

Double Ferrule Compression Fittings



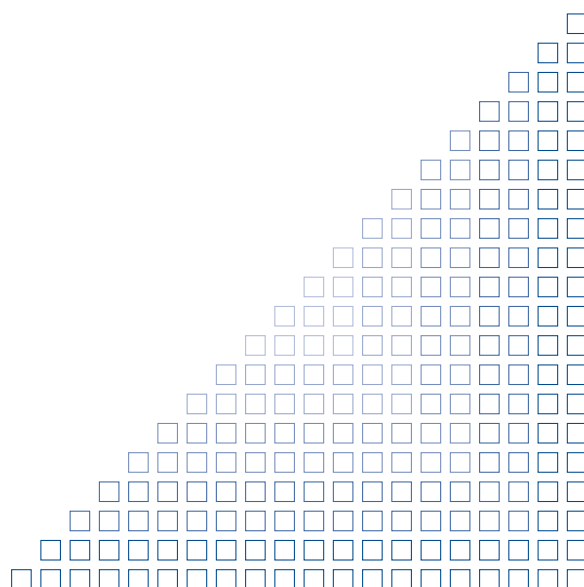
Fluid control division

DOUBLE FERRULE COMPRESSION FITTINGS

✓ GENERAL INFORMATION	2
✓ HOW TO ORDER	4
✓ PRODUCTS INDEX	5

PIPE FITTINGS

✓ GENERAL INFORMATION	38
✓ HOW TO ORDER	39
✓ PRODUCTS INDEX	39



BULK manufactures high quality compression and pipe fittings in various materials for any application requiring reliable tube connections with pressure tight sealing.

BULK compression fittings are designed, manufactured, sold and serviced by experienced instrument specialists understanding and respecting the need of reliable performance.

Construction material

BULK compression fittings have all components made by the same material as the fitting body for thermal compatibility and corrosion resistance.

Standard construction materials are listed on table 2 section "how to order".

It is recommended that the tubing and fitting be of same material to allow positive sealing and to avoid galvanic corrosion.

Pressure and temperature rating

BULK compression fittings are rated for working pressure higher than the tubing, therefore pressure rating depends on choice of tubing which should be based on material, wall thickness and temperature (see table below).

Degrating factors must be used to determinate tubing working pressure at high temperatures.

Please consult us if in doubt !

maximum allowable working pressure for fractional size tubing (value in psi)

tubing O.D. (inch)	tubing wall thickness (inch)											
	0.010"	0.012"	0.016"	0.020"	0.028"	0.035"	0.049"	0.065"	0.083"	0.095"	0.109"	0.120"
1/16"	6.852	8.395	11.510	14.395								
1/8"				6.843	9.948	12.622						
3/16"				4.345	6.342	8.145	11.760					
1/4"					4.575	5.910	8.700	11.773				
3/8"						3.770	5.465	7.520				
1/2"						2.770	3.980	5.415	7.155			
5/8"							3.130	4.240	5.550	6.480		
3/4"							2.570	3.490	4.535	5.270	6.150	
7/8"							2.190	2.948	3.845	4.443	5.180	
1"								2.568	3.318	3.843	4.462	4.970

maximum allowable working pressure for metric size tubing (value in bar)

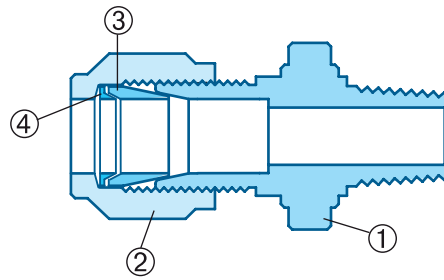
tubing O.D. (mm)	tubing wall thickness (mm)											
	0.5	0.6	0.8	1.0	1.2	1.5	1.6	1.8	2.0	2.2	2.5	3
3	492	610	825	1.030								
6			382	495	603	775	909					
8			281	357	441	560	603					
10			220	278	342	438	471					
12			180	235	280	360	384	438				
16				170	203	259	278	315	360	398	458	561
18				148	178	231	245	278	313	350	400	495
22				121	145	186	201	223	250	278	320	392
25				104	125	160	175	194	218	243	278	339

Tables are based on the following conditions:

AISI 304 and AISI 316 stainless steel annealed seamless tubing ASTM A-269 or A-213 or equivalent.

Tensile strength 75,000 psi at room temperature - Safety factor 4 (75,000 psi: 4 = 18,700 psi)

Metal temperature between -20° to 100° F, -29° to 38°C - Reference ANSI B31.3



BULK compression fittings are made by four parts consisting of **body (1)**, **nut (2)**, **front ferrule (3)**, **back ferrule (4)**.

The bodies of fitting for metric tubes are provided with a collar on the tube end side to differentiate from inch tube fitting. Reference standard is BS 4368 : Part IV 1984.

Assembly instruction

- 1) Loosen the nut (2)
- 2) Fully insert the tubing into the fitting. Make sure that the tubing rests firmly on the shoulder of the fitting and that the nut (2) is finger tight.
- 3) Tighten the nut (2) one and one quarter turns.

Reassembly instruction

- 1) Firmly insert the tubing end with the previously set ferrules (3)(4) into the fitting body (1) and tighten the nut (2) to a hand tight condition.
- 2) Tighten the nut until a sharp rise in torque is felt with a wrench
- 3) Snug with wrench

BULK compression fittings may be disconnected and retightened repeatedly.

Safety Guidelines

- 1) Never tight or loose a fitting with pressure in the system.
- 2) Do not bleed the system by loosening the fitting or fitting nut.
- 3) Always use proper thread lubricants and sealants (suitable to temperature system) on tapered pipe threads.
- 4) Always leave a length of straight tube between the tube bend and the fitting.
- 5) Always use a tube insert when assembling fitting to plastic tubing
- 6) Bulk does not recommend interchanging its fitting components with other manufacturers'.
- 7) Tubing must always be softer than the fitting material (RB 80 maximum for stainless steel).
- 8) Careful selection, handling and installation of tubing have vital importance to install safe and leak-free system.
- 9) Contact your local Bulk distributor for further informations.

HOW TO ORDER

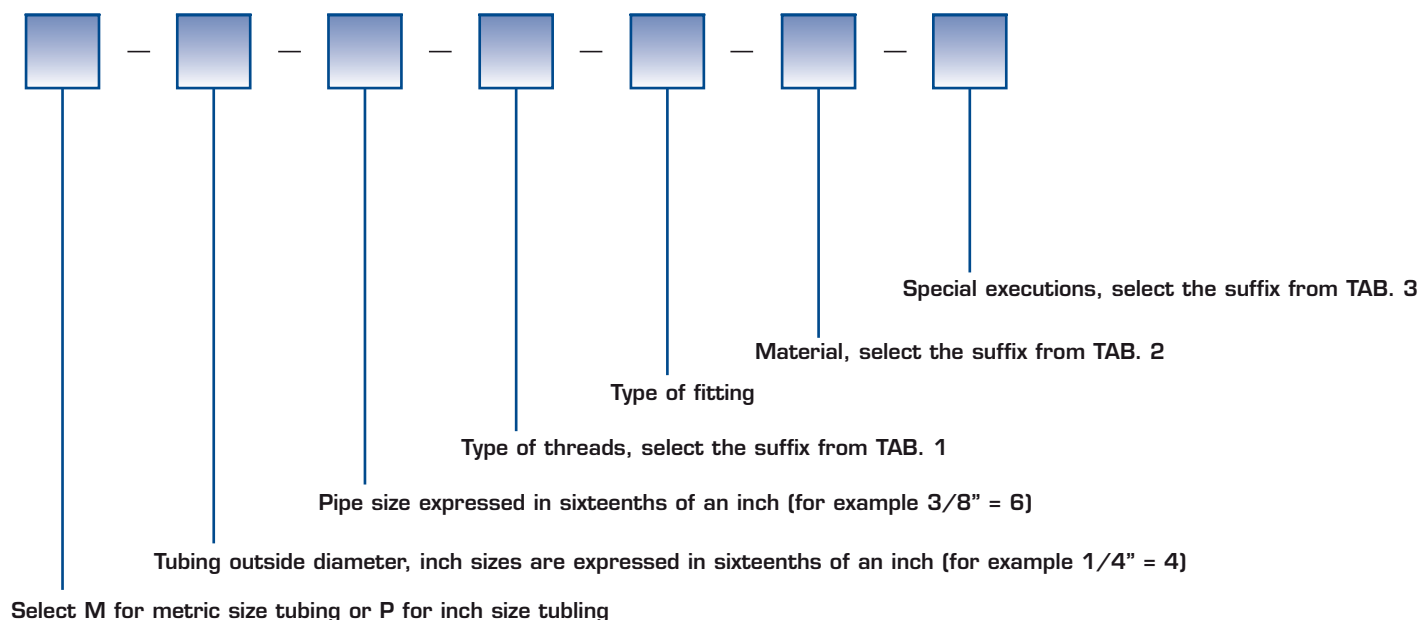


TABLE 1

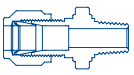
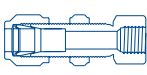
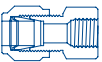
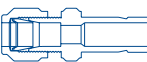
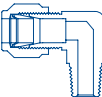
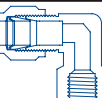
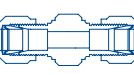
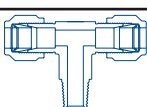
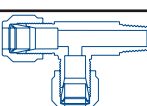
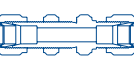
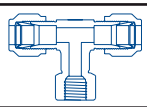
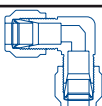
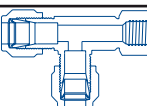
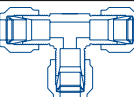
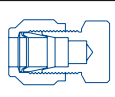
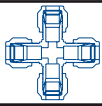
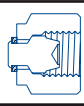
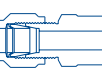
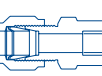
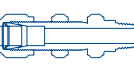
NO SUFFIX = NPT ANSI B1.20.1
K = BSPP ISO 228/1, BS 2779, DIN 3852 Form A
W = BSPP ISO 228/1, BS 2779, DIN 3852 Form B
J = BSPT ISO 7/1, BS 21, DIN 2999

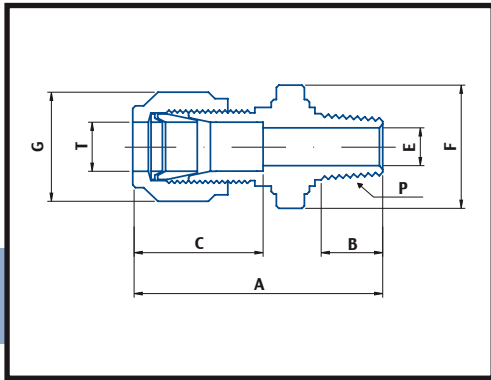
TABLE 3

FB = Connector for thermocouple
Z = Fittings cleaned for oxygen service

TABLE 2

NO SUFFIX = 316
L = 316L
O = BRASS
MO = MONEL
TI = TITANIUM
H = HASTELLOY
I = INCONEL

	MALE CONNECTOR DM	6/7		BULKHEAD FEMALE CONNECTOR DFP	23
	FEMALE CONNECTOR DF	8/9		REDUCER R	24/25
	MALE ELBOW GM	10/11		MALE ADAPTER AM	26
	FEMALE ELBOW GF	12/13		FEMALE ADAPTER AF	27
	UNION UD	14		MALE BRANCH TEE TMC	28/29
	REDUCING UNION UR	15		MALE RUN TEE TML	30/31
	BULKHEAD UNION UP	16		FEMALE BRANCH TEE TFC	32
	UNION ELBOW UG	17		FEMALE RUN TEE TFL	33
	UNION TEE UT	18		TUBE END CLOSURE TT	34
	UNION CROSS UC	19		FITTING END CLOSURE TR	35
	BUTT WELD PIPE CONNECTOR DBW	20		NUT D	36
	SOCKET WELD TUBE CONNECTOR DSW	21		FRONT FERRULE FA	37
	BULKHEAD MALE CONNECTOR DMP	22		BACK FERRULE FP	37

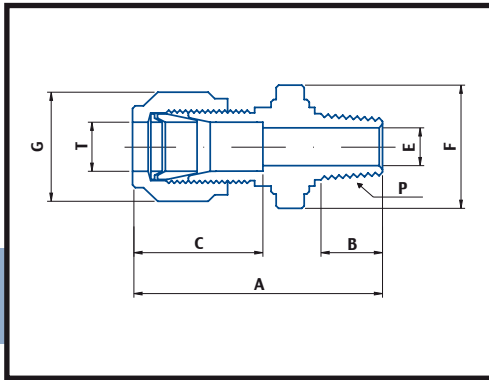


MALE CONNECTOR

DM

Metric OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	B	C	E	F	G	PART No.
3	1/8"	30.5	9.6	12.9	2.4	11	11	M - 3 - 2 - DM
3	1/4"	35.6	14.3	12.9	2.4	14	11	M - 3 - 4 - DM
6	1/8"	32.8	9.6	15.3	4.8	14	14	M - 6 - 2 - DM
6	1/4"	37.9	14.3	15.3	4.8	14	14	M - 6 - 4 - DM
6	3/8"	38.4	14.3	15.3	4.8	19	14	M - 6 - 6 - DM
6	1/2"	44.7	19.1	15.3	4.8	22	14	M - 6 - 8 - DM
8	1/8"	34.2	9.6	16.2	4.8	14	16	M - 8 - 2 - DM
8	1/4"	38.7	14.3	16.2	6.3	14	16	M - 8 - 4 - DM
8	3/8"	39.3	14.3	16.2	6.3	19	16	M - 8 - 6 - DM
8	1/2"	45.6	19.1	16.2	6.3	22	16	M - 8 - 8 - DM
10	1/8"	36.3	9.6	17.2	4.8	17	19	M - 10 - 2 - DM
10	1/4"	40.9	14.3	17.2	7.9	19	19	M - 10 - 4 - DM
10	3/8"	40.9	14.3	17.2	7.9	19	19	M - 10 - 6 - DM
10	1/2"	46.5	19.1	17.2	7.9	22	19	M - 10 - 8 - DM
12	1/4"	43.4	14.3	22.8	7.1	22	22	M - 12 - 4 - DM
12	3/8"	43.4	14.3	22.8	9.5	22	22	M - 12 - 6 - DM
12	1/2"	49.0	19.1	22.8	9.5	22	22	M - 12 - 8 - DM
12	3/4"	50.5	19.1	22.8	9.5	27	22	M - 12 - 12 - DM
12	1"	57.1	23.8	22.8	9.5	35	22	M - 12 - 16 - DM
14	1/4"	44.1	14.3	24.4	7.1	24	25	M - 14 - 4 - DM
14	3/8"	44.1	14.3	24.4	9.5	24	25	M - 14 - 6 - DM
14	1/2"	49.0	19.1	24.4	11.1	24	25	M - 14 - 8 - DM
15	1/2"	49.0	19.1	24.4	11.9	24	25	M - 15 - 8 - DM
16	3/8"	44.1	14.3	24.4	9.5	24	25	M - 16 - 6 - DM
16	1/2"	49.0	19.1	24.4	11.9	24	25	M - 16 - 8 - DM
16	3/4"	50.5	19.1	24.4	12.7	27	25	M - 16 - 12 - DM
18	1/2"	50.5	19.1	24.4	11.9	27	30	M - 18 - 8 - DM
18	3/4"	50.5	19.1	24.4	15.1	27	30	M - 18 - 12 - DM
20	1/2"	52.3	19.1	26.0	11.9	30	32	M - 20 - 8 - DM
20	3/4"	52.3	19.1	26.0	15.9	30	32	M - 20 - 12 - DM
22	3/4"	52.3	19.1	26.0	15.9	30	32	M - 22 - 12 - DM
22	1"	57.1	23.8	26.0	18.3	35	32	M - 22 - 16 - DM
25	1/2"	57.5	19.1	31.3	11.9	35	38	M - 25 - 8 - DM
25	3/4"	57.5	19.1	31.3	15.8	35	38	M - 25 - 12 - DM
25	1"	62.3	23.8	31.3	21.8	35	38	M - 25 - 16 - DM
28	1"	72.4	23.8	36.6	21.8	41	46	M - 28 - 16 - DM
28	1.1/4"	73.1	23.8	36.6	21.8	46	46	M - 28 - 20 - DM
30	1.1/4"	77.2	23.8	39.6	26.2	46	50	M - 30 - 20 - DM
32	1.1/4"	79.6	23.8	42.0	28.6	46	50	M - 32 - 20 - DM
38	1.1/2"	96.6	26.2	49.4	33.7	55	60	M - 38 - 20 - DM

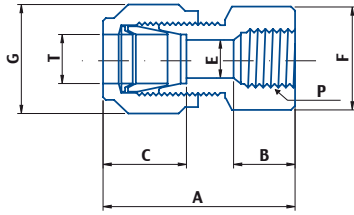


MALE CONNECTOR

DM

Inch OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	B	C	E	F	G	PART No.
1/16"	1/16"	23.9	9.6	8.6	1.3	8	8	P - 1 - 1 - DM
1/16"	1/8"	26.2	9.6	8.6	1.3	14	8	P - 1 - 2 - DM
1/8"	1/8"	30.5	9.6	12.7	2.4	11	11	P - 2 - 2 - DM
1/8"	1/4"	35.6	14.3	12.7	2.4	14	11	P - 2 - 4 - DM
1/4"	1/8"	32.8	9.6	15.3	4.8	14	14	P - 4 - 2 - DM
1/4"	1/4"	37.8	14.3	15.3	4.8	14	14	P - 4 - 4 - DM
1/4"	3/8"	38.4	14.3	15.3	4.8	19	14	P - 4 - 6 - DM
1/4"	1/2"	44.7	19.1	15.3	4.8	22	14	P - 4 - 8 - DM
5/16"	1/4"	38.6	14.3	16.3	6.3	14	16	P - 5 - 4 - DM
3/8"	1/8"	35.3	9.6	16.8	4.8	16	17	P - 6 - 2 - DM
3/8"	1/4"	39.8	14.3	16.8	7.1	16	17	P - 6 - 4 - DM
3/8"	3/8"	39.8	14.3	16.8	7.1	19	17	P - 6 - 6 - DM
3/8"	1/2"	41.2	19.1	16.8	7.1	22	17	P - 6 - 8 - DM
1/2"	1/4"	43.4	14.3	22.9	7.1	22	22	P - 8 - 4 - DM
1/2"	3/8"	43.4	14.3	22.9	9.6	22	22	P - 8 - 6 - DM
1/2"	1/2"	49.0	19.1	22.9	10.4	22	22	P - 8 - 8 - DM
1/2"	3/4"	50.5	19.1	22.9	10.4	27	22	P - 8 - 12 - DM
1/2"	1"	57.1	23.8	22.9	10.4	35	22	P - 8 - 16 - DM
5/8"	3/8"	44.2	14.3	24.4	9.6	24	25	P - 10 - 6 - DM
5/8"	1/2"	49.0	19.1	24.4	10.4	24	25	P - 10 - 8 - DM
3/4"	1/2"	50.5	19.1	24.4	10.4	27	28.5	P - 12 - 8 - DM
3/4"	3/4"	50.5	19.1	24.4	15.8	27	28.5	P - 12 - 12 - DM
3/4"	1"	57.1	23.8	24.4	15.8	35	28.5	P - 12 - 16 - DM
7/8"	3/4"	50.5	19.1	26.0	15.8	30	32	P - 14 - 12 - DM
1"	1/2"	57.4	19.1	31.2	10.4	35	38	P - 16 - 8 - DM
1"	3/4"	57.4	19.1	31.2	15.8	35	38	P - 16 - 12 - DM
1"	1"	62.2	23.8	31.2	22.3	35	38	P - 16 - 16 - DM
1.1/4"	1"	77.2	23.8	41.2	22.3	46	50	P - 20 - 16 - DM
1.1/4"	1.1/4"	77.2	23.8	41.2	27.6	46	50	P - 20 - 20 - DM
1.1/2"	1.1/2"	88.9	26.2	50.0	34.0	55	60	P - 24 - 24 - DM

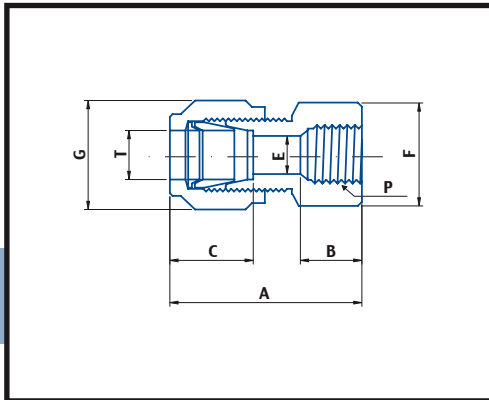


FEMALE CONNECTOR

DF

Metric OD tube x Female NPT thread

T TUBE OD	P NPT FEMALE	A	B	C	E	F	G	PART No.
3	1/8"	28.7	10.4	12.9	2.4	14	11	M - 3 - 2 - DF
3	1/4"	33.5	15.0	12.9	2.4	19	11	M - 3 - 4 - DF
6	1/8"	31.3	10.4	15.3	4.8	14	14	M - 6 - 2 - DF
6	1/4"	35.8	15.0	15.3	4.8	19	14	M - 6 - 4 - DF
6	3/8"	37.6	15.0	15.3	4.8	22	14	M - 6 - 6 - DF
6	1/2"	42.5	19.8	15.3	4.8	27	14	M - 6 - 8 - DF
8	1/8"	32.1	10.4	16.2	6.3	14	16	M - 8 - 2 - DF
8	1/4"	37.0	15.0	16.2	6.3	19	16	M - 8 - 4 - DF
8	3/8"	38.5	15.0	16.2	6.3	22	16	M - 8 - 6 - DF
8	1/2"	43.3	19.8	16.2	6.3	27	16	M - 8 - 8 - DF
10	1/4"	37.8	15.0	17.2	7.9	19	19	M - 10 - 4 - DF
10	3/8"	39.4	15.0	17.2	7.9	22	19	M - 10 - 6 - DF
10	1/2"	44.2	19.8	17.2	7.9	27	19	M - 10 - 8 - DF
12	1/4"	40.3	15.0	22.8	9.5	22	22	M - 12 - 4 - DF
12	3/8"	41.9	15.0	22.8	9.5	22	22	M - 12 - 6 - DF
12	1/2"	46.7	19.8	22.8	9.5	27	22	M - 12 - 8 - DF
15	1/2"	46.7	19.8	24.4	11.9	27	25	M - 15 - 8 - DF
16	1/2"	46.9	19.8	24.4	12.7	27	25	M - 16 - 8 - DF
20	1/2"	47.9	19.8	26.0	15.9	30	32	M - 20 - 8 - DF
20	3/4"	49.7	20.6	26.0	15.9	35	32	M - 20 - 12 - DF
22	3/4"	49.7	20.6	26.0	18.3	35	32	M - 22 - 12 - DF
22	1"	57.9	25.4	26.0	18.3	41	32	M - 22 - 16 - DF
25	3/4"	53.4	20.6	31.3	21.8	35	38	M - 25 - 12 - DF
25	1"	62.3	25.4	31.3	21.8	41	38	M - 25 - 16 - DF
32	1.1/4"	74.6	25.4	42.0	27.6	55	50	M - 32 - 20 - DF
38	1.1/2"	83.3	27.6	49.4	34.0	60	60	M - 38 - 24 - DF

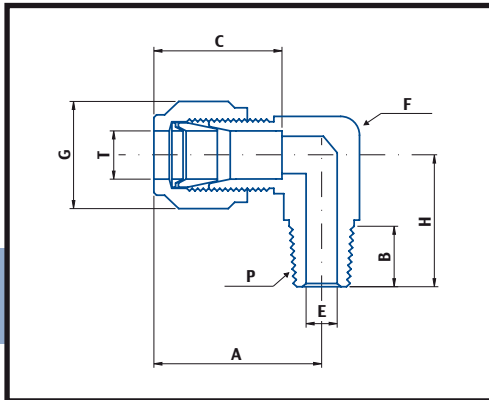


FEMALE CONNECTOR

DF

Inch OD tube x Female NPT thread

T TUBE OD	P NPT FEMALE	A	B	C	E	F	G	PART No.
1/16"	1/16"	23.6	9.9	8.6	1.3	11	8	P - 1 - 1 - DF
1/16"	1/8"	24.4	10.4	8.6	1.3	14	8	P - 1 - 2 - DF
1/8"	1/8"	28.7	10.4	12.7	2.4	14	11	P - 2 - 2 - DF
1/8"	1/4"	33.6	15.0	12.7	2.4	19	11	P - 2 - 4 - DF
1/4"	1/8"	31.2	9.9	15.3	4.8	14	14	P - 4 - 2 - DF
1/4"	1/4"	35.8	15.0	15.3	4.8	19	14	P - 4 - 4 - DF
1/4"	3/8"	37.6	15.0	15.3	4.8	22	14	P - 4 - 6 - DF
1/4"	1/2"	42.4	19.8	15.3	4.8	27	14	P - 4 - 8 - DF
5/16"	1/8"	32.0	10.4	16.3	6.3	14	16	P - 5 - 2 - DF
5/16"	1/4"	36.8	15.0	16.3	6.3	19	16	P - 5 - 4 - DF
3/8"	1/8"	32.8	10.4	16.8	7.1	16	17	P - 6 - 2 - DF
3/8"	1/4"	37.6	15.0	16.8	7.1	19	17	P - 6 - 4 - DF
3/8"	3/8"	39.1	15.0	16.8	7.1	22	17	P - 6 - 6 - DF
3/8"	1/2"	43.9	19.8	16.8	7.1	27	17	P - 6 - 8 - DF
1/2"	1/4"	40.4	15.0	22.9	10.4	22	22	P - 8 - 4 - DF
1/2"	3/8"	41.9	15.0	22.9	10.4	22	22	P - 8 - 6 - DF
1/2"	1/2"	46.7	19.8	22.9	10.4	27	22	P - 8 - 8 - DF
1/2"	3/4"	48.3	20.6	22.9	10.4	32	22	P - 8 - 12 - DF
5/8"	3/8"	41.9	15.0	24.4	12.7	24	25	P - 10 - 6 - DF
5/8"	1/2"	46.7	19.8	24.4	12.7	27	25	P - 10 - 8 - DF
3/4"	1/2"	46.7	19.8	24.4	15.8	27	28.5	P - 12 - 8 - DF
3/4"	3/4"	48.3	20.6	24.4	15.8	32	28.5	P - 12 - 12 - DF
7/8"	3/4"	49.8	20.6	25.9	18.3	35	32	P - 14 - 12 - DF
1"	3/4"	53.4	20.6	31.2	22.3	35	38	P - 16 - 12 - DF
1"	1"	62.3	25.4	31.2	22.3	41	38	P - 16 - 16 - DF
1.1/4"	1.1/4"	74.6	25.4	41.2	27.6	55	50	P - 20 - 20 - DF
1.1/2"	1.1/2"	83.3	27.6	50.0	34.0	60	60	P - 24 - 24 - DF

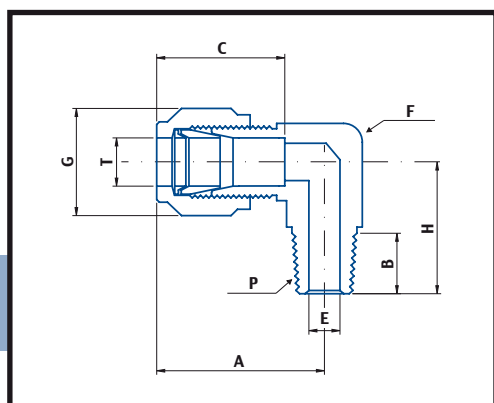


MALE ELBOW

GM

Metric OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	B	C	E	F	G	H	PART No.
3	1/8"	23.6	9.6	12.9	2.4	11	11	17.8	M - 3 - 2 - GM
3	1/4"	24.6	14.3	12.9	2.4	14	11	23.4	M - 3 - 4 - GM
6	1/8"	27.0	9.6	15.3	4.8	14	14	18.8	M - 6 - 2 - GM
6	1/4"	27.0	14.3	15.3	4.8	14	14	23.4	M - 6 - 4 - GM
6	3/8"	29.8	14.3	15.3	4.8	17	14	26.2	M - 6 - 6 - GM
6	1/2"	31.8	19.1	15.3	4.8	22	14	33.0	M - 6 - 8 - GM
8	1/8"	28.8	9.6	16.2	4.8	14	16	19.8	M - 8 - 2 - GM
8	1/4"	28.8	14.3	16.2	6.3	14	16	24.4	M - 8 - 4 - GM
8	3/8"	30.6	14.3	16.2	6.3	17	16	26.2	M - 8 - 6 - GM
8	1/2"	32.6	19.1	16.2	6.3	22	16	33.0	M - 8 - 8 - GM
10	1/8"	31.5	9.6	17.2	4.8	17	19	21.6	M - 10 - 2 - GM
10	1/4"	31.5	14.3	17.2	7.1	17	19	26.2	M - 10 - 4 - GM
10	3/8"	31.5	14.3	17.2	7.9	17	19	26.2	M - 10 - 6 - GM
10	1/2"	33.5	19.1	17.2	7.9	22	19	33.0	M - 10 - 8 - GM
12	1/4"	36.0	14.3	22.8	7.1	22	22	26.2	M - 12 - 4 - GM
12	3/8"	36.0	14.3	22.8	9.5	22	22	28.2	M - 12 - 6 - GM
12	1/2"	36.0	19.1	22.8	9.5	22	22	33.0	M - 12 - 8 - GM
12	3/4"	39.8	19.1	22.8	9.5	27	22	36.8	M - 12 - 12 - GM
15	1/2"	38.0	19.1	24.4	11.9	24	25	35.1	M - 15 - 8 - GM
16	1/2"	38.0	19.1	24.4	11.9	24	25	35.1	M - 16 - 8 - GM
16	3/4"	39.8	19.1	24.4	12.7	27	25	36.8	M - 16 - 12 - GM
18	1/2"	39.8	19.1	24.4	11.9	27	30	36.8	M - 18 - 8 - GM
18	3/4"	39.8	19.1	24.4	15.1	27	30	36.8	M - 18 - 12 - GM
20	1/2"	44.6	19.1	26.0	11.9	35	32	41.7	M - 20 - 8 - GM
20	3/4"	44.6	19.1	26.0	15.9	35	32	41.7	M - 20 - 12 - GM
22	3/4"	44.6	19.1	26.0	15.9	35	32	41.7	M - 22 - 12 - GM
22	1"	44.6	23.8	26.0	18.3	35	32	46.5	M - 22 - 16 - GM
25	3/4"	49.1	19.1	31.3	15.8	35	38	41.7	M - 25 - 12 - GM
25	1"	49.1	23.8	31.3	21.8	35	38	46.5	M - 25 - 16 - GM
30	1.1/4"	69.9	23.8	39.6	26.2	45	50	53.1	M - 30 - 20 - GM
32	1.1/4"	72.3	23.8	42.0	27.6	45	50	53.1	M - 32 - 20 - GM
38	1.1/2"	84.0	26.2	49.4	33.7	55	60	60.4	M - 38 - 24 - GM

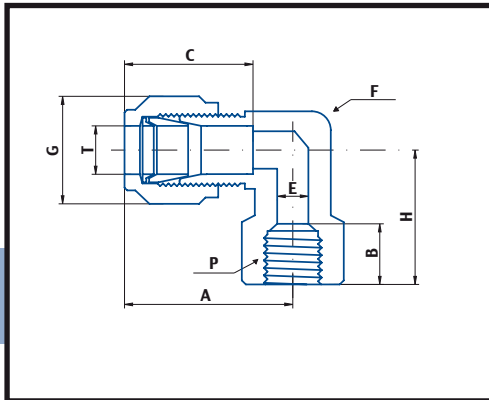


MALE ELBOW

GM

Inch OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	B	C	E	F	G	H	PART No.
1/16"	1/16"	19.0	9.6	8.6	1.3	11	8	17.8	P - 1 - 1 - GM
1/16"	1/8"	19.0	9.6	8.6	1.3	11	8	17.8	P - 1 - 2 - GM
1/8"	1/8"	23.6	9.6	12.7	2.4	11	11	17.8	P - 2 - 2 - GM
1/8"	1/4"	24.6	14.3	12.7	2.4	14	11	23.4	P - 2 - 4 - GM
1/4"	1/8"	26.9	9.6	15.3	4.8	14	14	18.8	P - 4 - 2 - GM
1/4"	1/4"	26.9	14.3	15.3	4.8	14	14	23.4	P - 4 - 4 - GM
1/4"	3/8"	29.7	14.3	15.3	4.8	17	14	26.2	P - 4 - 6 - GM
1/4"	1/2"	31.8	19.1	15.3	4.8	22	14	33.0	P - 4 - 8 - GM
5/16"	1/4"	28.7	9.6	16.3	6.3	14	16	24.4	P - 5 - 4 - GM
3/8"	1/8"	30.5	9.6	16.8	4.8	14	17	20.9	P - 6 - 2 - GM
3/8"	1/4"	30.5	14.3	16.8	7.1	17	17	25.4	P - 6 - 4 - GM
3/8"	3/8"	31.2	14.3	16.8	7.1	17	17	26.2	P - 6 - 6 - GM
3/8"	1/2"	33.3	19.1	16.8	7.1	22	17	33.0	P - 6 - 8 - GM
1/2"	1/4"	36.0	14.3	22.9	4.8	22	22	28.2	P - 8 - 4 - GM
1/2"	3/8"	36.0	14.3	22.9	9.6	22	22	28.2	P - 8 - 6 - GM
1/2"	1/2"	36.0	19.1	22.9	10.4	22	22	33.0	P - 8 - 8 - GM
1/2"	3/4"	39.9	19.1	22.9	10.4	27	22	36.8	P - 8 - 12 - GM
5/8"	1/2"	38.1	19.1	24.4	11.9	24	25	35.0	P - 10 - 8 - GM
3/4"	1/2"	39.9	19.1	24.4	11.9	27	28.5	36.8	P - 12 - 8 - GM
3/4"	3/4"	39.9	19.1	24.4	15.8	27	28.5	36.8	P - 12 - 12 - GM
7/8"	3/4"	44.7	19.1	25.9	15.8	35	32	41.6	P - 14 - 12 - GM
1"	3/4"	49.0	19.1	31.2	15.8	35	38	41.6	P - 16 - 12 - GM
1"	1"	49.0	23.8	31.2	22.3	35	38	46.5	P - 16 - 16 - GM
1.1/4"	1.1/4"	66.5	23.8	41.2	27.6	46	50	47.8	P - 20 - 20 - GM
1.1/2"	1.1/2"	78.0	26.2	50.0	34.0	55	60	60.4	P - 24 - 24 - GM

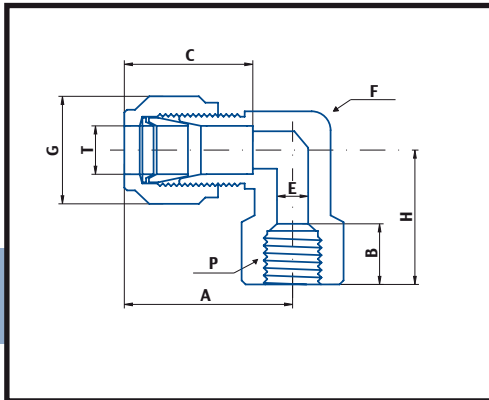


FEMALE ELBOW

GF

Metric OD tube x Female NPT thread

T TUBE OD	P NPT FEMALE	A	B	C	E	F	G	H	PART No.
3	1/8"	24.6	10.4	12.9	2.4	14	11	19.0	M - 3 - 2 - GF
3	1/4"	27.4	15.0	12.9	2.4	19	11	22.4	M - 3 - 4 - GF
6	1/8"	27.0	10.4	15.3	4.8	14	14	19.0	M - 6 - 2 - GF
6	1/4"	29.8	15.0	15.3	4.8	19	14	22.4	M - 6 - 4 - GF
6	1/2"	34.6	19.8	15.3	4.8	27	14	28.5	M - 6 - 8 - GF
8	1/4"	30.6	15.0	16.2	6.3	19	16	22.4	M - 8 - 4 - GF
8	3/8"	32.6	15.0	16.2	6.3	22	16	22.4	M - 8 - 6 - GF
10	1/4"	33.5	15.0	17.2	7.9	19	19	22.4	M - 10 - 4 - GF
10	3/8"	33.5	15.0	17.2	7.9	22	19	22.4	M - 10 - 6 - GF
12	1/4"	36.0	15.0	22.8	9.5	22	22	22.4	M - 12 - 4 - GF
12	3/8"	36.0	15.0	22.8	9.5	22	22	22.4	M - 12 - 6 - GF
12	1/2"	38.8	19.8	22.8	9.5	27	22	28.5	M - 12 - 8 - GF
16	1/2"	39.5	19.8	24.4	12.7	27	25	28.5	M - 16 - 8 - GF
25	3/4"	49.0	20.6	31.3	22.3	35	38	31.8	M - 25 - 12 - GF
25	1"	53.6	25.4	31.3	22.3	41	38	38.1	M - 25 - 16 - GF

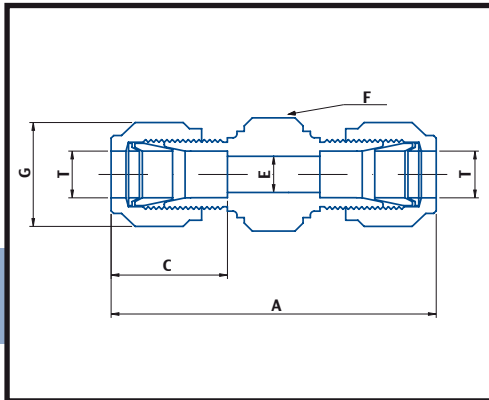


FEMALE ELBOW

GF

Inch OD tube x Female NPT thread

T TUBE OD	P NPT FEMALE	A	B	C	E	F	G	H	PART No.
1/8"	1/8"	24.6	10.4	12.7	2.4	14	11	19.0	P - 2 - 2 - GF
1/8"	1/4"	27.4	15.0	12.7	2.4	19	11	22.4	P - 2 - 4 - GF
1/4"	1/8"	26.9	10.4	15.3	4.8	14	14	19.0	P - 4 - 2 - GF
1/4"	1/4"	29.7	15.0	15.3	4.8	19	14	22.4	P - 4 - 4 - GF
1/4"	3/8"	31.8	15.0	15.3	4.8	22	14	22.4	P - 4 - 6 - GF
1/4"	1/2"	34.6	19.8	15.3	4.8	27	14	28.5	P - 4 - 8 - GF
5/16"	1/8"	28.7	10.4	16.3	6.3	19	16	19.1	P - 5 - 2 - GF
5/16"	1/4"	30.5	15.0	16.3	6.3	22	16	22.4	P - 5 - 4 - GF
3/8"	1/8"	30.5	10.4	16.8	7.1	17	17	19.1	P - 6 - 2 - GF
3/8"	1/4"	31.2	15.0	16.8	7.1	19	17	22.4	P - 6 - 4 - GF
3/8"	3/8"	33.3	15.0	16.8	7.1	22	17	22.4	P - 6 - 6 - GF
3/8"	1/2"	36.0	19.8	16.8	7.1	27	17	28.5	P - 6 - 8 - GF
1/2"	1/4"	36.0	15.0	22.9	7.1	22	22	22.4	P - 8 - 4 - GF
1/2"	3/8"	36.0	15.0	22.9	10.4	22	22	22.4	P - 8 - 6 - GF
1/2"	1/2"	38.9	19.8	22.9	10.4	27	22	28.5	P - 8 - 8 - GF
5/8"	3/8"	38.1	15.0	24.4	12.7	24	25	22.4	P - 10 - 6 - GF
5/8"	1/2"	39.9	19.8	24.4	12.7	27	25	28.5	P - 10 - 8 - GF
3/4"	1/2"	39.9	19.8	24.4	15.8	27	28.5	28.5	P - 12 - 8 - GF
3/4"	3/4"	44.7	20.6	24.4	15.8	35	28.5	31.8	P - 12 - 12 - GF
7/8"	3/4"	44.7	20.6	25.9	18.2	35	32	31.8	P - 14 - 12 - GF
1"	3/4"	49.0	20.6	31.2	22.3	35	38	31.8	P - 16 - 12 - GF
1"	1"	53.6	25.4	31.2	22.3	41	38	38.1	P - 16 - 16 - GF



UNION

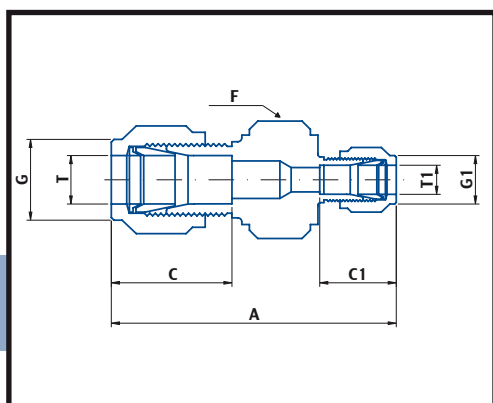
UD

Metric OD tubes

T TUBE OD	A	C	E	F	G	PART No.
3	35.3	12.9	2.4	11	11	M - 3 - UD
6	41.0	15.3	4.8	14	14	M - 6 - UD
8	43.2	16.2	6.3	16	16	M - 8 - UD
10	46.2	17.2	7.9	17	19	M - 10 - UD
12	51.2	22.8	9.5	22	22	M - 12 - UD
14	52.0	24.4	11.1	24	25	M - 14 - UD
15	52.0	24.4	11.9	24	25	M - 15 - UD
16	52.0	24.4	12.7	24	25	M - 16 - UD
18	53.5	24.4	15.1	27	30	M - 18 - UD
20	55.0	26.0	15.9	30	32	M - 20 - UD
22	55.0	26.0	18.3	30	32	M - 22 - UD
25	65.0	31.3	21.8	35	38	M - 25 - UD
28	85.0	36.6	21.8	41	46	M - 28 - UD
30	92.7	39.6	26.2	46	50	M - 30 - UD
32	97.3	42.0	28.6	46	50	M - 32 - UD
38	113.6	49.4	33.7	55	60	M - 38 - UD

Inch OD tubes

T TUBE OD	A	C	E	F	G	PART No.
1/16"	25.1	8.6	1.3	8	8	P - 1 - UD
1/8"	35.6	12.7	2.4	11	11	P - 2 - UD
1/4"	40.9	15.3	4.8	14	14	P - 4 - UD
5/16"	42.9	16.3	6.3	14	16	P - 5 - UD
3/8"	45.0	16.8	7.1	16	17	P - 6 - UD
1/2"	51.3	22.9	10.4	22	22	P - 8 - UD
5/8"	52.0	24.4	12.7	24	25	P - 10 - UD
3/4"	53.6	24.4	15.8	27	28.5	P - 12 - UD
7/8"	55.2	25.9	18.2	30	32	P - 14 - UD
1"	64.8	31.2	22.3	35	38	P - 16 - UD
1.1/4"	92.2	41.2	27.6	46	50	P - 20 - UD
1.1/2"	108.0	50.0	34.0	55	60	P - 24 - UD



REDUCING UNION

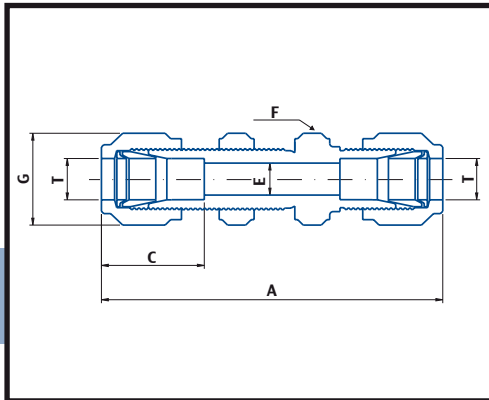
UR

Metric OD tubes

T TUBE OD	T1 TUBE OD	A	C	C1	F	G	G1	PART No.
6	3	38.6	15.3	12.9	14	14	11	M - 6 - 3 - UR
8	6	42.3	16.2	15.3	14	16	14	M - 8 - 6 - UR
10	6	44.5	17.2	15.3	17	19	14	M - 10 - 6 - UR
10	8	45.1	17.2	16.2	17	19	16	M - 10 - 8 - UR
12	6	47.0	22.8	15.3	22	22	14	M - 12 - 6 - UR
12	8	47.8	22.8	16.2	22	22	16	M - 12 - 8 - UR
12	10	48.7	22.8	17.2	22	22	19	M - 12 - 10 - UR
16	10	49.5	24.4	17.2	24	25	19	M - 16 - 10 - UR
16	12	52.0	24.4	22.8	24	25	22	M - 16 - 12 - UR
22	18	55.0	26.0	24.4	30	32	30	M - 22 - 18 - UR
22	20	55.0	26.0	26.6	30	32	32	M - 22 - 20 - UR
25	12	65.0	31.3	22.8	35	38	22	M - 25 - 12 - UR
25	20	65.0	31.3	26.0	35	38	32	M - 25 - 20 - UR
30	20	75.4	39.6	26.0	45	50	32	M - 30 - 20 - UR
30	25	80.1	39.6	31.3	45	50	38	M - 30 - 25 - UR
32	20	77.8	42.0	26.0	45	50	32	M - 32 - 20 - UR
32	25	82.3	42.0	31.3	45	50	38	M - 32 - 25 - UR
38	20	92.0	49.4	31.3	55	60	38	M - 38 - 20 - UR
38	25	104.6	49.4	39.6	55	60	50	M - 38 - 25 - UR

Inch OD tubes

T TUBE OD	T1 TUBE OD	A	C	C1	F	G	G1	PART No.
1/4"	1/8"	38.6	15.3	12.7	14	14	11	P - 4 - 2 - UR
5/16"	1/8"	39.6	16.3	12.7	14	16	11	P - 5 - 2 - UR
5/16"	1/4"	42.2	16.3	15.3	14	16	14	P - 5 - 4 - UR
3/8"	1/8"	40.9	16.8	12.7	16	17	11	P - 6 - 2 - UR
3/8"	1/4"	43.2	16.8	15.3	16	17	14	P - 6 - 4 - UR
1/2"	1/8"	45.2	22.9	12.7	22	22	11	P - 8 - 2 - UR
1/2"	1/4"	47.0	22.9	15.3	22	22	14	P - 8 - 4 - UR
1/2"	3/8"	48.5	22.9	16.8	22	22	17	P - 8 - 6 - UR
5/8"	3/8"	49.3	24.4	16.8	24	25	17	P - 10 - 6 - UR
5/8"	1/2"	52.0	24.4	22.9	24	25	22	P - 10 - 8 - UR
3/4"	1/4"	49.3	24.4	15.3	27	28.5	14	P - 12 - 4 - UR
3/4"	3/8"	50.8	24.4	16.8	27	28.5	17	P - 12 - 6 - UR
3/4"	1/2"	53.6	24.4	22.9	27	28.5	22	P - 12 - 8 - UR
1"	1/2"	60.5	31.2	22.9	35	38	22	P - 16 - 8 - UR
1"	3/4"	60.5	31.2	24.4	35	38	28.5	P - 16 - 12 - UR
1.1/4"	1"	92.2	41.2	31.2	45	50	38	P - 20 - 16 - UR
1.1/2"	1.1/4"	60.5	31.2	24.4	35	38	50	P - 24 - 20 - UR



BULKHEAD UNION

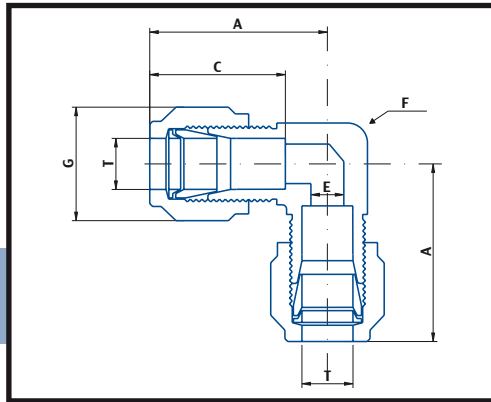
UP

Metric OD tubes

T TUBE OD	A	C	E	F	G	Panel Hole Drill Size	Max. Panel Thickness	PART No.
3	51.3	12.9	2.4	14	11	8.3	12.7	M - 3 - UP
6	57.7	15.3	4.8	16	14	11.5	10.2	M - 6 - UP
8	61.0	16.2	6.3	17	16	13.1	11.2	M - 8 - UP
10	63.7	17.2	7.9	22	19	16.3	11.2	M - 10 - UP
12	71.0	22.8	9.5	24	22	19.5	12.7	M - 12 - UP
14	72.5	24.4	11.1	27	25	22.5	12.7	M - 14 - UP
15	72.5	24.4	11.9	27	25	22.8	12.7	M - 15 - UP
16	72.5	24.4	12.7	27	25	22.8	12.7	M - 16 - UP
18	78.9	24.4	15.1	30	30	26.0	16.8	M - 18 - UP
20	84.5	26.0	15.8	35	32	29.0	19.0	M - 20 - UP
25	95.6	31.2	22.3	35	38	33.7	19.0	M - 25 - UP
30	123.7	39.6	26.2	50	46	40.5	19.0	M - 30 - UP
32	128.3	42.0	27.6	50	50	42.5	19.0	M - 32 - UP
38	144.6	49.4	33.7	60	60	50.5	19.0	M - 38 - UP

Inch OD tubes

T TUBE OD	A	C	E	F	G	Panel Hole Drill Size	Max. Panel Thickness	PART No.
1/16"	31.5	8.6	1.3	11	8	5.2	3.0	P - 1 - UP
1/8"	51.3	12.7	2.4	11	11	8.3	12.7	P - 2 - UP
1/4"	57.6	15.3	4.8	16	14	11.5	10.2	P - 4 - UP
5/16"	60.7	16.3	6.3	17	16	13.0	11.2	P - 5 - UP
3/8"	62.2	16.8	7.1	22	17	14.6	11.2	P - 6 - UP
1/2"	71.1	22.9	10.4	24	22	19.5	12.7	P - 8 - UP
5/8"	72.6	24.4	12.7	27	25	22.6	12.7	P - 10 - UP
3/4"	79.0	24.4	16.0	30	28.5	25.8	16.8	P - 12 - UP
1"	95.6	31.2	22.3	35	38	33.7	19.0	P - 16 - UP
1.1/4"	123.2	41.2	27.6	50	50	41.6	19.0	P - 20 - UP
1.1/2"	139.2	50.0	34.0	60	60	49.6	19.0	P - 24 - UP



UNION ELBOW

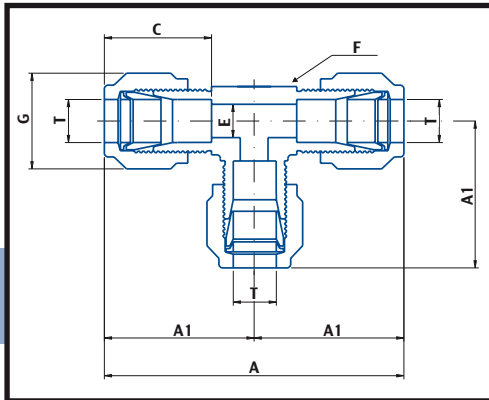
UG

Metric OD tube

T TUBE OD	A	C	E	F	G	PART No.
3	22.3	12.9	2.4	11	11	M - 3 - UG
6	27.0	15.3	4.8	14	14	M - 6 - UG
8	28.8	16.2	6.3	16	16	M - 8 - UG
10	31.5	17.2	7.9	17	19	M - 10 - UG
12	36.0	22.8	9.5	22	22	M - 12 - UG
14	38.0	24.4	11.1	24	25	M - 14 - UG
15	38.0	24.4	11.9	24	25	M - 15 - UG
16	38.0	24.4	12.7	24	25	M - 16 - UG
18	39.8	24.4	15.1	27	30	M - 18 - UG
20	44.6	26.0	15.9	32	32	M - 20 - UG
22	44.6	26.0	18.3	32	32	M - 22 - UG
25	49.1	31.2	21.8	35	38	M - 25 - UG
28	64.0	36.6	21.8	41	46	M - 28 - UG
30	69.9	39.6	26.2	46	50	M - 30 - UG
32	72.3	42.0	28.6	46	50	M - 32 - UG
38	84.0	49.4	33.7	55	60	M - 38 - UG

Inch OD tube

T TUBE OD	A	C	E	F	G	PART No.
1/16"	17.8	8.6	1.3	11	8	P - 1 - UG
1/8"	22.4	12.7	2.4	11	11	P - 2 - UG
1/4"	26.9	15.3	4.8	14	14	P - 4 - UG
5/16"	28.7	16.3	6.3	16	16	P - 5 - UG
3/8"	30.5	16.8	7.1	17	17	P - 6 - UG
1/2"	36.0	22.9	10.4	22	22	P - 8 - UG
5/8"	38.1	24.4	12.7	24	25	P - 10 - UG
3/4"	39.9	24.4	15.8	27	28.5	P - 12 - UG
7/8"	44.7	25.9	18.2	35	32	P - 14 - UG
1"	49.0	31.2	22.3	35	38	P - 16 - UG
1.1/4"	66.6	41.2	27.6	46	50	P - 20 - UG
1.1/2"	78.0	50.0	34.0	55	60	P - 24 - UG



UNION TEE

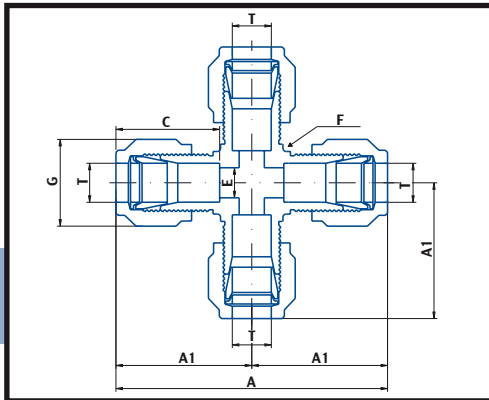
UT

Metric OD tube

T TUBE OD	A	A1	C	E	F	G	PART No.
3	44.6	22.3	12.9	2.4	11	11	M - 3 - UT
6	54.0	27.0	15.3	4.8	14	14	M - 6 - UT
8	57.6	28.8	16.2	6.3	16	16	M - 8 - UT
10	63.0	31.5	17.2	7.9	17	19	M - 10 - UT
12	72.0	36.0	22.8	9.5	22	22	M - 12 - UT
14	76.0	38.0	24.4	11.1	24	25	M - 14 - UT
15	76.0	38.0	24.4	11.9	24	25	M - 15 - UT
16	76.0	38.0	24.4	12.7	24	25	M - 16 - UT
18	79.6	39.8	24.4	15.1	27	30	M - 18 - UT
20	89.2	44.6	26.0	15.9	32	32	M - 20 - UT
22	89.2	44.6	26.0	18.3	32	32	M - 22 - UT
25	98.2	49.1	31.2	21.8	35	38	M - 25 - UT
28	128.0	64.0	36.6	21.8	41	46	M - 28 - UT
30	139.8	69.9	39.6	26.2	46	50	M - 30 - UT
32	144.6	72.3	42.0	28.6	46	50	M - 32 - UT
38	168.0	84.0	49.4	33.7	55	60	M - 38 - UT

Inch OD tube

T TUBE OD	A	A1	C	E	F	G	PART No.
1/16"	35.6	17.8	8.6	1.3	11	8	P - 1 - UT
1/8"	44.8	22.4	12.7	2.4	11	11	P - 2 - UT
1/4"	53.8	26.9	15.3	4.8	14	14	P - 4 - UT
5/16"	57.4	28.7	16.3	6.3	16	16	P - 5 - UT
3/8"	61.0	30.5	16.8	7.1	17	17	P - 6 - UT
1/2"	72.0	36.0	22.9	10.4	22	22	P - 8 - UT
5/8"	76.2	38.1	24.4	12.7	24	25	P - 10 - UT
3/4"	79.8	39.9	24.4	15.8	27	28.5	P - 12 - UT
7/8"	89.4	44.7	25.9	18.2	35	32	P - 14 - UT
1"	98.0	49.0	31.2	22.3	35	38	P - 16 - UT
1.1/4"	133.2	66.6	41.2	27.6	46	50	P - 20 - UT
1.1/2"	156.0	78.0	50.0	34.0	55	60	P - 24 - UT



UNION CROSS

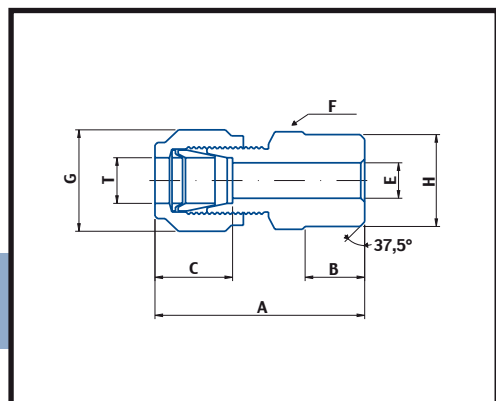
UC

Metric OD tube

T TUBE OD	A	A1	C	E	F	G	PART No.
3	44.6	22.3	12.9	2.4	11	11	M - 3 - UC
6	54.0	27.0	15.3	4.8	14	14	M - 6 - UC
8	57.6	28.8	16.2	6.3	16	16	M - 8 - UC
10	63.0	31.5	17.2	7.9	17	19	M - 10 - UC
12	72.0	36.0	22.8	9.5	22	22	M - 12 - UC
16	76.0	38.0	24.4	12.7	24	25	M - 16 - UC
22	89.2	44.6	26.0	18.3	32	32	M - 22 - UC
25	98.2	49.1	31.2	21.8	35	38	M - 25 - UC

Inch OD tube

T TUBE OD	A	A1	C	E	F	G	PART No.
1/8"	44.8	22.4	12.7	2.4	11	11	P - 2 - UC
1/4"	53.8	26.9	15.3	4.8	14	14	P - 4 - UC
3/8"	61.0	30.5	16.8	7.1	17	17	P - 6 - UC
1/2"	72.0	36.0	22.9	10.4	22	22	P - 8 - UC
3/4"	79.8	39.9	24.4	15.8	27	28.5	P - 12 - UC
1"	98.0	49.0	31.2	22.3	35	38	P - 16 - UC



BUTT WELD PIPE CONNECTOR

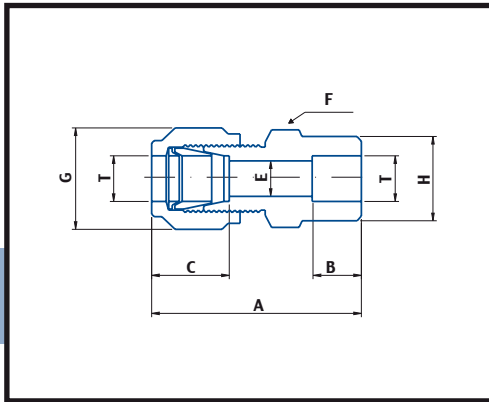
DBW

Metric OD tube x ANSI B 36.19 Pipe

T TUBE OD	PIPE WELD MALE	A	B	C	E	F	G	H	PART No.
3	1/8"	30.5	9.6	12.9	2.4	11	11	10.3	M - 3 - 2 - DBW
6	1/8"	32.8	9.6	15.3	4.8	14	14	10.3	M - 6 - 2 - DBW
6	1/4"	37.9	14.3	15.3	4.8	14	14	13.7	M - 6 - 4 - DBW
8	1/8"	34.2	9.6	16.3	5.1	16	16	10.3	M - 8 - 2 - DBW
8	1/4"	38.7	14.3	16.3	6.3	16	16	13.7	M - 8 - 4 - DBW
8	1/2"	45.6	19.1	16.3	6.3	22	16	21.3	M - 8 - 8 - DBW
10	1/4"	40.9	14.3	17.2	7.1	19	19	13.7	M - 10 - 4 - DBW
10	3/8"	40.9	14.3	17.2	7.9	19	19	17.2	M - 10 - 6 - DBW
10	1/2"	46.5	19.1	17.2	7.9	22	19	21.3	M - 10 - 8 - DBW
12	1/4"	43.4	14.3	22.9	7.1	22	22	13.7	M - 12 - 4 - DBW
12	3/8"	43.4	14.3	22.9	9.5	22	22	17.2	M - 12 - 6 - DBW
12	1/2"	49.0	19.1	22.9	9.5	22	22	21.3	M - 12 - 8 - DBW
16	1/2"	49.0	19.1	24.4	12.7	24	25	21.3	M - 16 - 8 - DBW
20	3/4"	52.3	19.1	26.0	15.9	30	32	26.7	M - 20 - 12 - DBW
22	3/4"	52.3	19.1	26.0	15.9	30	32	26.7	M - 22 - 12 - DBW
25	1"	62.3	23.8	31.2	21.8	35	38	33.4	M - 25 - 16 - DBW
30	1.1/4"	77.2	23.8	39.6	26.2	45	50	42.2	M - 30 - 20 - DBW
32	1.1/4"	79.6	23.8	42.0	28.6	45	50	42.2	M - 32 - 20 - DBW
38	1.1/2"	91.6	26.2	49.4	33.7	55	60	48.3	M - 38 - 24 - DBW

Inch OD tube x ANSI B 36.19 Pipe

T TUBE OD	PIPE WELD MALE	A	B	C	E	F	G	H	PART No.
1/8"	1/8"	30.5	9.6	12.7	2.4	11	11	10.3	P - 2 - 2 - DBW
1/4"	1/8"	32.8	9.6	15.3	4.8	14	14	10.3	P - 4 - 2 - DBW
1/4"	1/4"	37.8	14.3	15.3	4.8	14	14	13.7	P - 4 - 4 - DBW
5/16"	1/8"	34.0	9.6	16.3	5.1	14	16	10.3	P - 5 - 2 - DBW
5/16"	1/4"	38.6	14.3	16.3	6.3	16	16	13.7	P - 5 - 4 - DBW
3/8"	1/4"	39.9	14.3	16.8	7.1	16	17	13.7	P - 6 - 4 - DBW
3/8"	3/8"	39.9	14.3	16.8	7.1	17	17	17.2	P - 6 - 6 - DBW
3/8"	1/2"	46.3	19.1	16.8	7.1	22	17	21.3	P - 6 - 8 - DBW
1/2"	3/8"	43.4	14.3	22.9	10.4	22	22	17.2	P - 8 - 6 - DBW
1/2"	1/2"	49.0	19.1	22.9	10.4	22	22	21.3	P - 8 - 8 - DBW
1/2"	3/4"	50.5	19.1	22.9	10.4	27	22	26.7	P - 8 - 12 - DBW
5/8"	1/2"	49.0	19.1	24.4	12.7	24	25	21.3	P - 10 - 8 - DBW
3/4"	3/4"	50.5	19.1	24.4	15.8	27	28.5	26.7	P - 12 - 12 - DBW
1"	1"	62.2	23.8	31.2	22.3	35	38	33.4	P - 16 - 16 - DBW
1.1/4"	1.1/4"	77.2	23.8	41.2	27.6	46	50	42.2	P - 20 - 20 - DBW
1.1/2"	1.1/2"	88.9	26.2	50.0	34	55	60	48.3	P - 24 - 24 - DBW



SOCKET WELD TUBE CONNECTOR

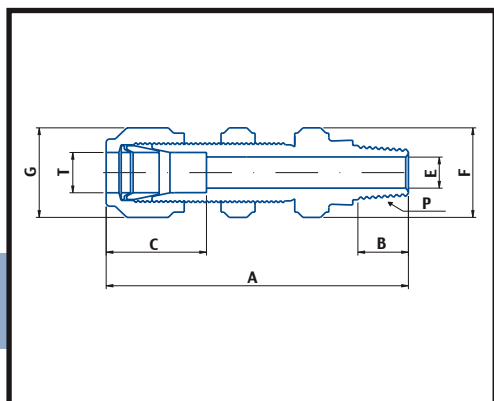
DSW

Metric OD tube

T TUBE OD	A	B	C	E	F	G	H	PART No.
3	29.0	6.4	12.9	2.4	11	11	22.9	M - 3 - 3 - DSW
6	33.5	7.9	15.3	4.8	14	14	26.2	M - 6 - 6 - DSW
10	37.6	9.6	17.2	7.1	16	19	30.3	M - 10 - 10 - DSW
12	41.2	12.7	22.8	10.4	22	22	31.0	M - 12 - 12 - DSW
20	43.4	14.3	26.0	15.8	27	32	33.3	M - 20 - 20 - DSW
25	52.6	19.1	31.3	22.3	35	38	40.4	M - 25 - 25 - DSW
32	72.4	19.1	42.0	27.6	45	50	50.3	M - 32 - 32 - DSW
38	81.8	23.8	49.4	34.0	55	60	54.6	M - 38 - 38 - DSW

Inch OD tube

T TUBE OD	A	B	C	E	F	G	H	PART No.
1/8"	29.0	6.4	12.7	2.4	11	11	22.9	P - 2 - 2 - DSW
1/4"	33.5	7.9	15.3	4.8	14	14	26.2	P - 4 - 4 - DSW
3/8"	37.6	9.6	16.8	7.1	16	17	30.3	P - 6 - 6 - DSW
1/2"	41.2	12.7	22.9	10.4	22	22	31.0	P - 8 - 8 - DSW
3/4"	43.4	14.3	24.4	15.8	27	28.5	33.3	P - 12 - 12 - DSW
1"	52.6	19.1	31.2	22.3	35	38	40.4	P - 16 - 16 - DSW
1.1/4"	72.4	19.1	41.2	27.6	45	50	50.3	P - 20 - 20 - DSW
1.1/2"	81.8	23.8	50.0	34.0	55	60	54.6	P - 24 - 24 - DSW



BULKHEAD MALE CONNECTOR

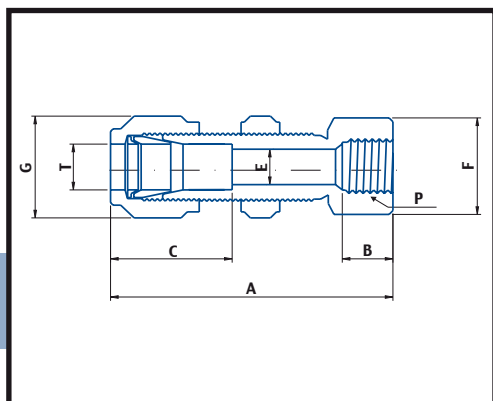
DMP

Metric OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	B	C	E	F	G	Panel Hole Drill Size	Max. Panel Thickness	PART No.
3	1/8"	46.4	9.6	12.9	2.4	11	11	8.3	12.7	M - 3 - 2 - DMP
6	1/8"	49.5	9.6	15.3	4.8	16	14	11.5	10.2	M - 6 - 2 - DMP
10	1/4"	57.4	14.3	17.2	7.1	19	17	14.7	11.2	M - 10 - 4 - DMP
10	3/8"	57.4	14.3	17.2	7.1	19	17	14.7	11.2	M - 10 - 6 - DMP
12	3/8"	63.3	14.3	22.8	9.6	24	22	19.5	12.7	M - 12 - 6 - DMP
12	1/2"	68.8	19.1	22.8	10.4	24	22	19.5	12.7	M - 12 - 8 - DMP
16	1/2"	69.6	19.1	24.4	11.9	27	25	22.8	12.7	M - 16 - 8 - DMP
22	3/4"	83.3	19.1	26.0	15.8	35	25	29.0	19.0	M - 22 - 12 - DMP
25	1"	93.2	23.9	31.2	22.3	41	38	33.7	19.0	M - 25 - 16 - DMP
32	1.1/4"	110.5	23.9	42.0	28.6	50	50	42.5	19.0	M - 32 - 20 - DMP
38	1.1/2"	122.8	26.2	49.4	33.7	60	60	50.5	19.0	M - 38 - 24 - DMP

Inch OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	B	C	E	F	G	Panel Hole Drill Size	Max. Panel Thickness	PART No.
1/8"	1/8"	46.4	9.6	12.7	2.4	14	11	8.3	12.7	P - 2 - 2 - DMP
1/4"	1/8"	49.5	9.6	15.3	4.8	16	14	11.5	10.2	P - 4 - 2 - DMP
1/4"	1/4"	54.1	14.3	15.3	4.8	16	14	11.5	10.2	P - 4 - 4 - DMP
3/8"	1/4"	57.4	14.3	16.8	7.1	19	17	14.7	11.2	P - 6 - 4 - DMP
3/8"	3/8"	57.4	14.3	16.8	7.1	19	17	14.7	11.2	P - 6 - 6 - DMP
3/8"	1/2"	63.7	19.1	16.8	7.1	22	17	14.7	11.2	P - 6 - 8 - DMP
1/2"	3/8"	63.3	14.3	22.9	9.6	24	22	19.5	12.7	P - 8 - 6 - DMP
1/2"	1/2"	68.8	19.1	22.9	10.4	24	22	19.5	12.7	P - 8 - 8 - DMP
3/4"	3/4"	76.2	19.1	24.4	15.8	30	28.5	25.8	16.8	P - 12 - 12 - DMP
1"	1"	93.2	23.9	31.2	22.3	41	38	33.7	19.0	P - 16 - 16 - DMP
1.1/4"	1.1/4"	110.5	23.9	41.2	27.6	50	50	42.5	19.0	P - 20 - 20 - DMP
1.1/2"	1.1/2"	122.8	26.2	50.0	34.0	60	60	50.5	19.0	P - 24 - 24 - DMP



BULKHEAD FEMALE CONNECTOR

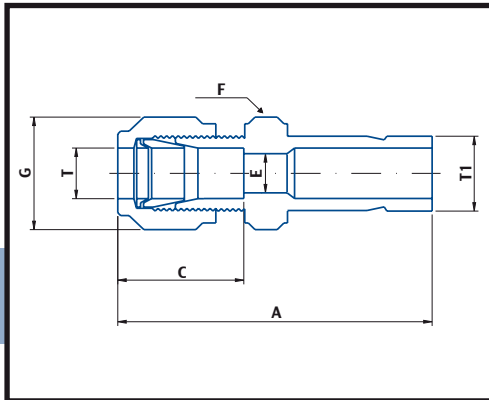
DFP

Metric OD tube x Female NPT thread

T	Tube OD	P	NPT Female	A	B	C	E	F	G	Panel Hole Drill Size	Max. Panel Thickness	PART No.
3		1/8"		44.7	10.4	12.9	2.4	14	11	8.3	12.7	M - 3 - 2 - DFP
6		1/4"		51.6	15.0	15.3	4.8	19	14	11.5	10.2	M - 6 - 4 - DFP
10		3/8"		56.8	15.0	17.2	7.9	22	19	16.3	11.2	M - 10 - 6 - DFP
12		3/8"		61.8	15.0	22.8	9.5	24	22	19.5	12.7	M - 12 - 6 - DFP
12		1/2"		66.7	19.8	22.8	9.5	27	22	19.5	12.7	M - 12 - 8 - DFP
16		1/2"		67.5	20.6	24.4	12.7	27	25	22.8	12.7	M - 16 - 8 - DFP
22		3/4"		79.9	20.6	26.0	15.8	35	32	29.0	19.0	M - 22 - 12 - DFP
25		3/4"		84.3	20.6	31.2	15.8	35	38	33.7	19.0	M - 25 - 12 - DFP
25		1"		93.2	25.4	31.2	22.3	35	38	33.7	19.0	M - 25 - 16 - DFP
32		1.1/4"		105.7	25.4	42.0	27.6	50	50	41.6	19.0	M - 32 - 20 - DFP
38		1.1/2"		114.5	27.6	49.4	33.7	60	60	49.6	19.0	M - 38 - 24 - DFP

Inch OD tube x Female NPT thread

T	Tube OD	P	NPT Female	A	B	C	E	F	G	Panel Hole Drill Size	Max. Panel Thickness	PART No.
1/8"		1/8"		44.7	10.4	12.7	2.4	14	11	8.3	12.7	P - 2 - 2 - DFP
1/4"		1/8"		47.0	10.4	15.3	4.8	16	14	11.5	10.2	P - 4 - 2 - DFP
1/4"		1/4"		51.5	15.0	15.3	4.8	19	14	11.5	10.2	P - 4 - 4 - DFP
3/8"		1/4"		54.8	15.0	16.8	7.1	19	17	14.7	11.2	P - 6 - 4 - DFP
1/2"		3/8"		61.7	15.0	22.9	10.4	22	22	19.5	12.7	P - 8 - 6 - DFP
1/2"		1/2"		66.7	19.8	22.9	10.4	27	22	19.5	12.7	P - 8 - 8 - DFP
5/8"		1/2"		67.6	19.8	24.4	12.7	27	25	22.6	12.7	P - 10 - 8 - DFP
3/4"		1/2"		72.4	19.8	24.4	16.0	30	28.5	25.8	16.8	P - 12 - 8 - DFP
3/4"		3/4"		74.4	20.6	24.4	16.0	30	28.5	25.8	16.8	P - 12 - 12 - DFP
1"		3/4"		84.3	20.6	31.2	16.0	35	38	33.7	19.0	P - 16 - 12 - DFP
1"		1"		93.2	25.4	31.2	22.3	35	38	33.7	19.0	P - 16 - 16 - DFP
1.1/4"		1.1/4"		105.7	25.4	41.2	27.6	50	50	41.6	19.0	P - 20 - 20 - DFP
1.1/2"		1.1/2"		114.5	27.6	50.0	34.0	60	60	49.6	19.0	P - 24 - 24 - DFP

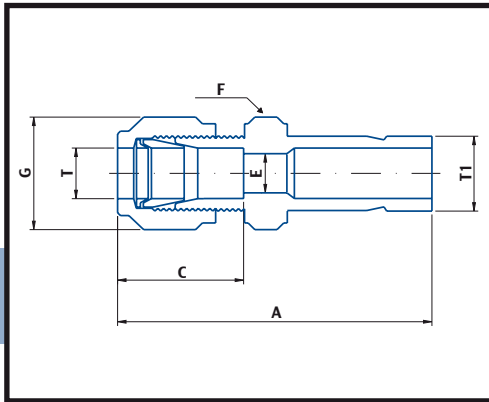


REDUCER

R

Metric OD tube x Metric OD port

T TUBE OD	T1 TUBE OD	A	C	E	F	G	PART No.
3	6	36.1	12.9	2.4	11	11	M - 3 - 6 - R
3	10	38.4	12.9	2.4	14	11	M - 3 - 10 - R
6	3	36.9	15.3	1.8	14	14	M - 6 - 3 - R
6	8	39.9	15.3	4.8	14	14	M - 6 - 8 - R
6	10	40.7	15.3	4.8	14	14	M - 6 - 10 - R
6	12	46.3	15.3	4.8	14	14	M - 6 - 12 - R
8	6	40.3	16.2	4.6	14	16	M - 8 - 6 - R
8	10	42.0	16.2	6.4	14	16	M - 8 - 10 - R
8	12	47.6	16.2	6.4	14	16	M - 8 - 12 - R
10	6	42.4	17.2	4.6	17	17	M - 10 - 6 - R
10	8	43.4	17.2	6.2	17	17	M - 10 - 8 - R
10	12	49.8	17.2	7.9	17	17	M - 10 - 12 - R
12	6	44.9	22.8	4.6	22	22	M - 12 - 6 - R
12	8	45.9	22.8	6.2	22	22	M - 12 - 8 - R
12	10	46.7	22.8	7.7	22	22	M - 12 - 10 - R
12	16	53.8	22.8	9.5	22	22	M - 12 - 16 - R
12	20	56.1	22.8	9.5	22	22	M - 12 - 20 - R
12	22	56.1	22.8	9.5	24	22	M - 12 - 22 - R
12	25	62.4	22.8	9.5	27	22	M - 12 - 25 - R
16	12	53.0	24.4	9.1	24	25	M - 16 - 12 - R
18	12	54.6	24.4	9.1	27	30	M - 18 - 12 - R
18	16	56.1	24.4	12.7	27	30	M - 18 - 16 - R
20	16	57.9	26.0	12.7	30	32	M - 20 - 16 - R
20	25	64.2	26.0	15.8	30	32	M - 20 - 25 - R
22	20	59.4	26.0	15.1	30	32	M - 22 - 20 - R
22	25	64.2	26.0	18.3	30	32	M - 22 - 25 - R
25	18	63.1	31.2	13.9	35	38	M - 25 - 18 - R
25	20	64.6	31.2	15.1	35	38	M - 25 - 20 - R

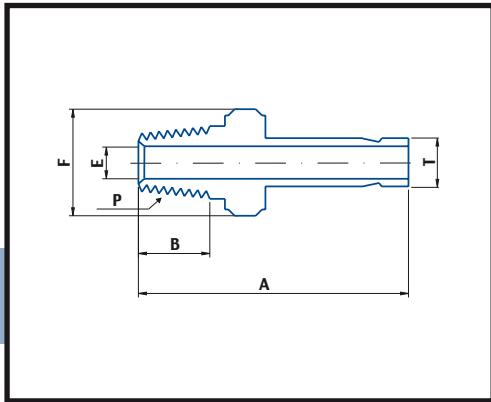


REDUCER

R

Inch OD tube x Inch OD port

T TUBE OD	T1 TUBE OD	A	C	E	F	G	PART No.
1/8"	1/8"	33.5	12.7	2.0	11	11	P - 2 - 2 - R
1/8"	1/4"	36.0	12.7	4.8	11	11	P - 2 - 4 - R
1/4"	1/8"	36.8	15.3	2.0	14	14	P - 4 - 2 - R
1/4"	1/4"	39.1	15.3	4.8	14	14	P - 4 - 4 - R
1/4"	3/8"	40.6	15.3	4.8	14	14	P - 4 - 6 - R
1/4"	1/2"	46.3	15.3	4.8	14	14	P - 4 - 8 - R
5/16"	3/8"	41.9	16.3	6.3	14	16	P - 5 - 6 - R
5/16"	1/2"	46.5	16.3	6.3	14	16	P - 5 - 8 - R
3/8"	1/4"	41.4	16.8	7.1	16	17	P - 6 - 4 - R
3/8"	3/8"	43.2	16.8	7.1	16	17	P - 6 - 6 - R
3/8"	1/2"	48.5	16.8	7.1	16	17	P - 6 - 8 - R
1/2"	1/4"	45.0	22.9	4.8	22	22	P - 8 - 4 - R
1/2"	3/8"	46.7	22.9	7.1	22	22	P - 8 - 6 - R
1/2"	1/2"	52.3	22.9	9.9	22	22	P - 8 - 8 - R
1/2"	3/4"	53.8	22.9	10.4	22	22	P - 8 - 12 - R
1/2"	1"	60.2	22.9	10.4	22	22	P - 8 - 16 - R
5/8"	3/4"	54.6	24.4	12.7	24	25	P - 10 - 12 - R
5/8"	7/8"	56.2	24.4	12.7	24	25	P - 10 - 14 - R
3/4"	1/2"	54.6	24.4	9.9	27	28.5	P - 12 - 8 - R
3/4"	1"	62.5	24.4	15.8	27	28.5	P - 12 - 16 - R
1"	1.1/4"	80.5	31.2	22.3	35	38	P - 16 - 20 - R
1"	1.1/2"	89.2	31.2	22.3	41	38	P - 16 - 24 - R



MALE ADAPTER

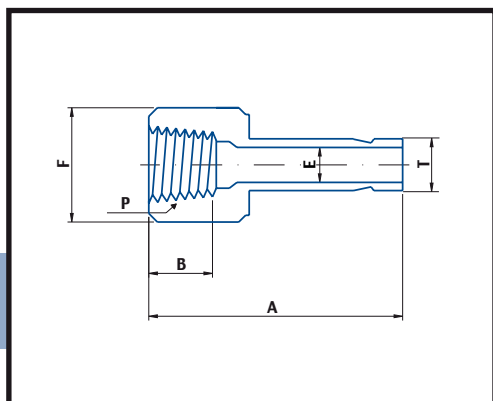
AM

Metric OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	B	E	F	PART No.
3	1/4"	34.8	9.6	7.1	14	M - 3 - 4 - AM
6	1/8"	32.8	14.3	4.6	14	M - 6 - 2 - AM
6	1/4"	38.1	14.3	4.6	14	M - 6 - 4 - AM
8	1/4"	39.1	14.3	6.2	14	M - 8 - 4 - AM
10	1/4"	39.9	14.3	7.7	14	M - 10 - 4 - AM
10	3/8"	40.6	14.3	7.7	19	M - 10 - 6 - AM
12	1/4"	46.5	14.3	7.1	14	M - 12 - 4 - AM
12	3/8"	46.5	14.3	9.1	19	M - 12 - 6 - AM
12	1/2"	52.0	14.3	9.1	22	M - 12 - 8 - AM
25	3/4"	62.0	19.1	15.7	27	M - 25 - 12 - AM
25	1"	66.8	23.8	15.7	35	M - 25 - 16 - AM
30	1"	79.2	23.8	22.2	41	M - 30 - 16 - AM
30	1.1/4"	80.0	23.8	24.6	45	M - 30 - 20 - AM
32	1.1/4"	81.0	23.8	27.4	46	M - 32 - 20 - AM
38	1.1/2"	92.2	26.2	33.3	55	M - 38 - 24 - AM

Inch OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	B	E	F	PART No.
1/8"	1/8"	29.5	9.6	4.8	11	P - 2 - 2 - AM
1/8"	1/4"	34.8	14.4	7.1	14	P - 2 - 4 - AM
1/4"	1/8"	31.8	9.6	4.8	11	P - 4 - 2 - AM
1/4"	1/4"	37.0	14.3	4.8	14	P - 4 - 4 - AM
1/4"	3/8"	37.8	14.3	4.8	19	P - 4 - 6 - AM
1/4"	1/2"	43.4	19.1	4.8	22	P - 4 - 8 - AM
5/16"	1/4"	38.1	14.3	6.3	14	P - 5 - 4 - AM
3/8"	1/4"	38.9	14.3	7.1	14	P - 6 - 4 - AM
3/8"	3/8"	39.6	14.3	7.1	19	P - 6 - 6 - AM
3/8"	1/2"	45.2	19.1	7.1	22	P - 6 - 8 - AM
1/2"	1/4"	44.5	14.3	7.1	14	P - 8 - 4 - AM
1/2"	3/8"	45.2	14.3	9.9	19	P - 8 - 6 - AM
1/2"	1/2"	50.8	19.1	9.9	22	P - 8 - 8 - AM
5/8"	1/2"	52.3	19.1	11.9	22	P - 10 - 8 - AM
3/4"	1/2"	52.3	19.1	11.9	22	P - 12 - 8 - AM
3/4"	3/4"	52.3	19.1	15.0	27	P - 12 - 12 - AM
1"	3/4"	58.7	19.1	15.7	27	P - 16 - 12 - AM
1"	1"	66.0	23.8	20.3	35	P - 16 - 16 - AM
1.1/4"	1.1/4"	80.3	23.8	27.6	45	P - 20 - 20 - AM
1.1/2"	1.1/2"	94.5	26.2	33.2	55	P - 24 - 24 - AM



FEMALE ADAPTER

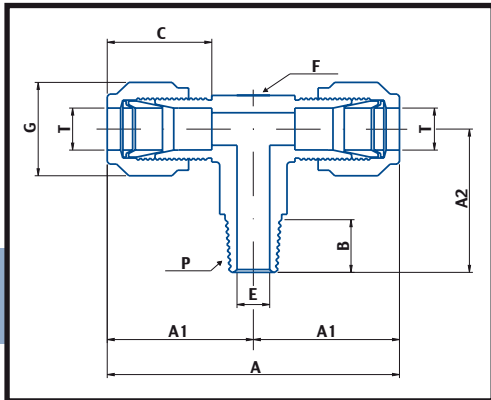
AF

Metric OD tube x Female NPT thread

T TUBE OD	P NPT FEMALE	A	B	E	F	PART No.
3	1/4"	31.7	15.0	2.4	14	M - 3 - 4 - AF
6	1/8"	32.5	9.9	4.6	14	M - 6 - 2 - AF
6	1/4"	37.1	15.0	4.6	19	M - 6 - 4 - AF
8	1/4"	37.6	15.0	6.4	19	M - 8 - 4 - AF
10	1/4"	38.1	15.0	7.7	19	M - 10 - 4 - AF
10	3/8"	40.1	15.0	7.7	22	M - 10 - 6 - AF
10	1/2"	46.5	19.8	7.7	27	M - 10 - 8 - AF
12	1/4"	43.7	15.0	9.1	19	M - 12 - 4 - AF
12	1/2"	52.3	19.8	9.1	27	M - 12 - 8 - AF
16	1/2"	47.7	19.8	9.1	27	M - 16 - 8 - AF
22	3/4"	52.0	20.6	15.0	35	M - 22 - 12 - AF
25	3/4"	51.2	20.6	15.0	35	M - 25 - 12 - AF
25	1"	66.5	25.4	19.8	41	M - 25 - 16 - AF
32	1.1/4"	78.0	25.4	27.4	55	M - 32 - 20 - AF
38	1.1/2"	88.9	27.6	33.3	60	M - 38 - 24 - AF

Inch OD tube x Female NPT thread

T TUBE OD	P NPT FEMALE	A	B	E	F	PART No.
1/8"	1/8"	31.5	10.4	2.4	14	P - 2 - 2 - AF
1/8"	1/4"	35.3	15.0	2.4	19	P - 2 - 4 - AF
1/4"	1/8"	33.0	10.4	4.8	14	P - 4 - 2 - AF
1/4"	1/4"	37.0	15.0	4.8	19	P - 4 - 4 - AF
1/4"	3/8"	39.4	15.0	4.8	22	P - 4 - 6 - AF
1/4"	1/2"	45.5	19.8	4.8	27	P - 4 - 8 - AF
5/16"	1/4"	37.6	15.0	6.3	19	P - 5 - 4 - AF
3/8"	1/4"	38.1	15.0	7.1	19	P - 6 - 4 - AF
3/8"	3/8"	40.4	15.0	7.1	22	P - 6 - 6 - AF
3/8"	1/2"	46.7	19.8	7.1	27	P - 6 - 8 - AF
1/2"	1/4"	43.5	15.0	9.9	19	P - 8 - 4 - AF
1/2"	3/8"	45.5	15.0	9.9	22	P - 8 - 6 - AF
1/2"	1/2"	51.8	19.8	9.9	27	P - 8 - 8 - AF
5/8"	1/2"	53.0	19.8	12.7	27	P - 10 - 8 - AF
3/4"	1/2"	52.8	19.8	15.0	27	P - 12 - 8 - AF
3/4"	3/4"	52.8	20.6	15.0	32	P - 12 - 12 - AF
3/4"	1"	58.4	25.4	15.0	41	P - 12 - 16 - AF
1"	3/4"	60.7	20.6	20.3	32	P - 16 - 12 - AF
1"	1"	64.3	25.4	20.3	41	P - 16 - 16 - AF
1.1/4"	1.1/4"	77.7	25.4	27.6	55	P - 20 - 20 - AF
1.1/2"	1.1/2"	88.9	27.6	33.2	60	P - 24 - 24 - AF

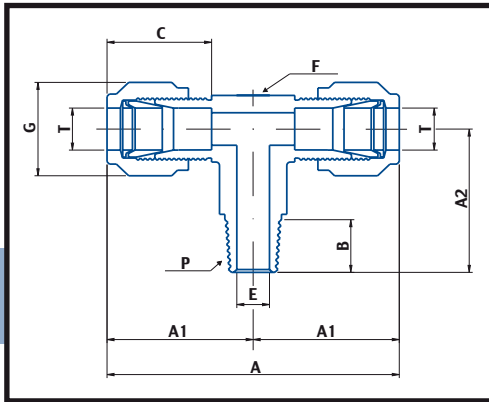


MALE BRANCH TEE

TMC

Metric OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	A1	A2	B	C	E	F	G	PART No.
3	1/8"	47.2	23.6	17.8	9.6	12.9	2.4	11	11	M - 3 - 2 - TMC
3	1/4"	49.2	24.6	23.4	14.3	12.9	2.4	14	11	M - 3 - 4 - TMC
6	1/8"	54.0	27.0	18.8	9.6	15.3	4.8	14	14	M - 6 - 2 - TMC
6	1/4"	54.0	27.0	23.4	14.3	15.3	4.8	14	14	M - 6 - 4 - TMC
6	3/8"	59.6	29.8	26.2	14.3	15.3	4.8	17	14	M - 6 - 6 - TMC
8	1/4"	57.6	28.8	24.4	14.3	16.2	6.3	14	16	M - 8 - 4 - TMC
8	3/8"	61.2	30.6	26.2	14.3	16.2	6.3	17	16	M - 8 - 6 - TMC
8	1/2"	65.2	32.6	33.0	19.1	16.2	6.3	22	16	M - 8 - 8 - TMC
10	1/4"	63.0	31.5	36.2	14.3	17.2	7.1	17	19	M - 10 - 4 - TMC
10	3/8"	63.0	31.5	26.2	14.3	17.2	7.9	17	19	M - 10 - 6 - TMC
10	1/2"	67.0	33.5	33.0	19.1	17.2	7.9	22	19	M - 10 - 8 - TMC
12	1/4"	72.0	36.0	26.2	14.3	22.8	7.1	22	22	M - 12 - 4 - TMC
12	3/8"	72.0	36.0	28.2	14.3	22.8	9.5	22	22	M - 12 - 6 - TMC
12	1/2"	72.0	36.0	33.0	19.1	22.8	9.5	22	22	M - 12 - 8 - TMC
16	1/2"	76.0	38.0	35.1	19.1	24.4	11.9	24	25	M - 16 - 8 - TMC
25	3/4"	98.2	49.1	41.7	19.1	31.2	15.8	35	38	M - 25 - 12 - TMC
25	1"	98.2	49.1	46.5	23.8	31.2	21.8	35	38	M - 25 - 16 - TMC
30	1.1/4"	139.8	66.9	53.1	23.8	39.6	26.2	45	50	M - 30 - 20 - TMC
32	1.1/4"	144.6	72.3	53.1	23.8	42.0	27.6	45	50	M - 32 - 20 - TMC
38	1.1/2"	168.0	84.0	60.4	26.2	49.4	33.7	55	60	M - 38 - 24 - TMC

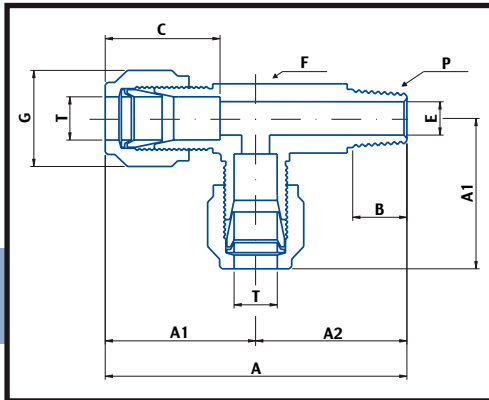


MALE BRANCH TEE

TMC

Inch OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	A1	A2	B	C	E	F	G	PART No.
1/8"	1/8"	47.2	23.6	17.8	9.6	12.7	2.4	11	11	P - 2 - 2 - TMC
1/8"	1/4"	49.2	24.6	23.4	14.3	12.7	2.4	14	11	P - 2 - 4 - TMC
1/4"	1/8"	53.8	26.9	18.8	9.6	15.3	4.8	14	14	P - 4 - 2 - TMC
1/4"	1/4"	53.8	26.9	23.4	14.3	15.3	4.8	14	14	P - 4 - 4 - TMC
1/4"	3/8"	59.4	29.7	26.2	14.3	15.3	4.8	17	14	P - 4 - 6 - TMC
1/4"	1/2"	63.6	31.8	33.0	19.1	15.3	4.8	22	14	P - 4 - 8 - TMC
3/8"	1/4"	61.0	30.5	25.4	14.3	16.8	7.1	17	17	P - 6 - 4 - TMC
3/8"	3/8"	62.4	31.2	26.2	14.3	16.8	7.1	17	17	P - 6 - 6 - TMC
3/8"	1/2"	66.0	33.0	33.0	19.1	16.8	7.1	22	17	P - 6 - 8 - TMC
1/2"	1/4"	72.0	36.0	28.2	14.3	22.9	4.8	22	22	P - 8 - 4 - TMC
1/2"	3/8"	72.0	36.0	28.2	14.3	22.9	9.6	22	22	P - 8 - 6 - TMC
1/2"	1/2"	72.0	36.0	33.0	19.1	22.9	10.4	22	22	P - 8 - 8 - TMC
5/8"	1/2"	76.2	38.1	35.0	19.1	24.4	11.9	22	25	P - 10 - 8 - TMC
3/4"	1/2"	79.8	39.9	36.8	19.1	24.4	11.9	27	28.5	P - 12 - 8 - TMC
3/4"	3/4"	79.8	39.9	36.8	19.1	24.4	15.8	27	28.5	P - 12 - 12 - TMC
1"	3/4"	98.0	49.0	41.6	19.1	31.2	15.8	35	38	P - 16 - 12 - TMC
1"	1"	98.0	49.0	46.5	23.8	31.2	22.3	35	38	P - 16 - 16 - TMC
1.1/4"	1.1/4"	133.0	66.5	47.6	23.8	41.2	27.6	46	50	P - 20 - 20 - TMC
1.1/2"	1.1/2"	156.0	78.0	60.4	26.2	50.0	34.0	55	60	P - 24 - 24 - TMC

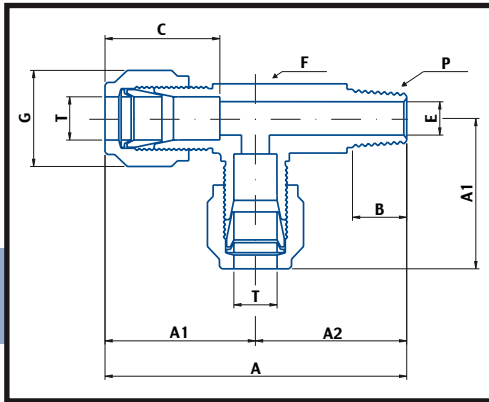


MALE RUN TEE

TML

Metric OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	A1	A2	B	C	E	F	G	PART No.
3	1/8"	41.4	23.6	17.8	9.6	12.9	2.4	11	11	M - 3 - 2 - TML
3	1/4"	48.0	24.6	23.4	14.3	12.9	2.4	14	11	M - 3 - 4 - TML
6	1/8"	45.8	27.0	18.8	9.6	15.3	4.8	14	14	M - 6 - 2 - TML
6	1/4"	50.4	27.0	23.4	14.3	15.3	4.8	14	14	M - 6 - 4 - TML
6	3/8"	56.0	29.8	26.2	14.3	15.3	4.8	17	14	M - 6 - 6 - TML
8	1/4"	53.2	28.8	24.4	14.3	16.2	6.3	14	16	M - 8 - 4 - TML
8	3/8"	56.8	30.6	26.2	14.3	16.2	6.3	17	16	M - 8 - 6 - TML
8	1/2"	65.6	32.6	33.0	19.1	16.2	6.3	22	16	M - 8 - 8 - TML
10	1/4"	57.7	31.5	26.2	14.3	17.2	7.1	17	19	M - 10 - 4 - TML
10	3/8"	57.7	31.5	26.2	14.3	17.2	7.9	17	19	M - 10 - 6 - TML
10	1/2"	66.5	33.5	33.0	19.1	17.2	7.9	22	19	M - 10 - 8 - TML
12	1/4"	62.2	36.0	26.2	14.3	22.8	7.1	22	22	M - 12 - 4 - TML
12	3/8"	62.2	36.0	28.2	14.3	22.8	9.5	22	22	M - 12 - 6 - TML
12	1/2"	69.0	36.0	33.0	19.1	22.8	9.5	22	22	M - 12 - 8 - TML
16	1/2"	73.1	38.0	35.1	19.1	24.4	11.9	24	25	M - 16 - 8 - TML
25	3/4"	90.8	49.1	41.7	19.1	31.3	15.8	35	38	M - 25 - 12 - TML
25	1"	95.6	49.1	46.5	23.8	31.3	21.8	35	38	M - 25 - 16 - TML
30	1.1/4"	120.0	66.9	53.1	23.8	39.6	26.2	45	50	M - 30 - 20 - TML
32	1.1/4"	125.4	72.3	53.1	23.8	42.0	27.6	45	50	M - 32 - 20 - TML
38	1.1/2"	144.4	84.0	60.4	26.2	49.4	33.7	55	60	M - 38 - 24 - TML

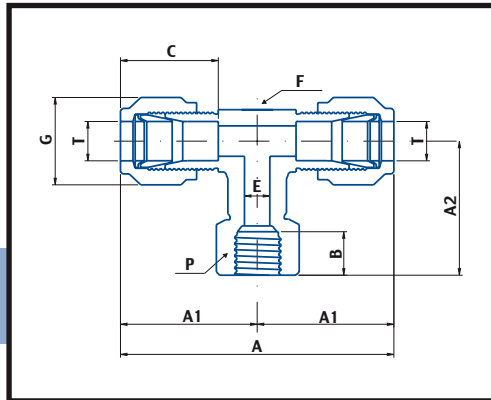


MALE RUN TEE

TML

Inch OD tube x Male NPT thread

T TUBE OD	P NPT MALE	A	A1	A2	B	C	E	F	G	PART No.
1/8"	1/8"	41.4	23.6	17.8	9.6	12.7	2.4	11	11	P - 2 - 2 - TML
1/8"	1/4"	48.0	24.6	23.4	14.3	12.7	2.4	14	11	P - 2 - 4 - TML
1/4"	1/8"	45.7	26.9	18.8	9.6	15.3	4.8	14	14	P - 4 - 2 - TML
1/4"	1/4"	50.3	23.4	26.9	14.3	15.3	4.8	14	14	P - 4 - 4 - TML
1/4"	3/8"	55.9	29.7	26.2	14.3	15.3	4.8	17	14	P - 4 - 6 - TML
1/4"	1/2"	64.8	31.8	33.0	19.1	15.3	4.8	22	14	P - 4 - 8 - TML
3/8"	1/4"	55.9	30.5	25.4	14.3	16.8	7.1	17	17	P - 6 - 4 - TML
3/8"	3/8"	57.4	31.2	26.2	14.3	16.8	7.1	17	17	P - 6 - 6 - TML
3/8"	1/2"	66.0	33.0	33.0	19.1	16.8	7.1	22	17	P - 6 - 8 - TML
1/2"	1/4"	64.2	36.0	28.2	14.3	22.9	4.8	22	22	P - 8 - 4 - TML
1/2"	3/8"	64.2	36.0	28.2	14.3	22.9	9.6	22	22	P - 8 - 6 - TML
1/2"	1/2"	69.0	36.0	33.0	19.1	22.9	10.4	22	22	P - 8 - 8 - TML
5/8"	1/2"	73.1	38.1	35.0	19.1	24.4	11.9	22	25	P - 10 - 8 - TML
3/4"	1/2"	76.7	39.9	36.8	19.1	24.4	11.9	27	28.5	P - 12 - 8 - TML
3/4"	3/4"	76.7	39.9	36.8	19.1	24.4	15.8	27	28.5	P - 12 - 12 - TML
1"	3/4"	90.6	49.0	41.6	19.1	31.2	15.8	35	38	P - 16 - 12 - TML
1"	1"	95.5	49.0	46.5	23.8	31.2	22.3	35	38	P - 16 - 16 - TML
1.1/4"	1.1/4"	114.1	66.5	47.6	23.8	41.2	27.6	46	50	P - 20 - 20 - TML
1.1/2"	1.1/2"	138.4	78.0	60.4	26.2	50.0	34.0	55	60	P - 24 - 24 - TML



FEMALE BRANCH TEE

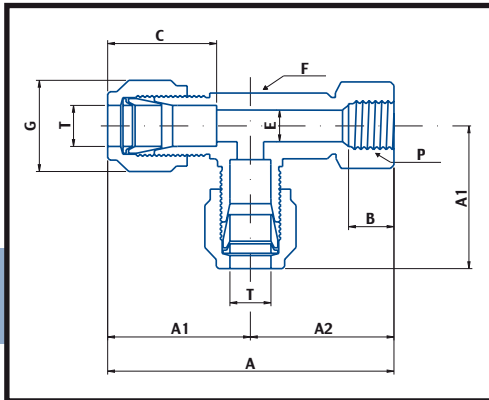
TFC

Metric OD tube x Female NPT thread

T TUBE OD	P NPT FEMALE	A	A1	A2	B	C	E	F	G	PART No.
3	1/8"	49.2	24.6	19.0	10.4	12.9	2.4	14	11	M - 3 - 2 - TFC
6	1/8"	54.0	27.0	19.0	10.4	15.3	4.8	14	14	M - 6 - 2 - TFC
6	1/4"	59.6	29.8	22.4	15.0	15.3	4.8	19	14	M - 6 - 4 - TFC
8	1/8"	59.8	29.9	19.0	10.4	16.2	6.3	16	16	M - 8 - 2 - TFC
8	1/4"	61.2	30.6	22.4	15.0	16.2	6.3	19	16	M - 8 - 4 - TFC
10	1/4"	67.0	33.5	22.4	15.0	17.2	7.9	19	19	M - 10 - 4 - TFC
12	3/8"	72.0	36.0	22.4	15.0	22.8	9.5	22	22	M - 12 - 6 - TFC
12	1/2"	77.6	38.8	28.5	19.8	22.8	9.5	27	22	M - 12 - 8 - TFC
16	1/2"	79.0	39.5	28.5	19.8	24.4	12.7	27	25	M - 16 - 8 - TFC
25	1"	107.2	53.6	38.1	25.4	31.3	22.3	41	38	M - 25 - 16 - TFC

Inch OD tube x Female NPT thread

T TUBE OD	P NPT FEMALE	A	A1	A2	B	C	E	F	G	PART No.
1/8"	1/8"	49.2	24.6	19.0	10.4	12.7	2.4	14	11	P - 2 - 2 - TFC
1/4"	1/8"	53.8	26.9	19.0	10.4	15.3	4.8	14	14	P - 4 - 2 - TFC
1/4"	1/4"	59.4	29.7	22.4	15.0	15.3	4.8	19	14	P - 4 - 4 - TFC
3/8"	1/4"	62.4	31.2	22.4	15.0	16.8	7.1	19	17	P - 6 - 4 - TFC
3/8"	3/8"	66.6	33.3	22.4	15.0	16.8	7.1	22	17	P - 6 - 6 - TFC
1/2"	3/8"	72.0	36.0	22.4	15.0	22.9	10.4	22	22	P - 8 - 6 - TFC
1/2"	1/2"	77.8	38.9	28.5	19.8	22.9	10.4	27	22	P - 8 - 8 - TFC
3/4"	3/4"	89.4	44.7	31.8	20.6	24.4	15.8	35	28.5	P - 12 - 12 - TFC
1"	3/4"	98.0	49.0	31.8	20.6	31.2	22.3	35	38	P - 16 - 12 - TFC
1"	1"	107.2	53.6	38.1	25.4	31.2	22.3	41	38	P - 16 - 16 - TFC



FEMALE RUN TEE

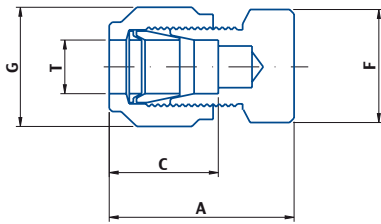
TFL

Metric OD tube x Female NPT thread

T TUBE OD	P NPT FEMALE	A	A1	A2	B	C	E	F	G	PART No.
3	1/8"	43.6	24.6	19.0	10.4	12.9	2.4	14	11	M - 3 - 2 - TFL
6	1/8"	46.0	27.0	19.0	10.4	15.3	4.8	14	14	M - 6 - 2 - TFL
6	1/4"	52.2	29.8	22.4	15.0	15.3	4.8	19	14	M - 6 - 4 - TFL
8	1/8"	48.9	29.9	19.0	10.4	16.2	6.3	16	16	M - 8 - 2 - TFL
8	1/4"	53.0	30.6	22.4	15.0	16.2	6.3	19	16	M - 8 - 4 - TFL
10	1/4"	55.9	33.5	22.4	15.0	17.2	7.9	19	19	M - 10 - 4 - TFL
12	3/8"	58.4	36.0	22.4	15.0	22.8	9.5	22	22	M - 12 - 6 - TFL
12	1/2"	67.3	38.8	28.5	19.8	22.8	9.5	27	22	M - 12 - 8 - TFL
16	1/2"	68.0	39.5	28.5	19.8	24.4	12.7	27	25	M - 16 - 8 - TFL
25	1"	91.7	53.6	38.1	25.4	31.3	22.3	41	38	M - 25 - 16 - TFL

Inch OD tube x Female NPT thread

T TUBE OD	P NPT FEMALE	A	A1	A2	B	C	E	F	G	PART No.
1/8"	1/8"	43.6	24.6	19.0	10.4	12.7	2.4	14	11	P - 2 - 2 - TFL
1/4"	1/8"	45.9	26.9	19.0	10.4	15.3	4.8	14	14	P - 4 - 2 - TFL
1/4"	1/4"	52.1	29.7	22.4	15.0	15.3	4.8	19	14	P - 4 - 4 - TFL
3/8"	1/4"	53.6	31.2	22.4	15.0	16.8	7.1	19	17	P - 6 - 4 - TFL
3/8"	3/8"	55.7	33.3	22.4	15.0	16.8	7.1	22	17	P - 6 - 6 - TFL
1/2"	3/8"	58.4	36.0	22.4	15.0	22.9	10.4	22	22	P - 8 - 6 - TFL
1/2"	1/2"	67.4	38.9	28.5	19.8	22.9	10.4	27	22	P - 8 - 8 - TFL
3/4"	3/4"	76.5	44.7	31.8	20.6	24.4	15.8	35	28.5	P - 12 - 12 - TFL
1"	3/4"	80.8	49.0	31.8	20.6	31.2	22.3	35	38	P - 16 - 12 - TFL
1"	1"	91.7	53.6	38.1	25.4	31.2	22.3	41	38	P - 16 - 16 - TFL



TUBE END CLOSURE

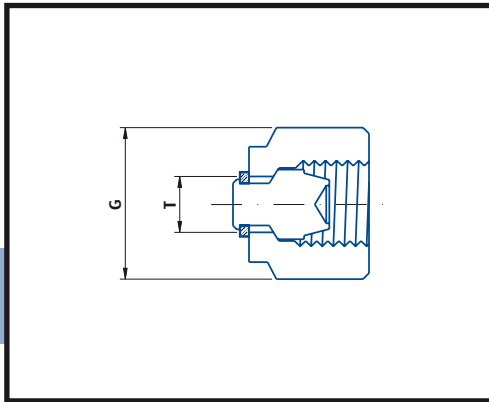
TT

Metric OD tube

T TUBE OD	A	C	F	G	PART No.
3	20.1	12.9	11	11	M - 3 - TT
6	23.1	15.3	14	14	M - 6 - TT
8	24.5	16.2	16	16	M - 8 - TT
10	26.6	17.2	17	19	M - 10 - TT
12	29.1	22.8	22	22	M - 12 - TT
14	29.9	24.4	24	25	M - 14 - TT
15	29.9	24.4	24	25	M - 15 - TT
16	29.9	24.4	24	25	M - 16 - TT
18	31.4	24.4	27	30	M - 18 - TT
20	34.0	26.0	32	32	M - 20 - TT
22	34.0	26.0	32	32	M - 22 - TT
25	38.5	31.3	35	38	M - 25 - TT
28	48.5	36.6	41	46	M - 28 - TT
30	53.4	39.6	46	50	M - 30 - TT
32	55.8	42.0	46	50	M - 32 - TT
38	65.4	49.4	55	60	M - 38 - TT

Inch OD tube

T TUBE OD	A	C	F	G	PART No.
1/16"	13.0	8.6	11	8	P - 1 - TT
1/8"	20.0	12.7	11	11	P - 2 - TT
1/4"	23.4	15.3	14	14	P - 4 - TT
5/16"	24.4	16.3	16	16	P - 5 - TT
3/8"	25.7	16.8	17	17	P - 6 - TT
1/2"	29.2	22.9	22	22	P - 8 - TT
5/8"	30.0	24.4	24	25	P - 10 - TT
3/4"	31.5	24.4	27	28.5	P - 12 - TT
7/8"	34.0	25.9	35	32	P - 14 - TT
1"	38.4	31.2	35	38	P - 16 - TT
1.1/4"	53.3	41.2	46	50	P - 20 - TT
1.1/2"	64.5	50.0	55	60	P - 24 - TT



FITTING END CLOSURE

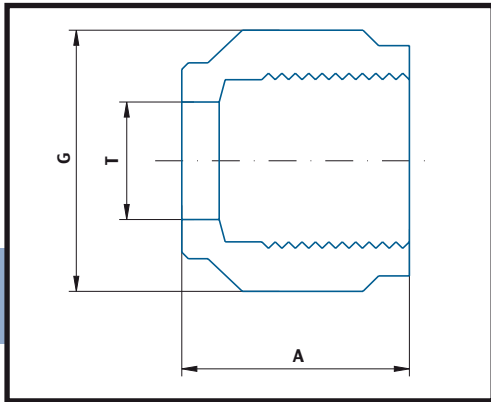
TR

Metric OD tube

T TUBE OD	G	PART No.
3	11	M - 3 - TR
6	14	M - 6 - TR
8	16	M - 8 - TR
10	19	M - 10 - TR
12	22	M - 12 - TR
14	25	M - 14 - TR
15	25	M - 15 - TR
16	25	M - 16 - TR
18	30	M - 18 - TR
20	32	M - 20 - TR
22	32	M - 22 - TR
25	38	M - 25 - TR
28	46	M - 28 - TR
30	50	M - 30 - TR
32	50	M - 32 - TR
38	60	M - 38 - TR

Inch OD tube

T TUBE OD	G	PART No.
1/16"	8	P - 1 - TR
1/8"	11	P - 2 - TR
1/4"	14	P - 4 - TR
5/16"	16	P - 5 - TR
3/8"	17	P - 6 - TR
1/2"	22	P - 8 - TR
5/8"	25	P - 10 - TR
3/4"	28.5	P - 12 - TR
7/8"	32	P - 14 - TR
1"	38	P - 16 - TR
1.1/4"	50	P - 20 - TR
1.1/2"	60	P - 24 - TR



NUT

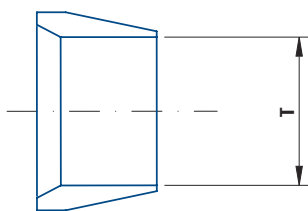
D

Metric OD tube

T TUBE OD	A	G	PART No.
3	12	11	M - 3 - D
6	12.7	14	M - 6 - D
8	13.5	16	M - 8 - D
10	15.1	19	M - 10 - D
12	17.5	22	M - 12 - D
14	17.5	25	M - 14 - D
15	17.5	25	M - 15 - D
16	17.5	25	M - 16 - D
18	17.5	30	M - 18 - D
20	17.5	32	M - 20 - D
22	17.5	32	M - 22 - D
25	20.6	38	M - 25 - D
28	30.6	46	M - 28 - D
30	32.7	50	M - 30 - D
32	31.8	50	M - 32 - D
38	38.1	60	M - 38 - D

Inch OD tube

T TUBE OD	A	G	PART No.
1/16"	17.8	8	P - 1 - D
1/8"	12.0	11	P - 2 - D
1/4"	12.7	14	P - 4 - D
5/16"	14.0	16	P - 5 - D
3/8"	14.5	17	P - 6 - D
1/2"	17.5	22	P - 8 - D
5/8"	17.5	25	P - 10 - D
3/4"	17.5	28.5	P - 12 - D
7/8"	17.5	32	P - 14 - D
1"	20.6	38	P - 16 - D
1.1/4"	31.8	50	P - 20 - D
1.1/2"	38.0	60	P - 24 - D



FRONT FERRULE

FA

Metric OD tube

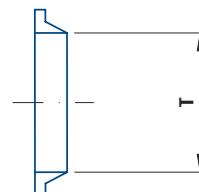
T TUBE OD	PART No.
3	M - 3 - FA
6	M - 6 - FA
8	M - 8 - FA
10	M - 10 - FA
12	M - 12 - FA
14	M - 14 - FA
15	M - 15 - FA
16	M - 16 - FA
18	M - 18 - FA
20	M - 20 - FA
22	M - 22 - FA
25	M - 25 - FA
28	M - 28 - FA
30	M - 30 - FA
32	M - 32 - FA
38	M - 38 - FA

Inch OD tube

T TUBE OD	PART No.
1/16"	P - 1 - FA
1/8"	P - 2 - FA
1/4"	P - 4 - FA
5/16"	P - 5 - FA
3/8"	P - 6 - FA
1/2"	P - 8 - FA
5/8"	P - 10 - FA
3/4"	P - 12 - FA
7/8"	P - 14 - FA
1"	P - 16 - FA
1.1/4"	P - 20 - FA
1.1/2"	P - 24 - FA

BACK FERRULE

FP



Metric OD tube

T TUBE OD	PART No.
3	M - 3 - FP
6	M - 6 - FP
8	M - 8 - FP
10	M - 10 - FP
12	M - 12 - FP
14	M - 14 - FP
15	M - 15 - FP
16	M - 16 - FP
18	M - 18 - FP
20	M - 20 - FP
22	M - 22 - FP
25	M - 25 - FP
28	M - 28 - FP
30	M - 30 - FP
32	M - 32 - FP
38	M - 38 - FP

Inch OD tube

T TUBE OD	PART No.
1/16"	P - 1 - FP
1/8"	P - 2 - FP
1/4"	P - 4 - FP
5/16"	P - 5 - FP
3/8"	P - 6 - FP
1/2"	P - 8 - FP
5/8"	P - 10 - FP
3/4"	P - 12 - FP
7/8"	P - 14 - FP
1"	P - 16 - FP
1.1/4"	P - 20 - FP
1.1/2"	P - 24 - FP

- BULK precision pipe fittings are manufactured in a wide range of configurations
- Size range from 1/8" to 1"
- Construction from bar stock or forging materials
- Threads meet requirements of ANSI B1.20.1, DIN 2999, BSP and ISO 7/1
- Male and female threads are protected to ensure their integrity

MATERIALS

BULK precision pipe fittings are available as standard in 316 Stainless Steel.

We can also supply other materials including Brass, Monel, Hastelloy, Inconel, Titanium,...

PRESSURE RATING

Working pressures are calculated in accordance to ANSI code for pressure piping B 31.1 and showed in the table below.

Female pipe end ratings are lower than male pipe end ratings for a given size because the inner and outer diameters of female threads are larger than male pipe threads.

NPT SIZE	316SS MALE	316SS FEMALE
1/8"	9.300	6.000
1/4"	7.300	6.000
3/8"	7.000	5.000
1/2"	6.900	4.500
3/4"	6.500	4.200
1"	4.800	4.000

ASSEMBLY INSTRUCTIONS

To ensure a leak tight seal, the use of a pipe thread sealant on all NPT threads is recommended.

The most effective sealing method is Teflon tape.

Pipe thread sealant should be used only on male tapered pipe threads.

1) Clean both male and female tapered threads.

2) Wrap the sealant tape in the direction of the male tapered thread spiral.

3) Make sure tape does not overhang the first thread as the tape could shred and get into the system.

4) Cut off excess tape.

NOTE

Pipe thread sealants may have lower temperature capabilities than the basic fitting.

HOW TO ORDER

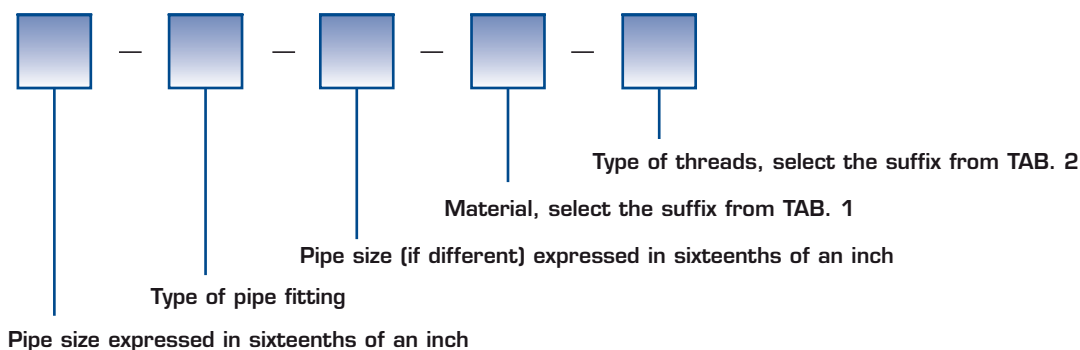


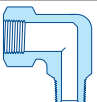
TABLE 1

NO SUFFIX = 316
L = 316 L
O = BRASS
M = MONEL
TI = TITANIUM
H = HASTELLOY
I = INCONEL

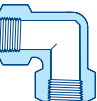
TABLE 2

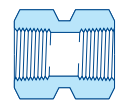
NO SUFFIX = NPT ANSI B1.20.1
K = BSPP ISO 228/1, BS 2779 - ISO 228/1
J = BSPT ISO 7/1, BS 21, DIN 2999

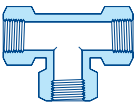
	HEX NIPPLE N	40
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	STREET ELBOW GMF	43
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	HEX REDUCING NIPPLE NR	40
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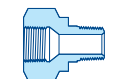
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	HEX COUPLING M	41
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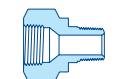
	FEMALE TEE FT	44
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	HEX REDUCING COUPLING MR	41
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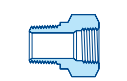
	STREET TEE TS	44
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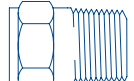
	ADAPTER A	42
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	BRANCH TEE TB	44
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	REDUCING ADAPTER AR	42
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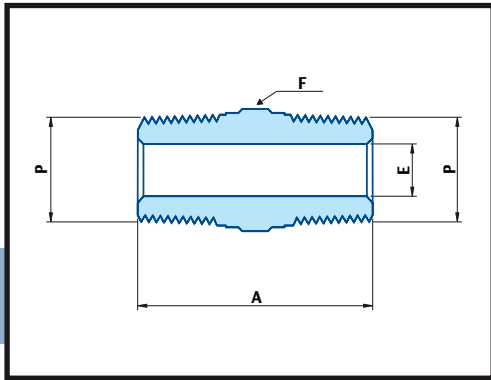
	MALE TEE MT	45
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	REDUCING BUSHING RMF	42
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	MALE PLUG TM	45
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	MALE ELBOW GMM	43
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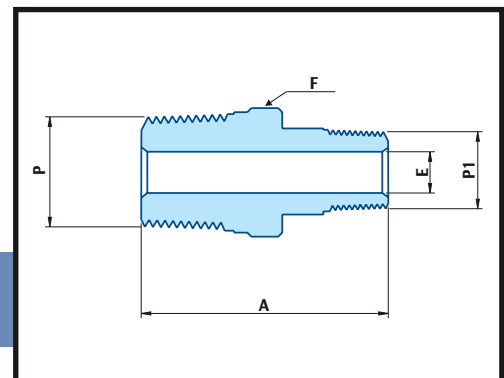
	CAP TF	45
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HEX NIPPLE

N

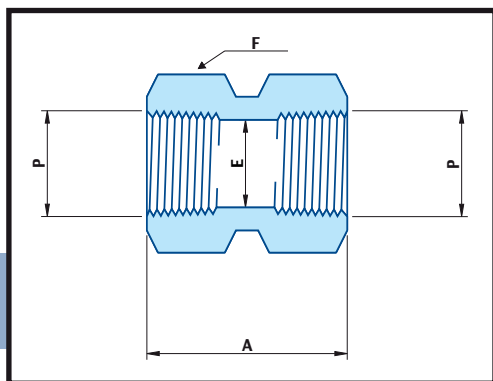
P NPT MALE	A	B	E	F	PART No.
1/16"	25.7	9.6	3.0	8	1 - N
1/8"	25.7	9.6	4.8	11	2 - N
1/4"	35.6	14.3	7.1	14	4 - N
3/8"	36.3	14.3	9.6	19	6 - N
1/2"	46.7	19.1	11.9	22	8 - N
3/4"	46.7	19.1	15.8	27	12 - N
1"	58.9	23.8	22.3	35	16 - N



HEX REDUCING NIPPLE

NR

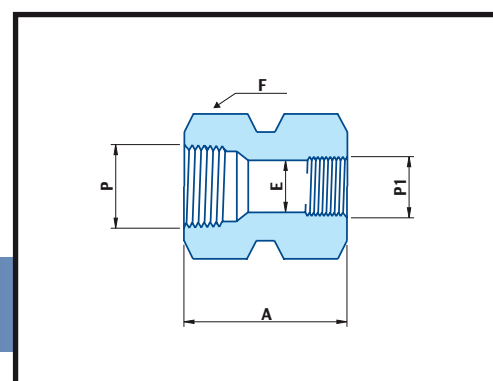
P NPT MALE	P1 NPT MALE	A	E	F	PART No.
1/8"	1/16"	25.7	3.0	11	2 - NR - 1
1/4"	1/8"	31.0	4.8	14	4 - NR - 2
3/8"	1/8"	31.8	4.8	19	6 - NR - 2
3/8"	1/4"	36.3	7.1	19	6 - NR - 4
1/2"	1/8"	37.4	4.8	22	8 - NR - 2
1/2"	1/4"	41.9	7.1	22	8 - NR - 4
1/2"	3/8"	41.9	9.6	22	8 - NR - 6
3/4"	1/4"	41.9	7.1	27	12 - NR - 4
3/4"	1/2"	46.7	11.9	27	12 - NR - 8
1"	1/2"	54.1	11.9	35	16 - NR - 8
1"	3/4"	54.1	15.8	35	16 - NR - 12



HEX COUPLING

M

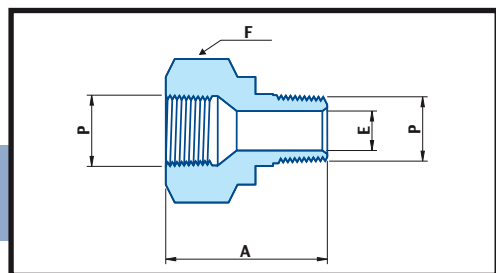
P NPT FEMALE	A	E	F	PART No.
1/8"	20.6	8.6	14	2 - M
1/4"	30.3	11.4	19	4 - M
3/8"	33.3	15.0	22	6 - M
1/2"	39.6	18.5	27	8 - M
3/4"	41.2	23.9	32	12 - M
1"	50.8	29.7	41	16 - M



HEX REDUCING COUPLING

MR

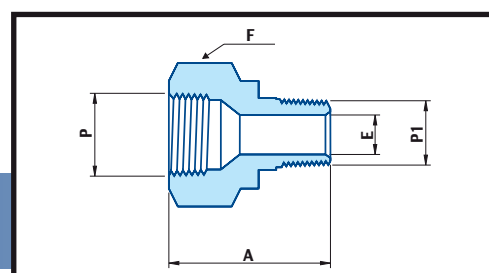
P NPT FEMALE	P1 NPT FEMALE	A	E	F	PART No.
1/4"	1/8"	31.0	8.6	19	4 - MR - 2
3/8"	1/4"	35.0	11.4	22	6 - MR - 4
1/2"	1/8"	39.6	8.6	27	8 - MR - 2
1/2"	1/4"	44.5	11.4	27	8 - MR - 4
1/2"	3/8"	45.2	15.0	27	8 - MR - 6
3/4"	1/4"	46.0	11.4	32	12 - MR - 4
3/4"	1/2"	52.3	18.5	32	12 - MR - 8
1"	1/2"	55.6	18.5	41	16 - MR - 8
1"	3/4"	57.2	23.8	41	16 - MR - 12



ADAPTER

A

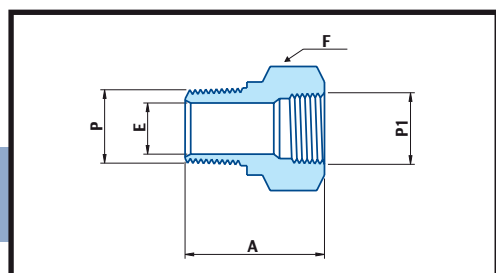
P NPT MALE & FEMALE	A	B	E	F	PART No.
1/8"	28.0	9.6	4.8	14	2 - A
1/4"	35.6	14.3	7.1	19	4 - A
3/8"	37.9	14.3	9.6	22	6 - A
1/2"	49.3	19.1	11.9	27	8 - A
3/4"	50.8	19.1	15.8	32	12 - A
1"	57.9	23.8	22.3	41	16 - A



REDUCING ADAPTER

AR

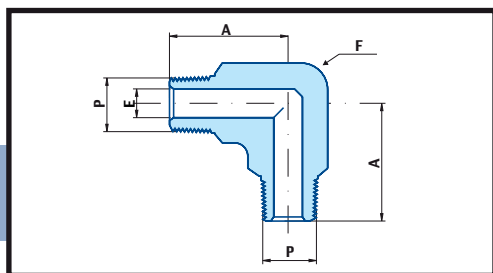
P NPT FEMALE	P1 NPT MALE	A	B	B1	E	F	PART No.
1/8"	1/16"	27.7	9.6	9.6	3.0	14	2 - AR - 1
1/4"	1/8"	32.0	14.3	9.6	4.8	19	4 - AR - 2
3/8"	1/8"	33.8	14.3	9.6	4.8	22	6 - AR - 2
3/8"	1/4"	38.1	14.3	14.3	7.1	22	6 - AR - 4
1/2"	1/8"	40.2	19.1	9.6	4.8	27	8 - AR - 2
1/2"	1/4"	44.7	19.1	14.3	7.1	27	8 - AR - 4
1/2"	3/8"	44.5	19.1	14.3	9.6	27	8 - AR - 6
3/4"	1/4"	46.3	19.1	14.3	7.1	32	12 - AR - 4
3/4"	3/8"	46.3	19.1	14.3	9.6	32	12 - AR - 6
3/4"	1/2"	51.3	19.1	19.1	11.9	32	12 - AR - 8
1"	1/4"	49.8	23.8	14.3	7.1	41	16 - AR - 4
1"	1/2"	54.9	23.8	19.1	11.9	41	16 - AR - 8
1"	3/4"	55.2	23.8	19.1	15.8	41	16 - AR - 12



REDUCING BUSHING

RMF

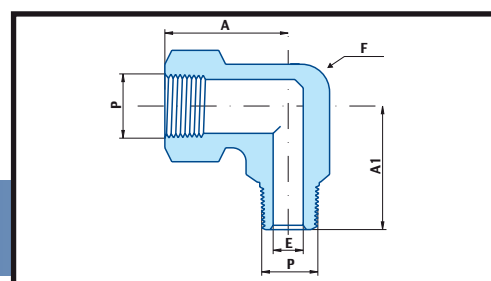
P NPT MALE	P1 NPT FEMALE	A	E	F	PART No.
1/8"	1/16"	26.2	4.8	11	2 - RMF - 1
1/4"	1/8"	26.9	7.1	14	4 - RMF - 2
3/8"	1/8"	21.8	8.6	19	6 - RMF - 2
3/8"	1/4"	30.3	9.6	19	6 - RMF - 4
1/2"	1/8"	27.4	8.6	22	8 - RMF - 2
1/2"	1/4"	27.4	11.4	22	8 - RMF - 4
1/2"	3/8"	35.8	11.9	22	8 - RMF - 6
3/4"	1/4"	27.4	11.4	27	12 - RMF - 4
3/4"	3/8"	27.4	15.0	27	12 - RMF - 6
3/4"	1/2"	41.4	15.8	27	12 - RMF - 8
1"	1/4"	34.8	11.4	35	16 - RMF - 4
1"	3/8"	34.8	15.0	35	16 - RMF - 6
1"	1/2"	34.8	18.5	35	16 - RMF - 8
1"	3/4"	47.0	22.3	35	16 - RMF - 12



MALE ELBOW

GMM

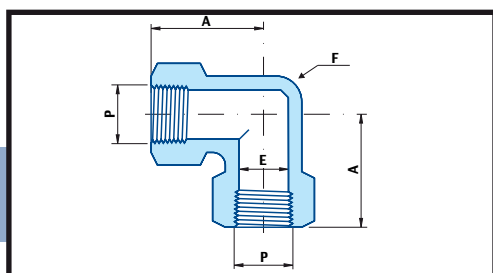
P NPT MALE	E	F	A	PART No.
1/8"	4.8	11	22.3	2 - GMM
1/4"	7.1	14	26.7	4 - GMM
3/8"	9.6	19	29.7	6 - GMM
1/2"	11.9	22	36.8	8 - GMM
3/4"	15.8	27	38.9	12 - GMM
1"	22.3	35	45.2	16 - GMM



STREET ELBOW

GMF

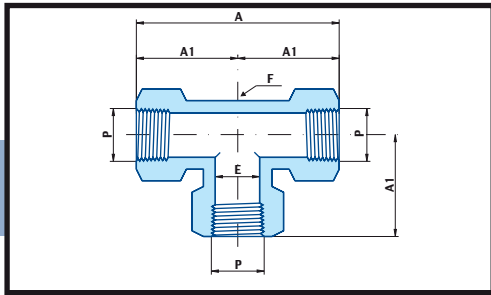
P NPT MALE & FEMALE	E	F	A	A1	PART No.
1/8"	4.8	14	26.4	22.3	2 - GMF
1/4"	7.1	19	29.7	26.7	4 - GMF
3/8"	9.6	22	36.0	29.7	6 - GMF
1/2"	11.9	27	39.6	36.8	8 - GMF
3/4"	15.8	32	48.8	38.9	12 - GMF
1"	22.3	35	48.5	45.2	16 - GMF



FEMALE ELBOW

GFF

P NPT FEMALE	E	F	A	PART No.
1/8"	8.6	14	26.4	2 - GFF
1/4"	11.4	19	29.7	4 - GFF
3/8"	15.0	22	36.1	6 - GFF
1/2"	18.5	27	39.6	8 - GFF
3/4"	23.9	32	48.8	12 - GFF
1"	29.7	35	48.5	16 - GFF



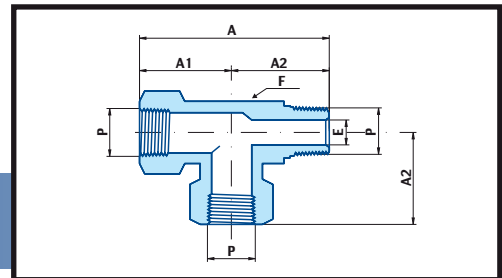
FEMALE TEE

FT

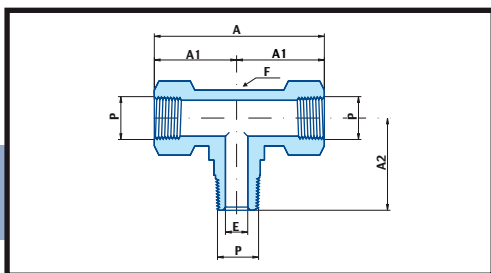
P NPT FEMALE	A	A1	E	F	PART No.
1/8"	52.8	26.4	8.67	14	2 - FT
1/4"	59.4	29.7	11.4	19	4 - FT
3/8"	72.0	36.0	15.0	22	6 - FT
1/2"	79.2	39.6	18.5	27	8 - FT
3/4"	97.6	48.8	23.9	32	12 - FT
1"	97.0	48.5	29.7	41	16 - FT

STREET TEE

TS



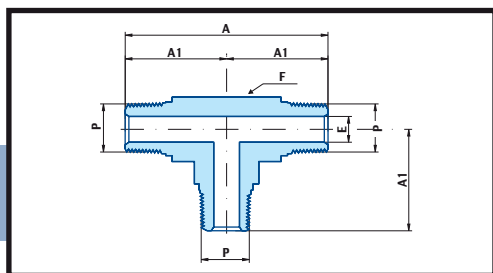
P NPT MALE & FEMALE	A	A1	A2	E	F	PART No.
1/8"	48.7	26.4	22.3	8.6	14	2 - TS
1/4"	56.4	29.7	26.7	11.4	19	4 - TS
3/8"	65.7	36.0	29.7	15.0	22	6 - TS
1/2"	76.4	39.6	36.8	18.5	27	8 - TS
3/4"	87.7	48.8	38.9	23.9	32	12 - TS
1"	93.7	48.5	45.2	29.7	41	16 - TS



BRANCH TEE

TB

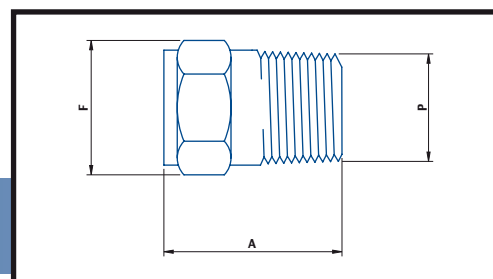
P NPT MALE & FEMALE	A	A1	A2	E	F	PART No.
1/8"	52.8	26.4	22.3	8.6	14	2 - TB
1/4"	59.4	29.7	26.7	11.4	19	4 - TB
3/8"	72.0	36.0	29.7	15.0	22	6 - TB
1/2"	79.2	39.6	36.8	18.5	27	8 - TB
3/4"	97.6	48.8	38.9	23.9	32	12 - TB
1"	97.0	48.5	45.2	29.7	41	16 - TB



MALE TEE

MT

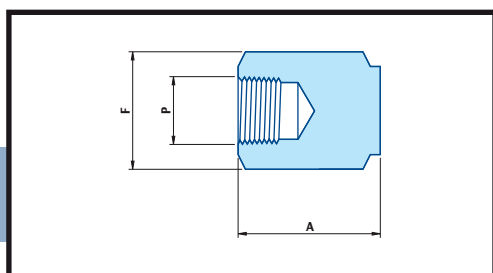
P NPT MALE	A	A1	B	E	F	PART No.
1/8"	44.6	22.3	9.6	4.8	11	2 - MT
1/4"	53.4	26.7	14.3	7.1	14	4 - MT
3/8"	59.4	29.7	14.3	9.6	19	6 - MT
1/2"	73.6	36.8	19.1	11.9	22	8 - MT
3/4"	77.8	38.9	19.1	15.8	27	12 - MT
1"	90.4	45.2	23.8	22.3	35	16 - MT



MALE PLUG

TM

P NPT MALE	A	F	PART No.
1/16"	19.0	8	1 - TM
1/8"	19.0	11	2 - TM
1/4"	24.4	14	4 - TM
3/8"	25.2	19	6 - TM
1/2"	30.7	22	8 - TM
3/4"	30.7	27	12 - TM
1"	38.1	35	16 - TM



CAP

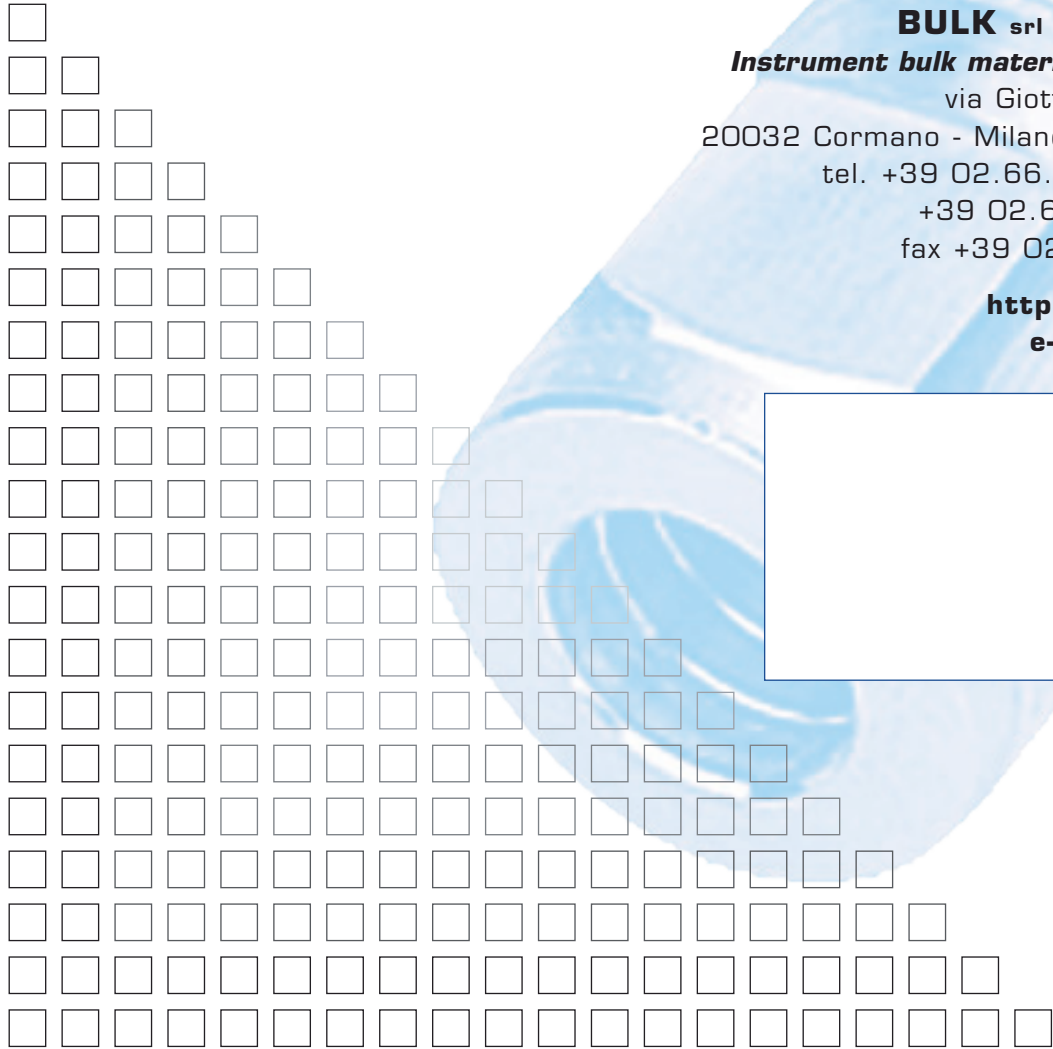
TF

P NPT FEMALE	A	F	PART No.
1/8"	19	14	2 - TF
1/4"	23.2	19	4 - TF
3/8"	26.2	22	6 - TF
1/2"	34.0	27	8 - TF
3/4"	36.6	32	12 - TF
1"	41.2	41	16 - TF

NOTES

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