HOKE®

A CIRCOR International company

Gyrolok® Tube Fittings

gyrolok®

HOKE Incorporated
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A division of CIRCOR International, Inc.

HOKE Gyrolok® Tube Fittings

7 Decades of Product Excellence

Samuel W. Hoke began manufacturing small gas flow control valves for jewelers' torches in 1925. At the same time, he also laid the foundation for a top international fluid control products company, HOKE Incorporated.

In the early 1940s, S.W. Hoke produced the forerunners of today's HOKE valves, masterfully crafted with the highest quality materials.

In the early 1960s, HOKE Incorporated (HOKE) took the industry by storm, introducing the HOKE Gyrolok® Tube Fitting. To this day, no other manufacturer has been able to improve upon its unique design.

Over the years, HOKE Incorporated built a first-class reputation for designing and manufacturing state-of-the-art products. In striving for maximum quality and value, HOKE set the industry standards for product safety, operability, durability and reliability.

Training and Engineering Support

HOKE offers extensive training designed to ensure that your craftspeople thoroughly understand how a HOKE Gyrolok fitting functions. By teaching proper tubing preparation and installation procedures, maximum performance is assured.

HOKE will take the time to assist our customers in finding the HOKE Gyrolok fitting that is right for their specific needs. Ask your HOKE distributor for details regarding HOKE's valve and fitting installation workshop and additional support materials.

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Installation Instructions

405 Centura Court
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Spartanburg, SC 29303
tel 864-574-7966
fax 864-587-5608
www.hoke.com
sales@hoke.com

Fitting Locator

To connect tubing to a female thread, use:

CM Male Connector
fractional or metric tube to
• NPT/RT threads
Page 8

CM/ Male Connector
fractional or metric tube to
• RP/RS threads
Pages 11, 12

BCM Bulkhead Connector, Male
fractional or metric tube to
• NPT Thread
Page 9

CMS Male Connector, SAE
fractional tube to
• SAE/MS straight thread
Page 9

LCMS Long Male Connector, SAE
fractional tube to
• SAE/MS straight thread
Page 9

COS O-ring Straight Connector
fractional tube to
• O-ring straight thread
Page 10

COM O-ring Male Connector
fractional tube to
• Female pipe thread
Page 10

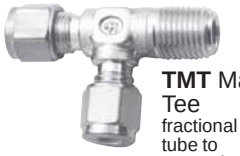
LM Male Elbow
fractional or metric tube to
• NPT thread
• RT/RS/RP thread
Pages 13, 14

LMF 45° Male Elbow
fractional tube to
• NPT thread
Page 15

LMFS 45° Positionable Male Elbow
fractional tube to
• SAE/MS straight thread
Page 15

LMS Positionable Male Elbow
fractional or metric tube to
• SAE/MS straight thread
Page 15

TTM Male Branch Tee
fractional or metric tube to
• NPT thread
Page 16



TMT Male Run Tee
fractional or metric tube to
• NPT thread
Page 17

TST Positionable Male Run Tee
fractional tube to
• SAE/MS straight thread
Page 17

TTS Positionable Male Branch Tee
fractional or metric tube to
• SAE/MS straight thread
Page 17

To connect tubing to a male thread, use:

CF Female Connector
fractional or metric tube to
• NPT thread
• RT/RG threads
Pages 18, 19, 20

BCF Bulkhead Connector, Female
fractional or metric tube to
• NPT thread
Page 21

LF Female Elbow
fractional or metric tube to
• NPT thread
• RT thread
Page 22

TFT Female Run Tee
fractional or metric tube to
• NPT thread
Page 23

TTF Female Branch Tee
fractional or metric tube to
• NPT thread
Page 23

To connect two or more tubes together, use:

U Union
fractional or metric tube
Page 24

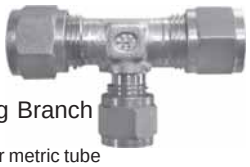
RU Reducing Union
fractional or metric tube
Pages 25

BU Bulkhead Union
fractional or metric tube
Page 26

LU Union Elbow
fractional or metric tube
Page 27

TTT Union Tee
fractional or metric tube
Page 27

TTT_B Reducing Run Tees
fractional tube
Page 28



TTTB Reducing Branch Tees
fractional or metric tube
Page 28

C Union Cross
fractional or metric tube
Page 29

To connect tubing to a 37° flare, use:

UAN Union, AN
fractional tube to AN
• flared tube
Page 30

UANO Union, AN O-ring
fractional tube to O-ring AN
• flared tube
Page 30

BUAN Bulkhead Union, AN
fractional tube to AN
• flared tube
Page 30

AAN Adapter, AN
AN to Gyrolok port
• flared tube
Page 31

To connect tubing to a welded system, use:

CW Tube Socket Weld Connector
fractional tube
Page 31

LW Tube Socket Weld Elbow
fractional tube
Page 31

CBW Butt Weld Connector
fractional or metric tube to pipe
Page 32

LBW Butt Weld Elbow
fractional or metric tube to pipe
Page 32

To reduce fitting size, use:

R Reducer
fractional or metric tube
Pages 33, 34

To connect tube fittings together, use:

PC Port Connector
fractional or metric tube
Page 35

PC Reducing Port Connector
fractional or metric tube
Page 35

To cap a tube or plug a fitting, use:

CP Cap
fractional or metric tube
Page 36

P Plug
fractional or metric tube
Page 36

As spare parts, use:

FR & FF Rear and Front Ferrules
fractional or metric tube
Page 43

Also, front and back ferrules available in nylon
Page 43

N Nut
fractional or metric tube
Page 43

KN Knurled Nut
fractional tube
Page 44

BN Bulkhead Nut
fractional or metric tube
Page 44

SCNF Safety Changer Nut & Ferrule Sets
frational or metric
Page 44

SCF Safety Changer Ferrule Sets
frational or metric
Page 44

For specific applications, use:

CMT Male Thermocouple Connector
Page 37

Chromatography Fittings
fractional tube
Pages 48, 49

CLF Lapped Joint Flange Connector
fractional or metric tube
Page 46

XT Heat Exchanger Tee
Page 38

DU, DCM Dielectric Fittings
fractional or metric
Page 44

Calibration Fittings
fractional tube
Page 46

TI Tube Inserts
fractional or metric tube
Page 45

Tools & Accessories

GG Gyrogage
fractional or metric
Page 50

LD Leak Detective
Page 51

PST Pre-setting Tool
Page 51

HPST Hydraulic Pre-set Tool
Page 52

Gyrolok Adapters

AM/ Male Adapter
fractional or metric tube to
• NPT thread
• RT thread
Page 39

AM/ Male Adapter
fractional or metric tube to
• RT, RS, RG threads
Page 40

AOS O-ring Straight Adapter
fractional tube to
• female straignt thread
Page 40

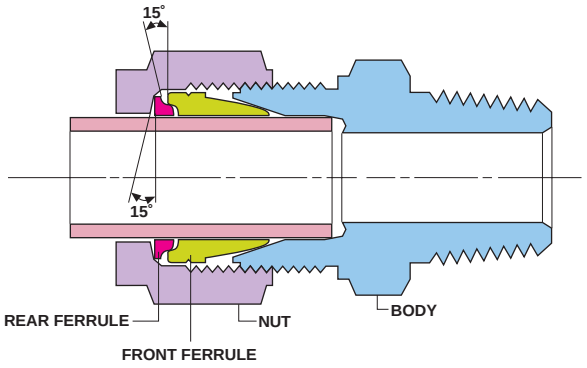
AMS Adapter, SAE
fractional tube to
• SAE/MS straight thread
Page 40

BA Bulkhead Adapter
fractional or metric tube
Page 34

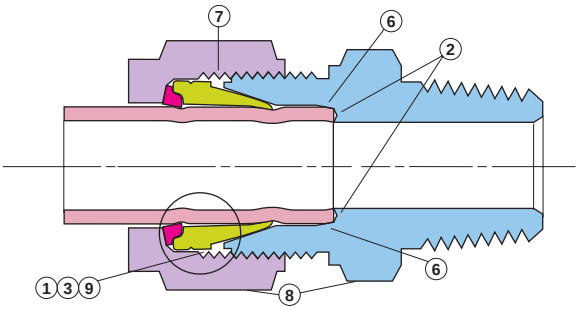
AOM Male Adapter
fractional or metric tube to
• female pipe thread
Page 40

AF Female Adapter
fractional or metric
• NPT thread
• RT, RG threads
Pages 41, 42

Gyrolok Features & Benefits



Hand Assembled



Fully Assembled Fitting & Tube

Features	Explanation	Benefits
1. Controlled Ferrule Drive: HOKE Exclusive	Roll-in locking action of rear ferrule: During fitting makeup, 15° angles close — between the rear ferrule and nut, and between the rear ferrule and front ferrule — thus preventing overstressing of tubing or excessively reducing tubing inside diameter.	Provides maximum user safety under high pressure/vibration conditions. Prevents overstressing, which causes tubing failure and possible injury. System efficiency is improved by maximizing flow.
	Front ferrule shoulder: Front ferrule shoulder prevents body expansion and nut jamming, caused by over-tightening.	Provides unmatched remake life. Maximizes value and economy.
2. Butt Seal: HOKE Exclusive	Provides a secondary seal and eliminates dead space.	Maximizes fitting leak integrity and user safety. Can seal with scratched tubing. Increases accuracy in sampling applications. Reduces pump-down time in vacuum applications.
3. HOKE Valves with integral HOKE Gyrolok end fittings: HOKE Exclusive	Controlled ferrule drive prevents end connection expansion, thus prolonging valve life and eliminating the need to use female-ended valves with separate fittings. Eliminates a possible leak path and extends valve life.	Long product life and maximum value. Safety and economy.
4. Gyrolok Safety Changer Nut and Ferrule sets: HOKE Exclusive	Nut and ferrule sets supplied on rods, already correctly oriented. (Not necessary to handle ferrules when replacing components.)	Safest, simplest device for component replacement.
5. Gyrogage: HOKE Exclusive	Marks tubing to show that tubing has been properly inserted into fitting, and that fitting has been properly tightened.	Maximum safety resulting from ability to verify correct tube insertion and proper tightening.
6. Sizing Angle:	Slight taper in the base of the tube socket reduces possibility of tube sticking	Less tube sticking during disassembly saves time and money
7. Silver-plated Nut Threads:	Silver-plating extends fitting life by preventing galling, up to 1200° F.	Extended product life at extreme temperatures.
8. Material traceability on fitting body and nut:	Bodies and nuts made of 316 Stainless Steel and Monel are heat code traceable to Certified Material Test Reports.	Traceability provides added safety. Certified Material Test Reports are available for review and verification.
9. Stainless Steel Ferrule Manufacture:	Front ferrules—no surface treatment in sizes 1” (25mm) and under. Sizes larger than 1” (25mm) are PFA coated. Rear ferrules—no surface treatment in sizes ½” (12mm) and under. Sizes over ½” (12mm) are Kolsterized. Sizes larger than 1” (25mm) are PFA coated	Increased resistance to media and atmospheric corrosion.

The HOKE Gyrolok Design

HOKE Gyrolok Tube Fittings have been carefully designed and manufactured to provide outstanding leak-tight integrity in a wide range of applications.

Materials
HOKE Gyrolok fittings are available in:

Brass:	BR
316 Stainless Steel:	316
Monel:	M
Hastelloy C:	HC
Duplex 2205:	DX5
Inconel:	600
Super Duplex 2507:	D50
Titanium:	TI
254 SMO:	6MO

316 Stainless Steel Forgings:	ASTM A-182
Brass Bar Stock, Alloy 360:	ASTM B-16
316 Stainless Steel Bar Stock:	ASTM A-479
Monel Forgings, Alloy 400:	QQ-N-281
Brass Forgings, Alloy 377:	QQ-S-626 ASTM B-283
Monel Bar Stock, Alloy 405:	QQ-N-281
Brass Bar Stock, Alloy 353:	ASTM B-453
Monel Bar Stock, Alloy K500:	QQ-N-286

Contact your local HOKE distributor for further information.

Certified Material Text Reports (CMTRs)
Bodies and nuts of HOKE Gyrolok fittings in all materials other than Brass are heat code traceable. To obtain CMTRs for these components, place separate orders for such items and specify “CMTRs required on all items”.

Pressure Rating
HOKE Gyrolok fitting ends are rated for working pressures higher than the tubing recommended for use with HOKE Gyrolok. Tubing should not be utilized at pressures above its maximum allowable working pressure. Check the HOKE Tubing Data Charts for specific information. If no pressure is identified for a given size and wall thickness of tubing, that tubing is not considered suitable for use with tube fittings. Pressure ratings may vary for other fitting ends, such as NPT or O-Ring Seal. Contact your local distributor or HOKE directly, for more information

PFA Coating
Stainless steel fittings larger than 1” and 25mm use stainless steel ferrules with a PFA coating.

Vacuum Rating
HOKE Gyrolok offers deep vacuum capability. With good quality tubing, HOKE Gyrolok fittings will be leak-tight at vacuum levels of 10^{-9} torr while tested with a leakage sensitivity of 10^{-9} sccs.

Temperature
HOKE Gyrolok fittings provide safe, reliable performance from cryogenic temperatures to high temperature bake out levels, depending on material.

316 Stainless Steel:	-325° F to +800° F (-200° C to +426° C)*

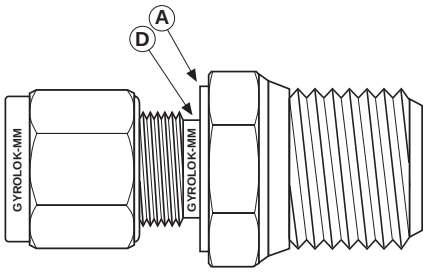
Stainless steel fittings larger than 1” and 25mm use ferrules with a PFA coating. Applications above 450° F (232° C) require silver-plated front ferrules and uncoated rear ferrules. To order extended temperature fittings, add –HT to the basic part number.

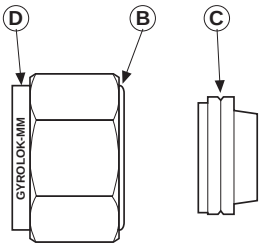
Brass (copper tubing):	-325° F to +400° F (-200° C to +203° C)
Monel:	-325° F to +800° F (-200° C to +426° C)
Nylon:	-65° F to +150° F (-53° C to +65° C)**

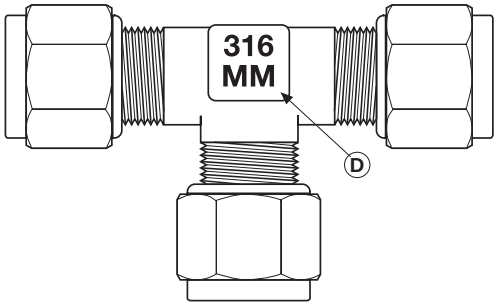
* **CAUTION: (for Stainless Steel):**
Intermittent use to 1200° F (649° C) is possible, however prolonged exposure to temperatures over 800° F (426° C) is not recommended.

****CAUTION: (for Nylon):**
Material strength decreases rapidly as temperature increases (e.g.: allowable pressure at 212° F; 100° C is approximately 40% of allowable pressure at 75° F; 24° C).

Identifying Metric Gyrolok Products







HOKE metric Gyrolok products have certain features which allow you to identify them from fractional products.

A. Step Machined on Body Hex
Straight bodies with a metric Gyrolok end have a step machined on the tube fitting side of the hex.

B. Short Shank on Nut
Metric nuts are machined with a short shank on the threaded end.

C. Groove in Front Ferrule
Metric front ferrules made from brass or 316 stainless steel have a groove machined into the shoulder. For other materials, see MM Marking.

D. MM Marking
The metric designation “MM” is stamped on:

- metric nuts and straight bodies—after the Gyrolok trademark
- metric elbows, tees and crosses—on the side opposite the HOKE logo
- front ferrules made from materials other than brass or 316 stainless steel—after material identification.

Color Coding
Blue boxes designate metric parts, while green boxes indicate fractionally sized items. Color is also used for all accessories, including Safety Changer packaging and Gyrogages, to differentiate metric from fractional parts.

General Information

How to Order

The HOKE Gyrolok numbering system is a completely descriptive system that's easy to understand. Each part number describes completely assembled fittings.

4 CM 4 316 [ ]

Tube O.D.
(Inches) In sixteenths of an inch (1/4" O.D.)
(Metric) In millimeters

Type Fitting
(male connector)

Pipe/Tube Size
(Inches) In sixteenths of an inch (1/4" NPT)
(Metric) In millimeters

Modifier per #5 and 8 (below)

Material
- **BR** – Brass
- **316** – 316 SS
- **M** – Monel
- **N** – Nylon
- **T** – Teflon
- **HC** – Hastelloy C
- **600** – Inconel
- **TI** – Titanium
- **DX3** – Duplex 2205
- **D50** – Super Duplex 2507
- **6MO** – 254 SMO

1. The first number (4) identifies the tube O.D. size. For example, 4 = 4/16" for fractional fittings. 4 = 4mm for metric fittings. If there is no 5th group, sizes are fractional.

2. The letter group, (CM) identifies the type of fitting (Male Connector). See fitting locator, pages 2 and 3.

3. The third group, a number (4), is only necessary if the second tube connection size is different from the first tube O.D. size. For pipe sizes, a number is always required.

4. Material is identified in the fourth group.

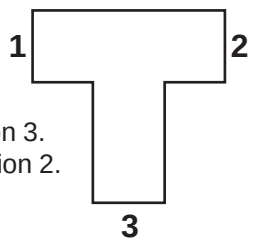
5. With the exception of branch tees, the fifth group, if present, contains two letter codes. The first letter designates the unit of measure for the first number in the part number—i.e, E for fractional, M for metric. The second letter indicates the unit of measure (E or M), or thread type, for the second number in the part number. If there is no 5th group, all sizes are fractional.

   Examples:
   4CM4 316 = 1/4 tube x 1/4 NPT male connector, 316 SS
   6RU3 BR ME = 6mm tube x 3/16 tube reducing union, brass
   8LM4 316 EC = 1/2 tube x 1/4 male RT, male elbow, 316 SS

Unit of measure/end connector codes:

A = RS male ends	M = Metric tube, in millimeters
B = RP male ends	X = RS/RP female ends
C = RT ends	Z = RG female ends
E = fractional unit of measure in 1/16th of an inch	

6. Tee part numbering: TEES are described by first the run (1 and 2) and next the branch (3), for example:
   TTM describes a tee that has tube connections at 1 and 2 and a male pipe thread at position 3.
   TFT describes a tee that has tube connections at 1 and 3 and a female pipe thread at position 2.



7. Fittings cleaned for oxygen service: To order, add HPS 18 to the basic fitting part number.
   Example: 4CM4 316 HPS 18

8. Fittings cleaned for nuclear service: To order, add HPS 90 to the basic fitting part number.
   Example: 4CM4 316 HPS 90

Thread Connections Available with Gyrolok Fittings

Pipe Thread Information

HOKE Gyrolok tube fittings are available with NPT (National Pipe Taper), BSP/ISO (British Standard Pipe/International Standards Organization), SAE or unified screw threads.

Tapered Threads

Specifications	Type	Part Number or Suffix Designation	Sealing Method
NPT	M/F	Fitting type ends in M or F, as in CM or CF	Seal is made on the thread. Thread sealant is required.
RT to ISO 7/1 • BS 21 • JIS B0203 • DIN 2999	M/F	Modifier is C, following the unit of measure for fractional (E) or metric (M), as in 6CM4316EC	Seal is made on the thread. Thread sealant is required. The BSP/ISO thread utilizes a different angle and the number of threads per inch may differ from NPT. Reference DIN 3852, Form C.
	M/F		
	M/F		
	Male		

FOR YOUR SAFETY
IT IS SOLELY THE RESPONSIBILITY OF THE SYSTEM DESIGNER AND USER TO SELECT PRODUCTS SUITABLE FOR THEIR SPECIFIC APPLICATION REQUIREMENTS AND TO ENSURE PROPER INSTALLATION, OPERATION AND MAINTENANCE OF THESE PRODUCTS. MATERIAL COMPATIBILITY, PRODUCT RATINGS AND APPLICATION DETAILS SHOULD BE CONSIDERED IN THE SELECTION. IMPROPER SELECTION OR USE OF PRODUCTS DESCRIBED HEREIN CAN CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.

Straight and Parallel Threads

Specifications	Type	Part Number or Suffix Designation	Sealing Method
American Standard unified screw threads	Male	Fitting type ends in S, as in COS or AOS.	Generally utilizes an elastomer o-ring to provide sealing.
RP to ISO 228/1 • BS 2779 • JIS B0202	Male	Modifier is B, following the unit of measure for fractional (E) or metric (M), as in 6CM4316EB	Metal to metal sealing to DIN 3852, Form B.**
RS to ISO 228/1 • BS 2779 • JIS B0202	Male	Modifier is A, following the unit of measure for fractional (E) or metric (M), as in 6CM4316EA	Utilizes a sealing washer to provide sealing. Reference DIN 3852, Form A.**
RG to ISO 228/1 • BS 2779 • JIS B0202	Female	Modifier is Z, following the unit of measure for fraction (E) or metric (M), as in 6CM4316EZ	Sealing form meets DIN 16288, Form Z.

** Female RP or RS end available with Form X.

HOKE Gyrolok Fittings with SAE Ends

SAE Straight Thread O-Ring Seal Fittings

HOKE Gyrolok's SAE Straight Thread O-Ring Seal Fittings are designed and manufactured to SAE standards defined below for use in many different applications including hydraulics and natural gas vehicles. HOKE's SAE Straight Thread O-Ring Fittings are supplied with Viton o-rings.

Fittings available include: Tube to SAE straight connectors, positionable SAE elbows and tees, and SAE reducers.

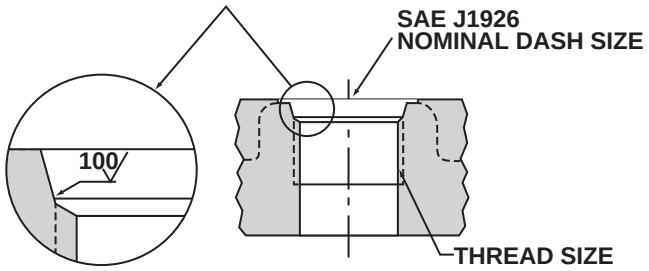
SAE Specifications

HOKE's SAE Straight Thread O-Ring Seal Fittings are designed and manufactured to meet SAE Standards as follows:

- Male or External Fitting End Dimensions: SAE J514
- Straight Threads: SAE J475 (equivalent to ANSI B1.1 or ISO R725)
- Female or Internal Straight Thread Boss: SAE J1926 (see diagram below)

Thread and O-ring Sizes

Nominal Tube O.D.	Port Size	Thread Size	O-ring Size #
1/8	2	5/16 - 24	902
1/4	4	7/16 - 20	904
3/8	6	9/16 - 18	906
1/2	8	3/4 - 16	908
5/8	10	7/8 - 14	910
3/4	12	1 1/16 - 12	912
1	16	1 5/16 - 12	916



Installation Instructions

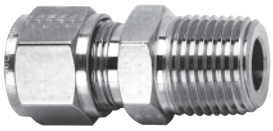
Positionable End Connections

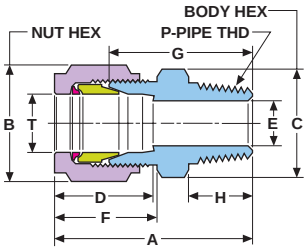
1. Assure that the locknut is fully raised.
2. Turn the external SAE end clockwise into the internal boss until the metal washer is in contact with the boss.
3. Orient the Gyrolok end to the proper direction by now turning the fitting *counterclockwise* up to a *maximum* of 1 turn.
4. While supporting the body wrench pad with a backup wrench, tighten the locknut until the washer is snug against the face of the boss.

Gyrolok Assembly Instructions, see page 53.

Male Connector: CM, CM/EC

connects **fractional** tube to female NPT or RT threads

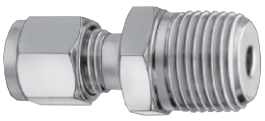


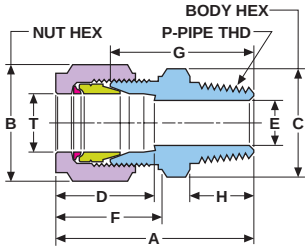


Part Number*		Dimensions — inches									
NPT Threads	RT Threads	T Tube O.D.	P Male NPT Size	A	B Hex Flat	C Hex Flat	D	E min	F	G	H
1CM1[ ]	—	1/16	1/16	.97	5/16	5/16	.41	.05	.48	.75	.38
1CM2[ ]	—	1/16	1/8	1.03	5/16	7/16	.41	.05	.48	.81	.38
1CM4[ ]	—	1/16	1/4	1.22	5/16	9/16	.41	.19	.48	1	.56
2CM1[ ]	—	1/8	1/16	1.19	7/16	7/16	.56	.09	.67	.88	.38
2CM2[ ]	2CM2[ ]EC	1/8	1/8	1.22	7/16	7/16	.56	.09	.67	.91	.38
2CM4[ ]	2CM4[ ]EC	1/8	1/4	1.44	7/16	9/16	.56	.09	.67	1.13	.56
3CM2[ ]	—	3/16	1/8	1.27	1/2	7/16	.59	.13	.70	.95	.38
3CM4[ ]	3CM4[ ]EC	3/16	1/4	1.50	1/2	9/16	.59	.13	.70	1.19	.56
4CM1[ ]	—	1/4	1/16	1.33	9/16	1/2	.64	.10	.77	1	.38
4CM2[ ]	4CM2[ ]EC	1/4	1/8	1.33	9/16	1/2	.64	.19	.77	1	.38
4CM4[ ]	4CM4[ ]EC	1/4	1/4	1.58	9/16	9/16	.64	.19	.77	1.25	.56
4CM6[ ]	4CM6[ ]EC	1/4	3/8	1.58	9/16	11/16	.64	.19	.77	1.25	.56
4CM8[ ]	4CM8[ ]EC	1/4	1/2	1.80	9/16	7/8	.64	.19	.77	1.47	.75
4CM12[ ]	—	1/4	3/4	1.83	9/16	1 1/16	.64	.19	.77	1.50	.75
6CM2[ ]	6CM2[ ]EC	3/8	1/8	1.45	11/16	5/8	.72	.19	.83	1.09	.38
6CM4[ ]	6CM4[ ]EC	3/8	1/4	1.64	11/16	5/8	.72	.30	.83	1.28	.56
6CM6[ ]	6CM6[ ]EC	3/8	3/8	1.64	11/16	11/16	.72	.30	.83	1.28	.56
6CM8[ ]	6CM8[ ]EC	3/8	1/2	1.86	11/16	7/8	.72	.28	.83	1.50	.75
6CM12[ ]	—	3/8	3/4	1.86	11/16	1 1/16	.72	.30	.83	1.50	.75
8CM2[ ]	—	1/2	1/8	1.56	7/8	13/16	.97	.19	.92	1.09	.38
8CM4[ ]	8CM4[ ]EC	1/2	1/4	1.78	7/8	13/16	.97	.30	.92	1.31	.56
8CM6[ ]	8CM6[ ]EC	1/2	3/8	1.78	7/8	13/16	.97	.41	.92	1.31	.56
8CM8[ ]	8CM8[ ]EC	1/2	1/2	1.97	7/8	7/8	.97	.42	.92	1.50	.75
8CM12[ ]	8CM12[ ]EC	1/2	3/4	2	7/8	1 1/16	.97	.42	.92	1.53	.75
8CM16[ ]	—	1/2	1	2.19	7/8	1 3/8	.97	.42	.92	1.72	.94
10CM6[ ]	—	5/8	3/8	1.78	1	15/16	1	.41	.92	1.34	.56
10CM8[ ]	10CM8[ ]EC	5/8	1/2	1.97	1	15/16	1	.50	.92	1.53	.75
10CM12[ ]	—	5/8	3/4	2	1	1 1/16	1	.50	.92	1.56	.75
12CM8[ ]	—	3/4	1/2	2.08	1 1/8	1 1/16	1	.42	.97	1.63	.75
12CM12[ ]	—	3/4	3/4	2.08	1 1/8	1 1/16	1	.66	.97	1.63	.75
12CM16[ ]	—	3/4	1	2.39	1 1/8	1 3/8	1	.66	.97	1.94	.94
14CM12[ ]	—	7/8	3/4	2.08	1 1/4	1 3/16	1.06	.72	.97	1.64	.75
16CM8[ ]	—	1	1/2	2.36	1 1/2	1 3/8	1.31	.50	1.08	1.78	.75
16CM12[ ]	—	1	3/4	2.36	1 1/2	1 3/8	1.31	.72	1.08	1.39	.75
16CM16[ ]	—	1	1	2.55	1 1/2	1 3/8	1.31	.88	1.08	1.97	.94
20CM16[ ]	—	1 1/4	1	3.04	1 7/8	1 3/4	1.62	.90	1.53	2.17	.94
20CM20[ ]	—	1 1/4	1 1/4	3.04	1 7/8	1 3/4	1.62	1.10	1.53	2.17	.94
24CM24[ ]	—	1 1/2	1 1/2	3.50	2 1/4	2 1/8	1.97	1.30	1.78	2.43	1.03
32CM32[ ]	—	2	2	4.47	3	2 3/4	2.66	1.80	2.47	3	1.06

Male Connector: CM/ME, CM/MC

connects **metric** tube with NPT or RT tapered threads





Part Number*		T Tube O.D.	P Pipe Thd.	Dimensions — mm							
NPT Threads	RT Threads			A	B Hex Flat	C Hex Flat	D	E min	F	G	H
3CM2[ ]ME	3CM2[ ]MC	3	1/8	32.3	11.1	11.1	14.3	2.2	17.1	24.4	9.5
3CM4[ ]ME	3CM4[ ]MC	3	1/4	37.1	11.1	14.3	14.3	2.2	17.1	29.1	14.3
4CM2[ ]ME	4CM2[ ]MC	4	1/8	33.1	12.7	11.1	15.1	2.3	17.9	25.3	9.5
4CM4[ ]ME	4CM4[ ]MC	4	1/4	38.0	12.7	14.3	15.1	2.3	17.9	30.2	14.3
6CM2[ ]ME	6CM2[ ]MC	6	1/8	34.8	14.3	12.7	16.3	3.8	19.5	26.4	9.5
6CM4[ ]ME	6CM4[ ]MC	6	1/4	39.5	14.3	14.3	16.3	3.8	19.5	31.2	14.3
6CM6[ ]ME	6CM6[ ]MC	6	3/8	40.1	14.3	17.5	16.3	3.8	19.5	31.8	14.3
6CM8[ ]ME	6CM8[ ]MC	6	1/2	45.7	14.3	22.2	16.3	3.8	19.5	37.3	19.1
6CM12[ ]ME	6CM12[ ]MC	6	3/4	46.5	14.3	27.0	16.3	3.8	19.5	38.1	19.1
8CM2[ ]ME	8CM2[ ]MC	8	1/8	35.6	15.9	14.3	16.7	4.6	19.1	27.6	9.5
8CM4[ ]ME	8CM4[ ]MC	8	1/4	39.8	15.9	14.3	16.7	5.8	19.1	31.8	14.3
8CM6[ ]ME	8CM6[ ]MC	8	3/8	39.8	15.9	17.5	16.7	5.8	19.1	31.8	14.3
8CM8[ ]ME	8CM8[ ]MC	8	1/2	46.3	15.9	22.2	16.7	5.8	19.1	38.3	19.1
8CM12[ ]ME	8CM12[ ]MC	8	3/4	46.5	15.9	27.0	16.7	5.8	19.1	38.9	19.1
10CM2[ ]ME	10CM2[ ]MC	10	1/8	35.8	19.1	17.5	17.5	4.6	19.8	27.8	9.5
10CM4[ ]ME	10CM4[ ]MC	10	1/4	40.5	19.1	17.5	17.5	7.0	19.8	32.5	14.3
10CM6[ ]ME	10CM6[ ]MC	10	3/8	40.5	19.1	17.5	17.5	7.4	19.8	32.5	14.3
10CM8[ ]ME	10CM8[ ]MC	10	1/2	46.1	19.1	22.2	17.5	7.9	19.8	38.1	19.1
12CM4[ ]ME	12CM4[ ]MC	12	1/4	45.3	22.2	20.6	24.6	7.0	23.4	33.3	14.3
12CM6[ ]ME	12CM6[ ]MC	12	3/8	45.3	22.2	20.6	24.6	9.9	23.4	33.3	14.3
12CM8[ ]ME	12CM8[ ]MC	12	1/2	50.0	22.2	22.2	24.6	9.9	23.4	38.1	19.1
12CM12[ ]ME	12CM12[ ]MC	12	3/4	50.8	22.2	27.0	24.6	9.9	23.4	38.9	19.1
14CM4[ ]ME	14CM4[ ]MC	14	1/4	42.0	23.8	22.2	22.2	7.0	21.0	32.6	14.3
14CM6[ ]ME	14CM6[ ]MC	14	3/8	42.0	23.8	22.2	22.2	9.9	21.0	32.6	14.3
14CM8[ ]ME	14CM8[ ]MC	14	1/2	47.5	23.8	22.2	22.2	11.9	21.0	38.1	19.1
15CM8[ ]ME	15CM8[ ]MC	15	1/2	48.4	23.8	22.2	22.2	12.7	21.8	38.1	19.1
16CM6[ ]ME	16CM6[ ]MC	16	3/8	45.2	25.4	23.8	25.0	9.9	23.4	34.0	14.3
16CM8[ ]ME	16CM8[ ]MC	16	1/2	50.0	25.4	23.8	25.0	12.7	23.4	38.9	19.1
16CM12[ ]ME	16CM12[ ]MC	16	3/4	50.8	25.4	27.0	25.0	12.7	23.4	39.6	19.1
18CM8[ ]ME	18CM8[ ]MC	18	1/2	51.1	28.6	27.0	25.4	12.7	24.6	41.2	19.1
18CM12[ ]ME	18CM12[ ]MC	18	3/4	51.1	28.6	27.0	25.4	15.8	24.6	41.2	19.1
20CM8[ ]ME	20CM8[ ]MC	20	1/2	55.5	31.8	30.2	31.0	11.9	27.0	41.7	19.1
20CM12[ ]ME	20CM12[ ]MC	20	3/4	55.5	31.8	30.2	31.0	16.7	27.0	41.7	19.1
22CM8[ ]ME	22CM8[ ]MC	22	1/2	52.8	31.8	30.2	27.0	12.7	24.6	41.6	19.1
22CM12[ ]ME	22CM12[ ]MC	22	3/4	52.8	31.8	30.2	27.0	17.9	24.6	41.6	19.1
22CM16[ ]ME	22CM16[ ]MC	22	1	62.0	31.8	34.9	27.0	17.9	24.6	50.8	23.8
25CM12[ ]ME	25CM12[ ]MC	25	3/4	59.7	38.1	34.9	33.3	18.1	27.4	45.2	19.1
25CM16[ ]ME	25CM16[ ]MC	25	1	65.4	38.1	34.9	33.3	21.7	27.4	51.0	23.8
30CM16[ ]ME	—	30	1	78.2	50.8	47.6	38.0	22.3	41.2	55.6	24.9
30CM20[ ]ME	—	30	1 1/4	77.9	50.8	46.0	37.8	27.6	41.0	55.6	23.9
32CM16[ ]ME	—	32	1	80.1	50.8	47.6	42.3	22.3	42.9	56.7	24.9
38CM16[ ]ME	—	38	1	89.5	60.3	55.6	49.4	22.3	49.5	61.7	24.9
38CM20[ ]ME	—	38	1 1/4	89.2	60.3	55.6	49.4	28.6	49.5	61.7	24.9
38CM24[ ]ME	—	38	1 1/2	91.6	60.3	55.6	49.4	33.9	49.5	64.0	26.2

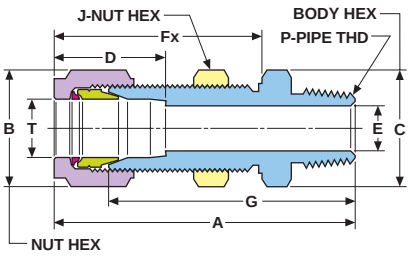
* [ ] see page 6 for material specifications.

Bulkhead Connector, Male: BCM

connects fractional tube to female NPT threads

Metric fitting shown

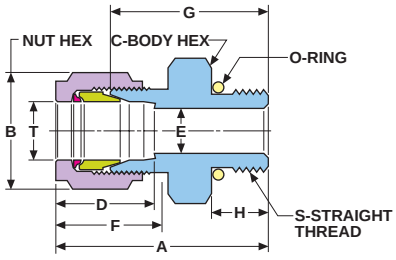
Part Number*	T Tube O.D.	P Pipe Size	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min	Fx	G	J Hex Flat	Panel Hole Size	Max. Panel Thickness
2BCM2[ ]	1/8	1/8	1.88	7/16	1/2	.56	.09	1.28	1.56	1/2	.33	.44
2BCM4[ ]	1/8	1/4	2.06	7/16	9/16	.56	.09	1.28	1.75	1/2	.33	.44
3BCM2[ ]	3/16	1/8	1.91	1/2	9/16	.59	.13	1.31	1.59	9/16	.39	.47
4BCM2[ ]	1/4	1/8	1.98	9/16	5/8	.64	.19	1.36	1.66	5/8	.45	.47
4BCM4[ ]	1/4	1/4	2.17	9/16	5/8	.64	.19	1.36	1.84	5/8	.45	.47
6BCM4[ ]	3/8	1/4	2.31	11/16	3/4	.72	.30	1.50	1.97	3/4	.58	.53
6BCM6[ ]	3/8	3/8	2.33	11/16	3/4	.72	.30	1.52	1.97	3/4	.58	.53
6BCM8[ ]	3/8	1/2	2.53	11/16	15/16	.7	.30	1.50	2.19	3/4	.58	.53
8BCM6[ ]	1/2	3/8	2.56	7/8	15/16	.97	.41	1.72	2.09	15/16	.77	.59
8BCM8[ ]	1/2	1/2	2.75	7/8	15/16	.97	.42	1.72	2.28	15/16	.77	.59



Bulkhead Connector, Male: BCM/ME

connects metric tube to female NPT threads

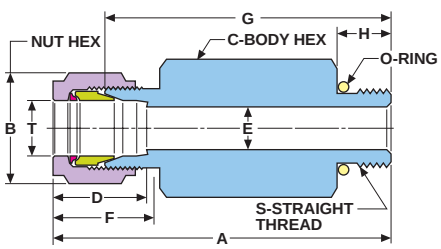
Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions — mm A	B Hex Flat	C Hex Flat	D	E min	Fx	G	J Hex Flat	Panel Hole Size	Max. Panel Thickness
3BCM2[ ]ME	3	1/8	48.0	11.1	12.5	14.3	2.2	32.5	40.0	12.7	8.3	12.0
6BCM2[ ]ME	6	1/8	50.5	14.3	15.9	16.3	3.8	34.6	42.2	15.9	11.5	13.0
6BCM4[ ]ME	6	1/4	55.2	14.3	15.9	16.3	3.8	34.6	46.8	15.9	11.5	13.0
6BCM6[ ]ME	6	3/8	55.1	14.3	17.5	16.3	3.8	34.6	46.8	15.9	11.5	13.0
6BCM8[ ]ME	6	1/2	60.7	14.3	22.2	16.3	3.8	34.6	52.3	15.9	11.5	13.0
8BCM4[ ]ME	8	1/4	57.0	15.9	15.9	16.7	5.8	36.6	50.0	17.5	13.1	14.0
10BCM2[ ]ME	10	1/8	54.2	19.1	19.1	17.5	7.8	37.3	46.3	19.1	16.5	14.0
10BCM4[ ]ME	10	1/4	59.0	19.1	19.1	17.5	6.6	37.3	51.1	19.1	16.5	14.0
10BCM6[ ]ME	10	3/8	59.0	19.1	19.1	17.5	7.9	37.3	51.1	19.1	16.5	14.0
12BCM6[ ]ME	12	3/8	66.0	22.2	23.8	24.6	9.9	43.7	54.1	23.8	19.5	16.0
12BCM8[ ]ME	12	1/2	69.9	22.2	23.8	24.6	9.9	43.7	57.9	23.8	19.5	16.0
14BCM8[ ]ME	14	1/2	72.0	23.8	23.8	22.2	11.9	41.1	59.0	23.8	19.5	16.0
16BCM8[ ]ME	16	1/2	70.7	25.4	27.0	25.0	12.7	43.7	59.5	27.0	22.5	14.0
18BCM8[ ]ME	18	1/2	76.0	28.6	30.0	25.4	12.7	48.0	64.0	30.2	26.0	17.0
22BCM8[ ]ME	22	1/2	81.0	31.8	33.5	27.0	12.7	53.0	68.0	33.3	29.5	24.0
25BCM8[ ]ME	25	1/2	88.0	38.1	40.0	33.3	12.7	60.0	73.0	39.7	33.8	24.0



Male Connector, SAE: CMS

connects fractional tube to SAE straight thread boss

Part Number*	T	S	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min.	F	G	H	O-ring Uniform Size #
2CMS2[ ]	1/8	5/16-24	1.25	7/16	7/16	.56	.09	.67	.94	.30	902
4CMS4[ ]	1/4	7/16-20	1.41	9/16	9/16	.64	.19	.77	1.08	.36	904
4CMS6[ ]	1/4	9/16-18	1.47	9/16	11/16	.64	.19	.77	1.14	.39	906
4CMS8[ ]	1/4	3/4-16	1.55	9/16	7/8	.64	.19	.77	1.22	.44	908
4CMS10[ ]	1/4	7/8-14	1.67	9/16	1	.64	.19	.77	1.34	.50	910
6CMS4[ ]	3/8	7/16-20	1.56	11/16	3/4	.72	.19	.83	1.22	.36	904
6CMS6[ ]	3/8	9/16-18	1.63	11/16	3/4	.72	.30	.83	1.27	.39	906
6CMS8[ ]	3/8	3/4-16	1.61	11/16	7/8	.72	.30	.83	1.27	.44	908
6CMS10[ ]	3/8	7/8-14	1.73	11/16	1	.72	.30	.83	1.38	.50	910
8CMS6[ ]	1/2	9/16-18	1.72	7/8	13/16	.97	.30	.92	1.25	.39	906
8CMS8[ ]	1/2	3/4-16	1.70	7/8	7/8	.97	.42	.92	1.25	.44	908
8CMS12[ ]	1/2	1 1/16-12	1.98	7/8	1 1/4	.97	.42	.92	1.52	.59	912
10CMS10[ ]	5/8	7/8-14	1.83	1	1	1	.50	.92	1.39	.50	910
12CMS8[ ]	3/4	3/4-16	1.91	1 1/8	1 1/16	1	.42	.97	1.45	.44	908
12CMS12[ ]	3/4	1 1/16-12	2.03	1 1/8	1 1/4	1	.66	.97	1.59	.59	912
16CMS12[ ]	1	1 1/16-12	2.19	1 1/2	1 3/8	1.31	.66	1.08	1.63	.59	912
16CMS16[ ]	1	1 5/16-12	2.25	1 1/2	1 1/2	1.31	.88	1.08	1.69	.59	916
20CMS20[ ]	1 1/4	1 5/8-12	2.69	1 7/8	1 7/8	1.62	1.09	1.53	1.82	.59	920
24CMS24[ ]	1 1/2	1 7/8-12	3.06	2 1/4	2 1/8	1.97	1.34	1.78	1.99	.59	924
32CMS32[ ]	2	2 1/2-12	4	3	2 3/4	2.66	1.81	2.47	2.53	.59	932



Long Male Connector, SAE: LCMS

connects fractional tube to SAE straight thread boss

Part Number*	T Tube O.D.	S	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min.	F	G	H	O-ring Uniform Size #
4LCMS4[ ]	1/4	7/16-20	2.30	9/16	9/16	.64	.19	.77	1.97	.36	904
6LCMS6[ ]	3/8	9/16-18	2.55	11/16	3/4	.72	.30	.83	2.19	.39	906
8LCMS8[ ]	1/2	3/4-16	3.05	7/8	7/8	.97	.42	.92	2.58	.44	908
12LCMS12[ ]	3/4	1 1/16-12	3.92	1 1/8	1 1/4	1	.66	.97	3.48	.59	912
16LCMS16[ ]	1	1 5/16-12	4.42	1 1/2	1 1/2	1.31	.88	1.08	3.86	.59	916

* [ ] see page 6 for material specifications.

O-ring Installation Instructions

HOKE Gyrolok o-ring seal fittings are used for direct connection to existing pipe thread or straight thread ports—which have a smooth, flat surface perpendicular to the threaded port. O-ring seal fittings provide leak-tight sealing on both vacuum and high pressure systems. In the pipe thread version, a special short thread insures against thread interference.

The standard Buna N o-ring is completely contained in a precision groove, to prevent o-ring extrusion at high pressure. The precision groove also provides a controlled squeeze for a vacuum-tight seal.

The chart lists pertinent dimensions useful with o-ring seal connectors and adapters.

Note:
When installing an o-ring port:

1. Hand-thread until the o-ring compresses on the port end.
2. Snug the fitting to the port with a wrench to completely compress the o-ring.
3. Always use a back-up wrench to hold the o-ring seal fitting body, when connecting or disconnecting a HOKE Gyrolok end.

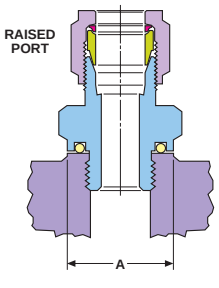


Fig. 1

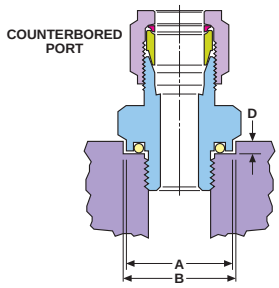


Fig. 2

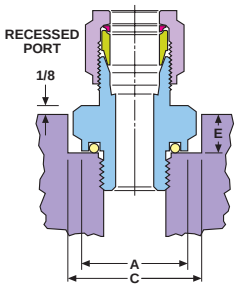
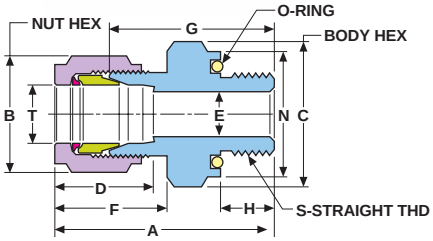


Fig. 3

Mounting Dimensions For O-ring Seal Connectors and Adapters

Straight Thread Size*	Pipe Thread Size**	Diameter A Min. Flat for Sealing	Diameter B Min. for Clearance (Fig. 2)	Diameter C Min. for Clearance (Fig. 3)	Depth D Max. (Fig. 2)	Depth E Max. for Adapter (Fig. 3)
5/16-24	—	1/2	9/16	21/32	3/32	3/32
3/8-24	—	17/32	21/32	3/4	3/32	1/8
7/16-20	—	11/16	25/32	7/8	3/32	5/32
1/2-20	—	3/4	29/32	1 1/32	3/32	11/64
9/16-18	—	13/16	31/32	1 3/32	3/32	11/64
3/4-16	—	1	1 5/32	1 5/16	3/32	7/32
7/8-14	—	1 7/32	1 11/32	1 17/32	3/32	5/16
1 1/16-12	—	1 13/32	1 17/32	1 3/4	3/32	11/32
1 5/16-12	—	1 11/16	1 25/32	2 1/32	3/32	7/16
—	1/8 NPT	11/16	25/32	7/8	3/32	9/64
—	1/4 NPT	13/16	31/32	1 3/32	3/32	11/64
—	3/8 NPT	1	1 5/32	1 5/16	3/32	3/16
—	1/2 NPT	1 7/32	1 11/32	1 17/32	3/32	5/16
—	3/4 NPT	1 13/32	1 17/32	1 3/4	3/32	3/8
—	1 NPT	1 11/16	1 25/32	2 1/32	3/32	27/64

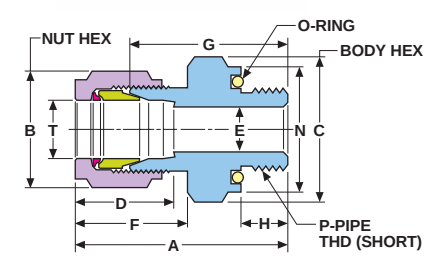
Dimensions for reference only, subject to change.



O-ring Straight Connector: COS

connects fractional tube to female straight thread

Part Number*	T Tube O.D.	S Thread Size	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min	F	G	H	N	O-ring I.D.	O-ring O.D.
1COS[ ]	1/16	5/16-24	1.13	5/16	9/16	.41	.05	.48	.91	.34	.56	.31	.44
2COS[ ]	1/8	5/16-24	1.25	7/16	9/16	.56	.09	.67	1.03	.34	.56	.31	.44
3COS[ ]	3/16	3/8-24	1.41	1/2	5/8	.59	.13	.70	1.09	.38	.63	.38	.50
4COS[ ]	1/4	7/16-20	1.55	9/16	3/4	.64	.19	.77	1.22	.41	.75	.44	.63
6COS[ ]	3/8	9/16-18	1.72	11/16	15/16	.72	.30	.83	1.38	.47	.94	.56	.75
8COS6[ ]	1/2	9/16-18	1.88	7/8	15/16	.97	.30	.92	1.41	.47	.94	.58	.78
8COS[ ]	1/2	3/4-16	1.88	7/8	1 1/8	.97	.42	.92	1.41	.47	1.13	.75	.94
10COS[ ]	5/8	7/8-14	1.94	1	1 5/16	1	.50	.92	1.50	.47	1.31	.88	1.13
12COS[ ]	3/4	1 1/16-12	2.09	1 1/8	1 1/2	1	.66	.97	1.66	.56	1.50	1.06	1.31
14COS[ ]	7/8	1 1/16-12	2.09	1 1/4	1 1/2	1.06	.72	.97	1.66	.56	1.50	1.06	1.31
16COS[ ]	1	1 5/16-12	2.38	1 1/2	1 3/4	1.31	.88	1.08	1.81	.56	1.75	1.31	1.56

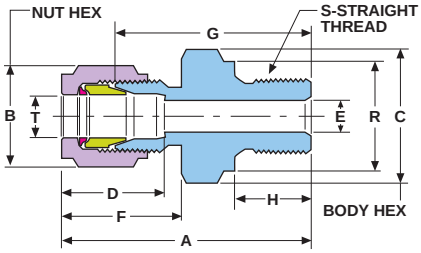


O-ring Male Connector: COM

connects fractional tube to female NPT threads

Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min	F	G	H	N	O-ring I.D.	O-ring O.D.
1COM2[ ]	1/16	1/8	1.06	5/16	3/4	.41	.05	.48	.84	.28	.75	.44	.63
2COM2[ ]	1/8	1/8	1.34	7/16	3/4	.56	.09	.67	1.03	.28	.75	.44	.63
2COM4[ ]	1/8	1/4	1.47	7/16	15/16	.56	.09	.67	1.16	.38	.94	.56	.75
3COM2[ ]	3/16	1/8	1.38	1/2	3/4	.59	.13	.70	1.06	.28	.75	.44	.63
3COM4[ ]	3/16	1/4	1.50	1/2	15/16	.59	.13	.70	1.19	.38	.94	.56	.75
4COM2[ ]	1/4	1/8	1.42	9/16	3/4	.64	.19	.77	1.09	.28	.75	.44	.63
4COM4[ ]	1/4	1/4	1.55	9/16	15/16	.64	.19	.77	1.22	.38	.94	.56	.75
4COM6[ ]	1/4	3/8	1.61	9/16	1 1/8	.64	.19	.77	1.28	.41	1.13	.75	.94
6COM2[ ]	3/8	1/8	1.50	11/16	3/4	.72	.19	.83	1.16	.28	.75	.44	.63
6COM4[ ]	3/8	1/4	1.63	11/16	15/16	.72	.28	.83	1.28	.38	.94	.56	.75
6COM6[ ]	3/8	3/8	1.69	11/16	1 1/8	.72	.28	.83	1.34	.41	1.13	.75	.94
6COM8[ ]	3/8	1/2	1.91	11/16	1 5/16	.72	.28	.83	1.56	.53	1.31	.88	1.13
8COM4[ ]	1/2	1/4	1.75	7/8	15/16	.97	.28	.92	1.28	.38	.94	.56	.75
8COM6[ ]	1/2	3/8	1.81	7/8	1 1/8	.97	.41	.92	1.34	.41	1.13	.75	.94
8COM8[ ]	1/2	1/2	2.03	7/8	1 5/16	.97	.41	.92	1.56	.53	1.31	.88	1.13
10COM8[ ]	5/8	1/2	2	1	1 5/16	1	.50	.92	1.56	.53	1.31	.88	1.13
10COM12[ ]	5/8	3/4	2.09	1	1 1/2	1	.50	.92	1.66	.56	1.50	1.06	1.31
12COM8[ ]	3/4	1/2	2	1 1/8	1 5/16	1	.55	.97	1.56	.53	1.31	.88	1.13
12COM12[ ]	3/4	3/4	2.09	1 1/8	1 1/2	1	.63	.97	1.66	.56	1.50	1.06	1.31
16COM12[ ]	1	3/4	2.31	1 1/2	1 1/2	1.31	.63	1.08	1.75	.56	1.50	1.06	1.31
16COM16[ ]	1	1	2.38	1 1/2	1 3/4	1.31	.88	1.08	1.91	.66	1.75	1.31	1.56

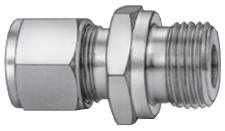
* [ ] see page 6 for material specifications.

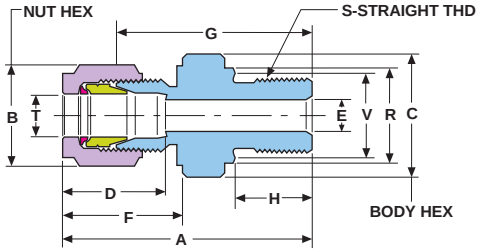


Male Connector: CM/EB

connects fractional tube with RP parallel threads

Part Number*	T Tube O.D.	S Thd. Size	Dimensions — inches A	B	C	D	E min.	F	G	H	R	V
2CM2[ ]EB	1/8	1/8	1.25	7/16	5/8	.56	.09	.67	.94	.31	.55	.52
2CM4[ ]EB	1/8	1/4	1.42	7/16	3/4	.56	.09	.67	1.11	.47	.70	.67
4CM2[ ]EB	1/4	1/8	1.34	9/16	5/8	.64	.19	.77	1.02	.31	.55	.52
4CM4[ ]EB	1/4	1/4	1.52	9/16	3/4	.64	.19	.77	1.19	.47	.70	.67
4CM6[ ]EB	1/4	3/8	1.55	9/16	15/16	.64	.19	.77	1.22	.47	.86	.83
4CM8[ ]EB	1/4	1/2	1.67	9/16	1 1/16	.64	.19	.77	1.34	.55	1.03	.98
6CM4[ ]EB	3/8	1/4	1.61	11/16	3/4	.72	.27	.83	1.23	.47	.70	.67
6CM6[ ]EB	3/8	3/8	1.64	11/16	15/16	.72	.27	.83	1.27	.47	.86	.83





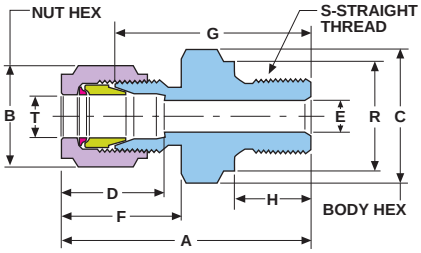
Male Connector: CM/MB

connects metric tube with RP parallel threads

Part Number*	T Tube O.D.	S Straight Thd.	Dimensions—mm A	B Hex Flat	C Hex Flat	D	E min.	F	G	H	R	V
3CM2[ ]MB	3	1/8	32.8	11.1	14.3	14.3	2.2	17.1	24.9	8.0	14.0	13.0
3CM4[ ]MB	3	1/4	37.2	11.1	19.1	14.3	2.2	17.1	29.2	12.0	18.0	17.0
6CM2[ ]MB	6	1/8	35.8	14.3	14.3	16.3	3.8	19.5	27.4	8.0	14.0	13.0
6CM4[ ]MB	6	1/4	40.1	14.3	19.1	16.3	3.8	19.5	31.8	12.0	18.0	17.0
6CM6[ ]MB	6	3/8	40.1	14.3	22.2	16.3	3.8	19.5	31.8	12.0	22.0	21.0
6CM8[ ]MB	6	1/2	43.4	14.3	27.0	16.3	3.8	19.5	35.1	14.0	26.0	25.0
8CM2[ ]MB	8	1/8	34.7	15.9	14.3	16.7	4.6	19.1	26.7	8.0	14.0	13.0
8CM4[ ]MB	8	1/4	39.5	15.9	19.1	16.7	5.8	19.1	31.5	12.0	18.0	17.0
8CM6[ ]MB	8	3/8	40.5	15.9	22.0	16.7	5.8	19.1	32.5	12.0	22.0	21.0
8CM8[ ]MB	8	1/2	43.1	15.9	27.0	16.7	5.8	19.1	35.1	14.0	26.0	25.0
8CM12[ ]MB	8	3/4	45.0.	15.9	33.5	16.7	6.0	19.1	37.0	12.0	32.0	30.0
10CM2[ ]MB	10	1/8	36.9	19.1	17.5	17.5	4.6	19.8	29.0	8.0	14.0	13.0
10CM4[ ]MB	10	1/4	41.0	19.1	19.1	17.5	5.8	19.8	33.0	12.0	18.0	17.0
10CM6[ ]MB	10	3/8	41.5	19.1	24.0	17.5	7.4	19.8	33.5	12.0	22.0	21.0
10CM8[ ]MB	10	1/2	44.1	19.1	27.0	17.5	7.9	19.8	36.1	14.0	26.0	25.0
12CM4[ ]MB	12	1/4	44.5	22.2	22.2	24.6	7.0	23.4	32.5	12.0	18.0	17.0
12CM6[ ]MB	12	3/8	45.0	22.2	24.0	24.6	10.0	23.4	33.0	12.0	22.0	21.0
12CM8[ ]MB	12	1/2	47.5	22.2	27.0	24.6	9.9	23.4	35.6	14.0	26.0	25.0
12CM12[ ]MB	12	3/4	49.5	22.2	33.3	24.6	9.9	23.4	37.6	16.0	32.0	30.0
14CM4[ ]MB	14	1/4	41.9	23.8	22.2	22.2	7.0	21.0	32.5	12.0	18.0	17.0
14CM6[ ]MB	14	3/8	42.4	23.8	.22.2	22.2	9.9	21.0	33.0	12.0	22.0	21.0
14CM8[ ]MB	14	1/2	45.2	23.8	27.0	22.2	11.9	21.0	35.8	14.0	26.0	25.0
15CM8[ ]MB	15	1/2	46.6	23.8	27.0	22.2	12.7	21.8	36.3	14.0	26.0	25.0
16CM6[ ]MB	16	3/8	44.9	25.4	23.8	25.0	9.9	23.4	33.8	12.0	22.0	21.0
16CM8[ ]MB	16	1/2	47.5	25.4	27.0	25.0	12.7	23.4	36.3	14.0	26.0	25.0
16CM12[ ]MB	16	3/4	49.5	25.4	33.3	25.0	12.7	23.4	38.4	16.0	32.0	30.0
18CM8[ ]MB	18	1/2	47.3	28.6	27.0	25.4	12.7	24.6	37.3	14.0	26.0	25.0
18CM12[ ]MB	18	3/4	49.1	28.6	33.3	25.4	15.8	24.6	37.1	16.0	32.0	30.0
20CM8[ ]MB	20	1/2	52.5	31.8	30.2	31.0	11.9	27.0	38.6	14.0	26.0	25.0
22CM8[ ]MB	22	1/2	50.6	31.8	30.2	27.0	12.6	24.6	39.4	14.0	26.0	25.0
22CM12[ ]MB	22	3/4	52.6	31.8	33.3	27.0	17.9	24.6	41.4	16.0	32.0	30.0
22CM16[ ]MB	22	1	54.6	31.8	41.3	27.0	17.9	24.6	43.4	18.0	39.0	37.0
25CM12[ ]MB	25	3/4	59.9	38.1	34.9	33.3	18.1	27.4	45.5	16.0	32.0	30.0
25CM16[ ]MB	25	1	57.6	38.1	41.3	33.3	21.7	27.4	43.2	18.0	39.0	37.0

RP parallel thread ends are typically used with a flat gasket to seal.

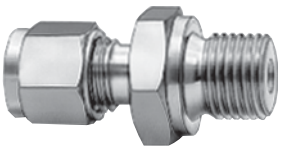
* [ ] see page 6 for material specifications.

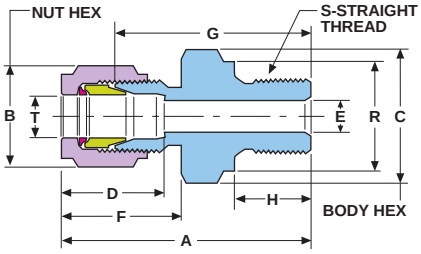


Male Connector: CM/EA

connects fractional tube with RS parallel threads

Part Number*	T Tube O.D.	S Thd. Size	Dimensions — inches A	B	C	D	E min	F	G	H	R
2CM2[ ]EA	1/8	1/8	1.19	7/16	9/16	.56	.09	.67	.72	.31	.55
2CM4[ ]EA	1/8	1/4	1.41	7/16	3/4	.56	.09	.67	1.09	.47	.70
2CM6[ ]EA	1/8	3/8	1.47	7/16	7/8	.56	.09	.67	1.16	.47	.86
4CM2[ ]EA	1/4	1/8	1.30	9/16	9/16	.64	.19	.77	.97	.31	.55
4CM4[ ]EA	1/4	1/4	1.48	9/16	3/4	.64	.19	.77	1.16	.47	.70
4CM6[ ]EA	1/4	3/8	1.55	9/16	7/8	.64	.19	.77	1.22	.47	.86
4MC8[ ]EA	1/4	1/2	1.67	9/16	1 1/16	.64	.19	.77	1.34	.55	1.03
6CM4[ ]EA	3/8	1/4	1.61	11/16	3/4	.72	.30	.83	1.25	.47	.70
6CM6[ ]EA	3/8	3/8	1.61	11/16	7/8	.72	.30	.83	1.25	.47	.86
6CM8[ ]EA	3/8	1/2	1.73	11/16	1 1/16	.72	.30	.83	1.38	.55	1.03
8CM4[ ]EA	1/2	1/4	1.75	7/8	13/16	.97	.23	.92	1.25	.47	.70
8CM6[ ]EA	1/2	3/8	1.75	7/8	7/8	.97	.23	.92	1.25	.47	.86
8CM8[ ]EA	1/2	1/2	1.72	7/8	1 1/16	.97	.23	.92	1.38	.55	1.03
12CM8[ ]EA	3/4	1/2	1.88	1 1/8	1 1/16	1	.39	.97	1.50	.55	1.03
12CM12[ ]EA	3/4	3/4	1.92	1 1/8	1 5/16	1	.39	.97	1.48	.63	1.27
16CM8[ ]EA	1	1/2	2	1 1/2	1 3/8	1.31	.47	1.08	1.44	.55	1.03
16CM16[ ]EA	1	1	2.23	1 1/2	1 5/8	1.31	.70	1.08	1.67	.70	1.53





Male Connector: CM/MA

connects metric tube with RS parallel threads

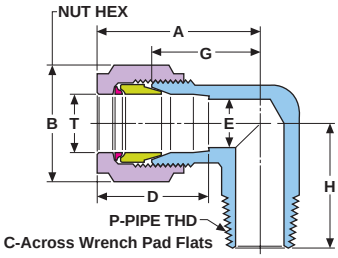
Part Number*	T Tube Size	S Thd. Size	Dimensions — mm A	B Hex Flat	C Hex Flat	D	E min	F	G	H	R
3CM2[ ]MA	3	1/8	32.8	11.1	14.3	14.3	2.2	17.1	24.9	8.0	14.0
3CM4[ ]MA	3	1/4	37.2	11.1	19.1	14.3	2.2	17.1	29.2	12.0	18.0
6CM2[ ]MA	6	1/8	35.8	14.3	14.3	16.3	3.8	19.5	27.4	8.0	14.0
6CM4[ ]MA	6	1/4	40.1	14.3	19.1	16.3	3.8	19.5	31.8	12.0	18.0
6CM6[ ]MA	6	3/8	40.1	14.3	22.2	16.3	3.8	19.5	31.8	12.0	22.0
6CM8[ ]MA	6	1/2	43.4	14.3	27.0	16.3	3.8	19.5	35.1	14.0	26.0
8CM2[ ]MA	8	1/8	34.7	15.9	14.3	16.7	5.8	19.1	26.7	8.0	14.0
8CM4[ ]MA	8	1/4	39.5	15.9	19.1	16.7	5.8	19.1	31.5	12.0	18.0
8CM6[ ]MA	8	3/8	43.0	15.9	22.0	16.7	5.8	19.1	35.0	12.0	22.0
8CM8[ ]MA	8	1/2	43.1	15.9	27.0	16.7	5.8	19.1	35.0	14.0	26.0
8CM12[ ]MA	8	3/4	48.0	15.9	33.0	16.7	6.5	19.1	38.0	12.0	32.0
10CM2[ ]MA	10	1/8	37.0	19.1	17.5	17.5	4.6	19.8	29.0	8.0	14.0
10CM4[ ]MA	10	1/4	41.0	19.1	19.0	17.5	5.8	19.8	33.0	12.0	18.0
10CM6[ ]MA	10	3/8	44.0	19.1	22.0	17.5	6.0	19.8	36.0	12.0	22.0
10CM8[ ]MA	10	1/2	44.1	19.1	27.0	17.5	7.9	19.8	36.1	14.0	26.0
12CM4[ ]MA	12	1/4	44.5	22.2	22.2	24.6	5.8	23.4	32.5	12.0	18.0
12CM6[ ]MA	12	3/8	47.5	22.2	22.0	24.6	6.0	23.4	35.5	12.0	22.0
12CM8[ ]MA	12	1/2	47.5	22.2	27.0	24.6	9.9	23.4	35.6	14.0	26.0
12CM12[ ]MA	12	3/4	49.5	22.2	33.3	24.6	9.9	23.4	37.6	16.0	33.0
14CM4[ ]MA	14	1/4	41.9	23.8	22.2	22.2	5.8	21.0	32.5	12.0	18.0
14CM6[ ]MA	14	3/8	42.4	23.8	.22.2	22.2	7.8	21.0	33.0	12.0	22.0
14CM8[ ]MA	14	1/2	45.2	23.8	27.0	22.2	11.9	21.0	35.8	14.0	26.0
15CM8[ ]MA	15	1/2	46.6	23.8	27.0	22.2	12.7	21.8	36.3	14.0	26.0
16CM6[ ]MA	16	3/8	45.0	25.4	23.8	25.0	7.8	23.4	33.8	12.0	22.0
16CM8[ ]MA	16	1/2	47.5	25.4	27.0	25.0	12.7	23.4	36.3	14.0	26.0
16CM12[ ]MA	16	3/4	49.5	25.4	33.3	25.0	12.7	23.4	38.4	16.0	32.0
18CM8[ ]MA	18	1/2	47.3	28.6	27.0	25.4	11.4	24.6	37.3	14.0	26.0
18CM12[ ]MA	18	3/4	49.1	28.6	33.3	25.4	15.3	24.6	39.1	16.0	32.0
20CM8[ ]MA	20	1/2	52.5	31.8	30.2	31.0	11.9	27.0	38.6	14.0	26.0
22CM8[ ]MA	22	1/2	50.6	31.8	30.2	27.0	11.4	24.6	39.4	14.0	26.0
22CM12[ ]MA	22	3/4	52.6	31.8	33.3	27.0	15.8	24.6	41.4	16.0	32.0
22CM16[ ]MA	22	1	54.6	31.8	41.3	27.0	17.9	24.6	43.4	18.0	39.0
25CM12[ ]MA	25	3/4	59.9	38.1	34.9	33.3	17.9	27.4	45.5	16.0	32.0
25CM16[ ]MA	25	1	57.6	38.1	41.3	33.3	17.9	27.4	43.2	18.0	39.0

RS parallel thread ends are typically used with a gasket having a bonded elastomer seal. RP-type gaskets may also be used.

* [ ] see page 6 for material specifications.

Male Elbow: LM

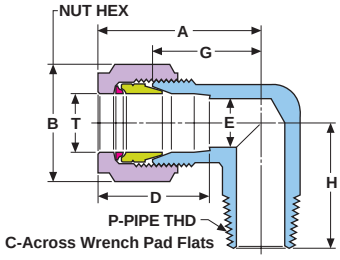
connects fractional tube to female NPT thread



Part Number*	T Tube O.D.	P Male NPT Size	Dimensions — inches A	B Hex Flat	C	D	E min	G	H
1LM1[ ]	1/16	1/16	.78	5/16	7/16	.41	.05	.56	.72
1LM2[ ]	1/16	1/8	.78	5/16	7/16	.41	.05	.56	.88
2LM1[ ]	1/8	1/16	.97	7/16	7/16	.56	.09	.66	.72
2LM2[ ]	1/8	1/8	.97	7/16	7/16	.56	.09	.66	.72
2LM4[ ]	1/8	1/4	1.09	7/16	1/2	.56	.09	.78	.94
3LM2[ ]	3/16	1/8	1	1/2	7/16	.59	.13	.69	.75
3LM4[ ]	3/16	1/4	1	1/2	1/2	.59	.13	.72	.94
4LM2[ ]	1/4	1/8	1.05	9/16	7/16	.64	.19	.72	.78
4LM4[ ]	1/4	1/4	1.11	9/16	1/2	.64	.19	.78	1
4LM6[ ]	1/4	3/8	1.20	9/16	11/16	.64	.19	.88	1.13
4LM8[ ]	1/4	1/2	1.33	9/16	13/16	.64	.42	1	1.25
6LM2[ ]	3/8	1/8	1.19	11/16	1/2	.72	.19	.84	.88
6LM4[ ]	3/8	1/4	1.19	11/16	1/2	.72	.30	.84	1
6LM6[ ]	3/8	3/8	1.28	11/16	11/16	.72	.30	.94	1.13
6LM8[ ]	3/8	1/2	1.38	11/16	13/16	.72	.30	1.03	1.25
8LM4[ ]	1/2	1/4	1.44	7/8	11/16	.97	.30	.97	1.13
8LM6[ ]	1/2	3/8	1.44	7/8	11/16	.97	.41	.97	1.13
8LM8[ ]	1/2	1/2	1.50	7/8	11/16	.97	.42	1.03	1.31
8LM12[ ]	1/2	3/4	1.56	7/8	1	.97	.72	1.06	1.50
10LM6[ ]	5/8	3/8	1.47	1	13/16	1	.41	1.03	1.25
10LM8[ ]	5/8	1/2	1.47	1	13/16	1	.50	1.03	1.38
12LM8[ ]	3/4	1/2	1.59	1 1/8	1	1	.50	1.16	1.50
12LM12[ ]	3/4	3/4	1.59	1 1/8	1	1	.66	1.16	1.50
14LM12[ ]	7/8	3/4	1.72	1 1/4	1 1/4	1.06	.72	1.28	1.50
16LM12[ ]	1	3/4	1.88	1 1/2	1 1/4	1.31	.72	1.31	1.66
16LM16[ ]	1	1	1.88	1 1/2	1 1/4	1.31	.88	1.31	1.84
20LM20[ ]	1 1/4	1 1/4	2.62	1 7/8	1 11/16	1.53	1.09	1.75	1.88
24LM24[ ]	1 1/2	1 1/2	3.07	2 1/4	2	1.78	1.34	2	2.38
32LM32[ ]	2	2	4.22	3	2 3/4	2.47	1.81	2.75	2.78

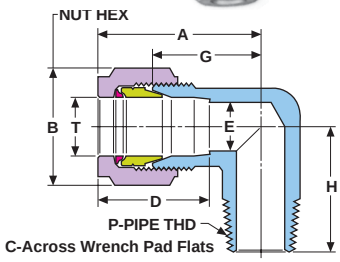
Male Elbow: LM/ME, LM/MC

connects metric tube with NPT or RT tapered threads



Part Number* NPT Threads	Part Number* RT Threads	T Tube O.D.	P Male NPT Size	Dimensions — mm A	B Hex Flat	C	D	E min	G	H
3LM2[ ]ME	3LM2[ ]MC	3	1/8	24.7	11.1	11.0	14.3	2.2	16.8	19.8
3LM4[ ]ME	3LM4[ ]MC	3	1/4	27.8	11.1	13.7	14.3	2.2	19.8	23.8
4LM2[ ]ME	4LM2[ ]MC	4	1/8	25.3	12.7	11.7	15.1	2.3	17.5	19.1
4LM4[ ]ME	4LM4[ ]MC	4	1/4	25.3	12.7	13.7	15.1	2.3	17.5	23.8
6LM2[ ]ME	6LM2[ ]MC	6	1/8	26.3	14.3	11.7	16.3	3.8	18.3	19.8
6LM4[ ]ME	6LM4[ ]MC	6	1/4	28.2	14.3	13.7	16.3	3.8	19.8	25.4
6LM6[ ]ME	6LM6[ ]MC	6	3/8	30.6	14.3	17.2	16.3	3.8	22.2	28.6
6LM8[ ]ME	6LM8[ ]MC	6	1/2	33.8	14.3	21.3	16.3	3.8	25.4	31.8
8LM2[ ]ME	8LM2[ ]MC	8	1/8	28.6	15.9	12.7	16.7	5.8	20.6	22.2
8LM4[ ]ME	8LM4[ ]MC	8	1/4	28.6	15.9	13.7	16.7	5.8	20.6	25.4
8LM6[ ]ME	8LM6[ ]MC	8	3/8	31.0	15.9	17.2	16.7	5.8	23.0	28.6
8LM8[ ]ME	8LM8[ ]MC	8	1/2	34.2	15.9	21.4	16.7	5.8	26.2	31.8
10LM2[ ]ME	10LM2[ ]MC	10	1/8	31.9	19.1	17.5	17.5	4.6	23.9	23.9
10LM4[ ]ME	10LM4[ ]MC	10	1/4	32.6	19.1	17.8	17.5	7.1	24.6	28.7
10LM6[ ]ME	10LM6[ ]MC	10	3/8	31.8	19.1	17.2	17.5	7.9	28.8	28.6
10LM8[ ]ME	10LM8[ ]MC	10	1/2	34.1	19.1	21.3	17.5	7.9	26.2	31.8
12LM4[ ]ME	12LM4[ ]MC	12	1/4	36.6	22.2	17.8	24.6	7.1	24.6	28.6
12LM6[ ]ME	12LM6[ ]MC	12	3/8	36.6	22.2	17.8	24.6	9.9	24.6	28.7
12LM8[ ]ME	12LM8[ ]MC	12	1/2	38.1	22.2	21.3	24.6	9.9	26.2	33.3
12LM12[ ]ME	12LM12[ ]MC	12	3/4	41.3	22.2	26.7	24.6	9.9	29.4	38.1
14LM6[ ]ME	14LM6[ ]MC	14	3/8	35.6	23.8	20.6	22.2	10.2	26.2	30.6
14LM8[ ]ME	14LM8[ ]MC	14	1/2	35.6	23.8	22.6	22.2	11.9	26.2	33.3
15LM8[ ]ME	15LM8[ ]MC	15	1/2	36.5	23.8	20.7	22.2	12.7	26.2	31.8
16LM6[ ]ME	16LM6[ ]MC	16	3/8	37.3	25.4	20.6	25.0	10.2	26.2	32.2
16LM8[ ]ME	16LM8[ ]MC	16	1/2	37.3	25.4	21.5	25.0	12.7	26.2	33.3
16LM12[ ]ME	16LM12[ ]MC	16	3/4	40.6	25.4	26.7	25.0	12.7	29.5	38.1
18LM8[ ]ME	18LM8[ ]MC	18	1/2	39.5	28.6	24.9	25.4	12.7	29.5	38.1
18LM12[ ]ME	18LM12[ ]MC	18	3/4	39.3	28.6	25.4	25.4	15.8	29.4	38.1
20LM8[ ]ME	20LM8[ ]MC	20	1/2	46.4	31.8	31.8	31.0	12.7	32.5	38.1
20LM12[ ]ME	20LM12[ ]MC	20	3/4	46.4	31.8	31.8	31.0	16.7	32.5	39.4
22LM8[ ]ME	22LM8[ ]MC	22	1/2	43.7	31.8	31.8	27.0	12.6	32.5	38.1
22LM12[ ]ME	22LM12[ ]MC	22	3/4	44.5	31.8	31.8	27.0	17.9	33.3	41.7
22LM16[ ]ME	22LM16[ ]MC	22	1	43.7	31.8	33.3	27.0	17.9	32.5	46.7
25LM12[ ]ME	25LM12[ ]MC	25	3/4	47.7	38.1	31.8	33.3	18.1	33.3	42.2
25LM16[ ]ME	25LM16[ ]MC	25	1	47.7	38.1	33.3	33.3	21.7	33.3	46.7

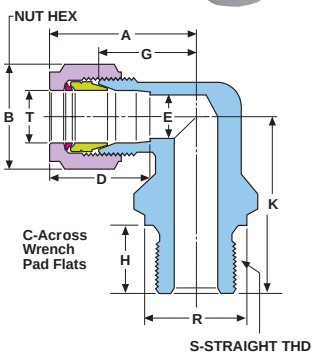
* [ ] see page 6 for material specifications.



Male Elbow: LM/EC

connects fractional tube with RT tapered threads

Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions — inches A	B Hex Flat	C	D	E min	G	H
4LM2[ ]EC	1/4	1/8	1.05	9/16	7/16	.64	.19	.72	.78
4LM4[ ]EC	1/4	1/4	1.11	9/16	1/2	.64	.19	.78	1
8LM4[ ]EC	1/2	1/4	1.44	7/8	11/16	.97	.30	.97	1.13
8LM6[ ]EC	1/2	3/8	1.44	7/8	11/16	.97	.41	.97	1.13
8LM8[ ]EC	1/2	1/2	1.50	7/8	13/16	.97	.42	1.03	1.31

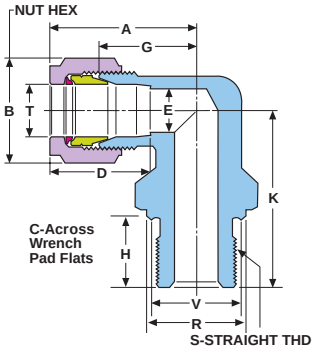


Male Elbow: LM/MA

connects metric with RS parallel threads

Part Number*	T Tube O.D.	S Straight Thd.	Dimensions—mm A	B Hex Flat	C	D	E min	G	H	K	R
6LM4[ ]MA	6	1/4	33.0	14.3	17.3	16.3	3.8	24.6	12.0	27.9	18.0
8LM4[ ]MA	8	1/4	34.2	15.9	20.5	16.7	7.6	26.2	12.0	34.3	18.0
10LM4[ ]MA	10	1/4	32.6	19.1	16.7	17.5	5.8	24.6	12.0	28.7	18.0
10LM8[ ]MA	10	1/2	37.2	19.1	20.5	17.5	7.9	29.2	14.0	38.1	26.0
12LM4[ ]MA	12	1/4	38.1	22.2	22.3	24.6	5.8	26.2	12.0	34.3	18.0
12LM8[ ]MA	12	1/2	40.6	22.2	20.5	24.6	9.9	28.7	14.0	38.1	26.0
16LM6[ ]MA	16	3/8	40.6	25.4	26.1	25.0	7.8	29.5	12.0	38.1	22.0
16LM8[ ]MA	16	1/2	40.6	25.4	20.5	25.0	11.8	29.5	14.0	38.1	26.0
22LM12[ ]MA	22	3/4	43.7	31.8	28.5	27.0	15.8	32.5	16.0	44.5	32.0

RS parallel thread ends are typically used with a gasket having a bonded elastomer seal. RP-type gaskets may also be used.



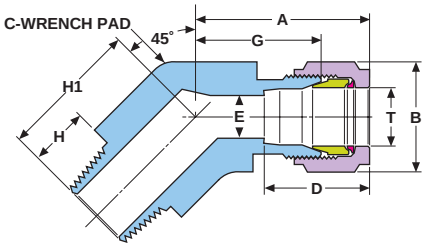
Male Elbow: LM/MB

connects metric with RP parallel threads

Part Number*	T Tube O.D.	S Straight Thd.	Dimensions—mm A	B Hex Flat	C	D	E min	G	H	K	R	V
6LM2[ ]MB	6	1/8	29.0	14.3	12.6	16.3	3.8	20.6	8.0	21.8	14.0	13.0
6LM4[ ]MB	6	1/4	29.0	14.3	12.6	16.3	3.8	20.6	12.0	29.0	18.0	17.0

RP parallel thread ends are typically used with a flat gasket to seal.

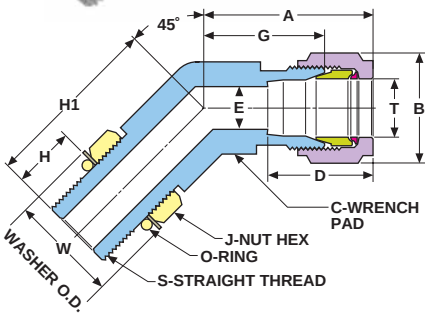
* [ ] see page 6 for material specifications.



45° Male Elbow: LMF

connects fractional tube to female NPT thread

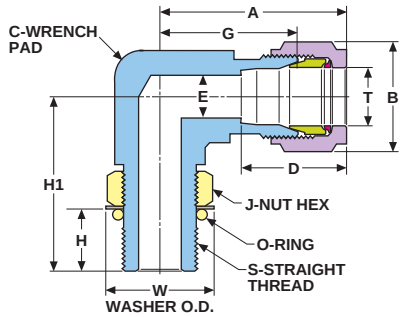
Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions — inches A	B	C	D	E min.	G	H	H1
4LMF2[ ]	1/4	1/8	1.05	.56	.50	.64	.19	.72	.38	.78
4LMF4[ ]	1/4	1/4	1.11	.56	.63	.64	.19	.78	.56	1
6LMF2[ ]	3/8	1/8	1.19	.69	.63	.72	.19	.84	.38	.88
6LMF4[ ]	3/8	1/4	1.19	.69	.63	.72	.30	.84	.56	1
6LMF6[ ]	3/8	3/8	1.28	.69	.81	.72	.30	.94	.56	1.13
8LMF6[ ]	1/2	3/8	1.44	.88	.81	.97	.41	.97	.56	1.13
8LMF8[ ]	1/2	1/2	1.53	.88	.94	.97	.42	1.06	.75	1.38



45° Male Elbow, SAE, Positionable: LMFS

connects fractional tube to SAE straight thread boss

Part Number*	T	S	Dimensions — inches A	B	C	D	E min.	G	H	H1	J Hex Flat	W	O-ring Uniform Size #
4LMFS4[ ]	1/4	7/16-20	1.05	9/16	1/2	.64	.19	.78	.39	1.05	9/16	.66	904
6LMFS6[ ]	3/8	9/16-18	1.19	11/16	5/8	.72	.30	.84	.44	1.14	11/16	.80	906
8LMFS8[ ]	1/2	3/4-16	1.44	7/8	13/16	.97	.42	.97	.50	1.30	7/8	1.02	908
12LMFS12[ ]	3/4	1 1/16-12	1.59	1 1/8	1 1/8	1	.66	1.16	.66	1.73	1 1/4	1.44	912
16LMFS16[ ]	1	1 5/16-12	1.88	1 7/8	1 3/8	1.31	.88	1.31	.66	1.86	1 1/2	1.73	916



Male Elbow, SAE, Positionable: LMS

connects fractional tube to SAE straight thread boss

Part Number*	T	S	Dimensions — inches A	B	C	D	E min.	G	H	H1	J Hex Flat	W	O-ring Uniform Size #
4LMS4[ ]	1/4	7/16-20	1.17	9/16	1/2	.64	.19	.84	.39	1.03	9/16	.66	904
4LMS6[ ]	1/4	9/16-18	1.31	9/16	13/16	.64	.19	.98	.44	1.25	11/16	.80	906
6LMS6[ ]	3/8	9/16-18	1.38	11/16	13/16	.72	.30	1.03	.44	1.25	11/16	.80	906
6LMS8[ ]	3/8	3/4-16	1.41	11/16	1	.72	.30	1.06	.50	1.48	7/8	1.02	908
8LMS8[ ]	1/2	3/4-16	1.59	7/8	1	.97	.42	1.13	.50	1.45	7/8	1.02	908
12LMS12[ ]	3/4	1 1/16-12	1.69	1 1/8	1 1/4	1	.66	1.25	.66	1.94	1 1/4	1.44	912
16LMS16[ ]	1	1 5/16-12	1.88	1 1/2	1 1/4	1.31	.88	1.31	.66	2.05	1 1/2	1.73	916
20LMS20[ ]	1 1/4	1 5/8-12	2.67	1 7/8	1 11/16	1.62	1.09	1.80	.66	2.29	1 7/8	2.16	920
24LMS24[ ]	1 1/2	1 7/8-12	3.07	2 1/4	2	1.97	1.34	2	.66	2.38	2 1/8	2.45	924

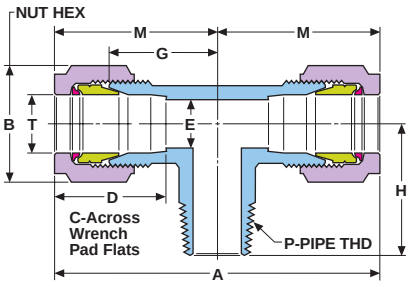
* [ ] see page 6 for material specifications.

Male Branch: TTM

connects fractional tube to female NPT theads

Part Number*	T Tube O.D.	P Male Pipe Size	Dimensions — inches A	B Hex Flat	C	D	E min	G	H	M
1TTM1[ ]	1/16	1/16	1.56	5/16	7/16	.41	.05	.56	.72	.78
2TTM2[ ]	1/8	1/8	1.94	7/16	7/16	.56	.09	.66	.72	.97
2TTM4[ ]	1/8	1/4	2	7/16	1/2	.56	.09	.69	.84	1
3TTM2[ ]	3/16	1/8	2	1/2	7/16	.59	.13	.69	.75	1
4TTM2[ ]	1/4	1/8	2.09	9/16	7/16	.64	.19	.72	.78	1.05
4TTM4[ ]	1/4	1/4	2.22	9/16	1/2	.64	.19	.78	1.03	1.11
6TTM4[ ]	3/8	1/4	2.38	11/16	1/2	.72	.30	.84	1	1.19
6TTM6[ ]	3/8	3/8	2.59	11/16	11/16	.72	.41	.94	1.13	1.30
6TTM8[ ]	3/8	1/2	2.75	11/16	13/16	.72	.30	1.03	1.31	1.38
8TTM4[ ]	1/2	1/4	2.88	7/8	11/16	.97	.28	.97	1	1.44
8TTM6[ ]	1/2	3/8	2.88	7/8	11/16	.97	.41	.97	1.13	1.44
8TTM8[ ]	1/2	1/2	3	7/8	13/16	.97	.42	1.03	1.31	1.50
10TTM6[ ]	5/8	3/8	2.94	1	13/16	1	.41	1.03	1.38	1.47
10TTM8[ ]	5/8	1/2	2.94	1	13/16	1	.50	1.03	1.38	1.47
12TTM8[ ]	3/4	1/2	3.23	1 1/8	1	1	.69	1.16	1.50	1.61
12TTM12[ ]	3/4	3/4	3.19	1 1/8	1	1	.66	1.16	1.50	1.59
14TTM12[ ]	7/8	3/4	3.44	1 1/4	1 1/4	1.06	.72	1.28	1.50	1.72
16TTM12[ ]	1	3/4	3.75	1 1/2	1 1/4	1.31	.72	1.31	1.66	1.88
16TTM16[ ]	1	1	3.75	1 1/2	1 1/4	1.31	.88	1.31	1.84	1.88

Metric fitting shown



Male Branch Tee: TTM/ME

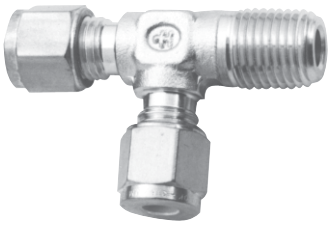
connects metric tube to female NPT threads

Part Number*	T Tube O.D.	P Male Pipe Thd.	Dimensions — mm A	B Hex Flat	C	D	E min	G	H	M
3TTM2[ ]ME	3	1/8	49.4	11.1	11.1	14.3	2.2	16.8	18.3	24.7
4TTM2[ ]ME	4	1/8	50.7	12.7	11.1	15.1	2.3	17.5	19.1	25.4
4TTM4[ ]ME	4	1/4	50.7	12.7	12.7	15.1	2.3	17.5	21.3	25.4
6TTM2[ ]ME	6	1/8	53.3	14.3	11.1	16.3	3.8	18.3	19.8	26.7
6TTM4[ ]ME	6	1/4	56.3	14.3	12.7	16.3	3.8	19.8	26.2	28.2
6TTM6[ ]ME	6	3/8	61.4	14.3	17.5	16.3	3.8	22.4	28.7	30.7
8TTM2[ ]ME	8	1/8	57.2	15.9	12.7	16.7	4.7	20.6	20.6	28.6
8TTM4[ ]ME	8	1/4	57.2	15.9	12.7	16.7	5.9	20.6	25.4	28.6
8TTM6[ ]ME	8	3/8	62.2	15.9	17.5	16.7	5.9	23.1	28.7	31.1
8TTM8[ ]ME	8	1/2	68.3	15.9	20.7	16.7	5.9	26.2	33.3	34.2
10TTM2[ ]ME	10	1/8	65.2	19.1	17.5	17.5	4.7	24.6	25.4	32.6
10TTM4[ ]ME	10	1/4	65.2	19.1	12.7	17.5	7.5	24.6	25.4	32.6
10TTM6[ ]ME	10	3/8	65.2	19.1	17.5	17.5	8.0	24.6	28.7	32.6
10TTM8[ ]ME	10	1/2	68.3	19.1	20.7	17.5	8.0	26.2	33.3	34.1
12TTM4[ ]ME	12	1/4	73.2	22.2	17.5	24.6	7.5	24.6	28.7	36.6
12TTM6[ ]ME	12	3/8	73.2	22.2	17.5	24.6	10.0	24.6	28.7	36.6
12TTM8[ ]ME	12	1/2	76.2	22.2	20.7	24.6	10.0	26.2	33.3	38.1

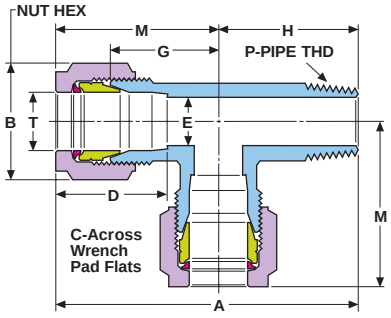
* [ ] see page 6 for material specifications.

Male Run Tee: TMT

connects fractional tube to female NPT thread



Metric fitting shown



Part Number*	T Tube O.D.	P Male NPT Size	Dimensions — inches A	B Hex Flat	C	D	E min	G	H	M
1TMT1[ ]	1/16	1/16	1.50	5/16	7/16	.41	.05	.56	.72	.78
2TMT2[ ]	1/8	1/8	1.69	7/16	7/16	.56	.09	.66	.72	.97
3TMT2[ ]	3/16	1/8	1.75	1/2	7/16	.59	.13	.69	.75	1
4TMT2[ ]	1/4	1/8	1.83	9/16	7/16	.64	.19	.72	.78	1.05
4TMT4[ ]	1/4	1/4	2.13	9/16	1/2	.64	.19	.78	1.02	1.11
6TMT4[ ]	3/8	1/4	2.19	11/16	1/2	.72	.30	.84	1	1.19
6TMT6[ ]	3/8	3/8	2.42	11/16	11/16	.72	.30	.94	1.13	1.30
8TMT6[ ]	1/2	3/8	2.56	7/8	11/16	.99	.42	.97	1.13	1.44
8TMT8[ ]	1/2	1/2	2.81	7/8	13/16	.99	.42	1.03	1.31	1.50
10TMT8[ ]	5/8	1/2	2.84	1	13/16	1	.50	1.03	1.38	1.47
12TMT12[ ]	3/4	3/4	3.09	1 1/8	1	1	.66	1.16	1.50	1.59
14TMT12[ ]	7/8	3/4	3.22	1 1/4	1 1/4	1.06	.72	1.28	1.50	1.72
16TMT12[ ]	1	3/4	3.53	1 1/2	1 1/4	1.31	.72	1.31	1.66	1.88
16TMT16[ ]	1	1	3.72	1 1/2	1 1/4	1.31	.88	1.31	1.84	1.88

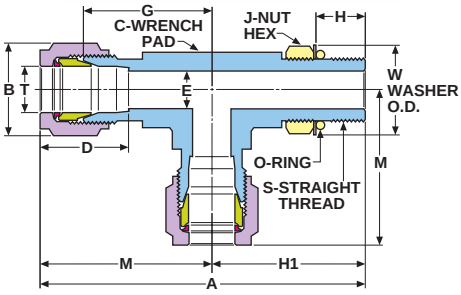
Male Run Tee: TMT/ME

connects metric tube to female NPT threads

Part Number*	T Tube O.D.	S Pipe Thd.	Dimensions — mm A	B Hex Flat	C	D	E min	G	H	M
3TMT2[ ]ME	3	1/8	43.0	11.1	11.1	14.3	2.2	16.8	18.3	24.7
6TMT2[ ]ME	6	1/8	46.4	14.3	11.1	16.3	3.8	18.2	17.8	26.6
6TMT4[ ]ME	6	1/4	54.1	14.3	12.7	16.3	3.8	19.8	25.9	28.2
6TMT6[ ]ME	6	3/8	59.4	14.3	17.5	16.3	3.8	22.4	28.7	30.7
6TMT8[ ]ME	6	1/2	67.0	14.3	20.7	16.3	3.8	25.4	33.3	33.8
8TMT2[ ]ME	8	1/8	49.3	15.9	12.7	16.7	4.7	20.6	20.6	28.6
8TMT4[ ]ME	8	1/4	58.0	15.9	17.5	16.7	5.9	21.6	25.4	32.6
10TMT2[ ]ME	10	1/8	58.0	19.1	17.5	17.5	4.7	24.6	25.4	32.6
10TMT4[ ]ME	10	1/4	61.1	19.1	17.5	17.5	7.5	24.6	25.4	32.6
10TMT6[ ]ME	10	3/8	61.3	19.1	17.5	17.5	8.0	24.6	28.7	32.6
12TMT4[ ]ME	12	1/4	61.9	22.2	17.5	24.6	7.5	24.6	25.4	36.5
12TMT8[ ]ME	12	1/2	71.5	22.2	19.8	24.6	10.0	26.2	33.3	38.2

Tee, SAE Run, Positionable: TST

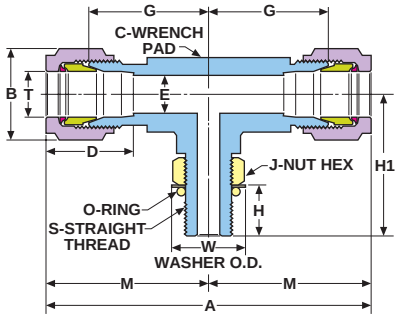
connects fractional tube to SAE straight thread boss



Part Number*	T Tube O.D.	S	Dimensions — inches A	B	C	D	E min.	G	H	H1	J Hex Flat	M	W	O-ring Uniform Size #
4TST4[ ]	1/4	7/16-20	2.13	9/16	.50	.64	.19	.78	.39	1.03	9/16	1.11	.66	904
6TST6[ ]	3/8	9/16-18	2.63	11/16	.81	.72	.30	1.03	.44	1.25	11/16	1.38	.80	906
8TST8[ ]	1/2	3/4-16	3.05	7/8	1	.97	.42	1.13	.50	1.45	7/8	1.59	1.02	908
12TST12[ ]	3/4	1 1/16-12	3.63	1 1/8	1.25	1	.66	1.25	.66	1.94	1 1/4	1.69	1.44	912
16TST16[ ]	1	1 5/16-12	3.92	1 7/8	1.25	1.31	.88	1.31	.66	2.05	1 1/2	1.88	1.73	916

Tee, SAE Branch, Positionable: TTS

connects fractional tube to SAE straight thread boss



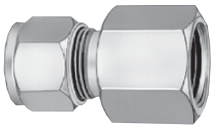
Part Number*	T Tube O.D.	S	Dimensions — inches A	B	C	D	E	G	H	H1	J Hex Flat	M	W	O-ring Uniform Size #
4TTS4[ ]	1/4	7/16-20	2.22	9/16	.50	.64	.19	.78	.39	1.03	9/16	1.11	.66	904
6TTS6[ ]	3/8	9/16-18	2.75	11/16	.81	.72	.30	1.03	.44	1.25	11/16	1.38	.80	906
8TTS8[ ]	1/2	3/4-16	3.19	7/8	1	.97	.42	1.13	.50	1.45	7/8	1.59	1.02	908
12TTS12[ ]	3/4	1 1/16-12	3.38	1 1/8	1.25	1	.66	1.25	.66	1.94	1 1/4	1.69	1.44	912
16TTS16[ ]	1	1 5/16-12	3.75	1 7/8	1.25	1.31	.88	1.31	.66	2.05	1 1/2	1.88	1.73	916

* [ ] see page 6 for material specifications.

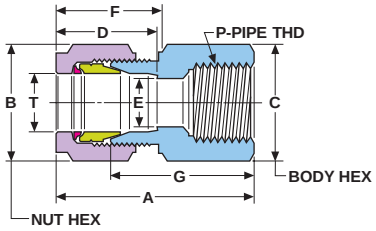
Female Connector: CF

connects fractional tube to male NPT threads

Part Number*	T Tube O.D.	P Male NPT Size	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min.	F	G
1CF1[ ]	1/16	1/16	1	5/16	7/16	.41	.05	.48	.78
1CF2[ ]	1/16	1/8	1.03	5/16	9/16	.41	.05	.48	.81
2CF2[ ]	1/8	1/8	1.19	7/16	9/16	.56	.09	.67	.88
2CF4[ ]	1/8	1/4	1.38	7/16	3/4	.56	.09	.67	1.06
3CF2[ ]	3/16	1/8	1.22	1/2	9/16	.59	.13	.70	.91
3CF4[ ]	3/16	1/4	1.41	1/2	3/4	.59	.13	.70	1.09
4CF2[ ]	1/4	1/8	1.25	9/16	9/16	.69	.19	.77	.94
4CF4[ ]	1/4	1/4	1.44	9/16	3/4	.69	.19	.77	1.13
4CF6[ ]	1/4	3/8	1.50	9/16	7/8	.69	.19	.77	1.19
4CF8[ ]	1/4	1/2	1.70	9/16	1 1/16	.69	.19	.77	1.38
6CF2[ ]	3/8	1/8	1.34	11/16	5/8	.72	.30	.83	1
6CF4[ ]	3/8	1/4	1.53	11/16	3/4	.72	.30	.83	1.19
6CF6[ ]	3/8	3/8	1.59	11/16	7/8	.72	.30	.83	1.25
6CF8[ ]	3/8	1/2	1.78	11/16	1 1/16	.72	.30	.83	1.44
6CF12[ ]	3/8	3/4	1.92	11/16	1 1/4	.72	.30	.83	1.56
8CF4[ ]	1/2	1/4	1.72	7/8	13/16	.97	.42	.92	1.25
8CF6[ ]	1/2	3/8	1.72	7/8	7/8	.97	.42	.92	1.25
8CF8[ ]	1/2	1/2	1.91	7/8	1 1/16	.97	.42	.92	1.44
8CF12[ ]	1/2	3/4	2.06	7/8	1 1/4	.97	.42	.92	1.59
8CF16[ ]	1/2	1	2.50	7/8	1 5/8	.97	.42	.92	1.94
10CF6[ ]	5/8	3/8	1.69	1	15/16	1	.50	.92	1.25
10CF8[ ]	5/8	1/2	1.88	1	1 1/16	1	.50	.92	1.44
12CF8[ ]	3/4	1/2	1.94	1 1/8	1 1/16	1	.66	.97	1.25
12CF12[ ]	3/4	3/4	2	1 1/8	1 1/4	1	.66	.97	1.56
14CF12[ ]	7/8	3/4	2	1 1/4	1 1/4	1.06	.72	.97	1.56
16CF12[ ]	1	3/4	2.19	1 1/2	1 3/8	1.31	.88	1.08	1.63
16CF16[ ]	1	1	2.53	1 1/2	1 5/8	1.31	.88	1.08	1.97
20CF20[ ]	1 1/4	1 1/4	2.98	1 7/8	2 1/8	1.62	1.09	1.53	1
24CF24[ ]	1 1/2	1 1/2	3.28	2 1/4	2 3/8	1.97	1.34	1.78	1.09
32CF32[ ]	2	2	4	3	2 7/8	2.66	1.81	2.47	1.12



Metric fitting shown



Female Connector: CF/ME

connects metric tube to male NPT threads

Part Number*	T Tube O.D.	P Male NPT Size	Dimensions—mm A	B Hex Flat	C	D	E min.	F	G
3CF2[ ]ME	3	1/8	32.1	11.1	14.5	14.3	2.2	17.1	24.1
3CF4[ ]ME	3	1/4	34.9	11.1	19.1	14.3	2.2	17.1	27.0
6CF2[ ]ME	6	1/8	31.9	14.3	14.5	16.3	3.8	19.5	23.9
6CF4[ ]ME	6	1/4	36.4	14.3	19.1	16.3	3.8	19.5	28.5
6CF6[ ]ME	6	3/8	39.6	14.3	22.2	16.3	3.8	19.5	31.2
6CF8[ ]ME	6	1/2	43.3	14.3	27.0	16.3	3.8	19.5	35.0
8CF2[ ]ME	8	1/8	32.6	15.9	14.3	16.7	5.8	19.1	24.6
8CF4[ ]ME	8	1/4	37.4	15.9	19.1	16.7	5.8	19.1	29.4
8CF6[ ]ME	8	3/8	38.2	15.9	22.2	16.7	5.8	19.1	30.2
8CF8[ ]ME	8	1/2	44.5	15.9	27.0	16.7	5.8	19.1	36.5
10CF2[ ]ME	10	1/8	33.4	19.1	17.5	17.5	7.9	19.8	25.4
10CF4[ ]ME	10	1/4	38.1	19.1	19.1	17.5	7.9	19.8	30.2
10CF6[ ]ME	10	3/8	39.7	19.1	22.2	17.5	7.9	19.8	31.8
10CF8[ ]ME	10	1/2	44.5	19.1	27.0	17.5	7.9	19.8	36.5
12CF4[ ]ME	12	1/4	43.7	22.2	20.6	24.6	9.9	23.4	31.8
12CF6[ ]ME	12	3/8	43.7	22.2	20.6	24.6	9.9	23.4	31.8
12CF8[ ]ME	12	1/2	48.5	22.2	27.0	24.6	9.9	23.4	36.5
12CF12[ ]ME	12	3/4	52.4	22.2	31.8	24.6	9.9	23.4	40.5
14CF4[ ]ME	14	1/4	41.1	23.8	23.8	22.2	11.9	21.0	31.2
14CF8[ ]ME	14	1/2	45.9	23.8	27.0	22.2	11.9	21.0	36.5
15CF8[ ]ME	15	1/2	46.3	23.8	27.0	22.2	12.7	21.8	36.0
16CF8[ ]ME	16	1/2	47.7	25.4	27.0	25.0	12.7	23.4	36.5
16CF12[ ]ME	16	3/4	53.0	25.4	32.0	25.0	12.7	23.4	41.0
18CF8[ ]ME	18	1/2	48.1	28.6	27.0	25.4	15.8	24.6	38.1
18CF12[ ]ME	18	3/4	49.8	28.6	31.8	25.4	15.8	24.6	39.9
20CF8[ ]ME	20	1/2	52.5	31.8	30.2	31.0	16.7	27.0	38.6
20CF12[ ]ME	20	3/4	53.5	31.8	31.8	31.0	16.7	27.0	39.6
22CF8[ ]ME	22	1/2	49.3	31.8	33.3	27.0	17.8	24.6	38.1
22CF12[ ]ME	22	3/4	53.8	31.8	33.3	27.0	17.8	24.6	42.7
22CF16[ ]ME	22	1	61.0	31.8	41.5	27.0	17.8	24.6	50.0
25CF8[ ]ME	25	1/2	55.8	38.1	34.9	33.3	11.9	27.4	41.4
25CF12[ ]ME	25	3/4	56.0	38.1	35.0	33.3	21.7	27.4	41.0
25CF16[ ]ME	25	1	64.4	38.1	41.3	33.3	21.7	27.4	50.0

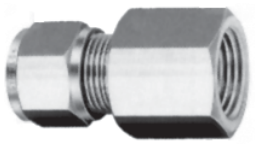
* [ ] see page 6 for material specifications.

Female Connector: CF/EZ

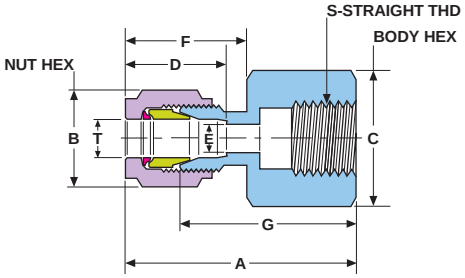
connects fractional tube with RG parallel threads

Part Number*	T Tube O.D.	S Thd. Size	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min.	F	G
2CF2[ ]EZ	1/8	1/8	1.33	7/16	5/8	.56	.09	.67	1.02
2CF4[ ]EZ	1/8	1/4	1.45	7/16	3/4	.56	.09	.67	1.14
4CF[ ]EZ	1/4	1/4	1.50	9/16	3/4	.64	.19	.77	1.17
4CF8[ ]EZ	1/4	1/2	1.89	9/16	1 1/16	.64	.19	.77	1.56
6CF4[ ]EZ	3/8	1/4	1.55	11/16	3/4	.72	.22	.83	1.20
6CF8[ ]EZ	3/8	1/2	1.78	11/16	1 1/16	.72	.28	.83	1.44
8CF4[ ]EZ	1/2	1/4	1.80	7/8	13/16	.97	.22	.92	1.33
8CF8[ ]EZ	1/2	1/2	2.05	7/8	1 1/16	.97	.28	.92	1.58

RG female thread ends require a gasket inserted into the flat bottom of the thread. The male end, when assembled, exerts pressure on the gasket, creating a seal.



Fractional fitting shown



Female Connector: CF/MZ

connects metric tube with RG parallel threads

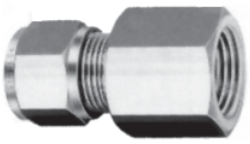
Part Number*	T Tube O.D.	S Thd. Size	Dimensions—mm A	B Hex Flat	C Hex Flat	D	E min.	F	G
3CF4[ ]MZ	3	1/4	38.1	11.1	19.0	14.3	2.4	17.1	30.1
6CF4[ ]MZ	6	1/4	39.0	14.3	22.2	16.3	4.0	19.5	30.7
6CF8[ ]MZ	6	1/2	45.3	14.3	27.0	16.3	4.0	19.5	40.0
8CF4[ ]MZ	8	1/4	35.6	15.9	19.1	16.7	5.9	19.1	27.6
8CF8[ ]MZ	8	1/2	44.8	15.9	27.0	16.7	5.9	19.1	36.8
10CF4[ ]MZ	10	1/4	36.4	19.1	19.1	17.5	5.5	19.8	28.4
10CF8[ ]MZ	10	1/2	44.9	19.1	27.0	17.5	7.0	19.8	36.9
12CF4[ ]MZ	12	1/4	46.4	22.2	22.2	24.6	5.5	23.4	34.4
12CF8[ ]MZ	12	1/2	52.3	22.2	27.0	24.6	7.0	23.4	40.4
14CF8[ ]MZ	14	1/2	49.2	23.8	27.0	22.2	7.0	21.0	39.8
16CF8[ ]MZ	16	1/2	55.5	25.4	27.0	25.0	7.0	23.4	44.4
18CF8[ ]MZ	18	1/2	56.2	28.6	30.2	25.4	7.0	24.6	46.3
20CF8[ ]MZ	20	1/2	59.3	31.8	30.2	31.0	7.0	27.0	45.5
22CF8[ ]MZ	22	1/2	56.6	31.8	30.2	27.0	7.0	24.6	45.4
25CF8[ ]MZ	25	1/2	64.9	38.1	34.9	33.3	7.0	27.4	50.5

* [ ] see page 6 for material specifications.

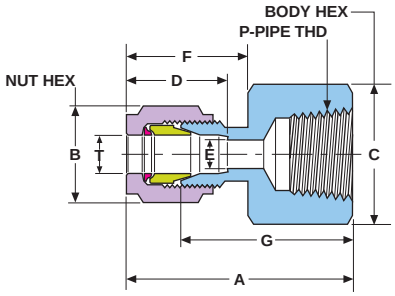
Female Connector: CF/EC

connects fractional tube with RT tapered threads

Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions—inches A	B Hex Flat	C Hex Flat	D	E min	F	G
4CF2[ ]EC	1/4	1/8	1.25	9/16	9/16	.64	.19	.77	.94
4CF4[ ]EC	1/4	1/4	1.44	9/16	3/4	.64	.19	.77	1.13
4CF6[ ]EC	1/4	3/8	1.50	9/16	7/8	.64	.19	.77	1.19
4CF8[ ]EC	1/4	1/2	1.70	9/16	1 1/16	.64	.19	.77	1.38
6CF4[ ]EC	3/8	1/4	1.53	11/16	3/4	.72	.30	.83	1.19
6CF6[ ]EC	3/8	3/8	1.59	11/16	7/8	.72	.30	.83	1.25
6CF8[ ]EC	3/8	1/2	1.78	11/16	1 1/16	.72	.30	.83	1.44
8CF4[ ]EC	1/2	1/4	1.72	7/8	13/16	.97	.42	.92	1.25
8CF6[ ]EC	1/2	3/8	1.72	7/8	7/8	.97	.42	.92	1.25
8CF8[ ]EC	1/2	1/2	1.91	7/8	1 1/16	.97	.42	.92	1.44
10CF8[ ]EC	5/8	1/2	1.88	1	1 1/16	1	.50	.92	1.44



Fractional fitting shown



Female Connector: CF/MC

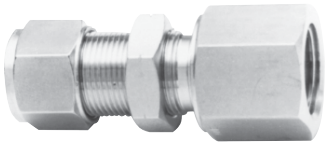
connects metric tube with RT tapered threads

Part Number* RT Threads	T Tube O.D.	P Pipe Thd.	Dimensions—mm A	B Hex Flat	C Hex Flat	D	E min	F	G
3CF2[ ]MC	3	1/8	32.1	11.1	14.5	14.3	2.2	17.1	24.1
3CF4[ ]MC	3	1/4	34.9	11.1	19.1	14.3	2.2	17.1	27.0
6CF2[ ]MC	6	1/8	31.9	14.3	14.5	16.3	3.8	19.5	23.9
6CF4[ ]MC	6	1/4	36.4	14.3	19.1	16.3	3.8	19.5	28.5
6CF6[ ]MC	6	3/8	39.6	14.3	22.2	16.3	3.8	19.5	31.2
6CF8[ ]MC	6	1/2	43.3	14.3	27.0	16.3	3.8	19.5	35.0
8CF2[ ]MC	8	1/8	32.6	15.9	14.3	16.7	5.8	19.1	24.6
8CF4[ ]MC	8	1/4	37.4	15.9	19.1	16.7	5.8	19.1	29.4
8CF6[ ]MC	8	3/8	38.2	15.9	22.2	16.7	5.8	19.1	30.2
8CF8[ ]MC	8	1/2	44.5	15.9	27.0	16.7	5.8	19.1	36.5
10CF2[ ]MC	10	1/8	33.4	19.1	17.5	17.5	7.9	19.8	25.4
10CF4[ ]MC	10	1/4	38.1	19.1	19.1	17.5	7.9	19.8	30.2
10CF6[ ]MC	10	3/8	39.7	19.1	22.2	17.5	7.9	19.8	31.8
10CF8[ ]MC	10	1/2	44.5	19.1	27.0	17.5	7.9	19.8	36.5
12CF4[ ]MC	12	1/4	43.7	22.2	20.6	24.6	9.9	23.4	31.8
12CF6[ ]MC	12	3/8	43.7	22.2	20.6	24.6	9.9	23.4	31.8
12CF8[ ]MC	12	1/2	48.5	22.2	27.0	24.6	9.9	23.4	36.5
12CF12[ ]MC	12	3/4	52.4	22.2	31.8	24.6	9.9	23.4	40.5
14CF4[ ]MC	14	1/4	41.1	23.8	23.8	22.2	11.9	21.0	31.2
14CF8[ ]MC	14	1/2	45.9	23.8	27.0	22.2	11.9	21.0	36.5
15CF8[ ]MC	15	1/2	46.3	23.8	27.0	22.2	12.7	21.8	36.0
16CF8[ ]MC	16	1/2	47.7	25.4	27.0	25.0	12.7	23.4	36.5
16CF12[ ]MC	16	3/4	53.0	25.4	32.0	25.0	12.7	23.4	41.0
18CF8[ ]MC	18	1/2	48.1	28.6	27.0	25.4	15.8	24.6	38.1
18CF12[ ]MC	18	3/4	49.8	28.6	31.8	25.4	15.8	24.6	39.9
20CF8[ ]MC	20	1/2	52.5	31.8	30.2	31.0	16.7	27.0	38.6
20CF12[ ]MC	20	3/4	53.5	31.8	31.8	31.0	16.7	27.0	39.6
22CF8[ ]MC	22	1/2	49.3	31.8	33.3	27.0	17.8	24.6	38.1
22CF12[ ]MC	22	3/4	53.8	31.8	33.3	27.0	17.8	24.6	42.7
22CF16[ ]MC	22	1	61.0	31.8	41.5	27.0	17.8	24.6	50.0
25CF8[ ]MC	25	1/2	55.8	38.1	34.9	33.3	11.9	27.4	41.4
25CF12[ ]MC	25	3/4	56.0	38.1	35.0	33.3	21.7	27.4	41.0
25CF16[ ]MC	25	1	64.4	38.1	41.3	33.3	21.7	27.4	50.0

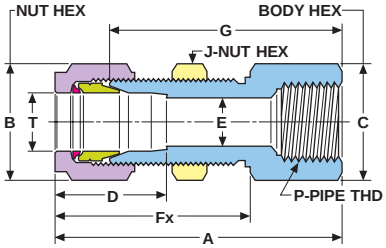
Bulkhead Connector, Female: BCF

connects fractional tube to male NPT thread

Part Number*	T Tube O.D.	P Male NPT Size	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min	Fx	G	J Hex Flat	Panel Hole Size	Max. Panel Thickness
2BCF2[ ]	1/8	1/8	1.81	7/16	9/16	.56	.09	1.28	1.50	1/2	.33	.44
4BCF2[ ]	1/4	1/8	1.89	9/16	5/8	.64	.19	1.36	1.56	5/8	.45	.47
4BCF4[ ]	1/4	1/4	2.08	9/16	3/4	.64	.19	1.40	1.75	5/8	.45	.47
6BCF2[ ]	3/8	1/8	2.22	11/16	3/4	.72	.30	1.50	1.88	3/4	.58	.53
6BCF4[ ]	3/8	1/4	2.22	11/16	3/4	.72	.30	1.50	1.88	3/4	.58	.53
6BCF6[ ]	3/8	3/8	2.28	11/16	7/8	.72	.30	1.50	.94	3/4	.58	.53
8BCF4[ ]	1/2	1/4	2.44	7/8	15/16	.97	.42	1.72	1.97	15/16	.77	.59
8BCF6[ ]	1/2	3/8	2.50	7/8	15/16	.97	.42	1.72	2.03	15/16	.77	.59
8BCF8[ ]	1/2	1/2	2.69	7/8	1 1/16	.97	.42	1.72	2.22	15/16	.77	.59
10BCF8[ ]	5/8	1/2	2.69	1	1 1/16	1	.50	1.72	2.25	1 1/16	.89	.56



Metric fitting shown



Bulkhead Connector, Female: BCF/ME

connects metric tube to male NPT threads

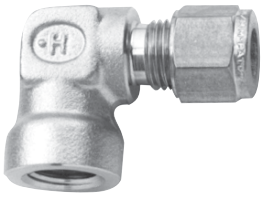
Part Number*	T Tube O.D.	P Male NPT Size	Dimensions—mm A	B Hex Flat	C Hex Flat	D	E min	Fx	G	J Hex Flat	Panel Hole Size	Max. Panel Thickness
3BCF2[ ]ME	3	1/8	46.0	11.1	14.5	14.3	2.5	32.5	38.0	12.7	8.3	12.0
6BCF2[ ]ME	6	1/8	48.0	14.3	14.3	16.3	3.9	34.6	39.6	15.9	11.5	13.0
6BCF4[ ]ME	6	1/4	53.8	14.3	19.1	16.3	3.9	34.6	45.5	15.9	11.5	13.0
8BCF4[ ]ME	8	1/4	55.0	15.9	17.5	16.7	6.0	36.5	47.0	17.5	13.1	14.0
10BCF4[ ]ME	10	1/4	55.6	19.1	19.1	17.5	7.9	37.3	47.6	19.1	16.5	14.0
12BCF6[ ]ME	12	3/8	63.0	22.2	24.0	24.6	10.0	44.0	52.0	23.8	19.5	16.0
12BCF8[ ]ME	12	1/2	68.3	22.2	26.9	24.6	9.9	43.7	56.4	23.8	19.5	16.0
14BCF8[ ]ME	14	1/2	68.0	23.8	24.0	22.2	12.0	41.1	56.0	23.8	19.5	16.0
16BCF8[ ]ME	16	1/2	68.3	25.4	26.9	25.0	12.6	43.7	57.2	27.0	22.5	14.0
18BCF8[ ]ME	18	1/2	72.0	28.6	30.0	25.4	12.6	48.0	61.0	30.2	26.0	17.0
22BCF8[ ]ME	22	1/2	77.0	31.8	33.5	27.0	12.6	53.0	65.0	33.3	29.5	24.0
25BCF8[ ]ME	25	1/2	84.0	38.1	40.0	33.3	12.6	60.0	70.0	39.7	33.8	24.0

* [ ] see page 6 for material specifications.

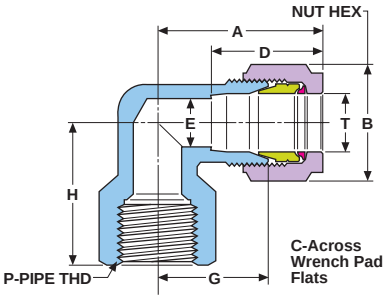
Female Elbow: LF

connects fractional tube to male NPT threads

Part Number*	T Tube O.D.	P Pipe Size	Dimensions — inches A	B Hex Flat	C	D	E min	G	H
1LF1[ ]	1/16	1/16	.78	5/16	7/16	.41	.05	.56	.75
1LF2[ ]	1/16	1/8	.84	5/16	1/2	.41	.05	.63	.75
2LF2[ ]	1/8	1/8	1	7/16	1/2	.56	.09	.69	.75
2LF4[ ]	1/8	1/4	1.13	7/16	11/16	.56	.09	.81	.84
3LF2[ ]	3/16	1/8	1.03	1/2	1/2	.59	.13	.72	.75
4LF2[ ]	1/4	1/8	1.08	9/16	1/2	.64	.19	.75	.81
4LF4[ ]	1/4	1/4	1.20	9/16	11/16	.64	.19	.88	.84
4LF6[ ]	1/4	3/8	1.33	9/16	13/16	.64	.19	1	.84
4LF8[ ]	1/4	1/2	1.45	9/16	1	.64	.19	1.13	1.13
6LF2[ ]	3/8	1/8	1.81	11/16	1/2	.72	.30	.84	.69
6LF4[ ]	3/8	1/4	1.28	11/16	11/16	.72	.30	.94	.84
6LF6[ ]	3/8	3/8	1.38	11/16	13/16	.72	.30	1.03	.84
6LF8[ ]	3/8	1/2	1.48	11/16	1	.72	.30	1.13	1.13
8LF4[ ]	1/2	1/4	1.44	7/8	11/16	.97	.42	.97	.91
8LF6[ ]	1/2	3/8	1.50	7/8	13/16	.97	.42	1.03	.91
8LF8[ ]	1/2	1/2	1.59	7/8	1	.97	.42	1.13	1.13
8LF12[ ]	1/2	3/4	1.66	7/8	1 1/4	.97	.42	1.19	1.25
10LF6[ ]	5/8	3/8	1.47	1	13/16	1	.50	1.03	.91
10LF8[ ]	5/8	1/2	1.56	1	1	1	.50	1.13	1.13
12LF8[ ]	3/4	1/2	1.59	1 1/8	1	1	.66	1.16	1.13
12LF12[ ]	3/4	3/4	1.34	1 1/8	1 1/4	1	.66	1.25	1.25
14LF12[ ]	7/8	3/4	1.69	1 1/4	1 1/4	1.06	.72	1.25	1.25
16LF12[ ]	1	3/4	1.88	1 1/2	1 1/4	1.31	.88	1.31	1.25
16LF16[ ]	1	1	2.06	1 1/2	1 11/16	1.31	.88	1.50	1.50



Metric fitting shown



Female Elbow: LF/ME, LF/MC

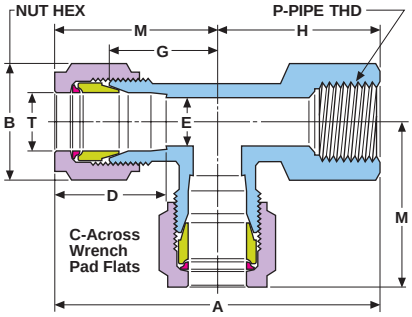
connects metric tube to male NPT or RT tapered threads

Part Number* NPT Threads	Part Number* RT Threads	T Tube O.D.	P Pipe Size	Dimensions—mm A	B Hex Flat	C	D	E min	G	H
3LF2[ ]ME	3LF2[ ]MC	3	1/8	25.5	11.1	12.6	14.3	2.2	17.5	17.1
3LF4[ ]ME	3LF4[ ]MC	3	1/4	25.0	11.1	12.6	14.3	2.3	17.5	21.5
4LF4[]ME	4LF4[ ]MC	4	1/4	30.2	12.7	17.3	15.1	2.3	22.4	21.3
6LF2[ ]ME	6LF2[ ]MC	6	1/8	27.4	14.3	12.6	16.3	3.8	19.1	20.6
6LF4[ ]ME	6LF4[ ]MC	6	1/4	30.7	14.3	17.3	16.3	3.8	22.4	21.3
6LF6[ ]ME	6LF6[ ]MC	6	3/8	33.8	14.3	20.5	16.3	3.8	25.4	21.3
6LF8[ ]ME	6LF8[ ]MC	6	1/2	37.1	14.3	25.3	16.3	3.8	28.7	28.7
8LF2[ ]ME	8LF2[ ]MC	8	1/8	27.8	15.9	12.6	16.7	5.8	19.8	16.0
8LF4[ ]ME	8LF4[ ]MC	8	1/4	31.1	15.9	17.3	16.7	5.8	23.1	22.4
8LF6[ ]ME	8LF6[ ]MC	8	3/8	29.0	15.9	20.5	16.7	5.8	23.1	23.1
10LF2[ ]ME	10LF2[ ]MC	10	1/8	31.9	19.1	17.3	17.5	7.9	23.9	21.3
10LF4[ ]ME	10LF4[ ]MC	10	1/4	31.9	19.1	17.3	17.5	7.9	23.9	21.3
10LF6[ ]ME	10LF6[ ]MC	10	3/8	34.1	19.1	20.5	17.5	7.9	26.2	21.3
10LF8[ ]ME	10LF8[ ]MC	10	1/2	36.7	19.1	25.3	17.5	7.9	28.7	28.7
12LF4[ ]ME	12LF4[ ]MC	12	1/4	36.6	22.2	17.3	24.6	7.5	24.6	21.3
12LF6[ ]ME	12LF6[ ]MC	12	3/8	38.1	22.2	20.5	24.6	9.9	26.2	23.1
12LF8[ ]ME	12LF8[ ]MC	12	1/2	40.6	22.2	25.3	24.6	9.9	28.7	28.7
14LF8[ ]ME	14LF8[ ]MC	14	1/2	37.0	23.8	21.0	22.2	12.0	25.0	28.5
16LF8[ ]ME	16LF8[ ]MC	16	1/2	40.9	25.4	25.3	25.0	12.7	29.7	28.7
18LF8[ ]ME	18LF8[ ]MC	18	1/2	39.4	28.6	25.3	25.4	15.8	29.5	28.7
18LF12[ ]ME	18LF12[ ]MC	18	3/4	41.7	28.6	31.6	25.4	15.8	31.8	31.8
22LF8[ ]ME	22LF8[ ]MC	22	1/2	44.0	31.8	25.3	27.0	17.9	29.5	28.5
22LF12[ ]ME	22LF12[ ]MC	22	3/4	44.0	31.8	31.6	27.0	17.9	33.5	32.0
25LF12[ ]ME	25LF12[ ]MC	25	3/4	47.5	38.1	31.6	33.3	21.7	33.5	32.0
25LF16[ ]ME	25LF16[ ]MC	25	1	52.0	38.1	38.5	33.3	21.7	38.0	38.0

Female Run Tee: TFT

connects fractional tube to male NPT threads

Fractional fitting shown



Part Number*	T Tube O.D.	P Pipe Size	Dimensions — inches A	B Hex Flat	C	D	E min	G	H	M
1TFT1 [ ]	1/16	1/16	1.53	5/16	7/16	.41	.05	.56	.75	.78
2TFT2 [ ]	1/8	1/8	1.75	7/16	1/2	.56	.09	.69	.75	1
3TFT2 [ ]	3/16	1/8	1.81	1/2	1/2	.59	.13	.75	.75	1.06
4TFT2 [ ]	1/4	1/8	1.83	9/16	1/2	.64	.19	.75	.75	1.08
4TFT4 [ ]	1/4	1/4	2.11	9/16	11/16	.64	.19	.94	.84	1.27
6TFT4 [ ]	3/8	1/4	2.23	11/16	11/16	.72	.30	.94	.84	1.28
6TFT6 [ ]	3/8	3/8	2.30	11/16	13/16	.72	.30	1.03	.91	1.39
8TFT4 [ ]	1/2	1/4	2.41	7/8	11/16	.97	.42	.97	.97	1.44
8TFT6 [ ]	1/2	3/8	2.53	7/8	13/16	.97	.42	1.03	.91	1.50
8TFT8 [ ]	1/2	1/2	2.66	7/8	1	.97	.42	1.06	1.13	1.53
10TFT8 [ ]	5/8	1/2	2.69	1	1	1	.50	1.13	1.13	1.56
12TFT8 [ ]	3/4	1/2	2.73	1 1/8	1	1	.66	1.16	1.13	1.61
12TFT12 [ ]	3/4	3/4	2.94	1 1/8	1 1/4	1	.66	1.25	1.25	1.69
14TFT12 [ ]	7/8	3/4	2.94	1 1/4	1 1/4	1.06	.72	1.25	1.25	1.69
16TFT12 [ ]	1	3/4	3.13	1 1/2	1 1/4	1.31	.88	1.94	1.25	1.88
16TFT16 [ ]	1	1	3.56	1 1/2	1 11/16	1.31	.88	1.50	1.50	2.06

Female Run Tee: TFT/ME

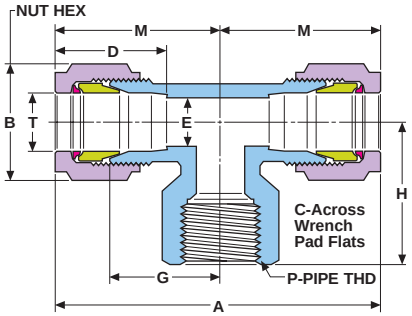
connects metric tube to male NPT threads

Part Number*	T Tube O.D.	S Pipe Thd.	Dimensions — mm A	B Hex Flat	C	D	E min	G	H	M
3TFT2[ ]ME	3	1/8	44.0	11.1	12.7	14.3	3.3	17.5	19.1	25.5
6TFT2[ ]ME	6	1/8	46.5	14.3	12.7	16.3	3.8	19.1	19.1	27.4
6TFT4[ ]ME	6	1/4	52.1	14.3	17.5	16.3	3.8	22.4	21.3	30.7
6TFT8[ ]ME	6	1/2	63.2	14.3	25.4	16.3	3.8	26.2	28.7	34.5
10TFT2[ ]ME	10	1/8	57.3	19.1	17.5	17.5	7.9	24.6	24.6	32.6
10TFT4[ ]ME	10	1/4	57.3	19.1	17.5	17.5	7.9	24.6	24.6	32.6
10TFT6[ ]ME	10	3/8	57.3	19.1	20.7	17.5	7.9	26.2	23.1	34.1
10TFT8[ ]ME	10	1/2	63.6	19.1	25.4	17.5	7.9	26.9	28.7	34.9
12TFT4[ ]ME	12	1/4	56.0	22.2	17.5	24.6	9.9	23.0	21.3	30.7
12TFT8[ ]ME	12	1/2	67.5	22.2	25.4	24.6	9.9	27.0	28.6	38.9

Female Branch Tee: TTF

connects fractional tube to male NPT threads

Fractional fitting shown



Part Number*	T Tube O.D.	P Pipe Size	Dimensions — inches A	B Hex Flat	C	D	E min	G	H	M
1TTF1 [ ]	1/16	1/16	1.56	5/16	7/16	.41	.05	.56	.75	.78
2TTF2 [ ]	1/8	1/8	2	7/16	1/2	.56	.09	.69	.75	1
3TTF2 [ ]	3/16	1/8	2.13	1/2	1/2	.59	.13	.75	.75	1.06
4TTF2 [ ]	1/4	1/8	2.16	9/16	1/2	.64	.19	.75	.75	1.08
4TTF4 [ ]	1/4	1/4	2.53	9/16	11/16	.64	.19	.94	.84	1.27
6TTF4 [ ]	3/8	1/4	2.56	11/16	11/16	.72	.30	.94	.84	1.28
6TTF6 [ ]	3/8	3/8	2.78	11/16	13/16	.72	.30	1.03	.91	1.39
6TTF8 [ ]	3/8	1/2	2.47	11/16	1	.72	.30	1.06	1.13	1.41
8TTF4 [ ]	1/2	1/4	2.88	7/8	11/16	.97	.42	.97	.91	1.44
8TTF6 [ ]	1/2	3/8	3	7/8	13/16	.97	.42	1.03	.91	1.50
8TTF8 [ ]	1/2	1/2	3.06	7/8	1	.97	.42	1.06	1.13	1.53
10TTF8 [ ]	5/8	1/2	3.13	1	1	1	.50	1.13	1.13	1.56
12TTF8 [ ]	3/4	1/2	3.20	1 1/8	1	1	.66	1.16	1.13	1.61
12TTF12 [ ]	3/4	3/4	3.38	1 1/8	1 1/4	1	.66	1.25	1.25	1.69
14TTF12 [ ]	7/8	3/4	3.44	1 1/4	1 1/4	1.06	.72	1.25	1.25	1.72
16TTF12 [ ]	1	3/4	3.75	1 1/2	1 1/4	1.31	.88	1.31	1.25	1.88
16TTF16 [ ]	1	1	4.13	1 1/2	1 11/16	1.31	.88	1.50	1.50	2.06

Female Branch Tee: TTF/ME

connects metric tube to male NPT threads

Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions—mm A	B Hex Flat	C	D	E min	G	H	M
3TTF2[ ]ME	3	1/8	51.0	11.1	12.7	14.3	2.3	17.5	19.1	25.5
4TTF2[ ]ME	4	1/8	50.7	12.7	12.7	15.1	2.3	17.5	19.1	25.4
4TTF4[ ]ME	4	1/4	60.3	12.7	17.5	15.1	2.3	22.4	21.3	30.2
6TTF2[ ]ME	6	1/8	54.8	14.3	12.7	16.3	3.8	19.1	19.1	27.4
6TTF4[ ]ME	6	1/4	61.4	14.3	17.5	16.3	3.8	22.4	21.3	30.7
6TTF6[ ]ME	6	3/8	67.5	14.3	20.7	16.3	3.8	25.4	23.1	33.8
6TTF8[ ]ME	6	1/2	69.0	14.3	25.4	16.3	3.8	26.2	28.7	34.5
8TTF2[ ]ME	8	1/8	55.6	15.9	12.7	16.7	5.8	19.8	19.1	27.8
8TTF4[ ]ME	8	1/4	62.2	15.9	17.5	16.7	5.8	23.1	22.4	31.1
10TTF2[ ]ME	10	1/8	62.2	19.1	17.5	17.5	7.9	24.6	23.1	32.6
10TTF4[ ]ME	10	1/4	62.2	19.1	17.5	17.5	7.9	24.6	23.1	32.6
10TTF6[ ]ME	10	3/8	68.3	19.1	20.7	17.5	7.9	26.2	23.1	34.1
10TTF8[ ]ME	10	1/2	69.8	19.1	25.4	17.5	7.9	26.9	28.7	34.9
12TTF4[ ]ME	12	1/4	73.0	22.2	20.7	24.6	10.0	24.6	23.1	36.6
12TTF8[ ]ME	12	1/2	81.3	22.2	25.4	24.6	10.0	28.7	28.7	40.6
16TTF8[ ]ME	16	1/2	81.7	25.4	25.4	25.0	12.7	29.7	28.7	40.9

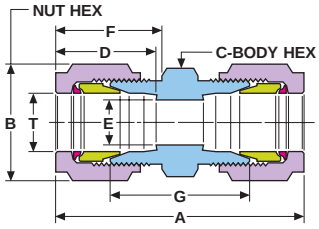
* [ ] see page 6 for material specifications.

Union: U

connects fractional tubes

Part Number*	T Tube O.D.	Dimensions — inches A	B	C	D	E min.	F	G
1U [ ]	1/16	1.13	5/16	5/16	.41	.05	.48	.69
2U [ ]	1/8	1.50	7/16	7/16	.56	.09	.67	.88
3U [ ]	3/16	1.61	1/2	7/16	.59	.13	.70	.98
4U [ ]	1/4	1.75	9/16	1/2	.64	.19	.77	1.09
6U [ ]	3/8	1.89	11/16	5/8	.72	.30	.83	1.20
8U [ ]	1/2	2.16	7/8	13/16	.97	.42	.92	1.22
10U [ ]	5/8	2.16	1	15/16	1	.50	.92	1.28
12U [ ]	3/4	2.28	1 1/8	1 1/16	1	.66	.97	1.41
14U [ ]	7/8	2.28	1 1/4	1 3/16	1.06	.72	.97	1.41
16U [ ]	1	2.73	1 1/2	1 3/8	1.31	.88	1.08	1.59
20U [ ]	1 1/4	3.63	1 7/8	1 3/4	1.62	1.09	1.53	1.89
24U [ ]	1 1/2	4.25	2 1/4	2 1/8	1.97	1.34	1.78	2.11
32U [ ]	2	5.88	3	2 3/4	2.66	1.81	2.47	2.94

Fractional fitting shown



Union: U/MM

connects metric tubes

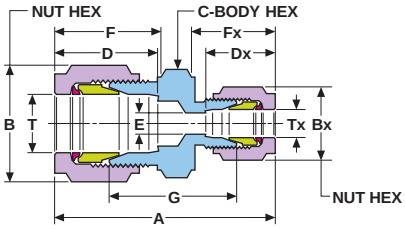
Part Number*	T Tube O.D.	Dimensions — mm A	B Hex Flat	C Hex Flat	D	E min.	F	G
3U[ ]MM	3	40.8	11.1	11.1	14.3	2.2	17.1	24.9
4U[ ]MM	4	42.7	12.7	11.1	15.1	2.2	17.9	27.0
6U[ ]MM	6	45.7	14.3	12.7	16.3	3.8	19.5	28.9
8U[ ]MM	8	45.6	15.9	14.3	16.7	5.8	19.1	29.6
10U[ ]MM	10	46.9	19.1	17.5	17.5	7.9	19.8	30.9
12U[ ]MM	12	54.8	22.2	20.6	24.6	9.9	23.4	30.9
14U[ ]MM	14	50.5	23.8	22.2	22.2	11.9	21.0	31.8
15U[ ]MM	15	42.1	23.8	22.2	22.2	12.7	21.8	31.8
16U[ ]MM	16	54.8	25.4	23.8	25.0	12.7	23.4	32.5
18U[ ]MM	18	55.6	28.6	27.0	25.4	15.8	24.6	35.7
20U[ ]MM	20	63.5	31.8	30.2	31.0	16.7	27.0	35.8
22U[ ]MM	22	60.3	31.8	30.2	27.0	19.9	24.6	37.9
25U[ ]MM	25	69.3	38.1	34.9	33.3	21.7	27.4	40.5
30U[ ]MM	30	92.7	50.8	46	39.6	26.2	39.2	49.5
32U[ ]MM	32	97.3	50.8	46	42	28.6	41.6	51.3
38U[ ]MM	38	113.6	60.3	55	49.4	33.7	47.9	58.4

* [ ] see page 6 for material specifications.

Reducing Union: RU connects fractional tubes

Part Number*	T Tube O.D.	Tx Tube O.D.	Dimensions — inches A	B Hex Flat	Bx Hex Flat	C Hex Flat	D	Dx	E min	F	Fx	G
2RU1 [ ]	1/8	1/16	1.30	7/16	5/16	7/16	.56	.41	.05	.67	.48	.77
3RU1 [ ]	3/16	1/16	1.34	1/2	5/16	7/16	.59	.41	.05	.70	.48	.81
3RU2 [ ]	3/16	1/8	1.55	1/2	7/16	7/16	.59	.56	.09	.70	.67	.92
4RU1 [ ]	1/4	1/16	1.48	9/16	5/16	1/2	.64	.41	.05	.77	.48	.94
4RU2 [ ]	1/4	1/8	1.66	9/16	7/16	1/2	.64	.56	.09	.77	.67	1.02
4RU3 [ ]	1/4	3/16	1.67	9/16	1/2	1/2	.64	.70	.13	.77	.70	1.03
6RU1 [ ]	3/8	1/16	1.50	11/16	5/16	5/8	.72	.41	.05	.83	.48	.94
6RU2 [ ]	3/8	1/8	1.77	11/16	7/16	5/8	.72	.56	.09	.83	.67	1.09
6RU4 [ ]	3/8	1/4	1.83	11/16	9/16	5/8	.72	.64	.19	.83	.77	1.16
8RU2 [ ]	1/2	1/8	1.94	7/8	7/16	13/16	.97	.56	.09	.92	.67	1.16
8RU4 [ ]	1/2	1/4	1.95	7/8	9/16	13/16	.97	.64	.19	.92	.77	1.16
8RU6 [ ]	1/2	3/8	2.03	7/8	11/16	13/16	.97	.72	.30	.92	.83	1.22
10RU6 [ ]	5/8	3/8	2.05	1	11/16	15/16	1	.72	.30	.92	.83	1.25
10RU8 [ ]	5/8	1/2	2.16	1	7/8	15/16	1	.97	.42	.92	.92	1.25
12RU4 [ ]	3/4	1/4	2.16	1 1/8	9/16	1 1/16	1	.64	.19	.97	.77	1.36
12RU6 [ ]	3/4	3/8	2.22	1 1/8	11/16	1 1/16	1	.72	.30	.97	.83	1.41
12RU8 [ ]	3/4	1/2	2.25	1 1/8	7/8	1 1/16	1	.97	.42	.97	.92	1.34
12RU10 [ ]	3/4	5/8	2.25	1 1/8	1	1 1/16	1	1	.50	.97	.92	1.38
14RU12 [ ]	7/8	3/4	2.33	1 1/4	1 1/8	1 3/16	1.06	1	.66	.97	.97	1.44
16RU8 [ ]	1	1/2	2.61	1 1/2	7/8	1 3/8	1.31	.97	.42	1.08	.92	1.56
16RU12 [ ]	1	3/4	2.55	1 1/2	1 1/8	1 3/8	1.31	1	.66	1.08	.97	1.53
16RU14 [ ]	1	7/8	2.58	1 1/2	1 1/4	1 3/8	1.31	1.06	.72	1.08	.97	1.56
32RU24 [ ]	2	1 1/2	5.18	3	2 1/4	2 3/4	2.64	1.97	1.34	2.46	1.78	2.65

Fractional fitting shown

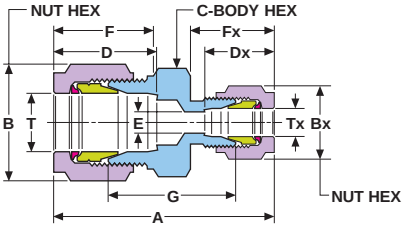


Reducing Union: RU/MM connects metric tubes

Part Number*	T Tube O.D.	Tx Tube O.D	Dimensions — mm A	B Hex Flat	Bx Hex Flat	C Hex Flat	D	Dx	E min	F	Fx	G
4RU3[ ]MM	4	3	41.6	12.7	11.1	11.1	15.1	14.3	2.2	17.9	17.1	25.8
6RU3[ ]MM	6	3	43.2	14.3	11.1	12.7	16.3	14.3	2.2	19.5	17.1	26.9
6RU4[ ]MM	6	4	44.0	14.3	12.7	12.7	16.3	15.1	2.3	19.5	17.9	27.8
8RU4[ ]MM	8	4	43.6	15.9	12.7	14.3	16.7	15.1	2.3	19.1	17.9	27.6
8RU6[ ]MM	8	6	46.1	15.9	14.3	14.3	16.7	16.3	3.8	19.1	19.5	29.7
10RU6[ ]MM	10	6	46.2	19.1	14.3	17.5	17.5	16.3	3.8	19.8	19.5	29.9
10RU8[ ]MM	10	8	45.7	19.1	15.9	17.5	17.5	16.7	5.8	19.8	19.1	29.7
12RU6[ ]MM	12	6	49.7	22.2	14.3	20.6	24.6	16.3	3.8	23.4	19.5	29.4
12RU8[ ]MM	12	8	50.4	22.2	15.9	20.6	24.6	16.7	5.8	23.4	19.1	30.5
12RU10[ ]MM	12	10	50.9	22.2	19.1	20.6	24.6	17.5	7.9	23.4	19.8	30.9
14RU8[ ]MM	14	8	47.2	23.8	15.9	22.2	22.2	16.7	5.8	21.0	19.1	29.8
14RU10[ ]MM	14	10	48.3	23.8	19.1	22.2	22.2	17.5	7.9	21.0	19.8	30.9
14RU12[ ]MM	14	12	52.3	23.8	22.2	22.2	22.2	24.6	9.9	21.0	23.4	30.9
16RU10[ ]MM	16	10	50.9	25.4	19.1	23.8	25.0	17.5	7.9	23.4	19.8	31.8
16RU12[ ]MM	16	12	54.8	25.4	22.2	23.8	25.0	24.6	9.9	23.4	23.4	31.8
18RU12[ ]MM	18	12	57.5	28.6	22.2	27.0	25.4	24.6	9.9	24.6	23.4	35.6
18RU16[ ]MM	18	16	57.4	28.6	25.4	27.0	25.4	25.0	12.7	24.6	23.4	36.3
22RU12[ ]MM	22	12	59.5	31.8	22.2	30.1	27.0	24.6	9.9	24.6	23.4	36.3
22RU18[ ]MM	22	18	61.1	31.8	28.6	34.9	27.0	25.4	15.8	24.6	24.6	40.0
25RU12[ ]MM	25	12	66.0	38.1	22.2	34.9	33.3	24.6	9.9	27.4	23.4	39.6
25RU18[ ]MM	25	18	64.0	38.1	28.6	34.9	33.3	25.4	15.8	27.4	24.6	39.6

Reducing Union: RU/ME connects metric tubes to fractional tubes

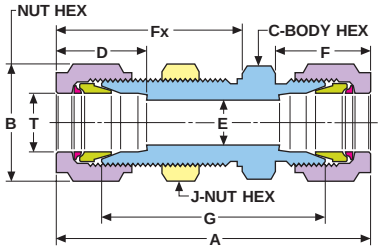
Part Number*	T Tube O.D.	Tx Tube O.D	Dimensions — mm A	B Hex Flat	Bx Hex Flat	C Hex Flat	D	Dx	E min	F	Fx	G
3RU1[ ]ME	3	1/16	36.1	11.1	7.9	11.1	14.3	10.3	1.2	17.1	12.3	22.6
3RU2[ ]ME	3	1/8	38.0	11.1	11.1	11.1	14.3	14.3	2.2	17.1	17.1	22.0
3RU4[ ]ME	3	1/4	42.5	11.1	14.3	12.5	14.3	16.3	2.5	17.1	19.5	26.0
4RU2[ ]ME	4	1/8	40.6	12.7	11.1	11.1	15.1	14.3	2.2	17.9	17.1	24.8
4RU4[ ]ME	4	1/4	43.0	12.7	14.3	12.7	15.1	16.3	2.2	17.9	19.5	26.0
6RU1[ ]ME	6	1/16	37.5	14.3	7.9	12.7	16.3	10.3	1.2	19.5	12.3	23.5
6RU2[ ]ME	6	1/8	43.2	14.3	11.1	12.7	16.3	14.3	2.2	19.5	17.1	26.9
6RU4[ ]ME	6	1/4	44.7	14.3	14.3	12.7	16.3	16.3	3.8	19.5	19.5	27.9
6RU8[ ]ME	6	1/2	49.7	14.3	22.2	20.6	16.3	24.6	3.8	19.5	23.4	29.4
8RU2[ ]ME	8	1/8	42.9	15.9	11.1	14.3	16.7	14.3	2.2	19.1	17.1	26.9
8RU3[ ]ME	8	3/16	43.2	15.9	12.7	14.3	16.7	15.1	3.1	19.1	17.9	27.2
8RU4[ ]ME	8	1/4	44.8	15.9	14.3	14.3	16.7	16.3	4.6	19.1	19.5	28.5
8RU6[ ]ME	8	3/8	42.7	15.9	17.5	15.9	16.7	18.3	5.9	19.5	23.4	29.4
8RU8[ ]ME	8	1/2	50.9	15.9	22.2	20.6	16.7	24.6	5.8	19.1	23.4	31.0
8RU10[ ]ME	8	5/8	50.1	15.9	25.4	23.8	16.7	25.4	5.8	19.1	23.4	31.0
10RU2[ ]ME	10	1/8	43.5	19.1	11.1	17.5	17.5	14.3	2.3	19.8	17.1	27.5
10RU4[ ]ME	10	1/4	46.8	19.1	14.3	17.5	17.5	16.3	4.6	19.8	19.5	30.5
10RU6[ ]ME	10	3/8	46.8	19.1	17.5	17.5	17.5	18.3	7.4	19.8	21.0	30.0
10RU8[ ]ME	10	1/2	50.3	19.1	22.2	20.6	17.5	24.6	7.9	19.8	23.4	30.4
10RU10[ ]ME	10	5/8	50.9	19.1	25.4	23.8	17.5	25.4	7.9	19.8	23.4	31.8
12RU4[ ]ME	12	1/4	49.5	22.2	14.3	20.6	24.6	16.3	4.8	23.4	19.5	29.5
12RU6[ ]ME	12	3/8	50.1	22.2	17.5	20.6	24.6	18.3	7.4	23.4	21.0	29.4
12RU8[ ]ME	12	1/2	54.9	22.2	22.2	20.6	24.6	24.6	9.9	23.4	23.4	31.0
16RU10[ ]ME	16	5/8	55.0	25.4	25.4	23.8	25.0	25.4	12.7	23.4	23.4	32.5
16RU12[ ]ME	16	3/4	57.5	25.4	28.6	27.0	25.0	25.4	12.7	23.4	24.6	35.0
18RU12[ ]ME	18	3/4	57.0	28.6	28.6	27.0	25.4	25.4	15.8	24.6	24.6	35.5



Bulkhead Union: BU connects fractional tubes

Part Number*	T Tube O.D.	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min.	F	Fx	G	J Hex Flat	Panel Hole Size	Max. Panel Thickness
1BU [ ]	1/16	1.50	5/16	7/16	.41	.05	.48	.91	1	3/8	.20	11/32
2BU [ ]	1/8	2.13	7/16	1/2	.56	.09	.67	1.19	1.50	1/2	.33	7/16
3BU [ ]	3/16	2.22	1/2	9/16	.59	.13	.70	1.31	1.59	9/16	.39	15/32
4BU [ ]	1/4	2.34	9/16	5/8	.64	.19	.77	1.36	1.69	5/8	.45	15/32
6BU [ ]	3/8	2.56	11/16	3/4	.72	.30	.83	1.50	1.88	3/4	.58	17/32
8BU [ ]	1/2	2.94	7/8	15/16	.97	.42	.92	1.72	2	15/16	.77	19/32
10BU [ ]	5/8	2.94	1	1 1/16	1	.50	.92	1.72	2.06	1 1/16	.89	9/16
12BU [ ]	3/4	3.19	1 1/8	1 3/16	1	.66	.97	1.91	2.31	1 3/16	1.02	21/32
14BU [ ]	7/8	3.41	1 1/4	1 5/16	1.06	.72	.97	2.09	2.53	1 5/16	1.14	25/32
16BU [ ]	1	3.95	1 1/2	1 9/16	1.31	.88	1.08	2.34	2.81	1 9/16	1.33	1 1/32
24BU [ ]	1 1/2	5.48	2 1/4	2 1/4	1.97	1.34	1.78	3.01	3.34	2 1/4	1.95	3/4
32BU [ ]	2	7.10	3	2 3/4	2.66	1.81	2.47	3.69	4.16	3	2.64	3/4

Fractional fitting shown



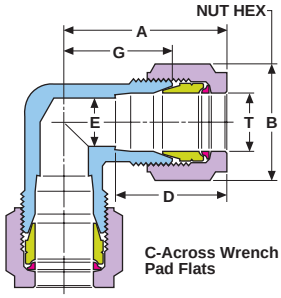
Bulkhead Union: BU/MM connects metric tubes

Part Number*	T Tube O.D.	Dimensions — mm A	B Hex Flat	C Hex Flat	D	E min.	F	Fx	G	J Hex Flat	Panel Hole Size	Max. Panel Thickness
3BU[ ]MM	3	56.3	11.1	12.7	14.3	2.2	17.1	32.5	40.4	12.7	8.3	12.0
4BU[ ]MM	4	58.1	12.7	14.3	15.1	2.3	17.9	33.2	42.4	14.3	10.0	12.0
6BU[ ]MM	6	60.8	14.3	15.9	16.3	3.8	19.5	34.6	44.1	15.9	11.5	13.0
8BU[ ]MM	8	64.0	15.9	17.5	16.7	5.8	19.1	36.6	48.0	17.5	13.1	14.0
10BU[ ]MM	10	64.2	19.1	19.1	17.5	7.9	19.8	37.3	48.2	19.1	16.5	14.0
12BU[ ]MM	12	74.7	22.2	23.8	24.6	9.9	23.4	43.7	50.8	23.8	19.5	16.0
14BU[ ]MM	14	69.6	23.8	25.4	22.2	11.9	21.0	41.1	50.8	23.8	21.0	16.0
15BU[ ]MM	15	72.5	23.8	25.4	22.2	12.7	21.8	42.1	51.9	23.8	21.0	16.0
16BU[ ]MM	16	74.7	25.4	27.0	25.0	12.7	23.4	43.7	52.4	27.0	22.5	14.0
18BU[ ]MM	18	78.7	28.6	30.2	25.4	15.8	24.6	48.0	58.7	30.2	26.0	17.0
20BU[ ]MM	20	92.0	31.8	33.3	31.0	16.7	27.0	41.8	64.3	33.3	29.0	20.0
22BU[ ]MM	22	89.0	31.8	33.3	27.0	17.9	24.6	53.0	66.6	33.3	29.5	24.0
25BU[ ]MM	25	100.7	38.1	39.7	33.3	21.7	27.4	60.0	71.9	39.7	33.8	24.0

* [ ] see page 6 for material specifications.

Union Elbow: LU connects fractional tubes

Metric fitting shown



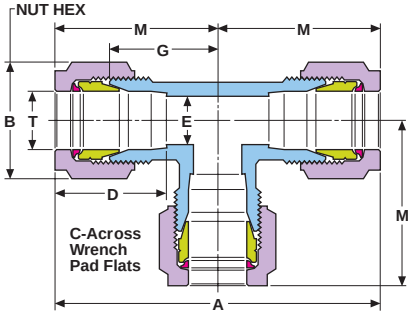
Part Number*	T Tube O.D.	A	B Hex Flat	C	D	E min	G
1LU [ ]	1/16	.78	5/16	7/16	.41	.05	.56
2LU [ ]	1/8	.97	7/16	7/16	.56	.09	.66
3LU [ ]	3/16	1	1/2	7/16	.59	.13	.69
4LU [ ]	1/4	1.05	9/16	7/16	.64	.19	.72
6LU [ ]	3/8	1.19	11/16	1/2	.72	.30	.84
8LU [ ]	1/2	1.44	7/8	11/16	.97	.42	.97
10LU [ ]	5/8	1.47	1	13/16	1	.50	.03
12LU [ ]	3/4	1.59	1 1/8	1	1	.66	.16
14LU [ ]	7/8	1.72	1 1/4	1 1/4	1.06	.72	.28
16LU [ ]	1	1.88	1 1/2	1 1/4	1.31	.88	.31
20LU [ ]	1 1/4	2.67	1 7/8	1 11/16	1.62	1.09	1.75
24LU [ ]	1 1/2	3.07	2 1/4	2	1.97	1.34	2
32LU32 [ ]	2	4.22	3	2 3/4	2.66	1.81	2.75

Union Elbow: LU/MM connects metric tubes

Part Number*	T Tube O.D.	A	B Hex Flat	C	D	E min	G
3LU[ ]MM	3	24.6	11.1	11.0	14.3	2.2	16.7
4LU[ ]MM	4	25.3	12.7	11.0	15.1	2.3	17.5
6LU[ ]MM	6	26.6	14.3	11.0	16.3	3.8	18.3
8LU[ ]MM	8	28.6	15.9	12.6	16.7	5.8	20.6
10LU[ ]MM	10	32.6	19.1	17.3	17.5	7.9	24.6
12LU[ ]MM	12	36.6	22.2	17.3	24.6	9.9	24.6
14LU[ ]MM	14	34.0	23.8	17.3	22.2	11.9	24.6
15LU[ ]MM	15	36.5	23.8	17.4	22.2	12.7	26.2
16LU[ ]MM	16	37.3	25.4	20.5	25.0	12.7	26.2
18LU[ ]MM	18	39.3	28.6	25.3	25.4	15.8	29.4
20LU[ ]MM	20	46.4	31.8	31.8	31.0	16.7	32.5
22LU[ ]MM	22	43.7	31.8	31.6	27.0	17.9	32.5
25LU[ ]MM	25	47.8	38.1	31.6	33.3	21.8	33.3
30LU[ ]MM	30	69.9	50.8	46	39.2	26.2	48.3
32LU[ ]MM	32	72.3	50.8	46	41.6	28.6	49.3
38LU[ ]MM	38	84	60.3	55	47.9	33.7	56.4

Union Tee: TTT connects fractional tubes

Metric fitting shown

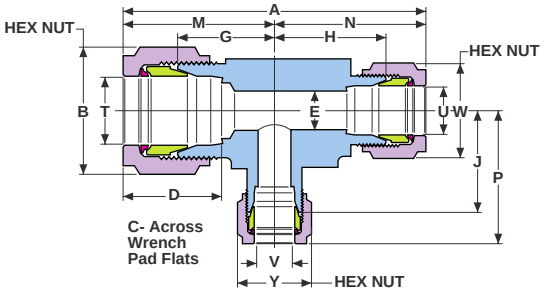


Part Number*	T Tube O.D.	A	B Hex Flat	C	D	E min	G	M
1TTT [ ]	1/16	1.56	5/16	7/16	.41	.05	.56	.78
2TTT [ ]	1/8	1.94	7/16	7/16	.56	.09	.66	.97
3TTT [ ]	3/16	2	1/2	7/16	.59	.13	.69	1
4TTT [ ]	1/4	2.04	9/16	7/16	.64	.19	.72	1.05
6TTT [ ]	3/8	2.38	11/16	1/2	.72	.30	.84	1.19
8TTT [ ]	1/2	2.88	7/8	11/16	.97	.42	.97	1.44
10TTT [ ]	5/8	2.94	1	13/16	1	.50	1.03	1.47
12TTT [ ]	3/4	3.19	1 1/8	1	1	.66	1.16	1.59
14TTT [ ]	7/8	3.44	1 1/4	1 1/4	1.06	.72	1.28	1.72
16TTT [ ]	1	3.75	1 1/2	1 1/4	1.31	.88	1.31	1.88
20TTT [ ]	1 1/4	5.24	1 7/8	1 11/16	1.53	1.09	1.75	2.62
24TTT [ ]	1 1/2	6.14	2 1/4	2	1.78	1.34	2	3.07
32TTT [ ]	2	8.44	3	2 3/4	2.50	1.81	2.75	4.22

Union Tee: TTT/MM connects metric tubes

Part Number*	T Tube O.D.	A	B Hex Flat	C	D	E min	G	M
3TTT[ ]MM	3	49.4	11.1	11.1	14.3	2.2	16.8	24.7
4TTT[ ]MM	4	50.7	12.7	11.1	15.1	2.2	17.5	25.4
6TTT[ ]MM	6	53.3	14.3	11.1	16.3	3.8	18.3	26.7
8TTT[ ]MM	8	57.2	15.9	12.7	16.7	5.8	20.6	28.6
10TTT[ ]MM	10	65.2	19.1	17.5	17.5	7.9	24.6	32.6
12TTT[ ]MM	12	73.2	22.2	17.5	24.6	9.9	24.6	36.6
14TTT[ ]MM	14	71.1	23.8	20.7	22.2	11.9	26.2	35.6
15TTT[ ]MM	15	72.9	23.8	20.7	22.2	12.7	26.2	36.5
16TTT[ ]MM	16	74.6	25.4	20.7	25.0	12.7	26.2	37.3
18TTT[ ]MM	18	78.9	28.6	25.4	25.4	15.8	29.5	39.4
20TTT[ ]MM	20	92.7	31.8	31.8	31.0	16.7	32.5	46.4
22TTT[ ]MM	22	87.4	31.8	31.8	27.0	17.9	32.5	43.7
25TTT[ ]MM	25	95.4	38.1	31.8	33.3	21.7	33.3	47.7
30TTT[ ]MM	30	139.7	50.8	46	39.2	26.2	48.3	69.9
32TTT[ ]MM	32	144.6	50.8	46	41.6	28.6	49.3	72.3
38TTT[ ]MM	38	168	60.3	55	47.9	33.7	56.4	84

* [ ] see page 6 for material specifications.

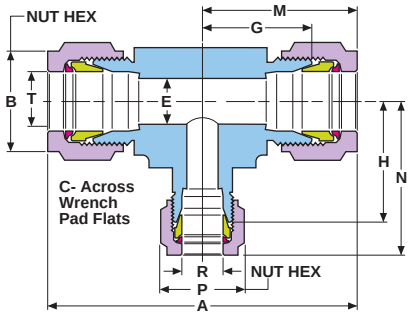


Reducing Run Tee: TTT_B

connects fractional tubes

Part Number* 316 SS	T Tube O.D.	U Run	V Branch	A	B Hex Flat	C	D	E min	G	H	J	M	N	P	W Hex Flat	Y Hex Flat
	Dimensions — inches															
10TTT 8BR6 [ ]	5/8	1/2	3/8	2.94	1	.81	1.11	.42	1.03	1	1.02	1.47	1.47	1.36	7/8	11/16
12TTT 10BR6 [ ]	3/4	5/8	3/8	3.16	1 1/8	1	1.09	.50	1.16	1.12	1.11	1.60	1.56	1.45	1 1/8	11/16
12TTT 10BR8 [ ]	3/4	5/8	1/2	3.16	1 1/8	1	1.09	.50	1.16	1.12	1.09	1.60	1.56	1.56	1 1/8	7/8
16TTT 10BR6 [ ]	1	5/8	3/8	3.60	1 1/2	1.25	1.40	.50	1.31	1.29	1.28	1.87	1.73	1.62	1 1/8	11/16
16TTT 10BR8 [ ]	1	5/8	1/2	3.60	1 1/2	1.25	1.40	.50	1.31	1.29	1.26	1.87	1.73	1.73	1 1/8	7/8
16TTT 12BR6 [ ]	1	3/4	3/8	3.62	1 1/2	1.25	1.40	.66	1.31	1.31	1.28	1.87	1.75	1.62	11/16	11/16

Fractional fitting shown



Reducing Branch Tee: TTTB

connects fractional tubes

Part Number* 316 SS	T Tube O.D.	R Branch	A	B Hex Flat	C	E min	G	H	M	N	P Hex Flat
	Dimensions — inches										
6TTTB6 [ ]	3/8	1/2	2.57	11/16	.68	.30	.94	.97	1.44	1.44	7/8
8TTTB6 [ ]	1/2	3/8	2.88	7/8	.68	.42	.97	.99	1.33	1.33	11/16
10TTTB6 [ ]	5/8	3/8	2.94	1	.81	.50	1.03	1.02	1.36	1.36	11/16
10TTTB8 [ ]	5/8	1/2	2.94	1	.81	.50	1.03	1	1.47	1.47	7/8
12TTTB6 [ ]	3/4	3/8	3.20	1 1/8	1	.66	1.16	1.11	1.45	1.45	11/16
12TTTB8 [ ]	3/4	1/2	3.20	1 1/8	1	.66	1.16	1.09	1.56	1.56	7/8
16TTTB6 [ ]	1	3/8	3.75	1 1/2	1.25	.88	1.31	1.28	1.62	1.62	11/16
16TTTB8 [ ]	1	1/2	3.75	1 1/2	1.25	.88	1.31	1.26	1.73	1.73	7/8
20TTTB16 [ ]	1 1/4	1	5.27	1 7/8	1.68	1.11	1.75	1.69	2.65	2.29	1 1/2
24TTTB16 [ ]	1 1/2	1	6.17	2 1/4	1.68	1.33	2	1.88	3.08	2.48	1 1/2
32TTTB16 [ ]	2	1	8.41	3	2.75	1.80	2.75	2.31	4.21	2.90	1 1/2
32TTTB24 [ ]	2	1 1/2	8.41	3	2.75	1.80	2.75	2.75	4.21	3.85	2 1/4

Reducing Union Tee: TTTB/MM

connects metric tubes

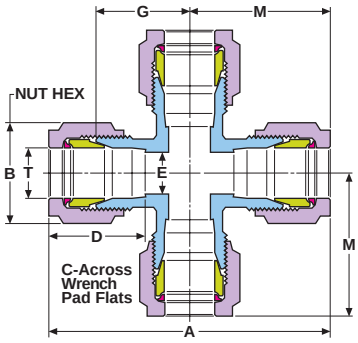
Part Number*	T Tube O.D	R Branch	A	B Hex Flat	C	E	G	H	M	N	P Hex Flat
	Dimensions — mm										
32TTTB25316MM	32	25	144.6	50.8	46	28.6	49.3	49.1	72.3	449.1	38

* [ ] see page 6 for material specifications.

Union Cross: C connects fractional tubes

Part Number*	T Tube O.D.	Dimensions — inches A	B Hex Flat	C	D	E min	G	M
1C [ ]	1/16	1.56	5/16	7/16	.41	.05	.56	.78
2C [ ]	1/8	1.94	7/16	7/16	.56	.09	.66	.97
3C [ ]	3/16	2	1/2	7/16	.59	.13	.69	1
4C [ ]	1/4	2.14	9/16	7/16	.64	.19	.72	1.08
6C [ ]	3/8	2.38	11/16	1/2	.72	.30	.84	1.19
8C [ ]	1/2	2.88	7/8	11/16	.97	.42	.97	1.44
10C [ ]	5/8	2.94	1	1 1/16	1	.50	1.03	1.47
12C [ ]	3/4	3.19	1 1/8	1 3/16	1	.66	1.16	1.59
14C [ ]	7/8	3.44	1 1/4	1 7/16	1.06	.72	1.28	1.72
16C [ ]	1	3.75	1 1/2	1 7/16	1.31	.88	1.31	1.88

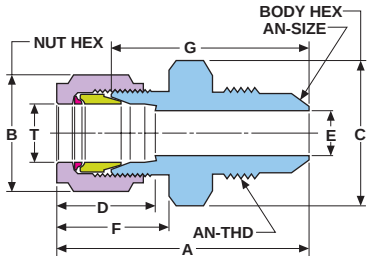
Fractional fitting shown



Union Cross: C/MM connects metric tubes

Part Number*	T Tube O.D.	Dimensions — mm A	B Hex Flat	C	D	E min	G	M
3C[ ]MM	3	49.2	11.1	11.1	14.3	2.2	16.7	24.6
4C[ ]MM	4	50.5	12.7	11.1	15.1	2.3	17.5	25.3
6C[ ]MM	6	53.2	14.3	11.1	16.3	3.8	18.2	26.6
8C[ ]MM	8	57.2	15.9	12.7	16.7	5.8	20.6	28.6
10C[ ]MM	10	65.1	19.1	17.5	17.5	7.9	24.6	32.6
12C[ ]MM	12	73.1	22.2	17.5	24.6	9.9	24.6	36.5
14C[ ]MM	14	69.6	23.8	20.7	22.2	11.0	25.4	34.8
15C[ ]MM	15	77.8	23.8	20.7	22.2	12.7	26.2	38.9
16C[ ]MM	16	74.8	25.4	20.7	25.0	12.7	26.2	37.4
18C[ ]MM	18	78.6	29.6	25.4	25.4	15.8	29.4	39.3
20C[ ]MM	20	92.7	31.8	31.8	31.0	16.7	32.5	46.4
22C[ ]MM	22	88.0	31.8	31.8	27.0	17.9	32.5	43.7
25C[ ]MM	25	95.0	38.1	31.8	33.3	21.7	33.3	43.7

AN Fittings



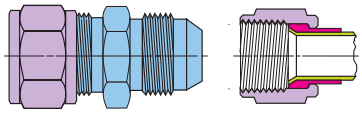
Union, AN: UAN

connects fractional tube to flared tube

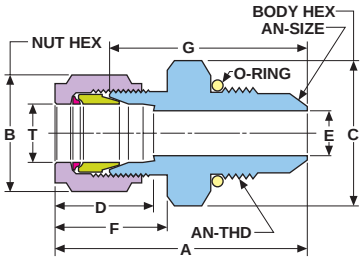
Part Number*	T Tube O.D.	AN Size	AN Thread	A	B Hex Flat	C Hex Flat	D	E min	F	G
				Dimensions — inches						
1UAN4 [ ]	1/16	1/4	7/16-20	1.22	5/16	1/2	.41	.05	.48	1
2UAN2 [ ]	1/8	1/8	5/16-24	1.19	7/16	7/16	.56	.06	.67	.97
2UAN4 [ ]	1/8	1/4	7/16-20	1.44	7/16	1/2	.56	.09	.67	1.13
3UAN3 [ ]	3/16	3/16	3/8-24	1.38	1/2	7/16	.59	.13	.70	1.06
4UAN4 [ ]	1/4	1/4	7/16-20	1.52	9/16	1/2	.64	.17	.77	1.19
6UAN4 [ ]	3/8	1/4	7/16-20	1.61	11/16	5/8	.72	.17	.83	1.27
6UAN6 [ ]	3/8	3/8	9/16-18	1.63	11/16	5/8	.72	.30	.83	1.28
8UAN8 [ ]	1/2	1/2	3/4-16	1.88	7/8	13/16	.97	.39	.92	1.41
10UAN10 [ ]	5/8	5/8	7/8-14	1.97	1	15/16	1	.48	.92	1.53
12UAN12 [ ]	3/4	3/4	1 1/16-12	2.16	1 1/8	1 1/8	1	.61	.97	1.72
16UAN16 [ ]	1	1	1 5/16-12	2.50	1 1/2	1 3/8	1.31	.84	1.08	1.94

UAN Application:

HOKE Gyrolok with AND 10056 or MS 33656, 37° flare connections for use with flared tubing.



UAN Mating Part



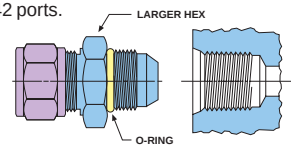
Union, AN O-ring: UANO

connects fractional tube to flared tube

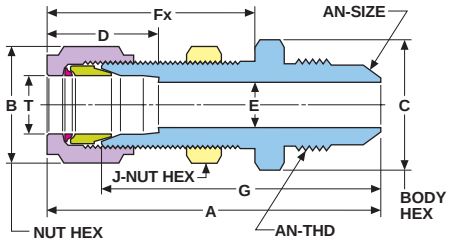
Part Number*	T Tube O.D.	AN Size	AN Thread		A	B	C	D	E min	F	G
					Dimensions — inches						
2UAN02 [ ]	1/8	1/8	5/16-24	UNF-3A	1.28	7/16	9/16	.56	.06	.67	.97
2UAN04 [ ]	1/8	1/4	7/16-20	UNF-3A	1.44	7/16	11/16	.56	.09	.67	1.13
4UAN04 [ ]	1/4	1/4	7/16-20	UNF-3A	1.52	9/16	11/16	.64	.17	.77	1.19
4UAN06 [ ]	1/4	3/8	9/16-18	UNF-3A	1.58	9/16	13/16	.64	.19	.77	1.25
6UAN04 [ ]	3/8	1/4	7/16-20	UNF-3A	1.61	11/16	11/16	.72	.17	.83	1.27
6UAN06 [ ]	3/8	3/8	9/16-18	UNF-3A	1.63	11/16	13/16	.72	.30	.83	1.28
8UAN08 [ ]	1/2	1/2	3/4-16	UNF-3A	1.88	7/8	1	.97	.39	.92	1.41

UANO Application:

HOKE Gyrolok with AND 10056 or MS 33656 for gasket sealing with AND 10050 or MS 16142 ports.



UANO Mating Part



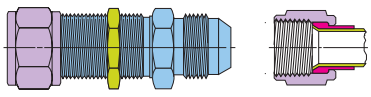
Bulkhead Union, AN: BUAN

connects fractional tube to flared tube

Part Number*	T Tube O.D.	AN Size	AN Thread	A	B	C	D	E min	Fx	G	J	Panel Hole	Max. Panel Thick.
				Dimensions — inches									
2BUAN2 [ ]	1/8	1/8	5/16-24	1.92	7/16	1/2	.56	.06	1.28	1.61	1/2	21/64	7/16
2BUAN4 [ ]	1/8	1/4	7/16-20	2.08	7/16	1/2	.56	.09	1.28	1.77	1/2	21/64	7/16
3BUAN3 [ ]	3/16	3/16	3/8-24	2.09	1/2	9/16	.59	.13	1.31	1.78	9/16	25/64	15/32
4BUAN4 [ ]	1/4	1/4	7/16-20	2.16	9/16	5/8	.64	.17	1.36	1.83	5/8	29/64	15/32
6BUAN4 [ ]	3/8	1/4	7/16-20	2.31	11/16	3/4	.72	.17	1.50	1.97	3/4	37/64	17/32
6BUAN6 [ ]	3/8	3/8	9/16-18	2.31	11/16	3/4	.72	.30	1.50	1.97	3/4	37/64	17/32
8BUAN8 [ ]	1/2	1/2	3/4-16	2.66	7/8	15/16	.97	.39	1.72	2.19	15/16	49/64	19/32
10BUAN10 [ ]	5/8	5/8	7/8-14	2.80	1	1 1/16	1	.48	1.72	2.36	1 1/16	57/64	9/16
12BUAN12 [ ]	3/4	3/4	1 1/16-12	3.34	1 1/8	1 3/16	1	.61	1.91	2.70	1 3/16	1 21/64	21/32
16BUAN16 [ ]	1	1	1 5/16-12	3.72	1 1/2	1 9/16	1.31	.84	2.34	3.16	1 9/16	1 21/64	1 1/32

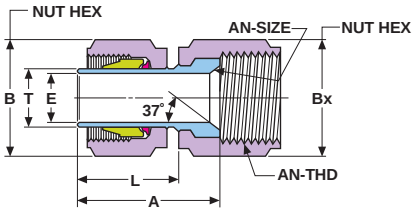
BUAN Application:

HOKE Gyrolok bulkhead configuration and AND 10056 or MS 33656, 37° flare connection for use with flared tubing.



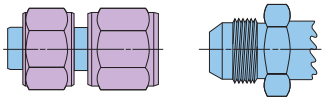
BUAN Mating Part

* [ ] see page 6 for material specifications.



AAN Application:

HOKE Gyrolok tube stub with ferrules pre-set with 37° flare connection for use with AND 10056 or MS 33656 ends.



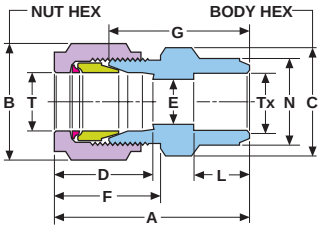
AAN Mating Part

Note: The tube stub end comes with pre-set HOKE Gyrolok ferrules. To assemble, follow HOKE Gyrolok remake instructions, page 53.

Adapter, AN: AAN

connects fractional Gyrolok port to flared tube

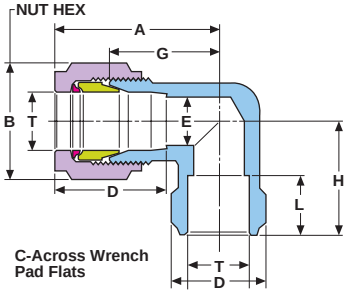
Part Number*	T Tube O.D.	AN Size	AN Thread	Dimensions — inches A	B Hex Flat	Bx Hex Flat	E min	L
2AAN2 [ ]	1/8	1/8	5/16-24	.92	7/16	3/8	.09	.61
2AAN4 [ ]	1/8	1/4	7/16-20	.91	7/16	9/16	.09	.61
3AAN3 [ ]	3/16	3/16	3/8-24	1	1/2	7/16	.13	.67
4AAN4 [ ]	1/4	1/4	7/16-20	1	9/16	9/16	.19	.70
6AAN6 [ ]	3/8	3/8	9/16-18	1.17	11/16	11/16	.28	.78
8AAN8 [ ]	1/2	1/2	3/4-16	1.44	7/8	7/8	.39	.98
10AAN10 [ ]	5/8	5/8	7/8-14	1.53	1	1	.50	1.09
12AAN12 [ ]	3/4	3/4	1 1/16-12	1.59	1 1/8	1 1/4	.59	1.14
16AAN16 [ ]	1	1	1 5/16-12	1.84	1 1/2	1 1/2	.80	1.31



Tube Socket Weld Connector: CW

connects fractional tubes

Part Number*	T Tube O.D.	Tx Tube O.D.	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min	F	G	L	N
2CW2 [ ]	1/8	1/8	1.19	7/16	7/16	.56	.09	.67	.88	.25	.31
3CW3 [ ]	3/16	3/16	1.27	1/2	7/16	.59	.13	.70	.95	.28	.38
4CW4 [ ]	1/4	1/4	1.36	9/16	1/2	.64	.19	.77	1.03	.31	.44
4CW6 [ ]	1/4	3/8	1.42	9/16	5/8	.64	.19	.77	1.09	.47	.61
6CW6 [ ]	3/8	3/8	1.53	11/16	5/8	.72	.30	.83	1.19	.38	.63
8CW6 [ ]	1/2	3/8	1.69	7/8	13/16	.97	.30	.92	1.22	.47	.61
8CW8 [ ]	1/2	1/2	1.69	7/8	13/16	.97	.42	.92	1.22	.50	.75
10CW10 [ ]	5/8	5/8	1.69	1	15/16	1	.50	.92	1.25	.56	.88
12CW12 [ ]	3/4	3/4	1.75	1 1/8	1 1/16	1	.66	.97	1.31	.56	1.06
16CW16 [ ]	1	1	2.16	1 1/2	1 3/8	1.31	.88	1.08	1.59	.75	1.31



Tube Socket Weld Elbow: LW

connects fractional tubes

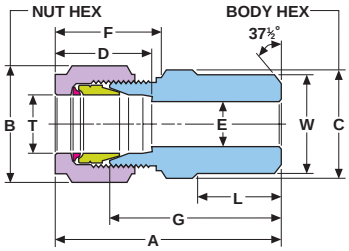
Part Number*	T Tube O.D.	Dimensions — inches A	B Hex Flat	C	D	E min.	G	H	L	N
2LW2 [ ]	1/8	.97	7/16	7/16	.56	.09	.66	.66	.25	.48
3LW3 [ ]	3/16	1	1/2	7/16	.59	.13	.69	.69	.28	.48
4LW4 [ ]	1/4	1.05	9/16	7/16	.64	.19	.72	.72	.31	.48
6LW6 [ ]	3/8	1.19	11/16	1/2	.72	.30	.84	.84	.38	.61
8LW8 [ ]	1/2	1.44	7/8	11/16	.97	.42	.97	.97	.50	.83
10LW10 [ ]	5/8	1.47	1	13/16	1	.50	1.03	1.03	.56	.95
12LW12 [ ]	3/4	1.59	1 1/8	1	1	.66	1.16	1.16	.56	1.13
16LW16 [ ]	1	1.88	1 1/2	1 1/4	1.31	.88	1.31	1.31	.75	1.38

* [ ] see page 6 for material specifications.

Butt Weld Connector: CBW

connects fractional tube to pipe

Metric fitting shown



Part Number*	T Tube O.D.	W Butt Weld O.D.	Nom. Pipe Size	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min	F	G	L
2CBW2 [ ]	1/8	.41	1/8	1.22	7/16	7/16	.56	.22	.67	.91	.38
3CBW2 [ ]	3/16	.41	1/8	1.27	1/2	7/16	.59	.22	.70	.95	.38
4CBW2 [ ]	1/4	.41	1/8	1.33	9/16	1/2	.64	.22	.77	1	.38
4CBW4 [ ]	1/4	.54	1/4	1.52	9/16	9/16	.64	.30	.77	1.19	.56
6CBW4 [ ]	3/8	.54	1/4	1.63	11/16	5/8	.72	.30	.83	1.28	.56
6CBW6 [ ]	3/8	.68	3/8	1.63	11/16	11/16	.72	.42	.83	1.28	.56
6CBW8 [ ]	3/8	.84	1/2	1.84	11/16	7/8	.72	.55	.83	1.50	.75
8CBW4 [ ]	1/2	.54	1/4	1.69	7/8	13/16	.97	.30	.92	1.22	.56
8CBW6 [ ]	1/2	.68	3/8	1.78	7/8	13/16	.97	.42	.92	1.31	.56
8CBW8 [ ]	1/2	.84	1/2	1.97	7/8	7/8	.97	.55	.92	1.50	.75
10CBW8 [ ]	5/8	.84	1/2	1.97	1	15/16	1	.55	.97	1.53	.75
12CBW12 [ ]	3/4	1.05	3/4	2.03	1 1/8	1 1/16	1	.78	.97	1.59	.75
16CBW16 [ ]	1	1.32	1	2.53	1 1/2	1 3/8	1.31	1	1.08	1.97	.94
20CBW20[ ]	1 1/4	1.25	2	3.04	2	1 3/4	1.62	1.09	1.53	2.17	.94
24CBW24[ ]	1 1/2	1.50	2 1/4	3.50	2 1/4	2 1/8	1.97	1.34	1.78	2.43	1.03
32CBW32[ ]	2	2	3	4.47	3	2 3/4	2.66	1.88	2.47	3	1.06

Butt Weld Connector: CBW/ME

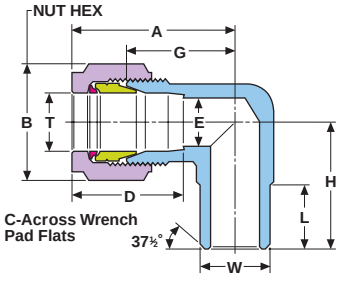
connects metric tube to pipe

Part Number*	T Tube O.D.	W Butt Weld O.D.	Nom. Pipe Size	Dimensions — mm A	B Hex Flat	C Hex Flat	D	E min	F	G	L
3CBW2[ ]ME	3	10.3	1/8	31.0	11.1	11.1	14.3	2.2	17.1	23.0	9.5
4CBW2[ ]ME	4	10.3	1/8	34.1	12.7	11.1	15.1	2.4	17.9	26.3	9.5
6CBW2[ ]ME	6	10.3	1/8	35.0	14.3	12.7	16.3	3.8	19.5	26.7	9.5
6CBW4[ ]ME	6	13.7	1/4	39.9	14.3	14.3	16.3	3.8	19.5	31.5	14.3
8CBW2[ ]ME	8	10.3	1/8	34.5	15.9	14.3	16.7	3.8	19.1	26.5	9.5
8CBW4[ ]ME	8	13.7	1/4	39.4	15.9	14.3	16.7	5.8	19.1	31.4	14.3
8CBW6[ ]ME	8	17.2	3/8	39.4	15.9	17.5	16.7	5.8	19.1	31.4	14.2
8CBW8[ ]ME	8	21.5	1/2	45.0	15.9	22.2	16.7	5.8	19.1	37.0	19.1
10CBW4[ ]ME	10	13.7	1/4	40.5	19.1	17.5	17.5	7.7	19.8	32.5	14.3
10CBW6[ ]ME	10	17.2	3/8	41.5	19.1	17.5	17.5	7.9	19.8	33.5	14.2
10CBW8[ ]ME	10	21.3	1/2	46.1	19.1	22.2	17.5	7.9	19.8	38.1	19.1
12CBW4[ ]ME	12	13.7	1/4	43.7	22.2	20.6	24.6	7.7	23.4	31.8	14.3
12CBW6[ ]ME	12	17.2	3/8	44.0	22.2	22.2	24.6	7.9	23.4	32.0	14.2
12CBW8[ ]ME	12	21.3	1/2	50.0	22.2	22.2	24.6	9.9	23.4	38.1	19.1
12CBW12[ ]ME	12	26.7	3/4	51.8	22.2	27.0	24.6	9.9	23.4	39.9	19.1
14CBW8[ ]ME	14	21.3	1/2	47.5	23.8	22.2	22.2	11.9	21.0	38.1	19.1
16CBW8[ ]ME	16	21.3	1/2	50.0	25.4	23.8	25.0	12.7	23.4	38.9	19.1
18CBW8[ ]ME	18	21.3	1/2	51.2	28.6	27.0	25.4	13.8	24.6	41.3	19.1
22CBW16[ ]ME	22	33.4	1	57.4	31.8	34.9	27.0	17.9	24.6	46.2	23.8
25CBW16[ ]ME	25	33.4	1	64.0	38.1	34.9	33.3	21.7	27.4	50.0	23.8

Butt Weld Elbow: LBW

connects fractional tube to pipe

Metric fitting shown



Part Number*	T Tube O.D.	W Butt Weld O.D.	Nom. Pipe Size	Dimensions — inches A	B Hex Flat	C	D	E min	G	H	L
2LBW2 [ ]	1/8	.41	1/8	.97	7/16	7/16	.56	.09	.66	.72	.41
3LBW2 [ ]	3/16	.41	1/8	1	1/2	7/16	.59	.13	.69	.75	.45
4LBW2 [ ]	1/4	.41	1/8	1.05	9/16	7/16	.64	.19	.72	.78	.48
4LBW4 [ ]	1/4	.54	1/4	1.11	9/16	1/2	.64	.19	.78	.94	—
6LBW4 [ ]	3/8	.54	1/4	1.19	11/16	1/2	.72	.30	.84	1	—
8LBW6 [ ]	1/2	.68	3/8	1.44	7/8	11/16	.97	.42	.97	1.13	—
8LBW8 [ ]	1/2	.84	1/2	1.50	7/8	13/16	.97	.42	1.03	1.31	—
10LBW8 [ ]	5/8	.84	1/2	1.47	1	13/16	1	.50	1.03	1.38	—
12LBW12 [ ]	3/4	1.05	3/4	1.59	1 1/8	13/16	1	.66	1.16	1.50	—
16LBW12 [ ]	1	1.05	3/4	1.88	1 1/2	1 1/4	1.31	.88	1.31	1.66	.86
16LBW16 [ ]	1	1.32	1	1.88	1 1/2	1 1/4	1.31	.88	1.31	1.84	—

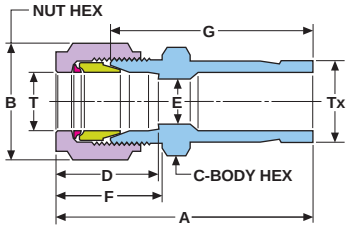
Butt Weld Elbow: LBW/ME

connects metric to pipe

Part Number*	T Tube O.D.	W Butt Weld O.D.	Nom. Pipe Size	Dimensions — mm A	B Hex Flat	C	D	E min	G	H	L
3LBW2[ ]ME	3	10.3	1/8	25.0	11.1	11.0	14.3	2.2	17.0	19.0	9.5
6LBW2[ ]ME	6	10.3	1/8	26.5	14.3	11.0	16.3	3.8	18.5	20.0	9.5
6LBW4[ ]ME	6	13.7	1/4	28.0	14.3	12.5	16.3	3.8	18.5	25.5	14.3
12LBW12[ ]ME	12	26.7	3/4	38.1	22.2	25.4	24.6	9.9	26.2	38.1	19.1
16LBW8[ ]ME	16	21.3	1/2	37.5	25.4	21.5	25.0	12.7	26.0	33.5	19.1
18LBW8[ ]ME	18	21.3	1/2	39.4	28.6	25.4	25.4	13.9	29.5	38.1	19.1

* [ ] see page 6 for material specifications.

Fractional fitting shown



Reducer: R connects fractional tube to fractional port

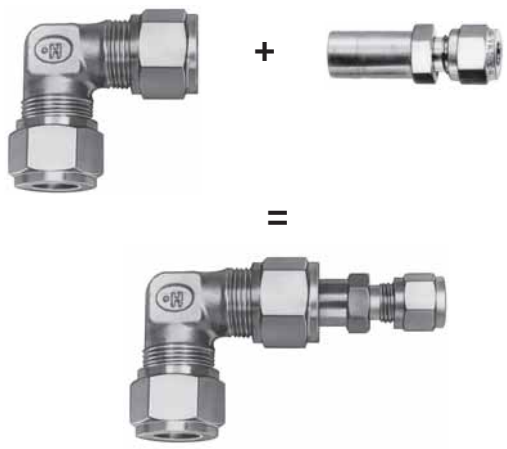
Part Number*	T Tube O.D.	Tx Tube O.D.	Dimensions — inches A	B Hex Flat	C Hex Flat	D	E min	F	G
1R2 [ ]	1/16	1/8	1.28	5/16	5/16	.41	.05	.48	1.06
1R4 [ ]	1/16	1/4	1.34	5/16	5/16	.41	.05	.48	1.13
2R3 [ ]	1/8	3/16	1.50	7/16	7/16	.56	.09	.67	1.19
2R4 [ ]	1/8	1/4	1.53	7/16	7/16	.56	.09	.67	1.22
2R6 [ ]	1/8	3/8	1.63	7/16	7/16	.56	.09	.67	1.31
2R8 [ ]	1/8	1/2	1.84	7/16	9/16	.56	.09	.67	1.53
3R4 [ ]	3/16	1/4	1.59	1/2	7/16	.59	.13	.70	1.28
3R6 [ ]	3/16	3/8	1.67	1/2	7/16	.59	.13	.70	1.36
3R8 [ ]	3/16	1/2	1.88	1/2	9/16	.59	.13	.70	1.56
4R2 [ ]	1/4	1/8	1.58	9/16	1/2	.64	.05	.77	1.25
4R4 [ ]	1/4	1/4	1.64	9/16	1/2	.64	.19	.77	1.31
4R6 [ ]	1/4	3/8	1.73	9/16	1/2	.64	.19	.77	1.41
4R8 [ ]	1/4	1/2	1.95	9/16	9/16	.64	.19	.77	1.63
4R10 [ ]	1/4	5/8	2.05	9/16	11/16	.64	.19	.77	1.72
4R12 [ ]	1/4	3/4	2.14	9/16	13/16	.64	.19	.77	1.81
6R4 [ ]	3/8	1/4	1.73	11/16	5/8	.72	.13	.83	1.38
6R6 [ ]	3/8	3/8	1.86	11/16	5/8	.72	.28	.83	1.52
6R8 [ ]	3/8	1/2	1.03	11/16	5/8	.72	.30	.83	1.69
6R10 [ ]	3/8	5/8	2.13	11/16	11/16	.72	.30	.83	1.78
6R12 [ ]	3/8	3/4	2.22	11/16	13/16	.72	.30	.83	1.88
6R14 [ ]	3/8	7/8	2.25	11/16	15/16	.72	.30	.83	1.91
6R16 [ ]	3/8	1	2.45	11/16	1 1/16	.72	.30	.83	2.11
8R4 [ ]	1/2	1/4	1.84	7/8	13/16	.97	.13	.92	1.38
8R6 [ ]	1/2	3/8	1.94	7/8	13/16	.97	.25	.92	1.47
8R8 [ ]	1/2	1/2	2.20	7/8	13/16	.97	.39	.92	1.73
8R10 [ ]	1/2	5/8	2.28	7/8	13/16	.97	.42	.92	1.81
8R12 [ ]	1/2	3/4	2.34	7/8	13/16	.97	.42	.92	1.88
8R16 [ ]	1/2	1	2.56	7/8	1 1/16	.97	.42	.92	2.09
10R12 [ ]	5/8	3/4	2.31	1	15/16	1	.50	.92	1.88
10R14 [ ]	5/8	7/8	2.38	1	15/16	1	.50	.92	1.94
10R16 [ ]	5/8	1	2.50	1	1 1/16	1	.50	.92	2.06
12R14 [ ]	3/4	7/8	2.50	1 1/8	1 1/16	1	.66	.97	2.06
12R16 [ ]	3/4	1	2.56	1 1/8	1 1/16	1	.66	.97	2.13
14R16 [ ]	7/8	1	2.56	1 1/4	1 3/16	1.06	.72	.97	2.13
16R24[ ]	1	1 1/2	3.51	1 1/2	1 5/8	1.23	.88	1.04	3.03
20R24[ ]	1 1/4	1 1/2	4.10	2 1/4	1 7/8	1.62	1.09	1.53	3.23
20R32[ ]	1 1/4	2	4.93	3	2 1/4	1.62	1.09	1.53	4.06
24R32[ ]	1 1/2	2	5.17	3	2 1/4	1.97	1.34	1.78	4.10

Reducer: R/MM connects metric tube to metric port

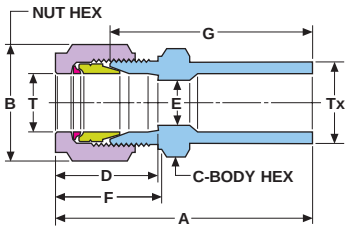
Part Number*	T Tube O.D.	Tx Tube O.D.	Dimensions — mm A	B Hex Flat	C Hex Flat	D	E min	F	G
3R4[ ]MM	3	4	41.1	11.1	11.1	14.3	2.2	17.1	33.2
3R6[ ]MM	3	6	41.1	11.1	11.1	14.3	2.2	17.1	33.2
3R10[ ]MM	3	10	43.8	11.1	12.7	14.3	2.2	17.1	35.8
4R6[ ]MM	4	6	41.9	12.7	11.1	15.1	2.3	17.9	34.1
4R8[ ]MM	4	8	43.8	12.7	12.7	15.1	2.3	17.9	35.9
4R10[ ]MM	4	10	44.5	12.7	12.7	15.1	2.3	17.9	36.7
6R3[ ]MM	6	3	42.1	14.3	12.7	16.3	2.1	19.5	33.8
6R4[ ]MM	6	4	42.9	14.3	12.7	16.3	2.3	19.5	34.6
6R8[ ]MM	6	8	45.3	14.3	12.7	16.3	3.8	19.5	37.0
6R10[ ]MM	6	10	46.1	14.3	12.7	16.3	3.8	19.5	37.7
6R12[ ]MM	6	12	50.7	14.3	14.3	16.3	3.8	19.5	42.4
6R18[ ]MM	6	18	55.1	14.3	20.6	16.3	3.8	19.5	46.7
8R6[ ]MM	8	6	43.8	15.9	15.9	16.7	4.4	19.1	35.8
8R8[ ]MM	8	8	44.8	15.9	14.3	16.7	5.8	19.1	36.8
8R10[ ]MM	8	10	45.6	15.9	14.3	16.7	5.8	19.1	37.6
8R12[ ]MM	8	12	50.2	15.9	14.3	16.7	5.8	19.1	42.2
8R16[ ]MM	8	16	54.5	15.9	17.5	16.7	5.8	19.1	46.5
10R2[ ]MM	10	2	44.2	19.1	17.5	17.5	1.0	19.8	36.2
10R6[ ]MM	10	6	44.2	19.1	17.5	17.5	4.4	19.8	36.2
10R8[ ]MM	10	8	45.8	19.1	17.5	17.5	6.2	19.8	37.8
10R12[ ]MM	10	12	51.3	19.1	17.5	17.5	7.9	19.8	43.4
10R16[ ]MM	10	16	54.7	19.1	17.5	17.5	7.9	19.8	46.7
10R18[ ]MM	10	18	54.0	19.1	20.6	17.5	7.9	19.8	47.0
10R25[ ]MM	10	25	62.8	19.1	27.0	17.5	7.9	19.8	54.9
12R6[ ]MM	12	6	49.3	22.2	20.6	24.6	4.4	23.4	37.3
12R8[ ]MM	12	8	50.3	22.2	20.6	24.6	6.2	23.4	38.4
12R10[ ]MM	12	10	51.8	22.2	20.6	24.6	7.6	23.4	39.9
12R16[ ]MM	12	16	56.0	22.2	20.6	24.6	9.9	23.4	46.0
12R18[ ]MM	12	18	59.2	22.2	20.6	24.6	9.9	23.4	47.2
12R22[ ]MM	12	22	62.2	22.2	23.8	24.6	9.9	23.4	50.3
12R25[ ]MM	12	25	67.6	22.2	28.6	24.6	9.9	23.4	55.6
14R12[ ]MM	14	12	53.5	23.8	22.2	22.2	9.1	21.0	44.1
15R12[ ]MM	15	12	55.0	23.8	22.2	22.2	9.1	21.8	44.7
16R12[ ]MM	16	12	57.4	25.4	23.8	25.0	9.1	23.4	46.2
18R10[ ]MM	18	10	53.1	28.6	27.0	25.4	12.6	24.6	43.2
18R12[ ]MM	18	12	56.7	28.6	27.0	25.4	9.1	24.6	46.7
18R16[ ]MM	18	16	57.0	28.6	27.0	25.4	9.9	24.6	47.0
18R22[ ]MM	18	22	61.9	28.6	27.0	25.4	15.8	24.6	51.9
18R25[ ]MM	18	25	64.0	28.6	30.0	25.4	15.8	24.6	54.0
25R32[ ]MM	25	32	89.1	38.1	38.1	31.3	21.8	26.5	76.8
30R25[ ]MM	30	25	89.7	50.8	46.0	38.0	19.5	41.2	67.4
32R10[ ]MM	32	10	76.1	50.8	46.0	42.3	7.6	42.9	52.6
32R25[ ]MM	32	25	91.7	50.8	46.0	42.3	19.5	42.9	68.2
38R25[ ]MM	38	25	100.6	60.3	55.6	49.4	19.5	49.5	73.0

Reducing Assemblies Made With HOKE Gyrolok Fittings

Use the HOKE Gyrolok Reducer to reduce the size of an existing fitting, there by providing more flexibility in a variety of installations. It comes with a HOKE Gyrolok fitting on one end and a machined tube stub on the other.

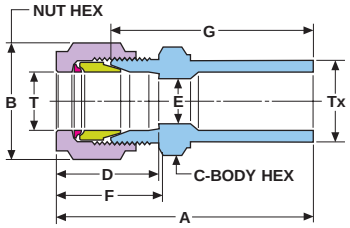


* [ ] see page 6 for material specifications.



Reducer: R/ME connects metric tube to fractional port

Part Number*	T Tube O.D.	Tx Tube O.D.	Dimensions — mm A	B Hex Flat	C Hex Flat	D	E min	F	G
3R2[ ]ME	3	1/8	39.0	11.1	11.1	14.3	2.2	17.1	30.0
3R4[ ]ME	3	1/4	40.0	11.1	11.1	14.3	2.2	17.1	31.0
3R6[ ]ME	3	3/8	43.0	11.1	12.7	14.3	2.2	17.1	34.0
4R4[ ]ME	4	1/4	41.4	12.7	11.1	15.1	2.3	17.9	33.5
6R2[ ]ME	6	1/8	41.1	14.3	12.7	16.3	3.8	19.5	32.8
6R4[ ]ME	6	1/4	42.6	14.3	12.7	16.3	3.8	19.5	34.2
6R6[ ]ME	6	3/8	44.9	14.3	12.7	16.3	3.8	19.5	36.6
6R8[ ]ME	6	1/2	49.8	14.3	14.3	16.3	3.8	19.5	41.4
6R10[ ]ME	6	5/8	52.0	14.3	17.5	16.3	4.6	19.5	43.6
8R6[ ]ME	8	3/8	45.1	15.9	14.3	16.7	5.9	19.1	37.1
8R8[ ]ME	8	1/2	49.2	15.9	14.3	16.7	5.8	19.1	41.2
8R10[ ]ME	8	5/8	53.5	15.9	17.5	16.7	5.8	19.1	45.5
10R6[ ]ME	10	3/8	45.7	19.1	17.5	17.5	7.0	19.8	37.7
10R8[ ]ME	10	1/2	50.6	19.1	17.5	17.5	7.9	19.8	42.6
10R10[ ]ME	10	5/8	53.8	19.1	17.5	17.5	7.9	19.8	45.8
12R8[ ]ME	12	1/2	56.4	22.2	20.6	24.6	9.9	23.4	44.5
12R12[ ]ME	12	3/4	61.5	22.2	20.6	24.6	9.9	23.4	49.5
18R12[ ]ME	18	3/4	61.0	28.6	27.0	25.4	15.0	24.6	51.1
25R16[ ]ME	25	1	64.0	38.1	27.0	33.3	13.8	27.4	54.0



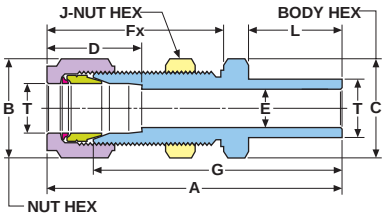
Reducer: R/EM connects fractional tube to metric port

Part Number*	T Tube O.D.	Tx Tube O.D.	Dimensions — mm A	B Hex Flat	C Hex Flat	D	E min	F	G
1R3[ ]EM	1/16	3	33.5	7.9	7.9	10.3	1.2	12.3	27.9
1R8[ ]EM	1/16	8	37.3	7.9	11.1	10.3	1.2	12.3	31.8
2R6[ ]EM	1/8	6	38.9	11.1	11.1	14.3	4.5	17.1	30.9
4R3[ ]EM	1/4	3	42.1	14.3	12.7	16.3	2.1	19.5	33.8
4R8[ ]EM	1/4	8	45.2	14.3	12.7	16.3	4.6	19.5	36.8
4R10[ ]EM	1/4	10	46.1	14.3	12.7	16.3	4.6	19.5	37.7
4R12[ ]EM	1/4	12	50.7	14.3	14.3	16.3	4.6	19.5	42.4
4R18[ ]EM	1/4	18	54.1	14.3	20.6	16.3	4.6	19.5	45.7

Metric fitting shown

Bulkhead Adapter: BA connects fractional tube to fractional port

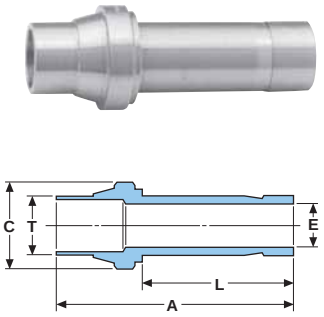
Part Number*	T Tube O.D.	A	Dimensions — inches B Hex Flat	C Hex Flat	D	E min.	Fx	G	J Hex Flat	L	Panel Hole Size	Max. Panel Thick.
2BA2 [ ]	1/8	2.09	7/16	1/2	.56	.09	1.28	1.72	1/2	.63	.33	7/16
3BA3 [ ]	3/16	2.16	1/2	9/16	.59	.13	1.31	1.84	9/16	.66	.39	15/32
4BA4 [ ]	1/4	2.27	9/16	5/8	.64	.19	1.36	1.94	5/8	.69	.45	15/32
6BA6 [ ]	3/8	2.50	11/16	3/4	.72	.28	1.50	2.16	3/4	.78	.58	17/32
8BA8 [ ]	1/2	2.94	7/8	15/16	.97	.39	1.72	2.47	15/16	.97	.77	17/32
10BA10 [ ]	5/8	3.09	1	1 1/16	1	.50	1.72	2.66	1 1/16	1.08	.89	9/16
12BA12 [ ]	3/4	3.38	1 1/8	1 3/16	1	.59	1.91	2.94	1 3/16	1.13	1.02	21/32
14BA14 [ ]	7/8	3.63	1 1/4	1 5/16	1.06	.69	2.09	3.19	1 5/16	1.19	1.14	25/32
16BA16 [ ]	1	4.14	1 1/2	1 9/16	1.08	.80	2.34	3.58	1 9/16	1.38	1.33	1 1/32



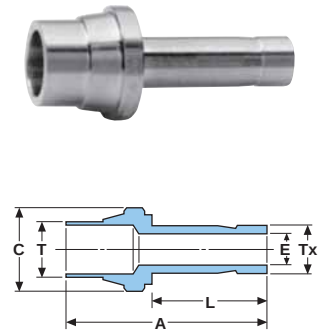
Bulkhead Adapter: BA/MM connects metric tube to metric port

Part Number*	T Tube O.D.	A	Dimensions — mm B Hex Flat	C Hex Flat	D	E min.	Fx	G	J Hex Flat	L	Panel Hole Size	Max. Panel Thick.
3BA3[ ]MM	3	55.1	11.1	12.7	14.3	2.1	32.5	47.1	12.7	15.9	8.3	12.0
4BA4[ ]MM	4	56.7	12.7	14.3	15.1	2.3	33.2	48.9	14.3	16.7	10.0	12.0
6BA6[ ]MM	6	58.7	14.3	15.9	16.3	3.8	34.6	50.3	15.9	17.3	11.5	13.0
8BA8[ ]MM	8	62.9	15.9	17.5	16.7	5.8	36.6	54.9	17.5	19.1	13.1	14.0
10BA10[ ]MM	10	64.1	19.1	19.1	17.5	7.5	37.3	56.1	19.1	19.9	16.5	14.0
12BA12[ ]MM	12	75.4	22.2	23.8	24.6	9.1	43.7	63.5	23.8	24.5	19.5	16.0
14BA14[ ]MM	14	75.0	23.8	23.8	22.2	11.9	41.1	63.0	23.8	24.5	19.5	16.0
16BA16[ ]MM	16	79.0	25.4	27.0	25.0	12.7	43.7	68.0	27.0	27.3	22.5	14.0
18BA18[ ]MM	18	86.0	28.6	30.0	25.4	13.8	48.0	75.0	30.2	28.2	26.0	17.0
22BA22[ ]MM	22	92.0	31.8	33.5	27.0	17.9	53.0	81.0	33.3	30.0	29.5	24.0
25BA25[ ]MM	25	105.0	38.1	40.0	33.3	18.1	60.0	91.0	39.7	35.4	33.8	24.0

* [ ] see page 6 for material specifications.



HOKE Gyrolok ended ball valve using port connector for close connection to another port.



Installation Instructions
(For Port Connector and Reducing Port Connector):

1. Firmly insert machined ferrule end into fitting body.
2. Place nut only (no ferrules) over the machined ferrule. Finger-tighten.
3. Using wrench, turn nut until sharp rise in torque is felt. Snug tight. (Do not tighten 1¼ turns. No ferrules to set.)
4. Insert tube stub end into HOKE Gyrolok assembly. Follow standard HOKE Gyrolok assembly instructions, page 53.

* [ ] see page 6 for material specifications.

Port Connector: PC

connects two fractional ports

Part Number*	T Tube O.D.	Dimensions — inches A	C	E min.	L
1PC [ ]	1/16	.73	.13	.03	.55
2PC [ ]	1/8	1	.25	.06	.63
4PC [ ]	1/4	1.16	.38	.13	.78
6PC [ ]	3/8	1.31	.50	.25	.86
8PC [ ]	1/2	2	.69	.33	1.30
12PC [ ]	3/4	1.83	.94	.53	1.13

Port Connector: PC/MM

connects two metric ports

Part Number*	T Tube O.D.	Dimensions — mm A	C	E min.	L
3PC[ ]MM	3	28.0	6.5	2.0	18.1
6PC[ ]MM	6	29.5	9.3	4.4	19.6
8PC[ ]MM	8	29.3	11.2	6.4	19.1
10PC[ ]MM	10	33.2	13.2	7.5	21.7
12PC[ ]MM	12	50.7	17.5	9.2	33.0
14PC[ ]MM	14	40.7	19.1	11.1	24.5
15PC[ ]MM	15	44.5	19.1	11.9	28.6
16PC[ ]MM	16	53.0	20.7	12.7	34.3
18PC[ ]MM	18	52.0	24.0	16.0	30.0
20PC[ ]MM	20	60.6	27.0	15.1	38.1
22PC[ ]MM	22	56.0	27.5	18.0	31.0
25PC[ ]MM	25	60.0	32.0	22.0	38.0

Reducing Port Connector: PC

connects two fractional ports

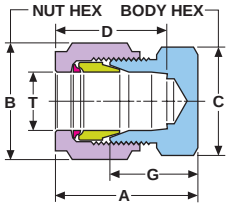
Part Number*	T Tube O.D.	Tx Reduced Tube O.D.	Dimensions—inches A	C	E min.	L
2PC1 [ ]	1/8	1/16	.84	.25	.03	.47
4PC1 [ ]	1/4	1/16	.95	.38	.03	.56
4PC2 [ ]	1/4	1/8	1.06	.38	.06	.66
6PC2 [ ]	3/8	1/8	1.16	.50	.09	.70
6PC4 [ ]	3/8	1/4	1.22	.50	.13	.78
8PC4 [ ]	1/2	1/4	1.47	.69	.13	.77
8PC6 [ ]	1/2	3/8	1.55	.69	.25	.83
12PC8 [ ]	3/4	1/2	2	.94	.33	1.14

Reducing Port Connector: PC/MM

connects two metric ports

Part Number*	T Tube O.D.	Tx Reduced Tube O.D.	Dimensions — mm A	C	E min.	L
6PC3[ ]MM	6	3	28.1	9.3	2.1	18.1
8PC6[ ]MM	8	6	29.4	11.2	4.4	19.2
10PC6[ ]MM	10	6	31.1	13.2	4.4	19.7
10PC8[ ]MM	10	8	31.5	13.2	6.4	20.0
12PC6[ ]MM	12	6	43.5	17.5	4.4	25.8
12PC8[ ]MM	12	8	44.0	17.5	6.4	21.0
12PC10[ ]MM	12	10	44.0	17.5	7.5	21.5
16PC12[ ]MM	16	12	52.0	20.7	9.2	27.0
18PC16[ ]MM	18	16	52.0	24.0	12.7	31.0
22PC18[ ]MM	22	18	55.0	27.5	16.0	30.0
25PC18[ ]MM	25	18	59.0	32.0	16.0	30.0

Fractional shown



Cap Assembled to Tubing

Assembly Instructions:
1. Insert tube into cap.
2. Follow standard HOKE Gyrolok assembly instructions, page 53.

Cap: CP

caps end of fractional tube

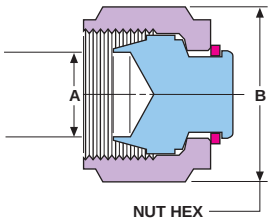
Part Number*	T Tube O.D.	Dimensions — inches A	B Hex Flat	C Hex Flat	D	G
1CP [ ]	1/16	.66	5/16	5/16	.41	.44
2CP [ ]	1/8	.91	7/16	7/16	.56	.53
3CP [ ]	3/16	.89	1/2	7/16	.59	.58
4CP [ ]	1/4	.95	9/16	1/2	.64	.63
6CP [ ]	3/8	1.06	11/16	5/8	.72	.72
8CP [ ]	1/2	1.28	7/8	13/16	.97	.81
10CP [ ]	5/8	1.33	1	15/16	1	.89
12CP [ ]	3/4	1.36	1 1/8	1 1/16	1	.92
14CP [ ]	7/8	1.41	1 1/4	1 3/16	1.06	.97
16CP [ ]	1	1.77	1 1/2	1 3/8	1.31	1.20
20CP [ ]	1 1/4	2.10	1 7/8	1 3/4	1.53	1.23
24CP [ ]	1 1/2	2.54	2 1/4	2 1/8	1.78	1.47
32CP [ ]	2	3.41	3	2 3/4	2.47	1.94

Tube Cap: CP/MM

caps end of metric tube

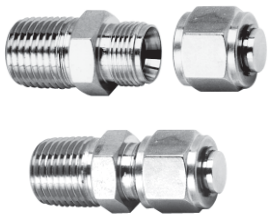
Part Number*	T Tube O.D.	Dimensions — mm A	B Hex Flat	C Hex Flat	D	G
3CP[ ]MM	3	22.8	11.1	11.1	14.3	14.8
4CP[ ]MM	4	23.6	12.7	11.1	15.1	15.8
6CP[ ]MM	6	25.3	14.3	12.7	16.3	16.9
8CP[ ]MM	8	25.1	15.9	14.3	16.7	17.1
10CP[ ]MM	10	26.2	19.1	17.5	17.5	18.3
12CP[ ]MM	12	32.6	22.2	20.6	24.6	20.6
14CP[ ]MM	14	31.6	23.8	22.2	22.2	22.2
15CP[ ]MM	15	31.9	23.8	22.2	22.2	21.5
16CP[ ]MM	16	35.0	25.4	23.8	25.0	23.9
18CP[ ]MM	18	33.4	28.6	27.0	25.4	23.4
20CP[ ]MM	20	40.0	31.8	30.2	31.0	25.2
22CP[ ]MM	22	35.8	31.8	30.2	27.0	24.6
25CP[ ]MM	25	45.9	38.1	34.9	33.3	31.5
30CP[ ]MM	30	53.4	50.8	46	39.6	31.8
32CP[ ]MM	32	55.8	50.8	46	42	32.8
38CP[ ]MM	38	65.4	60.3	55	49.4	37.8

Fractional shown



Usage Instructions:

1. Remove nut and ferrules from body.
2. Place plug assembly onto HOKE Gyrolok fitting body. Tighten to hand-tight condition.
3. Turn nut with wrench until sharp rise in torque. Then snug tight. (Do not tighten 1¼ turns. No ferrules to set).



Plug Assembled to HOKE Gyrolok Body

Plug: P fractional for Gyrolok ports

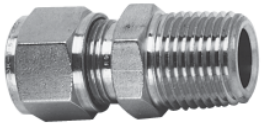
Part Number*	Dimensions — inches A Fitting Size	B Hex Size
1P [ ]	1/16	5/16
2P [ ]	1/8	7/16
3P [ ]	3/16	1/2
4P [ ]	1/4	9/16
6P [ ]	3/8	11/16
8P [ ]	1/2	7/8
10P [ ]	5/8	1
12P [ ]	3/4	1 1/8
14P [ ]	7/8	1 1/4
16P [ ]	1	1 1/2
20P [ ]	1 1/4	1 7/8
24P [ ]	1 1/2	2 1/4
32P [ ]	2	3

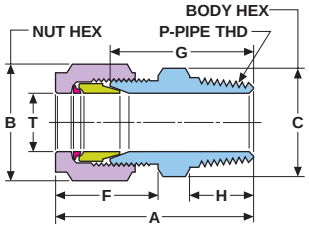
Plug: P/MM metric for Gyrolok ports

Part Number*	Dimensions — mm A Fitting Size	B Hex Size
3P[ ]MM	3	11.1
4P[ ]MM	4	12.7
6P[ ]MM	6	14.3
8P[ ]MM	8	15.9
10P[ ]MM	10	19.1
12P[ ]MM	12	22.2
14P[ ]MM	14	23.8
15P[ ]MM	15	23.8
16P[ ]MM	16	25.4
18P[ ]MM	18	28.6
20P[ ]MM	20	31.8
22P[ ]MM	22	31.8
25P[ ]MM	25	38.1
30P[ ]MM	30	50.8
32P[ ]MM	32	50.8
38P[ ]MM	38	60.3

* [ ] see page 6 for material specifications.

Male Thermocouple Connector: CMT (Fractional)

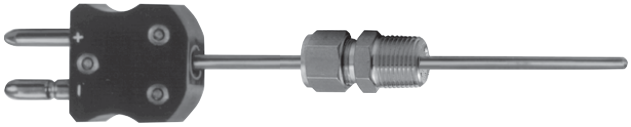




Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions — inches A	B Hex Flat	C Hex Flat	F	G	H
1CMT1[ ]	1/16	1/16	.97	5/16	5/16	.48	.75	.38
1CMT2[ ]	1/16	1/8	1.13	5/16	7/16	.48	.81	.38
1CMT4[ ]	1/16	1/4	1.22	5/16	9/16	.48	1	.56
2CMT2[ ]	1/8	1/8	1.22	7/16	7/16	.67	.91	.38
2CMT4[ ]	1/8	1/4	1.44	7/16	9/16	.67	1.13	.56
3CMT2[ ]	3/16	1/8	1.27	1/2	7/16	.70	.95	.38
3CMT4[ ]	3/16	1/4	1.50	1/2	9/16	.70	1.19	.56
4CMT2[ ]	1/4	1/8	1.33	9/16	1/2	.77	1	.38
4CMT4[ ]	1/4	1/4	1.52	9/16	9/16	.77	1.19	.56
4CMT6[ ]	1/4	3/8	1.58	9/16	11/16	.77	1.25	.56
4CMT8[ ]	1/4	1/2	1.80	9/16	7/8	.77	1.47	.75
6CMT4[ ]	3/8	1/4	1.64	11/16	5/8	.83	1.28	.56
6CMT6[ ]	3/8	3/8	1.63	11/16	11/16	.83	1.28	.56
6CMT8[ ]	3/8	1/2	1.84	11/16	7/8	.83	1.50	.75
8CMT8[ ]	1/2	1/2	1.97	7/8	7/8	.92	1.50	.75
12CMT12[ ]	3/4	3/4	2.08	1 1/8	1 1/16	.97	1.63	.75
20CMT20[ ]	1 1/4	1 1/4	3.06	1 7/8	1 7/8	1.56	2.17	.94

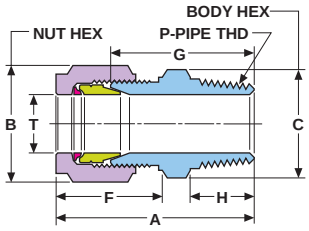
The CMT body does not contain a sizing angle or butt seal. As a result, the thermocouple can be extended beyond the fitting's NPT thread end.

Example: HOKE Gyrolok CMT assembled to thermocouple.



Assembly Instruction:
Because the thermocouple is not bottomed out within the fitting body, follow these simple steps before carrying out HOKE Gyrolok assembly instructions on page 53.

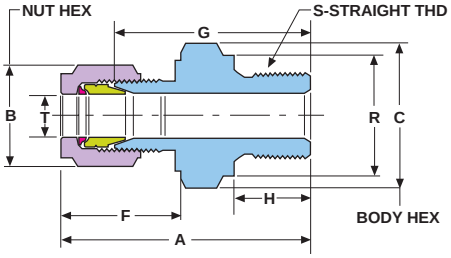
1. Position the length of the thermocouple to extend past the fitting's NPT end.
2. Once correctly positioned, carefully hold thermocouple in place to prevent shifting during assembly



Male Thermocouple Connector: CMT/ME, CMT/MC (Metric)

Metric Tube with NPT or RT tapered threads

Part Number* NPT Threads	RT Threads	T Tube O.D.	P Pipe Thd.	Dimensions — mm A	B Hex Flat	C Hex Flat	F	G	H
6CMT2[ ]ME	6CMT2[ ]MC	6	1/8	34.8	14.3	12.7	19.5	26.4	9.5
6CMT4[ ]ME	6CMT4[ ]MC	6	1/4	39.5	14.3	14.3	19.5	31.2	14.3
8CMT4[ ]ME	8CMT4[ ]MC	8	1/4	39.8	15.9	14.3	19.1	31.8	14.2



Male Thermocouple Connector: CMT/MA (Metric)

Metric Tube with RS parallel threads

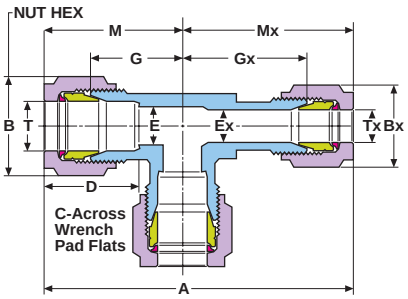
Part Number*	T Tube O.D.	S Straight Thd.	Dimensions — mm A	B Hex Flat	C Hex Flat	F	G	H	R
6CMT4[ ]MA	6	1/4	40.1	14.3	19.1	19.5	31.8	12.0	18.0

RS parallel thread ends are typically used with a gasket having a bonded elastomer seal. RP-type gaskets may also be used.

* [ ] see page 6 for material specifications.

Heat Exchanger Tee: XT

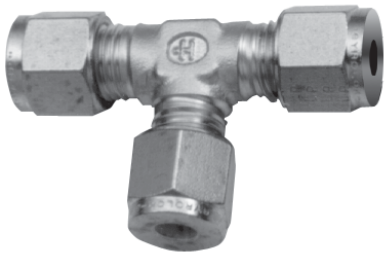
Part Number*	T Tube O.D.	Tx Tube O.D.	A	B Hex Flat	Bx	C	D	E min	Ex	G	Gx	M	Mx
				Dimensions — inches									
4XT2[ ]BR4	1/4	1/8	2.02	9/16	7/16	7/16	.64	.19	.13	.72	.66	1.05	.97
8XT4[ ]BR4	1/2	1/4	2.73	7/8	9/16	11/16	.97	.42	.25	.97	.97	1.44	1.30
8XT4[ ]BR8	1/2	1/4	2.73	7/8	9/16	11/16	.97	.42	.25	.97	.91	1.44	1.23

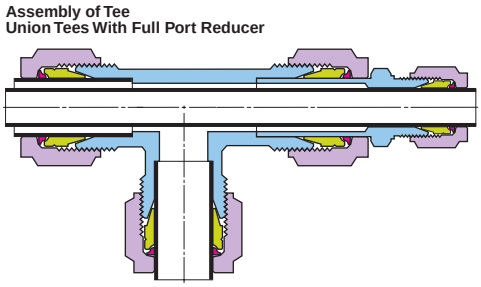


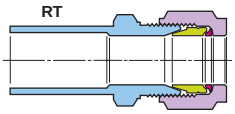
Special Ordering Instructions:
Heat Exchanger Tees are available in other fractional and metric sizes by special order. Ask your HOKE distributor for price and availability information. Specify “Heat Exchanger Tee” followed by quantity and the desired tube connection sizes.

Example		Standard Fitting 8XT4[ ]BR8
1.	Jacket and tubing O.D	1/2"
2.	Process tubing O.D.	1/4"
3.	Specify material	*
4.	Branch tubing O.D.	1/2”
5.	Metric	—

Heat Exchanger Tee Made With HOKE Gyrolok Tube Fittings







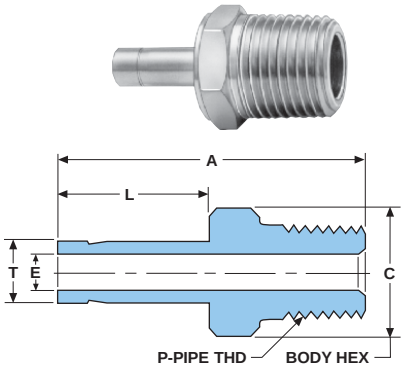
Heat exchanger tees made with HOKE Gyrolok tube fittings can provide additional flexibility as well as reduce costly fitting inventories.

Ordering Instructions
Heat Exchanger Tees can be created with standard union tees and full port reducers to allow process tubing to be inserted into and through the jacket tubing.

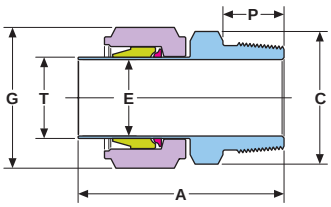
To order a full port reducer, add the letter “T” to the core reducer part number.

Example: 8RT12 316

* [ ] see page 6 for material specifications.



20AM20[ ] shown



Over 1 inch and over 25 mm Male Adapters feature pre-set ferrules. Follow HOKE Gyrolok* Reassembly *instructions, page 53.

Male Adapter: AM (Fractional)

Part Number*	T Tube O.D.	P Male NPT Size	Dimensions — inches A	C Hex Flat	E min.	L
1AM1[ ]	1/16	1/16	1	5/16	.03	.47
1AM2[ ]	1/16	1/8	1	7/16	.03	.47
2AM2[ ]	1/8	1/8	1.16	7/16	.09	.63
2AM4[ ]	1/8	1/4	1.34	9/16	.09	.63
3AM2[ ]	3/16	1/8	1.19	7/16	.13	.66
3AM4[ ]	3/16	1/4	1.38	9/16	.13	.66
4AM2[ ]	1/4	1/8	1.25	7/16	.19	.69
4AM4[ ]	1/4	1/4	1.44	9/16	.19	.69
4AM6[ ]	1/4	3/8	1.47	11/16	.19	.69
4AM8[ ]	1/4	1/2	1.69	7/8	.19	.69
6AM2[ ]	3/8	1/8	1.38	7/16	.28	.78
6AM4[ ]	3/8	1/4	1.56	9/16	.28	.78
6AM6[ ]	3/8	3/8	1.56	11/16	.28	.78
6AM8[ ]	3/8	1/2	1.78	7/8	.28	.78
8AM4[ ]	1/2	1/4	1.75	9/16	.39	.97
8AM6[ ]	1/2	3/8	1.78	11/16	.39	.97
8AM8[ ]	1/2	1/2	1.97	7/8	.39	.97
8AM12[ ]	1/2	3/4	1.98	1 1/16	.39	.97
10AM6[ ]	5/8	3/8	1.89	11/16	.50	1.08
10AM8[ ]	5/8	1/2	2.08	7/8	.50	1.08
10AM12[ ]	5/8	3/4	2.14	1 1/16	.50	1.08
12AM8[ ]	3/4	1/2	2.13	7/8	.59	1.13
12AM12[ ]	3/4	3/4	2.16	1 1/16	.59	1.13
12AM16[ ]	3/4	1	2.31	1 3/8	.59	1.13
14AM12[ ]	7/8	3/4	2.22	1 1/16	.69	1.19
16AM12[ ]	1	3/4	2.39	1 1/16	.80	1.38
16AM16[ ]	1	1	2.61	1 3/8	.80	1.38
20AM20[ ]	1 1/4	1 1/4	3.16	1 3/4	1.09	1.72
24AM24[ ]	1 1/2	1 1/2	3.72	2 1/8	1.31	2.06
32AM32[ ]	2	2	4.70	2 3/4	1.75	2.76

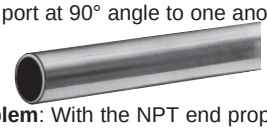
Male Adapter: AM/MC/ME (Metric) with RT Ends

Part Number*		T Tube O.D.	P Pipe Thd.	Dimensions — mm A	C Hex Flat	E min.	L
3AM2[ ]MC	3AM2[ ]ME	3	1/8	31.2	11.1	2.1	15.9
3AM4[ ]MC	3AM4[ ]ME	3	1/4	36.7	13.7	2.1	15.9
4AM2[ ]MC	4AM2[ ]ME	4	1/8	32.0	11.1	2.3	16.7
4AM4[ ]MC	4AM4[ ]ME	4	1/4	36.8	14.3	2.3	16.7
6AM2[ ]MC	6AM2[ ]ME	6	1/8	32.6	11.1	4.4	17.3
6AM4[ ]MC	6AM4[ ]ME	6	1/4	37.4	14.3	4.4	17.3
6AM6[ ]MC	6AM6[ ]ME	6	3/8	37.2	17.5	4.4	17.3
6AM8[ ]MC	6AM8[ ]ME	6	1/2	42.7	22.2	4.4	17.3
8AM2[ ]MC	8AM2[ ]ME	8	1/8	34.3	11.1	4.4	19.1
8AM4[ ]MC	8AM4[ ]ME	8	1/4	39.9	14.3	6.2	19.1
8AM6[ ]MC	8AM6[ ]ME	8	3/8	39.9	17.5	6.2	19.1
8AM8[ ]MC	8AM8[ ]ME	8	1/2	46.2	22.2	6.2	19.1
10AM2[ ]MC	10AM2[ ]ME	10	1/8	35.9	11.1	4.6	19.8
10AM4[ ]MC	10AM4[ ]ME	10	1/4	39.9	14.3	7.5	19.8
10AM6[ ]MC	10AM6[ ]ME	10	3/8	40.1	17.5	7.5	19.8
10AM8[ ]MC	10AM8[ ]ME	10	1/2	45.2	22.2	7.5	19.8
12AM4[ ]MC	12AM4[ ]ME	12	1/4	45.5	14.3	7.0	24.5
12AM6[ ]MC	12AM6[ ]ME	12	3/8	46.3	17.5	9.1	24.5
12AM8[ ]MC	12AM8[ ]ME	12	1/2	49.9	22.2	9.1	24.5
14AM4[ ]MC	14AM4[ ]ME	14	1/4	45.1	19.1	7.1	24.5
14AM6[ ]MC	14AM6[ ]ME	14	3/8	45.1	19.1	10.2	24.5
14AM8[ ]MC	14AM8[ ]ME	14	1/2	49.9	22.2	11.0	24.5
15AM8[ ]MC	15AM8[ ]ME	15	1/2	50.8	22.2	11.9	24.5
16AM6[ ]MC	16AM6[ ]ME	16	3/8	48.0	17.5	12.6	27.3
16AM8[ ]MC	16AM8[ ]ME	16	1/2	52.7	22.2	12.6	27.3
16AM12[ ]MC	16AM12[ ]ME	16	3/4	54.0	27.0	12.6	27.3
16AM16[ ]MC	16AM16[ ]ME	16	1	58.6	34.9	12.6	27.3
18AM6[ ]MC	18AM6[ ]ME	18	3/8	55.0	17.5	13.8	28.2
18AM8[ ]MC	18AM8[ ]ME	18	1/2	60.0	22.2	13.8	28.2
18AM12[ ]MC	18AM12[ ]ME	18	3/4	55.4	27.0	13.8	28.2
20AM8[ ]MC	20AM8[ ]ME	20	1/2	60.7	22.2	12.6	33.4
20AM12[ ]MC	20AM12[ ]ME	20	3/4	60.5	27.0	15.1	33.4
22AM8[ ]MC	22AM8[ ]ME	22	1/2	53.0	27.0	15.8	30.0
22AM12[ ]MC	22AM12[ ]ME	22	3/4	61.0	27.0	15.8	30.0
25AM8[ ]MC	25AM8[ ]ME	25	1/2	61.0	27.0	12.6	35.4
25AM12[ ]MC	25AM12[ ]ME	25	3/4	66.8	27.0	15.8	36.0
25AM16[ ]MC	25AM16[ ]ME	25	1	66.8	34.9	19.5	35.5

Eliminate Alignment Problems—Use Adapters

Female Pipe Port

Example: Need to join tubing and a female NPT port at 90° angle to one another.



Male Elbow

Problem: With the NPT end properly torqued, the tube fitting end of a male elbow may not properly line up with the tubing.

Male Adapter

Solution: Use a male adapter and union elbow. Tighten pipe thread of male adapter to convert the female port into a tube stub end.

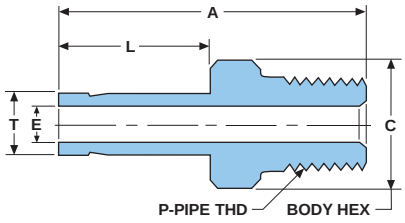
Assembly:

1. To connect union elbow to adapter, hold elbow pointing in desired direction and follow standard HOKE Gyrolok assembly Instructions on page 53.

Union Elbow

2. Insert tubing into other end of the union elbow and properly connect tubing.

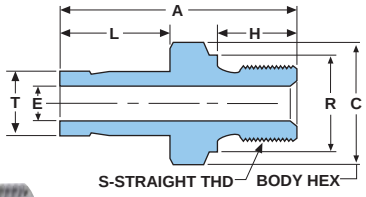
* [ ] see page 6 for material specifications.



Male Adapter: AM/EC (Fractional)

connects fractional port to female RT tapered threads

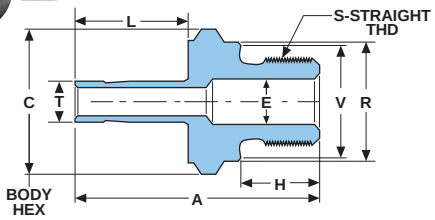
Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions — inches A	C Hex Flat	E min.	L
4AM2[ ]EC	1/4	1/8	1.25	7/16	.19	.69
4AM4[ ]EC	1/4	1/4	1.44	9/16	.19	.69
6AM4[ ]EC	3/8	1/4	1.56	9/16	.28	.78
6AM6[ ]EC	3/8	3/8	1.56	11/16	.28	.78
6AM8[ ]EC	3/8	1/2	1.78	7/8	.28	.78
8AM8[ ]EC	1/2	1/2	1.97	7/8	.39	.97



Male Adapter: AM/EA

connects fractional port to female RS parallel threads

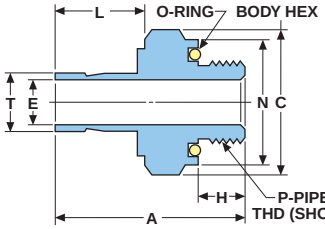
Part Number*	T Tube O.D.	S Thd. Size	Dimensions — inches A	C Hex Flat	E	H	L	R
4AM2[ ]EA	1/4	1/8	1.31	5/8	.19	.31	.69	.55
4AM4[ ]EA	1/4	1/4	1.39	3/4	.19	.47	.69	.70
6AM6[ ]EA	3/8	3/8	1.53	15/16	.28	.47	.78	.86
8AM8[ ]EA	1/2	1/2	1.86	1 3/32	.39	.55	.97	1.03



Male Adapter: AM/MB

connects metric port to female ISO straight thread

Part Number*	T Tube O.D.	S Thd. Size	Dimensions — mm A	C Hex Flat	E	H	L	R	V
6AM4[ ]MB	6	1/4	38.1	19.1	4.4	12.0	17.3	18.0	17.0
12AM8[ ]MB	12	1/2	40.1	27.0	9.1	14.0	24.5	26.0	25.0



O-ring Male Adapter: AOM

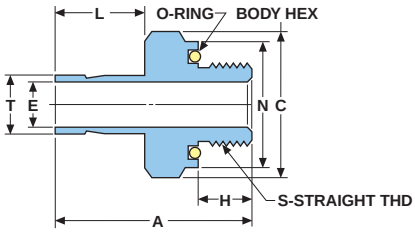
connects fractional port to female NPT threads

Part Number*	T Tube O.D.	P Pipe Size	Dimensions — inches A	C Hex Flat	E min	H	L	N	O-ring I.D.	O-ring O.D.
1AOM2[ ]	1/16	1/8	1.03	3/4	.03	.28	.47	.75	7/16	5/8
2AOM2[ ]	1/8	1/8	1.23	3/4	.09	.28	.63	.75	7/16	5/8
2AOM4[ ]	1/8	1/4	1.36	15/16	.09	.38	.63	.94	9/16	3/4
3AOM2[ ]	3/16	1/8	1.25	3/4	.13	.28	.66	.75	7/16	5/8
3AOM4[ ]	3/16	1/4	1.38	15/16	.13	.38	.66	.94	9/16	3/4
4AOM2[ ]	1/4	1/8	1.31	3/4	.13	.28	.69	.75	7/16	5/8
4AOM4[ ]	1/4	1/4	1.44	15/16	.19	.38	.69	.94	9/16	3/4
4AOM6[ ]	1/4	3/8	1.50	1 1/8	.19	.41	.69	1.13	3/4	15/16
6AOM2[ ]	3/8	1/8	1.38	3/4	.25	.28	.78	.75	7/16	5/8
6AOM4[ ]	3/8	1/4	1.52	15/16	.28	.38	.78	.94	9/16	3/4

O-ring Male Adapter: AOM/ME

connects metric port to female NPT threads

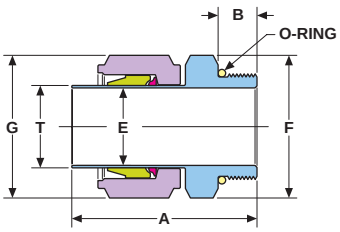
Part Number*	T Tube O.D.	P Pipe Size	Dimensions — mm A	C Hex Flat	E min	H	L	N	O-ring I.D.	O-ring O.D.
6AOM2[ ]ME	6	1/8	32.8	19.1	4.4	7.3	17.3	18.6	11.5	16.6
6AOM4[ ]ME	6	1/4	37.6	23.8	4.4	9.7	17.3	23.4	14.7	19.7
10AOM4[ ]ME	10	1/4	40.1	23.8	7.0	9.7	19.8	23.4	14.7	19.7
10AOM6[ ]ME	10	3/8	40.9	28.6	7.5	10.4	19.8	28.1	19.4	24.5
12AOM6[ ]ME	12	3/8	45.2	28.6	9.1	10.4	24.5	28.1	19.4	24.3
12AOM8[ ]ME	12	1/2	50.8	33.3	9.1	13.6	24.4	32.9	25.6	25.9



O-ring Straight Adapter: AOS

connects fractional port to female O-ring straight thread

Part Number*	T Tube O.D.	S Thd. Size	Dimensions — inches A	C Hex Flat	E min.	H	L	N	O-ring I.D.	O-ring O.D.
1AOS[ ]	1/16	5/16-24	1.06	9/16	.03	.34	.47	.56	.31	.44
2AOS[ ]	1/8	5/16-24	1.25	9/16	.09	.34	.63	.56	.31	.44
3AOS[ ]	3/16	3/8-24	1.34	5/8	.13	.38	.66	.63	.38	.50
4AOS[ ]	1/4	7/16-20	1.44	3/4	.19	.41	.69	.75	.44	.63
6AOS[ ]	3/8	9/16-18	1.61	15/16	.28	.47	.78	.94	.56	.75
8AOS[ ]	1/2	3/4-16	1.84	1 1/8	.39	.47	.97	1.13	.75	.94



Male SAE Adapter: AMS

connects fractional port to SAE/MS straight thread boss

Part Number	T Tube O.D.	Dimensions—inches S	A	B	E	F	G	O-ring
20AMS20316	1 1/4	1 5/8-12	2.81	.59	1.17	1 7/8	1.88	-920
24AMS24316	1 1/2	1 7/8-12	3.28	.59	1.30	2 1/8	2.25	-924
32AMS32316	2	2 1/2-12	4.24	.59	1.75	2 3/4	3	-932

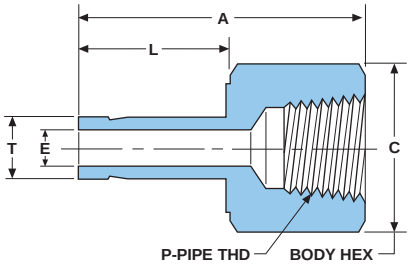
* [ ] see page 6 for material specifications.

Follow the HOKE Gyrolok remake instructions, page 8.

Female Adapter: AF

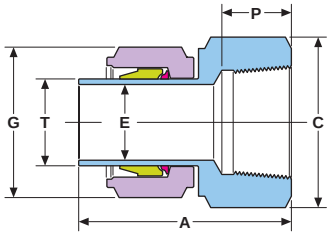
connects fractional port to male NPT thread

Metric fitting shown



Part Number*	T Tube O.D.	P Pipe Size	Dimensions — inches A	C Hex Flat	E min.	G Hex Flat	L
2AF2 [ ]	1/8	1/8	1.14	9/16	.09	—	.63
2AF4 [ ]	1/8	1/4	1.31	3/4	.09	—	.63
3AF2 [ ]	3/16	1/8	1.25	9/16	.13	—	.66
3AF4 [ ]	3/16	1/4	1.41	3/4	.13	—	.66
4AF2 [ ]	1/4	1/8	1.22	9/16	.19	—	.69
4AF4 [ ]	1/4	1/4	1.41	3/4	.19	—	.69
4AF6 [ ]	1/4	3/8	1.44	7/8	.19	—	.69
4AF8 [ ]	1/4	1/2	1.63	1 1/16	.19	—	.69
6AF2 [ ]	3/8	1/8	1.31	9/16	.28	—	.78
6AF4 [ ]	3/8	1/4	1.50	3/4	.28	—	.78
6AF6 [ ]	3/8	3/8	1.53	7/8	.28	—	.78
6AF8 [ ]	3/8	1/2	1.72	1 1/16	.28	—	.78
8AF4 [ ]	1/2	1/4	1.69	3/4	.39	—	.97
8AF6 [ ]	1/2	3/8	1.72	7/8	.39	—	.97
8AF8 [ ]	1/2	1/2	1.91	1 1/16	.39	—	.97
10AF6 [ ]	5/8	3/8	1.81	7/8	.50	—	1.08
10AF8 [ ]	5/8	1/2	2	1 1/16	.50	—	1.08
10AF12 [ ]	5/8	3/4	2.09	1 1/4	.50	—	1.08
12AF8 [ ]	3/4	1/2	2.06	1 1/16	.59	—	1.13
12AF12 [ ]	3/4	3/4	2.13	1 1/4	.59	—	1.13
12AF16 [ ]	3/4	1	2.44	1 5/8	.59	—	1.13
14AF12 [ ]	7/8	3/4	2.19	1 1/4	.69	—	1.19
16AF8 [ ]	1	1/2	2.28	1 1/16	.80	—	1.38
16AF12 [ ]	1	3/4	2.38	1 1/4	.80	—	1.38
16AF16 [ ]	1	1	2.63	1 5/8	.80	—	1.38
20AF20[ ]	1 1/4	1 1/4	3.06	2 1/8	1.09	1 7/8	—
24AF24[ ]	1 1/2	1 1/2	3.50	2 3/8	1.31	2	—
32AF32[ ]	2	2	4.53	2 7/8	1.75	3	—

20AF20[ ] shown



Over 1 inch and over 25 mm Female Adapters feature pre-set ferrules. Use the HOKE Gyrolok remake instructions, page 53.

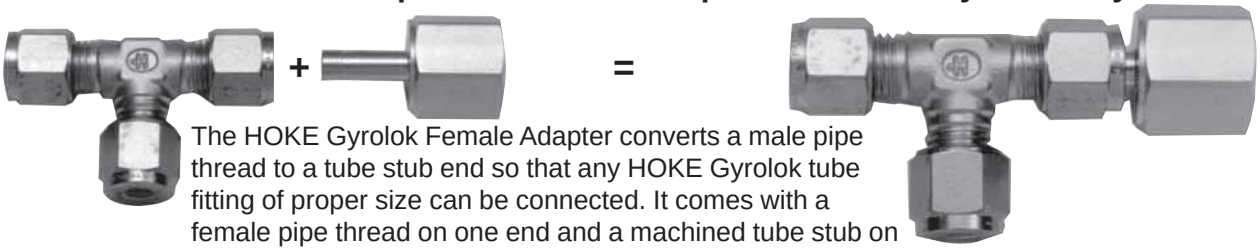
Female Adapter: AF/ME

connects metric port to male NPT thread

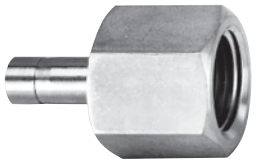
Part Number*	T Tube O.D.	P Pipe Size	Dimensions — mm A	C Hex Flat	E min.	L
3AF2[ ]ME	3	1/8	28.8	14.3	2.1	15.9
3AF4[ ]ME	3	1/4	33.3	19.1	2.1	15.9
6AF2[ ]ME	6	1/8	30.9	14.3	4.4	17.3
6AF4[ ]ME	6	1/4	35.7	19.1	4.4	17.3
6AF6[ ]ME	6	3/8	36.5	22.2	4.4	17.3
6AF8[ ]ME	6	1/2	41.3	27.0	4.4	17.3
8AF2[ ]ME	8	1/8	32.8	14.3	6.2	19.1
8AF4[ ]ME	8	1/4	37.5	19.1	6.2	19.1
8AF6[ ]ME	8	3/8	40.4	22.2	6.2	19.1
8AF8[ ]ME	8	1/2	43.9	27.0	6.2	19.1
10AF2[ ]ME	10	1/8	33.3	14.3	7.5	19.8
10AF4[ ]ME	10	1/4	38.1	19.1	7.5	19.8
10AF6[ ]ME	10	3/8	38.9	22.2	7.5	19.8
10AF8[ ]ME	10	1/2	43.7	27.0	7.5	19.8
12AF4[ ]ME	12	1/4	42.9	19.1	9.1	24.5
12AF6[ ]ME	12	3/8	44.7	22.2	9.1	24.5
12AF8[ ]ME	12	1/2	48.4	27.0	9.1	24.5
12AF12[ ]ME	12	3/4	53.3	31.8	9.1	24.5
14AF4[ ]ME	14	1/4	43.0	19.1	10.2	24.5
14AF8[ ]ME	14	1/2	47.5	27.0	11.0	24.5
15AF8[ ]ME	15	1/2	48.4	27.0	11.9	24.5
16AF6[ ]ME	16	3/8	46.0	22.2	12.6	27.3
16AF8[ ]ME	16	1/2	50.8	27.0	12.6	27.3
16AF12[ ]ME	16	3/4	53.0	31.8	12.6	27.3
18AF6[ ]ME	18	3/8	49.0	22.2	13.8	28.2
18AF8[ ]ME	18	1/2	51.8	27.0	13.8	28.2
18AF12[ ]ME	18	3/4	56.0	31.8	13.8	28.2
20AF8[ ]ME	20	1/2	57.2	27.0	15.1	33.4
20AF12[ ]ME	20	3/4	58.7	31.8	15.1	33.4
22AF8[ ]ME	22	1/2	54.0	27.0	15.8	30.0
22AF12[ ]ME	22	3/4	56.0	31.8	15.8	30.0
25AF8[ ]ME	25	1/2	60.0	27.0	19.3	35.5
25AF12[ ]ME	25	3/4	61.7	31.8	19.3	35.5
25AF16[ ]ME	25	1	67.2	41.3	19.5	35.5

* [ ] see page 6 for material specifications.

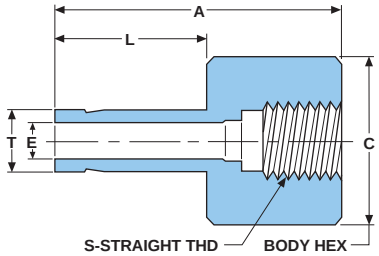
Union Tee Plus Adapter Assemblies Help Eliminate Costly Inventory



The HOKE Gyrolok Female Adapter converts a male pipe thread to a tube stub end so that any HOKE Gyrolok tube fitting of proper size can be connected. It comes with a female pipe thread on one end and a machined tube stub on the other. By using adapters with union tees, you'll need fewer male or female branch tees and run tees.



Fractional fitting shown



Female Adapter: AF/EZ

connects fractional port to male RG parallel threads (gauge)

Part Number*	T Tube O.D.	S Thd. Size	Dimensions — inches A	C Hex Flat	E min.	L
4AF4[ ]EZ	1/4	1/4	1.42	3/4	.19	.69
4AF8[ ]EZ	1/4	1/2	1.83	1 1/16	.19	.69
8AF4[ ]EZ	1/2	1/4	1.53	3/4	.22	.97
8AF8[ ]EZ	1/2	1/2	2	1 1/16	.28	.97

Female Adapter: AF/MZ

connects metric port to male RG parallel threads (gauge)

Part Number*	T Tube O.D.	S Straight Thd.	Dimensions — mm A	C Hex Flat	E min.	L
6AF4[ ]MZ	6	1/4	37.0	19.1	4.5	17.3
6AF8[ ]MZ	6	1/2	46.3	27.0	4.5	17.3
8AF4[ ]MZ	8	1/4	35.7	19.1	5.5	19.1
8AF8[ ]MZ	8	1/2	47.2	27.0	6.4	19.1
10AF4[ ]MZ	10	1/4	36.5	19.1	5.5	19.8
10AF8[ ]MZ	10	1/2	47.4	30.2	7.0	19.8
12AF4[ ]MZ	12	1/4	41.2	19.1	5.5	24.5
12AF8[ ]MZ	12	1/2	46.7	27.0	7.0	24.5
14AF8[ ]MZ	14	1/2	46.7	27.0	7.0	24.5
16AF8[ ]MZ	16	1/2	49.5	27.0	7.0	27.3
18AF8[ ]MZ	18	1/2	56.1	27.0	7.0	27.9
22AF8[ ]MZ	22	1/2	57.9	27.0	7.0	29.7
25AF8[ ]MZ	25	1/2	63.7	27.0	7.0	35.5

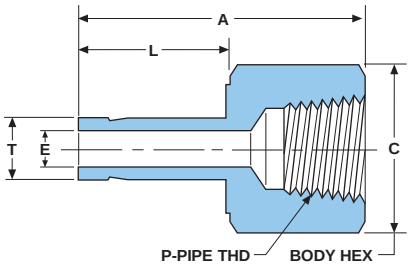
RG female thread ends require a gasket inserted into the bottom of the port. The male end, when assembled, exerts pressure on the gasket, creating a seal.

Female Adapter: AF/EC

connects fractional port to male RT tapered threads

Part Number*	T Tube O.D.	S Thd. Size	Dimensions — inches A	C Hex Flat	E min.	L
4AF2[ ]EC	1/4	1/8	1.22	9/16	.19	.69
4AF4[ ]EC	1/4	1/4	1.41	3/4	.19	.69
6AF6[ ]EC	3/8	3/8	1.53	7/8	.28	.78
8AF8[ ]EC	1/2	1/2	1.91	1 1/16	.39	.97

Metric fitting shown



Female Adapter: AF/MC

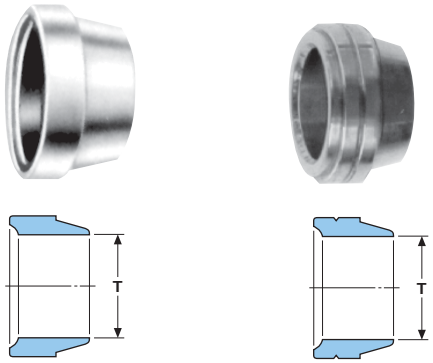
connects metric port to male RT tapered threads

Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions — mm A	C Hex Flat	E min.	L
3AF2[ ]MC	3	1/8	28.8	14.3	2.1	15.9
3AF4[ ]MC	3	1/4	33.3	19.1	2.1	15.9
6AF2[ ]MC	6	1/8	30.9	14.3	4.4	17.3
6AF4[ ]MC	6	1/4	35.7	19.1	4.4	17.3
6AF6[ ]MC	6	3/8	36.5	22.2	4.4	17.3
6AF8[ ]MC	6	1/2	41.3	27.0	4.4	17.3
8AF2[ ]MC	8	1/8	32.8	14.3	6.2	19.1
8AF4[ ]MC	8	1/4	37.5	19.1	6.2	19.1
8AF6[ ]ME	8	3/8	40.4	22.2	6.2	19.1
8AF8[ ]ME	8	1/2	43.9	27.0	6.2	19.1
10AF2[ ]MC	10	1/8	33.3	14.3	7.5	19.8
10AF4[ ]MC	10	1/4	38.1	19.1	7.5	19.8
10AF6[ ]MC	10	3/8	38.9	22.2	7.5	19.8
10AF8[ ]MC	10	1/2	43.7	27.0	7.5	19.8
12AF4[ ]MC	12	1/4	42.9	19.1	9.1	24.5
12AF6[ ]MC	12	3/8	44.7	22.2	9.1	24.5
12AF8[ ]MC	12	1/2	48.4	27.0	9.1	24.5
12AF12[ ]MC	12	3/4	53.3	31.8	9.1	24.5

* [ ] see page 6 for material specifications.

Front Ferrule: FF (Fractional)

Part Number*	T Tube O.D. — inches
1FF[ ]	1/16
2FF[ ]	1/8
3FF[ ]	3/16
4FF[ ]	1/4
6FF[ ]	3/8
8FF[ ]	1/2
10FF[ ]	5/8
12FF[ ]	3/4
14FF[ ]	7/8
16FF[ ]	1
20FF[ ]	1 1/4
24FF[ ]	1 1/2
32FF[ ]	2



Front Ferrule FF/MM (Metric)

Part Number*	T Tube O.D mm
3FF[ ]MM	3
4FF[ ]MM	4
6FF[ ]MM	6
8FF[ ]MM	8
10FF[ ]MM	10
12FF[ ]MM	12
14FF[ ]MM	14
15FF[ ]MM	15
16FF[ ]MM	16
18FF[ ]MM	18
20FF[ ]MM	20
22FF[ ]MM	22
25FF[ ]MM	25
30FF[ ]MM	30
32FF[ ]MM	32
38FF[ ]MM	38

Rear Ferrule: FR (Fractional)

Part Number*	T Tube O.D. inches
1FR[ ]	1/16
2FR[ ]	1/8
3FR[ ]	3/16
4FR[ ]	1/4
6FR[ ]	3/8
8FR[ ]	1/2
10FR[ ]	5/8
12FR[ ]	3/4
14FR[ ]	7/8
16FR[ ]	1
20FR[ ]	1 1/4
24FR[ ]	1 1/2
32FR[ ]	2

Rear Ferrule FR/MM (Metric)

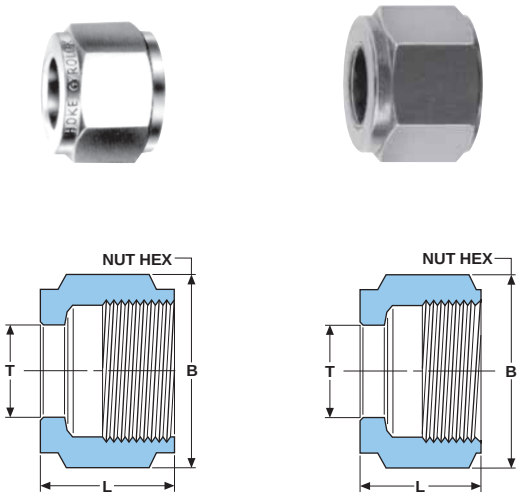
Part Number*	T Tube O.D. mm
3FR[ ]MM	3
4FR[ ]MM	4
6FR[ ]MM	6
8FR[ ]MM	8
10FR[ ]MM	10
12FR[ ]MM	12
14FR[ ]MM	14
15FR[ ]MM	15
16FR[ ]MM	16
18FR[ ]MM	18
20FR[ ]MM	20
22FR[ ]MM	22
25FR[ ]MM	25
30FR[ ]MM	30
32FR[ ]MM	32
38FR[ ]MM	38

Nylon front and rear ferrules are available in both fractional and metric.

Note: Stainless steel fittings larger than 1” and 25mm use stainless steel ferrules with a PFA coating.

Nut: N (Fractional)

Part Number*	T Tube O.D.	Dimensions — inches B	L
1N[ ]	1/16	5/16	.36
2N[ ]	1/8	7/16	.52
3N[ ]	3/16	1/2	.52
4N[ ]	1/4	9/16	.53
6N[ ]	3/8	11/16	.59
8N[ ]	1/2	7/8	.70
10N[ ]	5/8	1	.70
12N[ ]	3/4	1 1/8	.72
14N[ ]	7/8	1 1/4	.78
16N[ ]	1	1 1/2	.78
20N[ ]	1 1/4	1 7/8	1.25
24N[ ]	1 1/2	2 1/4	1.50
32N[ ]	2	3	2.06



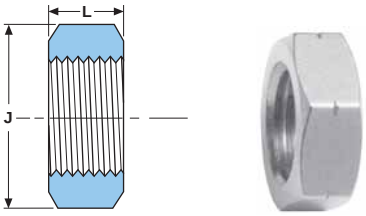
Nut N/MM (Metric)

Part Number*	T Tube O.D. mm	Dimensions - mm B	L
3N[ ]MM	3	11.1	13.1
4N[ ]MM	4	12.7	13.3
6N[ ]MM	6	14.3	13.4
8N[ ]MM	8	15.9	14.1
10N[ ]MM	10	19.1	15.0
12N[ ]MM	12	22.2	17.9
14N[ ]MM	14	23.8	16.8
15N[ ]MM	15	23.8	16.8
16N[ ]MM	16	25.4	17.8
18N[ ]MM	18	28.6	18.4
20N[ ]MM	20	31.8	20.0
22N[ ]MM	22	31.8	20.0
25N[ ]MM	25	38.1	21.3
30N[ ]MM	30	50.8	32.8
32N[ ]MM	32	50.8	34.4
38N[ ]MM	38	60.3	40.6

* [ ] see page 6 for material specifications.

Bulkhead Nut: BN (Fractional)

Part Number*	Dimensions — inches L	J
1BN[ ]	1/8	3/8
2BN[ ]	7/32	1/2
3BN[ ]	7/32	9/16
4BN[ ]	1/4	5/8
6BN[ ]	17/64	3/4
8BN[ ]	5/16	15/16
10BN[ ]	23/64	1 1/16
12BN[ ]	13/32	1 3/16
14BN[ ]	13/32	1 5/16
16BN[ ]	13/32	1 9/16
24BN[ ]	1/2	2 1/4
32BN[ ]	1/2	2 3/4

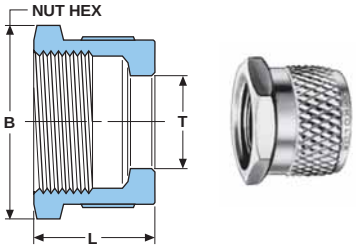


Bulkhead Nut: BN/MM (Metric)

Part Number*	Fitting Size mm	Dimensions - mm L	J
2BN[ ]	3	5.5	12.7
3BN[ ]	4	5.5	14.3
4BN[ ]	6	6.4	15.9
8BN[ ]MM	8	6.4	17.5
10BN[ ]MM	10	6.7	19.1
8BN[ ]	12	7.9	23.8
14BN[ ]MM	14 or 15	7.9	23.8
10BN[ ]	16	9.1	27.0
12BN[ ]	18	10.3	30.2
14BN[ ]	20 or 22	10.3	33.3
16BN[ ]	25	10.3	39.7

Knurled Nut: KN (Fractional)

Part Number*	T Tube O.D.	Dimensions — inches B	L
1KN[ ]	1/16	5/16	.36
2KN[ ]	1/8	7/16	.52
3KN[ ]	3/16	1/2	.52
4KN[ ]	1/4	9/16	.53
6KN[ ]	3/8	11/16	.59
8KN[ ]	1/2	7/8	.70
10KN[ ]	5/8	1	.70
12KN[ ]	3/4	1 1/8	.72
14KN[ ]	7/8	1 1/4	.78
16KN[ ]	1	1 1/2	.78



HOKE Gyrolok Fittings are available with knurled nuts and nylon ferrules for use with polyethylene tubing. Hand-tightening allows for quick, easy assembly and disassembly, while providing a leak-tight seal, ideally suited for laboratory hookups. Use such fittings with glass and other hard wall tubing materials.

To order, simply add KNN to the basic part number.
Example: 4CM4 with a knurled nut and nylon ferrules would be 4CM4 KNN.

Screen: SCRN

Part Number*	Gyrolok® End Size	Thickness
4SCRN 316	1/4	.05
6SCRN 316	3/8	.05

Use to prevent insects from entering open vent lines.
Usage Instructions:
1. Substitute screen for rear ferrule in an open HOKE Gyrolok-ended line. (No tubing connected.)
2. Finger-tighten nut.

Safety Changer Nut & Ferrule Sets: SCNF

Each SCNF contains 5 nut and ferrule sets. A nut and ferrule set consists of 1 nut, 1 front ferrule and 1 rear ferrule.

Safety Changer Ferrule Sets: SCF

Each SCF contains 10 ferrule sets as noted. A ferrule set consists of 1 front ferrule and 1 rear ferrule.

Provides a safe, easy, correct way to reuse existing fittings and valves with new HOKE Gyrolok components. Color coding differentiates metric and fractional parts and materials.

Fractional

Part Number*	Nut & Ferrule Sets/Changer	Tube O.D. — inches
1SCNF[ ]	5	1/16
2SCNF[ ]	5	1/8
3SCNF[ ]	5	3/16
4SCNF[ ]	5	1/4
6SCNF[ ]	5	3/8
8SCNF[ ]	5	1/2
10SCNF[ ]	5	5/8
12SCNF[ ]	5	3/4
16SCNF[ ]	5	1

Metric

Part Number*	Nut & Ferrule Sets/Changer	Tube O.D. — mm
3SCNF[ ]MM	5	3
6SCNF[ ]MM	5	6
8SCNF[ ]MM	5	8
10SCNF[ ]MM	5	10
12SCNF[ ]MM	5	12

Color Coded Package:
- Green: Fractional Brass
  Fractional 316 Stainless Steel
- Red: Fractional Monel
- Blue: Metric

How to Order
Add designated material to part number. For example:
Brass = BR
316 Stainless Steel = 316
Monel = M
Example: 2SCNF 316 (5 nut and ferrule sets for 1/8" tubing in 316 Stainless Steel.)

Fractional

Part Number	Ferrule Sets/Changer	Tube O.D.— Inches
1SCF[ ]	10	1/16
2SCF[ ]	10	1/8
3SCF[ ]	10	3/16
4SCF[ ]	10	1/4
6SCF[ ]	10	3/8
8SCF[ ]	10	1/2
10SCF[ ]	10	5/8
12SCF[ ]	10	3/4
16SCF[ ]	10	1

Metric

Part Number	Ferrule Sets/Changer	Tube O.D.— mm
3SCF[ ]MM	10	3
6SCF[ ]MM	10	6
8SCF[ ]MM	10	8
10SCF[ ]MM	10	10
12SCF[ ]MM	10	12

* [ ] see page 6 for material specifications.

Tube Inserts

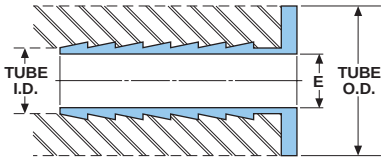
HOKE Gyrolok tube fittings may be used with various types of plastic tube material without any special preparation. Use tube inserts to support soft types of tubing, such as Tygon or polyvinyl chloride, prior to insertion into a HOKE Gyrolok end. See chart at lower right for recommendations.

Usage Instructions

1. Fully insert Tube Insert into plastic tubing, where appropriate.
2. If using standard nut, follow standard HOKE Gyrolok assembly instructions, page 53 (Hand-tighten, then tighten 1¼ turns with wrench.)
3. For finger-tight assembly, standard Brass fittings are available with knurled nuts and nylon ferrules.

Example:

4	TI	2	316
Tube O.D. in sixteenths of an inch — 1/4"	**Type Fitting** (Tube Insert)	**Tube I.D.** in sixteenths of an inch — 1/8" (Except .170 I.D.)	**Material** Brass = BR 316SS = 316



Tube Insert: TI (Fractional)

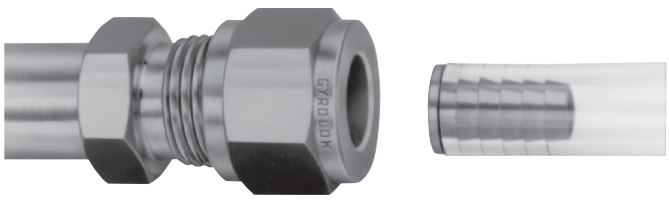
Part Number*	Tube O.D.	Pipe Size	Dimensions — inches E
3TI2 [ ]	3/16	1/8	.09
4TI2 [ ]	1/4	1/8	.09
4TI.170 [ ]	1/4	.170	.11
4TI3 [ ]	1/4	3/16	.13
6TI3 [ ]	3/8	3/16	.13
6TI4 [ ]	3/8	1/4	.19
8TI4 [ ]	1/2	1/4	.19
8TI6 [ ]	1/2	3/8	.28
10TI6 [ ]	5/8	3/8	.28
10TI8 [ ]	5/8	1/2	.42
12TI8 [ ]	3/4	1/2	.42
12TI10 [ ]	3/4	5/8	.50
14TI10 [ ]	7/8	5/8	.50
14TI12 [ ]	7/8	3/4	.66
16TI12 [ ]	1	3/4	.66
16TI14 [ ]	1	7/8	.72

Tube Insert: TI/MM (Metric)

Part Number*	T Tube O.D.	Tube I.D.	Dimensions — mm E min.
6TI4[ ]MM	6	4	2.2
8TI6[ ]MM	8	6	4.3
10TI8[ ]MM	10	8	6.3
12TI10[ ]MM	12	10	7.9

Tube Insert: TI/ME (Metric)

Part Number*	T Tube O.D.	Tube I.D.	Dimensions — mm E min.
8TI4[ ]ME	8	1/4	4.7



HOKE Gyrolok Used With Plastic Tubing and Tube Insert

Tubing Material	Front Ferrule	Rear Ferrule	Tube Insert Usage
Polyethylene	Metal Nylon	Metal Nylon	Not normally required
Nylon	Metal Nylon	Metal Nylon	Not normally required
Teflon®	Metal Teflon	Metal Teflon or Metal	Not normally required
Rigid PVC	Metal Teflon*	Metal Teflon*	None
Soft Polyvinyl Chloride or Tygon	Metal Nylon	Metal Nylon	Recommended

* Limited gripping, metal provides tighter grip for higher pressures.

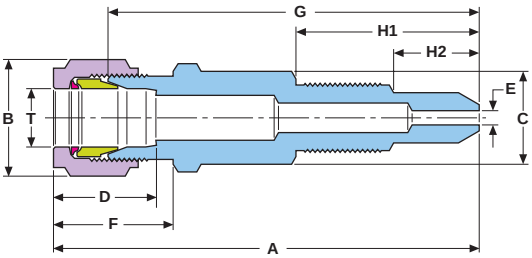
* [ ] see page 6 for material specifications.

HOKE Gyrolok Calibration Fittings

HOKE Gyrolok Calibration Fittings save time and money by reducing the time required to calibrate differential pressure transmitters. HOKE's calibration fittings, constructed of 316 Stainless Steel, combine a straight thread and conical metal-to-metal sealing surface on one end with a 1/4″ Gyrolok tube fitting on the other. This design allows the technician to easily calibrate the transmitter – in place – without removing the pipe plug/bleed port tap assemblies. No TFE tape is required. Gyrolok's exclusive Controlled Ferrule Drive increases value – extending cycle life.

Features	Benefits
Straight Thread/Metal-to-Metal Sealing:	• Ease of installation
Controlled Ferrule Drive:	• Greatly extends remake life • Protects tubing from overstressing
Butt Seal:	• Maximizes seal integrity and user safety
Sizing Angle:	• Reduces tube sticking
Nut and Ferrule Safety Changer:	• Safe, simple component replacement

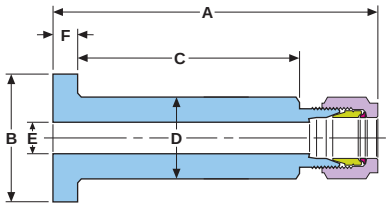
Dimensions (Fractional)



Part Number	T Tube O.D.	Straight Thread	Dimensions — inches A	B	C	D	E min.	F	G	H1	H2
CM005[ ]	1/4	1/4-28	1 23/32	9/16	1/2	41/64	1/16	49/64	1 13/32	25/32	27/64
CM009[ ]	1/4	5/16-24	2 11/32	9/16	1/2	41/64	1/16	49/64	2 1/32	1	25/64

CM005 – For use with Honeywell transmitters
CM009 – For use with Rosemount or Foxboro transmitters

Lapped Flange Connector



Flange Seal A **Flange Seal B**

Smooth **Serrated / Concentric**

Lapped Flange Connector: CLF (Fractional)

Part Number	T Tube O.D.	Flange Seal	Dimensions — inches A	B	C	D	E min.	F	Finish
4CLFA [ ]	1/4	A	3.33	1.38	2.28	.88	.19	.25	3.2 – 6.3 Micrometer (Ra)
4CLFB [ ]	1/4	B	3.33	1.38	2.28	.88	.19	.25	6.3 – 12.5 Micrometer (Ra)
6CLFA [ ]	3/8	A	3.34	1.38	2.28	.88	.30	.25	3.2 – 6.3 Micrometer (Ra)
6CLFB [ ]	3/8	B	3.34	1.38	2.28	.88	.30	.25	6.3 – 12.5 Micrometer (Ra)
8CLFA [ ]	1/2	A	3.47	1.38	2.28	.88	.42	.25	3.2 – 6.3 Micrometer (Ra)
8CLFB [ ]	1/2	B	3.47	1.38	2.28	.88	.42	.25	6.3 – 12.5 Micrometer (Ra)

Lapped Flange Connector: CLF/MM (Metric)

Part Number	T Tube O.D.	Flange Seal	Dimensions — mm A	B	C	D	E min.	F	Finish
10CLFA[ ]MM	10	A	84.1	34.9	57.9	22.2	7.1	6.4	3.2–6.3 Micrometer (Ra)
10CLFB[ ]MM	10	B	84.1	34.9	57.9	22.2	7.1	6.4	6.3–12.5 Micrometer (Ra)

The Lapped Flange Connector is used to allow safe and easy connections between process lines and instruments. The basic, one-piece unit consists of a HOKE Gyrolok tube connection end and a 1/2" lap joint pipe flange. The flange end is dimensioned to meet "ANSI 2500" flange specifications. Available in "Smooth" or "Serrated/Concentric" seal faces, and in 316 Stainless Steel or Monel.

* [ ] see page 6 for material specifications.

HOKE Dielectric Tube Fittings

The HOKE Gyrolok Dielectric Tube Fittings are for use in applications where electrical current flowing through a pipe or tube line must be interrupted to protect vital instrumentation and metering equipment.

Features

Thermoplastic Insulators with:
- Resistance in excess of 10^8 ohms at 70° F (21° C) and 50% relative humidity.
- Resistance in excess of 10^6 ohms at 100 °F (38° C) and 90% relative humidity.

Metal components made of 316 Stainless Steel:

Appropriate orifice for fitting size (e.g. .422" orifice in 1/2" fitting):

HOKE Gyrolok tube fitting ends:

Benefits

- Maximum safety and protection to critical monitoring station instrumentation.
- Long component life in rugged environment.
- Maximum flow capability provided by all sizes of HOKE Gyrolok Dielectric tube fittings.
- The unique value and performance offered by HOKE Gyrolok.

Technical Data

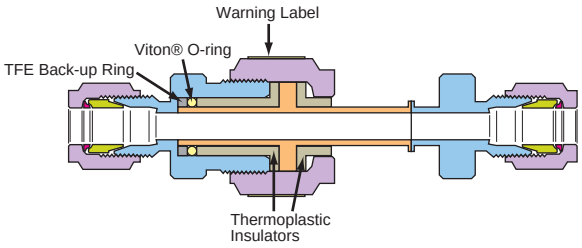
Body Construction Materials:	• 316 Stainless Steel
Insulator:	• Molded Thermoplastic
O-ring Material:	• 90 Durometer Viton
Back-up Washer:	• Virgin TFE
Electrical Resistance of Insulators:	• 7.0 X 10^8 Ω@ 10 Volts DC @ 70° F and 50% relative humidity • 1.0 X 10^6 Ω @ 10 Volts DC @ 100° F and 90% relative humidity
Pressure Rating:	• 4000 PSIG @ 70° F (27,580kPa @ 21° C)
Temperature Rating:	• -40° F to +200° F (-40° C to +93° C)

Design

The Dielectric Tube Fitting must perform three primary functions:
1. Electrical insulation
2. Reliable fluid containment
3. Appropriate flow for line size

In the HOKE design, the insulation function is performed by thermoplastic insulators which provide performance unequaled by any similar product.

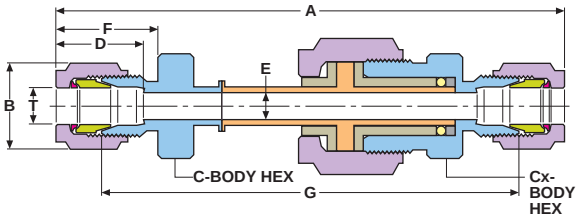
A Viton o-ring and TFE back up ring provide the containment function within the fitting. Gyrolok's 2-ferrule system provides sealing with the impulse line tubing.



Appropriate flow for line size is achieved by providing the appropriate inside diameter for tubing size. See "E" dimensions in Dimensional Table.

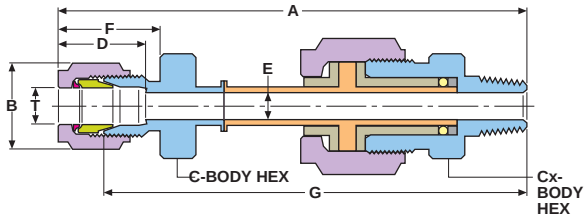
WARNING: A "NO WRENCHING" label is placed on the hex of the nut in the insulation sections. Do not disconnect at this point. Instructions are provided with every HOKE Dielectric fitting.

Dielectric Unions: DU

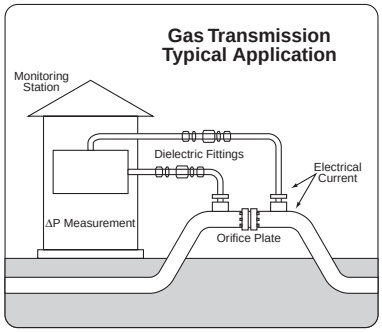


	T				Dimensions — inches				
	Tube			C	Cx				
Part No.	O.D.	A	B	Hex Flat	Hex Flat	D	E min	F	G
4DU-316	1/4	3.78	9/16	1/2	11/16	.64	.19	.77	3.12
6DU-316	3/8	3.92	11/16	5/8	13/16	.72	.28	.83	3.23
8DU-316	1/2	4.15	7/8	13/16	15/16	.97	.42	.92	3.21

Dielectric Male Connectors: DCM



	T				Dimensions — inches				
	Tube			C	Cx				
Part No.	O.D.	A	B	Hex Flat	Hex Flat	D	E min	F	G
6DCM4-316	3/8	3.66	11/16	5/8	13/16	.72	.28	.83	3.32



Application

Commonly used in the Natural Gas Transmission industry, the Dielectric Fitting will prevent current flow resulting from Impressed Current Cathodic Protection Systems, static electricity or even lightning strikes, from reaching sensitive monitoring station equipment.

Impressed Current Cathodic Protection Systems involve the application of a low voltage, low amperage direct current to a pipeline and eventual transfer of corrosive effects to a typically underground anode bed.

If the current flow is not interrupted before reaching the monitoring station critical equipment could be damaged or rendered inaccurate.

By installing HOKE's Gyrolok Dielectric Tube Fitting on impulse lines between the pipeline and the monitoring station, current flow is interrupted while full fluid flow is permitted.

HOKE Chromatography Fittings

HOKE Gyrolok tube fittings for use in gas or liquid chromatography applications are available in a variety of user-required configurations. HOKE's Chromatography Fittings feature low dead volumes, male nut designs, as well as configurations utilizing either press-fit or drop-in frits. For user convenience, both frit versions are available in a number of micron sizes. By combining the needs of the Chromatography Fitting with key Gyrolok features, such as controlled ferrule drive, the HOKE Chromatography Fitting offers capabilities and performance that are unmatched in the industry.

Features	Benefits
Low Dead Volume:	• Accurate analysis and measurement
Press-fit or Drop-in Frits:	• Filter elements can be ordered factory installed (press-fit) or for field installation (drop-in) • 4 micron sizes are offered as standard, other sizes can be provided • Perform final filtering function for low volume fluids • Press-fit frit design reduces internal volume
Conical Diffusion Angle:	• Assures fluid contact over a greater surface, extending frit life while reducing unfiltered volume
Male Nut Configuration:	• Reduced internal volume
Fritless Configurations:	• For use with G.C. columns or L.C.'s with screens
Controlled Ferrule Drive: HOKE Exclusive	• Long product life with outstanding remakeability
Interchangeability:	• Fittings are interchangeable with those of certain other manufacturers (consult factory)

Pressure Ratings
HOKE Gyrolok Chromatography fittings are rated for working pressures higher than the tubing recommended for use. Refer to HOKE's Tubing Data Charts for specific information.

Temperature Ratings
316 Stainless Steel: -325° F to +800° F (-200° C to +425° C)

Note: Intermittent use to 1200° F is possible, however prolonged exposure to temperatures over 800° F is not recommended.

How to Order—Fittings

2	F	U	M	P	1	316
Tube O.D. in 1/16's of an inch; 2=2/16=1/8"	**Nut Type** M=male F=female; size 2 nut is female	**Fitting Type** U=union RU=reducing union CM=male connector	**Nut Type** M=male F=female only used if different nut type is used	**Press-Fit Frit size** P=.5 micron R= 2 micron T= 5 micron V= 10 micron	**Tube Size** in 1/16's of an inch	**Material** 316 Stainless Steel

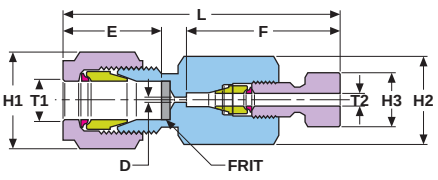
Dimension Tables

Drop-In Frit

Part No.	Column O.D.
4FRIT [*] - 316	1/4
6FRIT [*] - 316	3/8
8FRIT [*] - 316	1/2
16FRIT [*] - 316	1

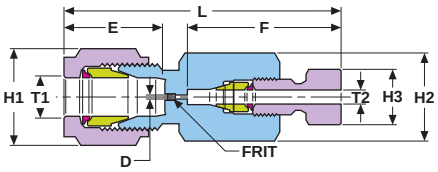
***** Frit designator in microns: E=2.0, G=5.0, I=10. Assign appropriate letter code for desired size.

Column End Fitting (for use with drop-in frit)



Part No.	T1 x T2 Tube Sizes	Dimensions — inches L Length	D Dia.	H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
4FUM1-316	1/4 x 1/16	1.57	0.020	9/16	1/2	1/4	41/64	51/64
6FUM1-316	3/8 x 1/16	1.65	0.020	11/16	5/8	1/4	23/32	51/64
8FUM1-316	1/2 x 1/16	1.93	0.030	7/8	13/16	1/4	31/32	51/64
16FUM1-316	1 x 1/16	2.30	0.030	1 1/2	1 3/8	1/4	1 5/16	51/64

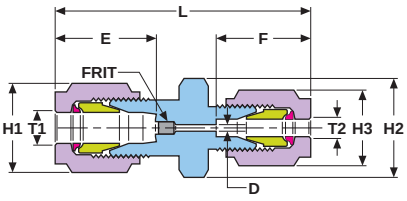
* [ ] see page 6 for material specifications.



Column End Fitting (with press-fit frit)

	Dimensions — inches							
Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
2FUM[*]1-316	1/8 X 1/16	1.50	0.013	7/16	7/16	1/4	9/16	51/64
4FUM[*]1-316	1/4 X 1/16	1.57	0.013	9/16	1/2	1/4	41/64	51/64
6FUM[*]1-316	3/8 X 1/16	1.64	0.013	11/16	5/8	1/4	23/32	51/64

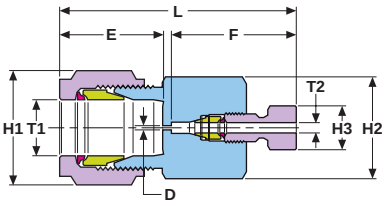
* Frit designator in microns: P=0.5, R=2.0, T=5.0, V=10. Assign letter code to complete part number.



Union (with press-fit frit)

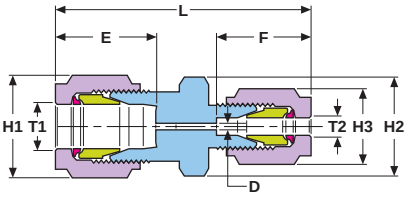
	Dimensions — inches							
Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
2FU[*]1-316	1/8 X 1/16	1.36	0.020	7/16	7/16	5/16	9/16	13/32
4FU[*]1-316	1/4 X 1/16	1.47	0.020	9/16	1/2	5/16	41/64	13/32
6FU[*]1-316	3/8 X 1/16	1.56	0.020	11/16	5/8	5/16	23/32	13/32

* Frit designator in microns: P=0.5, R=2.0, T=5.0, V=10. Assign letter code to complete part number.



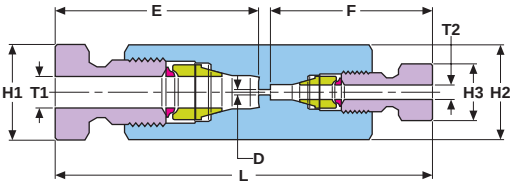
Column End Fitting

	Dimensions — inches							
Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
2FRUM1-316	1/8 X 1/16	1.41	0.013	7/16	7/16	1/4	9/16	51/64
4FRUM1-316	1/4 X 1/16	1.48	0.013	9/16	1/2	1/4	41/64	51/64
6FRUM1-316	3/8 X 1/16	1.56	0.013	11/16	5/8	1/4	23/32	51/64



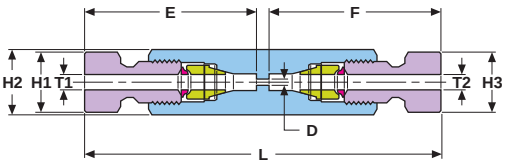
Reducing Union

	Dimensions — inches							
Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
2FRU1-316	1/8 X 1/16	1.33	0.020	7/16	7/16	5/16	9/16	13/32
4FRU1-316	1/4 X 1/16	1.47	0.020	9/16	1/2	5/16	41/64	13/32
6FRU1-316	3/8 X 1/16	1.56	0.020	11/16	5/8	5/16	23/32	13/32



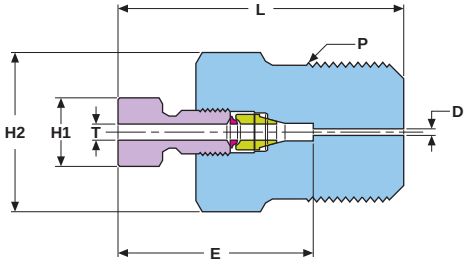
Reducing Union (male nut)

	Dimensions — inches							
Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
2MRU1-316	1/8 X 1/16	1.91	0.013	3/8	7/16	1/4	1 1/16	51/64



Union (male nut)

	Dimensions — inches							
Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
1MU-316	1/16 X 1/16	1.84	0.013	1/4	5/16	1/4	51/64	51/64
2MU-316	1/8 X 1/8	2.18	0.052	3/8	7/16	3/8	1 1/16	1 1/16



Male Connector (male nut)

	Dimensions — inches						
Part No.	T Tube Size	P Pipe Size	L Length	D Dia.	H1 Hex Size	H2 Hex Size	E Dim
1MCM1-316	1/16	1/16 NPT	0.880	0.013	1/4	5/16	51/64
1MCM2-316	1/16	1/8 NPT	0.940	0.013	1/4	7/16	51/64
1MCM4-316	1/16	1/4 NPT	1.160	0.013	1/4	9/16	51/64

Note: All dimensions are for reference only.

Gyrogage

Today's safety conscious users are paying greater attention to tube fitting performance. User studies indicate that, while superior fittings will greatly improve performance, problems still occur. Why? Data shows that the leading cause of performance loss is the incorrect assembly of the tubing and fitting. They found, for example, that:

- Difficult-to-reach fitting nuts were not always tightened.
- Improper ferrule set occurred because burrs, or too short a tube length after a bend, prevented tubing from being fully inserted
- Improper make-up was caused by missing ferrules, because a ferrule borrowed from a fitting in inventory was never replaced

HOKE has addressed all of these concerns with the HOKE Gyrogage!

Features	Benefits
Missing ferrule indicator:	• Maximizes system safety by confirming that all components are in place. **HOKE exclusive**
Scribing tool:	• Assures proper assembly by marking tubing to show that it has been properly inserted into fitting, and that fitting has been properly tightened.
Usable by both assembler and post assembly inspector:	• Redundant method of verification.
Color-coded gages:	• Simplifies selection of appropriate system gage: metric (blue) or fractional (green). **HOKE exclusive**
Size markings:	• Simplifies selection of appropriate size gage.
Single tool per size:	• Eliminates need for extra tools; use one tool for installation and inspection, even for hard-to-reach assemblies.
Choice of marking methods:	• Adds flexibility to assembly and inspection with choice of marking systems: built-in scriber or separate ink marker*. **HOKE exclusive**

How to Order

4 GG

TUBE SIZE — Tube O.D in sixteenths of an inch

TYPE OF PRODUCT — (HOKE Gyrogage)

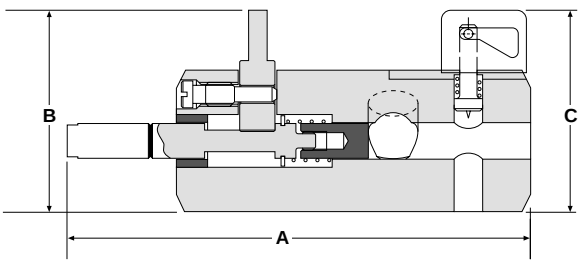
6 GG / MM

TUBE SIZE — Tube O.D in MM. (6mm)

METRIC DESIGNATION — (millimeters)

TYPE OF PRODUCT — (HOKE Gyrogage)

Dimensions



Part Number	Tube Size	A	B	C	Options: Replacement Scribers*
Fractional Sizes	**Inch**				
1GG	1/16	3 3/64	1 11/16	1	SPGGK1
2GG	1/8	3 1/64	1 11/16	1	SPGGK2
3GG	3/16	3 1/64	1 11/16	1	SPGGK3
4GG	1/4	3 17/64	1 11/16	1	SPGGK4
6GG	3/8	3 15/32	1 13/16	1 1/8	SPGGK4
8GG	1/2	4 3/64	1 31/32	1 1/4	SPGGK4
10GG	5/8	4 35/64	2 5/8	1 5/8	SPGGK5
12GG	3/4	4 47/64	2 11/16	1 3/4	SPGGK5
14GG	7/8	4 63/64	2 13/16	1 7/8	SPGGK5
16GG	1	5 9/16	3 1/32	2	SPGGK5
Metric Sizes	**mm**				
3GG/MM	3	3 13/64	1 11/16	1	SPGGK2
6GG/MM	6	3 1/4	1 11/16	1	SPGGK4
8GG/MM	8	3 11/32	1 3/4	1 1/16	SPGGK4
10GG/MM	10	3 1/2	1 13/16	1 1/8	SPGGK4
12GG/MM	12	4 7/64	1 31/32	1 1/4	SPGGK4
14GG/MM	14	4 3/16	2 15/32	1 9/16	SPGGK5
16GG/MM	16	4 9/16	2 17/32	1 5/8	SPGGK5
18GG/MM	18	4 23/32	2 5/8	1 11/16	SPGGK5
20GG/MM	20	5 1/8	2 3/4	1 13/16	SPGGK5
22GG/MM	22	4 61/64	2 13/16	1 7/8	SPGGK5
25GG/MM	25	5 35/64	3 1/32	2	SPGGK5

* Gyrogage scribers can be quickly and easily replaced using the referenced kit numbers.

Leak Detective Products

HOKE's Leak Detective products are used to detect leaks in pressurized gas systems. Use the Leak Detective to locate fugitive gas emissions in compressed air, oxygen, helium, hydrogen, nitrogen, natural gas, acetylene, and propane systems.

The Leak Detective is manufactured to meet specification MIL-L-25567D and is available in two types. Type 1 is for regular temperature applications 27° F to 200° F (-3° C to 95° C) while Type 2 is for colder application from -65° F to 200° F (-55° C to 95° C). The Leak Detective is packaged as standard in 8 ounce (230 ml) bottles or 1 gallon (4 liter) containers. A tracer tube is provided with each small bottle. 5 gallon containers and 55 gallon drums can also be provided upon request.

Benefits

Safety:
- Oxygen compatible and manufactured in accordance with MIL-L-25567D
- Meets requirements of ASME Section V for composition and purity

Certifications:
- Material Safety Data Sheets (MSDS) available

Helps eliminate fugitive emissions:
- Verifies leak-tight systems

Cleanliness:
- Leaves virtually no residue

Technical Data

Specification
- Complies with MIL-L-25567D

Fluids
- For use on pressurized gas systems

Operating Temperatures
- Type 1: 27° F to 200° F (-3° C to 95° C)
- Type 2: -65° F to 200° F (-55° C to 95° C)

Packaging

Standard	Options
8 ounce	2 ounce
1 gallon	5 gallon
230ml	55-gallon drum
4 liter	

Usage Instructions

1. Extend 12″ tracer tube
2. Direct solution
3. Squeeze bottle
4. Inspect system for foaming that indicates leakage

Ordering Information

Part Number	Type	Label Language	Size
1LD-E/8oz	1	English	8 ounce
1LD-E/1G	1	English	1 gallon
2LD-E/8oz	2	English	8 ounce
2LD-E/1G	2	English	1 gallon
1LD-EF/230	1	English/French	230ml
1LD-EF/4L	1	English/French	4 liter
2LD-EF/230	2	English/French	230ml
2LD-EF/4L	2	English/French	4 liter
1LD-G/230	1	German	230ml
1LD-G/4L	1	German	4 liter
2LD-G/230	2	German	230ml
2LD-G/4L	2	German	4 liter
1LD-S/230	1	Spanish	230ml
1LD-S/4L	1	Spanish	4 liter
2LD-S/230	2	Spanish	230ml
2LD-S/4L	2	Spanish	4 liter

Pre-setting Tool: PST

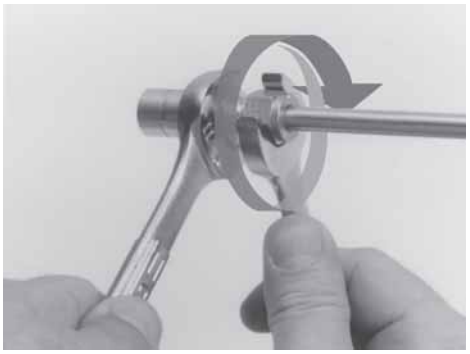
Used strictly for pre-assembling ferrules to tubing.

Fractional

Part Number*	Tube O.D.	Dimensions — inches Length	Across Flats
1PST	1/16	2.25	3/8
2PST	1/8	1.94	11/16
3PST	3/16	2	1/2
4PST	1/4	1.94	11/16
6PST	3/8	1.97	11/16
8PST	1/2	2	7/8
12PST	3/4	2.50	1 1/8
16PST	1	2.50	1 1/2

Metric

Part Number*	Tube O.D.	Dimensions — mm Length	Across Flats
3PSTMM	3	49.2	17.3
6PSTMM	6	49.0	17.3
8PSTMM	8	50.0	17.3
10PSTMM	10	50.8	17.3
12PSTMM	12	50.8	22.0
14PSTMM	14	50.8	22.0
16PSTMM	16	63.5	28.4
18PSTMM	18	63.5	28.4
20PSTMM	20	63.5	28.4
22PSTMM	22	63.5	37.9
25PSTMM	25	63.5	37.9



Usage Instructions

1. Place PST in vise.
2. Loosely assemble nut and ferrules to PSI. Use HOKE Gyrolok Safety Changer Nut & Ferrule Sets.
3. Follow standard HOKE Gyrolok assembly instructions to set ferrules onto tubing, see page 53.
4. Loosen nut and remove tubing with pre-set ferrules and nut.
5. With pre-set ferrules and nut in permanent location, reassemble tubing by following HOKE Gyrolok reassembly instructions on page 53.

Note: Threads of pre-setting tools should be lubricated the very first time and relubricated every tenth time thereafter.

* [ ] see page 6 for material specifications.

Hydraulic Pre-Setting Tool

Larger tube fittings often require more effort to assemble properly than can be consistently achieved using hand wrenches. HOKE offers a portable Hydraulic Pre-setting Tool to make the assembly of larger fittings:

- **Safer.** The Hydraulic Pre-setting Tool helps assure consistently correct assembly of larger fittings.
- **Simpler.** Interchangeable die sets allow easy conversion from one tube and fitting size to another.
- **More cost-efficient.** Using the Hydraulic Pre-setting Tool extends fitting life and reduces assembly time.

Using the portable Hydraulic Pre-setting Tool, the Gyrolok nut and ferrule system is initially set onto the tubing. The pre-set fitting and tube assembly is then easily installed by following the Gyrolok reassembly instructions.

Features

One basic pre-setting head for all sizes:

Interchangeable die sets:

10,000 PSI hydraulic pump:

Carrying case:

Benefits

- Provides versatility and value by covering sizes from ½″ through 2″ and 12mm through 50mm.
- Allows easy conversion from one tube and fitting size to another.
- Provides the force necessary for consistent, fast, and simple fitting assembly.
- Rugged steel carrying case offers easy transportation as well as a single storage location for all tool components.

How It Works

Gyrolok nut and ferrule system components are assembled onto Hydraulic Pre-Setting Tool. Hand pump is operated until indicator arm releases.

Pre-set tube assembly is ready for installation using standard Gyrolok remake instructions

How to Order

HOKE's Hydraulic Pre-Setting Tool, Pump and Ram Assembly.
Carrying case is included. Carrying case has room for 6 die sets.

Hydraulic Pre-Setting Tool, Pump and Ram Assembly

Size	Part Number
13" x 20" x 6.5" Case	2HPST

Note: Basic kit does not include die sets.

2HPST LM

TYPE OF PRODUCT

SF	Small fractional package
SM	Small metric package
LF	Large fractional package
LM	Large metric package
LSF	Large & small fractional package
LSM	Large & small metric package

Standard Kits

2HPSTSF
(≤1" fractional package) consists of:

- 2HPST Basic kit
- 59-1298-DJS8 ½" die set
- 59-1298-DJS12 ¾" die set
- 59-1298-DJS16 1" die set

2HPSTLF
(>1" fractional package) consists of:

- 2HPST Basic kit
- 59-1298-DJS20 1¼" die set
- 59-1298-DJS24 1½" die set
- 59-1298-DJS32 2" die set

2HPSTLSF consists of:

- 2HPST Basic kit
- All six die sets contained in 2HPSTSF and 2HPSTLF

2HPSTSM
(≤25mm metric package) consists of:

- 2HPST Basic kit
- 59-1302-DJS12M 12mm die set
- 59-1302-DJS18M 18mm die set
- 59-1302-DJS25M 25mm die set

2HPSTLM
(>25mm metric package) consists of:

- 2HPST Basic kit
- 59-1302-DJS30M 30mm die set
- 59-1302-DJS32M 32mm die set
- 59-1302-DJS38M 38mm die set

2HPSTLSM consists of:

- 2HPST Basic kit
- All six die sets contained in 2HPSTSM and 2HPSTLM

Die Sets. Consists of one die and one jig for an individual tube size.

Jig

Die

59-1302 - DJS 12 M

TYPE OF PRODUCT

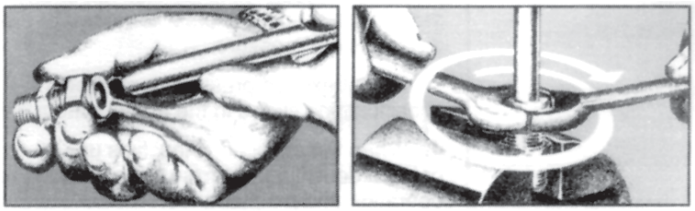
59-1298	Fractional HOKE die set
59-1302	Metric HOKE die set

TUBE SIZE
Tube O.D. in 1/16″
Tube O.D. in mm (with "M" suffix)

METRIC DESIGNATION *(millimeters)*

Fractional Tube Size	Part Number	*Metric* Tube Size	Part Number
1/2"	59-1298-DJS8	12mm	59-1302-DJS12M
5/8"	59-1298-DJS10	14mm	59-1302-DJS14M
3/4"	59-1298-DJS12	16mm	59-1302-DJS16M
7/8"	59-1298-DJS14	18mm	59-1302-DJS18M
1"	59-1298-DJS16	20mm	59-1302-DJS20M
1-1/4"	59-1298-DJS20	22mm	59-1302-DJS22M
1-1/2"	59-1298-DJS24	25mm	59-1302-DJS25M
2"	59-1298-DJS32	28mm	59-1302-DJS28M
		30mm	59-1302-DJS30M
		32mm	59-1302-DJS32M
		38mm	59-1302-DJS38M
		50mm	59-1302-DJS50M

HOKE Gyrolok Assembly Instructions



Initial setting of ferrules onto tubing or tube stub-ended fittings

Sizes 1", 25mm and Smaller

Manual Assembly

Use the following instructions when initially setting ferrules onto either tubing, or the tube stub end of certain fittings (e.g. adapters, port connectors, and reducers). Note that for tubing sizes above ½", or 12mm, the use of a presetting tool, either manual or hydraulic, may apply. See further details in the Section titled, "Presetting Tool Assembly".

1. Loosen the fitting nut.
2. Firmly insert the tubing into the fitting assembly. Proper assembly requires that the tubing be fully bottomed in the fitting body. Note: Use of the HOKE Gyrogage, explained below, will allow the assembler to confirm proper tube insertion.
3. Establish a consistent starting point for wrench tightening.
   For sizes under ½", finger tightening of the fitting nut is sufficient.

   For sizes ½" and above, tighten the fitting nut until the tubing will not rotate. If it is not possible to determine tubing rotation then, while supporting the body with a backup wrench, use a wrench to tighten the fitting nut an additional ¼-turn past finger-tight.
4. Mark the fitting body and nut at the 12:00 position with a readily visible marking.
5. While supporting the body with a backup wrench, tighten the nut with a wrench 1¼-turns by going completely around past the 12:00 position to the 3:00 position. Note that if a Gyrogage is used, the mark made on the tubing will become visible at the back of the nut when the nut has been sufficiently tightened.

Presetting Tool Assembly

Due to the inherent strength of large diameter heavy wall tubing, HOKE recommends the use of a presetting tool, either manual or hydraulic, for all installations involving tubing sizes from 5/8" or 16mm and above, regardless of application. When the tubing wall thickness being utilized in sizes less than 0.065" or 2.0mm, a manual presetting tool is sufficient. When the wall thickness is 0.065" or 2.0mm and greater, the use of a hydraulic presetting tool is specifically required. Each Hydraulic Pre-setting Tool is supplied with its own set of instruction.

The use of manual presetting tools is also suggested for smaller size fittings and tubing when the actual installation is in a hard-to-reach location, making it difficult to count turns. Use manual presetting tools by following the instructions for initially setting ferrules. By presetting the ferrules in the presetting tool, installation in place simply requires following Gyrolok remake instructions.

Remaking a fitting end, or assembling a fitting body to tubing with preset-ferrules

1. Firmly insert the end with the previously set ferrules into the fitting body and tighten the nut to a finger tight condition.
2. While supporting the body with a backup wrench, tighten the nut with a wrench until a sharp rise in torque is felt, then simply snug tight.

Sizes 1¼", 28mm and larger

A Hydraulic Pre-setting Tool must be used when assembling 1¼", 1½", 2", 28mm, 30mm, 32mm & 38mm Gyrolok Tube Fittings

1. A Hydraulic Pre-setting Tool is designed to set the ferrules on the tubing prior to installation into a fitting body. Each Hydraulic Pre-setting Tool is supplied with its own set of instructions.
2. Prior to installation into the fitting body, lubricate the back surface of the rear ferrule and threads on the nut with the lubricant supplied.
3. Using the lubricant supplied, periodically lubricate the cone angle and threads of the Pre-setting Tool die-set (prior to first fitting make-up and approximately every fifth fitting thereafter).
4. Insert tubing with preset ferrules into Gyrolok body, hand tighten the nut, while supporting the body with a backup wrench, further tighten the nut with a wrench until a sharp rise in torque is felt.

Remake Instructions:

1. Firmly insert the end with the previously set ferrules into the fitting body and tighten the nut to a finger tight condition.
2. While supporting the body with a backup wrench, tighten the nut with a wrench until a sharp rise in torque is felt, then simply snug tight.

When initially assembling the pre-set ferrule end of over 1", 25mm Gyrolok adapters, follow the **remake instructions** listed above.

All Sizes

Installations that do not involve setting of ferrules

Assembly instructions differ when installing fitting ends that do not involve setting ferrules, such as a plug (P), or the machined ferrule end of a port connector (PC), as well as for threaded ends such as NPT or SAE, for which appropriate standards should be used.

When assembling a Gyrolok plug onto a Gyrolok body:

1. Remove nut and ferrules from fitting body.
2. Place plug assembly onto fitting body. Tighten plug nut to a hand-tight condition.
3. While supporting fitting body with a backup wrench, tighten plug nut with a wrench until a sharp rise in torque is felt, (approximately ¼-turn on initial makeup, less on reconnections) then simply snug.

When initially assembling the machined ferrule end of a Gyrolok port connector:

1. Remove nut and ferrules from a fitting body.
2. Firmly insert machined ferrule end of port connector into fitting body.
3. Slide nut over tube stub end of port connector and then over machined ferrule. Hand-thread onto fitting body.
4. While supporting fitting body with a backup wrench, tighten nut with a wrench until a sharp rise in torque is felt (approximately ¼-turn on initial makeup, less on reconnections), then simply snug.

HOKE Gyrogage Assembly and Inspection Tool

Use the HOKE Gyrogage to perform step-by-step inspections during the initial assembly process. Each Gyrogage is supplied with instructions, allowing the user to:

1. Verify all components are present.
2. Ensure proper insertion of the tubing into the fitting.
3. Confirm sufficient tightening of the fitting nut.

Ask your HOKE distributor for details regarding HOKE Valve & Fitting Safety Installation Workshops.

Safety Information

Count on HOKE Safety

We pride ourselves on our commitment to safety. HOKE products are machined with total precision, for a long life and maximum performance. Available materials include 316 stainless steel, brass, Monel, Hastelloy C, Inconel, titanium, 254 SMO, Duplex 2205 and Super Duplex 2507. Each product is manufactured to resist the detrimental effects of corrosives, and to withstand extreme pressures or vacuum conditions, as well as temperatures ranging from cryogenic -325° F to +1200° F (-198° C to +648° C).

HOKE products meet the most stringent standards for safety, reliability and quality: AGA (American Gas Association), ANSI (American National Standards Institute), ASME (American Society of Mechanical Engineers), ASTM (American Society for Testing & Materials), MSS (Manufacturers Standardization Society) and NACE (National Association of Corrosion Engineers).

As a result, HOKE products are the choice of OEMs, refiners, chemical manufacturers and all those whose primary concern is safe, reliable performance.

If you have any questions about the design specifications of HOKE products, please contact your local HOKE distributor . Our worldwide network of distributors is specially trained to assist you in your selection of any HOKE product.

HOKE Gyrolok Safety Instructions

1. **Make sure the system is not pressurized when tightening or loosening a fitting or valve connection.**
2. **When relieving or bleeding system pressure**, do not loosen the HOKE Gyrolok nut or any product component.
3. **Do not exceed temperature specifications stated on page 5.**
4. **Do not exceed maximum allowable working pressure/temperature combinations for tubing** when using HOKE Gyrolok. Check the HOKE Tubing Data Charts for specific information. Note that if no pressure is identified for a given size and wall thickness of tubing, that tubing is not suitable for use with tube fittings.
5. **When the application involves use of a toxic or hazardous fluid**, exercise extra caution during operation and maintenance.
6. **When assembling new, unused HOKE Gyrolok tube fitting ends**, loosen the HOKE Gyrolok nut before inserting the tube to allow full insertion of the tube into the base of the body bore.
7. **Always use tubing that is compatible with the fitting or valve material.** Tubing appropriate for use with HOKE Gyrolok fittings is described in the HOKE Tubing Data Charts (e.g. use 316 Stainless Steel fittings with 316 Stainless Steel tubing).
8. **Always leave a length of straight tube between the tube bend and the fitting**. A tube bent too close to the fitting connection may be a source of leakage.
9. **During assembly of the HOKE Gyrolok tube end**, always hold the fitting or valve body with one wrench while separately wrench-tightening the HOKE Gyrolok nut. Follow the same precaution when disassembling.
10. **Always use a HOKE Tube Insert** when assembling a HOKE Gyrolok Fitting to soft, pliable plastic tubing (see page 48).
11. **Always use proper thread lubricants or sealants on tapered pipe threads**. Note that thread sealants may have different temperature ratings than the basic fitting.
12. **NPT threads should be torqued in accordance with an industry standard**, such as Underwriter's Laboratory UL842. Note that previously assembled threads may require additional tightening.
13. **When installing an NPT ended valve,** hold the valve body near the connection with one wrench, while separately wrench-tightening the mating pipe. Turn the pipe, not the valve. Follow the same precaution when disconnecting.
14. **Do not hold the valve handle when tightening an end connection**.
15. **For proper installation**, request a Safety Installation Training Program today! Ask your HOKE distributor for details.

The Issue of Interchangeability

Yes, you can interchange. Believe it. We guarantee the functional Interchangeability of HOKE Gyrolok® fittings with similar fittings of certain other manufacturers, including Swagelok®, Parker A-LOK®, and Parker CPI™.

You can interchange fittings either by using a complete HOKE Gyrolok® nut and ferrule system with a fitting body from certain other manufacturers, or vice versa. HOKE guarantees such interchanged fittings for a safe, secure, leak-tight seal, provided there is no deficiency in parts not supplied by HOKE. The properly interchanged product is covered by our standard warranty. For more information, ask your HOKE distributor.

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