CPI™/A-LOK® Tube Fittings

Introduction
Parker CPI™/A-LOK® Instrumentation Tube Fittings are designed as leak-free connections for process, power and instrumentation applications. These single and two ferrule fittings are manufactured to the highest quality standards and are available in a broad range of sizes, materials and configurations.

Features
The Parker CPI™/A-LOK® tube fitting has been specifically designed for use on instrumentation, process and control systems, analysers and environmental equipment employed in chemical, petroleum, power generating and pulp and paper plants. CPI™/A-LOK® fittings have also been used extensively in other applications and industries wherever high reliability and quality are required.

Materials
Parker CPI™/A-LOK® fittings are available as standard in Heat Code Traceable, 316 stainless steel. Other materials include steel, brass, aluminum, nickel-copper, Hastelloy C®, Alloy 600, Titanium, 6Mo, Incoloy 625 and 825. Straight fittings are machined from cold finished bar stock and shaped bodies are machined from close grain forgings. The raw materials used fully conform to the chemical requirements listed in Specification Table 1 found on page 38. For nuclear and other critical applications, stainless steel CPI™/A-LOK® fittings are readily available with documented heat code traceability.

Pipe Fittings/Adapters
Parker CPI™/A-LOK® tube fittings are available in combination with a variety of ISO and ANSI pipe thread configurations. For a full listing of these fittings, see pages 108-133.

Tubing
Parker CPI™/A-LOK® tube fittings can be used with a wide variety of tubing materials and a broad range of tube wall thicknesses. CPI™/A-LOK® seals equally well on both thin wall and heavy wall tubing. **Tubing and fitting materials should be selected to be compatible with the fluid media. Due to thermal expansion characteristics and chemical stability, the tubing should be of the same material as the fitting. (The exception is brass fittings and copper tubing.)**

Torque
Parker CPI™/A-LOK® tube fittings do not twist the tubing during installation. CPI™/A-LOK® ferrule designs assure that all make and remake motion is transmitted axially to the tubing. Since no radial movement of the tubing occurs, the tubing is not stressed. The mechanical integrity of the tubing is maintained.

No Distortion
In make-up, there is no undue force in an outward direction to distort the fitting body or ferrules to cause interference between the ferrules and nut. This assures that the nut will back-off freely for disassembly and permits a greater number of easy remakes.

Sealing
Positive, reliable connections with Parker CPI™/A-LOK® fittings have been qualified by exhaustive tests and over four decades of experience in the manufacture of quality tube fittings.

Nomenclature
Parker CPI™/A-LOK® fitting part numbers are constructed from symbols that identify the size and style of the fitting and material used.

Assembly, Remake, Gaugeability
Proper assembly is the key component to a leak-free system. CPI™/A-LOK® tube fitting assembly, remake and gaugeability instructions are found on page 107 of this catalog.

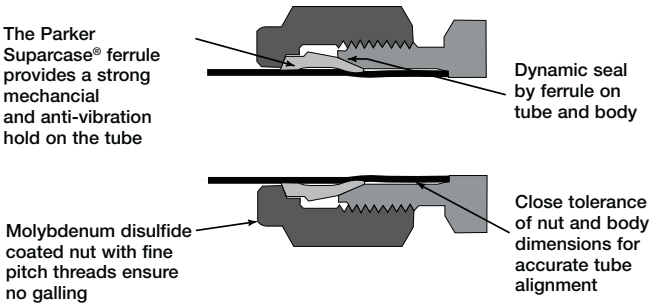
Pressure Rating & Tubing Selection
For working pressures of CPI™/A-LOK® tube connections, please see pages 20–23 of this catalog, the Instrument Tubing Selection Guide (4200-TS) found in the Technical Section of your Parker Instrumentation Products Process Binder, or the Parker Instrument Tube Fitting Installation Manual (Bulletin 4200-B4).

In cases where a male or female pipe thread is the second end of a Parker CPI™/A-LOK® fitting, such threads may be the pressure limiting factor of the tubing system. Pressure ratings for Pipe Ends are shown on page 19.

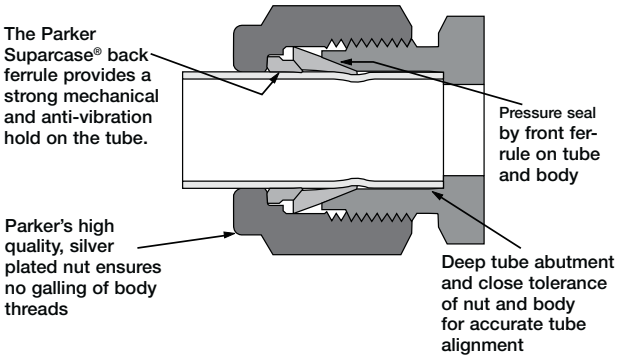
CPI™ / A-LOK® Tube Fittings

Parker CPI™/A-LOK® fittings consists of precision engineered parts designed to provide secure leak-proof joints capable of satisfying high pressure, vacuum and vibration applications.

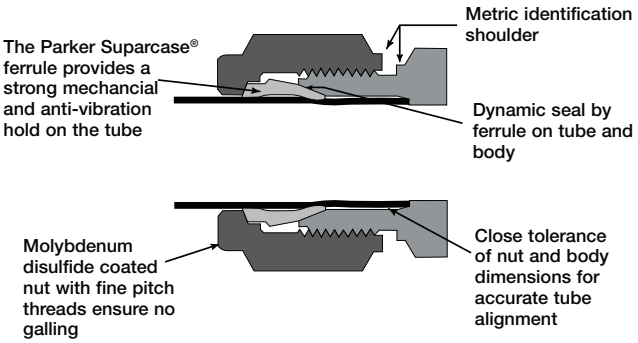
Inch — CPI™



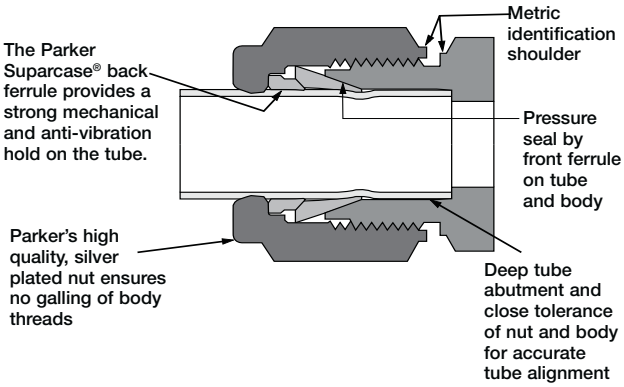
Inch — A-LOK®



Metric — CPI™



Metric — A-LOK®



Parker Instrumentation Tube Fittings are supplied complete and ready to use. The ferrule(s) swage onto the tube as it moves down the body seat creating a pressure/vacuum-tight seal on both tube and body by the interface pressure and surface finish of mating components. The Parker Suparcase™ ferrule (back-ferrule only on A-LOK®) creates a strong mechanical hold on the tube.

CPI™ / A-LOK® Tube Fittings

Table 1 – Typical Raw Material Specifications

BASIC FITTING MATERIAL	MATERIAL DESIGNATOR	BAR STOCK	FORGING	COMMON TUBING SPECIFICATION
Brass	B	CA-360 QQ-B 626 Alloy 360 ASTM-B16 Alloy 360 CA-345 ASTM-B-453 Alloy 345	CA-377 QQ-B 626 Alloy 377 ASTM-B-124 Alloy 377 BS2872 CZ122	ASTM-B75 ASME-SB75 (TEMPER "O")
Stainless Steel (Type 316)(1)	A-LOK® = 316(1)(2) CPI™ = SS	ASME-SA-479 Type 316-SS BS970 316-S31 DIN 4401 ASTM A276 Type 316	ASME-SA-182 316 BS970 316-S31 DIN 4401	ASME-SA-213 ASTM-A-213 ASTM-A-249 ASTM-A-269(3) MIL T-8504 MIL T-8506
Steel	S	ASTM-A-108 QQ-S-637	ASTM-A-576	SAE J524b SAE J525b ASTM-A-179
Aluminum	A	2017-T4 or 2024-T4 ASTM-B211 QQ-A-225/5 or 6	2014T (as fabricated) ASTM-B-211 QQ-A-225/4	303, 6061T6 ASTM-B-210
Monel® 400 – Forgings Monel® 405 – Bar Stock	M	ASTM-B-164 QQ-N-281 BS3076 NA13	ASTM-B-164 QQ-N-281 BS3076 NA13	ASTM-B-165
Hastelloy® C-276	NNR	ASTM-B-574 ASTMB575	ASTM-B-574	ASTM-B-622 ASTM-B-626
Inconel® Alloy 600	IN	ASTM B-166 ASME-SB-166	ASTM-B-564	ASTM-B-163
Carpenter® 20	SS20	ASTM-B-473	ASTM-B-462 ASTM-B-472	ASTM-B-468
Titanium	T	ASTM-B-348	ASTM-B-381	ASTM-B-338
Inconel® Alloy 625	625	BS3076 NA16 ASTMB425	BS3076 NA16 ASTMB425	ASTM-B-625 ASTM-B-444 ASTM-B-423 ASTM-B-829
Incoloy® Alloy 825	825			
6MO	6MO	UNS S31254 UNS N08367 ASTM A479	UNS S31254 UNS N08367 ASTM A 479	ASTM-A-269

(1) If more specific information, including heat code traceability, is required, your Parker Hannifin CPI™/A-LOK® distributor will provide details.
(2) If an "L" appears in the A-LOK® fitting description, then the material designator will be "SS" (e.g., JLZ drop size tee).
(3) Stainless steel CPI™/A-LOK® tube fittings work reliably on both seamless and welded-redrawn, fully annealed type 304, 316 and 316L tubing.
NOTE: Hastelloy® is a registered trademark of Haynes International. Inconel®, Incoloy® and Monel® are registered trademarks of Special Metals Corporation. Carpenter® is a registered trademark of CRS Holdings Inc.

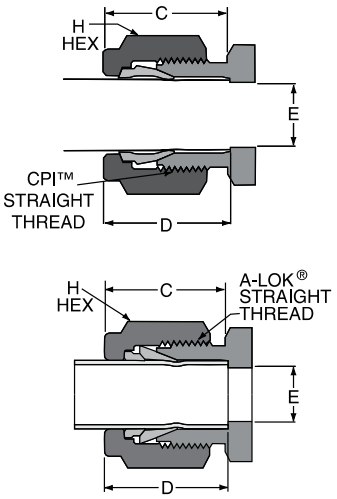
Tube End Dimensional Data

SIZE NO.	INCHES TUBE O.D.	STRAIGHT THREAD	†C	H HEX	E DIA.	†D TUBE INS. DEPTH
1	1/16	10-32	.43	5/16	.052	.34
2	1/8	5/16-20	.60	7/16	.093	.50
3	3/16	3/8-20	.64	1/2	.125	.54
4	1/4	7/16-20	.70	9/16	.187	.60
5	5/16	1/2-20	.73	5/8	.250	.64
6	3/8	9/16-20	.76	11/16	.281	.67
8	1/2	3/4-20	.87	7/8	.406	.90
10	5/8	7/8-20	.87	1	.500	.96
12	3/4	1-20	.87	1-1/8	.625	.96
14	7/8	1-1/8-20	.87	1-1/4	.750	1.03
16	1	1-5/16-20	1.05	1-1/2	.875	1.24
20	1-1/4	1-5/8-20	1.52	1-7/8	1.09	1.61
24	1-1/2	1-15/16-20	1.77	2-1/4	1.34	1.96
32	2	2-5/8-20	2.47	2-3/4	1.81	2.65

NOTE: Dimensions C and D are shown in the finger-tight position.

† Average Value

Dimensions for reference only, subject to change.



SIZE NO.	MILLIMETERS TUBE O.D.	STRAIGHT THREAD	†C	H HEX	E DIA.	†D TUBE INS. DEPTH
2	2mm	5/16-20	15,3	12,0	1,7	12,9
3	3mm	5/16-20	15,3	12,0	2,4	12,9
4	4mm	3/8-20	16,1	12,0	2,4	13,7
6	6mm	7/16-20	17,7	14,0	4,8	15,3
8	8mm	1/2-20	18,6	15,0	6,4	16,2
10	10mm	5/8-20	19,5	18,0	7,9	17,2
12	12mm	3/4-20	22,0	22,0	9,5	22,8
14	14mm	7/8-20	22,0	24,0	11,1	24,4
15	15mm	7/8-20	22,0	24,0	11,9	24,4
16	16mm	7/8-20	22,0	24,0	12,7	24,4
18	18mm	1-20	22,0	27,0	15,1	24,4
20	20mm	1-1/8-20	22,0	30,0	15,9	26,0
22	22mm	1-1/8-20	22,0	30,0	18,3	26,0
25	25mm	1-5/16-20	26,5	35,0	21,8	31,3

NOTE: Dimensions C and D are shown in the finger-tight position.

† Average Value

Dimensions for reference only, subject to change.

CPI™ / A-LOK® Tube Fittings

Nomenclature/How to Order

Parker CPI™ / A-LOK® tube fitting part numbers are constructed using alphanumeric characters to identify the size, style and material of the fitting.

CPI™ Inch Parts

Port 1 Size Designator	–	Port 2 Size Designator	Thread Designator	Shape Designator	–	Material	–	Options (see page 40)
Example: 8	–	**4**		**FBZ**	–	**SS**		
1/2" Tube O.D.	–	1/4" Pipe Thread	(blank – see Note 1 below)	Male Connector	–	Stainless Steel	–	(blank)

Part Number as it is ordered (without options): 8-4 FBZ-SS. This part appears on page 42 and is a CPI™ NPT male connector.

A-LOK® Inch Parts

Port 1 Size Designator	Shape Designator	Port 2 Size Designator	Thread Designator	–	Material	–	Options (see page 40)
Example: 8	**MSC**	**4**	**N**	–	**316**		
1/2" Tube O.D.	Male Connector	1/4" Pipe Thread	NPT	–	Stainless Steel	–	(blank)

Part Number as it is ordered (without options): 8MSC4N-316. This part appears on page 42 and is an A-LOK® NPT male connector.

CPI™ Metric Parts

Port 1 Size Designator	Port 2 Size Designator	–	Thread Size	Thread Designator	–	Material	–	Options See page 40
Example: GBZ	**12**	–	**1/4**	**K**	–	**SS**		
Female Connector	12mm	–	1/4"	BSP	–	Stainless Steel	–	(blank)

Part Number as it is ordered (without options): GBZ 12-1/4K-SS. This part appears on page 53 and is a CPI™ NPT female connector.

A-LOK® Metric Parts

Port 1 Size Designator	Shape Designator	Port 2 Size Designator	Thread Designator	–	Material	–	Options See page 40
Example: M12	**FSC**	**1/4**	**N**	–	**316**		
12mm	Female Connector	1/4"	NPT	–	Stainless Steel	–	(blank)

Part Number as it is ordered (without options): M12FSC1/4N-316. This part appears on page 53 and is a A-LOK® NPT female connector.

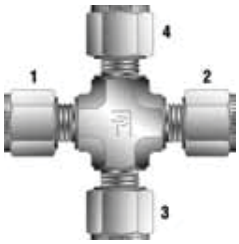
Body Designator: A letter or combination of letters and numbers are used to designate the type of fitting. See the visual index on pages 36 and 37 for body designator.

Fractional Size: Tube and pipe thread sizes are designed by the number of sixteenths of an inch (1/2" tube = 8/16" = 8) (1/4" pipe thread = 4/16" = 4).

Metric Size: Metric tube is designated in millimeters and prefixed "M" (i.e., 12mm tube – M12.) The pipe thread size is written as a fraction (i.e., 1/4 NPT = 1/4).

All Straights & Elbows: Call out largest CPI™ / A-LOK® tube end size first followed by the smaller CPI™ / A-LOK® tube end or pipe thread size.

Fractional Tees & Crosses: For drop size tees – first size the run (1 to 2) and then branch (3). Example – the size designator for a male run tee for 3/8" O.D. tube and 1/4" male pipe thread would be 6-4-6. For crosses – first size the run (1 to 2) and then the branch (3 to 4). For tees with all ends the same, use the tube and size before and after the style designator; i.e. 4-4-4 JBZ (CPI™), 4ET4 (A-LOK®).



Metric Tees & Crosses: For drop size tees – first size the run (1 to 2) and then branch (3). Example – the size designator for a male run tee for 6mm tube and 1/4" male pipe thread would be 6-4-6. For crosses – first size the run (1 to 2) and then the branch (3 to 4). For tees with all ends the same, use the tube end size after the style designator; i.e. JBZ 4-4-4 JBZ (CPI™), ETM4 (A-LOK®).

Material: See Table 1 on the previous page for the material symbol.

Thread Types:

N = NPT(1) / National Pipe Taper	ANSI B1.20.1
K = BSP / ISO Taper	BS21, ISO7/1
R = BSP / ISO Parallel	BS2779, ISO 228/1+2, DIN 3852 **FORM A**(2)
BR = BSP / ISO Parallel	BS2779, ISO 228/1+2, DIN 3852 **FORM B**(3)
M = Metric Thread	ISO 6149-2
R-ED = BSPP / ISO Parallel	BS2779, ISO 228/1+2, DIN 3852 **with elastic sealing washer**(4)
GC = BSPP Gauge Connector	B2779, ISO 228/1+2, DIN 3852

(1) **N thread designator is only used for A-LOK® nomenclature.**

(2) Form A requires the use of a bonded washer. See page 105 of this catalog.

(3) Form B (cutting face) may be used with or without a sealing washer.

(4) ED fittings are supplied with Nitrile sealing washers as standard. Fluorocarbon seals are available upon request.

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

Special Options: See the following page for available options.

CPI™/A-LOK® Tube Fittings

CPI™/A-LOK® Options

Parker CPI™/A-LOK® fittings may be ordered with the following options.

How to order

After the complete CPI™/A-LOK® number simply add a "dash" then the suffix for the option.

The following example is an A-LOK® male connector for 1/2" OD tube and 1/4" male pipe that has been cleaned for oxygen service. For additional options, please consult the factory.

8MSC4N-316-C

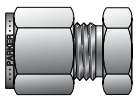
Suffix	Option	Additional Information
ZYF	Assembled with nylon ferrule(s)	
SPF	Silver plated ferrule(s)	
TF	PTFE ferrule(s)	
BP*	Bulk packed	* Indicates the quantity i.e BP50 for a fifty count package.
LWH	Lock wire hole	
BZP	Knurled nut	Replaces standard nut on CPI™/A-LOK® fittings for use on soft plastic tubing.
C	Silver plated nut	Replaces moly coated nut (BZ).
MI	Moly inside nut	
CNQ	Certified Nuclear Quality	
C1	Grade A Cleaning	Special cleaning, assembly, inspection and packaging for high purity applications.
C3	Cleaned for oxygen service	Meets the requirements of ASTM G93-88; Standard Practice for Cleaning Methods for Materials and Equipment used in Oxygen-Enriched Environments.
CNG	Compressed natural gas service	Assembled with a specific o-ring compound.
NIC	Nickel plated	
CRM	Chrome plated	
VO	Viton O-ring	
NC**	NACE Compliant material	See page 7 for details
DFARS	Defense Acquisition Regulations System	All components and raw material must be of US origin or from an approved country.

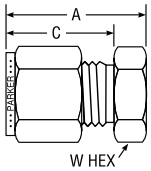
**Manufactured from materials that meet the metallurgical requirements of NACE MR0175 2003

Components

Cap
For fractional tube

For capping open ended tubing





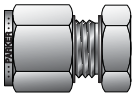
CPI™ PART NO.	A-LOK® PART NO.	INTER-CHANGES WITH	INCHES			
			TUBE O.D.	A	C	W HEX
1 PNBZ	1BLEN1	100-C	1/16	0.56	0.43	5/16
2 PNBZ	2BLEN2	200-C	1/8	0.79	0.60	7/16
3 PNBZ	3BLEN3	300-C	3/16	0.84	0.64	7/16
4 PNBZ	4BLEN4	400-C	1/4	0.92	0.70	1/2
5 PNBZ	5BLEN5	500-C	5/16	0.96	0.73	9/16
6 PNBZ	6BLEN6	600-C	3/8	1.01	0.76	5/8
8 PNBZ	8BLEN8	810-C	1/2	1.15	0.87	13/16
10 PNBZ	10BLEN10	1010-C	5/8	1.18	0.87	15/16
12 PNBZ	12BLEN12	1210-C	3/4	1.25	0.87	1-1/16
14 PNBZ	14BLEN14	1410-C	7/8	1.31	0.87	1-3/16
16 PNBZ	16BLEN16	1610-C	1	1.52	1.05	1-3/8
20 PNBZ	20BLEN20	2010-C	1-1/4	2.09	1.52	1-3/4
24 PNBZ	24BLEN24	2410-C	1-1/2	2.53	1.77	2-1/8
32 PNBZ	32BLEN32	3210-C	2	3.41	2.47	2-3/4

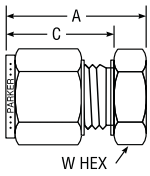
NOTE: For body only specify PNZ. Dimensions for reference only, subject to change.

A and C dimensions are typical finger-tight.

Cap
For metric tube

For capping open ended tubing





CPI™ PART NO.	A-LOK® PART NO.	INTER-CHANGES WITH	MILLIMETERS			
			TUBE O.D.	A	C	W HEX
PNBZ 2	BLENM2	2MO-C	2	13,5	15,3	12,0
PNBZ 3	BLENM3	3MO-C	3	13,5	15,3	12,0
PNBZ 4	BLENM4	4MO-C	4	14,3	16,1	12,0
PNBZ 6	BLENM6	6MO-C	6	15,9	17,7	14,0
PNBZ 8	BLENM8	8MO-C	8	17,1	18,6	15,0
PNBZ 10	BLENM10	10MO-C	10	19,1	19,5	18,0
PNBZ 12	BLENM12	12MO-C	12	19,1	22,0	22,0
PNBZ 14	BLENM14	14MO-C	14	19,8	22,0	24,0
PNBZ 15	BLENM15	15MO-C	15	19,8	22,0	24,0
PNBZ 16	BLENM16	16MO-C	16	19,8	22,0	24,0
PNBZ 18	BLENM18	18MO-C	18	21,3	22,0	27,0
PNBZ 20	BLENM20	20MO-C	20	23,9	22,0	30,0
PNBZ 22	BLENM22	22MO-C	22	23,9	22,0	30,0
PNBZ 25	BLENM25	25MO-C	25	26,2	26,5	35,0

NOTE: For body only specify PNZ. Dimensions for reference only, subject to change.

A and C dimensions are typical finger-tight.