

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

Pressure Rating: 300 psig (21 bar, gauge)

Temperature Rating: -20°F to 240°F
(-29°C to 116°C)

The 700H Series valves are flanged piston-type modulating valves used for ammonia and halocarbon applications. Valves in this series include the 700JRH, 700XH, 700AXH and 700BXH. If the valve is applied to a halocarbon system, the suffix "F" is applied to the valve designation (example: 700JRHF).

The 700H is controlled by a separate 275AP pilot float valve, typically to maintain a desired liquid level in a vertical condenser drain line or high pressure vessel. When the 275AP float valve is open (indicating a low liquid level), the PTFE seat disc on the 700H piston is held closed against the valve seat by the combination of an internal spring and pressure signal sent by the 275AP. (Figure 1A) When the 275AP is closed (indicating a high liquid level) the pressure above the 700H piston bleeds downstream through an orifice, and the pressure of the upstream flow pushes the piston off the valve seat. (Figure 1B) The 700XH valve will modulate between fully open and closed, based on the condition of the 275AP. Note that flow through the valve is upward, through the valve port.

The manual opening stem must be screwed outward for the valve to close completely.

INSTALLATION INSTRUCTIONS

Figure 2 shows schematically a typical installation on a condenser drain. Several important features should be noted.

- Flow through the 700H valve should always be upward through the valve port. (See Figure 1)
- The pilot line MUST be either 3/8" OD copper tubing (halocarbon applications) or 1/4" nominal pipe (halocarbon or ammonia applications).
- The pilot line should include a shut-off valve, pressure gauge and gauge valve for diagnostics. (See Troubleshooting section, pages 3 & 4)
- The 275AP float valve should be at least 18 in. above the 700H valve.
- Any reduction in the condenser drain line should be located below the 275AP, after the elbow turns the flow horizontal.
- A strainer upstream of the 700H will help ensure long, dependable service. See Table 1 for matching strainers.
- Always install in a horizontal pipe line with the pilot line port pointing up.

Figure 1: Valve Operation

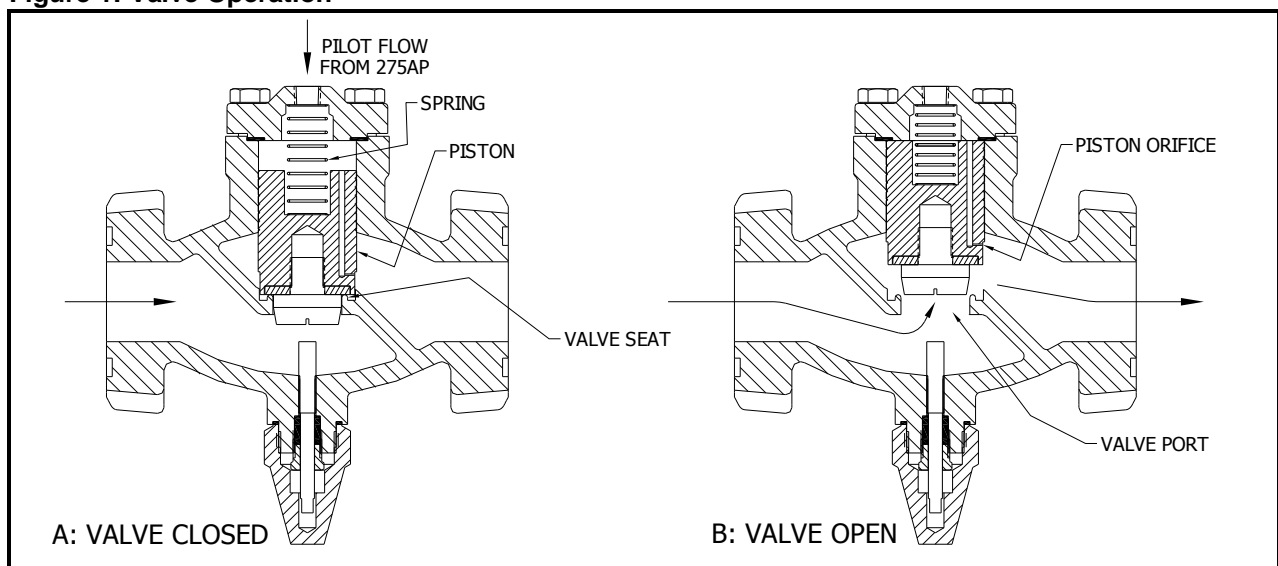


Figure 2: Typical Installation

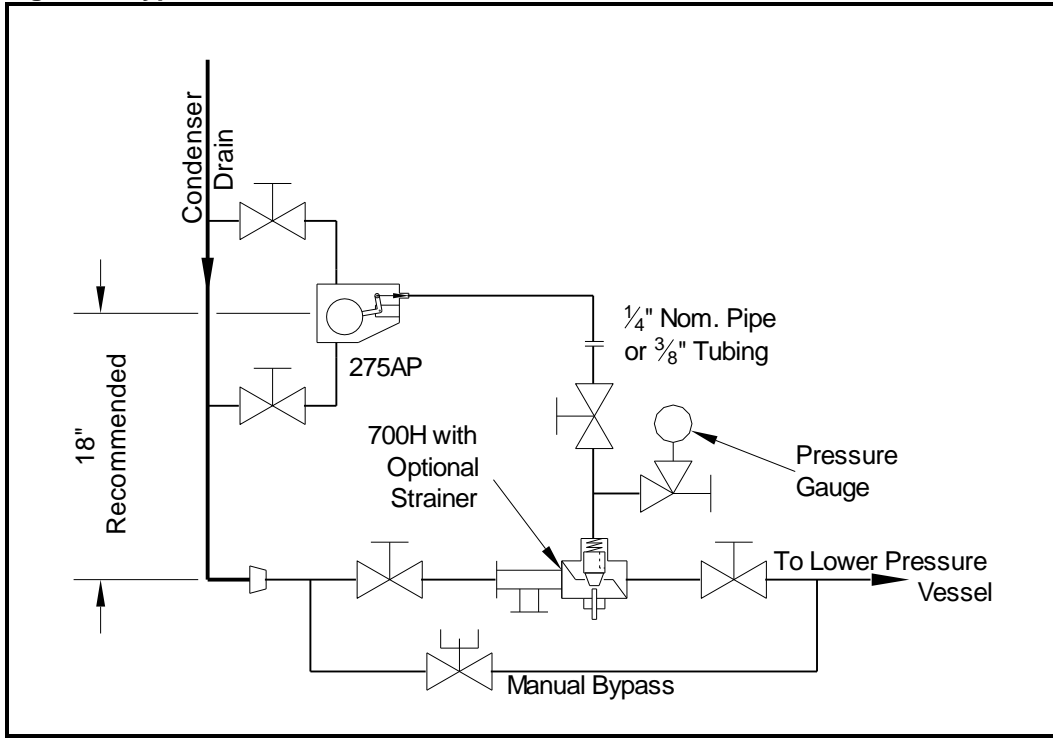
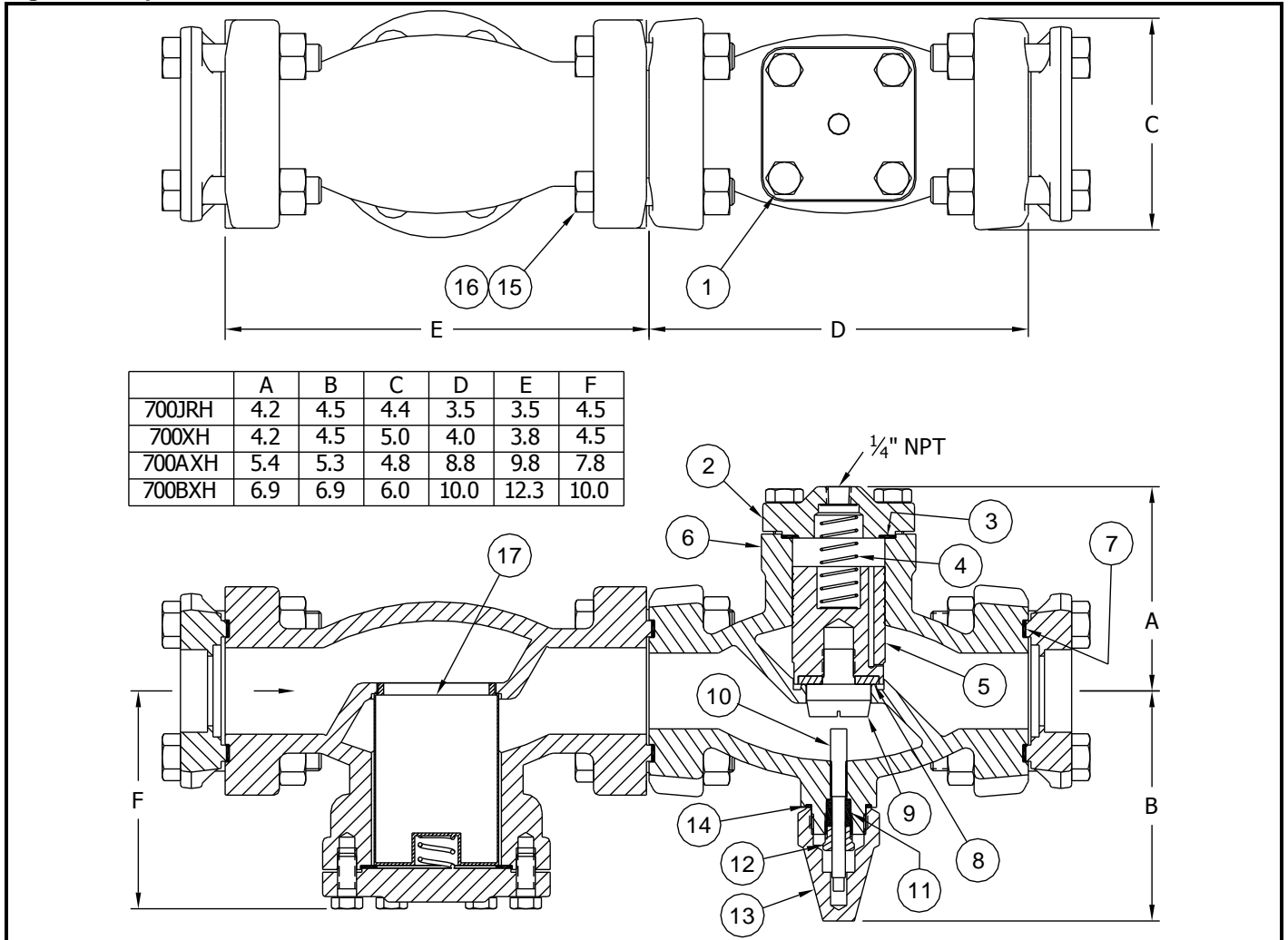


Figure 3: Replacement Parts and Dimensions



REPLACEMENT PARTS

When contacting Phillips for replacement parts, have the complete valve model and serial number (See Figure 4 Valve Nameplate) available to ensure you receive the correct components. For example: “700JRHF-ZEDDA” is a complete valve model, and “990123” or “E-12345” are complete serial numbers.

Figure 4: Valve Nameplate

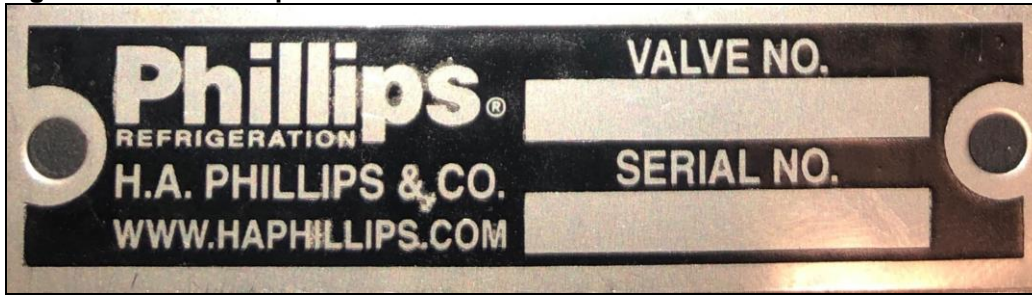


Table 1: Replacement Parts

Item #	Description	700JRH	700XH	700AXH	700BXH
1	Bonnet Screw	577 (4)	577 (4)	718 (4)	1459 (4)
2	Bonnet	702JRS	702S	702AS	702BS
3	Bonnet Gasket*	710	710	710A	710B
4	Spring	See Valves & Accessories Book – High Side Controls Section or Consult Factory			
5	Piston	700-4JRH	700-4XH	700-4AXH	700-4BXH
6	Valve Body	700JRF-VB	700F-VB	700AF-VB	700BXF-VB
7	Flange Gasket*	506 (2)	725N (2)	73 (2)	326Y (2)
8	Seat Disc*	703	700-3X	700-3AX	700-3BX
9	Metering Plug	Consult Factory			
10	Manual Stem	711XS	711XS	711X	711B
11	Packing Ring	775	775	775	777BN
12	Gland	8	8	8	8B
13	Seal Cap	714	714	714	714B
14	Seal Cap Gasket	720	720	720	720B
15	Flange Bolt	Valve without Strainer: 726B (2)	Valve without Strainer: 726 (2)	Valve without Strainer: 23 (8)	Valve without Strainer: 24A (8)
		Valve with Strainer: 726D (2)	Valve with Strainer: 726E (2)	Valve with Strainer: 23 (12)	Valve with Strainer: 24A (12)
16	Flange Nut	Valve without Strainer: 58 (2)	Valve without Strainer: 58 (2)	Valve without Strainer: 58 (8)	Valve without Strainer: 59 (8)
		Valve with Strainer: 58 (2)	Valve with Strainer: 58 (2)	Valve with Strainer: 58 (12)	Valve with Strainer: 59 (12)
-	Strainer	S701JRP	S701	S701A	S701B
17	Strainer Kit (Includes Filter Element & Gasket)	S701JR-SA	S701-SA	S701A-SA	S701B-SA
-	*Spare Parts Kit (Includes Items 3, 7, 8)	K700JR	K700X	K700AX	K700BX

SERVICE INSTRUCTIONS

The metering plug is threaded tightly into the piston and secured with thread locking compound. Be careful not to damage the piston surface when replacing a metering plug. Always use thread locking compound when installing the replacement plug. If the piston needs replacing, we advise you to order a new seat disc and metering plug as well. These parts can be assembled in our factory before shipment upon request.

TROUBLESHOOTING

Always be sure flow through the valve is in the proper direction. An arrow is affixed to each valve at the time it is manufactured. This arrow may not be visible in all installations. To ensure the 700H is installed properly, note the following.

- Flow through the 700H valve should always be upward through the valve port. (See Figure 1)
- Contact Phillips if you are unsure which direction the valve is supposed to be installed

Poor Liquid Level Control:

Many problems with the operation of the pilot-operated 700H should be diagnosed in conjunction with the 275AP pilot. Figure 2 shows schematically how these valves operate together.

As the liquid level rises in the 275AP float chamber, the float ball rises and an internal needle shuts off flow to the top of the 700H. The pressure above the 700H piston drops and the piston rises due to higher pressure underneath, opening the valve port and allowing flow. Conversely, as the liquid level drops, the 275AP opens and pressure above the piston rises, closing the 700H port with spring assist.

A pressure gauge in the pilot line is required to diagnose operating problems. To identify the cause of a problem, match the liquid condition (high or low) with the pressure gauge reading (condensing or downstream pressure) and note the possible causes given in Table 2.

Valve Chatters: Chattering, banging and/or general vibrations can be caused by an over-sized metering plug opening and closing rapidly in an attempt to satisfy a low refrigeration load. Consider using a smaller capacity plug.

Broken Spring: A broken spring in a 700H valve that is less than a few years old can also indicate an over-sized metering plug. Continual, rapid opening and closing to satisfy a small load will fatigue the spring. When replacing the spring, also consider replacing the metering plug with one having a smaller capacity.

Table 2: Troubleshooting the 275AP & 700H

		Pressure Gauge reads:	
		Approximately Downstream Pressure	Approximately Condensing Pressure
Condenser Liquid Level is:	T o o h i g h	<p>The pressure indicates that the 275AP is closed (as it should be). Therefore the 700H may be closed due to a malfunction.</p> <p>Check if the 700H is stuck partially or completely closed by dirt/debris, or if the strainer is blocked.</p> <p>Other possibilities: Operating conditions may have changed so that (1) The 700H cannot open fully due to too-strong spring, or (2) the 700H metering plug does not have sufficient capacity. Contact Phillips to resolve these issues.</p>	<p>The pressure indicates the 275AP is open (it is supposed to be closed). Therefore the 700H is being signaled to close inappropriately.</p> <p>Check if 275AP float is stuck in low (open) position, or if dirt/debris is keeping the needle from seating. See 275AP Service Bulletin to resolve the problem.</p> <p>Other possibilities: The 700H is installed backward. See Figure 1.</p>
	T o o l o w	<p>The pressure indicates the 275AP is closed (it is supposed to be open). Therefore the 700H is being signaled to open inappropriately.</p> <p>Check if the 275AP is stuck in the closed position. See 275AP Service Bulletin to resolve the problem.</p>	<p>The pressure level indicates the 275AP is open (as it should be). Therefore the 700H is open due to malfunction.</p> <p>Check if the 700H is stuck partially or completely open by dirt/debris, or the spring may have broken.</p> <p>Other possibilities: (1) The manual opening stem is partly screwed inward. (2) The 700H piston or body may have worn, permitting blow-by that prevents the pressure above piston from rising sufficiently to close the valve. (3) Operating conditions may have changed so that the 275AP does not have sufficient capacity to close the 700H. Contact Phillips to resolve these issues.</p>

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