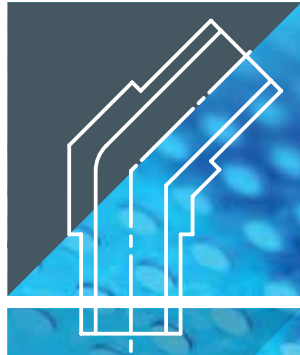


HI-TECH COMPONENTS

HTC[®]



ORBITAL WELD AND METAL GASKET FACE SEAL FITTINGS



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. **HTC®** has broken new ground in surface-finishing techniques by implementing improved electro-polishing processes.

PLATING

Female threads are silver plated in order to reduce the risk of galling and to improve the remakeability of the fitting. This high-quality plating also reduces the torque required for the 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	MATERIAL	F	C
HTC®Face Seal Fittings	SS316L	1000	538
	SS316L Var or Vim / Var ⁽¹⁾	1000	538
HTC® Welding Fittings	SS316L	1000	538
	SS316L Var or Vim / Var ⁽¹⁾	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; E49.9; SEMASPEC 91060573A-STD.

CLEANING SPECIFICATIONS

According to # H9800.

Reference Spec: SEMI E49.3.

MATERIAL TRACEABILITY

All **HTC®** components are Heat Coded for full traceability.

ASSEMBLY

According to SEMI E49.6.

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

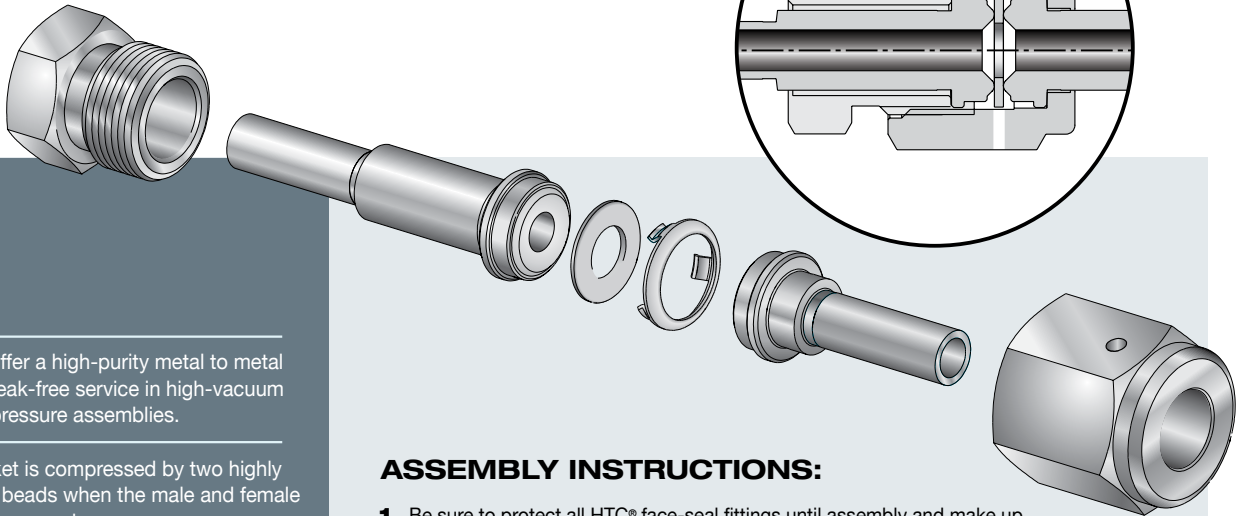
Products	Material	Size	Wall Thickness	Pressure Rating	
				psig	bar
HTC® Fittings	316L or 316LV	1/8	0.028	8550	590
		1/4	0.035	5200	359
		3/8	0.035	3350	231
		1/2	0.049	3750	259
		3/4*	0.065	3350	231
		3/4*	0.049	2400	165
		1*	0.065	2400	165

* 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.

⁽¹⁾ Per SEMI F20-0305

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 bead-to-bead assembly compresses a soft-metal gasket-to-seal. This assembly can be locked by the HAM-LET 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 the make up and assembly of high-purity fittings and applications.
3. Make up instructions:
Tighten the female nut to the male nut/body the finger tight.
Tighten the female nut 1/8 turn past the finger tight point.
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 186

MATERIAL

PRODUCTS	LEVEL "E"			LEVEL "H"		
	TREATMENT	Ra (Microinch)		TREATMENT	Ra (Microinch)	
		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

GLANDS

LONG GLAND 160
Without shoulder
GL-W



LONG GLAND 160
With shoulder
GL-S



MALE GLAND 161
Without shoulder
GM-W



SHORT GLAND 161
Without shoulder
GS-W



SHORT GLAND 162
With shoulder
GS-S



MINI SHORT GLAND 162
Without shoulder
MGS-W



MINI SHORT GLAND 163
With shoulder
MGS-S



GLAND ADAPTER TO LET-LOK® 163
AG



MALE GLAND 163
Short tube without shoulder
MG-W



SOCKET WELD GLAND 164
GSW



MINI BUTTWELDS

MINI ELBOW 164
Without shoulder
ME-W



MINI ELBOW REDUCER 165
Without shoulder
MER-W



MINI ELBOW 165
45°
Without shoulder
ME-45°-W



MINI ELBOW 166
With extended leg
Without shoulder
MEX-W



MINI TEE 166
Without shoulder
MT-W



MINI TEE REDUCER 167
Without shoulder
MTR-W



MINI CROSS 167
Without shoulder
MC-W



MINI TRI-EL 168
Without shoulder
MTB-W



REDUCING UNION 168
Without shoulder
RU-W



SHAPED UNIONS

ELBOW UNION 169
EU



TEE UNION 169
TU



CROSS UNION 170
CU



MALE ELBOW 170
EM



LONG WELD SHAPED CONNECTORS

ELBOW 171
Without shoulder
EW-W



TEE 171
Without shoulder
TW-W



TEE REDUCER 172
Without shoulder
TWR-W



CROSS 172
Without shoulder
CW-W



REDUCER 173
Without shoulder
RW-W



BUTTWELD UNION 173
Without shoulder
UB-W



BUTTWELD UNION 174
With shoulder
UB-S



BUTTWELD UNION 174
With locator and shoulder
UBL-S



THREADED STRAIGHT CONNECTORS

MALE UNION 175
UM



MALE TO MALE NPT CONNECTOR 175
CM











MALE REDUCING UNION 176
RUM





BULKHEAD UNION 176
BU





SHORT BULKHEAD UNION SBU 176 	MALE TO NPT BULKHEAD CONNECTOR BCM 177 	MALE PLUG MP 181 	MALE NUT NM 181 
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MALE TO SEAL O-RING CONNECTOR CMOB 177 	MALE TO FEMALE NPT CONNECTOR FC 177 	TAPERED MALE NUT TNM 181 	SHORT MALE NUT SNM 182 
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MALE TO LET-LOK UNION UGL 178 	MALE TO BULKHEAD LET-LOK UNION BUL 178 
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SWIVEL CONNECTORS

MALE TO SHORT BULKHEAD LET-LOK UNION SBUL 178 	BULKHEAD TO TUBE UNION Without shoulder BHUT-W 179 
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FEMALE TO MALE UNION UMF 182 	FEMALE TO MALE NPT CONNECTOR MCF 182 
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SHORT BULKHEAD TO TUBE UNION Without shoulder SBHUT-W 179 

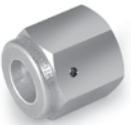

FEMALE TO FEMALE UNION UFF 183 	FEMALE TO FEMALE NPT CONNECTOR FCF 183 
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CAPS, NUTS & PLUGS

FEMALE TO LET-LOK® CONNECTOR FHTL 183 
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COUPLING CP 179 	DOUBLE FEMALE UNION DFU 180 
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GASKETS

FEMALE NUT NF 180 	FEMALE CAP CF 180 
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GASKET GA 184 	RETAINED GASKET GA-RT 184 
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HIGH FLOW CONNECTORS

LONG HIGH FLOW GLAND HGL 185 	HIGH FLOW MALE TO TUBE HMT 185 
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HIGH FLOW FEMALE NUT HNF 185 	HIGH FLOW MALE NUT HNM 185 
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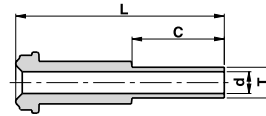
ORDERING INFORMATION

V	-	GL	-	1/2	-	W	-	E
Type of Fitting Designator			Surface Level Designator					
Size Designator			To indicate the desired level of polish, please add "E" or "H" to the part Number:					
1/8 6 mm			E - With Electropolish					
1/4 8 mm			H - Without Electropolish					
3/8 10 mm								
1/2 12 mm								
3/4 18 mm								
1			End Designator					
			S - With Shoulder					
			W - Without Shoulder					
Material Designator								
P - 316L/316L VOD (AOD)								
V - SS316L Var or Vim/Var ⁽¹⁾								
LM - Low Manganese								
H - Alloy C-276								
*NI - Nickel								
*SS - Stainless Steel								
* For Gaskets only								
⁽¹⁾ Per SEMI F20-0305								

GL-W

LONG GLAND

Without shoulder

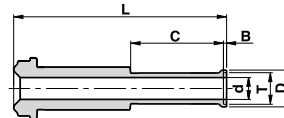


Ordering Information	Face Seal Size	L		C		d		T Tube O.D	W.T.	
		inch	mm	inch	mm	inch	mm		inch	mm
V-GL-1/8-W	1/8	36.1	1.42	19.1	0.75	1.9	0.07	1/8"	-	0.028
V-GL-1/4 X 1/8-W	1/4	36.1	1.42	19.1	0.75	1.9	0.07	1/8"	-	0.028
V-GL-1/4-W	1/4	43.2	1.70	19.1	0.75	4.6	0.18	1/4"	-	0.035
V-GL-3/8-W	1/2	45.5	1.79	19.1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

GL-S

LONG GLAND

With shoulder



Ordering Information	Face Seal Size	L		C		d		B		D		T Tube O.D	W.T.	
		inch	mm	inch	mm	inch	mm	inch	mm	inch	mm		inch	mm
V-GL-1/4-S	1/4	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	1/2	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	1/2	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	1/2	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	3/4	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	3/4	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	1	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	1/4	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	1/4	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	1/2	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	1/2	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	3/4	52.6	2.07	19.1	0.75	15.0	0.59	1.0	0.04	19.3	0.76	18mm	1.50	-

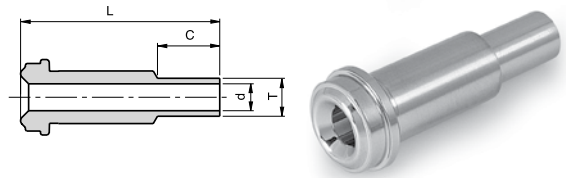
Dimensions are for reference only, and are subject to change without notice.

When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

GM-W

MALE GLAND

Without shoulder

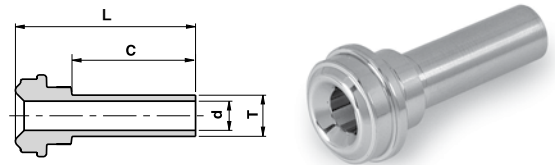


Ordering Information	Face Seal size	L		C		d		T
	inch	mm	inch	mm	inch	mm	inch	Tube O.D inch
V-GM-1/8-W	1/8	17.8	0.70	7.1	0.28	1.9	0.07	1/8
V-GM-1/4-W	1/4	33.3	1.31	10.4	0.41	3.0	0.12	1/4
V-GM-3/8-W	1/2	38.1	1.50	10.4	0.41	7.1	0.28	3/8
V-GM-1/2-W	1/2	38.1	1.50	12.7	0.50	10.2	0.40	1/2
P-GM-3/4-W	3/4	50.8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

GS-W

SHORT GLAND

Without shoulder



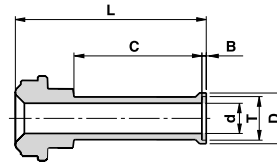
Ordering Information	Face Seal Size	L		C		d		T	W.T.	
	inch	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-GS-1/8-W	1/8	27.4	1.08	19.1	0.75	1.9	0.07	1/8"	-	0.028
V-GS-1/4-W	1/4	27.9	1.10	19.1	0.75	4.6	0.18	1/4"	-	0.035
V-GS-1/4 X 1/8 -W	1/4	27.9	1.10	19.1	0.75	1.9	0.07	1/8"	-	0.028
V-GS -1/4-W 0.72	1/4	18.3	0.72	9.6	0.38	4.6	0.18	1/4"	-	0.035
V-GS-3/8-W	1/2	28.4	1.12	19.1	0.75	7.7	0.30	3/8"	-	0.035
V-GS-1/2-W	1/2	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	1/2	28.4	1.12	19.1	0.75	9.5	0.37	1/2"	-	0.065
V-GS-1/2-W-0.74	1/2	18.8	0.74	9.7	0.38	10.2	0.40	1/2"	-	0.049
V-GS-1/2 X 1/4-W	1/2	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	3/4	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	3/4	29.0	1.14	19.1	0.75	15.8	0.62	3/4"	-	0.065
P-GS-1-W W.T.=0.065	1	32.0	1.26	19.1	0.75	22.1	0.87	1"	-	0.065
V-GS-6MM-W	1/4	29.4	1.16	19.1	0.75	4.0	0.16	6mm	1.00	-
V-GS-8MM-W	1/4	29.5	1.16	19.1	0.75	6.0	0.24	8mm	1.00	-
V-GS-10MM-W	1/2	29.4	1.16	19.1	0.75	8.0	0.31	10mm	1.00	-
V-GS-12MM-W	1/2	29.4	1.16	19.1	0.75	10.0	0.39	12mm	1.00	-
P-GS-18MM-W	3/4	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 157).

GS-S

SHORT GLAND

With shoulder

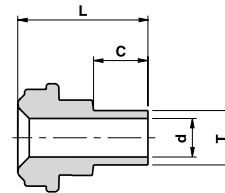


Ordering Information	Face Seal Size	L		C		d		B		D		T	W.T.	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-GS-1/4-S	1/4	28.5	1.12	19.1	0.75	4.6	0.18	0.6	0.02	7.4	0.29	1/4"	-	0.035
V-GS-3/8-S	1/2	29.2	1.15	19.1	0.75	7.7	0.30	0.8	0.03	10.4	0.41	3/8"	-	0.035
V-GS-1/2-S	1/2	29.4	1.16	19.1	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	1/2	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	3/4	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	3/4	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	1	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	1/4	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	1/4	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	1/2	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	1/2	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	3/4	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



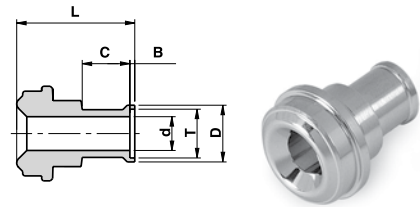
Ordering Information	Face Seal Size	L		C		d		T	W.T.	
	inch	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-MGS-1/4-W	1/4	15.2	0.60	6.4	0.25	4.6	0.18	1/4"	-	0.035
V-MGS-3/8-W	1/2	15.8	0.62	6.4	0.25	7.7	0.30	3/8"	-	0.035
V-MGS-1/2-W	1/2	15.8	0.62	6.4	0.25	10.2	0.40	1/2"	-	0.049
V-MGS-1/2-W W.T.=0.065	1/2	15.8	0.62	6.4	0.25	9.5	0.37	1/2"	-	0.065
V-MGS-6MM-W	1/4	15.2	0.60	6.4	0.25	4.0	0.16	6mm	1.00	-
V-MGS-8MM-W	1/4	15.8	0.62	6.4	0.25	6.0	0.24	8mm	1.00	-
V-MGS-10MM-W	1/2	15.8	0.62	6.4	0.25	8.0	0.31	10mm	1.00	-
V-MGS-12MM-W	1/2	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 157).

MGS-S

MINI SHORT GLAND

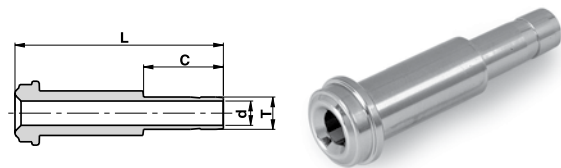
With shoulder



Ordering Information	Face Seal Size	L		C		d		B		D		T	W.T.	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-MGS-1/4-S	1/4	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	1/2	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	1/2	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	1/2	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	1/4	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	1/4	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	1/2	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	1/2	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®

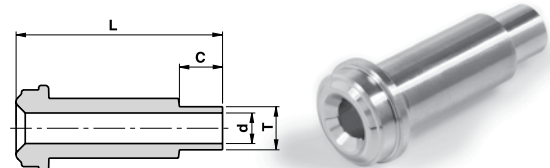


Ordering Information	Face Seal Size	L		C		d		T
	inch	mm	inch	mm	inch	mm	inch	inch/mm
V-AG-1/4	1/4	41.2	1.62	15.9	0.62	4.3	0.17	1/4"
P-AG-3/8	1/2	46.0	1.81	17.5	0.69	6.8	0.27	3/8"
V-AG-1/2	1/2	49.3	1.94	24.4	0.96	9.4	0.37	1/2"
V-AG-6M	1/4	41.2	1.62	15.7	0.62	4.0	0.16	6mm

MG-W

MALE GLAND

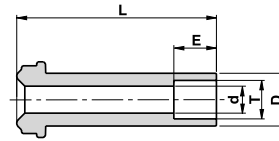
Short tube without shoulder



Ordering Information	Face Seal Size	L		C		d		T	W.T.	
	inch	mm	inch	mm	inch	mm	inch	inch / mm	mm	inch
V-MG-1/4-W	1/4	30.5	1.20	6.4	0.25	4.6	0.18	1/4"	-	0.035
V-MG-1/4-W 1.32	1/4	33.5	1.32	9.6	0.38	4.6	0.18	1/4"	-	0.035
V-MG-3/8-W	1/2	32.8	1.29	6.4	0.25	7.7	0.30	3/8"	-	0.035
V-MG-1/2-W	1/2	32.8	1.29	6.4	0.25	10.2	0.40	1/2"	-	0.049
V-MG-6MM-W	1/4	30.5	1.20	6.4	0.25	4.0	0.16	6mm	1.00	-
V-MG-8MM-W	1/4	30.5	1.20	6.4	0.25	6.0	0.24	8mm	1.00	-
V-MG-10MM-W	1/2	32.8	1.29	6.4	0.25	8.0	0.31	10mm	1.00	-
V-MG-12MM-W	1/2	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 157).

GSW

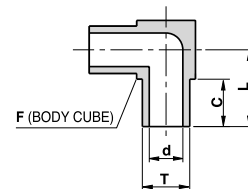
SOCKET WELD GLAND

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

ME-W

MINI ELBOW

Without shoulder



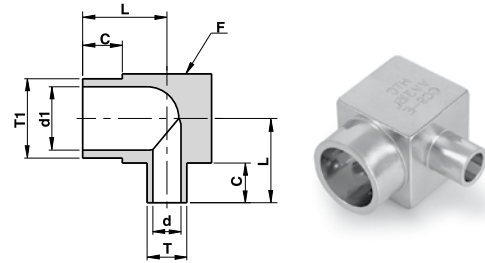
Ordering Information	L		C		d		F	T	W.T.	
	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch
V-ME-1/8-W	10.3	0.41	6.4	0.25	1.9	0.07	5/16	1/8"	-	0.028
V-ME-1/4-W	10.3	0.41	6.4	0.25	4.6	0.18	5/16	1/4"	-	0.035
V-ME-3/8-W	11.9	0.47	6.4	0.25	7.7	0.30	7/16	3/8"	-	0.035
V-ME-1/2-W	13.5	0.53	6.4	0.25	10.2	0.40	9/16	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 157).

MER-W

MINI ELBOW REDUCER

Without shoulder

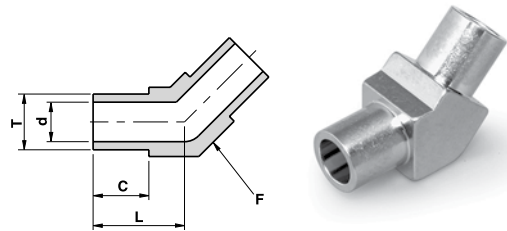


Ordering Information	L		C		d1		d		F	T1 Tube O.D	W.T. (T1)	T Tube O.D	W.T. (T)		
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch/mm	mm	inch/mm	mm	inch	
V-MER-1/4 X 1/8-W	10.3	0.41	6.4	0.25	4.6	0.18	1.9	0.07	5/16	1/4"	-	0.035	1/8"	-	0.028
V-MER-3/8 X 1/4-W	11.9	0.47	6.4	0.25	7.7	0.30	4.6	0.18	7/16	3/8"	-	0.035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

ME-45°-W

MINI ELBOW 45°

Without shoulder



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-1/4-W-45DEG	10.3	0.41	6.4	0.25	4.6	0.18	5/16	1/4"	-	0.035
V-ME-3/8-W-45DEG	11.9	0.47	6.4	0.25	7.7	0.30	7/16	3/8"	-	0.035
V-ME-1/2-W-45DEG	13.5	0.53	6.4	0.25	10.2	0.40	9/16	1/2"	-	0.049
V-ME-1/2-W-45DEG 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-45DEG	10.3	0.41	6.4	0.25	4.0	0.16	5/16	6mm	1.00	-
V-ME-8MM-W-45DEG	11.9	0.47	6.4	0.25	6.0	0.24	7/16	8mm	1.00	-
V-ME-10MM-W-45DEG	11.9	0.47	6.4	0.25	8.0	0.31	7/16	10mm	1.00	-
V-ME-12MM-W-45DEG	13.5	0.53	6.4	0.25	10.0	0.39	9/16	12mm	1.00	-

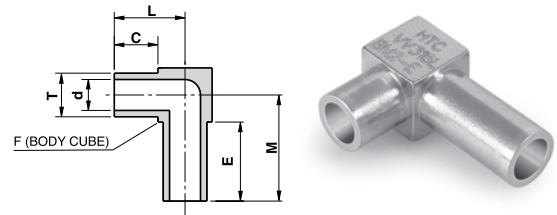
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

MEX-W

MINI ELBOW

With extended leg

Without shoulder

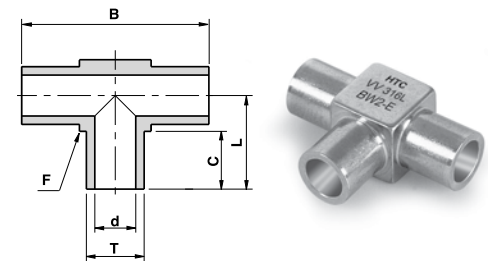


Ordering Information	L		C		M		E		d		F	T	W.T.
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch
V-MEX-1/4-W 0.41X0.66	10.3	0.41	6.4	0.25	16.8	0.66	12.7	0.50	4.6	0.18	5/16	1/4	0.035
V-MEX-1/4-W 0.41X0.61	10.3	0.41	6.4	0.25	15.4	0.61	11.4	0.45	4.6	0.18	5/16	1/4	0.035
V-MEX-1/4-W 0.66X0.66"	16.8	0.66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

MT-W

MINI TEE

Without shoulder



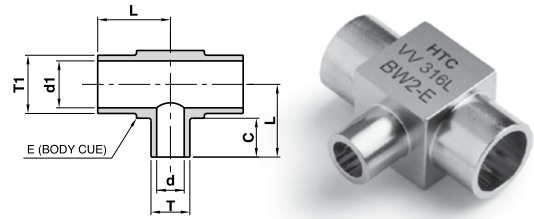
Ordering Information	L		B		C		d		F	T	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch
V-MT-1/8-W	10.3	0.41	20.7	0.81	6.4	0.25	1.9	0.07	5/16	1/8"	-	0.028
V-MT-1/4-W	10.3	0.41	20.7	0.81	6.4	0.25	4.6	0.18	5/16	1/4"	-	0.035
V-MT-3/8-W	11.9	0.47	23.9	0.94	6.4	0.25	7.7	0.30	7/16	3/8"	-	0.035
V-MT-1/2-W	13.5	0.53	27.1	1.07	6.4	0.25	10.2	0.40	9/16	1/2"	-	0.049
V-MT-1/2-W W.T.=0.065	13.5	0.53	27.1	1.07	6.4	0.25	9.5	0.37	9/16	1/2"	-	0.065
V-MT-6MM-W	10.3	0.41	20.7	0.81	6.4	0.25	4.0	0.16	5/16	6mm	1.00	-
V-MT-8MM-W	11.9	0.47	23.9	0.94	6.4	0.25	6.0	0.24	7/16	8mm	1.00	-
V-MT-10MM-W	11.9	0.47	23.9	0.94	6.4	0.25	8.0	0.31	7/16	10mm	1.00	-
V-MT-12MM-W	13.5	0.53	27.1	1.07	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 157).

MTR-W

MINI TEE REDUCER

Without shoulder

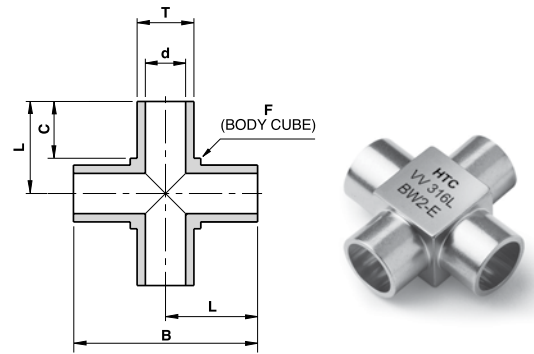


Ordering Information	L		B		C		d1		d		F	T1	W.T. (T1)		T	W.T. (T)	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch	inch / mm	mm	inch
V-MTR-1/2 X 1/4-W	13.5	0.53	27.1	1.07	6.4	0.25	10.2	0.40	4.6	0.18	9/16	1/2"	-	0.049	1/4"	-	0.035
V-MTR-1/2 X 3/8-W	13.5	0.53	27.1	1.07	6.4	0.25	10.2	0.40	7.7	0.30	9/16	1/2"	-	0.049	3/8"	-	0.035
V-MTR-3/8 X 1/4-W	11.9	0.47	23.9	0.94	6.4	0.25	7.7	0.30	4.6	0.18	7/16	3/8"	-	0.035	1/4"	-	0.035
V-MTR-8MMX6MM-W	11.9	0.47	23.9	0.94	6.4	0.25	6.0	0.24	4.0	0.16	7/16	8mm	1.00	-	6mm	1.00	-
V-MTR-12MMX6MM-W	13.5	0.53	27.1	1.07	6.4	0.25	10.0	0.39	4.0	0.16	9/16	12mm	1.00	-	6mm	1.00	-
V-MTR-12MMX8MM-W	13.5	0.53	27.1	1.07	6.4	0.25	10.0	0.39	6.0	0.24	9/16	12mm	1.00	-	8mm	1.00	-

MC-W

MINI CROSS

Without shoulder



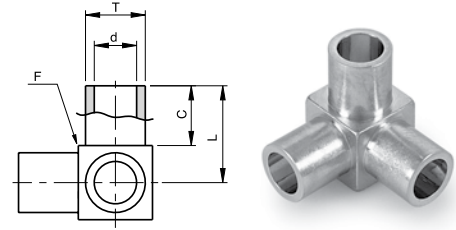
Ordering Information	L		B		C		d		F	T	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch
V-MC-1/8-W	10.3	0.41	20.7	0.81	6.4	0.25	1.9	0.07	5/16	1/8"	-	0.028
V-MC-1/4-W	10.3	0.41	20.7	0.81	6.4	0.25	4.6	0.18	5/16	1/4"	-	0.035
V-MC-3/8-W	11.9	0.47	23.9	0.94	6.4	0.25	7.7	0.30	7/16	3/8"	-	0.035
V-MC-1/2-W	13.5	0.53	27.1	1.07	6.4	0.25	10.2	0.40	9/16	1/2"	-	0.049
V-MC-1/2-W W.T.=0.065	13.5	0.53	27.1	1.07	6.4	0.25	9.5	0.37	9/16	1/2"	-	0.065
V-MC-6MM-W	10.3	0.41	20.7	0.81	6.4	0.25	4.0	0.16	5/16	6mm	1.00	-
V-MC-8MM-W	11.9	0.47	23.9	0.94	6.4	0.25	6.0	0.24	7/16	8mm	1.00	-
V-MC-10MM-W	11.9	0.47	23.9	0.94	6.4	0.25	8.0	0.31	7/16	10mm	1.00	-
V-MC-12MM-W	13.5	0.53	27.1	1.07	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 157).

MTB-W

MINI TRI-EL

Without shoulder

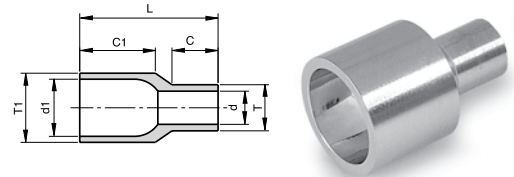


Ordering Information	L		C		d		F	T Tube O.D	W.T.	
	mm	inch	mm	inch	mm	inch	inch	inch / mm	mm	inch
V-MTB-1/8-W	10.3	0.41	6.4	0.25	1.9	0.07	5/16	1/8"	-	0.028
V-MTB-1/4-W	10.3	0.41	6.4	0.25	4.6	0.18	5/16	1/4"	-	0.035
V-MTB-3/8-W	11.9	0.47	6.4	0.25	7.7	0.30	7/16	3/8"	-	0.035
V-MTB-1/2-W	13.5	0.53	6.4	0.25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

RU-W

REDUCING UNION

Without shoulder

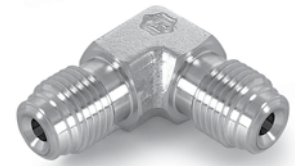
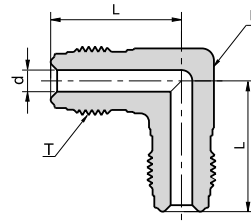


Ordering Information	L		C1		C		d1		d		T1 Tube O.D	W.T. (T1)		T Tube O.D	W.T. (T)	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch/ mm	mm	inch	inch/ mm	mm	inch
V-RU-1/4 X 1/8-W	19.1	0.75	10.4	0.41	6.4	0.25	4.6	0.18	1.9	0.07	1/4"	-	0.035	1/8"	-	0.028
V-RU-3/8 X 1/4-W	19.1	0.75	10.4	0.41	6.4	0.25	7.7	0.30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

Dimensions are for reference only, and are subject to change without notice.

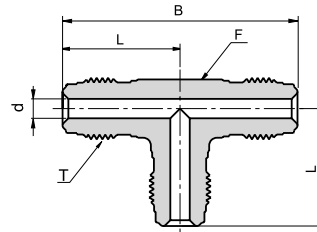
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

EU
ELBOW UNION



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

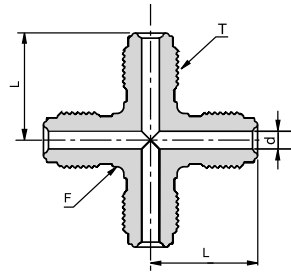
TU
TEE UNION



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

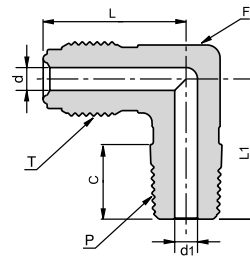
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

CU

CROSS UNION

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

EM

MALE ELBOW

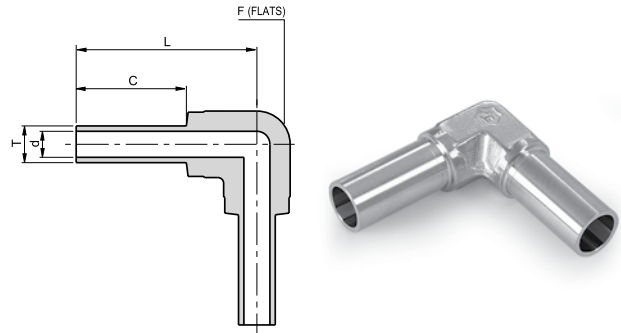
Ordering Information	Face Seal Size	L		L1		C		d		d1		F	T	P
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	Thread Size inch	NPT-M inch
P-EM-1/4 X 1/8	1/4	27.2	1.07	22.1	0.87	9.6	0.38	4.6	0.18	4.6	0.18	1/2	9/16-18	1/8
P-EM-1/4 X 1/4	1/4	27.2	1.07	26.7	1.05	14.2	0.56	4.6	0.18	4.6	0.18	1/2	9/16-18	1/4
P-EM-1/4 X 1/2	1/4	31.2	1.45	33.5	1.26	19.0	0.56	4.6	0.40	9.5	0.37	13/16	9/16-18	1/2
P-EM-1/2 X 1/4	1/2	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	1/2	36.8	1.45	32.0	1.26	14.2	0.56	10.2	0.40	9.5	0.37	13/16	7/8-14	3/8
P-EM-1/2 X 1/2	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 157).

EW-W

ELBOW

Without shoulder

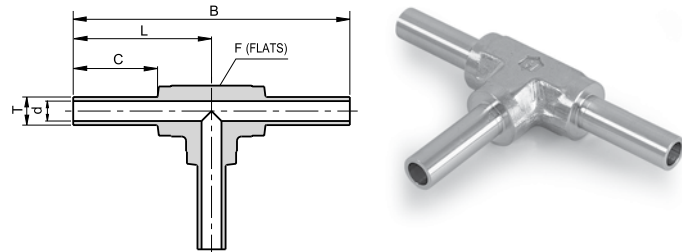


Ordering Information	L		C		d		F	T	W.T.	
	mm	inch	mm	inch	mm	inch	inch	inch/mm	mm	inch
P-EW-1/4-W	31.2	1.23	19.1	0.75	4.6	0.18	7/16	1/4"	-	0.035
P-EW-3/8-W	30.5	1.20	19.1	0.75	7.7	0.30	7/16	3/8"	-	0.035
P-EW-1/2-W	34.0	1.34	19.1	0.75	10.2	0.40	11/16	1/2"	-	0.049
P-EW-1/2-W W.T.=0.065	34.0	1.34	19.1	0.75	9.5	0.37	11/16	1/2"	-	0.065
P-EW-3/4-W W.T.=0.049	37.1	1.46	19.1	0.75	16.6	0.65	15/16	3/4"	-	0.049
P-EW-3/4-W W.T.=0.065	37.1	1.46	19.1	0.75	15.8	0.62	15/16	3/4"	-	0.065
P-EW-1-W W.T.=0.065	47.0	1.85	24.4	0.96	22.1	0.87	1 3/8	1"	-	0.065
P-EW-1-W W.T.=0.120	47.0	1.85	24.4	0.96	19.4	0.76	1 3/8	1"	-	0.120
P-EW-6M-W	31.2	1.23	19.1	0.75	4.0	0.16	7/16	6mm	1.00	-
P-EW-8MM-W	31.2	1.23	19.1	0.75	6.0	0.24	7/16	8mm	1.00	-
P-EW-10MM-W	34.0	1.34	19.1	0.75	8.0	0.31	11/16	10mm	1.00	-
P-EW-12MM-W	34.0	1.34	19.1	0.75	10.0	0.39	11/16	12mm	1.00	-

TW-W

TEE

Without shoulder



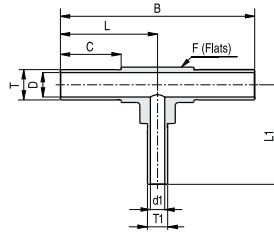
Ordering Information	L		B		C		d		F	T	W.T.	
	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch/mm	mm	inch
P-TW-1/4-W	31.2	1.23	62.5	2.46	19.1	0.75	4.6	0.18	7/16	1/4"	-	0.035
P-TW-3/8-W	30.5	1.20	61.0	2.40	19.1	0.75	7.7	0.30	7/16	3/8"	-	0.035
P-TW-1/2-W	34.0	1.34	68.1	2.68	19.1	0.75	10.2	0.40	11/16	1/2"	-	0.049
P-TW-1/2-W W.T.=0.065	34.0	1.34	68.1	2.68	19.1	0.75	9.5	0.37	11/16	1/2"	-	0.065
P-TW-3/4-W W.T.=0.065	37.1	1.46	74.2	2.92	19.1	0.75	15.8	0.62	15/16	3/4"	-	0.065
P-TW-3/4-W W.T.=0.049	37.1	1.46	74.2	2.92	19.1	0.75	16.6	0.65	15/16	3/4"	-	0.049
P-TW-1-W W.T.=0.065	47.0	1.85	94.0	3.70	24.4	0.96	22.1	0.87	1 3/8	1"	-	0.065
P-TW-1-W W.T.=0.120	47.0	1.85	94.0	3.70	24.4	0.96	19.4	0.76	1 3/8	1"	-	0.120
P-TW-6MM-W	31.2	1.23	62.5	2.46	19.1	0.75	4.0	0.16	7/16	6mm	1.00	-
P-TW-8MM-W	31.2	1.23	62.5	2.46	19.1	0.75	6.0	0.24	7/16	8mm	1.00	-
P-TW-10MM-W	34.0	1.34	68.1	2.68	19.1	0.75	8.0	0.31	11/16	10mm	1.00	-
P-TW-12MM-W	34.0	1.34	68.1	2.68	19.1	0.75	10.0	0.39	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 157).

TWR-W

TEE REDUCER

Without shoulder

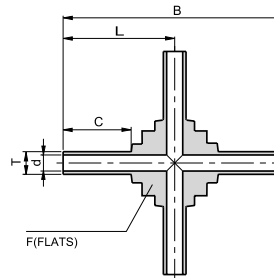


Ordering Information	L		L1		B		C		d		d1		F		T	W.T.	T1	W.T.
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch/mm	inch/mm	inch/mm	inch/mm	inch/mm	inch/mm
P-TWR-3/8X1/4 W	30.5	1.20	31.2	1.23	61.0	2.40	19.1	0.75	7.7	0.30	4.6	0.18	7/16	3/8"	0.035"	1/4"	0.035"	
P-TWR-1/2X1/4 W	34.0	1.34	34.0	1.34	68.0	2.68	19.1	0.75	10.2	0.40	4.6	0.18	11/16	1/2"	0.049"	1/4"	0.035"	
P-TWR-1/2X3/8 W	34.0	1.34	34.0	1.34	68.0	2.68	19.1	0.75	10.2	0.40	7.7	0.30	11/16	1/2"	0.049"	3/8"	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	19.1	0.75	16.6	0.65	4.6	0.18	15/16	3/4"	0.049"	1/4"	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	19.1	0.75	15.8	0.62	4.6	0.18	15/16	3/4"	0.065"	1/4"	0.035"	
P-TWR-3/4X1/2 W W.T.=0.049	37.1	1.46	37.1	1.46	74.2	2.92	19.1	0.75	16.6	0.65	10.2	0.40	15/16	3/4"	0.049"	1/2"	0.049"	
P-TWR-12MMX6MM W	34.0	1.34	34.0	1.34	68.0	2.68	19.1	0.75	10.0	0.39	4.0	0.16	11/16	12mm	1.00mm	6mm	1.00mm	

CW-W

CROSS

Without shoulder



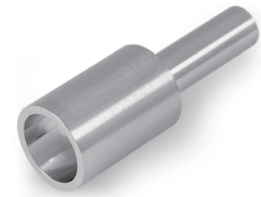
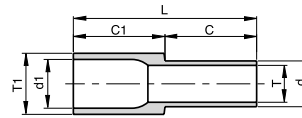
Ordering Information	L		B		C		d		F		T	W.T.		
	mm	inch	mm	inch	mm	inch	mm	inch	inch/mm	inch/mm	mm	inch	mm	inch
P-CW-1/4-W	31.2	1.23	62.5	2.46	19.1	0.75	4.6	0.18	17mm	1/4"	-	0.035		
P-CW-3/8-W	30.5	1.20	61.0	2.40	19.1	0.75	7.7	0.30	17mm	3/8"	-	0.035		
P-CW-1/2-W	31.0	1.22	62.0	2.44	19.1	0.75	10.2	0.40	17mm	1/2"	-	0.049		
P-CW-1/2-W W.T.=0.065	31.0	1.22	62.0	2.44	19.1	0.75	9.5	0.37	17mm	1/2"	-	0.065		
P-CW-6MM-W	31.2	1.23	62.5	2.46	19.1	0.75	4.0	0.16	17mm	6mm	1.00	-		
P-CW-8MM-W	30.5	1.20	61.0	2.40	19.1	0.75	6.0	0.24	17mm	8mm	1.00	-		
P-CW-10MM-W	31.0	1.22	62.0	2.44	19.1	0.75	8.0	0.31	17mm	10mm	1.00	-		
P-CW-12MM-W	31.0	1.22	62.0	2.44	19.1	0.75	10.0	0.39	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 157).

RW-W

REDUCER

Without shoulder



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

UB-W

BUTTWELD UNION

Without shoulder



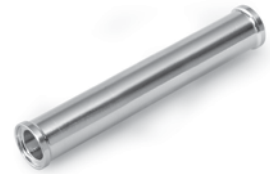
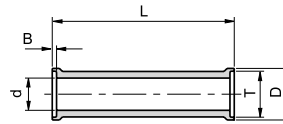
Ordering Information	L		d		T Tube O.D	W.T.
	mm	inch	mm	inch	inch	inch
V-UB-1/4-W	24.3	0.96	4.6	0.18	1/4	0.035
V-UB-3/8-W	23.9	0.94	7.7	0.30	3/8	0.035
V-UB-1/2-W	23.4	0.92	10.2	0.40	1/2	0.049
P-UB-3/4-W W.T.=0.049	23.4	0.92	16.6	0.65	3/4	0.049
P-UB-3/4-W W.T.=0 .065	23.4	0.92	15.8	0.62	3/4	0.065
P-UB-1-W 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 157).

UB-S

BUTTWELD UNION

With shoulder

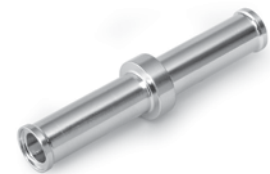
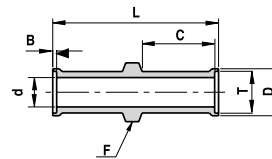


Ordering Information	L		d		B		D		T	W.T.
	mm	inch	mm	inch	mm	inch	mm	inch	Tube O.D.	inch
V-UB-1/4-S	25.4	1.00	4.6	0.18	0.55	0.02	7.4	0.29	1/4	0.035
V-UB-3/8-S	25.4	1.00	7.7	0.30	0.76	0.03	10.4	0.41	3/8	0.035
V-UB-1/2-S	25.4	1.00	10.2	0.40	1.00	0.04	14.0	0.55	1/2	0.049
P-UB-3/4-S W.T.=0 .049	25.4	1.00	16.5	0.65	1.00	0.04	20.3	0.80	3/4	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

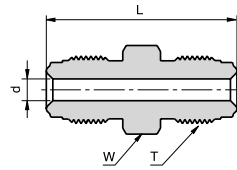
With locator and shoulder



Ordering Information	L		C		d		B		D		F		T	W.T.
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	Tube O.D.	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

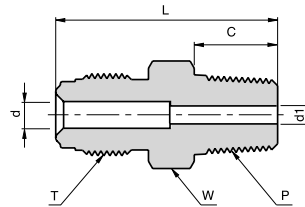
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

UM
MALE UNION



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

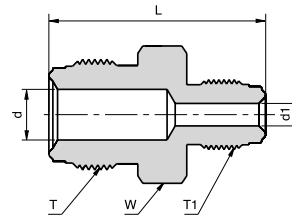
CM
**MALE TO MALE
NPT CONNECTOR**



Ordering Information	Face Seal Size	L		C		d		d1		W	T	P
	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	Thread Size	NPT-M
P-CM-1/4 X 1/8	1/4	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	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 BSPT	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 BSPT
P-CM-1/2 X 1/4	1/2	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 X 3/8	1/2	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	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	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	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

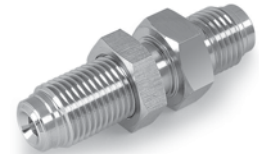
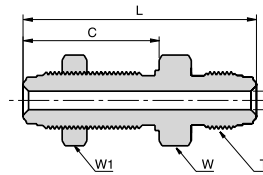
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

RUM

MALE REDUCING UNION

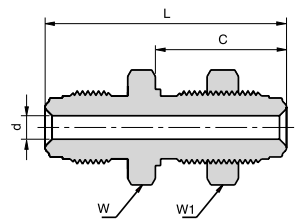
Ordering Information	Face Seal Size	Face Seal Size ¹	L		d		d1		W	T Thread Size	T1 Thread Size
	inch	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch
P-RUM 1/4 X 1/8	1/4	1/8	34.8	1.37	4.6	0.18	2.4	0.09	5/8	9/16-18	5/16-24
P-RUM 1/2 X 1/4	1/2	1/4	43.4	1.71	10.2	0.40	4.6	0.18	15/16	7/8-1/4	9/16-18

BU

BULKHEAD UNION

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

SBU

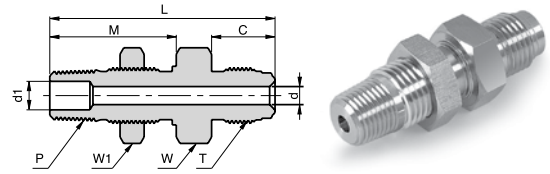
SHORT BULKHEAD UNION

Ordering Information	Face Seal Size	L		C		d		W	W1	T Thread Size	Panel hole drill Size
	inch	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch
P-SBU 1/4	1/4	46.2	1.82	25.1	0.99	4.6	0.18	3/4	3/4	9/16-18	19/32
P-SBU 1/2	1/2	54.4	2.14	28.2	1.11	10.2	0.40	1 1/16	1 1/16	7/8-14	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 157).

BCM

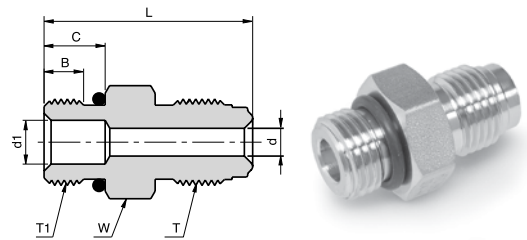
**MALE TO NPT
BULKHEAD CONNECTOR**



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

CMOB

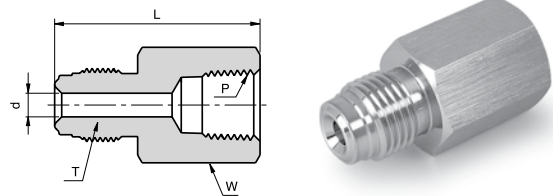
**MALE TO SEAL
O-RING CONNECTOR**



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

FC

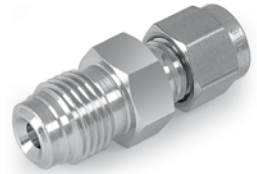
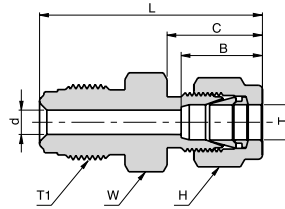
**MALE TO FEMALE
NPT CONNECTOR**



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

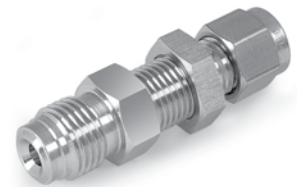
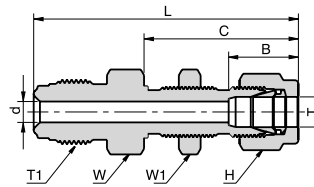
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

UGL

**MALE TO
LET-LOK UNION**

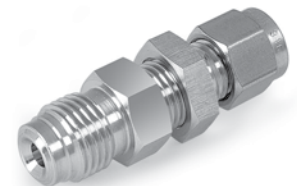
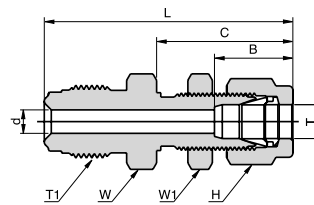
Ordering Information	Face Seal Size	L		C		B		d		W	H	T Tube O.D.	T1 Thread Size
	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch
P-UGL 1/4 X 1/8	1/4	38.9	1.53	15.2	0.60	12.7	0.50	4.6	0.18	5/8	7/16	1/8	9/16 - 18
P-UGL 1/4 X 1/4	1/4	41.1	1.62	17.8	0.70	15.2	0.60	4.6	0.18	5/8	9/16	1/4	9/16 - 18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

BUL

**MALE TO BULKHEAD
LET-LOK® UNION**

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

SBUL

**MALE TO SHORT BULKHEAD
LET-LOK UNION**

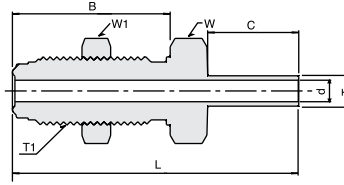
Ordering Information	Face Seal Size	L		C		B		d		W	W1	H	T Tube O.D.	T1 Thread Size	Panel hole drill Size
	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch	inch	inch
P-SBUL 1/4 X 1/4	1/4	47.8	1.88	26.7	1.05	15.2	0.60	4.6	0.18	5/8	5/8	9/16	1/4	9/16-18	29/64

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 157).

BHUT-W

BULKHEAD TO TUBE UNION

Without shoulder

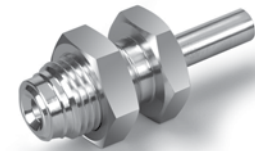
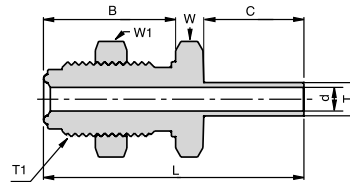


Ordering Information	Face Seal Size	L		B		C		d		W	W1	T Tube O.D.	T1 Thread Size	Panel hole drill Size
	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch	inch
P-BHUT- 1/4 X 1/4-W	1/4	59.9	2.36	33.0	1.30	19.1	0.75	4.6	0.18	3/4	3/4	1/4	9/16 - 18	19/32
P-BHUT- 1/2 X 1/2-W	1/2	66.6	2.62	37.6	1.48	19.1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

SBHUT-W

SHORT BULKHEAD TO TUBE UNION

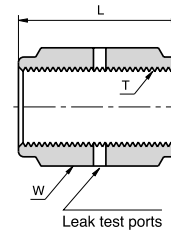
Without shoulder



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

CP

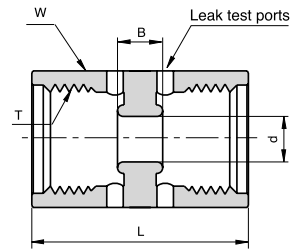
COUPLING



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

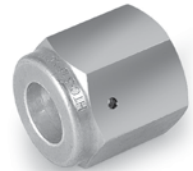
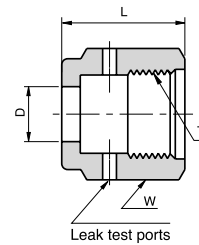
Dimensions are for reference only, and are subject to change without notice. When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

DFU

DOUBLE FEMALE UNION

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

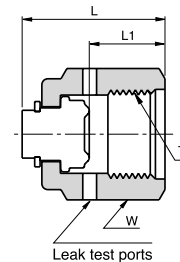
Caution: This fitting should be used with a swivel male connector only.



NF

FEMALE NUT

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



CF

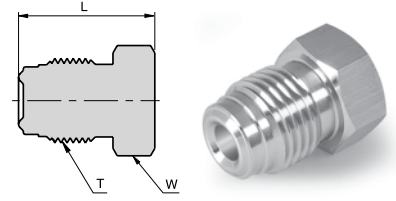
FEMALE CAP

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

Dimensions are for reference only, and are subject to change without notice.

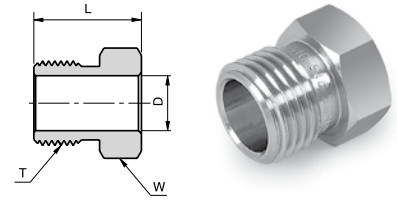
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

MP
MALE PLUG



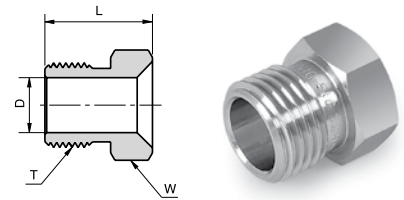
Ordering Information	Face Seal Size	L		W	T
	inch	mm	inch	inch	Thread Size
P-MP 1/8	1/8	17.3	0.68	3/8	5/16 - 24
P-MP 1/4	1/4	23.4	0.92	5/8	9/16 -18
P-MP 1/2	1/2	27.4	1.08	15/16	7/8 -14
P-MP 3/4	3/4	36.3	1.43	1 5/16	1 1/4 -18
P-MP 1	1	38.6	1.52	1 5/8	1 1/2 - 20

NM
MALE NUT



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

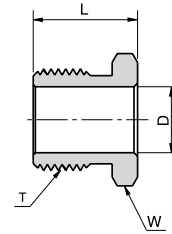
TNM
TAPERED MALE NUT



Ordering Information	Face Seal Size	L		D		W	T
	inch	mm	inch	mm	inch	inch	Thread Size
P-NM 1/4	1/4	18.0	0.71	9.2	0.36	5/8	9/16-18

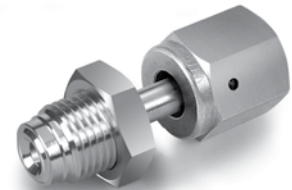
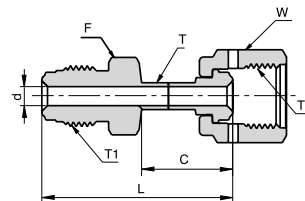
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

SNM

SHORT MALE NUT

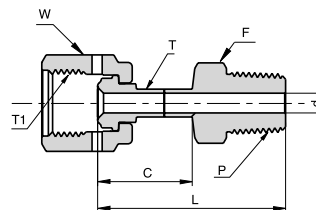
Ordering Information	Face Seal Size	L		D		W	T
	inch	mm	inch	mm	inch	inch	Thread Size
P-SNM 1/4 .54	1/4	13.7	0.54	9.2	0.36	5/8	9/16-18
P-SNM 1/4 .65	1/4	16.5	0.65	9.2	0.36	5/8	9/16-18

UMF

FEMALE TO MALE UNION

Ordering Information	Face Seal Size	L		C		d		F	W	T	T1	T2
	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch	inch
P-UMF-1/4 X 1/4	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 X 1/2	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

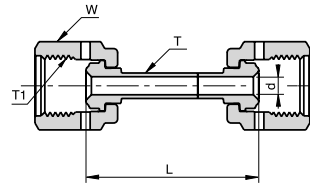
MCF

FEMALE TO MALE NPT CONNECTOR

Ordering Information	Face Seal Size	L		C		d		F	W	T	T1	P
	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch	NPT-M
P-MCF-1/4 X 1/4	1/4	45.5	1.79	23.4	0.92	4.6	0.18	9/16	3/4	1/4	9/16 - 18	1/4
P-MCF-1/2 X 1/2	1/2	53.1	2.09	25.6	1.01	10.2	0.40	7/8	1 1/16	1/2	7/8 - 14	1/2

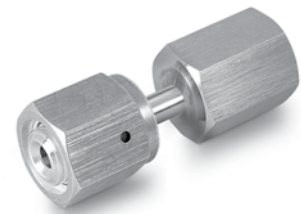
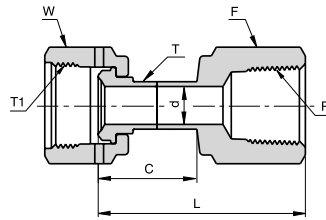
Dimensions are for reference only, and are subject to change without notice.
When ordering, be sure to add the Surface-Finish Designator (either H or E) to the Part Number. (See Material Table, page 157).

UFF

FEMALE TO FEMALE UNION

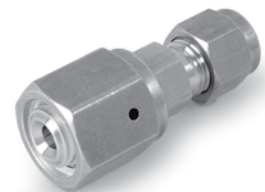
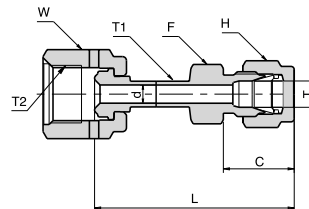
Ordering Information	Face Seal Size	L		d		W	T Tube O.D.	T1 Thread Size
	inch	mm	inch	mm	inch	inch	inch	inch
P-UFF-1/4 X 1/4	1/4	43.0	1.69	4.6	0.18	3/4	1/4	9/16 - 18
P-UFF-1/2 X 1/2	1/2	44.1	1.73	10.2	0.40	1 1/16	1/2	7/8 - 14

FCF

FEMALE TO FEMALE NPT CONNECTOR

Ordering Information	Face Seal Size	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	inch
P-FCF-1/4 X 1/4	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 X 1/2	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

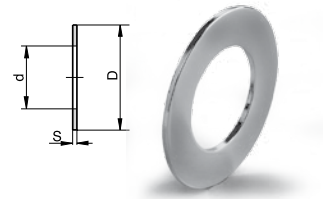
FHTL

FEMALE TO LET-LOK CONNECTOR

Ordering Information	Face Seal Size	L		C		d		F	W	H	T Tube O.D.	T1 Tube O.D.	T2 Thread Size
	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch	inch	inch	inch
P-FHTL-1/4 X 1/4	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	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 157).

GA GASKET



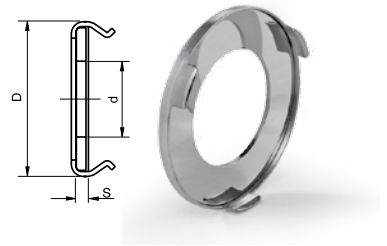
UNPLATED GASKETS

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

SILVER PLATED GASKETS

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

GA-RT RETAINED GASKET



UNPLATED RETAINED GASKETS

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

SILVER PLATED RETAINED GASKETS

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

HOW TO ORDER:

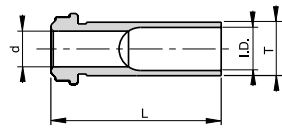
Example:

SS	-	GA-1/4
Material Description		
SS - Stainless Steel		
NI - Nickel		

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 157).

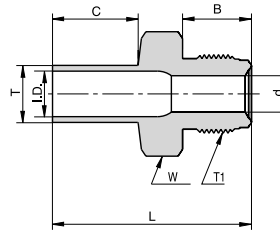
All orders should include the material description and ordering information (see product table).

HGL

LONG HIGH FLOW GLAND

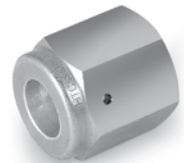
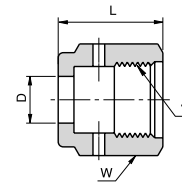
Ordering Information	Face Seal Size	L		d		T	I.D.	
	inch	mm	inch	mm	inch	inch	mm	inch
V-HGL-3/8 - 0.6	1/4	15.2	0.60	6.4	0.25	3/8	7.7	0.30
V-HGL-3/8 - 1.13	1/4	28.7	1.13	6.4	0.25	3/8	7.7	0.30
V-HGL-3/8 - 1.19	1/4	30.2	1.19	6.4	0.25	3/8	7.7	0.30
V-HGL-3/8 - 1.31	1/4	33.3	1.31	6.4	0.25	3/8	7.7	0.30

HMT

HIGH FLOW MALE TO TUBE

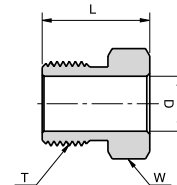
Ordering Information	Face Seal Size	L		B		C		d		W	T	T1	I.D.	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	inch	inch	inch	mm	inch
P- HMT 1/4	1/4	42.7	1.68	15.8	0.62	19.1	0.75	6.4	0.25	5/8	3/8	9/16 - 18	7.7	0.30

HNF

HIGH FLOW FEMALE NUT

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

HNM

HIGH FLOW MALE NUT

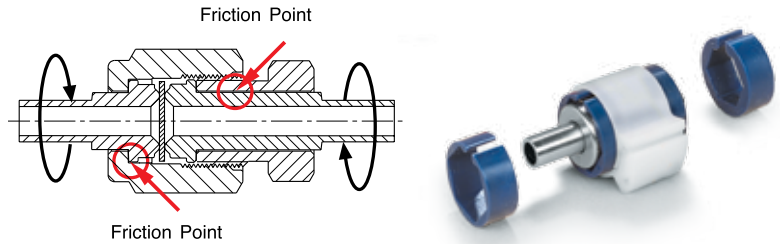
Ordering Information	Face Seal Size	L		D		T	W
	inch	mm	inch	mm	inch	inch	inch
P - HNM 1/4	1/4	18.0	0.71	10.0	0.39	9/16 - 18	5/8

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 157).

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



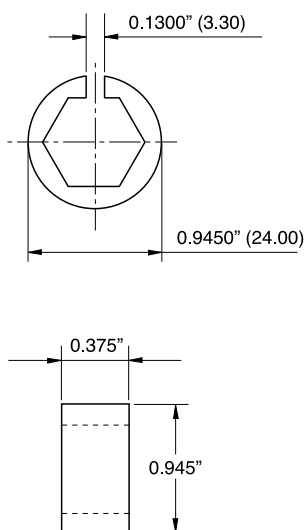
HOW IT WORKS

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.

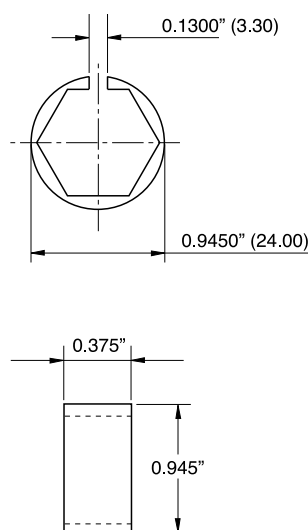
WHY USE GRIPKIT ?

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 5/8" CRESCENT SECTION



1" x 3/4" CRESCENT SECTION



1" CLAMP SECTION

