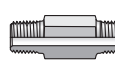
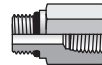
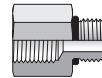
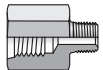
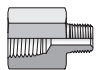
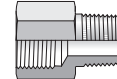
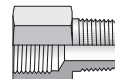
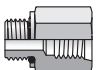
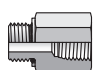
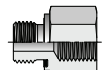
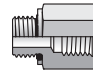
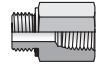
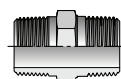
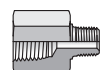
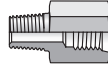
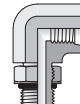
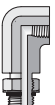


|                                                                                                                                                                 |                                                                                                                                                               |                                                                                                                                                                   |                                                                                                                                                               |                                                                                                                                                               |                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>Nipples</div>                                                                                                                                              | <div>F5OHAO</div> <div>SAE-ORB / SAE-ORB</div> <div></div> <div>E12</div>    | <div>F5OF</div> <div>SAE-ORB / NPTF</div> <div></div> <div>E12</div>             | <div>FF</div> <div>NPTF / NPTF</div> <div></div> <div>E12</div>              | <div>FFF</div> <div>NPTF / NPTF Long</div> <div></div> <div>E12</div>      | <div>F8OHA8O</div> <div>Metric-ORR / Metric-ORR</div> <div></div> <div>E13</div> |
|                                                                                                                                                                 | <div>FF33M</div> <div>BSPT / BSPT</div> <div></div> <div>E13</div>           | <div>Couplings</div>                                                                                                                                              | <div>G5HG5</div> <div>SAE-ORB / SAE-ORB</div> <div></div> <div>E13</div>     | <div>GG</div> <div>NPTF / NPTF</div> <div></div> <div>E13</div>              | <div>G8HG8</div> <div>Metric-ORR / Metric-ORR</div> <div></div> <div>E14</div>   |
| <div>Reducers, Expanders, Conversions</div>                                                                                                                     | <div>F5OG5</div> <div>SAE-ORB / SAE-ORB</div> <div></div> <div>E15</div>     |                                                                                                                                                                   | <div>F5OG</div> <div>SAE-ORB / NPTF</div> <div></div> <div>E15</div>         | <div>F5OHG8</div> <div>SAE-ORB / Metric</div> <div></div> <div>E16</div>     | <div>F5OHF42</div> <div>SAE-ORB / BSPP-ED</div> <div></div> <div>E16</div>       |
|                                                                                                                                                                 | <div>FHG5</div> <div>NPTF / SAE-ORB</div> <div></div> <div>E16</div>         | <div>FG</div> <div>NPTF / NPTF</div> <div></div> <div>E17</div>                  | <div>PTR</div> <div>Pipe Thread Reducer</div> <div></div> <div>E17</div>     | <div>FHG8</div> <div>NPTF / Metric</div> <div></div> <div>E17</div>          | <div>FHG4</div> <div>NPTF / BSPP</div> <div></div> <div>E17</div>                |
| <div>F8OHG5</div> <div>Metric-ORR / SAE-ORB</div> <div></div> <div>E18</div> | <div>F8OHG</div> <div>Metric-ORR / NPTF</div> <div></div> <div>E18</div>   | <div>F82HG8</div> <div>Metric-ED / Metric-ORR</div> <div></div> <div>E19</div> | <div>F4OHG5</div> <div>BSPP-ORR / SAE-ORB</div> <div></div> <div>E19</div> | <div>F4OHG</div> <div>BSPP-ORR / NPTF</div> <div></div> <div>E19</div>   | <div>GHG4</div> <div>BSPP / NPTF</div> <div></div> <div>E19</div>              |
| <div>PTR34M</div> <div>BSPT / BSPP</div> <div></div> <div>E19</div>          | <div>RI-ED</div> <div>BSPP-ED / BSPP</div> <div></div> <div>E20</div>      | <div>RI</div> <div>BSPP-CF / BSPP</div> <div></div> <div>E21</div>             | <div>FHF3</div> <div>BSPT / NPTF</div> <div></div> <div>E22</div>          | <div>F3HG</div> <div>BSPT / NPTF</div> <div></div> <div>E22</div>        | <div>F3HG5</div> <div>BSPT / SAE-ORB</div> <div></div> <div>E22</div>          |
| <div>45° Elbows</div>                                                                                                                                           | <div>CD45</div> <div>NPTF / NPTF</div> <div></div> <div>E22</div>          | <div>DD45</div> <div>NPTF / NPTF</div> <div></div> <div>E23</div>              | <div>90° Elbows</div>                                                                                                                                         | <div>AOEG5</div> <div>SAE-ORB / SAE-ORB</div> <div></div> <div>E23</div> | <div>AOEG</div> <div>SAE-ORB / NPTF</div> <div></div> <div>E23</div>           |
|                                                                                                                                                                 | <div>AOE4G</div> <div>SAE-ORB / NPTF Long</div> <div></div> <div>E23</div> | <div>CR</div> <div>NPTF / NPTF</div> <div></div> <div>E24</div>                |                                                                                                                                                               | <div>CD</div> <div>NPTF / NPTF</div> <div></div> <div>E24</div>            | <div>DD</div> <div>NPTF / NPTF</div> <div></div> <div>E24</div>                  |

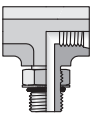
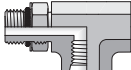
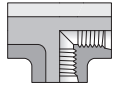
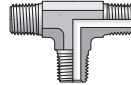
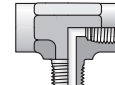
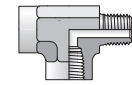
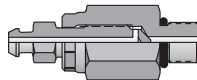
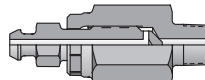
|                                                                                                                                     |                                                                                                                                      |                                                                                                                                    |                                                                                                                                |                                                                                                                             |                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>G5G5JAO</b><br>SAE-ORB Branch Tee<br><br>E25    | <b>AOG5JG5</b><br>SAE-ORB Run Tee<br><br>E26        | <b>G5G5JG5</b><br>SAE-ORB Tee<br><br>E26          | <b>RRS</b><br>NPTF Tee<br><br>E26             | <b>MMS</b><br>NPTF Branch Tee<br><br>E27 | <b>MRO</b><br>NPTF Run Tee<br><br>E27         |
| <b>MMO</b><br>NPTF Tee<br><br>E27                  | <b>MMO444M</b><br>BSPP Tee<br><br>E27               | <b>Cross</b><br>                                  | <b>KMMOO</b><br>NPTF Cross<br><br>E28         | <b>Plugs and Caps</b><br>                | <b>P5ON</b><br>SAE-ORB Hex Head<br><br>E28    |
| <b>HP5ON</b><br>SAE-ORB Hollow Hex<br><br>E28      | <b>HP</b><br>NPTF Hex Head<br><br>E28               | <b>SHP</b><br>NPTF Square Head<br><br>E29         | <b>HHP</b><br>NPTF Hollow Hex Head<br><br>E29 | <b>HPC</b><br>NPTF Pipe Cap<br><br>E29   | <b>P87OMN</b><br>ISO 6149 Hex Head<br><br>E29 |
| <b>VSTI M-OR</b><br>ISO 6149 Hollow Hex<br><br>E30 | <b>VSTI M-ED</b><br>Metric-ED Hollow Hex<br><br>E30 | <b>VSTI R-ED</b><br>BSPP-ED Hollow Hex<br><br>E30 | <b>P47OMN</b><br>BSPP-ORB Hex Head<br><br>E30 | <b>HP3M</b><br>BSPT Hex Head<br><br>E31  |                                                                                                                                  |

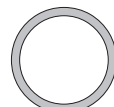
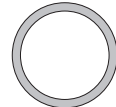
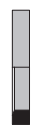
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## Bleed Adapters (Shown in Section L)

|                                                                                                              |                                                                                                                                            |                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Bleed Adapters</b><br> | <b>P5ONBA</b><br>Bleed Screw / Bleed Adapter<br><br>L10 | <b>HPBA</b><br>Bleed Screw / NPT<br><br>L10 |
|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|

## O-Rings and Seals (Shown in Section M)

|                                                                                                                         |                                                                                                                       |                                                                                                                     |                                                                                                                   |                                                                                                                             |                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>O-Rings and Seals</b><br>         | <b>SAE O-Ring</b><br><br>M4        | <b>ISO 6149 O-Ring</b><br><br>M5 | <b>Metric O-Ring</b><br><br>M5 | <b>Metric Retaining Ring</b><br><br>M5 | <b>BSPP O-Ring</b><br><br>M6 |
| <b>BSPP Retaining Ring</b><br><br>M6 | <b>Elastic Seal Ring</b><br><br>M6 |                                                                                                                     |                                                                                                                   |                                                                                                                             |                                                                                                                   |

## Pipe Fittings and Port Adapters

This Section contains adapters with thread types including: NPT, NPTF, BSPT, BSPP, SAE UN/UNF, and Metric. All the threads in this section are made to industry specifications with conformance shown in Table E1.

## Design and Construction

Shaped products (elbows, tees and crosses) are hot forged and machined, while straights are manufactured from cold drawn barstock. Where applicable, these products are made in conformance with the design criteria of the Society of Automotive Engineers Standards, SAE J514, J530.

Imperial tapered pipe products made from steel and brass, for the most part, have NPTF threads. Stainless steel products may have NPT or slightly modified NPT threads to minimize the chance of galling on assembly.

**Standard Material Specifications:** The standard materials used in the manufacture of Industrial Pipe and Adapter fittings are shown in Table S34 on page S46.

**Finish** - Zinc -Nickel plating is used on all standard steel products, unless otherwise noted. Stainless steel fittings are passivated.

## How Port Connections Work

### Tapered (“Pipe”) Threads

There are three types of tapered threads commonly used in industrial applications.

- NPT/NPTF
- BSPT
- Metric Taper

All three thread styles noted above use the same basic metal-to-metal sealing design for achieving a seal. Although very similar, there are differences in the thread dimensions, pitch, and flank angle that do not allow interchangeability.

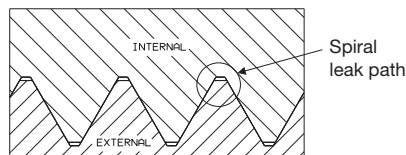
#### NPT / NPTF Threads

NPT threads, when assembled without a sealant, leave a spiral leak path at the crest-root junction as shown in Fig. E1. To seal pressurized fluid, NPT threads require a suitable sealant. NPTF threads (Dryseal), on the other hand, when assembled, do not leave the spiral leak path. This is because they have controlled truncation at the crest and root, ensuring metal-to-metal crest-root contact prior to, or just as the male-female thread flanks make contact as seen in Fig. E2. Upon further tightening, the thread crests are flattened out until the flanks also make metal-to-metal contact as seen in Fig. E3. Thus, theoretically at least, there is no passage left for the fluid to leak, provided all surfaces are flawless and dimensions exact. **In reality, this is not the case and a sealant/lubricant is necessary to achieve a leak free joint, even with NPTF threads.** The sealant/lubricant fills all imperfections in the surfaces affecting the seal and also provides lubrication to ease assembly and minimize galling.

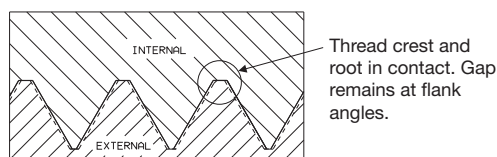
| Thread  | Standard                              |
|---------|---------------------------------------|
| NPT     | ANSI B1.20.1, FED-STD-H28/7           |
| NPTF    | SAE J476, ANSI B1.20.3, FED-STD-H28/8 |
| BSPT    | BS 21, ISO 7/1                        |
| BSPP    | BS 2779, ISO 228/1                    |
| Metric  | ISO 261, ANSI B1.13M, FED-STD-H28/21  |
| UN/UNF* | ANSI B1.1, FED-STD-H28/2              |

\*Class 2A or 2B

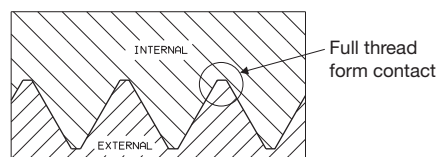
**Table E1 — Thread Conformance Standards**



**Fig. E1 — NPT: Wrench Tight, No Crest-Root Contact, Flank Contact Only**



**Fig. E2 — NPTF: Hand Tight, Crest to Root Contact**



**Fig. E3 — NPTF: Wrench Tight, Crest to Root and Flank Contact**

**Need help determining which fittings goes with which metric port?**  
**Read our article for explanation.**

Dimensions and pressures for reference only, subject to change.

## Application Guidelines for Tapered Threads

### Straight Connectors with NPT/NPTF 3/4-14 and Smaller

Straight connectors with 3/4-14 NPT/NPTF and smaller male pipe threads have very high pressure holding capability and seal reliability when used in applications without “make and break” (such as maintenance) requirements.

They are also well suited for low cycle non-pulsating (static) applications with pressures in excess of 6,000 psi.

### Straight Connectors with NPT/NPTF above 3/4 -14 and All Shaped Connectors with NPT/NPTF Threads

It is difficult to always tighten shapes with pipe threads to an optimum tightness level because of orientation requirements. Also, all connectors in this category with pipe threads have low reliability for leak free operation in dynamic applications. Therefore, they are not preferred where a leak free joint is required.

### All NPTF Connectors

While a pipe thread connection can be disassembled and re-assembled in low-pressure systems, it is not intended to be a frequently assembled and disassembled connection.

BSPT and metric taper are designed and perform similarly. Follow the NPT/NPTF guidelines for their application.

For the above applications, a port connection with an elastomeric seal, such as SAE straight thread port (SAE J1926/ISO11926), SAE four bolt split flange (SAE J518/ISO 6162), and ISO 6149 is recommended. For applications where elastomeric seals can't be used, consult the manufacturer.

In general, tapered thread connections have the following limitations which should be considered when specifying port connections:

- Poor dynamic sealing characteristics
- Possible expansion, and even cracking, of the port
- Orientation is a concern in shaped connectors
- Larger threads are more prone to leakage because of more potential leak points
- System contamination due to thread sealant
- Prone to galling, especially in stainless steel
- Limited remakeability

## Parallel Thread Adapters

Straight, or parallel, thread ports in various forms are becoming more popular in hydraulic systems because they are more reliable and easier to service.

Three types of threads are used for parallel thread ports:

- UN/UNF (SAE straight thread)
- BSPP (British Standard Pipe, Parallel)
- Metric parallel

Because parallel threads only serve one function (i.e. holding the fitting in place), some other means of sealing is always present, such as an elastomeric O-ring or a metal seal. There are many variations of sealing methods, and in some cases, they are interchangeable among the different thread forms and may appear to be similar.

## UN / UNF Threads

SAE J1926 uses **UN/UNF** threads and is often referred to as SAE Straight Thread. The female port is often referred to as ORB or O-ring boss. This port style, shown in Fig. E4, is widely used in North America.

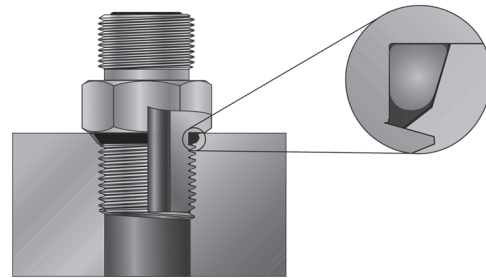


Fig. E4 — Typical O-Ring Boss Port

## BSPP

In Europe, Japan and many other former Commonwealth nations, the British Standard Pipe thread form, BSP, is still used extensively to connect pipes and components in hydraulic systems. The BSP thread is offered in a straight (parallel) form known as BSPP and a tapered form known as BSPT. These threads feature a 55° flank angle. Fittings in this section with male BSPP threads use a primary sealing method of an O-ring and retaining ring, as shown in Fig. E5.

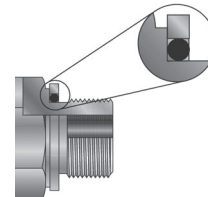


Fig. E5 — O-Ring with Retaining Ring

Additional sealing methods such as a cutting face or an EOlastic seal, as shown in Fig. E6, are also available on other fittings within the catalog. These BSPP fittings are all designed to thread into a female BSPP port (ISO 1179), however, the seal is created with one of the aforementioned sealing methods, not with the threads. It is also important to note that with these BSPP threaded connections, the seal occurs on the port surface, or spotface, not in an O-ring gland or chamfer as SAE and ISO-6149 straight threads do. A detail of the BSPP port is shown on page S37.

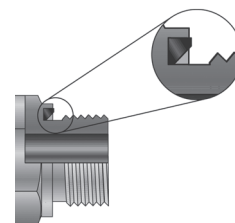


Fig. E6 — O-Ring in Fitting Groove

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## Metric Parallel

In Europe, primarily in Germany, the traditional metric parallel thread form is used extensively to connect components in hydraulic systems. This metric thread is designed to thread into and seal in a female Metric parallel port conforming to ISO-9974-1 (DIN-3852, Part 1). Fittings in this section with male metric threads use a primary sealing method of an O-ring and retaining ring (similar to Fig. E5). Additional sealing methods such as a cutting face or an EOlastic seal (similar to Fig. E6) are also available on other fittings within the catalog. Sealing is accommodated with one of the aforementioned sealing methods, not with the threads. It is also important to note that with these male metric threads, the seal occurs on the top face (spotface) of the port, not in an O-ring gland or chamfer as in SAE and ISO-6149 straight threads. A detail of this metric port is shown on page S34.

To minimize further proliferation of additional port thread styles, the International Standards Organization Technical Committee 131 completed the development of a world standard leak-free

port connection. It is recommended that this port, ISO 6149-1, be specified in all new hydraulic fluid power applications. Parker has expanded the product offering to incorporate the ISO 6149 male studs as a standard on many tube fitting products. Parker offers the ISO 6149 male stud end, shown in Fig. E7, on several tube fitting products including: Seal-Lok, Triple-Lok, EO, EO-2, Conversion Adapters, Plugs and more. This port, utilizes metric parallel threads for mechanical holding power and a sealing method similar to the SAE Straight Thread O-ring port. A detail of this metric port is shown on page S34.

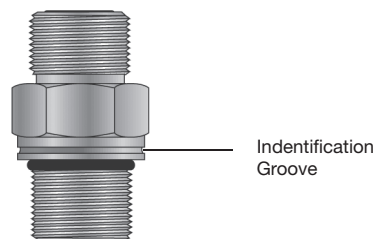


Fig. E7 — ISO 6149 Male

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## Reference locations:

**Standard Material Specifications:** Refer to Table S34 in the General Technical Section on page S46.

**Assembly and Installation:** Please refer to Port End Assembly located within the Assembly/Installation section of this catalog.

**Dynamic Pressure Ratings:** Please refer to the last column of the part number tables located on the following pages of this section for the appropriate dynamic pressure ratings.

Dimensions and pressures for reference only, subject to change.

| Feature                                                                   | Advantage                                                                                                             | Benefit                                                                                       |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Tapered Thread Fittings</b>                                            |                                                                                                                       |                                                                                               |
| Compact size                                                              | Suitable selection for plumbing in limited or tight space in a compact system.                                        | Compact systems are more efficient and reduce the need for excessive routing of hose or tube  |
| Widespread acceptability                                                  | Available worldwide for OEM and MRO applications                                                                      | Eases efforts to find component parts and replacement fittings, reducing unnecessary downtime |
| High static pressure rating                                               | Allows for use in high pressure applications                                                                          | Increases versatility of fitting                                                              |
| Offered in three standard materials (Steel, Stainless Steel, and Brass)   | Allows customer to match media and temperature applications without special fittings and seals.                       | Reduces component procurement costs and increases fitting availability                        |
| Adaptable to ORFS, Flareless Bite-type, Metric Bite-type, 37° flare, etc. | Versatility for end customer and for customer standardization efforts                                                 | Standardization reduces procurement costs                                                     |
| High temperature applications                                             | Is not limited by temperature range of elastomeric seal                                                               | Increases versatility of fitting                                                              |
| <b>Straight Thread Fittings</b>                                           |                                                                                                                       |                                                                                               |
| Reliable sealing in dynamics applications                                 | Ideal in systems with high pressure and cycling                                                                       | Provides reliable, long-term sealing                                                          |
| Unlimited reusability/remakeability                                       | Extends the service life of the fitting                                                                               | Reduces maintenance costs and component replacement costs                                     |
| No thread sealant needed                                                  | Eliminates the potential for contaminating and damaging sensitive hydraulic components due to thread sealant          | Reduces maintenance costs and component replacement costs                                     |
| Infinite positioning of shaped adapters                                   | Eliminates potential of damaging adapter and/or component by incorrectly assembling to accomplish correct orientation | Improves assembly time and reduces maintenance costs                                          |
| Elastomeric seal                                                          | Tolerant of minor surface imperfections to provide leak-free connection                                               | Reduces operational and maintenance costs                                                     |

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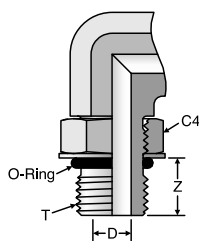
Dimensions and pressures for reference only, subject to change.



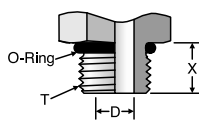
## Port Ends for SAE J1926-1 (ISO 11926-1) Port

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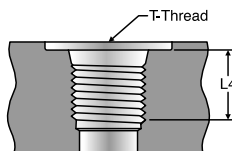
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**SAE J1926  
Adjustable**



**SAE J1926  
Nonadjustable**



**SAE J1926-1  
Port<sup>2)</sup>**

|                                                   | Thread      | Locknut<br>Hex | Drill            | Minimum<br>Thread | Stud Length |                 |
|---------------------------------------------------|-------------|----------------|------------------|-------------------|-------------|-----------------|
| SIZE                                              | T<br>UN/UNF | C4<br>(inch)   | D Ref.<br>(inch) | L4 Min<br>(inch)  | X<br>(inch) | Z Max<br>(inch) |
| <b>LIGHT DUTY (TRIPLE-LOK, FERULOK, ADAPTERS)</b> |             |                |                  |                   |             |                 |
| 2                                                 | 5/16-24     | 7/16           | 0.063            | 0.390             | 0.297       | 0.36            |
| 3                                                 | 3/8-24      | 1/2            | 0.126            | 0.390             | 0.297       | 0.33            |
| 4                                                 | 7/16-20     | 9/16           | 0.177            | 0.454             | 0.360       | 0.39            |
| 5                                                 | 1/2-20      | 5/8            | 0.236            | 0.454             | 0.360       | 0.43            |
| 6                                                 | 9/16-18     | 11/16          | 0.295            | 0.500             | 0.391       | 0.43            |
| 8                                                 | 3/4-16      | 7/8            | 0.394            | 0.562             | 0.438       | 0.49            |
| 10                                                | 7/8-14      | 1              | 0.492            | 0.656             | 0.500       | 0.56            |
| 12                                                | 1 1/16-12   | 1 1/4          | 0.610            | 0.750             | 0.594       | 0.65            |
| 14                                                | 1 3/16-12   | 1 3/8          | 0.709            | 0.750             | 0.594       | 0.65            |
| 16                                                | 1 5/16-12   | 1 1/2          | 0.846            | 0.750             | 0.594       | 0.65            |
| 20                                                | 1 5/8-12    | 1 7/8          | 1.083            | 0.750             | 0.594       | 0.65            |
| 24                                                | 1 7/8-12    | 2 1/8          | 1.319            | 0.750             | 0.594       | 0.65            |
| 32                                                | 2 1/2-12    | 2 3/4          | 1.772            | 0.750             | 0.594       | 0.59            |
| <b>HEAVY DUTY (SEAL-LOK)</b>                      |             |                |                  |                   |             |                 |
| 2                                                 | 5/16-24     | 1/2            | 0.063            | 0.390             | 0.374       | 0.38            |
| 3                                                 | 3/8-24      | 9/16           | 0.118            | 0.390             | 0.374       | 0.39            |
| 4                                                 | 7/16-20     | 5/8            | 0.177            | 0.454             | 0.433       | 0.43            |
| 5                                                 | 1/2-20      | 11/16          | 0.236            | 0.454             | 0.433       | 0.44            |
| 6                                                 | 9/16-18     | 3/4            | 0.264            | 0.500             | 0.472       | 0.47            |
| 8                                                 | 3/4-16      | 15/16          | 0.378            | 0.562             | 0.551       | 0.54            |
| 10                                                | 7/8-14      | 1 1/16         | 0.484            | 0.656             | 0.630       | 0.63            |
| 12                                                | 1 1/16-12   | 1 3/8          | 0.610            | 0.750             | 0.728       | 0.73            |
| 14                                                | 1 3/16-12   | 1 1/2          | 0.709            | 0.750             | 0.728       | 0.73            |
| 16                                                | 1 5/16-12   | 1 5/8          | 0.811            | 0.750             | 0.728       | 0.73            |
| 20                                                | 1 5/8-12    | 1 7/8          | 1.024            | 0.750             | 0.728       | 0.73            |
| 24                                                | 1 7/8-12    | 2 1/8          | 1.260            | 0.750             | 0.728       | 0.73            |
| 32                                                | 2 1/2-12    | 2 3/4          | 1.575            | 0.750             | 0.728       | 0.73            |

1) See page M4 for SAE O-rings.

2) See page S23 for port details.

Dimensions and pressures for reference only, subject to change.

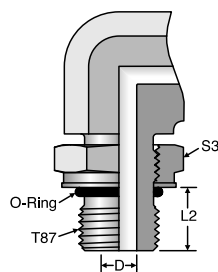


## Port Ends for ISO 6149-1 Port

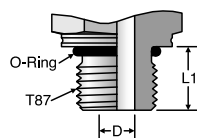
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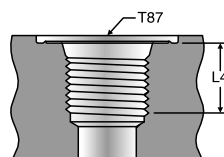
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**ISO 6149  
Adjustable**



**ISO 6149  
Nonadjustable**



**ISO 6149  
Port<sup>2)</sup>**

|                                                   | Thread        | Drill          | Minimum Thread | Stud Length |                | Lockhead Hex |
|---------------------------------------------------|---------------|----------------|----------------|-------------|----------------|--------------|
| SIZE                                              | T87<br>Metric | D Ref.<br>(mm) | L4 Min<br>(mm) | L1<br>(mm)  | L2 Max<br>(mm) | S3<br>(mm)   |
| <b>LIGHT DUTY (TRIPLE-LOK, FERULOK, ADAPTERS)</b> |               |                |                |             |                |              |
| <b>M8</b>                                         | M8X1          | 3              | 10.0           | 8.5         | 8.7            | 12           |
| <b>M10</b>                                        | M10X1         | 4.5            | 10.0           | 8.5         | 8.7            | 14           |
| <b>M12</b>                                        | M12X1.5       | 6              | 11.5           | 11.0        | 11.1           | 17           |
| <b>M14</b>                                        | M14X1.5       | 7.5            | 11.5           | 11.0        | 11.1           | 19           |
| <b>M16</b>                                        | M16X1.5       | 9              | 13.0           | 11.5        | 11.6           | 22           |
| <b>M18</b>                                        | M18X1.5       | 11             | 14.5           | 12.5        | 12.6           | 24           |
| <b>M20</b>                                        | M20X1.5       | —              | 14.5           |             |                | —            |
| <b>M22</b>                                        | M22X1.5       | 14             | 15.5           | 13.0        | 13.0           | 27           |
| <b>M27</b>                                        | M27X2         | 18             | 19.0           | 16.0        | 16.0           | 32           |
| <b>M30</b>                                        | M30X2         | —              | 19.0           |             |                | —            |
| <b>M33</b>                                        | M33X2         | 23             | 19.0           | 16.0        | 16.0           | 41           |
| <b>M38</b>                                        | M38X2         | —              | 19.0           |             |                | —            |
| <b>M42</b>                                        | M42X2         | 30             | 19.5           | 16.0        | 16.0           | 50           |
| <b>M48</b>                                        | M48X2         | 36             | 22.0           | 17.5        | 17.3           | 55           |
| <b>M60</b>                                        | M60X2         | 44             | 24.5           | 17.5        | 17.3           | 65           |
| <b>HEAVY DUTY (SEAL-LOK)</b>                      |               |                |                |             |                |              |
| <b>M8</b>                                         | M8X1          | 2              | 10.0           | 9.5         | 9.7            | 12           |
| <b>M10</b>                                        | M10X1         | 3              | 10.0           | 9.5         | 9.7            | 14           |
| <b>M12</b>                                        | M12X1.5       | 4              | 11.5           | 11.0        | 11.1           | 17           |
| <b>M14</b>                                        | M14X1.5       | 6              | 11.5           | 11.0        | 11.1           | 19           |
| <b>M16</b>                                        | M16X1.5       | 7              | 13.0           | 12.5        | 12.6           | 22           |
| <b>M18</b>                                        | M18X1.5       | 9              | 14.5           | 14.0        | 14.1           | 24           |
| <b>M20</b>                                        | M20X1.5       | 11             | 14.5           | 14.0        |                | —            |
| <b>M22</b>                                        | M22X1.5       | 12             | 15.5           | 15.0        | 15.0           | 27           |
| <b>M27</b>                                        | M27X2         | 15             | 19.0           | 18.5        | 18.0           | 32           |
| <b>M30</b>                                        | M30X2         | 18             | 19.0           | 18.5        | 18.5           | 36           |
| <b>M33</b>                                        | M33X2         | 20             | 19.0           | 18.5        | 18.5           | 41           |
| <b>M38</b>                                        | M38X2         | 26             | 19.0           | 18.5        | 19.0           | 46           |
| <b>M42</b>                                        | M42X2         | 26             | 19.5           | 19.0        | 19.0           | 50           |
| <b>M48</b>                                        | M48X2         | 32             | 22.0           | 21.5        | 21.5           | 55           |
| <b>M60</b>                                        | M60X2         | 40             | 24.5           | 24.0        | 24.0           | 65           |

1) See page M5 for ISO 6149 O-rings.

2) See page S22 for port details.

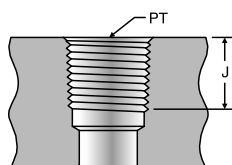
Dimensions and pressures for reference only, subject to change.



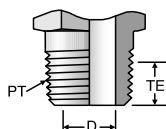
## NPTF and BSPT Port Ends

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**NPTF and BSPT  
Port**



**NPTF and BSPT  
Stud**

|             | Thread       | Drill            | Minimum<br>Thread | Thread<br>Engagement |
|-------------|--------------|------------------|-------------------|----------------------|
| SIZE        | PT           | D Ref.<br>(inch) | J<br>(inch)       | TE<br>(inch)         |
| <b>NPTF</b> |              |                  |                   |                      |
| <b>2</b>    | 1/8-27       | 0.188            | 0.31              | 0.24                 |
| <b>4</b>    | 1/4-18       | 0.281            | 0.44              | 0.34                 |
| <b>6</b>    | 3/8-18       | 0.406            | 0.47              | 0.34                 |
| <b>8</b>    | 1/2-14       | 0.531            | 0.59              | 0.46                 |
| <b>12</b>   | 3/4-14       | 0.719            | 0.63              | 0.46                 |
| <b>16</b>   | 1-11 1/2     | 0.938            | 0.75              | 0.59                 |
| <b>20</b>   | 1 1/4-11 1/2 | 1.250            | 0.78              | 0.59                 |
| <b>24</b>   | 1 1/2-11 1/2 | 1.500            | 0.81              | 0.59                 |
| <b>32</b>   | 2-11 1/2     | 1.938            | 0.81              | 0.59                 |
| <b>BSPT</b> |              |                  |                   |                      |
| <b>2</b>    | 1/8-28       | 0.188            | 0.31              | 0.24                 |
| <b>4</b>    | 1/4-19       | 0.281            | 0.44              | 0.34                 |
| <b>6</b>    | 3/8-19       | 0.406            | 0.47              | 0.34                 |
| <b>8</b>    | 1/2-14       | 0.531            | 0.59              | 0.46                 |
| <b>12</b>   | 3/4-14       | 0.719            | 0.63              | 0.46                 |
| <b>16</b>   | 1-11         | 0.938            | 0.75              | 0.59                 |
| <b>20</b>   | 1 1/4-11     | 1.250            | 0.78              | 0.59                 |
| <b>24</b>   | 1 1/2-11     | 1.438            | 0.81              | 0.59                 |
| <b>32</b>   | 2-11         | 1.938            | 0.81              | 0.59                 |

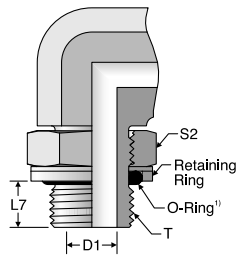
Dimensions and pressures for reference only, subject to change.

## Port Ends for ISO 9974-1 and 1179-1 Ports

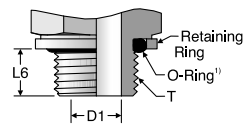
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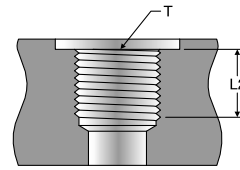
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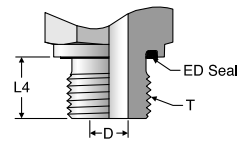
**ISO 9974 and 1179  
Adjustable O-Ring  
with Retaining Ring<sup>2)</sup>**



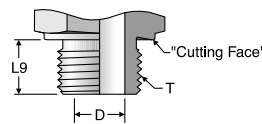
**ISO 9974 and 1179  
Non-Adjustable O-Ring  
with Retaining Ring<sup>2)</sup>**



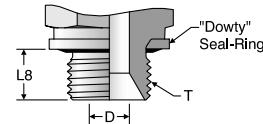
**ISO 9974<sup>3)</sup> and 1179<sup>4)</sup>  
Port**



**ISO 9974 and 1179  
ED Seal**



**ISO 9974 and 1179  
Cutting Face Seal**



**Dowty® Seal Stud End for  
ISO 9974-1 and ISO 1179-1 Ports**

### ISO 9974

|      |             | O-Ring,<br>RR Stud | Light Duty<br>(L Series) | Heavy Duty<br>(S Series) | Port Min<br>Depth | ED Stud    | O-Ring,<br>RR Non-<br>Adj Stud | O-Ring,<br>RR Adj-<br>Stud | O-Ring, RR<br>Adj-Stud,<br>Locknut<br>Hex | Dowty<br>Seal<br>Stud | Cutting<br>Face<br>Stud |
|------|-------------|--------------------|--------------------------|--------------------------|-------------------|------------|--------------------------------|----------------------------|-------------------------------------------|-----------------------|-------------------------|
|      | Thread      | Drill Ref.         |                          |                          |                   |            |                                |                            |                                           |                       |                         |
| SIZE | T<br>Metric | D1<br>(mm)         | D<br>(mm)                |                          | L2<br>(mm)        | L4<br>(mm) | L6<br>(mm)                     | L7<br>(mm)                 | S2<br>(mm)                                | L8<br>(mm)            | L9<br>(mm)              |
| M8   | M8X1        | 2                  | —                        | —                        | 8                 | —          | 8.0                            | 8.6                        | 11                                        | —                     | 8                       |
| M10  | M10X1       | 4                  | 4                        | —                        | 8                 | 8          | 8.0                            | 8.7                        | 14                                        | —                     | 8                       |
| M12  | M12X1.5     | 5                  | 6                        | 4                        | 12                | 12         | 8.7                            | 10.0                       | 17                                        | —                     | 12                      |
| M14  | M14X1.5     | 7                  | 7                        | 5                        | 12                | 12         | 8.7                            | 10.0                       | 19                                        | —                     | 12                      |
| M16  | M16X1.5     | 9                  | 9                        | 7                        | 12                | 12         | 9.0                            | 11.3                       | 21                                        | —                     | 12                      |
| M18  | M18X1.5     | 11                 | 11                       | 8                        | 12                | 12         | 11.0                           | 12.2                       | 22                                        | —                     | 12                      |
| M20  | M20X1.5     | 11                 | -                        | 10                       | 14                | 14         | 12.7                           | —                          | —                                         | —                     | 14                      |
| M22  | M22X1.5     | 13                 | 14                       | 12                       | 14                | 14         | 12.7                           | 13.7                       | 27                                        | —                     | 14                      |
| M26  | M26X1.5     | 13                 | 18                       | —                        | 16                | 16         | 14.0                           | —                          | —                                         | —                     | 16                      |
| M27  | M27X2       | 16                 | —                        | 16                       | 16                | 16         | 15.0                           | 16.8                       | 32                                        | —                     | 16                      |
| M33  | M33X2       | 22                 | 23                       | 20                       | 18                | 18         | 15.0                           | 16.8                       | 38                                        | —                     | 18                      |
| M42  | M42X2       | 28                 | 30                       | 25                       | 20                | 20         | 15.5                           | 17.3                       | 48                                        | —                     | 20                      |
| M48  | M48X2       | 36                 | 36                       | 32                       | 22                | 22         | 19.5                           | 19.3                       | 55                                        | —                     | 22                      |
| M60  | M60X2       | 44                 | —                        | —                        | 24.5              | —          | 20.5                           | 22.3                       | 65                                        | —                     | —                       |

### ISO 1179

|      |           | O-Ring,<br>RR Stud | Light Duty<br>(L Series) | Heavy Duty<br>(S Series) | Port Min<br>Depth | ED Stud    | O-Ring,<br>RR Non-<br>Adj Stud | O-Ring,<br>RR Adj-<br>Stud | O-Ring, RR<br>Adj-Stud,<br>Locknut<br>Hex | Dowty<br>Seal<br>Stud | Cutting<br>Face<br>Stud |
|------|-----------|--------------------|--------------------------|--------------------------|-------------------|------------|--------------------------------|----------------------------|-------------------------------------------|-----------------------|-------------------------|
|      | Thread    | Drill Ref.         |                          |                          |                   |            |                                |                            |                                           |                       |                         |
| SIZE | T<br>BSPP | D1<br>(mm)         | D<br>(mm)                |                          | L2<br>(mm)        | L4<br>(mm) | L6<br>(mm)                     | L7<br>(mm)                 | S2<br>(mm)                                | L8<br>(mm)            | L9<br>(mm)              |
| 2    | 1/8-28    | 4.4                | 4                        | —                        | 8                 | 8          | 6.3                            | 7.2                        | 14                                        | 8                     | 8                       |
| 4    | 1/4-19    | 7.5                | 7                        | 5                        | 12                | 12         | 9.4                            | 9.4                        | 19                                        | 11                    | 12                      |
| 6    | 3/8-19    | 9.9                | 9                        | 8                        | 12                | 12         | 9.4                            | 9.3                        | 22                                        | 12                    | 12                      |
| 8    | 1/2-14    | 12.3               | 14                       | 12                       | 14                | 14         | 12.6                           | 13.1                       | 30                                        | 14                    | 14                      |
| 12   | 3/4-14    | 15.5               | 18                       | 16                       | 16                | 16         | 12.6                           | 13.1                       | 36                                        | 16                    | 16                      |
| 16   | 1-11      | 21.5               | 23                       | 20                       | 18                | 18         | 16.0                           | 14.7                       | 46                                        | 16                    | 18                      |
| 20   | 1-1/4-11  | 27.5               | 30                       | 25                       | 20                | 20         | 16.0                           | 14.7                       | 50                                        | 19                    | 20                      |
| 24   | 1-1/2-11  | 33.0               | 36                       | 32                       | 22                | 22         | 16.0                           | 14.7                       | 55                                        | 22                    | 22                      |
| 32   | 2-11      | —                  | —                        | —                        | 26                | —          | 16.0                           | 14.7                       | 75                                        | 25                    | —                       |

1) See Section M for O-rings and seals.

2) O-ring with retaining ring stud ends are not shown in ISO 9974.

3) See page S38 for ISO 9974-1 port details.

4) See page S37 for ISO 1179-1 port details.

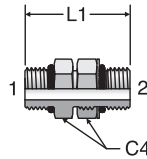
Dimensions and pressures for reference only, subject to change.

[Click here for CADs, Support Resources or to Configure Parts Online](#)

## F50HAO

Straight Thread Union  
SAE-ORB / SAE-ORB

HPD Base # 0505



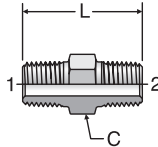
| TUBE<br>FITTING<br>PART # | END SIZE    |             | C4<br>HEX<br>(in.) | L1<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|-------------|--------------------|-------------|--------------------------------------|-----|-----|
|                           | 1           | 2           |                    |             | -S                                   | -SS | -B  |
|                           | UN/UNF-2A   | UN/UNF-2A   |                    |             |                                      |     |     |
| 4 F50HAO                  | 7/16 - 20   | 7/16 - 20   | 9/16               | 1.27        | 6.0                                  | 6.0 | 3.3 |
| 6 F50HAO                  | 9/16 - 18   | 9/16 - 18   | 11/16              | 1.41        | 6.0                                  | 6.0 | 3.3 |
| 8 F50HAO                  | 3/4 - 16    | 3/4 - 16    | 7/8                | 1.64        | 6.0                                  | 6.0 | 3.3 |
| 10 F50HAO                 | 7/8 - 14    | 7/8 - 14    | 1                  | 1.81        | 5.0                                  | 5.0 | 3.3 |
| 12 F50HAO                 | 1 1/16 - 12 | 1 1/16 - 12 | 1 1/4              | 2.13        | 5.0                                  | 5.0 | 3.3 |
| 16 F50HAO                 | 1 5/16 - 12 | 1 5/16 - 12 | 1 1/2              | 2.44        | 4.0                                  | 4.0 | 2.6 |
| 20 F50HAO                 | 1 5/8 - 12  | 1 5/8 - 12  | 1 7/8              | 2.44        | 4.0                                  | 4.0 | 2.6 |
| 24 F50HAO                 | 1 7/8 - 12  | 1 7/8 - 12  | 2 1/8              | 2.44        | 3.0                                  | 3.0 | 1.9 |
| 32 F50HAO                 | 2 1/2 - 12  | 2 1/2 - 12  | 2 3/4              | 2.44        | 2.0                                  | 2.0 | 1.3 |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

## FF

Pipe Nipple  
NPTF / NPTF

HPD Base # 0101 SAE 140137



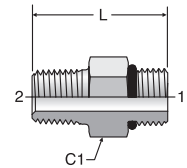
| TUBE<br>FITTING<br>PART # | END SIZE       |                | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|----------------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1<br>NPTF      | 2<br>NPTF      |                   |            | -S                                   | -SS | -B  |
|                           |                |                |                   |            |                                      |     |     |
| 1/8 FF                    | 1/8 - 27       | 1/8 - 27       | 7/16              | 1.06       | 6.0                                  | 7.2 | 3.9 |
| 1/4 x 1/8 FF              | 1/4 - 18       | 1/8 - 27       | 5/8               | 1.25       | 6.0                                  | 7.2 | 3.9 |
| 1/4 FF                    | 1/4 - 18       | 1/4 - 18       | 5/8               | 1.45       | 6.0                                  | 7.2 | 3.9 |
| 3/8 x 1/8 FF              | 3/8 - 18       | 1/8 - 27       | 3/4               | 1.27       | 6.0                                  | 7.2 | 3.9 |
| 3/8 x 1/4 FF              | 3/8 - 18       | 1/4 - 18       | 3/4               | 1.45       | 6.0                                  | 7.2 | 3.9 |
| 3/8 FF                    | 3/8 - 18       | 3/8 - 18       | 3/4               | 1.45       | 6.0                                  | 7.2 | 3.9 |
| 1/2 x 1/8 FF              | 1/2 - 14       | 1/8 - 27       | 7/8               | 1.52       | 6.0                                  | 7.2 | 3.3 |
| 1/2 x 3/8 FF              | 1/2 - 14       | 3/8 - 18       | 7/8               | 1.70       | 6.0                                  | 7.2 | 3.9 |
| 1/2 x 1/4 FF              | 1/2 - 14       | 1/4 - 18       | 7/8               | 1.70       | 6.0                                  | 7.2 | 3.9 |
| 1/2 FF                    | 1/2 - 14       | 1/2 - 14       | 7/8               | 1.89       | 6.0                                  | 7.2 | 3.9 |
| 3/4 x 1/4 FF              | 3/4 - 14       | 1/4 - 18       | 1 1/8             | 1.78       | 5.5                                  | 6.6 | 3.5 |
| 3/4 x 3/8 FF              | 3/4 - 14       | 3/8 - 18       | 1 1/8             | 1.78       | 5.5                                  | 6.6 | 3.3 |
| 3/4 x 1/2 FF              | 3/4 - 14       | 1/2 - 14       | 1 1/8             | 1.96       | 5.5                                  | 6.6 | 3.5 |
| 3/4 FF                    | 3/4 - 14       | 3/4 - 14       | 1 1/8             | 1.96       | 5.5                                  | 6.6 | 3.5 |
| 1 x 1/4 FF                | 1 - 11 1/2     | 1/4 - 18       | 1 3/8             | 1.96       | 4.5                                  | 5.4 | 3.3 |
| 1 x 3/8 FF                | 1 - 11 1/2     | 3/8 - 18       | 1 3/8             | 1.96       | 4.5                                  | 5.4 | 3.3 |
| 1 x 1/2 FF                | 1 - 11 1/2     | 1/2 - 14       | 1 3/8             | 2.09       | 4.5                                  | 5.4 | 3.3 |
| 1 x 3/4 FF                | 1 - 11 1/2     | 3/4 - 14       | 1 3/8             | 2.09       | 4.5                                  | 5.4 | 3.3 |
| 1 FF                      | 1 - 11 1/2     | 1 - 11 1/2     | 1 3/8             | 2.34       | 4.5                                  | 5.4 | 3.0 |
| 1 1/4 x 1 FF              | 1 1/4 - 11 1/2 | 1 - 11 1/2     | 1 3/4             | 2.45       | 3.0                                  | 3.6 | 2.3 |
| 1 1/4 FF                  | 1 1/4 - 11 1/2 | 1 1/4 - 11 1/2 | 1 3/4             | 2.48       | 3.0                                  | 3.6 | 2.3 |
| 1 1/2 x 1 FF              | 1 1/2 - 11 1/2 | 1 - 11 1/2     | 2                 | 2.55       | 3.0                                  | 3.6 | 2.3 |
| 1 1/2 FF                  | 1 1/2 - 11 1/2 | 1 1/2 - 11 1/2 | 2                 | 2.61       | 3.0                                  | 3.6 | 2.3 |
| 2 x 1 1/2 FF              | 2 - 11 1/2     | 1 1/2 - 11 1/2 | 2 1/2             | 2.79       | 2.0                                  | 2.4 | 1.5 |
| 2 FF                      | 2 - 11 1/2     | 2 - 11 1/2     | 2 1/2             | 2.83       | 2.0                                  | 2.4 | 1.5 |

**Note:** All steel "FF" fittings have a 30° chamfer for sealing with NPSM swivel type fittings.

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## F50F

Male Pipe Adapter  
SAE-ORB / NPTF

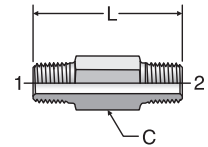


| TUBE<br>FITTING<br>PART # | END SIZE    |                | C1<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|----------------|--------------------|------------|--------------------------------------|-----|-----|
|                           | 1           | 2              |                    |            | -S                                   | -SS | -B  |
|                           | UN/UNF-2A   | NPTF           |                    |            |                                      |     |     |
| 4-1/8 F50F                | 7/16 - 20   | 1/8 - 27       | 9/16               | 1.00       | 6.0                                  | 6.0 | 3.3 |
| 4-1/4 F50F                | 7/16 - 20   | 1/4 - 18       | 9/16               | 1.20       | 6.0                                  | 6.0 | 3.3 |
| 5-1/4 F50F                | 1/2 - 20    | 1/4 - 18       | 5/8                | 1.20       | 6.0                                  | 6.0 | 3.3 |
| 6-1/4 F50F                | 9/16 - 18   | 1/4 - 18       | 11/16              | 1.25       | 6.0                                  | 6.0 | 3.3 |
| 6-3/8 F50F                | 9/16 - 18   | 3/8 - 18       | 11/16              | 1.34       | 6.0                                  | 6.0 | 3.3 |
| 8-1/4 F50F                | 3/4 - 16    | 1/4 - 18       | 7/8                | 1.36       | 6.0                                  | 6.0 | 3.3 |
| 8-3/8 F50F                | 3/4 - 16    | 3/8 - 18       | 7/8                | 1.36       | 6.0                                  | 6.0 | 3.3 |
| 8-1/2 F50F                | 3/4 - 16    | 1/2 - 14       | 7/8                | 1.53       | 6.0                                  | 6.0 | 3.3 |
| 10-1/2 F50F               | 7/8 - 14    | 1/2 - 14       | 1                  | 1.59       | 6.0                                  | 6.0 | 3.3 |
| 12-1/2 F50F               | 1 1/16 - 12 | 1/2 - 14       | 1 1/4              | 1.80       | 5.0                                  | 6.0 | 3.3 |
| 12-3/4 F50F               | 1 1/16 - 12 | 3/4 - 14       | 1 1/4              | 1.80       | 5.0                                  | 6.0 | 3.3 |
| 16-3/4 F50F               | 1 5/16 - 12 | 3/4 - 14       | 1 1/2              | 1.78       | 4.5                                  | 5.4 | 2.9 |
| 16-1 F50F                 | 1 5/16 - 12 | 1 - 11 1/2     | 1 1/2              | 1.98       | 4.5                                  | 5.4 | 2.9 |
| 20-1 1/4 F50F             | 1 5/8 - 12  | 1 1/4 - 11 1/2 | 1 7/8              | 2.02       | 3.0                                  | 3.6 | 1.9 |
| 24-1 1/2 F50F             | 1 7/8 - 12  | 1 1/2 - 11 1/2 | 2 1/8              | 2.25       | 3.0                                  | 3.0 | 1.9 |

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## FFF

Long Pipe Nipple  
NPTF / NPTF



| TUBE<br>FITTING<br>PART # | END SIZE   |            | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|------------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1          | 2          |                   |            | -S                                   | -SS | -B  |
|                           | NPTF       | NPTF       |                   |            |                                      |     |     |
| 1/8 x 1.5 FFF             | 1/8 - 27   | 1/8 - 27   | 7/16              | 1.5        | 6.0                                  | 7.2 | 3.9 |
| 1/8 x 2.0 FFF             | 1/8 - 27   | 1/8 - 27   | 7/16              | 2.0        | 6.0                                  | 7.2 | 3.9 |
| 1/8 x 2.5 FFF             | 1/8 - 27   | 1/8 - 27   | 7/16              | 2.5        | 6.0                                  | 7.2 | 3.9 |
| 1/8 x 3.0 FFF             | 1/8 - 27   | 1/8 - 27   | 7/16              | 3.0        | 6.0                                  | 7.2 | 3.9 |
| 1/4 x 1.5 FFF             | 1/4 - 18   | 1/4 - 18   | 5/8               | 1.5        | 6.0                                  | 7.2 | 3.9 |
| 1/4 x 2.0 FFF             | 1/4 - 18   | 1/4 - 18   | 5/8               | 2.0        | 6.0                                  | 7.2 | 3.9 |
| 1/4 x 2.5 FFF             | 1/4 - 18   | 1/4 - 18   | 5/8               | 2.5        | 6.0                                  | 7.2 | 3.9 |
| 1/4 x 3.0 FFF             | 1/4 - 18   | 1/4 - 18   | 5/8               | 3.0        | 6.0                                  | 7.2 | 3.9 |
| 1/4 x 4.0 FFF             | 1/4 - 18   | 1/4 - 18   | 5/8               | 4.0        | 6.0                                  | 7.2 | 3.9 |
| 3/8 x 2.0 FFF             | 3/8 - 18   | 3/8 - 18   | 3/4               | 2.0        | 6.0                                  | 7.2 | 3.3 |
| 3/8 x 3.0 FFF             | 3/8 - 18   | 3/8 - 18   | 3/4               | 3.0        | 6.0                                  | 7.2 | 3.3 |
| 3/8 x 3.5 FFF             | 3/8 - 18   | 3/8 - 18   | 3/4               | 3.5        | 6.0                                  | 7.2 | 3.3 |
| 3/8 x 4.0 FFF             | 3/8 - 18   | 3/8 - 18   | 3/4               | 4.0        | 6.0                                  | 7.2 | 3.3 |
| 1/2 x 2.0 FFF             | 1/2 - 14   | 1/2 - 14   | 7/8               | 2.0        | 6.0                                  | 7.2 | 3.3 |
| 1/2 x 2.5 FFF             | 1/2 - 14   | 1/2 - 14   | 7/8               | 2.5        | 6.0                                  | 7.2 | 3.3 |
| 1/2 x 3.0 FFF             | 1/2 - 14   | 1/2 - 14   | 7/8               | 3.0        | 6.0                                  | 7.2 | 3.9 |
| 1/2 x 4.0 FFF             | 1/2 - 14   | 1/2 - 14   | 7/8               | 4.0        | 6.0                                  | 7.2 | 3.3 |
| 1/2 x 6.0 FFF             | 1/2 - 14   | 1/2 - 14   | 7/8               | 6.0        | 6.0                                  | 7.2 | 3.3 |
| 3/4 x 3.0 FFF             | 3/4 - 14   | 3/4 - 14   | 1 1/8             | 3.0        | 5.5                                  | 6.6 | 3.3 |
| 1 x 3.0 FFF               | 1 - 11 1/2 | 1 - 11 1/2 | 1 3/8             | 3.0        | 4.5                                  | 5.4 | 3.3 |

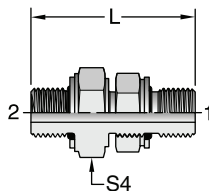
**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

Dimensions and pressures for reference only, subject to change.



## F80HA80

Metric Union  
Metric-ORR / Metric-ORR  
(for ISO 9974 / DIN 3852-1 Port)

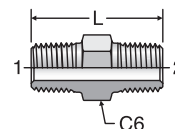


| TUBE FITTING PART # | End Size     |              | S4 Hex (mm) | L (mm) | Dynamic Pressure (x 1,000 PSI) |    |   |
|---------------------|--------------|--------------|-------------|--------|--------------------------------|----|---|
|                     | 1 Metric Str | 2 Metric Str |             |        | S                              | SS | B |
| M10F80HA80          | M10X1        | M10X1        | 16          | 33.8   | 6.0                            |    |   |
| M12F80HA80          | M12X1.5      | M12X1.5      | 19          | 36.8   | 6.0                            |    |   |
| M14F80HA80          | M14X1.5      | M14X1.5      | 22          | 37.3   | 6.0                            |    |   |
| M16F80HA80          | M16X1.5      | M16X1.5      | 22          | 46.0   | 5.0                            |    |   |
| M18F80HA80          | M18X1.5      | M18X1.5      | 27          | 48.8   | 5.0                            |    |   |
| M20M18F80HA80       | M20X1.5      | M18X1.5      | 27          | 49.8   | 4.0                            |    |   |
| M22F80HA80          | M22X1.5      | M22X1.5      | 27          | 52.6   | 4.0                            |    |   |
| M27F80HA80          | M27X2        | M27X2        | 32          | 62.0   | 4.0                            |    |   |
| M33F80HA80          | M33X2        | M33X2        | 41          | 62.0   | 3.0                            |    |   |

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## FF33M

BSPT Pipe Nipple  
BSPT / BSPT

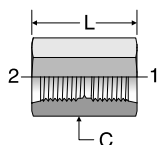


| TUBE FITTING PART # | END SIZE |          | C6 HEX (mm) | L (mm) | Dynamic Pressure (x 1,000 PSI) |     |     |
|---------------------|----------|----------|-------------|--------|--------------------------------|-----|-----|
|                     | 1 BSPT   | 2 BSPT   |             |        | S                              | SS  | B   |
| 1/8FF33M            | 1/8 - 28 | 1/8 - 28 | 11          | 27     | 6.0                            | 6.0 | 3.3 |
| 1/4x1/8FF33M        | 1/4 - 19 | 1/8 - 28 | 14          | 32     | 6.0                            | 6.0 | 3.3 |
| 1/4FF33M            | 1/4 - 19 | 1/4 - 19 | 14          | 37     | 6.0                            | 6.0 | 3.3 |
| 3/8x1/4FF33M        | 3/8 - 19 | 1/4 - 19 | 17          | 37     | 6.0                            | 6.0 | 3.3 |
| 3/8FF33M            | 3/8 - 19 | 3/8 - 19 | 17          | 37     | 6.0                            | 6.0 | 3.3 |
| 1/2FF33M            | 1/2 - 14 | 1/2 - 14 | 22          | 48     | 6.0                            | 6.0 | 3.3 |
| 1/2x3/8FF33M        | 1/2 - 14 | 3/8 - 19 | 22          | 43     | 6.0                            | 6.0 | 3.3 |
| 3/4FF33M            | 3/4 - 14 | 3/4 - 14 | 27          | 50     | 5.5                            | 5.5 | 3.3 |
| 3/4x1/2FF33M        | 3/4 - 14 | 1/2 - 14 | 27          | 50     | 5.5                            | 5.5 | 3.3 |
| 1X3/4FF33M          | 1 - 11   | 3/4 - 14 | 36          | 55     | 4.5                            | 4.5 | 2.9 |
| 1FF33M              | 1 - 11   | 1 - 11   | 36          | 59     | 4.5                            | 4.5 | 2.9 |

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## G5HG5

Straight Thread Coupling  
Female SAE / Female SAE

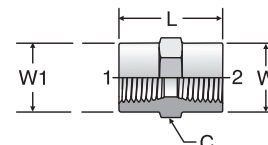


| TUBE FITTING PART # | END SIZE    |             | C HEX (in.) | L (in.) | Dynamic Pressure (x 1,000 PSI) |     |     |
|---------------------|-------------|-------------|-------------|---------|--------------------------------|-----|-----|
|                     | 1 UN/UNF-2B | 2 UN/UNF-2B |             |         | -S                             | -SS | -B  |
| 4 G5HG5             | 7/16 - 20   | 7/16 - 20   | 11/16       | 1.13    | 7.0                            | 6.0 | 3.3 |
| 6 G5HG5             | 9/16 - 18   | 9/16 - 18   | 13/16       | 1.26    | 6.0                            | 6.0 | 3.3 |
| 8 G5HG5             | 3/4 - 16    | 3/4 - 16    | 1           | 1.42    | 5.0                            | 5.0 | 3.3 |
| 10 G5HG5            | 7/8 - 14    | 7/8 - 14    | 1 3/16      | 1.60    | 4.5                            | 4.5 | 2.9 |
| 12 G5HG5            | 1 1/16 - 12 | 1 1/16 - 12 | 1 3/8       | 1.85    | 4.5                            | 4.5 | 2.9 |
| 16 G5HG5            | 1 5/16 - 12 | 1 5/16 - 12 | 1 5/8       | 1.85    | 3.5                            | 3.5 | 2.2 |

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## GG

Pipe Coupling  
NPTF / NPTF



SAE 140138  
HPD Base # 0202

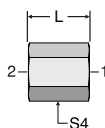
| TUBE FITTING PART # | END SIZE       |                | C HEX (in.) | L (in.) | W1 (in.) | W (in.) | Dynamic Pressure (x 1,000 PSI) |     |     |
|---------------------|----------------|----------------|-------------|---------|----------|---------|--------------------------------|-----|-----|
|                     | 1 NPTF         | 2 NPTF         |             |         |          |         | -S                             | -SS | -B  |
| 1/8 GG              | 1/8 - 27       | 1/8 - 27       | 5/8         | 0.75    | 0.63     | 0.63    | 6.0                            | 6.0 | 3.9 |
| 1/4 x 1/8 GG        | 1/4 - 18       | 1/8 - 27       | 3/4         | 0.94    | 0.75     | 0.63    | 6.0                            | 6.0 | 3.9 |
| 1/4 GG              | 1/4 - 18       | 1/4 - 18       | 3/4         | 1.13    | 0.75     | 0.75    | 6.0                            | 6.0 | 3.9 |
| 3/8 x 1/8 GG        | 3/8 - 18       | 1/8 - 27       | 7/8         | 1.03    | 0.88     | 0.63    | 6.0                            | 6.0 | 3.9 |
| 3/8 x 1/4 GG        | 3/8 - 18       | 1/4 - 18       | 7/8         | 1.13    | 0.88     | 0.75    | 6.0                            | 6.0 | 3.9 |
| 3/8 GG              | 3/8 - 18       | 3/8 - 18       | 7/8         | 1.13    | 0.88     | 0.88    | 6.0                            | 6.0 | 3.9 |
| 1/2 x 1/8 GG        | 1/2 - 14       | 1/8 - 27       | 1 1/8       | 1.06    | 1.13     | 0.63    | 6.0                            | 6.0 | 3.2 |
| 1/2 x 1/4 GG        | 1/2 - 14       | 1/4 - 18       | 1 1/8       | 1.38    | 1.13     | 0.75    | 5.0                            | 6.0 | 3.2 |
| 1/2 x 3/8 GG        | 1/2 - 14       | 3/8 - 18       | 1 1/8       | 1.50    | 1.13     | 0.88    | 5.0                            | 6.0 | 3.2 |
| 1/2 GG              | 1/2 - 14       | 1/2 - 14       | 1 1/8       | 1.50    | 1.13     | 1.13    | 5.0                            | 6.0 | 3.2 |
| 3/4 x 1/4 GG        | 3/4 - 14       | 1/4 - 18       | 1 3/8       | 1.55    | 1.36     | 0.75    | 4.0                            | 4.8 | 3.1 |
| 3/4 x 1/2 GG        | 3/4 - 14       | 1/2 - 14       | 1 3/8       | 1.88    | 1.36     | 1.13    | 4.0                            | 4.8 | 3.1 |
| 3/4 GG              | 3/4 - 14       | 3/4 - 14       | 1 3/8       | 1.53    | 1.38     | 1.38    | 4.0                            | 4.8 | 2.6 |
| 1 GG                | 1 - 11 1/2     | 1 - 11 1/2     | 1 5/8       | 1.89    | 1.63     | 1.63    | 3.0                            | 3.6 | 1.9 |
| 1 x 1/2 GG          | 1 - 11 1/2     | 1/2 - 14       | 1 5/8       | 1.77    | 1.63     | 1.13    | 3.0                            | 3.6 | 1.9 |
| 1 x 3/4 GG          | 1 - 11 1/2     | 3/4 - 14       | 1 5/8       | 1.77    | 1.63     | 1.38    | 3.0                            | 3.6 | 1.9 |
| 1 1/4 GG            | 1 1/4 - 11 1/2 | 1 1/4 - 11 1/2 | 2           | 1.93    | 2.00     | 2.00    | 2.5                            | 3.0 | 1.9 |
| 1 1/4 x 1 GG        | 1 1/4 - 11 1/2 | 1 - 11 1/2     | 2           | 1.93    | 2.00     | 1.63    | 2.5                            | 3.0 | 1.9 |
| 1 1/2 GG            | 1 1/2 - 11 1/2 | 1 1/2 - 11 1/2 | 2 3/8       | 1.93    | 2.38     | 2.38    | 2.0                            | 2.4 | 1.5 |
| 1 1/2 x 1 1/4 GG    | 1 1/2 - 11 1/2 | 1 1/4 - 11 1/2 | 2 3/8       | 1.93    | 2.37     | 2.37    | 2.0                            | 2.4 | 1.5 |
| 2 GG                | 2 - 11 1/2     | 2 - 11 1/2     | 2 7/8       | 1.97    | 2.88     | 2.88    | 2.0                            | 2.4 | 1.5 |

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Dimensions and pressures for reference only, subject to change.

## G8HG8

Metric Female Union  
Metric-ORR / Metric-ORR  
(for ISO 9974 / DIN 3852-1 Port)

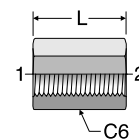


| TUBE<br>FITTING<br>PART # | End Size        |                 | S4<br>Hex<br>(mm) | L<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI)<br>S |
|---------------------------|-----------------|-----------------|-------------------|-----------|-------------------------------------------|
|                           | 1<br>Metric Str | 2<br>Metric Str |                   |           |                                           |
| M10G8HG8                  | M10X1           | M10X1           | 17                | 19        | 6.0                                       |
| M14G8HG8                  | M14X1.5         | M14X1.5         | 22                | 28        | 6.0                                       |
| M16G8HG8                  | M16X1.5         | M16X1.5         | 24                | 29        | 6.0                                       |
| M18G8HG8                  | M18X1.5         | M18X1.5         | 27                | 29        | 6.0                                       |
| M20G8HG8                  | M20X1.5         | M20X1.5         | 32                | 32        | 5.0                                       |
| M27G8HG8                  | M27X2           | M27X2           | 38                | 38        | 5.0                                       |
| M33G8HG8                  | M33X2           | M33X2           | 46                | 44        | 5.0                                       |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

## GG44M

BSPP Female Union  
BSPP / BSPP



| TUBE<br>FITTING<br>PART # | END SIZE  |           | C6<br>HEX<br>(mm) | L<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-----------|-----------|-------------------|-----------|--------------------------------------|-----|-----|
|                           | 1<br>BSPP | 2<br>BSPP |                   |           | S                                    | SS  | B   |
| 1/8GG44M                  | 1/8 - 28  | 1/8 - 28  | 14                | 19.0      | 6.0                                  | 6.0 | 3.3 |
| 1/4X1/8GG44M              | 1/4 - 19  | 1/8 - 28  | 17                | 24.0      | 6.0                                  | 6.0 | 3.3 |
| 1/4GG44M                  | 1/4 - 19  | 1/4 - 19  | 17                | 28.0      | 6.0                                  | 6.0 | 3.3 |
| 3/8GG44M                  | 3/8 - 19  | 3/8 - 19  | 22                | 28.0      | 6.0                                  | 6.0 | 3.3 |
| 3/8x1/4GG44M              | 3/8 - 19  | 1/4 - 19  | 22                | 28.0      | 6.0                                  | 6.0 | 3.3 |
| 1/2x3/8GG44M              | 1/2 - 14  | 3/8 - 19  | 27                | 31.0      | 5.0                                  | 5.0 | 3.3 |
| 1/2GG44M                  | 1/2 - 14  | 1/2 - 14  | 27                | 32.5      | 5.0                                  | 5.0 | 3.3 |
| 1GG44M                    | 1 - 11    | 1 - 11    | 46                | 42.0      | 3.0                                  | 3.0 | 1.9 |

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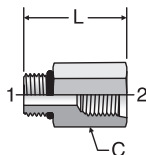
GEN TECH

Dimensions and pressures for reference only, subject to change.

## F50G5

Straight Thread Reducer / Expander  
SAE-ORB / SAE-ORB

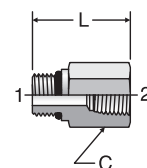
SAE 090136  
HPD Base # 0510



## F50G

Female Pipe Adapter  
SAE-ORB / NPTF

SAE 090156



| TUBE<br>FITTING<br>PART # | END SIZE    |             | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|-------------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1           | 2           |                   |            | -S                                   | -SS | -B  |
|                           | UN/UNF-2A   | UN/UNF-2B   |                   |            |                                      |     |     |
| 2-4 F50G5                 | 5/16 - 24   | 7/16 - 20   | 11/16             | 1.03       | 7.5                                  | 7.5 | 3.3 |
| 4-4 F50G5                 | 7/16 - 20   | 7/16 - 20   | 11/16             | 1.08       | 7.5                                  | 7.5 | 3.3 |
| 4-6 F50G5                 | 7/16 - 20   | 9/16 - 18   | 13/16             | 1.16       | 6.0                                  | 6.0 | 3.3 |
| 6-4 F50G5                 | 9/16 - 18   | 7/16 - 20   | 11/16             | 1.03       | 6.0                                  | 6.0 | 3.3 |
| 6-6 F50G5                 | 9/16 - 18   | 9/16 - 18   | 13/16             | 1.16       | 6.0                                  | 6.0 | 3.3 |
| 6-8 F50G5                 | 9/16 - 18   | 3/4 - 16    | 1 1/16            | 1.38       | 6.0                                  | 6.0 | 3.3 |
| 8-4 F50G5                 | 3/4 - 16    | 7/16 - 20   | 7/8               | 1.13       | 6.0                                  | 6.0 | 3.3 |
| 8-6 F50G5                 | 3/4 - 16    | 9/16 - 18   | 7/8               | 1.13       | 6.0                                  | 6.0 | 3.3 |
| 8-10 F50G5                | 3/4 - 16    | 7/8 - 14    | 1 1/8             | 1.56       | 4.5                                  | 4.5 | 2.9 |
| 10-4 F50G5                | 7/8 - 14    | 7/16 - 20   | 1                 | 0.81       | 5.0                                  | 5.0 | 3.3 |
| 10-6 F50G5                | 7/8 - 14    | 9/16 - 18   | 1                 | 1.26       | 5.0                                  | 5.0 | 3.3 |
| 10-8 F50G5                | 7/8 - 14    | 3/4 - 16    | 1                 | 1.31       | 5.0                                  | 5.0 | 3.3 |
| 10-12 F50G5               | 7/8 - 14    | 1 1/16 - 12 | 1 3/8             | 1.69       | 4.5                                  | 4.5 | 2.9 |
| 12-4 F50G5                | 1 1/16 - 12 | 7/16 - 20   | 1 1/4             | 1.00       | 5.0                                  | 5.0 | 3.3 |
| 12-6 F50G5                | 1 1/16 - 12 | 9/16 - 18   | 1 1/4             | 1.00       | 5.0                                  | 5.0 | 3.3 |
| 12-8 F50G5                | 1 1/16 - 12 | 3/4 - 16    | 1 1/4             | 1.45       | 5.0                                  | 5.0 | 3.3 |
| 12-10 F50G5               | 1 1/16 - 12 | 7/8 - 14    | 1 1/4             | 1.53       | 5.0                                  | 5.0 | 3.3 |
| 12-16 F50G5               | 1 1/16 - 12 | 1 5/16 - 12 | 1 5/8             | 1.88       | 3.5                                  | 3.5 | 2.2 |
| 16-6 F50G5                | 1 5/16 - 12 | 9/16 - 18   | 1 1/2             | 1.00       | 4.5                                  | 4.5 | 2.9 |
| 16-8 F50G5                | 1 5/16 - 12 | 3/4 - 16    | 1 1/2             | 1.00       | 4.5                                  | 4.5 | 2.9 |
| 16-10 F50G5               | 1 5/16 - 12 | 7/8 - 14    | 1 1/2             | 1.00       | 4.5                                  | 4.5 | 2.9 |
| 16-12 F50G5               | 1 5/16 - 12 | 1 1/16 - 12 | 1 1/2             | 1.75       | 4.5                                  | 4.5 | 2.9 |
| 16-20 F50G5               | 1 5/16 - 12 | 1 5/8 - 12  | 2 1/8             | 1.97       | 3.0                                  | 3.0 | 1.9 |
| 20-6 F50G5                | 1 5/8 - 12  | 9/16 - 18   | 1 7/8             | 1.00       | 4.0                                  | 4.0 | 2.6 |
| 20-8 F50G5                | 1 5/8 - 12  | 3/4 - 16    | 1 7/8             | 1.00       | 4.0                                  | 4.0 | 2.6 |
| 20-10 F50G5               | 1 5/8 - 12  | 7/8 - 14    | 1 7/8             | 1.00       | 4.0                                  | 4.0 | 2.6 |
| 20-12 F50G5               | 1 5/8 - 12  | 1 1/16 - 12 | 1 7/8             | 1.00       | 4.0                                  | 4.0 | 2.6 |
| 20-16 F50G5               | 1 5/8 - 12  | 1 5/16 - 12 | 1 7/8             | 1.72       | 4.0                                  | 4.0 | 2.6 |
| 20-24 F50G5               | 1 5/8 - 12  | 1 7/8 - 12  | 2 1/2             | 1.88       | 3.0                                  | 3.0 | 1.9 |
| 24-6 F50G5                | 1 7/8 - 12  | 9/16 - 18   | 2 1/8             | 1.00       | 3.0                                  | 3.0 | 1.9 |
| 24-12 F50G5               | 1 7/8 - 12  | 1 1/16 - 12 | 2 1/8             | 1.00       | 3.0                                  | 3.0 | 1.9 |
| 24-16 F50G5               | 1 7/8 - 12  | 1 5/16 - 12 | 2 1/8             | 1.00       | 3.0                                  | 3.0 | 1.9 |
| 24-20 F50G5               | 1 7/8 - 12  | 1 5/8 - 12  | 2 1/8             | 1.75       | 3.0                                  | 3.0 | 1.9 |
| 32-20 F50G5               | 2 1/2 - 12  | 1 5/8 - 12  | 2 3/4             | 1.00       | 2.0                                  | 2.0 | 1.3 |
| 32-24 F50G5               | 2 1/2 - 12  | 1 7/8 - 12  | 2 3/4             | 1.80       | 2.0                                  | 2.0 | 1.3 |

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| TUBE<br>FITTING<br>PART # | END SIZE    |                | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|----------------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1           | 2              |                   |            | -S                                   | -SS | -B  |
|                           | UN/UNF-2A   | NPTF           |                   |            |                                      |     |     |
| 2-1/8 F50G                | 5/16 - 24   | 1/8 - 27       | 9/16              | 0.91       | 6.0                                  | 6.0 | 3.3 |
| 4-1/8 F50G                | 7/16 - 20   | 1/8 - 27       | 9/16              | 1.00       | 6.0                                  | 6.0 | 3.3 |
| 4-1/4 F50G                | 7/16 - 20   | 1/4 - 18       | 3/4               | 1.16       | 6.0                                  | 6.0 | 3.3 |
| 5-1/8 F50G                | 1/2 - 20    | 1/8 - 27       | 5/8               | 1.06       | 6.0                                  | 6.0 | 3.3 |
| 5-1/4 F50G                | 1/2 - 20    | 1/4 - 18       | 3/4               | 1.19       | 6.0                                  | 6.0 | 3.3 |
| 6-1/8 F50G                | 9/16 - 18   | 1/8 - 27       | 11/16             | 1.00       | 6.0                                  | 6.0 | 3.3 |
| 6-1/4 F50G                | 9/16 - 18   | 1/4 - 18       | 3/4               | 1.16       | 6.0                                  | 6.0 | 3.3 |
| 6-3/8 F50G                | 9/16 - 18   | 3/8 - 18       | 7/8               | 1.28       | 6.0                                  | 6.0 | 3.3 |
| 6-1/2 F50G                | 9/16 - 18   | 1/2 - 14       | 1 1/8             | 1.53       | 5.0                                  | 6.0 | 3.3 |
| 8-1/8 F50G                | 3/4 - 16    | 1/8 - 27       | 7/8               | 0.80       | 6.0                                  | 6.0 | 3.3 |
| 8-1/4 F50G                | 3/4 - 16    | 1/4 - 18       | 7/8               | 1.13       | 6.0                                  | 6.0 | 3.3 |
| 8-3/8 F50G                | 3/4 - 16    | 3/8 - 18       | 7/8               | 1.28       | 6.0                                  | 6.0 | 3.3 |
| 8-1/2 F50G                | 3/4 - 16    | 1/2 - 14       | 1 1/8             | 1.50       | 5.0                                  | 6.0 | 3.3 |
| 10-1/4 F50G               | 7/8 - 14    | 1/4 - 18       | 1                 | 0.81       | 5.0                                  | 6.0 | 3.3 |
| 10-3/8 F50G               | 7/8 - 14    | 3/8 - 18       | 1                 | 1.31       | 5.0                                  | 6.0 | 3.3 |
| 10-1/2 F50G               | 7/8 - 14    | 1/2 - 14       | 1 1/8             | 1.53       | 5.0                                  | 6.0 | 3.3 |
| 10-3/4 F50G               | 7/8 - 14    | 3/4 - 14       | 1 3/8             | 1.63       | 4.0                                  | 4.0 | 2.6 |
| 12-1/4 F50G               | 1 1/16 - 12 | 1/4 - 18       | 1 1/4             | 1.00       | 6.0                                  | 6.0 | 3.3 |
| 12-3/8 F50G               | 1 1/16 - 12 | 3/8 - 18       | 1 1/4             | 1.34       | 5.0                                  | 6.0 | 3.3 |
| 12-1/2 F50G               | 1 1/16 - 12 | 1/2 - 14       | 1 1/4             | 1.41       | 5.0                                  | 6.0 | 3.3 |
| 12-3/4 F50G               | 1 1/16 - 12 | 3/4 - 14       | 1 3/8             | 1.72       | 4.0                                  | 4.8 | 3.1 |
| 14-1/2 F50G               | 1 3/16 - 12 | 1/2 - 14       | 1 3/8             | 1.06       | 5.0                                  | 5.0 | 3.3 |
| 14-3/4 F50G               | 1 3/16 - 12 | 3/4 - 14       | 1 3/8             | 1.69       | 4.0                                  | 4.0 | 2.6 |
| 16-1/2 F50G               | 1 5/16 - 12 | 1/2 - 14       | 1 1/2             | 1.00       | 5.0                                  | 6.0 | 3.3 |
| 16-3/4 F50G               | 1 5/16 - 12 | 3/4 - 14       | 1 1/2             | 1.50       | 4.0                                  | 4.8 | 2.6 |
| 16-1 F50G                 | 1 5/16 - 12 | 1 - 11 1/2     | 1 5/8             | 1.88       | 3.0                                  | 3.6 | 1.9 |
| 20-1 F50G                 | 1 5/8 - 12  | 1 - 11 1/2     | 1 7/8             | 1.00       | 3.0                                  | 3.6 | 1.9 |
| 20-1 1/2 F50G             | 1 5/8 - 12  | 1 1/2 - 11 1/2 | 2 1/4             | 2.16       | 2.5                                  | 3.0 | 1.6 |
| 20-1 1/4 F50G             | 1 5/8 - 12  | 1 1/4 - 11 1/2 | 2                 | 1.97       | 3.0                                  | 3.0 | 1.9 |
| 24-1 F50G                 | 1 7/8 - 12  | 1 - 11 1/2     | 2 1/8             | 1.00       | 3.0                                  | 3.6 | 1.9 |
| 24-1 1/4 F50G             | 1 7/8 - 12  | 1 1/4 - 11 1/2 | 2 1/8             | 1.94       | 2.5                                  | 2.5 | 1.6 |
| 24-1 1/2 F50G             | 1 7/8 - 12  | 1 1/2 - 11 1/2 | 2 1/4             | 2.00       | 2.0                                  | 2.4 | 1.3 |
| 32-2 F50G                 | 2 1/2 - 12  | 2 - 11 1/2     | 2 7/8             | 2.06       | 2.0                                  | 2.4 | 1.3 |

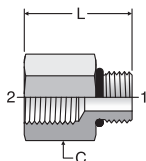
**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

Dimensions and pressures for reference only, subject to change.



## F50HG8

Conversion Adapter  
SAE-ORB / Metric

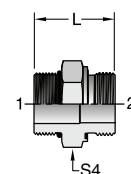


| TUBE<br>FITTING<br>PART # | END SIZE    |            | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|------------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1           | 2          |                   |            |                                      |     |     |
|                           | UN/UNF-2A   | METRIC STR |                   |            | S                                    | SS  | B   |
| 4M10F50HG8                | 7/16 - 20   | M10X1      | 5/8               | 0.95       | 6.0                                  | 6.0 | 3.3 |
| 4M12F50HG8                | 7/16 - 20   | M12X1.5    | 3/4               | 1.14       | 6.0                                  | 6.0 | 3.3 |
| 6M14F50HG8                | 9/16 - 18   | M14X1.5    | 13/16             | 1.17       | 6.0                                  | 6.0 | 3.3 |
| 6M16F50HG8                | 9/16 - 18   | M16X1.5    | 15/16             | 1.17       | 6.0                                  | 6.0 | 3.3 |
| 8M16F50HG8                | 3/4 - 16    | M16X1.5    | 15/16             | 1.30       | 6.0                                  | 6.0 | 3.3 |
| 8M18F50HG8                | 3/4 - 16    | M18X1.5    | 1                 | 1.30       | 6.0                                  | 6.0 | 3.3 |
| 10M22F50HG8               | 7/8 - 14    | M22X1.5    | 1 3/16            | 1.46       | 5.0                                  | 5.0 | 3.3 |
| 12M27F50HG8               | 1 1/16 - 12 | M27X2      | 1 1/2             | 1.72       | 5.0                                  | 5.0 | 3.3 |
| 16M33F50HG8               | 1 5/16 - 12 | M33X2      | 1 3/4             | 1.81       | 5.0                                  | 5.0 | 3.3 |

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## F50HF42

Conversion Adapter  
SAE-ORB / BSPP-ED

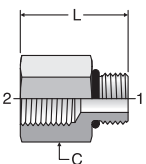


| TUBE<br>FITTING<br>PART # | End Size  |          | S4<br>Hex<br>(mm) | L<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |   |
|---------------------------|-----------|----------|-------------------|-----------|--------------------------------------|---|
|                           | 1         | 2        |                   |           |                                      |   |
|                           | UN/UNF-2A | BSPP     |                   |           | S                                    | B |
| 4-1/8F50HF42ED            | 7/16-20   | 1/8-28   | 17                | 27.2      | 9.2                                  |   |
| 4-1/4F50HF42ED            | 7/16-20   | 1/4-19   | 19                | 31.8      | 9.2                                  |   |
| 5-1/4F50HF42ED            | 1/2-20    | 1/4-19   | 19                | 31.4      | 9.2                                  |   |
| 6-1/4F50HF42ED            | 9/16-18   | 1/4-19   | 19                | 32.0      | 9.2                                  |   |
| 6-3/8F50HF42ED            | 9/16-18   | 3/8-19   | 22                | 32.5      | 9.2                                  |   |
| 8-1/4F50HF42ED            | 3/4-16    | 1/4-19   | 22                | 34.9      | 9.2                                  |   |
| 8-3/8F50HF42ED            | 3/4-16    | 3/8-19   | 22                | 36.5      | 9.2                                  |   |
| 8-1/2F50HF42ED            | 3/4-16    | 1/2-14   | 27                | 40.0      | 6.0                                  |   |
| 10-1/2F50HF42ED           | 7/8-14    | 1/2-14   | 27                | 42.0      | 6.0                                  |   |
| 12-1/2F50HF42ED           | 1 1/16-12 | 1/2-14   | 32                | 45.0      | 6.0                                  |   |
| 12-3/4F50HF42ED           | 1 1/16-12 | 3/4-14   | 32                | 47.0      | 6.0                                  |   |
| 16-3/4F50HF42ED           | 1 5/16-12 | 3/4-14   | 38                | 48.0      | 6.0                                  |   |
| 16-1F50HF42ED             | 1 5/16-12 | 1-11     | 41                | 51.0      | 6.0                                  |   |
| 20-11/4F50HF42ED          | 1 5/8-12  | 1 1/4-11 | 50                | 54.0      | 6.0                                  |   |
| 24-11/2F50HF42ED          | 1 7/8-12  | 1 1/2-11 | 55                | 56.0      | 5.0                                  |   |

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## F50HG4

Conversion Adapter  
SAE-ORB / BSPP



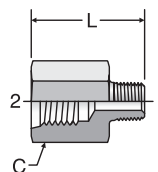
| TUBE<br>FITTING<br>PART # | END SIZE    |          | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|----------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1           | 2        |                   |            |                                      |     |     |
|                           | UN/UNF-2A   | BSPP     |                   |            | S                                    | SS  | B   |
| 4-1/8F50HG4               | 7/16 - 20   | 1/8 - 28 | 5/8               | 0.96       | 6.0                                  | 6.0 | 3.3 |
| 4-1/4F50HG4               | 7/16 - 20   | 1/4 - 19 | 3/4               | 1.16       | 6.0                                  | 6.0 | 3.3 |
| 6-1/4F50HG4               | 9/16 - 18   | 1/4 - 19 | 3/4               | 1.19       | 6.0                                  | 6.0 | 3.3 |
| 6-3/8F50HG4               | 9/16 - 18   | 3/8 - 19 | 7/8               | 1.19       | 6.0                                  | 6.0 | 3.3 |
| 8-1/4F50HG4               | 3/4 - 16    | 1/4 - 19 | 7/8               | 1.32       | 6.0                                  | 6.0 | 3.3 |
| 8-3/8F50HG4               | 3/4 - 16    | 3/8 - 19 | 15/16             | 1.32       | 6.0                                  | 6.0 | 3.3 |
| 10-1/2F50HG4              | 7/8 - 14    | 1/2 - 14 | 1 1/8             | 1.52       | 5.0                                  | 5.0 | 3.3 |
| 12-3/4F50HG4              | 1 1/16 - 12 | 3/4 - 14 | 1 7/16            | 1.74       | 4.0                                  | 4.0 | 2.6 |
| 16-1F50HG4                | 1 5/16 - 12 | 1 - 11   | 1 7/8             | 1.87       | 3.0                                  | 3.0 | 1.9 |

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## FHG5

Female Straight Thread Adapter  
NPTF / SAE-ORB

HPD Base # 0110



| TUBE<br>FITTING<br>PART # | END SIZE   |             | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|-------------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1          | 2           |                   |            |                                      |     |     |
|                           | NPTF       | UN/UNF-2B   |                   |            | -S                                   | -SS | -B  |
| 1/8-4 FHG5                | 1/8 - 27   | 7/16 - 20   | 11/16             | 1.06       | 6.0                                  | 6.0 | 3.3 |
| 1/8-5 FHG5                | 1/8 - 27   | 1/2 - 20    | 3/4               | 1.09       | 6.0                                  | 6.0 | 3.3 |
| 1/4-6 FHG5                | 1/4 - 18   | 9/16 - 18   | 3/4               | 1.36       | 6.0                                  | 6.0 | 3.3 |
| 3/8-6 FHG5                | 3/8 - 18   | 9/16 - 18   | 3/4               | 1.42       | 6.0                                  | 6.0 | 3.3 |
| 3/8-8 FHG5                | 3/8 - 18   | 3/4 - 16    | 1                 | 1.50       | 5.0                                  | 5.0 | 3.3 |
| 1/2-6 FHG5                | 1/2 - 14   | 9/16 - 18   | 7/8               | 1.58       | 6.0                                  | 6.0 | 3.3 |
| 1/2-8 FHG5                | 1/2 - 14   | 3/4 - 16    | 1                 | 1.66       | 5.0                                  | 5.0 | 3.3 |
| 1/2-10 FHG5               | 1/2 - 14   | 7/8 - 14    | 1 1/4             | 1.75       | 4.5                                  | 4.5 | 2.9 |
| 3/4-8 FHG5                | 3/4 - 14   | 3/4 - 16    | 1 1/8             | 1.13       | 4.5                                  | 4.5 | 2.9 |
| 3/4-12 FHG5               | 3/4 - 14   | 1 1/16 - 12 | 1 3/8             | 1.97       | 4.5                                  | 4.5 | 2.9 |
| 1-16 FHG5                 | 1 - 11 1/2 | 1 5/16 - 12 | 1 5/8             | 2.13       | 3.5                                  | 3.5 | 2.2 |

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Dimensions and pressures for reference only, subject to change.

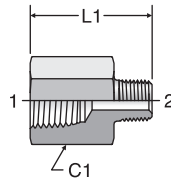


[Click here for CADs, Support Resources or to Configure Parts Online](#)

## FG

Expander / Adapter  
NPTF / NPTF

SAE 140139  
HPD Base # 0201

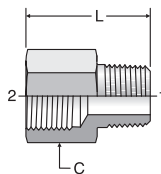


| TUBE<br>FITTING<br>PART # | END SIZE       |                | C1<br>HEX<br>(in.) | L1<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|----------------|--------------------|-------------|--------------------------------------|-----|-----|
|                           | 1<br>NPTF      | 2<br>NPTF      |                    |             | -S                                   | -SS | -B  |
|                           |                |                |                    |             |                                      |     |     |
| 1/8 x 1/16 FG             | 1/8 - 27       | 1/16 - 27      | 5/8                | 1.03        | 6.0                                  | 6.0 | 3.3 |
| 1/8 FG                    | 1/8 - 27       | 1/8 - 27       | 5/8                | 1.03        | 6.0                                  | 6.0 | 3.3 |
| 1/4 x 1/8 FG              | 1/4 - 18       | 1/8 - 27       | 3/4                | 1.21        | 6.0                                  | 6.0 | 3.9 |
| 1/4 FG                    | 1/4 - 18       | 1/4 - 18       | 3/4                | 1.39        | 6.0                                  | 6.0 | 3.9 |
| 3/8 x 1/8 FG              | 3/8 - 18       | 1/8 - 27       | 7/8                | 1.25        | 6.0                                  | 6.0 | 3.3 |
| 3/8 x 1/4 FG              | 3/8 - 18       | 1/4 - 18       | 7/8                | 1.44        | 6.0                                  | 6.0 | 3.9 |
| 3/8 FG                    | 3/8 - 18       | 3/8 - 18       | 7/8                | 1.44        | 6.0                                  | 6.0 | 3.9 |
| 1/2 x 1/8 FG              | 1/2 - 14       | 1/8 - 27       | 1 1/8              | 1.50        | 5.0                                  | 6.0 | 3.2 |
| 1/2 x 1/4 FG              | 1/2 - 14       | 1/4 - 18       | 1 1/8              | 1.69        | 5.0                                  | 6.0 | 3.2 |
| 1/2 x 3/8 FG              | 1/2 - 14       | 3/8 - 18       | 1 1/8              | 1.69        | 5.0                                  | 6.0 | 3.2 |
| 1/2 FG                    | 1/2 - 14       | 1/2 - 14       | 1 1/8              | 1.87        | 5.0                                  | 6.0 | 3.2 |
| 3/4 FG                    | 3/4 - 14       | 3/4 - 14       | 1 3/8              | 1.93        | 4.0                                  | 4.8 | 2.6 |
| 3/4 x 1/4 FG              | 3/4 - 14       | 1/4 - 18       | 1 3/8              | 1.75        | 4.0                                  | 4.8 | 2.6 |
| 3/4 x 3/8 FG              | 3/4 - 14       | 3/8 - 18       | 1 3/8              | 1.75        | 4.0                                  | 4.8 | 2.6 |
| 3/4 x 1/2 FG              | 3/4 - 14       | 1/2 - 14       | 1 3/8              | 1.93        | 4.0                                  | 4.8 | 2.6 |
| 1 FG                      | 1 - 11 1/2     | 1 - 11 1/2     | 1 5/8              | 2.37        | 3.0                                  | 3.6 | 2.3 |
| 1 x 1/4 FG                | 1 - 11 1/2     | 1/4 - 18       | 1 5/8              | 2.01        | 3.0                                  | 3.6 | 2.3 |
| 1 x 1/2 FG                | 1 - 11 1/2     | 1/2 - 14       | 1 5/8              | 2.19        | 3.0                                  | 3.6 | 2.3 |
| 1 x 3/4 FG                | 1 - 11 1/2     | 3/4 - 14       | 1 5/8              | 2.19        | 3.0                                  | 3.6 | 2.3 |
| 1 1/4 FG                  | 1 1/4 - 11 1/2 | 1 1/4 - 11 1/2 | 2                  | 2.50        | 2.5                                  | 3.0 | 1.9 |
| 1 1/4 x 1 FG              | 1 1/4 - 11 1/2 | 1 - 11 1/2     | 2                  | 2.47        | 2.5                                  | 3.0 | 1.9 |
| 1 1/2 x 1 FG              | 1 1/2 - 11 1/2 | 1 - 11 1/2     | 2 3/8              | 2.47        | 2.0                                  | 2.4 | 1.5 |
| 1 1/2 x 1 1/4 FG          | 1 1/2 - 11 1/2 | 1 1/4 - 11 1/2 | 2 3/8              | 2.50        | 2.0                                  | 2.4 | 1.5 |
| 2 FG                      | 2 - 11 1/2     | 2 - 11 1/2     | 2 7/8              | 2.66        | 2.0                                  | 2.4 | 1.5 |

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## FHG8

Conversion Adapter  
NPTF / Metric



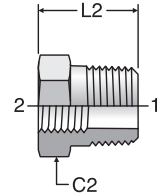
| TUBE<br>FITTING<br>PART # | END SIZE |            | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------|------------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1        | 2          |                   |            | S                                    | SS  | B   |
|                           | NPTF     | METRIC STR |                   |            |                                      |     |     |
| 1/8M10FHG8                | 1/8 - 27 | M10X1      | 5/8               | 0.95       | 6.0                                  | 6.0 | 3.3 |
| 1/8M12FHG8                | 1/8 - 27 | M12X1.5    | 3/4               | 1.16       | 6.0                                  | 6.0 | 3.3 |
| 1/4M14FHG8                | 1/4 - 18 | M14X1.5    | 13/16             | 1.35       | 6.0                                  | 6.0 | 3.3 |
| 1/4M16FHG8                | 1/4 - 18 | M16X1.5    | 15/16             | 1.37       | 6.0                                  | 6.0 | 3.3 |
| 3/8M18FHG8                | 3/8 - 18 | M18X1.5    | 1                 | 1.36       | 6.0                                  | 6.0 | 3.3 |
| 1/2M22FHG8                | 1/2 - 14 | M22X1.5    | 1 3/16            | 1.65       | 6.0                                  | 5.0 | 3.3 |
| 3/4M27FHG8                | 3/4 - 14 | M27X2      | 1 1/2             | 1.77       | 5.5                                  | 4.5 | 2.9 |

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## PTR

Pipe Thread Reducer  
NPTF / NPTF

SAE 140140  
HPD Base # 0102

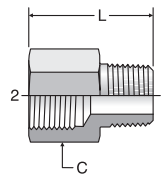


| TUBE<br>FITTING<br>PART # | END SIZE       |                | C2<br>HEX<br>(in.) | L2<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|----------------|--------------------|-------------|--------------------------------------|-----|-----|
|                           | 1              | 2              |                    |             | -S                                   | -SS | -B  |
|                           | NPTF           | NPTF           |                    |             |                                      |     |     |
| 1/4 x 1/8 PTR             | 1/4 - 18       | 1/8 - 27       | 5/8                | 0.86        | 6.0                                  | 6.0 | 3.9 |
| 3/8 x 1/8 PTR             | 3/8 - 18       | 1/8 - 27       | 3/4                | 0.86        | 6.0                                  | 6.0 | 3.9 |
| 3/8 x 1/4 PTR             | 3/8 - 18       | 1/4 - 18       | 3/4                | 0.86        | 6.0                                  | 6.0 | 3.9 |
| 1/2 x 1/8 PTR             | 1/2 - 14       | 1/8 - 27       | 7/8                | 1.11        | 6.0                                  | 6.0 | 3.2 |
| 1/2 x 1/4 PTR             | 1/2 - 14       | 1/4 - 18       | 7/8                | 1.11        | 6.0                                  | 6.0 | 3.2 |
| 1/2 x 3/8 PTR             | 1/2 - 14       | 3/8 - 18       | 7/8                | 1.11        | 6.0                                  | 6.0 | 3.2 |
| 3/4 x 1/8 PTR             | 3/4 - 14       | 1/8 - 27       | 1 1/8              | 1.17        | 5.5                                  | 6.0 | 3.3 |
| 3/4 x 1/4 PTR             | 3/4 - 14       | 1/4 - 18       | 1 1/8              | 1.17        | 5.5                                  | 6.0 | 3.7 |
| 3/4 x 3/8 PTR             | 3/4 - 14       | 3/8 - 18       | 1 1/8              | 1.17        | 5.5                                  | 6.0 | 3.7 |
| 3/4 x 1/2 PTR             | 3/4 - 14       | 1/2 - 14       | 1 1/8              | 1.17        | 5.0                                  | 6.0 | 3.3 |
| 1 x 1/8 PTR               | 1 - 11 1/2     | 1/8 - 27       | 1 3/8              | 1.36        | 4.5                                  | 5.4 | 3.3 |
| 1 x 1/4 PTR               | 1 - 11 1/2     | 1/4 - 18       | 1 3/8              | 1.36        | 4.5                                  | 5.4 | 3.3 |
| 1 x 3/8 PTR               | 1 - 11 1/2     | 3/8 - 18       | 1 3/8              | 1.36        | 4.5                                  | 5.4 | 3.0 |
| 1 x 1/2 PTR               | 1 - 11 1/2     | 1/2 - 14       | 1 3/8              | 1.36        | 4.5                                  | 5.4 | 3.0 |
| 1 x 3/4 PTR               | 1 - 11 1/2     | 3/4 - 14       | 1 3/8              | 1.36        | 4.0                                  | 4.8 | 2.7 |
| 1 1/4 x 1/4 PTR           | 1 1/4 - 11 1/2 | 1/4 - 18       | 1 3/4              | 1.47        | 3.0                                  | 3.6 | 2.3 |
| 1 1/4 x 3/8 PTR           | 1 1/4 - 11 1/2 | 3/8 - 18       | 1 3/4              | 1.47        | 3.0                                  | 3.6 | 2.3 |
| 1 1/4 x 1/2 PTR           | 1 1/4 - 11 1/2 | 1/2 - 14       | 1 3/4              | 1.47        | 3.0                                  | 3.6 | 2.3 |
| 1 1/4 x 3/4 PTR           | 1 1/4 - 11 1/2 | 3/4 - 14       | 1 3/4              | 1.47        | 3.0                                  | 3.6 | 2.3 |
| 1 1/4 x 1 PTR             | 1 1/4 - 11 1/2 | 1 - 11 1/2     | 1 3/4              | 1.47        | 3.0                                  | 3.6 | 2.3 |
| 1 1/2 x 1/4 PTR           | 1 1/2 - 11 1/2 | 1/4 - 18       | 2                  | 1.52        | 3.0                                  | 3.6 | 2.3 |
| 1 1/2 x 3/8 PTR           | 1 1/2 - 11 1/2 | 3/8 - 18       | 2                  | 1.58        | 3.0                                  | 3.6 | 2.3 |
| 1 1/2 x 1/2 PTR           | 1 1/2 - 11 1/2 | 1/2 - 14       | 2                  | 1.58        | 3.0                                  | 3.6 | 2.3 |
| 1 1/2 x 3/4 PTR           | 1 1/2 - 11 1/2 | 3/4 - 14       | 2                  | 1.58        | 3.0                                  | 3.6 | 2.3 |
| 1 1/2 x 1 PTR             | 1 1/2 - 11 1/2 | 1 - 11 1/2     | 2                  | 1.58        | 3.0                                  | 3.6 | 2.3 |
| 1 1/2 x 1 1/4 PTR         | 1 1/2 - 11 1/2 | 1 1/4 - 11 1/2 | 2                  | 1.58        | 2.5                                  | 3.0 | 1.9 |
| 2 x 1/2 PTR               | 2 - 11 1/2     | 1/2 - 14       | 2 1/2              | 1.75        | 2.0                                  | 2.4 | 1.5 |
| 2 x 3/4 PTR               | 2 - 11 1/2     | 3/4 - 14       | 2 1/2              | 1.75        | 2.0                                  | 2.4 | 1.5 |
| 2 x 1 PTR                 | 2 - 11 1/2     | 1 - 11 1/2     | 2 1/2              | 1.75        | 2.0                                  | 2.4 | 1.5 |
| 2 x 1 1/4 PTR             | 2 - 11 1/2     | 1 1/4 - 11 1/2 | 2 1/2              | 1.75        | 2.0                                  | 2.4 | 1.5 |
| 2 x 1 1/2 PTR             | 2 - 11 1/2     | 1 1/2 - 11 1/2 | 2 1/2              | 1.75        | 2.0                                  | 2.4 | 1.5 |

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## FHG4

Conversion Adapter  
NPTF / BSPP



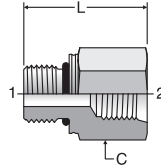
| TUBE<br>FITTING<br>PART # | END SIZE |          | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------|----------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1        | 2        |                   |            | -S                                   | -SS | -B  |
|                           | NPTF     | BSPP     |                   |            |                                      |     |     |
| 1/4X1/4FHG4               | 1/4 - 18 | 1/4 - 19 | 3/4               | 1.33       | 6.0                                  | 6.0 | 3.3 |
| 1/4X3/8FHG4               | 1/4 - 18 | 3/8 - 19 | 13/16             | 1.40       | 6.0                                  | 6.0 | 3.3 |
| 3/8X1/4FHG4               | 3/8 - 18 | 1/4 - 19 | 3/4               | 1.31       | 6.0                                  | 6.0 | 3.3 |
| 3/8X3/8FHG4               | 3/8 - 18 | 3/8 - 19 | 1                 | 1.34       | 6.0                                  | 6.0 | 3.3 |
| 1/2X3/8FHG4               | 1/2 - 14 | 3/8 - 19 | 15/16             | 1.50       | 6.0                                  | 6.0 | 3.3 |
| 1/2X1/2FHG4               | 1/2 - 14 | 1/2 - 14 | 1 1/8             | 1.66       | 5.0                                  | 5.0 | 3.3 |
| 3/4X3/4FHG4               | 3/4 - 14 | 3/4 - 14 | 1 7/16            | 1.75       | 4.0                                  | 4.0 | 2.6 |

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Dimensions and pressures for reference only, subject to change.

## F87OHG87M

Reducer / Expander  
ISO 6149 / ISO 6149

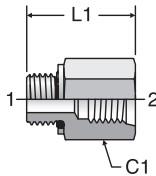


| TUBE<br>FITTING<br>PART # | END SIZE   |            | C<br>HEX<br>(mm) | L<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|------------|------------------|-----------|--------------------------------------|-----|-----|
|                           | 1          | 2          |                  |           | S                                    | SS  | B   |
|                           | METRIC STR | METRIC STR |                  |           |                                      |     |     |
| M8M10F87OHG87M            | M8X1       | M10X1      | 17               | 27.0      | 10.0                                 | 6.0 | 3.3 |
| M10M8F87OHG87M            | M10X1      | M8X1       | 14               | 27.5      | 10.0                                 | 7.5 | 3.3 |
| M10M12F87OHG87M           | M10X1      | M12X1.5    | 19               | 30.0      | 8.0                                  | 6.0 | 3.3 |
| M12M10F87OHG87M           | M12X1.5    | M10X1      | 17               | 29.5      | 10.0                                 | 6.0 | 3.3 |
| M12M14F87OHG87M           | M12X1.5    | M14X1.5    | 22               | 32.0      | 7.0                                  | 6.0 | 3.3 |
| M12M16F87OHG87M           | M12X1.5    | M16X1.5    | 24               | 33.5      | 6.0                                  | 6.0 | 3.3 |
| M14M12F87OHG87M           | M14X1.5    | M12X1.5    | 19               | 32.0      | 8.0                                  | 6.0 | 3.3 |
| M14M16F87OHG87M           | M14X1.5    | M16X1.5    | 24               | 33.5      | 6.0                                  | 6.0 | 3.3 |
| M16M14F87OHG87M           | M16X1.5    | M14X1.5    | 22               | 34.0      | 7.0                                  | 6.0 | 3.3 |
| M16M18F87OHG87M           | M16X1.5    | M18X1.5    | 27               | 37.0      | 6.0                                  | 6.0 | 3.3 |
| M18M16F87OHG87M           | M18X1.5    | M16X1.5    | 24               | 37.0      | 6.0                                  | 6.0 | 3.3 |
| M18M20F87OHG87M           | M18X1.5    | M20X1.5    | 30               | 39.5      | 6.0                                  | 6.0 | 3.3 |
| M20M18F87OHG87M           | M20X1.5    | M18X1.5    | 27               | 38.5      | 6.0                                  | 6.0 | 3.3 |
| M20M22F87OHG87M           | M20X1.5    | M22X1.5    | 30               | 39.5      | 5.0                                  | 5.0 | 3.3 |
| M22M20F87OHG87M           | M22X1.5    | M20X1.5    | 27               | 41.5      | 5.0                                  | 5.0 | 3.3 |
| M27M22F87OHG87M           | M27X2.0    | M22X1.5    | 32               | 46.0      | 5.0                                  | 5.0 | 3.3 |
| M27M33F87OHG87M           | M27X2.0    | M33X2.0    | 46               | 52.0      | 5.0                                  | 5.0 | 3.3 |
| M33M27F87OHG87M           | M33X2.0    | M27X2.0    | 41               | 48.0      | 5.0                                  | 5.0 | 3.3 |
| M33M42F87OHG87M           | M33X2.0    | M42X2.0    | 55               | 54.0      | 4.0                                  | 4.0 | 2.6 |
| M42M27F87OHG87M           | M42X2.0    | M27X2.0    | 50               | 54.0      | 3.0                                  | 3.0 | 1.9 |
| M42M33F87OHG87M           | M42X2.0    | M33X2.0    | 50               | 46.0      | 3.0                                  | 3.0 | 1.9 |
| M42M48F87OHG87M           | M42X2.0    | M48X2.0    | 65               | 57.0      | 2.0                                  | 2.0 | 1.3 |

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## F8OHG5

Conversion Adapter  
Metric-ORR / SAE-ORB  
(for ISO 9974 / DIN 3852-1 Port)

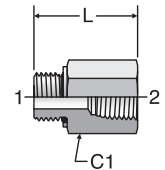


| TUBE<br>FITTING<br>PART # | END SIZE   |             | C1<br>HEX<br>(in.) | L1<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|-------------|--------------------|-------------|--------------------------------------|-----|-----|
|                           | 1          | 2           |                    |             | S                                    | SS  | B   |
|                           | METRIC STR | UN/UNF-2B   |                    |             |                                      |     |     |
| M10-4F8OHG5               | M10x1      | 7/16 - 20   | 11/16              | 1.06        | 5.0                                  | 5.0 | 3.3 |
| M10-6F8OHG5               | M10X1      | 9/16 - 18   | 7/8                | 1.15        | 5.0                                  | 5.0 | 3.3 |
| M14-6F8OHG5               | M14x1.5    | 9/16 - 18   | 13/16              | 1.19        | 5.0                                  | 5.0 | 3.3 |
| M16-8F8OHG5               | M16x1.5    | 3/4 - 16    | 1                  | 1.31        | 5.0                                  | 5.0 | 3.3 |
| M18-8F8OHG5               | M18X1.5    | 3/4 - 16    | 1                  | 1.38        | 3.5                                  | 3.5 | 2.2 |
| M22-10F8OHG5              | M22x1.5    | 7/8 - 14    | 1 1/8              | 1.50        | 3.5                                  | 3.5 | 2.2 |
| M27-12F8OHG5              | M27x2      | 1 1/16 - 12 | 1 1/4              | 1.88        | 3.5                                  | 3.5 | 2.2 |
| M33-16F8OHG5              | M33x2      | 1 5/16 - 12 | 1 5/8              | 1.91        | 3.0                                  | 3.0 | 1.9 |
| M42-20F8OHG5              | M42x2      | 1 5/8 - 12  | 2                  | 1.91        | 2.0                                  | 2.0 | 1.3 |

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## F8OHG

Conversion Adapter  
Metric-ORR / NPTF  
(for ISO 9974 / DIN 3852-1 Port)



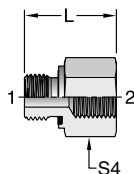
| TUBE<br>FITTING<br>PART # | END SIZE   |            | C1<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|------------|--------------------|------------|--------------------------------------|-----|-----|
|                           | 1          | 2          |                    |            | S                                    | SS  | B   |
|                           | METRIC STR | NPTF       |                    |            |                                      |     |     |
| M10-1/8F8OHG              | M10X1.0    | 1/8 - 27   | 9/16               | 0.99       | 5.0                                  | 5.0 | 3.3 |
| M12-1/4F8OHG              | M12X1.5    | 1/4 - 18   | 3/4                | 1.24       | 5.0                                  | 5.0 | 3.3 |
| M14-1/4F8OHG              | M14X1.5    | 1/4 - 18   | 3/4                | 1.24       | 5.0                                  | 5.0 | 3.3 |
| M16-3/8F8OHG              | M16X1.5    | 3/8 - 18   | 7/8                | 1.36       | 5.0                                  | 5.0 | 3.3 |
| M16-1/2F8OHG              | M16X1.5    | 1/2 - 14   | 1 1/8              | 1.58       | 5.0                                  | 5.0 | 3.3 |
| M18-3/8F8OHG              | M18X1.5    | 3/8 - 18   | 15/16              | 1.42       | 5.0                                  | 5.0 | 3.3 |
| M18-1/2F8OHG              | M18X1.5    | 1/2 - 14   | 1 1/8              | 1.67       | 5.0                                  | 5.0 | 3.3 |
| M22-1/2F8OHG              | M22X1.5    | 1/2 - 14   | 1 1/8              | 1.68       | 3.5                                  | 3.5 | 2.2 |
| M27-3/4F8OHG              | M27X2.0    | 3/4 - 14   | 1 3/8              | 1.87       | 3.5                                  | 3.5 | 2.2 |
| M33-1F8OHG                | M33X2.0    | 1 - 11 1/2 | 1 5/8              | 2.11       | 3.0                                  | 3.0 | 1.9 |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

Dimensions and pressures for reference only, subject to change.

## F82HG8

Conversion Adapter  
Metric-ED / Metric-ORR  
(for ISO 9974 / DIN 3852-1 Port)

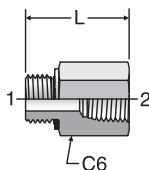


| TUBE FITTING PART # | End Size     |              | S4 Hex (mm) | L (mm) | Dynamic Pressure (x 1,000 PSI) |     |    |
|---------------------|--------------|--------------|-------------|--------|--------------------------------|-----|----|
|                     | 1 Metric Str | 2 Metric Str |             |        | -S                             | -SS | -B |
| M10-M8F82EDHG8      | M10X1        | M8X1         | 17          | 21.3   | 5.0                            |     |    |
| M10-M12F82EDHG8     | M10X1        | M12X1.5      | 17          | 27.4   | 5.0                            |     |    |
| M12-M10F82EDHG8     | M12X1.5      | M10X1        | 19          | 31.8   | 5.0                            |     |    |
| M12-M14F82EDHG8     | M12X1.5      | M15X1.5      | 19          | 32.8   | 5.0                            |     |    |
| M12-M16F82EDHG8     | M12X1.5      | M16X1.5      | 22          | 33.5   | 5.0                            |     |    |
| M14-M12F82EDHG8     | M14X1.5      | M12X1.5      | 22          | 32.3   | 5.0                            |     |    |
| M14-M16F82EDHG8     | M14X1.5      | M16X1.5      | 22          | 33.3   | 5.0                            |     |    |
| M16-M14F82EDHG8     | M16X1.5      | M14X1.5      | 24          | 32.3   | 5.0                            |     |    |
| M16-M18F82EDHG8     | M16X1.5      | M18X1.5      | 24          | 33.5   | 5.0                            |     |    |
| M18-M16F82EDHG8     | M18X1.5      | M16X1.5      | 27          | 32.8   | 3.4                            |     |    |
| M18-M20F82EDHG8     | M18X1.5      | M20X1.5      | 27          | 36.1   | 3.4                            |     |    |
| M22-M20F82EDHG8     | M22X1.5      | M20X1.5      | 30          | 36.8   | 3.4                            |     |    |

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## F4OHG

Conversion Adapter  
BSPP-ORR / NPTF  
(for ISO 1179-1 / DIN 3852-2 Port)

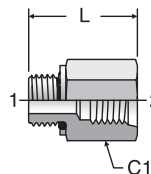


| TUBE FITTING PART # | End Size |            | C6 HEX (in.) | L (in.) | Dynamic Pressure (x 1,000 PSI) |     |     |
|---------------------|----------|------------|--------------|---------|--------------------------------|-----|-----|
|                     | 1 BSPP   | 2 NPTF     |              |         | -S                             | -SS | -B  |
| 1/8x1/8F4OHG        | 1/8 - 28 | 1/8 - 27   | 5/8          | 0.97    | 5.0                            | 5.0 | 3.3 |
| 1/4x1/4F4OHG        | 1/4 - 19 | 1/4 - 18   | 3/4          | 1.28    | 5.0                            | 5.0 | 3.3 |
| 3/8x3/8F4OHG        | 3/8 - 19 | 3/8 - 18   | 7/8          | 1.33    | 5.0                            | 5.0 | 3.3 |
| 1/2x1/2F4OHG        | 1/2 - 14 | 1/2 - 14   | 1 1/8        | 1.73    | 3.5                            | 3.5 | 2.2 |
| 3/4x3/4F4OHG        | 3/4 - 14 | 3/4 - 14   | 1 3/8        | 1.77    | 3.5                            | 3.5 | 2.2 |
| 1x1F4OHG            | 1 - 11   | 1 - 11 1/2 | 1 3/4        | 2.17    | 3.0                            | 3.0 | 1.9 |

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## F4OHG5

Conversion Adapter  
BSPP-ORR / SAE-ORB  
(for ISO 1179-1 / DIN 3852-2 Port)

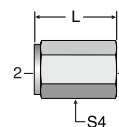


| TUBE FITTING PART # | End Size   |             | C1 HEX (in.) | L (in.) | Dynamic Pressure (x 1,000 PSI) |     |     |
|---------------------|------------|-------------|--------------|---------|--------------------------------|-----|-----|
|                     | 1 BSPP     | 2 UN/UNF-2B |              |         | -S                             | -SS | -B  |
| 1/8-4F4OHG5         | 1/8 - 28   | 7/16 - 20   | 11/16        | 1.00    | 5.0                            | 5.0 | 3.3 |
| 1/4-4F4OHG5         | 1/4 - 19   | 7/16 - 20   | 3/4          | 1.11    | 5.0                            | 5.0 | 3.3 |
| 1/4-6F4OHG5         | 1/4 - 19   | 9/16 - 18   | 13/16        | 1.25    | 5.0                            | 5.0 | 3.3 |
| 3/8-4F4OHG5         | 3/8 - 19   | 7/16 - 20   | 7/8          | 1.19    | 5.0                            | 5.0 | 3.3 |
| 3/8-5F4OHG5         | 3/8 - 19   | 1/2 - 20    | 7/8          | 1.19    | 5.0                            | 5.0 | 3.3 |
| 3/8-6F4OHG5         | 3/8 - 19   | 9/16 - 18   | 7/8          | 1.25    | 5.0                            | 5.0 | 3.3 |
| 3/8-8F4OHG5         | 3/8 - 19   | 3/4 - 16    | 1            | 1.33    | 5.0                            | 5.0 | 3.3 |
| 1/2-10F4OHG5        | 1/2 - 14   | 7/8 - 14    | 1 1/8        | 1.60    | 3.5                            | 3.5 | 2.2 |
| 3/4-12F4OHG5        | 3/4 - 14   | 1 1/16 - 12 | 1 3/8        | 1.74    | 3.5                            | 3.5 | 2.2 |
| 1-16F4OHG5          | 1 - 11     | 1 5/16 - 12 | 1 3/4        | 1.92    | 3.5                            | 3.5 | 2.2 |
| 1 1/4-16F4OHG5      | 1 1/4 - 11 | 1 5/16 - 12 | 2            | 1.95    | 2.0                            | 2.0 | 1.3 |
| 1 1/4-20F4OHG5      | 1 1/4 - 11 | 1 5/8 - 12  | 2            | 1.95    | 2.0                            | 2.0 | 1.3 |

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## GHG4

Female Pipe Adapter  
BSPP / NPTF

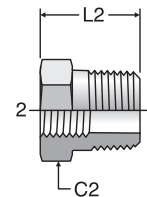


| TUBE FITTING PART # | End Size |        | S4 Hex (in.) | L (in.) | Dynamic Pressure (x 1,000 PSI) |     |    |
|---------------------|----------|--------|--------------|---------|--------------------------------|-----|----|
|                     | 1 NPTF   | 2 BSPP |              |         | -S                             | -SS | -B |
| 1/4 GHG4            | 1/4-18   | 1/4-19 | 3/4          | 1.23    | 6.0                            |     |    |
| 3/8 GHG4            | 3/8-18   | 3/8-19 | 7/8          | 1.26    | 6.0                            |     |    |
| 1/2 GHG4            | 1/2-14   | 1/2-14 | 1 1/8        | 1.50    | 5.0                            |     |    |
| 3/4 GHG4            | 3/4-14   | 3/4-14 | 1 3/8        | 1.87    | 4.0                            |     |    |
| 1 GHG4              | 1-11 1/2 | 1-11   | 1 5/8        | 2.17    | 3.0                            |     |    |

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## PTR34M

BSPT Reducing Adapter  
BSPT / BSPP



| TUBE FITTING PART # | End Size |        | C2 (mm) | L2 (mm) | Dynamic Pressure (x 1,000 PSI) |     |     |
|---------------------|----------|--------|---------|---------|--------------------------------|-----|-----|
|                     | 1 BSPT   | 2 BSPP |         |         | S                              | SS  | B   |
| 1/4X1/8PTR34M       | 1/4-19   | 1/8-28 | 17      | 28      | 6.0                            | 6.0 | 3.3 |
| 3/8X1/4PTR34M       | 3/8-19   | 1/4-19 | 19      | 33      | 6.0                            | 6.0 | 3.3 |
| 1/2X1/4PTR34M       | 1/2-14   | 1/4-19 | 22      | 39      | 5.0                            | 5.0 | 3.3 |
| 1/2X3/8PTR34M       | 1/2-14   | 3/8-19 | 22      | 39      | 5.0                            | 5.0 | 3.3 |

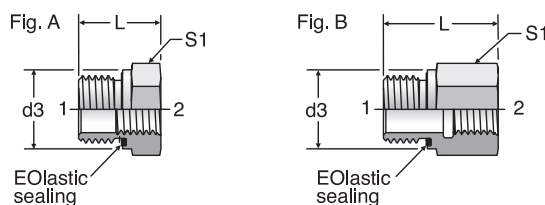
**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

Dimensions and pressures for reference only, subject to change.

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## RI-ED

BSPP Reducing Adapter / Expander  
BSPP / BSPP-ED  
(for ISO 1179-1 / DIN 3852-2 Port)



| TUBE<br>FITTING<br>PART # | END SIZE   |            | d3<br>(mm) | L<br>(mm) | S1<br>(mm) | Fig. | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|------------|------------|-----------|------------|------|--------------------------------------|-----|-----|
|                           | 1<br>BSPP  | 2<br>BSPP  |            |           |            |      | CF                                   | 71  | MS  |
| RI1/8EDX1/4               | 1/8 - 28   | 1/4 - 19   | 14         | 31.0      | 19         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/8EDX3/8               | 1/8 - 28   | 3/8 - 19   | 14         | 32.0      | 24         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/4EDX1/8               | 1/4 - 19   | 1/8 - 28   | 19         | 29.0      | 19         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/4EDX3/8               | 1/4 - 19   | 3/8 - 19   | 19         | 36.0      | 24         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/4EDX1/2               | 1/4 - 19   | 1/2 - 14   | 19         | 40.0      | 30         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/4EDX3/4               | 1/4 - 19   | 3/4 - 14   | 19         | 43.0      | 36         | B    | 5.8                                  | 5.8 | 3.3 |
| RI3/8EDX1/8               | 3/8 - 19   | 1/8 - 28   | 22         | 22.5      | 22         | A    | 5.8                                  | 5.8 | 3.3 |
| RI3/8EDX1/4               | 3/8 - 19   | 1/4 - 19   | 22         | 36.0      | 22         | B    | 5.8                                  | 5.8 | 3.3 |
| RI3/8EDX1/2               | 3/8 - 19   | 1/2 - 14   | 22         | 41.0      | 30         | B    | 5.8                                  | 5.8 | 3.3 |
| RI3/8EDX3/4               | 3/8 - 19   | 3/4 - 14   | 22         | 44.0      | 36         | B    | 4.5                                  | 4.5 | 3.0 |
| RI1/2EDX1/8               | 1/2 - 14   | 1/8 - 28   | 27         | 24.0      | 27         | A    | 5.8                                  | 5.8 | 3.3 |
| RI1/2EDX1/4               | 1/2 - 14   | 1/4 - 19   | 27         | 24.0      | 27         | A    | 5.8                                  | 5.8 | 3.3 |
| RI1/2EDX3/8               | 1/2 - 14   | 3/8 - 19   | 27         | 37.0      | 27         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/2EDX3/4               | 1/2 - 14   | 3/4 - 14   | 27         | 46.0      | 36         | B    | 4.5                                  | 4.5 | 3.0 |
| RI1/2EDX1                 | 1/2 - 14   | 1 - 11     | 27         | 49.0      | 41         | B    | 4.5                                  | 4.5 | 3.0 |
| RI1/2EDX11/4              | 1/2 - 14   | 1 1/4 - 11 | 27         | 53.0      | 55         | B    | 4.5                                  | 4.5 | 3.0 |
| RI3/4EDX1/4               | 3/4 - 14   | 1/4 - 19   | 32         | 26.0      | 32         | A    | 4.5                                  | 4.5 | 3.0 |
| RI3/4EDX3/8               | 3/4 - 14   | 3/8 - 19   | 32         | 26.0      | 32         | A    | 4.5                                  | 4.5 | 3.0 |
| RI3/4EDX1/2               | 3/4 - 14   | 1/2 - 14   | 32         | 43.0      | 32         | B    | 4.5                                  | 4.5 | 3.0 |
| RI3/4EDX1                 | 3/4 - 14   | 1 - 11     | 32         | 51.0      | 41         | B    | 4.5                                  | 4.5 | 3.0 |
| RI3/4EDX11/4              | 3/4 - 14   | 1 1/4 - 11 | 32         | 55.0      | 55         | B    | 4.5                                  | 4.5 | 3.0 |
| RI3/4EDX11/2              | 3/4 - 14   | 1 1/2 - 11 | 32         | 57.0      | 60         | B    | 3.6                                  | 3.6 | 2.3 |
| RI1EDX1/4                 | 1 - 11     | 1/4 - 19   | 40         | 29.0      | 41         | A    | 4.5                                  | 4.5 | 3.0 |
| RI1EDX3/8                 | 1 - 11     | 3/8 - 19   | 40         | 29.0      | 41         | A    | 4.5                                  | 4.5 | 3.0 |
| RI1EDX1/2                 | 1 - 11     | 1/2 - 14   | 40         | 29.0      | 41         | A    | 4.5                                  | 4.5 | 3.0 |
| RI1EDX3/4                 | 1 - 11     | 3/4 - 14   | 40         | 49.0      | 41         | B    | 4.5                                  | 4.5 | 3.0 |
| RI1EDX11/4                | 1 - 11     | 1 1/4 - 11 | 40         | 57.0      | 55         | B    | 4.5                                  | 4.5 | 3.0 |
| RI1EDX11/2                | 1 - 11     | 1 1/2 - 11 | 40         | 59.0      | 60         | B    | 3.6                                  | 3.6 | 2.3 |
| RI11/4EDX1/2              | 1 1/4 - 11 | 1/2 - 14   | 50         | 32.0      | 50         | A    | 4.5                                  | 4.5 | 3.0 |
| RI11/4EDX3/4              | 1 1/4 - 11 | 3/4 - 14   | 50         | 32.0      | 50         | A    | 4.5                                  | 4.5 | 3.0 |
| RI11/4EDX1                | 1 1/4 - 11 | 1 - 11     | 50         | 52.0      | 50         | B    | 4.5                                  | 4.5 | 3.0 |
| RI11/4EDX11/2             | 1 1/4 - 11 | 1 1/2 - 11 | 50         | 60.0      | 60         | B    | 3.6                                  | 3.6 | 2.3 |
| RI11/2EDX1/2              | 1 1/2 - 11 | 1/2 - 14   | 55         | 36.0      | 55         | A    | 3.6                                  | 3.6 | 2.3 |
| RI11/2EDX3/4              | 1 1/2 - 11 | 3/4 - 14   | 55         | 36.0      | 55         | A    | 3.6                                  | 3.6 | 2.3 |
| RI11/2EDX1                | 1 1/2 - 11 | 1 - 11     | 55         | 36.0      | 55         | A    | 3.6                                  | 3.6 | 2.3 |
| RI11/2EDX11/4             | 1 1/2 - 11 | 1 1/4 - 11 | 55         | 58.0      | 55         | B    | 3.6                                  | 3.6 | 2.3 |
| RI2EDX11/2                | 2 - 11     | 1 1/2 - 11 | 75         | 65.0      | 75         | B    | 2.3                                  | 2.3 | 1.5 |

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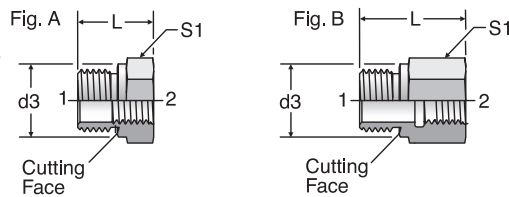
Dimensions and pressures for reference only, subject to change.



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## RI

BSPP Reducing Adapter / Expander  
BSPP / BSPP-CF  
(for ISO 1179-1 / DIN 3852-2 Port)



| TUBE<br>FITTING<br>PART # | END SIZE   |            | d3<br>(mm) | L<br>(mm) | S1<br>(mm) | Fig. | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|------------|------------|-----------|------------|------|--------------------------------------|-----|-----|
|                           | 1<br>BSPP  | 2<br>BSPP  |            |           |            |      | CF                                   | 71  | MS  |
| RI1/8X1/4                 | 1/8 - 28   | 1/4 - 19   | 14         | 31.0      | 19         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/8X3/8                 | 1/8 - 28   | 3/8 - 19   | 14         | 32.0      | 24         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/4X1/8                 | 1/4 - 19   | 1/8 - 28   | 18         | 28.0      | 19         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/4X3/8                 | 1/4 - 19   | 3/8 - 19   | 18         | 36.0      | 24         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/4X1/2                 | 1/4 - 19   | 1/2 - 14   | 18         | 40.0      | 30         | B    | 5.8                                  | 5.8 | 3.3 |
| RI1/4X3/4                 | 1/4 - 19   | 3/4 - 14   | 18         | 43.0      | 36         | B    | 4.5                                  | 4.5 | 3.0 |
| RI3/8X1/8                 | 3/8 - 19   | 1/8 - 28   | 22         | 22.5      | 22         | A    | 5.8                                  | 5.8 | 3.3 |
| RI3/8X1/4                 | 3/8 - 19   | 1/4 - 19   | 22         | 36.0      | 22         | B    | 5.8                                  | 5.8 | 3.3 |
| RI3/8X1/2                 | 3/8 - 19   | 1/2 - 14   | 22         | 41.0      | 30         | B    | 5.8                                  | 5.8 | 3.3 |
| RI3/8X3/4                 | 3/8 - 19   | 3/4 - 14   | 22         | 44.0      | 36         | B    | 4.5                                  | 4.5 | 3.0 |
| RI1/2X1/8                 | 1/2 - 14   | 1/8 - 28   | 26         | 24.0      | 27         | A    | 5.8                                  | 5.8 | 3.3 |
| RI1/2X1/4                 | 1/2 - 14   | 1/4 - 19   | 26         | 24.0      | 27         | A    | 4.5                                  | 4.5 | 3.0 |
| RI1/2X3/8                 | 1/2 - 14   | 3/8 - 19   | 26         | 37.0      | 27         | B    | 4.5                                  | 4.5 | 3.0 |
| RI1/2X3/4                 | 1/2 - 14   | 3/4 - 14   | 26         | 46.0      | 36         | B    | 4.5                                  | 4.5 | 3.0 |
| RI1/2X1                   | 1/2 - 14   | 1 - 11     | 26         | 49.0      | 41         | B    | 2.3                                  | 2.3 | 1.5 |
| RI1/2X11/4                | 1/2 - 14   | 1 1/4 - 11 | 26         | 53.0      | 55         | B    | 4.5                                  | 4.5 | 3.0 |
| RI3/4X1/4                 | 3/4 - 14   | 1/4 - 19   | 32         | 26.0      | 32         | A    | 4.5                                  | 4.5 | 3.0 |
| RI3/4X3/8                 | 3/4 - 14   | 3/8 - 19   | 32         | 26.0      | 32         | A    | 4.5                                  | 4.5 | 3.0 |
| RI3/4X1/2                 | 3/4 - 14   | 1/2 - 14   | 32         | 41.0      | 32         | B    | 4.5                                  | 4.5 | 3.0 |
| RI3/4X1                   | 3/4 - 14   | 1 - 11     | 32         | 51.0      | 41         | B    | 2.3                                  | 2.3 | 1.5 |
| RI3/4X11/4                | 3/4 - 14   | 1 1/4 - 11 | 32         | 55.0      | 55         | B    | 2.3                                  | 2.3 | 1.5 |
| RI3/4X11/2                | 3/4 - 14   | 1 1/2 - 11 | 32         | 57.0      | 60         | B    | 4.5                                  | 4.5 | 3.0 |
| RI1X1/4                   | 1 - 11     | 1/4 - 19   | 39         | 29.0      | 41         | A    | 4.5                                  | 4.5 | 3.0 |
| RI1X3/8                   | 1 - 11     | 3/8 - 19   | 39         | 29.0      | 41         | A    | 4.5                                  | 4.5 | 3.0 |
| RI1X1/2                   | 1 - 11     | 1/2 - 14   | 39         | 29.0      | 41         | A    | 4.5                                  | 4.5 | 3.0 |
| RI1X3/4                   | 1 - 11     | 3/4 - 14   | 39         | 47.0      | 41         | B    | 2.3                                  | 2.3 | 1.5 |
| RI1X11/4                  | 1 - 11     | 1 1/4 - 11 | 39         | 57.0      | 55         | B    | 2.3                                  | 2.3 | 1.5 |
| RI1X11/2                  | 1 - 11     | 1 1/2 - 11 | 39         | 59.0      | 60         | B    | 2.3                                  | 2.3 | 1.5 |
| RI11/4X1/2                | 1 1/4 - 11 | 1/2 - 14   | 49         | 32.0      | 50         | A    | 2.3                                  | 2.3 | 1.5 |
| RI11/4X3/4                | 1 1/4 - 11 | 3/4 - 14   | 49         | 32.0      | 50         | A    | 2.3                                  | 2.3 | 1.5 |
| RI11/4X1                  | 1 1/4 - 11 | 1 - 11     | 49         | 52.0      | 50         | B    | 2.3                                  | 2.3 | 1.5 |
| RI11/4X11/2               | 1 1/4 - 11 | 1 1/2 - 11 | 49         | 60.0      | 60         | B    | 2.3                                  | 2.3 | 1.5 |
| RI11/2X1/2                | 1 1/2 - 11 | 1/2 - 14   | 55         | 36.0      | 55         | A    | 2.3                                  | 2.3 | 1.5 |
| RI11/2X3/4                | 1 1/2 - 11 | 3/4 - 14   | 55         | 36.0      | 55         | A    | 2.3                                  | 2.3 | 1.5 |
| RI11/2X1                  | 1 1/2 - 11 | 1 - 11     | 55         | 36.0      | 55         | A    | 2.3                                  | 2.3 | 1.5 |
| RI11/2X11/4               | 1 1/2 - 11 | 1 1/4 - 11 | 55         | 58.0      | 55         | B    | 2.3                                  | 2.3 | 1.5 |
| RI2X11/2                  | 2 - 11     | 1 1/2 - 11 | 68         | 62.0      | 70         | B    | 2.3                                  | 2.3 | 1.5 |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

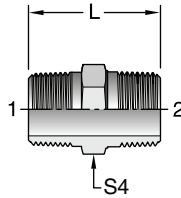
Dimensions and pressures for reference only, subject to change.



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## FHF3

Male Pipe Adapter  
BSPT / NPTF



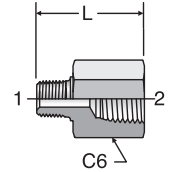
| TUBE<br>FITTING<br>PART # | End Size  |           | S4<br>Hex<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |    |
|---------------------------|-----------|-----------|--------------------|------------|--------------------------------------|-----|----|
|                           | 1<br>NPTF | 2<br>BSPT |                    |            | -S                                   | -SS | -B |
| 1/8 FHF3                  | 1/8-27    | 1/8-28    | 7/16               | 1.09       | 6.0                                  |     |    |
| 1/4 FHF3                  | 1/4-18    | 1/4-19    | 5/8                | 1.45       | 6.0                                  |     |    |
| 3/8 x 1/4 FHF3            | 3/8-18    | 1/4-19    | 3/4                | 1.45       | 6.0                                  |     |    |
| 1/4 x 3/8 FHF3            | 1/4-18    | 1/8-28    | 3/4                | 1.45       | 6.0                                  |     |    |
| 3/8 FHF3                  | 3/8-18    | 3/8-19    | 3/4                | 1.45       | 6.0                                  |     |    |
| 1/2 FHF3                  | 1/2-14    | 1/2-14    | 7/8                | 1.89       | 6.0                                  |     |    |
| 3/4 FHF3                  | 3/4-14    | 3/4-14    | 1 1/8              | 1.96       | 5.5                                  |     |    |
| 1 FHF3                    | 1-11      | 1-11      | 1 3/8              | 2.34       | 4.5                                  |     |    |

Note: The BSPT thread end has an identification collar.

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## F3HG

Conversion Adapter  
NPTF / BSPT

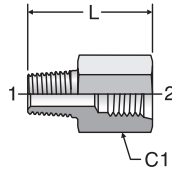


| TUBE<br>FITTING<br>PART # | END SIZE   |                | C6<br>HEX<br>(in.) | L<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|----------------|--------------------|-----------|--------------------------------------|-----|-----|
|                           | 1<br>BSPT  | 2<br>NPTF      |                    |           | -S                                   | -SS | -B  |
| 1/8x1/8F3HG               | 1/8 - 28   | 1/8 - 27       | 9/16               | 1.08      | 6.0                                  | 6.0 | 3.3 |
| 1/4x1/4F3HG               | 1/4 - 19   | 1/4 - 18       | 3/4                | 1.37      | 6.0                                  | 6.0 | 3.3 |
| 3/8x3/8F3HG               | 3/8 - 19   | 3/8 - 19       | 7/8                | 1.38      | 6.0                                  | 6.0 | 3.3 |
| 1/2x1/2F3HG               | 1/2 - 14   | 1/2 - 14       | 1 1/8              | 1.88      | 5.0                                  | 5.0 | 3.3 |
| 3/4x3/4F3HG               | 3/4 - 14   | 3/4 - 14       | 1 3/8              | 1.95      | 4.0                                  | 4.0 | 2.6 |
| 1x1F3HG                   | 1 - 11     | 1 - 11         | 1 5/8              | 2.38      | 3.0                                  | 3.0 | 1.9 |
| 1 1/2 x 1 1/2F3HG         | 1 1/2 - 11 | 1 1/2 - 11 1/2 | 2 3/8              | 2.53      | 2.0                                  | 2.0 | 1.3 |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

## F3HG5

Conversion Adapter  
BSPT / SAE-ORB



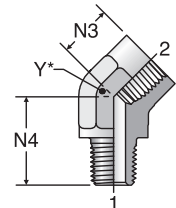
| TUBE<br>FITTING<br>PART # | END SIZE  |                | C1<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-----------|----------------|--------------------|------------|--------------------------------------|-----|-----|
|                           | 1<br>BSPT | 2<br>UN/UNF-2B |                    |            | -S                                   | -SS | -B  |
| 1/8-4F3HG5                | 1/8 - 28  | 7/16 - 20      | 11/16              | 1.09       | 6.0                                  | 6.0 | 3.3 |
| 1/8-5F3HG5                | 1/8 - 28  | 1/2 - 20       | 3/4                | 1.09       | 6.0                                  | 6.0 | 3.3 |
| 1/4-6F3HG5                | 1/4 - 19  | 9/16 - 18      | 13/16              | 1.36       | 6.0                                  | 6.0 | 3.3 |
| 3/8-8F3HG5                | 3/8 - 19  | 3/4 - 16       | 1                  | 1.45       | 5.0                                  | 5.0 | 3.3 |
| 1/2-10F3HG5               | 1/2 - 14  | 7/8 - 14       | 1 1/8              | 1.78       | 4.5                                  | 4.5 | 2.9 |
| 3/4-12F3HG5               | 3/4 - 14  | 1 1/16 - 12    | 1 3/8              | 1.92       | 4.5                                  | 4.5 | 2.9 |
| 1-16F3HG5                 | 1 - 11    | 1 5/16 - 12    | 1 5/8              | 2.13       | 3.5                                  | 3.5 | 2.2 |

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## CD45

45° Pipe Elbow  
NPTF / NPTF

SAE 140339  
HPD Base # 3102



| TUBE<br>FITTING<br>PART # | END SIZE       |                | N3<br>(in.) | N4<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|----------------|-------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1<br>NPTF      | 2<br>NPTF      |             |             |            | -S                                   | -SS | -B  |
| 1/8 CD45                  | 1/8 - 27       | 1/8 - 27       | 0.47        | 0.72        | 9/16       | 5.0                                  | 5.0 | 3.2 |
| 1/4 CD45                  | 1/4 - 18       | 1/4 - 18       | 0.63        | 1.05        | 3/4        | 5.0                                  | 5.0 | 3.2 |
| 3/8 CD45                  | 3/8 - 18       | 3/8 - 18       | 0.72        | 1.06        | 7/8        | 4.5                                  | 4.5 | 2.9 |
| 1/2 CD45                  | 1/2 - 14       | 1/2 - 14       | 0.91        | 1.34        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 3/4 CD45                  | 3/4 - 14       | 3/4 - 14       | 0.97        | 1.38        | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 1 CD45                    | 1 - 11 1/2     | 1 - 11 1/2     | 1.13        | 1.72        | 1 5/8      | 1.8                                  | 1.8 | 1.1 |
| 1 1/4 CD45                | 1 1/4 - 11 1/2 | 1 1/4 - 11 1/2 | 1.63        | 1.80        | 1 7/8      | 1.5                                  | 1.5 | 1.0 |

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Dimensions and pressures for reference only, subject to change.



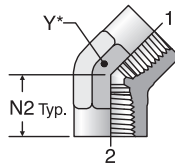


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## DD45

45° Female Pipe Elbow  
NPTF / NPTF

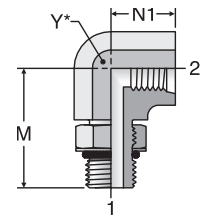
SAE 140338  
HPD Base # 4202



## AOEG5

Straight Thread Elbow  
SAE-ORB / SAE-ORB

HPD Base # 2510



\* Y – Across Wrench Flats

| TUBE<br>FITTING<br>PART # | END SIZE   |            | N2<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1          | 2          |             |            | -S                                   | -SS | -B  |
|                           | NPTF       | NPTF       |             |            |                                      |     |     |
| 1/4 DD45                  | 1/4 - 18   | 1/4 - 18   | 0.69        | 3/4        | 5.0                                  | 5.0 | 3.3 |
| 3/8 DD45                  | 3/8 - 18   | 3/8 - 18   | 0.75        | 7/8        | 4.5                                  | 4.5 | 2.9 |
| 1/2 DD45                  | 1/2 - 14   | 1/2 - 14   | 0.94        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 3/4 DD45                  | 3/4 - 14   | 3/4 - 14   | 1.00        | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 1 DD45                    | 1 - 11 1/2 | 1 - 11 1/2 | 1.19        | 1 5/8      | 1.8                                  | 1.8 | 1.1 |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

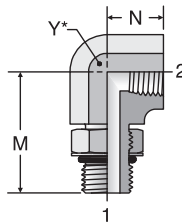
| TUBE<br>FITTING<br>PART # | END SIZE    |             | M<br>(in.) | N1<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|-------------|------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1           | 2           |            |             |            | -S                                   | -SS | -B  |
|                           | UN/UNF-2A   | UN/UNF-2B   |            |             |            |                                      |     |     |
| 4 AOE G5                  | 7/16 - 20   | 7/16 - 20   | 1.23       | 0.63        | 3/4        | 6.0                                  | 6.0 | 3.3 |
| 6 AOE G5                  | 9/16 - 18   | 9/16 - 18   | 1.38       | 0.75        | 7/8        | 5.0                                  | 5.0 | 3.3 |
| 8 AOE G5                  | 3/4 - 16    | 3/4 - 16    | 1.59       | 0.88        | 1 1/16     | 4.0                                  | 4.0 | 2.6 |
| 10 AOE G5                 | 7/8 - 14    | 7/8 - 14    | 1.81       | 1.02        | 1 1/16     | 2.5                                  | 2.5 | 1.6 |
| 12 AOE G5                 | 1 1/16 - 12 | 1 1/16 - 12 | 2.00       | 1.21        | 1 5/16     | 2.5                                  | 2.5 | 1.6 |
| 16 AOE G5                 | 1 5/16 - 12 | 1 5/16 - 12 | 2.26       | 1.33        | 1 5/8      | 2.5                                  | 2.5 | 1.6 |

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## AOEG

Female Pipe Elbow  
NPT / SAE-ORB

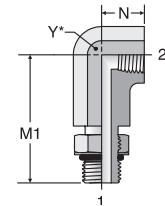
HPD Base # 2502



## AOE4G

Extra Long Female Pipe Elbow  
NPTF / SAE-ORB

HPD Base # 5502



| TUBE<br>FITTING<br>PART # | END SIZE    |            | M<br>(in.) | N<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|------------|------------|------------|------------|--------------------------------------|-----|-----|
|                           | 1           | 2          |            |            |            | -S                                   | -SS | -B  |
|                           | UN/UNF-2A   | NPTF       |            |            |            |                                      |     |     |
| 6-1/4 AOE4G               | 9/16 - 18   | 1/4 - 18   | 1.34       | 0.63       | 3/4        | 5.0                                  | 5.0 | 3.3 |
| 8-3/8 AOE4G               | 3/4 - 16    | 3/8 - 18   | 1.47       | 0.63       | 7/8        | 4.5                                  | 4.5 | 2.9 |
| 10-1/2 AOE4G              | 7/8 - 14    | 1/2 - 14   | 1.81       | 0.75       | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 12-3/4 AOE4G              | 1 1/16 - 12 | 3/4 - 14   | 2.00       | 0.81       | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 16-1 AOE4G                | 1 5/16 - 12 | 1 - 11 1/2 | 2.25       | 1.00       | 1 5/8      | 1.8                                  | 1.8 | 1.1 |

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| TUBE<br>FITTING<br>PART # | END SIZE    |            | M1<br>(in.) | N<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|------------|-------------|------------|------------|--------------------------------------|-----|-----|
|                           | 1           | 2          |             |            |            | -S                                   | -SS | -B  |
|                           | UN/UNF-2A   | NPTF       |             |            |            |                                      |     |     |
| 8-3/8 AOE4G               | 3/4 - 16    | 3/8 - 18   | 2.94        | 0.63       | 7/8        | 4.5                                  | 4.5 | 2.9 |
| 10-1/2 AOE4G              | 7/8 - 14    | 1/2 - 14   | 3.56        | 0.75       | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 12-3/4 AOE4G              | 1 1/16 - 12 | 3/4 - 14   | 4.06        | 0.81       | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 16-1 AOE4G                | 1 5/16 - 12 | 1 - 11 1/2 | 4.63        | 1.00       | 1 5/8      | 1.8                                  | 1.8 | 1.1 |

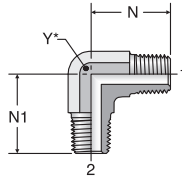
Dimensions and pressures for reference only, subject to change.



## CR

### Male Pipe Elbow NPTF / NPTF

SAE 140237\*



\* Y – Across  
Wrench Flats

| TUBE<br>FITTING<br>PART # | END SIZE       |                | N<br>(in.) | N1<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|----------------|------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1<br>NPTF      | 2<br>NPTF      |            |             |            | -S                                   | -SS | -B  |
|                           |                |                |            |             |            |                                      |     |     |
| 1/8 CR                    | 1/8 - 27       | 1/8 - 27       | 0.78       | 0.78        | 7/16       | 6.0                                  | 6.0 | 3.9 |
| 1/4 CR                    | 1/4 - 18       | 1/4 - 18       | 1.09       | 1.09        | 9/16       | 6.0                                  | 6.0 | 3.9 |
| 3/8 CR                    | 3/8 - 18       | 3/8 - 18       | 1.22       | 1.22        | 3/4        | 6.0                                  | 6.0 | 3.9 |
| 3/8 x 1/4 CR              | 3/8 - 18       | 1/4 - 18       | 1.22       | 1.22        | 3/4        | 6.0                                  | 6.0 | 3.3 |
| 1/2 CR                    | 1/2 - 14       | 1/2 - 14       | 1.47       | 1.47        | 7/8        | 6.0                                  | 6.0 | 3.9 |
| 1/2 x 3/8 CR              | 1/2 - 14       | 3/8 - 18       | 1.47       | 1.28        | 7/8        | 6.0                                  | 6.0 | 3.3 |
| 3/4 CR                    | 3/4 - 14       | 3/4 - 14       | 1.59       | 1.59        | 1 1/16     | 4.0                                  | 4.0 | 2.6 |
| 3/4 x 1/2 CR              | 3/4 - 14       | 1/2 - 14       | 1.59       | 1.47        | 1 1/16     | 4.0                                  | 4.0 | 2.6 |
| 1 CR                      | 1 - 11 1/2     | 1 - 11 1/2     | 1.97       | 1.97        | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 1 x 3/4 CR                | 1 - 11 1/2     | 3/4 - 14       | 1.97       | 1.78        | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 1 1/4 CR                  | 1 1/4 - 11 1/2 | 1 1/4 - 11 1/2 | 2.22       | 2.22        | 1 7/8      | 2.5                                  | 2.5 | 1.6 |
| 1 1/2 CR                  | 1 1/2 - 11 1/2 | 1 1/2 - 11 1/2 | 2.34       | 2.34        | 1 7/8      | 2.5                                  | 2.5 | 1.6 |

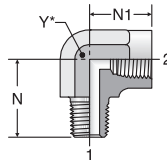
\* Not shown in SAE J514, but coded per SAE J846.

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

## CD

### Street Elbow NPTF / NPT

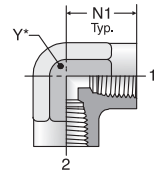
SAE 140239  
HPD Base # 2102



## DD

### Female Pipe Elbow NPT / NPT

SAE 140238  
HPD Base # 2202



| TUBE<br>FITTING<br>PART # | END SIZE      |               | N<br>(in.) | N1<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|---------------|---------------|------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1<br>NPTF     | 2<br>NPT      |            |             |            | -S                                   | -SS | -B  |
|                           |               |               |            |             |            |                                      |     |     |
| 1/8 CD                    | 1/8 - 27      | 1/8 - 27      | 0.78       | 0.66        | 9/16       | 5.0                                  | 5.0 | 3.2 |
| 1/8 x 1/4 CD              | 1/8 - 27      | 1/4 - 18      | 0.90       | 0.88        | 3/4        | 5.0                                  | 5.0 | 3.2 |
| 1/4 CD                    | 1/4 - 18      | 1/4 - 18      | 1.09       | 0.88        | 3/4        | 5.0                                  | 5.0 | 3.2 |
| 1/4 x 1/8 CD              | 1/4 - 18      | 1/8 - 27      | 1.09       | 0.66        | 9/16       | 5.0                                  | 5.0 | 3.2 |
| 1/4 x 1/2 CD              | 1/4 - 18      | 1/2 - 14      | 1.28       | 1.23        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 1/4 x 3/8 CD              | 1/4 - 18      | 3/8 - 18      | 1.22       | 1.01        | 7/8        | 4.5                                  | 4.5 | 2.9 |
| 3/8 CD                    | 3/8 - 18      | 3/8 - 18      | 1.22       | 1.02        | 7/8        | 4.5                                  | 4.5 | 3.0 |
| 3/8 x 1/4 CD              | 3/8 - 18      | 1/4 - 18      | 1.22       | 0.88        | 3/4        | 5.0                                  | 5.0 | 3.2 |
| 3/8 x 1/2 CD              | 3/8 - 18      | 1/2 - 14      | 1.28       | 1.23        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 1/2 CD                    | 1/2 - 14      | 1/2 - 14      | 1.47       | 1.23        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 1/2 x 3/8 CD              | 1/2 - 14      | 3/8 - 18      | 1.48       | 1.25        | 7/8        | 4.5                                  | 4.5 | 2.9 |
| 1/2 x 3/4 CD              | 1/2 - 14      | 3/4 - 14      | 1.58       | 1.36        | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 3/4 CD                    | 3/4 - 14      | 3/4 - 14      | 1.59       | 1.36        | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 3/4 x 1/2 CD              | 3/4 - 14      | 1/2 - 14      | 1.59       | 1.23        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 1 CD                      | 1 - 1 1/2     | 1 - 1 1/2     | 1.97       | 1.63        | 1 5/8      | 1.8                                  | 1.8 | 1.2 |
| 1 1/4 CD                  | 1 1/4 - 1 1/2 | 1 1/4 - 1 1/2 | 2.38       | 1.70        | 1 7/8      | 1.5                                  | 1.5 | 1.0 |
| 1 1/4 x 1 1/2 CD          | 1 1/4 - 1 1/2 | 1 1/2 - 1 1/2 | 2.61       | 2.08        | 2 1/2      | 1.5                                  | 1.5 | 1.0 |
| 1 1/2 CD                  | 1 1/2 - 1 1/2 | 1 1/2 - 1 1/2 | 2.64       | 2.08        | 2 1/2      | 1.5                                  | 1.5 | 1.0 |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

| TUBE<br>FITTING<br>PART # | END SIZE       |                | N1<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|----------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1<br>NPT       | 2<br>NPT       |             |            | -S                                   | -SS | -B  |
|                           |                |                |             |            |                                      |     |     |
| 1/8 DD                    | 1/8 - 27       | 1/8 - 27       | 0.66        | 9/16       | 5.0                                  | 5.0 | 3.2 |
| 1/4 DD                    | 1/4 - 18       | 1/4 - 18       | 0.88        | 3/4        | 5.0                                  | 5.0 | 3.2 |
| 3/8 DD                    | 3/8 - 18       | 3/8 - 18       | 1.02        | 7/8        | 4.5                                  | 4.5 | 3.0 |
| 1/2 DD                    | 1/2 - 14       | 1/2 - 14       | 1.23        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 1/2 x 3/8 DD              | 1/2 - 14       | 3/8 - 18       | 1.23        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 3/4 DD                    | 3/4 - 14       | 3/4 - 14       | 1.36        | 1 3/8      | 3.0                                  | 3.0 | 1.9 |
| 1 DD                      | 1 - 11 1/2     | 1 - 11 1/2     | 1.63        | 1 5/8      | 1.8                                  | 1.8 | 1.2 |
| 1 1/4 DD                  | 1 1/4 - 11 1/2 | 1 1/4 - 11 1/2 | 1.70        | 1 7/8      | 1.5                                  | 1.5 | 1.5 |
| 1 1/2 DD                  | 1 1/2 - 11 1/2 | 1 1/2 - 11 1/2 | 2.08        | 2 1/2      | 1.5                                  | 1.5 | 1.5 |

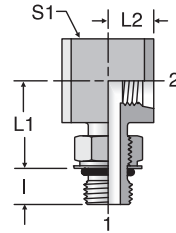
**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

Dimensions and pressures for reference only, subject to change.

## A87LPOEG87LPM

ISO 6149\* Female Elbow

SHORT ISO 6149 / SHORT ISO 6149



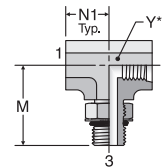
| TUBE<br>FITTING<br>PART # | END SIZE |         | I<br>(mm) | L1<br>(mm) | L2<br>(mm) | S1<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------|---------|-----------|------------|------------|------------|--------------------------------------|-----|-----|
|                           | 1        | 2       |           |            |            |            | S                                    | SS  | B   |
|                           | Metric   | Metric  |           |            |            |            |                                      |     |     |
| M08A87LPOEG87LPM          | M8X1     | M8X1    | 8.5       | 13.5       | 7.5        | 15         | 4.0                                  | 4.0 | 2.6 |
| M10A87LPOEG87LPM          | M10X1    | M10X1   | 8.5       | 14.5       | 7.5        | 15         | 4.0                                  | 4.0 | 2.6 |
| M12A87LPOEG87LPM          | M12X1.5  | M12X1.5 | 11.0      | 17.0       | 10.0       | 20         | 3.6                                  | 3.6 | 2.3 |
| M14A87LPOEG87LPM          | M14X1.5  | M14X1.5 | 11.0      | 18.0       | 10.0       | 20         | 3.6                                  | 3.6 | 2.3 |

\* Male and female thread lengths have been shortened for compact design.  
The lengths do not conform to ISO 6149.

## G5G5JAO

Straight Thread Branch Tee

SAE-ORB (all three ends)



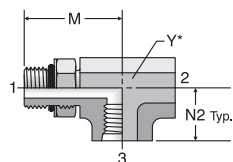
\* Y – Across  
Wrench Flats

| TUBE<br>FITTING<br>PART # | END SIZE    |             |             | M<br>(in.) | N1<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|-------------|-------------|------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1           | 2           | 3           |            |             |            | -S                                   | -SS | -B  |
|                           | UN/UNF-2B   | UN/UNF-2B   | UN/UNF-2A   |            |             |            |                                      |     |     |
| 4 G5G5JAO                 | 7/16 - 20   | 7/16 - 20   | 7/16 - 20   | 1.23       | 0.63        | 3/4        | 6.0                                  | 6.0 | 3.3 |
| 6 G5G5JAO                 | 9/16 - 18   | 9/16 - 18   | 9/16 - 18   | 1.38       | 0.75        | 7/8        | 5.0                                  | 5.0 | 3.3 |
| 8 G5G5JAO                 | 3/4 - 16    | 3/4 - 16    | 3/4 - 16    | 1.59       | 0.88        | 1 1/16     | 4.0                                  | 4.0 | 2.6 |
| 10 G5G5JAO                | 7/8 - 14    | 7/8 - 14    | 7/8 - 14    | 1.81       | 1.02        | 1 1/16     | 2.5                                  | 2.5 | 1.6 |
| 12 G5G5JAO                | 1 1/16 - 12 | 1 1/16 - 12 | 1 1/16 - 12 | 2.00       | 1.21        | 1 5/16     | 2.5                                  | 2.5 | 1.6 |
| 16 G5G5JAO                | 1 5/16 - 12 | 1 5/16 - 12 | 1 5/16 - 12 | 2.25       | 1.33        | 1 5/8      | 2.5                                  | 2.5 | 1.6 |

Dimensions and pressures for reference only, subject to change.

## AOG5JG5

Straight Thread Run Tee  
SAE-ORB (all three ends)

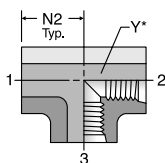


\* Y – Across Wrench Flats

| TUBE<br>FITTING<br>PART # | END SIZE    |             |             | M<br>(in.) | N2<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|-------------|-------------|------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1           | 2           | 3           |            |             |            | -S                                   | -SS | -B  |
|                           | UN/UNF-2A   | UN/UNF-2B   | UN/UNF-2B   |            |             |            |                                      |     |     |
| 4 AOG5JG5                 | 7/16 - 20   | 7/16 - 20   | 7/16 - 20   | 1.23       | 0.74        | 3/4        | 6.0                                  | 6.0 | 3.3 |
| 6 AOG5JG5                 | 9/16 - 18   | 9/16 - 18   | 9/16 - 18   | 1.38       | 0.86        | 7/8        | 5.0                                  | 5.0 | 3.3 |
| 8 AOG5JG5                 | 3/4 - 16    | 3/4 - 16    | 3/4 - 16    | 1.59       | 1.03        | 1 1/16     | 4.0                                  | 4.0 | 2.6 |
| 10 AOG5JG5                | 7/8 - 14    | 7/8 - 14    | 7/8 - 14    | 1.81       | 1.18        | 1 1/16     | 2.5                                  | 2.5 | 1.6 |
| 12 AOG5JG5                | 1 1/16 - 12 | 1 1/16 - 12 | 1 1/16 - 12 | 2.00       | 1.39        | 1 5/16     | 2.5                                  | 2.5 | 1.6 |
| 16 AOG5JG5                | 1 5/16 - 12 | 1 5/16 - 12 | 1 5/16 - 12 | 2.25       | 1.52        | 1 5/8      | 2.5                                  | 2.5 | 1.6 |

## G5G5JG5

Female Straight Thread Tee  
SAE-ORB (all three ends)



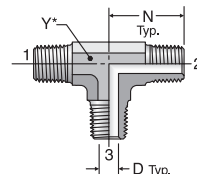
\* Y – Across  
Wrench Flats

| TUBE<br>FITTING<br>PART # | END SIZE    | N2<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1-3         |             |            | -S                                   | -SS | -B  |
|                           | UN/UNF-2B   |             |            |                                      |     |     |
| 4 G5G5JG5                 | 7/16 - 20   | 0.74        | 3/4        | 6.0                                  | 6.0 | 3.3 |
| 6 G5G5JG5                 | 9/16 - 18   | 0.86        | 7/8        | 5.0                                  | 5.0 | 3.3 |
| 8 G5G5JG5                 | 3/4 - 16    | 1.03        | 1 1/16     | 4.0                                  | 4.0 | 2.6 |
| 10 G5G5JG5                | 7/8 - 14    | 1.18        | 1 1/16     | 2.5                                  | 2.5 | 1.6 |
| 12 G5G5JG5                | 1 1/16 - 12 | 1.39        | 1 5/16     | 2.5                                  | 2.5 | 1.6 |
| 16 G5G5JG5                | 1 5/16 - 12 | 1.52        | 1 5/8      | 2.5                                  | 2.5 | 1.6 |

## RRS

Male Pipe Tee  
NPTF (all three ends)

SAE 140437



| TUBE<br>FITTING<br>PART # | END SIZE | N<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------|------------|------------|--------------------------------------|-----|-----|
|                           | 1-3      |            |            | -S                                   | -SS | -B  |
|                           | NPTF     |            |            |                                      |     |     |
| 1/8 RRS                   | 1/8 - 27 | 0.78       | 7/16       | 6.0                                  | 6.0 | 3.9 |
| 1/4 RRS                   | 1/4 - 18 | 1.09       | 9/16       | 6.0                                  | 6.0 | 3.9 |
| 3/8 RRS                   | 3/8 - 18 | 1.22       | 3/4        | 6.0                                  | 6.0 | 3.9 |
| 1/2 RRS                   | 1/2 - 14 | 1.47       | 7/8        | 6.0                                  | 6.0 | 3.9 |
| 3/4 RRS                   | 3/4 - 14 | 1.59       | 1 1/16     | 4.0                                  | 4.0 | 2.6 |

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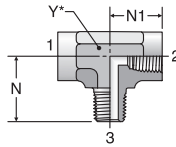
Dimensions and pressures for reference only, subject to change.

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## MMS

Male Branch Tee  
NPTF (all three ends)

SAE 140425  
HPD Base # 212T



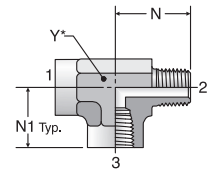
| TUBE<br>FITTING<br>PART # | END SIZE    | N<br>(in.) | N1<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1-3<br>NPTF |            |             |            | -S                                   | -SS | -B  |
| 1/8 MMS                   | 1/8 - 27    | 0.78       | 0.66        | 9/16       | 5.0                                  | 5.0 | 3.2 |
| 1/4 MMS                   | 1/4 - 18    | 1.09       | 0.88        | 3/4        | 5.0                                  | 5.0 | 3.2 |
| 3/8 MMS                   | 3/8 - 18    | 1.22       | 1.02        | 7/8        | 4.5                                  | 4.5 | 3.0 |
| 1/2 MMS                   | 1/2 - 14    | 1.47       | 1.23        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 3/4 MMS                   | 3/4 - 14    | 1.59       | 1.36        | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 1 MMS                     | 1 - 11 1/2  | 1.97       | 1.62        | 1 5/8      | 1.8                                  | 1.8 | 1.1 |

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## MRO

Male Run Tee  
NPTF (all three ends)

SAE 140424  
HPD Base # 012T



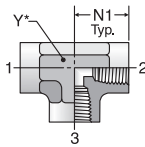
| TUBE<br>FITTING<br>PART # | END SIZE       | N<br>(in.) | N1<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1-3<br>NPTF    |            |             |            | -S                                   | -SS | -B  |
| 1/8 MRO                   | 1/8 - 27       | 0.78       | 0.66        | 9/16       | 5.0                                  | 5.0 | 3.2 |
| 1/4 MRO                   | 1/4 - 18       | 1.09       | 0.88        | 3/4        | 5.0                                  | 5.0 | 3.2 |
| 3/8 MRO                   | 3/8 - 18       | 1.22       | 1.02        | 7/8        | 4.5                                  | 4.5 | 3.0 |
| 1/2 MRO                   | 1/2 - 14       | 1.47       | 1.23        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 3/4 MRO                   | 3/4 - 14       | 1.59       | 1.36        | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 1 MRO                     | 1 - 11 1/2     | 1.97       | 1.63        | 1 5/8      | 1.8                                  | 1.8 | 1.1 |
| 1 1/4 MRO                 | 1 1/4 - 11 1/2 | 2.38       | 1.70        | 1 7/8      | 1.5                                  | 1.5 | 1.0 |
| 1 1/2 MRO                 | 1 1/2 - 11 1/2 | 2.64       | 2.08        | 2 1/2      | 1.5                                  | 1.5 | 1.0 |

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## MMO

Female Pipe Tee  
NPTF (all three ends)

SAE 140438  
HPD Base # 022T

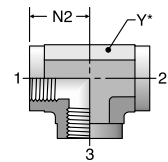


| TUBE<br>FITTING<br>PART # | END SIZE       | N1<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1-3<br>NPTF    |             |            | -S                                   | -SS | -B  |
| 1/8 MMO                   | 1/8 - 27       | 0.66        | 9/16       | 5.0                                  | 5.0 | 3.2 |
| 1/4 MMO                   | 1/4 - 18       | 0.88        | 3/4        | 5.0                                  | 5.0 | 3.2 |
| 3/8 MMO                   | 3/8 - 18       | 1.02        | 7/8        | 4.5                                  | 4.5 | 3.0 |
| 1/2 MMO                   | 1/2 - 14       | 1.23        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 3/4 MMO                   | 3/4 - 14       | 1.36        | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 1 MMO                     | 1 - 11 1/2     | 1.63        | 1 5/8      | 1.8                                  | 1.8 | 1.2 |
| 1 1/4 MMO                 | 1 1/4 - 11 1/2 | 1.70        | 1 7/8      | 1.5                                  | 1.5 | 1.0 |
| 1 1/2 MMO                 | 1 1/2 - 11 1/2 | 2.08        | 2 1/2      | 1.5                                  | 1.5 | 1.0 |

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## MMO444M

Female BSPP Tee  
BSPP (all three ends)



| TUBE<br>FITTING<br>PART # | END SIZE    | N2<br>(mm) | Y<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|------------|-----------|--------------------------------------|-----|-----|
|                           | 1-3<br>BSPP |            |           | S                                    | SS  | B   |
| 1/4MMO444M                | 1/4 - 19    | 22         | 19        | 5.0                                  | 5.0 | 3.3 |
| 3/8MMO444M                | 3/8 - 19    | 26         | 22        | 4.5                                  | 4.5 | 2.9 |
| 1/2MMO444M                | 1/2 - 14    | 31         | 27        | 3.0                                  | 3.0 | 1.9 |
| 3/4MMO444M                | 3/4 - 14    | 40         | 33        | 3.0                                  | 3.0 | 1.9 |
| 1MMO444M                  | 1 - 11      | 46         | 41        | 1.8                                  | 1.8 | 1.1 |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

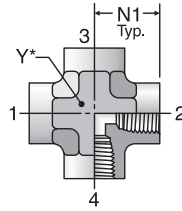
Dimensions and pressures for reference only, subject to change.

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## KMMOO

Female Pipe Cross  
NPTF (all four ends)

SAE 140538  
HPD Base # 022X



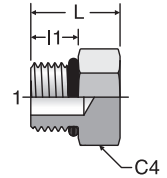
| TUBE<br>FITTING<br>PART # | END SIZE    | N1<br>(in.) | Y<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1-4<br>NPTF |             |            | -S                                   | -SS | -B  |
| 1/8 KMMOO                 | 1/8 - 27    | 0.66        | 9/16       | 5.0                                  | 5.0 | 3.2 |
| 1/4 KMMOO                 | 1/4 - 18    | 0.88        | 3/4        | 5.0                                  | 5.0 | 3.2 |
| 3/8 KMMOO                 | 3/8 - 18    | 1.02        | 7/8        | 4.5                                  | 4.5 | 2.9 |
| 1/2 KMMOO                 | 1/2 - 14    | 1.23        | 1 1/16     | 3.0                                  | 3.0 | 1.9 |
| 3/4 KMMOO                 | 3/4 - 14    | 1.36        | 1 5/16     | 3.0                                  | 3.0 | 1.9 |
| 1 KMMOO                   | 1 - 11 1/2  | 1.63        | 1 5/8      | 1.8                                  | 1.8 | 1.1 |

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## P50N

Hex Head Plug  
SAE-ORB

SAE 090109A  
HPD Base # 05CP



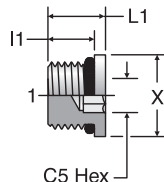
| TUBE<br>FITTING<br>PART # | END SIZE       | C4<br>HEX<br>(in.) | I1<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|--------------------|-------------|------------|--------------------------------------|-----|-----|
|                           | 1<br>UN/UNF-2A |                    |             |            | -S                                   | -SS | -B  |
| 2 P50N                    | 5/16 - 24      | 7/16               | 0.30        | 0.60       | 7.5                                  | 9.0 | 3.3 |
| 3 P50N                    | 3/8 - 24       | 1/2                | 0.30        | 0.60       | 7.5                                  | 9.0 | 3.3 |
| 4 P50N                    | 7/16 - 20      | 9/16               | 0.36        | 0.67       | 7.5                                  | 9.0 | 3.3 |
| 5 P50N                    | 1/2 - 20       | 5/8                | 0.36        | 0.67       | 6.0                                  | 7.2 | 3.3 |
| 6 P50N                    | 9/16 - 18      | 11/16              | 0.39        | 0.73       | 6.0                                  | 7.2 | 3.3 |
| 8 P50N                    | 3/4 - 16       | 7/8                | 0.44        | 0.80       | 6.0                                  | 7.2 | 3.3 |
| 10 P50N                   | 7/8 - 14       | 1                  | 0.50        | 0.94       | 6.0                                  | 7.2 | 3.3 |
| 12 P50N                   | 1 1/16 - 12    | 1 1/4              | 0.59        | 1.09       | 6.0                                  | 7.2 | 3.3 |
| 14 P50N                   | 1 3/16 - 12    | 1 3/8              | 0.59        | 1.09       | 5.5                                  | 6.6 | 3.3 |
| 16 P50N                   | 1 5/16 - 12    | 1 1/2              | 0.59        | 1.13       | 5.5                                  | 6.6 | 3.3 |
| 20 P50N                   | 1 5/8 - 12     | 1 7/8              | 0.59        | 1.20       | 4.0                                  | 4.8 | 2.6 |
| 24 P50N                   | 1 7/8 - 12     | 2 1/8              | 0.59        | 1.27       | 3.0                                  | 3.6 | 1.9 |
| 32 P50N                   | 2 1/2 - 12     | 2 3/4              | 0.59        | 1.44       | 2.0                                  | 2.4 | 1.3 |

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## HP50N

Hollow Hex Plug  
SAE-ORB

SAE 090109B  
HPD Base # 05HP



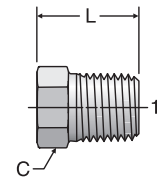
| TUBE<br>FITTING<br>PART # | END SIZE       | C5<br>HEX<br>(in.) | I1<br>(in.) | L1<br>(in.) | X<br>DIA<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|--------------------|-------------|-------------|-------------------|--------------------------------------|-----|-----|
|                           | 1<br>UN/UNF-2A |                    |             |             |                   | -S                                   | -SS | -B  |
| 2 HP50N                   | 5/16 - 24      | 1/8                | 0.30        | 0.40        | 0.44              | 6.0                                  | 6.0 | 3.3 |
| 3 HP50N                   | 3/8 - 24       | 5/32               | 0.30        | 0.40        | 0.50              | 6.0                                  | 6.0 | 3.3 |
| 4 HP50N                   | 7/16 - 20      | 3/16               | 0.36        | 0.47        | 0.56              | 6.0                                  | 6.0 | 3.3 |
| 5 HP50N                   | 1/2 - 20       | 7/32               | 0.36        | 0.47        | 0.63              | 6.0                                  | 6.0 | 3.3 |
| 6 HP50N                   | 9/16 - 18      | 1/4                | 0.40        | 0.50        | 0.69              | 6.0                                  | 6.0 | 3.3 |
| 8 HP50N                   | 3/4 - 16       | 5/16               | 0.44        | 0.58        | 0.88              | 6.0                                  | 6.0 | 3.3 |
| 10 HP50N                  | 7/8 - 14       | 3/8                | 0.50        | 0.65        | 1.00              | 6.0                                  | 6.0 | 3.3 |
| 12 HP50N                  | 1 1/16 - 12    | 9/16               | 0.59        | 0.77        | 1.25              | 6.0                                  | 6.0 | 3.3 |
| 14 HP50N                  | 1 3/16 - 12    | 9/16               | 0.59        | 0.77        | 1.38              | 5.5                                  | 5.5 | 3.3 |
| 16 HP50N                  | 1 5/16 - 12    | 5/8                | 0.59        | 0.77        | 1.50              | 5.5                                  | 5.5 | 3.3 |
| 20 HP50N                  | 1 5/8 - 12     | 3/4                | 0.59        | 0.77        | 1.88              | 4.0                                  | 4.0 | 2.6 |
| 24 HP50N                  | 1 7/8 - 12     | 3/4                | 0.59        | 0.77        | 2.13              | 3.0                                  | 3.0 | 1.9 |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

## HP

Hex Head Pipe Plug  
NPTF

SAE 130109E  
HPD Base # 01CP



| TUBE<br>FITTING<br>PART # | END SIZE       | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1<br>NPTF      |                   |            | -S                                   | -SS | -B  |
| 1/8 HP*                   | 1/8 - 27       | 7/16              | 0.56       | 6.0                                  | 7.2 | 3.9 |
| 1/4 HP*                   | 1/4 - 18       | 9/16              | 0.75       | 6.0                                  | 7.2 | 3.9 |
| 3/8 HP*                   | 3/8 - 18       | 11/16             | 0.78       | 6.0                                  | 7.2 | 3.9 |
| 1/2 HP*                   | 1/2 - 14       | 7/8               | 0.97       | 6.0                                  | 7.2 | 3.9 |
| 3/4 HP                    | 3/4 - 14       | 1 1/16            | 1.06       | 5.5                                  | 6.6 | 3.5 |
| 1 HP**                    | 1 - 11 1/2     | 1 5/16            | 1.25       | 4.5                                  | 5.4 | 3.0 |
| 1 1/4 HP                  | 1 1/4 - 11 1/2 | 1 3/4             | 1.41       | 3.0                                  | 3.6 | 1.9 |
| 1 1/2 HP                  | 1 1/2 - 11 1/2 | 2                 | 1.50       | 3.0                                  | 3.6 | 1.9 |
| 2 HP                      | 2 - 11 1/2     | 2 1/2             | 1.69       | 2.0                                  | 3.0 | 1.3 |

Note: \*Steel parts are zinc plated

\*\* 1 HP-SS Hex is 1 3/8

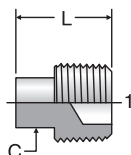
**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

Dimensions and pressures for reference only, subject to change.



## SHP

Square Head Plug  
NPTF



| TUBE<br>FITTING<br>PART # | END SIZE   | C<br>SQUARE<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|----------------------|------------|--------------------------------------|-----|-----|
|                           | 1<br>NPTF  |                      |            | -S                                   | -SS | -B  |
|                           |            |                      |            |                                      |     |     |
| 1/8 SHP                   | 1/8 - 27   | 9/32                 | 0.51       | 6.0                                  | 7.2 | 3.3 |
| 1/4 SHP                   | 1/4 - 18   | 3/8                  | 0.75       | 6.0                                  | 6.0 | 3.3 |
| 3/8 SHP                   | 3/8 - 18   | 7/16                 | 0.83       | 6.0                                  | 6.0 | 3.3 |
| 1/2 SHP                   | 1/2 - 14   | 9/16                 | 1.08       | 6.0                                  | 6.0 | 3.3 |
| 3/4 SHP                   | 3/4 - 14   | 5/8                  | 1.14       | 6.0                                  | 6.0 | 3.3 |
| 1 SHP                     | 1 - 11 1/2 | 13/16                | 1.38       | 5.5                                  | 5.5 | 3.3 |

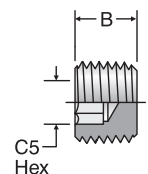
Note: Steel parts are zinc plated

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

## HHP

Hollow Hex Pipe Plug  
NPTF

SAE 130109N  
HPD Base # 01HP



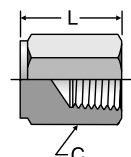
| TUBE<br>FITTING<br>PART # | END SIZE       | B<br>(in.) | C5 INTERNAL<br>HEX<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|----------------|------------|-----------------------------|--------------------------------------|-----|-----|
|                           | 1<br>NPTF      |            |                             | -S                                   | -SS | -B  |
|                           |                |            |                             |                                      |     |     |
| 1/16 HHP*                 | 1/16 - 27      | 0.30       | 5/32                        | 6.0                                  | 7.2 | 3.3 |
| 1/8 HHP*                  | 1/8 - 27       | 0.30       | 3/16                        | 6.0                                  | 7.2 | 3.9 |
| 1/4 HHP*                  | 1/4 - 18       | 0.46       | 1/4                         | 6.0                                  | 7.2 | 3.9 |
| 3/8 HHP*                  | 3/8 - 18       | 0.46       | 5/16                        | 6.0                                  | 7.2 | 3.3 |
| 1/2 HHP*                  | 1/2 - 14       | 0.61       | 3/8                         | 6.0                                  | 7.2 | 3.3 |
| 3/4 HHP*                  | 3/4 - 14       | 0.62       | 9/16                        | 5.5                                  | 6.6 | 3.3 |
| 1 HHP*                    | 1 - 11 1/2     | 0.77       | 5/8                         | 4.5                                  | 5.4 | 3.3 |
| 1 1/4 HHP*                | 1 1/4 - 11 1/2 | 0.77       | 3/4                         | 3.0                                  | 5.0 | 3.3 |
| 1 1/2 HHP*                | 1 1/2 - 11 1/2 | 0.83       | 1                           | 3.0                                  | 3.0 | 1.9 |
| 2 HHP                     | 2 - 11 1/2     | 0.86       | 3/4                         | 2.0                                  | 2.5 | 1.6 |

Note: \*Steel parts are zinc plated

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## HPC

Hex Pipe Cap  
NPTF



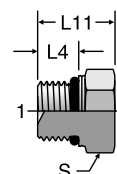
| TUBE<br>FITTING<br>PART # | END SIZE      | C<br>HEX<br>(in.) | L<br>(in.) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|---------------|-------------------|------------|--------------------------------------|-----|-----|
|                           | 1             |                   |            | -S                                   | -SS | -B  |
|                           | NPTF          |                   |            |                                      |     |     |
| 1/8 HPC                   | 1/8 - 27      | 9/16              | .75        | 6.0                                  | 6.0 | 3.3 |
| 1/4 HPC                   | 1/4 - 18      | 3/4               | .91        | 6.0                                  | 6.0 | 3.3 |
| 3/8 HPC                   | 3/8 - 18      | 7/8               | 1.03       | 6.0                                  | 6.0 | 3.3 |
| 1/2 HPC                   | 1/2 - 14      | 1 1/16            | 1.34       | 6.0                                  | 6.0 | 3.3 |
| 3/4 HPC                   | 3/4 - 14      | 1 1/4             | 1.44       | 4.8                                  | 4.8 | 3.1 |
| 1 HPC                     | 1 - 11 1/2    | 1 5/8             | 1.68       | 3.6                                  | 3.6 | 2.3 |
| 1 1/2 HPC                 | 1 1/2 - 1 1/2 | 2 3/8             | 1.92       | 2.4                                  | 2.4 | 1.5 |

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## P87OMN

ISO 6149 Hex Head Plug  
ISO 6149  
(for ISO 6149-1 Port)

SAE J2244-4\* 62M0109A



| TUBE<br>FITTING<br>PART # | END SIZE    | L4<br>(mm) | L11<br>(mm) | S<br>HEX<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|------------|-------------|------------------|--------------------------------------|-----|-----|
|                           | 1<br>THREAD |            |             |                  | S                                    | SS  | B   |
|                           |             |            |             |                  |                                      |     |     |
| M8P87OMN                  | M8X1        | 8.5        | 16.2        | 12               | 9.0                                  | 9.0 | 3.3 |
| M10P87OMN                 | M10X1       | 8.5        | 16.2        | 14               | 8.0                                  | 8.0 | 3.3 |
| M12P87OMN                 | M12X1.5     | 11.0       | 18.5        | 17               | 9.0                                  | 9.0 | 3.3 |
| M14P87OMN                 | M14X1.5     | 11.0       | 19.5        | 19               | 9.0                                  | 9.0 | 3.3 |
| M16P87OMN                 | M16X1.5     | 11.5       | 21.5        | 22               | 9.0                                  | 9.0 | 3.3 |
| M18P87OMN                 | M18X1.5     | 12.5       | 23.5        | 24               | 9.0                                  | 9.0 | 3.3 |
| M20P87OMN                 | M20X1.5     | 12.5       | 24.0        | 27               | 6.0                                  | 6.0 | 3.3 |
| M22P87OMN                 | M22X1.5     | 13.0       | 25.5        | 27               | 6.0                                  | 6.0 | 3.3 |
| M27P87OMN                 | M27X2       | 16.0       | 32.0        | 32               | 6.0                                  | 6.0 | 3.3 |
| M30P87OMN                 | M30X2       | 16.0       | 32.0        | 36               | 6.0                                  | 6.0 | 3.3 |
| M33P87OMN                 | M33X2       | 16.0       | 32.0        | 41               | 6.0                                  | 6.0 | 3.3 |
| M42P87OMN                 | M42X2       | 16.0       | 34.0        | 50               | 4.0                                  | 4.0 | 2.6 |
| M48P87OMN                 | M48X2       | 17.5       | 35.5        | 55               | 2.0                                  | 2.0 | 1.3 |
| M60P87OMN                 | M60X2       | 17.5       | 42.0        | 65               | 1.0                                  | 1.0 | 0.6 |

\* SAE J2244-4 and ISO 6149-4 are draft standards.

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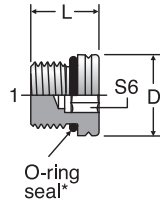
Dimensions and pressures for reference only, subject to change.

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## VSTI M-OR

ISO 6149 Hollow Hex Plug  
ISO 6149  
(for ISO 6149-1 Port)

SAE J2244-4\* 62M0109B



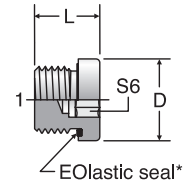
| TUBE<br>FITTING<br>PART # | END SIZE    | D<br>(mm) | L<br>(mm) | S6<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|-----------|-----------|------------|--------------------------------------|-----|-----|
|                           | 1<br>METRIC |           |           |            | CF                                   | 71  | MS  |
| VSTI10X1OR                | M10 x 1     | 13        | 13.5      | 5          | 9.1                                  | 9.1 | 3.3 |
| VSTI12X1.5OR              | M12 x 1.5   | 17        | 15.0      | 6          | 9.1                                  | 9.1 | 3.3 |
| VSTI14X1.5OR              | M14 x 1.5   | 19        | 16.0      | 6          | 9.1                                  | 9.1 | 3.3 |
| VSTI16X1.5OR              | M16 x 1.5   | 21        | 17.5      | 8          | 9.1                                  | 9.1 | 3.3 |
| VSTI18X1.5OR              | M18 x 1.5   | 23        | 19.0      | 8          | 9.1                                  | 9.1 | 3.3 |
| VSTI22X1.5OR              | M22 x 1.5   | 27        | 20.0      | 10         | 9.1                                  | 9.1 | 3.3 |
| VSTI27X2OR                | M27 x 2     | 32        | 23.5      | 12         | 5.8                                  | 5.8 | 3.3 |
| VSTI33X2OR                | M33 x 2     | 38        | 25.0      | 14         | 5.8                                  | 5.8 | 3.3 |
| VSTI42X2OR                | M42 x 2     | 48        | 25.5      | 22         | 5.8                                  | 5.8 | 3.3 |

\* SAE J2244-4 is a draft standard

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## VSTI M-ED

Metric Hollow Hex Plug  
Metric-ED  
(for ISO 9974-1 / DIN 3852-1 Port)

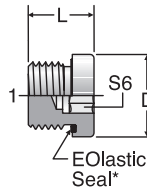


| TUBE<br>FITTING<br>PART # | END SIZE    | D<br>(mm) | L<br>(mm) | S6<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-------------|-----------|-----------|------------|--------------------------------------|-----|-----|
|                           | 1<br>THREAD |           |           |            | CF                                   | 71  | MS  |
| VSTI10X1ED                | M10 x 1     | 14        | 12.3      | 5          | 5.8                                  | 5.8 | 3.3 |
| VSTI12X1.5ED              | M12 x 1.5   | 17        | 17.3      | 6          | 5.8                                  | 5.8 | 3.3 |
| VSTI14X1.5ED              | M14 x 1.5   | 19        | 17.3      | 6          | 5.8                                  | 5.8 | 3.3 |
| VSTI16X1.5ED              | M16 x 1.5   | 22        | 17.3      | 8          | 5.8                                  | 5.8 | 3.3 |
| VSTI18X1.5ED              | M18 x 1.5   | 24        | 17.3      | 8          | 5.8                                  | 5.8 | 3.3 |
| VSTI20X1.5ED              | M20 x 1.5   | 26        | 19.3      | 10         | 5.8                                  | 5.8 | 3.3 |
| VSTI22X1.5ED              | M22 x 1.5   | 27        | 19.3      | 10         | 5.8                                  | 5.8 | 3.3 |
| VSTI26X1.5ED              | M26 x 1.5   | 32        | 21.3      | 12         | 5.8                                  | 5.8 | 3.3 |
| VSTI27X2ED                | M27 x 2     | 32        | 21.3      | 12         | 5.8                                  | 5.8 | 3.3 |
| VSTI33X2ED                | M33 x 2     | 40        | 22.8      | 17         | 5.8                                  | 5.8 | 3.3 |
| VSTI42X2ED                | M42 x 2     | 50        | 22.8      | 22         | 4.5                                  | 4.5 | 2.9 |
| VSTI48X2ED                | M48 x 2     | 55        | 22.8      | 24         | 4.5                                  | 4.5 | 2.9 |

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## VSTI R-ED

BSPP Hollow Hex Plug  
BSPP-ED  
(for ISO 1179-1 / DIN 3852-2 Port)

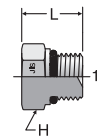


| TUBE<br>FITTING<br>PART # | END SIZE   | D<br>(mm) | L<br>(mm) | S6<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|------------|-----------|-----------|------------|--------------------------------------|-----|-----|
|                           | 1<br>BSPP  |           |           |            | CF                                   | 71  | MS  |
| VSTI1/8ED                 | 1/8 - 28   | 14        | 12.3      | 5          | 5.8                                  | 5.8 | 3.3 |
| VSTI1/4ED                 | 1/4 - 19   | 19        | 17.3      | 6          | 5.8                                  | 5.8 | 3.3 |
| VSTI3/8ED                 | 3/8 - 19   | 22        | 17.3      | 8          | 5.8                                  | 5.8 | 3.3 |
| VSTI1/2ED                 | 1/2 - 14   | 27        | 19.3      | 10         | 5.8                                  | 5.8 | 3.3 |
| VSTI3/4ED                 | 3/4 - 14   | 32        | 21.3      | 12         | 5.8                                  | 5.8 | 3.3 |
| VSTI1ED                   | 1 - 11     | 40        | 22.8      | 17         | 5.8                                  | 5.8 | 3.3 |
| VSTI1 1/4ED               | 1 1/4 - 11 | 50        | 22.8      | 22         | 4.5                                  | 4.5 | 2.9 |
| VSTI1 1/2ED               | 1 1/2 - 11 | 55        | 22.8      | 24         | 4.5                                  | 4.5 | 2.9 |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

## P47OMN

Hex Head Plug  
BSPP-ORB  
(for JIS B2351)



| TUBE<br>FITTING<br>PART # | END SIZE  | H<br>HEX<br>(mm) | L<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |    |   |
|---------------------------|-----------|------------------|-----------|--------------------------------------|----|---|
|                           | 1<br>BSPP |                  |           | S                                    | SS | B |
| 4P47OMN                   | 1/4-19    | 19               | 19.1      | 5.0                                  |    |   |
| 6P47OMN                   | 3/8-19    | 22               | 20.0      | 5.0                                  |    |   |
| 8P47OMN                   | 1/2-14    | 27               | 24.1      | 5.0                                  |    |   |
| 12P47OMN                  | 3/4-14    | 36               | 26.9      | 4.0                                  |    |   |
| 16P47OMN                  | 1-11      | 41               | 31.0      | 3.0                                  |    |   |

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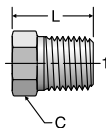
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## HP3M

Hex Head Pipe Plug  
BSPT



| TUBE<br>FITTING<br>PART # | END SIZE  | C<br>HEX<br>(mm) | L<br>(mm) | Dynamic<br>Pressure<br>(x 1,000 PSI) |     |     |
|---------------------------|-----------|------------------|-----------|--------------------------------------|-----|-----|
|                           | 1<br>BSPT |                  |           | S                                    | SS  | B   |
| 1/8HP3M                   | 1/8 - 28  | 10               | 14.2      | 6.0                                  | 6.0 | 3.3 |
| 1/4HP3M                   | 1/4 - 19  | 14               | 19.1      | 6.0                                  | 6.0 | 3.3 |
| 3/8HP3M                   | 3/8 - 19  | 17               | 19.8      | 6.0                                  | 6.0 | 3.3 |
| 1/2HP3M                   | 1/2 - 14  | 22               | 24.6      | 6.0                                  | 6.0 | 3.3 |
| 3/4HP3M                   | 3/4 - 14  | 27               | 26.9      | 5.5                                  | 5.5 | 3.3 |
| 1HP3M                     | 1 - 11    | 36               | 31.8      | 4.5                                  | 4.5 | 2.9 |

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## Bleed Adapters

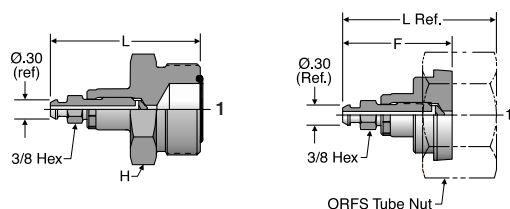
Entrapped air is a major contributor to inefficient operation. Typically, bleeding hydraulic systems is done by cracking a connection to “bleed off” the entrapped air. This practice is not recommended, especially in larger size fittings where high forces can exist. Parker’s bleed adapters are especially beneficial in applications where elastomeric seals (O-rings) can be extruded and/or damaged during bleeding such as with O-ring face seal fittings.

Parker’s bleed adapters are designed specifically for installation directly to ORFS (O-ring Face Seal) type fittings or into SAE/NPT manifolds and valves where bleeding is often required.

### Product Characteristics

- Bleed hydraulic systems without “cracking” hydraulic connections
- Uses standard automotive bleed screw design
- Bleed screw is permanently crimped into body housing for blowout prevention
- In-port options with SAE and NPT male studs
- Tube/hose connection options to male and female ORFS

## ORFS Bleed Adapters



PNLOBA

FNLBA

ORFS Tube Nut sold separately

| TUBE FITTING<br>PART # | END SIZE<br>1 (in.) | F (in.) | H (in.) | L (in.) | Pressure<br>(x 1,000 PSI)<br>Dynamic<br>-S |
|------------------------|---------------------|---------|---------|---------|--------------------------------------------|
| 4 PNLOBA               | 1/4                 | -       | 11/16   | 1.90    | 9.2                                        |
| 6 PNLOBA               | 3/8                 | -       | 3/4     | 1.97    | 9.2                                        |
| 8 PNLOBA               | 1/2                 | -       | 7/8     | 2.07    | 9.2                                        |
| 10 PNLOBA              | 5/8                 | -       | 1 1/16  | 2.19    | 6.0                                        |
| 12 PNLOBA              | 3/4                 | -       | 1 1/4   | 2.27    | 6.0                                        |
| 16 PNLOBA              | 1                   | -       | 1 1/2   | 2.35    | 6.0                                        |
| 20 PNLOBA              | 1 1/4               | -       | 1 3/4   | 2.41    | 6.0                                        |
| 24 PNLOBA              | 1 1/2               | -       | 2 1/8   | 2.48    | 5.0                                        |
| 8 FNLBA                | 1/2                 | 1.63    | 15/16   | 2.07    | 9.2                                        |
| 10 FNLBA               | 5/8                 | 1.63    | 1 1/8   | 2.17    | 6.0                                        |
| 12 FNLBA               | 3/4                 | 1.63    | 1 3/8   | 2.21    | 6.0                                        |
| 16 FNLBA               | 1                   | 1.63    | 1 5/8   | 2.21    | 6.0                                        |
| 20 FNLBA               | 1 1/4               | 1.63    | 1 7/8   | 2.21    | 6.0                                        |
| 24 FNLBA               | 1 1/2               | 1.63    | 2 1/4   | 2.21    | 5.0                                        |

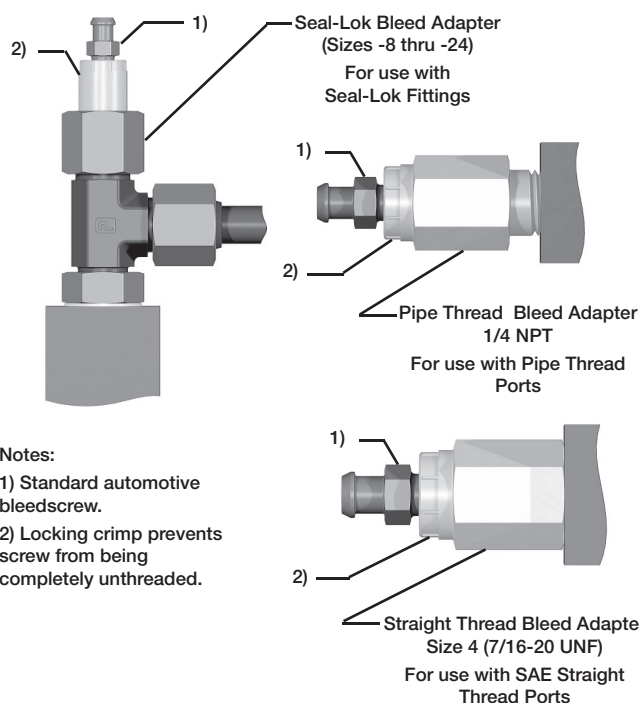
**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

## Bleeding Hydraulic Systems with Parker Bleed Adapters

Whenever possible, the bleed adapter should be mounted at the highest point within the hydraulic system. The trapped air can be relieved while the system is running at low pressure. To bleed, loosen the bleed screw 1/2 turn counterclockwise. After the hydraulic fluid begins to run freely from the bleed screw, the bleed screw should be re-tightened.

**Bleed Screw Tightening Torque:** 35-40 in.-lbs.

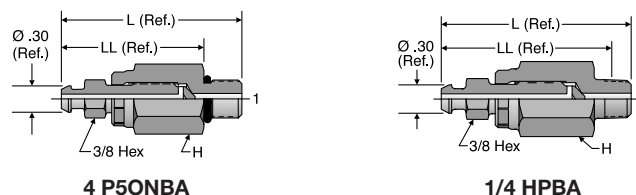
**Warning:** When bleeding hydraulic fluid, operate the system below 500 psi. To avoid injury, ensure that all persons are clear of the path of discharge. Another recommended practice is to attach a section of hose over the bleed screw/adapter to direct oil away from the area and to reduce oil spillage.



### Notes:

- Standard automotive bleedscrew.
- Locking crimp prevents screw from being completely unthreaded.

## Port Bleed Adapters



| TUBE FITTING<br>PART # | END SIZE<br>1     | BODY<br>HEX<br>(in.) | H<br>(in.) | L<br>REF.<br>(in.) | LL<br>REF.<br>(in.) | Pressure<br>(x 1,000 PSI)<br>Static<br>-S | Dynamic<br>-S |
|------------------------|-------------------|----------------------|------------|--------------------|---------------------|-------------------------------------------|---------------|
| 4 P5ONBA               | 7/16-20 UN/UNF-2A | 11/16                | 11/16      | 2.05               | 1.62                | 10.0                                      | 6.0           |
| 1/4 HPBA               | 1/4-18 NPTF       | 11/16                | 11/16      | 2.20               | 1.86                | 10.0                                      | 6.0           |

**WARNING:** This product can expose you to chemicals including Lead and Lead Compounds which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov).

Dimensions and pressures for reference only, subject to change.

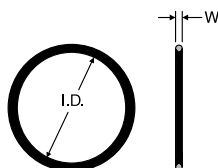
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## ORFS O-Ring

ORFS Tube End O-Ring

Specify size and compound

Example: 2-018 NBR (standard NBR)

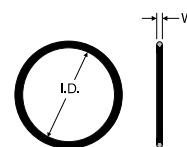


## XO O-Ring

Triple-Lok 2 O-Ring

Specify size and compound

Example: 2-019 NBR (standard NBR)



| TUBE<br>FITTING<br>PART # | FITTING<br>DASH<br>SIZE | END SIZE |            | I.D.  |      | W     |      | Material |       |        |
|---------------------------|-------------------------|----------|------------|-------|------|-------|------|----------|-------|--------|
|                           |                         | (in.)    | (mm)       | (in.) | (mm) | (in.) | (mm) | NBR*     | FKM** | CNG*** |
| 2-011                     | 4                       | 1/4      | 6          | 0.30  | 7.7  | 0.07  | 1.78 | •        | •     | •      |
| 2-012                     | 6                       | 3/8      | 8, 10      | 0.36  | 9.3  | 0.07  | 1.78 | •        | •     | •      |
| 2-014                     | 8                       | 1/2      | 12         | 0.49  | 12.4 | 0.07  | 1.78 | •        | •     | •      |
| 2-016                     | 10                      | 5/8      | 14, 15, 16 | 0.61  | 15.6 | 0.07  | 1.78 | •        | •     | •      |
| 2-018                     | 12                      | 3/4      | 18, 20     | 0.74  | 18.8 | 0.07  | 1.78 | •        | •     | •      |
| 2-020                     | 14                      | 7/8      | 22         | 0.86  | 21.8 | 0.07  | 1.78 | •        | •     | •      |
| 2-021                     | 16                      | 1        | 25         | 0.93  | 23.5 | 0.07  | 1.78 | •        | •     | •      |
| 2-025                     | 20                      | 1 1/4    | 28, 30, 32 | 1.18  | 29.9 | 0.07  | 1.78 | •        | •     | •      |
| 2-029                     | 24                      | 1 1/2    | 35, 38     | 1.49  | 37.8 | 0.07  | 1.78 | •        | •     | •      |
| 2-135                     | 32                      | 2        | 50         | 1.93  | 49.0 | 0.10  | 2.54 | •        | •     | •      |

\* NBR is the standard compound — 90-durometer Nitrile.

\*\* FKM is an optional 90-durometer fluorocarbon compound.

\*\*\* CNG is an optional 85 durometer HNBR compound for CNG applications

See page M3 for O-ring Material Selection and data.

| TUBE<br>FITTING<br>PART # | TUBE<br>O.D.<br>(in.) | I.D.<br>(in.) | W<br>(in.) | Material<br>NBR |
|---------------------------|-----------------------|---------------|------------|-----------------|
| 5-193                     | 1/4                   | 0.18          | 0.04       | •               |
| 5-179                     | 5/16                  | 0.24          | 0.04       | •               |
| 5-056                     | 3/8                   | 0.30          | 0.04       | •               |
| 5-058                     | 1/2                   | 0.43          | 0.05       | •               |
| 2-013                     | 5/8                   | 0.43          | 0.07       | •               |
| 2-016                     | 3/4                   | 0.61          | 0.07       | •               |
| 2-017                     | 7/8                   | 0.68          | 0.07       | •               |
| 2-019                     | 1                     | 0.80          | 0.07       | •               |
| 2-023                     | 1 1/4                 | 1.05          | 0.07       | •               |
| 2-026                     | 1 1/2                 | 1.24          | 0.07       | •               |
| 2-133                     | 2                     | 1.80          | 0.10       | •               |

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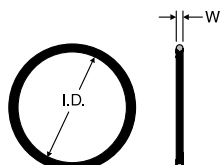
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## SAE O-Ring

SAE Straight Thread Port O-Ring

Specify size and compound

Example: 3-906 NBR (standard NBR)



| TUBE<br>FITTING<br>PART # | FITTING<br>DASH<br>SIZE | I.D.<br>(in.) | W<br>(in.) | Material |       |        |
|---------------------------|-------------------------|---------------|------------|----------|-------|--------|
|                           |                         |               |            | NBR*     | FKM** | CNG*** |
| 3-902                     | 2                       | 0.24          | 0.06       | •        | •     |        |
| 3-903                     | 3                       | 0.30          | 0.06       | •        | •     |        |
| 3-904                     | 4                       | 0.35          | 0.07       | •        | •     | •      |
| 3-905                     | 5                       | 0.41          | 0.07       | •        | •     |        |
| 3-906                     | 6                       | 0.47          | 0.08       | •        | •     | •      |
| 3-908                     | 8                       | 0.64          | 0.09       | •        | •     | •      |
| 3-910                     | 10                      | 0.76          | 0.10       | •        | •     |        |
| 3-912                     | 12                      | 0.92          | 0.12       | •        | •     |        |
| 3-914                     | 14                      | 1.05          | 0.12       | •        | •     |        |
| 3-916                     | 16                      | 1.17          | 0.12       | •        | •     |        |
| 3-920                     | 20                      | 1.48          | 0.12       | •        | •     |        |
| 3-924                     | 24                      | 1.72          | 0.12       | •        | •     |        |
| 3-932                     | 32                      | 2.34          | 0.12       | •        | •     |        |

\* NBR is the standard compound — 90-durometer Nitrile.

\*\* FKM is an optional 90-durometer fluorocarbon compound.

\*\*\* CNG is an optional 85 durometer HNBR compound for CNG applications

See page M3 for O-ring Material Selection and data.

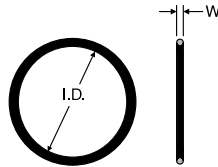
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## ISO 6149 O-Ring

Metric Straight Thread  
Port O-Ring

Specify size and compound (for option compound only)  
Example: M-12 ISO O-RING (standard NBR)  
M-12 ISO FKM (optional FKM o-ring)



| TUBE FITTING<br>PART # | PORT<br>THREAD | I.D.<br>(mm) | W<br>(mm) | Material |        |
|------------------------|----------------|--------------|-----------|----------|--------|
|                        |                |              |           | NBR**    | FKM*** |
| M-8 ISO O-Ring         | M8 x 1         | 6.1          | 1.6       | •        |        |
| M-10 ISO O-Ring        | M10 x 1        | 8.1          | 1.6       | •        |        |
| M-12 ISO O-Ring        | M12 x 1.5      | 9.3          | 2.2       | •        | •      |
| M-14 ISO O-Ring        | M14 x 1.5      | 11.3         | 2.2       | •        | •      |
| M-16 ISO O-Ring        | M16 x 1.5      | 13.3         | 2.2       | •        | •      |
| M-18 ISO O-Ring        | M18 x 1.5      | 15.3         | 2.2       | •        | •      |
| M-22 ISO O-Ring        | M22 x 1.5      | 19.3         | 2.2       | •        | •      |
| M-27 ISO O-Ring        | M27 x 2        | 23.6         | 2.9       | •        | •      |
| *M-30 ISO O-Ring       | M30 x 2        | 26.6         | 2.9       | •        |        |
| M-33 ISO O-Ring        | M33 x 2        | 29.6         | 2.9       | •        | •      |
| M-38 ISO O-Ring        | M38 x 2        | 34.6         | 2.9       | •        |        |
| M-42 ISO O-Ring        | M42 x 2        | 38.6         | 2.9       | •        | •      |
| M-48 ISO O-Ring        | M48 x 2        | 44.6         | 2.9       | •        | •      |
| M-60 ISO O-Ring        | M60 x 2        | 56.6         | 2.9       | •        |        |

\* M30X2 is not a standard ISO 6149 size.

\*\* NBR is the standard compound — 90-durometer peroxide-cured Nitrile.

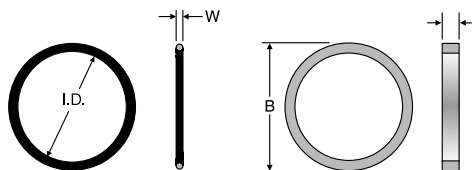
\*\*\* FKM is an optional 90-durometer fluorocarbon compound.

See page M3 for O-ring Material Selection and data.

## Metric O-Ring & Retaining Ring

For ISO 9974-1 / DIN 3852-1Port

Specify size, compound and material  
Example: 2-012 NBR (standard NBR O-ring)  
M12RRCF (standard steel retaining ring)



| TUBE<br>FITTING<br>PART # | METRIC<br>THREAD<br>SIZE | I.D.<br>(mm) | W<br>(mm) | From Stock |       | TUBE<br>FITTING<br>PART # | B<br>(mm) | L<br>(mm) | Material  |            |
|---------------------------|--------------------------|--------------|-----------|------------|-------|---------------------------|-----------|-----------|-----------|------------|
|                           |                          |              |           | NBR*       | FKM** |                           |           |           | CF<br>(S) | 71<br>(SS) |
| 3-902                     | M8 x 1                   | 6.07         | 1.63      | •          | •     | M8RR                      | 13.15     | 1.00      | •         |            |
| 6-074                     | M10 x 1                  | 8.00         | 1.50      | •          | •     | M10RR                     | 14.75     | 1.00      | •         |            |
| 2-012                     | M12 x 1.5                | 9.25         | 1.78      | •          | •     | M12RR                     | 17.75     | 1.30      | •         |            |
| 2-013                     | M14 x 1.5                | 10.82        | 1.78      | •          | •     | M14RR                     | 19.75     | 1.30      | •         |            |
| 3-907                     | M16 x 1.5                | 13.46        | 2.08      | •          | •     | M16RR                     | 21.75     | 1.50      | •         |            |
| 2-114                     | M18 x 1.5                | 15.54        | 2.62      | •          | •     | M18RR                     | 23.75     | 2.00      | •         |            |
| 2-017                     | M20 x 1.5                | 17.17        | 1.78      | •          |       | M20RR                     | 25.75     | 1.30      | •         |            |
| 2-018                     | M22 x 1.5                | 18.77        | 1.78      | •          | •     | M22RR                     | 27.75     | 1.30      | •         |            |
| 2-019                     | M24 x 1.5                | 20.35        | 1.78      | •          |       | M24RR                     | 29.75     | 1.30      | •         |            |
| 2-118                     | M26 x 1.5                | 21.89        | 2.62      | •          |       | M26RR                     | 31.75     | 2.00      | •         |            |
| 2-119                     | M27 x 2                  | 23.47        | 2.62      | •          | •     | M27RR                     | 32.75     | 2.00      | •         |            |
| 2-121                     | M30 x 2                  | 26.64        | 2.62      | •          |       | M30RR                     | 36.32     | 2.00      | •         |            |
| 2-122                     | M33 x 2                  | 28.24        | 2.62      | •          |       | M33RR                     | 39.75     | 2.00      | •         |            |
| 2-124                     | M36 x 2                  | 31.42        | 2.62      | •          |       | M36RR                     | 42.75     | 2.00      | •         |            |
| 2-128                     | M42 x 2                  | 37.77        | 2.62      | •          |       | M42RR                     | 49.75     | 2.00      | •         |            |
| 2-130                     | M45 x 2                  | 40.94        | 2.62      | •          |       | M45RR                     | 52.75     | 2.00      | •         |            |
| 2-132                     | M48 x 2                  | 44.12        | 2.62      | •          |       | M48RR                     | 54.95     | 2.00      | •         |            |
| 2-133                     | M50 x 2                  | 45.69        | 2.62      | •          |       | M50RR                     | 56.31     | 2.00      | •         |            |

\* NBR is the standard compound — 90-durometer Nitrile.

\*\* FKM is an optional 90-durometer fluorocarbon compound.

See page M3 for O-ring Material Selection and data.

Dimensions for reference only, subject to change.

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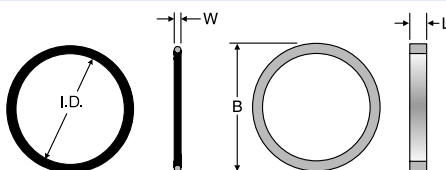
## BSPP O-Ring & Retaining Ring

For ISO 1179-1 / DIN 3852-2 Port

Specify size and compound (for O-ring only)

Example: 2-113 NBR (standard NBR O-ring)

8207-3/8 RETAINING RING (standard steel retaining ring)



| TUBE FITTING PART # | BSPP THREAD SIZE | I.D. (mm) | W (mm) | Material |       | STEEL TUBE FITTING PART # | STAINLESS STEEL TUBE FITTING PART # | B (mm) | L (mm) |
|---------------------|------------------|-----------|--------|----------|-------|---------------------------|-------------------------------------|--------|--------|
|                     |                  |           |        | NBR*     | FKM** |                           |                                     |        |        |
| 5-585               | 1/8-28           | 8         | 2      | •        | •     | 8207-1/8                  | 1/8 Retaining Ring                  | 15.0   | 1.4    |
| 2-111               | 1/4-19           | 10.77     | 2.62   | •        | •     | 8207-1/4                  | 1/4 Retaining Ring                  | 19.5   | 1.9    |
| 2-113               | 3/8-19           | 13.94     | 2.62   | •        | •     | 8207-3/8                  | 3/8 Retaining Ring                  | 23.5   | 1.9    |
| 5-256               | 1/2-14           | 17.96     | 2.62   | •        | •     | 8207-1/2                  | 1/2 Retaining Ring                  | 28.5   | 1.9    |
| 2-119               | 3/4-14           | 23.47     | 2.62   | •        | •     | 8207-3/4                  | 3/4 Retaining Ring                  | 34.5   | 2.6    |
| 2-217               | 1-11             | 29.74     | 3.53   | •        | •     | 8207-1                    | 1 Retaining Ring                    | 43.5   | 2.6    |
| 2-222               | 1 1/4-11         | 37.69     | 3.53   | •        |       | 8207-1-1/4                | 1 1/4 Retaining Ring                | 52.5   | 2.6    |
| 2-224               | 1 1/2-11         | 44.04     | 3.53   | •        |       | 8207-1-1/2                | 1 1/2 Retaining Ring                | 60.0   | 2.6    |

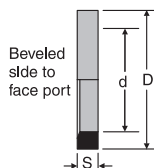
\* NBR is the standard compound — 90-durometer Nitrile.

\*\* FKM is an optional 90-durometer fluorocarbon compound.

See page M3 for O-ring Material Selection and data.

## EOlastic Seal Ring

EOlastic Soft Seal for  
BSPP & Metric Threads (“ED Seal”)  
DIN 3869



Specify size and compound

(for optional compound only)

Example: ED8X1X (standard NBR)

ED8X1VITX (optional FKM)

| TUBE FITTING PART # | For Male Metric Thread | For Male Thread BSPP | D (mm) | d (mm) | S (mm) | Material |       |
|---------------------|------------------------|----------------------|--------|--------|--------|----------|-------|
|                     |                        |                      |        |        |        | NBR*     | FKM** |
| ED8X1X              | M8 x 1                 |                      | 9.9    | 6.5    | 1.0    | •        | •     |
| ED10X1X             | M10 x 1                | G 1/8 A              | 11.9   | 8.4    | 1.0    | •        | •     |
| ED12X1.5X           | M12 x 1.5              |                      | 14.4   | 9.8    | 1.5    | •        | •     |
| ED14X1.5X           | M14 x 1.5              | G 1/4 A              | 16.5   | 11.6   | 1.5    | •        | •     |
| ED16X1.5X           | M16 x 1.5              |                      | 18.9   | 13.8   | 1.5    | •        | •     |
| ED3/8X              |                        | G 3/8 A              | 18.9   | 14.7   | 1.5    | •        | •     |
| ED18X1.5X           | M18 x 1.5              |                      | 20.9   | 15.7   | 1.5    | •        | •     |
| ED20X1.5X           | M20 x 1.5              |                      | 22.9   | 17.8   | 1.5    | •        | •     |
| ED1/2X              |                        | G 1/2 A              | 23.9   | 18.5   | 1.5    | •        | •     |
| ED22X1.5X           | M22 x 1.5              |                      | 24.3   | 19.6   | 1.5    | •        | •     |
| ED26X1.5X           | M26 x 1.5              | G 3/4 A              | 29.2   | 23.9   | 1.5    | •        | •     |
| ED26X1.5X           | M27 x 2                | G 3/4 A              | 29.2   | 23.9   | 1.5    | •        | •     |
| ED33X2X             | M33 x 2                | G 1 A                | 35.7   | 29.7   | 2.0    | •        | •     |
| ED42X2X             | M42 x 2                | G 1 1/4 A            | 45.8   | 38.8   | 2.0    | •        | •     |
| ED48X2X             | M48 x 2                | G 1 1/2 A            | 50.7   | 44.7   | 2.0    | •        | •     |

\* NBR is the standard compound — 90-durometer Nitrile.

\*\* FKM is an optional 85-durometer fluorocarbon compound (for part number VIT is used as suffix). Example: ED8X1VITX

Dimensions for reference only, subject to change.

