



Automatic Buttweld Fittings

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Automatic Butt weld Fittings

Parker Veriflo Division



Richmond, California

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Automatic Buttweld Purpose

Parker Buttweld fittings are designed for applications requiring the reliability of a welded tubing system. They were developed specifically for installation using automatic, orbital TIG (Tungsten/Inert Gas) welding equipment. These fittings offer the easiest, fastest and most reliable way to fabricate welded systems.

Automatic Buttweld fittings are available in 316, and 316L stainless steel in straight unions, tees, 90° elbows, and crosses. Automatic Buttweld ends are also available with male pipe and compression tube connections.

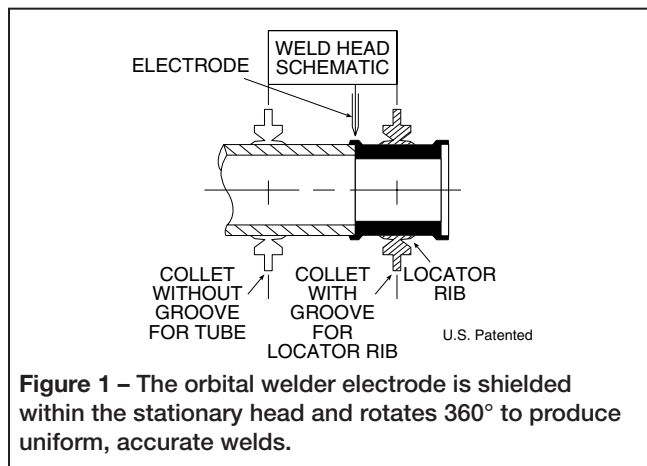
Pressure

Pressure ratings will be governed by the tubing wall thickness selected for a particular application.

Working pressures are rated at room temperature based on a 4 to 1 design factor. Pressure ratings are calculated in accordance with ANSI Power Piping Code B31.1.

Automatic Buttweld Principles of Operation

In an orbital welder, the electrode is contained and shielded within the head (see Figure 1). The head itself does not rotate; rather, the electrode rotates 360° within the head.



An orbital-type welder utilizes high-frequency current pulses, producing low-frequency arc pulses. These yield considerable arc penetration into the metal at low current values. As a result, arc-pressure variations are kept low and the resulting agitation of the weld puddle eliminates porosity and refines the grain structure at the weld area.

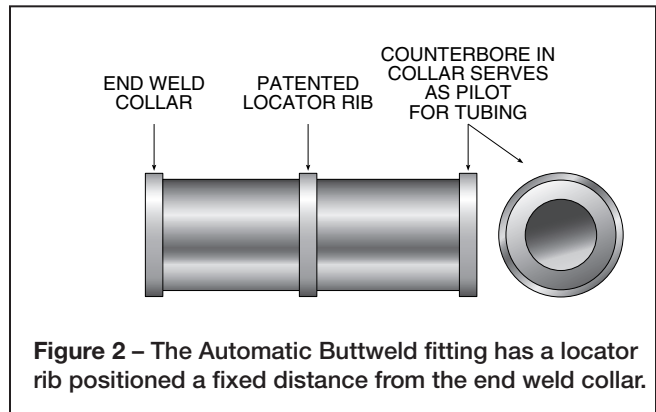
To operate a TIG welding machine:

1. Place the Automatic Buttweld fitting into the weld head, placing the locator rib in the corresponding locator groove.
2. Bottom the tubing (square cut, deburred) in the fitting end collar and close the second collet, which locks the tubing to the weld head. Engage the second collet.
3. Close the weld head. Press the “Start” button.

Note: Depending on the size and wall-thickness of the tubing, the welding machine parameters can be programmed to make one or more 360° passes. Once programmed, the machine will repeat the operation precisely, within very close tolerances and in areas too tight for manual welding.

Automatic Centering of Electrode

Each Parker Automatic Buttweld fitting has an external locator rib (patented) situated a fixed distance from the end welding collar (see Figure 2). When the welder-head clamping collet is applied, the rib fits snugly within a corresponding annular groove in the collet.

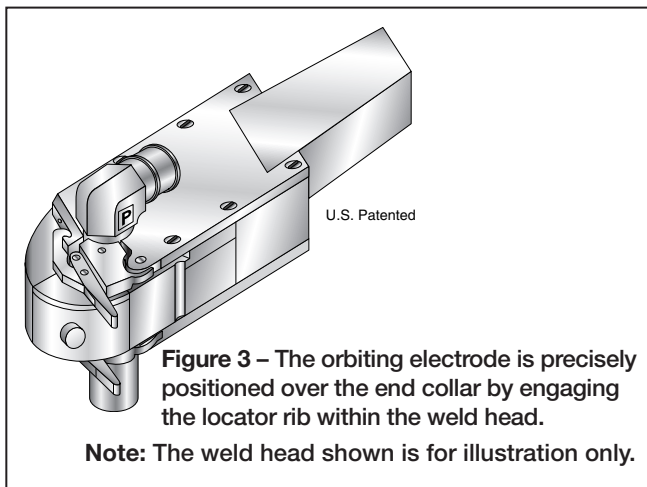


As the electrode orbits, the collet follows the rib, maintaining precise positioning of the electrode, over the end collar (see Figure 3). Thus, electrode and welding positioning are always accurately aligned.

End Weld Collar

On the O.D. of each Automatic Buttweld fitting end, there is an end collar. During welding, the electrode tip is positioned directly over this end collar. As the electrode orbits, a uniform bead on the butt-seam is achieved.

Automatic Buttweld Fittings



Piloted Mating of Tube to Fitting

The end collar of the Automatic Buttweld fitting is counter bored. This serves as a pilot for the tube end, guiding it accurately into the fitting end.

This feature provides for accurate alignment and consistent welds every time.

Compensation for Tube-Thickness Variations

The outside diameter of the end collar is designed to compensate for normal variations in the nominal O.D. of instrumentation tubing.

In addition, each fitting is machined for the specific wall thickness being specified.

These two features allow for the fitting bore and tube I.D. to be carefully matched. Thus, an ABW connection will allow for full flow, with no protrusions extending into the flow path. This will reduce a major cause of turbulence.

Backing Gas

Backing gas is an inert gas used to flood the interior of the fittings and tube system during welding. By reducing the interior oxygen level to as low as practicable, it also serves to control the combustion of contaminants that could affect weld quality.

When a backing gas is not used and nearly 100% weld penetration is achieved, blisters will tend to form on the internal tube wall. This will result in scale which may later break loose.

In most cases the backing gas will be argon or helium connected to the system through a control regulator. Flow rates, while small, should be high enough to purge the system. Welds should be made in downstream sequence from the gas connection.

Note that the entire system should be purged to insure that there are no openings that will allow air to be drawn into the system.

The use of backing gas, while often not mandatory, will give a better weld joint. This is because the welds are made and cooled under a shielded atmosphere, thus eliminating internal scaling or blistering.

Materials

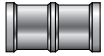
Automatic Buttweld Tube Fittings are available in stainless steel (Type 316 and 316L – AOD/VAR and 316L VIM/VAR). Straight fittings are machined from cold finished bar stock and shaped bodies are machined from close grain forgings. The raw materials used for fittings fully conform to the chemical and mechanical requirements of one or more of the specifications listed in the table on page 11. For nuclear and other critical applications, Automatic Buttweld fittings are available with documented heat code traceability.

Visual Index

Automatic Buttweld Fittings

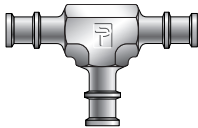
Automatic Buttweld Union

YHY page 7



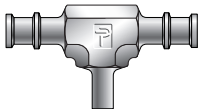
Automatic Buttweld Union Tee

YJY page 7



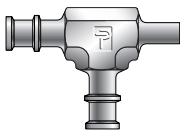
Automatic Buttweld Manifold Branch Tee

YJT3 page 7



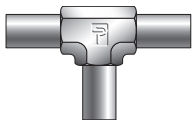
Automatic Buttweld Manifold Run Tee

YJT3Y page 8



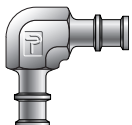
Automatic Tube Buttweld Manifold Tee

T3JT3 page 8



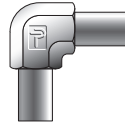
Automatic Buttweld Union Elbow

YEY page 8



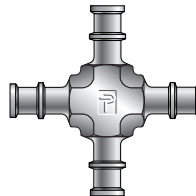
Automatic Tube Buttweld Manifold Elbow

T3ET3 page 9



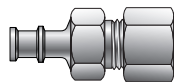
Automatic Buttweld Cross

YKY page 9



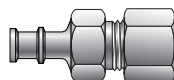
Automatic Buttweld to CPI™ Tube Union

YHBZ page 10



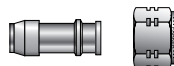
Automatic Buttweld to A-LOK® Tube Union

YHLZ page 10



Automatic Buttweld Adapter to Compression Port Connector

ZPY & BY page 11



Automatic Buttweld Plug

PNY page 11

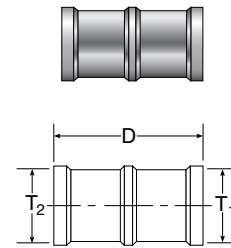


Automatic Butt weld Fittings

Automatic Butt weld Union

Part Number	Inches			
	D	T ₁	T ₂	*Auto-Butt weld Wall Size
4-4 YHY	0.77	1/4	1/4	.035-.035
6-4 YHY	1.34	3/8	1/4	.035-.035
6-6 YHY	0.77	3/8	3/8	.035-.035
8-4 YHY	1.48	1/2	1/4	.049-.035
8-6 YHY	1.48	1/2	3/8	.049-.035
8-8 YHY	0.77	1/2	1/2	.049-.049
12-12 YHY	1.07	3/4	3/4	.065-.065
16-16 YHY	1.07	1	1	.095-.095

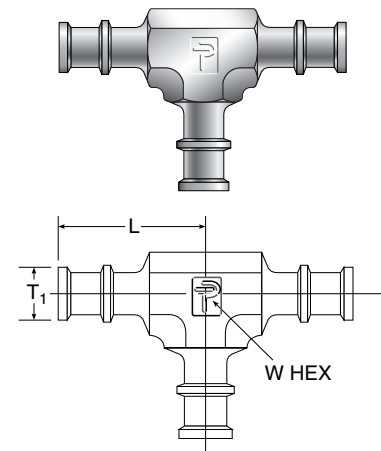
*Other fittings and wall sizes available upon request.



Automatic Butt weld Union Tee

Part Number	Inches			
	L	T ₁	*Auto-Butt weld Wall Size	W Hex
4-4-4 YJY	1.06	1/4	.035	7/16
6-6-6 YJY	1.19	3/8	.035	9/16
8-8-8 YJY	1.44	1/2	.049	3/4
12-12-12 YJY	1.64	3/4	.065	1-1/16
16-16-16 YJY	1.81	1	.095	1-5/16

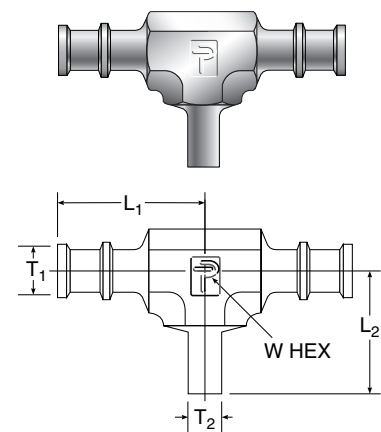
*Other fittings and wall sizes available upon request.



Automatic Butt weld Manifold Branch Tee

Part Number	Inches				
	L ₁	L ₂	T ₁	T ₂	*Auto-Butt weld Wall Size
4-4-4 YJT3	1.06	1.03	1/4	1/4	.035
6-6-4 YJT3	1.19	1.15	3/8	1/4	.035

*Other fittings and wall sizes available upon request.

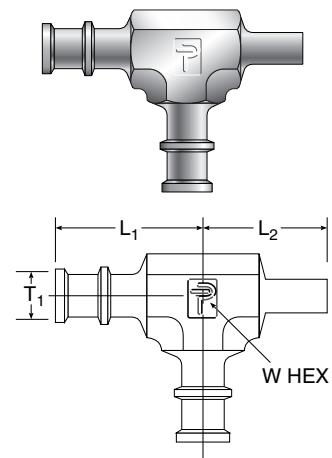


Dimensions for reference only, subject to change.

Automatic Butt weld Manifold Run Tee

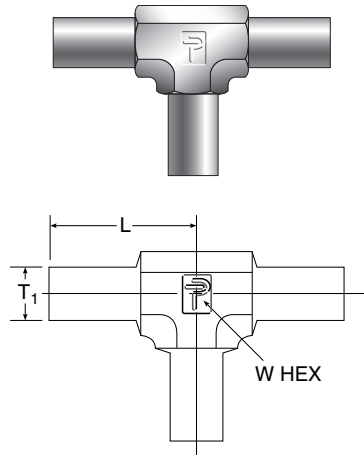
Part Number	Inches				W Hex
	L ₁	L ₂	T ₁	*Auto-Butt weld Wall Size	
4-4-4 YJT3Y	1.06	1.03	1/4	.035	7/16

*Other fittings and wall sizes available upon request.



Automatic Tube Butt weld Manifold Tee

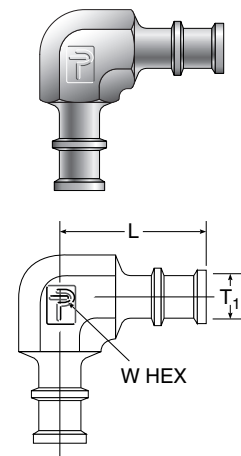
Part Number	Inches		
	L	T ₁	W Hex
4-4-4 T3JT3	1.03	1/4	7/16



Automatic Butt weld Union Elbow

Part Number	Inches			
	L	T ₁	*Auto-Butt weld Wall Size	W Hex
4-4 YEY	1.06	1/4	.035	7/16
6-6 YEY	1.19	3/8	.035	9/16
8-8 YEY	1.44	1/2	.049	3/4
12-12 YEY	1.64	3/4	.065	1-1/16
16-16 YEY	1.81	1	.095	1-5/16

*Other fittings and wall sizes available upon request.

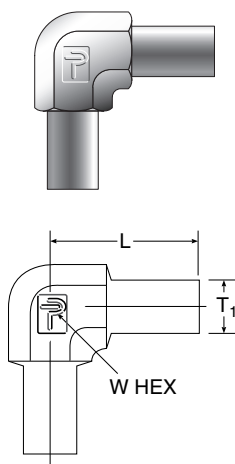


Dimensions for reference only, subject to change.

Automatic Butt weld Fittings

Automatic Tube Butt weld Manifold Elbow

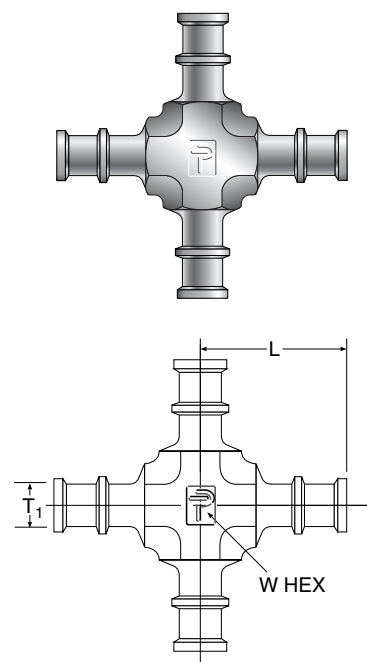
Part Number	Inches		
	L	T ₁	W Hex
4-4 T3ET3	1.03	1/4	7/16



Automatic Butt weld Cross

Part Number	Inches			
	L	T ₁	*Auto-Butt weld Wall Size	W Hex
4 YKY	1.06	1/4	.035	7/16
6 YKY	1.19	3/8	.035	9/16
8 YKY	1.44	1/2	.049	3/4

*Other fittings and wall sizes available upon request.



Dimensions for reference only, subject to change.

Automatic Butt weld to Tube Union

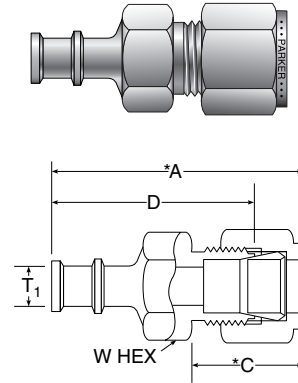
CPI™

Part Number	Inches					W Hex
	D	T ₁	*A	*C	**Auto-Butt weld Wall Size	
4-4 YHBZ	1.42	1/4	1.71	.70	.035	1/2
6-6 YHBZ	1.51	3/8	1.80	.78	.035	5/8
8-8 YHBZ	1.71	1/2	2.11	.91	.049	13/16

Silver plated nut and single ferrule are provided as shown.

*Dimensions shown with nut finger tight

**Other fittings and wall sizes available upon request. Silver plated nut and single ferrule are provided as shown.



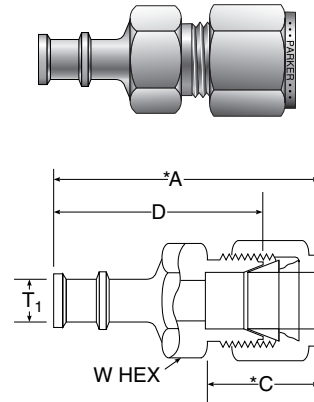
A-LOK®

Part Number	Inches					W Hex
	D	T ₁	*A	*C	**Auto-Butt weld Wall Size	
4-4 YHLZ	1.42	1/4	1.71	.70	.035	1/2
6-6 YHLZ	1.51	3/8	1.80	.76	.035	5/8
8-8 YHLZ	1.71	1/2	2.11	.87	.049	13/16

Silver plated nut and single ferrule are provided as shown.

*Dimensions shown with nut finger tight

**Other fittings and wall sizes available upon request. Silver plated nut and single ferrule are provided as shown.



Dimensions for reference only, subject to change.

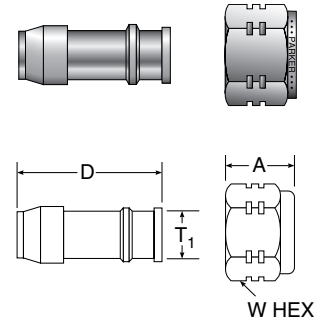
Automatic Butt weld Fittings

Automatic Butt weld Adapter to Compression Port Connector

Part Number	Inches		
	D	T ₁	*Auto-Butt weld Wall Size
4-4 ZPY	1.12	1/4	.035
6-6 ZPY	1.09	3/8	.035
8-8 ZPY	1.52	1/2	.049
12-12 ZPY	1.50	3/4	.049
16-16 ZPY	1.71	1	.083

*Other fittings and wall sizes available upon request

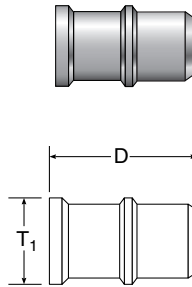
Part Number	Inches	
	A	W Hex
4 BY	0.50	9/16
6 BY	0.56	11/16
8 BY	0.69	7/8
12 BY	0.69	1-1/8
16 BY	0.81	1-1/2



Automatic Butt weld Plug

Part Number	Inches		
	D	T ₁	*Auto-Butt weld Wall Size
4 PNY	0.72	1/4	.035
6 PNY	0.72	3/8	.035
8 PNY	0.72	1/2	.049
12 PNY	1.02	3/4	.049
16 PNY	1.02	1	.083

*Other fittings and wall sizes available upon request



Dimensions for reference only, subject to change.

Nomenclature

Parker Automatic Buttweld Tube Fittings part numbers are constructed from symbols that identify the size and configuration of the fittings and material used.

How To Order

Parker Buttweld components are easily derived from the following example and ordering chart. The seven product characteristics required are coded as shown in the chart.

The example below describes an elbow fitting going from 1/4" tubing to 1/4" tubing, .035 wall thickness.

Example: 4-4YEY-SS.035

4	-	4	Y	E	Y	-	SS	.035
Fitting Size		Fitting Size	Machining Type	Fitting Type	Machining Type		Material	Wall Thickness
Fitting Size		Fitting Size	Machining Type	Fitting Type	Machining Type		Material	Wall Thickness*
The first two numbers denote the fitting size which matches the tubing O.D.			(First End)	H Straight	(Second End)	SS Stainless Steel 316L	.035 Sizes 4 and 6	
4 1/4" tube			Y ABW	J Union	Y ABW	SSR AOD/VAR (316R)	.049 Size 8	
6 3/8" tube				Tee	F Male Pipe	SSV VIM/VAR (316V)	Other wall thicknesses available upon request.	
8 1/2" tube				E Union Elbow	CPI™ BZ A-L0K® LZ			

*Fittings must be specified to match the corresponding tube wall thicknesses.

Special fittings: If a special fitting configuration is required, it is suggested that a sketch or drawing be submitted for review.

Availability: Only items listed in current price list are carried in stock. Customer Specials may be quoted through Parker Veriflo Division Customer Service.

Typical Raw Material Specifications

Fitting Material	Bar Stock	Forgings	Recommended Tubing Specifications
Stainless Steel 316L Stainless Steel 316L (AOD/VAR) Stainless Steel 316L (VIM/VAR)	ASTM A-276 TYPE 316LSS ASME SA-479 TYPE 316L-SS	ASME SA-182 GRADE 316L	ASME SA-213 ASTM A-213 ASTM A-249 ASTM A-269 MIL T-8504 MIL T-8506

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