



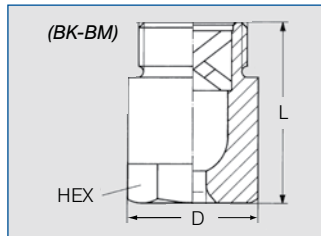
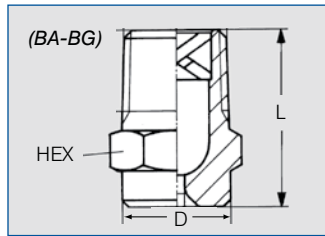
**Full cone nozzles**  
**Axial-flow**  
**Series 460 / 461**



**Excellent uniform full cone distribution and thorough atomization. X-style vane allows high free passage without heavy spots. Spray angles are consistent over the full capacity range and stable at a wide range of pressures.**

**Applications:**

- Washing and cleaning
- Dust suppression
- Mist eliminator washing
- Chemical reactors
- Surface spraying
- Chemical injection



Dimensions (in.)					
Connection Code	Inlet (Male NPT)	L	D	Hex	Weight Brass (lb.)
BA	1/8	.71	.51	9/16	.03
BC	1/4	.87	.51	9/16	.04
BE	3/8	.96/1.18*	.63	11/16	.07
BG	1/2	1.28/1.65*	.83	7/8	.15
BK	3/4	1.65/1.97*	1.09	1-1/8	.38
BM	1	2.20	1.32	1-3/8	.79

Subject to technical modifications

\* Dimension for PVDF model

Spray angle	Ordering no.										Orifice diam. (in.)	Free passage (in.)	Flow Rate (Gallons Per Minute)								Spray Diam. D (in.) @ 30 psi				
	Type	Material no.			Connection								10 psi	20 psi	liters per minute		30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	H=8"	H=20"	
	316 SS 17"	Brass 30	PVDF 5E	1/8"	1/4"	3/8"	1/2"	3/4"	1"	10			20	2	30	40	60	80	100	150					
45°	460.403	○	○	-	BA	-	-	-	-	-	.047	.033	.17	.23	1.0	.27	.30	.35	4.0	.43	.51	6	16		
	460.523	○	○	-	BA	-	-	-	-	-	.059	.053	.35	.46	2.0	.54	.60	.71	.79	.87	1.0	6	16		
	460.603	○	○	-	-	BC	BE	-	-	-	.075	.071	.54	.72	3.2	.84	.95	1.1	1.2	1.4	1.6	6	16		
	460.643	○	○	-	-	BC	BE	-	-	-	.085	.079	.69	.91	4.0	1.1	1.2	1.4	1.6	1.7	2.0	6	16		
	460.683	○	○*	-	-	BC	BE	-	-	-	.095	.079	.86	1.1	5.0	1.3	1.5	1.8	2.0	2.2	2.5	6	16		
	460.703	○	○	-	-	-	BE	-	-	-	.100	.087	.97	1.3	5.6	1.5	1.7	2.0	2.2	2.4	2.9	6	16		
	460.723	○	○	-	-	-	BE	BG	-	-	.106	.093	1.1	1.4	6.3	1.7	1.9	2.2	2.5	2.7	3.2	6	16		
	460.783	○	○	-	-	-	BG	-	-	-	.126	.126	1.6	2.0	9.0	2.4	2.7	3.2	3.6	3.9	4.6	6	16		
	460.803	○	○	-	-	-	BG	-	-	-	.133	.130	1.7	2.3	10.0	2.7	3.0	3.5	4.0	4.3	5.1	6	16		
	460.843	○	○	-	-	-	BG	-	-	-	.150	.146	2.2	2.8	12.5	3.3	3.8	4.4	5.0	5.4	6.4	6	16		
60°	460.404	○	○	-	BA	-	-	-	-	.047	.033	.17	.23	1.0	.27	.30	.35	4.0	.43	.51	9	22			
	460.444	○	○	-	BA	-	-	-	-	.051	.041	.22	.28	1.3	.33	.38	.44	.50	.54	.64	9	22			
	460.484	○	○	-	BA	-	-	-	-	.057	.045	.28	.36	1.6	.43	.48	.57	.63	.69	.82	9	22			
	460.524	○	○	-	BA	-	-	-	-	.063	.047	.35	.46	2.0	.54	.60	.71	.79	.87	1.0	9	22			
	460.564	○	○	-	BA	-	-	-	-	.066	.051	.43	.57	2.5	.67	.75	.88	.99	1.08	1.27	9	22			
	460.604	○	○	-	BA	-	-	-	-	.081	.055	.54	.72	3.2	.84	.95	1.1	1.2	1.4	1.6	9	22			
	460.644	○	○***	-	-	BC	BE	-	-	-	.095	.075	.69	.91	4.0	1.1	1.2	1.4	1.6	1.7	2.0	9	22		
	460.684	○	○	-	-	BC	BE	-	-	-	.102	.079	.86	1.1	5.0	1.3	1.5	1.8	2.0	2.2	2.5	9	22		
	460.724	○	○	-	-	BC	BE	-	-	-	.114	.079	1.1	1.4	6.3	1.7	1.9	2.2	2.5	2.7	3.2	9	22		
	460.764	○	○	-	-	-	BE	-	-	-	.128	.112	1.4	1.8	8.0	2.1	2.4	2.8	3.2	3.5	4.1	9	22		
	460.804	○	○	-	-	-	BE	-	-	-	.142	.116	1.7	2.3	10.0	2.7	3.0	3.5	4.0	4.3	5.1	9	22		
	460.844	○	○	-	-	-	BG	-	-	-	.158	.130	2.2	2.8	12.5	3.3	3.8	4.4	5.0	5.4	6.4	9	22		
	460.884	○	○	-	-	-	BG	-	-	-	.177	.146	2.8	3.6	16.0	4.3	4.8	5.7	6.3	6.9	8.2	9	22		
	460.924	○	○	-	-	-	-	BK	-	-	.205	.177	3.5	4.6	20	5.4	6.0	7.1	7.9	8.7	10.2	9	22		
	460.964	○	○	-	-	-	-	BK	-	-	.229	.193	4.3	5.7	25	6.7	7.5	8.8	9.9	10.8	12.7	9	22		
	461.004	○	○+	-	-	-	-	BK	BM	-	.252	.193	5.4	7.2	32	8.4	9.5	11.1	12.4	13.6	16.0	9	22		
461.044	○	○	-	-	-	-	-	BM	-	.284	.213	6.9	9.1	40	10.7	12.0	14.1	15.9	17.3	20	9	22			
461.084	○	○	-	-	-	-	-	BM	-	.339	.256	8.6	11.4	50	13.4	15.0	17.7	19.8	22	25	9	22			

\*\* Only available in connection BE

\*\*\* BE only available in Brass (Material no. 30)

+ BM only available in 316 SS (Material no. 17)

**Example for ordering:** Type + Material no. + Conn. = Ordering no.  
 460.724 + 17 + BE = 460.724.17.BE

Continued on the next page.

1) We reserve the right to deliver material 316 SS or 316L SS, if we show the material code 17.

**A listing of alternatives for various assembly possibilities is shown in the Accessories section beginning on page 129.**

**Conversion formula for the above series:**  $V_2 = V_1 \left( \frac{P_2}{P_1} \right)^{0.4}$   
 (See page 12 for symbol definitions.)



Full cone



# Full cone nozzles

## Axial-flow

### Series 460 / 461



Spray angle	Type	Ordering no.						Orifice diam. (in.)	Free passage (in.)	Flow Rate (Gallons Per Minute)								Spray Diam. D (in.) @ 30 psi				
		Material no.			Connection					10 psi	20 psi	liters per minute 2 bar	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	H=8"	H=20"		
		316 SS 17 <sup>1)</sup>	Brass 30	PVDF 5E	Male NPT 1/8" 1/4" 3/8" 1/2" 3/4" 1"																	
90°	460.326	-	-	○	BA	-	-	-	-	.032	.022	.07	.09	0.4	.11	.12	.14	.16	.17	.20	15	34
	460.406	○	○	○	BA	-	-	-	-	.047	.033	.17	.23	1.0	.27	.30	.35	.40	.43	.51	15	34
	460.446	○	○	-	BA	-	-	-	-	.051	.039	.22	.28	1.3	.33	.38	.44	.50	.54	.64	15	34
	460.486	○	○	-	BA	-	-	-	-	.057	.047	.28	.36	1.6	.43	.48	.57	.63	.69	.82	15	34
	460.506	○	○	-	BA	-	-	-	-	.057	.047	.31	.41	1.8	.48	.54	.64	.71	.78	.92	15	34
	460.526	○	○	○	BA	-	-	-	-	.065	.051	.35	.46	2.0	.54	.60	.71	.79	.87	1.0	15	34
	460.566	○	○	-	BA	-	-	-	-	.073	.051	.43	.57	2.5	.67	.75	.88	.99	1.1	1.3	15	34
	460.606	○	○	○	BA	-	BE	-	-	.081	.057	.54	.72	3.2	.84	.95	1.1	1.2	1.4	1.6	15	34
	460.646	○	○	○	-	BC	BE	-	-	.091	.071	.69	.91	4.0	1.1	1.2	1.4	1.6	1.7	2.0	15	38
	460.686	○	○	-	-	BC	BE	-	-	.102	.071	.86	1.1	5.0	1.3	1.5	1.8	2.0	2.2	2.5	15	38
	460.726	○	○	○*	-	BC	BE	-	-	.116	.079	1.1	1.4	6.3	1.7	1.9	2.2	2.5	2.7	3.2	15	38
	460.746	-	-	○	-	-	BE	-	-	.130	.075	1.2	1.6	7.1	1.9	2.1	2.5	2.8	3.1	3.6	15	38
	460.766	○	○	○	-	-	BE	-	-	.130	.095	1.4	1.8	8.0	2.1	2.4	2.8	3.2	3.5	4.1	15	38
	460.806	○	○	○	-	-	BE	-	-	.146	.106	1.7	2.3	10.0	2.7	3.0	3.5	4.0	4.3	5.1	15	38
	460.846	○	○	○	-	-	BE	-	-	.160	.126	2.2	2.8	12.5	3.3	3.8	4.4	5.0	5.4	6.4	15	38
	460.886	○**	○**	○	-	-	BE	BG	-	.185	.122	2.8	3.6	16.0	4.3	4.8	5.7	6.3	6.9	8.2	15	38
	460.926	○	○	○	-	-	-	BG	-	.205	.150	3.5	4.6	20	5.4	6.0	7.1	7.9	8.7	10.2	15	38
	460.966	○	○	○	-	-	-	BG	BK	.229	.150	4.3	5.7	25	6.7	7.5	8.8	9.9	10.8	12.7	15	38
	461.006	○	○	○**	-	-	-	BG	BK	.252	.150	5.4	7.2	32	8.4	9.5	11.1	12.5	13.7	16.1	15	38
	461.046	○	○	○	⊗	-	-	-	BK	.284	.209	6.9	9.1	40	10.7	12.0	14.1	15.9	17.3	20	15	38
461.086	○***	○	○**	-	-	-	-	BK	BM	.323	.209	8.6	11.4	50	13.4	15.0	17.7	19.8	22	25	15	38
461.126	○	○	○	-	-	-	-	BM	.366	.256	10.9	14.3	63	16.9	18.9	22	25	27	32	15	38	
461.146	○	○	○	-	-	-	-	BM	.390	.264	12.3	16.2	71	19.0	21	25	28	31	36	15	38	
120°	460.368	○	○	-	BA	-	-	-	-	.037	.028	.11	.14	0.6	.17	.19	.22	.25	.27	.32	27	48
	460.408	○	○	○	BA	-	-	-	-	.047	.033	.17	.23	1.0	.27	.30	.35	.40	.43	.51	27	48
	460.448	○	○	-	BA	-	-	-	-	.051	.035	.22	.28	1.3	.33	.38	.44	.50	.54	.64	27	48
	460.488	○	○	○	BA	-	-	-	-	.059	.039	.28	.36	1.6	.43	.48	.57	.63	.69	.82	27	48
	460.508	○	○	-	BA	-	-	-	-	.057	.043	.31	.41	1.8	.48	.54	.64	.71	.78	.92	27	48
	460.528	○	○	○	BA	-	-	-	-	.065	.047	.35	.46	2.0	.54	.60	.71	.79	.87	1.0	27	48
	460.568	○	○	-	BA	-	-	-	-	.075	.053	.43	.57	2.5	.67	.75	.88	.99	1.1	1.3	27	48
	460.608	○	○*	○*	BA	BC	-	-	-	.083	.055	.54	.72	3.2	.84	.95	1.1	1.2	1.4	1.6	27	48
	460.648	○	○	○	-	BC	BE	-	-	.097	.063	.69	.91	4.0	1.1	1.2	1.4	1.6	1.7	2.0	27	52
	460.688	○	○	-	BA	BC	BE	-	-	.108	.071	.86	1.1	5.0	1.3	1.5	1.8	2.0	2.2	2.5	27	52
	460.728	○	○	○*	-	BC	BE	-	-	.122	.075	1.1	1.4	6.3	1.7	1.9	2.2	2.5	2.7	3.2	27	52
	460.748	-	-	○	-	-	BE	-	-	.130	.075	1.2	1.6	7.1	1.9	2.1	2.5	2.8	3.1	3.6	27	52
	460.768	○	○	○	-	-	BE	-	-	.138	.075	1.4	1.8	8.0	2.1	2.4	2.8	3.2	3.5	4.1	27	52
	460.778	○	○	-	-	BC	-	-	-	.137	.075	.97	1.3	5.6	1.5	1.7	2.0	2.2	2.4	2.9	27	52
	460.808	○	○	○	-	-	BE	-	-	.150	.095	1.7	2.3	10.0	2.7	3.0	3.5	4.0	4.3	5.1	27	52
	460.848	○	○	○	-	-	BE	-	-	.165	.106	2.2	2.8	12.5	3.3	3.8	4.4	5.0	5.4	6.4	27	52
	460.868	○	○	-	-	BE	-	-	-	.173	.106	2.4	3.2	14.0	3.7	4.2	5.0	5.6	6.1	7.1	27	52
	460.888	○**	○	○	-	-	BE	BG	-	.181	.122	2.8	3.6	16.0	4.3	4.8	5.7	6.3	6.9	8.2	27	52
	460.928	○	○	-	-	-	BG	-	-	.209	.130	3.5	4.6	20	5.4	6.0	7.1	7.9	8.7	10.2	27	52
	460.968	○	○	○**	-	-	-	BG	BK	.232	.162	4.3	5.7	25	6.7	7.5	8.8	9.9	10.8	12.7	27	52
461.008	○	○	-	-	-	BG	-	-	.252	.185	5.4	7.2	32	8.4	9.5	11.1	12.4	13.6	16.0	27	52	
461.048	○	○	○	⊗	-	-	-	BK	.299	.193	6.9	9.1	40	10.7	12.0	14.1	15.9	17.3	20	27	52	
461.128	○	○	-	-	-	-	-	BM	.378	.260	10.9	14.3	63	16.9	18.9	22	25	27	32	27	52	
461.148	○	○	-	-	-	-	-	BM	.394	.260	12.3	16.2	71	21	19.0	25	28	31	36	27	52	

- ⊗ Material PP (Material no. 53)
- \* Only available in connection BE
- \*\* Only available in connection BG
- \*\*\* Only available in connection BM
- + BC only available in 316 SS (Material no. 17)
- \*\* Only available in connection BK

Different metallurgies may be available upon request.

**Example**    Type    + Material no.    + Conn.    = Ordering no.  
**for ordering:**    460.728    + 17                    + BE            = 460.728.17.BE

1) We reserve the right to deliver material 316 SS or 316L SS, if we show the material code 17.

A listing of alternatives for various assembly possibilities is shown in the Accessories section beginning on page 129.

