

Fittings and Tubing

QS Series

Medium Pressure

Pressures to 15,000 psi (1034 bar)

Since 1945 Parker Autoclave Engineers has designed and built premium quality valves, fittings and tubing. This commitment to engineering and manufacturing excellence has earned Parker Autoclave Engineers a reputation for reliable, efficient product performance. Parker Autoclave Engineers has long been established as the world leader in high pressure fluid handling components for the chemical/petrochemical, research, and oil and gas industries.



QS Medium Pressure Fittings and Tubing:

- Available sizes are 1/4, 3/8, 9/16, 3/4 and 1”.
- Fittings and tubing manufactured from high strength stainless steel.
- Molybdenum disulfide-coated gland nuts to prevent galling.
- Gland nut positioning mark for assembly.
- Single-ferrule compression sleeve.
- Connection weep holes for safety and leak detection.
- Fast easy make-up of connection.
- Operating Temperatures from 0°F (-17.8°C) to 650°F (343°C).
- 1" QS fitting bodies are 2507 Super Duplex standard.

The Medium Pressure QS Series uses Parker Autoclave Engineers' Quick Set compression sleeve design. This single-ferrule compression sleeve connection delivers fast, easy make-up and reliable bubble-tight performance in liquid or gas service.



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Fittings and Tubing - QS Series

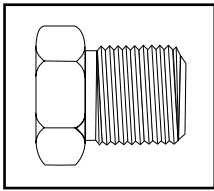
Pressures to 15,000 psi (1034 bar)

Parker Autoclave Engineers Medium Pressure QS Fittings are designed for use with QS Series valves and medium pressure tubing. These fittings feature improved compression connections with larger orifices for excellent flow capabilities. Parker Autoclave Engineers fittings and components are manufactured of high strength stainless steel.

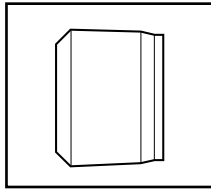


Connection Components

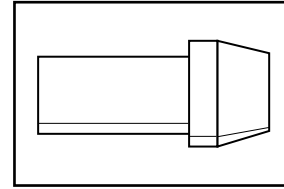
All Parker Autoclave Engineers valves and fittings are supplied complete with appropriate glands and sleeves. To order these components separately, use order numbers listed. When using plug, sleeve is not required.



Gland
QSG ()



Sleeve
QSS ()



Plug
QSP ()

Add tube size ()
 1/4" - 40
 3/8" - 60
 9/16" - 90
 3/4" - 120
 1" - 160

Example:
 1/4" Gland - QSG 40

To ensure proper fit use Parker Autoclave Engineers tubing. For mounting hole option add suffix PM to catalog number. Consult factory for mounting hole dimensions.

Catalog Number	Connection Type	Outside Diameter Tube	Pressure Rating psi (bar)*	Minimum Opening	Dimensions - inches (mm)							Block Thickness	Fitting Pattern
					A	B	C	D Typical	E	F	G Thickness		

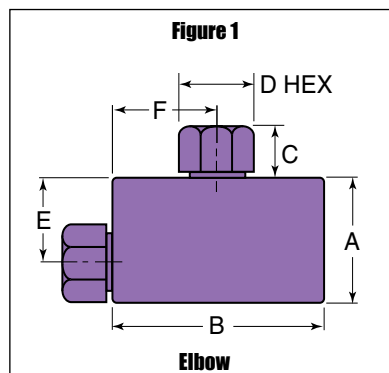
Elbow

QSL4400	QS250	1/4 (6.35)	15,000 (1034.20)	0.16 (3.99)	1.38 (34.93)	2.00 (50.80)	0.52 (13.23)	0.63 (15.88)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	See Figure 1
QSL6600	QS375	3/8 (9.53)	15,000 (1034.20)	0.25 (6.35)	1.50 (38.10)	2.00 (50.80)	0.55 (14.00)	0.75 (19.05)	1.00 (25.40)	1.00 (25.40)		0.81 (20.62)	
QSL9900	QS562	9/16 (14.29)	15,000 (1034.20)	0.36 (9.12)	2.19 (55.58)	3.00 (76.20)	0.82 (20.83)	1.19 (30.18)	1.50 (38.10)	1.50 (38.10)		1.25 (31.75)	
QSL12	QS750	3/4 (19.05)	15,000 (1034.20)	0.52 (13.11)	2.94 (74.63)	4.13 (104.78)	1.04 (26.37)	1.50 (38.10)	2.06 (52.40)	2.06 (52.40)		1.50 (38.10)	
QSL16	QSF1000	1 (25.4)	15,000 (1034.20)	0.688 (17.48)	3.5 (88.90)	4.75 (120.65)	1.19 (30.18)	1.75 (44.45)	2.38 (60.33)	2.38 (60.33)		2.00 (50.80)	

*Maximum pressure rating is based on the lowest rating of any component. Actual working pressure may be determined by tubing pressure rating, if lower.

All dimensions for reference only and subject to change. For prompt service, Parker Autoclave Engineers stocks select products. Consult your local representative.

1" QS fitting bodies are 2507 Super Duplex



For mounting hole option add suffix PM to catalog number. Consult factory for mounting hole dimensions.

Catalog Number	Connection Type	Outside Diameter Tube	Pressure Rating psi (bar)*	Minimum Opening	Dimensions - inches (mm)							Block Thickness	Fitting Pattern
					A	B	C	D Typical	E	F	G Thickness		

Tee

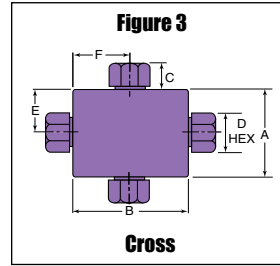
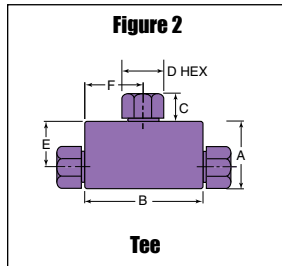
QST4440	QS250	1/4 (6.35)	15,000 (1034.20)	0.16 (3.99)	1.38 (34.93)	2.00 (50.80)	0.52 (13.23)	0.63 (15.88)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	See Figure 2
QST6660	QS375	3/8 (9.53)	15,000 (1034.20)	0.25 (6.35)	1.50 (38.10)	2.00 (50.80)	0.55 (14.00)	0.75 (19.05)	1.00 (25.40)	1.00 (25.40)		0.81 (20.62)	
QST9990	QS562	9/16 (14.29)	15,000 (1034.20)	0.36 (9.12)	2.19 (55.58)	3.00 (76.20)	0.82 (20.83)	1.19 (30.18)	1.50 (38.10)	1.50 (38.10)		1.25 (31.75)	
QST12	QS750	3/4 (19.05)	15,000 (1034.20)	0.52 (13.11)	2.94 (74.63)	4.13 (104.78)	1.04 (26.37)	1.50 (38.10)	2.06 (52.40)	2.06 (52.40)		1.50 (38.10)	
QST16	QSF1000	1 (25.4)	15,000 (1034.20)	0.688 (17.48)	3.50 (88.90)	4.75 (120.65)	1.19 (30.18)	1.75 (44.45)	2.38 (60.33)	2.38 (60.33)		2.00 (50.80)	

Cross

QSX4444	QS250	1/4 (6.35)	15,000 (1034.20)	0.16 (3.99)	2.00 (50.80)	2.00 (50.80)	0.52 (13.23)	0.63 (15.88)	1.00 (25.40)	1.00 (25.40)		0.75 (19.05)	See Figure 3
QSX6666	QS375	3/8 (9.53)	15,000 (1034.20)	0.25 (6.35)	2.00 (50.80)	2.00 (50.80)	0.55 (14.00)	0.75 (19.05)	1.00 (25.40)	1.00 (25.40)		0.81 (20.62)	
QSX9999	QS562	9/16 (14.29)	15,000 (1034.20)	0.36 (9.12)	3.00 (76.20)	3.00 (76.20)	0.82 (20.83)	1.19 (30.18)	1.50 (38.10)	1.50 (38.10)		1.25 (31.75)	
QSX12	QS750	3/4 (19.05)	15,000 (1034.20)	0.52 (13.11)	4.13 (104.78)	4.13 (104.78)	1.04 (26.37)	1.50 (38.10)	2.06 (52.40)	2.06 (52.40)		1.50 (38.10)	
QSX16	QSF1000	1 (25.4)	15,000 (1034.20)	0.688 (17.48)	4.75 (120.65)	4.75 (120.65)	1.19 (30.18)	1.75 (44.45)	2.38 (60.33)	2.38 (60.33)		2.00 (50.80)	

For mounting hole option add suffix PM to catalog number. Consult factory for mounting hole dimensions.

* QS fitting bodies are 2507 Super Duplex



Catalog Number	Connection Type	Outside Diameter Tube	Pressure Rating psi (bar)*	Minimum Opening	Dimensions - inches (mm)							Block Thickness	Fitting Pattern
					A	B	C	D Typical	E	F	G Thickness		

Straight Coupling

15F44QQ	QS250	1/4 (6.35)	15,000 (1034.20)	0.16 (3.99)	0.75 (19.05)	1.63 (41.28)	0.52 (13.23)	0.63 (15.88)	Straight			See Figure 4
15F66QQ	QS375	3/8 (9.53)	15,000 (1034.20)	0.25 (6.35)	0.81 (20.65)	1.75 (44.45)	0.55 (14.00)	0.75 (19.05)	Straight			
15F99QQ	QS562	9/16 (14.29)	15,000 (1034.20)	0.36 (9.12)	1.38 (34.93)	2.75 (69.85)	0.82 (20.83)	1.19 (30.18)	Straight			
15F12Q	QS750	3/4 (19.05)	15,000 (1034.20)	0.52 (13.11)	1.50 (38.10)	3.75 (95.25)	1.04 (26.37)	1.50 (38.10)	Straight			
15F16Q	QSF1000	1 (25.4)	15,000 (1034.20)	0.688 (17.48)	2.75 (69.85)	4.50 (114.30)	1.19 (30.23)	1.75 (44.45)	Straight			

Bulkhead Coupling

15BF44QQ	QS250	1/4 (6.35)	15,000 (1034.20)	0.16 (3.99)	0.88 (22.23)	2.00 (50.80)	0.52 (13.23)	0.63 (15.88)	0.63 (15.88)	1.00 (25.40)	0.38 (9.53)	See Figure 5
15BF66QQ	QS375	3/8 (9.53)	15,000 (1034.20)	0.25 (6.35)	1.06 (27.00)	2.38 (60.33)	0.55 (14.00)	0.75 (19.05)	0.79 (19.94)	1.38 (34.93)	0.38 (9.53)	
15BF99QQ	QS562	9/16 (14.29)	15,000 (1034.20)	0.36 (9.12)	1.63 (41.40)	2.63 (66.68)	0.82 (20.83)	1.19 (30.18)	0.91 (22.99)	1.75 (44.45)	0.38 (9.53)	
15BF12Q	QS750	3/4 (19.05)	15,000 (1034.20)	0.52 (13.11)	1.88 (47.63)	3.50 (88.90)	1.04 (26.37)	1.50 (38.10)	1.50 (38.10)	2.13 (53.98)	0.38 (9.53)	
15BF16Q	QSF1000	1 (25.4)	15,000 (1034.20)	0.688 (17.48)	2.38 (60.33)	5.00 (127.00)	1.19 (30.23)	1.75 (44.45)	2.00 (50.80)	1.88† (47.63)	0.38 (9.53)	

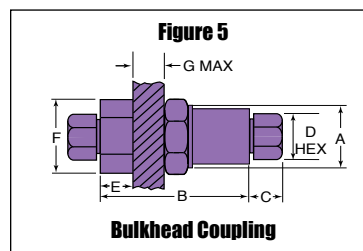
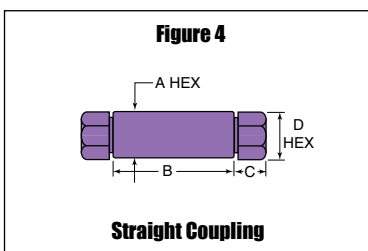
* Maximum pressure rating is based on the lowest rating of any component. Actual working pressure may be determined by tubing pressure rating, if lower.

All dimensions for reference only and subject to change. For prompt service, Parker Autoclave Engineers stocks select products. Consult your local representative.

Union Couplings are designed with a removable seat insert allowing disassembly and tubing removal without the necessity of loosening other items in a line.

† QS fitting bodies are 2507 Super Duplex

† Distance across flats



Medium Pressure Tubing

Pressures to 15,000 psi (1034 bar)

Parker Autoclave Engineers offers a complete selection of austenetic, cold drawn stainless steel tubing designed to match the performance standards of Parker Autoclave Engineers valves and fittings. Parker Autoclave Engineers medium pressure tubing is manufactured specifically for high pressure applications requiring both strength and corrosion resistance. The tubing is furnished in random lengths between 20 feet (6 meters) and 26.5 feet (8.0 meters). The average is 24 feet (7.3 meters). Medium Pressure Tubing is available in five sizes and a variety of materials.



Inspection and Testing

Parker Autoclave Engineer's medium pressure tubing is inspected to assure freedom from seams, laps, fissures or other flaws, as well as carburization or intergranular carbide precipitation. The outside and inside diameters of the tubing are subject to special inspection and are controlled within close tolerances to assure proper fit. Sample pieces of tube for each lot are tested to confirm mechanical properties. Hydrostatic testing is also performed on a statistical basis and is conducted at the working pressure of the tube. Parker Autoclave Engineers will perform 100% hydrostatic testing at additional cost if desired.

Special Materials

In addition to the type 316/316L and 304/304L stainless steel tubing listed in this section, Parker Autoclave Engineers has limited stock of hard-to-obtain special tubing materials: *Monel 400**, *Inconel 600**, *Inconel 625**, *Duplex*, *Super Duplex*, *Titanium Grade 2**, *Nickel 200**, *Hastelloy C276** (*Trademark names) Some are available in shorter lengths only. Please consult factory for stock availability.

Tubing Tolerance

Nominal Tubing Size inches (mm)	Tolerance/Outside Diameter inches (mm)
1/4 (6.35)	.248/.243 (6.30/6.17)
3/8 (9.53)	.370/.365 (9.40/9.27)
9/16 (14.27)	.557/.552 (14.15/14.02)
3/4 (19.05)	.745/.740 (18.92/18.80)
1 (25.4)	.995/.990 (25.27/25.14)

Catalog Number	Tube Material	Fits Connection Type	Tube Size Inches (mm)			Flow Area in. ² (mm ²)	Working Pressure psi (bar)*			
			Outside Diameter	Inside Diameter	Wall Thickness		-425 to 100°F -252 to 37.8°C	200°F 93°C	400°F 204°C	600°F 316°C
MS15-092**	316SS	QS250	1/4 (6.35)	0.109 (2.77)	0.070 (1.78)	0.009 (5.81)	20,000 (1378.93)	20,000 (1378.93)	19,250 (1327.22)	18,050 (1244.48)
MS15-192**	304SS						20,000 (1378.93)	18,950 (1306.54)	17,200 (1185.88)	17,000 (1172.09)
MS15-093**	316SS	QS375	3/8 (9.53)	0.203 (5.16)	0.086 (2.18)	0.032 (20.65)	20,000 (1378.93)	20,000 (1378.93)	19,250 (1327.22)	18,050 (1244.48)
MS15-193**	304SS						20,000 (1378.93)	20,000 (1378.93)	19,250 (1327.22)	18,050 (1244.48)
MS15-097	316SS	QS562	9/16 (14.29)	0.359 (9.12)	0.101 (2.57)	0.101 (65.16)	15,000 (1034.19)	15,000 (1034.19)	14,400 (992.82)	13,650 (941.12)
MS15-194	304SS						15,000 (1034.19)	15,000 (1034.19)	14,400 (992.82)	13,650 (941.12)
MS15-098	316SS	QS750	3/4 (19.05)	0.516 (13.11)	0.117 (2.97)	0.209 (134.84)	15,000 (1034.19)	15,000 (1034.19)	14,400 (992.82)	13,650 (941.12)
MS15-099	316SS	QS1000	1 (25.4)	0.688 (17.48)	0.156 (3.96)	0.371 (239.35)	15,000 (1034.16)	15,000 (1034.16)	14,400 (992.83)	13,650 (941.12)

*Maximum pressure rating is based on the lowest rating of any component.

Actual working pressure may be determined by tubing pressure rating, if lower.

All dimensions for reference only and subject to change.

For prompt service, Parker Autoclave Engineers stocks select products. Consult your local representative.

**Larger inside diameters are available as special order.

Nipples - QS Series

Pressures to 15,000 psi (1034 bar)

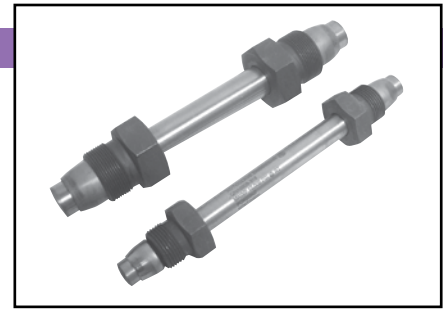
For rapid system make-up, Parker Autoclave Engineers supplies pre-assembled nipples in various sizes and lengths for Parker Autoclave QSS valves and fittings.

Special Lengths

In addition to the standard lengths listed in the table below, nipples are available in any custom length. Consult factory.

Materials

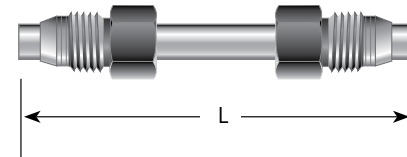
Catalog numbers in table refer to Type 316 Stainless Steel.



Catalog Numbers					Fits Connection Type	Tube Size Inches (mm)		Working Pressure at 100° psi (bar)
Nipple Length Inches (mm)						OD	ID	
4.00" (101.60)	6.00" (152.40)	8.00" (203.20)	10.00" (254.60)	12.00" (304.80)				
QNA4404-316	QNA4406-316	QNA4408-316	QNA44010-316	QNA44012-316	QS250	1/4" (6.35)	0.109 (2.77)	15,000 (1034.16)
QNA6604-316	QNA6606-316	QNA6608-316	QNA66010-316	QNA66012-316	QS375	3/8" (9.53)	0.203 (5.16)	15,000 (1034.16)
	QNA9906-316	QNA9908-316	QNA99010-316	QNA99012-316	QS562	9/16" (14.29)	0.359 (9.12)	15,000 (1034.16)
		QNA1208-316	QNA12010-316	QNA12012-316	QS750	3/4" (19.05)	0.516 (13.11)	15,000 (1034.16)
		QNA1608-316	QNA16010-316	QNA16012-316	QS1000	1" (25.40)	0.688 (17.48)	15,000 (1034.16)

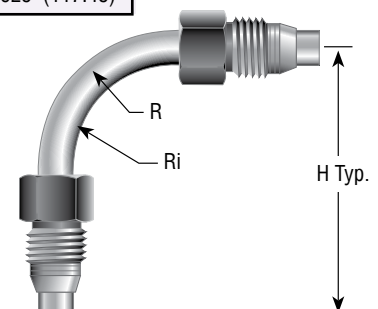
Close Tube Port Connectors

Model	Size Inches (mm)	Fits Connection Type	Dimension "L" Inches (mm)
QTS4403.25	1/4" (6.35)	QS250	3.25 (82.55)
QTS6603.50	3/8" (9.53)	QS375	3.50 (88.90)
QTS9905.25	9/16" (14.29)	QS562	5.25 (133.35)
QTS1206.375	3/4" (19.05)	QS750	6.38 (162.10)



Elbow Tube

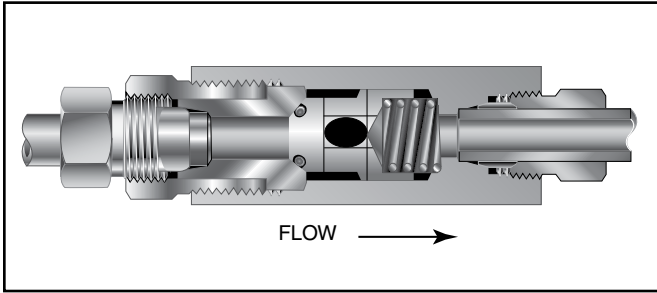
Model	Size Inches (mm)	Fits Connection Type	Dimension "H" Inches (mm)	Mean Radius "R" Inches (mm)	Inside Radius Ri Inches (mm)
QTE44-90	1/4" (6.35)	QS250	3.25 (82.55)	0.563 (14.30)	0.438 (11.13)
QTE66-90	3/8" (9.53)	QS375	3.50 (88.90)	0.938 (23.83)	0.75 (19.05)
QTE99-90	9/16" (14.29)	QS562	7.50 (19.05)	2.906 (73.82)	2.625 (66.68)
QTE12-90	3/4" (19.05)	QS750	10.00 (254.00)	3.875 (98.43)	3.5 (88.9)
QTE16-90	1" (25.40)	QS1000	11.50 (292.10)	5.125 (13.30)	4.625 (117.48)



Check Valves - QS Series

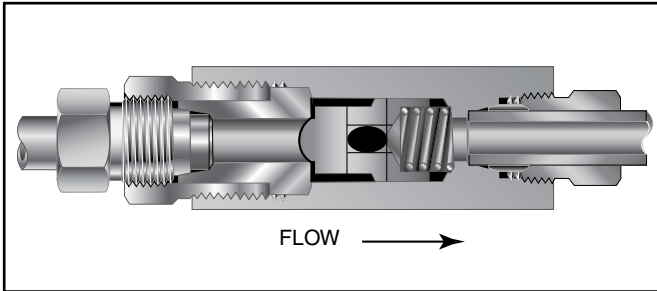
Pressures to 15,000 psi (1034 bar)

O-Ring Check Valves



Minimum operating temperature for standard o-ring check valves 0°F (-17.8°C)

Ball Check Valves



Minimum operating temperature for standard o-ring check valves 0°F (-17.8°C)

Provide unidirectional flow and tight shut-off for liquids and gases with high reliability. When differential drops below cracking pressure*, valve shuts off. **(Not for use as relief valve.)**

Materials: 316 Stainless Steel: Body, cover, poppet, cover gland. 300 Stainless Steel: Spring. Except 1" - see note below. Standard O-ring: Viton, for operation to 400° F (204°C). Buna-N or PTFE available for 250°F (121°C) or 400°F (204°C) respectively; specify when ordering.

***Cracking Pressure:** 20 psi (1.38 bar) ±30%. Springs for higher cracking pressures (up to 100 psi (6.89bar)) available on special order for O-ring style check valves only.

Prevent reverse flow where leak-tight shut-off is not mandatory. When differential drops below cracking pressure, valve closes. With all-metal components, valve can be used up to 650°F (343°C). See Technical Information section for connection temperature limitations. **(Not for use as a relief valve.)**

Ball and poppet are an integral design to assure positive, in-line seating without “chatter”. Poppet is designed essentially for axial flow with minimum pressure drop.

Materials: 316 Stainless Steel: Body, cover, cover gland, ball poppet. 300 Series Stainless Steel: Spring. Except 1" - see note below.

CAUTION: While testing has shown O-Rings to provide satisfactory service life, both cyclic and shelf life may vary widely with differing service conditions, properties of reactants, pressure and temperature cycling and age of the O-ring. FREQUENT INSPECTIONS SHOULD BE MADE to detect any deterioration, and O-rings replaced as required.

CAUTION: See Tubing section for proper selection of tubing.

Catalog Number	Fits Connection Type	Pressure Rating psi (bar)*	Orifice inches (mm)	Rated C _v	Dimensions - inches (mm)				
					A	B	C	D Typical	Hex

O-Ring Check Valves

QSO4400	QS250	15,000 (1034.20)	0.188 (4.78)	0.15	3.18 (80.77)	2.56 (65.02)	0.44 (11.18)	0.63 (16.00)	0.81 (20.57)	See Figure 1
QSO6600	QS375	15,000 (1034.20)	0.312 (7.93)	0.63	3.56 (90.42)	3.00 (76.20)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	
QSO9900	QS562	15,000 (1034.20)	0.359 (9.12)	2.30	5.21 (132.33)	4.50 (114.30)	0.81 (20.57)	1.19 (30.18)	1.75 (44.45)	
QSO12	QS750	15,000 (1034.20)	0.516 (13.11)	4.70	6.40 (162.56)	5.50 (139.70)	1.03 (26.16)	1.50 (38.10)	1.88 [†] (47.75)	
QSO16	QSF1000	15,000 (1034.20)	0.688 (17.48)	14.00	8.92 (226.57)	7.52 (191.01)	1.19 (30.23)	1.75 (44.45)	3.00 (76.20)	

Ball Check Valves

QSB4400	QS250	15,000 (1034.20)	0.188 (4.78)	0.15	3.18 (80.77)	2.56 (65.02)	0.44 (11.18)	0.63 (16.00)	0.81 (20.57)	See Figure 1
QSB6600	QS375	15,000 (1034.20)	0.312 (7.93)	0.63	3.56 (90.42)	3.00 (76.20)	0.53 (13.46)	0.75 (19.05)	1.00 (25.40)	
QSB9900	QS562	15,000 (1034.20)	0.359 (9.12)	2.30	5.21 (132.33)	4.50 (114.30)	0.81 (20.57)	1.19 (30.18)	1.75 (44.45)	
QSB12	QS750	15,000 (1034.20)	0.516 (13.11)	4.70	6.40 (162.56)	5.50 (139.70)	1.03 (26.16)	1.50 (38.10)	1.88 [†] (47.75)	
QSB16	QS1000	15,000 (1034.20)	0.688 (17.48)	14.00	8.92 (226.57)	7.52 (191.01)	1.19 (30.23)	1.75 (44.45)	3.00 (76.20)	

[†]Distance across flats

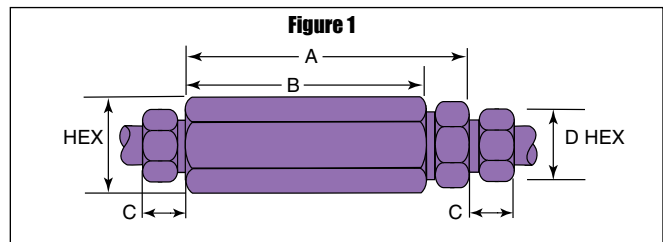
Note:
All check valves are furnished complete with connection components unless otherwise specified.

*Maximum pressure rating is based on the lowest rating of any component. Actual working pressure may be determined by tubing pressure rating, if lower.

All dimensions for reference only and subject to change.

For prompt service, Parker Autoclave stocks select products. Consult your local representative.

1" check valve bodies, cover, cover gland and poppet is 2507 Super Duplex standard.



WARNING

FAILURE, IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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Instrumentation Products Division
Autoclave Engineers Operation
8325 Hessinger Drive
Erie, Pennsylvania 16509-4679 USA
PH: 814-860-5700 FAX: 814-860-5811
www.autoclave.com

Parker Hannifin Manufacturing Ltd.
Instrumentation Products Division, Europe
Industrial Estate Whitemill
Wexford, Republic of Ireland
PH: 353 53 914 1566
FAX: 353 53 914 1582

Caution! Do not mix or interchange parts or tubing with those of other manufacturers. Doing so is unsafe and will void warranty.

Caution! Parker Autoclave Engineers Valves, Fittings and Tools are not designed to work with common commercial instrument tubing and will only work with tubing built to Parker Autoclave Engineers AES Specifications. Failure to do so will void warranty.

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