

System drawings shown in this bulletin are for illustration purposes only. Refrigeration systems should only be serviced by a qualified technician. Always observe proper safety procedures when servicing a refrigeration system. For more information see the latest revision of Phillips Safety Bulletin SGRV.

#### GENERAL INFORMATION

| Valve Model                                          | Temperature Rating              | Pressure Rating          |
|------------------------------------------------------|---------------------------------|--------------------------|
| 600D2, 600D3,<br>600JR, 600J, 600AJ,<br>600BJ, 600DJ | -20°F to 240°F (-29°C to 116°C) | 300 PSIG (21 bar, gauge) |
| 600K, 600AK                                          | -50°F to 240°F (-46°C to 116°C) | 600 PSIG (41 bar, gauge) |

H.A. Phillips & Co. offers a wide variety of flanged, normally closed, in-line disc-type check valves designed to prevent reverse flow in many refrigeration applications. These valves are summarized in Table 1 and illustrated in Figures 1 through 4. Many of these are directly interchangeable with Wolfe-Linde check valves. The 600D2 and 600D3 models feature metal-to-metal seats; all other check valves have PTFE-to-metal seats.

#### APPLICATION NOTES

All 600 Series check valves may be installed in either horizontal or vertical lines.

#### GRAVITY DRAIN

Note that, due to their low pressure drops, only the following valves are suitable for gravity-drain applications such as gas-driven recirculating and compressor protection systems:

|       |       |
|-------|-------|
| 600K  | 600AK |
| 600AJ | 600DJ |
| 600BJ | 600J  |

#### COMPRESSOR DISCHARGE

Disc-type check valves are **not recommended** for applications with highly variable flow, such as compressor discharge. For these applications, consider using the Phillips 700X Series piston-type check valves, described in Engineering Data Bulletin 700X.

Table 1: Valve Configurations

| Valve Model | Approx. ΔP to Open | Flange Size Avail. | Body Material           | Purge Line Conn. | Wolfe-Linde Ref.     |
|-------------|--------------------|--------------------|-------------------------|------------------|----------------------|
| 600D2       | 2 psid             | 1/2"<br>3/4"       | Machined Steel (Fig. 1) | -                | -                    |
| 600D3       | 2 psid             | 1"                 |                         | -                | -                    |
| 600JR       | <1 psid            | 1/2"<br>3/4"<br>1" | Cast Iron (Fig. 2)      | -                | 5970<br>5972<br>5974 |
| 600J        | <1 psid            | 1-1/4"<br>1-1/2"   |                         | -                | 5975<br>5976         |
| 600AJ       | <1 psid            | 1-1/2"<br>2"       |                         | -                | -<br>5978            |
| 600K        | < 0.2 psid         | 1"                 | Machined Steel (Fig. 3) | 1/4" FPT         | -                    |
| 600KS       | 2 psid             | 1-1/4"             |                         |                  | -                    |
| 600AK       | < 0.2 psid         | 1-1/2"             |                         |                  | -                    |
| 600AKS      | 2 psid             | 2"                 | Cast Iron (Fig. 4)      | 1/4" FPT         | -                    |
| 600BJ       | < 0.2 psid         | 3"                 |                         |                  | 5980                 |
| 600BJS      | 2 psid             | 4"                 |                         |                  | 5982                 |
| 600DJ       | < 0.2 psid         |                    |                         |                  |                      |
| 600DJS      | 2 psid             |                    |                         |                  |                      |

#### SERVICE INSTRUCTIONS

##### 600D2/D3

Refer to Figure 1 and Table 2. Remove valve piece (Item 3) by pulling out through the valve inlet, overcoming the friction of the O-Ring (Item 6). Apply O-Ring grease to the O-Ring before installing the new valve piece.

##### 600JR / J / AJ

Refer to Figure 2 and Table 2. Remove the back plate ring and back plate (Items 9 and 10). Install the new valve piece and spring.

##### 600K / KS / AK / AKS

Refer to Figure 3 and Table 2. Remove the guide piece (Item 2) by pulling out through the valve outlet, overcoming the friction of the O-Ring (Item 6). Apply O-Ring grease to the O-Ring before installing the new valve piece and spring. If removing the pipe plug (Item 13) and installing a new one, use pipe thread sealant and tighten to 60 ft-lbs torque.

##### 600BJ / BJS / DJ / DJS

Refer to Figure 4 and Table 2. Remove the back plate ring and back plate (Items 9 and 10). Install the new valve piece and spring. If removing the pipe plug (Item 13) and installing a new one, use pipe thread sealant and tighten 60 ft-lbs torque.

Figure 1: 600D2, 600D3

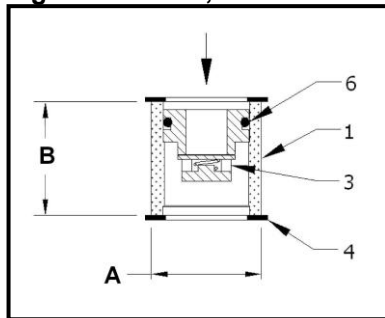


Figure 2: 600JR, 600J, 600AJ

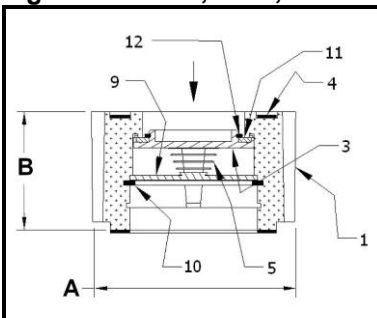


Figure 3: 600K, 600AK

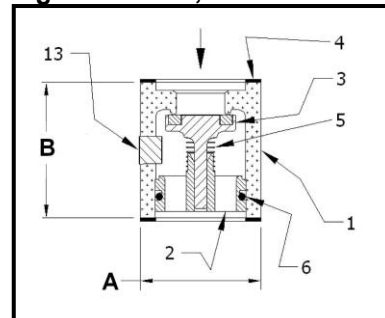


Table 3: Dimensions (in.)

| Valve Number | Figure Number | Flanged Connection** | Outside Diameter A | Height Less Flanges B | Height with Flanges | Orifice Size | Flange Type | Weight (lbs) |
|--------------|---------------|----------------------|--------------------|-----------------------|---------------------|--------------|-------------|--------------|
| 600D2        | 1             | 1/2, 3/4             | 1.69               | 1.75                  | 3.50                | 5/8          | Oval        | 4.0          |
| 600D3        | 1             | 1                    | 2.06               | 2.38                  | 4.13                | 7/8          | Oval        | 5.5          |
| 600JR        | 2             | 1/2, 3/4, 1          | 2.31               | 1.56                  | 3.31                | 1            | Oval        | 5.0          |
| 600J         | 2             | 1-1/4, 1-1/2         | 3.25               | 2.03                  | 4.06                | 1-1/2        | Square      | 10.0         |
| 600AJ        | 2             | 1-1/2, 2             | 4.00               | 2.31                  | 4.44                | 2            | Square      | 12.0         |
| 600K*        | 3             | 1, 1-1/4             | 2.38               | 2.63                  | 4.63                | 1-5/16       | Square      | 7.0          |
| 600AK*       | 3             | 1-1/2, 2             | 3.25               | 3.33                  | 5.46                | 1-9/16       | Square      | 10.5         |
| 600BJ*       | 4             | 3                    | 5.63               | 3.50                  | 6.50                | 3            | Square      | 30.0         |
| 600DJ*       | 4             | 4                    | 7.13               | 4.19                  | 7.82                | 4            | Square      | 45.0         |

All dimensions in inches

\*If ordered with suffix "S," the valve will be supplied with a heavy spring (not suitable for gravity- drain).

\*\*Only these valves have the 1/4" FPT purge connection.

\*\*Flanges may be available in socket weld, weld neck, FPT, or ODC configurations, depending on size.

Figure 4: 600BJ, 600DJ

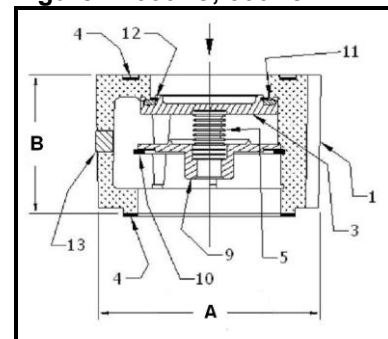


Table 2: Replacement Parts

| Item No. | Description                     | 600D2 (Fig. 1) | 600D3 (Fig. 1) | 600JR (Fig. 2) | 600J (Fig. 2) | 600AJ (Fig. 2) | 600K† (Fig. 3) | 600AK† (Fig. 3) | 600BJ† (Fig. 4) | 600DJ† (Fig. 4) |
|----------|---------------------------------|----------------|----------------|----------------|---------------|----------------|----------------|-----------------|-----------------|-----------------|
| 1        | Valve Body                      | 600D2-1        | 600D3-1        | 600JR-VB       | 600J-VB       | 600AJ-VB       | 600K-VB        | 600AK-VB        | 600BJ-VB        | 600DJ-VB        |
| 2        | Guide Piece                     | -              | -              | -              | -             | -              | 602K           | 602AK           | -               | -               |
| 3        | Valve Piece*                    | 600D2-2        | 600D3-2        | 604JR          | 604J          | 604AJ          | 604            | 604A            | 604BJ           | 604DJ           |
| 4        | Gasket* (2)                     | 728            | 723            | 626            | 63W           | 73             | 63             | 73              | 326Y            | 326YA           |
| 5        | Spring*                         | Light          | -              | 605JR          | 605AJ         | 605AJ          | 477K           | 605A4           | 605BJ           | 605DJ           |
|          |                                 | Heavy          | -              | -              | -             | -              | 477-1          | 605A1           | 605BJS          | 605DJS          |
| 6        | O-Ring*                         | 11-215         | 11-222         | -              | -             | -              | 11-222         | 11-229          | -               | -               |
| 7        | Flange Bolt (4)                 | 72C**          | 72E**          | 72C**          | 721A          | 72E            | 721L           | 726C            | 24B             | 24C             |
| 8        | Flange Nut (4)                  | 58             | 58             | 58             | 57            | 58             | 57             | 58              | 59              | 60              |
| 9        | Back Plate                      | -              | -              | 602JR          | 602J          | 602AJ          | -              | -               | 602BJ           | 602DJ           |
| 10       | Back Plate Ring                 | -              | -              | 608JR          | 608J          | 608AJ          | -              | -               | 608BJ           | 608DJ           |
| 11       | PTFE Ring                       | -              | -              | 603JR          | 603J          | 603AJ          | -              | -               | 603BJ           | 603DJ           |
| 12       | Snap Ring                       | -              | -              | 601JR          | 601J          | 601AJ          | -              | -               | 601BJ           | 601DJ           |
| 13       | Pipe Plug                       | -              | -              | -              | -             | -              | 12             | 12              | 12              | 12              |
| -        | *Service Kit (Items 3, 4, 5, 6) | -              | -              | K600JR         | K600J         | K600AJ         | K600 K600S     | K600A K600AS    | K600BJ K600BJS  | K600DJ K600DJS  |

\*\*Only 2 bolts and nuts

†If ordered with suffix "S," the valve will be supplied with a heavy spring (not suitable for gravity-drain).

†Only these valves have the 1/4" FPT purge connection.

H. A. Phillips & Co.  
770 Enterprise Avenue  
DeKalb, IL 60115 U.S.A.  
Phone: (630) 377-0050

