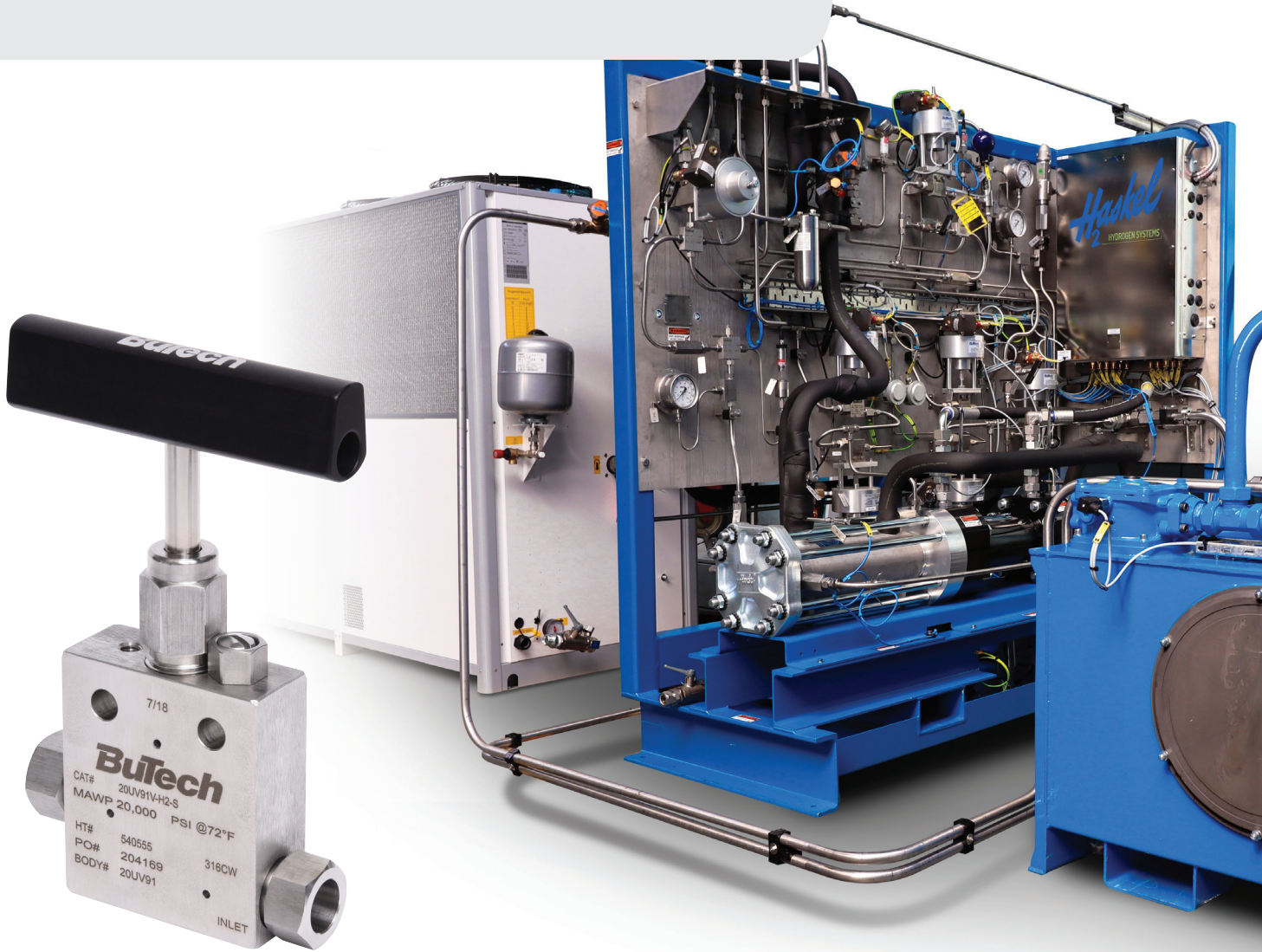




Hydrogen Gas Services

Valves, Fitting and Tubing

Rated up to 18,000 PSI (1241 bar)



BuTech Valves for Hydrogen Service

BuTech high quality valves and components for hydrogen service are engineered to deliver safe, and reliable performance at pressures to 18,000 PSI (1241) bar. Designed to withstand the demands of hydrogen service, BuTech valves provide proven service in hydrogen storage, compression and dispensing applications, as well as in hydrogen fuel cell testing, production and process facilities.



Needle Valves and Air Actuators 18K PSI

Needle Valves

Available in a variety of body styles designed for operation at temperatures ranging from -58° to +392°F (-50° to +200°C). Extended stuffing box allows for operation down to -423°F (-253°C).

18K PSI 2-Way Straight Needle Valve

Description	Part No.	Catalog Number	Stem Style	Connection	A	B	C	D	E	F	G	H	I	J	K	L	Thk.	Fig.
1/4" MP Needle Valve	20UV41V-H2-*	20UV41V-H2-*	Vee	1/4" M/P Tube	2.00"	1.00"	2.00"	4.50"	1.62"	1.19"	0.62"	0.38"	3.00"	0.25"	-	-	0.75"	1
3/8" MP Needle Valve	20UV41R-H2-*	20UV41R-H2-*	Reg	1/4" M/P Tube	(50.8)	(25.4)	(50.8)	(114.3)	(41.1)	(30.2)	(15.7)	(9.7)	(76.2)	(6.4)	-	-	(19.1)	1
9/16" MP Needle Valve	20UV91V-H2-*	20UV91V-H2-*	Vee	3/8" M/P Tube	2.00"	1.00"	2.00"	4.50"	1.62"	1.19"	0.62"	0.38"	3.00"	0.25"	-	-	0.75"	1
3/4" MP Needle Valve	20V121V-H2-*	20UV61R-H2-*	Reg	3/8" M/P Tube	(50.8)	(25.4)	(50.8)	(114.3)	(41.1)	(30.2)	(15.7)	(9.7)	(76.2)	(6.4)	-	-	(19.1)	1
1" MP Needle Valve	20V161V-H2-*	20UV91V-H2-*	Vee	9/16" M/P Tube	2.50"	1.25"	2.88"	6.32"	2.38"	1.75"	0.69"	0.50"	4.00"	0.34"	-	-	1.00"	1
Low Temp. (Liquid)	Add-LT to Part No.	20UV91R-H2-*	Reg	9/16" M/P Tube	(63.5)	(31.8)	(73.2)	(160.5)	(60.5)	(44.5)	(17.5)	(12.7)	(101.6)	(8.6)	-	-	(25.4)	1
		20V121V-H2-*	Vee	3/4" M/P Tube	3.00"	1.50"	3.75"	8.75"	3.00"	2.25"	0.88"	0.62"	8.00"	0.43"	-	-	1.38"	1
		20V121R-H2-*	Reg	3/4" M/P Tube	(76.2)	(38.1)	(95.3)	(222.3)	(76.2)	(57.2)	(22.4)	(15.7)	(203.2)	(10.9)	-	-	(35.1)	1
		20V161V-H2-*	Vee	1" M/P Tube	4.12"	2.06"	4.75"	10.19"	3.75"	2.81"	1.25"	1.12"	10.00"	0.56"	-	-	1.75"	1
		20V161R-H2-*	Reg	1" M/P Tube	(104.6)	(52.3)	(258.8)	(258.8)	(95.3)	(71.4)	(31.8)	(28.4)	(254.0)	(14.2)	-	-	(44.5)	1

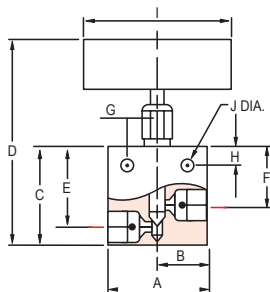
*H2-S = Treated 316 Stem
H2-N = High Nickel

18K PSI 2-Way Angle Needle Valve

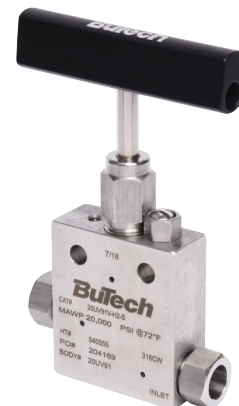
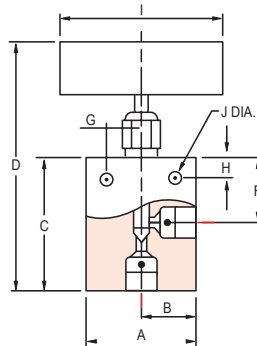
Description	Part No.	Catalog Number	Stem Style	Connection	A	B	C	D	E	F	G	H	I	J	K	L	Thk.	Fig.
1/4" MP Needle Valve	20UV42V-H2-*	20UV42V-H2-*	Vee	1/4" M/P Tube	2.00"	1.00"	2.00"	4.50"	1.62"	1.19"	0.62"	0.38"	3.00"	0.25"	-	-	0.75"	1
3/8" MP Needle Valve	20UV62V-H2-*	20UV42R-H2-*	Reg	1/4" M/P Tube	(50.8)	(25.4)	(50.8)	(114.3)	(41.1)	(30.2)	(15.7)	(9.7)	(76.2)	(6.4)	-	-	(19.1)	1
9/16" MP Needle Valve	20UV92V-H2-*	20UV62V-H2-*	Vee	3/8" M/P Tube	2.00"	1.00"	2.00"	4.50"	1.62"	1.19"	0.62"	0.38"	3.00"	0.25"	-	-	0.75"	1
3/4" MP Needle Valve	20V122V-H2-*	20UV62R-H2-*	Reg	3/8" M/P Tube	(50.8)	(25.4)	(50.8)	(114.3)	(41.1)	(30.2)	(15.7)	(9.7)	(76.2)	(6.4)	-	-	(19.1)	1
1" MP Needle Valve	20V162V-H2-*	20UV92V-H2-*	Vee	9/16" M/P Tube	2.50"	1.25"	2.88"	6.32"	2.38"	1.75"	0.69"	0.50"	4.00"	0.34"	-	-	1.00"	1
Low Temp. (Liquid)	Add-LT to Part No.	20UV92R-H2-*	Reg	9/16" M/P Tube	(63.5)	(31.8)	(73.2)	(160.5)	(60.5)	(44.5)	(17.5)	(12.7)	(101.6)	(8.6)	-	-	(25.4)	1
		20V122V-H2-*	Vee	3/4" M/P Tube	3.00"	1.50"	3.75"	8.75"	3.00"	2.25"	0.88"	0.62"	8.00"	0.43"	-	-	1.38"	1
		20V122R-H2-*	Reg	3/4" M/P Tube	(76.2)	(38.1)	(95.3)	(222.3)	(76.2)	(57.2)	(22.4)	(15.7)	(203.2)	(10.9)	-	-	(35.1)	1
		20V162V-H2-*	Vee	1" M/P Tube	4.12"	2.06"	4.75"	10.19"	3.75"	2.81"	1.25"	1.12"	10.00"	0.56"	-	-	1.75"	1
		20V162R-H2-*	Reg	1" M/P Tube	(104.6)	(52.3)	(258.8)	(258.8)	(95.3)	(71.4)	(31.8)	(28.4)	(254.0)	(14.2)	-	-	(44.5)	1

*H2-S = Treated 316 Stem
H2-N = High Nickel

18K PSI 2-Way Straight Needle Valve



18K PSI 2-Way Angle Needle Valve



Air Actuators

Designed for remote control, BuTech air operators are virtually maintenance free - ideally suited for service in limited access areas. Their compact size and weight permits installation where space or weight is at a premium. Also available with limit switches and solenoid valves.

The single-acting actuators have a fail-safe feature: The Air-to-Open actuator closes the valve on loss of operating pressure, while the Air-to-Close actuator opens the valve on loss of operating pressure. These safety features are necessary in critical systems.



Valve Model			Normally Open Air-to-Close Actuators psi (bar)			Normally Closed Air-to-Open Actuators psi (bar)			Double-Acting Pneumatic Actuators psi (bar)		
			ATC5	ATC8	2XATC5	ATO5	ATO8	2XATO5	DA5	DA8	2XDA5
20UV4-20UV6	MAWP	psi (bar)	18,000 (1241)			18,000 (1241)			18,000 (1241)		
	Req'd Actuator Pressure	psi (bar)	74 (5)			82 (6)	55 (4)		63 (4)		
20UV9	MAWP	psi (bar)	18,000 (1240)	18,000 (1240)	18,000 (1240)	10,000 (689)	18,000 (1240)	18,000 (1240)	18,000 (1240)		18,000 (1240)
	Req'd Actuator Pressure	psi (bar)	100 (7)	49 (3)	55 (4)	84 (6)	58 (5)	67 (5)	98 (7)		49 (5)
20V12	MAWP	psi (bar)		18,000 (1240)	10,000 (689)		12,500 (860)	10,500 (720)		18,000 (1240)	12,000 (830)
	Req'd Actuator Pressure	psi (bar)		100 (7)	90 (6)		66 (1)	79 (5)			89 (2)
20V16	MAWP	psi (bar)		12,000 (830)	8,000 (550)		7,500 (520)			12,000 (830)	
	Req'd Actuator Pressure	psi (bar)		100 (3)	52 (4)		66 (5)			89 (4)	

Tubing, Fittings, Connection Components 18K PSI

Tubing

Description	Part No.
1/4" MP Tube 0.109" ID	20-109-316
3/8" MP Tube 0.203" ID	20-203-316
9/16" MP Tube 0.312" ID	20-312-316
3/4" MP Tube 0.438" ID	20-438-316
1" MP Tube 0.562" ID	20-562-316



Elbow

Description	Part No.
1/4" MP Elbow	20L4
3/8" MP Elbow	20L6
9/16" MP Elbow	20L9
3/4" MP Elbow	20L12
1" MP Elbow	20L16



Tee

Description	Part No.
1/4" MP Tee	20T4
3/8" MP Tee	20T6
9/16" MP Tee	20T9
3/4" MP Tee	20T12
1" MP Tee	20T16



Cross

Description	Part No.
1/4" MP Cross	20X4
3/8" MP Cross	20X6
9/16" MP Cross	20X9
3/4" MP Cross	20X12
1" MP Cross	20X16



Straight Coupling

Description	Part No.
1/4" MP Straight Coupling	20F4
3/8" MP Straight Coupling	20F6
9/16" MP Straight Coupling	20F9
3/4" MP Straight Coupling	20F12
1" MP Straight Coupling	20F16



Bulk Coupling

Description	Part No.
1/4" MP Bulkhead	20BF4
3/8" MP Bulkhead	20BF6
9/16" MP Bulkhead	20BF9
3/4" MP Bulkhead	20BF12
1" MP Bulkhead	20BF16



Gland

Description	Part No.
1/4" MP Gland	20G4
3/8" MP Gland	20G6
9/16" MP Gland	20G9
3/4" MP Gland	20G12
1" MP Gland	20G16



Collar

Description	Part No.
1/4" MP Collar	20C4
3/8" MP Collar	20C6
9/16" MP Collar	20C9
3/4" MP Collar	20C12
1" MP Collar	20C16



Plug

Description	Part No.
1/4" MP Plug	20P4
3/8" MP Plug	20P6
9/16" MP Plug	20P9
3/4" MP Plug	20P12
1" MP Plug	20P16



Anti-Vibration Collet Gland

Description	Part No.
1/4" MP Anti-Vibration Assembly	20AVCG4
3/8" MP Anti-Vibration Assembly	20AVCG6
9/16" MP Anti-Vibration Assembly	20AVCG9
3/4" MP Anti-Vibration Assembly	20AVCG12
1" MP Anti-Vibration Assembly	20AVCG16



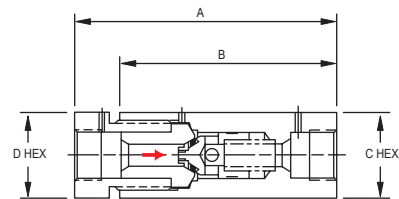
Cap

Description	Part No.
1/4" MP Cap	20CA4
3/8" MP Cap	20CA6
9/16" MP Cap	20CA9
3/4" MP Cap	20CA12
1" MP Cap	20CA16



Check Valves

Rugged construction provides assurance of fail-safe operation at pressures up to 18,000 psi (1240 bar). For operation in temperatures ranging from -320° to 500°F (-195° to 260°C).



ex. 20SC6-TFE-H2-S

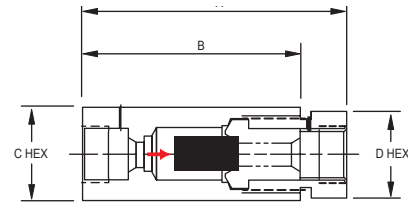
Catalog	Connection	MAWP	Cv	A	B	C	D
20SC4-H2-S	1/4" M/P Tube	18,000 PSI 1240 bar	0.25	2.94" (74.7)	2.50" (63.5)	1.00" (25.4)	0.88" (22.4)
20SC6-H2-S	3/8" M/P Tube	18,000 PSI 1240 bar	0.80	3.12" (79.2)	2.62" (66.5)	1.12" (28.4)	0.88" (22.4)
20SC9-H2-S	9/16" M/P Tube	18,000 PSI 1240 bar	2.30	4.23" (107.4)	3.50" (88.9)	1.38" (35.1)	1.38" (35.1)
20SC12-H2-S	3/4" M/P Tube	18,000 PSI 1240 bar	3.40	5.89" (149.6)	4.75" (120.7)	1.75" (44.5)	1.38" (35.1)
20SC16-H2-S	1" M/P Tube	18,000 PSI 1240 bar	7.40	6.50" (165.1)	5.55" (141.0)	2.12" (53.8)	1.75" (44.5)

Operating Temperature Ranges:		
O-Ring Material	Operating Temp Range	Catalog Suffix
Viton	-40° to +500° F (-40° to +260° C)	—
Teflon	-320° to +400° F (-195° to +204° C)	-TFE

Sintered Cup Filters

Provide maximum filtration surface area for removal of contaminating particles from the fluid system. May be used in systems requiring high flow rates with minimum pressure drop. Available in nominal ratings of: 5, 10, 20, 40 and 100 micron.

Catalog	Connection	MAWP	Area*	A	B	C	D
20SCF4	1/4" M/P Tube	18,000 PSI 1240 bar	0.54 in ² 348 mm ²	3.22" (81.8)	2.50" (63.5)	1.00" (25.4)	0.88" (22.4)
20SCF6	3/8" M/P Tube	18,000 PSI 1240 bar	0.99 in ² 639 mm ²	3.12" (79.2)	2.50" (63.5)	1.38" (34.9)	1.12" (28.4)
20SCF9	9/16" M/P Tube	18,000 PSI 1240 bar	1.47 in ² 948 mm ²	4.22" (107.2)	3.50" (88.9)	1.38" (34.9)	1.38" (34.9)
20SCF12	3/4" M/P Tube	18,000 PSI 1240 bar	1.75 in ² 1129 mm ²	5.90" (149.9)	4.75" (120.7)	1.75" (44.5)	1.38" (34.9)
20SCF16	1" M/P Tube	18,000 PSI 1240 bar	4.86 in ² 3135 mm ²	6.48" (164.6)	5.55" (141.0)	2.12" (53.8)	1.75" (44.5)



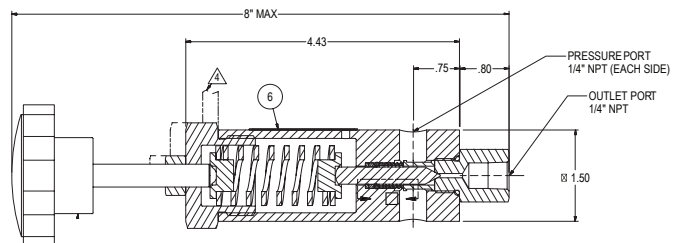
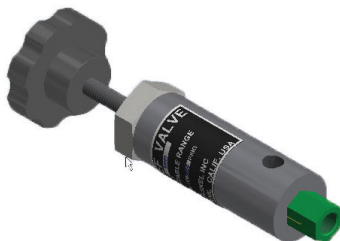
ex. 20SCF9-20

*Effective area of filter element

Regulating Valves

These Regulating Relief valves use a differential area poppet design with a high ratio between the seal and seat are for smooth control, repeatability and low deadband between crack and reseal pressure. The design also makes the control settings virtually unaffected by downstream outlet pressure.

Model Number	Pressure Range	Port Size-Pressure	Port Size-Outlet	Material-Body	Material-Seat	Material-Seal	Orifice-Diameter	Orifice-Cv
27741-3	300-3000 psi	1/4" NPT	1/4" NPT	St. Steel	Nylon	EPR/PTFE	.070"	.12
27741-4	1,000-10,000 psi	1/4" NPT	1/4" NPT	St. Steel	Nylon	EPR/PTFE	.070"	.12



Tools

Hand Tools

BuTech hand tools are designed to permit on-sight end preparation for tubing. The coning tool uses a precision collet to maintain concentricity between the tube and the cutter blades. The threading tool uses an adjustable split die and a precision guide bushing to cut a perfect thread.

Hand Tools			
Tube OD	Series	Coning Tool	Threading Tool
1/4"	20000 PSI	20HCT4	THT4-H
3/8"	20000 PSI	20HCT6	THT6-H
9/16"	20000 PSI	20HCT9	THT9-H
3/4"	20000 PSI	20HCT12	THT12-H
1"	20000 PSI	20HCT16	THT16-H

Tube Vises	
Tube OD	Catalog Number
1/4"	TV4
3/8"	TV6
9/16"	TV9
3/4"	TV12
1"	TV16

Power Tools

BuTech power tools are designed to be used with a variable speed power hand drill. This unique feature makes them perfect for fast machining of several tube ends.

Power Tools			
Tube OD	Series	Coning Tool	Threading Tool
1/4"	20000 PSI	20CT4	THT4-P
3/8"	20000 PSI	20CT6	THT6-P
9/16"	20000 PSI	20CT9	THT9-P

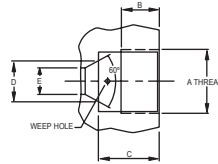
Tube Benders	
Tube OD	Catalog Number
1/4"	MTB4
3/8"	MTB6
9/16"	MTB9
1/4", 3/8", 9/16"	MTB469

Tube Vises

BuTech tube vises are the lightweight and inexpensive way to hold tubing tightly during coning and threading operations.

Tube Bender

The BuTech tube bender is designed to provide fast, accurate and reliable bending of heavy wall tubing with only one setup.

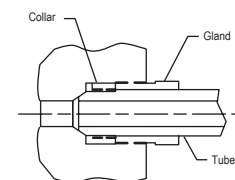
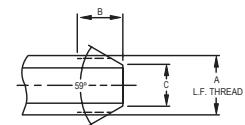


Connection	A Thread	B	C	D	E
1/4" M/P	7/16" -20	0.28" (7.1)	0.50" (12.7)	0.19" (4.8)	0.109" (2.8)
3/8" M/P	9/16" -18	0.38" (9.7)	0.62" (15.7)	0.31" (7.9)	0.203" (5.2)
9/16" M/P	13/16" -16	0.44" (11.2)	0.75" (19.1)	0.50" (12.7)	0.312" (7.9)
3/4" M/P	3/4" -14 NPSM	0.50" (12.7)	0.94" (23.9)	0.62" (15.7)	0.437" (11.1)
1" M/P	1-3/8" -12	0.81" (20.6)	1.31" (33.3)	0.88" (22.4)	0.562" (14.3)

Assembly Procedure

- Slip gland nut onto tubing or nipple.
- Screw collar onto threaded end of tubing or nipple. Allow one or two threads to be exposed on tubing or nipple between collar and coned tubing.
- Lubricate male threads of gland nut with a non-hardening lubricant suitable for use on stainless steel. Lubricant chosen should also be compatible with working temperature requirements.
- Insert tubing into female connection of valve or fitting. Screw gland into connection until finger-tight.
- Tighten gland nut to torque value shown at right which corresponds to connection size being assembled.

Connection	A Thread	B	C
1/4" M/P	1/4" -28	0.34" (8.6)	0.140" (3.6)
3/8" M/P	3/8" -24	0.44" (11.2)	0.250" (6.4)
9/16" M/P	9/16" -18	0.50" (12.7)	0.406" (10.3)
3/4" M/P	3/4" -14	0.62" (15.7)	0.562" (14.3)
1" M/P	1" -16	0.78" (19.8)	0.718" (18.2)



Tube Size	Engagement Allowance	Required Torque
1/4"	0.55" (14.0)	20 lb-ft (27 Nm)
3/8"	0.69" (17.5)	30 lb-ft (41 Nm)
9/16"	0.84" (21.3)	55 lb-ft (75 Nm)
3/4"	1.01" (25.7)	90 lb-ft (122 Nm)
1"	1.47" (31.3)	125 lb-ft (170 Nm)



BuTech, a business of the Precision and Science Technologies Segment at Ingersoll Rand, is a leading brand of high-pressure valves, fittings and tubing designed to meet the critical requirements of today's most severe applications.

For more information on our high-pressure products, visit butech-valve.com or contact your local BuTech representative.

Ingersoll Rand (NYSE:IR), is a global leader in mission-critical flow creation and industrial technologies. For more information, visit www.IRCO.com.