Excelock®

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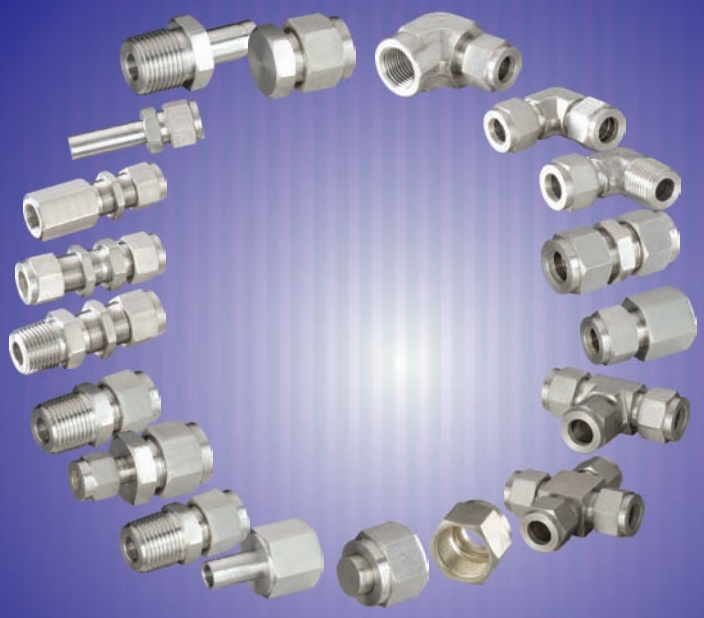
INSTRUMENT TUBE FITTINGS



The proven leader in fluid control technology

www.excelhydro.com

Excelock®

Excel Hydro-Pneumatics and Hydro-Pneumatic Accessories manufacture high technology products for petroleum and process industries applications. The company aims to be a leading partner to system builders and user of high pressure fittings, valves and components. The product range includes standardized high pressure ratings up to 30000 PSI, made of stainless steel AISI 316 or high graded alloys and special materials.

' National Award for Excellence 1995 '
At the hands of Shri S. Krishnakumar,
Minister for Non-conventional Energy sources
at New Delhi

'National Award for Export Excellence 1995'
At the hands of Shri Rajiv Pratap Rudy,
Minister of State for Commerce and Industry

Our Beginning . . . .

Excel - Hydro was established in 1986 in Mumbai , India and started with manufacturing of tube / pipe fittings and isolation valves. The experience gained in the metal processing sector proved an excellent basis for diversification into various high technology areas and led to the subsequent manufacturing of high quality manifold valves, multi port gauge valves, check valves, ball valves, precision double compression ferrule fittings, distribution manifolds, condensate pots, quick couplers, pipe clamps and instrument enclosures, canopy, etc.

Quality Standards

High quality and safety standards are maintained through a Total Quality Management System. **We are Accredited for ISO 9001-2000 by TUV NORD, GERMANY as the " Design, Manufacture and Supply of Instrumentation Valves and Fittings"** Organization. Our effectively implemented control systems all through the organization ensures, that only the Quality products are delivered to all our customers.

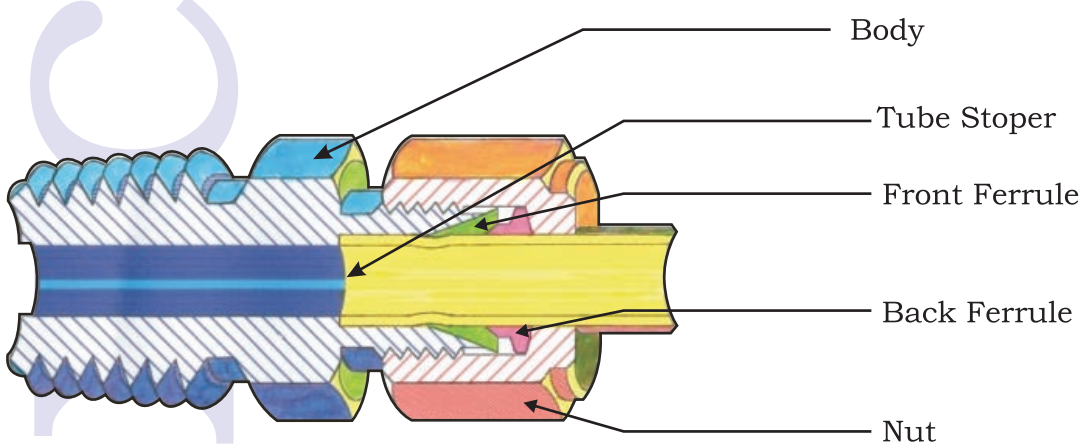
The products are type tested for Helium leak test, Seismic test by ECIL (NPCL- DAE) and C_V test by Indian Institute of Technology, Powai, Mumbai . We have full fledged required in-house testing facilities.

CONTENTS

Tube Fittings : General

High quality, leak-proof instrument tube fittings with double ferrules for process, power, automation and instrumentation applications . Designed and manufactured by Excelock, these fittings undergo special processes like burnishing, cold hardening, thread rolling and case hardening of back ferrule for better swagging. Nut threads are silver plated for antiseizing of threads. Easy identifications are provided for tube fittings , such as step shoulder on hex body and nuts for metric size fittings.

Fittings conform to ANSI 31.1 for power piping, ANSI B 31.2 for petroleum and refinery plant and ASME Sec. VIII for boiler and pressure vessels. Fittings are tested in accordance to BS 4368 part IV.



Double Ferrule Connection

This cut-away section of Excelock fittings shows the sealing action which takes place when the assembly is 1-1/4 turn tightened.

The Excelock Double Ferrule Connection

Excelock double Ferrule compression fittings have been developed to complete the compression fittings range.

The advantages of this type of fittings are the following:

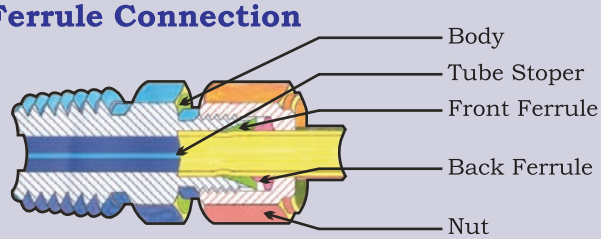
- O Facility of assembling with self aligning front and back Ferrule
- O Low tightening with self torque [the nut is of non-binding design]
- O Controlled tightening effect, distortion of the tube without rupture of fibers, minimum reduction of tube bore size.
- O No twisting of the tube when fitting
- O Withstands high vacuum and pressure.
- O Re-usable , can be assembled and taken apart several times.
- O Recommended for use with thin and thick walled tube.

Excelock couplings and compression Ferrules are made from 316 stainless steel. Other materials optional on request.

All common sizes of fittings will be stocked but specials can be made to order. The fittings are designed for tube sizes 1/16" to 1-1/2", 4mm to 38mm, outside diameter of tube. Stud sizes are 1/8" to 2" ,NPT, API, ISO Parallel (BSPP) and ISO Taper(BSPT)

The Excelock Double Ferrule Connection

This cut-away section of a Excelock fitting shows the sealing action which takes place when the assembly is fully tightened.



The Excelock double ferrule connection is a high safety device operating by compression. It avoids threading soldering, swaggeing or crimping the tube and permits rapid, easy and reliable connections where dismantable tubes require perfect tightness, both under pressure and high vacuum levels as well as under severe temperature and vibration conditions.

The Excelock double ferrule connection consists of :

- O A Body
- O A Front ferrule
- O A Back ferule
- O A Nut providing the tightening element.

As a result of the force developed by nut when tightened, the two ferrules swages into the tube with their leading internal edges. This force the tube up to the stop with in the body. At the same time the back ferrule then takes up a seat, so that its rear internal edge starts to grip the tube, thus ensuring a tight grip and seal.

The Excelock double ferrule connection does not in any way reduce the strength of the tube. Therefore tubes with very thin walls can be used without affecting the safety of your installations.

Excelock connections can also be used on plastic or glass tubes by using Teflon ferrules. This ensure perfect tightness on glass without the risk of breakage.

Excelock Assembly Instructions

Reassembly of Excelock Fittings

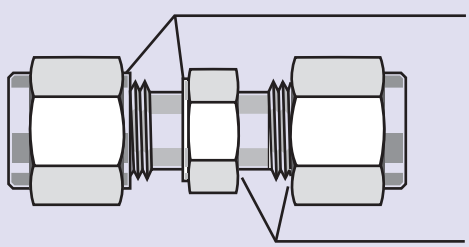
Excelock fittings may be assembled and disassembled repeatedly. The following instructions should be followed for assembly and reassembly.

Insert the tubing end with the previously set ferrules into the fitting body and tighten the nut until hand-tight.

Tighten the nut with a wrench for 1-1/4 turn

Identification of Excelock Fittings

For ease of identification, Excelock fittings in metric sizes have an additional stepped shoulder on the nuts and the bodies to distinguish them from imperial sizes.



Excelock Part Numbering and Ordering

The part numbers of Excelock fittings are established as follows :

A small letter “m” following this number identifies the o/d size in mm, e.g. 4m denotes 4mm o/d size of tubes

If the first digit is not followed by “m”, the number denotes the o/d size in sixteenths of an inch, e.g. 4 denotes 1/4 “

As with the thread sizes are expressed in sixteenths of an inch, thus stud thread sizes are below :

1/8 “ = 2, 1/4 “ = 4, 3/8 “ = 6, 1/2 “ = 8

5/8 “ = 10, 3/4 “ = 12, 7/8” = 14, 1” = 16

Please state whether API, NPT, BSPP or BSPT threads are required.

For ordering use our Part Numbers.

General Information

Materials Standards

Excelock Fittings are manufactured in Materials

Materials	Barstock	Forgings
316 Stainless Steel	ASTM A-276 ASTM A-182	ASME SA-479 ASME SA-182
Alloy 20	ASTM B-473	ASTM B-462
Alloy 400	ASTM B 164 ASTM B-564	ASME SB 164 ASME SB-564
Alloy C-276	ASTM B-574	ASTM B-564
Brass	ASTM B-16 ASTM B 453	ASTM B-283
Carbon Steel	ASTM A-108	-
Nylon	ASTM D-4066	-
PTFE	ASTM D-1710	ASTM D3293
Titanium	ASTM B-348	ASTM B-381
	For Straight configuration Fittings	For all Elbows, Tees & crosses Etc.

For other Materials, Please consult us.

Plating and Coating

For improved performance, Fitting components like Body's and Nuts are subjected to further processing indicated below

Fitting Material	Body Process
Carbon Steel in General	Zinc, Chrome, Nickel or Cadmium Plating
Carbon Steel with Weld able bodies	Hydrocarbon film Chemical conversion Coating
Titanium	Silver Plating or Anodized
Brass,Nylao,316 Stainless Steel, and PTFE	No Coating

Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.
Dimension is with Excelock Nuts finger-tight.

Thread Specifications

Thread Type	Ref. Specifications
NPT	ASME B1.20.1,SAE AS 71051
ISO/BSP(Parallel)	ISO 228 , BS 2779 , JIS B 0202
ISO/BSP(Tapered)	ISO 7 , BS 21, JIS B 0203
ISO/BSP(Gauge) Unified(SAE)	ISO 228 , BS 2779 ASME B1.1

A thread sealant or Teflon tape should always be used when assembling tapered threads.

All EXCELOCK fitting components are cleaned to remove machine oil grease, and loose particles, using ultrasonic clearing process. specially made fittings are available in O2 Service

Tubing Selection

Selection of proper Tubing, their handling and installation is very essential for use with EXCELOCK fittings.Proper selection of Tubes based on the material, hardness, and wall thickness is very essential.

Stainless Steel Tubing

304 or 316 stainless steel tubing, cold-drawn seamless properly annealed to ASTM A-269 or A-213 or equivalent based on Ultimate Tensile strength of 75,000 psi and suitable for temperature between 20° C TO 100° C Should be selected.

The hardness of the Tubes should normally be around RB 80-85 and preferably this should be in the range of RB 75-80. Tubes should be suitable for bending and should be free from surface defects and imperfections.

Carbon Steel Tubing

Soft annealed seamless carbon steel tubing to ASTM A-179 or DIN-2391 or equivalent based on Ultimate Tensile strength of 47,000 psi and suitable for temperature between 20° C TO 100° C Should be selected.

The hardness of the Tubes should normally be around RB 72 or less Tube should be suitable for bending and should be free from surface defects and imperfections.

Copper Tubing

Soft annealed seamless copper tubing to ASTM B-75 or ASTM B-88 or equivalent based on Ultimate Tensile strength of 30,000 psi and suitable for temperature between 20° C TO 80° C Should be selected.

The hardness of the Tubes should normally be around RB 50 or less Tube should preferably be in the range of RB 40-45.

Monel Tubing

Fully annealed Monel 400 seamless tubing to ASTM B-165 or equivalent based on Ultimate Tensile strength of 70,000 psi and suitable for temperatures between 20° C TO 90° C Should be selected.

The hardness of the Tubes should normally be around RB 75 or less Tube should be suitable for bending and should be free from surface defects and imperfections.

Technical Specifications of the fittings

There are no available standard specifications for Double ferrule compression fittings. The following two standards which are applicable to Single compression fittings can be used for Double compression fittings also

1. BS 4368: Part IV, 1984
2. IS 10103:1982

These standards cover the basic type test requirements for Fittings as indicated below.

PROOF PRESSURE TEST
Fitting assemblies are to be subjected to a pressure of 1.5 times the maximum working pressure of the fittings applied at the the rate of 200 Kg/cm^2 per minute and maintained at this pressure for five minutes without leak

DISMANTLING AND REASSEMBLY TEST
Fitting assemblies successfully completing the Proof Pressure Test are dis-assembled and assembled again twenty five times after which operation they must pass the Proof Pressure Test

BURST PRESSURE TEST
Fitting assemblies are subjected to Hydraulic Pressure up to a maximum of four times the working pressure at the rate not exceeding 200 Kg/cm^2 per minute and maintain for five minutes without leak.

STATIC VACUUM TEST
Fitting assemblies satisfactorily Proof Pressure tested are subjected to negative pressure of up to 700mbar and then isolated from the vacuum source. The assemblies must maintain the vacuum for 15 minutes. The fitting assemblies are to be suitably degreased before this test and total exhausted volume should not exceed 20% of the total assembly volume.

IMPULSE VIBRATION TEST
Test assemblies suitably proof pressure tested are connected to a Hydraulic Pressure impulse and vibration test bench and subjected simultaneously to Pressure impulse at 30 to 100 cycles per minute and vibration in two mutually perpendicular planes at 1300 to 2820 cycles per minute for a minimum of 5x10^6 pressure impulses and 20x10^5 vibration cycles. The method of choosing the displacement and the cycle is is outlined in the above standards The only permissible retightening is allowed after the first 1,000 pressure impulses to allow for bedding-in. When subjected to the test described this coupling should not leak in the assembly. Couplings that fail shall be examined for signs of cracking due to fatigue stress.

Pipe End Pressure ratings

Pressure ratings for fittings that have both Tube fitting and Pipe thread ends are determined by the end connections with the lowest Pressure rating **The Pipe End Pressure rating charts** lists the pressure rating for male and female **pipe thread ends**. For female and male pipe threads to have the same pressure rating in the same nominal pipe size. The female thread would require a heavier wall, resulting in a fitting too large and bulky to be practical

Stress values based on ASME B31.3 Code for Process Piping

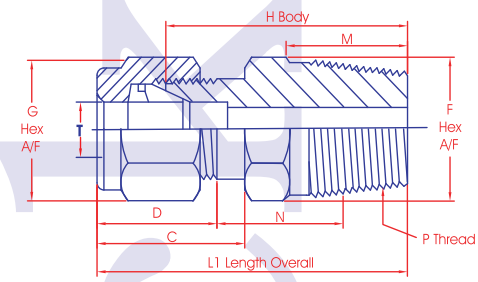
Materials	Allowable Stress Values		Design Factor	Ultimate Tensile Strength	
	psig	bar		psig	bar
316 SS	20,000	1378	3.75:1	75,000	5170
BRASS	10,000	689	4.1	40,000	2760
STEEL	20,000	1378	3.1	60,000	4140

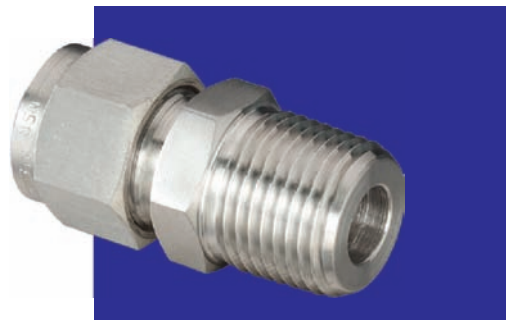
Calculations based on ASME B31.3 Code for Process Piping

NPT / ISO	316 SS and Carbon Steel				Brass			
Pipe Size	Male		Female		Male		Female	
in	psig	bar	psig	bar	psig	bar	psig	bar
1/16	11,000	760	6,700	460	5,500	380	3,300	230
1/8	10,000	690	6,500	440	5,000	340	3,200	220
1/4	8,000	550	6,600	450	4,000	270	3,300	220
3/8	7,800	540	5,300	360	3,900	270	2,600	180
1/2	7,700	530	4,900	330	3,800	260	2,400	160
¾	7,300	500	4,600	320	3,600	250	2,300	160
1	5,300	370	4,400	300	2,600	180	2,200	150
1 ¼	6,000	410	5,000	350	3,000	200	2,500	170
1 ½	5,000	340	4,600	310	2,500	170	2,300	150
2	3,900	270	3,900	270	1,900	130	1,900	130

To determine working pressure ratings in accordance with ASME B31.1, Power piping for 316 Stainless steel, multiply psig with 0.94, for carbon steel, multiply psig by 0.75.Brass ratings remain the same. To determine working kPa, multiply psig by 6.89

MALE CONNECTOR





METRIC RANGE

Dimensions in mm.

Part No	T mm o/d	P	L1 Length	M	C	D	F Body	G Nut	H Body	N
4mMC2	4	1/8"	31.35	9.53	16.67	14.29	12	12	24.21	10.72
4mMC4	4	1/4"	35.72	14.29	16.67	14.29	14	12	29.37	15.88
6mMC2	6	1/8"	33.34	9.53	18.26	15.88	14	14	25.40	11.11
6mMC4	6	1/4"	33.34	14.29	18.26	15.88	14	14	30.16	12.70
6mMC6	6	3/8"	38.89	14.29	18.26	15.88	19	14	30.96	13.49
6mMC8	6	1/2"	44.45	19.05	18.26	15.88	22	14	36.51	15.88
8mMC2	8	1/8"	34.53	9.53	19.05	16.67	14	17	26.59	11.51
8mMC4	8	1/4"	39.29	14.29	19.05	16.67	14	17	31.35	13.10
10mMC2	10	1/8"	35.72	9.53	19.84	17.46	17	19	27.78	11.91
10mMC4	10	1/4"	40.48	14.29	19.84	17.46	17	19	32.54	13.49
10mMC6	10	3/8"	40.48	14.29	19.84	17.46	19	19	32.54	13.49
10mMC8	10	1/2"	46.04	19.05	19.84	17.46	22	19	38.10	15.88
10mMC12	10	3/4"	46.83	19.05	19.84	17.46	27	19	38.89	15.08
12mMC4	12	1/4"	43.66	14.29	22.23	23.02	22	22	33.34	11.11
12mMC6	12	3/8"	43.66	14.29	22.23	23.02	22	22	33.34	11.11
12mMC8	12	1/2"	48.42	19.05	22.23	23.02	22	22	38.10	12.70
12mMC12	12	3/4"	49.21	19.05	22.23	23.02	27	22	38.89	11.91
16mMC6	16	3/8"	44.45	14.29	22.23	24.61	24	27	34.13	10.32
16mMC8	16	1/2"	49.21	19.05	22.23	24.61	24	27	38.89	11.91
16mMC12	16	3/4"	49.21	19.05	22.23	24.61	27	27	38.89	10.32
18mMC8	18	1/2"	50.80	19.05	22.23	24.61	27	30	40.48	13.49
18mMC12	18	3/4"	50.80	19.05	22.23	24.61	27	30	40.48	10.32
18mMC16	18	1"	56.36	23.81	22.23	24.61	36	30	46.40	14.29
20mMC8	20	1/2"	50.80	19.05	22.23	24.60	27	30	40.48	13.49
20mMC12	20	3/4"	50.80	19.05	22.23	24.61	27	30	40.48	10.32
20mMC16	20	1"	56.36	23.81	22.23	14.61	36	30	46.04	14.39
25mMC12	25	3/4"	57.15	19.05	26.19	30.96	36	41	45.24	11.91
25mMC16	25	1"	61.91	23.81	26.19	30.96	36	41	50.01	13.49
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-

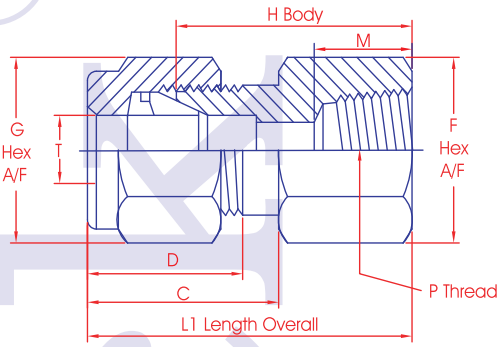
METRIC RANGE

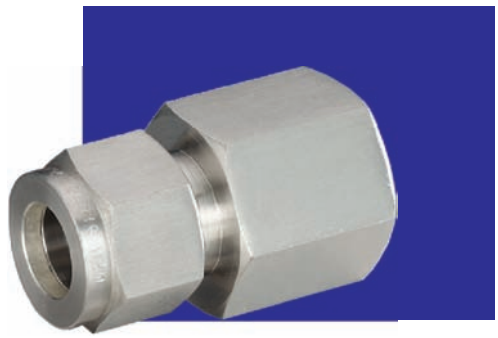
Dimensions in inches

Part No	T mm o/d	P	L1 Length	M	C	D	F Body	G Nut	H Boby	N
1MC1	1/16	1/16	.94	.38	.44	.34	5/16	5/16	.78	.34
1MC2	1/16	1/8	1.00	.38	.44	.34	1/2	5/16	.84	.41
2MC1	1/8	1/16	1.19	.38	.63	.53	1/2	7/16	.91	.41
2MC2	1/8	1/8	1.19	.38	.63	.53	1/2	7/16	.91	.41
2MC4	1/8	1/4	1.41	.56	.63	.53	9/16	7/16	1.13	.50
3MC2	3/16	1/8	1.21	.38	.63	.54	7/16	1/2	.95	.43
3MC4	3/16	1/4	1.42	.56	.63	.54	9.16	1/2	1.16	.54
4MC1	1/4	1/16	1.29	.38	.70	.60	1/2	9/16	1.00	.46
4MC2	1/4	1/8	1.29	.38	.70	.60	1/2	9/16	1.00	.45
4MC4	1/4	1/4	1.50	.56	.72	.63	9/16	9/16	1.19	.50
4MC6	1/4	3/8	1.51	.56	.70	.60	11/16	9/16	1.19	.56
4MC8	1/4	1/2	1.73	.75	.70	.60	7/8	9/16	1.44	.67
5MC2	5/16	1/8	1.34	.38	.73	.64	9/16	5/8	1.05	.46
5MC4	5/16	1/4	1.52	.56	.73	.64	9/16	5/8	1.23	.54
6MC2	3/8	1/8	1.38	.38	.76	.66	5/8	11/16	1.09	.48
6MC4	3/8	1/4	1.57	.56	.76	.66	5/8	11/16	1.28	.57
6MC6	3/8	3/8	1.57	.56	.76	.66	11/16	11/16	1.28	.56
6MC8	3/8	1/2	1.79	.75	.76	.66	7/8	11/16	1.50	.67
6MC12	3/8	3/4	1.82	.75	.76	.66	1-1/16	11/16	1.53	.68
8MC4	1/2	1/4	1.17	.56	.86	.90	13.16	7/8	1.31	.47
8MC6	1/2	3/8	1.71	.56	.86	.90	13/16	7/8	1.31	.46
8MC8	1/2	1/2	1.90	.75	.86	.90	7/8	7/8	1.50	.54
8MC12	1/2	3/4	1.93	.75	.86	.90	1-1/16	7/8	1.53	.55
10MC6	5/8	3/8	1.74	.56	.86	.96	15/16	1	1.34	.43
10MC8	5/8	1/2	1.93	.75	.86	.96	15/16	1	1.53	.51
10MC12	5/8	3/4	1.93	.75	.86	.96	1-1/16	1	1.53	.49
12MC8	3/4	1/2	1.99	.75	.86	.96	1-1/16	1-1/8	1.59	.57
12MC12	3/4	3/4	1.99	.75	.86	.96	1-1/16	1-1/8	1.59	.55
12MC16	3/4	1	2.21	.94	.86	.96	1-3/16	1-1/8	1.81	.68
16MC12	1	3/4	2.26	.75	1.04	1.23	1-3/8	1-1/2	1.78	.55
16MC16	1	1	2.45	.94	1.04	1.23	1-3/8	1-1/2	1.97	.65

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

FEMALE CONNECTOR





METRIC RANGE

Dimensions in mm.

Part No	T mm o/d	P	L1 Length	M	C	D	F Body	G Nut	H Body
4mFC2	4	1/8"	30.16	10	16.67	14.29	14	12	23.02
6mFC2	6	1/8"	31.75	10	18.26	15.88	14	14	23.81
6mFC4	6	1/4"	36.51	14	18.26	15.88	19	14	28.58
6mFC6	6	3/8"	38.07	14	18.26	15.88	22	14	30.16
6mFC8	6	1/2"	43.66	19	18.26	15.88	27	14	35.72
8mFC2	8	1/8"	32.54	10	19.05	16.67	14	17	24.61
8mFC4	8	1/4	37.31	14	19.05	16.67	19	17	29.37
10mFC2	10	1/8"	33.34	10	19.84	17.46	17	19	25.40
10mFC4	10	1/4"	38.10	14	19.84	17.46	19	19	30.16
10mFC6	10	3/8"	39.69	14	19.84	17.46	22	19	31.75
10mFC8	10	1/2"	44.45	19	19.84	17.46	27	19	36.51
12mFC4	12	1/4"	42.07	14	22.23	23.02	22	22	31.75
12mFC6	12	3/8"	42.07	14	22.23	23.02	22	22	31.75
12mFC8	12	1/2"	46.83	19	22.23	23.02	27	22	36.51
16mFC8	16	1/2"	46.83	19	22.23	24.61	27	27	36.51
18mFC8	18	1/2"	46.83	19	22.23	24.61	27	30	36.51
18mFC12	18	3/4"	48.42	19	22.23	24.61	32	30	38.10
20mFC8	20	1/2"	46.83	19	22.23	24.61	27	30	36.51
20mFC12	20	3/4"	48.42	19	22.23	24.61	32	30	38.10
25mFC12	25	3/4"	53.18	19	26.19	31.75	36	41	41.28
25mFC16	25	1"	6191	24	26.19	30.96	41	41	50.01
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-

IMPERIAL RANGE

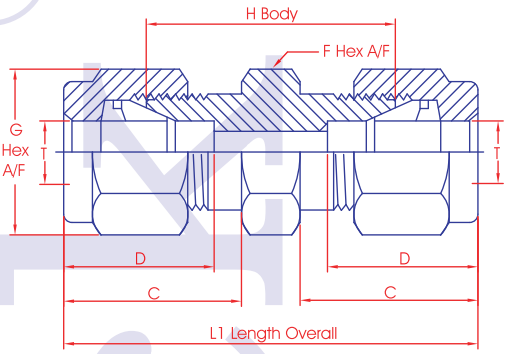
Dimensions in inches

Part No	T o/d	P	L1 Length	M	C	D	F Body	G Nut	H Body
1FC1	1/16	1/16	0.94	0.36	0.44	0.34	1/2	5/16	0.78
2FC2	1/8	1/8	1.16	0.39	0.63	0.53	9/16	7/16	0.88
2FC4	1/8	1/8	1.16	0.59	0.63	0.53	3/4	7/16	1.06
3FC2	3/16	1/8	1.17	0.39	0.63	0.54	9/16	9/16	0.91
4FC2	1/4	1/8	1.23	0.39	0.70	0.60	9/16	9/16	0.94
4FC4	1/4	1/4	1.41	0.59	0.70	0.60	3/4	9/16	1.12
4FC6	1/4	3/8	1.48	0.59	0.70	0.60	7/8	9/16	1.19
4FC8	1/4	1/2	1.70	0.78	0.70	0.60	1-1/16	9/16	1.41
5FC2	5/16	1/8	1.26	0.39	0.73	0.64	3/4	5/8	0.97
5FC4	5/16	1/4	1.45	0.59	0.73	0.64	3/4	5/8	1.16
6FC2	3/8	1/8	1.29	0.39	0.76	0.66	5/8	11/16	1.00
6FC4	3/8	1/4	1.48	0.59	0.76	0.66	3/4	11/16	1.19
6FC6	3/8	3/8	1.54	0.59	0.76	0.66	7/8	11/16	1.25
6FC8	3/8	1/2	1.73	0.78	0.76	0.66	1-1/16	11/16	1.44
8FC4	1/2	1/4	1.65	0.59	0.86	0.90	13/16	7/8	1.25
8FC6	1/2	3/8	1.65	0.59	0.86	0.90	7/8	7/8	1.25
8FC8	1/2	1/2	1.84	0.78	0.86	0.90	1-1/16	7/8	1.44
10FC6	5/8	3/8	1.65	0.59	0.86	0.96	15/16	1	1.25
10FC8	5/8	1/2	1.84	0.78	0.86	0.96	1-1/16	1	1.44
12FC8	3/4	1/2	1.84	0.78	0.86	0.96	1-1/16	1-1/8	1.44
12FC12	3/4	3/4	1.90	0.81	0.86	0.96	1-5/16	1-1/8	1.50
16FC12	1	3/4	2.10	0.81	1.04	1.23	1-3/8	1-1/2	1.62
16FC16	1	1	2.45	1.00	1.04	1.23	1-5/8	1-1/2	1.97

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Excelock®

Union



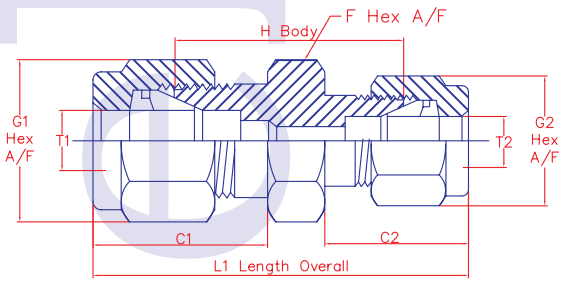
METRIC RANGE — Dimensions in mm

Part No.	T o/d	L1 Length	C	D	F Body	G Nut	H Body
4mU	4	38.50	16.67	14.29	12	12	24.21
6mU	6	42.07	18.26	15.88	14	14	26.19
8mU	8	44.04	19.05	16.67	14	17	28.18
10mU	10	46.04	19.84	17.46	17	19	30.16
12mU	12	51.59	22.23	23.01	22	22	30.96
16mU	16	52.39	22.23	24.61	24	27	31.75
18mU	18	53.98	22.23	24.61	27	30	33.34
20mU	20	53.98	22.23	24.61	30	32	33.34
25mU	25	64.29	26.19	30.96	36	41	40.48

IMPERIAL RANGE — Dimensions in inches

Part No	T o/d	L1 Length	C	D	F Body	G Nut	H Body
1U	1/16	1.00	0.44	0.34	5/16	5/16	0.69
2U	1/8	1.44	0.63	0.53	1/2	7/16	0.88
3U	3/16	1.47	0.63	0.54	7/16	1/2	0.95
4U	1/4	1.61	0.70	0.60	1/2	9/16	1.03
5U	5/16	1.68	0.73	0.64	9/16	5/8	1.10
6U	3/8	1.77	0.76	0.66	5/8	11/16	1.19
8U	1/2	2.02	0.86	0.90	13/16	7/8	1.22
10U	5/8	2.05	0.86	0.96	15/16	1	1.25
12U	3/4	2.11	0.86	0.96	1-1/16	1-1/8	1.31
16U	1	2.55	1.04	1.23	1-3/8	1-1/2	1.59

Reducing Union



METRIC RANGE — Dimensions in mm

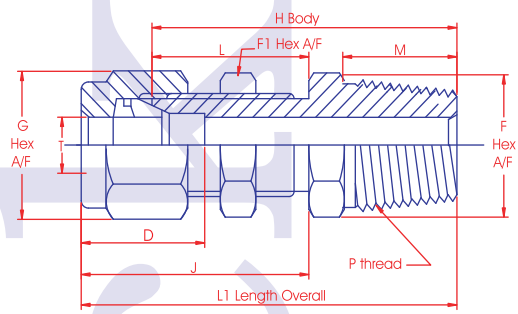
Part No	T1 mm o/d	T2 mm o/d	L1 Length	C1	C2	F Body	G1 Nut	G2 Nut	H Body
6-4mRU	6	4	40.48	19.97	19.05	14	14	12	25.40
8-6mRU	8	6	43.26	19.05	19.97	14	17	14	27.38
10-6mRU	10	6	44.45	19.84	19.97	17	19	14	28.58
10-8mRU	10	8	45.24	19.84	19.05	17	19	17	29.37
12-6mRU	12	6	47.63	22.23	19.97	22	22	14	29.37
12-10mRU	12	10	49.21	22.23	19.84	22	22	19	30.96
16-10mRU`	16	10	50.01	22.23	19.84	24	27	19	31.75
16-12mRU	16	12	52.39	22.23	22.23	24	27	22	31.75
20-12mRU	20	12	53.98	22.23	22.23	27	30	22	33.34
20-16mRU	20	16	53.98	22.23	22.23	27	30	27	33.34
25-20mRU	25	20	60.32	26.19	22.23	36	41	30	38.10

IMPERIAL RANGE — Dimensions in inches

Part No	T1 o/d	T2 o/d	L1 Length	C1	C2	F Body	G1 Nut	G2 Nut	H Body
2RU1	1/8	1/16	1.25	0.63	0.44	1/2	7/16	5/16	0.81
3RU2	3/16	1/8	1.48	0.66	0.63	1/2	1/2	7/16	0.92
4RU1	1/4	1/16	1.37	0.72	0.44	1/2	9/16	5/16	0.91
4RU2	1/4	1/8	1.56	0.72	0.63	1/2	9/16	7/16	0.97
4RU3	1/4	3/16	1.55	0.70	0.63	1/2	9/16	1/2	1.00
5RU4	5/16	1/4	1.66	0.73	0.70	9/16	5/8	9/16	1.08
6RU4	3/8	1/4	1.70	0.76	0.70	5/8	11/16	9/16	1.12
6RU5	3/8	5/16	1.74	0.76	0.73	5/8	11/16	5/8	1.16
8RU4	1/2	1/4	1.85	0.86	0.70	13/16	7/8	9/16	1.16
8RU6	1/2	3/8	1.91	0.86	0.76	13/16	7/8	11/16	1.22
10RU6	5/8	3/8	1.94	0.86	0.76	15/16	1	11/16	1.25
10RU8	5/8	1/2	2.05	0.86	0.86	15/16	1	7/8	1.25
12RU8	3/4	1/2	2.11	0.86	0.86	1-1/16	1-1/8	7/8	1.31
12RU10	3/4	5/8	2.11	0.86	0.86	1-1/16	1-1/8	1	1.31
16RU12	1	3/4	2.47	1.04	0.86	1-3/8	1-1/2	1-1/8	1.59

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Bulkhead Male Connector

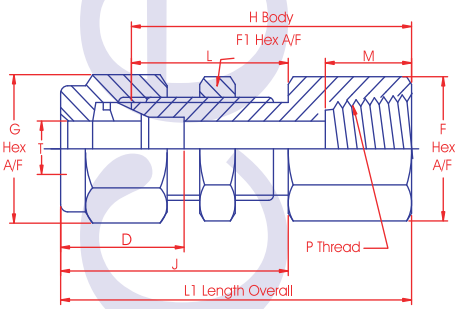


IMPERIAL RANGE

Dimensions in inches

Part No.	T o/d	P	M	D	F Body	G Nut	F1 Check NUt	H	J	L	L1	Panel Hole	Max PaneL
2MBH2	1/8	1/8	0.38	0.60	5/8	9/16	5/8	1.66	1.32	1.03	1.95	29/64	0.40
4MBH4	1/4	1/4	0.56	0.60	5/8	9/16	5/8	1.81	1.32	1.03	2.10	29/64	0.40
6MBH6	3/8	3/8	0.56	0.66	3/4	11/16	3/4	1.97	1.45	1.16	2.26	37/64	0.44
8MBH8	1/2	1/2	0.75	0.90	15/16	7/8	15/16	2.28	1.65	1.25	2.68	49/64	0.50

Bulkhead Female Connector



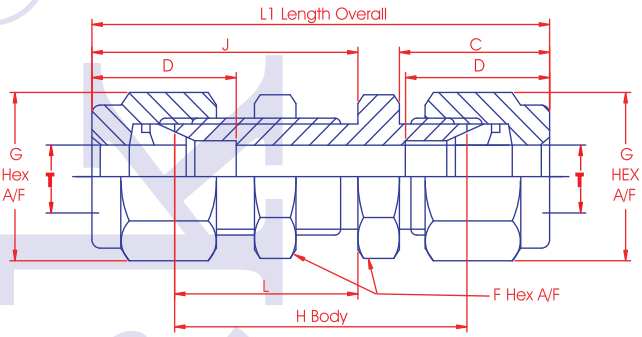
IMPERIAL RANGE

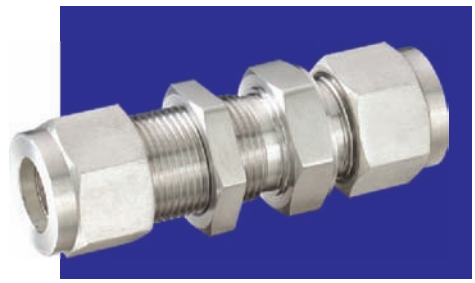
Dimensions in inches

Part No.	T o/d	p	M	D	F Body	G Nut	F1 Check NUt	H	J	L	L1	Panel Hole	Max PaneL
2FBH2	1/8	1/8	0.39	0.60	5/8	9/16	5/8	1.56	1.32	1.32	1.85	24/64	0.40
4FBH4	1/4	1/4	0.59	0.60	3/4	9/16	5/8	1.75	1.32	1.32	2.04	29/64	0.40
6FBH6	3/8	1/4	0.59	0.66	3/4	11/16	3/4	1.88	1.45	1.45	2.17	37/64	0.44
8FBH8	1/2	1/2	0.78	0.90	1-1/16	7/8	15/16	2.22	1.65	1.65	2.62	49/64	0.50

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Bulkhead Union





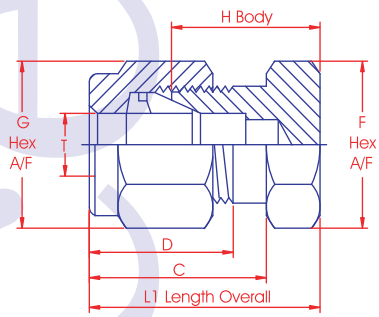
METRIC RANGE — Dimensions in mm

Part No.	T o/d	L1 Length	C	D	F Body check nut	G nut	H Body	J	L
4mBHU	4	54.77	16.67	14.30	14	12	40.48	32.54	25.40
6mBHU	6	58.74	18.26	15.88	17	14	42.86	34.13	26.10
8mBHU	8	61.91	19.05	16.67	17	17	46.04	36.51	28.50
10mBHU	10	63.50	19.84	17.46	19	19	47.63	37.71	29.30
12mBHU	12	71.44	22.23	23.02	24	22	50.80	42.07	31.70
16mBHU	16	73.03	22.23	24.61	27	27	50.80	42.86	32.50
18mBHU	18	73.03	22.23	24.61	30	30	58.74	47.63	37.30
20mBHU	20	79.38	22.23	24.61	30	30	58.74	47.63	37.30
25mBHU	25	95.25	26.19	30.96	41	41	71.44	57.15	45.20

IMPERIAL RANGE — Dimensions in inches

Part No.	T o/d	L1 Length	C	D	F Body Check Nut	G Nut	H Body	J	L
2BHU	1/8	2.10	0.63	0.53	1/2	7/16	0.77	1.25	0.97
3BHU	3/16	2.11	0.63	0.54	9/16	1/2	1.59	1.26	1.00
4BHU	1/4	2.27	0.70	0.60	5/8	9/16	1.69	1.32	1.03
5BHU	5/16	2.39	0.73	0.64	11/16	5/8	1.81	1.41	1.12
6BHU	3/8	2.46	0.79	0.66	3/4	11/16	1.88	1.45	1.16
8BHU	1/2	2.80	0.86	0.90	15/16	7/8	2.00	1.65	1.25
10BHU	5/8	2.87	0.86	0.96	1	1	2.06	1.69	1.28
12BHU	3/4	3.11	0.86	0.96	1-3/16	1-1/8	2.31	1.87	1.47
16BHU	1	3.75	1.04	1.23	1-5/8	1-1/2	2.81	2.26	1.78

Tube End Closure (Cap)



METRIC RANGE — Dimensions in mm

Part No.	T o/d	L1 Length	C	D	F Body	G Nut	H Body
4mTC	4	21.83	16.67	14.29	12	12	14.68
6mTC	6	23.81	18326	15.88	14	14	15.88
8mTC	8	25.00	19.05	16.67	14	17	17.67
10mTC	10	26.19	19.84	17.46	17	19	18.26
12mTC	12	29.37	22.23	23.02	22	22	19.05
16mTC	16	30.16	22.23	24.61	24	27	19.84
18mTC	18	31.75	22.23	24.61	27	30	21.43
20mTC	20	31.75	22.23	24.61	27	30	21.43
25mTC	25	38.10	26.19	30.96	36	41	26.19

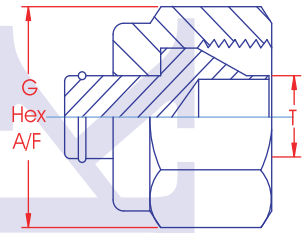
IMPERIAL RANGE — Dimensions in inches

Part No.	T o/d	L1 Length	C	D	F Body	G Nut	H Body
1TC	1/16	0.59	0.44	0.34	5/16	5/16	0.44
2TC	1/8	0.81	0.63	0.53	1/2	7/16	0.53
3TC	3/16	0.84	0.63	0.54	7/16	1/2	0.58
4TC	1/4	0.91	0.70	0.60	1/2	9/16	0.62
5TC	5/16	0.96	0.73	0.64	9/16	5/8	0.67
6TC	3/8	1.01	0.76	0.66	5/8	11/16	0.72
8TC	1/2	1.15	0.86	0.90	13/16	7/8	0.75
10TC	5/8	1.18	0.86	0.96	15/16	1	0.78
12TC	3/4	1.24	0.86	0.96	1-1/16	1-1/8	0.84
16TC	1	1.51	1.04	1.23	1-3/8	1-1/2	1.03

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Excelock®

Fitting End Closure (Plug)



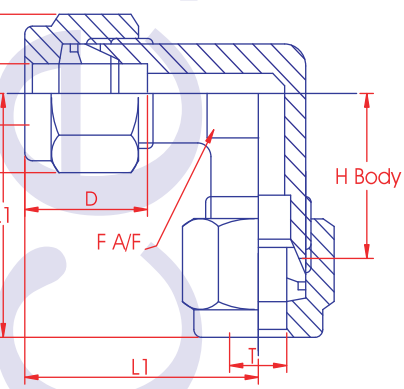
METRIC RANGE — Dimensions in mm

Part No.	T o/d	G Nut
4mFC	4	12
6mFC	6	14
8mFC	8	17
10mFC	10	19
12mFC	12	22
16mFC	16	27
18mFC	18	30
20mFC	20	30
25mFC	25	41

IMPERIAL RANGE — Dimensions in inches

Part No.	T o/d	G Nut
1FC	1/16	5/16
2FC	1/8	7/16
3FC	3/16	1/2
4FC	1/4	9/16
5FC	5/16	5/8
6FC	3/8	11/16
8FC	1/2	7/8
10FC	5/8	1
12FC	3/4	1-1/8
16FC	1	1-1/2

Union Elbow



METRIC RANGE — Dimensions in mm

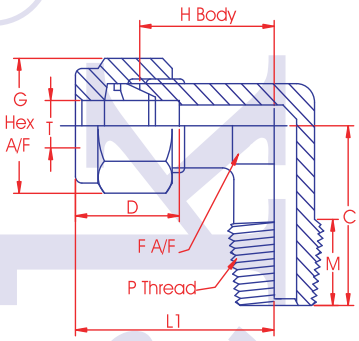
Part No.	T o/d	L1 Length	D	F Body	G Nut	H Body
4mELU	4	24.61	14.29	12	12	19.05
6mELU	6	26.19	15.88	12	14	19.81
8mELU	8	28.58	16.67	14	17	22.23
10mELU	10	29.37	17.46	14	19	23.11
12mELU	12	34.93	23.02	19	22	24.89
16mELU	16	36.51	24.61	24	27	26.19
18mELU	18	39.69	24.61	27	30	29.37
20mELU	20	39.69	24.61	27	30	29.37
25mELU	25	45.24	30.96	32	41	33.34

IMPERIAL RANGE — Dimensions in inches

Part No.	T o/d	L1 Lenght	D	F Body	G Nut	H Body
1ELU	1/16	0.72	0.34	0.47	5/16	0.56
2ELU	1/8	0.94	0.53	0.47	7/16	0.72
3ELU	3/16	1.01	0.54	0.47	1/2	0.75
4ELU	1/4	1.07	0.60	0.47	9/16	0.78
5ELU	5/16	1.17	0.64	0.55	5/8	0.88
6ELU	3/8	1.20	0.66	0.55	11/16	0.91
8ELU	1/2	1.38	0.90	0.74	7/8	0.98
10ELU	5/8	1.46	0.96	0.94	1	1.06
12ELU	3/4	1.51	0.96	1.06	1-1/8	1.11
16ELU	1	1.79	1.23	1.26	1-1/2	1.31

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Male Elbow



METRIC RANGE

Dimensions in mm

Part No.	T mm o/d	P	L1 Length	M	C	D	F Body	G Nut	H Body
4mME2	4	1/8"	24.61	19.53	19.30	14.29	12	12	19.05
6mME2	6	1/8"	26.19	09.53	19.84	15.88	12	14	19.80
6mME4	6	1/4"	26.19	14.29	23.81	15.88	12	14	19.80
6mME6	6	3/8"	27.60	14.29	23.58	15.88	14	14	21.33
6mME8	6	1/2"	29.40	19.05	33.24	15.88	19	14	23.11
8mME2	8	1/8"	28.58	09.53	20.64	16.67	14	17	22.22
8mME4	8	1/4"	28.58	14.29	25.40	16.67	14	17	22.22
8mME6	8	3/8"	28.58	14.24	25.40	16.67	14	17	22.22
8mME8	8	1/2"	31.75	19.05	32.00	16.67	19	17	24.00
10mME2	10	1/8"	28.90	09.53	22.23	17.46	14	19	23.11
10mME4	10	1/4"	28.90	14.29	25.40	17.46	14	19	23.11
10mME6	10	3/8"	28.90	14.29	28.58	17.46	14	19	23.11
10mME8	10	1/2"	30.60	19.05	31.75	17.46	19	19	24.89
12mME4	12	1/4"	35.80	14.29	28.58	23.02	19	22	24.89
12mME6	12	3/8"	35.80	14.29	28.58	23.02	19	22	24.89
12mME8	12	1/2"	35.80	19.05	33.34	23.02	19	22	24.89
16mME6	16	3/8"	36.51	14.29	31.75	24.61	19	27	26.19
16mME8	16	1/2"	36.51	19.05	34.93	24.61	19	27	26.19
18mME8	18	1/2"	39.69	19.05	38.10	24.61	27	30	29.37
18mME12	18	3/8"	39.69	19.05	38.10	24.61	27	30	29.37
20mME8	20	1/2"	39.69	19.05	38.10	24.61	27	30	29.37
20mME12	20	3/4"	39.69	19.05	38.10	24.61	27	30	29.37
25mME12	25	3/4"	45.24	19.05	38.10	26.19	32	41	33.34
25mME16	25	1"	45.24	23.81	46.83	30.96	32	41	33.34
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IMPERIAL RANGE

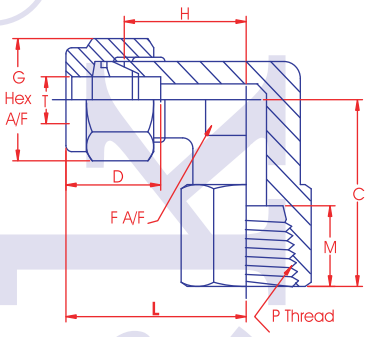
Dimensions in mm

Part No.	T mm o/d	P	L1 Length	M	C	D	F Body	G Nut	H Body
1ME1	1/16	1/16	0.72	0.38	0.69	0.34	0.47	5/16	0.56
1ME2	1/16	1/8	0.72	0.38	0.72	0.34	0.47	5/16	0.56
2ME1	1/8	1/16	0.99	0.38	0.76	0.51	0.47	7/16	0.72
2ME2	1/8	1/8	0.94	0.38	0.76	0.53	0.47	7/16	0.72
2ME4	1/8	1/4	0.97	0.56	0.94	0.53	0.47	7/16	0.72
3ME2	3/16	1/8	1.01	0.38	0.76	0.54	0.47	1/2	0.75
4ME2	1/4	1/8	1.07	0.38	0.76	0.60	0.47	9/16	0.78
4ME4	1/4	1/4	1.07	0.56	0.94	0.60	0.47	9/16	0.78
4ME6	1/4	3/8	1.17	0.56	1.00	0.60	0.55	9/16	0.84
4ME8	1/4	1/2	1.26	0.75	1.26	0.60	0.75	9/16	0.91
5ME2	5/16	1/8	1.17	0.38	0.82	0.64	0.55	5/8	0.88
5ME4	5/16	1/4	1.17	0.56	1.00	0.64	0.55	5/8	0.88
6ME2	3/8	1/8	1.20	0.38	0.82	0.66	0.55	11/16	0.91
6ME4	3/8	1/4	1.20	0.56	1.00	0.66	0.55	11/16	0.91
6ME6	3/8	3/8	1.23	0.56	1.00	0.66	0.55	11/16	0.91
6ME8	3/8	1/2	1.32	0.75	1.26	0.66	0.75	11/16	0.98
8ME4	1/2	1/4	1.38	0.56	1.08	0.91	0.75	7/8	0.98
8ME6	1/2	3/8	1.38	0.56	1.08	0.91	0.75	7/8	0.98
8ME8	1/2	1/2	1.44	0.75	1.26	0.91	0.75	7/8	0.98
10ME6	5/8	3/8	1.46	0.56	1.16	0.96	0.94	1	1.06
10ME8	5/8	1/2	1.46	0.75	1.34	0.96	0.94	1	1.06
12ME8	3/4	1/2	1.51	0.75	1.39	0.96	1.06	1-1/8	1.11
12ME12	3/4	3/4	1.51	0.75	1.39	0.96	1.06	1-1/8	1.11
16ME12	1	3/4	1.79	0.94	1.66	1.23	1.25	1-1/2	1.31
16ME16	1	1	1.79	0.94	1.84	1.23	1.25	1-1/2	1.31

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Excelock®

Female Elbow



METRIC SIZE — Dimensions in mm

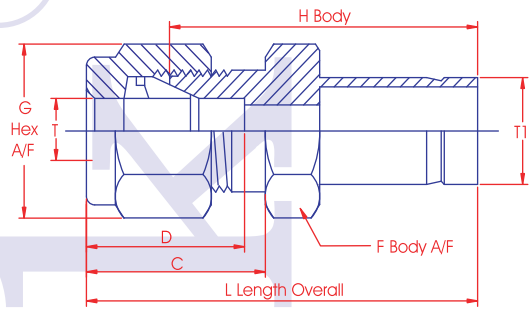
Part No	T o/d	P	L Length	M	C	D	F Body	G Nut	H Body
4mFE2	4	1/8	24.20	10.00	19.00	12	12	12.70	17.80
6mFE2	6	1/8	26.40	10.00	19.00	15.20	14.00	14.00	19.00
6mFE4	6	1/4	29.72	14.00	22.40	15.20	19.00	14.00	22.30
6mFE6	6	3/8	34.50	14.00	25.00	15.20	22.00	14.00	23.00
6mFE8	6	1/2	34.50	19.00	30.00	19.80	27.00	14.00	27.00
8mFE2	8	1/8	29.70	10.00	19.00	16.25	14.00	17.00	22.35
8mFE4	8	1/4	30.48	14.00	22.35	16.26	19.00	17.00	23.20
8mFE6	8	3/8	33.50	14.00	24.00	16.26	22.00	17.00	25.00
8mFE8	8	1/2	33.50	19.00	28.00	19.80	27.00	17.00	30.00
10mFE2	10	1/8	30.40	10.00	19.00	16.70	17.00	19.00	23.22
10mFE4	10	1/4	31.24	14.00	22.35	16.70	19.00	19.00	23.88
10mFE6	10	3/8	33.50	14.00	22.35	16.70	22.00	19.00	25.00
10mFE8	10	1/2	35.80	19.00	22.35	16.70	27.00	19.00	28.50
12mFE4	12	1/4	35.00	14.00	22.35	22.86	22.00	22.00	25.00
12mFE6	12	3/8	36.32	14.00	22.35	22.86	22.00	22.00	25.00
12mFE8	12	1/2	38.60	19.00	28.45	22.86	27.00	22.00	25.00
16mFE8	16	1/2	38.60	19.00	28.50	22.86	27.00	27.00	28.50

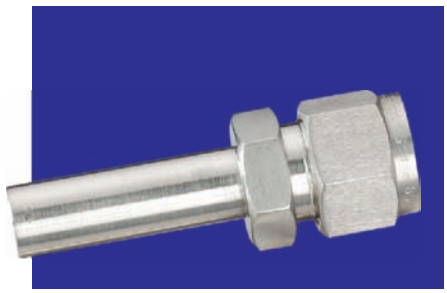
IMPERIAL RANGE — Dimensions in Inches

Part No	T o/d	P	L Length	M	C	D	F Body	G Nut	H Body
2FE2	1/8	1/8	0.95	0.39	0.15	0.50	0.50	7/16	0.69
2FE4	1/8	1/4	1.07	0.59	0.88	0.50	0.69	7/16	0.81
3FE2	3/16	1/8	0.98	0.39	0.75	0.54	0.50	1/2	0.72
4FE2	1/4	1/8	1.04	0.39	0.75	0.60	0.50	9/16	0.75
4FE4	1/4	1/4	1.17	0.59	0.88	0.60	0.69	9/16	0.88
5FE2	5/16	1/8	1.17	0.39	0.75	0.64	0.63	5/8	0.88
5EF4	5/16	1/4	1.20	0.59	0.88	0.64	0.69	5/8	0.91
6FE2	3/8	1/8	1.20	0.39	0.75	0.66	0.63	11/16	0.91
6FE4	3/8	1/4	1.23	0.59	0.88	0.66	0.69	11.16	0.94
6FE6	3/8	3/8	1.32	0.59	0.88	0.66	0.81	11/16	1.03
6FE8	3/8	1/2	1.41	0.78	1.12	0.66	1.00	11/16	1.12
8FE4	1/2	1/4	1.38	0.59	0.88	0.90	0.81	7/8	0.98
8FE6	1/2	3/8	1.43	0.59	0.88	0.90	0.80	7/8	1.03
8FE8	1/2	1/2	1.52	0.78	1.12	0.90	1.00	7/8	1.12
10FE6	5/8	3/8	1.46	0.59	0.88	0.96	0.94	1	1.06
10FE8	5/8	1/2	1.53	0.78	1.82	0.96	1.00	1	1.12
12FE8	3/4	1/2	1.51	0.78	1.12	0.96	1.06	1-1/8	1.11
12FE12	3/4	3/4	1.65	0.81	1.25	0.96	1.25	1-1/8	1.25

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Reducer



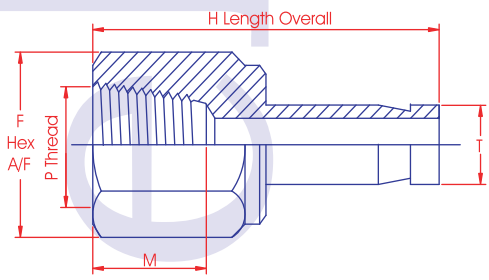


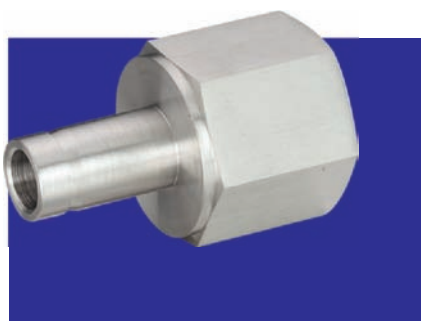
IMPERIAL RANGE

Dimensions in inches

Part No	T o/d	T1 o/d	L	C	D	F Body	G Nut	H Body
2RED4	11/8	1/4	1.42	0.60	0.50	7/16	7/16	1.16
4RED2	1/4	1/8	1.45	0.70	0.60	1/2	9/16	1.16
4RED6	1/4	3/8	1.60	0.70	0.60	1/2	9/6	1.31
4RED8	1/4	1/2	1.82	0.70	0.60	9/16	9/16	1.53
6RED4	3/8	1/4	1.63	0.76	0.66	5/8	11/16	1.34
6RED8	3/8	1/2	1.91	0.76	0.66	5/8	11/16	1.62
8RED6	1/2	3/8	1.84	0.86	0.90	11/16	7/8	1.44

Female Adaptor





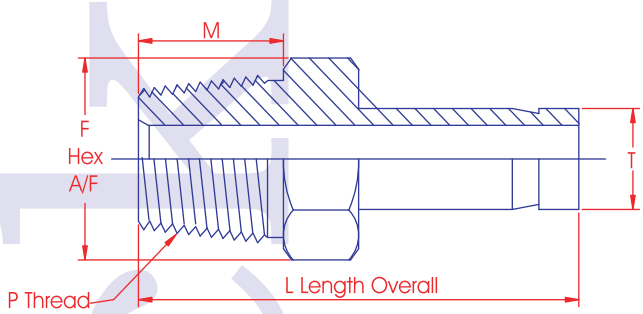
IMPERIAL RANGE

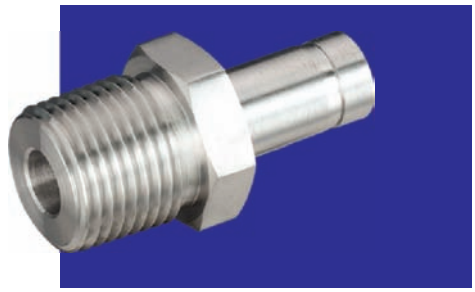
Dimensions in inches

PART No.	T	P	M	F	H
2ADF2	1/8	1/8	0.39	9/16	1-5/32
4ADF2	1/8	1/8	0.39	9/16	1-5/32
4ADF4	1/4	1/4	0.59	3/4	1-11/32
5ADF4	5/16	1/4	0.59	3/4	1-7/16
5ADF6	5/16	3/8	0.59	7/8	1-17/32
6ADF4	3/8	1/4	0.59	3/4	1-13.32
6ADF6	3/8	3/8	0.59	7/8	1-15/32
6ADF8	3/8	1/2	0.78	1-1/16	1-21/32
8ADF4	1/2	1/4	0.59	3/16	1-5/8
8ADF4	1/2	1/4	0.59	3/16	1-5/8
8ADF6	1/2	3/8	0.59	7/8	1-11/16
8ADF8	1/2	1/2	0.78	1-1/16	1-7/8
12ADF8	3/4	1/2	0.78	1-1/16	2.0
12ADF12	3/4	3/4	0.81	1-5/16	2-1/16

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Male Adaptor





METRIC RANGE — Dimensions in mm

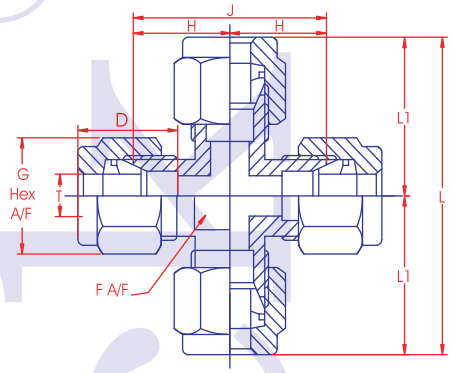
Part No	T	P	M	F Body	L
4mADM2	4	1/8"	9.52	12	29.37
4mADM4	4	1/4"	14.29	14	34.13
6mADM2	6	1/8"	9.52	12	30.96
6mADM4	6	1/8"	14.29	14	35.72
6mADM6	6	3/8"	14.29	19	36.51
6mADM8	6	1/2"	19.05	24	42.07
8mADM2	8	1/8"	9.52	12	31.75
8mADM4	8	1/4"	14.29	14	37.31
8mADM6	8	3/8"	14.29	19	37.31
8mADM8	8	1/2"	19.05	24	42.86
10mADM2	10	1/8"	9.52	12	33.34
10mADM4	10	1/4"	14.29	14	38.10
10mADM6	10	3/8"	14.29	19	38.10
10mADM8	10	1/2"	19.05	24	42.66
12mADM4	12	1/4"	14.29	14	42.66
12mADM6	12	3/8"	14.29	19	44.45
16mADM6	16	3/8"	14.29	19	46.04
16mADM8	16	1/2"	19.05	24	50.80
16mADM12	16	3/4"	19.05	27	51.59
20mADM8	20	1/2"	19.05	24	50.80
20mADM12	20	3/4	19.05	27	51.59
20mADM16	20	1"	23.81	36	57.94
25mADM12	25	3/4"	19.05	27	57.94
25mADM16	25	1"	23.81	36	65.09

IMPERIAL RANGE — Dimensions in inches

Part No	T	P	M	F Body	L
2ADM2	1/8	1/8	0.38	1/2	1-1/8
2ADM4	1/8	1/4	0.56	9/16	1-5/16
3ADM2	3/16	1/8	0.38	7.16	1-5/32
4ADM2	1/4	1/8	0.38	7/16	1-7/32
4ADM4	1/4	1/4	0.56	9/16	1-13/32
4ADM6	1/4	3/8	0.56	11/16	1-7/16
4ADM8	1/4	1/2	0.75	15/16	1-21/32
5ADM4	5/16	1/4	0.56	9/16	1-15/32
5ADM6	5/16	3/8	0.56	11/16	1-15/32
6ADM4	3/8	1/4	0.56	9/16	1-1/2
6ADM6	3/8	3/8	0.56	11/16	1-1/2
6ADM8	3/8	1/2	0.75	15/16	1-11/16
8ADM4	1/2	1/4	0.56	1/2	1-11/16
8ADM6	1/2	3/8	0.56	11/16	1-3/4
8ADM8	1/2	1/2	0.75	15/16	1-15/16
10ADM6	5/8	3/8	0.56	11/16	1-13/16
10ADM8	5/8	1/2	0.75	15/16	2
10ADM12	5/8	3/4	0.75	1-1/16	2-1/32
12ADM8	3/4	1/2	0.75	15/16	2
12ADM12	3/4	3/4	0.75	1-1/16	2-1/32
12ADM16	3/4	1	0.94	1-3/8	2-9/32
16ADM12	1	3/4	0.75	1-1/16	2-9/32
16ADM16	1	1	0.94	1-3/8	2-9/16

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Union Cross



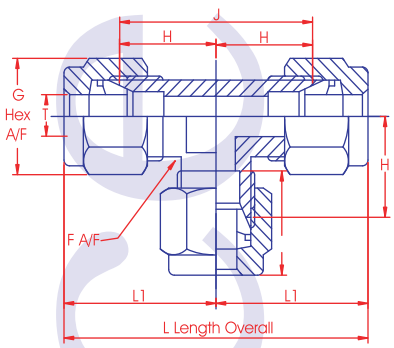
METRIC RANGE — Dimensions in mm.

Part No.	T mm o/d	L1 Lenght	D	F Body	G Nut	H Body	J Body	L
4mUC	4	26.15	14.29	12	12	19.00	38.00	52.30
6mUC	6	27.20	15.88	12	14	19.80	39.60	54.40
8mUC	8	29.70	16.67	14	17	22.20	44.40	59.40
10mUC	10	30.80	17.46	14	19	23.10	46.20	61.60
12mUC	12	35.00	23.02	17	22	24	49.80	70.00
16mUC	16	36.39	24.61	24	27	26.19	52.39	72.78

IMPERIAL RANGE — Dimensions in inches

Part No.	T mm o/d	L1 Lenght	D	F Body	G Nut	H Body	J Body	L
2UC	1/8	0.99	0.53	0.50	7/16	0.72	1.44	1.98
3UC	3/16	1.01	0.54	0.50	1/2	0.75	1.50	2.02
4UC	1/4	1.07	0.60	0.50	9/16	0.78	1.56	2.14
5UC	5/16	1.17	0.64	0.62	5/8	0.88	1.76	2.34
6UC	3/8	1.20	0.66	0.62	11/16	0.91	1.82	2.40
8UC	1/2	1.38	0.90	0.81	7/8	0.98	1.96	2.76
10UC	5/8	1.46	0.96	0.81	1	1.06	2.12	2.92

Union Tee



METRIC RANGE — Dimensions in mm.

Part No.	T mm o/d	L1 Lenght	D	F Body	G Nut	H Body	J Body	L
4	4	26.15	14.29	12	12	19.00	38.00	52.30
6mTTT	6	27.20	15.88	12	14	19.80	39.60	54.40
8mTTT	8	29.70	16.67	14	17	22.20	44.40	59.40
10mTTT	10	30.80	17.46	14	19	23.10	46.20	61.60
12mTTT	12	35.00	23.02	19	22	24.90	49.80	70.00
16mTTT	16	36.39	24.61	24	27	26.19	52.38	72.78
18mTTT	18	39.37	24.61	27	30	29.37	58.74	78.74
20mTTT	20	39.37	24.61	27	30	29.37	58.74	78.74
25mTTT	25	45.24	30.96	32	41	33.54	67.08	90.48

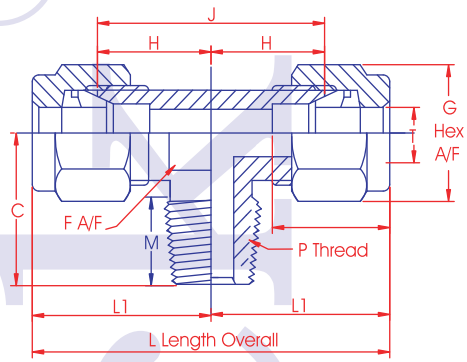
IMPERIAL RANGE — Dimensions in inches

Part No.	T mm o/d	L1 Lenght	D	F Body	G Nut	H Body	J Body	L
1TTT	1/16	0.72	0.34	0.47	5/16	0.56	1.12	1.44
2TTT	1/8	0.99	0.50	0.47	7/16	0.72	1.44	1.98
3TTT	3/16	1.01	0.54	0.47	1/2	0.75	1.50	2.02
4TTT	1/4	1.07	0.60	0.47	9/16	0.78	1.56	2.25
5TTT	5/16	1.17	0.64	0.55	5/8	0.88	1.76	2.34
6TTT	3/8	1.20	0.66	0.55	11/66	0.91	1.82	2.40
8TTT	1/2	1.3	0.90	0.75	7/8	0.98	1.96	2.76
10TTT	5/8	1.46	0.96	0.94	1	1.06	2.12	2.92
12TTT	3/4	1.51	0.96	1.06	1-1/8	1.11	2.22	3.02
16TTT	1	1.79	1.23	1.25	1-1/2	1.31	2.62	3.58

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Excelock®

Male Branch Tee



METRIC RANGE — Dimensions in mm

Part No.	T mm o/d	P	L1 Length	M	C	F	G Nut	H Body	J Body	L
4mTTM1	4	1/16	26.15	9.53	19.3	12	12	19.05	38.10	52.30
4mTTM2	4	1/8	26.15	9.53	19.53	12	12	19.05	38.10	52.30
4mTTM	4	1/4	26.15	14.29	23.9	12	12	19.05	38.10	52.30
6mTTM	6	1/8	27.21	9.53	19.3	12	14	19.80	39.60	54.42
6mTTM4	6	1/4	27.21	14.29	23.9	12	14	19.80	39.60	54.42
6mTTM6	6	3/8	28.73	14.29	25.4	14	14	21.33	42.66	57.46
6mTTM8	6	1/2	30.51	19.05	32.0	19	14	23.10	46.20	61.00
8mTTM2	8	1/8	29.70	9.53	20.8	14	17	22.22	44.44	59.40
8mTTM4	8	1/4	29.70	14.29	25.4	14	17	22.22	44.44	59.40
8mTTM6	8	3/8	29.70	14.29	25.4	14	17	22.22	44.44	59.40
8mTTM8	8	1/2	31.50	19.50	32.0	19	17	24.00	48.00	63.00
10mTTM210	1/8	30.80	9.53	20.8	14	19	23.10	46.20	61.60
10mTTM	10	1/4	30.80	14.29	25.4	14	19	23.10	46.20	61.60
10mTTM610	3/8	30.80	14.29	25.4	14	19	23.10	46.20	61.60
10mTTM810	1/2	32.59	19.05	32.0	19	19	24.89	49.78	65.18
12mTTM412	1/4	34.99	14.29	27.4	19	22	24.89	49.78	69.98
12mTTM612	3/8	32.59	14.29	27.4	19	22	24.89	49.78	65.18
12mTTM812	1/2	32.59	19.05	32.0	19	22	24.89	49.78	65.18
16mTTM816	1/2	36.39	19.05	34.9	24	27	26.19	52.39	72.78

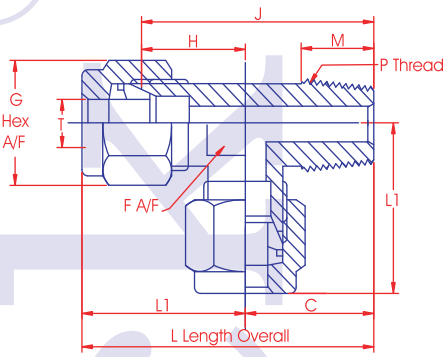
METRIC RANGE — Dimensions in mm

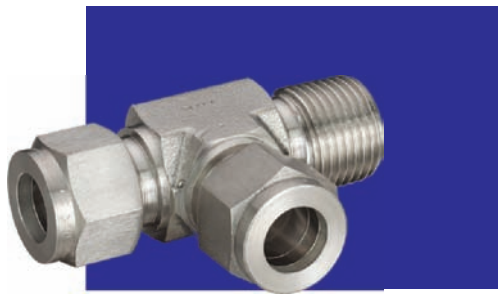
Part No.	T mm o/d	P	L1 Length	M	C	F	G Nut	H Body	J Body	L
2TTM2	1/8	1/8	0.99	0.38	0.76	0.47	7/16	0.72	1.44	1.98
2TTM4	1/8	1/4	0.99	0.56	0.94	0.47	7/16	0.72	1.44	1.98
3TTM2	3/16	1/8	1.01	0.38	0.76	0.47	1/2	0.75	1.50	2.02
4TTM2	1/4	1/8	1.07	0.38	0.76	0.47	9/16	0.78	1.56	2.14
4TTM4	1/4	1/4	1.07	0.56	0.94	0.47	9/16	0.78	1.56	2.14
4TTM6	1/4	3.8	1.13	0.56	1.00	0.55	9/16	0.84	1.68	2.26
5TTM2	5/16	1/8	1.16	0.38	0.82	0.55	5/8	0.87	1.74	2.32
6TTM2	3/8	1/8	1.21	0.38	0.82	0.55	11/16	0.91	1.82	2.42
6TTM4	3/8	1/4	1.21	0.56	1.00	0.55	11/16	0.91	1.82	2.42
6TTM6	3/8	3/8	1.21	0.56	1.00	0.55	11/16	0.91	1.82	2.42
6TTM8	3/8	1/2	1.21	0.75	1.26	0.75	11/16	0.91	1.82	2.42
8TTM	1/2	1/4	1.38	0.56	1.08	0.75	7/8	0.98	1.96	2.76
8TTM6	1/2	3/8	1.38	0.56	1.08	0.75	7/8	0.98	1.96	2.76
8TTM8	1/2	1/2	1.38	0.75	1.26	0.75	7/8	0.98	1.96	2.76
10TTM8	5/8	1/2	1.46	0.75	1.38	0.75	1	1.06	2.12	2.92

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Excelock®

Male Run Tee





METRIC RANGE — Dimensions in mm

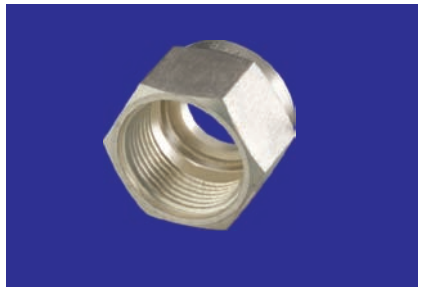
Part No	T mm o/d	P	L1 Length	M	C	F Body	G Nut	H Body	J	L
4mTMT1	4	1/16	26.15	9.53	19.30	12	12	19.05	38.10	45.45
4mTMT2	4	1/8	26.15	9.53	19.30	12	12	19.05	38.10	45.45
4mTMT4	4	1/4	26.15	14.29	23.88	12	12	19.05	38.10	50.03
6mTMT2	6	1/8	27.21	9.53	19.30	12	14	19.81	39.62	46.51
6mTMT4	6	1/4	27.21	14.29	23.88	12	14	19.81	39.62	51.09
6mTMT6	6	3/8	28.74	14.29	25.40	14	14	21.34	42.68	54.14
6mTMT8	6	1/2	30.51	19.05	32.00	19	14	23.11	43.22	62.51
8mTMT2	8	1/8	29.73	9.53	20.83	14	17	22.23	44.46	50.56
8mTMT4	8	1/4	29.73	14.29	25.40	14	17	22.23	44.46	55.13
8mTMT6	8	3/8	29.73	14.29	25.40	14	17	22.23	44.46	55.13
8mTMT8	8	1/2	31.50	19.05	32.00	19	17	24.00	48.00	63.50
10mTMT2	10	1/8	30.81	9.53	20.83	14	19	23.11	46.22	51.64
10mTMT4	10	1/4	30.81	14.29	25.40	14	19	23.11	46.22	56.21
10mTMT6	10	3/8	30.81	14.29	25.40	14	19	23.11	46.22	56.21
10mTMT8	10	1/2	32.59	19.05	32.00	19	19	24.89	49.78	64.59
12mTMT4	12	1/4	34.99	14.29	27.43	19	22	24.89	49.78	62.42
12mTMT6	12	3/8	34.99	14.29	27.43	19	22	24.89	49.78	62.42
12mTMT8	12	1/2	34.99	19.05	32.00	19	22	24.89	49.78	66.99
16mTMT8	16	1/2	36.39	19.05	34.93	24	27	26.19	52.38	71.32

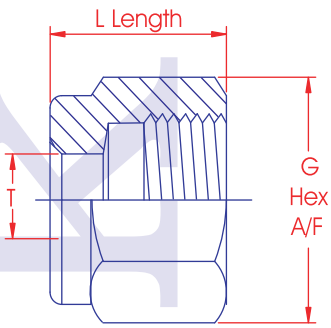
IMPERIALRANGE — Dimensions in mm

Part No	T mm o/d	P	L1 Length	M	C	F Body	G Nut	H Body	J	L
2TMT2	1/8	1/8	1.00	0.38	0.76	0.47	7/16	0.72	1.48	1.76
2TMT4	1/8	1/4	1.00	0.56	0.94	0.47	7/16	0.72	1.66	1.94
3TMT2	3/16	1/8	1.00	0.38	0.76	0.47	1/2	0.75	1.51	1.76
4TMT2	1/4	1/8	1.07	0.38	0.76	0.47	9/16	0.78	1.54	1.83
4TMT4	1/4	1/4	1.07	0.56	0.94	0.47	9/16	0.78	1.72	2.01
5TMT2	5/16	1/8	1.16	0.38	0.82	0.55	5/8	0.87	1.70	1.98
6TMT4	3/8	1/4	1.21	0.56	1.00	0.55	11/16	0.91	1.91	2.21
8TMT6	1/2	3/8	1.38	0.56	1.08	0.74	7/8	0.98	2.06	2.46
8TMT8	1/2	1/2	1.38	0.75	1.26	0.74	7/8	0.98	2.24	2.64
10TMT8	5/8	1/2	1.47	0.75	1.38	0.74	1	1.06	2.40	2.85

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Nut





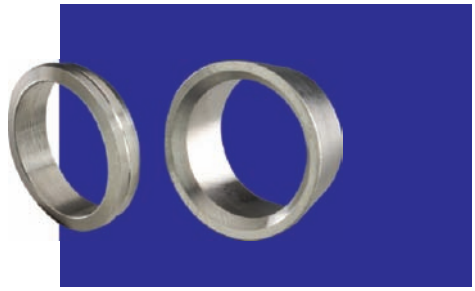
METRIC RANGE — Dimensions in mm

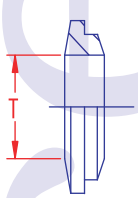
Part	T mm	G	L
4mN	4	12	11.80
6mN	6	14	12.70
8mN	8	17	13.49
10mN	10	19	14.29
12mN	12	22	17.46
16mN	16	27	17.46
18mN	18	30	17.46
20mN	20	30	17.46
25mN	25	41	20.64

IMPERIAL RANGE — Dimensions in inches

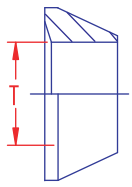
Part	T mm	G	L
1N	1/16	5/16	0.31
2N	1/8	7/16	0.47
3N	3/16	1/2	0.47
4N	1/4	9/16	0.50
5N	5/16	5/8	0.53
6N	3/8	11/16	0.56
8N	1/2	7/8	0.69
10N	5/8	1	0.69
12N	3/4	1-1/8	0.69
16N	1	1-1/2	0.80

Ferrules





Back Ferrule



Front Ferrule

METRIC RANGE — Dimensions in mm

Back Ferrule Part No.	T o/d	Front Ferrule Part No.
4mBF	4	4mFF
6mBF	6	6mFF
8mBF	8	8mFF
10mBF	10	10mFF
12mBF	12	12mFF
16mBF	16	16mFF
18mBF	18	18mFF
20mBF	20	20mFF
25mBF	25	25mFF

METRIC RANGE — Dimensions in mm

Back Ferrule Part No.	T o/d	Front Ferrule Part No.
1BF	1/16	1FF
2BF	1/8	2FF
3BF	3/8	3FF
4BF	1/4	4FF
5BF	5/16	5FF
6BF	3/8	6FF
8BF	1/2	8FF
10BF	5/8	10FF
12BF	3/4	12FF
16BF	1	16FF

Note : ALL DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Notes :

CERTIFICATE

TÜV CERT

Management system as per
DIN EN ISO 9001 : 2000

In accordance with TÜV CERT procedures, it is hereby certified that

HYDRO-PNEUMATIC ACCESSORIES (I) PVT. LTD.
A-791/9, T.T.C. Industrial Estate, MIDC Khairane,
Navi Mumbai 400 705, Maharashtra,
India

applies a quality system in line with the above standard for the following scope

Manufacturing and Supply of
Instrumentation Fittings and Valves

Certificate Registration No. **44 100 074031-E3** Valid until **05.02.2010**
Audit Report No. **2.5-3508/2006**

S.K.Kulkarni
TÜV CERT Certification Body
at TÜV NORD CERT GmbH

Mumbai, **06.02.2007**

This certification was conducted in accordance with the TÜV CERT auditing and certification procedures and is subject to regular surveillance audits.
TUV India Pvt. Ltd., 801, Raheja Plaza – 1, L.B.S. Marg, Ghatkopar (W), Mumbai - 400 086, India www.tuvindia.co.in

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TÜV NORD

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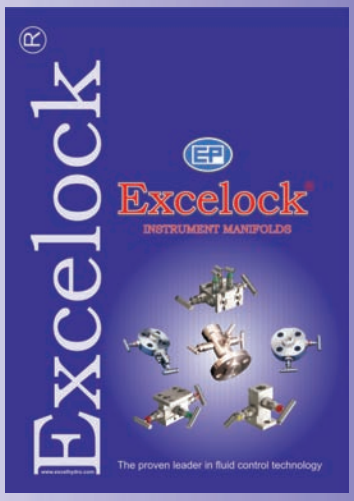
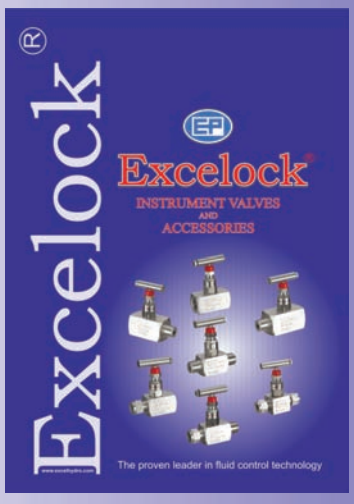
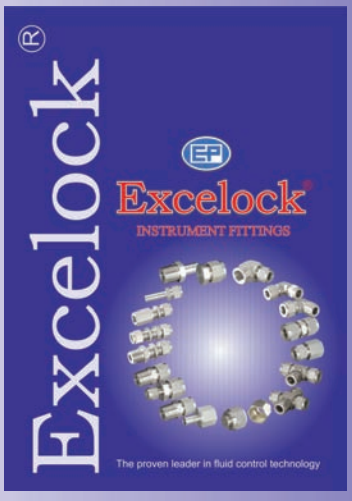
Cat6-2007

OUR PRODUCT RANGE







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