















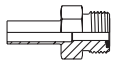
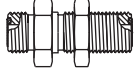
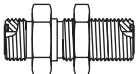
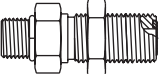

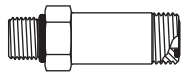







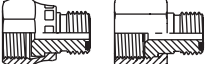

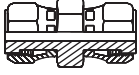

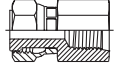
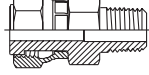
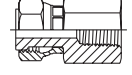
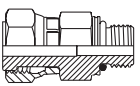
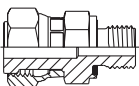
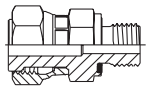

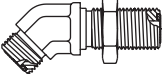

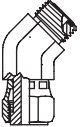

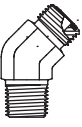

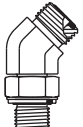





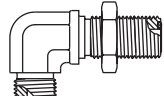
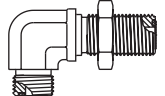
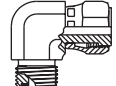
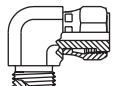
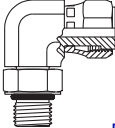
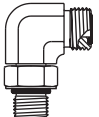
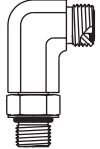

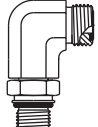
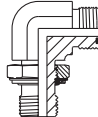
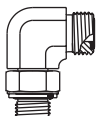

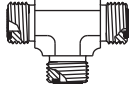
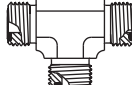
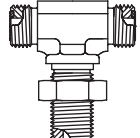
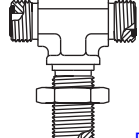
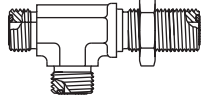
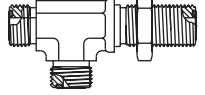
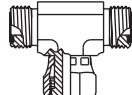
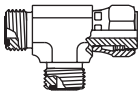
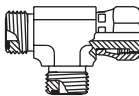
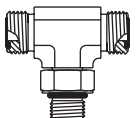
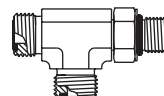
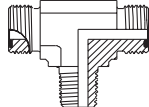
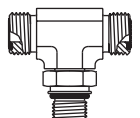
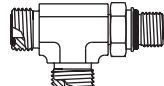
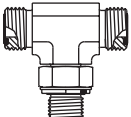
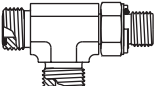

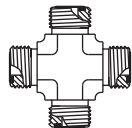
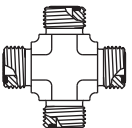







Seal-Lok™ O-Ring Face Seal Tube Fittings


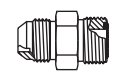
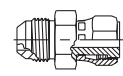
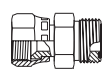
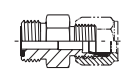
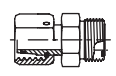
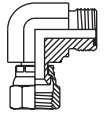


The Fitting Authority


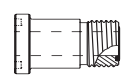
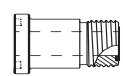

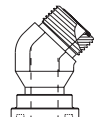
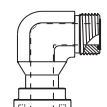
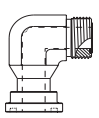
 <p>Nuts, Sleeves, Locknuts</p>	<p>BL Tube Nut</p>  <p>B9</p>	<p>BML Tube Nut - mm Hex</p>  <p>B9</p>	<p>TPL (Inch and Metric) Parflange Sleeve</p>  <p>B9</p>	<p>TL (Inch and Metric) Braze Sleeve</p>  <p>B10</p>	<p>TL-Reducer Braze Reducer Sleeve</p>  <p>B10</p>
<p>WLNL Bulkhead Locknut</p>  <p>B11</p>	<p>WLNML Blkhd Locknut - mm Hex</p>  <p>B11</p>	<p>SBR (Inch and Metric) Braze Ring</p>  <p>B11</p>	 <p>Straights</p>	<p>HLO Union</p>  <p>B12</p>	<p>HMLO Union - mm Hex</p>  <p>B12</p>
<p>LHP ORFS Flange Seal</p>  <p>B16</p>	<p>LHMP ORFS Flange Seal</p>  <p>B16</p>	<p>LOHB3 ORFS / Braze Socket</p>  <p>B17</p>	<p>MMLOHB3 ORFS / Braze - mm Hex</p>  <p>B17</p>	<p>LOHT3 ORFS / Tube Weld</p>  <p>B17</p>	<p>WLO Bulkhead Union</p>  <p>B12</p>
<p>WMLO Bulkhead Union - mm Hex</p>  <p>B13</p>	<p>WF5OLO ORFS Blkhd / SAE-ORB</p>  <p>B13</p>	<p>F5OLO ORFS / SAE-ORB</p>  <p>B14</p>	<p>FF5OLO ORFS - Long / SAE-ORB</p>  <p>B14</p>	<p>G5LO ORFS / SAE-ORB</p>  <p>B14</p>	<p>FLO ORFS/NPTF</p>  <p>B14</p>
<p>GLO ORFS/NPTF</p>  <p>B15</p>	<p>F87OMLO ORFS / ISO 6149</p>  <p>B15</p>	<p>F82EDMLO ORFS / Metric-ED</p>  <p>B15</p>	<p>F42EDMLO ORFS / BSPP-ED</p>  <p>B15</p>	 <p>Straight Swivels</p>	<p>TRLON Tube End Reducer</p>  <p>B17</p>
<p>LOHL6 Extender and Expander</p>  <p>B18</p>	<p>HL6 ORFS Swivel Union</p>  <p>B18</p>	<p>F65OL ORFS Swivel / SAE-ORB</p>  <p>B18</p>	<p>G65L ORFS Swivel / SAE-ORB</p>  <p>B18</p>	<p>F6L ORFS Swivel / NPTF</p>  <p>B18</p>	<p>G6L ORFS Swivel / NPTF</p>  <p>B18</p>
<p>F687OML ORFS Swivel / ISO 6149</p>  <p>B19</p>	<p>F682EDML ORFS Swivel / Metric-ED</p>  <p>B19</p>	<p>F642EDML ORFS Swivel / BSPP-ED</p>  <p>B19</p>	 <p>45° Elbows</p>	<p>WNLO Bulkhead Union</p>  <p>B19</p>	<p>WNMLO Bulkhead Union - mm Hex</p>  <p>B20</p>
<p>V6LO ORFS Swivel Elbow</p>  <p>B20</p>	<p>V5OLO ORFS / SAE-ORB</p>  <p>B20</p>	<p>VLO ORFS / NPTF</p>  <p>B20</p>	<p>V87OMLO ORFS / ISO 6149</p>  <p>B21</p>	<p>V4OMLO ORFS / BSPP-ORR</p>  <p>B21</p>	

	ELO Union Elbow  B21	EMLO Union Elbow - mm Hex  B21	WELO Bulkhead Union  B22	WEMLO Bulkhead Union - mm Hex  B22	C6LO ORFS Swivel Elbow  B23
	C6MLO Swivel Elbow - mm Hex  B23	AOEL6 ORFS Swivel / SAE-ORB  B23	C5OLO ORFS / SAE-ORB  B23	CC5OLO ORFS / SAE-ORB - Long  B24	CLO ORFS / NPTF  B24
CC87OMLO ORFS / ISO 6149 - Long  B25	C8OMLO ORFS / Metric-ORR  B25	C4OMLO ORFS / BSPP-ORR  B26		JLO Union Tee  B26	JMLO Union Tee - mm Hex  B26
WJLO Bulkhead Branch  B26	WJMLO Blkhd Branch - mm Hex  B27	WJJLO Bulkhead Run  B27		WJJMLO Bulkhead Run - mm Hex  B28	S6LO ORFS Swivel Branch  B28
R6LO ORFS Swivel Run  B29	R6MLO Swivel Run - mm Hex  B29	S5OLO SAE-ORB Branch Tee  B29	R5OLO SAE-ORB Run Tee  B30	SLO NPTF Branch Tee  B30	S87OMLO ISO 6149 Branch Tee  B30
R87OMLO ISO 6149 Run Tee  B31	S4OMLO BSPP-ORR Branch Tee  B31	R4OMLO BSPP-ORR Run Tee  B32		KLO Union Cross  B32	KMLO Union Cross - mm Hex  B32
	PNLO ORFS Plug  B33	PNMLO ORFS Plug - mm Hex  B33		FNL ORFS Cap  B33	FNML ORFS Cap - mm Hex  B33


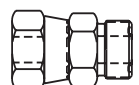
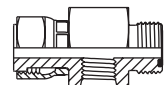
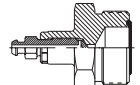
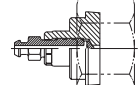
Conversion Adapters (Shown in Section L)

 <p>Conversion Adapters</p>	<p>XHLO 37° Flare / ORFS</p>  <p>L3</p>	<p>XHL6 37° Flare / ORFS Swivel</p>  <p>L3</p>	<p>LOHX6 ORFS / 37° Swivel</p>  <p>L3</p>	<p>BUHLO ORFS / Flareless (inch)</p>  <p>L4</p>	<p>LOHU86 Metric Swivel (EO)/ORFS</p>  <p>L4</p>
	<p>LOEX6 ORFS / 37° Swivel</p>  <p>L3</p>				



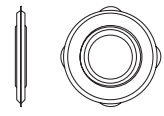



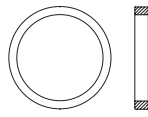

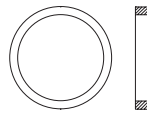

Flange Adapters (Shown in Section M)

 <p>SAE Flange Adapters</p>	<p>LOHQ1 Code 61 / ORFS</p>  <p>M9</p>	<p>LOHQ2 Code 62 / ORFS</p>  <p>M9</p>	<p>LOVQ1 Code 61 / ORFS</p>  <p>M27</p>	<p>LOVQ2 Code 62 / ORFS</p>  <p>M27</p>	<p>LOEQ1 Code 61 / ORFS</p>  <p>M28</p>
	<p>LOEQ2 Code 62 / ORFS</p>  <p>M28</p>				

Diagnostic & Bleed Adapters (Shown in Section N)

 <p>Diagnostic & Bleed Adapters</p>	<p>LOHL6 Orifice Orifice Swivel with Orifice / ORFS</p>  <p>N11</p>	<p>LOHL6G5TP Orifice Swivel / ORFS / SAE-ORB</p>  <p>N5</p>	<p>PNLOBA Bleed Screw / ORFS</p>  <p>N12</p>	<p>FNLBA Bleed Screw / SAE-ORB</p>  <p>N12</p>

O-Rings and Seals (Shown in Section O)

 <p>O-Rings and Seals</p>	<p>ORFS O-Ring</p>  <p>O3</p>	<p>PLS Bonded Seal</p>  <p>O3</p>	<p>SAE O-Ring</p>  <p>O3</p>	<p>ISO 6149 O-Ring</p>  <p>O4</p>	<p>Metric O-Ring</p>  <p>O4</p>
	<p>Metric Retaining Ring</p>  <p>O4</p>	<p>BSPP O-Ring</p>  <p>O5</p>	<p>BSPP Retaining Ring</p>  <p>O5</p>	<p>Eoelastic Seal Ring</p>  <p>O6</p>	

Introduction

The Seal-Lok fitting was developed by the Tube Fittings Division in the early 1980s. This product has proven to be very effective in eliminating leakage at the higher pressures found in today's hydraulic systems. It meets or exceeds the strict requirements of SAE J1453 and ISO 8434-3. The Seal-Lok fitting is an O-ring face seal type fitting that consists of a nut, a body, an O-ring and a sleeve (Fig. B1). As shown in Fig. B3, the tube is flanged to 90° (or the tube may be brazed instead to a braze-type sleeve). When the fitting is assembled, it compresses an O-ring in the precision machined groove in the fitting body to form a leak tight seal.

Seal-Lok fittings are suitable for a wide range of tube wall thickness and are readily adaptable to pipe, inch or metric tubing and hose. (Please refer to Table B2 and Table B3 for min./max. tube wall thickness for inch and metric tubing, respectively). Seal-Lok's leak-free design and rugged construction make it suitable for a wide range of applications where higher pressures, vibration and impulse are prevalent. It is popular in markets such as construction, agriculture, machine tool, utility, paper making, automotive, etc.

Design and Construction

The Seal-Lok fitting consists of four main components: a body, a sleeve, an O-ring and a nut. The more popular materials from which Seal-Lok is manufactured are shown in Table B1.

The Seal-Lok Fitting Body. There are over 60 different body configurations to choose from for specific applications. The body face is manufactured with Parker's CORG (captive O-ring groove) which keeps the high durometer O-ring captive during installation (see Fig. B2). In addition, the Seal-Lok fitting body shapes are forged for added strength and longer service life. Straight products are made from cold drawn barstock. The cold drawing process ensures consistent dimensional tolerances, improved strength and better surface finish.

The Seal-Lok Fitting Nut. Smaller size Seal-Lok fitting nuts are cold-formed to provide a more tightly packed grain structure, resulting in a much stronger component. Larger size nuts are machined from cold drawn barstock.

The Seal-Lok Flange Sleeve. The preferred method of making a Seal-Lok connection is by using the Parker Parflange machine (see section S) to create the 90° flange on the tube end. A flange sleeve is used to support the flange and the tube. It also provides the contact shoulder for the nut, a back-up for the 90° tube flange and support at the tube O.D (see Fig. B3). The Parflange process provides the following advantages:

- Is several times faster than brazing.
- Does not require any special pre- or post-flange cleaning.
- Is cleaner and safer than brazing.
- Accommodates the use of plated or unplated sleeve and tube.
- Eliminates a potential leak path associated with braze joints.

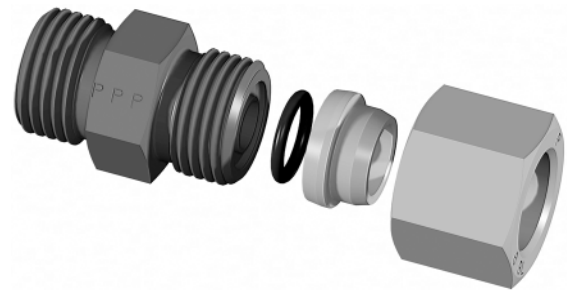


Fig. B1 — Seal-Lok Fitting Body, O-ring, Sleeve and Nut

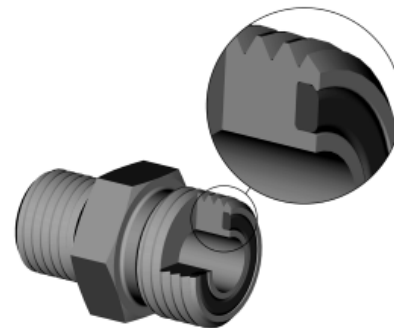


Fig. B2 — Captive O-ring Groove (CORG) Cutaway

Seal-Lok Fittings	Steel**		Stainless Steel**	
	ASTM	Type	ASTM	Type
Forged Bodies	A576	1214/1215	A182	316
Bar Stock Bodies	A108	12L14	A479	316
Cold Formed Nuts	A576	C1010	--	--
Machined Nuts*	A108	12L14 11L37	A479	316
Braze Sleeves & Braze Connectors	A108	12L14	A276	316L
Flange Sleeves	A108	12L14	A479	316

*All stainless steel nuts are coated to prevent galling at assembly.

**Other materials can be produced upon request.

Finish: Zinc with yellow chromate is used on all standard steel products. Stainless steel fittings are passivated.

Table B1 — Standard Material Specifications for Seal-Lok Fittings

The Seal-Lok Braze Sleeve. A second method of sleeve attachment is with the braze sleeve. The sleeve is brazed to the tube end as shown in Fig. B3. The flat, smooth surface of the braze sleeve seals against the O-ring when fully assembled. The holding power is provided by the braze.

How Seal-Lok Fittings Work

The Seal-Lok fitting body face contains a high durometer O-ring that is held captive in a precision machined groove. As the nut is tightened onto the fitting body, the O-ring is compressed between the body and flat face of the tube flange or braze sleeve to form a tight, positive seal (see Fig. B3).

As the two faces come in contact, further tightening of the nut produces a sharp rise in assembly torque. A solid pull of the wrench at this point, to recommended assembly torque, completes the assembly. The sharp torque rise gives a “solid feel” at assembly, and minimizes the possibility of over tightening.

Because the sealing surfaces are flat and perpendicular to the assembly pull, they remain virtually free of distortion during assembly, giving Seal-Lok fittings virtually unlimited remakeability. The O-ring should be inspected at each disassembly and replaced when necessary. **See the O-Rings and Seals section for information on replacement face seal O-rings.**

Metric Seal-Lok

The tube/hose end connection for metric Seal-Lok is the same as standard (inch) Seal-Lok. It consists of a body, a flange or braze sleeve, an O-ring and a nut. The difference is at the port end of the fitting. Instead of the SAE straight thread connection, it features a similar connection with metric threads per ISO 6149-2. Additionally, the fitting body, tube nut and locknut are manufactured with metric hexes or forging wrench flats. The metric Seal-Lok fittings meet or exceed all requirements of ISO 8434-3.

Identification

To differentiate metric Seal-Lok from standard (inch) Seal-Lok, the following identification features have been incorporated in the design:

- Straight connectors (straight studs) have a short length of turn diameter with a small groove machined in it's middle, as seen in Fig. B4.
- The lock nuts on shaped connectors (stud elbows, tees and crosses) have a similar turn diameter adjacent to the washer, without a groove, as seen in Fig. B4.
- The sleeve is identified by a small groove machined on its large diameter as shown in Fig. B5.

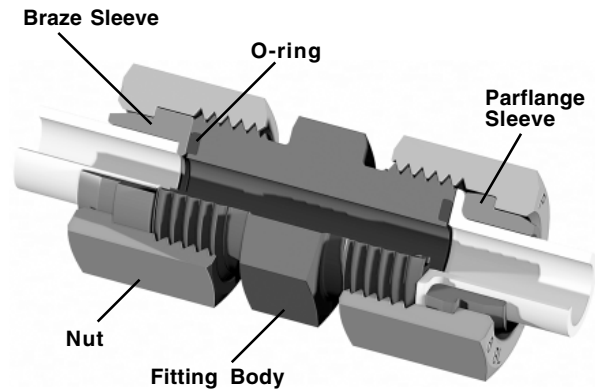


Fig. B3 — Seal-Lok Union cutaway with flanged and brazed assemblies

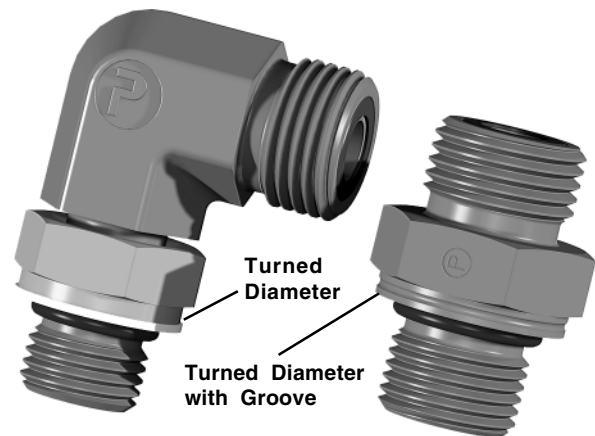


Fig. B4 — Metric Seal-Lok Straight and Shaped Connectors with Identification for use with ISO 6149-1 Port

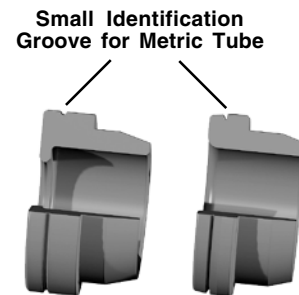


Fig. B5 — Metric (Tube) Seal-Lok Sleeves

Versatility

The Seal-Lok fitting is very versatile in that it can be used with inch and metric tubing, as well as hose (see Fig B6).

The following example illustrates the options with a 1/2" (-8) Seal-Lok fitting:

- 1/2" fitting and 1/2" nut can connect to 1/2" tubing using the 1/2" sleeve.
- 1/2" fitting and 1/2" nut can connect to 12 mm tubing using 12 mm sleeve.
- Without nut and sleeve, 1/2" fitting can connect to hose.

The process also works in reverse. A metric Seal-Lok fitting and metric nut can connect to inch tubing by simply using the inch sleeve.

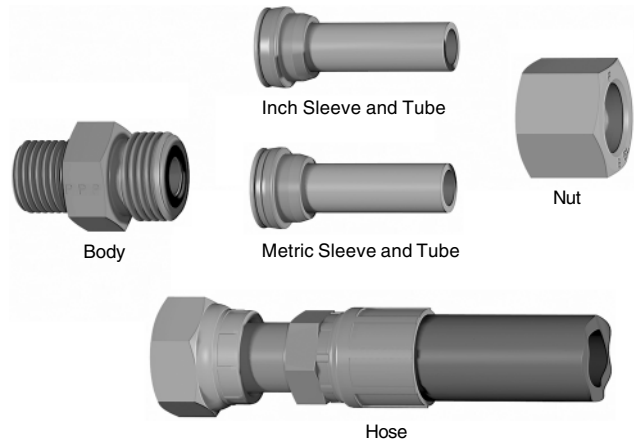


Fig. B6 — Seal-Lok Works with Inch or Metric Tube and Hose

Tube Wall Thickness

Recommended min/max tube wall thicknesses for inch and metric Seal-Lok are provided in Table B2 and Table B3 respectively. When using the braze method, all tube wall thicknesses can be used. For Parflange min/max tube wall thickness range, please refer to page S29 for tooling availability.

With any fitting, proper assembly and installation is critical to its success. Please refer to pages T10-T16 for the proper assembly and installation procedures for the Seal-Lok fitting.

Note: Brazing to attach the sleeve can be used for all wall thicknesses.

Size		Steel, Alloy Steel, St. Steel, Copper, Monel
O.D. Inches	Dash Number	SAE O-Ring Face Seal Seal-Lok
1/4	-4	.020 – .083
3/8	-6	.020 – .109
1/2	-8	.028 – .148
5/8	-10	.035 – .134
3/4	-12	.035 – .148
7/8	-14	.035 – .156
1	-16	.035 – .188
1 1/4	-20	.049 – .220
1 1/2	-24	.049 – .250
2	-32	.058 – .250

Table B2 — Recommended Min./Max. Tube Wall Thickness for Inch Seal-Lok

O.D. Size in mm	Steel, Alloy Steel, Stainless Steel, Copper, Monel	Used With Fitting Size
	Wall Thickness in mm	
6	.5 - 2.25	-4
8	1.0 - 2.5	-6
10	1.0 - 3.0	-6
12	1.0 - 3.5	-8
14	1.0 - 4.0	-10
15	1.0 - 3.0	-10
16	1.0 - 3.0	-10
18	1.0 - 3.0	-12
20	1.5 - 4.0	-12
22	1.0 - 3.0	-16
25	2.0 - 5.0	-16
28	1.5 - 5.0	-20
30	2.0 - 5.0	-20
32	2.0 - 2.5	-20
35	2.0 - 6.0	-24
38	2.5 - 7.0	-24

Table B3 — Recommended Min./Max. Tube Wall Thickness for Metric Seal-Lok

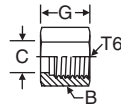
Seal-Lok Features

Feature	Advantage	Benefit
Conformance to SAE J1453 and ISO 8434-3	Suitable for a wider range of global markets	Global acceptance and availability
Elastomeric seal	Tolerant of surface imperfections	Provides leak-free connection
High pressure rating	Up to 9200 psi depending on size	Good for wider range of applications
No tube entry	Easy and fast drop-in installation	Saves assembly and disassembly time
Captive O-ring groove (CORG)	Prevents O-ring fall-out	Ensures positive and leak-free connection
Close to envelope size of 37° flared fitting	Minimal or no re-design of hydraulic systems	Re-design costs are minimized
Wide tube wall range	No min./max. wall limitation with braze method	Flexibility in design
Resistant to overtorque	Minimizes damage during assembly	Consistent quality of connection
Unlimited reusability/remakeability	Extends the service life of the fitting	Reduces maintenance costs and component replacement costs
Forged shapes	Stronger than brazed shapes	Provides the highest quality in shaped fittings
	Higher resistance to mechanical shock and vibration	
Parflange method of assembly	Several times faster than brazing	Reduces assembly cost
	No special pre- and post-braze cleaning	Reduces tube preparation cost
	No open flame or heat source required	Improves operator safety
	No braze joint or potential leak path	Provides consistency in quality
	Accommodates the use of plated component, such as the fitting and tube	Eliminates special corrosion-resistant treatment

Table B4 — Seal-Lok Features, Advantages and Benefits

BL

Tube Nut
ORFS



SAE 520110

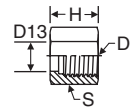
TUBE FITTING PART #	TUBE O.D. (in.)	T6 UNF/UNF-2B	B HEX (in.)	C (in.)	G (in.)	STANDARD From Stock		
						S	SS	B
4 BL	1/4	9/16-18	11/16	0.41	0.58	•	•	
6 BL	3/8	11/16-16	13/16	0.53	0.67	•	•	
8 BL	1/2	13/16-16	15/16	0.65	0.83	•	•	
10 BL	5/8	1-14	1 1/8	0.83	0.93	•	•	
12 BL	3/4	1 3/16-12	1 3/8	0.95	1.02	•	•	
12-14 BL	7/8	1 3/16-12	1 3/8	0.99	1.22	•	•	
14 BL*	7/8	1 5/16-12	1 1/2	1.08	1.04	•	•	
16 BL	1	1 7/16-12	1 5/8	1.14	1.10	•	•	
20 BL	1 1/4	1 11/16-12	1 7/8	1.42	1.10	•	•	
24 BL	1 1/2	2-12	2 1/4	1.73	1.10	•	•	
32 BL*	2	2 1/2-2	2 7/8	2.22	1.30	•	•	

* Sizes 14 and 32 are not included in SAE J1453.

** These tube nuts should not be exposed to annealing temperatures, such as furnace brazing. [Contact the Tube Fittings Division](#) for information on special nuts.

BML

Tube Nut – mm Hex
ORFS



ISO 8434-3 NA
SAE 52M0110A

TUBE FITTING PART #	TUBE O.D.		D THREAD UN/UNF-2B	D13 DRILL (mm)	H (mm)	S HEX (mm)	STANDARD From Stock		
	(mm)	(in.)					S	SS	B
4BML	6	1/4	9/16-18	10.50	15.0	17	•	•	
6BML	8,10	3/8	11/16-16	13.55	17.0	22	•	•	
8BML	12	1/2	13/16-16	16.60	20.0	24	•	•	
10BML	14,15,16	5/8	1-14	21.10	24.0	30	•	•	
12BML	18,20	3/4	1 3/16-12	24.15	26.5	36	•	•	
16BML	22,25	1	1 7/16-12	29.10	27.5	41	•	•	
20BML	28,30,32	1 1/4	1 11/16-12	36.00	27.5	50	•	•	
24BML	35,38	1 1/2	2-12	44.00	27.5	60	•	•	

How to Order

Specs

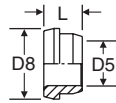
Assembly / Installation

3-D CAD Model

Reference

TPL

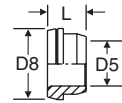
Parflange Sleeve for Inch Tubing
ORFS Mechanically Attachable Sleeve



TUBE FITTING PART #	D5 TUBE O.D. (in.)	D8 DIA. (in.)	L (in.)	STANDARD From Stock		
				S	SS	B
4 TPL	1/4	0.50	0.30	•	•	
6 TPL	3/8	0.62	0.34	•	•	
8 TPL	1/2	0.74	0.42	•	•	
10 TPL	5/8	0.92	0.42	•	•	
12 TPL	3/4	1.09	0.47	•	•	
16 TPL	1	1.34	0.53	•	•	
20 TPL	1 1/4	1.59	0.52	•	•	
24 TPL	1 1/2	1.91	0.49	•	•	
32 TPL	2	2.39	0.54	•	•	

TPL (Metric)

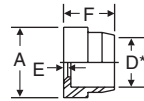
Parflange Sleeve for Metric Tubing
ORFS Mechanically Attachable Sleeve



TUBE FITTING PART #	USED WITH FITTING SIZE	D5 TUBE O.D. (mm)	D8 DIA. (mm)	L (mm)	STANDARD From Stock		
					S	SS	B
TPLS6	-4	6	13.0	7.5	•	•	
TPLS8	-6	8	16.0	8.5	•	•	
TPLS10	-6	10	16.0	8.5	•	•	
TPLS12	-8	12	19.0	10.5	•	•	
TPLS14	-10	14	21.0	10.5	•	•	
TPLS15	-10	15	23.5	10.5	•	•	
TPLS16	-10	16	23.5	10.5	•	•	
TPLS18	-12	18	28.0	12.0	•	•	
TPLS20	-12	20	28.0	12.0	•	•	
TPLS22	-16	22	34.0	13.5	•	•	
TPLS25	-16	25	34.0	13.5	•	•	
TPLS28	-20	28	40.5	13.0	•	•	
TPLS30	-20	30	40.5	13.0	•	•	
TPLS32	-20	32	40.5	13.0	•	•	
TPLS35	-24	35	48.5	12.5	•	•	
TPLS38	-24	38	48.5	12.5	•	•	

TL

Braze Sleeve for Inch Tubing
ORFS Silver Braze Sleeve



SAE 520115

TUBE FITTING PART #	TUBE O.D. (in.)	A DIA. (in.)	D* (in.)	E (in.)	F (in.)	STANDARD From Stock		
						S	SS	B
4 TL	1/4	0.50	0.26	0.04	0.37	•	•	
6 TL	3/8	0.62	0.38	0.04	0.37	•	•	
8 TL	1/2	0.75	0.51	0.04	0.37	•	•	
10 TL	5/8	0.92	0.63	0.06	0.41	•	•	
12 TL	3/4	1.10	0.76	0.06	0.55	•	•	
14 TL**	7/8	1.22	0.88	0.06	0.55	•	•	
16 TL	1	1.35	1.01	0.06	0.61	•	•	
20 TL	1 1/4	1.60	1.26	0.06	0.61	•	•	
24 TL	1 1/2	1.91	1.51	0.06	0.61	•	•	
32 TL**	2	2.41	2.01	0.06	0.65	•	•	

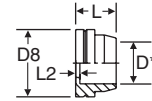
Unplated part, oil dipped for corrosion protection.

* D is for silver brazing.

** Sizes 14 and 32 are not included in SAE J1453.

TL (Metric)

Braze Sleeve for Metric Tubing
ORFS Silver Braze Sleeve



ISO 8434-3 BRSL
SAE 5201M15

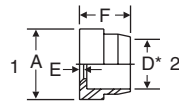
TUBE FITTING PART #	USED WITH FITTING SIZE	D TUBE O.D. (mm)	D8 DIA. (mm)	L (mm)	L2 (mm)	STANDARD From Stock		
						S	SS	B
TLS6	-4	6	12.8	9.5	1.0	•	•	
TLS8	-6	8	15.8	9.5	1.0	•	•	
TLS10	-6	10	15.8	9.5	1.0	•	•	
TLS12	-8	12	18.9	9.5	1.0	•	•	
TLS16	-10	16	23.5	10.5	1.5	•	•	
TLS20	-12	20	27.9	14.0	1.5	•	•	
TLS25	-16	25	34.2	15.5	1.5	•	•	
TLS30	-20	30	40.6	15.5	1.5	•	•	
TLS38	-24	38	48.5	15.5	1.5	•	•	
TLS50-42	-32	42	61.0	16.5	1.5			
TLS50	-32	50	61.0	16.5	1.5			

Unplated part, oil dipped for corrosion protection.

* D is for silver brazing.

TL-Reducer

Reducer Sleeve
ORFS Silver Braze Sleeve Reducer



SAE 520115

TUBE FITTING PART #	END SIZE		A (in.)	D (in.)	E (in.)	F (in.)	STANDARD From Stock		
	1 (in.)	2 (in.)					S	SS	B
6-4 TL	3/8	1/4	0.62	0.26	0.08	0.41	•	•	
8-4 TL	1/2	1/4	0.75	0.26	0.14	0.47	•	•	
8-6 TL	1/2	3/8	0.75	0.38	0.14	0.47	•	•	
10-4 TL	5/8	1/4	0.92	0.26	0.20	0.53	•		
10-6 TL	5/8	3/8	0.92	0.38	0.20	0.53	•		
10-8 TL	5/8	1/2	0.92	0.51	0.20	0.53	•		
12-4 TL	3/4	1/4	1.10	0.26	0.24	0.57	•	•	
12-6 TL	3/4	3/8	1.10	0.38	0.24	0.57	•		
12-8 TL	3/4	1/2	1.10	0.51	0.24	0.57	•		
12-10 TL	3/4	5/8	1.10	0.63	0.24	0.57	•		
12-14 TL	3/4	7/8	1.10	0.88	0.06	0.65	•		
16-8 TL	1	1/2	1.35	0.51	0.28	0.61	•		
16-10 TL	1	5/8	1.35	0.63	0.28	0.61	•		
16-12 TL	1	3/4	1.35	0.76	0.18	0.67	•	•	
16-14 TL	1	7/8	1.35	0.88	0.12	0.67	•		
20-12 TL	1 1/4	3/4	1.60	0.76	0.28	0.77	•		
20-16 TL	1 1/4	1	1.60	1.01	0.28	0.83	•	•	
24-16 TL	1 1/2	1	1.91	1.01	0.28	0.83	•		
24-20 TL	1 1/2	1 1/4	1.91	1.26	0.28	0.83	•	•	

Unplated part, oil dipped for corrosion protection.

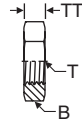
* D is for silver brazing.



WLNL

Bulkhead Locknut

SAE 520118



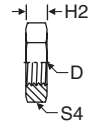
TUBE FITTING PART #	TUBE O.D. (in.)	T TUBE END UN/UNF-2B	B HEX (in.)	TT (in.)	STANDARD From Stock		
					S	SS	B
4 WLNL	1/4	9/16-18	13/16	0.27	•	•	
6 WLNL	3/8	11/16-16	1	0.32	•	•	
8 WLNL	1/2	13/16-16	1 1/8	0.35	•	•	
10 WLNL	5/8	1-14	1 5/16	0.41	•	•	
12 WLNL	3/4	1 3/16-12	1 1/2	0.41	•	•	
14 WLNL*	7/8	1 5/16-12	1 5/8	0.41	•	•	
16 WLNL	1	1 7/16-12	1 3/4	0.41	•	•	
20 WLNL	1 1/4	1 11/16-12	2	0.41	•	•	
24 WLNL	1 1/2	2-12	2 3/8	0.41	•	•	

* Size 14 is not included in SAE J1453.

WLMNL

Bulkhead Locknut – mm Hex

ISO 8434-3 BHLN
SAE 52M0118

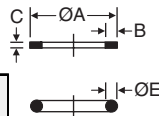
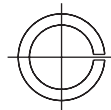


TUBE FITTING PART #	TUBE O.D.		D TUBE END UN/UNF-2B	H2 (mm)	S4 HEX (mm)	STANDARD From Stock		
	(mm)	(in.)				S	SS	B
4WLNML	6	1/4	9/16-18	7.0	22	•	•	
6WLNML	8,10	3/8	11/16-16	8.0	27	•	•	
8WLNML	12	1/2	13/16-16	9.0	30	•	•	
10WLNML	14,15,16	5/8	1-14	10.5	36	•	•	
12WLNML	18,20	3/4	1 3/16-12	10.5	41	•	•	
16WLNML	22,25	1	1 7/16-12	10.5	46	•	•	
20WLNML	28,30,32	1 1/4	1 11/16-12	10.5	50	•	•	
24WLNML	35,38	1 1/2	2-12	10.5	60	•	•	

- How to Order
- Specs
- Assembly / Installation
- 3-D CAD Model
- Reference

SBR

Silver Braze Ring for Inch Tubing



TUBE FITTING PART #	TUBE O.D. (in.)	A DIA. (in.)	B (in.)	C (in.)	E (in.)	STANDARD From Stock		
						S	SS	B
4 SBR	1/4	0.260	—	—	0.05	•	•	
6 SBR	3/8	0.390	0.07	0.03	—	•	•	
8 SBR	1/2	0.515	0.07	0.03	—	•	•	
10 SBR	5/8	0.640	0.07	0.03	—	•	•	
12 SBR	3/4	0.765	0.08	0.04	—	•	•	
14 SBR	7/8	0.890	—	—	0.06	•	•	
16 SBR	1	1.015	0.08	0.04	—	•	•	
20 SBR	1 1/4	1.265	0.08	0.04	—	•	•	
24 SBR	1 1/2	1.515	0.08	0.04	—	•	•	
32 SBR	2	2.015	—	—	0.09	•	•	

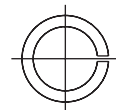
SBR recommended for steel or copper tubing.

SBR-SS recommended for stainless tubing, but can be used on steel tubing.

Contact the [Tube Fittings Division](#) for braze rings used in marine or special applications.

SBR

Silver Braze Ring for Metric Tubing



TUBE FITTING PART #	TUBE O.D. (mm)	A DIA. (mm)	E (mm)	STANDARD From Stock		
				S	SS	B
SBR 6mm	6	6.4	1.2	•	•	
SBR 8mm	8	8.4	1.2	•	•	
SBR 10mm	10	10.4	1.2	•	•	
SBR 12mm	12	12.4	1.2	•	•	
SBR 14mm	14	14.4	1.2	•	•	
SBR 15mm	15	15.4	1.2	•	•	
SBR 16mm	16	16.4	1.2	•	•	
SBR 18mm	18	18.4	1.2	•	•	
SBR 20mm	20	20.4	1.6	•	•	
SBR 22mm	22	22.4	1.6	•	•	
SBR 25mm	25	25.4	1.6	•	•	
SBR 28mm	28	28.4	1.6	•	•	
SBR 30mm	30	30.4	1.6	•	•	
SBR 32mm	32	32.4	1.6	•	•	
SBR 35mm	35	35.4	1.6	•	•	
SBR 38mm	38	38.4	1.6	•	•	
SBR 42mm	42	42.4	1.6	•	•	
SBR 50mm	50	50.4	2.4	•	•	

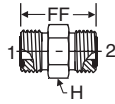
SBR recommended for steel or copper tubing.

SBR-SS recommended for stainless tubing, but can be used on steel tubing.

Contact the [Tube Fittings Division](#) for braze rings used in marine or special applications.

HLO Full Dimensions

Union
ORFS / ORFS



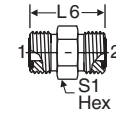
SAE 520101

TUBE FITTING PART #	END SIZE		FF (in.)	H HEX (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 (in.)			S	SS	B
	4 HLO	1/4			1/4	1.08	5/8
6 HLO	3/8	3/8	1.22	3/4	9.2	9.2	
6-4 HLO	3/8	1/4	1.17	3/4	9.2		
8 HLO	1/2	1/2	1.39	7/8	9.2	9.2	
8-6 HLO	1/2	3/8	1.33	7/8	9.2		
10 HLO	5/8	5/8	1.68	1 1/16	6.0	6.0	
10-8 HLO	5/8	1/2	1.57	1 1/16	6.0		
12 HLO	3/4	3/4	1.85	1 1/4	6.0	6.0	
12-10 HLO	3/4	5/8	1.80	1 1/4	6.0		
14 HLO*	7/8	7/8	1.87	1 3/8			
16 HLO	1	1	1.94	1 1/2	6.0	6.0	
16-12 HLO	1	3/4	1.92	1 1/2	6.0		
20 HLO	1 1/4	1 1/4	2.02	1 3/4	6.0		
24 HLO	1 1/2	1 1/2	2.09	2 1/8	5.0	5.0	
32 HLO*	2	2	2.87	2 3/4	3.0		

* Sizes 14 and 32 are not included in SAE J1453.

HMLO Full Dimensions

Union – mm Hex
ORFS / ORFS

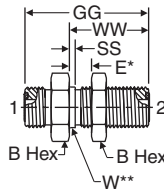


ISO 8434-3 S
SAE 52M0101

TUBE FITTING PART #	END SIZE		L6 (mm)	S1 HEX (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 & 2				S	SS	B
	(mm)	(in.)					
4HMLO	6	1/4	27.5	14	9.2		
6HMLO	8,10	3/8	31	19	9.2		
8HMLO	12	1/2	35.5	22	9.2		
10HMLO	14,15,16	5/8	42.5	27	6.0		
12HMLO	18,20	3/4	47	32	6.0		
16HMLO	22,25	1	49.5	41	6.0		
20HMLO	28,30,32	1 1/4	51.5	46	6.0		
24HMLO	35,38	1 1/2	53	55	5.0		

WLO Full Dimensions

Bulkhead Union
ORFS (all three ends)



TUBE FITTING PART #	END SIZE		B HEX (in.)	E MAX. (in.)	GG (in.)	SS (in.)	W DIA. (in.)	WW (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 (in.)							S	SS	B
	4 WLO	1/4							1/4	13/16	0.53
6 WLO	3/8	3/8	1	0.53	2.09	0.06	0.69	1.34	9.2	9.2	
8 WLO	1/2	1/2	1 1/8	0.53	2.30	0.06	0.81	1.44	9.2	9.2	
10 WLO	5/8	5/8	1 5/16	0.52	2.62	0.06	1.00	1.60	6.0		
12 WLO	3/4	3/4	1 1/2	0.50	2.72	0.06	1.19	1.64	6.0	6.0	
14 WLO*	7/8	7/8	1 5/8	0.51	2.76	0.06	1.31	1.66	6.0		
16 WLO	1	1	1 3/4	0.51	2.76	0.06	1.44	1.66	6.0	6.0	
20 WLO	1 1/4	1 1/4	2	0.51	2.76	0.06	1.69	1.66	6.0		
24 WLO	1 1/2	1 1/2	2 3/8	0.51	2.76	0.06	2.00	1.66	5.0		

* Sizes 14 and 32 are not included in SAE J1453.

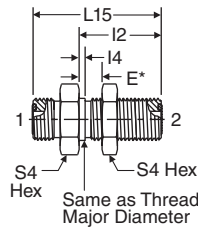
** W – Bulkhead pilot diameter. Recommended clearance hole is W ± 0.015".



WMLO Full Dimensions

Bulkhead Union – mm Hex
ORFS / ORFS

ISO 8434-3 BHS
SAE 52M0601



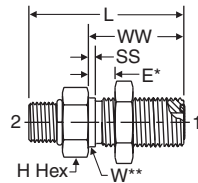
TUBE FITTING PART #	END SIZE		E (mm)	I 2 (mm)	I 4 (mm)	L15 (mm)	S4 HEX (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 & 2							S	SS	B
	(mm)	(in.)								
4WMLO	6	1/4	14	31.5	1.5	48	22	9.2		
6WMLO	8,10	3/8	14	34	1.5	53	27	9.2		
8WMLO	12	1/2	14	36.5	2.5	58.5	30	9.2		
10WMLO	14,15,16	5/8	14	40.5	2.5	66.5	36	6.0		
12WMLO	18,20	3/4	14	41.5	3	69	41	6.0		
16WMLO	22,25	1	14	42	3	70	46	6.0		
20WMLO	28,30,32	1 1/4	14	42	3	70	50	6.0		
24WMLO	35,38	1 1/2	14	42	3	70	60	5.0		

* E – Maximum bulkhead thickness.



WF5OLO Full Dimensions

Straight Thread Bulkhead Connector
ORFS / SAE-ORB



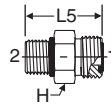
TUBE FITTING PART #	END SIZE		E MAX. (in.)	H HEX (in.)	L (in.)	SS (in.)	W DIA. (in.)	WW (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2A							S	SS	B
	4 WF5OLO	1/4									
4-6 WF5OLO	1/4	9/16-18	0.53	13/16	2.18	0.06	0.56	1.24	9.2		
6 WF5OLO	3/8	9/16-18	0.53	1	2.31	0.06	0.69	1.34	9.2		
8 WF5OLO	1/2	3/4-16	0.53	1 1/8	2.60	0.06	0.81	1.44	9.2		
10 WF5OLO	5/8	7/8-14	0.52	1 5/16	2.69	0.06	1.00	1.60	6.0		
12 WF5OLO	3/4	1 1/16-12	0.50	1 1/2	2.89	0.06	1.19	1.64	6.0		

* E – Maximum bulkhead thickness.

** W – Bulkhead pilot diameter. Recommended clearance hole is W + 0.015".

F5OLO Full Dimensions

Straight Thread Connector
ORFS / SAE-ORB



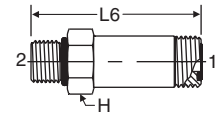
SAE 520120

TUBE FITTING PART #	END SIZE		H HEX (in.)	L5 (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2A			S	SS	B
4 F5OLO	1/4	7/16-20	5/8	1.13	9.2	9.2	
4-5 F5OLO	1/4	1/2-20	5/8	1.13	9.2		
4-6 F5OLO	1/4	9/16-18	3/4	1.20	9.2	9.2	
4-8 F5OLO	1/4	3/4-16	7/8	1.32	9.2		
6 F5OLO	3/8	9/16-18	3/4	1.25	9.2	9.2	
6-4 F5OLO	3/8	7/16-20	3/4	1.34	9.2	9.2	
6-5 F5OLO	3/8	1/2-20	3/4	1.22	9.2		
6-8 F5OLO	3/8	3/4-16	7/8	1.38	9.2	9.2	
6-10 F5OLO	3/8	7/8-14	1	1.53	9.2		
6-12 F5OLO	3/8	1 1/16-12	1 1/4	1.68	9.2		
8 F5OLO	1/2	3/4-16	7/8	1.44	9.2	9.2	
8-4 F5OLO	1/2	7/16-20	7/8	1.43	9.2		
8-6 F5OLO	1/2	9/16-18	7/8	1.47	6.0	9.2	
8-10 F5OLO	1/2	7/8-14	1	1.59	6.0		
8-12 F5OLO	1/2	1 1/16-12	1 1/4	1.75	6.0		
8-16 F5OLO	1/2	1 5/16-12	1 1/2	1.79	6.0		
10 F5OLO	5/8	7/8-14	1 1/16	1.70	6.0	6.0	
10-6 F5OLO	5/8	9/16-18	1 1/16	1.65	6.0		
10-8 F5OLO	5/8	3/4-16	1 1/16	1.78	6.0		
10-12 F5OLO	5/8	1 1/16-12	1 1/4	1.86	6.0		
10-16 F5OLO	5/8	1 5/16-12	1 1/2	1.90	6.0		
12 F5OLO	3/4	1 1/16-12	1 1/4	1.92	6.0	6.0	
12-8 F5OLO	3/4	3/4-16	1 1/4	1.91	6.0	6.0	
12-10 F5OLO	3/4	7/8-14	1 1/4	1.99	6.0	6.0	
12-16 F5OLO	3/4	1 5/16-12	1 1/2	1.96	6.0	6.0	
14 F5OLO *	7/8	1 3/16-12	1 3/8	1.91			
16 F5OLO	1	1 5/8-12	1 1/2	1.98	6.0	6.0	
16-10 F5OLO	1	7/8-14	1 1/2	2.04	6.0		
16-12 F5OLO	1	1 1/16-12	1 1/2	2.14	6.0		
16-20 F5OLO	1	1 5/8-12	1 7/8	2.06	6.0		
20 F5OLO	1 1/4	1 5/8-12	1 7/8	2.06	6.0	6.0	
20-16 F5OLO	1 1/4	1 5/16-12	1 7/8	2.28	6.0	6.0	
20-24 F5OLO	1 1/4	1 7/8-12	2 1/8	2.13	5.0		
24 F5OLO	1 1/2	1 7/8-12	2 1/8	2.13	5.0	5.0	
24-20 F5OLO	1 1/2	1 5/8-12	2 1/8	2.35	5.0		
32 F5OLO *	2	2 1/2-12	2 3/4	2.32	3.0		

* Sizes 14 and 32 are not included in SAE J1453.

FF5OLO Full Dimensions

Long Straight Thread Connector
ORFS-Long / SAE-ORB

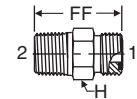


SAE 521720 (previously 520122)

TUBE FITTING PART #	END SIZE		H HEX (in.)	L6 (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2A			S	SS	B
4 FF5OLO	1/4	7/16-20	5/8	2.07	9.2	9.2	
6 FF5OLO	3/8	9/16-18	3/4	2.27	9.2		
8 FF5OLO	1/2	3/4-16	7/8	2.68	9.2	9.2	
10 FF5OLO	5/8	7/8-14	1 1/16	3.13	6.0		
12 FF5OLO	3/4	1 1/16-12	1 1/4	3.76	6.0		
16 FF5OLO	1	1 5/16-12	1 1/2	4.14	6.0		
20 FF5OLO	1 1/4	1 5/8-12	1 7/8	4.76	6.0		
24 FF5OLO	1 1/2	1 7/8-12	2 1/8	5.26	5.0		

FLO Full Dimensions

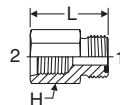
Male Pipe Connector
ORFS / NPTF



TUBE FITTING PART #	END SIZE		FF (in.)	H HEX (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 NPTF			S	SS	B
4 FLO	1/4	1/8-27	1.07	5/8	6.0	6.0	
4-4 FLO	1/4	1/4-18	1.26	5/8	6.0	6.0	
4-6 FLO	1/4	3/8-18	1.32	3/4	6.0	6.0	
4-8 FLO	1/4	1/2-14	1.52	7/8	6.0	6.0	
6 FLO	3/8	1/4-18	1.25	3/4	6.0	6.0	
6-6 FLO	3/8	3/8-18	1.34	3/4	6.0	6.0	
6-8 FLO	3/8	1/2-14	1.55	7/8	6.0	6.0	
8 FLO	1/2	3/8-18	1.48	7/8	6.0	6.0	
8-4 FLO	1/2	1/4-18	1.48	7/8	6.0	6.0	
8-8 FLO	1/2	1/2-14	1.64	7/8	6.0	6.0	
8-12 FLO	1/2	3/4-14	1.69	1 1/8	6.0	6.0	
10 FLO	5/8	1/2-14	1.82	1 1/16	6.0	6.0	
10-6 FLO	5/8	3/8-18	1.63	1 1/16	6.0		
10-12 FLO	5/8	3/4-14	1.82	1 1/8	5.5		
12 FLO	3/4	3/4-14	1.93	1 1/4	5.5	6.0	
12-8 FLO	3/4	1/2-14	1.93	1 1/4	6.0		
12-16 FLO	3/4	1-11 1/2	2.13	1 3/8	4.5		
14 FLO	7/8	3/4-14	2.00	1 3/8			
16 FLO	1	1-11 1/2	2.19	1 1/2	4.5	4.5	
16-12 FLO	1	3/4-14	2.00	1 1/2	5.5		
16-20 FLO	1	1 1/4-11 1/2	2.30	1 3/4	3.0		
20 FLO	1 1/4	1 1/4-11 1/2	2.30	1 7/8	3.0	4.0	
20-16 FLO	1 1/4	1-11 1/2	2.27	1 7/8	4.5		
24 FLO	1 1/2	1 1/2-11 1/2	2.40	2 1/8	3.0		
32 FLO	2	2-11 1/2	2.79	2 3/4	1.8		

G5LO Full Dimensions

Female Straight Thread Connector
ORFS / SAE-ORB



TUBE FITTING PART #	END SIZE		H HEX (in.)	L (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 UN/UNF-2A	2 UN/UNF-2B			S	SS	B
4 G5LO	9/16-18	7/16-20	3/4	1.10	6.0		
6-4 G5LO	11/16-16	7/16-20	3/4	1.08	6.0		
8-4 G5LO	13/16-16	7/16-20	7/8	0.78	6.0		

How to Order

Specs

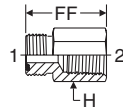
Assembly / Installation

3-D CAD Model

Reference

GLO Full Dimensions

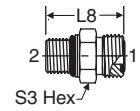
Female Pipe Connector
ORFS / Female Pipe



TUBE FITTING PART #	END SIZE		FF (in.)	H HEX (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1	2			S	SS	B
	(in.)	NPTF					
4-4 GLO	1/4	1/4-18	1.25	3/4	6.0	6.0	
6 GLO	3/8	1/4-18	1.30	3/4	6.0	6.0	
8-4 GLO	1/2	1/4-18	1.20	7/8	6.0	6.0	

F870MLO Full Dimensions

Metric Straight Thread Connector
ORFS / ISO 6149

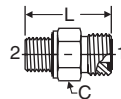


ISO 8434-3 SDS
SAE 52M0187

TUBE FITTING PART #	END SIZE			L8 (mm)	S3 HEX (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1		2			S	SS	B
	(mm)	(in.)						
4M12F870MLO	6	1/4	M12x1.5	28.5	17	9.2		
4M14F870MLO	6	1/4	M14x1.5	29.5	19			
6M12F870MLO	8,10	3/8	M12x1.5	32.0	19	9.2		
6M14F870MLO	8,10	3/8	M14x1.5	32.0	19	9.2		
6M16F870MLO	8,10	3/8	M16x1.5	33.5	22	9.2		
6M18F870MLO	8,10	3/8	M18x1.5	36.0	24	9.2		
8M14F870MLO	12	1/2	M14x1.5	35.0	22	9.2		
8M16F870MLO	12	1/2	M16x1.5	36.5	24	9.2		
8M18F870MLO	12	1/2	M18x1.5	38.0	24	9.2		
8M22F870MLO	12	1/2	M22x1.5	39.5	27	6.0		
8M27F870MLO	12	1/2	M27x2	44.0	32	6.0		
10M18F870MLO	14,15,16	5/8	M18x1.5	41.0	27	6.0		
10M22F870MLO	14,15,16	5/8	M22x1.5	42.0	27	6.0		
10M27F870MLO	14,15,16	5/8	M27x2	47.0	32	6.0		
12M22F870MLO	18,20	3/4	M22x1.5	45.0	32	6.0		
12M27F870MLO	18,20	3/4	M27x2	48.5	32	6.0		
12M33F870MLO	18,20	3/4	M33x2	51.5	41			
16M33F870MLO	22,25	1	M33x2	52.0	41	6.0		
20M38F870MLO*	28,30,32	1 1/4	M38x2	53.0	46	6.0		
20M42F870MLO	28,30,32	1 1/4	M42x2	54.5	50	5.0		
24M48F870MLO	35,38	1 1/2	M48x2	57.0	55			

F42EDMLO Full Dimensions

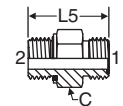
Male Connector – BSPP
(for ISO 1179-1 Port)
ORFS / BSPP-ED



TUBE FITTING PART #	END SIZE			C HEX (mm)	L (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1		2 BSPP			S	SS	B
	(mm)	(in.)						
4F42EDMLO	6	1/4	1/8 - 28	17	25.7	9.2	9.2	
4-4F42EDMLO	6	1/4	1/4 - 19	19	30.9	9.2		
4-6F42EDMLO	6	1/4	3/8 - 19	22	31.6	9.2		
4-8F42EDMLO	6	1/4	1/2 - 14	27	38.4	6.0		
6F42EDMLO	8,10	3/8	1/4 - 19	19	31.9	9.2	9.2	
6-2F42EDMLO	8,10	3/8	1/8 - 28	19	31.1	9.2		
6-6F42EDMLO	8,10	3/8	3/8 - 19	22	33.5	9.2		
6-8F42EDMLO	8,10	3/8	1/2 - 14	27	38.5	6.0	6.0	
6-12F42EDMLO	8,10	3/8	3/4 - 14	32	40.3	6.0		
8F42EDMLO	12	1/2	3/8 - 19	22	34.6	9.2	9.2	
8-4F42EDMLO	12	1/2	1/4 - 19	22	36.7	9.2		
8-8F42EDMLO	12	1/2	1/2 - 14	27	40.1	6.0	6.0	
8-12F42EDMLO	12	1/2	3/4 - 14	32	41.9	6.0		
10F42EDMLO	14,15,16	5/8	1/2 - 14	27	41.1	6.0	6.0	
10-6F42EDMLO	14,15,16	5/8	3/8 - 19	27	42.4	9.2		
10-12F42EDMLO	14,15,16	5/8	3/4 - 14	32	44.3	6.0		
10-16F42EDMLO	14,15,16	5/8	1 - 11	41	47.8			
12F42EDMLO	18,20	3/4	3/4 - 14	32	46.1	6.0	6.0	
12-8F42EDMLO	18,20	3/4	1/2 - 14	32	48.5	6.0		
12-16F42EDMLO	18,20	3/4	1 - 11	41	47.5	6.0		
12-20F42EDMLO	18,19,20	3/4	1 1/4 - 11	50	53.5			
16F42EDMLO	22,25	1	1 - 11	41	49.8	6.0		
16-12F42EDMLO	22,25	1	3/4 - 14	38	50.3	6.0		
16-20F42EDMLO	22,25	1	1 1/4 - 11	50	53.8	6.0		
16-24F42EDMLO	22,25	1	1 1/2 - 11	55	57.5	5.0		
20F42EDMLO	28,30,32	1 1/4	1 1/4 - 11	50	53.8	6.0		
20-16F42EDMLO	28,30,32	1 1/4	1 - 11	48	57.3	6.0		
20-24F42EDMLO	28,30,32	1 1/4	1 1/2 - 11	55	57.6	5.0		
24F42EDMLO	38	1 1/2	1 1/2 - 11	55	57.6	5.0		

F82EDMLO Full Dimensions

Male Connector – Metric
(for ISO 9974-1 Port)
ORFS / Metric-ED

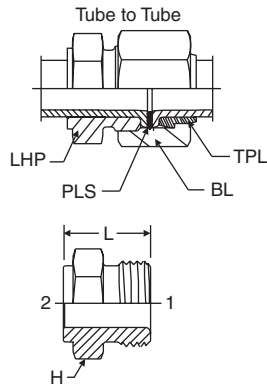


TUBE FITTING PART #	END SIZE			C HEX (mm)	L5 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1		2			S	SS	B
	(mm)	(in.)						
4M12F82EDMLO	6	1/4	M12x1.5	17	29.7	9.2		
6M14F82EDMLO	8,10	3/8	M14x1.5	22	32.0	9.2		
6M16F82EDMLO	8,10	3/8	M16x1.5	22	32.0	9.2		
8M18F82EDMLO	12	1/2	M18x1.5	24	34.6	9.2		
10M22F82EDMLO	14,15,16	5/8	M22x1.5	27	41.1	6.0		
12M27F82EDMLO	18,20	3/4	M27x2	32	46.1	6.0		
16M33F82EDMLO	22,25	1	M33x2	41	49.8	6.0		
20M42F82EDMLO	28,30,32	1 1/4	M42x2	50	53.8	5.0		



LHP (Inch)

Flange - Seal Connector
Tube-to-Tube



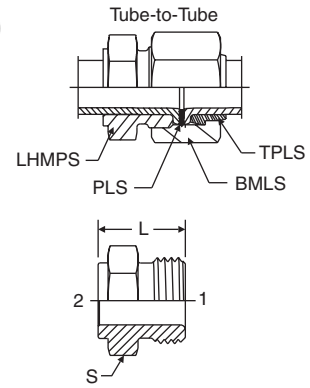
Full Dimensions

TUBE FITTING PART #	END SIZE 1 & 2 (in.)	H HEX (in.)	L (in.)	Max. Tube Wall Thickness (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
					S	SS	B
4 LHP	1/4	5/8	0.59	0.049	6.0		
6 LHP	3/8	3/4	0.69	0.065	5.0		
8 LHP	1/2	7/8	0.79	0.095	5.5		
10 LHP	5/8	1 1/16	0.95	0.095	4.5		
12 LHP	3/4	1 1/4	1.00	0.120	4.5		
16 LHP	1	1 1/2	1.02	0.120	3.5		

See page O3 for the required PLS bonded seal.
For availability of Parflange tooling, please [contact the Tube Fittings Division](#).

LHMP (Metric)

Flange - Seal Connector
Tube-to-Tube



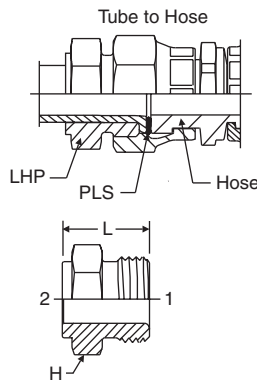
Full Dimensions

TUBE FITTING PART #	DASH SIZE	END SIZE 1 & 2 (mm)	L (mm)	S HEX (mm)	Max. Tube Wall Thickness (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
						S	SS	B
LHMPs6	4	6	15.0	17	1.0			
LHMPs8	6	8	17.5	19	1.5			
LHMPs10	6	10	17.5	19	1.5			
LHMPs12	8	12	20.0	22	2.0			
LHMPs16	10	16	24.0	27	2.0			
LHMPs20	12	20	25.5	32	2.5			

See page O3 for the required PLS bonded seal.
For availability of Parflange tooling, please [contact the Tube Fittings Division](#).

LHP (Inch)

Flange - Seal Connector
Tube-to-Hose



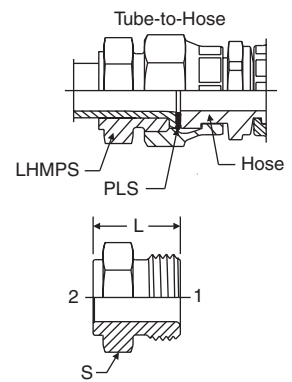
Full Dimensions

TUBE FITTING PART #	END SIZE 1 & 2 (in.)	H HEX (in.)	L (in.)	Max. Tube Wall Thickness (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
					S	SS	B
4 LHP	1/4	5/8	0.59	0.065	6.0		
6 LHP	3/8	3/4	0.69	0.083	6.0		
8 LHP	1/2	7/8	0.79	0.120	6.0		
10 LHP	5/8	1 1/16	0.95	0.120	6.0		
12 LHP	3/4	1 1/4	1.00	0.134	5.5		
16 LHP	1	1 1/2	1.02	0.120	3.5		

See page O3 for the required PLS bonded seal.
For availability of Parflange tooling, please [contact the Tube Fittings Division](#).

LHMP (Metric)

Flange - Seal Connector
Tube-to-Hose



Full Dimensions

TUBE FITTING PART #	DASH SIZE	END SIZE 1 & 2 (mm)	L (mm)	S HEX (mm)	Max. Tube Wall Thickness (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
						S	SS	B
LHMPs6	4	6	15.0	17	1.5			
LHMPs8	6	8	17.5	19	2.0			
LHMPs10	6	10	17.5	19	2.0			
LHMPs12	8	12	20.0	22	2.5			
LHMPs16	10	16	24.0	27	3.0			
LHMPs20	12	20	25.5	32	3.5			

See page O3 for the required PLS bonded seal.
For availability of Parflange tooling, please [contact the Tube Fittings Division](#).

How to Order

Specs

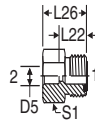
Assembly / Installation

3-D CAD Model

Reference

MMLOHB3 Full Dimensions

Braze Connector
ORFS / Braze Socket



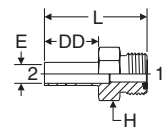
ISO 8434-3 BRS
SAE 52M0104

TUBE FITTING PART #	END SIZE		D5 TUBE SOCKET (mm)	L22 (mm)	L26 (mm)	S1 HEX (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)			
	1	2					S	SS	B	
	(mm)	(in.)								
4-6MMLOHB3	6	1/4	6	6.15	13.5	22	17	9.2		
4-8MMLOHB3	6	1/4	8	8.15	13.5	22	17	9.2		
6-10MMLOHB3	8, 10	3/8	10	10.15	14.5	23	19	9.2		
8-12MMLOHB3	12	1/2	12	12.15	16.0	24.5	22	9.2		
10-16MMLOHB3	14, 15, 16	5/8	16	16.15	19.0	27.5	27	6.0		
12-20MMLOHB3	18, 20	3/4	20	20.18	21.0	33.5	32	6.0		
16-25MMLOHB3	22, 25	1	25	25.18	24.5	38.5	41	6.0		
20-30MMLOHB3	28, 30, 32	1 1/4	30	30.20	24.5	38.5	46	6.0		
24-38MMLOHB3	35, 38	1 1/2	38	38.20	24.5	38.5	55	5.0		

* D5 is for silver brazing. Standard steel parts are not recommended for welding.

LOHT3 Full Dimensions

Tube Stub Connector
ORFS / Tube Weld

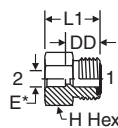


TUBE FITTING PART #	END SIZE		DD (in.)	E (in.)	H (in.)	L (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1	2					S	SS*	B
	(in.)	(in.)							
4 LOHT3	1/4	1/4	0.88	0.25	5/8	1.58			
6 LOHT3	3/8	3/8	0.88	0.38	3/4	1.67			
8 LOHT3	1/2	1/2	1.00	0.50	7/8	1.89			
12 LOHT3	3/4	3/4	1.16	0.75	1 1/4	2.35			
16 LOHT3	1	1	1.13	1.00	1 1/2	2.40			

* Contact Tube Fittings Division for pressure ratings.

LOHB3 Full Dimensions

Braze Connector
ORFS / Braze Socket



SAE 520104

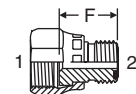
TUBE FITTING PART #	END SIZE		DD (in.)	E* (in.)	H (in.)	L1 (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1	2					S	SS	B
	(in.)	(in.)							
4 LOHB3	1/4	1/4	0.52	0.26	5/8	0.86	9.2		
4-6 LOHB3	1/4	3/8	0.52	0.38	5/8	0.86	9.2		
6 LOHB3	3/8	3/8	0.56	0.38	3/4	0.90	9.2		
6-4 LOHB3	3/8	1/4	0.56	0.26	3/4	0.90	9.2		
6-8 LOHB3	3/8	1/2	0.56	0.51	3/4	0.90	9.2		
8 LOHB3	1/2	1/2	0.63	0.51	7/8	0.97	9.2		
8-4 LOHB3	1/2	1/4	0.64	0.26	7/8	0.97	9.2		
8-6 LOHB3	1/2	3/8	0.63	0.38	7/8	0.97	9.2		
8-10 LOHB3	1/2	5/8	0.63	0.63	7/8	0.97	6.0		
8-12 LOHB3	1/2	3/4	0.67	0.76	1 1/16	1.16	6.0		
10 LOHB3	5/8	5/8	0.73	0.63	1 1/16	1.07	6.0		
10-6 LOHB3	5/8	3/8	0.73	0.38	1 1/16	1.07	6.0		
10-8 LOHB3	5/8	1/2	0.73	0.51	1 1/16	1.07	6.0		
10-12 LOHB3	5/8	3/4	0.74	0.76	1 1/16	1.23	6.0		
12 LOHB3	3/4	3/4	0.83	0.76	1 1/4	1.32	6.0		
12-8 LOHB3	3/4	1/2	0.83	0.51	1 1/4	1.16	6.0		
12-10 LOHB3	3/4	5/8	0.83	0.63	1 1/4	1.16	6.0		
12-16 LOHB3	3/4	1	0.83	1.01	1 1/2	1.38	6.0		
14 LOHB3**	7/8	7/8	0.97	0.88	1 3/8	1.52			
16 LOHB3	1	1	0.97	1.01	1 1/2	1.52	6.0		
16-8 LOHB3	1	1/2	0.97	0.51	1 1/2	1.30	6.0		
16-12 LOHB3	1	3/4	0.97	0.76	1 1/2	1.46	6.0		
16-20 LOHB3	1	1 1/4	0.97	1.26	1 3/4	1.52	6.0		
20 LOHB3	1 1/4	1 1/4	0.97	1.26	1 3/4	1.52	6.0		
20-16 LOHB3	1 1/4	1	0.97	1.01	1 3/4	1.52	6.0		
20-24 LOHB3	1 1/4	1 1/2	0.97	1.51	2 1/8	1.52	5.0		
24 LOHB3	1 1/2	1 1/2	0.97	1.51	2 1/8	1.52	5.0		
24-20 LOHB3	1 1/2	1 1/4	0.97	1.26	2 1/8	1.52	5.0		

* E is for silver brazing. Standard steel parts are not recommended for welding.

** Size 14 is no included in SAE J1453.

TRLON Full Dimensions

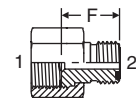
Tube End Reducer
ORFS Swivel / ORFS Tube End



* Assembled with Crimp Nut

SAE 520123 (body only)
SAE 520123A (body with large nut)

TUBE FITTING PART #	END SIZE		F (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)	
	1	2		S	SS
	(in.)	(in.)			
6-4 TRLON*	3/8	1/4	0.77	9.2	9.2
8-4 TRLON**	1/2	1/4	0.86	9.2	9.2
8-6 TRLON*	1/2	3/8	0.88	9.2	9.2
10-4 TRLON**	5/8	1/4	0.90	6.0	
10-6 TRLON**	5/8	3/8	0.95	6.0	
10-8 TRLON**	5/8	1/2	1.02	6.0	6.0
12-4 TRLON**	3/4	1/4	0.98	6.0	
12-6 TRLON**	3/4	3/8	1.03	6.0	6.0
12-8 TRLON**	3/4	1/2	1.09	6.0	6.0
12-10 TRLON*	3/4	5/8	1.16	6.0	
16-8 TRLON**	1	1/2	1.15	6.0	6.0
16-10 TRLON**	1	5/8	1.26	6.0	
16-12 TRLON*	1	3/4	1.30	6.0	6.0
20-12 TRLON**	1 1/4	3/4	1.32	5.0	5.0
20-16 TRLON*	1 1/4	1	1.51	5.0	
24-16 TRLON**	1 1/2	1	1.23	4.0	4.0
24-20 TRLON**	1 1/2	1 1/4	1.35	4.0	
32-20 TRLON**	2	1 1/4	1.42	3.0	
32-24 TRLON**	2	1 1/2	1.42	3.0	



** Assembled with Large BL Nut

* Assembled with crimp nut.

** Assembled with large BL nut. To order reducer without large nut, remove the "N" from the part number (i.e., TRLO).

How to Order

Specs

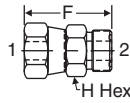
Assembly / Installation

3-D CAD Model

Reference

LOHL6 Full Dimensions

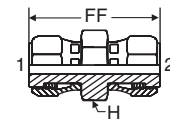
Tube End Extender / Expander
ORFS / ORFS Swivel



TUBE FITTING PART #	END SIZE		F (in.)	H HEX (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2A			S	SS	B
	4 LOHL6	1/4					
6 LOHL6	3/8	11/16	1.44	3/4	9.2		
6-4 LOHL6	3/8	11/16-16	1.37	3/4	9.2		
8 LOHL6	1/2	13/16-16	1.67	7/8	9.2		
8-6 LOHL6	1/2	13/16-16	1.52	7/8	9.2		
10-8 LOHL6	5/8	1-14	1.81	1 1/16	6.0		
12-10 LOHL6	3/4	1 3/16-12	1.99	1 1/4	6.0		
16-12 LOHL6	1	1 7/16-12	2.16	1 1/2	6.0		
20-16 LOHL6	1 1/4	1 11/16-12	2.28	1 3/4	5.0		
24-20 LOHL6	1 1/2	2-12	2.35	2 1/8	4.0		

HL6 Full Dimensions

Swivel Nut Union
ORFS Swivel / ORFS Swivel

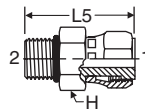


TUBE FITTING PART #	END SIZE		FF (in.)	H HEX (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 (in.)			S	SS	B
	4 HL6	1/4					
6 HL6	3/8	3/8	1.77	3/4	9.2		
8 HL6	1/2	1/2	2.12	7/8	9.2		
10 HL6	5/8	5/8	2.42	1 1/16	6.0		
12 HL6	3/4	3/4	2.74	1 1/4	6.0		
16 HL6	1	1	2.95	1 7/16	6.0		
20 HL6	1 1/4	1 1/4	3.12	1 3/4			
24 HL6	1 1/2	1 1/2	3.33	2 1/8			



F650L Full Dimensions

Straight Thread Swivel Connector
ORFS Swivel / SAE-ORB

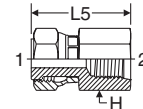


SAE 520181

TUBE FITTING PART #	END SIZE		H HEX (in.)	L5 (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2A			S	SS	B
	4 F650L	1/4					
6 F650L	3/8	9/16-18	3/4	1.58	9.2		
8 F650L	1/2	3/4-16	7/8	1.95	9.2		
10 F650L	5/8	7/8-14	1 1/16	2.13	6.0		
12 F650L	3/4	1 1/16-12	1 1/4	2.34	6.0		
16 F650L	1	1 5/16-12	1 1/2	2.66	6.0		
20 F650L	1 1/4	1 5/8-12	1 3/4	2.66	5.0		

G65L Full Dimensions

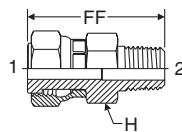
Straight Thread Swivel
Female Connector
ORFS Swivel / SAE-ORB



TUBE FITTING PART #	END SIZE		H HEX (in.)	L5 (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2B			S	SS	B
	4 G65L	1/4					
4-6 G65L	1/4	9/16-18	13/16	1.45	6.0	6.0	
6-4 G65L	3/8	7/16-20	3/4	1.51	6.0	6.0	
8-4 G65L	1/2	7/16-20	7/8	1.57	6.0	6.0	
8-6 G65L	1/2	9/16-18	7/8	1.6	6.0	6.0	
12 G65L	3/4	1 1/16-12	1 3/8	2.27	4.2	4.2	
16-4 G65L	1	7/16-20	1 3/8	1.55	6.0	6.0	
24-4 G65L	2	7/16-20	2	1.84	4.0	4.0	

F6L Full Dimensions

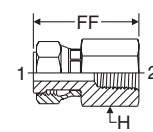
Pipe Thread Swivel
Connector
ORFS Swivel / NPTF



TUBE FITTING PART #	END SIZE		FF (in.)	H HEX (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 NPTF			S	SS	B
	4 F6L	1/4					
4-4 F6L	1/4	1/4-18	1.52	5/8	6.0		
6 F6L	3/8	1/4-18	1.69	3/4	6.0		
6-6 F6L	3/8	3/8-18	1.67	3/4	6.0		
8 F6L	1/2	3/8-18	1.95	3/4	6.0		
8-8 F6L	1/2	1/2-14	2.14	7/8	6.0		
10 F6L	5/8	1/2-14	2.29	1 1/16	6.0		
12 F6L	3/4	3/4-14	2.37	1 1/4	5.5		
16 F6L	1	1-11 1/2	2.87	1 1/2	4.5		

G6L Full Dimensions

Female Pipe Thread Swivel
Connector
ORFS Swivel / NPTF

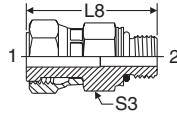


TUBE FITTING PART #	END SIZE		FF (in.)	H HEX (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 NPTF			S	SS	B
	4-4 G6L	1/4					
6 G6L	3/8	1/4-18	1.60	7/8	6.0		
8-4 G6L	1/2	1/4-18	1.75	7/8	6.0		



F687OML Full Dimensions

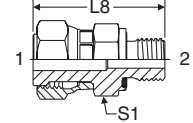
Swivel ISO 6149 Connector
ORFS Swivel / ISO 6149



TUBE FITTING PART #	END SIZE			L8 (mm)	S3 HEX (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1		2			S	SS	B
	(mm)	(in.)	ISO 261					
4M12F687OML	6	1/4	M12x1.5	37.0	17	9.2		
6M12F687OML	8, 10	3/8	M12x1.5	39.2	19	9.2		
6M14F687OML	8, 10	3/8	M14x1.5	39.2	19	9.2		
6M16F687OML	8, 10	3/8	M16x1.5	43.5	22	9.2		
8M16F687OML	12	1/2	M16x1.5	47.8	22	9.2		
10M22F687OML	14, 15, 16	5/8	M22x1.5	53.0	27	6.0		
10M27F687OML	14, 15, 16	5/8	M27x2	57.0	32	6.0		
12M27F687OML	18, 20	3/4	M27x2	59.5	32	6.0		
16M33F687OML	22, 25	1	M33x2	67.5	41	6.0		

F682EDML Full Dimensions

Swivel Metric Connector
ORFS Swivel / Metric-ED

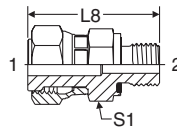


TUBE FITTING PART #	END SIZE			L8 (mm)	S1 HEX (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1		2			S	SS	B
	(mm)	(in.)	Metric					
4M12F682EDML	6	1/4	M12x1.5	38.2	17	9.2		
6M14F682EDML	8, 10	3/8	M14x1.5	40.2	19	9.2		
8M16F682EDML	12	1/2	M16x1.5	47.3	22	9.2		
10M22F682EDML	14, 15, 16	5/8	M22x1.5	51.8	27	6.0		
12M27F682EDML	18, 20	3/4	M27x2	57.2	32	6.0		
16M33F682EDML	22, 25	1	M33x2	67	41	6.0		

- [How to Order](#)
- [Specs](#)
- [Assembly / Installation](#)
- [3-D CAD Model](#)
- [Reference](#)

F642EDML Full Dimensions

Swivel BSPP Connector
ORFS Swivel / BSPP-ED

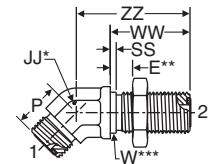


TUBE FITTING PART #	END SIZE			L8 (mm)	S1 HEX (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1		2			S	SS	B
	(mm)	(in.)	BSPP					
6F642EDML	8, 10	3/8	1/4	40.2	19	9.2		
8F642EDML	12	1/2	3/8	47.3	22	9.2		
10F642EDML	14, 15, 16	5/8	1/2	51.8	27	6.0		
12F642EDML	18, 20	3/4	3/4	57.2	32	6.0		
16F642EDML	22, 25	1	1	67	46	6.0		

WNLO Full Dimensions

45° Bulkhead Union Elbow
ORFS / ORFS

SAE 520801



TUBE FITTING PART #	END SIZE		E MAX. (in.)	JJ (in.)	P (in.)	SS (in.)	W DIA. (in.)	WW (in.)	ZZ (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 (in.)								S	SS	B
	4 WNLO	1/4								1/4	0.53	9/16
6 WNLO	3/8	3/8	0.53	3/4	0.74	0.06	0.69	1.34	1.91	9.2		
8 WNLO	1/2	1/2	0.53	3/4	0.80	0.06	0.81	1.44	2.01	9.2		
10 WNLO	5/8	5/8	0.52	1 1/16	0.92	0.06	1.00	1.60	2.23	6.0		
12 WNLO	3/4	3/4	0.50	1 3/16	1.02	0.06	1.19	1.64	2.39	6.0		
16 WNLO	1	1	0.51	1 7/16	1.18	0.06	1.44	1.66	2.57	6.0		
20 WNLO	1 1/4	1 1/4	0.51	1 5/8	1.26	0.06	1.69	1.66	2.64	5.0		
24 WNLO	1 1/2	1 1/2	0.51	1 7/8	1.45	0.06	2.00	1.66	2.64	4.0		

* JJ – Across wrench flats.

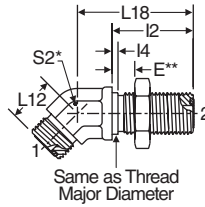
** E – Maximum bulkhead thickness.

*** W – Bulkhead pilot diameter. Recommended clearance hole is W + 0.015".

WNMLO Full Dimensions

45° Bulkhead Union Elbow – mm Hex
ORFS / ORFS

ISO 8434-3 BHE45
SAE 52M081



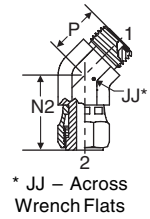
TUBE FITTING PART #	END SIZE		E (mm)	I2 (mm)	I4 (mm)	L12 (mm)	L18 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 & 2								S	SS	B
	(mm)	(in.)									
4WNMLO	6	1/4	14	31.5	1.5	16	44	14	9.2		
6WNMLO	8,10	3/8	14	34	1.5	19	48.5	19			
8WNMLO	12	1/2	14	36.5	2.5	20.5	51	19			
10WNMLO	14,15,16	5/8	14	40.5	2.5	23.5	56.5	27	6.0		
12WNMLO	18,20	3/4	14	41.5	3	26	60.5	30			
16WNMLO	22,25	1	14	42	3	30	65	36			
20WNMLO	28,30,32	1 1/4	14	42	3	32	67	41	5.0		
24WNMLO	35,38	1 1/2	14	42	3	37	67	50	4.0		

* S2 – Across Wrench Flats.

** E – Maximum bulkhead thickness.

V6LO Full Dimensions

45° Swivel Nut Elbow
ORFS / ORFS Swivel



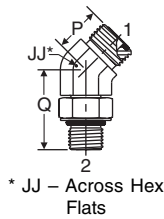
TUBE FITTING PART #	END SIZE		JJ (in.)	N2 (in.)	P (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 & 2					S	SS	B
	(in.)	(in.)						
4 V6LO	1/4	9/16	0.99	0.63	9.2			
6 V6LO	3/8	3/4	1.12	0.74	9.2			
8 V6LO	1/2	3/4	1.49	0.80	9.2			
10 V6LO	5/8	1 1/16	1.53	0.92	6.0			
12 V6LO	3/4	1 3/16	1.73	1.02	6.0			
16 V6LO	1	1 7/16	1.87	1.18	6.0			
20 V6LO	1 1/4	1 5/8	1.98	1.26	5.0			
24 V6LO	1 1/2	1 7/8	2.06	1.45	4.0			

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V5OLO Full Dimensions

45° Straight Thread Elbow
ORFS / SAE-ORB

SAE 520320

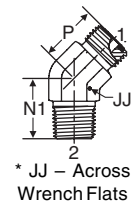


TUBE FITTING PART #	END SIZE		JJ (in.)	P (in.)	Q (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2A				S	SS	B
4 V5OLO	1/4	7/16-20	9/16	0.63	1.18	6.0	6.0	
4-6 V5OLO	1/4	9/16-18	3/4	0.68	1.30	6.0		
6 V5OLO	3/8	9/16-18	3/4	0.74	1.30	6.0	6.0	
6-4 V5OLO	3/8	7/16-20	3/4	0.74	1.22	6.0		
6-8 V5OLO	3/8	3/4-16	3/4	0.74	1.43	6.0		
8 V5OLO	1/2	3/4-16	3/4	0.80	1.43	6.0	6.0	
8-6 V5OLO	1/2	9/16-18	3/4	0.80	1.27	6.0		
8-10 V5OLO	1/2	7/8-14	3/4	0.82	1.76	6.0		
10 V5OLO	5/8	7/8-14	1 1/16	0.92	1.76	6.0	6.0	
10-8 V5OLO	5/8	3/4-16	1 1/16	0.92	1.59	6.0		
10-12 V5OLO	5/8	1 1/16-12	1 3/16	0.96	1.97	6.0		
12 V5OLO	3/4	1 1/16-12	1 3/16	1.02	1.97	6.0	6.0	
12-10 V5OLO	3/4	7/8-14	1 3/16	1.02	1.81	6.0	6.0	
12-16 V5OLO	3/4	1 5/16-12	1 7/16	1.16	2.06	5.5		
14 V5OLO**	7/8	1 3/16-12	1 5/16	1.18	2.03			
16 V5OLO	1	1 5/16-12	1 7/16	1.18	2.06	5.5		
16-10 V5OLO	1	7/8-14	1 7/16	1.18	1.89	6.0		
16-12 V5OLO	1	1 1/16-12	1 7/16	1.18	2.03	6.0		
16-20 V5OLO	1	1 5/8-12	1 5/8	1.26	2.11	4.0		
20 V5OLO	1 1/4	1 5/8-12	1 5/8	1.26	2.11	4.0	4.0	
24 V5OLO	1 1/2	1 7/8-12	1 7/8	1.45	2.11	4.0		

**Size 14 is not included in SAE J1453.

VLO Full Dimensions

45° Male Elbow
ORFS / NPTF



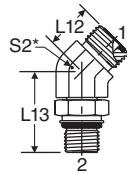
TUBE FITTING PART #	END SIZE		JJ (in.)	N1 (in.)	P (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 NPTF				S	SS	B
4 VLO	1/4	1/8-27	9/16	0.64	0.63	6.0		
4-4 VLO	1/4	1/4-18	9/16	0.86	0.68	6.0		
6 VLO	3/8	1/4-18	3/4	0.87	0.74	6.0		
6-6 VLO	3/8	3/8-18	3/4	0.87	0.74	6.0		
8 VLO	1/2	3/8-18	3/4	0.95	0.80	6.0		
8-8 VLO	1/2	1/2-14	7/8	1.17	0.86	6.0		
10 VLO	5/8	1/2-14	1 1/16	1.17	0.92	6.0		
12 VLO	3/4	3/4-14	1 5/16	1.30	1.02	4.0		
16 VLO	1	1-11 1/2	1 7/16	1.48	1.18	3.0		
20 VLO	1 1/4	1 1/4-11 1/2	1 5/8	1.67	1.26	2.5		



V870MLO Full Dimensions

45° Metric Straight Thread Elbow
ORFS / ISO 6149

ISO 8434-3 SDE45
SAE 52M0387



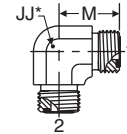
* S2 – Across Hex Flats

TUBE FITTING PART #	END SIZE		ISO 261	L12 (mm)	L13 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)					
	1						2			S	SS	B
	(mm)	(in.)										
4M12V870MLO	6	1/4	M12x1.5	16.0	30.0	14	6.0					
4M14V870MLO	6	1/4	M14x1.5	18.0	31.5	17						
6M16V870MLO	8,10	3/8	M16x1.5	19.0	33.5	17	6.0					
8M18V870MLO	12	1/2	M18x1.5	20.5	37.0	19	6.0					
10M22V870MLO	14,15,16	5/8	M22x1.5	23.5	44.0	27	6.0					
12M27V870MLO	18,20	3/4	M27x2	26.0	50.5	27	6.0					
16M33V870MLO	22,25	1	M33x2	30.0	52.5	36	5.0					
20M42V870MLO	28,30,32	1 1/4	M42x2	32.0	54.0	41	4.0					
24M48V870MLO	35,38	1 1/2	M48x2	37.0	56.5	50						

ELO Full Dimensions

Union Elbow
ORFS / ORFS

SAE 520201



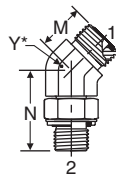
* JJ – Across Wrench Flats

TUBE FITTING PART #	END SIZE		JJ (in.)	M (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)			
	1				2			
	(in.)	(in.)			S	SS	B	
4 ELO	1/4	1/4	9/16	0.85	9.2	9.2		
6 ELO	3/8	3/8	3/4	0.98	9.2	9.2		
8 ELO	1/2	1/2	3/4	1.10	9.2	9.2		
10 ELO	5/8	5/8	1 1/16	1.31	6.0			
12 ELO	3/4	3/4	1 3/16	1.47	6.0	6.0		
14 ELO*	7/8	7/8	1 5/16	1.63				
16 ELO	1	1	1 7/16	1.64	6.0			
20 ELO	1 1/4	1 1/4	1 5/8	1.76	5.0			
24 ELO	1 1/2	1 1/2	1 7/8	1.92	4.0	4.0		
32 ELO*	2	2	2 1/2	2.76	3.0			

* Sizes 14 and 32 are not included in SAE J1453.

V40MLO Full Dimensions

Male 45° Elbow – BSPP
(for ISO 1179-1 Port)
ORFS / BSPP-ORR



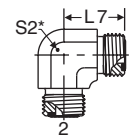
* Y – Across Hex Flats

TUBE FITTING PART #	END SIZE		BSPP	M (mm)	N (mm)	Y (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)					
	1						2			S	SS	B
	(mm)	(in.)										
4V40MLO	6	1/4	1/8-28	16.0	27.5	14	4.0					
4-4V40MLO	6	1/4	1/4-19	17.5	32.0	19	4.0					
6V40MLO	8,10	5/16	1/4-19	19.0	32.0	19	4.0					
6-6V40MLO	8,10	5/16	3/8-19	19.0	33.5	19	4.0					
6-8V40MLO	8,10	5/16	1/2-14	19.5	43.5	27	4.0					
8V40MLO	12	1/2	3/8-19	20.5	33.5	19	4.0					
10V40MLO	14,15,16	5/8	1/2-14	23.5	43.5	27	4.0					
10-12V40MLO	14,15,16	5/8	3/4-14	24.5	46.5	30	4.0					
12V40MLO	18,20	3/4	3/4-14	26.0	46.5	30	4.0					
12-16V40MLO	18,20	3/4	1-11	26.0	51.0	37	4.0					
16V40MLO	22,25	1	1-11	30.0	51.0	37	4.0					

EMLO Full Dimensions

Union Elbow – mm Hex
ORFS / ORFS

ISO 8434-3 E
SAE 52M0201



* S2 – Across Hex Flats

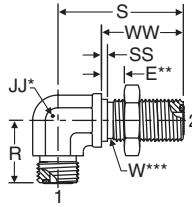
TUBE FITTING PART #	END SIZE		L7 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 & 2				2		
	(mm)	(in.)			S	SS	B
4EMLO	6	1/4	21.5	14	9.2		
6EMLO	8,10	3/8	25	19	9.2		
8EMLO	12	1/2	28	19	9.2		
10EMLO	14,15,16	5/8	33.5	27	6.0		
12EMLO	18,20	3/4	37.5	30	6.0		
16EMLO	22,25	1	41.5	36	6.0		
20EMLO	28,30,32	1 1/4	44.5	41	5.0		
24EMLO	35,38	1 1/2	49	50	4.0		



WELO Full Dimensions

Bulkhead Union Elbow
ORFS / ORFS

SAE 520701



TUBE FITTING PART #	END SIZE		E MAX. (in.)	JJ (in.)	R (in.)	S (in.)	SS (in.)	W (in.)	WW (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 (in.)								S	SS	B
4 WELO	1/4	1/4	0.53	9/16	0.89	1.85	0.06	0.56	1.24	9.2		
6 WELO	3/8	3/8	0.53	3/4	1.02	2.05	0.06	0.69	1.34	9.2		
8 WELO	1/2	1/2	0.53	3/4	1.14	2.18	0.06	0.81	1.44	9.2		
10 WELO	5/8	5/8	0.52	1 1/16	1.36	2.48	0.06	1.00	1.60	6.0		
12 WELO	3/4	3/4	0.50	1 3/16	1.52	2.65	0.06	1.19	1.64	6.0		
14 WELO****	7/8	7/8	0.51	1 7/16	1.67	2.80	0.06	1.31	1.66			
16 WELO	1	1	0.51	1 7/16	1.67	2.80	0.06	1.44	1.66	6.0		
20 WELO	1 1/4	1 1/4	0.51	1 5/8	1.79	2.97	0.06	1.69	1.66	5.0		
24 WELO	1 1/2	1 1/2	0.51	1 7/8	1.95	3.13	0.06	2.00	1.66	4.0		

* JJ – Across wrench flats.

** E – Maximum bulkhead thickness.

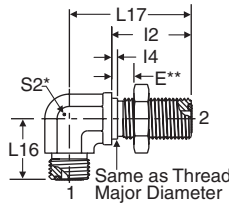
*** W – Bulkhead pilot diameter. Recommended clearance hole is W + 0.015".

**** Size 14 is not included in SAE J1453.

WEMLO Full Dimensions

Bulkhead Union Elbow – mm Hex
ORFS / ORFS

ISO 8434-3 BHE
SAE 52M0701



TUBE FITTING PART #	END SIZE		E (mm)	I 2 (mm)	I 4 (mm)	L 16 (mm)	L 17 (mm)	S 2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (mm)	2 (in.)							S	SS	B
4WEMLO	6	1/4	14	31.5	1.5	22.5	47	14	9.2		
6WEMLO	8,10	3/8	14	34	1.5	26	52	19	9.2		
8WEMLO	12	1/2	14	36.5	2.5	29	55.5	19	9.2		
10WEMLO	14,15,16	5/8	14	40.5	2.5	34.5	63	27	6.0		
12WEMLO	18,20	3/4	14	41.5	3	38.5	67	30	6.0		
16WEMLO	22,25	1	14	42	3	42.5	71	36	6.0		
20WEMLO	28,30,32	1 1/4	14	42	3	45.5	75.5	41	5.0		
24WEMLO	35,38	1 1/2	14	42	3	49.5	79.5	50	4.0		

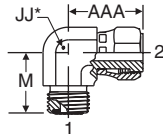
* S2 – Across wrench flats.

** E – Maximum bulkhead thickness.



C6LO Full Dimensions

Swivel Nut Elbow
ORFS / ORFS Swivel



SAE 520221

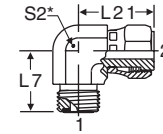
* JJ – Across Wrench Flats

TUBE FITTING PART #	END SIZE		AAA (in.)	JJ (in.)	M (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 (in.)				S	SS	B
	4 C6LO	1/4						
6 C6LO	3/8	3/8	1.17	3/4	0.98	9.2	9.2	
8 C6LO	1/2	1/2	1.49	3/4	1.10	9.2	9.2	
10 C6LO	5/8	5/8	1.65	1 1/16	1.31	6.0	6.0	
12 C6LO	3/4	3/4	1.82	1 3/16	1.47	6.0	6.0	
14 C6LO*	7/8	7/8	2.07	1 5/16	1.63			
16 C6LO	1	1	2.10	1 7/16	1.64	6.0	6.0	
20 C6LO	1 1/4	1 1/4	2.29	1 5/8	1.76	5.0	5.0	
24 C6LO	1 1/2	1 1/2	2.41	1 7/8	1.92	4.0		

* Size 14 is not included in SAE J1453.

C6MLO Full Dimensions

Swivel Nut Elbow – mm Hex
ORFS / ORFS Swivel



ISO 8434-3 SWE
SAE 52M0221

* S2 – Across Hex Flats

TUBE FITTING PART #	END SIZE		L7 (mm)	L21 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (mm)	2 (in.)				S	SS	B
	4C6MLO	6						
6C6MLO	8,10	3/8	25	29	19	9.2		
8C6MLO	12	1/2	28	38	19	9.2		
10C6MLO	14,15,16	5/8	33.5	41	27	6.0		
12C6MLO	18,20	3/4	37.5	46.5	30	6.0		
16C6MLO	22,25	1	41.5	53.5	36	6.0		
20C6MLO	28,30,32	1 1/4	44.5	58	41	4.0		
24C6MLO	35,38	1 1/2	49	61	50	4.0		

How to Order

Specs

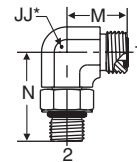
Assembly / Installation

3-D CAD Model

Reference

C5OLO Full Dimensions

Straight Thread Elbow
ORFS / SAE-ORB

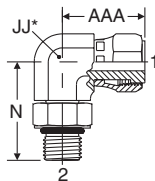


SAE 520220

* JJ – Across Wrench Flats

AOEL6 Full Dimensions

Straight Thread Swivel Elbow
ORFS Swivel / SAE-ORB



SAE 520281

* JJ – Across Wrench Flats

TUBE FITTING PART #	END SIZE		AAA (in.)	JJ (in.)	N (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2A				S	SS	B
	4 AOEL6	1/4						
6 AOEL6	3/8	9/16-18	1.17	3/4	1.45	6.0		
8 AOEL6	1/2	3/4-16	1.49	3/4	1.60	6.0		
10 AOEL6	5/8	7/8-14	1.65	1 1/16	1.97	6.0		
12 AOEL6	3/4	1 1/16-12	1.82	1 1/16	2.17	6.0		
16 AOEL6	1	1 5/16-12	2.10	1 5/16	2.35	5.5		
20 AOEL6	1 1/4	1 5/8-12	2.29	1 5/8	2.45	4.0		
24 AOEL6	1 1/2	1 7/8-12	2.41	1 7/8	2.59	4.0		

TUBE FITTING PART #	END SIZE		JJ (in.)	M (in.)	N (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2A				S	SS	B
	4 C5OLO	1/4						
4-6 C5OLO***	1/4	9/16-18	9/16	0.92	1.45	6.0	6.0	
4-8 C5OLO	1/4	3/4-16	3/4	0.97	1.60	6.0		
6 C5OLO	3/8	9/16-18	3/4	0.98	1.45	6.0	6.0	
6-4 C5OLO	3/8	7/16-20	3/4	0.98	1.37	6.0	6.0	
6-5 C5OLO	3/8	1/2-20	3/4	0.98	1.37	6.0		
6-8 C5OLO	3/8	3/4-16	3/4	1.04	1.60	6.0	6.0	
6-10 C5OLO***	3/8	7/8-14	7/8	1.15	1.97	6.0		
6-12 C5OLO	3/8	1 1/16-12	1 1/16	1.28	2.17	6.0		
8 C5OLO	1/2	3/4-16	3/4	1.10	1.60	6.0	6.0	
8-6 C5OLO	1/2	9/16-18	3/4	1.10	1.44	6.0	6.0	
8-10 C5OLO***	1/2	7/8-14	7/8	1.21	1.97	6.0		
8-12 C5OLO	1/2	1 1/16-12	1 3/16	1.32	2.17	6.0		
10 C5OLO	5/8	7/8-14	1 1/16	1.31	1.97	6.0	6.0	
10-8 C5OLO	5/8	3/4-16	1 1/16	1.31	1.80	6.0		
10-12 C5OLO	5/8	1 1/16-12	1 3/16	1.41	2.17	6.0		
12 C5OLO	3/4	1 1/16-12	1 3/16	1.47	2.17	6.0	6.0	
12-8 C5OLO	3/4	3/4-16	1 3/16	1.47	1.84	6.0		
12-10 C5OLO	3/4	7/8-14	1 3/16	1.47	2.01	6.0		
12-16 C5OLO	3/4	1 5/16-12	1 7/16	1.62	2.35	5.5		
14 C5OLO**	7/8	1 3/16-12	1 5/16	1.63	2.30			
16 C5OLO	1	1 5/16-12	1 7/16	1.64	2.35	5.5	5.5	
16-12 C5OLO	1	1 1/16-12	1 7/16	1.64	2.32	6.0		
16-20 C5OLO	1	1 5/8-12	1 5/8	1.76	2.45	4.0		
20 C5OLO	1 1/4	1 5/8-12	1 5/8	1.76	2.45	4.0	4.0	
20-16 C5OLO	1 1/4	1 5/16-12	1 5/8	1.76	2.42	4.0		
20-24 C5OLO	1 1/4	1 7/8-12	1 7/8	1.92	2.59	4.0		
24 C5OLO	1 1/2	1 7/8-12	1 7/8	1.92	2.59	4.0	4.0	
24-20 C5OLO	1 1/2	1 5/8-12	1 7/8	1.92	2.59	4.0		
32 C5OLO**	2	2 1/2-12	2 1/2	2.76	3.07	2.5		

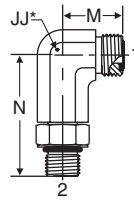
** Sizes 14 and 32 are not included in SAE J1453.

*** JJ for these parts does not conform to SAE.

CC5OLO Full Dimensions

Long Straight Thread Elbow
ORFS-Long / SAE-ORB

SAE 521520

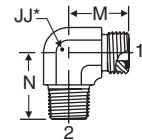


* JJ – Across Wrench Flats

TUBE FITTING PART #	END SIZE		JJ (in.)	M (in.)	N (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2A				S	SS	B
	4 CC5OLO	1/4				7/16-20	9/16	0.85
6 CC5OLO	3/8	9/16-18	3/4	0.98	2.61	6.0		
8 CC5OLO	1/2	3/4-16	3/4	1.10	2.95	6.0		
10 CC5OLO	5/8	7/8-14	1 1/16	1.31	3.51	6.0		
12 CC5OLO	3/4	1 1/16-12	1 3/16	1.47	3.97	6.0		
16 CC5OLO	1	1 5/16-12	1 7/16	1.64	4.51	5.5		

CLO Full Dimensions

Straight Thread Elbow
ORFS / NPTF



* JJ – Across Wrench Flats

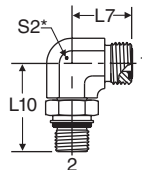
TUBE FITTING PART #	END SIZE		JJ (in.)	M (in.)	N (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 NPTF				S	SS	B
	4 CLO	1/4				1/8-27	9/16	0.85
4-4 CLO	1/4	1/4-18	9/16	0.85	1.12	6.0	6.0	
4-6 CLO	1/4	3/8-18	3/4	0.97	1.22		6.0	
4-8 CLO	1/4	1/2-14	7/8	1.07	1.47	6.0		
6 CLO	3/8	1/4-18	3/4	0.98	1.09	6.0	6.0	
6-6 CLO	3/8	3/8-18	3/4	0.98	1.22	6.0	6.0	
6-8 CLO	3/8	1/2-14	7/8	1.15	1.47	6.0	6.0	
8 CLO	1/2	3/8-18	3/4	1.10	1.22	6.0	6.0	
8-4 CLO	1/2	1/4-18	3/4	1.10	1.22		6.0	
8-8 CLO	1/2	1/2-14	7/8	1.10	1.47	6.0	6.0	
8-12 CLO	1/2	3/4-14	1 1/16	1.32	1.59	4.0		
10 CLO	5/8	1/2-14	1 1/16	1.31	1.47	6.0	6.0	
10-6 CLO	5/8	3/8-18	1 1/16	1.31	1.28	6.0		
10-12 CLO	5/8	3/4-14	1 3/16	1.41	1.59	4.0		
12 CLO	3/4	3/4-14	1 3/16	1.47	1.59	4.0	4.0	
12-8 CLO	3/4	1/2-14	1 3/16	1.47	1.59	6.0		
12-16 CLO	3/4	1-11 1/2	1 5/16	1.62	1.97	3.0		
14 CLO*	7/8	3/4-14	1 5/16	1.63	1.69			
16 CLO	1	1-11 1/2	1 7/16	1.64	1.97	3.0	3.0	
16-12 CLO	1	3/4-14	1 7/16	1.64	1.78	4.0		
20 CLO	1 1/4	1 1/4-11 1/2	1 5/8	1.76	2.38	2.5	2.5	
24 CLO	1 1/2	1 1/2-11 1/2	1 7/8	1.92	2.64	2.5		
24-20 CLO	1 1/2	1 1/4-11 1/2	1 7/8	1.92	2.61	2.5		

* Size 14 is not included in SAE J1453.

C87OMLO Full Dimensions

90° Metric Straight Thread Elbow
ORFS / ISO 6149

ISO 8434-3 SDE
SAE 52M0287



* S2 – Across Hex Flats

TUBE FITTING PART #	END SIZE			L7 (mm)	L10 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (mm)	2 (in.)	ISO 261				S	SS	B
	4M12C87OMLO	6	1/4				M12x1.5	21.5	33.0
4M14C87OMLO	6	1/4	M14x1.5	24.0	35.5	17			
6M12C87OMLO	8,10	3/8	M12x1.5	25.0	35.5	17	6.0		
6M14C87OMLO	8,10	3/8	M14x1.5	25.0	35.5	17	6.0		
6M16C87OMLO	8,10	3/8	M16x1.5	25.0	37.5	17	6.0		
8M14C87OMLO	12	1/2	M14x1.5	28.0	36.0	19	6.0		
8M18C87OMLO	12	1/2	M18x1.5	28.0	41.0	19	6.0		
8M22C87OMLO	12	1/2	M22x1.5	31.0	49.0	27	6.0		
10M18C87OMLO	14,15,16	5/8	M18x1.5	33.5	47.5	37	6.0		
10M22C87OMLO	14,15,16	5/8	M22x1.5	33.5	49.0	27	6.0		
12M22C87OMLO	18,20	3/4	M22x1.5	37.5	49.5	27			
12M27C87OMLO	18,20	3/4	M27x2	37.5	55.5	27	6.0		
16M33C87OMLO	22,25	1	M33x2	41.5	59.5	36	5.0		
20M38C87OMLO*	28,30,32	1 1/4	M38x2	44.5	62.0	41	4.0		
20M42C87OMLO	28,30,32	1 1/4	M42x2	44.5	63.0	41	4.0		
24M48C87OMLO	35,38	1 1/2	M48x2	49.0	71.5	50			

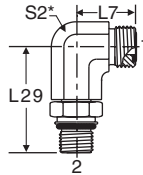
* For special M38x2 (ISO 6149-1 style) port. The current ISO 6149 does not include the M38 size.



CC870MLO Full Dimensions

Long 90° Metric Straight Thread Elbow
ORFS-Long / ISO 6149

ISO 8434-3 SDEL
SAE 52M1587

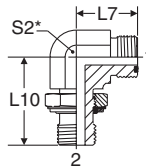


* S2 – Across Hex Flats

TUBE FITTING PART #	END SIZE		ISO 261	L7 (mm)	L29 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)			
	1						2	S	SS	B
	(mm)	(in.)								
4M12CC870MLO	6	1/4	M12x1.5	21.5	56.4	14	6.0			
6M14CC870MLO	8,10	3/8	M14x1.5	25.0	56.4	17	6.0			
6M16CC870MLO	8,10	3/8	M16x1.5	25.0	66.5	17	6.0			
8M18CC870MLO	12	1/2	M18x1.5	28.0	74.9	19	6.0			
8M22CC870MLO	12	1/2	M22x1.5	31.0	87.9	27	6.0			
10M22CC870MLO	14,15,16	5/8	M22x1.5	33.5	87.9	27	6.0			
12M27CC870MLO	18,20	3/4	M27x2	37.5	100.5	27	6.0			
16M33CC870MLO	22,25	1	M33x2	41.5	114.5	36	5.0			
20M42CC870MLO	28,30,32	1 1/4	M42x2	44.5	126.5	41	4.0			

C80MLO Full Dimensions

Metric Straight Thread Elbow
ORFS / Metric-ORR



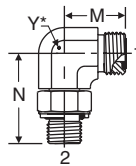
* S2 – Across Hex Flats

TUBE FITTING PART #	END SIZE		ISO 261	L7 (mm)	L10 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)			
	1						2	S	SS	B
	(mm)	(in.)								
4M12C80MLO	6	1/4	M12x1.5	21.5	33.0	14	3.6			
6M12C80MLO	8, 10	3/8	M12x1.5	25.0	35.5	17	3.6			
6M14C80MLO	8, 10	3/8	M14x1.5	25.0	35.5	17	3.6			
6M16C80MLO	8, 10	3/8	M16x1.5	25.0	37.5	17	3.6			
8M14C80MLO	12	1/2	M14x1.5	28.0	36.0	19	3.6			
8M18C80MLO	12	1/2	M18x1.5	28.0	41.0	19	3.6			
8M22C80MLO	12	1/2	M22x1.5	31.5	49.0	27	3.6			
10M22C80MLO	14, 15, 16	5/8	M22x1.5	33.5	49.0	27	3.6			
12M27C80MLO	18, 20	3/4	M27x2	37.5	55.5	30	3.6			
16M33C80MLO	22, 25	1	M33x2	41.5	59.5	36	2.5			
20M38C80MLO	28, 30, 32	1 1/4	M38x2	44.5	62.0	41	2.5			
20M42C80MLO	28, 30, 32	1 1/4	M42x2	44.5	63.0	41	2.5			



C4OMLO Full Dimensions

Male Elbow – BSPP
(for ISO 1179-1 Port)
ORFS / BSPP-ORR

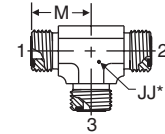


* Y – Across Wrench Flats

TUBE FITTING PART #	END SIZE			M (mm)	N (mm)	Y (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1		2				S	SS	B
	(mm)	(in.)	BSPP						
4C4OMLO	6	1/4	1/8-28	21.5	30.0	14	4.0		
4-4C4OMLO	6	1/4	1/4-19	23.5	36.0	19	4.0		
4-6C4OMLO	6	1/4	3/8-19	24.5	38.0	19	4.0		
6C4OMLO	8,10	3/8	1/4-19	25.0	36.0	19	4.0	4.0	
6-6C4OMLO	8,10	3/8	3/8-19	26.5	38.0	19	4.0		
8-4C4OMLO	12	1/2	1/4-19	28.0	35.5	19	4.0		
8C4OMLO	12	1/2	3/8-19	28.0	38.0	19	4.0		
8-8C4OMLO	12	1/2	1/2-14	31.0	48.5	27	4.0		
8-12C4OMLO	12	1/2	3/4-14	33.5	51.5	30	4.0		
10-6C4OMLO	14,15,16	5/8	3/8-19	33.5	40.5	27	4.0		
10C4OMLO	14,15,16	5/8	1/2-14	33.5	48.5	27	4.0		
10-12C4OMLO	14,15,16	5/8	3/4-14	36.0	51.5	30	4.0		
10-16C4OMLO	14,15,16	5/8	1-11	39.5	58.5	36			
12-8C4OMLO	18,20	3/4	1/2-14	37.5	49.5	30	4.0		
12C4OMLO	18,20	3/4	3/4-14	37.5	51.5	30	4.0		
12-16C4OMLO	18,20	3/4	1-11	41.0	58.5	36	4.0		
16-12C4OMLO	22,25	1	3/4-14	41.5	56.0	36	4.0		
16C4OMLO	22,25	1	1-11	41.5	58.5	36	4.0		
16-20C4OMLO	22,25	1	1 1/4-11	44.5	61.0	41	3.0		
20-16C4OMLO	28,30,32	1 1/4	1-11	44.5	61.0	41	4.0		
20C4OMLO	28,30,32	1 1/4	1 1/4-11	44.5	61.0	41			
20-24C4OMLO	28,30,32	1 1/4	1 1/2-11	49.0	64.5	50	2.0		
24C4OMLO	35,38	1 1/2	1 1/2-11	49.0	64.5	50	2.0		

JLO Full Dimensions

Union Tee
ORFS (all three ends)



SAE 520401

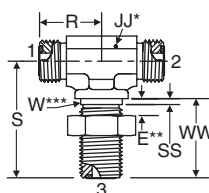
* JJ – Across Wrench Flats

TUBE FITTING PART #	END SIZE		JJ (in.)	M (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 - 3				S	SS	B
	(in.)	(in.)					
4 JLO	1/4	9/16	0.85	9.2	9.2		
6 JLO	3/8	3/4	0.98	9.2	9.2		
8 JLO	1/2	3/4	1.10	9.2	9.2		
10 JLO	5/8	1 1/16	1.31	6.0	6.0		
12 JLO	3/4	1 3/16	1.47	6.0	6.0		
14 JLO*	7/8	1 5/16	1.63				
16 JLO	1	1 7/16	1.64	6.0	6.0		
20 JLO	1 1/4	1 5/8	1.76	5.0	5.0		
24 JLO	1 1/2	1 7/8	1.92	4.0	4.0		
32 JLO*	2	2 1/2	2.76	3.0			

* Sizes 14 and 32 are not included in SAE J1453.

WJLO Full Dimensions

Bulkhead Branch Tee
ORFS (all three ends)



TUBE FITTING PART #	END SIZE 1 - 3 (in.)	E MAX. (in.)	JJ (in.)	R (in.)	S (in.)	SS (in.)	W DIA. (in.)	WW (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
									S	SS	B
4 WJLO	1/4	0.53	9/16	0.89	1.85	0.06	0.56	1.24	9.2		
6 WJLO	3/8	0.53	3/4	1.02	2.05	0.06	0.69	1.34	9.2		
8 WJLO	1/2	0.53	3/4	1.14	2.18	0.06	0.81	1.44	9.2		
10 WJLO	5/8	0.52	1 1/16	1.36	2.48	0.06	1.00	1.60	6.0		
12 WJLO	3/4	0.50	1 3/16	1.52	2.65	0.06	1.19	1.64	6.0		
16 WJLO	1	0.51	1 7/16	1.67	2.80	0.06	1.44	1.66	6.0		

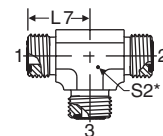
* JJ – Across wrench flats.

** E – Maximum bulkhead thickness.

*** W – Bulkhead pilot diameter. Recommended clearance hole is W + 0.015".

JMLO Full Dimensions

Union Tee – mm Hex
ORFS (all three ends)



ISO 8434-3 T
SAE 52M0401

* S2 – Across Hex Flats

TUBE FITTING PART #	END SIZE		L7 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 - 3				S	SS	B
	(mm)	(in.)					
4JMLO	6	1/4	21.5	14	9.2		
6JMLO	8,10	3/8	25.0	19	9.2		
8JMLO	12	1/2	28.0	19	9.2		
10JMLO	14,15,16	5/8	33.5	27	6.0		
12JMLO	18,20	3/4	37.5	30	6.0		
16JMLO	22,25	1	41.5	36	6.0		
20JMLO	28,30,32	1 1/4	44.5	41	5.0		
24JMLO	35,38	1 1/2	49.0	50	4.0		

How to Order

Specs

Assembly / Installation

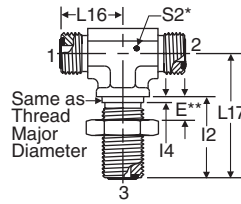
3-D CAD Model

Reference

WJMLO Full Dimensions

Bulkhead Branch Tee – mm Hex
ORFS (all three ends)

ISO 8434-3 BHBT
SAE 52M0959



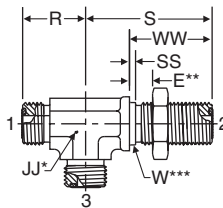
TUBE FITTING PART #	END SIZE		E (mm)	I 2 (mm)	I 4 (mm)	L16 (mm)	L17 (mm)	S2 (mm)	S4 HEX (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 - 3									S	SS	B
	(mm)	(in.)										
4WJMLO	6	1/4	14	31.5	1.5	22.5	47	14	22	9.2		
6WJMLO	8,10	3/8	14	34	1.5	26	52	19	27	9.2		
8WJMLO	12	1/2	14	36.5	2.5	29	55.5	19	30	9.2		
10WJMLO	14,15,16	5/8	14	40.5	2.5	34.5	63	27	36	6.0		
12WJMLO	18,20	3/4	14	41.5	3	38.5	67	30	41	6.0		
16WJMLO	22,25	1	14	42	3	42.5	71	36	46	6.0		
20WJMLO	28,30,32	1 1/4	14	42	3	45.5	75.5	41	50			
24WJMLO	35,38	1 1/2	14	42	3	49.5	79.5	50	60			

* S2 – Across wrench flats.
** E – Maximum bulkhead thickness.

WJJLO Full Dimensions

Bulkhead Run Tee
ORFS (all three ends)

SAE 520958



TUBE FITTING PART #	END SIZE (in.)	E MAX. (in.)	JJ (in.)	R (in.)	S (in.)	SS (in.)	W DIA. (in.)	WW (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
									S	SS	B
4 WJJLO	1/4	0.53	9/16	0.89	1.85	0.06	0.56	1.24	9.2		
6 WJJLO	3/8	0.53	3/4	1.02	2.05	0.06	0.69	1.34	9.2		
8 WJJLO	1/2	0.53	3/4	1.14	2.18	0.06	0.81	1.44	9.2		
10 WJJLO	5/8	0.52	1 1/16	1.36	2.48	0.06	1.00	1.60	6.0		
12 WJJLO	3/4	0.50	1 3/16	1.52	2.65	0.06	1.19	1.64	6.0		
16 WJJLO	1	0.51	1 7/16	1.67	2.80	0.06	1.44	1.66	6.0		
20 WJJLO	1 1/4	0.51	1 5/8	1.79	2.97	0.06	1.69	1.66	5.0		
24 WJJLO	1 1/2	0.51	1 7/8	1.95	3.13	0.06	2.00	1.66	4.0		

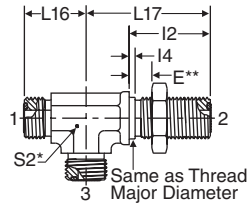
* JJ – Across wrench flats.
** E – Maximum bulkhead thickness.
*** W – Bulkhead pilot diameter. Recommended clearance hole is W + 0.015".



WJJMLO Full Dimensions

Bulkhead Run Tee – mm Hex
ORFS (all three ends)

ISO 8434-3 BHRT
SAE 52M0958



TUBE FITTING PART #	END SIZE		E (mm)	I2 (mm)	I4 (mm)	L16 (mm)	L17 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 - 3								S	SS	B
	(mm)	(in.)									
4WJJMLO	6	1/4	14	31.5	1.5	22.5	47	14	9.2		
6WJJMLO	8,10	3/8	14	34	1.5	26	52	19	9.2		
8WJJMLO	12	1/2	14	36.5	2.5	29	55.5	19	9.2		
10WJJMLO	14,15,16	5/8	14	40.5	2.5	34.5	63	27	6.0		
12WJJMLO	18,20	3/4	14	41.5	3	38.5	67	30	6.0		
16WJJMLO	22,25	1	14	42	3	42.5	71	36	6.0		
20WJJMLO	28,30,32	1 1/4	14	42	3	45.5	75.5	41			
24WJJMLO	35,38	1 1/2	14	42	3	49.5	79.5	50			

* S2 – Across wrench flats.

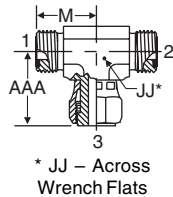
** E – Maximum bulkhead thickness.

- How to Order
- Specs
- Assembly / Installation
- 3-D CAD Model
- Reference

S6LO Full Dimensions

Swivel Nut Branch Tee
ORFS / ORFS / ORFS Swivel

SAE 520433



* JJ – Across Wrench Flats

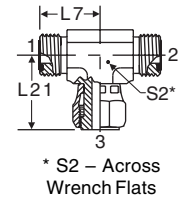
TUBE FITTING PART #	END SIZE		AAA (in.)	JJ (in.)	M (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 - 3 (in.)					S	SS	B
	(mm)	(in.)						
4 S6LO	1/4	1.07	9/16	0.85	9.2	9.2		
6 S6LO	3/8	1.17	3/4	0.98	9.2	9.2		
8 S6LO	1/2	1.49	3/4	1.10	9.2	9.2		
10 S6LO	5/8	1.65	1 1/16	1.31	6.0	6.0		
12 S6LO	3/4	1.82	1 3/16	1.47	6.0	6.0		
14 S6LO*	7/8	2.07	1 5/16	1.63				
16 S6LO	1	2.10	1 7/16	1.64	6.0			
20 S6LO	1 1/4	2.29	1 5/8	1.76	5.0	5.0		
24 S6LO	1 1/2	2.41	1 7/8	1.92	4.0			

* Size 14 is not included in SAE J1453.

S6MLO Full Dimensions

Swivel Nut Branch Tee – mm Hex
ORFS / ORFS / ORFS Swivel

ISO 8434-3 SWBT
SAE 52M0433



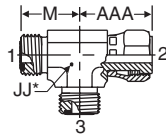
* S2 – Across Wrench Flats

TUBE FITTING PART #	END SIZE		L7 (mm)	L21 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 - 3					S	SS	B
	(mm)	(in.)						
4S6MLO	6	1/4	21.5	26.5	14			
6S6MLO	8,10	3/8	25	29	19	9.2		
8S6MLO	12	1/2	28	38	19	9.2		
10S6MLO	14,15,16	5/8	33.5	41	27	6.0		
12S6MLO	18,20	3/4	37.5	46.5	30	6.0		
16S6MLO	22,25	1	41.5	53.5	36	6.0		
20S6MLO	28,30,32	1 1/4	44.5	58	41	4.0		
24S6MLO	35,38	1 1/2	49	61	50			

R6LO Full Dimensions

Swivel Nut Run Tee
ORFS / ORFS Swivel / ORFS

SAE 520432



* JJ – Across Wrench Flats

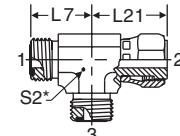
TUBE FITTING PART #	END SIZE 1 - 3 (in.)	AAA (in.)	JJ (in.)	M (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
					S	SS	B
					4 R6LO	1/4	1.07
6 R6LO	3/8	1.17	3/4	0.98	9.2		
8 R6LO	1/2	1.49	3/4	1.10	9.2		
10 R6LO	5/8	1.65	1 1/16	1.31	6.0		
12 R6LO	3/4	1.82	1 3/16	1.47	6.0	6.0	
14 R6LO*	7/8	2.07	1 5/16	1.63			
16 R6LO	1	2.10	1 7/16	1.64	6.0		
20 R6LO	1 1/4	2.29	1 5/8	1.76	5.0		
24 R6LO	1 1/2	2.41	1 7/8	1.92	4.0		

* Size 14 is not included in SAE J1453.

R6MLO Full Dimensions

Swivel Nut Run Tee – mm Hex
ORFS / ORFS Swivel / ORFS

ISO 8434-3 SWRT
SAE 52M0432



* S2 – Across Hex Flats

TUBE FITTING PART #	END SIZE 1 - 3		L7 (mm)	L21 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	(mm)	(in.)				S	SS	B
	4R6MLO	6				1/4	21.5	26.5
6R6MLO	8,10	3/8	25	29	19	9.2		
8R6MLO	12	1/2	28	38	19	9.2		
10R6MLO	14,15,16	5/8	33.5	41	27	6.0		
12R6MLO	18,20	3/4	37.5	46.5	30	6.0		
16R6MLO	22,25	1	41.5	53.5	36	6.0		
20R6MLO	28,30,32	1 1/4	44.5	58	41	4.0		
24R6MLO	35,38	1 1/2	49	61	50	4.0		

How to Order

Specs

Assembly / Installation

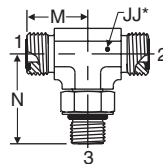
3-D CAD Model

Reference

S5OLO Full Dimensions

Straight Thread Branch Tee
ORFS / ORFS / SAE-ORB

SAE 520429



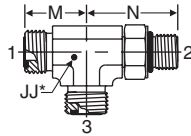
* JJ – Across Wrench Flats

TUBE FITTING PART #	END SIZE			JJ (in.)	M (in.)	N (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 (in.)	3 UN/UNF-2A				S	SS	B
	4 S5OLO	1/4	1/4				7/16-20	9/16	0.85
4-4-6 S5OLO	1/4	1/4	9/16-18	9/16	0.92	1.45	6.0		
6 S5OLO	3/8	3/8	9/16-18	3/4	0.98	1.45	6.0	6.0	
6-6-4 S5OLO	3/8	3/8	7/16-20	3/4	0.98	1.45	6.0		
6-6-8 S5OLO	3/8	3/8	3/4-16	3/4	1.04	1.60	6.0		
8 S5OLO	1/2	1/2	3/4-16	3/4	1.10	1.60	6.0	6.0	
8-8-10 S5OLO	1/2	1/2	7/8-14	1 1/16	1.21	1.97	6.0		
8-8-12 S5OLO	1/2	1/2	1 1/16-12	1 3/16	1.32	2.17	6.0		
10 S5OLO	5/8	5/8	7/8-14	1 1/16	1.31	1.97	6.0		
10-10-12 S5OLO	5/8	5/8	1 1/16-12	1 3/16	1.41	2.17	6.0		
12 S5OLO	3/4	3/4	1 1/16-12	1 3/16	1.47	2.17	6.0	6.0	
12-12-16 S5OLO	3/4	3/4	1 5/16-12	1 7/16	1.62	2.35	5.5		
16 S5OLO	1	1	1 5/16-12	1 7/16	1.64	2.35	5.5	5.5	
16-16-20 S5OLO	1	1	1 5/8-12	1 5/8	1.76	2.45	4.0		
20 S5OLO	1 1/4	1 1/4	1 5/8-12	1 5/8	1.76	2.45	4.0		
24 S5OLO	1 1/2	1 1/2	1 7/8-12	1 7/8	1.92	2.59	4.0		

R5OLO Full Dimensions

Straight Thread Run Tee
ORFS / SAE-ORB / ORFS

SAE 520428

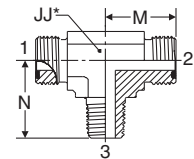


* JJ – Across Wrench Flats

SLO Full Dimensions

Male Pipe Tee
ORFS / ORFS / NPTF

SAE 520425



* JJ – Across Wrench Flats

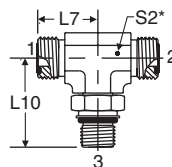
TUBE FITTING PART #	END SIZE			JJ (in.)	M (in.)	N (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 (in.)	2 UN/UNF-2A	3 (in.)				S	SS	B
	4 R5OLO	1/4	7/16-20				1/4	9/16	0.85
4-6-4 R5OLO	1/4	9/16-18	1/4	3/4	0.92	1.45	6.0		
6 R5OLO	3/8	9/16-18	3/8	3/4	0.98	1.45	6.0	6.0	
6-8-6 R5OLO	3/8	3/4-16	3/8	3/4	1.04	1.60	6.0		
8 R5OLO	1/2	3/4-16	1/2	3/4	1.10	1.60	6.0	6.0	
8-10-8 R5OLO	1/2	7/8-14	1/2	1 1/16	1.21	1.97	6.0		
10 R5OLO	5/8	7/8-14	5/8	1 1/16	1.31	1.97	6.0	6.0	
10-12-10 R5OLO	5/8	1 1/16-12	5/8	1 3/16	1.41	2.17	6.0		
12 R5OLO	3/4	1 1/16-12	3/4	1 3/16	1.47	2.17	6.0	6.0	
12-16-12 R5OLO	3/4	1 5/16-12	3/4	1 7/16	1.62	2.35	5.5		
16 R5OLO	1	1 5/16-12	1	1 7/16	1.64	2.35	5.5	5.5	
16-20-16 R5OLO	1	1 5/8-12	1	1 5/8	1.76	2.45	4.0		
20 R5OLO	1 1/4	1 5/8-12	1 1/4	1 5/8	1.76	2.45	4.0	4.0	
24 R5OLO	1 1/2	1 7/8-12	1 1/2	1 7/8	1.92	2.59	4.0		

TUBE FITTING PART #	END SIZE		JJ (in.)	M (in.)	N (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 & 2 (in.)	3 NPTF				S	SS	B
	4-4-4 SLO	1/4				1/4-18	9/16	0.85
6-6-6 SLO	3/8	3/8-18	3/4	0.98	1.22	6.0		
6 SLO	3/8	1/4-18	3/4	0.98	1.09	6.0		
8 SLO	1/2	3/8-18	3/4	1.10	1.22	6.0		
8-8-8 SLO	1/2	1/2-14	7/8	1.10	1.47	6.0		
10 SLO	5/8	1/2-14	1 1/16	1.31	1.47	6.0		
12 SLO	3/4	3/4-14	1 3/16	1.47	1.59	4.0		
16 SLO	1	1-11 1/2	1 7/16	1.64	1.97	3.0		
20 SLO	1 1/4	1 1/4-11 1/2	1 5/8	1.76	2.38	2.5		

S87OMLO Full Dimensions

Metric Straight Thread Branch Tee
ORFS / ORFS / ISO 6149

ISO 8434-3 SDBT
SAE 52M0489



* S2 – Across Hex Flats

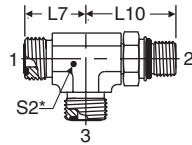
TUBE FITTING PART #	END SIZE			L7 (mm)	L10 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 & 2		3				S	SS	B
	(mm)	(in.)	ISO 261						
4M12S87OMLO	6	1/4	M12x1.5	21.5	33.0	14			
4M14S87OMLO	6	1/4	M14x1.5	24.0	35.5	19	6.0		
6M14S87OMLO	8,10	3/8	M14x1.5	25.0	35.5	19	6.0		
6M16S87OMLO	8,10	3/8	M16x1.5	25.0	37.5	19	6.0		
8M14S87OMLO	12	1/2	M14x1.5	28.0	36.0	19			
8M18S87OMLO	12	1/2	M18x1.5	28.0	41.0	19	6.0		
8M22S87OMLO	12	1/2	M22x1.5	31.0	49.0	27	6.0		
10M22S87OMLO	14,15,16	5/8	M22x1.5	33.5	49.0	27	6.0		
12M27S87OMLO	18,20	3/4	M27x2	37.5	55.5	30	6.0		
16M33S87OMLO	22,25	1	M33x2	41.5	59.5	36	5.1		
20M42S87OMLO	28,30,32	1 1/4	M42x2	44.5	63.0	41	4.0		
24M48S87OMLO	35,38	1 1/2	M48x2	49	71.5	50			



R87OMLO Full Dimensions

Metric Straight Thread Run Tee
ORFS / ISO 6149 / ORFS

ISO 8434-3 SDRT
SAE 52M0488



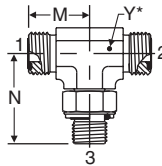
* S2 – Across Hex Flats

TUBE FITTING PART #	END SIZE		ISO 261	L7 (mm)	L10 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 & 3						S	SS	B
	(mm)	(in.)							
4M12R87OMLO	6	1/4	M12x1.5	21.5	33.0	14	6.0		
4M14R87OMLO	6	1/4	M14x1.5	24.0	35.5	19			
6M14R87OMLO	8,10	3/8	M14x1.5	25.0	35.5	19			
6M16R87OMLO	8,10	3/8	M16x1.5	25.0	37.5	19	6.0		
8M14R87OMLO	12	1/2	M14x1.5	28.0	36.0	19	6.0		
8M18R87OMLO	12	1/2	M18x1.5	28.0	41.0	19			
8M22R87OMLO	12	1/2	M22x1.5	31.0	49.0	27			
10M22R87OMLO	14,15,16	5/8	M22x1.5	33.5	49.0	27	6.0		
12M27R87OMLO	18,20	3/4	M27x2	37.5	55.5	30	6.0		
16M33R87OMLO	22,25	1	M33x2	41.5	59.5	36			
20M42R87OMLO	28,30,32	1 1/4	M42x2	44.5	63.0	41	4.0		
24M28R87OMLO	35,38	1 1/2	M48x2	49.0	71.5	50			

- [How to Order](#)
- [Specs](#)
- [Assembly / Installation](#)
- [3-D CAD Model](#)
- [Reference](#)

S40MLO Full Dimensions

Branch Tee – BSPP
(for ISO 1179-1 Port)
ORFS / ORFS / BSPP-ORR

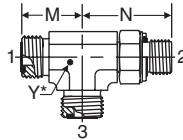


* Y – Across Wrench Flats

TUBE FITTING PART #	END SIZE			M (mm)	N (mm)	Y (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 & 2		3				S	SS	B
	(mm)	(in.)							
4S40MLO	6	1/4	1/8-28	21.5	30.0	14	4.0		
4-4-4S40MLO	6	1/4	1/4-19	23.5	36.0	19	4.0		
6S40MLO	8,10	3/8	1/4-19	25	36.0	19	4.0		
6-6-6S40MLO	8,10	3/8	3/8-19	26.5	38.0	19	4.0		
8S40MLO	12	1/2	3/8-19	28	38.0	19	4.0		
8-8-8S40MLO	12	1/2	1/2-14	31	48.5	27	4.0		
10S40MLO	14,15,16	5/8	1/2-14	33.5	48.5	27	4.0		
10-10-12S40MLO	14,15,16	5/8	3/4-14	36	51.5	30			
12S40MLO	18,20	3/4	3/4-14	37.5	51.5	30	4.0		
16S40MLO	22, 25	1	1-11	41.5	58.5	36	4.0		

R4OMLO Full Dimensions

Run Tee – BSPP
 (for ISO 1179-1 Port)
 ORFS / BSPP-ORR / ORFS



* Y – Across
 Wrench Flats

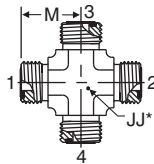
TUBE FITTING PART #	END SIZE			M (mm)	N (mm)	Y (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	1 & 3		2				S	SS	B
	(mm)	(in.)	BSPP						
4R4OMLO	6	1/4	1/8-28	21.5	30.0	14	4.0		
4-4-4R4OMLO	6	1/4	1/4-19	23.5	36.0	19	4.0		
6R4OMLO	8,10	3/8	1/4-19	25.0	36.0	19	4.0		
6-6-6R4OMLO	8,10	3/8	3/8-19	26.5	38.0	19	4.0		
8R4OMLO	12	1/2	3/8-19	28.0	38.0	19	4.0		
8-8-8R4OMLO	12	1/2	1/2-14	31.0	48.5	27	4.0		
10R4OMLO	14,15,16	5/8	1/2-14	33.5	48.5	27	4.0		
10-12-10R4OMLO	14,15,16	5/8	3/4-14	36.0	51.5	30			
12R4OMLO	18,20	3/4	3/4-14	37.5	51.5	30	4.0		
12-16-12R4OMLO	18,20	3/4	1-11	41.0	58.5	37			
16R4OMLO	22,25	1	1-11	41.5	58.5	37	4.0		

- [How to Order](#)
- [Specs](#)
- [Assembly / Installation](#)
- [3-D CAD Model](#)
- [Reference](#)

KLO Full Dimensions

Union Cross
 ORFS (all four ends)

SAE 520501



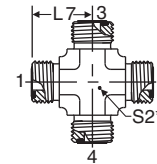
* JJ – Across
 Wrench Flats

TUBE FITTING PART #	END SIZE 1 - 4 (in.)	JJ (in.)	M (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
				S	SS	B
4 KLO	1/4	9/16	0.85	9.2		
6 KLO	3/8	3/4	0.98	9.2		
8 KLO	1/2	3/4	1.10	9.2		
10 KLO	5/8	1 1/16	1.31	6.0		
12 KLO	3/4	1 3/16	1.47	6.0		
16 KLO	1	1 7/16	1.64	6.0		
20 KLO	1 1/4	1 5/8	1.76	5.0		

KMLO Full Dimensions

Union Cross – mm Hex
 ORFS (all four ends)

ISO 8434-3 K
 SAE 52M0501



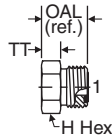
* S2 – Across
 Hex Flats

TUBE FITTING PART #	END SIZE 1 - 4		L7 (mm)	S2 (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	(mm)	(in.)			S	SS	B
4KMLO	6	1/4	21.5	14			
6KMLO	8,10	3/8	25	19			
8KMLO	12	1/2	28	19	9.2		
10KMLO	14,15,16	5/8	33.5	27	6.0		
12KMLO	18,20	3/4	37.5	30			
16KMLO	22,25	1	41.5	36	6.0		
20KMLO	28,30,32	1 1/4	44.5	41			
24KMLO	35,38	1 1/2	49	50			

PNLO Full Dimensions

Plug
ORFS

SAE 520109



TUBE FITTING PART #	END SIZE 1 (in.)	H HEX (in.)	OAL (REF.) (in.)	TT (in.)	STANDARD Dynamic Pressure (x 1,000 PSI)		
					S	SS	B
					4 PNLO	1/4	5/8
6 PNLO	3/8	3/4	0.76	0.32	9.2		
8 PNLO	1/2	7/8	0.86	0.35	9.2	9.2	
10 PNLO	5/8	1 1/16	1.02	0.41	6.0		
12 PNLO	3/4	1 1/4	1.08	0.41	6.0	6.0	
14 PNLO*	7/8	1 3/8	1.18	0.49			
16 PNLO	1	1 1/2	1.10	0.41	6.0	6.0	
20 PNLO	1 1/4	1 3/4	1.10	0.41	6.0	6.0	
24 PNLO	1 1/2	2 1/8	1.10	0.41	5.0		
32 PNLO*	2	2 3/4	1.37	0.50	3.0		

* Sizes 14 and 32 are not included in SAE J1453.

PNMLO Full Dimensions

Plug – mm Hex
ORFS

ISO 8434-3 PL
SAE 52M0109



TUBE FITTING PART #	ORFS TUBE O.D.		L24 (mm)	S1 HEX (mm)	STANDARD Dynamic Pressure (x 1,000 PSI)		
	(mm)	(in.)			S	SS	B
	4PNMLO	6			1/4	16.5	17
6PNMLO	8,10	3/8	19.0	19	9.2		
8PNMLO	12	1/2	22.0	22	9.2		
10PNMLO	14,15,16	5/8	26.0	27	6.0		
12PNMLO	18,20	3/4	27.5	32	6.0		
16PNMLO	22,25	1	28.0	41	6.0		
20PNMLO	28,30,32	1 1/4	28.0	46	6.0		
24PNMLO	38	1 1/2	28.0	55	5.0		

How to Order

Specs

Assembly/Installation

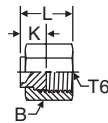
3-D CAD Model

Reference

FNL

Cap
ORFS

SAE 520112

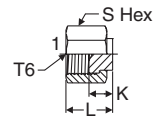


TUBE FITTING PART #	TUBE O.D. (in.)	T6 SWIVEL UN/UNF-2B	B HEX (in.)	K (in.)	L (in.)	STANDARD From Stock		
						S	SS	B
						4 FNL	1/4	9/16-18
6 FNL	3/8	11/16-16	13/16	0.39	0.76	9.2	9.2	
8 FNL	1/2	13/16-16	15/16	0.45	0.88	9.2	9.2	
10 FNL	5/8	1-14	1 1/8	0.51	1.04	6.0	6.0	
12 FNL	3/4	1 3/16-12	1 3/8	0.57	1.14	6.0	6.0	
14 FNL*	7/8	1 5/16-12	1 1/2	0.57	1.10			
16 FNL	1	1 7/16-12	1 5/8	0.61	1.18	6.0	6.0	
20 FNL	1 1/4	1 11/16-12	1 7/8	0.61	1.18	6.0	6.0	
24 FNL	1 1/2	2-12	2 1/4	0.61	1.18	5.0	5.0	
32 FNL*	2	2 1/2-12	2 7/8	0.80	1.47	3.0		

* Sizes 14 and 32 are not included in SAE J1453.

FNML

Cap
ORFS



TUBE FITTING PART #	TUBE O.D.		T6 SWIVEL UN/UNF-2B	K (mm)	L (mm)	S HEX (mm)	STANDARD From Stock		
	(mm)	(in.)					S	SS	B
	4FNML	6					1/4	9/16-18	8.5
6FNML	8, 10	3/8	11/16-16	10	18.5	22	9.2		
8FNML	12	1/2	13/16-16	11.5	21.5	24			
10FNML	14, 15, 16	5/8	1-14	13	25.5	30			
12FNML	18, 20	3/4	1 3/16-12	14.5	28	36			
16FNML	22, 25	1	1 7/16-12	15.5	29	41			
20FNML	28, 30, 32	1 1/4	1 11/16-12	15.5	29	50			
24FNML	35, 38	1 1/2	2-12	15.5	29	60			