

# REFRIGERANT STRAINER

## Type RSF

**Size: 1/2" - 4" (13 - 100mm)**

**Suitable For: Ammonia, R-22, R-134a, R-502 and Other Common Refrigerants**

### FEATURES

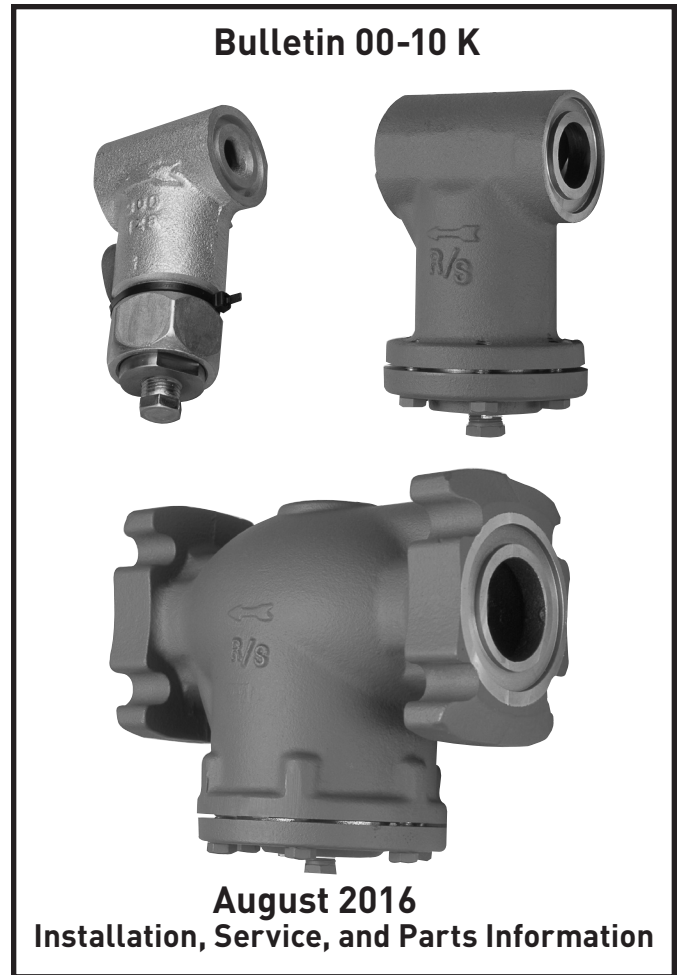
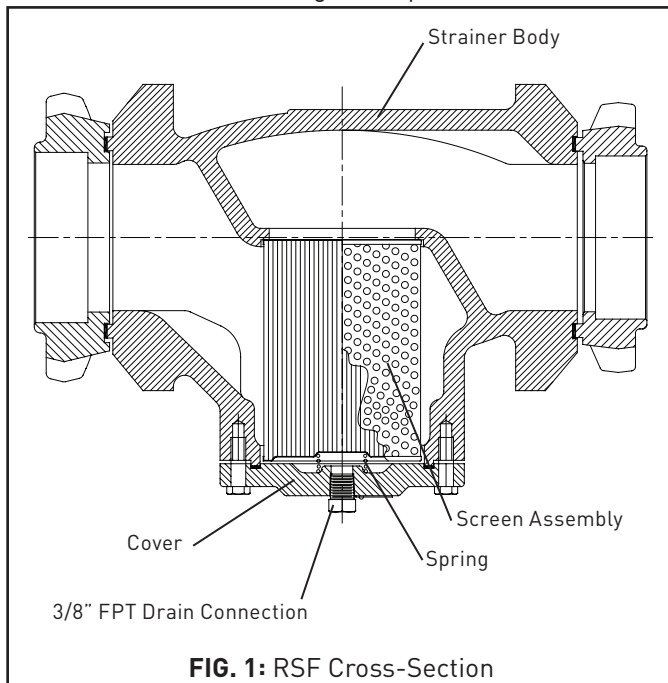
- Stainless Steel (60 Mesh) Screen
- Drain Connection for Safe Cleaning In Line
- Ample Screen Area
- Low Pressure Drop
- Design Pressure: 400 psig (28 Bar)
- Can Be Close Coupled
- Durable Filter Bags Available 3/4" - 4" (20-100mm)

### DESCRIPTION

These industrial type Refrigerant Strainers with stainless steel screen are designed especially for the protection of R/S control valves from foreign materials present in refrigeration systems. The fine stainless screen mesh will collect particles as small as 0.009" in diameter (60 mesh @ 0.0075" wire). Generous available screen area allows maximum dirt capacity at minimum pressure drop. The strainers may be close coupled to R/S valves having the same flange gasket size.

### PURPOSE

The RSF Refrigerant Strainer collect foreign materials and dirt in a refrigerant system at minimal pressure drop in order to minimize damage to or prevent malfunction of

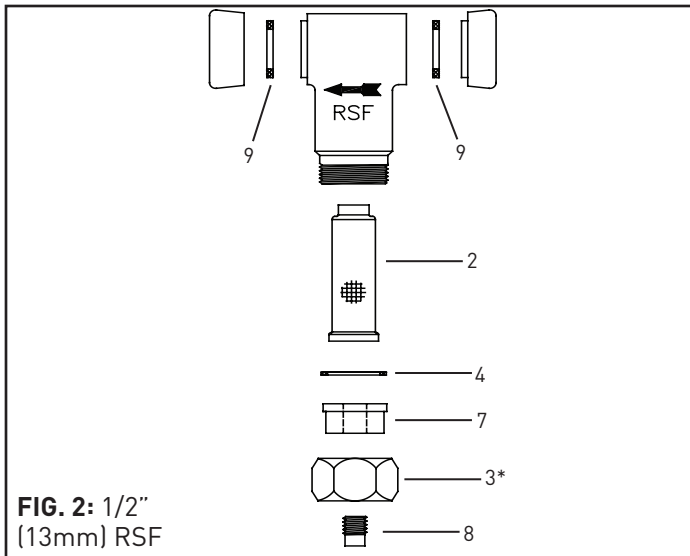


control valves. This, of course, is extremely important upon start-up of a new refrigeration system where dirt, scale, and weld particles may be present in the system and are disturbed and circulated when pressure testing or upon system start-up. Also when an existing system is revised, any settled dirt or foreign matter may be disturbed and circulated throughout the system. If particles are too small to be removed by the strainer, it is suggested that a R/S Filter Bag be installed where applicable, periodically cleaned and removed when necessary.

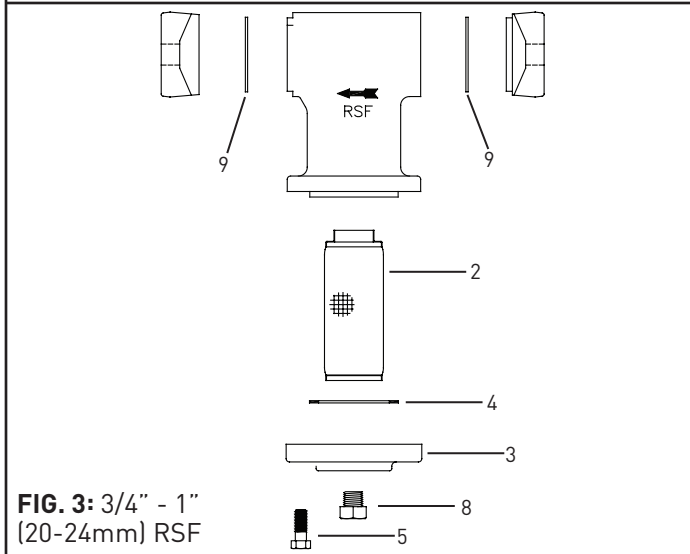
**NOTE:** It is not safe to omit strainers upstream of the control valves unless there is a certainty that the system will always be clean.

### RSF SPECIFICATIONS

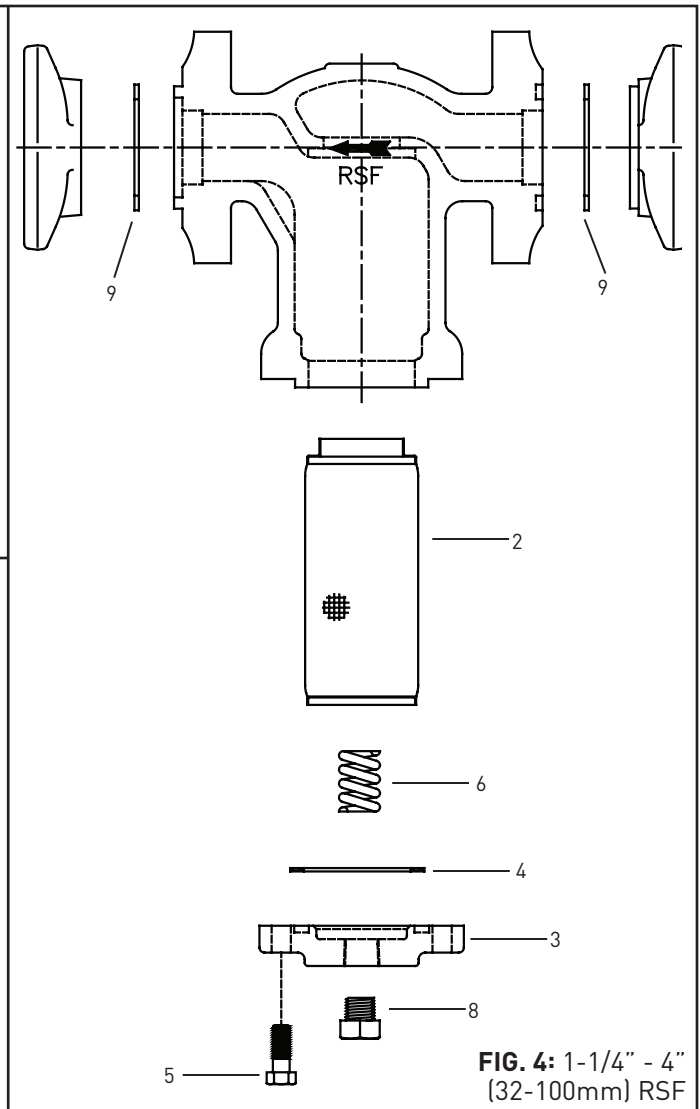
| Port Size |     | Body Material | Screen Area |        | Screen Material   |
|-----------|-----|---------------|-------------|--------|---|
| inch      | mm  |               | Sq. in.     | Sq. cm |   |
| 1/2       | 13  | Cast Iron     | 3           | 2.6    | Stainless Steel with Openings 0.009" x 0.009" (0.23mm x 0.23mm) |
| 1         | 25  | Cast Iron     | 9.4         | 8.1    |   |
| 1-1/4     | 32  | Cast Iron     | 16.3        | 14     |   |
| 2         | 50  | Cast Iron     | 67.7        | 58.2   | 0.0075" (0.2mm) Wire (60 Mesh)                                  |
| 2-1/2     | 65  | Cast Iron     | 112         | 96     |   |
| 3         | 75  | Cast Iron     | 112         | 96     |   |
| 4         | 100 | Cast Iron     | 170         | 146    |   |



**FIG. 2:** 1/2"  
(13mm) RSF



**FIG. 3:** 3/4" - 1"  
(20-24mm) RSF



**FIG. 4:** 1-1/4" - 4"  
(32-100mm) RSF

**REPAIR KITS FOR TYPE RSF STRAINER**

| Item    | Description           | Qty | 1/2"   | 3/4" - 1" | 1 - 1/4" | 1-5/8" - 2" | 2-1/2" | 3"     | 4"     |
|---------|-----------------------|-----|--------|-----------|----------|-------------|--------|--------|--------|
| 2       | Screen Assembly       | 1   |        |           |          |             |        |        |        |
| 3       | Cover                 | 1   |        |           |          |             |        |        |        |
| 3*      | Nut (1/2" Only)       | 1   |        |           |          |             |        |        |        |
| 4       | Gasket                | 1   | 303070 | 301585    | 301585   | 301688      | 301690 | 301690 | 301690 |
| 5       | Cover Bolt            |     |        |           |          |             |        |        |        |
| 6       | Spring                | 1   |        |           |          |             |        |        |        |
| 7       | Bottom Cap            | 1   |        |           |          |             |        |        |        |
| 8       | Pipe Plug             | 1   |        |           |          |             |        |        |        |
| 2-4,7,8 | 1/2" Screen Kit       |     | 205945 | -----     | -----    | -----       | -----  | -----  | -----  |
| 2,4     | 3/4"-1" Screen Kit    |     | -----  | 200140    | -----    | -----       | -----  | -----  | -----  |
| 2,4,6   | 1-1/4"-4" Screen Kit  |     | -----  | -----     | 200142   | 200144      | 200146 | 200146 | 200148 |
| 5       | Cover Bolt PKG        | 6   | -----  | 202248    | 202248   | -----       | -----  | -----  | -----  |
|         |                       | 8   | -----  | -----     | -----    | 202253      | 202253 | 202253 | 202253 |
| 3,4,5   | 3/4"-1-1/4" Cover Kit |     | -----  | 200160    | 200160   | -----       | -----  | -----  | -----  |
| 3,4     | 1-5/8"-4" Cover Kit   |     | -----  | -----     | -----    | 200162      | 200165 | 200165 | 200165 |
| 4,10    | Strainer Bag Kit      |     | -----  | 201701    | 201702   | 201703      | 202513 | 202513 | 202514 |

## RSF CONNECTION AVAILABILITY

| Port Size |     | Used with Port Size |        | Available Connection Codes<br>(Bold Type Indicates Standard Size) |                         |                    | Weight       |     |              |     |
|-----------|-----|---------------------|--------|---|-------------------------|--------------------|--------------|-----|--------------|-----|
|           |     |                     |        |   |                         |                    | Less Flanges |     | With Flanges |     |
| inch      | mm  | inch                | mm     | ODS   | FPT, SW, WN             | DIN Weld Neck      | lbs.         | kg  | lbs.         | kg  |
| 1/2       | 13  | 3/16, 1/2           | 5, 13  | 04, <b>05</b> , 07  | 02*, 03, <b>04</b> , 06 | 10, <b>15</b> , 20 | 2            | 0.9 | 3            | 1.4 |
| 1         | 25  | 3/4, 1              | 20, 25 | 07, <b>09</b> , 11  | 06, <b>08</b> , 10      | 20, <b>25</b> , 32 | 7            | 3.2 | 10           | 4.5 |
| 1-1/4     | 32  | 1-1/4               | 32     | 11, <b>13</b> , 17  | <b>10</b> , 12          | <b>32</b> , 40, 50 | 15           | 6.8 | 18           | 8.2 |
| 2         | 50  | 1-5/8, 2            | 40, 50 | 13, <b>17</b> , 21  | 12, <b>16</b>           | 40, <b>50</b>      | 32           | 15  | 38           | 17  |
| 2-1/2     | 65  | 2-1/2               | 65     | <b>21</b> , 25  | <b>20</b> (no FPT)      | <b>65</b> , 75     | 53           | 24  | 63           | 29  |
| 3         | 75  | 3                   | 75     | <b>25</b> , 29  | <b>24</b> (no FPT)      | <b>75</b>          | 53           | 24  | 63           | 29  |
| 4         | 100 | 4                   | 100    | <b>33</b>   | <b>32</b> (no FPT)      | <b>A0</b>          | 114          | 52  | 132          | 60  |

### SERVICE POINTERS

It is very important that the strainer is frequently inspected for dirt and cleaned during system start-up and until no further dirt is found.

Before beginning to loosen cover screws, (or cover nut on the 1/2" RSF), be sure that the strainer has been pumped out and any entrapped refrigerant liquid is properly removed. Then remove Screen Assembly #2 by removing Strainer Cover #3, (Bottom Cap #7 on 1/2" RSF). The screen assembly should be washed with a good solvent and blown dry. The inside of the Strainer Body #1 should also be cleaned.

#### 1/2" (13MM) RSF

After the strainer has been thoroughly inspected and cleaned place the screen assembly of the 1/2" RSF into the body so that the spring clip on the closed end is towards the open end of the body. Spring clips must fit tight into the thread since they help to hold the basket in place for servicing. Lightly oil and place gasket on the valve body and fit the Bottom Cap over the gasket. Place the Strainer Nut on top of the Bottom Cap and torque to 8.3 mkg (60-ft. lb.). Use the flat surfaces on Bottom Cap to secure it with a wrench when installing pipe plug. Do not permit bottom cap to turn while threading in pipe plug.

#### 1" - 4" (25-100MM) RSF

After the strainer has been thoroughly inspected and cleaned, insert the screen assembly into the strainer body, making sure that it is properly centered to avoid crushing (and that the Spring #6 is properly located). Lightly oil

### COVER BOLT TORQUE REQUIREMENTS

| Strainer Size | Bolt Size  | Torque   |     |
|---------------|------------|----------|-----|
|               |            | Ft. Lbs. | mkg |
| 1/2"          | N/A        | 60       | 8.3 |
| 3/4" - 1-1/4" | 5/16" - 18 | 15       | 2.1 |
| 2" - 4"       | 3/8" - 16  | 30       | 4.1 |

and place gasket on the valve body and fasten the strainer cover in place. Cover bolts must be tightened evenly to the torque values shown.

### ADDITIONAL SERVICE POINTERS

Ruptured Screen Assembly: (a) Screen is clogged causing excessive pressure drop to rupture the screen - check and clean more frequently. (b) Fluid velocity too great. Use oversized strainer, or a restricting hand valve to reduce fluid flow.

#### Collapsed Screen Assembly:

- (a) Possibly caused by reverse flow through the strainer (avoid reverse flow and never open a hand valve downstream of a strainer before a valve upstream has been opened first).
- (b) Screen Assembly crushed during installation.

#### Dirt Passing Through Strainer:

- (a) Ruptured or collapsed screen assembly.
- (b) Spring #6 is broken or missing.
- (c) Fine dirt, less than several thousandths of an inch in size requires more frequent cleaning of the strainer or possible temporary insertion of R/S Filter Bag where applicable.

When used with R/S Control Valves, the strainer may be bolted directly to the inlet side of the valve to be protected. Standard R/S flange nuts and bolts is used to connect the strainer male outlet flange to the valve female inlet flange. Consequently, only one pair of R/S standard male companion flanges is needed for a close-coupled strainer and valve combination. Strainer must be installed in a horizontal line with the cover on the bottom.

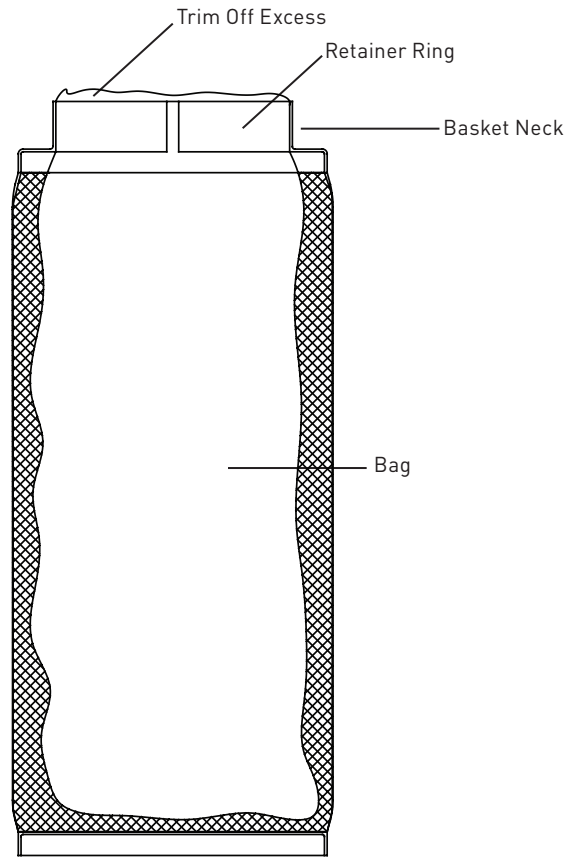
### INSTALLATION

Allow sufficient space below the Strainer Cover #3 (see page 1), to permit the Screen Assembly #2 to be removed for cleaning. If the strainer is insulated make sure the insulation can be easily removed to allow access to the strainer cover. Installation must be done according to all

applicable Safety Codes and Standards, and by personnel qualified to install refrigeration systems. Refrigerating Specialties Division control valves and strainers must be installed according to the specific valve's instructions, this bulletin, and generally known safe practices.

Allow proper space for installing the strainer, do not use the strainer to "stretch" or "align" the pipe. Using flange bolts to close a large gap can distort the strainer or at least stress it unduly, or the bolts may be damaged or stripped. For proper sealing the gaskets should be lightly oiled and all bolts must be tightened evenly. Make sure flange tongue and groove is properly aligned. Where necessary support the strainer by brackets or hangers to avoid pipe or valve overstressing.

Since most maintenance problems caused by dirt occur at the start-up of a system, it is advisable to delay insulating the control valves and strainers until the system has operated for several days. During that time the strainers should be checked for dirt and cleaned as necessary. During installation of strainer remove drain plug, pipe plug, #8 (see page 2) from cover and install a refrigerant drain valve.



**FIG. 7:** 3/4"-4" (20-100mm) Strainer Bag

**BOLT TORQUE TABLE**

| Flange Bolt |    | Port Size   |         | Torque  |      |
|-------------|----|-------------|---------|---------|------|
| inch        | mm | inch        | mm      | Ft. Lbs | mkg  |
| 7/16"       | 11 | 1/2"        | 13      | 28      | 3.9  |
| 5/8"        | 16 | 3/4" - 2"   | 20 - 50 | 85      | 11.8 |
| 3/4"        | 20 | 2-1/2" - 3" | 65 - 75 | 105     | 14.5 |
| 7/8"        | 22 | 4"          | 100     | 150     | 20.7 |

**FILTER BAG ASSEMBLY INSTRUCTIONS**

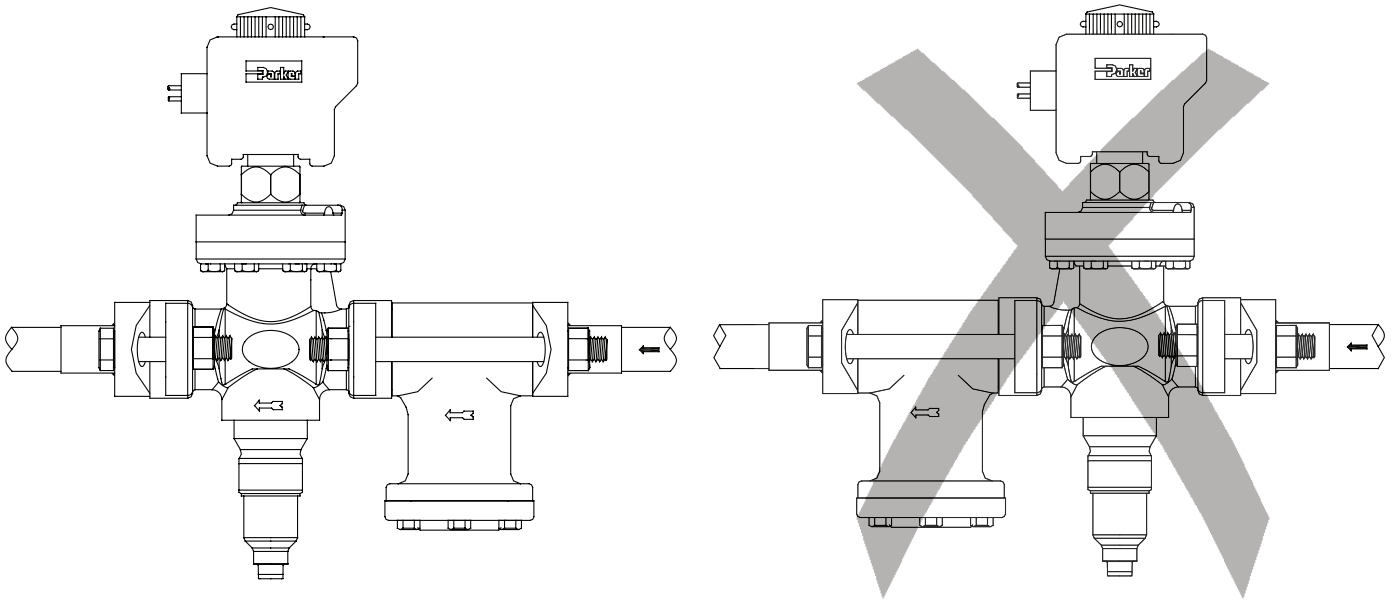
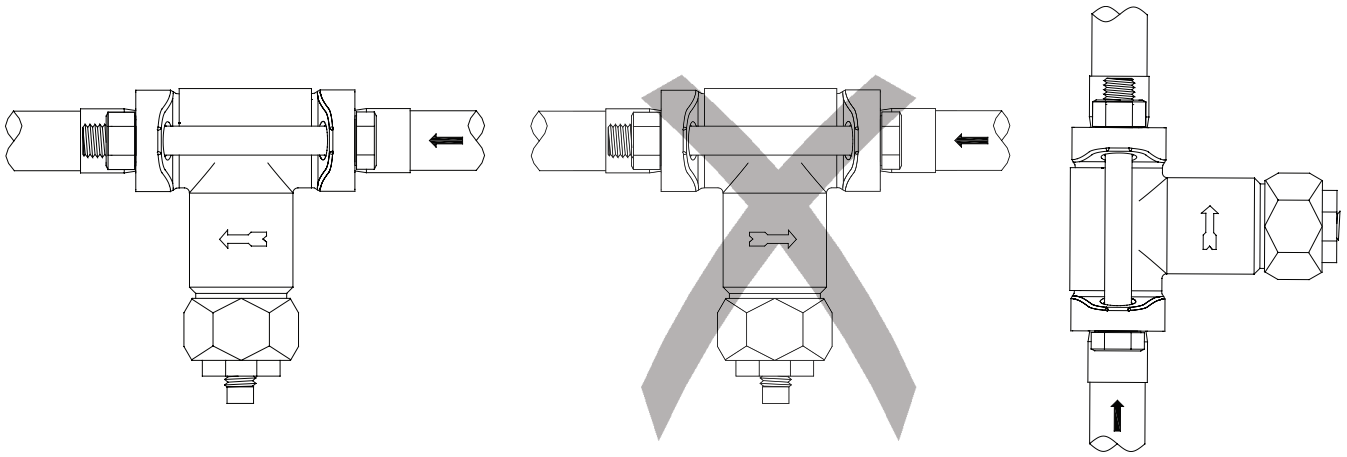
Assembling the 3/4" and 1" filters, support the strainer basket in your hand. The other sizes may be bench rested.

1. Insert bag into filter-basket, allowing a portion of the bag to extend out of the basket neck.
2. Place the retainer ring inside the open end of the bag.
3. Holding the retainer ring inside the top, open end of the bag, squeeze and insert band and ring into the neck of the filter.
4. Retainer ring must fit flush with top of basket neck.
5. Trim protruding bag material and discard.
6. Using a pencil, smooth out the bag inside the wire basket.

Bag should now be retained between retainer ring and basket neck inside diameter.

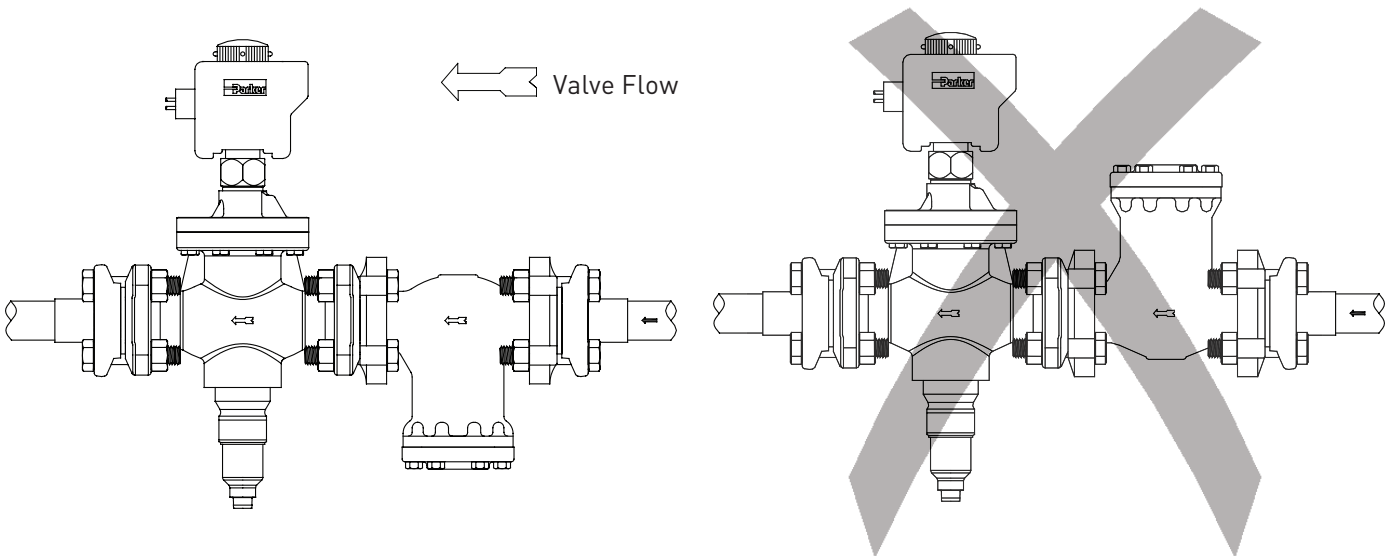
**FLOW COEFFICIENTS**

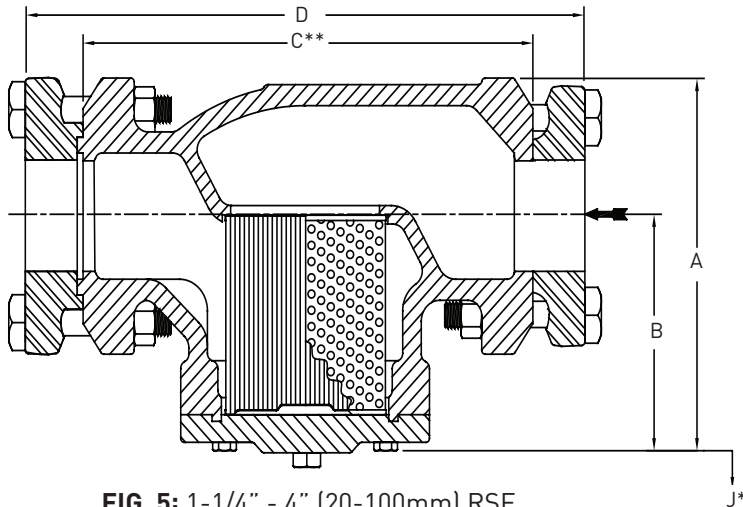
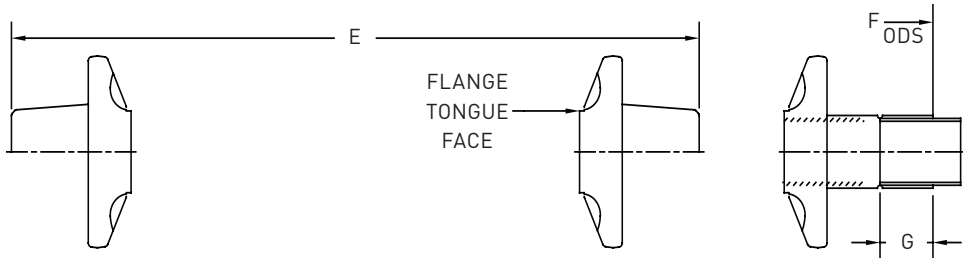
| Port Size |     | Type | C <sub>v</sub> | K <sub>v</sub> |
|-----------|-----|------|----------------|----------------|
| inch      | mm  |      |                |                |
| 1/2       | 13  | RSF  | 3              | 2.6            |
| 1         | 25  | RSF  | 9.4            | 8.1            |
| 1-1/4     | 32  | RSF  | 16.3           | 14             |
| 2         | 50  | RSF  | 67.7           | 58.2           |
| 2-1/2     | 65  | RSF  | 112            | 96             |
| 3         | 75  | RSF  | 112            | 96             |
| 4         | 100 | RSF  | 170            | 146            |



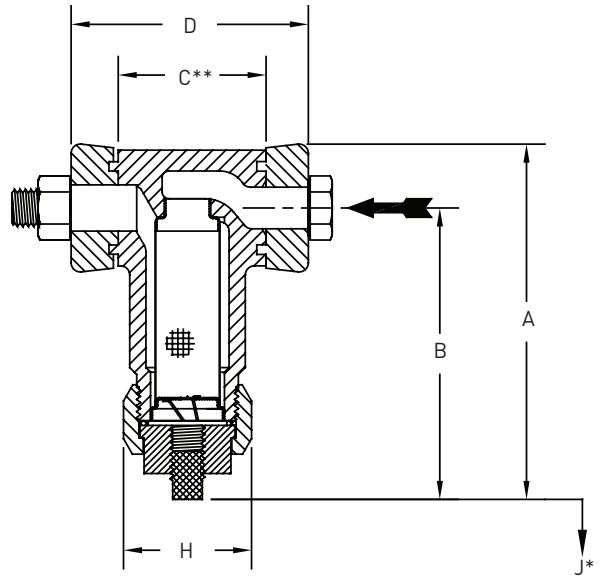
← Refrigerant Flow

⇐ Valve Flow





**FIG. 5:** 1-1/4" - 4" (20-100mm) RSF



**FIG. 6:** 1/2" (13mm) RSF

\* Space required for removal of strainer screen assembly

\*\* Distance from one flange face to the other. This is the space between the flanges in the line to allow the installation of the strainer.

**RSF DIMENSIONAL TABLE**

| Strainer Size |       | Valve Port Size |                   | A   |       | B   |      | C   |       | D (FPT, SW) |      | E (WN) |       | ODS SIZE | F (ODS) |       | G (ODS) |      | H   |      | J   |     |
|---------------|-------|-----------------|-------------------|-----|-------|-----|------|-----|-------|-------------|------|--------|-------|----------|---------|-------|---------|------|-----|------|-----|-----|
| mm            | in    | mm              | in                | mm  | in    | mm  | in   | mm  | in    | mm          | in   | mm     | in    | in       | mm      | in    | mm      | in   | mm  | in   | mm  | in  |
| 13            | 1/2   | 5<br>or<br>13   | 3/16<br>or<br>1/2 | 107 | 4.96  | 86  | 4.1  | 54  | 2.13  | 93          | 3.63 | 119    | 5.44  | 1/2      | 138     | 5.44  | 8.6     | 0.37 | 38  | 1.7  | 76  | 3.0 |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 5/8      | 145     | 5.69  | 13      | 0.5  |     |      |     |     |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 7/8      | 170     | 6.69  | 19      | 0.75 |     |      |     |     |
| 25            | 1     | 20<br>or<br>25  | 3/4<br>or<br>1    | 141 | 5.56  | 111 | 4.37 | 95  | 3.75  | 149         | 5.8  | 138    | 7.63  | 7/8      | 213     | 8.38  | 19      | 0.75 | 95  | 3.75 | 127 | 5.0 |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 1-1/8    | 219     | 8.63  | 23      | 0.9  |     |      |     |     |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 1-3/8    | 219     | 8.63  | 24      | 0.96 |     |      |     |     |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 1-5/8    | 229     | 9.03  | 29      | 1.15 |     |      |     |     |
| 32            | 1-1/4 | 32              | 1-1/4             | 181 | 7.12  | 127 | 5.0  | 175 | 6.8   | 227         | 8.9  | 283    | 11.16 | 1-3/8    | 295     | 11.63 | 23      | 0.96 | 95  | 3.75 | 127 | 5.0 |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 1-5/8    | 310     | 12.2  | 29      | 1.15 |     |      |     |     |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 2-1/8    | 340     | 13.4  | 34      | 1.34 |     |      |     |     |
| 50            | 2     | 40<br>or<br>50  | 1-5/8<br>or<br>2  | 195 | 7.68  | 124 | 4.87 | 248 | 9.75  | 305         | 12   | 380    | 14.5  | 1-5/8    | 403     | 15.9  | 29      | 1.15 | 133 | 5.25 | 127 | 5.0 |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 2-1/8    | 403     | 15.9  | 34      | 1.34 |     |      |     |     |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 2-5/8    | 418     | 16.44 | 37      | 1.47 |     |      |     |     |
| 65            | 2-1/2 | 65              | 2-1/2             | 229 | 9.0   | 145 | 5.69 | 311 | 12.25 | 378         | 14.8 | 448    | 17.64 | 2-5/8    | 492     | 19.03 | 37      | 1.47 | 170 | 6.69 | 127 | 5.0 |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 3-1/8    | 530     | 20.9  | 42      | 1.65 |     |      |     |     |
| 75            | 3     | 75              | 3                 | 229 | 9.0   | 145 | 5.69 | 311 | 12.25 | 378         | 14.8 | 448    | 17.64 | 3-1/8    | 530     | 20.9  | 42      | 1.65 | 170 | 6.69 | 127 | 5.0 |
|               |       |                 |                   |     |       |     |      |     |       |             |      |        |       | 3-5/8    | 537     | 21.13 | 48      | 1.9  |     |      |     |     |
| 100           | 4     | 100             | 4                 | 291 | 11.45 | 178 | 7    | 330 | 13    | 401         | 15.8 | 523    | 20.58 | 4-1/8    | 571     | 22.5  | 55      | 2.16 | 173 | 6.8  | 165 | 6.5 |

### **SAFE OPERATION (SEE BULLETIN RSBCV)**

People doing any work on a refrigeration system must be qualified and completely familiar with the system and the Refrigerating Specialties Division valves involved, or all other precautions will be meaningless. This includes reading and understanding pertinent Refrigerating Specialties Division product Bulletins and Safety Bulletin RSB prior to installation or servicing work.

Where cold refrigerant liquid lines are used, it is necessary that certain precautions be taken to avoid damage that could result from liquid expansion. Temperature increase in a piping section full of solid liquid will cause high pressure due to the expanding liquid that can possibly rupture a gasket, pipe or valve. All hand valves isolating such sections should be marked, warning against accidental closing, and must not be closed until the liquid is removed. Check valves must never be installed upstream of solenoid valves, or regulators with electric shut-off, nor should hand valve upstream of solenoid valves or downstream of check valves be close until the liquid has been removed. It is advisable to properly install relief devices in any section where liquid expansion could take place.

Avoid all piping or control arrangements that might produce thermal or pressure shock. For the protection of people and products, all refrigerant must be removed from the section to be worked on before a valve, strainer, or other device is opened or removed. Flanges with ODS connections are not suitable for ammonia service.

### **WARRANTY**

All Refrigerating Specialties products are warranted against defects in workmanship and materials for a period of one (1) year from date of shipment from originating factory. This warranty is in force only when products are properly installed, field assembled, maintained, and operated in use and service as specifically stated in Refrigerating Specialties catalogs or bulletins for normal refrigeration applications, unless otherwise approved in writing by Refrigerating Specialties Division. Defective products or parts of returned to the factory with transportation charges prepaid and found to be defective by factory inspection will be replaced or repaired at Refrigerating Specialties option, free of charge F.O.B. factory. Warranty does not cover products that have been altered or repaired in the field, damaged in transit as a result of accidents, misuse, or abuse. Products disabled by dirt or other foreign substances will not be considered defective.

**THE EXPRESS WARRANTY ABOVE CONSTITUTES THE ONLY WARRANTY OF REFRIGERATING SPECIALTIES PRODUCTS AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, WRITTEN OR ORAL, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.** In no event is Refrigerating Specialties responsible for any consequential damages of any nature whatsoever. No employee, agent, dealer or other person is authorized neither to give any warranties on behalf of Refrigerating Specialties nor to assume for Refrigerating Specialties any other liability in connection with any of its products.

