23	260	510
	612.444	●	●	●	1.35	0.90	0.63*	0.89	1.25	1.53	**1.98**	2.34	2.80	260	510
	612.484	●	●	●	1.50	1.00	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	260	520
	612.514	●	●	●	1.65	1.10	0.95*	1.34	1.90	2.32	**3.00**	3.55	4.24	270	520
	612.564	●	●	●	2.00	1.30	1.25	1.77	2.50	3.06	**3.95**	4.67	5.59	270	530
	612.604	●	●	●	2.20	1.50	1.57	2.23	3.15	3.86	**4.98**	5.89	7.04	270	540
	612.644	●	●	●	2.50	1.60	2.00	2.83	4.00	4.90	**6.33**	7.49	8.95	270	540
	612.674	●	●	●	2.70	1.80	2.37	3.36	4.75	5.82	**7.51**	8.89	10.62	270	550
	612.724	●	●	●	3.00	2.10	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	280	560
	612.764	●	●	●	3.50	2.30	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	280	570
	612.804	●	●	●	4.00	2.60	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	290	580
	612.884	●		●	5.00	3.40	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	290	580
75°	**612.145**	●		●	0.20	0.12	–	0.04*	0.05	0.06	**0.08**	0.09	0.11	380	690
	612.165	●		●	0.20	0.14	–	0.05*	0.07	0.08	**0.10**	0.12	0.15	380	690
	612.185	●		●	0.20	0.16	–	0.06*	0.08	0.10	**0.13**	0.15	0.18	380	690
	612.215	●		●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.21	0.25	380	690
	612.245	●		●	0.50	0.30	–	0.12*	0.16	0.20	**0.26**	0.31	0.37	380	690
	612.275	●		●	0.60	0.30	0.11*	0.16	0.22	0.27	**0.35**	0.41	0.49	380	690
90°	**612.216**	●		●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.21	0.25	420	780
	612.276	●		●	0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.41	0.49	430	790
	612.306	●	●	●	0.70	0.40	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	440	800
	612.336	●	●	●	0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	0.84	1.00	440	820
	612.366	●	●	●	1.00	0.50	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	450	830
	612.406	●	●	●	1.20	0.70	0.50*	0.71	1.00	1.22	**1.58**	1.87	2.23	450	840
	612.446	●	●	●	1.35	0.80	0.63*	0.89	1.25	1.53	**1.98**	2.34	2.80	460	860
	612.486	●	●	●	1.50	0.80	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	470	870
	612.516	●	●	●	1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	3.55	4.24	480	880
	612.566	●	●	●	2.00	1.10	1.25	1.77	2.50	3.06	**3.95**	4.67	5.59	490	900
	612.606	●	●	●	2.20	1.20	1.57	2.23	3.15	3.86	**4.98**	5.89	7.04	500	910
	612.646	●	●	●	2.50	1.30	2.00	2.83	4.00	4.90	**6.33**	7.49	8.95	510	930
	612.676	●	●	●	2.70	1.40	2.37	3.36	4.75	5.82	**7.51**	8.89	10.62	510	950
	612.726	●	●	●	3.00	1.70	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	520	980
	612.766	●	●	●	3.50	1.90	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	530	1,000
	612.806	●		●	4.00	2.40	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	530	1,030

Spray angle	Ordering no.				Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]							Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass			p [bar] 0.5	1.0	2.0	3.0	**5.0**	7.0	10.0	H = 250 [mm]	H = 500 [mm]
120°	**612.187**	●		●	0.35	0.20	–	0.06*	0.08	0.10	**0.13**	0.15	0.18	630	1,060
	612.217	●		●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.21	0.25	650	1,080
	612.247	●		●	0.50	0.20	–	0.12*	0.16	0.20	**0.26**	0.31	0.37	660	1,100
	612.277	●		●	0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.41	0.49	670	1,150
	612.307	●		●	0.70	0.30	0.16*	0.23*	0.32	0.40	**0.51**	0.60	0.72	710	1,240
	612.337	●	●	●	0.90	0.40	0.22*	0.32*	0.45	0.55	**0.71**	0.84	1.00	740	1,350
	612.367	●	●	●	1.00	0.40	0.32*	0.45*	0.63	0.77	**1.00**	1.18	1.41	800	1,430
	612.407	●	●	●	1.20	0.60	0.50*	0.71	1.00	1.22	**1.58**	1.87	2.23	830	1,480
	612.447	●	●	●	1.35	0.60	0.63*	0.89	1.25	1.53	**1.98**	2.34	2.80	840	1,520
	612.487	●	●	●	1.50	0.60	0.80*	1.13	1.60	1.96	**2.53**	2.99	3.58	850	1,540
	612.517	●	●	●	1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	3.55	4.24	850	1,560
	612.567	●	●	●	2.00	0.90	1.25	1.77	2.50	3.06	**3.95**	4.67	5.59	870	1,590
	612.607	●	●	●	2.20	1.10	1.57	2.23	3.15	3.86	**4.98**	5.89	7.04	870	1,620
	612.647	●	●	●	2.50	1.30	2.00	2.83	4.00	4.90	**6.33**	7.49	8.95	880	1,640
	612.677	●	●	●	2.70	1.40	2.37	3.36	4.75	5.82	**7.51**	8.89	10.62	890	1,660
	612.727	●	●	●	3.00	1.60	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	890	1,680
	612.767	●	●	●	3.50	1.70	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	900	1,700
	612.807	●		●	4.00	2.00	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	900	1,710

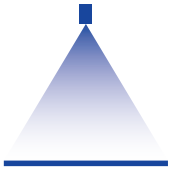
* Differing spray pattern.
[1] We reserve the right to supply material 316Ti or 316L under material no. 17.

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.
	612.187	+	16	=	612.187.16

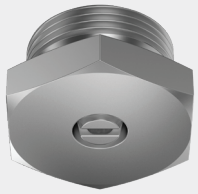
Assembly accessories can be found in Chapter 9 “Accessories”.

Low pressure flat fan nozzles
Series 616/617

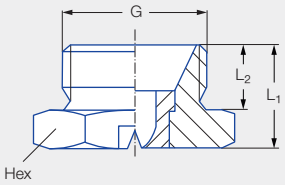


Features:
- Uniform, parabolic liquid distribution
- Stable spray angle
- Compact design for narrow installation conditions

Applications:
- Spray cleaning
- Surface cleaning
- Filter cleaning
- Coating processes
- Belt cleaning
- Lubrication processes



Series 616/617



G	Dimensions [mm]			Weight [g]
	L_1	L_2	Hex	Brass
3/4 BSPP	19.0	12.0	32	75.0

Spray angle	Ordering no.				Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]							Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass			p [bar] 0.5	1.0	2.0	3.0	**5.0**	7.0	10.0	H = 250 [mm]	H = 500 [mm]
20°	**616.721**	●	●	●	3.00	2.50	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	100	180
	616.801	●	●	●	4.00	3.20	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	100	180
	616.881	●	●	●	5.00	4.00	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	100	180
	616.921	●	●	●	5.50	4.40	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	100	180
	616.961	●	●	●	6.00	5.10	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	100	180
30°	**616.722**	●	●	●	3.00	2.50	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	140	260
	616.762	●	●	●	3.50	2.80	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	140	260
	616.802	●	●	●	4.00	3.10	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	140	260
	616.882	●	●	●	5.00	4.00	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	140	270
	616.922	●	●	●	5.50	4.40	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	140	270
	616.962	●		●	6.00	5.00	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	140	270
45°	**616.723**	●	●	●	3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	220	420
	616.763	●	●	●	3.50	2.60	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	220	420
	616.803	●	●	●	4.00	3.00	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	220	420
	616.843	●	●	●	4.50	3.40	6.25	8.84	12.50	15.31	**19.76**	23.38	27.94	220	420
	616.883	●	●	●	5.00	3.80	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	220	420
	616.923	●	●	●	5.50	4.20	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	220	430
	616.963	●	●	●	6.00	4.40	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	220	430

Spray angle	Ordering no.				Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]							Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass			p [bar] 0.5	1.0	2.0	3.0	**5.0**	7.0	10.0	H = 250 [mm]	H = 500 [mm]
60°	**616.724**	●	●	●	3.00	2.10	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	280	560
	616.764	●	●	●	3.50	2.30	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	280	570
	616.804	●	●	●	4.00	2.60	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	290	580
	616.844	●	●	●	4.50	3.00	6.25	8.84	12.50	15.31	**19.76**	23.38	27.94	290	580
	616.884	●	●	●	5.00	3.40	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	290	580
	616.924	●	●	●	5.50	4.10	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	290	580
	616.964	●	●	●	6.00	4.20	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	290	580
	617.044	●		●	8.00	5.50	20.00	28.26	39.97	48.95	**63.20**	74.78	89.38	290	580
	617.124			●	10.00	7.40	31.50	44.54	62.99	77.15	**99.60**	117.85	140.86	290	580
90°	**616.726**	●	●	●	3.00	1.80	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	520	980
	616.766	●	●	●	3.50	1.90	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	530	1,000
	616.806	●	●	●	4.00	2.40	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	530	1,030
	616.846	●	●	●	4.50	2.40	6.25	8.84	12.50	15.31	**19.76**	23.38	27.94	540	1,050
	616.886	●	●	●	5.00	3.10	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	540	1,060
	616.926	●	●	●	5.50	3.60	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	540	1,070
	616.966	●	●	●	6.00	3.90	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	540	1,070
120°	**616.727**	●	●	●	3.00	1.60	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	890	1,680
	616.767	●	●	●	3.50	1.70	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	900	1,700
	616.807	●	●	●	4.00	2.00	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	900	1,710
	616.887	●	●	●	5.00	2.60	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	910	1,710
	616.927	●	●	●	5.50	2.90	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	910	1,710
	616.967			●	6.00	3.20	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	910	1,710
	617.047			●	8.00	4.40	20.00	28.26	39.97	48.95	**63.20**	74.78	89.38	910	1,710

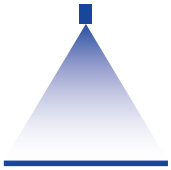
[1] We reserve the right to supply material 316Ti or 316L under material no. 17.

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

Ordering example:	Type 616.724	+	Material no. 16	=	Ordering no. 616.724.16

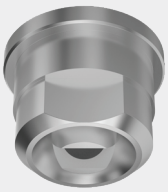
Assembly accessories can be found in Chapter 9 “Accessories”.

Low pressure flat fan nozzles for retaining nut
Series 652

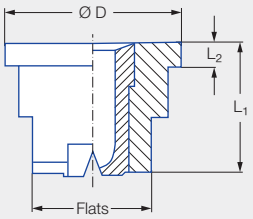


Features:
- Uniform, parabolic liquid distribution
- Stable spray angle
- Assembly with retaining nut

Applications:
- Spray cleaning
- Surface cleaning
- Filter cleaning
- Coating processes
- Belt cleaning
- Lubrication processes



Series 652



Code	Dimensions [mm]				Weight [g]
	L_1	L_2	Ø D	Flats	Brass
Assembly with retaining nut 3/8 BSPP	11.0	2.0	14.8	10	9.0

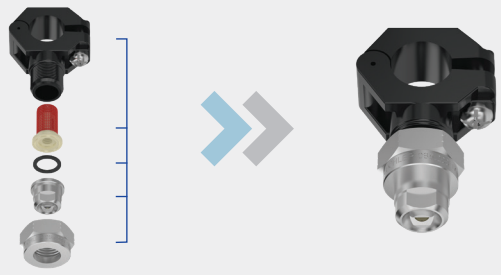
Spray angle	Ordering no.						Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]						Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass	Mat. no. 5E PVDF				p [bar] 0.5	1.0	2.0	3.0	**5.0**	10.0	H = 250 [mm]	H = 500 [mm]
20°	**652.301**	●	●	●	●		0.70	0.60	0.16*	0.23*	0.32	0.40	**0.51**	0.72	85	160
	652.361	●	●	●	●		1.00	0.80	0.32*	0.45*	0.63	0.77	**1.00**	1.41	85	160
	652.441	●	●	●	●		1.35	1.10	0.63*	0.89	1.25	1.53	**1.98**	2.80	85	160
	652.481	●	●	●	●		1.50	1.20	0.80*	1.13	1.60	1.96	**2.53**	3.58	85	160
30°	**652.302**	●	●	●	●		0.60	0.50	0.16*	0.23*	0.32	0.40	**0.51**	0.72	120	220
	652.362	●	●	●	●		1.00	0.70	0.32*	0.45*	0.63	0.77	**1.00**	1.41	120	220
	652.402	●	●	●	●		1.20	0.90	0.50*	0.71	1.00	1.22	**1.58**	2.23	120	230
	652.482	●	●	●	●		1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	3.58	130	230
	652.562	●	●	●	●		2.00	1.50	1.25	1.77	2.50	3.06	**3.95**	5.59	130	240
	652.642	●	●	●			2.50	1.80	2.00	2.83	4.00	4.90	**6.33**	8.95	140	250
	652.722	●	●	●			3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	14.09	140	260
	652.762	●	●	●			3.50	2.70	4.00	5.66	8.00	9.80	**12.65**	17.89	140	260
	652.802	●	●	●			4.00	3.10	5.00	7.07	10.00	12.25	**15.81**	22.36	140	260
45°	**652.303**	●	●	●			0.70	0.50	0.16*	0.23*	0.32	0.40	**0.51**	0.72	170	330
	652.363	●	●	●	●		1.00	0.60	0.32*	0.45*	0.63	0.77	**1.00**	1.41	190	350
	652.403	●	●	●	●		1.20	0.90	0.50*	0.71	1.00	1.22	**1.58**	2.23	200	370
	652.483	●	●	●	●		1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	3.58	200	390
	652.563	●	●	●	●		2.00	1.40	1.25	1.77	2.50	3.06	**3.95**	5.59	210	410
	652.643	●	●	●	●		2.50	1.80	2.00	2.83	4.00	4.90	**6.33**	8.95	220	410
	652.723	●	●	●			3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	14.09	220	420
	652.763	●	●	●			3.50	2.60	4.00	5.66	8.00	9.80	**12.65**	17.89	220	420
	652.803	●	●	●			4.00	3.00	5.00	7.07	10.00	12.25	**15.81**	22.36	220	420

Spray angle	Ordering no.					Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]						Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no.						p [bar]							
		16	17[1]	30	5E										
		Stainless steel 303	Stainless steel 316Ti/ Stainless steel 316L	Brass	PVDF			0.5	1.0	2.0	3.0	**5.0**	10.0	H = 250 [mm]	H = 500 [mm]
60°	**652.304**	●	●	●	●	0.70	0.40	0.16*	0.23*	0.32	0.40	**0.51**	0.72	260	480
	652.334	●	●	●	●	0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	1.00	260	490
	652.364	●	●	●	●	1.00	0.60	0.32*	0.45*	0.63	0.77	**1.00**	1.41	260	500
	652.404	●	●	●	●	1.20	0.80	0.50*	0.71	1.00	1.22	**1.58**	2.23	260	510
	652.444	●	●	●	●	1.35	0.90	0.63*	0.89	1.25	1.53	**1.98**	2.80	260	510
	652.484	●	●	●	●	1.50	1.00	0.80*	1.13	1.60	1.96	**2.53**	3.58	260	520
	652.514	●	●	●	●	1.65	1.10	0.95*	1.34	1.90	2.32	**3.00**	4.24	270	520
	652.564	●	●	●	●	2.00	1.30	1.25	1.77	2.50	3.06	**3.95**	5.59	270	530
	652.604	●	●	●	●	2.20	1.50	1.57	2.23	3.15	3.86	**4.98**	7.04	270	540
	652.644	●	●	●	●	2.50	1.60	2.00	2.83	4.00	4.90	**6.33**	8.95	270	540
	652.674	●	●	●	●	2.70	1.80	2.37	3.36	4.75	5.82	**7.51**	10.62	270	550
	652.724	●	●	●	●	3.00	2.10	3.15	4.45	6.30	7.71	**9.96**	14.09	280	560
	652.764	●	●	●		3.50	2.30	4.00	5.66	8.00	9.80	**12.65**	17.89	280	570
	652.804	●	●	●	●	4.00	2.60	5.00	7.07	10.00	12.25	**15.81**	22.36	290	580
	652.844	●			●	4.50	3.00	6.25	8.84	12.50	15.31	**19.76**	27.94	290	580
	652.884	●		●		5.00	3.40	8.00	11.31	16.00	19.60	**25.30**	35.78	290	580
75°	**652.145**	●		●		0.20	0.12	–	0.04*	0.05	0.06	**0.08**	0.11	380	690
	652.165	●		●		0.20	0.14	–	0.05*	0.07	0.08	**0.10**	0.14	380	690
	652.185	●		●		0.20	0.16	–	0.06*	0.08	0.10	**0.13**	0.18	380	690
	652.215	●		●		0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.25	380	690
	652.245	●		●		0.50	0.30	–	0.12*	0.16	0.20	**0.26**	0.37	380	690
	652.275	●		●		0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.49	380	690
90°	**652.216**	●		●		0.40	0.20	0.06*	0.08*	0.11	0.14	**0.18**	0.25	420	780
	652.246	●		●		0.50	0.30	0.08*	0.12*	0.16	0.20	**0.26**	0.37	420	780
	652.276	●		●		0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.49	430	790
	652.306	●	●	●	●	0.70	0.40	0.16*	0.23*	0.32	0.40	**0.51**	0.72	440	800
	652.336	●	●	●	●	0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	1.00	440	820
	652.366	●	●	●	●	1.00	0.50	0.32*	0.45*	0.63	0.77	**1.00**	1.41	450	830
	652.406	●	●	●	●	1.20	0.70	0.50*	0.71	1.00	1.22	**1.58**	2.23	450	840
	652.446	●	●	●	●	1.35	0.80	0.63*	0.89	1.25	1.53	**1.98**	2.80	460	860
	652.486	●	●	●	●	1.50	0.80	0.80*	1.13	1.60	1.96	**2.53**	3.58	470	870
	652.516	●	●	●	●	1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	4.24	480	880
	652.566	●	●	●	●	2.00	1.10	1.25	1.77	2.50	3.06	**3.95**	5.59	490	900
	652.606	●	●	●	●	2.20	1.20	1.57	2.23	3.15	3.86	**4.98**	7.04	500	910
	652.646	●	●	●	●	2.50	1.30	2.00	2.83	4.00	4.90	**6.33**	8.95	510	930
	652.676	●	●	●	●	2.70	1.40	2.37	3.36	4.75	5.82	**7.51**	10.62	510	950
	652.726	●	●	●	●	3.00	1.70	3.15	4.45	6.30	7.71	**9.96**	14.09	520	980
	652.766	●	●	●		3.50	1.90	4.00	5.66	8.00	9.80	**12.65**	17.89	530	1,000
	652.806	●	●	●	●	4.00	2.40	5.00	7.07	10.00	12.25	**15.81**	22.36	530	1,030
	652.846			●	●	4.50	2.40	6.25	8.84	12.50	15.31	**19.76**	27.94	540	1,050
	652.886	●		●	●	5.00	3.10	8.00	11.31	16.00	19.60	**25.30**	35.78	540	1,060

Spray angle	Ordering no.					Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]						Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no.						p [bar]							
		16	17[1]	30	5E										
		Stainless steel 303	Stainless steel 316Ti/ Stainless steel 316L	Brass	PVDF			0.5	1.0	2.0	3.0	**5.0**	10.0	H = 250 [mm]	H = 500 [mm]
120°	**652.187**	●		●		0.35	0.20	–	0.06*	0.08	0.10	**0.13**	0.18	630	1,060
	652.217	●		●		0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.25	650	1,080
	652.247	●		●		0.50	0.20	–	0.12*	0.16	0.20	**0.26**	0.37	660	1,100
	652.277	●		●		0.60	0.30	–	0.16*	0.22	0.27	**0.35**	0.49	670	1,150
	652.307	●		●	●	0.70	0.30	0.16*	0.23*	0.32	0.40	**0.51**	0.72	710	1,240
	652.337	●	●	●	●	0.90	0.40	0.22*	0.32*	0.45	0.55	**0.71**	1.00	740	1,350
	652.367	●	●	●	●	1.00	0.50	0.32*	0.45*	0.63	0.77	**1.00**	1.41	800	1,430
	652.407	●	●	●	●	1.20	0.60	0.50*	0.71	1.00	1.22	**1.58**	2.23	830	1,480
	652.447	●	●	●	●	1.35	0.60	0.63*	0.89	1.25	1.53	**1.98**	2.80	840	1,520
	652.487	●	●	●	●	1.50	0.60	0.80*	1.13	1.60	1.96	**2.53**	3.58	850	1,540
	652.517	●	●	●	●	1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	4.24	850	1,560
	652.567	●	●	●	●	2.00	0.90	1.25	1.77	2.50	3.06	**3.95**	5.59	870	1,590
	652.607	●	●	●	●	2.20	1.10	1.57	2.23	3.15	3.86	**4.98**	7.04	870	1,620
	652.647	●	●	●		2.50	1.30	2.00	2.83	4.00	4.90	**6.33**	8.95	880	1,640
	652.677	●	●	●		2.70	1.40	2.37	3.36	4.75	5.82	**7.51**	10.62	890	1,660
	652.727	●	●	●	●	3.00	1.60	3.15	4.45	6.30	7.71	**9.96**	14.09	890	1,680
	652.767	●	●	●		3.50	1.70	4.00	5.66	8.00	9.80	**12.65**	17.89	900	1,700
	652.807	●		●		4.00	2.00	6.25	8.84	12.50	15.31	**19.76**	27.94	900	1,710
	652.847				●	4.50	2.30	6.25	8.84	12.50	15.31	**19.76**	27.94	900	1,710
	652.887				●	5.00	2.60	8.00	11.31	16.00	19.60	**25.30**	35.78	910	1,710

* Differing spray pattern.
[1] We reserve the right to supply material 316Ti or 316L under material no. 17.

Assembly example

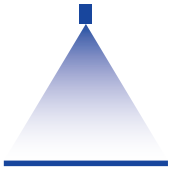


Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type 652.187	+	Material no. 16	=	Ordering no. 652.187.16

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

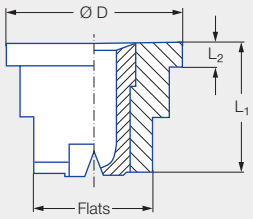
Low pressure flat fan nozzles
Belt lubrication
Series 652



Features:
- Particularly low flow rate
- Parabolic liquid distribution
- Assembly with retaining nut

Applications:
- Belt lubrication
- Spraying on food products
- Moistening of rollers
- Oiling of metal sheets

Series 652.xxx.56.03

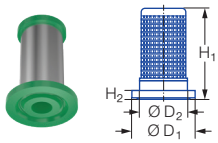
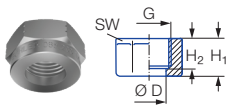


Code	Material	Dimensions [mm]				Weight [g]
		L_1	L_2	Ø D	Flats	
Assembly with retaining nut 3/8 BSPP	Stainless steel 303	11.0	2.0	14.8	10	10.0
	POM/Stainless steel	12.0	2.0	14.8	8	3.0
	POM	11.0	2.0	15.0	8	2.0

Spray angle	Ordering no. Type	Mat. no. 16 Stainless steel 303	Mat. no. 8H.03 Housing: POM Insert: 303 SS	Mat. no. 56.03 POM	Color	Narrowest free cross section Ø [mm]	V̇ water [l/min] p [bar] 1.0	2.0	**3.0**	5.0
75°	**652.145**	●	●	●	Green	0.12	0.04*	0.05	**0.06**	0.08
	652.165	●	●		Black	0.14	0.05*	0.07	**0.08**	0.10
	652.185	●	●	●	Red	0.16	0.06*	0.08	**0.10**	0.13
	652.215	●	●	●	Blue	0.20	0.08*	0.11	**0.14**	0.18
	652.245	●	●	●	Orange	0.30	0.12*	0.16	**0.20**	0.26
	652.275	●	●		Brown	0.30	0.16*	0.22	**0.27**	0.35
120°	**652.187**	●	●		Grey	0.20	0.06*	0.08	**0.10**	0.13
	652.247	●	●		Black	0.20	0.12*	0.16	**0.20**	0.26
	652.277	●	●		Black	0.30	0.16*	0.22	**0.27**	0.35

* Differing spray pattern.

Accessories:

	Designation	Ordering no.	Material	Color	Pressure [bar] Opening	Pressure [bar] Closing	G BSPP	Dimensions [mm] H_1	H_2	Ø D	Ø D_1	Ø D_2	Hex	Mesh size [mm]
	Filter with non-return valve	095.016.53.11.00	PP	Blue	0.50	0.30	–	21.00	1.60	–	15.00	11.00	–	0.08
		095.016.53.14.63	PP	Green	2.80	1.60	–	21.00	1.50	–	15.00	11.00	–	0.08
	Flat gasket	065.240.55	PTFE	–	–	–	–	–	–	–	–	–	–	–
		065.240.72	EWP 210	–	–	–	–	–	–	–	–	–	–	–
	Retaining nut	065.200.16	Stainless steel 303	–	–	–	3/8	13.00	10.00	12.80	–	–	22	–
		065.200.56	POM	Black	–	–	3/8	14.50	11.50	13.00	–	–	22	–

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.
	652.145	+	16	=	652.145.16

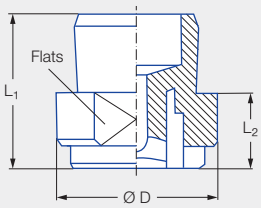
Assembly accessories can be found in Chapter 9 “Accessories”.

Low pressure flat fan nozzles
Press-in nozzle
Series 612.xxx.5E.03

Features:
- Uniform, parabolic liquid distribution
- For pressing into pipes

Applications:
- Cleaning and rinsing procedures
- Industrial dish washers

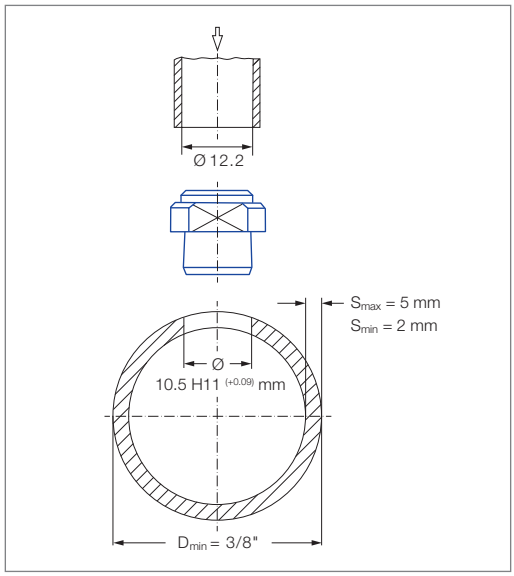
Series 612.xxx.5E.03



Dimensions [mm]				Weight [g]
L_1	L_2	Ø D	Flats	
12.5	5.5	14.0	12	2.0

Spray angle	Ordering no. Type	Mat. no. 5E.03 PVDF	Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min] p [bar] 0.3	0.5	0.7	1.0	1.5	**2.0**	Spray width B [mm] (at p = 2 bar) H = 250 [mm]	H = 500 [mm]
90°	**612.366**	●	1.00	0.50	0.24	0.31	0.37	0.44	0.55	**0.63**	360	730
	612.486	●	1.50	0.60	0.62	0.80	0.95	1.13	1.39	**1.60**	360	730
120°	**612.487**	●	1.50	0.60	0.62	0.80	0.95	1.13	1.39	**1.60**	720	1,280
	612.647	●	2.50	1.20	1.55	2.00	2.37	2.83	3.46	**4.00**	720	1,280

Assembly :



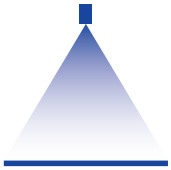
Drill pipe (Ø 10 mm), ream to Ø 10.5 H11 $^{(+0.09)}$ mm, adjust nozzle, place press-in pipe (inner diameter 12.2 mm) on nozzle and tap in using a rubber mallet. Max. flow velocity in the pipe 2–3 m/s.

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.
	612.366	+	5E.03	=	612.366.5E.03

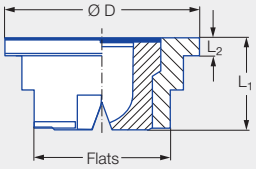
Assembly accessories can be found in Chapter 9 “Accessories”.

Low pressure flat fan nozzles for retaining nut
Series 656/657



Features:
- Uniform, parabolic liquid distribution
- Stable spray angle
- High spray energy
- Assembly with retaining nut
- Non-clogging

Series 656/657



Applications:
- Cleaning installations
- Gravel washing
- Roll cooling
- Cooling of rolled stock
- Cooling pipes

Code	Dimensions [mm]				Weight [g] Brass
	L_1	L_2	Ø D	Flats	
Assembly with retaining nut 3/4 BSPP	11.0	2.0	24.0	17	23.0

Spray angle	Ordering no. Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass	Equivalent bore diameter A [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 width B [mm] (at p = 5 bar) H = 250 [mm]	H = 500 [mm]
20°	**656.721**	●	●	●	3.00	2.50	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	100	180
	656.801	●	●	●	4.00	3.20	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	100	180
	656.881	●	●	●	5.00	4.00	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	100	180
	656.921	●	●	●	5.50	4.40	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	100	180
	656.961	●	●	●	6.00	5.30	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	100	180
30°	**656.722**	●	●	●	3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	140	260
	656.762	●	●	●	3.50	2.70	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	140	260
	656.802	●	●	●	4.00	3.10	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	140	260
	656.882	●	●	●	5.00	4.00	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	140	270
	656.922	●	●	●	5.50	4.40	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	140	270
	656.962	●	●	●	6.00	5.00	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	140	270
45°	**656.723**	●	●	●	3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	220	420
	656.763	●	●	●	3.50	2.60	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	220	420
	656.803	●	●	●	4.00	3.00	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	220	420
	656.843	●	●	●	4.50	3.40	6.25	8.84	12.50	15.31	**19.76**	23.38	27.94	220	420
	656.883	●	●	●	5.00	3.80	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	220	420
	656.923	●	●	●	5.50	4.20	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	220	430
	656.963	●	●	●	6.00	4.40	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	220	430

Spray angle	Ordering no.				Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]							Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass			p [bar] 0.5	1.0	2.0	3.0	**5.0**	7.0	10.0	H = 250 [mm]	H = 500 [mm]
60°	**656.724**	●	●	●	3.00	2.10	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	280	560
	656.764	●	●	●	3.50	2.30	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	280	570
	656.804	●	●	●	4.00	2.60	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	290	580
	656.844	●	●	●	4.50	3.00	6.25	8.84	12.50	15.31	**19.76**	23.38	27.94	290	580
	656.884	●	●	●	5.00	3.40	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	290	580
	656.924	●	●	●	5.50	4.10	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	290	580
	656.964	●	●	●	6.00	4.20	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	290	580
	657.044		●	●	8.00	5.50	20.00	28.29	40.00	48.99	**63.25**	74.84	89.45	290	580
90°	**656.726**	●	●	●	3.00	1.70	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	520	980
	656.766	●	●	●	3.50	1.90	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	530	1,000
	656.806	●	●	●	4.00	2.40	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	530	1,030
	656.846	●	●	●	4.50	2.40	6.25	8.84	12.50	15.31	**19.76**	23.38	27.94	540	1,050
	656.886	●	●	●	5.00	3.10	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	540	1,060
	656.926	●	●	●	5.50	3.60	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	540	1,070
	656.966	●	●	●	6.00	3.90	12.50	17.68	25.00	30.62	**39.53**	46.77	55.90	540	1,070
	657.046			●	8.00	4.90	20.00	28.29	40.00	48.99	**63.25**	74.84	89.45	540	1,070
120°	**656.727**	●	●	●	3.00	1.60	3.15	4.45	6.30	7.71	**9.96**	11.78	14.09	890	1,680
	656.767	●	●	●	3.50	1.70	4.00	5.66	8.00	9.80	**12.65**	14.97	17.89	900	1,700
	656.807	●	●	●	4.00	2.00	5.00	7.07	10.00	12.25	**15.81**	18.71	22.36	900	1,710
	656.887	●	●	●	5.00	2.60	8.00	11.31	16.00	19.60	**25.30**	29.94	35.78	910	1,710
	656.927	●	●	●	5.50	2.90	10.00	14.14	20.00	24.49	**31.62**	37.41	44.72	910	1,710

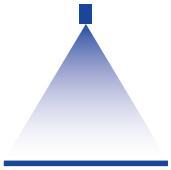
[1] We reserve the right to supply material 316Ti or 316L under material no. 17.

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:	656.724	+	16	=	656.724.16

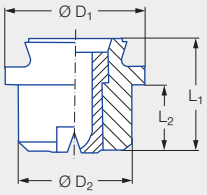
Assembly accessories can be found in Chapter 9 “Accessories”.

Low pressure flat fan nozzles with dovetail guide
Series 660



Features:
- Uniform, parabolic liquid distribution
- Stable spray angle
- Spray automatically aligned approx. 5° to the longitudinal axis of the pipe due to dovetail guide
- Assembly with retaining nut
- Non-clogging
- High spray energy

Series 660



Applications:
- Cleaning installations
- Spray pipes
- Cooling pipes

Code	Dimensions [mm]				Weight [g] Brass
	L_1	L_2	Ø D_1	Ø D_2	
Assembly with retaining nut 3/8 BSPP and dovetail guide	12.0	7.0	14.8	12.0	10.0

Spray angle	Ordering no. Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass	Equivalent bore diameter A [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	Spray width B [mm] (at p = 5 bar) H = 250 [mm]	H = 500 [mm]
20°	**660.301**	●	●	●	0.70	0.60	0.16*	0.23*	0.32	0.40	**0.51**	0.72	85	160
	660.361	●	●	●	1.00	0.80	0.32*	0.45*	0.63	0.77	**1.00**	1.41	85	160
	660.441	●	●	●	1.35	1.10	0.63*	0.89	1.25	1.53	**1.98**	2.80	85	160
	660.481	●	●	●	1.50	1.20	0.80*	1.13	1.60	1.96	**2.53**	3.58	85	160
30°	**660.302**	●	●	●	0.60	0.50	0.16*	0.23*	0.32	0.40	**0.51**	0.72	120	220
	660.362	●	●	●	1.00	0.70	0.32*	0.45*	0.63	0.77	**1.00**	1.41	120	220
	660.402	●	●	●	1.20	0.90	0.50*	0.71	1.00	1.22	**1.58**	2.23	120	230
	660.482	●	●	●	1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	3.58	130	230
	660.562	●	●	●	2.00	1.50	1.25	1.77	2.50	3.06	**3.95**	5.59	130	240
45°	**660.303**	●	●	●	0.70	0.50	0.16*	0.23*	0.32	0.40	**0.51**	0.72	170	330
	660.363	●	●	●	1.00	0.60	0.32*	0.45*	0.63	0.77	**1.00**	1.41	190	350
	660.403	●	●	●	1.20	0.90	0.50*	0.71	1.00	1.22	**1.58**	2.23	200	370
	660.483	●	●	●	1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	3.58	200	390
	660.563	●	●	●	2.00	1.40	1.25	1.77	2.50	3.06	**3.95**	5.59	210	410
	660.643	●	●	●	2.50	1.80	2.00	2.83	4.00	4.90	**6.33**	8.95	220	410
60°	**660.304**	●	●	●	0.70	0.40	0.16*	0.23*	0.32	0.40	**0.51**	0.72	260	480
	660.334	●	●	●	0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	1.00	260	490
	660.364	●	●	●	1.00	0.60	0.32*	0.45*	0.63	0.77	**1.00**	1.41	260	500
	660.404	●	●	●	1.20	0.80	0.50*	0.71	1.00	1.22	**1.58**	2.23	260	510
	660.444	●	●	●	1.35	0.90	0.63*	0.89	1.25	1.53	**1.98**	2.80	260	510

Spray angle	Ordering no.				Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]						Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass			p [bar] 0.5	1.0	2.0	3.0	**5.0**	10.0	H = 250 [mm]	H = 500 [mm]
60°	**660.484**	●	●	●	1.50	1.00	0.80*	1.13	1.60	1.96	**2.53**	3.58	260	520
	660.514	●	●	●	1.65	1.10	0.95*	1.34	1.90	2.32	**3.00**	4.24	270	520
	660.564	●	●	●	2.00	1.30	1.25	1.77	2.50	3.06	**3.95**	5.59	270	530
	660.604	●	●	●	2.20	1.50	1.57	2.23	3.15	3.86	**4.98**	7.04	270	540
	660.644	●	●	●	2.50	1.60	2.00	2.83	4.00	4.90	**6.33**	8.95	270	540
	660.724	●	●	●	3.00	2.10	3.15	4.45	6.30	7.71	**9.96**	14.09	280	560
	660.804	●		●	4.00	2.60	5.00	7.07	10.00	12.25	**15.81**	22.36	290	580
75°	**660.145**	●		●	0.20	0.14	–	0.04*	0.05	0.06	**0.08**	0.11	380	690
	660.165	●		●	0.20	0.14	–	0.05*	0.07	0.08	**0.10**	0.15	380	690
	660.185	●		●	0.20	0.16	–	0.06*	0.08	0.10	**0.13**	0.18	380	690
	660.215	●		●	0.50	0.20	–	0.08*	0.11	0.14	**0.18**	0.25	380	690
	660.245	●		●	0.50	0.30	–	0.12*	0.16	0.20	**0.26**	0.37	380	690
	660.275	●		●	0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.49	380	690
90°	**660.216**	●		●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.25	420	780
	660.276	●		●	0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.49	430	790
	660.306	●	●	●	0.70	0.40	0.16*	0.23*	0.32	0.40	**0.51**	0.72	440	800
	660.336	●	●	●	0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	1.00	440	820
	660.366	●	●	●	1.00	0.50	0.32*	0.45*	0.63	0.77	**1.00**	1.41	450	830
	660.406	●	●	●	1.20	0.70	0.50*	0.71	1.00	1.22	**1.58**	2.23	450	840
	660.446	●	●	●	1.35	0.80	0.63*	0.89	1.25	1.53	**1.98**	2.80	460	860
	660.486	●	●	●	1.50	0.80	0.80*	1.13	1.60	1.96	**2.53**	3.58	470	870
	660.516	●	●	●	1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	4.24	480	880
	660.566	●	●	●	2.00	1.10	1.25	1.77	2.50	3.06	**3.95**	5.59	490	900
	660.606	●	●	●	2.20	1.20	1.57	2.23	3.15	3.86	**4.98**	7.04	500	910
	660.646	●	●	●	2.50	1.30	2.00	2.83	4.00	4.90	**6.33**	8.95	510	930
	660.676	●	●	●	2.70	1.40	2.37	3.36	4.75	5.82	**7.51**	10.62	510	950
	660.726	●	●	●	3.00	1.70	3.15	4.45	6.30	7.71	**9.96**	14.09	520	980
	660.806		●	●	4.00	2.40	5.00	7.07	10.00	12.25	**15.81**	22.36	530	1,030
120°	**660.187**	●		●	0.35	0.20	–	0.06*	0.08	0.10	**0.13**	0.18	630	1,060
	660.217	●		●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.25	650	1,080
	660.247	●		●	0.50	0.30	–	0.12*	0.16	0.20	**0.26**	0.37	660	1,100
	660.277	●		●	0.60	0.30	–	0.16*	0.22	0.27	**0.35**	0.49	670	1,150
	660.307	●		●	0.70	0.30	0.16*	0.23*	0.32	0.40	**0.51**	0.72	710	1,240
	660.337	●	●	●	0.90	0.40	0.22*	0.32*	0.45	0.55	**0.71**	1.00	740	1,350
	660.367	●	●	●	1.00	0.40	0.32*	0.45*	0.63	0.77	**1.00**	1.41	800	1,430
	660.407	●	●	●	1.20	0.60	0.50*	0.71	1.00	1.22	**1.58**	2.23	830	1,480
	660.447	●	●	●	1.35	0.60	0.63*	0.88	1.25	1.53	**1.98**	2.80	840	1,520
	660.487	●	●	●	1.50	0.60	0.80*	1.13	1.60	1.96	**2.53**	3.58	850	1,540
	660.517	●	●	●	1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	4.24	850	1,560
	660.567	●	●	●	2.00	0.90	1.25	1.77	2.50	3.06	**3.95**	5.59	870	1,590
	660.607	●	●	●	2.20	1.10	1.57	2.23	3.15	3.86	**4.98**	7.04	870	1,620
	660.647	●	●	●	2.50	1.30	2.00	2.83	4.00	4.90	**6.33**	8.95	880	1,640
	660.727	●	●	●	3.00	1.60	3.15	4.45	6.30	7.71	**9.96**	14.09	890	1,680
	660.807	●		●	4.00	2.00	5.00	7.07	10.00	12.25	**15.81**	22.36	900	1,710

* Differing spray pattern.

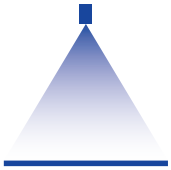
[1] We reserve the right to supply material 316Ti or 316L under material no. 17.

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

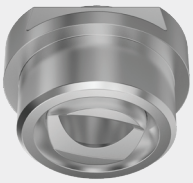
Ordering example:	Type	+	Material no.	=	Ordering no.
	660.484	+	16	=	660.484.16

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

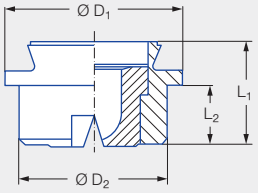
Low pressure flat fan nozzles with dovetail guide
Series 664/665



Features:
- Uniform, parabolic liquid distribution
- Stable spray angle
- Spray automatically aligned approx. 15° to the longitudinal axis of the pipe via dovetail guide
- Assembly with retaining nut
- Non-clogging
- High spray energy



Series 664/665



Applications:
- Cleaning installations
- Spray pipes
- Roll cooling
- Cooling pipes
- Cooling of rolled stock

Code	Dimensions [mm]				Weight [g]
	L_1	L_2	Ø D_1	Ø D_2	
Assembly with retaining nut 3/4 BSPP and dovetail guide	14.0	8.0	24.0	20.0	35.0

Spray angle	Ordering no. Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass	Equivalent bore diameter A [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	Spray width B [mm] (at p = 5 bar) H = 250 [mm]	H = 500 [mm]
20°	**664.721**	●	●	●	3.00	2.50	3.15	4.45	6.30	7.71	**9.96**	14.09	100	180
	664.801	●	●	●	4.00	3.20	5.00	7.07	10.00	12.25	**15.81**	22.36	100	180
	664.881	●	●	●	5.00	4.00	8.00	11.31	16.00	19.60	**25.30**	35.78	100	180
	664.921	●	●	●	5.50	4.40	10.00	14.14	20.00	24.49	**31.62**	44.72	100	180
	664.961	●	●	●	6.00	5.10	12.50	17.68	25.00	30.62	**39.53**	55.90	100	180
30°	**664.722**	●	●	●	3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	14.09	140	260
	664.762	●	●	●	3.50	2.70	4.00	5.66	8.00	9.80	**12.65**	17.89	140	260
	664.802	●	●	●	4.00	3.10	5.00	7.07	10.00	12.25	**15.81**	22.36	140	260
	664.882	●	●	●	5.00	4.00	8.00	11.31	16.00	19.60	**25.30**	35.78	140	270
	664.922	●	●	●	5.50	4.40	10.00	14.14	20.00	24.49	**31.62**	44.72	140	270
	664.962	●	●	●	6.00	5.00	12.50	17.68	25.00	30.62	**39.53**	55.90	140	270
	665.042	●		●	8.00	6.40	20.00	28.29	40.00	48.99	**63.25**	89.45	140	270
	665.122			●	10.00	8.20	31.50	44.55	63.00	77.16	**99.61**	140.87	140	270

Spray angle	Ordering no.				Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]						Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 17[1] Stainless steel 316Ti/ Stainless steel 316L	Mat. no. 30 Brass			p [bar] 0.5	1.0	2.0	3.0	**5.0**	10.0	H = 250 [mm]	H = 500 [mm]
45°	**664.723**	●	●	●	3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	14.09	220	420
	664.763	●	●	●	3.50	2.60	4.00	5.66	8.00	9.80	**12.65**	17.89	220	420
	664.803	●	●	●	4.00	3.00	5.00	7.07	10.00	12.25	**15.81**	22.36	220	420
	664.843	●	●	●	4.50	3.40	6.25	8.84	12.50	15.31	**19.76**	27.94	220	420
	664.883	●	●	●	5.00	3.80	8.00	11.31	16.00	19.60	**25.30**	35.78	220	420
	664.923	●	●	●	5.50	4.20	10.00	14.14	20.00	24.49	**31.62**	44.72	220	430
	664.963	●	●	●	6.00	4.40	12.50	17.68	25.00	30.62	**39.53**	55.90	220	430
	665.043			●	8.00	5.90	20.00	28.29	40.00	48.99	**63.25**	89.45	220	430
60°	**664.724**	●	●	●	3.00	2.10	3.15	4.45	6.30	7.71	**9.96**	14.09	280	560
	664.764	●	●	●	3.50	2.30	4.00	5.66	8.00	9.80	**12.65**	17.89	280	570
	664.804	●	●	●	4.00	2.60	5.00	7.07	10.00	12.25	**15.81**	22.36	290	580
	664.844	●	●	●	4.50	3.00	6.25	8.84	12.50	15.31	**19.76**	27.94	290	580
	664.884	●	●	●	5.00	3.40	8.00	11.31	16.00	19.60	**25.30**	35.78	290	580
	664.924	●	●	●	5.50	4.10	10.00	14.14	20.00	24.49	**31.62**	44.72	290	580
	664.964	●	●	●	6.00	4.20	12.50	17.68	25.00	30.62	**39.53**	55.90	290	580
	665.044	●	●	●	8.00	5.50	20.00	28.29	40.00	48.99	**63.25**	89.45	290	580
	665.084		●	●	9.00	6.20	25.00	35.36	50.00	61.24	**79.06**	111.81	290	580
	665.124			●	10.00	7.40	31.50	44.55	63.00	77.16	**99.61**	140.87	290	580
90°	**664.726**	●	●	●	3.00	1.70	3.15	4.45	6.30	7.71	**9.96**	14.09	520	980
	664.766	●	●	●	3.50	1.90	4.00	5.66	8.00	9.80	**12.65**	17.89	530	1,000
	664.806	●	●	●	4.00	2.40	5.00	7.07	10.00	12.25	**15.81**	22.36	530	1,030
	664.846	●	●	●	4.50	2.40	6.25	8.84	12.50	15.31	**19.76**	27.94	540	1,050
	664.886	●	●	●	5.00	3.10	8.00	11.31	16.00	19.60	**25.30**	35.78	540	1,060
	664.926	●	●	●	5.50	3.60	10.00	14.14	20.00	24.49	**31.62**	44.72	540	1,070
	664.966	●	●	●	6.00	3.90	12.50	17.68	25.00	30.62	**39.53**	55.90	540	1,070
	665.046			●	8.00	4.90	20.00	28.29	40.00	48.99	**63.25**	89.45	540	1,070
	665.126			●	10.00	6.40	31.50	44.55	63.00	77.16	**99.61**	140.87	540	1,070
120°	**664.727**	●	●	●	3.00	1.60	3.15	4.45	6.30	7.71	**9.96**	14.09	890	1,680
	664.767	●	●	●	3.50	1.70	4.00	5.66	8.00	9.80	**12.65**	17.89	900	1,700
	664.807	●	●	●	4.00	2.00	5.00	7.07	10.00	12.25	**15.81**	22.36	900	1,710
	664.887	●	●	●	5.00	2.60	8.00	11.31	16.00	19.60	**25.30**	35.78	910	1,710
	664.927	●	●	●	5.50	2.90	10.00	14.14	20.00	24.49	**31.62**	44.72	910	1,710
	664.967			●	6.00	3.20	12.50	17.68	25.00	30.62	**39.53**	55.90	910	1,710
	665.047			●	8.00	4.40	20.00	28.29	40.00	48.99	**63.25**	89.45	910	1,710

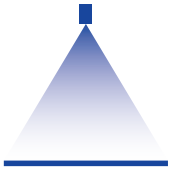
[1] We reserve the right to supply material 316Ti or 316L under material no. 17.

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

Ordering example:	Type 664.723	+	Material no. 16	=	Ordering no. 664.723.16

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

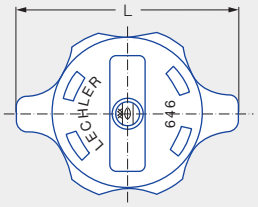
Low pressure flat fan nozzles
Series 646

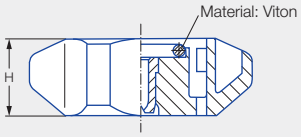


Features:
- Uniform, parabolic liquid distribution
- Adjusted spray direction
- Simple, fast manual assembly due to bayonet quick-release system

Applications:
- Belt cleaning
- Surface treatment
- Spray cleaning
- Coating processes

Series 646





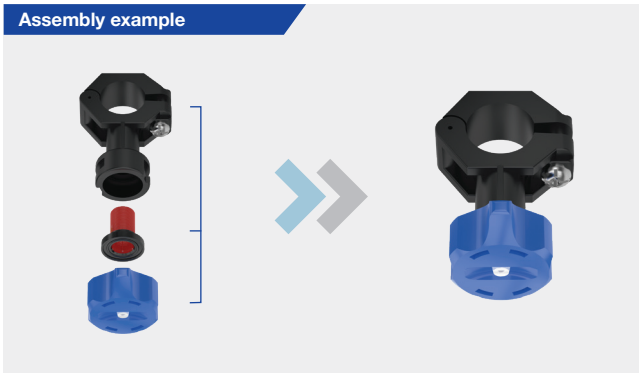
Dimensions [mm]		Weight [g]
H	L	
15.0	44.0	12.0

Spray angle	Ordering no. Type	Mat. no. 5E PVDF	Equivalent bore diameter A [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	Spray width B [mm] (at p = 5 bar) H = 250 [mm]	H = 500 [mm]
20°	**646.301**	●	0.70	0.60	0.16*	0.23*	0.32	0.39	**0.51**	0.72	85	160
	646.361	●	1.00	0.80	0.31*	0.44*	0.63	0.77	**1.00**	1.41	85	160
	646.441	●	1.35	1.10	0.63*	0.88	1.25	1.53	**1.98**	2.80	85	160
	646.481	●	1.50	1.20	0.80*	1.13	1.60	1.96	**2.53**	3.58	85	160
30°	**646.302**	●	0.70	0.50	0.16*	0.23*	0.32	0.39	**0.51**	0.72	120	220
	646.362	●	1.00	0.70	0.31*	0.44*	0.63	0.77	**1.00**	1.40	120	220
	646.402	●	1.20	0.90	0.50*	0.71	1.00	1.22	**1.58**	2.24	120	230
	646.482	●	1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	3.58	130	230
	646.562	●	2.00	1.50	1.25	1.77	2.50	3.06	**3.95**	5.59	130	240
45°	**646.363**	●	1.00	0.60	0.31*	0.44*	0.63	0.77	**1.00**	1.40	190	350
	646.403	●	1.20	0.90	0.50*	0.71	1.00	1.23	**1.58**	2.24	200	370
	646.483	●	1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	3.58	200	390
	646.563	●	2.00	1.40	1.20	1.77	2.50	3.06	**3.95**	5.59	210	410
	646.643	●	2.50	1.80	2.00	2.83	4.00	4.90	**6.32**	8.94	210	410
60°	**646.304**	●	0.70	0.40	0.16*	0.23*	0.32	0.39	**0.51**	0.72	260	480
	646.334	●	0.90	0.50	0.23*	0.32*	0.45	0.55	**0.71**	1.01	260	490
	646.364	●	1.00	0.60	0.32*	0.45*	0.63	0.77	**1.00**	1.41	260	500
	646.404	●	1.20	0.80	0.50*	0.71	1.00	1.22	**1.58**	2.24	260	510
	646.444	●	1.35	0.90	0.63*	0.88	1.25	1.53	**1.98**	2.80	260	510
	646.484	●	1.50	1.00	0.80*	1.13	1.60	1.96	**2.53**	3.58	260	520
	646.514	●	1.65	1.10	0.95*	1.34	1.90	2.33	**3.00**	4.25	270	520
	646.564	●	2.00	1.30	1.25	1.77	2.50	3.06	**3.95**	5.59	270	530
	646.604	●	2.20	1.50	1.58	2.23	3.15	3.86	**4.98**	7.04	270	540

Spray angle	Ordering no.		Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]						Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 5E			p [bar]							
		PVDF			0.5	1.0	2.0	3.0	**5.0**	10.0	H = 250 [mm]	H = 500 [mm]
90°	**646.306**	●	0.70	0.40	0.16*	0.23*	0.32	0.39	**0.51**	0.72	440	800
	646.336	●	0.90	0.50	0.23*	0.32*	0.45	0.55	**0.71**	1.01	440	820
	646.366	●	1.00	0.50	0.32*	0.45*	0.63	0.77	**1.00**	1.41	450	830
	646.406	●	1.20	0.70	0.50*	0.71	1.00	1.22	**1.58**	2.24	450	840
	646.446	●	1.35	0.80	0.63*	0.88	1.25	1.53	**1.98**	2.80	460	860
	646.486	●	1.50	0.80	0.80*	1.13	1.60	1.96	**2.53**	3.58	470	870
	646.516	●	1.65	0.90	0.95*	1.34	1.90	2.33	**3.00**	4.25	480	880
	646.566	●	2.00	1.10	1.25	1.77	2.50	3.06	**3.95**	5.59	490	900
	646.606	●	2.20	1.20	1.58	2.23	3.15	3.86	**4.98**	7.04	500	910
120°	**646.307**	●	0.70	0.30	0.16*	0.23*	0.32	0.39	**0.51**	0.72	710	1,240
	646.337	●	0.90	0.40	0.23*	0.32*	0.45	0.55	**0.71**	1.01	740	1,310
	646.367	●	1.00	0.50	0.32*	0.45*	0.63	0.77	**1.00**	1.41	800	1,350
	646.407	●	1.20	0.60	0.50*	0.71	1.00	1.22	**1.58**	2.24	830	1,390
	646.447	●	1.35	0.60	0.63*	0.88	1.25	1.53	**1.98**	2.80	840	1,410
	646.487	●	1.50	0.60	0.80*	1.13	1.60	1.96	**2.53**	3.58	850	1,420
	646.517	●	1.65	0.90	0.95*	1.34	1.90	2.33	**3.00**	4.25	850	1,430
	646.567	●	2.00	0.90	1.25	1.77	2.50	3.06	**3.95**	5.59	870	1,440
	646.607	●	2.20	1.10	1.58	2.23	3.15	3.86	**4.98**	7.04	870	1,450

* Differing spray pattern.

Assembly example



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

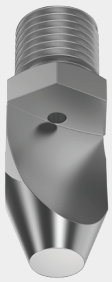
Ordering example:	Type 646.306	+	Material no. 5E	=	Ordering no. 646.306*

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

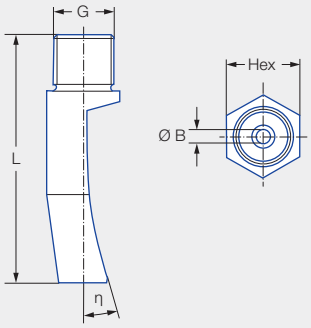
Low pressure tongue-type nozzles
Series 688/689

Features:
- Narrowly delimited, powerful flat fan spray
- Non-clogging

Applications:
- Cleaning processes
- Washing processes
- Degreasing installations
- Phosphating installations
- Preparation techniques



Series 688/689



Type	Code	G	Dimensions [mm]		Weight [g]
			L	Hex	
688.763	**CE**	3/8 BSPT	43.0	19	114.0 (Stainless steel 303)
688.843	**CE**	3/8 BSPT	50.0	19	133.0 (Stainless steel 303)
688.923	**CE**	3/8 BSPT	59.0	22	247.0 (Stainless steel 303)
689.003	**90**	3/4 BSPP	80.0	32/24	306.0/33.0 (Stainless steel 303/PVDF)

Spray angle	η	Ordering no.					Bore diameter B [mm]	V̇ water [l/min]				Spray width B [mm] (at p = 2 bar)	
		Type	Mat. no. 16 Stainless steel 303	Mat. no. 5E PVDF	Code 3/8 BSPT	Code 3/4 BSPP		p [bar] 0.5	p [bar] 1.0	p [bar] **2.0**	p [bar] 5.0	H = 250 [mm]	H = 500 [mm]
45°	35°	**688.763**	●		**CE**		3.00	4.00	5.66	**8.00**	12.65	220	420
	30°	**688.843**	●		**CE**		3.80	6.25	8.84	**12.50**	19.76	220	420
	29°	**688.923**	●		**CE**		4.80	10.00	14.14	**20.00**	31.62	220	430
	35°	**689.003**	●	●		**90**	6.00	15.75	22.27	**31.50**	49.81	220	430

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

Ordering example:	Type 688.763	+	Material no. 16	+	Code CE	=	Ordering no. 688.763.16.CE

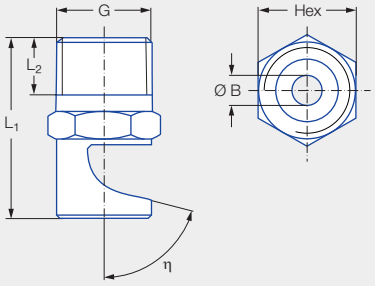
Assembly accessories can be found in Chapter 9 “Accessories”.

Low pressure tongue-type nozzles
Series 686

Features:
- Sharply delimited, powerful flat fan spray
- Large spray angle
- Non-clogging

Applications:
- Foam control
- Cleaning processes
- Washing processes

Series 686



Type	BSPP BSPT	Code	Dimensions [mm]			Weight [g] Brass
			L_1	L_2	Hex	
686.366	1/8	**CA**	23.0	6.5	11	13.0
686.406	1/8	**CA**	23.0	6.5	11	13.0
686.686	1/4	**CC**	29.5	9.7	14	23.0
686.726	1/8	**CA**	25.0	6.5	11	13.0
686.806	1/4	**CC**	33.0	9.7	14	24.0
686.886	1/4	**CC**	35.0	9.7	17	30.0
686.926	3/8	**CE**	38.5	10.1	17	32.0
686.368	1/8	**CA**	20.0	6.5	11	13.0
686.408	1/8	**CA**	23.0	6.5	11	13.0
686.448	1/4	**CC**	24.0	9.7	14	21.0
686.488	1/8	**CA**	23.0	6.5	11	13.0
686.488	1/4	**CC**	24.0	9.7	14	21.0
686.528	1/8	**CA**	23.0	6.5	11	13.0
686.528	1/4	**CC**	24.0	9.7	14	21.0
686.568	1/8	**CA**	23.0	6.5	11	13.0
686.568	1/4	**CC**	24.0	9.7	14	21.0
686.608	1/8	**CA**	23.0	6.5	11	13.0
686.608	1/4	**CC**	24.0	9.7	14	21.0
686.648	1/4	**CC**	24.0	9.7	14	21.0
686.688	1/8	**CA**	23.0	6.5	11	13.0
686.688	1/4	**CC**	27.0	9.7	14	22.0
686.728	1/8	**CA**	23.0	6.5	11	13.0
686.728	1/4	**CC**	27.0	9.7	14	22.0
686.768	1/4	**CC**	27.0	9.7	14	22.0
686.808	1/8	**CA**	23.0	6.5	11	13.0
686.808	1/4	**CC**	27.0	9.7	14	22.0
686.828	1/4	**CC**	27.0	9.7	14	22.0
686.848	1/4	**CC**	27.0	9.7	14	22.0
686.868	1/4	**CC**	28.0	9.7	14	23.0
686.888	1/4	**CC**	28.0	9.7	14	23.0
686.908	1/4	**CC**	28.0	9.7	14	23.0
686.928	3/8	**CE**	30.0	10.1	17	32.0
686.968	1/2	**CG**	37.0	13.2	22	60.0
686.988	3/8	**CE**	32.0	10.1	17	32.0
686.988	1/2	**CG**	37.0	13.2	22	60.0

Also suitable for air or saturated steam (see Page 172).

Spray angle	η	Ordering no.								Bore diameter B [mm]	V̇ water [l/min]			Spray width B [mm] (at p = 2 bar)
		Type	Mat. no.			Code					p [bar]			
			16	30	5E									
			Stainless steel 303	Brass	PVDF	1/8 BSPT	1/4 BSPT	3/8 BSPT	1/2 BSPT		1.0	**2.0**	5.0	H = 250 [mm]
90°	75°	**686.366**		●		**CA**				0.80	0.45	**0.63**	1.00	450
		686.406	●	●		**CA**				1.00	0.71	**1.00**	1.58	450
	40°	**686.686**	●	●			**CC**			2.40	3.54	**5.00**	7.91	510
		686.726		●		**CA**				2.70	4.45	**6.30**	9.96	530
		686.806	●	●			**CC**			3.40	7.07	**10.00**	15.81	540
		686.886	●				**CC**			4.20	11.31	**16.00**	25.30	540
		686.926	●					**CE**		4.70	14.14	**20.00**	31.62	540
140°	75°	**686.368**	●	●		**CA**				0.80	0.45	**0.63**	1.00	1,250
		686.408	●	●		**CA**				1.00	0.71	**1.00**	1.58	1,260
		686.448	●	●			**CC**			1.20	0.88	**1.25**	1.98	1,260
		686.488	●	●		**CA**	**CC**			1.30	1.13	**1.60**	2.53	1,270
		686.528	●	●		**CA**	**CC**			1.50	1.41	**2.00**	3.16	1,280
		686.568	●	●	●[1]	**CA**	**CC**			1.70	1.77	**2.50**	3.95	1,290
		686.608	●	●		**CA**	**CC**			1.90	2.23	**3.15**	4.98	1,300
		686.648	●	●			**CC**			2.20	2.83	**4.00**	6.32	1,320
		686.688	●	●		**CA**	**CC**			2.40	3.54	**5.00**	7.91	1,330
		686.728	●	●		**CA**	**CC**			2.70	4.45	**6.30**	9.96	1,340
		686.768	●	●			**CC**			3.00	5.66	**8.00**	12.65	1,350
		686.808	●	●		**CA**	**CC**			3.40	7.07	**10.00**	15.81	1,360
		686.828	●	●			**CC**			3.60	7.92	**11.20**	17.71	1,360
		686.848	●	●			**CC**			3.80	8.84	**12.50**	19.76	1,360
		686.868	●	●			**CC**			4.00	9.90	**14.00**	22.14	1,360
		686.888	●	●			**CC**			4.20	11.31	**16.00**	25.30	1,360
		686.908	●	●			**CC**			4.50	12.73	**18.00**	28.46	1,360
		686.928	●					**CE**		4.70	14.14	**20.00**	31.62	1,360
		686.968		●					**CG**	5.30	17.68	**25.00**	39.53	1,360
		686.988	●					**CE**	**CG**	5.60	19.80	**28.00**	44.27	1,360

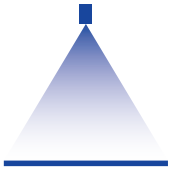
[1] Only available with code CA.

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

Ordering example:	Type 686.366	+	Material no. 30	+	Code CA	=	Ordering no. 686.366.30.CA

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

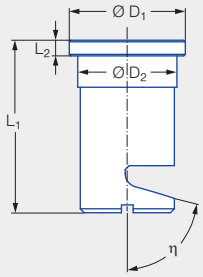
Low pressure tongue-type nozzles
Series 684



Features:
- Sharply delimited, powerful flat fan spray
- Large spray angle
- Assembly with retaining nut
- Non-clogging

Applications:
- Foam control
- Cleaning processes
- Washing processes

Series 684

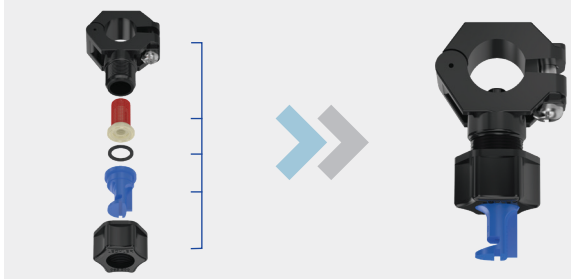


G	Dimensions [mm]			Weight [g]
	L_2	Ø D_1	Ø D_2	
Assembly with retaining nut 3/8 BSPP	2.00	14.80	12.65	3.00

Spray angle	η	Ordering no. Type	Mat. no. 56 POM	Mat. no. 5E PVDF	Color[1]	Bore diameter B [mm]	L_1 [mm]	V̇ water [l/min] p [bar] 1.0	2.0	5.0	Spray width B [mm] (at p = 2 bar) H = 250 [mm]
140°	75°	684.348	●		Green	0.70	20.00	0.35*	**0.50**	0.79	1,240
		684.368	●	●	Yellow	0.80	20.00	0.45*	**0.63**	1.00	1,250
		684.408	●		Blue	1.00	20.00	0.71	**1.00**	1.58	1,260
		684.448	●		Red	1.20	20.00	0.88	**1.25**	1.98	1,260
		684.488	●	●	Brown	1.30	20.00	1.13	**1.60**	2.53	1,270
		684.528	●		Grey	1.50	20.00	1.41	**2.00**	3.16	1,280
		684.568	●	●	White	1.70	19.00	1.77	**2.50**	3.95	1,290
		684.608	●		Light blue	1.90	19.00	2.23	**3.15**	4.98	1,300
		684.688	●		Green	2.40	17.00	3.54	**5.00**	7.91	1,330
		684.728	●	●	Black	2.70	17.00	4.45	**6.30**	9.96	1,340
		684.808	●		Beige	3.40	16.00	7.07	**10.00**	15.81	1,340

* Differing spray pattern.
[1] PVDF material is always blue.

Assembly example

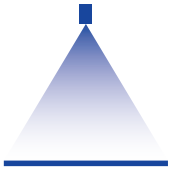


Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type 684.348	+	Material no. 56	=	Ordering no. 684.348.56

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

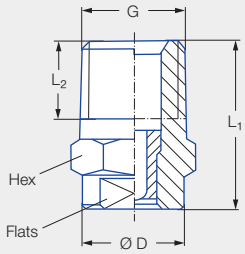
High pressure flat fan nozzles
Series 602



Features:
- Sharp, uniform flat fan spray
- Extremely narrow spray depth
- Housing: Stainless steel 303, Insert: Hardened stainless steel 420F

Applications:
- High pressure cleaning

Series 602



G	Dimensions [mm]					Weight [g]	p_{max} [1] [bar]
	L_1	L_2	Ø D	Hex	Flats		
1/4 BSPT	22.0	10.0	13.0	14	10	18.0	approx. 700
1/4 NPT	22.0	10.2	13.0	14	10	18.0	approx. 700

[1] Applies only to operation at constant pressure.

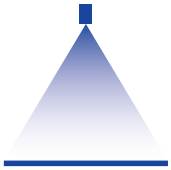
US gal/min at 40 psi	Ordering no.								Equivalent bore diameter A [mm]	V̇ water [l/min]						
	Series	Flow rate code				Mat. no.	Code			p [bar]						
		Spray angle				A3										
		20°	30°	45°	60°	Stainless steel 303/420F	1/4 BSPT	1/4 NPT		40	60	**80**	100	120	150	200
02	602	361	362	363	364	●	00	07	1.00	2.88	3.53	**4.08**	4.56	5.00	5.58	6.45
021	602	371	372	373	374	●	00	07	1.02	3.03	3.71	**4.28**	4.79	5.25	5.87	6.77
025	602	381	382	383	384	●	00	07	1.10	3.60	4.42	**5.10**	5.70	6.24	6.98	8.06
028	602	391	392	393	394	●	00	07	1.16	4.04	4.94	**5.71**	6.38	6.99	7.81	9.02
03	602	401	402	403	404	●	00	07	1.18	4.32	5.29	**6.11**	6.83	7.48	8.37	9.66
034	602	411	412	413	414	●	00	07	1.30	4.90	6.00	**6.93**	7.75	8.49	9.49	10.96
038	602	441	442	443		●	00	07	1.33	5.48	6.72	**7.75**	8.67	9.50	10.62	12.26
04	602	451	452	453	454	●	00	07	1.35	5.77	7.06	**8.16**	9.12	9.99	11.17	12.90
043	602	461	462			●	00	07	1.38	6.20	7.59	**8.77**	9.80	10.74	12.00	13.86
045	602	471	472	473	474	●	00	07	1.40	6.49	7.95	**9.18**	10.26	11.24	12.57	14.51
05	602	481	482	483	484	●	00	07	1.55	7.21	8.83	**10.20**	11.40	12.49	13.96	16.12
055	602	501	502	503	504	●	00	07	1.60	7.93	9.71	**11.22**	12.54	13.74	15.36	17.73
06	602	521	522	523	524	●	00	07	1.72	8.65	10.60	**12.24**	13.68	14.99	16.75	19.35
065	602	531	532	533	534	●	00	07	1.75	9.37	11.48	**13.26**	14.82	16.23	18.15	20.96
07	602	541	542	543	544	●	00	07	1.80	10.09	12.36	**14.28**	15.96	17.48	19.55	22.57
075	602	551	552	553	554	●	00	07	1.90	10.81	13.25	**15.29**	17.10	18.73	20.94	24.18
08	602	571	572	573	574	●	00	07	2.05	11.54	14.13	**16.31**	18.24	19.98	22.34	25.80
087	602	581	582	583	584	●	00	07	2.06	12.54	15.36	**17.74**	19.83	21.72	24.29	28.04
09	602	591	592	593	594	●	00	07	2.10	12.98	15.89	**18.35**	20.52	22.48	25.13	29.02
10	602	601	602	603	604	●	00	07	2.30	14.41	17.65	**20.38**	22.79	24.97	27.91	32.23
11	602	621	622	623	624	●	00	07	2.40	15.86	19.42	**22.42**	25.07	27.46	30.70	35.45
125	602	641	642	643	644	●	00	07	2.50	18.02	22.07	**25.48**	28.49	31.21	34.89	40.29
131	602	651	652	653	654	●	00	07	2.55	18.89	23.13	**26.71**	29.86	32.71	36.57	42.23
139	602	661	662	663	664	●	00	07	2.65	20.04	24.54	**28.34**	31.68	34.70	38.80	44.80
15	602	671	672	673	674	●	00	07	2.70	21.62	26.48	**30.58**	34.19	37.45	41.87	48.35
175	602	701	702	703	704	●	00	07	3.00	25.23	30.90	**35.68**	39.89	43.70	48.86	56.41
20	602			723	724	●	00	07	3.05	28.83	35.31	**40.78**	45.59	49.94	55.84	64.47
25	602			763	764	●	00	07	3.50	36.04	44.14	**50.97**	56.99	62.43	69.80	80.60
30	602			793		●	00	07	3.90	43.25	52.97	**61.16**	68.38	74.91	83.75	96.70

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

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

Ordering example:	Series	+ Flow rate code	+ Material no.	+ Code	= Ordering no.
	602	+ 361	+ A3	+ 00	= 602.361.A3.00

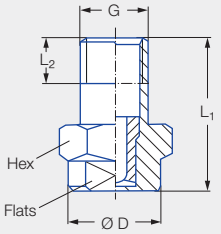
High pressure flat fan nozzles
Series 608



Features:
- Sharp, uniform flat fan spray
- Extremely narrow spray depth
- Housing: Stainless steel 303, Insert: Hardened stainless steel 420F

Applications:
- High pressure cleaning

Series 608



G	Dimensions [mm]					Weight [g]	p_{max} [1] [bar]
	L_1	L_2	Ø D	Hex	Flats		
1/8 BSPT	22.0	6.5	13.0	14	10	13.0	approx. 700
1/8 NPT	22.0	6.7	13.0	14	10	13.0	approx. 700

[1] Applies only to operation at constant pressure.

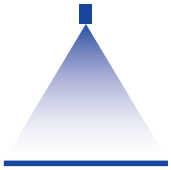
US gal/min at 40 psi	Ordering no.								Equivalent bore diameter A [mm]	V̇ water [l/min]						
	Series	Flow rate code				Mat. no.	Code			p [bar]						
		Spray angle				A3										
		20°	30°	45°	60°	Stainless steel 303/420F	1/8 BSPT	1/8 NPT		40	60	80	100	120	150	200
02	608	361	362	363	364	●	00	07	1.00	2.88	3.53	**4.08**	4.56	5.00	5.58	6.45
021	608	371	372	373	374	●	00	07	1.02	3.03	3.71	**4.28**	4.79	5.25	5.87	6.77
025	608	381	382	383	384	●	00	07	1.10	3.60	4.42	**5.10**	5.70	6.24	6.98	8.06
028	608	391	392	393	394	●	00	07	1.16	4.04	4.94	**5.71**	6.38	6.99	7.81	9.02
03	608	401	402	403	404	●	00	07	1.18	4.32	5.29	**6.11**	6.83	7.48	8.37	9.66
034	608	411	412	413	414	●	00	07	1.30	4.90	6.00	**6.93**	7.75	8.49	9.49	10.96
038	608	441	442	443		●	00	07	1.33	5.48	6.72	**7.75**	8.67	9.50	10.62	12.26
04	608	451	452	453	454	●	00	07	1.35	5.77	7.06	**8.16**	9.12	9.99	11.17	12.90
043	608	461	462			●	00	07	1.38	6.20	7.59	**8.77**	9.80	10.74	12.00	13.86
045	608	471	472	473	474	●	00	07	1.40	6.49	7.95	**9.18**	10.26	11.24	12.57	14.51
05	608	481	482	483	484	●	00	07	1.55	7.21	8.83	**10.20**	11.40	12.49	13.96	16.12
055	608	501	502	503	504	●	00	07	1.60	7.93	9.71	**11.22**	12.54	13.74	15.36	17.73
06	608	521	522	523	524	●	00	07	1.72	8.65	10.60	**12.24**	13.68	14.99	16.75	19.35
065	608	531	532	533	534	●	00	07	1.75	9.37	11.48	**13.26**	14.82	16.23	18.15	20.96
07	608	541	542	543	544	●	00	07	1.80	10.09	12.36	**14.28**	15.96	17.48	19.55	22.57
075	608	551	552	553	554	●	00	07	1.90	10.81	13.25	**15.29**	17.10	18.73	20.94	24.18
08	608	571	572	573	574	●	00	07	2.05	11.54	14.13	**16.31**	18.24	19.98	22.34	25.80
087	608	581	582	583	584	●	00	07	2.06	12.54	15.36	**17.74**	19.83	21.72	24.29	28.04
09	608	591	592	593	594	●	00	07	2.10	12.98	15.89	**18.35**	20.52	22.48	25.13	29.02
10	608	601	602	603	604	●	00	07	2.30	14.41	17.65	**20.38**	22.79	24.97	27.91	32.23

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

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

Ordering example:	Series	+ Flow rate code	+ Material no.	+ Code	= Ordering no.
	608	+ 361	+ A3	+ 00	= 608.361.A3.00

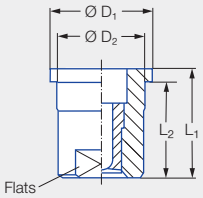
High pressure flat fan nozzles
Series 652



Features:
- Sharp, uniform flat fan spray
- Extremely narrow spray depth
- Assembly with retaining nut
- Housing: Stainless steel 303, Insert: Hardened stainless steel 420F

Applications:
- High pressure cleaning

Series 652



G	Dimensions [mm]					Weight [g]	p_{max} [1] [bar]
	L_1	L_2	Ø D_1	Ø D_2	Flats		
Assembly with retaining nut 3/8 BSPP	16.00	14.00	14.80	12.65	10	13.00	approx. 300

[1] Applies only to operation at constant pressure.

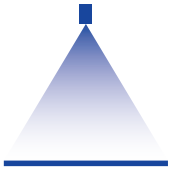
US gal/min at 40 psi	Ordering no.							Equivalent bore diameter A [mm]	V̇ water [l/min]						
	Series	Flow rate code				Mat. no.	Code		p [bar]						
		Spray angle				A3									
		20°	30°	45°	60°	Stainless steel 303/420F	For retaining nut		40	60	80	100	120	150	200
02	652	361	362	363	364	●	29	1.00	2.88	3.53	**4.08**	4.56	5.00	5.58	6.45
021	652	371	372	373	374	●	29	1.02	3.03	3.71	**4.28**	4.79	5.25	5.87	6.77
025	652	381	382	383	384	●	29	1.10	3.60	4.42	**5.10**	5.70	6.24	6.98	8.06
028	652	391	392	393	394	●	29	1.16	4.04	4.94	**5.71**	6.38	6.99	7.81	9.02
03	652	401	402	403	404	●	29	1.18	4.32	5.29	**6.11**	6.83	7.48	8.37	9.66
034	652	411	412	413	414	●	29	1.30	4.90	6.00	**6.93**	7.75	8.49	9.49	10.96
038	652	441	442	443		●	29	1.33	5.48	6.72	**7.75**	8.67	9.50	10.62	12.26
04	652	451	452	453	454	●	29	1.35	5.77	7.06	**8.16**	9.12	9.99	11.17	12.90
043	652	461	462			●	29	1.38	6.20	7.59	**8.77**	9.80	10.74	12.00	13.86
045	652	471	472	473	474	●	29	1.40	6.49	7.95	**9.18**	10.26	11.24	12.57	14.51
05	652	481	482	483	484	●	29	1.55	7.21	8.83	**10.20**	11.40	12.49	13.96	16.12
055	652	501	502	503	504	●	29	1.60	7.93	9.71	**11.22**	12.54	13.74	15.36	17.73
06	652	521	522	523	524	●	29	1.72	8.65	10.60	**12.24**	13.68	14.99	16.75	19.35
065	652	531	532	533	534	●	29	1.75	9.37	11.48	**13.26**	14.82	16.23	18.15	20.96
07	652	541	542	543	544	●	29	1.80	10.09	12.36	**14.28**	15.96	17.48	19.55	22.57
075	652	551	552	553	554	●	29	1.90	10.81	13.25	**15.29**	17.10	18.73	20.94	24.18
08	652	571	572	573	574	●	29	2.05	11.54	14.13	**16.31**	18.24	19.98	22.34	25.80
087	652	581	582	583	584	●	29	2.06	12.54	15.36	**17.74**	19.83	21.72	24.29	28.04
09	652	591	592	593	594	●	29	2.10	12.98	15.89	**18.35**	20.52	22.48	25.13	29.02
10	652	601	602	603	604	●	29	2.30	14.41	17.65	**20.38**	22.79	24.97	27.91	32.23
11	652	621	622	623	624	●	29	2.40	15.86	19.42	**22.42**	25.07	27.46	30.70	35.45
125	652	641	642	643	644	●	29	2.50	18.02	22.07	**25.48**	28.49	31.21	34.89	40.29
131	652	651	652	653	654	●	29	2.55	18.89	23.13	**26.71**	29.86	32.71	36.57	42.23
139	652	661	662	663	664	●	29	2.65	20.04	24.54	**28.34**	31.68	34.70	38.80	44.80
15	652	671	672	673	674	●	29	2.70	21.62	26.48	**30.58**	34.19	37.45	41.87	48.35
175	652	701	702	703	704	●	29	3.00	25.23	30.90	**35.68**	39.89	43.70	48.86	56.41
20	652			723	724	●	29	3.05	28.83	35.31	**40.78**	45.59	49.94	55.84	64.47
25	652			763	764	●	29	3.50	36.04	44.14	**50.97**	56.99	62.43	69.80	80.60
30	652			793		●	29	3.90	43.25	52.97	**61.16**	68.38	74.91	83.75	96.70

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

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

Ordering example:	Series	+ Flow rate code	+ Material no.	+ Code	= Ordering no.
	652	+ 361	+ A3	+ 29	= 652.361.A3.29

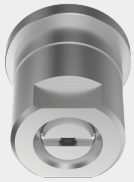
High pressure flat fan nozzles
Series 6FH with spray stabiliser



Features:
- Sharp, uniform flat fan spray
- Extremely narrow spray depth
- Nozzle with spray stabilizer
- Housing: Stainless steel 303, Insert: Hardened stainless steel 420F, spray stabiliser: Stainless steel 301

Applications:
- High pressure cleaning

Series 6FH



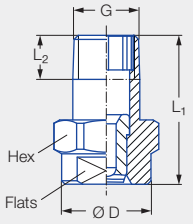


Figure 1

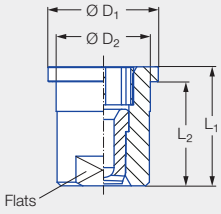


Figure 2

Code	Figure	G	Dimensions [mm]							Weight [g]	p_{max} [1] [bar]
			L_1	L_2	Ø D	Ø D_1	Ø D_2	Hex	Flats		
CA	1	1/8 BSPT	22.00	6.50	13.00	–	–	14	10	13.00	approx. 700
BA	1	1/8 NPT	22.00	6.70	13.00	–	–	14	10	13.00	approx. 700
CC	1	1/4 BSPT	22.00	10.00	13.00	–	–	14	10	18.00	approx. 700
BC	1	1/4 NPT	22.00	10.20	13.00	–	–	14	10	18.00	approx. 700
Assembly with retaining nut 3/8 BSPP	2	–	16.00	14.00	–	14.80	12.65	–	10	13.00	approx. 300

[1] Applies only to operation at constant pressure.

US gal/min at 40 psi	**Ordering no.**						Equivalent bore diameter A [mm]	**V̇ water [l/min]**						
	Series	Flow rate code / Spray angle				Mat. no. **A3**		**p [bar]**						
		20°	30°	45°	60°	Stainless steel 303/420F/301		40	60	**80**	100	120	150	200
02	**6FH**	**361**	**362**	**363**	**364**	●	1.00	2.88	3.53	**4.08**	4.56	5.00	5.58	6.45
021	**6FH**	**371**	**372**	**373**	**374**	●	1.02	3.03	3.71	**4.28**	4.79	5.25	5.87	6.77
025	**6FH**	**381**	**382**	**383**	**384**	●	1.10	3.60	4.42	**5.10**	5.70	6.24	6.98	8.06
028	**6FH**	**391**	**392**	**393**	**394**	●	1.16	4.04	4.94	**5.71**	6.38	6.99	7.81	9.02
03	**6FH**	**401**	**402**	**403**	**404**	●	1.18	4.32	5.29	**6.11**	6.83	7.48	8.37	9.66
034	**6FH**	**411**	**412**	**413**	**414**	●	1.30	4.90	6.00	**6.93**	7.75	8.49	9.49	10.96
038	**6FH**	**441**	**442**	**443**		●	1.33	5.48	6.72	**7.75**	8.67	9.50	10.62	12.26
04	**6FH**	**451**	**452**	**453**	**454**	●	1.35	5.77	7.06	**8.16**	9.12	9.99	11.17	12.90
043	**6FH**	**461**	**462**			●	1.38	6.20	7.59	**8.77**	9.80	10.74	12.00	13.86
045	**6FH**	**471**	**472**	**473**	**474**	●	1.40	6.49	7.95	**9.18**	10.26	11.24	12.57	14.51
05	**6FH**	**481**	**482**	**483**	**484**	●	1.55	7.21	8.83	**10.20**	11.40	12.49	13.96	16.12
055	**6FH**	**501**	**502**	**503**	**504**	●	1.60	7.93	9.71	**11.22**	12.54	13.74	15.36	17.73
06	**6FH**	**521**	**522**	**523**	**524**	●	1.72	8.65	10.60	**12.24**	13.68	14.99	16.75	19.35
065	**6FH**	**531**	**532**	**533**	**534**	●	1.75	9.37	11.48	**13.26**	14.82	16.23	18.15	20.96

US gal/min at 40 psi	Ordering no.						Equivalent bore diameter A [mm]	V̇ water [l/min]						
	Series	Flow rate code				Mat. no.		p [bar]						
		Spray angle				A3								
		20°	30°	45°	60°	Stainless steel 303/420F/301		40	60	**80**	100	120	150	200
07	**6FH**	**541**	**542**	**543**	**544**	●	1.80	10.09	12.36	**14.28**	15.96	17.48	19.55	22.57
075	**6FH**	**551**	**552**	**553**	**554**	●	1.90	10.81	13.25	**15.29**	17.10	18.73	20.94	24.18
008	**6FH**	**571**	**572**	**573**	**574**	●	2.05	11.54	14.13	**16.31**	18.24	19.98	22.34	25.80
087	**6FH**	**581**	**582**	**583**	**584**	●	2.06	12.54	15.36	**17.74**	19.83	21.72	24.29	28.04
09	**6FH**	**591**	**592**	**593**	**594**	●	2.10	12.98	15.89	**18.35**	20.52	22.48	25.13	29.02
10	**6FH**	**601**	**602**	**603**	**604**	●	2.30	14.41	17.65	**20.38**	22.79	24.97	27.91	32.23
11	**6FH**	**621***	**622***	**623***	**624***	●	2.40	15.86	19.42	**22.42**	25.07	27.46	30.70	35.45
125	**6FH**	**641***	**642***	**643***	**644***	●	2.50	18.02	22.07	**25.48**	28.49	31.21	34.89	40.29
131	**6FH**	**651***	**652***	**653***	**654***	●	2.55	18.89	23.13	**26.71**	29.86	32.71	36.57	42.23
139	**6FH**	**661***	**662***	**663***	**664***	●	2.65	20.04	24.54	**28.34**	31.68	34.70	38.80	44.80
15	**6FH**	**671***	**672***	**673***	**674***	●	2.70	21.62	26.48	**30.58**	34.19	37.45	41.87	48.35
175	**6FH**	**701***	**702***	**703***	**704***	●	3.00	25.23	30.9	**35.68**	39.89	43.70	48.86	56.41
20	**6FH**			**723***	**724***	●	3.05	28.83	35.31	**40.78**	45.59	49.94	55.84	64.47
25	**6FH**			**763***	**764***	●	3.50	36.04	44.14	**50.97**	56.99	62.43	69.80	80.60
30	**6FH**			**793***		●	3.90	43.25	52.97	**61.16**	68.38	74.91	83.75	96.70

* Only available with code CC, BC or 29.

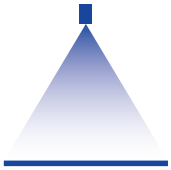
Code	Type of connection
CA	1/8 BSPT
BA	1/8 NPT
CC	1/4 BSPT
BC	1/4 NPT
29	Assembly with retaining nut 3/8 BSPP

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

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

Ordering example:	Series 6FH	+ Flow rate code 541	+ Material no. A3	+ Code CA	= Ordering no. 6FH.541.A3.CA

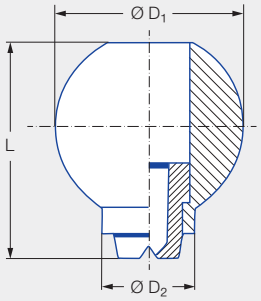
Low pressure flat fan nozzles with ball joint
Series 676



Features:
- Swivelling nozzle
- Precise spray alignment according to requirements
- Assembly with retaining nut, threaded socket, threaded nipple, welded nipple

Applications:
- Cleaning
- Cooling
- Lubrication

Series 676



Dimensions [mm]			Weight [g] Brass	p_{max} [bar]
L	Ø D_1	Ø D_2		
25.0	22.0	11.0	45.0	30.0

Spray angle	Ordering no. Type	Mat. no. 16 Stainless steel 303	Mat. no. 30 Brass	Equivalent bore diameter A [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	Spray width B [mm] (at p = 5 bar) H = 250 [mm]	H = 500 [mm]
20°	**676.301**	●	●	0.70	0.60	0.16*	0.23*	0.32	0.40	**0.51**	0.72	85	160
	676.361	●	●	1.00	0.80	0.32*	0.45*	0.63	0.77	**1.00**	1.41	85	160
	676.441	●	●	1.35	1.10	0.63*	0.89	1.25	1.53	**1.98**	2.80	85	160
	676.481	●	●	1.50	1.30	0.80*	1.13	1.60	1.96	**2.53**	3.58	85	160
30°	**676.302**	●	●	0.70	0.50	0.16*	0.23*	0.32	0.40	**0.51**	0.72	120	220
	676.362	●	●	1.00	0.80	0.32*	0.45*	0.63	0.77	**1.00**	1.41	120	220
	676.402	●	●	1.20	1.00	0.50*	0.71	1.00	1.22	**1.58**	2.23	120	230
	676.482	●	●	1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	3.58	130	230
	676.562	●	●	2.00	1.50	1.25	1.77	2.50	3.06	**3.95**	5.59	130	240
	676.642	●	●	2.50	1.80	2.00	2.83	4.00	4.90	**6.33**	8.95	140	250
	676.722	●	●	3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	14.09	140	260
	676.762	●	●	3.50	2.70	4.00	5.66	8.00	9.80	**12.65**	17.89	140	260
	676.802	●	●	4.00	3.10	5.00	7.07	10.00	12.25	**15.81**	22.36	140	260
45°	**676.303**	●	●	0.70	0.50	0.16*	0.23*	0.32	0.40	**0.51**	0.72	170	330
	676.363	●	●	1.00	0.70	0.32*	0.45*	0.63	0.77	**1.00**	1.41	190	350
	676.403	●	●	1.20	0.90	0.50*	0.71	1.00	1.22	**1.58**	2.23	200	370
	676.483	●	●	1.50	1.10	0.80*	1.13	1.60	1.96	**2.53**	3.58	200	390
	676.563	●	●	2.00	1.40	1.25	1.77	2.50	3.06	**3.95**	5.59	210	410
	676.643	●	●	2.50	1.80	2.00	2.83	4.00	4.90	**6.33**	8.95	220	410
	676.723	●	●	3.00	2.40	3.15	4.45	6.30	7.71	**9.96**	14.09	220	420
	676.763	●	●	3.50	2.70	4.00	5.66	8.00	9.80	**12.65**	17.89	220	420
	676.803	●	●	4.00	3.00	5.00	7.07	10.00	12.25	**15.81**	22.36	220	420
60°	**676.304**	●	●	0.70	0.40	0.16*	0.23*	0.32	0.40	**0.51**	0.72	260	480
	676.334	●	●	0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	1.00	260	490
	676.364	●	●	1.00	0.60	0.32*	0.45*	0.63	0.77	**1.00**	1.41	260	500
	676.404	●	●	1.20	0.80	0.50*	0.71	1.00	1.22	**1.58**	2.23	260	510
	676.444	●	●	1.35	1.00	0.63*	0.89	1.25	1.53	**1.98**	2.80	260	510
	676.484	●	●	1.50	1.00	0.80*	1.13	1.60	1.96	**2.53**	3.58	260	520

Spray angle	Ordering no.			Equivalent bore diameter A [mm]	Narrowest free cross section Ø [mm]	V̇ water [l/min]						Spray width B [mm] (at p = 5 bar)	
	Type	Mat. no. 16 Stainless steel 303	Mat. no. 30 Brass			p [bar] 0.5	1.0	2.0	3.0	**5.0**	10.0	H = 250 [mm]	H = 500 [mm]
60°	**676.514**	●	●	1.65	1.10	0.95*	1.34	1.90	2.32	**3.00**	4.24	270	520
	676.564	●	●	2.00	1.30	1.25	1.77	2.50	3.06	**3.95**	5.59	270	530
	676.604	●	●	2.20	1.50	1.57	2.23	3.15	3.86	**4.98**	7.04	270	540
	676.644	●	●	2.50	1.60	2.00	2.83	4.00	4.90	**6.33**	8.95	270	540
	676.674	●	●	2.70	1.80	2.37	3.36	4.75	5.82	**7.51**	10.62	270	550
	676.724	●	●	3.00	2.10	3.15	4.45	6.30	7.71	**9.96**	14.09	280	560
	676.764	●	●	3.50	2.30	4.00	5.66	8.00	9.80	**12.65**	17.89	280	570
75°	**676.145**	●	●	0.20	0.12	–	0.04*	0.05	0.06	**0.08**	0.11	380	690
	676.165	●	●	0.20	0.08	–	0.05*	0.06	0.08	**0.10**	0.14	380	690
	676.185	●	●	0.20	0.15	–	0.06*	0.08	0.09	**0.12**	0.17	380	690
	676.215	●	●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.25	380	690
	676.245	●	●	0.50	0.30	–	0.12*	0.16	0.20	**0.26**	0.37	380	690
	676.275	●	●	0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.49	380	690
90°	**676.216**	●	●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.25	420	780
	676.276	●	●	0.60	0.30	0.11*	0.16*	0.22	0.27	**0.35**	0.49	430	790
	676.306	●	●	0.70	0.40	0.16*	0.23*	0.32	0.40	**0.51**	0.72	440	800
	676.336	●	●	0.90	0.50	0.22*	0.32*	0.45	0.55	**0.71**	1.00	440	820
	676.366	●	●	1.00	0.50	0.32*	0.45*	0.63	0.77	**1.00**	1.41	450	830
	676.406	●	●	1.20	0.70	0.50*	0.71	1.00	1.22	**1.58**	2.23	450	840
	676.446	●	●	1.35	0.80	0.63*	0.89	1.25	1.53	**1.98**	2.80	460	860
	676.486	●	●	1.50	0.80	0.80*	1.13	1.60	1.96	**2.53**	3.58	470	870
	676.516	●	●	1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	4.24	480	880
	676.566	●	●	2.00	1.10	1.25	1.77	2.50	3.06	**3.95**	5.59	490	900
	676.606	●	●	2.20	1.20	1.57	2.23	3.15	3.86	**4.98**	7.04	500	910
	676.646	●	●	2.50	1.30	2.00	2.83	4.00	4.90	**6.33**	8.95	510	930
	676.676	●	●	2.70	1.40	2.37	3.36	4.75	5.82	**7.51**	10.62	510	950
	676.726	●	●	3.00	1.70	3.15	4.45	6.30	7.71	**9.96**	14.09	520	980
120°	**676.187**	●	●	0.35	0.20	–	0.06*	0.08	0.10	**0.13**	0.18	630	1,060
	676.217	●	●	0.40	0.20	–	0.08*	0.11	0.14	**0.18**	0.25	650	1,080
	676.247	●	●	0.50	0.20	–	0.12*	0.16	0.20	**0.26**	0.37	660	1,100
	676.277	●	●	0.60	0.30	–	0.16*	0.22	0.27	**0.35**	0.49	670	1,150
	676.307	●	●	0.70	0.30	0.16*	0.23*	0.32	0.40	**0.51**	0.72	710	1,240
	676.337	●	●	0.90	0.40	0.22*	0.32*	0.45	0.55	**0.71**	1.00	740	1,350
	676.367	●	●	1.00	0.50	0.32*	0.45*	0.63	0.77	**1.00**	1.41	800	1,430
	676.407	●	●	1.20	0.60	0.50*	0.71	1.00	1.22	**1.58**	2.23	830	1,480
	676.447	●	●	1.35	0.70	0.63*	0.89	1.25	1.53	**1.98**	2.80	840	1,520
	676.487	●	●	1.50	0.60	0.80*	1.13	1.60	1.96	**2.53**	3.58	850	1,540
	676.517	●	●	1.65	0.90	0.95*	1.34	1.90	2.32	**3.00**	4.24	850	1,560
	676.567	●	●	2.00	0.90	1.25	1.77	2.50	3.06	**3.95**	5.59	870	1,590
	676.607	●	●	2.20	1.10	1.57	2.23	3.15	3.86	**4.98**	7.04	870	1,620
	676.647	●	●	2.50	1.30	2.00	2.83	4.00	4.90	**6.33**	8.95	880	1,640
	676.677	●	●	2.70	1.40	2.37	3.36	4.75	5.82	**7.51**	10.62	890	1,660
	676.727	●	●	3.00	1.60	3.15	4.45	6.30	7.71	**9.96**	14.09	890	1,680
	676.767	●	●	3.50	1.70	4.00	5.66	8.00	9.80	**12.65**	17.89	900	1,700

* Differing spray pattern.

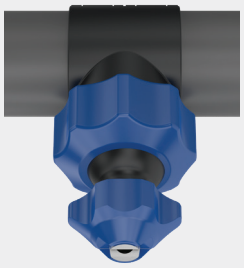
Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering example:	Type 676.514	+	Material no. 16	=	Ordering no. 676.514.16

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

Nozzle systems for surface treatment
Series 676/677 MEMOSPRAY

Features:
- Retention of the adjusted spray direction when changing nozzles
- Simple, quick nozzle assembly without the need for tools
- Many combination options
- Large range of flow rates, spray angles and materials

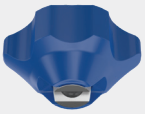


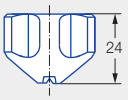
Applications:
- Degreasing
- Phosphating in surface treatment
- Industrial cleaning
- Container washers

Assembly example

① a Flat fan nozzle

Incl. gasket 095.015.7A.05.65
(Material: Viton)



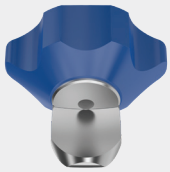


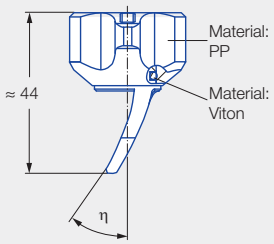
Designation	Spray angle	Ordering no.	Mat. no.				Narrowest free cross section Ø [mm]	V̇ [l/min] p [bar]					Weight [g]			
		Type	8F Housing: PP Insert: 303 SS	8R Housing: PP Insert: 316L SS	E8 Housing: PP Insert: Ceramic	53 Polypropylene (PP)		1.0	1.5	**2.0**	2.5	5.0	PP/Stainless steel 303	PP/Stainless steel 316L	PP/Ceramic	Polypropylene (PP)
① a **Flat fan nozzle**	30°	**676.642.xx.40**	●	●			1.60	2.83	3.46	**4.00**	4.47	6.33	15.00	15.00	–	–
		676.722.xx.40	●	●			2.10	4.46	5.46	**6.30**	7.04	9.96	15.00	15.00	–	–
		676.762.xx.40	●	●			2.30	5.66	6.93	**8.00**	8.94	12.65	15.00	15.00	–	–
		676.802.xx.40	●	●			2.60	7.07	8.66	**10.00**	11.18	15.81	15.00	15.00	–	–
		676.842.xx.40	●	●			3.00	8.84	10.82	**12.50**	13.97	19.76	15.00	15.00	–	–
		676.882.xx.40	●	●			3.40	11.31	13.86	**16.00**	17.89	25.30	15.00	15.00	–	–
		676.922.xx.40	●	●			4.10	14.14	17.32	**20.00**	22.36	31.62	15.00	15.00	–	–
		676.962.xx.40	●	●			4.20	17.68	21.65	**25.00**	27.95	39.53	15.00	15.00	–	–
		677.002.xx.40	●				4.70	22.27	27.28	**31.50**	35.22	49.81	15.00	–	–	–
	60°	**676.644.xx.40**	●	●			1.60	2.83	3.46	**4.00**	4.47	6.33	15.00	15.00	–	–
		676.724.xx.40	●	●			2.10	4.46	5.46	**6.30**	7.04	9.96	15.00	15.00	–	–
		676.764.xx.40	●	●			2.30	5.66	6.93	**8.00**	8.94	12.65	15.00	15.00	–	–
		676.804.xx.40	●	●			2.60	7.07	8.66	**10.00**	11.18	15.81	15.00	15.00	–	–
		676.844.xx.40	●	●			3.00	8.84	10.82	**12.50**	13.97	19.76	15.00	15.00	–	–
		676.884.xx.40	●	●	●	●	3.40	11.31	13.86	**16.00**	17.89	25.30	15.00	15.00	10.00	8.00
		676.924.xx.40	●	●	●	●	4.10	14.14	17.32	**20.00**	22.36	31.62	15.00	15.00	10.00	8.00
		676.964.xx.40	●	●	●	●	4.20	17.68	21.65	**25.00**	27.95	39.53	15.00	15.00	10.00	8.00
		677.004.xx.40	●	●	●	●	4.70	22.27	27.28	**31.50**	35.22	49.81	15.00	15.00	10.00	8.00
		677.044.xx.40	●	●			5.50	28.28	34.64	**40.00**	44.72	63.25	15.00	15.00	–	–
		677.084.xx.40	●	●			6.20	35.36	43.30	**50.00**	55.90	79.06	15.00	15.00	–	–

Designation	Spray angle	Ordering no.					Narrowest free cross section Ø [mm]	V̇ [l/min]					Weight [g]			
		Type	Mat. no. 8F: Housing: PP Insert: 303 SS	Mat. no. 8R: Housing: PP Insert: 316L SS	Mat. no. E8: Housing: PP Insert: Ceramic	Mat. no. 53: Polypropylene (PP)		p [bar] 1.0	1.5	**2.0**	2.5	5.0	PP/Stainless steel 303	PP/Stainless steel 316L	PP/Ceramic	Polypropylene (PP)
① a **Flat fan nozzle**	90°	**676.646.xx.40**	●	●			1.60	2.83	3.46	**4.00**	4.47	6.33	15.00	15.00	–	–
		676.726.xx.40	●	●			2.10	4.46	5.46	**6.30**	7.04	9.96	15.00	15.00	–	–
		676.766.xx.40	●	●			2.30	5.66	6.93	**8.00**	8.94	12.65	15.00	15.00	–	–
		676.806.xx.40	●	●			2.60	7.07	8.66	**10.00**	11.18	15.81	15.00	15.00	–	–
		676.846.xx.40	●	●			3.00	8.84	10.82	**12.50**	13.97	19.76	15.00	15.00	–	–
		676.886.xx.40	●	●			3.40	11.31	13.86	**16.00**	17.89	25.30	15.00	15.00	–	–
		676.926.xx.40	●	●			4.10	14.14	17.32	**20.00**	22.36	31.62	15.00	15.00	–	–
		676.966.xx.40	●	●			4.20	17.68	21.65	**25.00**	27.95	39.53	15.00	15.00	–	–
	120°	**676.647.xx.40**	●	●			1.60	2.83	3.46	**4.00**	4.47	6.33	15.00	15.00	–	–
		676.727.xx.40	●	●			2.10	4.46	5.46	**6.30**	7.04	9.96	15.00	15.00	–	–
		676.767.xx.40	●	●			2.30	5.66	6.93	**8.00**	8.94	12.65	15.00	15.00	–	–
		676.807.xx.40	●	●			2.60	7.07	8.66	**10.00**	11.18	15.81	15.00	15.00	–	–
		676.847.xx.40	●	●			3.00	8.84	10.82	**12.50**	13.97	19.76	15.00	15.00	–	–
		676.887.xx.40	●	●			3.40	11.31	13.86	**16.00**	17.89	25.30	15.00	15.00	–	–
		676.927.xx.40	●	●			4.10	14.14	17.32	**20.00**	22.36	31.62	15.00	15.00	–	–
Blind nozzle	–	**067.630.8F.40.01**	●				–	–	–	**–**	–	–	15.00	–	–	–

① b Tongue-type nozzle

Incl. gasket 095.015.7A.05.65
(Material: Viton)





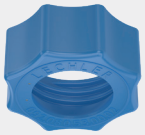
Designation	Spray angle	η	Ordering no.			Narrowest free cross section Ø [mm]	V̇ [l/min]					Weight [g]	
			Type	Mat. no. 8R: Housing: PP Insert:316L SS	Mat. no. 5E: PVDF		p [bar] 1.0	1.5	2.0	2.5	5.0	PP/Stainless steel 316L	PVDF
① b **Tongue-type nozzle**	45°	35°	**676.803.xx.41**	●		3.40	7.07	8.66	10.00	11.18	15.81	25.00	–
	60°	35°	**676.874.xx.41**	●		4.20	10.61	12.99	15.00	16.77	23.72	25.00	–
	60°	35°	**676.924.xx.41**	●		4.70	14.14	17.32	20.00	22.36	31.62	25.00	–
	70°	40°	**677.005.xx.41**	●	●	6.00	22.27	27.28	31.50	35.22	49.81	25.00	11.00

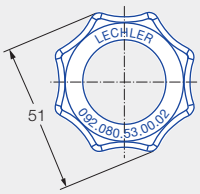
Ordering	Type	+	Material no.	=	Ordering no.
example:	676.646.xx.40	+	8F	=	676.646.8F.40

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

② a Retaining nut

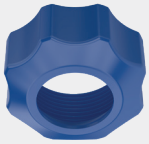
092.080.xx.00.02

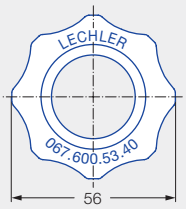




② b Retaining nut

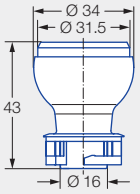
067.600.xx.40





③ Ball bayonet base

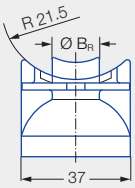
067.630.xx.40



④ a Ball seat

067.631.xx.40.x2

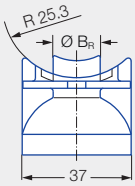
For eyelet clamp
067.631.xx.40.00



④ b Ball seat

067.631.xx.50.x2

For eyelet clamp
067.631.xx.50.00

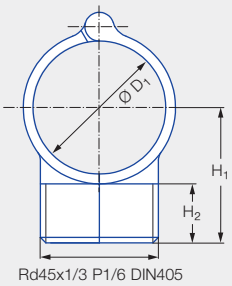


Designation	Ordering no.			Ø B_R[1] [mm]	Recommended bore diameter [mm]	Pipe Ø [mm]	Weight [g]
	Type	Mat. no. 53 Polypropylene (PP)	Mat. no. 6M PP reinforced				Polypropylene (PP)
② a **Retaining nut**	**092.080.xx.00.02**	●		–	–	–	18.0
② b **Retaining nut**	**067.600.xx.40**	●		–	–	–	18.0
③ **Ball bayonet base**	**067.630.xx.40**	●		–	–	–	12.0
④ a **Ball seat for eyelet clamp no. 067.631.xx.40.00**	**067.631.xx.40.22**		●	13.8	14.0–14.3	1 1/4" (40.0–43.0)	9.0
	067.631.xx.40.02		●	16.0	16.5–17.0	1 1/4" (40.0–43.0)	11.0
	067.631.xx.40.12		●	19.8	20.3–20.8	1 1/4" (40.0–43.0)	13.0
④ b **Ball seat for eyelet clamp no. 067.631.xx.50.00**	**067.631.xx.50.22**		●	13.8	14.0–14.3	1 1/2" (46.0–49.0)	9.0
	067.631.xx.50.02		●	16.0	16.5–17.0	1 1/2" (46.0–49.0)	11.0
	067.631.xx.50.12		●	19.8	20.3–20.8	1 1/2" (46.0–49.0)	13.0

[1] Ø B_R = spigot diameter.

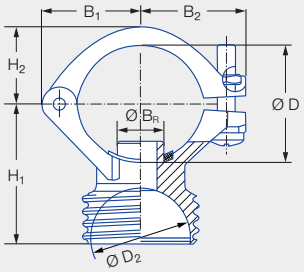
⑤ a Eyelet clamp

067.631.xx.x0.00



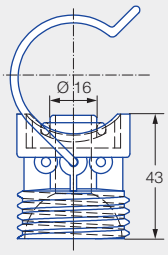
⑤ b Eyelet clamp

090.0x3.xx.4x.10



⑤ c Single clamp

092.08x.xx.00



Designation	Ordering no.		Dimensions [mm]						Ø B_R[1] [mm]	Recommended bore diameter [mm]	Pipe Ø (Ø D) [mm]	Weight [g]
	Type	Mat. no. 53 Polypropylene (PP)	B_1	B_2	H_1	H_2	Ø D_1	Ø D_2				Polypropylene (PP)
⑤ a Eyelet clamp	067.631.xx.40.00	●	–	–	47.7	22.0	43.0	–	–	–	1 1/4" (40.0–43.0)	31.0
	067.631.xx.50.00	●	–	–	51.5	22.0	50.6	–	–	–	1 1/2" (46.0–49.0)	33.0
⑤ b Eyelet clamp	090.023.xx.44.10	●	30.0	32.0	44.5	23.0	–	34.0	13.8	14.0–14.3	1" (32.0–34.5)	48.0
	090.023.xx.43.10	●	30.0	32.0	44.5	23.0	–	34.0	16.0	16.5–17.0	1" (32.0–34.5)	48.0
	090.033.xx.44.10	●	33.0	36.0	48.0	27.0	–	34.0	13.8	14.0–14.3	1 1/4" (40.0–43.0)	50.0
	090.033.xx.43.10	●	33.0	36.0	48.0	27.0	–	34.0	16.0	16.5–17.0	1 1/4" (40.0–43.0)	50.0
	090.033.xx.40.10	●	33.0	36.0	48.0	27.0	–	34.0	20.0	20.5–21.0	1 1/4" (40.0–43.0)	50.0
	090.043.xx.44.10	●	36.0	35.0	52.0	30.0	–	34.0	13.8	14.0–14.3	1 1/2" (46.0–49.0)	52.0
	090.043.xx.43.10	●	36.0	35.0	52.0	30.0	–	34.0	16.0	16.5–17.0	1 1/2" (46.0–49.0)	52.0
	090.043.xx.40.10	●	36.0	35.0	52.0	30.0	–	34.0	20.0	20.5–21.0	1 1/2" (46.0–49.0)	52.0
⑤ c Single clamp	092.080.xx.00	●	–	–	–	–	–	–	16.3*	16.5–17.0	1" (32.0–34.5)	36.0
	092.081.xx.00	●	–	–	–	–	–	–	16.3*	16.5–17.0	1 1/4" (40.0–43.0)	38.0
	092.082.xx.00	●	–	–	–	–	–	–	16.3*	16.5–17.0	1 1/2" (46.0–49.0)	40.0
	092.083.xx.00	●	–	–	–	–	–	–	16.3*	16.5–17.0	2" (58.0–62.0)	42,0

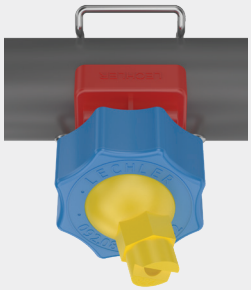
* Other spigot diameters available on request.
[1] Ø B_R = spigot diameter.

Ordering example:	Type	+	Material no.	=	Ordering no.
	067.631.xx.40.00	+	53	=	067.631.53.40.00

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

Nozzle systems for surface treatment
Series 676 Easy-Clip

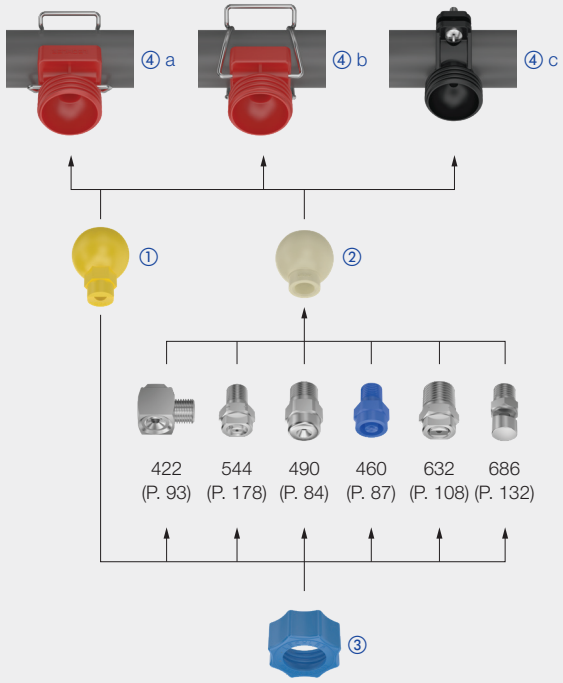
Features:
- Simple, quick nozzle assembly without the need for tools
- All-round 30° swivelling
- Easy adjustment and cleaning



Applications:
- Degreasing
- Phosphating in surface treatment
- Industrial cleaning
- Container washers

Materials:
- Clamp: Stainless steel 301
- Gasket: EPDM
- Cylinder pin, screw, screw unit: Stainless steel 316L
- Body, retaining nut: Polypropylene, glass fibre reinforced
- Ball nozzle, ball joint: Polypropylene

Assembly example



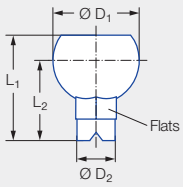
Sets – series 676 Easy-Clip

Designation	Spray angle	Ordering no. Type	Nozzle Color	V̇ [l/min] p [bar] 0.5	1.0	1.5	**2.0**	2.5
Set 1 consisting of: Ball nozzle, Single clamp for 1 1/4" pipe, Retaining nut	60°	**676.724.53.31**	Grey	3.15	4.45	5.45	**6.30**	7.04
		676.764.53.31	Brown	4.00	5.66	6.93	**8.00**	8.94
		676.804.53.31	Purple	5.00	7.07	8.66	**10.00**	11.18
		676.844.53.31	Yellow	6.25	8.84	10.83	**12.50**	13.98
		676.884.53.31	Red	8.00	11.31	13.85	**16.00**	17.89
		676.904.53.31	Blue	9.10	12.87	15.76	**18.20**	20.35
		676.924.53.31	Green	10.00	14.14	17.32	**20.00**	22.36

Designation	Ordering no. Type	Ball Color	BSPP	Matches series
Set 2 consisting of: Ball joint, Single clamp for 1 1/4" pipe, Retaining nut	**092.081.53.AB**	Beige	1/8	460, 490, 632, 686, 610, 544
	092.081.53.AD	Beige	1/4	422, 460, 490, 544, 612, 632, 686
	092.081.53.AF	Beige	3/8	422, 460, 490, 632, 686, 688
	092.081.53.AH	Beige	1/2	422, 460, 490, 632, 686

Individual parts – series 676 Easy-Clip

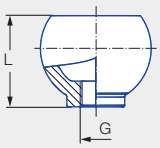
① Ball nozzle



Dimensions [mm]				
L_1	L_2	Ø D_1	Ø D_2	Flats
41.5	31.5	34.0	15.0	16.0

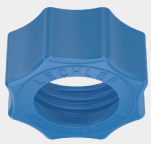
Designation	Spray angle	Ordering no. Type	Nozzle Color	V̇ [l/min] p [bar] 0.5	1.0	1.5	**2.0**	2.5
① Ball nozzle	60°	676.724.53.30.01	Grey	3.15	4.45	5.45	**6.30**	7.04
		676.764.53.30.01	Brown	4.00	5.66	6.93	**8.00**	8.94
		676.804.53.30.01	Purple	5.00	7.07	8.66	**10.00**	11.18
		676.844.53.30.01	Yellow	6.25	8.84	10.83	**12.50**	13.98
		676.884.53.30.01	Red	8.00	11.31	13.85	**16.00**	17.89
		676.904.53.30.01	Blue	9.10	12.87	15.67	**18.20**	20.35
		676.924.53.30.01	Green	10.00	14.14	17.32	**20.00**	22.36
Blind nozzle	–	092.080.53.00.01	Grey	–	–	–	–	–

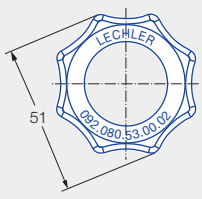
② Ball joint



Designation	Ordering no. Type	Ball Color	BSPP	L [mm]	Matches series
② Ball joint	092.080.53.AB.01	Beige	1/8	28.4	460, 490, 632, 686, 610, 544
	092.080.53.AD.01	Beige	1/4	32.4	422, 460, 490, 544, 612, 632, 686
	092.080.53.AF.01	Beige	3/8	31.4	422, 460, 490, 632, 686, 688
	092.080.53.AH.01	Beige	1/2	33.0	422, 460, 490, 632, 686

③ Retaining nut



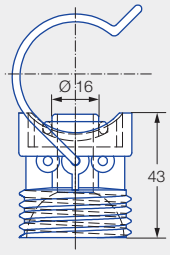


Designation	Ordering no. Type
③ Retaining nut	092.080.53.00.02

Nozzle systems for surface treatment
Series 676 Easy-Clip

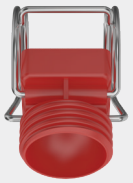
④ a Single clamp

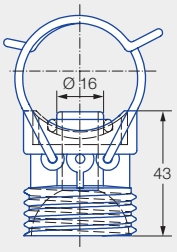
092.08x.53.00



④ b Double clamp

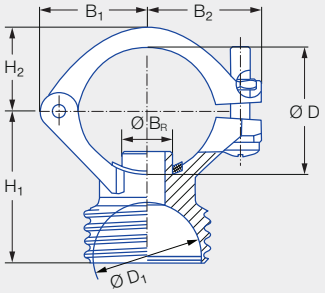
092.09x.53.00





④ c Eyelet clamp

090.0x3.53.43.10



Designation	Ordering no.	Dimensions [mm]					Ø B_R[1] [mm]	Recommend-ed bore diameter [mm]	Pipe Ø (Ø D) [mm]	Weight [g]
	Type	B_1	B_2	H_1	H_2	Ø D_1				Polypropylene (PP)
④ a **Single clamp**	**092.080.53.00**	–	–	–	–	–	16.3*	16.5–17.0	1" (32.0–34.5)	36.0
	092.081.53.00	–	–	–	–	–	16.3*	16.5–17.0	1 1/4" (40.0–43.0)	38.0
	092.082.53.00	–	–	–	–	–	16.3*	16.5–17.0	1 1/2" (46.0–49.0)	40.0
	092.083.53.00	–	–	–	–	–	16.3*	16.5–17.0	2" (58.0–62.0)	42.0
④ b **Double clamp**	**092.090.53.00**	–	–	–	–	–	16.3*	16.5–17.0	1" (32.0–34.5)	46.0
	092.091.53.00	–	–	–	–	–	16.3*	16.5–17.0	1 1/4" (40.0–43.0)	48.0
	092.092.53.00	–	–	–	–	–	16.3*	16.5–17.0	1 1/2" (46.0–49.0)	50.0
	092.093.53.00	–	–	–	–	–	16.3*	16.5–17.0	2" (58.0–62.0)	52.0
④ c **Eyelet clamp**	**090.023.53.43.10**	30.0	32.0	44.5	23.0	34.0	16.3**	16.5–17.0	1" (32.0–34.5)	48.0
	090.033.53.43.10	33.0	36.0	48.0	27.0	34.0	16.3**	16.5–17.0	1 1/4" (40.0–43.0)	50.0
	090.043.53.43.10	36.0	35.0	52.0	30.0	34.0	16.3**	16.5–17.0	1 1/2" (46.0–49.0)	52.0

* Other spigot diameters (13.8/19.0 mm) available on request.
** Other spigot diameters (13.8/20.0 mm) available on request.
[1] Ø B_R = spigot diameter.