



UltraSeal™ Fittings

Catalog 4245-UltraSeal™


















September 2009

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



ENGINEERING YOUR SUCCESS.

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The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

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Introduction

Parker UHP products are designed as leak-free connections where ultra-high pure conditions are required. UltraSeal™ products, with their o-ring face seal design, and optional metal o-ring, provide a leak-free seal from vacuum to positive pressure.

Cleaning and Packing

Ultra-High Purity 'OMEGA' cleaning and packing in a class 100 clean room environment validated per Federal Standard 209E, is standard for all electropolished UltraSeal™ components.

Performance

Parker High Purity Components are rated to a helium leak rate of 1×10^{-9} cc/sec utilizing a helium mass spectrometer. Temperature ratings are governed by the choice of o-ring seal materials.

321 Stainless Steel

(Silver or Nickel plated):

-350° to +1000° F
(-212° to +538° C)

Fluorocarbon:

-15° to +400° F
(-26° to +204° C)

PTFE:

-50° to +400° F
(-46° to +232° C)

Pressure

Pressure ratings will be governed by the gland selected for a particular system. Working pressures are rated at room temperature based on a 4-to-1 design factor. Pressure ratings are calculated in accordance with A.N.S.I. Power Piping Code B31.1.

Materials

UltraSeal components are available in standard 316L, 316L VAR, and 316L VIM/VAR Stainless Steels. Consult your local Parker distributor or factory for details. Refer to tables 1 and 2 for respective material specifications of gaskets and o-rings.

Interior (I.D.) Surface Finishes

Parker High Purity components can be supplied with extremely low Ra internal surface finishes to meet requirements of ultra-high purity tubing systems. Electropolished internal surfaces can also be provided. Consult your local Parker distributor or the factory for more information.

Make-Up

For Leak-tight UltraSeal Assemblies:

A positive seal is achieved by advancing the nut no less than 1/4 turn from finger-tight position. When a sharp rise in torque is felt, the sealing faces have met and the o-ring seal is compressed into its groove.

UltraSeal is capable of repeated remakes; advance the nut to a finger-tight position and wrench until a sharp rise in torque is felt. No axial clearance is needed to remove components from a system; therefore, other system components are not disturbed.

Design

The UltraSeal coupling is designed to effect a helium leak-tight seal when the face of the gland makes full metal-to-metal contact with the face of the body, compressing the o-ring in the body groove.

The UltraSeal gland face and body o-ring groove are precision machined to accept either metallic (S.S.) or synthetic o-ring seals.

UltraSeal virtually eliminates turbulence and dead zones within the fitting. The bore diameter of body and gland are matched in all sizes, providing a smoother flow path. At no point does the O-ring seal intrude into the flow path.

Disassembly

Position the o-ring UltraSeal Removal Tool against the seated o-ring and advance the nut to fingertight position. Continue to advance the nut until a sharp rise in torque is felt. The removal tool shoulder will seal against the body face preventing any over torque damage. The o-ring will "pinch" and release from the sealing groove.

TABLE 1

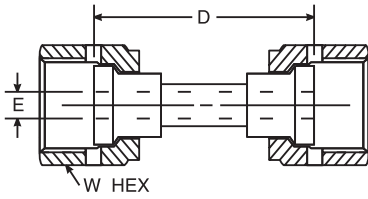
TYPICAL RAW Material SPECIFICATIONS			
FITTING Material	BAR STOCK	FORGINGS	RECOMMENDED TUBING SPECIFICATIONS
Stainless Steel 316 Stainless Steel 316L	ASTM A-276 TYPE 316 ASME SA-479 TYPE 316	ASME SA-182 GRADE F316	ASME SA-213 ASTM A-213 ASTM A-249
Stainless Steel 316L (VAR) Stainless Steel 316L (VIM/VAR)	ASME SA-479 TYPE 316L	ASME SA-182 GRADE F316L	ASTM A-269 MIL T-8504 MIL T-8506

MATERIAL IS MARKED WITH HEAT CODE TO ENSURE MATERIAL TRACEABILITY

TABLE 2

O-RINGS TYPICAL RAW Material SPECIFICATIONS / TEMPERATURE RATINGS		
	Material SPECIFICATIONS	TEMPERATURE RATINGS
Metal O-Rings	SAE AMS-5570 TYPE 321-SS (silver plated) SAE AMS-5576 TYPE 321-SS (silver plated)	(-350° to + 1000° F) (-212° to + 538° C)
Metal O-Rings	SAE AMS-5570 TYPE 321-SS (nickel plated) SAE AMS-5576 TYPE 321-SS (nickel plated)	(-350° to + 1000° F) (-212° to + 538° C)
Fluorocarbon O-Rings	MIL-R-25897 TYPE 1	(-15° to + 400° F) (-26° to + 204° C)
PTFE	SAE AMS-2651	(-50° to + 400° F) (-46° to + 232° C)

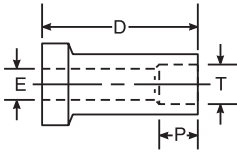
UltraSeal Gland Union (Welded) Q1HBQ1



Part No.	Inches		
	W Hex	D	*E Bore
4-4 Q1HBQ1	11/16	1.33	.18
6-6 Q1HBQ1	7/8	1.25	.25
8-8 Q1HBQ1	1	1.25	.38

*Note: Machined bore diameters to match machined bore in body.

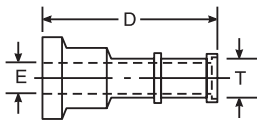
UltraSeal Gland to Weld-lok Socket Q1W



Part No.	T	Inches			Working Pressure
		D	P	*E Bore	
4-2 Q1W	1/8	1	.16	.09	10,000
4-4 Q1W	1/4	1	.25	.18	7,700
6-4 Q1W	1/4	1	.28	.18	10,000
6-6 Q1W	3/8	1	.31	.25	5,000
8-4 Q1W	1/4	1	.25	.18	10,000
8-6 Q1W	3/8	1	.34	.31	9,500
8-8 Q1W	1/2	1	.41	.38	4,300
12-12 Q1W	3/4	1.50	.50	.50	4,600

*Note: Machined bore diameters to match machined bore in body.

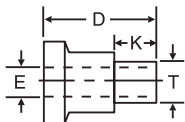
UltraSeal Gland to Automatic Buttweld Q1Y



Part No.	T	Inches		**Auto Buttweld Wall Size	Working Pressure
		D	*E Bore		
4-4 Q1Y	1/4	1.13	.18	.035	7,700
6-4 Q1Y	1/4	1.19	.18	.035	7,700
6-6 Q1Y	3/8	1.19	.31	.035	4,900
8-4 Q1Y	1/4	1.19	.18	.035	7,700
8-6 Q1Y	3/8	1.19	.31	.035	4,900
8-8 Q1Y	1/2	1.34	.38	.049	5,000
12-12 Q1Y	3/4	1.50	.50	.065	3,900

*Note: Machine bore diameters to match machined bore in body.

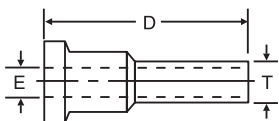
UltraSeal Gland to MiniButtweld Q1M



Part No.	Inches				Working Pressure
	D	*E Bore	T	K	
4-4 Q1M	.60	.180	.25	.25	5,400
6-6 Q1M	.62	.250	.38	.25	4,300
8-8 Q1M	.62	.380	.50	.25	3,600

*Note: Machined bore diameters to match machined bore in body.

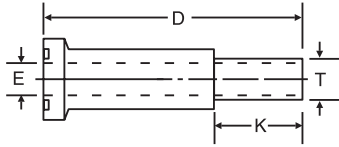
UltraSeal Gland to Tube Stub Adapter Q1T2/Q1TU



Part No.	Inches			Working Pressure
	T	D	*E Bore	
4-4 Q1T2 (CPI™)	1/4	1.25	.18	4,500
6-6 Q1T2	3/8	1.38	.25	6,700
8-8 Q1T2	1/2	1.68	.38	6,250
12-12 Q1T2	3/4	2.31	.50	6,250
4-4 Q1TU (A-lok®)	1/4	1.21	.18	4,500
6-6 Q1TU	3/8	1.38	.25	6,700
8-8 Q1TU	1/2	1.56	.38	6,250
12-12 Q1TU	3/4	2.25	.50	6,250

*Note: Machined bore diameters to match machined bore in body.

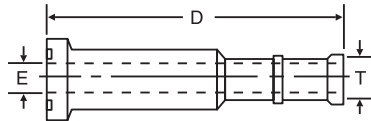
UltraSeal Inverted Gland to Male Tube Weld Q1RT3



Part No.	Inches			
	D	E	T	K
4-4 Q1RT3	1.70	.18	.25	.75

*Note: Machined bore diameters to match machined bore in body.

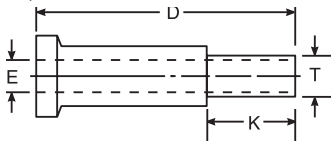
UltraSeal Inverted Gland to Automatic Butt weld Q1RY



Part No.	Inches			**Auto Butt weld Wall Size	Working Pressure
	T	D	*E Bore		
4-4 Q1RY	1/4	1.72	.18	.035	7,700

*Note: Machine bore diameters to match machined bore in body.

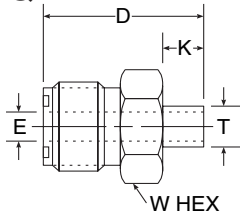
UltraSeal Gland to Male Tube Weld Q1T3



Part No.	Inches			
	D	E	Wall Thickness T	K
4-4 Q1T3	1.25	.18	.25	.75
8-6 Q1T3	1.50	.31	.38	.75
8-8 Q1T3	1.79	.38	.50	.75
12-12 Q1T3	1.22	.50	.75	.75

*Note: Machined bore diameters to match machined bore in body.

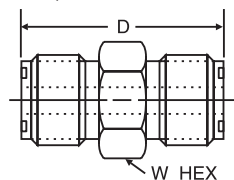
UltraSeal Body to MiniButt weld QHM



Part No.	Inches				
	T	D	K	*E Bore	W Hex
4-4 QHM .035	.25	1.00	.25	.18	5/8
6-6 QHM .035	.38	1.03	.25	.25	15/16
8-8 QHM .049	.50	1.00	.25	.31	15/16

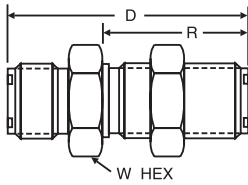
*Note: Machined bore diameters to match machined bore in body.

UltraSeal Union HQ



Part No.	Inches	
	W Hex	D
4-4 HQ	5/8	1.19
6-4 HQ	13/16	1.22
6-6 HQ	13/16	1.22
8-4 HQ	15/16	1.25
8-8 HQ	15/16	1.25
12-12 HQ	1-3/8	1.59

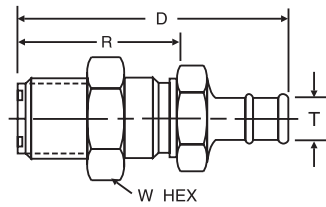
UltraSeal to Bulkhead Connector WBQ



Part No.	Inches		
	W Hex	D	R
4-4 WBQ	3/4	1.59	.88
6-6 WBQ	15/16	2.00	.88
8-8 WBQ	1-1/16	1.69	.91
12-12 WBQ	1-9/16	2.09	1.06

Note: Fitting includes WLZ bulkhead lock nut.

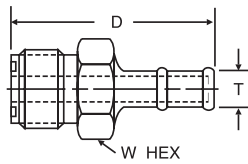
UltraSeal Bulkhead to Automatic Butt Weld Connector YH2BQ



Part No.	Inches			
	W Hex	D	T	R
4-4 YH2BQ	3/4	2.11	1/4	.88
6-6 YH2BQ	15/16	1.91	3/8	.88
8-8 YH2BQ	1-1/16	2.13	1/2	.91

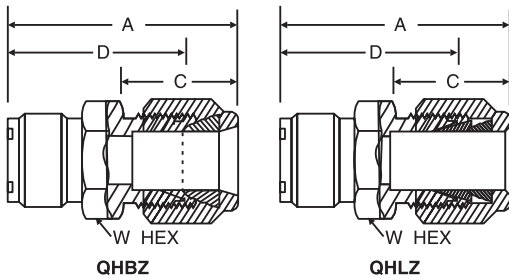
Note: Fitting includes WLZ bulkhead lock nut.

UltraSeal to Automatic Butt Weld Connector QHY



Part No.	Inches			*Auto Butt Weld Wall Size
	T	W Hex	D	
4-4 QHY	1/4	5/8	1.47	.035
6-4 QHY	1/4	13/16	1.50	.035
6-6 QHY	3/8	13/16	1.53	.049
8-4 QHY	1/4	15/16	1.66	.035
8-6 QHY	3/8	15/16	1.53	.035
8-8 QHY	1/2	15/16	1.66	.049
12-12 QHY	3/4	1-3/8	2.03	.065

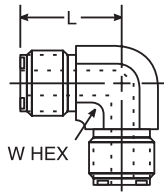
UltraSeal to Compression Tube Union QHBZ/QHLZ



Part No.	Inches				
	Tube O.D.	W Hex	C	A	D
4-4 QHBZ (CPI™)	1/4	5/8	.70	1.42	1.13
6-4 QHBZ	1/4	13/16	.70	1.45	1.16
6-6 QHBZ	3/8	13/16	.76	1.51	1.22
8-4 QHBZ	1/4	15/16	.70	1.48	1.19
8-6 QHBZ	3/8	15/16	.76	1.55	1.25
8-8 QHBZ	1/2	15/16	.87	1.65	1.25
12-12 QHBZ	3/4	1-3/8	.87	1.89	1.49

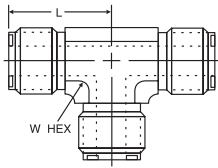
Part No.	Inches				
	Tube O.D.	W Hex	C	A	D
4-4 QHLZ (A-lok®)	1/4	5/8	.70	1.42	1.13
6-4 QHLZ	1/4	13/16	.70	1.45	1.16
6-6 QHLZ	3/8	13/16	.76	1.51	1.22
8-4 QHLZ	1/4	15/16	.70	1.48	1.19
8-6 QHLZ	3/8	15/16	.76	1.55	1.25
8-8 QHLZ	1/2	15/16	.87	1.65	1.25
12-12 QHLZ	3/4	1-3/8	.87	1.89	1.49

UltraSeal Union Elbow EQ



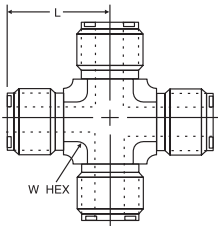
Part No.	Inches	
	W Hex	L
4-4 EQ	9/16	.84
6-6 EQ	3/4	.97
8-8 EQ	7/8	1.03
12-12 EQ	1-3/8	1.46

UltraSeal Union Tee JQ



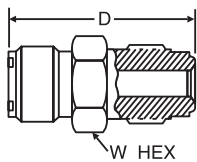
Part No.	Inches	
	W Hex	L
4-4-4 JQ	9/16	.84
6-6-6 JQ	3/4	.97
8-8-8 JQ	7/8	1.03
12-12-12 JQ	1-5/16	1.31

UltraSeal Union Cross KQ



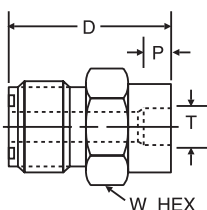
Part No.	Inches	
	W Hex	L
4 KQ	9/16	.84
6 KQ	3/4	.97
8 KQ	7/8	1.03

UltraSeal to VacuSeal VHQ



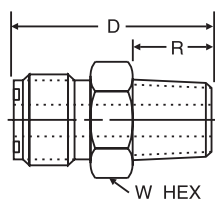
Part No.	Inches	
	W Hex	D
4-4 VHQ	5/8	1.39
8-8 VHQ	15/16	1.55

UltraSeal to Socket Weld Connector QHW



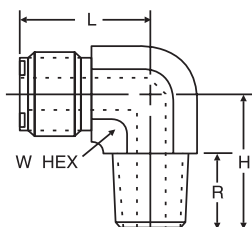
Part No.	Inches			
	T Tube O.D.	W Hex	D	P
4-2 QHW	1/8	5/8	1.02	.16
4-4 QHW	1/4	5/8	1.09	.25
6-4 QHW	1/4	13/16	1.06	.28
6-6 QHW	3/8	13/16	1.16	.31
8-4 QHW	1/4	15/16	1.03	.25
8-6 QHW	3/8	15/16	1.13	.34
8-8 QHW	1/2	15/16	1.19	.41
12-12 QHW	3/4	1-3/8	1.53	.50

UltraSeal to Male Pipe Connector FQ



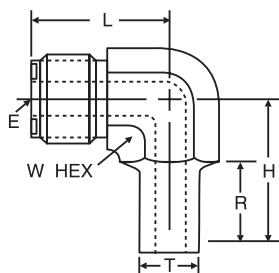
Part No.	Inches			
	Pipe Thread	W Hex	D	R
4-2 FQ	1/8	5/8	1.09	.38
4-4 FQ	1/4	5/8	1.28	.56
6-4 FQ	1/4	13/16	1.31	.56
6-6 FQ	3/8	13/16	1.31	.56
8-4 FQ	1/4	15/16	1.34	.56
8-6 FQ	3/8	15/16	1.34	.56
8-8 FQ	1/2	15/16	1.53	.75
12-8 FQ	1/2	1-3/8	1.78	.75
12-12 FQ	3/4	1-3/8	1.78	.75

UltraSeal to Male Elbow CQ



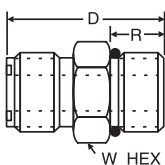
Part No.	Inches				
	Pipe Thread	W Hex	H	L	R
4-4 CQ	1/4	9/16	1.00	.84	.56
6-4 CQ	1/4	3/4	1.13	.97	.56
6-6 CQ	3/8	3/4	1.13	.97	.56
8-6 CQ	3/8	7/8	1.25	1.03	.56
8-8 CQ	1/2	7/8	1.31	1.03	.75
12-12 CQ	3/4	1-5/16	1.66	1.31	.75

UltraSeal to Tube Stub Weld Elbow QET3



Part No.	Inches					
	H	*E Bore	L	R	W Hex	T
4-4 QET3	1.03	.18	.84	.65	9/16	.25

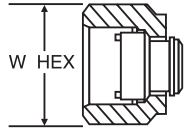
UltraSeal to Male Connector Straight Thread QHAO



Part No.	Inches			
	Straight Thread Size	W Hex	D	R
4-2 QHAO*	5/16-24	5/8	1.03	.30
4-4 QHAO	7/16-20	5/8	1.09	.36
4-6 QHAO	9/16-18	11/16	1.13	.39
6-6 QHAO	9/16-18	7/8	1.14	.39
6-8 QHAO	3/4-16	7/8	1.19	.44
8-8 QHAO	3/4-16	15/16	1.31	.47

*Note: Mass flow controller fitting with .125" orifice in straight thread end. Fitting is assembled with Fluorocarbon O-Ring. Other materials are available upon request.

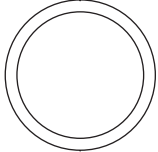
UltraSeal O-Ring Removal Tool



Part No.	Inches	
	W	Hex
4 O-Ring Removal Tool	11/16	
6 O-Ring Removal Tool	7/8	
8 O-Ring Removal Tool	1	

Note: For O-Ring removal instructions, see page 3.

UltraSeal O-Rings QO



Stainless Steel

Part No.	Material
4QO-SS	321 (SILVER PLATED)
6QO-SS	321 (SILVER PLATED)
8QO-SS	321 (SILVER PLATED)
12QO-SS	321 (SILVER PLATED)

Fluorocarbon Rubber

Part No.	Material Compound
4QO-VI	FLUOROCARBON
6QO-VI	FLUOROCARBON
8QO-VI	FLUOROCARBON
12QO-VI	FLUOROCARBON

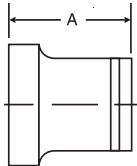
Nickel

Part No.	Material
4QO-SS-NIC	321 (NICKEL PLATED)
6QO-SS-NIC	321 (NICKEL PLATED)
8QO-SS-NIC	321 (NICKEL PLATED)

PTFE

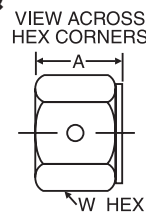
Part No.	Material Compound
4QO-TE	PTFE
6QO-TE	PTFE
8QO-TE	PTFE
12QO-TE	PTFE

UltraSeal Plug FNQ1



Part No.	Inches	
	A	
4 FNQ1	.69	
6 FNQ1	.81	
8 FNQ1	.84	
12 FNQ1	1.00	

UltraSeal Nuts BQ

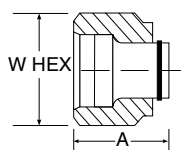


Part No.	Inches		
	W Hex	A	Straight Thread Size
4 BQ	11/16	.56	9/16-20
6 BQ	7/8	.69	3/4-20
8 BQ	1	.69	7/8-20
12 BQ	1-1/2	.81	1-5/16-20

Note: UltraSeal nuts are silver plated (I.D.) only to provide for lubrication during assembly.

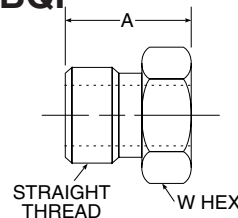
UltraSeal Plug Assembly FNQ

Assembly includes plug, nut and snap ring



Part No.	Inches	
	A	W Hex
4 FNQ	1.02	11/16
6 FNQ	1.19	7/8
8 FNQ	1.21	1
12 FNQ	1/42	1-1/2

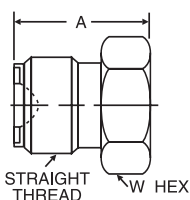
BQI*



Part No.	Inches		
	W Hex	A	Straight Thread Size
4 BQI*	5/8	.65	9/16-20

*For use with Q1RY inverted glands.

PNQ



Part No.	Inches		
	W Hex	A	Straight Thread Size
4 PNQ	5/8	.72	9/16-20
6 PNQ	13/16	.75	3/4-20
8 PNQ	15/16	.81	7/8-20

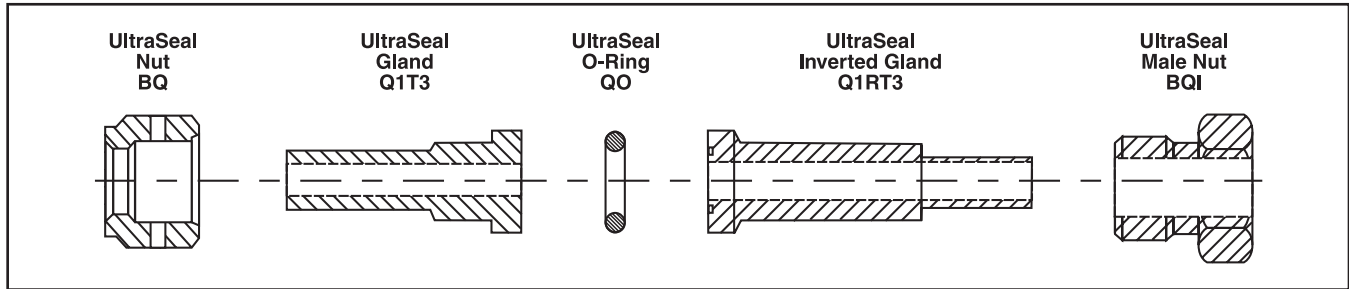
Nomenclature

UltraSeal coupler part numbers are constructed from symbols that identify the size and configuration of the fitting and material used.

How To Order

Parker UltraSeal components are ordered by part number, as listed in this catalog. Note: Each component must be ordered separately.

Example: If your system requires an UltraSeal coupler going from 1/4" tubing to 1/4" tubing, you would order the following part. (Keep in mind that you must order each component separately.)



To Order:

- 4 BQ-SS Size 4 UltraSeal Nut Stainless Steel
- 4-4 Q1T3-SSR Size 4 UltraSeal Gland to Size 4 Male Tube Weld – Stainless Steel
- 4 QO-SS Size 4 Stainless Steel O-Ring
- 4-4 Q1RT3-SSR.035 Size 4 UltraSeal Inverted Gland to Size 4 Male Tube – Stainless Steel
- 4 BQI-SS Size 4 UltraSeal Male Nut Weld

Size: Tube and Pipe Thread sizes are designated by the number of sixteenths of an inch (1/4" Pipe Thread = 4/16" = 4).

Straights, Elbows and Tees: Call out the UltraSeal end first, followed by the corresponding Pipe Thread size or Weld-lok end.

Type: A letter or combination of letters and numbers are used to designate the type of UltraSeal fitting (i.e., F = Male Connector, H = Union, etc.). See Visual Index for other type fittings.

Special Fittings: If there is any question as to the fitting desired, particularly for special fitting configurations, it is suggested that a customer print be submitted with the request for quote.

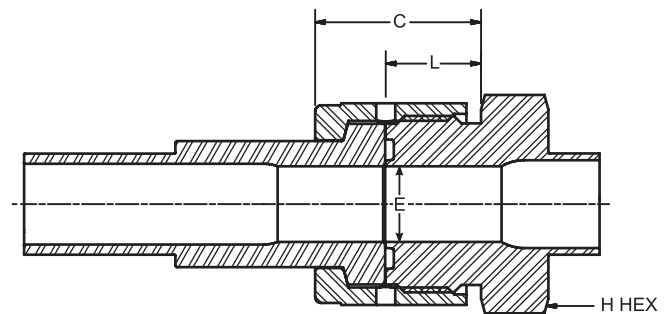
Availability: Only items as standard are carried in stock. Non-standard items can be quoted on request for quantities or materials specified.

UltraSeal End Data Information

Size	UltraSeal Straight Thread	Inches			
		*L	**C	W Hex	E Diameter
4	9/16-20	.46	.73	11/16	.18
6	3/4-20	.47	.82	7/8	.25
8	7/8-20	.47	.85	1	.38
12	1-5/16-20	.57	1.05	1-3/8	.50

*Average Value

**Dimension C is shown in the finger tight position



Offer of Sale

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

- 1. Terms and Conditions.** Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is expressly conditioned on Buyer's assent to these Terms and Conditions and to the terms and conditions found on-line at www.parker.com/saleterms/. Seller objects to any contrary or additional term or condition of Buyer's order or any other document issued by Buyer.
- 2. Price Adjustments; Payments.** Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.
- 3. Delivery Dates; Title and Risk; Shipment.** All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility (i.e., when it's on the truck, it's yours). Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's changes in shipping, product specifications or in accordance with Section 13, herein.
- 4. Warranty.** Seller warrants that the Products sold here-under shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. This warranty is made only to Buyer and does not extend to anyone to whom Products are sold after purchased from Seller. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**
- 5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.
- 6. LIMITATION OF LIABILITY.** UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.
- 7. Contingencies.** Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.
- 8. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
- 9. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
- 10. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.
- 11. Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.
- 12. Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
- 13. Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
- 14. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
- 15. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
- 16. Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
- 17. Termination.** This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.
- 18. Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.
- 19. Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
- 20. Taxes.** Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.
- 21. Equal Opportunity Clause.** For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRRA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.

01/09



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