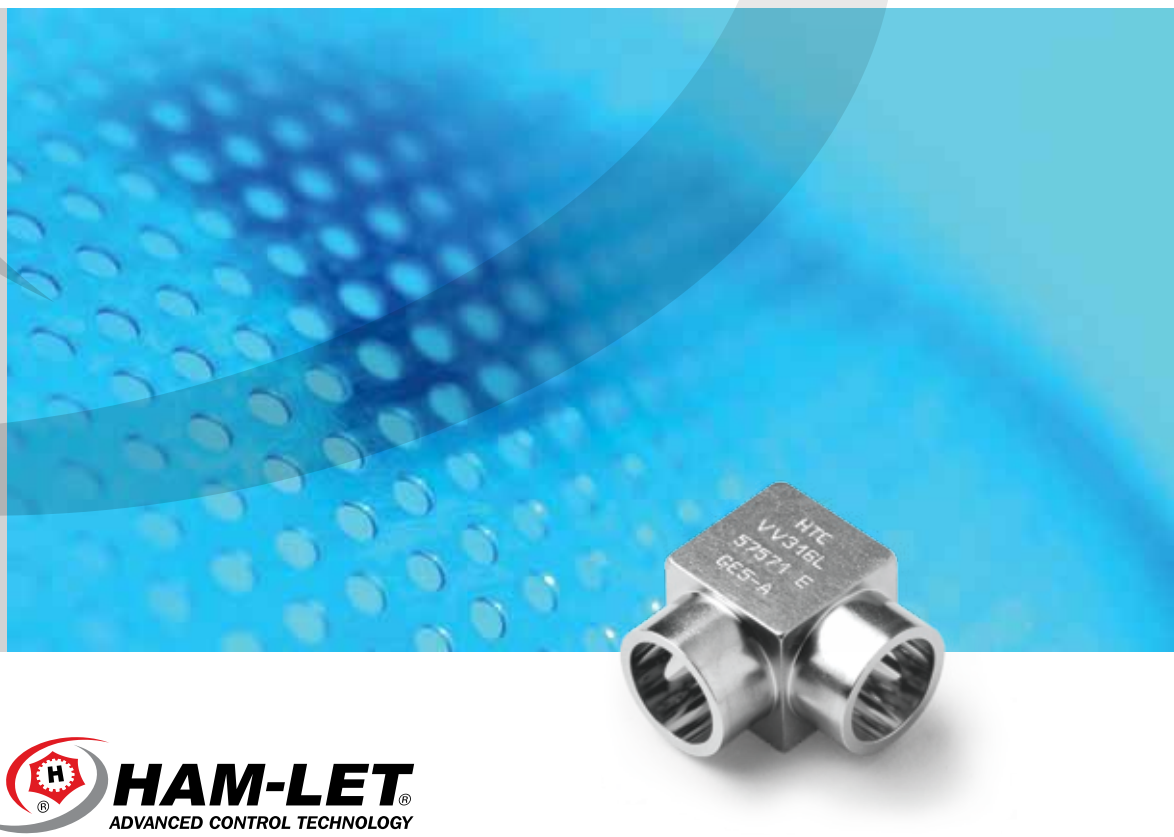
HI-TECH COMPONENTS
HTC

ORBITAL WELD AND METAL GASKET FACE SEAL FITTINGS



HAM-LET®
ADVANCED CONTROL TECHNOLOGY

TECHNICAL INFORMATION

HAM-LET®/HTC® specializes in the design and production of high-quality, specially manufactured valves and fittings for High Purity and Ultra-High Purity applications.

A joint effort of **HTC®**'s expert engineers and technicians resulted in the development a complete line that reflects the company's deep understanding of the critical requirements of the semiconductor, biotech, and pharmaceutical industries.

HAM-LET®/HTC® is a leader in the manufacturing of fittings and valves for clean industries and has consistently spearheaded significant new developments in this field. For example, the company has set new standards in the production of Ultra Pure fittings by incorporating the use of 316L Vim/Var as the standard material for the manufacturing of fittings. **HTC®** has also broken new ground in surface-finishing techniques by implementing improved electro-polishing processes.

PLATING

Female threads are silver plated to reduce the risk of galling and to improve the remakeability of the fitting. This high-quality plating also reduces the torque required for fitting assembly.
Reference Spec: Meeting and exceeding – Mil Spec: QQ-S-365.

Note: Do not apply any type of cleaning acid and/or electropolishing solutions to any female threads. These solutions damage the silver plating and invalidate any expressed or implied warranty.

WELDING

Options: butt weld, shoulder weld, socket weld. Reference Specs: All welded products are manufactured and welded according to SEMI F75,F81.

TESTING

HAM-LET follows the relevant ASTM, ANSI, ASME, ISO, SEMI & SEMASPEC standards for testing and for qualifying processes and results.

JAPANESE STANDARDS

HAM-LET, upon request, manufactures the HTC product line to meet Japanese standards:

- Low Manganese Material Specifications (JIS)
- Wall thickness
- Hardness

TEMPERATURE RATING

PRODUCTS	FITTINGS	F	F
HTC Face Seal Fittings	SS316L	1000	538
	SS316L VAR VIM / VAR	1000	538
HTC Welding Fittings	SS316L	1000	538
	SS316L VAR VIM / VAR	1000	538
HTC Gaskets	SS316	1000	538
	NICKEL	1000	538

HELIUM LEAK

All HAM-LET Face Seal products are tested and qualified to a helium leak rate of less than 3x10-10 std cm3/sec.
Reference Spec: SEMI F1.

SURFACE FINISH

Reference Spec: ANSI B46.1 and ISO 4288.

SURFACE ANALYSIS

SEM/EDX/AES analysis is used to monitor surface defects per ASTM F1372 and ASTM F1375.

MOISTURE ANALYSIS

Based on ASTM F1397.

PARTICLE CONTRIBUTION TEST

Based on Semaspec 90120390 B.

SURFACE CHEMISTRY

All UHP products are electropolished with a proprietary process for achieving and exceeding the Sematec Standards of surface cleanliness and anticorrosion requirements. Parameters are measured by SEM, AUGER, ESCA.
Reference Spec: SEMI F19-95; E49.9-0298; SEMASPEC 91060573A-STD.

CLEANING SPECIFICATIONS

According to # H9800.
Reference Spec: SEMI E49.2-0298.

MATERIAL TRACEABILITY

All HTC components are Heat Coded for full traceability.

ASSEMBLY

According to SEMI E49.6-95.

ACCESSORIES

Grip Kit, Plastic Bead Protector.

PACKAGING: Each "E" finished component is double bagged to ensure component cleanliness and to protect it from environmental contamination. The inner bag is Nylon 6 and vacuum sealed. The outer bag is polyethylene.
Reference Spec: SEMI E49.1

INTERNATIONAL CERTIFICATIONS

ISO 9001, Certified by S.I.I.

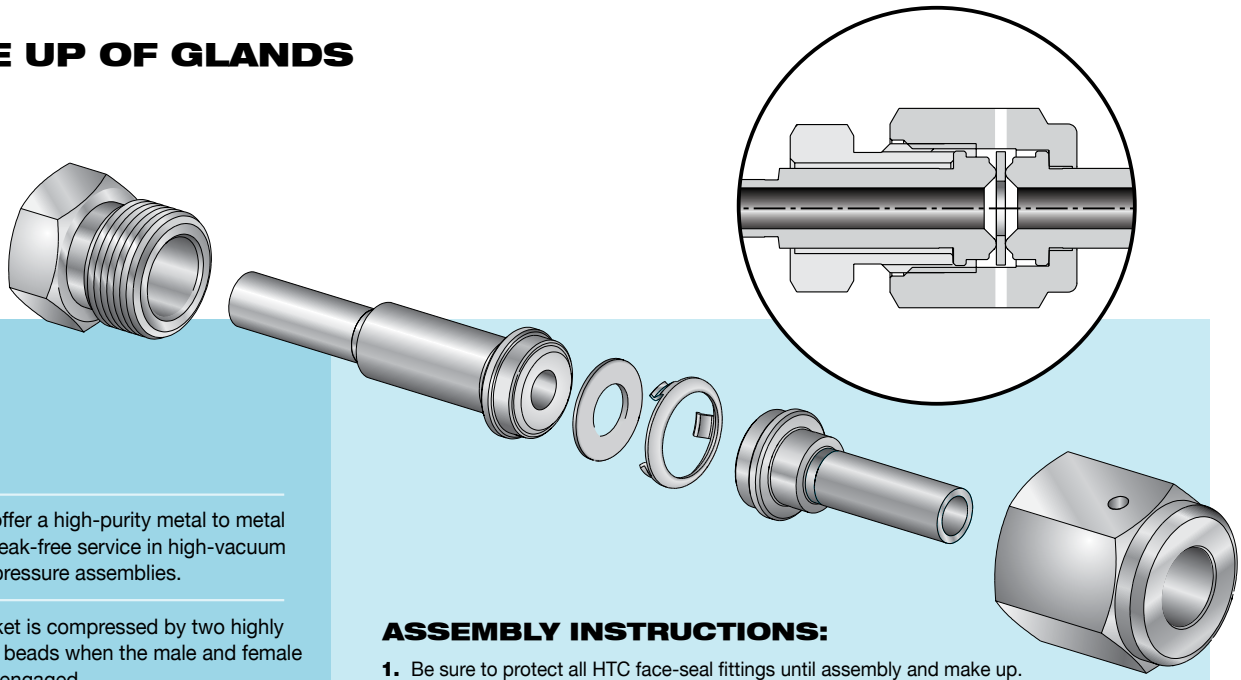
HTC® FITTINGS PRESSURE RATING

Products	Material	Material	Wall Thickness	Pressure Rating	
				psig	bar
HTC Fittings	316L or 316LV	1/8	0.028	8550	590
		1/4	0.035	5200	359
		3/8	0.035	3350	231
		1/2	0.049	3750	259
		3/4*	0.065	3350	231
		1*	0.065	2400	165

* 3/4" & 1" sizes are not standard, but can be manufactured on request

Pressure ratings are calculated in accordance with ANSI Code for Pressure Piping ANSI B-31, for stainless steel fittings. All working pressures are at 4:1 safety factor.
Pressure indicated in the catalogue is at room temp.

MAKE UP OF GLANDS



Glands offer a high-purity metal to metal seal for leak-free service in high-vacuum or high-pressure assemblies.

The gasket is compressed by two highly polished beads when the male and female nuts are engaged.

The gland's bead-to-bead assembly compresses a soft-metal gasket-to-seal. This assembly can be locked by HAM-LET's Grip-Kit (See A below).

Visual test and leak testing are performed through two test ports in opposite locations from the female nut.

ASSEMBLY INSTRUCTIONS:

1. Be sure to protect all HTC face-seal fittings until assembly and make up. Exercise great care so that the sealing surfaces are not scratched, damaged or contaminated in any way during handling and assembly.
2. Always use a clean environment, and always employ proper cleanroom protocol for make up and assembly of high-purity fittings and applications.
3. Make up instructions:
   Tighten the female nut to the male nut/body finger tight.
   Tighten the female nut 1/8 turn past finger tight.
   Always torque the female nut while keeping the male nut/body stationary.
   Face seal connections are remakable - please use a new gasket for each remake.

GRIPKIT ordering information
See page 172

MATERIAL

PRODUCTS	LEVEL "E"			LEVEL "H"		
	TREATMENT	Ra (Mmicroinch)		TREATMENT	Ra (Mmicroinch)	
		MAX	AVERAGE		MAX	AVERAGE
GLANDS	ELECTROPOLISHED	10	5	NON- ELECTROPOLISHED	15	10
MINI BUTTWELD	ELECTROPOLISHED	10	5	NON- ELECTROPOLISHED	15	10
SHAPED UNIONS	ELECTROPOLISHED	10	5	NON- ELECTROPOLISHED	20	15
LONG WELD SHAPED CONNECTORS	ELECTROPOLISHED	10	5	NON- ELECTROPOLISHED	15	10
THREADED STRAIGHT CONNECTORS	ELECTROPOLISHED	10	5	NON- ELECTROPOLISHED	20	15

* **"E"** level - Electropolished ** **"H"** level - Not Electropolished

HTC INDEX

HAM-LET ADVANCED CONTROL TECHNOLOGY

HIGH FLOW CONNECTORS

ORDERING INFORMATION

V - GL - 1/2 - W - E

Type of Fitting Designator

Size Designator

1/8	- 6 mm
1/4	- 8 mm
3/8	- 10 mm
1/2	- 12 mm
3/4	- 18 mm
1	

Surface Level Designator

To indicate the desired level of polish, please add "E" or "H" to the part Number:

E - With Electropolish
H - Without Electropolish

End Designator

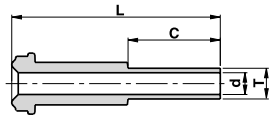
S	- With Shoulder
W	- Without Shoulder

Material Designator

P	- 316L/316L VOD (AOD)
V	- 316L Vim/Var (Var)
LM	- Low Manganese
H	- Haste lloy
*NI	- Nickel
*SS	Stainless Steel

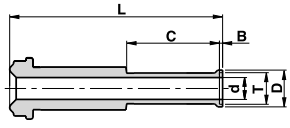
* For Gaskets only

GL-W
LONG GLAND
Without shoulder



Ordering Information	L		C		d		T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-GL-1/8-W	36.1	1.42	19.1	0.75	1.9	0.07	1/8"	-	0.028
V-GL-1/4 X 1/8-W	36.1	1.42	19.1	0.75	1.9	0.07	1/8"	-	0.028
V-GL-1/4-W	43.2	1.70	19.1	0.75	4.6	0.18	1/4"	-	0.035
V-GL-3/8-W	45.5	1.79	19.1	0.75	7.7	0.30	3/8"	-	0.035
V-GL-1/2-W	45.5	1.79	19.1	0.75	10.2	0.40	1/2"	-	0.049
V-GL-1/2-W 1.41	35.8	1.41	9.6	0.38	10.2	0.40	1/2"	-	0.049
V-GL-1/2-W W.T.=0.065	45.5	1.79	19.1	0.75	9.5	0.37	1/2"	-	0.065
V-GL-1/2 X 1/4-W	45.5	1.79	19.1	0.75	4.6	0.18	1/4"	-	0.035
P-GL-3/4-W W.T.=0.049	51.6	2.03	19.1	0.75	16.6	0.65	3/4"	-	0.049
P-GL-3/4-W W.T.=0.065	51.6	2.03	19.1	0.75	15.8	0.62	3/4"	-	0.065
P-GL-1-W W.T.=0.065	58.9	2.32	19.1	0.75	22.1	0.87	1"	-	0.065
V-GL-6MM-W	43.2	1.70	19.1	0.75	4.0	0.16	6mm	1.00	-
V-GL-8MM-W	43.2	1.70	19.1	0.75	6.0	0.24	8mm	1.00	-
V-GL-10MM-W	45.5	1.79	19.1	0.75	8.0	0.31	10mm	1.00	-
V-GL-12MM-W	45.5	1.79	19.1	0.75	10.0	0.39	12mm	1.00	-
P-GL-18MM-W	51.6	2.03	19.1	0.75	15.0	0.59	18mm	1.50	-

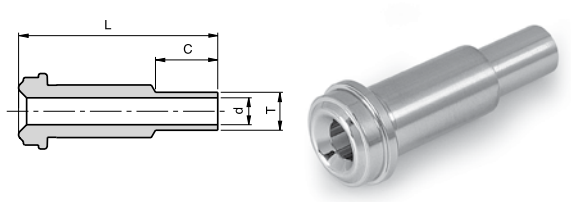
GL-S
LONG GLAND
With shoulder



Ordering Information	L		C		d		B		D		T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-GL-1/4-S	43.7	1.72	19.1	0.75	4.6	0.18	0.6	0.02	7.4	0.29	1/4"	-	0.035
V-GL-3/8-S	46.2	1.82	19.1	0.75	7.7	0.30	0.8	0.03	10.4	0.41	3/8"	-	0.035
V-GL-1/2-S	46.5	1.83	19.1	0.75	10.2	0.40	1.0	0.04	14.0	0.55	1/2"	-	0.049
V-GL-1/2-S W.T.=0.065	46.5	1.83	19.1	0.75	9.5	0.37	1.0	0.04	14.0	0.55	1/2"	-	0.065
P-GL-3/4-S W.T.=0.049	52.6	2.07	19.1	0.75	16.6	0.65	1.0	0.04	20.3	0.80	3/4"	-	0.049
P-GL-3/4-S W.T.=0.065	52.6	2.07	19.1	0.75	15.8	0.62	1.0	0.04	20.3	0.80	3/4"	-	0.065
P-GL-1-S W.T.=0.065	65.3	2.57	19.1	0.75	22.1	0.87	1.0	0.04	26.9	1.06	1"	-	0.065
V-GL-6MM-S	43.7	1.72	19.1	0.75	4.0	0.16	0.5	0.02	7.0	0.27	6mm	1.00	-
V-GL-8MM-S	46.2	1.82	19.1	0.75	6.0	0.24	0.8	0.03	8.9	0.35	8mm	1.00	-
V-GL-10MM-S	46.2	1.82	19.1	0.75	8.0	0.31	0.8	0.03	10.9	0.43	10mm	1.00	-
V-GL-12MM-S	46.5	1.83	19.1	0.75	10.0	0.39	1.0	0.04	13.2	0.52	12mm	1.00	-
P-GL-18MM-S	52.6	2.07	19.1	0.75	15.0	0.59	1.0	0.04	19.3	0.76	18mm	1.50	-

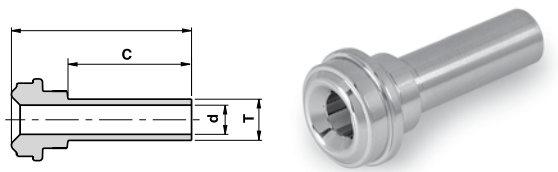
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

GM-W
MALE GLAND
Without shoulder



Ordering Information	L		d		C		T Tube O.D
	mm	inch	mm	inch	mm	inch	inch
V-GM-1/8-W	17.8	0.70	1.9	0.07	7.1	0.28	1/8
V-GM-1/4-W	33.3	1.31	3.0	0.12	10.4	0.41	1/4
V-GM-3/8-W	38.1	1.50	7.1	0.28	10.4	0.41	3/8
V-GM-1/2-W	38.1	1.50	10.2	0.40	12.7	0.50	1/2
P-GM-3/4-W	50.8	2.00	13.5	0.53	15.7	0.62	3/4
P-GM-1-W	56.4	2.22	19.1	0.75	20.6	0.81	1

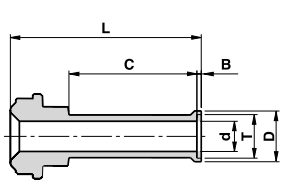
GS-W
SHORT GLAND
Without shoulder



Ordering Information	L		C		d		T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-GS-1/8-W	27.4	1.08	19.1	0.75	1.9	0.07	1/8"	-	0.028
V-GS-1/4-W	27.9	1.10	19.1	0.75	4.6	0.18	1/4"	-	0.035
V-GS-1/4 X 1/8 -W	27.9	1.10	19.1	0.75	1.9	0.07	1/8"	-	0.028
V-GS -1/4-W 0.72	18.3	0.72	9.6	0.38	4.6	0.18	1/4"	-	0.035
V-GS-3/8-W	28.4	1.12	19.1	0.75	7.7	0.30	3/8"	-	0.035
V-GS-1/2-W	28.4	1.12	19.1	0.75	10.2	0.40	1/2"	-	0.049
V-GS-1/2-W W.T.=0.065	28.4	1.12	19.1	0.75	9.5	0.37	1/2"	-	0.065
V-GS-1/2-W-0.74	18.8	0.74	9.7	0.38	10.2	0.40	1/2"	-	0.049
V-GS-1/2 X 1/4-W	28.4	1.12	19.1	0.75	4.6	0.18	1/4"	-	0.035
P-GS-3/4-W W.T.=0.049	29.0	1.14	19.1	0.75	16.6	0.65	3/4"	-	0.049
P-GS-3/4-W W.T.=0.065	29.0	1.14	19.1	0.75	15.8	0.62	3/4"	-	0.065
P-GS-1-W W.T.=0.065	32.0	1.26	19.1	0.75	22.1	0.87	1"	-	0.065
V-GS-6MM-W	29.4	1.16	19.1	0.75	4.0	0.16	6mm	1.00	-
V-GS-8MM-W	29.5	1.16	19.1	0.75	6.0	0.24	8mm	1.00	-
V-GS-10MM-W	29.4	1.16	19.1	0.75	8.0	0.31	10mm	1.00	-
V-GS-12MM-W	29.4	1.16	19.1	0.75	10.0	0.39	12mm	1.00	-
P-GS-18MM-W	31.0	1.22	19.1	0.75	15.0	0.59	18mm	1.50	-

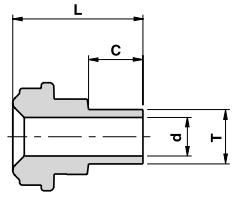
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

GS-S
SHORT GLAND
With shoulder



Ordering Information	L		C		d		B		D		T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-GS-1/4-S	28.5	1.12	19.1	0.75	4.6	0.18	0.6	0.02	7.4	0.29	1/4"	-	0.035
V-GS-3/8-S	29.2	1.15	19.1	0.75	7.7	0.30	0.8	0.03	10.4	0.41	3/8"	-	0.035
V-GS-1/2-S	29.4	1.16	19.1	0.75	10.2	0.40	1.0	0.04	14.0	0.55	1/2"	-	0.049
V-GS-1/2-S W.T.=0.065	29.4	1.16	19.1	0.75	9.5	0.37	1.0	0.04	14.0	0.55	1/2"	-	0.065
P-GS-3/4-S W.T.=0.049	30.0	1.18	19.1	0.75	16.6	0.65	1.0	0.04	20.3	0.80	3/4"	-	0.049
P-GS-3/4-S W.T.=0.065	30.0	1.18	19.1	0.75	15.8	0.62	1.0	0.04	20.3	0.80	3/4"	-	0.065
P-GS-1-S W.T.=0.065	32.1	1.26	19.1	0.75	22.1	0.87	1.0	0.04	26.9	1.06	1"	-	0.065
V-GS-6MM-S	30.0	1.18	19.1	0.75	4.0	0.16	0.5	0.02	7.0	0.27	6mm	1.00	-
V-GS-8MM-S	30.2	1.19	19.1	0.75	6.0	0.24	0.8	0.03	8.9	0.35	8mm	1.00	-
V-GS-10MM-S	31.0	1.22	19.1	0.75	8.0	0.31	0.8	0.03	10.9	0.43	10mm	1.00	-
V-GS-12MM-S	30.5	1.20	19.1	0.75	10.0	0.39	1.0	0.04	13.2	0.52	12mm	1.00	-
P-GS-18MM-S	31.0	1.22	19.1	0.75	15.0	0.59	1.0	0.04	19.3	0.76	18mm	1.50	-

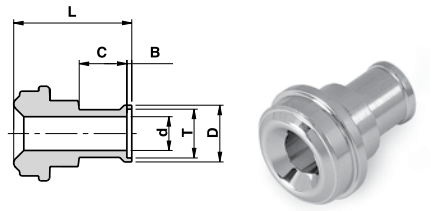
MGS-W
MINI SHORT GLAND
Without shoulder



Ordering Information	L		C		d		T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-MGS-1/4-W	15.2	0.60	6.4	0.25	4.6	0.18	1/4"	-	0.035
V-MGS-3/8-W	15.8	0.62	6.4	0.25	7.7	0.30	3/8"	-	0.035
V-MGS-1/2-W	15.8	0.62	6.4	0.25	10.2	0.40	1/2"	-	0.049
V-MGS-1/2-W W.T.=0.065	15.8	0.62	6.4	0.25	9.5	0.37	1/2"	-	0.065
V-MGS-6MM-W	15.2	0.60	6.4	0.25	4.0	0.16	6mm	1.00	-
V-MGS-8MM-W	15.8	0.62	6.4	0.25	6.0	0.24	8mm	1.00	-
V-MGS-10MM-W	15.8	0.62	6.4	0.25	8.0	0.31	10mm	1.00	-
V-MGS-12MM-W	15.8	0.62	6.4	0.25	10.0	0.39	12mm	1.00	-

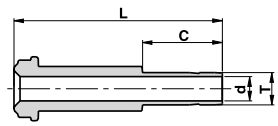
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

MGS-S
MINI SHORT GLAND
With shoulder



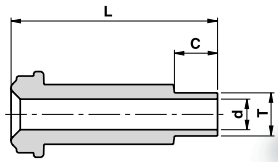
Ordering Information	L		C		d		B		D		T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-MGS-1/4-S	15.8	0.62	6.4	0.25	4.6	0.18	0.6	0.02	7.4	0.29	1/4"	-	0.035
V-MGS-3/8-S	16.5	0.65	6.4	0.25	7.7	0.30	0.8	0.03	10.4	0.41	3/8"	-	0.035
V-MGS-1/2-S	16.8	0.66	6.4	0.25	10.2	0.40	1.0	0.04	14.0	0.55	1/2"	-	0.049
V-MGS-1/2-S W.T.=0.065	16.8	0.66	6.4	0.25	9.5	0.37	1.0	0.04	14.0	0.55	1/2"	-	0.065
V-MGS-6MM-S	15.8	0.62	6.4	0.25	4.0	0.16	0.5	0.02	7.0	0.27	6mm	1.00	-
V-MGS-8MM-S	16.5	0.65	6.4	0.25	6.0	0.24	0.8	0.03	8.9	0.35	8mm	1.00	-
V-MGS-10MM-S	16.5	0.65	6.4	0.25	8.0	0.31	0.8	0.03	10.9	0.43	10mm	1.00	-
V-MGS-12MM-S	16.8	0.66	6.4	0.25	10.0	0.39	1.0	0.04	13.2	0.52	12mm	1.00	-

AG
GLAND ADAPTER TO LET-LOK



Ordering Information	L		C		d		T Tube O.D
	mm	inch	mm	inch	mm	inch	inch/mm
V-AG-1/4	41.2	1.62	15.9	0.62	4.3	0.17	1/4"
P-AG-3/8	46.0	1.81	17.5	0.69	6.8	0.27	3/8"
V-AG-1/2	49.3	1.94	24.4	0.96	9.4	0.37	1/2"
V-AG-6M	41.2	1.62	15.7	0.62	4.0	0.16	6mm

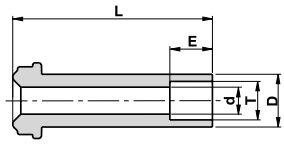
MG-W
MALE GLAND
Short tube without shoulder



Ordering Information	L		C		d		T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-MG-1/4-W	30.5	1.20	6.4	0.25	4.6	0.18	1/4"	-	0.035
V-MG-1/4-W 1.32	33.5	1.32	9.6	0.38	4.6	0.18	1/4"	-	0.035
V-MG-3/8-W	32.8	1.29	6.4	0.25	7.7	0.30	3/8"	-	0.035
V-MG-1/2-W	32.8	1.29	6.4	0.25	10.2	0.40	1/2"	-	0.049
V-MG-6MM-W	30.5	1.20	6.4	0.25	4.0	0.16	6mm	1.00	-
V-MG-8MM-W	30.5	1.20	6.4	0.25	6.0	0.24	8mm	1.00	-
V-MG-10MM-W	32.8	1.29	6.4	0.25	8.0	0.31	10mm	1.00	-
V-MG-12MM-W	32.8	1.29	6.4	0.25	10.0	0.39	12mm	1.00	-

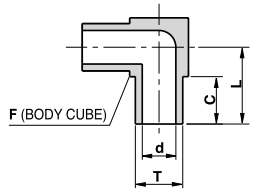
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

GSW
SOCKET WELD GLAND



Ordering Information	L		d		E		D		T Tube O.D
	mm	inch	mm	inch	mm	inch	mm	inch	inch
V-GSW-1/8	17.8	0.70	2.4	0.09	2.5	0.10	5.1	0.20	1/8
V-GSW-1/4	33.3	1.31	4.6	0.18	7.1	0.28	8.9	0.35	1/4
V-GSW-1/4-W-0.75”	19.1	0.75	4.6	0.18	7.1	0.28	8.9	0.35	1/4
V-GSW-1/4-W-0.50”	12.7	0.50	4.6	0.18	7.1	0.28	8.9	0.35	1/4
V-GSW-3/8	38.1	1.50	7.1	0.28	7.9	0.31	15.2	0.60	3/8
V-GSW-1/2	38.1	1.50	10.2	0.40	9.6	0.38	15.2	0.60	1/2
P-GSW-3/4	50.8	2.00	15.7	0.62	11.2	0.44	22.4	0.88	3/4
P-GSW-1	56.4	2.22	22.1	0.87	15.7	0.62	30.2	1.19	1

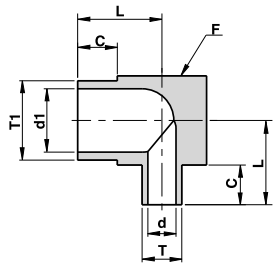
ME
MINI ELBOW



Ordering Information	L		C		d		F	T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch
V-ME-1/8-W	10.3	0.41	6.4	0.25	1.9	0.07	5/16	1/8''	-	0.028
V-ME-1/4-W	10.3	0.41	6.4	0.25	4.6	0.18	5/16	1/4''	-	0.035
V-ME-3/8-W	11.9	0.47	6.4	0.25	7.7	0.30	7/16	3/8''	-	0.035
V-ME-1/2-W	13.5	0.53	6.4	0.25	10.2	0.40	9/16	1/2''	-	0.049
V-ME-1/2-W W.T.=0.065	13.5	0.53	6.4	0.25	9.5	0.37	9/16	1/2''	-	0.065
V-ME-6MM-W	10.3	0.41	6.4	0.25	4.0	0.16	5/16	6mm	1.00	-
V-ME-8MM-W	11.9	0.47	6.4	0.25	6.0	0.24	7/16	8mm	1.00	-
V-ME-10MM-W	11.9	0.47	6.4	0.25	8.0	0.31	7/16	10mm	1.00	-
V-ME-12MM-W	13.5	0.53	6.4	0.25	10.0	0.39	9/16	12mm	1.00	-

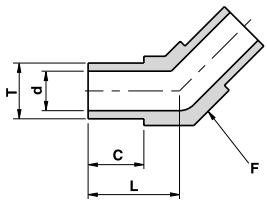
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

MER
MINI ELBOW REDUCER



Ordering Information	L		d1		d		C		F	T1 Tube O.D	W.T. (T1)		T Tube O.D	W.T. (T)	
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch/mm	mm	inch	inch/mm	mm	inch
V-MER-1/4 X 1/8	10.3	0.41	4.6	0.18	1.9	0.07	6.4	0.25	5/16	1/4”	-	0.035	1/8”	-	0.028
V-MER-3/8 X 1/4	11.9	0.47	7.7	0.30	4.6	0.18	6.4	0.25	7/16	3/8”	-	0.035	1/4”	-	0.035
V-MER-1/2 X 1/4	13.5	0.53	10.2	0.40	4.6	0.18	6.4	0.25	9/16	1/2”	-	0.049	1/4”	-	0.035
V-MER-1/2 X 3/8	13.5	0.53	10.2	0.40	7.7	0.30	6.4	0.25	9/16	1/2”	-	0.049	3/8”	-	0.035
V-MER-8MM X 6MM	11.9	0.47	6.0	0.24	4.0	0.16	6.4	0.25	7/16	8mm	1.00	-	6mm	1.00	-
V-MER-12MM X 6MM	13.5	0.53	10.0	0.39	4.0	0.16	6.4	0.25	9/16	12mm	1.00	-	6mm	1.00	-
V-MER-12MM X 8MM	13.5	0.53	10.0	0.39	6.0	0.24	6.4	0.25	9/16	12mm	1.00	-	8mm	1.00	-

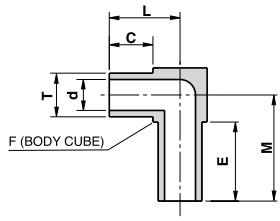
ME-45°
MINI ELBOW 45°

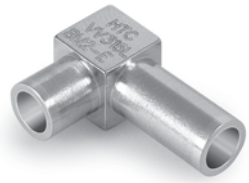


Ordering Information	L		d		C		F	T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch
V-ME-1/4-W-45DEG	10.3	0.41	4.6	0.18	6.4	0.25	5/16	1/4"	-	0.035
V-ME-3/8-W-45DEG	11.9	0.47	7.7	0.30	6.4	0.25	7/16	3/8"	-	0.035
V-ME-1/2-W-45DEG	13.5	0.53	10.2	0.40	6.4	0.25	9/16	1/2"	-	0.049
V-ME-1/2-W-45DEG W.T.=0.065	13.5	0.53	9.5	0.37	6.4	0.25	9/16	1/2"	-	0.065
V-ME-6MM-W-45DEG	10.3	0.41	4.0	0.16	6.4	0.25	5/16	6mm	1.00	-
V-ME-8MM-W-45DEG	11.9	0.47	6.0	0.24	6.4	0.25	7/16	8mm	1.00	-
V-ME-10MM-W-45DEG	11.9	0.47	8.0	0.31	6.4	0.25	7/16	10mm	1.00	-
V-ME-12MM-W-45DEG	13.5	0.53	10.0	0.39	6.4	0.25	9/16	12mm	1.00	-

Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

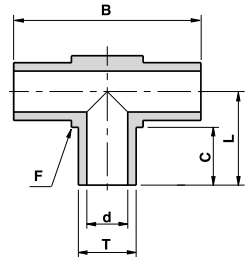
MEX
MINI ELBOW
With extended leg





Ordering Information	L		M		d		C		E		F	T Tube O.D	W.T.
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch
V-MEX-1/4-0.41X0.66	10.3	0.41	16.8	0.66	4.6	0.18	6.4	0.25	12.7	0.50	5/16	1/4	0.035
V-MEX-1/4-0.41X0.61	10.3	0.41	15.4	0.61	4.6	0.18	6.4	0.25	11.4	0.45	5/16	1/4	0.035
V-MEX-1/4-W 0.66X0.66"	16.8	0.66	16.8	0.66	4.6	0.18	12.7	0.50	12.7	0.50	5/16	1/4	0.035

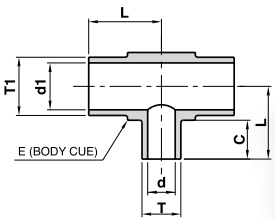
MT
MINI TEE



Ordering Information	L		B		d		C		F	T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch
V-MT-1/8	10.3	0.41	20.7	0.81	1.9	0.07	6.4	0.25	5/16	1/8"	-	0.028
V-MT-1/4	10.3	0.41	20.7	0.81	4.6	0.18	6.4	0.25	5/16	1/4"	-	0.035
V-MT-3/8	11.9	0.47	23.9	0.94	7.7	0.30	6.4	0.25	7/16	3/8"	-	0.035
V-MT-1/2	13.5	0.53	27.1	1.07	10.2	0.40	6.4	0.25	9/16	1/2"	-	0.049
V-MT-1/2 W.T.=0.065	13.5	0.53	27.1	1.07	9.5	0.37	6.4	0.25	9/16	1/2"	-	0.065
V-MT-6MM	10.3	0.41	20.7	0.81	4.0	0.16	6.4	0.25	5/16	6mm	1.00	-
V-MT-8MM	11.9	0.47	23.9	0.94	6.0	0.24	6.4	0.25	7/16	8mm	1.00	-
V-MT-10MM	11.9	0.47	23.9	0.94	8.0	0.31	6.4	0.25	7/16	10mm	1.00	-
V-MT-12MM	13.5	0.53	27.1	1.07	10.0	0.39	6.4	0.25	9/16	12mm	1.00	-

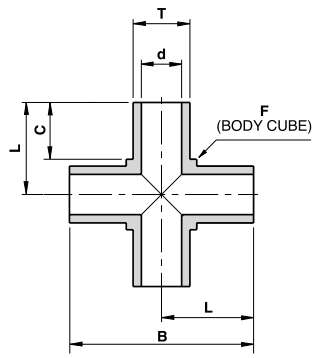
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

MTR
MINI TEE REDUCER



Ordering Information	L		B		d		d1		C		F	T1 Tube O.D	W.T. (T1)		T Tube O.D	W.T. (T)	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch	inch / mm	mm	inch
V-MTR-1/2 X 1/4	13.5	0.53	27.1	1.07	4.6	0.18	10.2	0.40	6.4	0.25	9/16	1/2”	-	0.049	1/4”	-	0.035
V-MTR-1/2 X 3/8	13.5	0.53	27.1	1.07	7.7	0.30	10.2	0.40	6.4	0.25	9/16	1/2”	-	0.049	3/8”	-	0.035
V-MTR-3/8 X 1/4	11.9	0.47	23.9	0.94	4.6	0.18	7.7	0.30	6.4	0.25	7/16	3/8”	-	0.035	1/4”	-	0.035
V-MTR-8MX6M	11.9	0.47	23.9	0.94	4.0	0.16	6.0	0.24	6.4	0.25	7/16	8mm	1.00	-	6mm	1.00	-
V-MTR-12MX6M	13.5	0.53	27.1	1.07	4.0	0.16	10.0	0.39	6.4	0.25	9/16	12mm	1.00	-	6mm	1.00	-
V-MTR-12MX8M	13.5	0.53	27.1	1.07	6.0	0.24	10.0	0.39	6.4	0.25	9/16	12mm	1.00	-	8mm	1.00	-

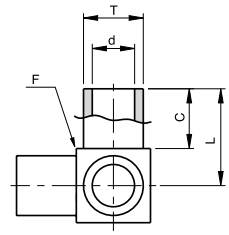
MC
MINI CROSS



Ordering Information	L		B		d		C		F	T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch
V-MC-1/8	10.3	0.41	20.7	0.81	1.9	0.07	6.4	0.25	5/16	1/8"	-	0.028
V-MC-1/4	10.3	0.41	20.7	0.81	4.6	0.18	6.4	0.25	5/16	1/4"	-	0.035
V-MC-3/8	11.9	0.47	23.9	0.94	7.7	0.30	6.4	0.25	7/16	3/8"	-	0.035
V-MC-1/2	13.5	0.53	27.1	1.07	10.2	0.40	6.4	0.25	9/16	1/2"	-	0.049
V-MC-1/2 W.T.=0.065	13.5	0.53	27.1	1.07	9.5	0.37	6.4	0.25	9/16	1/2"	-	0.065
V-MC-6MM	10.3	0.41	20.7	0.81	4.0	0.16	6.4	0.25	5/16	6mm	1.00	-
V-MC-8MM	11.9	0.47	23.9	0.94	6.0	0.24	6.4	0.25	7/16	8mm	1.00	-
V-MC-10MM	11.9	0.47	23.9	0.94	8.0	0.31	6.4	0.25	7/16	10mm	1.00	-
V-MC-12MM	13.5	0.53	27.1	1.07	10.0	0.39	6.4	0.25	9/16	12mm	1.00	-

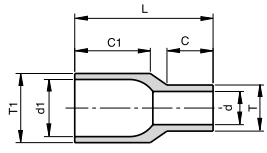
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

MTB
MINI TRI-EL



Ordering Information	L		d		C		F	T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch
V-MTB-1/8	10.3	0.41	1.9	0.07	6.4	0.25	5/16	1/8"	-	0.028
V-MTB-1/4	10.3	0.41	4.6	0.18	6.4	0.25	5/16	1/4"	-	0.035
V-MTB-3/8	11.9	0.47	7.7	0.30	6.4	0.25	7/16	3/8"	-	0.035
V-MTB-1/2	13.5	0.53	10.2	0.40	6.4	0.25	9/16	1/2"	-	0.049
V-MTB-6MM	10.3	0.41	4.0	0.16	6.4	0.25	5/16	6mm	1.00	-
V-MTB-8MM	11.9	0.47	6.0	0.24	6.4	0.25	7/16	8mm	1.00	-
V-MTB-10MM	11.9	0.47	8.0	0.31	6.4	0.25	7/16	10mm	1.00	-
V-MTB-12MM	13.5	0.53	10.0	0.39	6.4	0.25	9/16	12mm	1.00	-

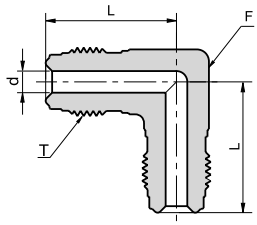
RU
REDUCING UNION



Ordering Information	L		d1		d		C1		C		T1 Tube O.D	W.T. (T1)		T Tube O.D	W.T. (T)	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch/mm	mm	inch	inch/mm	mm	inch
V-RU-1/4 X 1/8	19.1	0.75	4.6	0.18	1.9	0.07	10.4	0.41	6.4	0.25	1/4”	-	0.035	1/8”	-	0.028
V-RU-3/8 X 1/4	19.1	0.75	7.7	0.30	4.6	0.18	10.4	0.41	6.4	0.25	3/8”	-	0.035	1/4”	-	0.035
V-RU-1/2 X 1/4	19.1	0.75	10.2	0.40	4.6	0.18	10.4	0.41	6.4	0.25	1/2”	-	0.049	1/4”	-	0.035
V-RU-1/2 X 3/8	19.1	0.75	10.2	0.40	7.7	0.30	10.4	0.41	6.4	0.25	1/2”	-	0.049	3/8”	-	0.035
P-RU- 1 X 1/2	19.1	0.75	22.1	0.87	10.2	0.40	10.4	0.41	6.4	0.25	1”	-	0.065	1/2”	-	0.049
V-RU- 8MM X 6MM	19.1	0.75	6.0	0.24	4.0	0.16	10.4	0.41	6.4	0.25	8mm	1.00	-	6mm	1.00	-
V-RU- 10MM X 6MM	19.1	0.75	8.0	0.31	4.0	0.16	10.4	0.41	6.4	0.25	10mm	1.00	-	6mm	1.00	-
V-RU- 10MM X 8MM	19.1	0.75	8.0	0.31	6.0	0.24	10.4	0.41	6.4	0.25	10mm	1.00	-	8mm	1.00	-
V-RU- 12MM X 6MM	19.1	0.75	10.0	0.39	4.0	0.16	10.4	0.41	6.4	0.25	12mm	1.00	-	6mm	1.00	-
V-RU- 12MM X 8MM	19.1	0.75	10.0	0.39	6.0	0.24	10.4	0.41	6.4	0.25	12mm	1.00	-	8mm	1.00	-
V-RU- 12MM X 10MM	19.1	0.75	10.0	0.39	8.0	0.31	10.4	0.41	6.4	0.25	12mm	1.00	-	10mm	1.00	-

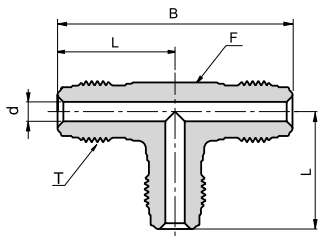
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

EU
ELBOW UNION



Ordering Information	L		d		F	T Thread Size
	mm	inch	mm	inch	inch	inch
P-EU-1/4	27.2	1.07	4.6	0.18	1/2	9/16-18
P-EU-1/2	36.8	1.45	10.2	0.40	13/16	7/8-14
P-EU-3/4	48.8	1.92	15.8	0.62	1 1/4	1 1/4 -18
P-EU-1	50.8	2.00	22.1	0.87	1 11/16	1 1/2 -20

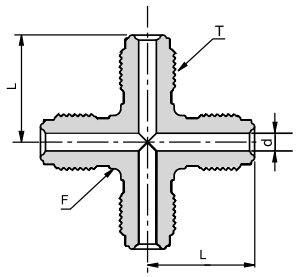
TU
TEE UNION



Ordering Information	L		B		d		F	T Thread Size
	mm	inch	mm	inch	mm	inch	inch	inch
P-TU-1/4	27.2	1.07	54.4	2.14	4.6	0.18	1/2	9/16-18
P-TU-1/2	36.8	1.45	73.6	2.90	10.2	0.40	13/16	7/8-14
P-TU-3/4	48.8	1.92	97.6	3.84	15.8	0.62	1 1/4	1 1/4 -18
P-TU-1	50.8	2.00	101.6	4.00	22.1	0.87	1 11/16	1 1/2 -20

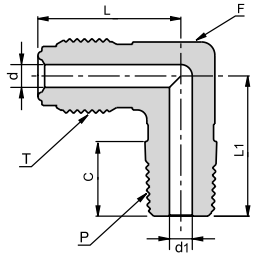
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

CU
CROSS UNION



Ordering Information	L		d		F	T Thread Size
	mm	inch	mm	inch	inch	inch
P-CU-1/4	27.2	1.07	4.6	0.18	1/2	9/16-18
P-CU-1/2	36.8	1.45	10.2	0.40	13/16	7/8-14

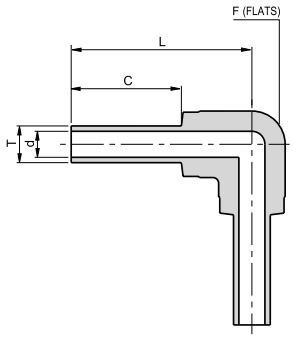
EM
MALE ELBOW



Ordering Information	L		L1		C		d		d1		F	T Thread Size	P NPT-M
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch
P-EM-1/4 X 3/8	27.2	1.07	22.1	0.87	9.6	0.38	4.6	0.18	4.6	0.18	1/2	9/16-18	1/8
P-EM-1/4 X 1/4	27.2	1.07	26.7	1.05	14.2	0.56	4.6	0.18	4.6	0.18	1/2	9/16-18	1/4
P-EM-1/4 X 1/2	31.2	1.45	33.5	1.26	19.0	0.56	4.6	0.40	9.6	0.34	13/16	9/16-18	1/2
P-EM-1/2 X 1/4	36.8	1.23	32.0	1.32	14.2	0.75	10.2	0.18	4.6	0.40	13/16	7/8-14	1/4
P-EM-1/2 X 3/8	36.8	1.45	32.0	1.26	14.2	0.56	10.2	0.40	7.1	0.28	13/16	7/8-14	3/8
P-EM-1/2 X 1/2	36.8	1.45	36.8	1.45	19.0	0.75	10.2	0.40	10.2	0.40	13/16	7/8-14	1/2

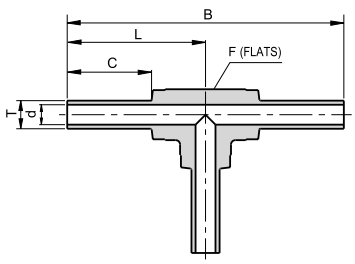
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

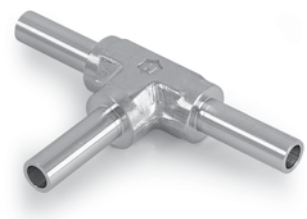
EW-W
ELBOW
Without shoulder



Ordering Information	L		d		C		F	T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	inch	inch/mm	mm	inch
P-EW-1/4-W	31.2	1.23	4.6	0.18	19.1	0.75	7/16	1/4"	-	0.035
P-EW-3/8-W	30.5	1.20	7.7	0.30	19.1	0.75	7/16	3/8"	-	0.035
P-EW-1/2-W	34.0	1.34	10.2	0.40	19.1	0.75	11/16	1/2"	-	0.049
P-EW-1/2-W W.T.=0.065	34.0	1.34	9.5	0.37	19.1	0.75	11/16	1/2"	-	0.049
P-EW-3/4-W W.T.=0.049	37.1	1.46	16.6	0.65	19.1	0.75	15/16	3/4"	-	0.065
P-EW-3/4-W W.T.=0.065	37.1	1.46	15.8	0.62	19.1	0.75	15/16	3/4"	-	0.065
P-EW-1-W W.T.=0.065	47.0	1.85	22.1	0.87	24.4	0.96	1 3/8	1''	-	0.065
P-EW-1-W W.T.=0.120	47.0	1.85	19.4	0.76	24.4	0.96	1 3/8	1''	-	0.120
P-EW-6M-W	31.2	1.23	4.0	0.16	19.1	0.75	7/16	6mm	1.00	-
P-EW-8MM-W	31.2	1.23	6.0	0.24	19.1	0.75	7/16	8mm	1.00	-
P-EW-10MM-W	34.0	1.34	8.0	0.31	19.1	0.75	11/16	10mm	1.00	-
P-EW-12MM-W	34.0	1.34	10.0	0.39	19.1	0.75	11/16	12mm	1.00	-

TW-W
TEE
Without shoulder

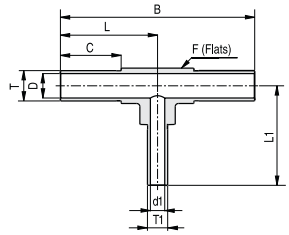




Ordering Information	L		B		d		C		F	T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch/mm	mm	inch
P-TW-1/4-W	31.2	1.23	62.5	2.46	4.6	0.18	19.1	0.75	7/16	1/4"	-	0.035
P-TW-3/8-W	30.5	1.20	61.0	2.40	7.7	0.30	19.1	0.75	7/16	3/8"	-	0.035
P-TW-1/2-W	34.0	1.34	68.1	2.68	10.2	0.40	19.1	0.75	11/16	1/2"	-	0.049
P-TW-1/2-W W.T.=0.065	34.0	1.34	68.1	2.68	9.5	0.37	19.1	0.75	11/16	1/2"	-	0.065
P-TW-3/4-W W.T.=0.065	37.1	1.46	74.2	2.92	15.8	0.62	19.1	0.75	15/16	3/4"	-	0.065
P-TW-3/4-W W.T.=0.049	37.1	1.46	74.2	2.92	16.6	0.65	19.1	0.75	15/16	3/4"	-	0.065
P-TW-1-W W.T.=0.065	47.0	1.85	94.0	3.70	22.1	0.87	24.4	0.96	1 3/8	1''	-	0.065
P-TW-1-W W.T.=0.120	47.0	1.85	94.0	3.70	19.4	0.76	24.4	0.96	1 3/8	1''		0.120
P-TW-6MM-W	31.2	1.23	62.5	2.46	4.0	0.16	19.1	0.75	7/16	6mm	1.00	-
P-TW-8MM-W	31.2	1.23	62.5	2.46	6.0	0.24	19.1	0.75	7/16	8mm	1.00	-
P-TW-10MM-W	34.0	1.34	68.1	2.68	8.0	0.31	19.1	0.75	11/16	10mm	1.00	-
P-TW-12MM-W	34.0	1.34	68.1	2.68	10.0	0.39	19.1	0.75	11/16	12mm	1.00	-

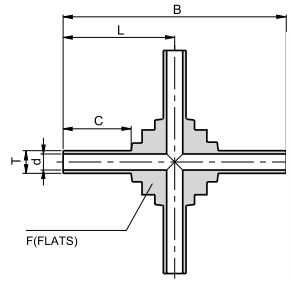
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

TWR-W
TEE REDUCER
Without shoulder



Ordering Information	L		L1		B		d		d1		C		F	T Tube	T Tube O.D.	W.T. (T)	W.T (T1)
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch/mm	inch/mm	inch/mm	inch/mm
P-TWR-3/8X1/4 W	30.5	1.20	30.5	1.20	61.0	2.40	7.7	0.30	4.6	0.18	19.1	0.75	7/16	3/8”	1/4”	0.035”’	0.035”’
P-TWR-1/2X1/4 W	34.0	1.34	34.0	1.34	68.0	2.68	10.2	0.40	4.6	0.18	19.1	0.75	11/16	1/2”	1/4”	0.049”	0.035”’
P-TWR-1/2X3/8 W	34.0	1.34	34.0	1.34	68.0	2.68	10.2	0.40	7.7	0.30	19.1	0.75	11/16	1/2”	3/8”	0.049”	0.035”’
P-TWR-3/4X1/4 W W.T= 0.049 X 0.035	37.1	1.46	37.1	1.46	74.2	2.92	16.6	0.65	4.6	0.18	19.1	0.75	15/16	3/4”	1/4”	0.049”	0.035”’
P-TWR-3/4X1/4 W W.T.=0.065 X 0.035	37.1	1.46	37.1	1.46	74.2	2.92	15.8	0.62	4.6	0.18	19.1	0.75	15/16	3/4”	1/4”	0.065”	0.035”’
P-TWR-3/4X1/2 W W.T.=0.049	37.1	1.46	37.1	1.46	74.2	2.92	16.6	0.65	10.2	0.40	19.1	0.75	15/16	3/4”	1/2”	0.049”	0.049”
P-TWR-12MMX6MM W	34.0	1.34	34.0	1.34	68.0	2.68	10.0	0.39	4.0	0.16	19.1	0.75	11/16	12mm	6mm	1.00mm	1.00mm

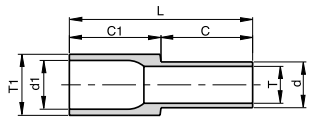
CW-W
CROSS
Without shoulder



Ordering Information	L		B		d		C		F	T Tube O.D.	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	inch/mm	inch/mm	mm	inch
P-CW-1/4-W	31.2	1.23	62.5	2.46	4.6	0.18	19.1	0.75	17mm	1/4"	-	0.035
P-CW-3/8-W	30.5	1.20	61.0	2.40	7.7	0.30	19.1	0.75	17mm	3/8"	-	0.035
P-CW-1/2-W	31.0	1.22	62.0	2.44	10.2	0.40	19.1	0.75	17mm	1/2"	-	0.049
P-CW-1/2-W W.T.=0.065	31.0	1.22	62.0	2.44	9.5	0.37	19.1	0.75	17mm	1/2"	-	0.065
P-CW-1-W W.T.=0.065	47.0	1.85	94.0	3.70	22.1	0.87	24.4	0.96	1 3/8”	1''	-	0.065
P-CW-1-W W.T.=0.120	47.0	1.85	94.0	3.70	19.4	0.76	24.4	0.96	1 3/8”	1''	-	0.120
P-CW-6MM-W	31.2	1.23	62.5	2.46	4.0	0.16	19.1	0.75	17mm	6mm	1.00	-
P-CW-8MM-W	30.5	1.20	61.0	2.40	6.0	0.24	19.1	0.75	17mm	8mm	1.00	-
P-CW-10MM-W	31.0	1.22	62.0	2.44	8.0	0.31	19.1	0.75	17mm	10mm	1.00	-
P-CW-12MM-W	31.0	1.22	62.0	2.44	10.0	0.39	19.1	0.75	17mm	12mm	1.00	-

Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

RW-W
REDUCER
Without shoulder



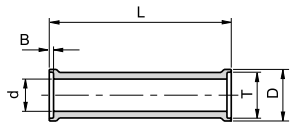
Ordering Information	L		d1		d		C1		C		T1 Tube O.D.	W.T. (T1)		T Tube O.D.	W.T. (T)	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch/mm	mm	inch	inch/mm	mm	inch
V-RW-1/4X1/8	38.1	1.50	4.6	0.18	1.9	0.07	19.1	0.75	19.1	0.75	1/4”	-	0.035	1/8”	-	0.028
V-RW-3/8X1/4-W	38.1	1.50	7.7	0.30	4.6	0.18	19.1	0.75	19.1	0.75	3/8”	-	0.035	1/4”	-	0.035
V-RW-1/2X1/4-W	38.1	1.50	10.2	0.40	4.6	0.18	19.1	0.75	19.1	0.75	1/2”	-	0.049	1/4”	-	0.035
V-RW-1/2X3/8-W	38.1	1.50	10.2	0.40	7.7	0.30	19.1	0.75	19.1	0.75	1/2”	-	0.049	3/8”	-	0.035
V-RW-3/4X1/2 W W.T.=0.049	38.5	1.51	16.6	0.65	10.2	0.40	19.1	0.75	19.1	0.75	3/4”	-	0.049	1/2”	-	0.049
P-RW-3/4X1/2 W W.T.=0.065X0.049	38.5	1.51	15.8	0.62	10.2	0.40	19.1	0.75	19.1	0.75	3/4”	-	0.065	1/2”	-	0.065
P-RW-3/4X1/4 W W.T.=0.049X0.035	38.5	1.51	16.6	0.65	4.6	0.18	19.1	0.75	19.1	0.75	3/4”	-	0.049	1/4”	-	0.049
P-RW-1X1/2 W W.T.= 0.065X0.049	40.5	1.59	22.1	0.87	10.2	0.40	19.1	0.75	19.1	0.75	1”	-	0.065	1/2”	-	0.049
V-RW-8MM X 6MM	38.1	1.50	6.0	0.24	4.0	0.16	19.1	0.75	19.1	0.75	8mm	1.00	-	6mm	1.00	-
V-RW-10MM X 6MM	38.1	1.50	8.0	0.31	4.0	0.16	19.1	0.75	19.1	0.75	10mm	1.00	-	6mm	1.00	-
V-RW-10MM X 8MM	38.1	1.50	8.0	0.31	6.0	0.24	19.1	0.75	19.1	0.75	10mm	1.00	-	8mm	1.00	-
V-RW-12MM X 6MM	38.1	1.50	10.0	0.39	4.0	0.16	19.1	0.75	19.1	0.75	12mm	1.00	-	6mm	1.00	-
V-RW-12MM X 8MM	38.1	1.50	10.0	0.39	6.0	0.24	19.1	0.75	19.1	0.75	12mm	1.00	-	8mm	1.00	-
V-RW-12MM X 10MM	38.1	1.50	10.0	0.39	8.0	0.31	19.1	0.75	19.1	0.75	12mm	1.00	-	10mm	1.00	-

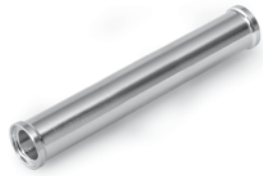
UB-W
BUTTWELD UNION
Without shoulder

Ordering Information	L		d		T Tube O.D	W.T.
	mm	inch	mm	inch	inch	inch
V-UB-1/4-W	24.3	0.96	4.6	0.18	1/4	0.035
V-UB-3/8-W	23.9	0.94	7.7	0.30	3/8	0.035
V-UB-1/2-W	23.4	0.92	10.2	0.40	1/2	0.049
P-UB-3/4-W W.T.=0 .065	23.4	0.92	15.8	0.62	3/4	0.065
P-UB-1-W W.T.=0 .065	29.7	1.17	22.1	0.87	1	0.065

Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

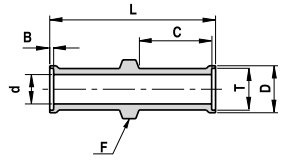
UB-S
BUTTWELD UNION
With shoulder

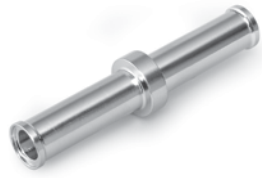




Ordering Information	L		d		B		D		T Tube O.D.	W.T.
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch
V-UB-1/4-S	25.4	1.00	4.6	0.18	0.55	0.02	7.4	0.29	1/4	0.035
V-UB-3/8-S	25.4	1.00	7.7	0.30	0.76	0.03	10.4	0.41	3/8	0.035
V-UB-1/2-S	25.4	1.00	10.2	0.40	1.00	0.04	14.0	0.55	1/2	0.049
P-UB-3/4-S W.T.=0 .065	25.4	1.00	15.8	0.62	1.00	0.04	20.3	0.80	3/4	0.065
P-UB-1-S W.T.=0 .065	31.8	1.25	22.1	0.87	1.00	0.04	26.9	1.06	1	0.065

UBL-S
BUTTWELD UNION
With locator and shoulder

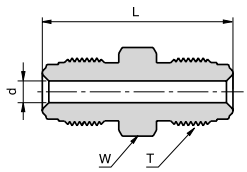




Ordering Information	L		C		d		B		D		F		T Tube O.D.	W.T.
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch
V-UBL-1/4-S	42.9	1.69	19.1	0.75	4.6	0.18	0.6	0.02	7.4	0.29	9.1	0.36	1/4	0.035
V-UBL-3/8-S	43.4	1.71	19.1	0.75	7.7	0.30	0.8	0.03	10.4	0.41	10.7	0.42	3/8	0.035
V-UBL-1/2-S	43.9	1.73	19.1	0.75	10.2	0.40	1.0	0.04	14.0	0.55	15.2	0.60	1/2	0.049

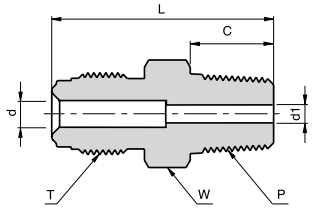
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 115).

UM
MALE UNION



Ordering Information	L		d		T Thread size	W
	mm	inch	mm	inch	inch	inch
P-UM 1/4	39.4	1.55	4.6	0.18	9/16 - 18	5/8
P-UM 1/2	46.7	1.84	10.2	0.40	7/8 - 14	15/16
P-UM 3/4	62.0	2.44	15.8	0.62	1 1/4 - 18	1 5/16
P-UM 1	65.8	2.59	22.2	0.87	1 1/2 - 20	1 5/8

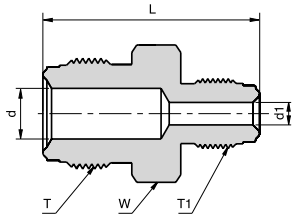
CM
MALE TO MALE NPT CONNECTOR



Ordering Information	L		C		d		d1		W	T Thread size	P NPT-M
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch
P-CM-1/4 X 1/8	33.3	1.31	9.6	0.38	4.6	0.18	4.6	0.18	5/8	9/16 - 18	1/8
P-CM-1/4 X 1/4	37.8	1.49	14.2	0.56	4.6	0.18	4.6	0.18	5/8	9/16 - 18	1/4
P-CM-1/4 X R1/4-H BSPT	37.8	1.49	14.2	0.56	4.6	0.18	4.6	0.18	5/8	9/16 - 18	1/4 BSPT
P-CM-1/2 X 1/4	41.9	1.65	14.2	0.56	10.2	0.40	7.1	0.28	15/16	7/8 - 14	1/4
P-CM-1/2 X3/8	41.9	1.65	14.2	0.56	9.6	0.38	9.6	0.38	15/16	7/8 - 14	3/8
P-CM-1/2 X 1/2	46.7	1.84	19.0	0.75	10.2	0.40	10.2	0.40	15/16	7/8 - 14	1/2
P-CM-3/4 X 3/4	55.6	2.19	19.0	0.75	15.8	0.62	15.8	0.62	1 5/16	1 1/4 - 18	3/4
P-CM-1 X 1	62.7	2.47	23.9	0.94	22.2	0.87	22.2	0.87	1 5/8	1 1/2 - 20	1

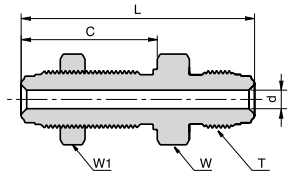
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 115).

RUM
MALE REDUCING UNION



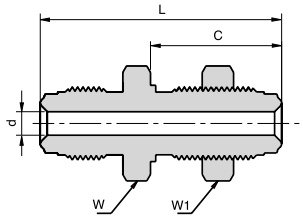
Ordering Information	L		d		d1		T Thread size	T1 Thread size	W
	mm	inch	mm	inch	mm	inch	inch	inch	inch
P-RUM 1/4 X 1/8	34.8	1.37	4.6	0.18	2.4	0.09	9/16-18	5/16-24	5/8
P-RUM 1/2 X 1/4	43.4	1.71	10.2	0.40	4.6	0.18	7/8-1/4	9/16 -18	15/16

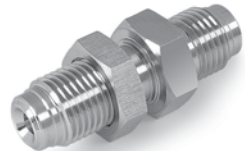
BU
BULKHEAD UNION



Ordering Information	L		C		d		T Thread size	W	W1	Panel hole drill size
	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch
P-BU 1/4	56.6	2.23	33.0	1.30	4.6	0.18	9/16 -18	3/4	3/4	19/32
P-BU 1/2	65.3	2.57	37.6	1.48	10.2	0.40	7/8 -14	1 1/16	1 1/16	29/32

SBU
SHORT BULKHEAD UNION

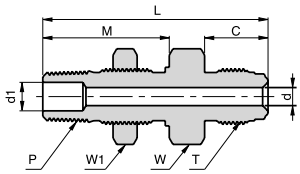




Ordering Information	L		C		d		T Thread size	W	W1	Panel hole drill size
	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch
P-SBU 1/4	46.2	1.82	25.1	0.99	4.6	0.18	9/16-18	3/4	3/4	19/32
P-SBU 1/2	54.4	2.14	28.2	1.11	10.2	0.40	7/8-14	1 1/16	1 1/16	29/32

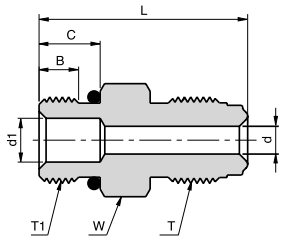
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

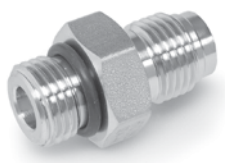
BCM
MALE TO NPT BULKHEAD CONNECTOR



Ordering Information	L		M		C		d		d1		T Thread size inch	W	W1	P NPT–M inch	Panel hole drill size inch
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch		inch	inch		
P-BCM 1/4 X 1/4	56.1	2.21	31.5	1.24	15.8	0.62	4.6	0.18	7.1	0.28	9/16 -18	13/16	13/16	1/4	19/32
P-BCM 1/2 X 1/4	59.4	2.34	31.5	1.24	17.8	0.70	10.2	0.40	7.1	0.28	7/8 -14	15/16	13/16	1/2	19/32

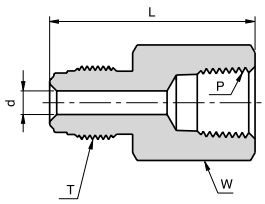
CMOB
MALE TO SEAL O-RING CONNECTOR





Ordering Information	L		C		B		d		d1		T Thread size inch	T1 Thread size inch	W	O-Ring size
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch			inch	
P-CMOB 1/4 X 9/16	33.8	1.33	9.9	0.39	6.4	0.25	4.6	0.18	7.1	0.28	9/16 -18	9/16 -18	3/4	3-906
P-CMOB 1/2 X 7/8	42.2	1.66	12.7	0.50	10.2	0.40	7.1	0.28	15.0	0.59	7/8 -14	7/8 -14	1	3-910
P-CMOB 1/2 X 9/16	37.6	1.48	9.9	0.39	6.4	0.25	7.1	0.28	7.1	0.28	7/8 -14	9/16 -18	15/16	3-906

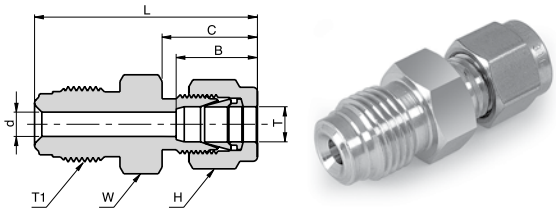
FC
MALE TO FEMALE NPT CONNECTOR



Ordering Information	L		d		T Thread size inch	W	P NPT–F inch
	mm	inch	mm	inch		inch	
P-FC 1/4 X 1/8	35.8	1.41	4.6	0.18	9/16 -18	5/8	1/8
P-FC 1/4 X 1/4	39.1	1.54	4.6	0.18	9/16 -18	3/4	1/4
P-FC 1/2 X 1/4	39.1	1.54	10.2	0.40	7/8 -14	15/16	1/4
P-FC 1/2 X 3/8	44.7	1.76	10.2	0.40	7/8 -14	15/16	3/8
P-FC 1/2 X 1/2	50.5	1.99	10.2	0.40	7/8 -14	1 1/16	1/2
P-FC 3/4 X 3/4	59.9	2.36	15.8	0.62	1 1/4 -18	1 5/16	3/4
P-FC 1 X 1	63.8	2.51	22.1	0.87	1 1/2 -20	1 5/8	1

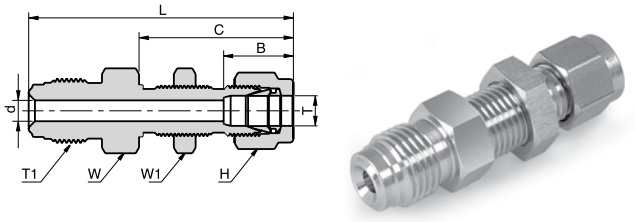
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

UGL
MALE TO LET-LOK UNION



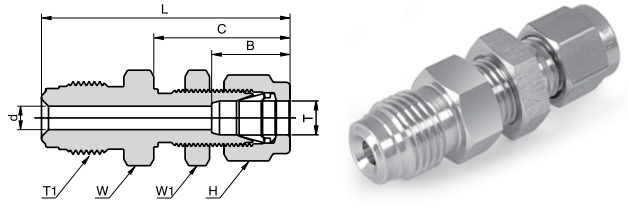
Ordering Information	L		C		B		d		T Tube O.D. inch	T1 Thread size inch	W	H
	mm	inch	mm	inch	mm	inch	mm	inch			inch	inch
P-UGL 1/4 X 1/8	38.9	1.53	15.2	0.60	12.7	0.50	4.6	0.18	1/8	9/16 - 18	5/8	7/16
P-UGL 1/4 X 1/4	41.1	1.62	17.8	0.70	15.2	0.60	4.6	0.18	1/4	9/16 - 18	5/8	9/16
P-UGL 1/4 X 3/8	42.1	1.66	19.4	0.76	16.8	0.66	4.6	0.18	3/8	9/16 - 18	5/8	11/16
P-UGL 1/2 X 3/8	46.7	1.84	19.4	0.76	16.8	0.66	7.1	0.28	3/8	7/8 - 14	15/16	11/16
P-UGL 1/2 X 1/2	49.5	1.95	21.8	0.86	22.9	0.90	10.2	0.40	1/2	7/8 - 14	15/16	7/8

BUL
MALE TO BULKHEAD LET-LOK UNION



Ordering Information	L		C		B		d		T Tube O.D. inch	T1 Thread size inch	W	W1	H	Panel hole drill size
	mm	inch	mm	inch	mm	inch	mm	inch			inch	inch	inch	inch
P-BUL 1/4 X 1/4	57.2	2.25	33.5	1.32	15.2	0.60	4.6	0.18	1/4	9/16 - 18	5/8	5/8	9/16	29/64
P-BUL 1/2 X 3/8	64.5	2.54	36.8	1.45	16.8	0.66	7.1	0.28	3/8	7/8 - 14	15/16	3/4	11/16	37/64
P-BUL 1/2 X 1/2	69.9	2.74	19.4	1.65	22.9	0.90	10.2	0.40	1/2	7/8 - 14	15/16	15/16	7/8	49/64

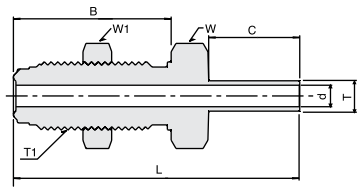
SBUL
MALE TO SHORT BULKHEAD LET-LOK UNION



Ordering Information	L		C		B		d		T Tube O.D. inch	T1 Thread size inch	W	W1	H	Panel hole drill size
	mm	inch	mm	inch	mm	inch	mm	inch			inch	inch	inch	inch
P-SBUL 1/4 X 1/4	47.8	1.88	26.7	0.60	15.2	0.60	4.6	0.18	1/4	9/16-18	5/8	5/8	9/16	29/64

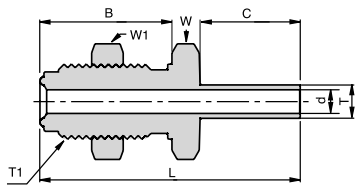
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

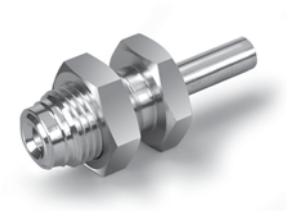
BHUT
BULKHEAD TO TUBE UNION



Ordering Information	L		B		C		d		T Tube O.D. inch	T1 Thread size inch	W	W1	Panel hole drill size inch
	mm	inch	mm	inch	mm	inch	mm	inch			inch	inch	
P-BHUT- 1/4	59.9	2.36	33.0	1.30	19.1	0.75	4.6	0.18	1/4	9/16 - 18	3/4	3/4	19/32
P-BHUT- 1/2	66.6	2.62	37.6	1.48	19.1	0.75	10.2	0.40	1/2	7/8 - 14	1 1/16	1 1/16	29/32

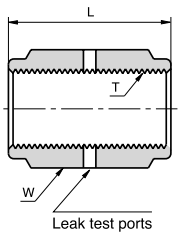
SBHUT
SHORT BULKHEAD TO TUBE UNION





Ordering Information	L		B		C		d		T Tube O.D. inch	T1 Thread size inch	W	W1	Panel hole drill size inch
	mm	inch	mm	inch	mm	inch	mm	inch			inch	inch	
P-SBHUT- 1/4	49.5	1.95	25.1	0.99	19.1	0.75	4.6	0.18	1/4	9/16 - 18	3/4	3/4	19/32
P-SBHUT- 1/2	58.7	2.31	29.7	1.17	19.1	0.75	10.2	0.40	1/2	7/8 - 14	1 1/16	1 1/16	29/32

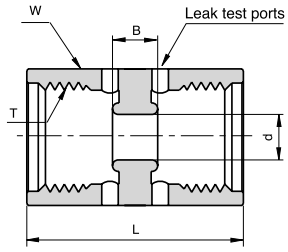
CP
COUPLING



Ordering Information	L		T Thread size	W
	mm	inch	inch	inch
P-CP 1/4	30.2	1.19	9/16 -18	3/4
P-CP 1/2	33.3	1.31	7/8 -14	1 1/16
P-CP 3/4	42.7	1.68	1 1/4 -18	1 1/2
P-CP 1	51.8	2.04	1 1/2 -20	1 3/4

Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

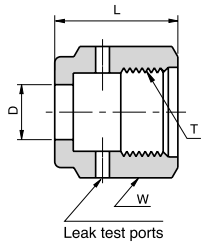
DFU
DOUBLE FEMALE UNION

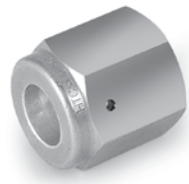


Ordering Information	L		B		d		W	T Thread size
	mm	inch	mm	inch	mm	inch	inch	inch
P-DFU-1/4	30.2	1.19	6.0	0.24	6.4	0.25	3/4	9/16 - 18
P-DFU-1/2	33.3	1.31	6.0	0.24	14.0	0.55	1 1/16	7/8 - 14

Caution: This fitting should be used with a swivel male connector only.

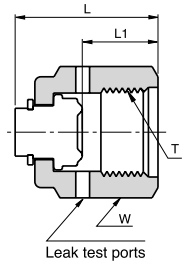
NF
FEMALE NUT





Ordering Information	L		D		T Thread size	W
	mm	inch	mm	inch	inch	inch
P-NF 1/8	13.6	0.54	5.3	0.21	5/16-24	7/16
P-NF 1/4	20.6	0.81	9.2	0.36	9/16-18	3/4
P-NF 1/2	22.5	0.88	15.5	0.61	7/8-14	1 1/16
P-NF 3/4	28.5	1.12	22.6	0.89	1 1/4-18	1 1/2
P-NF 1	34.0	1.34	30.6	1.20	1 1/2-20	1 3/4

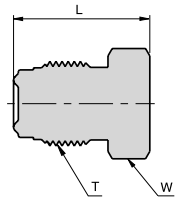
CF
FEMALE CAP



Ordering Information	L		L1		T Thread size	W
	mm	inch	mm	inch	inch	inch
PCF1/8	16.6	0.65	8.4	0.33	5/16-24	7/16
P-CF 1/4	23.9	0.94	12.7	0.50	9/16-18	3/4
P-CF 1/2	25.6	1.01	14.2	0.56	7/8-14	1 1/16
P-CF 3/4	32.3	1.27	19.1	0.75	1 1/4-18	1 1/2
P-CF 1	39.0	1.53	23.4	0.92	1 1/2-20	1 3/4

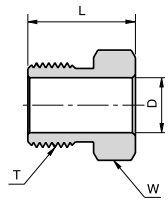
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

MP
MALE PLUG



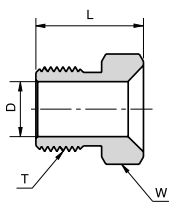
Ordering Information	L		T Thread size	W
	mm	inch	inch	inch
P-MP 1/8	17.3	0.68	5/16 - 24	3/8
P-MP 1/4	23.4	0.92	9/16 -18	5/8
P-MP 1/2	27.4	1.08	7/8 -14	15/16
P-MP 3/4	36.3	1.43	1 1/4 -18	1 5/16
P-MP 1	38.6	1.52	1 1/2 - 20	1 5/8

NM
MALE NUT



Ordering Information	L		D		T Thread size	W
	mm	inch	mm	inch	inch	inch
P-NM 1/8	12.7	0.50	5.3	0.21	5/16-24	3/8
P-NM 1/4	18.0	0.71	9.2	0.36	9/16-18	5/8
P-NM 1/2	20.6	0.81	15.5	0.61	7/8-14	15/16
P-NM 3/4	25.4	1.00	22.7	0.89	1 1/4-18	1 5/16
P-NM 1	30.2	1.19	30.5	1.20	1 1/2-20	1 5/8

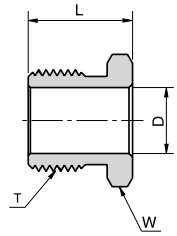
TNM
TAPERED MALE NUT



Ordering Information	L		D		T Thread size	W
	mm	inch	mm	inch	inch	inch
P-NN 1/4	18.0	0.71	9.2	0.36	9/16-18	5/8

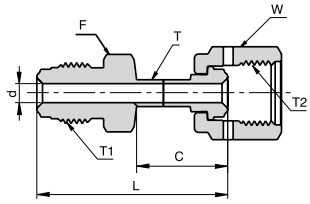
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

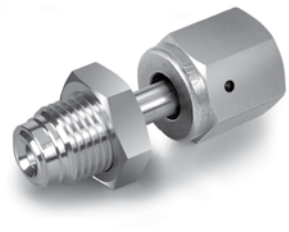
SNM
SHORT MALE NUT



Ordering Information	L		D		T Thread size	W
	mm	inch	mm	inch	inch	inch
P-SNM 1/4 .54	13.7	0.54	9.2	0.36	9/16-18	5/8
P-SNM 1/4 .65	16.5	0.65	9.2	0.36	9/16-18	5/8

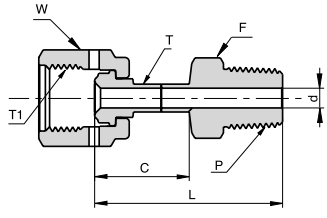
UMF
MALE TO FEMALE UNION





Ordering Information	L		C		d		F	W	T Tube O.D.	T1 Thread size	T2 Thread size
	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch	inch
P-UMF-1/4	45.2	1.78	21.6	0.85	4.6	0.18	5/8	3/4	1/4	9/16 - 18	9/16 - 18
P-UMF-1/2	49.8	1.96	22.1	0.87	10.2	0.40	15/16	1-1/16	1/2	7/8 - 14	7/8 - 14

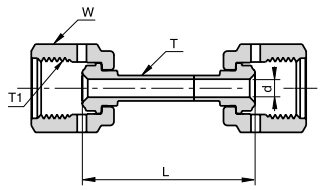
MCF
FEMALE TO MALE NPT CONNECTOR

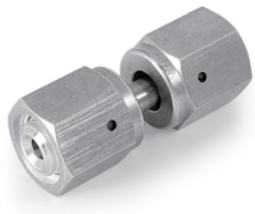


Ordering Information	L		C		d		W	F	T Tube O.D.	T1 Thread size	P NPT-M
	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch	inch
P-MCF-1/4	45.5	1.79	23.4	0.92	4.6	0.18	3/4	9/16	1/4	9/16 - 18	1/4
P-MCF-1/2	53.1	2.09	25.6	1.01	10.2	0.40	1 1/16	7/8	1/2	7/8 - 14	1/2

Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

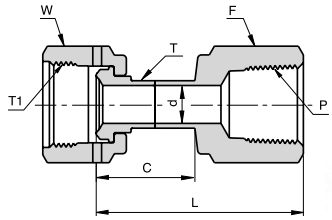
UFF
FEMALE TO FEMALE UNION

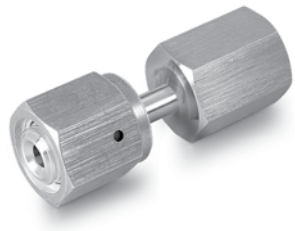




Ordering Information	L		d		W	T Tube O.D.	T1 Thread size
	mm	inch	mm	inch	inch	inch	inch
P-UFF-1/4	43.0	1.69	4.6	0.18	3/4	1/4	9/16 - 18
P-UFF-1/2	44.1	1.73	10.2	0.40	1 1/16	1/2	7/8 - 14

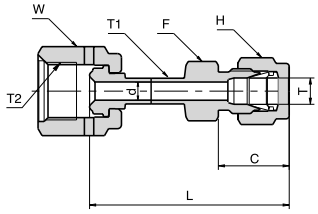
FCF
FEMALE TO FEMALE NPT CONNECTOR





Ordering Information	L		C		d		F	W	T Tube O.d.	T Thread size	P NPT-F inch
	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch	
P-FCF-1/4	45.0	1.77	23.4	0.92	4.6	0.18	3/4	3/4	1/4	9/16 - 18	1/4
P-FCF-1/2	54.8	2.16	26.4	1.04	10.2	0.40	1 1/16	1 1/16	1/2	7/8 - 14	1/2

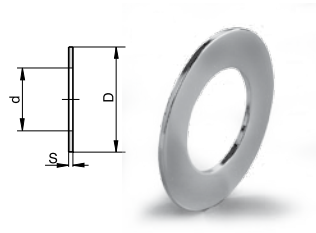
FHTL
FEMALE TO LET-LOK CONNECTOR



Ordering Information	L		C		d		F	W	H	T Tube O.D.	T1 Tube O.D.	T2 Thread size
	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch	inch	inch
P-FHTL-1/4 X 1/4	49.3	1.94	17.8	0.70	4.6	0.18	1/2	3/4	9/16	1/4	1/4	9/16 - 18
P-FHTL-1/2 X 1/2	56.6	2.23	21.8	0.86	10.2	0.40	13/16	1 1/16	7/8	1/2	1/2	7/8 - 14

Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

GA
GASKET



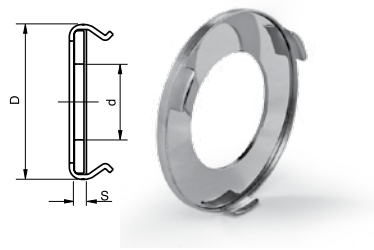
UNPLATED GASKETS

Ordering Information	D		d		S	
	mm	inch	mm	inch	mm	inch
GA-1/4 - E	11.9	0.47	5.6	0.22	0.7	0.028
GA-1/2 - E	19.8	0.78	11.2	0.44	0.7	0.028

SILVER PLATED GASKETS

Ordering Information	D		d		S	
	mm	inch	mm	inch	mm	inch
GA-1/4 SILVER PLATED	11.9	0.47	5.6	0.22	0.7	0.028
GA-1/2 SILVER PLATED	19.8	0.78	11.2	0.44	0.7	0.028
GA-3/4 SILVER PLATED	29.0	1.14	16.8	0.66	0.7	0.028
GA-1 SILVER PLATED	35.6	1.40	22.6	0.89	0.7	0.028

GA-RT
RETAINED GASKET



UNPLATED RETAINED GASKETS

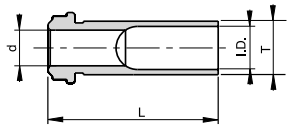
Ordering Information	D		d		S	
	mm	inch	mm	inch	mm	inch
GA-1/4 -RT- E	12.7	0.50	6.1	0.24	0.7	0.028
GA-1/2 -RT- E	20.1	0.79	11.1	0.44	0.7	0.028

SILVER PLATED RETAINED GASKETS

Ordering Information	D		d		S	
	mm	inch	mm	inch	mm	inch
GA-1/4-RT SILVER PLATED	12.7	0.50	6.1	0.24	0.7	0.028
GA-1/2-RT SILVER PLATED	20.1	0.79	11.1	0.44	0.7	0.028
GA-3/4-RT SILVER PLATED	29.0	1.14	16.8	0.66	0.7	0.028
GA-1-RT SILVER PLATED	35.6	1.40	22.6	0.89	0.7	0.028

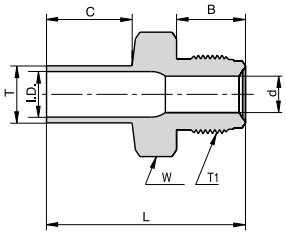
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

HGL
LONG HIGH FLOW GLAND



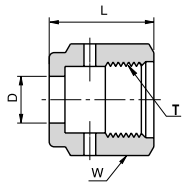
Ordering Information	L		T Tube O.D	I.D.		d	
	mm	inch	inch	mm	inch	mm	inch
V-HGL-3/8 - 0.6	15.2	0.60	3/8	7.7	0.30	6.4	0.25
V-HGL-3/8 - 1.13	28.7	1.13	3/8	7.7	0.30	6.4	0.25
V-HGL-3/8 - 1.19	30.2	1.19	3/8	7.7	0.30	6.4	0.25
V-HGL-3/8 - 1.31	33.3	1.31	3/8	7.7	0.30	6.4	0.25

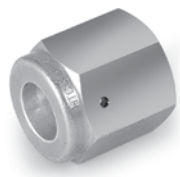
HMT
HIGH FLOW MALE TO TUBE



Ordering Information	L		B		C		d		W	T Tube O.D.	T1 Thread size	I.D.	
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch	mm	inch
P- HMT 1/4	42.7	1.68	15.8	0.62	19.1	0.75	6.4	0.25	5/8	3/8	9/16 - 18	7.7	0.30

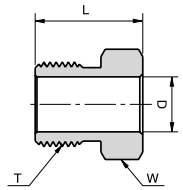
HNF
HIGH FLOW FEMALE NUT





Ordering Information	L		D		T Thread size	W
	mm	inch	mm	inch	inch	inch
P - HNF 1/4	20.6	0.81	10.0	0.39	9/16 - 18	3/4

HNM
HIGH FLOW MALE NUT

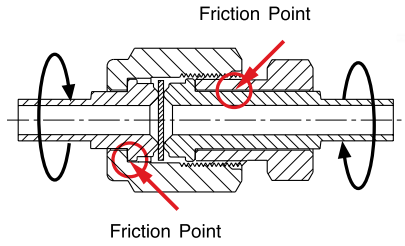


Ordering Information	L		D		T Thread size	W
	mm	inch	mm	inch	inch	inch
P - HNM 1/4	18.0	0.71	10.0	0.39	9/16 - 18	5/8

Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the part Number. (See Material Table, page 143).

GRIPKIT

Gripkit is a patented product designed to help preventing potential leaks in metal-gasket face-seal fittings. The Gripkit is designed for use with critical, semiconductor-industry ultra-pure and high-purity gas applications, as well as vacuum delivery systems. The product is color coded for easy identification within the system and is engineered to be used with the fitting components of most major manufacturers.



MATERIAL Gripkit® consists of three components:

Part Number	Description	Material
GK-NY-M4	5/8" Hex male crescent adapter	Blue Nylon
GK-NY-F4	3/4" Hex female crescent adapter	Blue Nylon
GK-1-CL-WH	White color coded clamp	Acetyl
GK-1-CL-BL	Blue color coded clamp	Acetyl
GK-1-CL-YL	Yellow color coded clamp	Acetyl
GK-1-CL-RD	Red color coded clamp	Acetyl
GK-1-CL-GR	Green color coded clamp	Acetyl

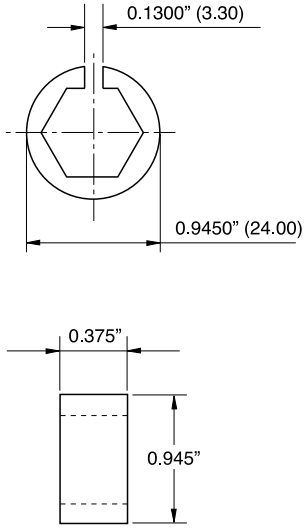
HOW IT WORKS

The Gripkit® fixes the position of the male nut relative to the female nut, and therefore, the distance between the two sealing glands. Consequently, when torque is applied to either side of the fitting connection, it does not cause the nuts to rotate in opposition and lose their compression on the gasket. In extreme cases, when very high torque is applied to the fitting joint, the glands may rotate within the fixed nuts, but the connector will remain intact. Gripkit will prevent the kind of catastrophic leak that results from the loss of gland compression on the gasket.

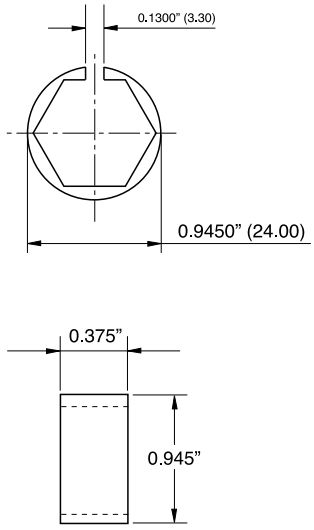
WHY USE GRIPKIT®?

When pipe fitters, maintenance technicians and operators work on gas distribution systems, they can accidentally "torque" the system, causing fittings down-line to come apart. Most veteran gas system engineers recognize this common phenomenon. Another widespread problem occurs when a fitting connection "shakes apart" because it is mounted on, or near, vibrating equipment. Sources of system vibration include pumps, motors, pneumatic actuators, as well as mobile equipment. Gripkit® offers a very inexpensive solution to these real and potentially costly problems.

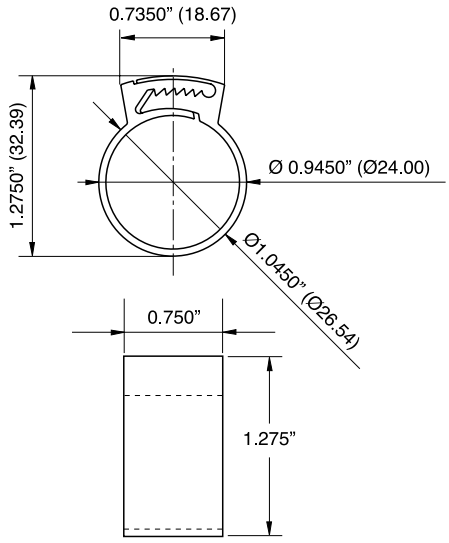
1" x 3/4" CRESCENT SECTION



1" x 5/8" CRESCENT SECTION



1" CLAMP SECTION



HAM-LET ADVANCED CONTROL TECHNOLOGY