

HSME[®]





Valves & Fittings

Bite Type Tube Fittings

JIS B2351 & KS B1535



- Metric Tube OD: 4 mm to 50 mm
- Pipe DN: 06A to 40A (1/8 to 1 1/2 in.)
- Fitting Materials: Stainless Steel, Steel, and Brass

<p>Quality System Certificate</p>  <p>ISO 9001</p>	<p>HSE Management Certificates</p>  <p>ISO 14001 OHSAS18001</p>	<p>Nuclear Quality System Certificates</p>  <p>N NPT NS Kopic</p>	<p>Type Approval Certificates</p>  <p>ABS GL KR Lloyd's Register</p>	<p>www.hsmecorp.com[®]</p> <p>HSME[®] since 1976 Registered Trade Mark</p>
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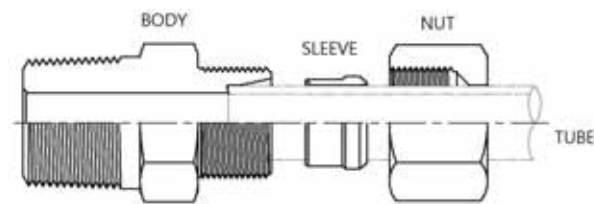
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Design and Interchangeability

HSME's Bite Type Tube Fittings conform to the design requirements of JIS B2351 and KS B1535 standards. This ensures that HSME's Bite Type fittings are interchangeable with those fittings designed and manufactured in the identical standards.

Standard Components

HSME Bite Type Tube Fitting consists of three components: Body, Sleeve, and Nut.



HSME's flareless Bite Type Tube Fittings are designed to use medium & heavy wall tubing for medium and high pressure application. The design standard of JIS B2351 is derived from the L Series of metric tube fitting DIN2353 standard.

Tube Port Threads

JIS B2351 and DIN 2353 Tube Fittings

Tube OD, mm	Bite Type Tube Fitting	DIN Type Tube Fitting		
	JIS B2351 KS B1535	DIN2353		
		L	S	LL
4	M10 x 1.25	-	-	M8 X 1
6	M12 x 1.5	M12 x 1.5	M14 x 1.5	M10 x 1
8	M14 x 1.5	M14 x 1.5	M16 x 1.5	M12 x 1
10	M16 x 1.5	M16 x 1.5	M18 x 1.5	M14 x 1
12	M18 x 1.5	M18 x 1.5	M20 x 1.5	M16 x 1
14	-	-	M22 x 1.5	-
15	M22 x 1.5	M22 x 1.5	-	-
16	M24 x 1.5	-	M24 x 1.5	-
18	M26 x 1.5	M26 x 1.5	-	-
20	M28 x 1.5	-	M30 x 2	-
22	M30 x 1.5	M30 x 2	-	-
25	M35 x 1.5	-	M36 x 2	-
28	M38 x 1.5	M36 x 2	-	-
30	M40 x 1.5	-	M42 x 2	-
32	M42 x 1.5	-	-	-
35	M45 x 1.5	M45 x 2	-	-
38	M48 x 1.5	-	M52 x 2	-
42	M52 x 2.0	M52 x 2	-	-
50	M64 x 2.0	-	-	-

Metric Thread Standard: ISO 261.

Bite Type Tube Fittings are available from 4mm OD to 50 mm OD as well as pipe nominal diameter 06A to 40A (1/8 to 1 1/2 in. Pipe) whereas DIN Type Tube Fittings are available from 4 mm OD to 42 mm OD.

Fitting Materials

The standard fitting materials include Stainless Steel, Carbon Steel, and Brass.

Stainless Steel

Barstock Body & Nut	Forging Body
SUS316/JIS G4303	SUS316/JIS G4303
SUS304/JIS G4303	SUS304/JIS G4303
ASTM A276 Type 316	ASTM A182 F316
ASTM A276 Type 304	ASTM A182 F304

Sleeve Heat-Treated
SUS316/JIS G4303
SUS304/JIS G4303
ASTM A276 Type 316
ASTM A276 Type 304

Carbon Steel

Barstock Body & Nut	Forging Body
JIS G4051 S20C~S48C	JIS G4051 S20C~S48C
ASTM A108	ASTM A105

Sleeve Heat-Treated
JIS G4051 S10C - S20C
ASTM A108

Brass

Barstock Body & Nut	Forging Body
JIS H3250 C3604	JIS H3250 C3771
ASTM B16 UNS C36000	ASTM B283 UNS C37700

Sleeve Un-heat treated
JIS H3250/C3604
ASTM B16/ UNS C36000

Fitting Cleaning and Surface Protection

Fittings are cleaned to remove surface contamination, loose particles, iron particles out of cutting tools, and oil from cutting fluid.

Fittings are further processed for the surface protection to enhance corrosion-resistance.

Fitting Materials	Surface Protection
Stainless Steel	Passivation
Carbon Steel	Standard Black Phosphate Plating. Optional White or Yellow Zinc Plating
Brass	Acid Cleaning

Working Pressure Rating @37 °C (100 °F)

Fitting's working pressure varies depending on tube OD and fitting material.

Table 1.

Unit: bar

Fitting's Tube OD, mm	Stainless Steel	Carbon Steel	Brass
4 to 15	500	500	250
16 to 22	400	400	210
25 to 28	350	350	170
30 to 38	250	250	150
40 to 50	210	210	120

Temperature Rating

Table 2

Fitting Materials	Temperature Rating	
	°C	°F
Stainless Steel	-60 to 400	-76 to 752
Carbon Steel	-40 to 120	-40 to 248
Brass	-60 to 175	-76 to 347

When combining seal material, the temperature rating of seal may become the limiting factor on the fitting's temperature rating.

Elastomer Seal's Temperature Rating

Table 3.

Seal Material	Designator	Temperature Rating °C (°F)
NBR	BN	-23 to 120 (-9 to 248)
FKM	VT	-20 to 180 (-4 to 356)

NBR O-Ring seal is standard.

To order factory assembled fitting with an optional FKM O-Ring, insert the seal material designator in the fitting part number. Example: BOM12-02G-VT-SSA

To order fitting with standard NBR seal, the seal material designator is not required to add to the fitting part number. Example: BOM12-02G-SSA

Pressure Reduction in Elevated Temperature

In operation, the working pressure reduction may be caused by the elevated system temperature.

Table 4.

Fitting Material	Temperature Range °C (°F)	Pressure Reduction Factor %
Stainless Steel	-60 to 20 (-4 to 68)	-
	50 (122)	4
	100 (212)	11
	200 (392)	20
	300 (572)	29
Steel	400 (752)	33
	-40 to 120 (-40 to 248)	-
Brass	-60 to 65 (-4 to 150)	-
	93 (200)	6
	121 (250)	8
	300 (148)	15
	175 (347)	35

How to use the pressure reduction factor.

Apply the factor to the working pressure of the fitting.

Example

A stainless steel fitting with 6 mm Tube OD.
Working pressure: 400 bar
Refer to table 1.

Identify system fluid temperature and the factor applicable:

Fluid Temperature: 400 °C (752 °F)

Multiply the working pressure by the factor
400bar x 33% = 132 bar

Subtract the result from the working pressure.
400 bar – 132 bar = 268 bar

The applicable working pressure of the fitting at 400 °C is 268 bar.

Recommended Tubing Selection

For the leak-free tubing system, tubing should be considered as one of fitting components.

Stainless Steel Tubing

Fully annealed seamless or welded and drawn stainless steel hydraulic tubing. ASTM A269 or A213 ,or equivalent. Tubing must have a surface free from scratches; draw marks, flat spots, and be suitable for bending and flaring. Recommended hardness is 90 HRB or less.

Carbon Steel Tubing

Soft annealed carbon steel tubing, ASTM A179 or DIN 2391 or equivalent. Finished tubes shall be free of scale. A slight amount of oxidation will be not considered as scale. Hardness not to exceed 72 HRB.

Copper Tubing for Brass Fitting

High quality, soft annealed seamless copper tubing, ASTM B75 or EN 1057 or equivalent. Soft annealed – Temper O copper water tube, type K or type L to ASTM B88.

Recommended Tubing Wall Thickness

Too thin wall tubing may collapse with little resistance against sleeve sealing action whereas heavier wall tubing resists the sealing action properly.

Table 5.

JIS B 2351 standard specifies the tubing wall thickness range recommended for use with each tubing OD. The table below includes some tube ODs that are not listed in the JIS B 2351 standard.

Tube OD, mm	Recommended Tubing Wall Thickness, mm
4	0.5 to 1.0
6	1.0 to 1.5
8	1.0 to 1.5
10	1.0 to 2.0
12	1.0 to 2.5
15	1.5 to 2.5
16	1.5 to 3.0
18	2.0 to 3.3
20	2.0 to 3.5
22	2.0 to 4.0
25	3.0 to 4.5
28	2.5 to 5.0
30	2.5 to 5.5
35	3.3 to 6.0
38	2.5 to 7.0
42	2.5 to 8.0
50	3.3 to 9.0

Fitting for Welding

For welding integrity, low carbon stainless steel such as SS316L or SS304L is supplied for SS316 or SS304 weld fittings.

For steel welding fitting, the standard black phosphate plated fitting is supplied.

Designators

Table 6. Pipe Thread Designator

Pipe Thread Designator	Industrial Symbol	Standards
N	NPT	ANSI/ASME B1.20.1
R	BSPT, PT	ISO 7-1, JIS B0203
G	BSPP, PF	ISO 228-1, JIS B0202

Table 7. Tube OD Designator

OD Size, mm	4	6	8	10	12	40	42	50
Designator	04	06	08	10	12	40	42	50

Table 8. Pipe Size Designator

Nominal Pipe Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Nominal Diameter	6	8	10	15	20	25	32	40	50
Pipe Standard and OD, Unit: mm									
JIS	10.50	13.80	17.30	21.70	27.20	34.00	42.70	48.60	60.50
Designator	6A	8A	10A	15A	20A	25A	32A	40A	50A
ANSI	10.29	13.72	17.14	21.34	26.67	33.40	42.16	48.26	60.32
Designator	6AA	8AA	10AA	15AA	20AA	25AA	32AA	40AA	50AA

Table 9. Pipe Thread Size Designator

Nominal Pipe Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
NPT	01N	02N	03N	04N	06N	08N	10N	12N	16N
PT, BSPT	01R	02R	03R	04R	06R	08R	10R	12R	16R
PF, BSPP	01G	02G	03G	04G	06G	08G	10G	12G	16G

Ordering Information

To order, select part number, and add material designator to the part number.

Examples: BU-04-**SSA**, BU-04-**S4A**, BU-04-**CA**, and BU-04-**BA**.

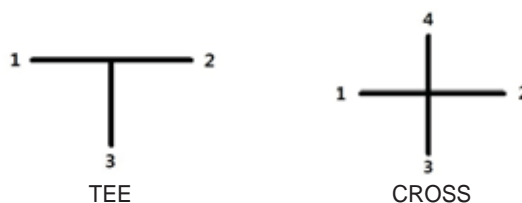
To order fitting without nut & sleeve, select part number, and add "body only" designator to the part number.

Examples: BU-04-**SS**, BU-04-**S4**, BU-04-**C**, and BU-04-**B**.

Table 10. Fitting Material Designator

Fitting Material	Stainless Steel				Carbon Steel			Brass
	SS316	SS316L	SS304	SS304L	Black Phosphate Plated Carbon Steel	White Zinc Plated Carbon Steel	Yellow Zinc Plated Carbon Steel	
Designator	SSA	SSLA	S4A	S4LA	CA	CWPA	CYPA	BA
Body only Designator	SS	SSL	S4	S4L	C	CWP	CYP	B

Tee and cross fittings



Tee fitting part number is described first by the run (1 and 2) and next by the branch (3).

Cross fitting part number is described first by the run (1 and 2) and next by the branch (3 and 4).

Example:

Union Tee with tube 4mm OD on port 1, 6mm OD on port 2, and 8mm OD on port 3: **BT-04-06-08-SSA**.

Fitting Assembly Instruction

Preparation of Tubes

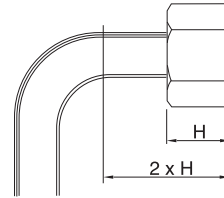
1. Use like tube and fitting material. The only exception is copper tubing on brass fitting.
2. Using sawing machine, saw off the tube-end at right angle. Tube cutter is not recommended.
3. Using de-burring tool, de-burr the inside and outside diameter of tube-end lightly.

Preparation of Fittings

1. Prior to assembly, lubricate the threads on nut & body, and sleeve.
2. Do not use grease for lubrication.

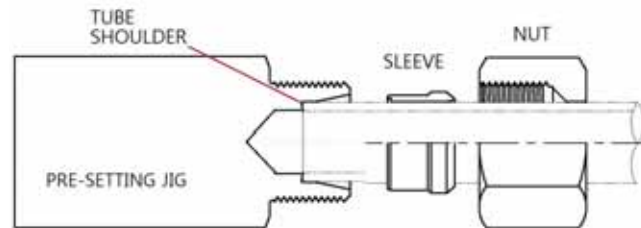
Bending of Tubes

1. Do not bend the tube in the fitting. Use the tube bender prior to assembly.
2. Keep the minimum straight length on tube in the fitting.
3. The minimum straight length is 2 times the nut's height.

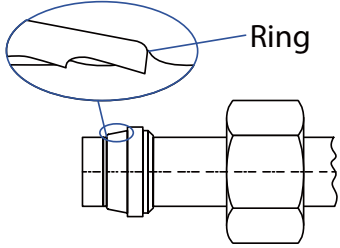
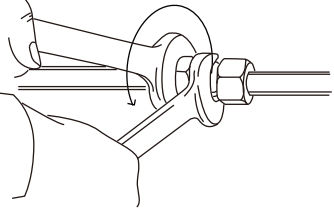


Fitting Pre-Assembly on Pre-Setting Jig

Fitting pre-assembly ensures the positive final assembly on fitting body.



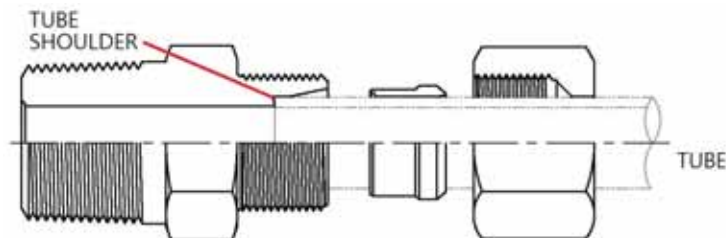
	<p>Step 1</p> <p>Place the pre-oiled nut and sleeve over the tube in the right direction,</p>
	<p>Step 2</p> <p>Place the Pre-Setting Jig in the vise and tighten the vise enough to hold the Pre-Setting Jig securely. Insert the tube end up to the tube shoulder in the Pre-Setting Jig. Hand-tighten the nut.</p>
	<p>Step 3</p> <p>Wrench- tighten the nut 1 1/2 turns beyond the hand-tighten position.</p>

	<p>Step 4</p> <p>Untighten the nut and take the pre-assembled tubing out from the pre-setting jig. Check out if a ring is formed up in front of sleeve around the tube OD.</p> <p>The visible ring in front of the sleeve is formed up due to the penetration of the sleeve into the tube wall. The ring stops the sleeve from moving axially but it may rotate.</p>
	<p>Step 5. Final assembly on fitting body</p> <p>Insert the pre-assembled tubing into fitting body until the tube end sits on tube shoulder and then hand-tighten the nut.</p> <p>Wrench-tighten the nut by holding up the fitting body with a second wrench until a noticeable increase in torque is felt. Beyond this point tighten the nut 1/4 turn for final assembly.</p> <p>Caution: Turn the nut, never turn the fitting body</p>

Caution:

If the pre-assembled tubing is difficult to remove from the Pre-Setting Jig, gently rock the tubing back and forth, Do not rotate the tubing.

Direct Assembly on fitting body



1. Place the pre-oiled nut and sleeve over the tube in the right direction.
2. Insert the tube end into the fitting body up to tube shoulder.
3. Hand-tighten the nut.
4. Wrench-tighten the nut 1 1/2 turns by holding the fitting body with a second wrench for final assembly.

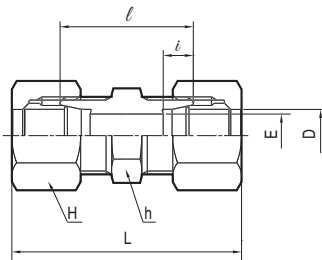
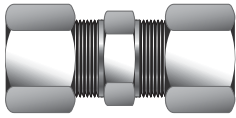
Caution: Turn the nut, never turn the fitting body.

Re-assembly

Fittings in service in the system may be dis-assembled for maintenance purpose.
To re-use the fitting back in the place, make sure that fitting components and tubing are clean and free of defects.

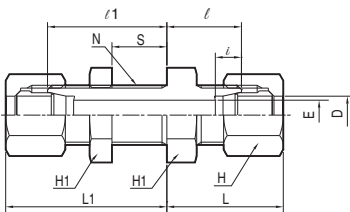
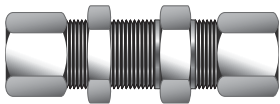
1. Lubricate the threads on nut & body, and sleeve.
2. Insert the tubing end with sleeve and nut up to the tube shoulder in the fitting.
3. Hand-tighten the nut.
4. Wrench-tighten the nut by holding up the fitting body with a second wrench until a noticeable increase in torque is felt.
5. Beyond this point tighten the nut 1/4 turn to complete the re-assembly.

Straight Union
BU



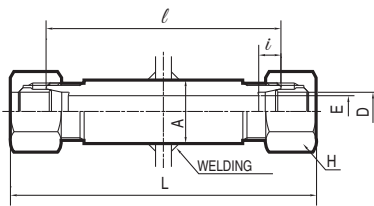
Part No.	Tube O.D. D		E	h	H	i	l	L
BU-04	4		2.5	12	12	6	20	35
BU-06	6		4	14	14	7	30	51
BU-08	8		6	17	17	7	31	52
BU-10	10		8	17	19	7	31	54
BU-12	12		10	19	22	7	31	54
BU-15	15		12	24	27	7.5	39	61
BU-16	16		13	27	30	7.5	36	61
BU-18	18		14	27	32	8	36	61
BU-20	20		17	30	36	8	38	63
BU-22	22		18	32	36	9	38	63
BU-25	25		20	36	41	10	38	66
BU-28	28		22	41	46	10	43	71
BU-30	30		25	41	46	10	43	72
BU-35	35		28	46	55	12	44	79
BU-38	38		32	50	60	12	46	85
BU-40	40		32	55	60	12	55	94
BU-42	42		34	55	60	12	55	94
BU-50	50		40	65	75	12	60	103
BU-6A	1/8	10.5	8	17	19	7	31	54
BU-8A	1/4	13.8	11	22	24	7.5	38	60
BU-10A	3/8	17.3	14	27	32	8	38	61
BU-15A	1/2	21.7	18	32	36	9	38	63
BU-20A	3/4	27.2	22	41	46	10	43	71
BU-25A	1	34.0	28	46	55	11	44	79
BU-32A	1 1/4	42.7	34	60	65	12	57	98

Bulkhead Union
BBU



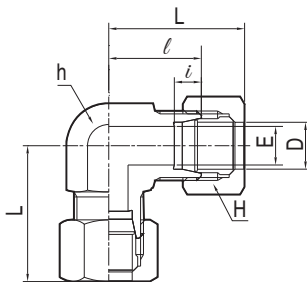
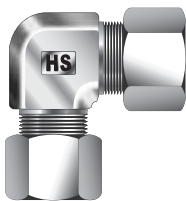
Part No.	Tube O.D. D	E	H	H1	i	l1	l	Approx.		N	Max. S	
								L1	L			
BBU-04	4	2.5	14	12	6	25	14	32.5	21.5	M10 x 1.25	13	
BBU-06	6	4	17	14	7	32	19	42.5	29.5	M12x1.5	13	
BBU-08	8	6	19	17	7	32	19	42.5	29.5	M14x1.5	13	
BBU-10	10	8	22	19	7	32	20	43.5	31.5	M16x1.5	13	
BBU-12	12	10	24	22	7	32	20	43.5	31.5	M18x1.5	13	
BBU-15	15	12	27	27	7.5	37	22	49.5	34.5	M22x1.5	15	
BBU-16	16	13	30	30	7.5	37	24	49.5	36.5	M24x1.5	15	
BBU-18	18	14	32	32	8	39	24	51.5	36.5	M26x1.5	15	
BBU-20	20	17	32	36	8	39	24	51.5	36.5	M28x1.5	15	
BBU-22	22	18	36	36	9	39	25	51.5	37.5	M30x1.5	15	
BBU-25	25	20	41	41	10	39	25	52.5	38.5	M35x1.5	15	
BBU-28	28	22	46	46	10	41	28	55	42	M38x1.5	15	
BBU-30	30	25	46	46	10	41	28	55.5	42.5	M40x1.5	15	
BBU-35	35	28	50	55	11	43	30	60.5	47.5	M45x1.5	15	
BBU-38	38	32	55	60	12	45	31	64.5	50.5	M48x1.5	15	
BBU-40	40	32	60	60	12	50	37	69.5	56.5	M52x2.0	15	
BBU-50	50	40	70	75	12	50	43	71.5	64.5	M64x2.0	15	
BBU-6A	1/8	10.5	8	22	19	7	32	20	43.5	31.5	M16x1.5	13
BBU-8A	1/4	13.8	11	27	24	7.5	37	22	49	34	M20x1.5	15
BBU-10A	3/8	17.3	14	32	32	8	39	24	51.5	36.5	M26x1.5	15
BBU-15A	1/2	21.7	18	36	36	9	39	25	51.5	37.5	M30x1.5	15
BBU-20A	3/4	27.2	22	46	46	10	41	28	55	42	M38x1.5	15
BBU-25A	1	34.0	28	50	55	11	43	30	60.5	47.5	M45x1.5	15
BBU-32A	1 1/4	42.7	34	65	65	12	50	40	70.5	59.5	M56x2.0	15
BBU-40A	1 1/2	48.6	40	70	75	12	50	43	71.5	64.5	M64x2.0	15

Welding Bulkhead Union
BBUW



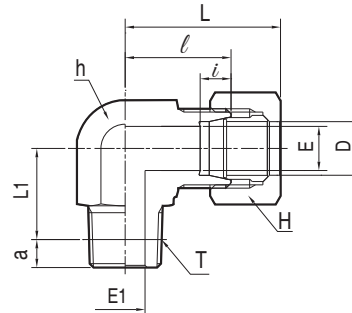
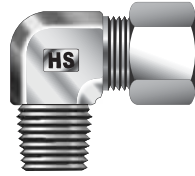
Part No.	Tube O.D. D		A	E	H	i	l	Approx. L
BBUW-06	6		16	4	14	7	74	95
BBUW-08	8		16	6	17	7	74	95
BBUW-10	10		19	8	19	7	74	97
BBUW-12	12		20	10	22	7	74	97
BBUW-15	15		26	12	27	7.5	78	103
BBUW-16	16		28	13	30	7.5	78	103
BBUW-18	18		28	14	32	8	78	103
BBUW-20	20		32	17	36	8	78	103
BBUW-22	22		32	18	36	9	78	103
BBUW-25	25		38	20	41	10	78	105
BBUW-28	28		39	22	46	10	82	110
BBUW-30	30		46	25	46	10	82	111
BBUW-35	35		46	28	55	11	82	117
BBUW-38	38		55	32	60	12	82	121
BBUW-40	40		55	32	60	12	90	129
BBUW-50	50		65	40	75	12	90	133
BBUW-6A	1/8	10.5	19	8	19	7	74	97
BBUW-8A	1/4	13.8	22	11	24	7.5	78	102
BBUW-10A	3/8	17.3	28	14	32	8	78	103
BBUW-15A	1/2	21.7	32	18	36	9	78	103
BBUW-20A	3/4	27.2	39	22	46	10	82	110
BBUW-25A	1	34.0	46	28	55	11	82	117
BBUW-32A	1 1/4	42.7	58	34	65	12	90	129
BBUW-40A	1 1/2	48.6	65	40	75	12	90	133

Union Elbow
BL



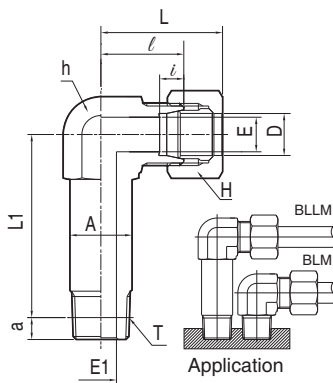
Part No.	Tube O.D. D		E	h	H	i	l	Approx. L
BL-06	6		4.0	14	14	7	20	30.5
BL-08	8		6.0	17	17	7	23	33.5
BL-10	10		8.0	17	19	7	23	34.5
BL-12	12		10.0	19	22	7	24	35.5
BL-15	15		12.0	24	27	7.5	29	41.5
BL-16	16		13.0	27	30	7.5	32	44.5
BL-18	18		14.0	27	32	8	32	44.5
BL-20	20		17.0	30	36	8	33	45.5
BL-22	22		18.0	32	36	9	34	46.5
BL-25	25		20.0	36	41	10	36	49.5
BL-28	28		22.0	41	46	10	41	55
BL-30	30		25.0	41	46	10	41	55.5
BL-35	35		28.0	46	55	11	46	63.5
BL-38	38		32.0	50	60	12	50	69.5
BL-40	40		32.0	55	60	12	55	74.5
BL-42	42		34.0	55	60	12	55	74.5
BL-50	50		40.0	65	75	12	62	83.5
BL-6A	1/8	10.5	8.0	17	19	7	23	34.5
BL-8A	1/4	13.8	11.0	22	24	7.5	28	40
BL-10A	3/8	17.3	14.0	27	32	8	32	44.5
BL-15A	1/2	21.7	18.0	32	36	9	34	46.5
BL-20A	3/4	27.2	22.0	41	46	10	41	55
BL-25A	1	34.0	28.0	46	55	11	46	63.5
BL-32A	1 1/4	42.7	34.0	60	65	12	57	77.5
BL-40A	1 1/2	48.6	40.0	65	75	12	62	83.5

Male ELBOW
BLM



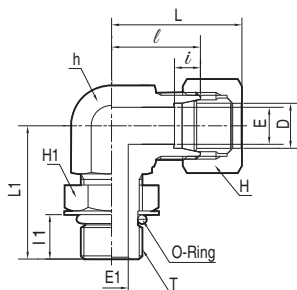
Part No.	Tube O.D. D		T (PT)	E	E1	Basic gauge length (a)	h	H	i	l	Approx.	
											L	L1
BLM04-01R	4		1/8	2.5	4	3.97	12	12	6	15	22.5	13.0
BLM06-01R	6		1/8	4	4	3.97	14	14	7	20	30.5	14.0
BLM06-02R	6		1/4	4	7	6.01	17	14	7	23	33.5	17.0
BLM08-01R	8		1/8	6	4	3.97	17	17	7	23	33.5	16.0
BLM08-02R	8		1/4	6	7	6.01	17	17	7	23	33.5	18.0
BLM10-02R	10		1/4	8	7	6.01	17	19	7	23	34.5	19.0
BLM10-03R	10		3/8	8	9	6.35	19	19	7	24	35.5	19.5
BLM10-04R	10		1/2	8	12	8.16	22	19	7	29	40.5	26.0
BLM12-02R	12		1/4	10	7	6.01	19	22	7	24	35.5	20.0
BLM12-03R	12		3/8	10	9	6.35	19	22	7	24	35.5	20.5
BLM12-04R	12		1/2	10	12	8.16	24	22	7	29	40.5	26.0
BLM15-03R	15		3/8	12	9	6.35	24	27	7.5	29	41.5	23.5
BLM15-04R	15		1/2	12	12	8.16	24	27	7.5	29	41.5	26.0
BLM16-03R	16		3/8	13	9	6.35	27	30	7.5	32	44.5	25.5
BLM16-04R	16		1/2	13	12	8.16	27	30	7.5	32	44.5	27.0
BLM18-03R	18		3/8	14	9	6.35	27	32	8	32	44.5	27.5
BLM18-04R	18		1/2	14	12	8.16	27	32	8	32	44.5	30.0
BLM20-04R	20		1/2	17	12	8.16	30	36	8	33	45.5	32.0
BLM20-06R	20		3/4	17	16	9.53	30	36	8	33	45.5	30.5
BLM22-04R	22		1/2	18	12	8.16	32	36	9	34	46.5	32.0
BLM22-06R	22		3/4	18	16	9.53	32	36	9	34	46.5	32.5
BLM25-06R	25		3/4	20	16	9.53	36	41	10	36	49.5	33.5
BLM25-08R	25		1	20	22	10.39	36	41	10	36	49.5	35.5
BLM28-06R	28		3/4	22	16	9.53	41	46	10	41	55.0	37.5
BLM28-08R	28		1	22	22	10.39	41	46	10	41	55.0	39.5
BLM30-08R	30		1	25	22	10.39	41	46	10	41	55.5	39.5
BLM30-10R	30		1 1/4	25	31	12.70	46	46	10	46	60.5	42.5
BLM35-10R	35		1 1/4	28	31	12.70	46	55	11	46	63.5	45.5
BLM38-12R	38		1 1/2	32	36	12.70	50	60	12	50	69.5	48.5
BLM40-12R	40		1 1/2	32	36	12.70	55	60	12	55	74.5	49.5
BLM42-12R	42		1 1/2	34	36	12.70	55	60	12	55	74.5	49.5
BLM50-16R	50		2	40	46	15.88	65	75	12	62	83.5	58.0
BLM6A-01R	1/8	10.5	1/8	8	4	3.97	17	19	7	23	34.5	17.0
BLM6A-02R	1/8	10.5	1/4	8	7	6.01	17	19	7	23	34.5	19.0
BLM8A-02R	1/4	13.8	1/4	11	7	6.01	22	24	7.5	28	40.0	22.0
BLM8A-03R	1/4	13.8	3/8	11	9	6.35	22	24	7.5	28	40.0	22.5
BLM10A-03R	3/8	17.3	3/8	14	9	6.35	27	32	8	32	44.5	27.5
BLM10A-04R	3/8	17.3	1/2	14	12	8.16	27	32	8	32	44.5	30.0
BLM15A-04R	1/2	21.7	1/2	18	12	8.16	32	36	9	34	46.5	32.0
BLM15A-06R	1/2	21.7	3/4	18	16	9.53	32	36	9	34	46.5	32.5
BLM20A-06R	3/4	27.2	3/4	22	16	9.53	41	46	10	41	55.0	37.5
BLM20A-08R	3/4	27.2	1	22	22	10.39	41	46	10	41	55.0	39.5
BLM25A-08R	1	34.0	1	28	22	10.39	46	55	11	46	63.5	44.5
BLM25A-10R	1	34.0	1 1/4	28	31	12.70	46	55	11	46	63.5	45.5
BLM32A-10R	1 1/4	42.7	1 1/4	34	31	12.70	60	65	12	57	77.5	51.5
BLM32A-12R	1 1/4	42.7	1 1/2	34	36	12.70	60	75	12	57	77.5	51.5
BLM40A-12R	1 1/2	48.6	1 1/2	40	36	12.70	65	75	12	62	83.5	57.5
BLM40A-16R	1 1/2	48.6	2	40.0	46	15.88	65	75	12	62	83.5	58.0

Long Male Elbow BLLM



Part No.	Tube O.D. D	T (PT)	E	E1	Basic gauge length (a)	h	H	i	l	A	Approx.	
											L	L1
BLLM 06-01R	6	1/8	4	4	3.97	14	14	7	20	12	30.5	36
BLLM 08-02R	8	1/4	6	7	6.01	17	17	7	23	16	33.5	43
BLLM 10-02R	10	1/4	8	7	6.01	17	19	7	23	16	34.5	46
BLLM 12-02R	12	1/4	10	7	6.01	19	22	7	24	18	35.5	52
BLLM 12-03R	12	3/8	10	9	6.35	19	22	7	24	18	35.5	53
BLLM 15-03R	15	3/8	12	9	6.35	24	27	7.5	29	23	41.5	61.5
BLLM 15-04R	15	1/2	12	12	8.16	24	27	7.5	29	23	41.5	67
BLLM 16-04R	16	1/2	13	12	8.16	27	30	7.5	32	24	44.5	70
BLLM 18-04R	18	1/2	14	12	8.16	27	32	8	32	26	44.5	77
BLLM 20-06R	20	3/4	17	16	9.53	30	36	8	33	28	45.5	82.5
BLLM 22-06R	22	3/4	18	16	9.53	32	36	9	34	30	46.5	83.5
BLLM 25-06R	25	3/4	20	16	9.53	36	41	10	36	35	49.5	90.5
BLLM 25-08R	25	1	20	22	10.39	36	41	10	36	35	49.9	91.5
BLLM 28-08R	28	1	22	22	10.39	41	46	10	41	40	55.0	104.5
BLLM 30-10R	30	1 1/4	25	31	12.70	46	46	10	46	44	60.5	104.5
BLLM 35-10R	35	1 1/4	28	31	12.70	46	55	11	46	44	63.5	121.5

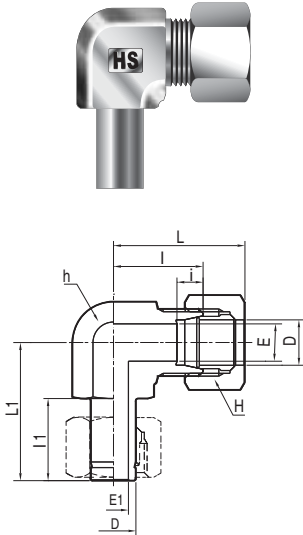
O-Seal Male Elbow BOLM



Part No.	Tube O.D. D	T (PF)	E	E1	h	H1	H	i	l	l1	O-Ring	L	L1
BOLM 08-02G	8	1/4	6	6	17	19	17	7	23	12	P11	33.5	34
BOLM 10-02G	10	1/4	8	6	17	19	19	7	23	12	P11	34.5	35
BOLM 12-02G	12	1/4	10	6	19	19	22	7	24	12	P11	35.5	36
BOLM 12-03G	12	3/8	10	9	19	22	22	7	24	12	P14	35.5	36
BOLM 12-04G	12	1/2	10	12	24	27	22	7	24	16	P18	35.5	46
BOLM 15-03G	15	3/8	12	9	24	22	27	7.5	29	12	P14	41.5	40
BOLM 15-04G	15	1/2	12	12	24	27	27	7.5	29	16	P18	41.5	46
BOLM 16-03G	16	3/8	13	9	24	22	27	7.5	32	12	P14	44.5	40
BOLM 16-04G	16	1/2	13	12	24	27	30	7.5	32	16	P18	44.5	46
BOLM 18-04G	18	1/2	14	12	30	27	32	8	32	16	P18	44.5	52
BOLM 20-06G	20	3/4	17	16	30	36	36	8	33	17	P24	45.5	52
BOLM 22-06G	22	3/4	18	16	32	36	36	9	34	17	P24	46.5	52
BOLM 25-06G	25	3/4	20	16	36	36	41	10	36	17	P24	49.5	60
BOLM 25-08G	25	1	20	22	36	41	41	10	36	21	P29	49.5	62
BOLM 28-08G	28	1	22	22	41	41	46	10	41	21	P29	55	62
BOLM 30-08G	30	1	25	22	41	41	46	10	41	21	P29	55.5	66
BOLM 30-10G	30	1 1/4	25	31	46	50	46	10	44	21	P38	58.5	66
BOLM 35-10G	35	1 1/4	28	31	46	50	55	11	46	21	P38	63.5	66
BOLM 38-12G	38	1 1/2	32	36	50	50	60	12	50	21	P44	69.5	73

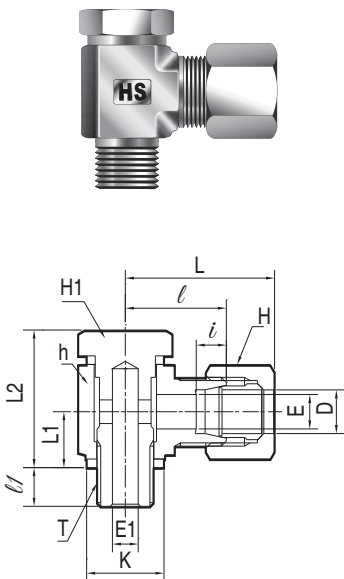
NBR O-Ring is included in the fitting supply.

Adjustable Elbow
BLA



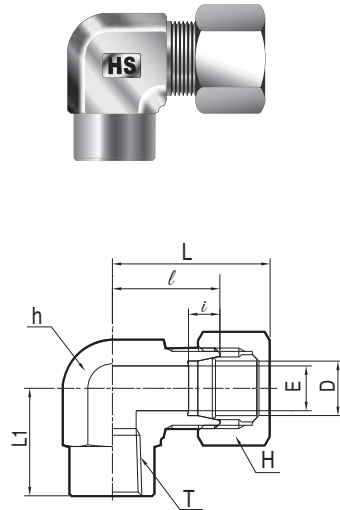
Part No.	Tube O.D. D	E	E1	h	H	i	l	l1	Approx.	
									L	L1
BLA-06	6	4	3	17	14	7	22	22	32.5	31
BLA-08	8	6	5	17	17	7	23	21	33.5	32
BLA-10	10	8	6	17	19	7	23	22	34.5	35
BLA-12	12	10	8	19	22	7	24	22.5	35.5	37
BLA-15	15	12	10	27	27	7.5	32	24.5	44.5	43
BLA-16	16	13	11	27	30	7.5	32	24.5	44.5	43
BLA-18	18	14	12	27	32	8	32	24.5	44.5	43
BLA-20	20	17	14	30	36	8	33	26	45.5	45
BLA-22	22	18	14	32	36	9	34	27	46.5	46
BLA-25	25	20	17	36	41	10	36	29.5	49.5	49
BLA-28	28	22	18	41	46	10	41	29.5	55	53
BLA-30	30	25	20	41	46	10	41	30.5	55.5	54
BLA-35	35	28	23	46	55	11	46	34	63.5	58
BLA-38	38	32	26	50	60	12	50	36	69.5	72

Stud Elbow
BSLM



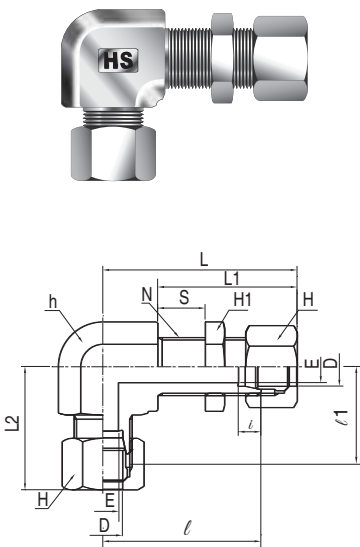
Part No.	Tube O.D. D	T (PF)	E	E1	h	H1	H	i	l	l1	K	Approx.			
												L	L1	L2	
BSLM 06- 01G	6	1/8	4	4	17	17	14	7	23	8	14	33.5	13	14	
BSLM 08-02G	8	1/4	6	7	22	22	17	7	25	12	18	35.5	16	17	
BSLM 10-02G	10	1/4	8	7	22	22	19	7	25	12	18	36.5	16	17	
BSLM 12-03G	12	3/8	10	9	27	27	22	7	29	12	21.5	40.5	19	22	
BSLM 15-04G	15	1/2	12	12	36	30	27	7.5	36	14	25.5	48.5	24	28	
BSLM 16-04G	16	1/2	13	12	36	30	30	7.5	36	14	25.5	48.5	24	28	
BSLM 18-04G	18	1/2	14	12	36	30	32	8	36	14	25.5	48.5	24	28	
BSLM 20-06G	20	3/4	17	16	41	41	36	8	38	16	31.5	50.5	28	32	
BSLM 22-06G	22	3/4	18	16	42	41	36	9	38	16	31.5	50.5	28	32	
BSLM 25-08G	25	1	20	22	50	50	41	10	42	18	38	55.5	37	38	
BSLM 28-08G	28	1	22	22	50	50	46	10	42	18	38	56.0	37	38	
BSLM 6A-02G	1/8	10.5	1/4	8	7	22	22	19	7	25	12	18	36.5	16	17
BSLM 8A-03G	1/4	13.8	3/8	11	9	27	27	24	7.5	29	12	21.5	41.0	19	22
BSLM10A-04G	3/8	17.3	1/2	14	12	36	30	32	8	36	14	21.5	48.5	24	28
BSLM15A-06G	1/2	21.7	3/4	18	16	41	41	36	9	38	16	31.5	50.5	28	32
BSLM20A-08G	3/4	27.2	1	22	22	50	50	46	10	42	18	38	56.0	37	38

Female Elbow
BLF



Part No.	Tube O.D. D	T (PT)	E	Width across flat		i	l	Approx.	
				h	H			L	L1
BLF 08 - 02R	8	1/4	6	19	17	7	24	34.5	24
BLF 10 - 02R	10	1/4	8	19	19	7	24	35.5	24
BLF 12 - 02R	12	1/4	10	19	22	7	24	35.5	24
BLF 12 - 03R	12	3/8	10	24	22	7	29	40.5	29
BLF 15 - 03R	15	3/8	12	24	27	7.5	29	41.5	29
BLF 15 - 04R	15	1/2	12	30	27	7.5	33	45.5	33
BLF 16 - 04R	16	1/2	13	30	30	7.5	33	45.5	33
BLF 18 - 04R	18	1/2	14	30	32	8	33	45.5	33
BLF 20 - 06R	20	3/4	17	36	36	8	36	48.5	36
BLF 22 - 06R	22	3/4	18	36	36	9	36	48.5	36
BLF 25 - 06R	25	3/4	20	36	41	10	36	49.5	36
BLF 25 - 08R	25	1	20	46	41	10	46	59.5	46
BLF 28 - 08R	28	1	22	46	46	10	46	60.0	46
BLF 30 - 10R	30	1 1/4	25	55	46	10	55	69.5	55
BLF 35 - 10R	35	1 1/4	28	55	55	11	55	72.5	55

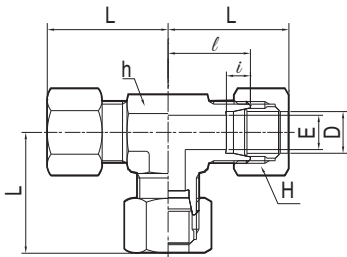
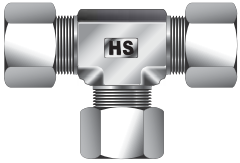
Bulkhead Union Elbow
BBL



Part No.	Tube O.D. D	E	h	H1	H	i	l1	l	Approx.			N	Max. S
									L1	L2	L		
BBL-06	6	4	17	17	14	7	23	45	42.5	33.5	55.5	M12x1.5	13
BBL-08	8	6	19	19	17	7	24	46	42.5	34.5	56.5	M14x1.5	13
BBL-10	10	8	22	22	19	7	26	48	43.5	37.5	59.5	M16x1.5	13
BBL-12	12	10	24	24	22	7	27	49	43.5	38.5	60.5	M18x1.5	13
BBL-15	15	12	27	27	27	7.5	31	57	49.5	43.5	69.5	M22x1.5	15
BBL-16	16	13	30	30	30	7.5	33	59	49.5	45.5	71.5	M24x1.5	15
BBL-18	18	14	32	32	32	8	33	63	51.5	45.5	75.5	M26x1.5	15
BBL-20	20	17	32	32	36	8	33	65	51.5	45.5	77.5	M28x1.5	15
BBL-22	22	18	36	36	36	9	36	65	51.5	48.5	77.5	M30x1.5	15
BBL-25	25	20	41	41	41	10	39	68	52.5	52.5	81.5	M35x1.5	15
BBL-28	28	22	41	46	46	10	41	70	55	55	84	M38x1.5	15
BBL-30	30	25	46	46	46	10	46	74	55.5	60.5	88.5	M40x1.5	15

Union Tee

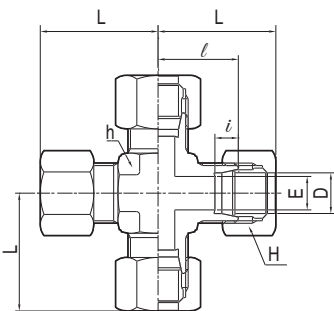
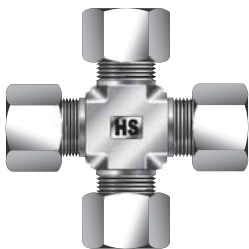
BT



Part No.	Tube O.D.		E	h	H	i	l	Approx. L
	D							
BT-04	4		2.5	12	12	6	15	22.5
BT-06	6		4.0	14	14	7	20	30.5
BT-08	8		6.0	17	17	7	23	33.5
BT-10	10		8.0	17	19	7	23	34.5
BT-12	12		10.0	19	22	7	24	35.5
BT-15	15		12.0	24	27	7.5	29	41.5
BT-16	16		13.0	27	30	7.5	32	44.5
BT-18	18		14.0	27	32	8	32	44.5
BT-20	20		17.0	30	36	8	33	45.5
BT-22	22		18.0	32	36	9	34	46.5
BT-25	25		20.0	36	41	9	36	49.5
BT-28	28		22.0	41	46	10	41	55.0
BT-30	30		25.0	41	46	10	41	55.5
BT-35	35		28.0	46	55	11	46	63.5
BT-38	38		32.0	50	60	11	50	69.5
BT-40	40		33.0	55	60	12	55	74.5
BT-42	42		34.0	55	60	12	55	74.5
BT-50	50		40.0	65	75	12	62	83.5
BT-6A	1/8	10.5	8.0	17	19	7	23	34.5
BT-8A	1/4	13.8	11.0	22	24	7.5	28	40.0
BT-10A	3/8	17.3	14.0	27	32	8	32	44.5
BT-15A	1/2	21.7	18.0	32	36	9	34	46.5
BT-20A	3/4	27.2	22.0	41	46	10	41	55.0
BT-25A	1	34.0	28.0	46	55	11	46	63.5
BT-32A	1 1/4	42.7	34.0	60	65	12	57	77.5
BT-40A	1 1/2	48.6	40.0	65	75	12	62	83.5

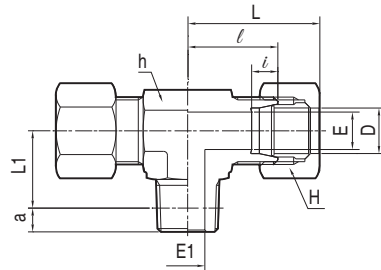
Union Cross

BC



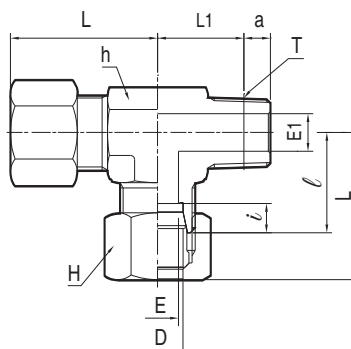
Part No.	Tube O.D.		E	Width across flat		i	l	Approx. L
	D			h	H			
BC-06	6		4	14	14	7	20	30.5
BC-08	8		6	17	17	7	23	33.5
BC-10	10		8	17	19	7	23	34.5
BC-12	12		10	19	22	7	24	35.5
BC-15	15		12	24	27	7.5	29	41.5
BC-16	16		13	27	30	7.5	32	44.5
BC-18	18		14	27	32	8	32	44.5
BC-20	20		17	30	36	8	33	45.5
BC-25	25		20	36	41	10	36	49.5
BC-30	30		25	41	46	10	41	55.5

Male Branch Tee
BBTM



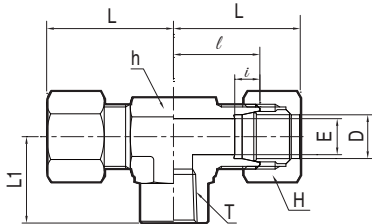
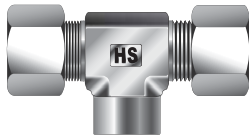
Part No.	Tube O.D.		T (PT)	E	E1	Basic gauge length (a)	h	H	i	l	Approx.	
	D										L	L1
BBTM 04 - 01R	4		1/8	2.5	4	3.97	12	12	6	15	22.5	13
BBTM 06 - 01R	6		1/8	4.0	4	3.97	14	14	7	20	30.5	14
BBTM 06 - 02R	6		1/4	4.0	7	6.01	17	14	7	23	33.5	17
BBTM 08 - 01R	8		1/8	6.0	4	3.97	17	17	7	23	33.5	16
BBTM 08 - 02R	8		1/4	6.0	7	6.01	17	17	7	23	33.5	18
BBTM 10 - 02R	10		1/4	8.0	7	6.01	17	19	7	23	34.5	19
BBTM 10 - 03R	10		3/8	8.0	9	6.35	19	19	7	24	35.5	19.5
BBTM 12 - 02R	12		1/4	10.0	7	6.01	19	22	7	24	35.5	18
BBTM 12 - 03R	12		3/8	10.0	9	6.35	19	22	7	24	35.5	20.5
BBTM 15 - 03R	15		3/8	12.0	9	6.35	24	27	7.5	29	41.5	23.5
BBTM 15 - 04R	15		1/2	12.0	12	8.16	24	27	7.5	29	41.5	26
BBTM 16 - 04R	16		1/2	13.0	12	8.16	27	30	7.5	32	44.5	27
BBTM 18 - 04R	18		1/2	14.0	12	8.16	27	32	8	32	44.5	30
BBTM 20 - 06R	20		3/4	17.0	16	9.53	30	36	8	33	45.5	30.5
BBTM 22 - 06R	22		3/4	18.0	16	9.53	32	36	9	34	46.5	32.5
BBTM 25 - 06R	25		3/4	20.0	16	9.53	36	41	10	36	49.5	33.5
BBTM 25 - 08R	25		1	20.0	22	10.39	36	41	10	36	49.5	35.5
BBTM 28 - 08R	28		1	22.0	22	10.39	41	46	10	41	55.0	39.5
BBTM 30 - 08R	30		1	25.0	22	10.39	41	46	10	41	55.5	39.5
BBTM 30 - 10R	30		1 1/4	25.0	31	12.70	46	46	10	46	60.5	42.5
BBTM 35 - 10R	35		1 1/4	28.0	31	12.70	46	55	11	46	63.5	45.5
BBTM 38 - 12R	38		1 1/2	32.0	36	12.70	50	60	12	50	69.5	48.5
BBTM 40 - 12R	40		1 1/2	32.0	36	12.70	55	60	12	55	74.5	49.5
BBTM 50 - 16R	50		2	40.0	46	15.88	65	75	12	62	83.5	58
BBTM 6A - 02R	1/8	10.5	1/4	8.0	7	6.01	17	19	7	23	34.5	19
BBTM 8A - 03R	1/4	13.8	3/8	11.0	9	6.35	22	24	7.5	28	40	22.5
BBTM 10A - 04R	3/8	17.3	1/2	14.0	12	8.16	27	32	8	32	44.5	30
BBTM 15A - 06R	1/2	21.7	3/4	18.0	16	9.53	32	36	9	24	46.5	32.5
BBTM 20A - 08R	3/4	27.2	1	22.0	22	10.39	41	46	10	41	55.0	39.5
BBTM 25A - 10R	1	34.0	1 1/4	28.0	31	12.70	46	55	11	46	63.5	45.5
BBTM 32A - 12R	1 1/4	42.7	1 1/2	34.0	36	12.70	60	65	12	57	77.5	51.5
BBTM 40A - 16R	1 1/2	48.6	2	40.0	46	15.88	65	75	12	62	83.5	58

Male Run Tee
BRTM



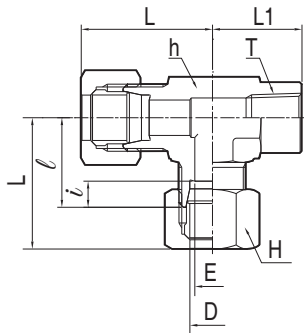
Part No.	Tube O.D.		T (PT)	E	E1	Basic gauge length (a)	h	H	i	l	Approx.	
	D										L	L1
BRTM 04 - 01R	4		1/8	2.5	4	3.97	12	12	6	15	22.5	13
BRTM 06 - 01R	6		1/8	4.0	4	3.97	14	14	7	20	30.5	14
BRTM 06 - 02R	6		1/4	4.0	7	6.01	17	14	7	23	33.5	17
BRTM 08 - 01R	8		1/8	6.0	4	3.97	17	17	7	23	33.5	16
BRTM 08 - 02R	8		1/4	6.0	7	6.01	17	17	7	23	33.5	18
BRTM 10 - 02R	10		1/4	8.0	7	6.01	17	19	7	23	34.5	19
BRTM 10 - 03R	10		3/8	8.0	9	6.35	19	19	7	24	35.5	19.5
BRTM 12 - 02R	12		1/4	10.0	7	6.01	19	22	7	24	35.5	18
BRTM 12 - 03R	12		3/8	10.0	9	6.35	19	22	7	24	35.5	20.5
BRTM 15 - 03R	15		3/8	12.0	9	6.35	24	27	7.5	29	41.5	23.5
BRTM 15 - 04R	15		1/2	12.0	12	8.16	24	27	7.5	29	41.5	26
BRTM 16 - 04R	16		1/2	13.0	12	8.16	27	30	7.2	32	44.5	27
BRTM 18 - 04R	18		1/2	14.0	12	8.16	27	32	8	32	44.5	30
BRTM 20 - 06R	20		3/4	17.0	16	9.53	30	36	8	33	45.5	30.5
BRTM 22 - 06R	22		3/4	18.0	16	9.53	32	36	9	34	46.5	32.5
BRTM 25 - 06R	25		3/4	20.0	16	9.53	36	41	10	36	49.5	33.5
BRTM 25 - 08R	25		1	20.0	22	10.39	36	41	10	36	49.5	35.5
BRTM 28 - 08R	28		1	22.0	22	10.39	41	46	10	41	55.0	39.5
BRTM 30 - 08R	30		1	25.0	22	10.39	41	46	10	41	55.5	39.5
BRTM 30 - 10R	30		1 1/4	25.0	31	12.70	46	46	10	46	60.5	42.5
BRTM 35 - 10R	35		1 1/4	28.0	31	12.70	46	55	11	46	63.5	45.5
BRTM 38 - 12R	38		1 1/2	32.0	36	12.70	50	60	12	50	69.5	48.5
BRTM 40 - 12R	40		1 1/2	32.0	36	12.70	55	60	12	55	74.5	49.5
BRTM 50 - 16R	50		2	40.0	46	15.88	65	75	12	62	83.5	58
BRTM 6A - 02R	1/8	10.5	1/4	8.0	7	6.01	17	19	7	23	34.5	19
BRTM 8A - 03R	1/4	13.8	3/8	11.0	9	6.35	22	24	7.5	28	40	22.5
BRTM 10A - 04R	3/8	17.3	1/2	14.0	12	8.16	27	32	8	32	44.5	30
BRTM 15A - 06R	1/2	21.7	3/4	18.0	16	9.53	32	36	9	24	46.5	32.5
BRTM 20A - 08R	3/4	27.2	1	22.0	22	10.39	41	46	10	41	55.0	39.5
BRTM 25A - 10R	1	34.0	1 1/4	28.0	31	12.70	46	55	11	46	63.5	45.5
BRTM 32A - 12R	1 1/4	42.7	1 1/2	34.0	36	12.70	60	65	12	57	77.5	51.5
BRTM 40A - 16R	1 1/2	48.6	2	40.0	46	15.88	65	70	12	62	83.5	58

Female Branch Tee
BBTF



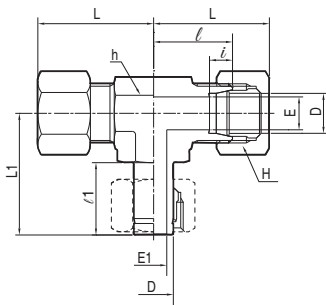
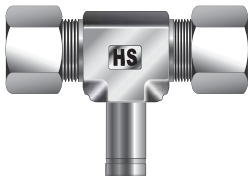
Part No.	Tube O.D. D	T (PT)	E	h	H	i	l	Approx.	
								L	L1
BBTF08-02R	8	1/4	6	19	17	7	24	34.5	24
BBTF10-02R	10	1/4	8	19	19	7	24	35.5	24
BBTF12-02R	12	1/4	10	19	22	7	24	35.5	24
BBTF12-03R	12	3/8	10	24	22	7	29	40.5	29
BBTF15-03R	15	3/8	12	24	27	7.5	29	41.5	29
BBTF15-04R	15	1/2	12	30	27	7.5	33	45.5	33
BBTF16-04R	16	1/2	13	30	30	7.5	33	45.5	33
BBTF18-04R	18	1/2	14	30	32	8	33	45.5	33
BBTF20-06R	20	3/4	17	36	36	8	36	48.5	36
BBTF22-06R	22	3/4	18	36	36	9	36	48.5	36
BBTF25-06R	25	3/4	20	36	41	10	36	49.5	36
BBTF25-08R	25	1	20	46	41	10	46	59.5	46
BBTF28-08R	28	1	22	46	46	10	46	60.0	46
BBTF30-08R	30	1	25	46	46	10	46	60.5	46
BBTF30-10R	30	1 1/4	25	55	46	10	55	69.5	55
BBTF35-10R	35	1 1/4	28	55	55	11	55	72.5	55
BBTF6A-02R	1/8	10.5	1/4	8	19	7	24	35.5	24
BBTF8A-03R	1/4	13.8	3/8	11	24	7.5	29	41.0	29
BBTF10A-04R	3/8	17.3	1/2	14	30	8	33	45.5	33
BBTF15A-06R	1/2	21.7	3/4	18	36	9	36	48.5	36
BBTF20A-08R	3/4	27.2	1	22	46	10	46	60.0	46
BBTF25A-10R	1	34.0	1 1/4	28	55	11	55	72.5	55

Female Run Tee
BRTF



Part No.	Tube O.D. D	T (PT)	E	h	H	i	l	Approx.	
								L	L1
BRTF 08 - 02R	8	1/4	6	19	17	7	24	34.5	24
BRTF 10 - 02R	10	1/4	8	19	19	7	24	35.5	24
BRTF 12 - 02R	12	1/4	10	19	22	7	24	35.5	24
BRTF 12 - 03R	12	3/8	10	24	22	7	29	40.5	29
BRTF 15 - 03R	15	3/8	12	24	27	7.5	29	41.5	29
BRTF 15 - 04R	15	1/2	12	30	27	7.5	33	45.5	33
BRTF 16 - 04R	16	1/2	13	30	30	7.5	33	45.5	33
BRTF 18 - 04R	18	1/2	14	30	32	8	33	45.5	33
BRTF 20 - 06R	20	3/4	17	36	36	8	36	48.5	36
BRTF 22 - 06R	22	3/4	18	36	36	9	36	48.5	36
BRTF 25 - 06R	25	3/4	20	36	41	10	36	49.5	36
BRTF 25 - 08R	25	1	20	46	41	10	46	59.5	46
BRTF 28 - 08R	28	1	22	46	46	10	46	60	46
BRTF 30 - 08R	30	1	25	46	46	10	46	60.5	46
BRTF 30 - 10R	30	1 1/4	25	55	46	10	55	69.5	55
BRTF 35 - 10R	35	1 1/4	28	55	55	11	55	72.5	55
BRTF 6A - 02R	1/8	10.5	1/4	8	19	7	24	35.5	24
BRTF 8A - 03R	1/4	13.8	3/8	11	24	7.5	29	41	29
BRTF 10A - 04R	3/8	17.3	1/2	14	30	8	33	45.5	33
BRTF 15A - 06R	1/2	21.7	3/4	18	36	9	36	48.5	36
BRTF 20A - 08R	3/4	27.2	1	22	46	10	46	60	46
BBTF 25A - 10R	1	34.0	1 1/4	28	55	11	55	72.5	55

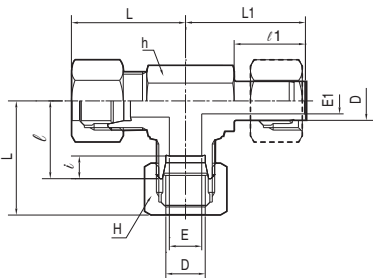
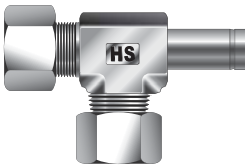
Adjustable Branch Tee
BBTA



Part No.	Tube O.D. D	E	E1	h	H	i	l	l1	Approx.	
									L	L1
BBTA-10	10	8	6	17	19	7	23	22	34.5	35
BBTA-12	12	10	8	19	22	7	24	22.5	35.5	37
BBTA-15	15	12	10	27	27	7.5	32	24.5	44.5	43
BBTA-16	16	13	11	27	30	7.5	32	24.5	44.5	43
BBTA-18	18	14	12	27	32	8	32	24.5	44.5	43
BBTA-20	20	17	14	32	36	8	33	26	45.5	45
BBTA-22	22	18	14	32	36	9	34	27	46.5	46
BBTA-25	25	20	17	41	41	10	41	29.5	54.5	50.5

Nut and Sleeve on tube adapter are not included in the fitting supply.

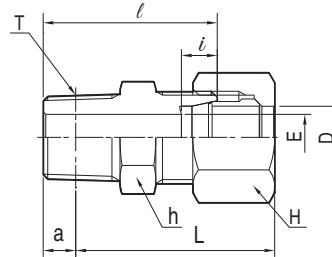
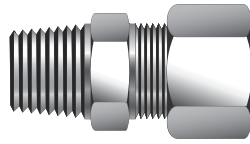
Adjustable Run Tee
BRTA



Part No.	Tube O.D. D	E	E1	h	H	i	l	l1	Approx.	
									L	L1
BRTA-10	10	8	6	17	19	7	23	22	34.5	35
BRTA-12	12	10	8	19	22	7	24	22.5	35.5	37
BRTA-15	15	12	10	27	27	7.5	32	24.5	44.5	43
BRTA-16	16	13	11	27	30	7.5	32	24.5	44.5	43
BRTA-18	18	14	12	27	32	8	32	24.5	44.5	43
BRTA-20	20	17	14	32	36	8	33	26	45.5	45
BRTA-22	22	18	14	32	36	9	34	27	46.5	46
BRTA-25	25	20	17	41	41	10	41	29.5	54.5	50.5

Nut and Sleeve on tube adapter are not included in the fitting supply.

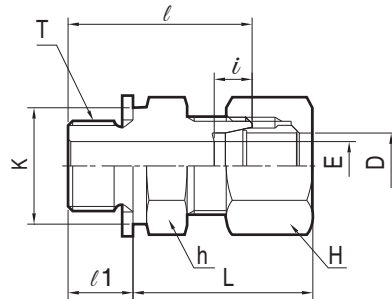
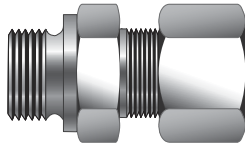
Male Connector
BMC



Part No.	Tube O.D. D		T (PT)	E	Basic gauge length (a)	h	H	i	l	Approx L
BMC 04 - 01R	4		1/8	2.5	3.97	12	12	6	22	25.5
BMC 06 - 01R	6		1/8	4	3.97	14	14	7	28	34.5
BMC 06 - 02R	6		1/4	4	6.01	17	14	7	33	37.5
BMC 08 - 01R	8		1/8	4	3.97	17	17	7	29	35.5
BMC 08 - 02R	8		1/4	6	6.01	17	17	7	33	37.5
BMC 10 - 02R	10		1/4	7	6.01	17	19	7	33	38.5
BMC 10 - 03R	10		3/8	8	6.35	19	19	7	34	39
BMC 10 - 04R	10		1/2	8	8.16	22	19	7	39	42.5
BMC 12 - 02R	12		1/4	7	6.01	19	22	7	33	38.5
BMC 12 - 03R	12		3/8	9	6.35	19	22	7	34	39
BMC 12 - 04R	12		1/2	10	8.16	24	22	7	39	42.5
BMC 15 - 03R	15		3/8	9	6.35	24	27	7.5	37	43
BMC 15 - 04R	15		1/2	12	8.16	24	27	7.5	41	45.5
BMC 16 - 03R	16		3/8	9	6.35	27	30	7.5	37	43
BMC 16 - 04R	16		1/2	12	8.16	27	30	7.5	41	45.5
BMC 18 - 03R	18		3/8	9	6.35	27	32	8	37	43
BMC 18 - 04R	18		1/2	12	8.16	27	32	8	41	45.5
BMC 20 - 04R	20		1/2	12	8.16	30	36	8	43	47.5
BMC 20 - 06R	20		3/4	16	9.53	30	36	8	45	48
BMC 22 - 04R	22		1/2	12	8.16	32	36	9	43	47.5
BMC 22 - 06R	22		3/4	16	9.53	32	36	9	45	48
BMC 25 - 06R	25		3/4	16	9.53	36	41	10	46	50
BMC 25 - 08R	25		1	20	10.39	36	41	10	49	52.0
BMC 28 - 06R	28		3/4	16	9.53	41	46	10	48	52.5
BMC 28 - 08R	28		1	22	10.39	41	46	10	51	54.5
BMC 30 - 08R	30		1	22	10.39	41	46	10	51	55
BMC 30 - 10R	30		1 1/4	25	12.70	46	46	10	55	57
BMC 35 - 10R	35		1 1/4	28	12.70	46	55	11	55	60
BMC 38 - 12R	38		1 1/2	32	12.70	50	60	12	57	64
BMC 40 - 12R	40		1 1/2	32	12.70	55	60	12	62	69
BMC 42 - 12R	42		1 1/2	34	12.70	55	60	12	62	69
BMC 50 - 16R	50		2	40	15.88	65	75	12	71	76.5
BMC 6A - 01R	1/8	10.5	1/8	4	3.97	17	19	7	29	36.5
BMC 6A - 02R	1/8	10.5	1/4	7	6.01	17	19	7	33	38.5
BMC 8A - 02R	1/4	13.8	1/4	7	6.01	22	24	7.5	36	42
BMC 8A - 03R	1/4	13.8	3/8	9	6.35	22	24	7.5	37	42.5
BMC 10A - 03R	3/8	17.3	3/8	9	6.35	27	32	8	37	43
BMC 10A - 04R	3/8	17.3	1/2	12	8.16	27	32	8	41	45.5
BMC 15A - 04R	1/2	21.7	1/2	12	8.16	32	36	9	43	47.5
BMC 15A - 06R	1/2	21.7	3/4	16	9.53	32	36	9	45	48
BMC 20A - 06R	3/4	27.2	3/4	16	9.53	41	46	10	48	52.5
BMC 20A - 08R	3/4	27.2	1	22	10.39	41	46	10	51	54.5
BMC 25A - 08R	1	34.0	1	22	10.39	46	55	11	52	59
BMC 25A - 10R	1	34.0	1 1/4	28	12.70	46	55	11	55	60
BMC 32A - 10R	1 1/4	42.7	1 1/4	31	12.70	60	65	12	64	71
BMC 32A - 12R	1 1/4	42.7	1 1/2	34	12.70	60	65	12	64	71
BMC 40A - 12R	1 1/2	48.6	1 1/2	36	12.70	65	75	12	67	76
BMC 40A - 16R	1 1/2	48.6	2	40	15.88	65	75	12	71	76.5

Male Connector (For Copper Gasket)

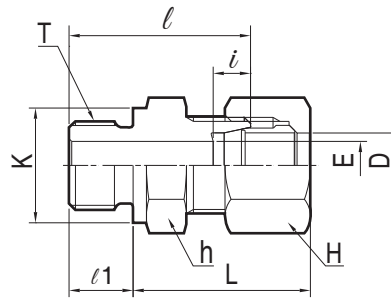
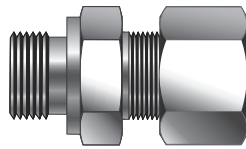
BMC-G



Part No.	Tube O.D. D		T (PF)	E	h	H	K	i	l1	l	Approx L
BMC 04 – 01G	4		1/8	2.5	14	12	14	6	8	23	22.5
BMC 06 – 01G	6		1/8	4	14	14	14	7	8	28	30.5
BMC 06 – 02G	6		1/4	4	19	14	18	7	12	33	31.5
BMC 08 – 01G	8		1/8	4	17	17	14	7	8	28	30.5
BMC 08 – 02G	8		1/4	6	19	17	18	7	12	33	31.5
BMC 10 – 02G	10		1/4	6	19	19	18	7	12	33	32.5
BMC 10 – 03G	10		3/8	8	22	19	21.5	7	12	34	33.5
BMC 12 – 02G	12		1/4	6	19	22	18	7	12	33	32.5
BMC 12 – 03G	12		3/8	8	22	22	21.5	7	12	34	33.5
BMC 12 – 04G	12		1/2	10	27	22	25.5	7	14	39	36.5
BMC 15 – 03G	15		3/8	8	24	27	21.5	7.5	12	37	37.5
BMC 15 – 04G	15		1/2	12	27	27	25.5	7.5	14	41	39.5
BMC 16 – 04G	16		1/2	12	27	30	25.5	7.5	14	41	39.5
BMC 18 – 04G	18		1/2	12	27	32	25.5	8	14	41	39.5
BMC 20 – 06G	20		3/4	16	32	36	31.5	8	16	46	42.5
BMC 22 – 04G	22		1/2	12	32	36	25.5	9	14	43	41.5
BMC 22 – 06G	22		3/4	16	32	36	31.5	9	16	46	42.5
BMC 25 – 06G	25		3/4	16	36	41	31.5	10	16	46	43.5
BMC 25 – 08G	25		1	20	41	41	38	10	18	50	45.5
BMC 28 – 08G	28		1	22	41	46	38	10	18	52	48.0
BMC 30 – 08G	30		1	22	41	46	38	10	18	52	48.5
BMC 30 – 10G	30		1 1/4	25	50	46	48.5	10	20	57	51.5
BMC 35 – 10G	35		1 1/4	28	50	55	48.5	11	20	57	54.5
BMC 38 – 12G	38		1 1/2	32	55	60	53.5	12	21	58	56.5
BMC 40 – 12G	40		1 1/2	32	55	60	53.5	12	21	62	60.5
BMC 42 – 12G	42		1 1/2	34	55	60	53.5	12	21	62	60.5
BMC 50 – 16G	50		2	40	70	75	66	12	25	73	69.5
BMC 6A – 01G	1/8	10.5	1/8	4	17	19	14	7	8	29	32.5
BMC 6A – 02G	1/8	10.5	1/4	6	19	19	18	7	12	33	32.5
BMC 8A – 02G	1/4	13.8	1/4	6	22	24	18	7.5	12	36	36
BMC 8A – 03G	1/4	13.8	3/8	8	22	24	21.5	7.5	12	36	36
BMC 10A – 03G	3/8	17.3	3/8	8	27	32	21.5	8	12	38	38.5
BMC 10A – 04G	3/8	17.3	1/2	12	27	32	25.5	8	14	41	39.5
BMC 15A – 04G	1/2	21.7	1/2	12	32	36	25.5	9	14	43	41.5
BMC 15A – 06G	1/2	21.7	3/4	16	32	36	31.5	9	16	46	42.5
BMC 20A – 06G	3/4	27.2	3/4	16	41	46	31.5	10	16	50	48
BMC 20A – 08G	3/4	27.2	1	22	41	46	38	10	18	52	48
BMC 25A – 08G	1	34.0	1	22	46	55	38	11	18	54	53.5
BMC 25A – 10G	1	34.0	1 1/4	28	50	55	48.5	11	20	57	54.5
BMC 32A – 10G	1 1/4	42.7	1 1/4	31	60	65	48.5	12	20	63	63.5
BMC 32A – 12G	1 1/4	42.7	1 1/2	34	60	65	53.5	12	21	64	63.5
BMC 40A – 12G	1 1/2	48.6	1 1/2	36	65	75	53.5	12	21	65	65.5
BMC 40A – 16G	1 1/2	48.6	2	40	70	75	66	12	25	73	69.5

To order copper gasket, refer to page 36.

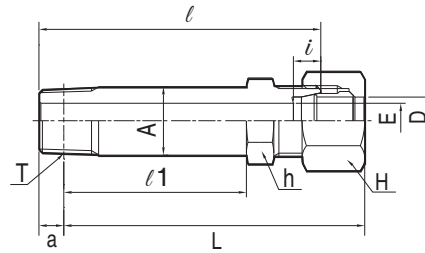
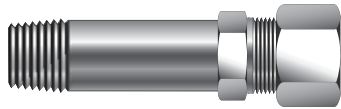
Male Connector (For O-Seal)
BOM-G



Part No.	Tube O.D. D		T (PF)	E	h	H	K	i	l1	l	Approx L
BOM 04 – 01G	4		1/8	2.5	14	12	14	6	8	23	22.5
BOM 06 – 01G	6		1/8	4	14	14	14	7	8	28	30.5
BOM 06 – 02G	6		1/4	4	19	14	19	7	12	33	31.5
BOM 08 – 01G	8		1/8	4	17	17	14	7	8	28	30.5
BOM 08 – 02G	8		1/4	6	19	17	19	7	12	33	31.5
BOM 10 – 02G	10		1/4	6	19	19	19	7	12	33	32.5
BOM 10 – 03G	10		3/8	8	22	19	22	7	12	34	33.5
BOM 12 – 02G	12		1/4	6	19	22	19	7	12	33	32.5
BOM 12 – 03G	12		3/8	8	22	22	22	7	12	34	33.5
BOM 12 – 04G	12		1/2	10	27	22	27	7	14	39	36.5
BOM 15 – 03G	15		3/8	8	24	27	22	7.5	12	37	37.5
BOM 15 – 04G	15		1/2	12	27	27	27	7.5	14	41	39.5
BOM 16 – 04G	16		1/2	12	27	30	27	7.5	14	41	39.5
BOM 18 – 04G	18		1/2	12	27	32	27	8	14	41	39.5
BOM 20 – 06G	20		3/4	16	36	36	36	8	16	46	42.5
BOM 22 – 04G	22		1/2	12	32	36	27	9	14	43	41.5
BOM 22 – 06G	22		3/4	16	36	36	36	9	16	46	42.5
BOM 25 – 06G	25		3/4	16	36	41	36	10	16	46	43.5
BOM 25 – 08G	25		1	20	41	41	41	10	18	50	45.5
BOM 28 – 08G	28		1	22	41	46	41	10	18	52	48.0
BOM 30 – 08G	30		1	22	41	46	41	10	18	52	48.5
BOM 30 – 10G	30		1 1/4	25	50	46	50	10	20	57	51.5
BOM 35 – 10G	35		1 1/4	28	50	55	50	11	20	57	54.5
BOM 38 – 12G	38		1 1/2	32	55	60	55	12	21	58	56.5
BOM 40 – 12G	40		1 1/2	32	55	60	55	12	21	62	60.5
BOM 42 – 12G	42		1 1/2	34	55	60	55	12	21	62	60.5
BOM 50 – 16G	50		2	40	70	75	75	12	25	73	69.5
BOM 6A – 01G	1/8	10.5	1/8	4	17	14	14	7	8	29	32.5
BOM 6A – 02G	1/8	10.5	1/4	6	19	19	19	7	12	33	32.5
BOM 8A – 02G	1/4	13.8	1/4	6	22	24	29	7.5	12	36	36
BOM 8A - 03G	1/4	13.8	3/8	8	22	24	22	7.5	12	36	36
BOM 10A – 03G	3/8	17.3	3/8	8	27	32	22	8	12	38	38.5
BOM 10A – 04G	3/8	17.3	1/2	12	27	32	27	8	14	41	39.5
BOM 15A – 04G	1/2	21.7	1/2	12	32	36	27	9	14	43	41.5
BOM 15A – 06G	1/2	21.7	3/4	16	36	36	36	9	16	46	42.5
BOM 20A – 06G	3/4	27.2	3/4	16	41	46	36	10	16	50	48
BOM 20A – 08G	3/4	27.2	1	22	41	46	41	10	18	52	48
BOM 25A – 08G	1	34.0	1	22	46	55	41	11	18	54	53.5
BOM 25A – 10G	1	34.0	1 1/4	28	50	55	50	11	20	57	54.5
BOM 32A – 10G	1 1/4	42.7	1 1/4	31	60	65	50	12	20	63	63.5
BOM 32A – 12G	1 1/4	42.7	1 1/2	34	60	65	55	12	21	64	63.5
BOM 40A – 12G	1 1/2	48.6	1 1/2	36	65	75	55	12	21	65	65.5
BOM 40A – 16G	1 1/2	48.6	2	40	75	75	75	12	25	73	69.5

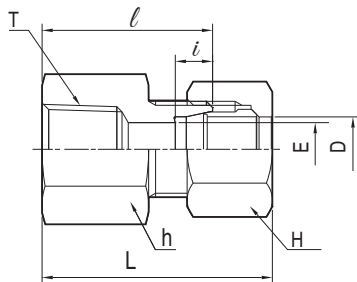
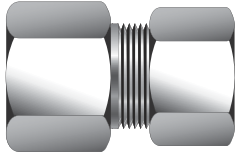
O-Ring is not included in the fitting supply.

Long Male Connector
BLMC



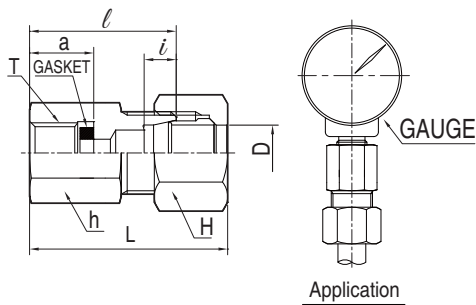
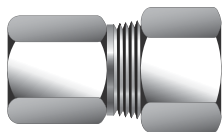
Part No.	Tube O.D. D		T (PT)	E	Basic gauge length (a)	h	H	A	i	l	l1	Approx L
BLMC 04 - 01R	4		1/8	2.5	3.97	12	12	10.5	6	46	30	49.5
BLMC 06 - 01R	6		1/8	4	3.97	14	14	10.5	7	63	41	69.5
BLMC 08 - 02R	8		1/4	6	6.01	17	17	14	7	70	45	74.5
BLMC 10 - 02R	10		1/4	7	6.01	17	19	14	7	71	46	76.5
BLMC 10 - 03R	10		3/8	8	6.35	19	19	17.5	7	72	46.5	77
BLMC 12 - 02R	12		1/4	7	6.01	19	22	14	7	71	46	76.5
BLMC 12 - 03R	12		3/8	9	6.35	19	22	17.5	7	72	46.5	77
BLMC 15 - 03R	15		3/8	9	6.35	24	27	17.5	7.5	81	52.5	87
BLMC 15 - 04R	15		1/2	12	8.16	24	27	22	7.5	86	56	90.5
BLMC 16 - 04R	16		1/2	12	8.16	27	30	22	7.5	86	56	90.5
BLMC 18 - 04R	18		1/2	12	8.16	27	32	22	8	86	56	90.5
BLMC 20 - 06R	20		3/4	16	9.53	30	36	27.5	8	92	58.5	95
BLMC 22 - 06R	22		3/4	16	9.53	32	36	27.5	9	93	59.5	96
BLMC 25 - 08R	25		1	20	10.39	36	41	34	10	99	63.5	102
BLMC 28 - 08R	28		1	22	10.39	41	46	34	10	104	66.5	107.5
BLMC 30 - 10R	30		1 1/4	25	12.70	46	46	42.5	10	109	68.5	111
BLMC 35 - 10R	35		1 1/4	28	12.70	46	55	42.5	11	113	72.5	112
BLMC 6A - 02R	1/8	10.5	1/4	7	6.01	17	19	14	7	71	46	76.5
BLMC 8A - 03R	1/4	13.8	3/8	9	6.35	22	24	17.5	7.5	81	52.5	86.5
BLMC 10A - 03R	3/8	17.3	3/8	9	6.35	27	32	17.5	8	81	52.5	87
BLMC 10A - 04R	3/8	17.3	1/2	12	8.16	27	32	22	8	86	56	90.5
BLMC 15A - 06R	1/2	21.7	3/4	16	9.53	32	36	27.5	9	93	59.5	96
BLMC 20A - 08R	3/4	27.2	1	22	10.39	41	46	34	10	104	66.5	107.5

Female Connector BFC



Part No.	Tube O.D. D	T (PT)	E	h	H	i	l	Approx. L	
BFC 06 - 01R	6	1/8	4	17	14	7	25	35.5	
BFC 08 - 02R	8	1/4	6	19	17	7	30	40.5	
BFC 10 - 02R	10	1/4	8	19	19	7	30	41.5	
BFC 10 - 03R	10	3/8	8	24	19	7	32	43.5	
BFC 12 - 02R	12	1/4	10	19	22	7	30	41.5	
BFC 12 - 03R	12	3/8	10	24	22	7	32	43.5	
BFC 15 - 03R	15	3/8	12	24	27	7.5	34	46.5	
BFC 15 - 04R	15	1/2	12	30	27	7.5	39	51.5	
BFC 16 - 04R	16	1/2	13	30	30	7.5	39	51.5	
BFC 18 - 04R	18	1/2	14	30	32	8	39	51.5	
BFC 20 - 06R	20	3/4	17	36	36	8	41	53.5	
BFC 22 - 06R	22	3/4	18	36	36	9	41	53.5	
BFC 25 - 06R	25	3/4	20	36	41	10	41	54.5	
BFC 25 - 08R	25	1	20	46	41	10	45	58.5	
BFC 28 - 08R	28	1	22	46	46	10	47	61	
BFC 30 - 08R	30	1	25	46	46	10	47	61.5	
BFC 30 - 10R	30	1 1/4	25	55	46	10	51	65.5	
BFC 35 - 10R	35	1 1/4	28	55	55	11	51	68.5	
BFC 38 - 12R	38	1 1/2	32	65	60	12	51	70.5	
BFC 40 - 12R	40	1 1/2	32	65	60	12	55	74.5	
BFC 42 - 12R	42	1 1/2	34	65	60	12	55	74.5	
BFC 50 - 16R	50	2	40	80	75	12	60	81.5	
BFC 6A - 02R	1/8	10.5	1/4	8	19	19	7	30	41.5
BFC 8A - 03R	1/4	13.8	3/8	11	24	24	7.5	34	46
BFC 10A - 04R	3/8	17.3	1/2	14	30	32	8	39	51.5
BFC 15A - 06R	1/2	21.7	3/4	18	36	36	9	41	53.5
BFC 20A - 08R	3/4	27.2	1	22	46	46	10	47	61
BFC 25A - 10R	1	34.0	1 1/4	28	55	55	11	51	68.5
BFC 32A - 12R	1 1/4	42.7	1 1/2	34	65	65	12	55	78.5
BFC 40A - 16R	1 1/2	48.6	2	40	80	75	12	60	81.5

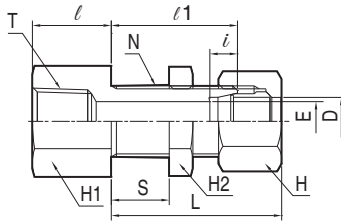
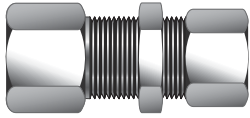
Gauge Connector BGC



Part No.	Tube O.D. D	T (PF)	a	h	H	l	l	Approx. L	Gasket No.
BGC 04-02G	4	1/4	14	19	12	6	29	36.5	-01
BGC 04-03G	4	3/8	15	24	12	6	30	37.5	-02
BGC 06-02G	6	1/4	14	19	14	7	32	42.5	-01
BGC 06-03G	6	3/8	15	24	14	7	34	44.5	-02
BGC 06-04G	6	1/2	16	30	14	7	36	46.5	-03
BGC 08-02G	8	1/4	14	19	17	7	32	42.5	-01
BGC 08-03G	8	3/8	15	24	17	7	34	44.5	-02
BGC 08-04G	8	1/2	16	30	17	7	36	46.5	-03
BGC 10-02G	10	1/4	14	19	19	7	32	43.5	-01
BGC 10-03G	10	3/8	15	24	19	7	34	45.5	-02
BGC 10-04G	10	1/2	16	30	19	7	36	47.5	-03
BGC 12-02G	12	1/4	14	19	22	7	32	43.5	-01
BGC 12-03G	12	3/8	15	24	22	7	34	45.5	-02
BGC 12-04G	12	1/2	16	30	22	7	36	47.5	-03

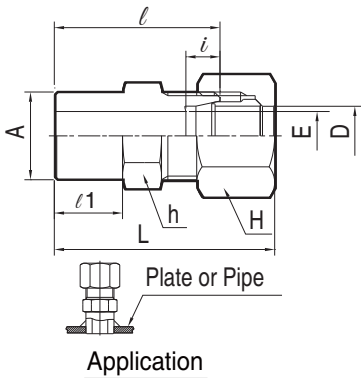
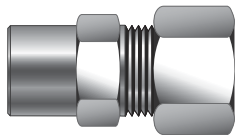
Gasket is not included in the fitting supply.

Bulkhead Female Connector
BBFC



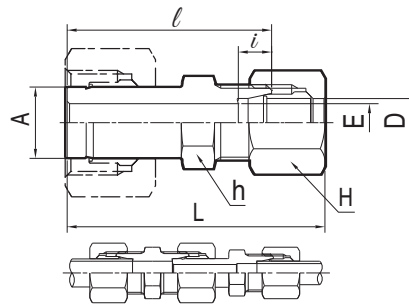
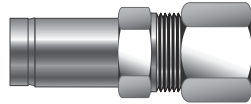
Part No.	Tube O.D. D	T (PT)	E	h	H2	H	i	l1	l	Approx. L	N	Max. S
BBFC 06-02R	6	1/4	4	17	17	14	7	32	13	42.5	M12x1.5	13
BBFC 08-02R	8	1/4	6	19	19	17	7	32	18	42.5	M14x1.5	13
BBFC 10-02R	10	1/4	8	19	22	19	7	32	18	43.5	M16x1.5	13
BBFC 10-03R	10	3/8	8	24	22	19	7	32	20	43.5	M16x1.5	13
BBFC 12-02R	12	1/4	10	22	24	22	7	32	18	43.5	M18x1.5	13
BBFC 12-03R	12	3/8	10	24	24	22	7	32	20	43.5	M18x1.5	13
BBFC 15-03R	15	3/8	12	27	27	27	7.5	37	20	49.5	M22x1.5	15
BBFC 15-04R	15	1/2	12	30	27	27	7.5	37	25	49.5	M22x1.5	15
BBFC 16-04R	16	1/2	13	30	30	30	7.5	37	25	49.5	M24x1.5	15
BBFC 18-04R	18	1/2	14	30	32	32	8	39	25	51.5	M26x1.5	15
BBFC 20-06R	20	3/4	17	36	36	36	8	39	27	51.5	M28x1.5	15
BBFC 22-06R	22	3/4	18	36	36	36	9	39	27	51.5	M30x1.5	15
BBFC 25-06R	25	3/4	20	41	41	41	10	39	27	52.5	M35x1.5	15
BBFC 25-08R	25	1	20	46	41	41	10	39	31	52.5	M35x1.5	15
BBFC 28-08R	28	1	22	46	46	46	10	41	31	55	M38x1.5	15
BBFC 30-08R	30	1	25	46	46	46	10	41	31	55.5	M40x1.5	15
BBFC 30-10R	30	1 1/4	25	55	46	46	10	41	35	55.5	M40x1.5	15
BBFC 35-10R	35	1 1/4	28	55	50	55	11	43	35	60.5	M45x1.5	15

Welding Connector
BCW



Part No.	Tube O.D. D	A	E	h	H	i	l1	l	Approx. L	
BCW - 06	6	12	4	14	14	7	11	29	39.5	
BCW - 08	8	14	6	17	17	7	15	34	44.5	
BCW - 10	10	16	8	17	19	7	15	34	45.5	
BCW - 12	12	18	10	19	22	7	15	34	45.5	
BCW - 15	15	21	12	24	27	7.5	18	40	52.5	
BCW - 16	16	22	13	27	30	7.5	22	44	56.5	
BCW - 18	18	25	14	27	32	8	22	44	56.5	
BCW - 20	20	28	17	30	36	8	22	46	58.5	
BCW - 22	22	28	18	32	36	9	22	46	58.5	
BCW - 25	25	33	20	36	41	10	26	51	64.5	
BCW - 28	28	36	22	41	46	10	28	55	69	
BCW - 30	30	39	25	41	46	10	28	55	69.5	
BCW - 35	35	43	28	46	55	11	28	56	73.5	
BCW - 38	38	45	32	50	60	12	28	58	77.5	
BCW - 40	40	46	32	55	60	12	30	65	84.5	
BCW - 50	50	57	40	65	75	12	30	70	91.5	
BCW - 6A	1/8	10.5	16	8	17	19	7	15	34	45.5
BCW - 8A	1/4	13.8	19	11	22	24	7.5	18	40	52
BCW - 10A	3/8	17.3	24	14	27	32	8	22	44	56.5
BCW - 15A	1/2	21.7	28	18	32	36	9	22	46	58.5
BCW - 20A	3/4	27.2	30	22	41	46	10	25	52	66
BCW - 25A	1	34.0	40	28	46	55	11	28	56	73.5
BCW - 32A	1 1/4	42.7	47	34	60	65	12	28	65	85.5
BCW - 40A	1 1/2	48.6	55	40	65	75	12	30	70	91.5

Reducer
BR

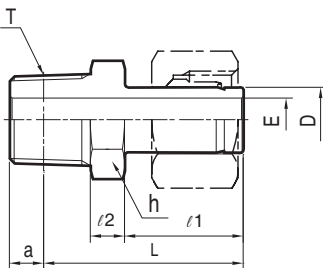
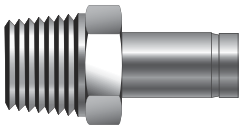


Application

Part No.	A		Tube O.D. D		E	h	H	i	l	Approx L
BR 08 - 06	8		6		4	14	14	7	39	49.5
BR 10 - 06	10		6		4	14	14	7	40	50.5
BR 10 - 08	10		8		6	17	17	7	40	50.5
BR 12 - 06	12		6		4	14	14	7	41	51.5
BR 12 - 08	12		8		6	17	17	7	41	51.5
BR 12 - 10	12		10		8	17	19	7	41	52.5
BR 15 - 08	15		8		6	17	17	7	43	53.5
BR 15 - 10	15		10		8	17	19	7	43	54.5
BR 16 - 06	16		6		4	17	14	7	43	53.5
BR 16 - 10	16		10		8	17	19	7	43	54.5
BR 16 - 12	16		12		10	19	22	7	43	54.5
BR 18 - 10	18		10		8	19	19	7	44	55.5
BR 18 - 15	18		15		12	24	27	7.5	45	57.5
BR 20 - 06	20		6		4	22	14	7	45	55.5
BR 20 - 12	20		12		10	22	22	7	45	56.5
BR 20 - 16	20		16		13	27	30	7.5	47	59.5
BR 22 - 15	22		15		12	24	27	7.5	48	60.5
BR 22 - 18	22		18		14	27	32	8	48	60.5
BR 25 - 16	25		16		13	27	30	7.5	50	62.5
BR 25 - 20	25		20		17	30	36	8	52	64.5
BR 28 - 18	28		18		14	30	32	8	52	64.5
BR 28 - 22	28		22		18	32	36	9	52	64.5
BR 30 - 20	30		20		17	32	36	8	53	65.5
BR 30 - 25	30		25		20	36	41	10	54	67.5
BR 35 - 22	35		22		18	36	36	9	58	70.5
BR 35 - 28	35		28		22	36	46	10	60	74.0
BR 38 - 25	38		25		20	41	41	10	61	74.5
BR 38 - 30	38		30		25	41	46	10	63	77.5
BR 8A - 6A	1/4	13.8	1/8	10.5	17	17	19	7	41	52.5
BR 10A - 6A	3/8	17.3	1/8	10.5	8	19	19	7	44	55.5
BR 10A - 8A	3/8	17.3	1/4	13.8	11	22	24	7.5	46	58.0
BR 15A - 8A	1/2	21.7	1/4	13.8	11	24	24	7.5	48	60.0
BR 15A - 10A	1/2	21.7	3/8	17.3	14	27	32	8	48	60.5
BR 20A - 10A	3/4	27.2	3/8	17.3	14	30	32	8	52	64.5
BR 20A - 15A	3/4	27.2	1/2	21.7	18	32	36	9	52	64.5
BR 25A - 15A	1	34.0	1/2	21.7	18	36	36	9	58	70.5
BR 25A - 20A	1	34.0	3/4	27.2	22	41	46	10	60	74.0

Nut and Sleeve on tube adapter are not included in the fitting supply.

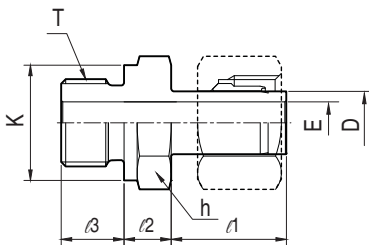
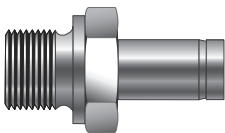
Adapter
BA-R



Part No.	Tube O.D. D	T (PT)	E	Basic gauge length (a)	h	l1	l2	Approx L	
BA 06 - 01R	6	1/8	3	3.97	12	21	5	32	
BA 08 - 02R	8	1/4	5	6.01	14	21	6	35	
BA 10 - 02R	10	1/4	6	6.01	14	22	6	36	
BA 10 - 03R	10	3/8	6	6.35	19	22	6	36.5	
BA 12 - 02R	12	1/4	7	6.01	14	22.5	6.5	37	
BA 12 - 03R	12	3/8	8	6.35	19	22.5	6.5	37.5	
BA 15 - 03R	15	3/8	8	6.35	19	24.5	7.5	40.5	
BA 15 - 04R	15	1/2	10	8.16	22	24.5	7.5	43	
BA 16 - 04R	16	1/2	11	8.16	22	24.5	7.5	43	
BA 18 - 04R	18	1/2	12	8.16	22	24.5	7.5	43	
BA 20 - 06R	20	3/4	14	9.53	27	26	9	46.5	
BA 22 - 06R	22	3/4	14	9.53	27	27	9	47.5	
BA 25 - 06R	25	3/4	16	9.53	27	29.5	8.5	49.5	
BA 25 - 08R	25	1	17	10.39	36	29.5	9.5	52.5	
BA 28 - 08R	28	1	18	10.39	36	29.5	9.5	52.5	
BA 30 - 08R	30	1	20	10.39	36	30.5	9.5	53.5	
BA 30 - 10R	30	1 1/4	20	12.70	46	30.5	10.5	55	
BA 35 - 10R	35	1 1/4	24	12.70	46	34	11	59	
BA 38 - 12R	38	1 1/2	26	12.70	50	36	14	64.5	
BA 40 - 12R	40	1 1/2	28	12.70	50	36	14	64	
BA 50 - 16R	50	2	34	15.88	65	37	20	72	
BA 6A - 02R	1/8	10.5	1/4	6	6.01	14	21	7	36
BA 8A - 03R	1/4	13.8	3/8	9	6.35	19	22	8	38.5
BA10A - 04R	3/8	17.3	1/2	11	8.16	22	24	8	43
BA15A - 06R	1/2	21.7	3/4	14	9.53	27	26	10	47.5
BA20A - 08R	3/4	27.2	1	18	10.39	36	28	11	52.5
BA25A - 10R	1	34.0	1 1/4	23	12.70	46	33	12	59
BA32A - 12R	1 1/4	42.7	1 1/2	29	12.70	50	36	17	67
BA40A - 16R	1 1/2	48.6	2	33	15.88	65	37	20	72

Nut and Sleeve on tube adapter are not included in the fitting supply.

Adapter(For Copper Gasket)
BA-G

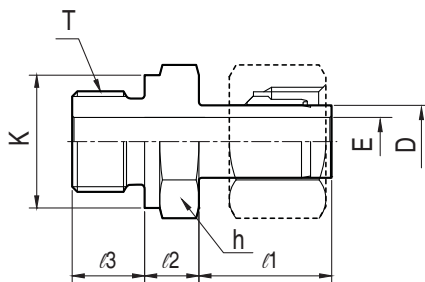
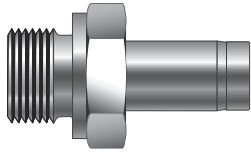


Part No.	Tube O.D. D	T (PF)	E	K	h	l1	l2	l3	
BA 06 - 01G	6	1/8	3	14	14	21	7	8	
BA 08 - 02G	8	1/4	5	18	19	21	8	12	
BA 10 - 02G	10	1/4	6	18	19	22	8	12	
BA 10 - 03G	10	3/8	6	21.5	22	22	9	12	
BA 12 - 02G	12	1/4	7	18	19	22.5	8.5	12	
BA 12 - 03G	12	3/8	8	21.5	22	22.5	9.5	12	
BA 15 - 03G	15	3/8	8	21.5	22	24.5	9.5	12	
BA 15 - 04G	15	1/2	10	25.5	27	24.5	12.5	14	
BA 16 - 04G	16	1/2	11	25.5	27	24.5	12.5	14	
BA 18 - 04G	18	1/2	12	25.5	27	24.5	12.5	14	
BA 20 - 06G	20	3/4	14	31.5	32	26	15	16	
BA 22 - 06G	22	3/4	14	31.5	32	27	15	16	
BA 25 - 06G	25	3/4	16	31.5	32	29.5	14.5	16	
BA 25 - 08G	25	1	17	38	41	29.5	16.5	18	
BA 28 - 08G	28	1	18	38	41	29.5	16.5	18	
BA 30 - 08G	30	1	20	38	41	30.5	19.5	18	
BA 30 - 10G	30	1 1/4	20	48.5	50	30.5	19.5	20	
BA 35 - 10G	35	1 1/4	24	48.5	50	34	20	20	
BA 38 - 12G	38	1 1/2	26	53.5	55	36	21	21	
BA 40 - 12G	40	1 1/2	28	53.5	55	36	21	21	
BA 50 - 16G	50	2	34	66	70	37	28	24	
BA 6A - 02G	1/8	10.5	1/4	6	18	19	21	9	12
BA 8A - 03G	1/4	13.8	3/8	9	21.5	22	22	10	12
BA10A - 04G	3/8	17.3	1/2	11	25.5	27	24	13	14
BA15A - 06G	1/2	21.7	3/4	14	31.5	32	26	16	16
BA20A - 08G	3/4	27.2	1	18	38	41	28	18	18
BA25A - 10G	1	34.0	1 1/4	23	48.5	50	33	21	20
BA32A - 12G	1 1/4	42.7	1 1/2	29	53.5	55	36	23	21
BA40A - 16G	1 1/2	48.6	2	33	66	70	37	28	24

Nut and Sleeve on tube adapter are not included in the fitting supply.

To order copper gasket, refer to page 36.

Adapter (For O-Seal)
BA-GF

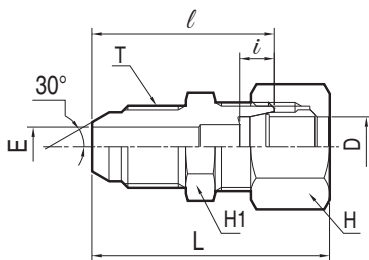
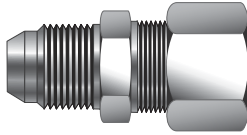


Part No.	Tube O.D. D		T (PF)	E	K	h	l1	l2	l3
BA 06 – 01GF	6		1/8	3	14	14	21	7	8
BA 08 – 02GF	8		1/4	5	19	19	21	8	12
BA 10 – 02GF	10		1/4	6	19	19	22	8	12
BA 10 – 03GF	10		3/8	6	22	22	22	9	12
BA 12 – 02GF	12		1/4	7	19	19	22.5	8.5	12
BA 12 – 03GF	12		3/8	8	22	22	22.5	9.5	12
BA 15 – 03GF	15		3/8	8	22	22	24.5	9.5	12
BA 15 – 04GF	15		1/2	10	27	27	24.5	12.5	14
BA 16 – 04GF	16		1/2	11	27	27	24.5	12.5	14
BA 18 – 04GF	18		1/2	12	27	27	24.5	12.5	14
BA 20 – 06GF	20		3/4	14	36	36	26	15	16
BA 22 – 06GF	22		3/4	14	36	36	27	15	16
BA 25 – 06GF	25		3/4	16	36	36	29.5	14.5	16
BA 25 – 08GF	25		1	17	41	41	29.5	16.5	18
BA 28 – 08GF	28		1	18	41	41	29.5	16.5	18
BA 30 – 08GF	30		1	20	41	41	30.5	19.5	18
BA 30 – 10GF	30		1 1/4	20	50	50	30.5	19.5	20
BA 35 – 10GF	35		1 1/4	24	50	50	34	20	20
BA 38 – 12GF	38		1 1/2	26	55	55	36	21	21
BA 40 – 12GF	40		1 1/2	28	55	55	36	21	21
BA 50 – 16GF	50		2	34	75	75	37	28	24
BA 6A – 02GF	1/8	10.5	1/4	6	19	19	21	9	12
BA 6A – 03GF	1/4	13.8	3/8	9	22	22	22	10	12
BA10A – 04GF	3/8	17.3	1/2	11	27	27	24	13	14
BA15A – 06GF	1/2	21.7	3/4	14	36	36	26	16	16
BA20A – 08GF	3/4	27.2	1	18	41	41	28	18	18
BA25A – 10GF	1	34.0	1 1/4	23	50	50	33	21	20
BA32A – 12GF	1 1/4	42.7	1 1/2	29	55	55	36	23	21
BA40A – 16GF	1 1/2	48.6	2	33	75	75	37	28	24

Nut and Sleeve on tube adapter are not included in the fitting supply.

Hose Male Union

BHUM

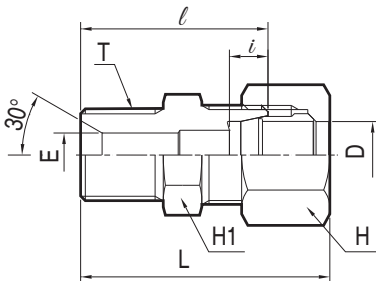
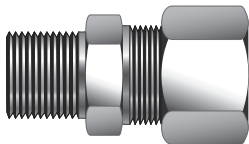


Part No.	Tube O.D. D	T (PF)	E	H1	H	i	l	Approx. L
BHUM 08 – 02G	8	1/4	5.5	17	17	7	35	45.5
BHUM 08 – 03G	8	3/8	6	19	17	7	37	47.5
BHUM 10 – 02G	10	1/4	5.5	17	19	7	35	46.5
BHUM 10 – 03G	10	3/8	8	19	19	7	37	48.5
BHUM 10 – 04G	10	1/2	8	22	19	7	40	51.5
BHUM 12 – 02G	12	1/4	5.5	19	22	7	35	46.5
BHUM 12 – 03G	12	3/8	8	19	22	7	37	48.5
BHUM 12 – 04G	12	1/2	10	22	22	7	40	51.5
BHUM 15 – 03G	15	3/8	8	24	27	7.5	40	52.5
BHUM 15 – 04G	15	1/2	11	24	27	7.5	42	54.5
BHUM 16 – 03G	16	3/8	8	27	30	7.5	40	52.5
BHUM 16 – 04G	16	1/2	11	27	30	7.5	42	54.5
BHUM 18 – 04G	18	1/2	11	27	32	8	42	54.5
BHUM 20 – 06G	20	3/4	16	30	36	8	46	58.5
BHUM 22 – 04G	22	1/2	11	32	36	9	44	56.5
BHUM 22 – 06G	22	3/4	16	32	36	9	46	58.5
BHUM 25 – 06G	25	3/4	16	36	41	10	47	60.5
BHUM 25 – 08G	25	1	20	36	41	10	49	62.5
BHUM 28 – 06G	28	3/4	16	41	46	10	49	63.0
BHUM 28 – 08G	28	1	21.5	41	46	10	51	65
BHUM 30 – 06G	30	3/4	16	41	46	10	49	63.5
BHUM 30 – 08G	30	1	21.5	41	46	10	51	65.5
BHUM 35 – 10G	35	1 1/4	28	46	55	11	56	73.5

30° flare angle according to JIS B8363.

Hose Female Union

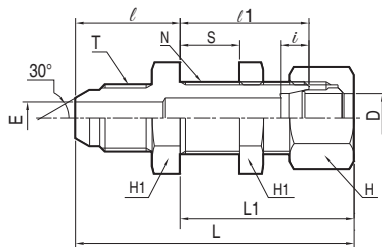
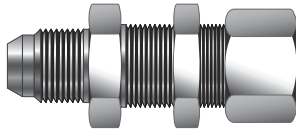
BHUF



Part No.	Tube O.D. D	T (PF)	E	H1	H	i	l	Approx. L
BHUF 08 – 02G	8	1/4	5.5	17	17	7	33	43.5
BHUF 08 – 03G	8	3/8	6	19	17	7	34	44.5
BHUF 10 – 02G	10	1/4	5.5	17	19	7	33	44.5
BHUF 10 – 03G	10	3/8	8	19	19	7	34	45.5
BHUF 10 – 04G	10	1/2	8	22	19	7	38	49.5
BHUF 12 – 02G	12	1/4	5.5	19	22	7	33	44.5
BHUF 12 – 03G	12	3/8	8	19	22	7	34	45.5
BHUF 12 – 04G	12	1/2	10	22	22	7	38	49.5
BHUF 15 – 03G	15	3/8	8	24	27	7.5	37	49.5
BHUF 15 – 04G	15	1/2	11	24	27	7.5	40	52.5
BHUF 16 – 03G	16	3/8	8	27	30	7.5	37	49.5
BHUF 16 – 04G	16	1/2	11	27	30	7.5	40	52.5
BHUF 18 – 04G	18	1/2	11	27	32	8	40	52.5
BHUF 20 – 06G	20	3/4	16	30	36	8	43	55.5
BHUF 22 – 04G	22	1/2	11	32	36	9	42	54.5
BHUF 22 – 06G	22	3/4	16	32	36	9	43	55.5
BHUF 25 – 06G	25	3/4	16	36	41	10	44	57.5
BHUF 25 – 08G	25	1	20	36	41	10	46	59.5
BHUF 28 – 06G	28	3/4	16	41	46	10	46	60
BHUF 28 – 08G	28	1	21.5	41	46	10	48	62
BHUF 30 – 06G	30	3/4	16	41	46	10	46	60.5
BHUF 30 – 08G	30	1	21.5	41	46	10	48	62.5
BHUF 35 – 10G	35	1 1/4	28	46	55	11	55	72.5

30° flare angle according to JIS B8363.

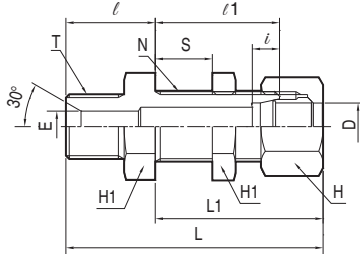
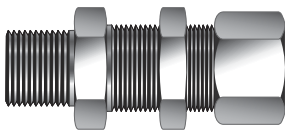
Hose Bulkhead Male Union BHBM



Part No.	Tube O.D. D	T (PF)	E	H1	H	i	l1	l	Approx.		N	Approx. S
									L	L1		
BHBM 08 – 02G	8	1/4	5.5	19	17	7	32	23	65.5	42.5	M14x1.5	13
BHBM 08 – 03G	8	3/8	6	19	17	7	32	25	67.5	42.5	M14x1.5	13
BHBM 10 – 02G	10	1/4	5.5	22	19	7	32	24	67.5	43.5	M16x1.5	13
BHBM 10 – 03G	10	3/8	8	22	19	7	32	26	69.5	43.5	M16x1.5	13
BHBM 10 – 04G	10	1/2	8	22	19	7	32	28	71.5	43.5	M16x1.5	13
BHBM 12 – 02G	12	1/4	5.5	24	22	7	32	24	67.5	43.5	M18x1.5	13
BHBM 12 – 03G	12	3/8	8	24	22	7	32	26	69.5	43.5	M18x1.5	13
BHBM 12 – 04G	12	1/2	10	24	22	7	32	28	71.5	43.5	M18x1.5	13
BHBM 15 – 03G	15	3/8	8	27	27	7.5	37	26	75.5	49.5	M22x1.5	15
BHBM 15 – 04G	15	1/2	11	27	27	7.5	37	28	77.5	49.5	M22x1.5	15
BHBM 16 – 03G	16	3/8	8	30	30	7.5	37	28	77.5	49.5	M24x1.5	15
BHBM 16 – 04G	16	1/2	11	30	30	7.5	37	30	79.5	49.5	M24x1.5	15
BHBM 18 – 04G	18	1/2	11	32	32	8	39	30	81.5	51.5	M26x1.5	15
BHBM 20 – 06G	20	3/4	16	36	36	8	39	32	83.5	51.5	M28x1.5	15
BHBM 22 – 04G	22	1/2	11	36	36	9	39	31	82.5	51.5	M30x1.5	15
BHBM 22 – 06G	22	3/4	16	36	36	9	39	33	84.5	55.0	M30x1.5	15
BHBM 25 – 06G	25	3/4	16	41	41	10	39	33	87.5	52.5	M35x1.5	15
BHBM 25 – 08G	25	1	20	41	41	10	39	35	89.5	52.5	M35x1.5	15
BHBM 28 – 06G	28	3/4	16	46	46	10	41	34	89	55	M38x1.5	15
BHBM 28 – 08G	28	1	21.5	46	46	10	41	36	91	55	M38x1.5	15
BHBM 30 – 06G	30	3/4	16	46	46	10	41	34	89.5	55.5	M40x1.5	15
BHBM 30 – 08G	30	1	21.5	46	46	10	41	36	91.5	55.5	M40x1.5	15
BHBM 35 – 10G	35	1 1/4	28	50	55	11	43	42	103	60.5	M45x1.5	15

30° flare angle according to JIS B8363.

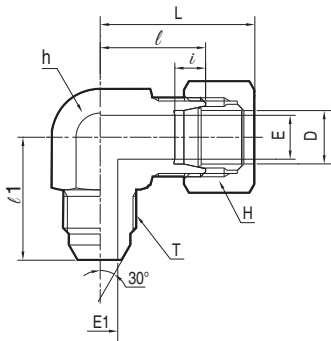
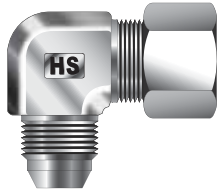
Hose Bulkhead Female Union BHBF



Part No.	Tube O.D. D	T (PF)	E	H1	H	i	l1	l	Approx.		N	Approx. S
									L	L1		
BHBF 08 – 02G	8	1/4	5.5	19	17	7	32	21	63.5	42.5	M14x1.5	13
BHBF 08 – 03G	8	3/8	6	19	17	7	32	22	64.5	42.5	M14x1.5	13
BHBF 10 – 02G	10	1/4	5.5	22	19	7	32	22	65.5	43.5	M16x1.5	13
BHBF 10 – 03G	10	3/8	8	22	19	7	32	23	66.5	43.5	M16x1.5	13
BHBF 10 – 04G	10	1/2	8	22	19	7	32	26	69.5	43.5	M16x1.5	13
BHBF 12 – 02G	12	1/4	5.5	24	22	7	32	22	65.5	43.5	M18x1.5	13
BHBF 12 – 03G	12	3/8	8	24	22	7	32	23	66.5	43.5	M18x1.5	13
BHBF 12 – 04G	12	1/2	10	24	22	7	32	26	69.5	43.5	M18x1.5	13
BHBF 15 – 03G	15	3/8	8	27	27	7.5	37	23	72.5	49.5	M22x1.5	15
BHBF 15 – 04G	15	1/2	11	27	27	7.5	37	26	75.5	49.5	M22x1.5	15
BHBF 16 – 03G	16	3/8	8	30	30	7.5	37	25	74.5	49.5	M24x1.5	15
BHBF 16 – 04G	16	1/2	11	30	30	7.5	37	28	77.5	49.5	M24x1.5	15
BHBF 18 – 04G	18	1/2	11	32	32	8	39	28	79.5	51.5	M26x1.5	15
BHBF 20 – 06G	20	3/4	16	36	36	8	39	29	80.5	51.5	M28x1.5	15
BHBF 22 – 04G	22	1/2	11	36	36	9	39	29	80.5	51.5	M30x1.5	15
BHBF 22 – 06G	22	3/4	16	36	36	9	39	30	81.5	51.5	M30x1.5	15
BHBF 25 – 06G	25	3/4	16	41	41	10	39	30	82.5	52.5	M35x1.5	15
BHBF 25 – 08G	25	1	20	41	41	10	39	32	84.5	52.5	M35x1.5	15
BHBF 28 – 06G	28	3/4	16	46	46	10	41	31	86	55	M38x1.5	15
BHBF 28 – 08G	28	1	21.5	46	46	10	41	33	88	55	M38x1.5	15
BHBF 30 – 06G	30	3/4	16	46	46	10	41	31	86.5	55.5	M40x1.5	15
BHBF 30 – 08G	30	1	21.5	46	46	10	41	33	88.5	55.5	M40x1.5	15
BHBF 35 – 10G	35	1 1/4	28	50	55	11	43	41	121.5	60.5	M45x1.5	15

30° flare angle according to JIS B8363.

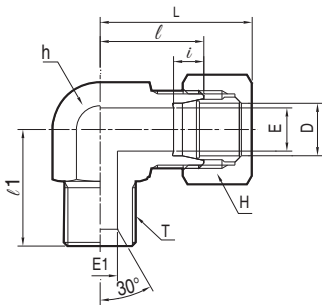
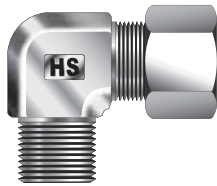
Hose Male ELBOW
BHLM



Part No.	Tube O.D. D	T (PF)	E	E1	h	H	i	l1	l	Approx. L
BHLM 08 – 02G	8	1/4	6	5.5	17	17	7	25	23	33.5
BHLM 08 – 03G	8	3/8	6	8	19	17	7	28	24	34.5
BHLM 10 – 02G	10	1/4	8	5.5	19	19	7	28	24	35.5
BHLM 10 – 03G	10	3/8	8	8	19	19	7	28	24	35.5
BHLM 10 – 04G	10	1/2	8	11	24	19	7	34	29	40.5
BHLM 12 – 02G	12	1/4	10	5.5	19	22	7	28	24	35.5
BHLM 12 – 03G	12	3/8	10	8	19	22	7	28	24	35.5
BHLM 12 – 04G	12	1/2	10	11	24	22	7	34	29	40.5
BHLM 15 – 03G	15	3/8	12	8	24	27	7.5	33	29	41.5
BHLM 15 – 04G	15	1/2	12	11	24	27	7.5	34	29	41.5
BHLM 16 – 03G	16	3/8	13	8	27	30	7.5	36	32	44.5
BHLM 16 – 04G	16	1/2	13	11	27	30	7.5	38	32	44.5
BHLM 18 – 04G	18	1/2	14	11	27	32	8	38	32	44.5
BHLM 20 – 06G	20	3/4	17	16	30	36	8	41	33	45.5
BHLM 22 – 04G	22	1/2	18	11	32	36	9	40	34	46.5
BHLM 22 – 06G	22	3/4	18	16	32	36	9	42	34	46.5
BHLM 25 – 06G	25	3/4	20	16	36	41	10	44	36	49.5
BHLM 25 – 08G	25	1	20	21.5	36	41	10	46	36	49.5
BHLM 28 – 06G	28	3/4	22	16	41	46	10	47	41	55
BHLM 28 – 08G	28	1	22	21.5	41	46	10	49	41	55
BHLM 30 – 06G	30	3/4	25	16	41	46	10	47	41	55.5
BHLM 30 – 08G	30	1	25	21.5	41	46	10	49	41	55.5
BHLM 35 – 10G	35	1 1/4	28	28	46	55	11	58	46	63.5

30° flare angle according to JIS B8363.

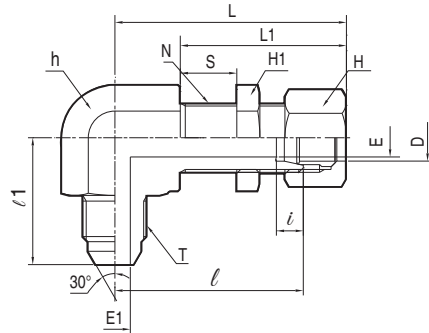
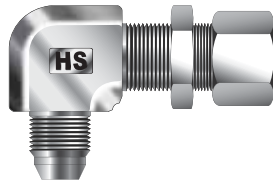
Hose Female ELBOW
BHLF



Part No.	Tube O.D. D	T (PF)	E	E1	h	H	i	l1	l	Approx. L
BHLF 08 – 02G	8	1/4	6	5.5	17	17	7	25	23	33.5
BHLF 08 – 03G	8	3/8	6	8	19	17	7	27	24	34.5
BHLF 10 – 02G	10	1/4	8	5.5	19	19	7	26	24	35.5
BHLF 10 – 03G	10	3/8	8	8	19	19	7	27	24	35.5
BHLF 10 – 04G	10	1/2	8	11	24	19	7	33	29	40.5
BHLF 12 – 02G	12	1/4	10	5.5	19	22	7	26	24	35.5
BHLF 12 – 03G	12	3/8	10	8	19	22	7	27	24	35.5
BHLF 12 – 04G	12	1/2	10	11	24	22	7	33	29	40.5
BHLF 15 – 03G	15	3/8	12	8	24	27	7.5	30	29	41.5
BHLF 15 – 04G	15	1/2	12	11	24	27	7.5	33	29	41.5
BHLF 16 – 03G	16	3/8	13	8	27	30	7.5	33	32	44.5
BHLF 16 – 04G	16	1/2	13	11	27	30	7.5	36	32	44.5
BHLF 18 – 04G	18	1/2	14	11	27	32	8	36	32	44.5
BHLF 20 – 06G	20	3/4	17	16	30	36	8	38	33	45.5
BHLF 22 – 04G	22	1/2	18	11	32	36	9	38	34	46.5
BHLF 22 – 06G	22	3/4	18	16	32	36	9	39	34	46.5
BHLF 25 – 06G	25	3/4	20	16	36	41	10	41	36	49.5
BHLF 25 – 08G	25	1	20	21.5	36	41	10	43	36	49.5
BHLF 28 – 06G	28	3/4	22	16	41	46	10	44	41	55
BHLF 28 – 08G	28	1	22	21.5	41	46	10	46	41	55
BHLF 30 – 06G	30	3/4	25	16	41	46	10	44	41	55.5
BHLF 30 – 08G	30	1	25	21.5	41	46	10	46	41	55.5
BHLF 35 – 10G	35	1 1/4	28	28	46	55	11	57	46	63.5

30° flare angle according to JIS B8363.

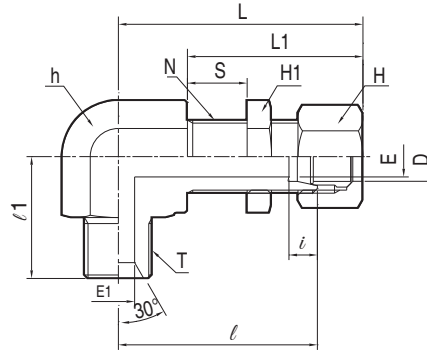
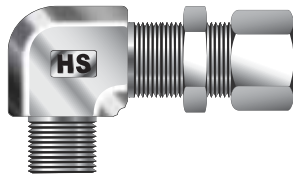
Hose Bulkhead Male Elbow
BHBLM



Part No.	Tube O.D. D	T (PF)	E	E1	h	H1	H	i	l1	l	Approx.		N	Approx S
											L	L1		
BHBLM 08 – 02G	8	1/4	6	5.5	19	19	17	7	28	46	56.5	42.5	M14x1.5	13
BHBLM 08 – 03G	8	3/8	6	8	19	19	17	7	30	46	56.5	42.5	M14x1.5	13
BHBLM 10 – 02G	10	1/4	8	5.5	22	22	19	7	30	48	59.5	43.5	M16x1.5	13
BHBLM 10 – 03G	10	3/8	8	8	22	22	19	7	32	48	59.5	43.5	M16x1.5	13
BHBLM 10 – 04G	10	1/2	8	11	24	22	19	7	35	49	60.5	43.5	M16x1.5	13
BHBLM 12 – 02G	12	1/4	10	5.5	24	24	22	7	31	49	60.5	43.5	M18x1.5	13
BHBLM 12 – 03G	12	3/8	10	8	24	24	22	7	33	49	60.5	43.5	M18x1.5	13
BHBLM 12 – 04G	12	1/2	10	11	24	24	22	7	35	49	60.5	43.5	M18x1.5	13
BHBLM 15 – 03G	15	3/8	12	8	27	27	27	7.5	36	57	69.5	49.5	M22x1.5	15
BHBLM 15 – 04G	15	1/2	12	11	27	27	27	7.5	37	57	69.5	49.5	M22x1.5	15
BHBLM 16 – 03G	16	3/8	13	8	30	30	30	7.5	37	59	71.5	49.5	M24x1.5	15
BHBLM 16 – 04G	16	1/2	13	11	30	30	30	7.5	38	59	71.5	49.5	M24x1.5	15
BHBLM 18 – 04G	18	1/2	14	11	32	32	32	8	39	63	75.5	51.5	M26x1.5	15
BHBLM 20 – 06G	20	3/4	16	16	36	36	36	8	40	65	77.5	51.5	M28x1.5	15
BHBLM 22 – 04G	22	1/2	18	11	36	36	36	9	40	65	77.5	51.5	M30x1.5	15
BHBLM 22 – 06G	22	3/4	18	16	36	36	36	9	40	65	77.5	51.5	M30x1.5	15
BHBLM 25 – 06G	25	3/4	20	16	41	41	41	10	43	68	81.5	52.5	M35x1.5	15
BHBLM 25 – 08G	25	1	20	21.5	46	41	41	10	48	68	81.5	52.5	M35x1.5	15
BHBLM 28 – 06G	28	3/4	22	16	46	46	46	10	48	74	88	55	M38x1.5	15
BHBLM 28 – 08G	28	1	22	21.5	46	46	46	10	48	74	88	55	M38x1.5	15
BHBLM 30 – 06G	30	3/4	25	16	46	46	46	10	48	74	88.5	55.5	M40x1.5	15
BHBLM 30 – 08G	30	1	25	21.5	46	46	46	10	51	74	88.5	55.5	M40x1.5	15

30° flare angle according to JIS B8363.

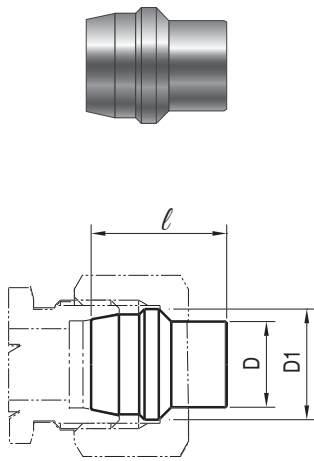
Hose Bulkhead Female Elbow
BHBLF



Part No.	Tube O.D. D	T (PF)	E	E1	h	H1	H	i	l1	l	Approx.		N	Approx S
											L	L1		
BHBLF 08 – 02G	8	1/4	6	5.5	19	19	17	7	26	46	56.5	42.5	M14x1.5	13
BHBLF 08 – 03G	8	3/8	6	8	19	19	17	7	27	46	56.5	42.5	M14x1.5	13
BHBLF 10 – 02G	10	1/4	8	5.5	22	22	19	7	28	48	59.5	43.5	M16x1.5	13
BHBLF 10 – 03G	10	3/8	8	8	22	22	19	7	29	48	59.5	43.5	M16x1.5	13
BHBLF 10 – 04G	10	1/4	8	11	24	22	19	7	33	49	60.5	43.5	M16x1.5	13
BHBLF 12 – 02G	12	1/4	10	5.5	24	24	22	7	30	49	60.5	43.5	M18x1.5	13
BHBLF 12 – 03G	12	3/8	10	8	24	24	22	7	30	49	60.5	43.5	M18x1.5	13
BHBLF 12 – 04G	12	1/2	10	11	24	24	22	7	33	49	60.5	43.5	M18x1.5	13
BHBLF 15 – 03G	15	3/8	12	8	27	27	27	7.5	33	57	69.5	49.5	M22x1.5	15
BHBLF 15 – 04G	15	1/2	12	11	27	27	27	7.5	36	57	69.5	49.5	M22x1.5	15
BHBLF 16 – 03G	16	3/8	13	8	30	30	30	7.5	34	59	71.5	49.5	M24x1.5	15
BHBLF 16 – 04G	16	1/2	13	11	30	30	30	7.5	37	59	71.5	49.5	M24x1.5	15
BHBLF 18 – 04G	18	1/2	14	11	32	32	32	8	37	63	75.5	51.5	M26x1.5	15
BHBLF 20 – 06G	20	3/4	16	16	36	36	36	8	40	65	77.5	51.5	M28x1.5	15
BHBLF 22 – 04G	22	1/2	18	11	36	36	36	9	40	65	77.5	51.5	M30x1.5	15
BHBLF 22 – 06G	22	3/4	18	16	36	36	36	9	40	65	77.5	51.5	M30x1.5	15
BHBLF 25 – 06G	25	3/4	20	16	41	41	41	10	43	68	81.5	52.5	M35x1.5	15
BHBLF 25 – 08G	25	1	20	21.5	41	41	41	10	43	68	81.5	52.5	M35x1.5	15
BHBLF 28 – 06G	28	3/4	22	16	46	46	46	10	48	74	88.0	55.0	M38x1.5	15
BHBLF 28 – 08G	28	1	22	21.5	46	46	46	10	48	74	88.0	55.0	M38x1.5	15
BHBLF 30 – 06G	30	3/4	25	16	46	46	46	10	48	74	88.5	55.5	M40x1.5	15
BHBLF 30 – 08G	30	1	25	21.5	46	46	46	10	48	74	88.5	55.5	M40x1.5	15

30° flare angle according to JIS B8363.

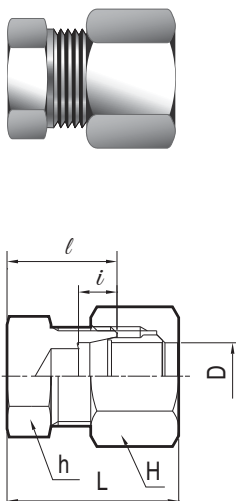
Plug
BP



Plug for an un-used fitting's tube port.

Part No.	Tube O.D. D	D	D1	l
BP - 06	6	6	9.5	19
BP - 08	8	8	11.5	19
BP - 10	10	10	13.5	19
BP - 12	12	12	15.5	19
BP - 15	15	15	19	20
BP - 16	16	16	20	20
BP - 18	18	18	22.5	20
BP - 20	20	20	25	20
BP - 22	22	22	27	20
BP - 25	25	25	30	24
BP - 28	28	28	33	24
BP - 30	30	30	35.5	24
BP - 35	35	35	40.5	30

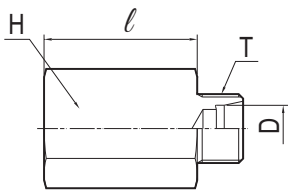
Tube Cap
BCA



Part No.	Tube O.D. D	h	H	i	l	Approx. L
BCA - 06	6	14	14	7	18	28.5
BCA - 08	8	17	17	7	19	29.5
BCA - 10	10	17	19	7	20	31.5
BCA - 12	12	19	22	7	20	31.5
BCA - 15	15	24	27	7.5	22	34.5
BCA - 16	16	27	30	7.5	24	36.5
BCA - 18	18	27	32	8	24	36.5
BCA - 20	20	30	36	8	24	36.5
BCA - 22	22	32	36	9	25	37.5
BCA - 25	25	36	41	10	25	38.5
BCA - 28	28	41	46	10	28	42
BCA - 30	30	41	46	10	28	42.5
BCA - 35	35	46	55	11	30	47.5

Presetting-Jig

BJ



Part No.	Tube O.D. D		l	H	T
BJ - 04-C	6		40	17	M12 X 1.5
BJ - 08-C	8		40	17	M14 X 1.5
BJ - 10-C	10		40	17	M16 X 1.5
BJ - 12-C	12		40	27	M18 X 1.5
BJ - 15-C	15		40	27	M22 X 1.5
BJ - 16-C	16		40	27	M24 X 1.5
BJ - 18-C	18		40	27	M26 X 1.5
BJ - 20-C	20		40	41	M28 X 1.5
BJ - 22-C	22		40	41	M30 X 1.5
BJ - 25-C	25		40	41	M35 X 1.5
BJ - 28-C	28		40	41	M38 X 1.5
BJ - 30-C	30		40	41	M40 X 1.5
BJ - 32-C	32		40	55	M42 X 1.5
BJ - 35-C	35		40	55	M45 X 1.5
BJ - 38-C	38		50	55	M48 X 1.5
BJ - 40-C	40		50	55	M52 X 2.0
BJ - 42-C	42		50	55	M52 X 2.0
BJ - 50-C	50		50	65	M64 X 2.0
BJ - 6A-C	1/8	10.5	40	17	M16 X 1.5
BJ - 8A-C	1/4	13.8	40	27	M20 X 1.5
BJ - 10A-C	3/8	17.3	40	27	M26 X 1.5
BJ - 15A-C	1/2	21.7	40	41	M30 X 1.5
BJ - 20A-C	3/4	27.2	40	41	M38 X 1.5
BJ - 25A-C	1	34.0	40	55	M46 X 1.5
BJ - 32A-C	1 1/4	42.7	50	65	M46 X 2.0
BJ - 40A-C	1 1/2	48.6	50	65	M64 X 2.0

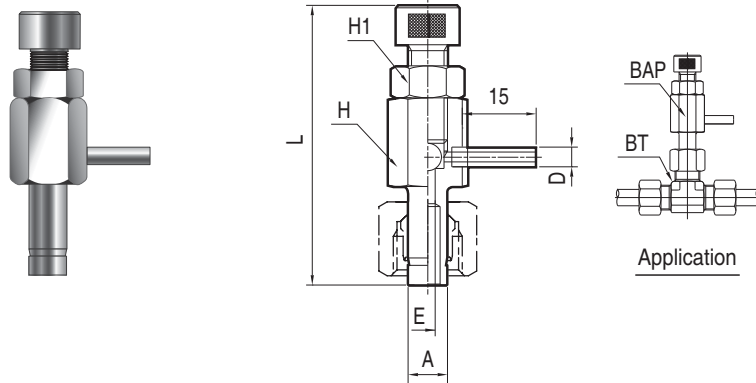
Pre-Setting Jig

The pre-setting jig is useful tool for pre-assembly of fitting at more open & safe place prior to fitting's final assembly at site. .
The features include consistent fitting pre-assembly of many tubing-runs.

For operation, refer to page 5 fitting Pre-Assembly.

Air Purge Valve

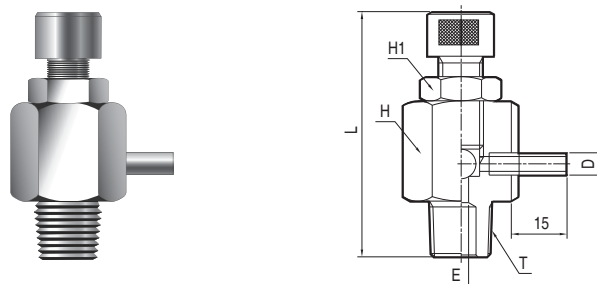
BAP



Part No.	Tube O.D. A	D	E	H	H1	L	Ball size SUJ 2
BAP - 06	6	4	3	14	13	56	7/32
BAP - 08	8	4	3	14	13	56	7/32
BAP - 10	10	4	3	14	13	57	7/32
BAP - 12	12	4	3	14	13	58	7/32
BAP - 15	15	6	4	27	19	74	5/16
BAP - 16	16	6	4	27	19	74	5/16
BAP - 18	18	6	4	27	19	74	5/16
BAP - 20	20	6	4	27	19	75	5/16
BAP - 22	22	6	4	27	19	76	5/16
BAP - 25	25	6	4	27	19	78	5/16
BAP - 28	28	6	4	30	19	78	5/16
BAP - 11	10.5	4	3	14	13	57	7/32
BAP - 13	13.8	6	4	27	19	72	5/16
BAP - 17	17.3	6	4	27	19	74	5/16
BAP - 21	21.7	6	4	27	19	76	5/16
BAP - 27	27.2	6	4	30	19	79	5/16

Air Purge Valve

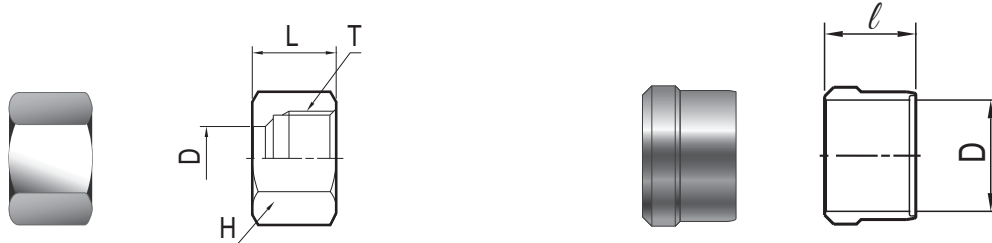
BAP



Part No.	T (PT)	D	E	H	H1	L	Ball size SUJ 2
BAP - 01R	1/8	4	3	14	13	51	7/32
BAP - 02R	1/4	4	3	14	13	53	7/32
BAP - 03R	3/8	6	4	19	13	54	7/32
BAP - 04R	1/2	6	4	27	19	69	5/16

NUT BN

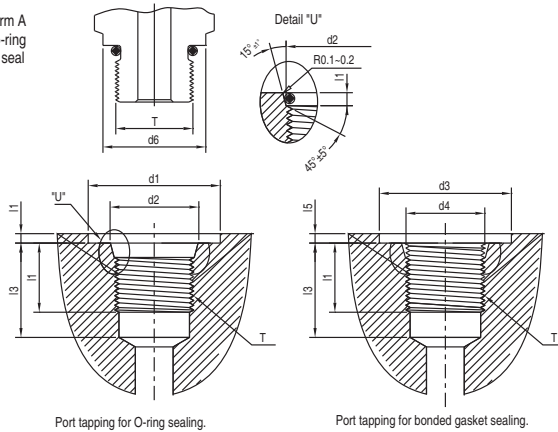
Sleeve BS



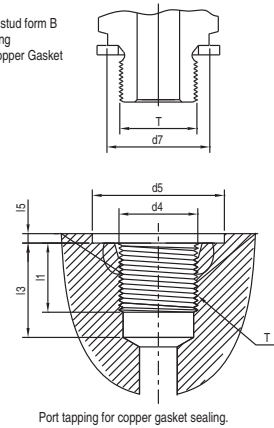
Part No. Nut	Part No. Sleeve	Tube O.D. D		T	L	l	H
BN - 04	BS - 04	4		M10 x 1.25	10.5	7	12
BN - 06	BS - 06	6		M12 x 1.5	15.0	9	14
BN - 08	BS - 08	8		M14 x 1.5	15.0	9	17
BN - 10	BS - 10	10		M16 x 1.5	16.0	10	19
BN - 12	BS - 12	12		M18 x 1.5	16.0	10	22
BN - 15	BS - 15	15		M22 x 1.5	17.5	10	27
BN - 16	BS - 16	16		M24 x 1.5	19.0	10	30
BN - 18	BS - 18	18		M26 x 1.5	18.0	10	32
BN - 20	BS - 20	20		M28 x 1.5	19.0	10	36
BN - 22	BS - 22	22		M30 x 1.5	19.0	10	36
BN - 25	BS - 25	25		M35 x 1.5	20.0	11	41
BN - 28	BS - 28	28		M38 x 1.5	21.0	11	46
BN - 30	BS - 30	30		M40 x 1.5	22.0	11	46
BN - 32	BS - 32	32		M42 x 1.5	22.0	11	50
BN - 35	BS - 35	35		M45 x 1.5	25.0	14	50
BN - 38	BS - 38	38		M48 x 1.5	27.0	14	60
BN - 40	BS - 40	40		M52 x 2.0	29.5	14	60
BN - 42	BS - 42	42		M52 x 2.0	29.5	14	60
BN - 50	BS - 50	50		M64 x 2.0	31.5	14	75
BN - 6A	BS - 6A	1/8	10.5	M16 x 1.5	16.0	10	19
BN - 8A	BS - 8A	1/4	13.8	M20 x 1.5	18.0	10	24
BN - 10A	BS - 10A	3/8	17.3	M26 x 1.5	19.0	10	32
BN - 15A	BS - 15A	1/2	21.7	M30 x 1.5	19.0	10	36
BN - 20A	BS - 20A	3/4	27.2	M38 x 1.5	21.0	11	46
BN - 25A	BS - 25A	1	34.0	M45 x 1.5	25.0	14	55
BN - 32A	BS - 32A	1 1/4	42.7	M56 x 2.0	30.5	14	65
BN - 40A	BS - 40A	1 1/2	48.6	M64 x 2.0	31.5	14	75

JIS B2351 Standard Male Stud Form and Sealing

Male stud form A
Sealing by o-ring
and bonded seal

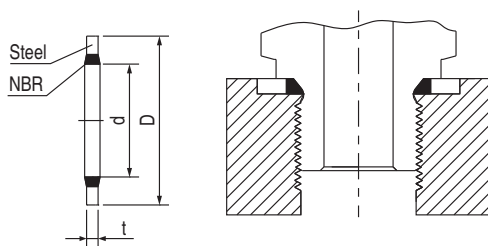


Male stud form B
Sealing
by Copper Gasket



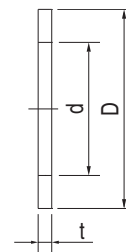
T	d1	d2+0.3 -0	d3+0.3 -0	Max. d4	d5+0.3 -0	d6	d7	Min. l1	Max. l2	Min. l3	l4+0.3 -0	I5	Suitable Seal		
													O-Ring	Bonded Seal	Copper Gasket
PF 1/8	18	11.6	17.4	9.7	18.2	14	14	10	1	15	2	1	P8	9PP-B01G	9PBN-01G
PF 1/4	24	15.6	20.9	13.1	13.1	19	18	14	1.5	20	2.5	1	P11	9PP-B02G	9PBN-02G
PF 3/8	28	18.6	24.4	16.6	16.6	22	21.5	14	2	20	2.5	1	P14	9PP-B03G	9PBN-03G
PF 1/2	34	22.6	29.4	20.9	20.9	27	25.5	17	2.5	25	2.5	1	P18	9PP-B04G	9PBN-04G
PF 3/4	45	29.8	34.9	26.4	26.4	36	31.5	19	2.5	27	3.5	1	P24	9PP-B06G	9PBN-06G
PF 1	51	35.8	41.9	33.2	33.2	41	38	22	2.5	31	3.5	1	P29	9PP-B08G	9PBN-08G
PF 1-1/4	62	44.8	50.9	41.9	41.9	50	48.5	24	2.5	33	3.5	1	P38	9PP-B10G	9PBN-10G
PF 1-1/2	68	50.8	57.4	47.8	47.8	55	53.5	25	2.5	34	3.5	1	P44	9PP-B12G	9PBN-12G
PF 2	76	67.2	69.4	59.6	5.6	75	66	29	2.5	38	3.5	1	P56	9PP-B16G	9PBN-16G

Bonded Seal



Part No.	Male Thread	d	D	t
9PBN-01G	PF 1/8	9.9	17	2
9PBN-02G	PF 1/4	13.3	20.5	2
9PBN-03G	PF 3/8	16.8	24	2
9PBN-04G	PF 1/2	21.1	29	2
9PBN-06G	PF 3/4	26.6	34.5	2
9PBN-08G	PF 1	33.4	41.5	2.3
9PBN-10G	PF 1-1/4	42.1	50.5	2.3
9PBN-12G	PF 1-1/2	48.0	57	2.3
9PBN-16G	PF 2	59.8	69	2.3

Copper Gasket



Part No.	Male Thread	d	D	t
9PP-B01G	PF 1/8	10	18	2
9PP-B02G	PF 1/4	14	22	2
9PP-B03G	PF 3/8	17	24	2
9PP-B04G	PF 1/2	22	32	2
9PP-B06G	PF 3/4	27	38	2
9PP-B09G	PF 1	34	42	2
9PP-B10G	PF 1-1/4	43	53	2
9PP-B12G	PF 1-1/2	49	60	2
9PP-B16G	PF 2	61	72	2

Carbon Steel Tubing Standards

Japanese Standards		JOHS hydraulic line service		JIS B2351 bite type fitting		JIS G3455 carbon steel pipes for high pressure service	
Code Number		OST.1	OST.2	STPS.1	STPS.2	STS.410	STS.370
Chemical Composition (%)	C	<0.20	0.08~0.18	<0.20	0.08~0.18	<0.30	<0.25
	Si	<0.035	0.10~0.35	<0.35	0.10~0.35	0.10~0.35	0.10~0.35
	Mn	0.25~0.60	0.30~0.60	0.25~0.60	0.30~0.60	0.30~1.40	0.30~1.10
	P	<0.040	<0.035	<0.040	<0.035	<0.035	<0.035
	S	<0.040	<0.035	<0.040	<0.035	<0.035	<0.035
	Cu		<0.20		<0.20		
Mechanical property	Tensile strength (kg/mm ²)	<45	<45	<45	<45	>410 (N/mm ²)	>370 (N/mm ²)
	Yield point (kg/mm ²)	>18	>20	>18	>18	>245 (N/mm ²)	>215 (N/mm ²)
	Elongation(%)	>35	>35	>30	>30	>25	>30
	Hardness						
	Bending test	4D×108°	4D×108°	4D×108°	4D×108°	6D×90°	6D×90°
	Flattening test					>20	>20
	Flaring test	1.2×D	1.2×D			$H = \frac{(1+e)t}{e+t/D}$	$H = \frac{(1+e)t}{e+t/D}$
Dimensional tolerance	Outside diameter (mm)	$\pm 0.10 \leq 22$	$\pm 0.10 \leq 22$	$\pm 0.10 \leq 25$	$\pm 0.10 \leq 25$	$\pm 0.8\%$, but	$\pm 0.8\%$, but
		28~35 ± 0.15	28~35 ± 0.15	30~38 ± 0.15	30~38 ± 0.15	minimum	minimum
		45~50 ± 0.20	45~50 ± 0.20			value is 0.3mm	value is 0.3mm
	wal thickness (mm)	0.5 $\pm 20\%$	0.5 $\pm 20\%$	1.0 $\pm 0.15\%$	1.0 $\pm 0.15\%$	For Smaller than 2mm ± 0.20 mm	For Smaller than 2mm ± 0.20 mm
		1.0~1.5 $\pm 15\%$	1.0~1.5 $\pm 15\%$	1.5 $\pm 0.20\%$	1.5 $\pm 0.20\%$	For over 2mm $\pm 10\%$	For over 2mm $\pm 10\%$
		10% ≥ 2.0	10% ≥ 2.0	10% ≥ 2.0	10% ≥ 2.0		
Length(mm)	$\leq 6000 +10$ -0	$\leq 6000 +10$ -0	$\leq 6000 +10$ -0	$\leq 6000 +10$ -0	greater than specified length	greater than specified length	
	$\geq 6000 +15$ -0	$\geq 6000 +15$ -0	$\geq 6000 +15$ -0	$\geq 6000 +15$ -0			
Inspection and test	Eddy current Flaw detection						
	Water pressure test(kg/mm ²)	50	50	50	50	p=200s t/D	p=200s t/D

Note:
In place of the water pressure test, the eddy current test shall be conducted.

Carbon Steel Tubing Standards

Western Standards Code Number		SAE J524b	AMS 5050F(E)	JIC APPENDIX-D	ANSI (NFPA) SMLS	DIN 2391
Chemical Composition (%)	C	<0.18	<0.15	0.08~0.18	<0.18	0.10
	Si					
	Mn	0.30~0.60	0.30~0.60	0.30~0.60	0.30~0.60	
	P	<0.040	<0.040	<0.050	<0.040	
	S	<0.050	<0.050	<0.055	<0.050	
	Cu					
Mechanical property	Tensile strength (kg/mm ²)	>31.6		<38.7	<38.7	35~45
	Yield point (kg/mm ²)	>17.6			>17.6	>20.0
	Elongation(%)	>35	OD ≤ 12.7>32 OD ≥ 12.7>35	>35	>35	>25.0
	Hardness	<65		<65	<65	
	Flattening test	H=3xt		H=3xt	H=3xt	
	Flaring test	1.25xD	t<7% × D35% t>7% × D45%	1.30xD	1.30xD	
	Development test					
	Lengthwise pressure test					
Dimensional tolerance	Outside diameter (mm)	≤ 25.4±0.102		6.35~12.7 ±0.076	≤ 12.7 ±0.076	≤ 10.00 ±0.10
		OVER 25.4~38.1±0.152	AMS2253	OVER 12.7~38.1±0.127	OVER 12.7~38.1±0.127	11.00~30.0 ±0.08
		OVER 38.1~50.8±0.203		OVER 38.1~88.9±0.254	OVER 38.1~88.9±0.254	32~40 ±0.15
	Inside diameter	±15%	AMS2253	6.35~12.7 OVER 12.7~38.1±0.127 OVER 38.1~88.9±0.254	≤ 12.7 OVER 12.7~38.1±0.127 OVER 38.1~88.9±0.254	
Inspection and test	Eddy current Flaw detection					
	Water pressure test(kg/mm ²)					

SAE:Society of Automotive Engineers
 JIC:The Joint Industrial Congress (JIC Hydraulic STD.)
 DIN:German Industry Standards.

AMS:Aerospace Materials Specification
 ANSI:American National Standards
 JOHS:The Oil Hydraulic Association Standards



Note:

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The accuracy of information here is not the liability of our company.

Component Selection

The selection of component for any application or system design must be considered to ensure safe performance. Component function, material compatibility, component pressure and temperature rating, proper installation, operation and maintenance remain the sole responsibility of the system designer and the user. HSME Corporation accepts no liability for any improper selection, installation, operation or maintenance.

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