

Tube Fittings



Introduction:

PAP Co. is a high-tech manufacturing group. We have a strong focus on enhancing customer productivity and sustainability through our unique expertise and solutions for oil & gas refineries, petrochemicals, power plants and chemical industries.

Our offering covers value chains and is based on extensive investment in research and development (R&D). our products category consists of mechanical instruments such as strainer, condensate pot, flange, pipe fitting, sample connections, sample cooler, sample point, seal pot, separation and filtration systems. The manufacturing facilities – factories and workshops – a 24,000 square-meter is located in 5 different areas. Along with sales offices in the heart of Tehran city.

we apply our expert minds and collaborative ways of working with customers to build more resilient and stronger businesses trying to deliver different products category in a short possible time.

Due to ability of producing products in variety of materials, sizes, pressures and etc. all items can be manufactured according to customers' demand.

To support our customer's needs, PAP Co. owns supplying departments which import the best products related to its work field, from global companies and agents.

PAP Co is approved and listed among the Ministry of petroleum AVL (MOP AVL) and National petroleum company (NPC AVL). this clearly means the wide range of our products have been tested and used in refineries and petrochemical sites for several years and makes customers to do business with us with great confidence

Features of PAP Tube Fittings



PAP Tube Fitting is produced by a strict material management, a high precision design and the best processing technology.

PAP Tube Fitting is tightened softly in linking and is leakage free entirely under shock, impact and high tension. Therefore, it can contribute for productivity improvement and cost reduction to PAP Tube Fitting users because It's the best product whose flow of fluid is very smooth caused by Fitting's excellent inner surface condition.

PAP can be assembled easily without any other special tool but the use of low quality tubing may deteriorate Fitting's function.

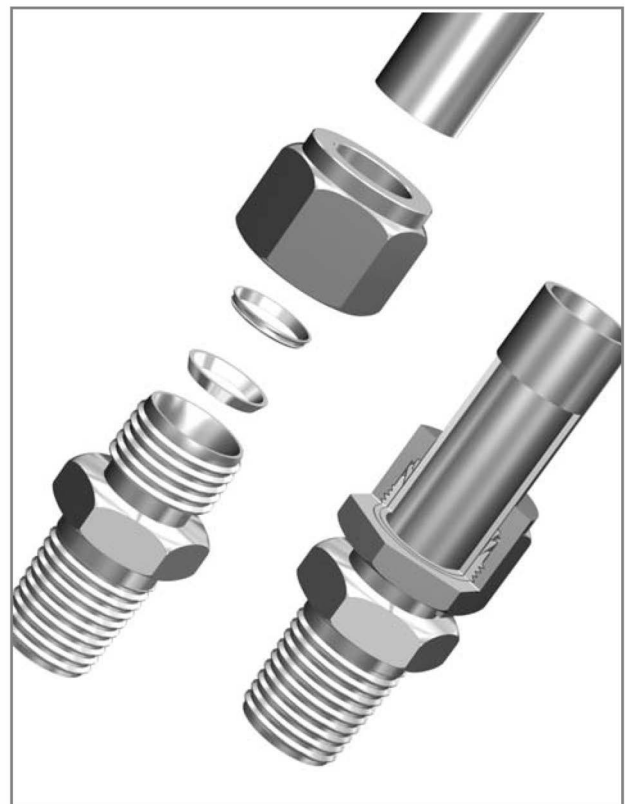
Structure of PAP

The whole system design should be considered so that there is no problem to secure reliable safety.

PAP is consists of 4 precision parts and all parts are being manufactured through a very strict tolerance superintendence under systematic and constant quality control.

All parts that are being made by this process can cope with the inferior enviromental conditions and various customer's needs.

PAP Tube Fitting secures the leakage prevention and sufficient tightness with less forces in all the tubing connections and reduces the cost and potential leakage risk in a course of tubing assembly and process.



■ Quality and Process Control

PAP Tube Fitting & Valve are produced as the product of best quality through a statistical process control and a strict quality control (various test and the self-examination included) and the written systematic quality control assurance.

■ Warranty of Quality and Exchange

PAP warrants that PAP Tube Fitting is being manufactured without defect in raw materials and manufacturing process, with the guarantee of its construction and workmanship of enough quality control and process control according to the specifications.

However, the defect owing to user's recklessness, an unreasonable assembling method and operation and the operation disregarding manufacturer's indications can not be compensated.

In case that leakage happens by the defect on PAP Tube Fitting in spite of normal operation, all the defected fittings shall be exchanged immediately.

PAP acknowledges this leaflet is regarded as warranty and does not publish separate warranty as long as special requirement issues are not required.

PAP Installation Instruction

1. Installation under 1 inch or 25MM

PAP Tube Fitting shall be delivered to customer with completely assembled state, so be ready to immediate use only with finger-tightening. Disassembling the product prior to use can be a cause of leakage or a cause of inflow something into the fitting's inside. Do not use for the poor quality tubes, which can be a cause of leakage or functional deterioration.

PAP Tube Fittings are installed in three easy steps:

Step 1

Insert the tubing into PAP Tube Fitting's inside. At this moment, make sure that the tubing is completely contact with the shoulder of fittings and then finger-tighten the nut.

Step 2

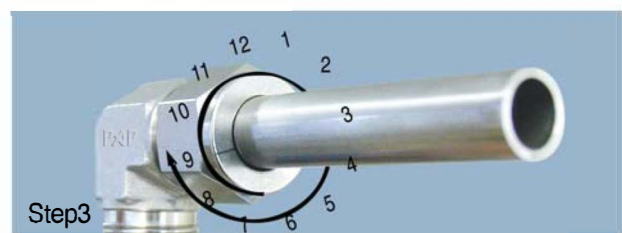
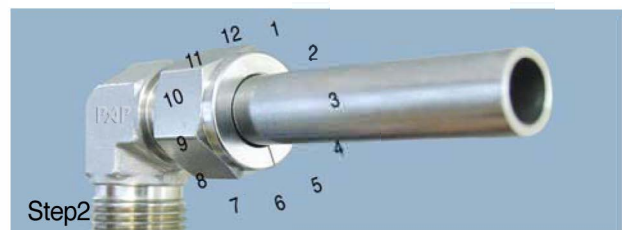
Before tightening the PAP nut, mark the starting point of turning at the 6 o'clock position.

Step 3

Hold the fitting body safely with a backup wrench and tighten the nut 1-1/4 turns. (pay attention to the mark of starting point of turning, make one revolution and place at 9 o'clock position. Marking the starting point of turning at the 6 o'clock position will let you notice where the starting point is).

After 1-1/4 revolution, when the starting point is placed at 9 o'clock position, you can easily confirm and see that PAP Tube Fitting is installed accurately.

After 1-1/4 revolution of the PAPnut by finger-tightening, make sure whether it is sufficiently tightened using by the Gap Inspection Gage.



2. Installation at the high pressure or the high safety systems

Since there are various variations of tubing, unifying the starting point of the fitting is desirable. The starting point is determined by that when tighten the nut by using a wrench until the tubing shall not be turn freely in the fitting. At this point, make the 1-1/4 revolution and tighten the nut.

(If tube rotation is not possible, tighten the nut approximately 1/8 turn from the finger-tight position)

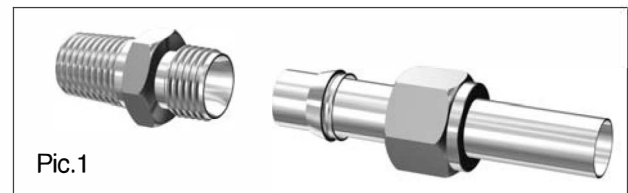
Safety Considerations on Installations for High Pressure System

(Apply to the installation of general system)

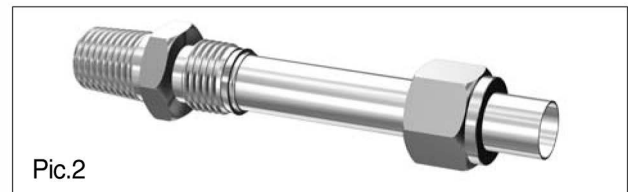
1. Make sure whether the thickness and material of tubing is proper to applicable usage. The material of tubing is compatible with the material of fitting and the hardness of tubing shall be less than that of fitting.
2. Do not assemble or disassemble the fitting when the pressure is hold at the system.
3. Since straightly assembled tubing to a pair of fixed fitting cannot be completely contacted with the both sides of fittings' shoulder, there shall be a leakage risk caused by deformation from high temperature and high pressure.
4. Do not turn the fitting body.

3. Re-tightening Instruction

1. Shown the disconnected position of fittings.
2. When inserting the tubing with preswaged ferrule into the fitting body, the front ferrule shall be seated in the fitting body.
3. Finger-tighten the nut and revolve the nut to the original position with a wrench. At the original position, the resistance increases. At the point, the job will be done by tightening slightly more.



Pic.1



Pic.2



Pic.3

Technological Information

■ Hardness Limitation

Generally, heat treated tubing shall be used in Metal tubing so that can be used properly with PAP tube fitting.

Hardness of stainless steel tubing is being limited below HRb90 but large majority of users are using the hardness of tube limited below HRb80. On the other hand, it is actually economical to use tubing by lowering the hardness of tubing because the assembly is easy and tubing can be bent easily. Therefore, encourage customers to use tubing with the hardness

below HRb 80. This is for customer's convenience and perfect leakage prevention in operation.

■ Compatibility

PAP is manufactured in order to be compatible with other firm's tube fitting from the beginning of design so that can warrant 100% confidence in case of being made under the mutual control of tolerance and hardness with other firm. But it is safe to operate with only products if possible.

Technological Data

Table 2 Stainless Steel Tubing

Stainless Steel tubing which is high quality (such as 304, 316, 316L and so on), fully annealed and seamless or welding, ASTM A269, A213 or equivalent.

STAINLESS STEEL FRACTIONAL TUBE

Tube O.D. (inch)	TUBE WALL THICKNESS (inch)												
	0.010	0.012	0.014	0.016	0.020	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120
1/16	5600	6800	8100	9400	12000								
1/8						8500	10900						
3/16						5400	7000	10200					
1/4						4000	5100	7500	10200				
5/16							4000	5800	8000				
3/8							3300	4800	6500				
1/2							2600	3700	5100	6700			
5/8								2900	4000	5200	6000		
3/4								2400	3300	4200	4900	5800	
7/8								2000	2800	3600	4200	4800	
1									2400	3100	3600	4200	4700

* 가스용 Tubing working pressure(psi) / 허용상용압력(psi)

STAINLESS STEEL METRIC TUBE

Tube O.D. (mm)	TUBE WALL THICKNESS (mm)												
	0.71	0.89	1.00	1.25	1.50	1.65	2.00	2.11	2.41	2.50	2.77	3.00	3.05
3	10800	13800	15300										
4	7900	10100	11500	14400									
6	5000	6500	7400	9400	11500	12700							
8		4700	5800	6800	8400	9300							
10		3700	4200	5300	6500	7300							
12		3000	3400	4400	5300	5900	6800	7200					
16			2500	3200	3900	4300	5300	5700	6600	6800			
18				2800	3400	3800	4700	5000	5800	6000	6700		
20				2500	3000	3400	4200	4400	5100	5300	6000		
22				2300	2800	3000	3800	4000	4600	4800	5400		
25				2000	2400	2700	3300	3500	4000	4200	4700	5100	5200

* 가스용 Tubing working pressure(psi) / 허용상용압력(psi)

Allowable stress value between -20 °F and 100 °F (-28.9 °C ~ 37.8 °C) is 19,500 psi

Safety factor is 4 (Ultimate tensile strength is 75,000 psi)

- The above data are based on the minimum wall thickness and the maximum O. D. allowed by and under the standard of ASTM A269.
- The dimensions are not considered to erosion or corrosion.

Hydraulic tubing – metric sizes													
PART NO.	Outside Wall diameter thick-ness		Weight kg/m	SS304/304L		SS316/316L		INCONEL 825		MONEL 400			
	mm	mm		DIN 1.4306	ASME	DIN 1.4435	ASME	EN	ASME	EN	ASME		
Max. working pressure in bar													
T0305	3	0.5	0.03			510	470						
T0307		0.7	0.04			718	684						
T0607	6	0.7	0.13	470	470	510	470	522	470	550	470		
T0610		1.0	0.17			774	738			635	738		
T0810	8	1.0	0.18	338	340	366	340	375	366	340	365	340	
T0815		1.5	0.24	541	537	587	537	600	537	633	537		
T0820		2.0	0.3	714	738	774	738	792	738				
T1010	10	1.0	0.23	253	267	286	267	292	267	308	267		
T1015		1.5	0.32	416	417	451	417	461	417	486	417		
T1020		2.0	0.4	585	577	635	577	649	577	684	577		
T1210	12	1.0	0.28	216	220	234	220	240	220	253	220		
T1215		1.5	0.39	338	340	366	340	375	340	395	340		
T1220		2.0	0.5	470	470	510	470	522	470	550	470		
T1410	14	1.0	0.33	163	186	198	186						
T1415		1.5	0.47							332	288		
T1420		2	0.6	393	395	426	395	436	395	460	395		
T1510	15	1.0	0.36	170	173	184	173						
T1515		1.5	0.51	263	267	286	267	292	267	308	267		
T1520		2	0.65	363	366	394	366			425	366		
T1610	16	1.0	0.38	158	162	172	162						
T1615		1.5	0.54	245	249	266	249			267	249		
T1620		2	0.7	338	340	366	340	375	340	395	340		
T1625		2.5	0.85			473	437	484	437	510	437		
T1630		3	0.98							633	537		
T1810	18	1.0	0.43	140	143	152	143						
T1815		1.5	0.62	216	220	234	220	240	220	252	220		
T1820		2.0	0.8	296	299	321	299	328	299	346	299		
T1825		2.5	0.97							445	383		
T2015	20	1.5	0.69	193	196	209	196						
T2020		2.0	0.9	263	267	286	267			308	267		
T2025		2.5	1.09			366	340	375	340	395	340		
T2030		3.0	1.28					461	417	486	417		
T2040		4.0	1.6			635	577						
T2215	22	1.5	0.77	174	177	189	177	193	177	203	177		
T2220		2.0	1	237	241	257	241	263	241	278	241		
T2515	25	1.5	0.88	152	155								
T2520		2.0	1.15	206	210	224	210			242	210		
T2525		2.5	1.41	263	267	286	267			308	267		
T2530		3.0	1.65	322	326	350	326			377	326		
T2815	28	1.5	1	135	138	146	138	149	138				
T2820		2.0	1.3	183	186	198	186	203	186	214	186		
T2825		2.5	1.6	233	236	252	236						
T3025	30	2.5	1.72			234	220						
T3030		3.0	2.03	263	267	286	267			308	267		
T3040		4.0	2.6			394	366						
T3520	35	2.0	1.65	144	147	156	147						
T3525		2.5	2.03	183	186					214	186		
T3530		3.0	2.4	222	226	241	226						
T3820	38	2.0	1.8	132	135	143	135						
T3830		3.0	2.63	203	207	221	207						
T3840		4.0	3.41			302	282						
T3850		5.0	4.13			388	360			362	282		
T4220	42	2.0	2			129	122						
T4230		3.0	2.93	183	186	198	186			214	186		
T5050	50	5.0	5.63			266	267						

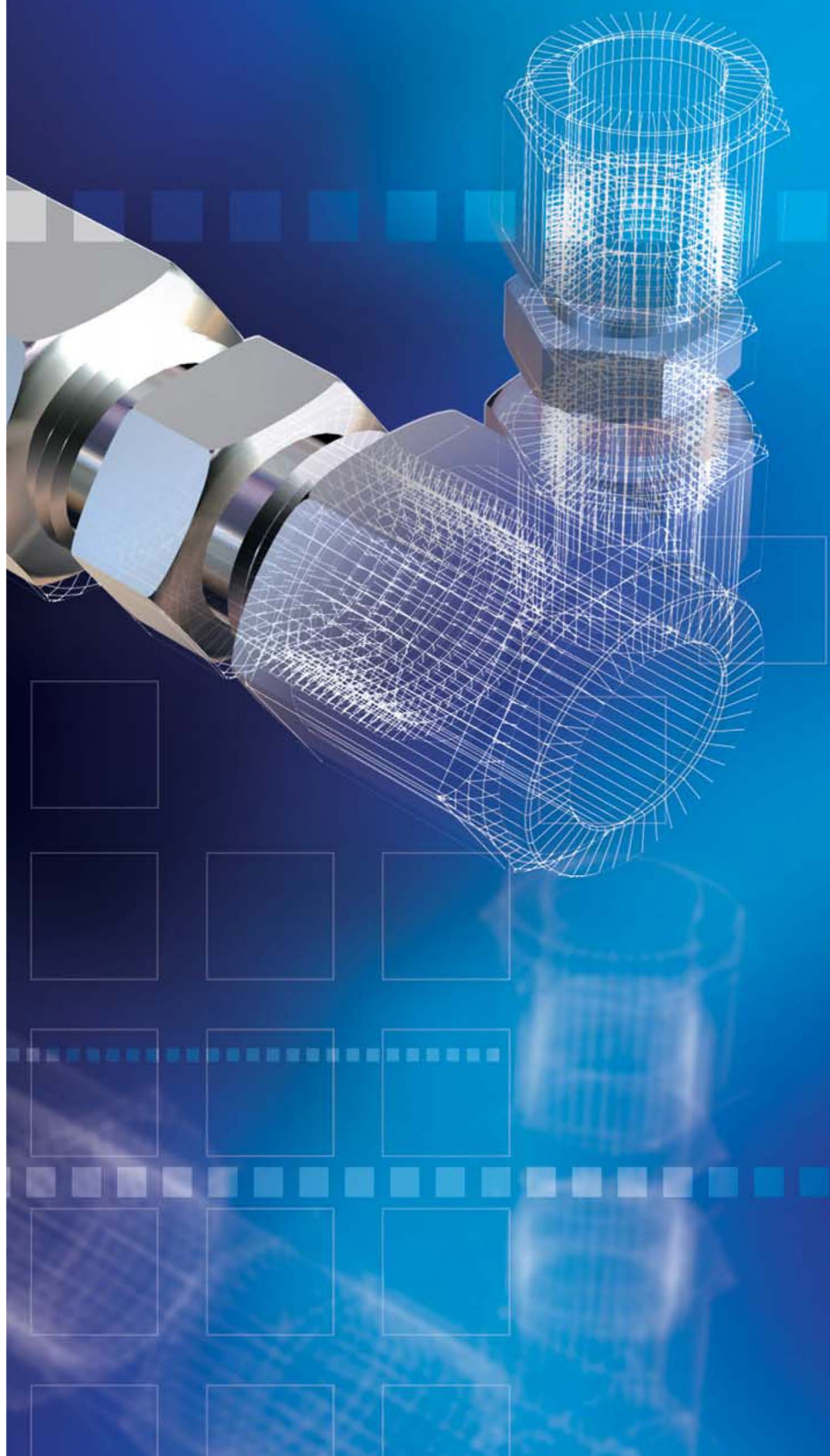
1) SWG = Standard Wire Gauge, BWG = Birmingham Wire Gauge
28 BWG = 0.014 inch 25 BWG = 0.020 inch
16 BWG = 0.065 inch 16 SWG = 0.064 inch
2) 1bar = 0.1MPa, 1ksi = 6.895MPa

Instrumentation tubing – imperial sizes																				
PART NO.	Outside Wall diameter thick-ness		Imperial size		W.T	Weight	SS304/304L		SS316/316L		UNS N08904		INCONEL 625		MONEL 400					
	mm	mm					inch		BWG,SWG	kg/m	DIN 1.4306		DIN 1.4435		DIN 1.4539		EN	ASME	EN	ASME
											EN	ASME	EN	ASME	EN	ASME				
Max. working pressure in bar																				
T0128BW T0125BW	1.59	0.36 0.51	1/16"	X	28 BWG 25BWG	0.011 0.014			740 1008	662 961										
T0222BW T0220BW	3.18	0.71 0.89	1/8"	X	22BWG 20BWG	0.044 0.051			727 874	652 834										
T0320BW	4.76	0.89	3/16"	X	20 BWG	0.086			585	536										
T0422BW T0420BW	6.35	0.71 0.89	1/4"	X	22BWG 20BWG	0.1 0.122			323 417	301 386										
T0420SW T0418SW		0.91			20SWG 18 SWG	0.124 0.157	384 557	386 552	428 604	396 552	469 680	392 560	962	748						
T0418BW T0416SW T0416BW	6.35	1.22 1.24 1.63 1.65	1/4"	X	18 BWG 16 SWG 16 BWG	0.159 0.193 0.194	568 568	562 562	616 797 807	562 759 770	693 896 908	570 771 781	1421 1851	1088 1490						
T0620BW T0620SW T0618SW T0618BW	9.53	0.89 0.91 1.22	3/8"	X	20BWG 20SWG 18 SWG	0.193 0.196 0.254	244 250	248 254	265 272	248 254	298 305	252 258	611	480						
T0616SW T0616BW T0616BW T0614SW T0614BW	9.53	1.24 1.63 1.65 2.03 2.11	3/8"	X	18 BWG 16 SWG 16 BWG 14SWG 14 BWG	0.257 0.322 0.326 0.381 0.391			363 526 534 686 720	356 484 490 619 646	431 591 600	361 491 498	884 1230	689 950	416 424 582 590	362 368 501 508				
T0820BW T0820SW T0818SW T0818BW	12.7	0.89 0.91 1.22	1/2"	X	20BWG 20SWG 18 SWG	0.263 0.268 0.35	179 183	183 187	194 199	183 187	219 224	185 190	448	354						
T0816SW T0816BW T0816BW T0814SW T0814BW	12.7	1.24 1.63 1.65 2.03 2.11	1/2"	X	18 BWG 16 SWG 16 BWG 14SWG 14BWG	0.356 0.452 0.456 0.542 0.559	256 348 353	260 351 355	278 377 383	260 351 355	313 430 430	264 361 361	642 882	504 688	423 423	368 368				
T1018SW T1018BW T1016SW T1016BW	15.88	1.22 1.24 1.63 1.65	5/8"	X	18 SWG 18BWG 16 SWG 16BWG	0.448 0.454 0.582 0.588			214 218	201 205										
T1218SW T1218BW T1216SW T1216BW T1214BW T1213BW T1212BW	19.05	1.22 1.24 1.63 1.65 2.11 2.41 2.77	3/4"	X	18 SWG 18 BWG 16 SWG 16 BWG 14 BWG 13 BWG 12 BWG	0.544 0.553 0.711 0.718 0.895 1 1.13			176 180 241 244 320 371 435	166 169 226 229 298 345 403			414	328						
T1618SW T1618BW T1616BW T1614BW T1613BW T163.2	25.4	1.22 1.24 1.65 2.11 2.41 3.2	1"	X	18 SWG 18 BWG 16 BWG 14BWG 13 BWG -	0.739 0.75 0.981 1.23 1.39 1.78			130 132 179 233 270 370	123 125 169 219 252 343										
1) SWG = Standard Wire Gauge, BWG = Birmingham Wire Gauge 28 BWG = 0.014 inch 25 BWG = 0.020 inch 16 BWG = 0.065 inch 16 SWG = 0.064 inch 2) 1bar = 0.1MPa, 1ksi = 6.895MPa																				

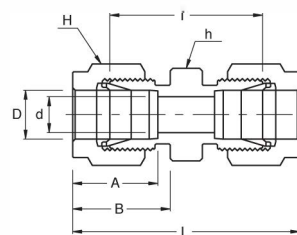


Tube Fittings

Union & Connector



PAP-U Union



Connects Fractional Tubes

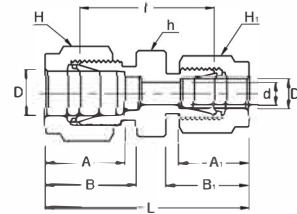
Part No.	Tube O.D. D (inch)	d Min	Width Across Flat		A	B	I	L
			h (inch)	H (inch)				
PAP-U -1	1/16	1.27	5/16	5/16	8.63	10.92	17.52	25.15
PAP-U -2	1/8	2.28	7/16	7/16	12.70	15.24	22.35	35.56
PAP-U -3	3/16	3.04	7/16	1/2	13.71	16.00	24.13	37.33
PAP-U -4	1/4	4.82	1/2	9/16	15.24	17.78	26.16	40.89
PAP-U -5	5/16	6.35	9/16	5/8	16.25	18.54	28.19	42.92
PAP-U -6	3/8	7.11	5/8	11/16	16.76	19.30	30.22	44.95
PAP-U -8	1/2	10.41	13/16	7/8	22.86	21.84	30.98	51.30
PAP-U -10	5/8	12.70	15/16	1	24.38	21.84	31.75	52.07
PAP-U -12	3/4	15.74	1-1/16	1-1/8	24.38	21.84	33.27	53.59
PAP-U -14	7/8	18.28	1-3/16	1-1/4	25.90	21.84	34.79	55.11
PAP-U -16	1	22.35	1-3/8	1-1/2	31.24	26.41	40.38	64.77
PAP-U -20	1-1/4	27.69	1-3/4	1-7/8	41.15	38.86	48.00	92.20
PAP-U -24	1-1/2	34.04	2-1/8	2-1/4	50.04	45.21	53.59	107.95
PAP-U -32	2	45.97	2-3/4	3	67.56	62.74	74.68	149.35

Connects Metric Tubes

Part No.	Tube O.D. D	d Min	Width Across Flat		A	B	I	L
			h	H				
PAP-U - 2M	2	1.7	12	12	12.9	15.3	22.4	35.6
PAP-U - 3M	3	2.4	12	12	12.9	15.3	22.1	35.3
PAP-U - 4M	4	2.4	12	12	13.7	16.1	24.1	37.3
PAP-U - 6M	6	4.8	14	14	15.3	17.7	26.2	41.0
PAP-U - 8M	8	6.4	15	16	16.2	18.6	28.2	43.2
PAP-U -10M	10	7.9	18	19	17.2	19.5	31.0	46.2
PAP-U -12M	12	9.5	22	22	22.8	22.0	31.0	51.2
PAP-U -15M	15	11.9	24	25	24.4	22.0	31.8	52.0
PAP-U -16M	16	12.7	24	25	24.4	22.0	31.8	52.0
PAP-U -18M	18	15.1	27	30	24.4	22.0	33.3	53.5
PAP-U -20M	20	15.9	30	32	26.0	22.0	34.8	55.0
PAP-U -22M	22	18.3	30	32	26.0	22.0	34.8	55.0
PAP-U -25M	25	21.8	35	38	31.3	26.5	40.4	65.0

• All dimensions in millimeters unless specified as "inch"

PAP-RU Reducing Union



Connects Fractional Tubes

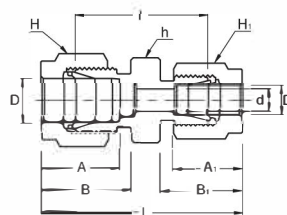
Part No.	Tube O.D.		d Min	Width Across Flat			A	A ₁	B	B ₁	I	L
	D (inch)	D ₁ (inch)		h (inch)	H (inch)	H ₁ (inch)						
PAP-RU 2- 1	1/8	1/16	1.27	7/16	7/16	5/16	12.7	8.63	15.24	10.92	20.60	31.00
PAP-RU 3- 2	3/16	1/8	2.28	7/16	1/2	7/16	13.71	12.70	16.00	15.24	23.36	36.57
PAP-RU 4- 2	1/4	1/8	2.28	1/2	9/16	7/16	15.24	12.70	17.78	15.24	24.63	38.60
PAP-RU 4- 3	1/4	3/16	3.04	1/2	9/16	1/2	15.24	13.71	17.78	16.00	25.40	39.37
PAP-RU 5- 2	5/16	1/8	2.28	9/16	5/8	7/16	16.25	12.70	18.54	15.24	25.90	39.87
PAP-RU 5- 4	5/16	1/4	4.82	9/16	5/8	9/16	16.25	15.24	18.54	17.78	27.43	42.16
PAP-RU 6- 2	3/8	1/8	2.28	5/8	11/16	7/16	16.76	12.70	19.30	15.24	26.92	40.89
PAP-RU 6- 4	3/8	1/4	4.82	5/8	11/16	9/16	16.76	15.24	19.30	17.78	28.44	43.18
PAP-RU 6- 5	3/8	5/16	6.35	5/8	11/16	5/8	16.76	16.25	19.30	18.54	29.46	44.19
PAP-RU 8- 2	1/2	1/8	2.28	13/16	7/8	7/16	22.86	12.70	21.84	15.24	28.44	45.21
PAP-RU 8- 4	1/2	1/4	4.82	13/16	7/8	9/16	22.86	15.24	21.84	17.78	29.46	46.99
PAP-RU 8- 6	1/2	3/8	7.11	13/16	7/8	11/16	22.86	16.76	21.84	19.30	30.98	48.51
PAP-RU 10- 6	5/8	3/8	7.11	15/16	1	11/16	24.38	16.76	21.84	19.30	31.75	49.27
PAP-RU 10- 8	5/8	1/2	10.41	15/16	1	7/8	24.38	22.86	21.84	21.84	31.75	52.07
PAP-RU 12- 4	3/4	1/4	4.82	1-1/16	1-1/8	9/16	24.38	15.24	21.84	17.78	31.75	49.27
PAP-RU 12- 6	3/4	3/8	7.11	1-1/16	1-1/8	11/16	24.38	16.76	21.84	19.30	33.27	50.80
PAP-RU 12- 8	3/4	1/2	10.41	1-1/16	1-1/8	7/8	24.38	22.86	21.84	21.84	33.27	53.59
PAP-RU 12- 10	3/4	5/8	12.70	1-1/16	1-1/8	1	24.38	24.38	21.84	21.84	33.27	53.59
PAP-RU 18- 8	1	1/2	10.41	1-3/8	1-1/2	7/8	31.24	22.86	26.41	21.84	39.50	63.24
PAP-RU 16- 12	1	3/4	15.74	1-3/8	1-1/2	1-1/8	31.24	24.38	26.41	21.84	39.00	62.73

Connects Metric Tubes

Part No.	Tube O.D.		d Min	Width Across Flat			A	A ₁	B	B ₁	I	L
	D	D ₁		h	H	H ₁						
PAP-RU 6M- 3M	6	3	2.4	14	14	12	15.3	12.9	17.7	15.3	24.6	38.6
PAP-RU 6M- 4M	6	4	2.4	14	14	12	15.3	13.7	17.7	16.1	25.4	39.4
PAP-RU 8M- 6M	8	6	4.8	15	16	14	16.2	15.3	18.6	17.7	27.4	42.3
PAP-RU 10M- 6M	10	6	4.8	18	19	14	17.2	15.3	19.5	17.7	29.5	44.5
PAP-RU 10M- 8M	10	8	6.4	18	19	16	17.2	16.2	19.5	18.6	30.0	45.1
PAP-RU12M- 6M	12	6	4.8	22	22	14	22.8	15.3	22.0	17.7	29.5	47.0
PAP-RU12M- 8M	12	8	6.4	22	22	16	22.8	16.2	22.0	18.6	30.2	47.8
PAP-RU12M-10M	12	10	7.9	22	22	19	22.8	17.2	22.0	19.5	31.0	48.7
PAP-RU16M-12M	16	12	9.5	24	25	22	24.4	22.8	22.0	22.0	31.8	52.0
PAP-RU25M-18M	25	18	15.1	35	38	30	31.3	24.4	26.5	22.0	38.6	61.0
PAP-RU25M-20M	25	20	15.9	35	38	32	31.3	26.0	26.5	22.0	39.9	62.3

• All dimensions in millimeters unless specified as "inch"

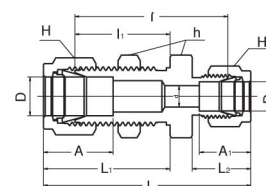
PAP-RU Reducing Union



Connects Metric Tubes To Fractional Tubes

Part No.	Tube O.D.		d Min	Width Across Flat			A	A ₁	B	B ₁	I	L
	D	D ₁ (inch)		h	H	H ₁						
PAP-RU 3M - 2	3	1/8	2.4	12	12	11.1	12.9	12.8	15.3	15.2	22.1	35.2
PAP-RU 4M - 2	4	1/8	2.4	12	12	11.1	13.7	12.8	16.1	15.2	23.4	36.5
PAP-RU 4M - 4	4	1/4	2.4	14	12	14.3	13.7	15.3	16.1	17.7	25.4	39.4
PAP-RU 6M - 2	6	1/8	2.4	14	14	11.1	15.3	12.8	17.7	15.2	24.6	38.5
PAP-RU 6M - 4	6	1/4	4.8	14	14	14.3	15.3	15.3	17.7	17.7	26.2	41.0
PAP-RU 6M - 5	6	5/16	4.8	14	14	15.9	15.3	16.2	17.7	18.6	27.4	42.3
PAP-RU 8M - 4	8	1/4	4.8	15	16	14.3	16.2	15.3	18.6	17.7	27.4	42.3
PAP-RU 10M - 2	10	1/8	2.4	18	19	11.1	17.2	12.8	19.5	15.2	27.7	41.8
PAP-RU 10M - 4	10	1/4	4.8	18	19	14.3	17.2	15.3	19.5	17.7	29.5	44.5
PAP-RU 10M - 5	10	5/16	6.4	18	19	15.9	17.2	16.2	19.5	18.6	30.0	45.1
PAP-RU 10M - 6	10	3/8	7.1	18	19	17.5	17.2	16.9	19.5	19.2	31.0	45.9
PAP-RU 12M - 5	12	5/16	6.4	22	22	15.9	22.8	16.2	22.0	18.6	30.2	47.8
PAP-RU 12M - 6	12	3/8	7.1	22	22	17.5	22.8	16.9	22.0	19.2	31.0	48.4
PAP-RU 12M - 8	12	1/2	9.5	22	22	22.2	22.8	22.8	22.0	22.0	31.0	51.2
PAP-RU 15M - 8	15	1/2	10.3	24	25	22.2	24.4	22.8	22.0	22.0	31.8	52.0
PAP-RU 16M -10	16	5/8	12.7	24	25	25.4	24.4	24.4	22.0	22.0	31.8	52.0
PAP-RU 18M -12	18	3/4	15.1	27	30	28.6	24.4	24.4	22.0	22.0	33.3	53.5
PAP-RU 20M -12	20	3/4	15.9	30	32	28.6	26.0	24.4	22.0	22.0	34.8	54.9
PAP-RU 20M -16	20	1	15.9	35	32	38.1	26.0	31.2	22.0	26.4	40.4	62.8
PAP-RU 25M -16	25	1	21.8	35	38	38.1	31.3	31.3	26.5	26.5	40.4	65.0

PAP-BHRU Bulkhead Reducing Union

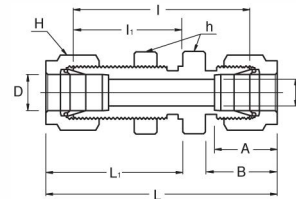


Connects Fractional Tubes

Part No.	Tube O.D.		d Min	Width Across Flat			A	A ₁	I	I ₁	L	L ₁	L ₂	Panel Hole Drill Size	Panel Max. Thickness
	D (inch)	D ₁ (inch)		h (inch)	H (inch)	H ₁ (inch)									
PAP-BHRU 4 - 2	1/4	1/8	2.28	5/8	9/16	7/16	15.24	12.70	41.14	26.16	55.11	33.52	15.24	11.50	10.16
PAP-BHRU 6 - 4	3/8	1/4	4.82	3/4	11/16	9/16	16.76	15.24	45.97	29.46	60.70	36.57	17.78	14.68	11.17
PAP-BHRU 8 - 4	1/2	1/4	4.82	15/16	7/8	9/16	22.86	15.24	49.27	31.75	66.80	41.91	17.78	19.44	12.70

• All dimensions in millimeters unless specified as "inch"

PAP-BHU Bulkhead Union



Connects Fractional Tubes

Part No.	Tube O.D. D (inch)	d Min	Width Across Flat		A	B	I	I ₁	L	L ₁	Panel Hole Drill Size	Panel Max. Thickness
			h (inch)	H (inch)								
PAP-BHU - 1	1/16	1.27	5/16	5/16	8.63	10.92	23.87	13.46	31.50	17.27	5.16	3.05
PAP-BHU - 2	1/8	2.28	1/2	7/16	12.70	15.24	38.10	24.63	51.30	31.24	8.33	12.70
PAP-BHU - 3	3/16	3.04	9/16	1/2	13.71	16.00	40.38	25.40	53.59	32.00	9.92	12.70
PAP-BHU - 4	1/4	4.82	5/8	9/16	15.24	17.78	42.92	26.16	57.65	33.52	11.50	10.16
PAP-BHU - 5	5/16	6.35	11/16	5/8	16.25	18.54	45.97	28.44	60.70	35.81	13.09	11.17
PAP-BHU - 6	3/8	7.11	3/4	11/16	16.76	19.30	47.49	29.46	62.23	36.83	14.68	11.17
PAP-BHU - 8	1/2	10.41	15/16	7/8	22.86	21.84	50.80	31.75	71.12	41.91	19.44	12.70
PAP-BHU - 10	5/8	12.70	1-1/16	1	24.38	21.84	52.32	32.51	72.64	42.67	22.62	12.70
PAP-BHU - 12	3/4	15.74	1-3/16	1-1/8	24.38	21.84	58.67	37.33	78.99	47.49	25.79	16.76
PAP-BHU - 14	7/8	18.28	1-3/8	1-1/4	25.90	21.84	64.26	42.92	84.58	53.08	28.97	19.05
PAP-BHU - 16	1	22.35	1-5/8	1-1/2	31.24	26.41	71.37	45.21	95.75	57.40	33.73	19.05

Connects Metric Tubes

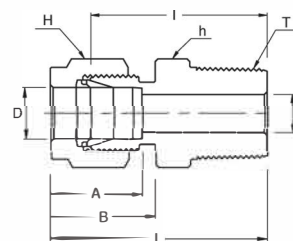
Part No.	Tube O.D. D	d Min	Width Across Flat			A	B	I	I ₁	L	L ₁	Panel Hole Drill Size	Panel Max. Thickness
			h	h ₁ *	H								
PAP-BHU - 3M	3	2.4	14	12.7	12	12.9	15.3	38.1	24.6	51.3	31.2	8.3	12.7
PAP-BHU - 4M	4	2.4	14	14.3	12	13.7	16.1	40.4	25.4	53.6	32.0	9.9	12.7
PAP-BHU - 6M	6	4.8	16	15.9	14	15.3	17.7	42.9	26.2	57.7	33.6	11.5	10.2
PAP-BHU - 8M	8	6.4	18	17.5	16	16.2	18.6	46.0	28.6	61.0	36.1	13.1	11.2
PAP-BHU - 10M	10	7.9	22	22.0	19	17.2	19.5	48.5	29.4	63.7	37.0	16.2	11.2
PAP-BHU - 12M	12	9.5	24	23.8	22	22.8	22.0	50.8	31.8	71.0	41.9	19.5	12.7
PAP-BHU - 15M	15	11.9	27	27.0	25	24.4	22.0	52.3	32.5	72.5	42.6	22.8	12.7
PAP-BHU - 16M	16	12.7	27	27.0	25	24.4	22.0	52.3	32.5	72.5	42.6	22.8	12.7
PAP-BHU - 18M	18	15.1	30	30.0	30	24.4	22.0	58.7	37.3	78.9	47.4	26.0	16.8
PAP-BHU - 20M	20	15.9	35	35.0	32	26.0	22.0	64.3	42.9	84.5	53.0	29.0	17.0
PAP-BHU - 22M	22	18.3	35	35.0	32	26.0	22.0	64.3	42.9	84.5	53.0	29.0	19.1
PAP-BHU - 25M	25	21.8	41.3	41.3	38	31.3	26.5	71.4	45.2	95.9	57.5	33.7	19.1

h₁* : Metric Tubes Bulkhead Hexagon application only

* All dimensions in millimeters unless specified as "inch"

PAP-MC

Male Connector



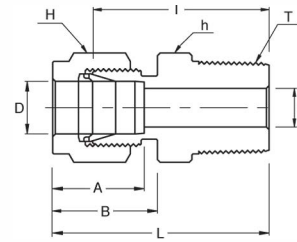
Connects Fractional Tubes To Female NPT Thread

Part No.	Tube O.D. D (inch)	T (NPT)	d Min	Width Across Flat		A	B	I	L
				h (inch)	H (inch)				
PAP-MC 1- 1N	1/16	1/16	1.27	5/16	5/16	8.63	10.92	20.00	23.83
PAP-MC 1- 2N	1/16	1/8	1.27	7/16	7/16	8.63	10.92	22.35	26.23
PAP-MC 2- 2N	1/8	1/8	2.28	7/16	7/16	12.70	15.24	23.87	30.48
PAP-MC 2- 4N	1/8	1/4	2.28	9/16	7/16	12.70	15.24	28.95	35.56
PAP-MC 2- 6N	1/8	3/8	2.28	11/16	7/16	12.70	15.24	29.21	35.81
PAP-MC 2- 8N	1/8	1/2	2.28	7/8	7/16	12.70	15.24	35.56	42.16
PAP-MC 3- 2N	3/16	1/8	3.04	7/16	1/2	13.71	16.00	24.63	31.24
PAP-MC 3- 4N	3/16	1/4	3.04	9/16	1/2	13.71	16.00	29.71	36.32
PAP-MC 4- 2N	1/4	1/8	4.82	1/2	9/16	15.24	17.78	25.40	32.76
PAP-MC 4- 4N	1/4	1/4	4.82	9/16	9/16	15.24	17.78	30.48	37.84
PAP-MC 4- 6N	1/4	3/8	4.82	11/16	9/16	15.24	17.78	30.98	38.35
PAP-MC 4- 8N	1/4	1/2	4.82	7/8	9/16	15.24	17.78	37.33	44.70
PAP-MC 4- 12N	1/4	3/4	4.82	1-1/16	9/16	15.24	17.78	38.86	46.22
PAP-MC 5- 2N	5/16	1/8	4.82	9/16	5/8	16.25	18.54	26.67	34.03
PAP-MC 5- 4N	5/16	1/4	6.35	9/16	5/8	16.25	18.54	31.24	38.60
PAP-MC 5- 6N	5/16	3/8	6.35	11/16	5/8	16.25	18.54	31.75	39.11
PAP-MC 6- 2N	3/8	1/8	4.82	5/8	11/16	16.76	19.30	27.94	35.30
PAP-MC 6- 4N	3/8	1/4	7.11	5/8	11/16	16.76	19.30	32.51	39.87
PAP-MC 6- 6N	3/8	3/8	7.11	11/16	11/16	16.76	19.30	32.51	39.87
PAP-MC 6- 8N	3/8	1/2	7.11	7/8	11/16	16.76	19.30	38.86	46.22
PAP-MC 6- 12N	3/8	3/4	7.11	1-1/16	11/16	16.76	19.30	40.38	47.75
PAP-MC 8- 2N	1/2	1/8	4.82	13/16	7/8	22.86	21.84	28.70	38.86
PAP-MC 8- 4N	1/2	1/4	7.11	13/16	7/8	22.86	21.84	33.27	43.43
PAP-MC 8- 6N	1/2	3/8	9.65	13/16	7/8	22.86	21.84	33.27	43.43
PAP-MC 8- 8N	1/2	1/2	10.41	7/8	7/8	22.86	21.84	38.86	49.02
PAP-MC 8- 12N	1/2	3/4	10.41	1-1/16	7/8	22.86	21.84	40.38	50.54
PAP-MC 8- 16N	1/2	1	10.41	1-3/8	7/8	22.86	21.84	46.99	57.15
PAP-MC 10- 6N	5/8	3/8	9.65	15/16	1	24.38	21.84	34.03	44.19
PAP-MC 10- 8N	5/8	1/2	11.93	15/16	1	24.38	21.84	38.86	49.02
PAP-MC 10- 12N	5/8	3/4	12.70	1-1/16	1	24.38	21.84	40.38	50.54
PAP-MC 12- 8N	3/4	1/2	11.93	1-1/16	1-1/8	24.38	21.84	40.38	50.54
PAP-MC 10- 12N	3/4	3/4	15.74	1-1/16	1-1/8	24.38	21.84	40.38	50.54
PAP-MC 10- 16N	3/4	1	15.74	1-3/8	1-1/8	24.38	21.84	46.99	57.15
PAP-MC 14- 12N	7/8	3/4	15.74	1-3/16	1-1/4	25.90	21.84	40.38	50.54
PAP-MC 14- 16N	7/8	1	18.28	1-3/8	1-1/4	25.90	21.84	46.99	57.15
PAP-MC 16- 8N	1	1/2	11.93	1-3/8	1-1/2	31.24	26.41	45.21	57.40
PAP-MC 16- 12N	1	3/4	15.74	1-3/8	1-1/2	31.24	26.41	45.21	57.40
PAP-MC 16- 16N	1	1	22.35	1-3/8	1-1/2	31.24	26.41	50.03	62.23
PAP-MC 20- 16N	1-1/4	1	22.35	1-3/4	1-7/8	41.15	38.86	55.12	77.22
PAP-MC 20- 20N	1-1/4	1-1/4	27.69	1-3/4	1-7/8	41.15	38.86	55.12	77.22
PAP-MC 24- 24N	1-1/2	1-1/2	34.04	2-1/8	2-1/4	50.04	45.21	61.72	88.90
PAP-MC 32- 32N	2	2	45.97	2-3/4	3	67.56	62.74	76.20	113.54

• All dimensions in millimeters unless specified as "inch"

PAP-MC

Male Connector

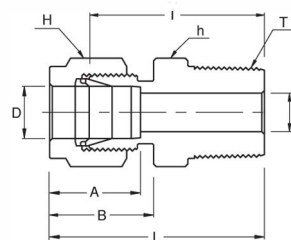


Connects Fractional Tube To Female ISO Tapered Thread

Part No.	Tube O.D. D (inch)	T R (PT)	d Min	Width Across Flat		A	B	I	L
				h (inch)	H (inch)				
PAP-MC 2 - 2R	1/8	1/8	2.28	7/16	7/16	12.70	15.24	23.87	30.48
PAP-MC 2 - 4R	1/8	1/4	2.28	9/16	7/16	12.70	15.24	28.95	35.56
PAP-MC 4 - 2R	1/4	1/8	4.82	1/2	9/16	15.24	17.78	25.40	32.76
PAP-MC 4 - 4R	1/4	1/4	4.82	9/16	9/16	15.24	17.78	30.48	37.84
PAP-MC 4 - 6R	1/4	3/8	4.82	11/16	9/16	15.24	17.78	30.98	38.35
PAP-MC 4 - 8R	1/4	1/2	4.82	7/8	9/16	15.24	17.78	37.33	44.70
PAP-MC 5 - 2R	5/16	1/8	4.82	9/16	5/8	16.25	18.54	26.67	34.03
PAP-MC 5 - 4R	5/16	1/4	6.35	9/16	5/8	16.25	18.54	31.24	38.60
PAP-MC 6 - 2R	3/8	1/8	4.82	5/8	11/16	16.76	19.30	27.94	35.30
PAP-MC 6 - 4R	3/8	1/4	7.11	5/8	11/16	16.76	19.30	32.51	39.87
PAP-MC 6 - 6R	3/8	3/8	7.11	11/16	11/16	16.76	19.30	32.51	39.87
PAP-MC 6 - 8R	3/8	1/2	7.11	7/8	11/16	16.76	19.30	38.86	46.22
PAP-MC 8 - 4R	1/2	1/4	7.11	13/16	7/8	22.86	21.84	33.27	43.43
PAP-MC 8 - 6R	1/2	3/8	9.65	13/16	7/8	22.86	21.84	33.27	43.43
PAP-MC 8 - 8R	1/2	1/2	10.41	7/8	7/8	22.86	21.84	38.86	49.02
PAP-MC 8 - 12R	1/2	3/4	10.41	1-1/16	7/8	22.86	21.84	40.38	50.54
PAP-MC 12-12R	3/4	3/4	15.74	1-1/16	1-1/8	24.38	21.84	40.38	50.54
PAP-MC 16- 16R	1	1	22.35	1-3/8	1-1/2	31.24	26.41	50.03	62.23

• All dimensions in millimeters unless specified as "inch"

PAP-MC Male Connector

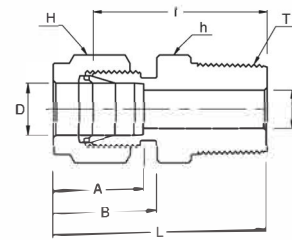


Connects Metric Tube To Female NPT Thread

Part No.	Tube O.D. D	T (NPT)	d Min	Width Across Flat		A	B	I	L
				h	H				
PAP-MC 2M- 2N	2	1/8	1.7	12	12	12.9	15.3	23.9	30.5
PAP-MC 3M- 2N	3	1/8	2.4	12	12	12.9	15.3	23.9	30.5
PAP-MC 3M- 4N	3	1/4	2.4	14	12	12.9	15.3	29.0	35.6
PAP-MC 4M- 2N	4	1/8	2.4	12	12	13.7	16.1	24.6	31.2
PAP-MC 4M- 4N	4	1/4	2.4	14	12	13.7	16.1	29.7	36.3
PAP-MC 6M- 2N	6	1/8	4.8	14	14	15.3	17.7	25.4	32.8
PAP-MC 6M- 4N	6	1/4	4.8	14	14	15.3	17.7	30.5	37.9
PAP-MC 6M- 6N	6	3/8	4.8	18	14	15.3	17.7	31.0	38.4
PAP-MC 6M- 8N	6	1/2	4.8	22	14	15.3	17.7	37.3	44.7
PAP-MC 8M- 2N	8	1/8	4.8	15	16	16.2	18.6	26.7	34.2
PAP-MC 8M- 4N	8	1/4	6.4	15	16	16.2	18.6	31.2	38.7
PAP-MC 8M- 6N	8	3/8	6.4	18	16	16.2	18.6	31.8	39.3
PAP-MC 8M- 8N	8	1/2	6.4	22	16	16.2	18.6	38.1	45.6
PAP-MC 10M- 2N	10	1/8	4.8	18	19	17.2	19.5	28.7	36.3
PAP-MC 10M- 4N	10	1/4	7.9	18	19	17.2	19.5	33.3	40.9
PAP-MC 10M- 6N	10	3/8	7.9	18	19	17.2	19.5	33.3	40.9
PAP-MC 10M- 8N	10	1/2	7.9	22	19	17.2	19.5	38.9	46.5
PAP-MC 12M- 2N	12	1/8	4.8	22	22	22.8	22.0	28.7	38.8
PAP-MC 12M- 4N	12	1/4	7.1	22	22	22.8	22.0	33.3	43.4
PAP-MC 12M- 6N	12	3/8	9.5	22	22	22.8	22.0	33.3	43.4
PAP-MC 12M- 8N	12	1/2	9.5	22	22	22.8	22.0	38.9	49.0
PAP-MC 12M- 12N	12	3/4	9.5	27	22	22.8	22.0	40.4	50.5
PAP-MC 14M- 4N	14	1/4	7.1	24	25	24.4	22.0	34.0	44.1
PAP-MC 14M- 6N	14	3/8	9.5	24	25	24.4	22.0	34.0	44.1
PAP-MC 14M- 8N	14	1/2	11.1	24	25	24.4	22.0	38.9	49.0
PAP-MC 16M- 6N	16	3/8	9.5	24	25	24.4	22.0	34.0	44.1
PAP-MC 16M- 8N	16	1/2	11.9	24	25	24.4	22.0	38.9	49.0
PAP-MC 16M- 12N	16	3/4	12.7	27	25	24.4	22.0	40.4	50.5
PAP-MC 18M- 8N	18	1/2	11.9	27	30	24.4	22.0	40.4	50.5
PAP-MC 18M- 12N	18	3/4	15.1	27	30	24.4	22.0	40.4	50.5
PAP-MC 20M- 8N	20	1/2	11.9	30	32	26.0	22.0	42.2	52.3
PAP-MC 20M- 12N	20	3/4	15.9	30	32	26.0	22.0	42.2	52.3
PAP-MC 22M- 12N	22	3/4	15.9	30	32	26.0	22.0	42.2	52.3
PAP-MC 22M- 16N	22	1	18.3	35	32	26.0	22.0	47.0	57.1
PAP-MC 25M- 12N	25	3/4	15.9	35	38	31.3	26.5	45.2	57.5
PAP-MC 25M- 16N	25	1	21.8	35	38	31.3	26.5	50.0	62.3
PAP-MC 28M- 16N	28	1	21.8	41	46	36.6	36.6	51.6	72.4
PAP-MC 28M- 20N	28	1-1/4	21.8	46	46	36.6	36.6	52.3	73.1
PAP-MC 30M- 20N	30	1-1/4	26.2	46	50	39.6	39.2	55.6	77.2
PAP-MC 32M- 20N	32	1-1/4	28.6	46	50	42.0	41.6	56.6	79.6
PAP-MC 38M- 24N	38	1-1/2	33.7	55	60	49.4	47.9	64.0	91.6

• All dimensions in millimeters unless specified as "inch"

PAP-MC Male Connector

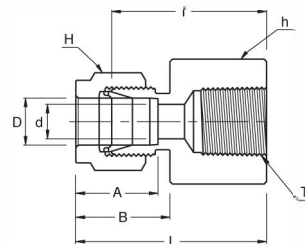


Connects Metric Tube To Female ISO Tapered Thread

Part No.	Tube O.D. D	T R (PT)	d Min	Width Across Flat		A	B	I	L
PAP-MC 2M - 2R	2	1/8	1.7	12	12	12.9	15.3	23.9	30.5
PAP-MC 3M - 2R	3	1/8	2.4	12	12	12.9	15.3	23.9	30.5
PAP-MC 3M - 4R	3	1/4	2.4	14	12	12.9	15.3	29.0	35.6
PAP-MC 4M - 2R	4	1/8	2.4	12	12	13.7	16.1	24.6	31.2
PAP-MC 4M - 4R	4	1/4	2.4	14	12	13.7	16.1	29.7	36.3
PAP-MC 6M - 2R	6	1/8	4.8	14	14	15.3	17.7	25.4	32.8
PAP-MC 6M - 4R	6	1/4	4.8	14	14	15.3	17.7	30.5	37.9
PAP-MC 6M - 6R	6	3/8	4.8	18	14	15.3	17.7	31.0	38.4
PAP-MC 6M - 8R	6	1/2	4.8	22	14	15.3	17.7	37.3	44.7
PAP-MC 8M - 2R	8	1/8	4.8	15	16	16.2	18.6	26.7	34.2
PAP-MC 8M - 4R	8	1/4	6.4	15	16	16.2	18.6	31.2	38.7
PAP-MC 8M - 6R	8	3/8	6.4	18	16	16.2	18.6	31.8	39.3
PAP-MC 8M - 8R	8	1/2	6.4	22	16	16.2	18.6	38.1	45.6
PAP-MC 10M - 2R	10	1/8	4.8	18	19	17.2	19.5	28.7	36.3
PAP-MC 10M - 4R	10	1/4	7.9	18	19	17.2	19.5	33.3	40.9
PAP-MC 10M - 6R	10	3/8	7.9	18	19	17.2	19.5	33.3	40.9
PAP-MC 10M - 8R	10	1/2	7.9	22	19	17.2	19.5	38.9	46.5
PAP-MC 12M - 4R	12	1/4	7.1	22	22	22.8	22.0	33.3	43.4
PAP-MC 12M - 6R	12	3/8	9.5	22	22	22.8	22.0	33.3	43.4
PAP-MC 12M - 8R	12	1/2	9.5	22	22	22.8	22.0	38.9	49.0
PAP-MC 12M - 12R	12	3/4	9.5	27	22	22.8	22.0	40.4	50.5
PAP-MC 15M - 8R	15	1/2	11.9	24	25	24.4	22.0	38.9	49.0
PAP-MC 16M - 4R	16	1/4	7.1	24	25	24.4	22.0	34.0	44.1
PAP-MC 16M - 6R	16	3/8	9.5	24	25	24.4	22.0	34.0	44.1
PAP-MC 16M - 8R	16	1/2	11.9	24	25	24.4	22.0	38.9	49.0
PAP-MC 16M - 12R	16	3/4	12.7	27	25	24.4	22.0	40.4	50.5
PAP-MC 18M - 8R	18	1/2	11.9	27	30	24.4	22.0	40.4	50.5
PAP-MC 16M - 12R	18	3/4	15.1	27	30	24.4	22.0	40.4	50.5
PAP-MC 20M - 8R	20	1/2	11.9	30	32	26.0	22.0	42.2	52.3
PAP-MC 20M - 12R	20	3/4	15.9	30	32	26.0	22.0	42.2	52.3
PAP-MC 22M - 12R	22	3/4	15.9	30	32	26.0	22.0	42.2	52.3
PAP-MC 22M - 16R	22	1	18.3	35	32	26.0	22.0	47.0	57.1
PAP-MC 25M - 12R	25	3/4	15.9	35	38	31.3	26.5	45.2	57.5
PAP-MC 25M - 16R	25	1	21.8	35	38	31.3	26.5	50.0	62.3
PAP-MC 28M - 16R	28	1	21.8	41	46	36.6	36.6	51.6	72.4
PAP-MC 28M - 20R	28	1-1/4	21.8	46	46	36.6	36.6	52.3	73.1
PAP-MC 30M - 20R	30	1-1/4	26.2	46	50	39.6	39.2	55.6	77.2
PAP-MC 32M - 20R	32	1-1/4	28.6	46	50	42.0	41.6	56.6	79.6
PAP-MC 38M - 24R	38	1-1/2	33.7	55	60	49.4	47.9	64.0	91.6

• All dimensions in millimeters unless specified as "inch"

PAP-FC Female Connector



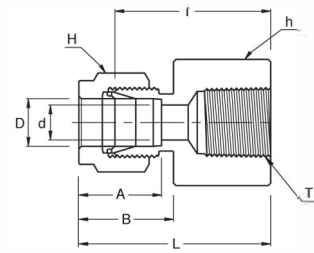
Connects Fractional Tubes To Male NPT Thread

Part No.	Tube O.D. D (inch)	T* (NPT)	d Min	Width Across Flat		A	B	I	L
				h (inch)	H (inch)				
PAP-FC 2 - 2N	1/8	1/8	2.28	9/16	7/16	12.70	15.24	22.09	28.70
PAP-FC 2 - 4N	1/8	1/4	2.28	3/4	7/16	12.70	15.24	26.92	33.52
PAP-FC 3 - 2N	3/16	1/8	3.04	9/16	1/2	13.71	16.00	23.11	29.71
PAP-FC 4 - 2N	1/4	1/8	4.82	9/16	9/16	15.24	17.78	23.87	31.24
PAP-FC 4 - 4N	1/4	1/4	4.82	3/4	9/16	15.24	17.78	28.44	35.81
PAP-FC 4 - 6N	1/4	3/8	4.82	7/8	9/16	15.24	17.78	30.22	37.59
PAP-FC 4 - 8N	1/4	1/2	4.82	1-1/16	9/16	15.24	17.78	35.05	42.41
PAP-FC 5 - 2N	5/16	1/8	6.35	9/16	5/8	16.25	18.54	24.63	32.00
PAP-FC 4 - 4N	5/16	1/4	6.35	3/4	5/8	16.25	18.54	29.46	36.83
PAP-FC 6 - 2N	3/8	1/8	7.11	5/8	11/16	16.76	19.30	25.40	32.76
PAP-FC 6 - 4N	3/8	1/4	7.11	3/4	11/16	16.76	19.30	30.22	37.59
PAP-FC 6 - 6N	3/8	3/8	7.11	7/8	11/16	16.76	19.30	31.75	39.11
PAP-FC 6 - 8N	3/8	1/2	7.11	1-1/16	11/16	16.76	19.30	36.57	43.94
PAP-FC 4 - 12N	3/8	3/4	7.11	1-5/16	11/16	16.76	19.30	40.38	47.75
PAP-FC 8 - 4N	1/2	1/4	10.41	13/16	7/8	22.86	21.84	30.22	40.38
PAP-FC 8 - 6N	1/2	3/8	10.41	7/8	7/8	22.86	21.84	31.75	41.91
PAP-FC 8 - 8N	1/2	1/2	10.41	1-1/16	7/8	22.86	21.84	36.57	46.73
PAP-FC 8 - 12N	1/2	3/4	10.41	1-5/16	7/8	22.86	21.84	38.10	48.26
PAP-FC 10 - 6N	5/8	3/8	12.70	15/16	1	24.38	21.84	31.75	41.91
PAP-FC 10 - 8N	5/8	1/2	12.70	1-1/16	1	24.38	21.84	36.57	46.73
PAP-FC 12 - 8N	3/4	1/2	15.74	1-1/16	1-1/8	24.38	21.84	36.57	46.73
PAP-FC 12 - 12N	3/4	3/4	15.74	1-5/16	1-1/8	24.38	21.84	38.10	48.26
PAP-FC 14 - 12N	7/8	3/4	18.28	1-5/16	1-1/4	25.90	21.84	39.62	49.78
PAP-FC 16 - 12N	1	3/4	22.35	1-3/8	1-1/2	31.24	26.41	41.14	53.34
PAP-FC 16 - 16N	1	1	22.35	1-5/8	1-1/2	31.24	26.41	50.03	62.23

* ISO Tapered Threads are available upon request

• All dimensions in millimeters unless specified as "inch"

PAP-FC Female Connector



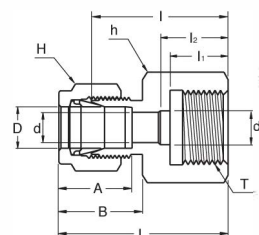
Connects Metric Tubes To Male ISO Tapered Thread

Part No.	Tube O.D. D	T * R (PT)	d Min	Width Across Flat		A	B	I	L
PAP-FC 3M - 2R	3	1/8	2.4	14	12	12.9	15.3	22.1	28.7
PAP-FC 3M - 4R	3	1/4	2.4	19	12	12.9	15.3	26.9	33.5
PAP-FC 4M - 2R	4	1/8	2.4	14	12	13.7	16.1	23.1	29.7
PAP-FC 6M - 2R	6	1/8	4.8	14	14	15.3	17.7	23.9	31.3
PAP-FC 6M - 4R	6	1/4	4.8	19	14	15.3	17.7	28.4	35.8
PAP-FC 6M - 6R	6	3/8	4.8	22	14	15.3	17.7	30.2	37.6
PAP-FC 6M - 8R	6	1/2	4.8	27	14	15.3	17.7	35.1	42.5
PAP-FC 8M - 2R	8	1/8	6.4	15	16	16.2	18.6	24.6	32.1
PAP-FC 8M - 4R	8	1/4	6.4	19	16	16.2	18.6	29.5	37.0
PAP-FC 8M - 6R	8	3/8	6.4	22	16	16.2	18.6	31.0	38.5
PAP-FC 8M - 8R	8	1/2	6.4	27	16	16.2	18.6	35.8	43.3
PAP-FC 10M - 2R	10	1/8	7.9	18	19	17.2	19.5	25.4	33.0
PAP-FC 10M - 4R	10	1/4	7.9	19	19	17.2	19.5	30.2	37.8
PAP-FC 10M - 6R	10	3/8	7.9	22	19	17.2	19.5	31.8	39.4
PAP-FC 10M - 8R	10	1/2	7.9	27	19	17.2	19.5	36.6	44.2
PAP-FC 12M - 2R	12	1/8	8.3	22	22	22.8	22.0	25.4	35.5
PAP-FC 12M - 4R	12	1/4	9.5	22	22	22.8	22.0	30.2	40.3
PAP-FC 12M - 6R	12	3/8	9.5	22	22	22.8	22.0	31.8	41.9
PAP-FC 12M - 8R	12	1/2	9.5	27	22	22.8	22.0	36.6	46.7
PAP-FC 12M - 12R	12	3/4	9.5	35	22	22.8	22.0	38.9	49.0
PAP-FC 15M - 8R	15	1/2	11.9	27	25	24.4	22.0	36.6	46.7
PAP-FC 16M - 8R	16	1/2	12.7	27	25	24.4	22.0	36.8	46.9
PAP-FC 20M - 8R	20	1/2	15.9	30	32	26.0	22.0	37.8	47.9
PAP-FC 20M - 12R	20	3/4	15.9	35	32	26.0	22.0	39.6	49.7
PAP-FC 22M - 12R	22	3/4	18.3	35	32	26.0	22.0	39.6	49.7
PAP-FC 22M - 16R	22	1	18.3	41	32	26.0	22.0	47.8	57.9
PAP-FC 25M - 12R	25	3/4	21.8	35	38	31.3	26.5	41.1	53.4
PAP-FC 25M - 16R	25	1	21.8	41	38	31.3	26.5	50.0	62.3

* NPT Threads are available upon request

• All dimensions in millimeters unless specified as "inch"

PAP-GC Gauge Connector



Connects Fractional Tubes To ISO Parallel Thread

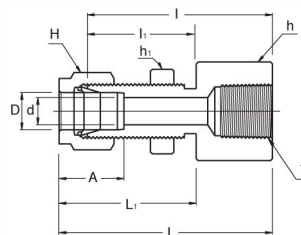
Part No.	Tube O.D. D (inch)	T G (PF)	d Min	d ₁	Width Across Flat		A	B	I	I ₁	I ₂	L
					h (inch)	H (inch)						
PAP-GC 2- 4G	1/4	1/4	4.82	5.58	3/4	9/16	15.24	17.78	30.22	13.00	17.00	37.59
PAP-GC 4- 6G	1/4	3/8	4.82	6.60	15/16	9/16	15.24	17.78	30.22	14.20	20.30	37.59
PAP-GC 4- 8G	1/4	1/2	4.82	6.60	1-1/16	9/16	15.24	17.78	36.07	18.80	24.90	43.43
PAP-GC 5- 4G	5/16	1/4	5.58	-	3/4	5/8	16.25	18.54	30.98	13.00	-	38.35
PAP-GC 5- 8G	5/16	1/2	7.11	-	1-1/16	5/8	16.25	18.54	33.53	18.80	-	40.89
PAP-GC 6- 4G	3/8	1/4	5.58	-	3/4	11/16	16.76	19.30	31.75	13.00	-	39.12
PAP-GC 6- 6G	3/8	3/8	6.60	-	15/16	11/16	16.76	19.30	31.24	14.20	-	38.61
PAP-GC 6- 8G	3/8	1/2	7.11	-	1-1/16	11/16	16.76	19.30	34.54	18.80	-	41.91
PAP-GC 8- 4G	1/2	1/4	5.58	-	7/8	7/8	22.86	21.84	31.80	13.00	-	41.95
PAP-GC 8- 6G	1/2	3/8	6.60	-	15/16	7/8	22.86	21.84	34.29	14.20	-	44.45
PAP-GC 8- 8G	1/2	1/2	7.11	7.11	1-1/16	7/8	22.86	21.84	38.10	18.80	-	48.26

Connects Metric Tubes To ISO Parallel Thread

Part No.	Tube O.D. D	T G (PF)	d Min	d ₁	Width Across Flat		A	B	I	I ₁	I ₂	L
					h	H						
PAP-GC 3M - 4G	3	1/4	2.4	5.5	19	12	12.9	15.3	28.7	13	17	35.3
PAP-GC 6M - 4G	6	1/4	4.8	5.5	19	14	15.3	17.7	30.2	13	17	37.6
PAP-GC 6M - 6G	6	3/8	4.8	6.5	24	14	15.3	17.7	30.2	14	20	37.6
PAP-GC 6M - 8G	6	1/2	4.8	7.0	27	14	15.3	17.7	36.1	19	25	43.5
PAP-GC 8M - 4G	8	1/4	5.5	5.5	19	16	16.2	18.6	31.0	13	-	38.5
PAP-GC 8M - 6G	8	3/8	6.5	6.5	24	16	16.2	18.6	28.7	14	-	36.2
PAP-GC 8M - 8G	8	1/2	7.0	7.0	27	16	16.2	18.6	33.5	19	-	41.0
PAP-GC 10M - 4G	10	1/4	5.5	5.5	19	19	17.2	19.5	31.8	13	-	39.4
PAP-GC 10M - 6G	10	3/8	6.5	6.5	24	19	17.2	19.5	31.2	14	-	38.8
PAP-GC 10M - 8G	10	1/2	7.0	7.0	27	19	17.2	19.5	34.5	19	-	42.1
PAP-GC 12M - 4G	12	1/4	5.5	5.5	22	22	22.8	22.0	31.8	13	-	41.9
PAP-GC 12M - 6G	12	3/8	6.5	6.5	24	22	22.8	22.0	34.3	14	-	44.4
PAP-GC 12M - 8G	12	1/2	7.0	7.0	27	22	22.8	22.0	38.1	19	-	48.2
PAP-GC 20M - 8G	20	1/2	7.0	7.0	30	32	26.0	22.0	44.2	19	-	54.3
PAP-GC 22M - 8G	22	1/2	7.0	7.0	30	32	26.0	22.0	44.2	19	-	54.3

• All dimensions in millimeters unless specified as "inch"

PAP-BFC Bulkhead Female Connector



Connects Fractional Tubes To Male NPT Thread

Part No.	Tube O.D. D (inch)	T * (NPT)	d Min	Width Across Flat			A	I	I ₁	L	L ₁	Panel Hole Drill Size	Panel Max. Thickness
				h (inch)	h ₁ (inch)	H (inch)							
PAP-BFC 2- 2N	1/8	1/8	2.28	9/16	1/2	7/16	12.70	38.10	24.63	44.70	31.24	8.33	12.70
PAP-BFC 4- 2N	1/4	1/8	4.82	5/8	5/8	9/16	15.24	39.62	26.16	46.99	33.52	11.50	10.16
PAP-BFC 4- 4N	1/4	1/4	4.82	3/4	5/8	9/16	15.24	44.45	26.16	51.81	33.52	11.50	10.16
PAP-BFC 6- 4N	3/8	1/4	7.11	3/4	3/4	11/16	16.76	47.75	29.46	55.11	36.83	14.68	11.17
PAP-BFC 8- 6N	1/2	3/8	10.41	15/16	15/16	7/8	22.86	51.56	31.75	61.72	41.91	19.44	12.70
PAP-BFC 8- 8N	1/2	1/2	10.41	1-1/16	15/16	7/8	22.86	56.38	31.75	66.54	41.91	19.44	12.70
PAP-BFC 12-12N	3/4	3/4	15.74	1-1/4	1-3/16	1-1/8	24.38	63.60	37.33	73.51	47.49	25.79	16.76

* ISO Tapered Threads are available upon request

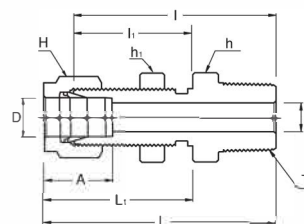
Connects Metric Tubes To Male NPT Thread

Part No.	Tube O.D. D	T * (NPT)	d Min	Width Across Flat			A	I	I ₁	L	L ₁	Panel Hole Drill Size	Panel Max. Thickness
				h	h ₁	H							
PAP-BFC 6M- 2N	6	1/8	4.8	15.8	15.8	14	15.3	39.6	27.7	46.90	35.00	11.5	10.2
PAP-BFC 6M- 4N	6	1/4	4.8	19.0	16.0	14	15.3	44.4	26.2	51.80	33.60	11.5	10.2
PAP-BFC 8M- 4N	8	1/4	6.3	19.0	17.4	16	16.2	46.7	28.4	53.85	35.55	13.1	11.2
PAP-BFC 12M- 8N	12	1/2	9.5	27.0	24.0	22	22.8	56.4	31.8	66.50	41.90	19.5	12.7

* ISO Tapered Threads are available upon request

• All dimensions in millimeters unless specified as "inch"

PAP-BMC Bulkhead Male Connector



Connects Fractional Tubes To Female NPT Thread

Part No.	Tube O.D. D (inch)	T* (NPT)	d Min	Width Across Flat			A	I	I ₁	L	L ₁	Panel Hole Drill Size	Panel Max. Thickness
				h (inch)	h ₁ (inch)	H (inch)							
PAP-BMC 2 - 2N	1/8	1/8	2.28	1/2	1/2	7/16	12.70	39.87	24.63	46.48	31.24	8.33	12.70
PAP-BMC 4 - 2N	1/4	1/8	4.82	5/8	5/8	9/16	15.24	42.16	26.16	49.53	33.52	11.50	10.16
PAP-BMC 4 - 4N	1/4	1/4	4.82	5/8	5/8	9/16	15.24	46.73	26.16	54.10	33.52	11.50	10.16
PAP-BMC 6 - 4N	3/8	1/4	7.11	3/4	3/4	11/16	16.76	50.03	29.46	57.40	36.83	14.68	11.17
PAP-BMC 6 - 6N	3/8	3/8	7.11	3/4	3/4	11/16	16.76	50.03	29.46	57.40	36.83	14.68	11.17
PAP-BMC 6 - 8N	3/8	1/2	7.11	7/8	3/4	11/16	16.76	56.38	29.46	63.75	36.83	14.68	11.17
PAP-BMC 8 - 6N	1/2	3/8	9.65	15/16	15/16	7/8	22.86	53.08	31.75	63.24	41.91	19.44	12.70
PAP-BMC 8 - 8N	1/2	1/2	10.41	15/16	15/16	7/8	22.86	58.67	31.75	68.83	41.91	19.44	12.70
PAP-BMC 12 - 12N	3/4	3/4	15.74	1-3/16	1-3/16	1-1/8	24.38	66.04	37.33	76.20	47.49	25.79	16.76
PAP-BMC 16 - 16N	1	1	22.35	1-5/8	1-5/8	1-1/2	31.24	81.02	45.21	93.21	57.40	33.73	19.05

* ISO Tapered Threads are available upon request

• All dimensions in millimeters unless specified as "inch"

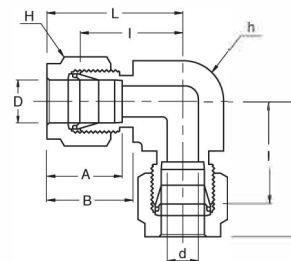


Tube Fittings

Elbow & Tee



PAP-UE Union Elbow



Connects Fractional Tubes

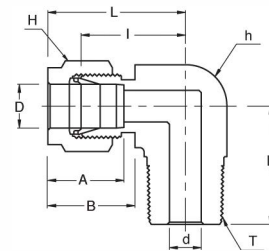
Part No.	Tube O.D. D (inch)	d Min	Width Across Flat		A	B	I	L
			h (inch)	H (inch)				
PAP-UE - 1	1/16	1.27	3/8	5/16	8.63	10.92	14.00	18.03
PAP-UE - 2	1/8	2.28	3/8	7/16	12.70	15.24	15.74	22.35
PAP-UE - 3	3/16	3.04	1/2	1/2	13.71	16.00	18.54	25.14
PAP-UE - 4	1/4	4.82	1/2	9/16	15.24	17.78	20.10	27.40
PAP-UE - 5	5/16	6.35	5/8	5/8	16.25	18.54	22.35	29.71
PAP-UE - 6	3/8	7.11	5/8	11/16	16.76	19.30	23.11	30.48
PAP-UE - 8	1/2	10.41	13/16	7/8	22.86	21.84	25.90	36.06
PAP-UE - 10	5/8	12.70	15/16	1	24.38	21.84	27.94	38.10
PAP-UE - 12	3/4	15.74	1-1/16	1-1/8	24.38	21.84	29.71	39.87
PAP-UE - 14	7/8	18.28	1-3/8	1-1/4	25.90	21.84	34.54	44.70
PAP-UE - 16	1	22.35	1-3/8	1-1/2	31.24	26.41	36.83	49.02
PAP-UE - 20	1-1/4	27.69	1-11/16	1-7/8	41.15	38.86	44.45	66.55
PAP-UE - 24	1-1/2	34.04	2	2-1/4	50.04	45.21	50.80	77.98
PAP-UE - 32	2	45.97	2-3/4	3	67.56	62.74	69.85	107.19

Connects Metric Tubes

Part No.	Tube O.D. D	d Min	Width Across Flat		A	B	I	L
			h	H				
PAP-UE - 2M	2	1.7	9.5	12	12.9	15.3	15.7	22.3
PAP-UE - 3M	3	2.4	9.5	12	12.9	15.3	15.7	22.3
PAP-UE - 4M	4	2.4	12.7	12	13.7	16.1	18.8	25.4
PAP-UE - 6M	6	4.8	12.7	14	15.3	17.7	19.6	27.0
PAP-UE - 8M	8	6.4	15.9	16	16.2	18.6	22.4	29.9
PAP-UE - 10M	10	7.9	17.5	19	17.2	19.5	23.9	31.5
PAP-UE - 12M	12	9.5	20.6	22	22.8	22.0	25.9	36.0
PAP-UE - 15M	15	11.9	23.8	25	24.4	22.0	27.9	38.8
PAP-UE - 16M	16	12.7	23.8	25	24.4	22.0	27.9	38.0
PAP-UE - 18M	18	15.1	27.0	30	24.4	22.0	29.7	39.8
PAP-UE - 20M	20	15.9	34.9	32	26.0	22.0	34.5	44.6
PAP-UE - 22M	22	18.3	34.9	32	26.0	22.0	34.5	44.6
PAP-UE - 25M	25	21.8	34.9	38	31.3	26.5	36.8	49.1
PAP-UE - 28M	28	21.8	41	46	36.6	36.6	43.2	64.0
PAP-UE - 30M	30	26.2	46	50	39.6	39.2	48.3	69.9
PAP-UE - 32M	32	28.6	46	50	42.0	41.6	49.3	72.3
PAP-UE - 38M	38	33.7	55	60	49.4	47.9	56.4	84.0

• All dimensions in millimeters unless specified as "inch"

PAP-ME
Male Elbow

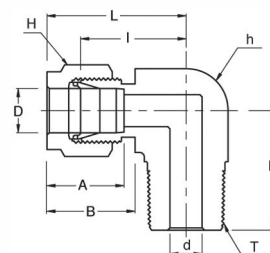


Connects Metric Tubes To Female NPT Thread

Part No.	Tube O.D. D	T (NPT)	d Min	Width Across Flat		A	B	I	L	L ₁
				h	H					
PAP-ME 2M - 2N	3	1/8	2.4	12.7	12	12.9	15.3	17.0	23.6	17.8
PAP-ME 3M - 4N	3	1/4	2.4	12.7	12	12.9	15.3	18.0	24.6	23.4
PAP-ME 4M - 2N	4	1/8	2.4	12.7	12	13.7	16.1	18.8	25.4	18.8
PAP-ME 4M - 4N	4	1/4	2.4	12.7	12	13.7	16.1	18.8	25.4	23.4
PAP-ME 6M - 2N	6	1/8	4.8	12.7	14	15.3	17.7	19.6	27.0	18.8
PAP-ME 6M - 4N	6	1/4	4.8	12.7	14	15.3	17.7	19.6	27.0	23.4
PAP-ME 6M - 6N	6	3/8	4.8	15.9	14	15.3	17.7	22.4	29.8	26.2
PAP-ME 6M - 8N	6	1/2	4.8	20.6	14	15.3	17.7	24.4	31.8	33.0
PAP-ME 8M - 2N	8	1/8	4.8	14.3	16	16.2	18.6	21.3	28.8	19.8
PAP-ME 8M - 4N	8	1/4	6.4	14.3	16	16.2	18.6	21.3	28.8	24.4
PAP-ME 8M - 6N	8	3/8	6.4	15.9	16	16.2	18.6	23.1	30.6	26.2
PAP-ME 8M - 8N	8	1/2	6.4	20.6	16	16.2	18.6	25.1	32.6	33.0
PAP-ME 10M - 2N	10	1/8	4.8	17.5	19	17.2	19.5	23.9	31.5	21.6
PAP-ME 10M - 4N	10	1/4	7.1	17.5	19	17.2	19.5	23.9	31.5	26.2
PAP-ME 10M - 6N	10	3/8	7.9	17.5	19	17.2	19.5	23.9	31.5	26.2
PAP-ME 10M - 8N	10	1/2	7.9	20.6	19	17.2	19.5	25.9	33.5	33.0
PAP-ME 12M - 4N	12	1/4	7.1	20.6	22	22.8	22.0	25.9	36.0	28.2
PAP-ME 12M - 6N	12	3/8	9.5	20.6	22	22.8	22.0	25.9	36.0	28.2
PAP-ME 12M - 8N	12	1/2	9.5	20.6	22	22.8	22.0	25.9	36.0	33.0
PAP-ME 12M - 12N	12	3/4	9.5	27.0	22	22.8	22.0	29.7	39.8	36.8
PAP-ME 16M - 6N	16	3/8	9.5	23.8	25	24.4	22.0	27.9	38.0	30.2
PAP-ME 16M - 8N	16	1/2	11.9	23.8	25	24.4	22.0	27.9	38.0	35.1
PAP-ME 16M - 12N	16	3/4	12.7	27.0	25	24.4	22.0	29.7	39.8	36.8
PAP-ME 18M - 8N	18	1/2	11.9	27.0	30	24.4	22.0	29.7	39.8	36.8
PAP-ME 18M - 12N	18	3/4	15.1	27.0	30	24.4	22.0	29.7	39.8	36.8
PAP-ME 20M - 8N	20	1/2	11.9	34.9	32	26.0	22.0	34.5	44.6	41.7
PAP-ME 20M - 12N	20	3/4	15.9	34.9	32	26.0	22.0	34.5	44.6	41.7
PAP-ME 22M - 12N	22	3/4	15.9	34.9	32	26.0	22.0	34.5	44.6	41.7
PAP-ME 20M - 16N	22	1	18.3	34.9	32	26.0	22.0	34.5	44.6	46.5
PAP-ME 25M - 12N	25	3/4	15.9	34.9	38	31.3	26.5	36.8	49.1	41.7
PAP-ME 25M - 16N	25	1	21.8	34.9	38	31.3	26.5	36.8	49.1	46.5
PAP-ME 30M - 20N	30	1-1/4	26.2	46	50	39.6	39.2	48.3	69.9	53.1
PAP-ME 32M - 20N	32	1-1/4	27.8	46	50	42.0	41.6	49.3	72.3	53.1
PAP-ME 38M - 24N	38	1-1/2	33.7	55	60	49.4	47.9	56.4	84.0	60.4

• All dimensions in millimeters unless specified as "inch"

PAP-ME Male Elbow



Connects Metric Tubes To Female ISO Tapered Thread

Part No.	Tube O.D. D	T R (PT)	d Min	Width Across Flat		A	B	I	L	L ₁
				h	H					
PAP-ME 3M - 2R	3	1/8	2.4	12.7	12	12.9	15.3	17.0	23.6	17.8
PAP-ME 3M - 4R	3	1/4	2.4	12.7	12	12.9	15.3	18.0	24.6	23.4
PAP-ME 4M - 2R	4	1/8	2.4	12.7	12	13.7	16.1	18.8	25.4	18.8
PAP-ME 4M - 4R	4	1/4	2.4	12.7	12	13.7	16.1	18.8	25.4	23.4
PAP-ME 6M - 2R	6	1/8	4.8	12.7	14	15.3	17.7	19.6	27.0	18.8
PAP-ME 6M - 4R	6	1/4	4.8	12.7	14	15.3	17.7	19.6	27.0	23.4
PAP-ME 6M - 6R	6	3/8	4.8	15.9	14	15.3	17.7	22.4	29.8	26.2
PAP-ME 6M - 8R	6	1/2	4.8	20.6	14	15.3	17.7	24.4	31.8	33.0
PAP-ME 8M - 2R	8	1/8	4.8	14.3	16	16.2	18.6	21.3	28.8	19.8
PAP-ME 8M - 4R	8	1/4	6.4	14.3	16	16.2	18.6	21.3	28.8	24.4
PAP-ME 8M - 6R	8	3/8	6.4	15.9	16	16.2	18.6	23.1	30.6	26.2
PAP-ME 8M - 8R	8	1/2	6.4	20.6	16	16.2	18.6	25.1	32.6	33.0
PAP-ME 10M - 4R	10	1/4	7.1	17.5	19	17.2	19.5	23.9	31.5	26.2
PAP-ME 10M - 6R	10	3/8	7.9	17.5	19	17.2	19.5	23.9	31.5	26.2
PAP-ME 10M - 8R	10	1/2	7.9	20.6	19	17.2	19.5	25.9	33.5	33.0
PAP-ME 12M - 2R	12	1/8	4.8	20.6	22	22.8	22.0	25.9	36.0	23.6
PAP-ME 12M - 4R	12	1/4	7.1	20.6	22	22.8	22.0	25.9	36.0	28.2
PAP-ME 12M - 6R	12	3/8	9.5	20.6	22	22.8	22.0	25.9	36.0	28.2
PAP-ME 10M - 8R	12	1/2	9.5	20.6	22	22.8	22.0	25.9	36.0	33.0
PAP-ME 10M - 12R	12	3/4	9.5	27.0	22	22.8	22.0	29.7	39.8	36.8
PAP-ME 16M - 6R	16	3/8	9.5	23.8	25	24.4	22.0	27.9	38.0	30.2
PAP-ME 16M - 8R	16	1/2	11.9	23.8	25	24.4	22.0	27.9	38.0	35.1
PAP-ME 18M - 8R	18	1/2	11.9	27.0	30	24.4	22.0	29.7	39.8	36.8
PAP-ME 18M - 12R	18	3/4	15.1	27.0	30	24.4	22.0	29.7	39.8	36.8
PAP-ME 20M - 8R	20	1/2	11.9	34.9	32	26.0	22.0	34.5	44.6	41.7
PAP-ME 20M - 12R	20	3/4	15.9	34.9	32	26.0	22.0	34.5	44.6	41.7
PAP-ME 22M - 12R	22	3/4	15.9	34.9	32	26.0	22.0	34.5	44.6	41.7
PAP-ME 22M - 16R	22	1	18.3	34.9	32	26.0	22.0	34.5	44.6	46.5
PAP-ME 25M - 12R	25	3/4	15.9	34.9	38	31.3	26.5	36.8	49.1	41.7
PAP-ME 25M - 16R	25	1	21.8	34.9	38	31.3	26.5	36.8	49.1	46.5

• All dimensions in millimeters unless specified as "inch"

Close Nipple

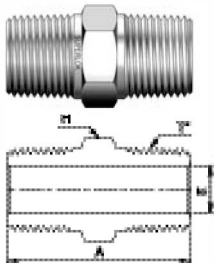
Male NPT Threads



NPT Pipe Size	Dimension(mm)	
	A	E
1/8	19.1	4.8
1/4	28.4	7.1
3/8	28.4	9.6
1/2	38.1	11.9
3/4	38.1	15.7
1	47.8	22.4

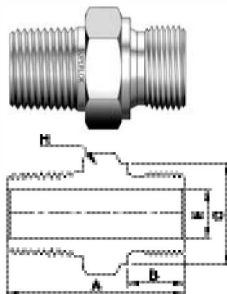
Hex Nipple

Male NPT Threads



NPT Pipe Size	Dimension(mm)			T* ISO/BSP Pipe Size (ISO 7/1)
	A	E	H	
1/8	25.6	4.8	11.1	1/8
1/4	35.6	7.1	14.2	1/4
3/8	36.3	9.6	17.4	3/8
1/2	46.7	11.9	22.2	1/2
3/4	46.7	15.7	26.9	3/4
1	58.9	22.4	34.9	1

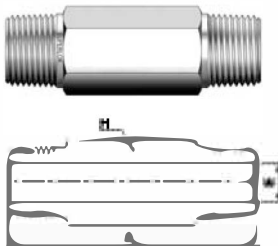
Male NPT to Male ISO Parallel Pipe Threads



NPT Pipe Size	ISO/BSP Pipe Size (ISO 228)	Dimension(mm)				
		A	B	C	E	H
1/8	1/8	27.7	7.1	13.7	4.1	14.2
1/4	1/4	36.8	11.2	18.0	5.8	19.1
3/8	3/8	37.6	11.2	21.6	7.9	22.2
1/2	1/2	44.4	14.2	25.9	11.9	26.9
3/4	3/4	49.0	15.7	32.0	15.7	33.3
1	1	56.6	18.3	38.9	19.8	41.2

Hex Long Nipple

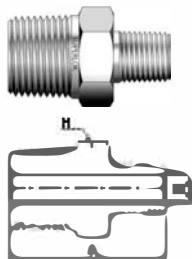
Male NPT Threads



NPT Pipe Size	Dimension(mm)		
	A	E	H
1/8	*	4.8	11.1
1/4	*	7.1	14.2
3/8	*	9.6	17.4
1/2	*	11.9	22.2
3/4	*	15.7	26.9
1	*	22.8	34.9

Hex Reducing Nipple

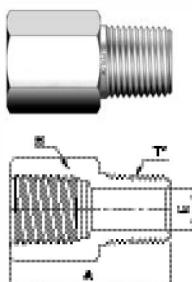
Male NPT Threads



NPT Pipe Size	Reduced Pipe Size	Dimension(mm)		
		A	E	H
1/8	1/16	25.6	3.0	11.1
1/4	1/8	31.0	4.8	14.2
3/8	1/8	31.8	4.8	17.4
3/8	1/4	36.3	7.1	17.4
1/2	1/8	37.3	4.8	22.2
1/2	1/4	41.9	7.1	22.2
1/2	3/8	41.9	9.6	22.2
3/4	1/4	41.9	7.1	26.9
3/4	1/2	46.7	11.9	26.9
1	1/4	49.3	7.1	34.9
1	1/2	54.1	11.9	34.9
1	3/4	54.1	15.7	34.9

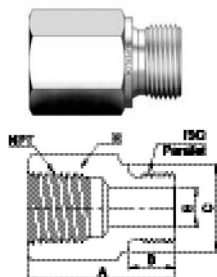
Adapter

Female to Male NPT Threads



NPT Pipe Size	Dimension(mm)			T' ISO/BSP Pipe Size (ISO 7/1)
	A	E	H	
1/8	27.9	4.8	14.2	1/8
1/4	35.6	7.1	19.1	1/4
3/8	38.4	9.6	22.2	3/8
1/2	49.3	11.9	26.9	1/2
3/4	51.3	15.7	33.3	3/4
1	57.9	22.4	41.2	1

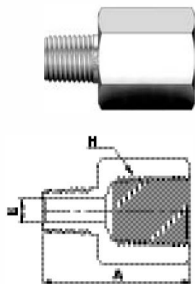
Female NPT to Male ISO Parallel Pipe Threads



NPT Pipe Size	ISO/BSP Pipe Size (ISO 228)	Dimension(mm)				
		A	B	C	E	H
1/8	1/8	25.1	7.1	13.7	4.1	14.2
1/4	1/4	33.5	11.2	18.0	5.8	19.1
3/8	3/8	35.8	11.2	21.6	7.9	22.2
1/2	1/2	44.2	14.2	25.9	11.9	26.9
3/4	3/4	48.0	15.7	32.0	15.7	33.3
1	1	53.3	18.3	38.9	19.8	41.2

Reducing Adapter

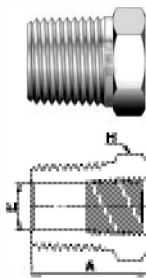
■ Male to Female NPT Threads



Male Pipe Size	Female Pipe Size	Dimension(mm)		
		A	E	H
1/8	1/4	32.0	4.8	19.1
1/8	3/8	33.8	4.8	22.2
1/4	3/8	38.1	7.1	22.2
1/8	1/2	40.1	4.8	26.9
1/4	1/2	44.7	7.1	26.9
3/8	1/2	44.4	9.6	26.9
1/4	3/4	47.0	7.1	33.3
3/8	3/4	46.2	9.6	33.3
1/2	3/4	51.3	11.9	33.3
1/4	1	49.8	7.1	41.2
1/2	1	54.9	11.9	41.2
3/4	1	55.1	15.7	41.2

Reducing Hex Bushing

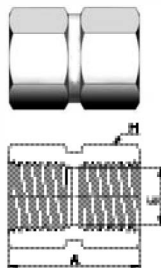
■ Male to Female NPT Threads



Male Pipe Size	Female Pipe Size	Dimension(mm)		
		A	E	H
1/4	1/8	26.9	7.1	14.2
3/8	1/8	21.8	8.6	17.4
3/8	1/4	30.2	9.6	19.1
1/2	1/8	27.4	8.6	22.2
1/2	1/4	27.4	11.4	22.2
1/2	3/8	35.8	11.9	22.2
3/4	1/4	27.4	11.4	26.9
3/4	3/8	27.4	15.0	26.9
3/4	1/2	41.4	15.7	26.9
1	1/4	34.8	11.4	34.9
1	3/8	34.8	15.0	34.9
1	1/2	34.8	18.5	34.9
1	3/4	47.0	22.4	34.9

Hex Coupling

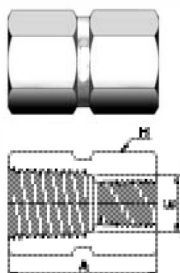
■ Female NPT Threads



Pipe Size	Dimension(mm)		
	A	E	H
1/8	20.6	8.6	14.2
1/4	30.2	11.4	19.1
3/8	33.3	15.0	22.2
1/2	39.6	18.5	26.9
3/4	41.1	23.9	33.3
1	50.8	29.7	41.2

Hex Reducing Coupling

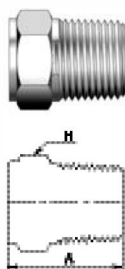
■ Female NPT Threads



Pipe Size	Reduced Pipe Size	Dimension(mm)		
		A	E	H
1/4	1/8	31.0	8.6	19.1
3/8	1/4	35.1	11.4	22.2
1/2	1/8	39.6	8.6	26.9
1/2	1/4	44.4	11.4	26.9
1/2	3/8	45.2	15.0	26.9
3/4	1/4	46.0	11.4	33.3
3/4	1/2	52.3	18.5	33.3
1	1/2	55.6	18.5	41.2
1	3/4	57.2	23.9	41.2

Pipe Plug

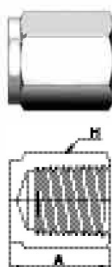
■ Female NPT Threads



Pipe Size	Dimension(mm)	
	A	H
1/8	19.1	11.1
1/4	24.4	14.2
3/8	25.1	17.4
1/2	30.7	22.2
3/4	30.7	26.9
1	38.1	34.9

Pipe Cap

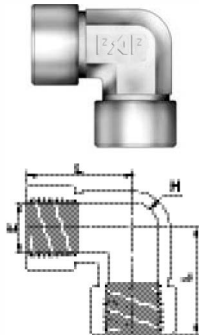
■ Female NPT Threads



Pipe Size	Dimension(mm)	
	A	H
1/8	19.1	14.2
1/4	23.1	19.1
3/8	26.2	22.2
1/2	34.0	26.9
3/4	36.6	33.3
1	41.1	41.2

Female Elbow

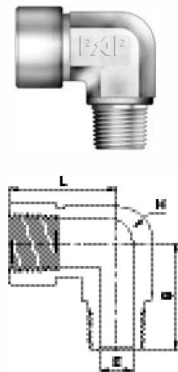
Female NPT Threads



Pipe Size	Dimension(mm)		
	E	L	H
1/8	8.6	24.0	12.7
1/4	11.4	29.0	17.5
3/8	15.0	34.5	20.6
1/2	18.5	37.0	25.4
3/4	23.9	46.5	31.8
1	29.7	48.8	42.9

Street Elbow

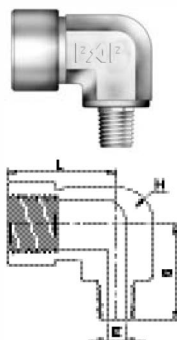
Female to Male NPT Threads



Pipe Size	Dimension(mm)			
	E	L	S	H
1/8	4.8	24.1	19.6	12.7
1/4	7.1	29.0	26.5	17.5
3/8	9.6	34.5	28.2	20.6
1/2	11.9	37.0	35.3	25.4
3/4	15.7	46.5	39.6	31.8
1	22.4	48.8	49.2	42.9

Reducing Street Elbow

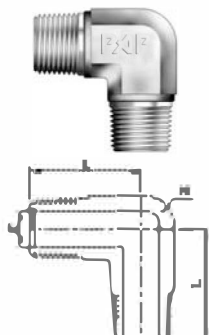
Female to Male NPT Threads



Female Pipe Size	Male Pipe Size	Dimension(mm)			
		E	L	S	H
1/8	1/16	3.0	26.4	22.1	12.7
1/4	1/8	4.8	29.0	22.4	17.5
3/8	1/4	7.1	34.5	28.2	20.6
1/2	1/4	7.1	37.0	30.5	25.4
1/2	3/8	9.6	37.0	30.5	25.4
3/4	1/2	11.9	46.5	39.6	31.8
1	1/2	11.9	48.8	44.5	42.9

Male Elbow

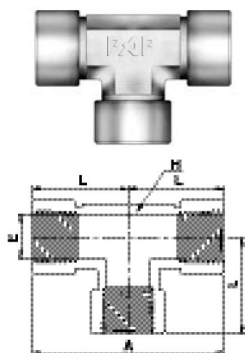
■ Male NPT Threads



Pipe Size	Dimension(mm)		
	E	L	H
1/8	4.8	19.1	12.7
1/4	7.1	24.5	12.7
3/8	9.6	26.9	17.5
1/2	11.9	33.2	20.6
3/4	15.7	35.3	25.4
1	22.4	44.5	31.8

Female Tee

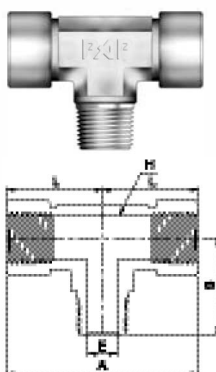
■ Female NPT Threads



Pipe Size	Dimension(mm)			
	A	E	L	H
1/8	48.0	8.6	24.0	12.7
1/4	58.0	11.4	29.0	17.5
3/8	69.0	15.0	34.5	20.6
1/2	74.0	18.5	37.0	25.4
3/4	93.0	23.9	46.5	31.8
1	97.0	29.7	48.5	42.9

Branch Tee

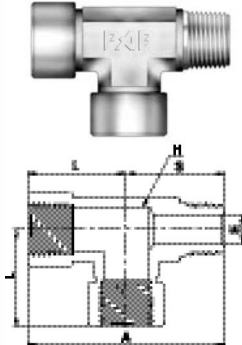
■ Male to Female NPT Threads



Pipe Size	Dimension(mm)				
	A	E	L	S	H
1/8	48.0	4.8	24.0	19.6	12.7
1/4	58.0	7.1	29.0	26.5	17.5
3/8	69.0	9.6	34.5	28.2	20.6
1/2	74.0	11.9	37.0	35.3	25.4
3/4	93.0	15.7	46.5	39.6	31.8
1	97.0	22.4	48.5	49.2	42.9

Run Tee

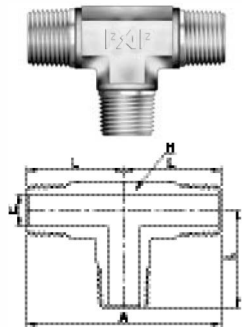
■ Male to Female NPT Threads



Pipe Size	Dimension(mm)				
	A	E	L	S	H
1/8	43.6	4.8	24.0	19.6	12.7
1/4	56.2	7.1	29.0	26.5	17.5
3/8	62.7	9.6	34.5	28.2	20.6
1/2	72.3	11.9	37.0	35.3	25.4
3/4	86.1	15.7	46.5	39.6	31.8
1	97.7	22.4	48.5	49.2	42.9

Male Tee

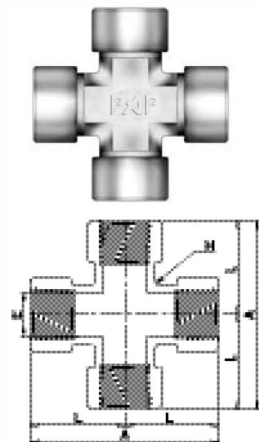
■ Male NPT Threads



Pipe Size	Dimension(mm)			
	A	E	L	H
1/8	38.2	4.8	19.1	12.7
1/4	49.0	7.1	24.5	12.7
3/8	53.8	9.6	26.9	17.5
1/2	66.4	11.9	33.2	20.6
3/4	70.6	15.7	35.3	25.4
1	89.0	22.4	44.5	31.8

Female Cross

■ Female NPT Threads



Pipe Size	Dimension(mm)			
	A	E	L	H
1/8	48.0	8.6	24.0	12.7
1/4	58.0	11.4	29.0	17.5
3/8	69.0	15.0	34.5	20.6
1/2	74.0	18.5	37.0	25.4
3/4	93.0	23.9	46.5	31.8
1	97.0	29.7	48.5	42.9