



4" Model A Dry Pipe Valve Flange x Groove

GENERAL DESCRIPTION

The Star Model A Dry Pipe Valve is uniquely designed to be the easiest dry pipe valve to set up and maintain now available. The special clapper assembly allows vital parts, including the air/water seat diaphragm, to swing outside the valve for inspection and service, saving time and labor during set up and subsequent service. The Star Model A Dry Pipe Valve is the only dry valve on the market with a field-replaceable air and water seat.

OPERATION

The Star Model A Dry Pipe Valve is a "differential clapper" type. This design utilizes a moderate sprinkler system air pressure to restrain a much greater water supply pressure. The ratio between the system water pressure and air pressure, called the "differential," is approximately 5.5 to 1. The ratio determines the value to which the air pressure must drop (trip pressure) in order for the valve to operate at a given water supply pressure. When the system air pressure is reduced due to the operation of a sprinkler, the clapper rises, exposing the water supply pressure to the full area of the clapper and opening the valve with rapid action. A latch on the clapper then prevents the clapper from closing and provides an unobstructed flow of water through the valve.

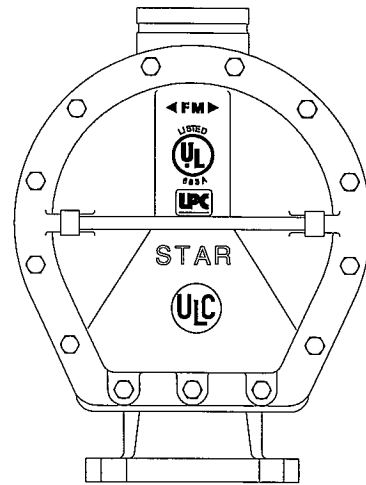
To prevent premature operation due to water surges in the supply line, the air line pressure is maintained at 20 psi higher than the 5.5 to 1 ratio. (For example, if the supply pressure were 100 psi, normal air pressure due to the ratio would be 20 psi. Adding an additional 20 psi to the 20 psi air pressure would result in 40 psi normal system pressure.) Normal system pressure should be maintained at all times.

APPROVALS

The Star Model A Dry Pipe Valve is UL and ULC listed; FM, LPC, and NYC (273-74-SA) approved.

INSTALLATION

Install in accordance with NFPA requirements for dry systems and all other applicable NFPA requirements.



#1086 Model A - Flange x Groove

SET UP AND RESETTING VALVE

1. Close the main gate valve controlling the water supply to the dry pipe valve.
2. Open 1" main drain valve (A, Fig. 1) and drain system. Open all drain valves or plugs at low points throughout the system, and close them when water has stopped flowing.

WARNING

Do not remove all cover bolts at once. When servicing valve, leave two (2) loose bolts in the cover until no air or water pressure remains in the system. This will also ensure that the cover will not blow off or fall, which could cause injury or damage.

3. Remove valve cover and rotate clapper assembly outward. Carefully clean the interior of the valve, especially the water and air seat surfaces, and clean all surfaces of the rubber diaphragm with a clean cloth. If necessary, replace clapper diaphragm.

WARNING

Never apply grease, tallow, or any oily substance to the molded rubber clapper diaphragm or cover gasket.

4. Rotate clapper to the set position, taking care to ensure that the clapper seats completely down on seat rings and is not caught on the lowest latch point.
5. Replace rubber cover gasket and valve cover. Tighten bolts and nuts uniformly and securely.
6. Open priming water level control valve (E, Fig. 1).

7. Open priming valve (F, Fig. 1); pour water into fill cup until water flows from the outlet of valve E; then close valve F tightly.
8. Tightly close valve E when water ceases to flow from its outlet.
9. Open air supply valve (R, Fig. 1) and allow a few points of air pressure to enter the system. This will be indicated on air gauge (P, Fig. 1).
10. Open system drain valves one at a time, as in step 2, to force water from low points of the system. Close these valves when dry air appears.
11. Open valve R and admit sufficient air pressure into the system to hold the dry pipe valve closed. Air pressure should be maintained within the following limits:

Maximum Water Pressure	Air Pressure Range
50	28-30
75	32-35
100	36-40
125	39-45
150	43-50
175	47-55

After air pressure has remained at the prescribed limit for a few minutes, inspect the velocity drip check valve (H, Fig. 1). If no leak occurs, air seal is tight. (If leak occurs, see the section on leaks under "Maintenance.")

12. Fully open valve A and then very carefully slightly open the main water supply valve (not shown). Slowly close valve A until water pressure on water gauge (N, Fig. 1) reaches maximum pressure.
13. Inspect velocity drip check valve H. If no leak occurs, air and water seats are tight. (If leak occurs, see the section on leaks under "Maintenance.") Open the main water supply valve slowly and fully.
14. Open bell valve (K, Fig. 1) to the wide open position. This valve should be sealed in the open position to permit water flow to alarms.

TESTING

Please refer to NFPA publications for recommendations on testing frequency and procedures. Also, refer to applicable NFPA standards for recommendations regarding testing of all electrical components of system.

Before conducting any test involving water flow, certain precautions must be taken:

1. **Weather Conditions:** Tests involving water flow should not be conducted during periods of freezing weather.

2. **Give Notice:** If system is connected to a central station or fire department, notify them before testing.
3. **Check Location:** Be sure test water discharge will not cause property damage or injury.
4. **Check for Obstructions:** Check drain piping for obstructions. To obtain a satisfactory test result, there must be an unobstructed flow of water when the valve (A, Fig. 1) is fully opened.

Testing Water Flow Alarm Devices

The water motor alarm and/or the alarm pressure switch are tested by opening the alarm test valve (L, Fig. 1). This releases water into the alarm line which should activate the alarm. Close this valve tightly when testing has been completed.

If the water motor alarm is sluggish or does not sound at all, remove and inspect the strainer screen. Remove plug from the strainer (33, Fig. 1), clear the strainer screen and body of all foreign matter, and retest.

Drainage of the alarm piping after testing occurs automatically through a small hole in the clapper of the check valve (B, Fig. 1).

Main Drain Test

1. With the main drain valve (A, Fig. 1) closed, record the reading on the gauge (N, Fig. 1).
2. Slowly open the main drain valve until it is fully open. A full steady flow of water should be discharging from the drain.
3. Allow the water pressure gauge to stabilize and then record the reading.
4. Slowly close the main drain valve.
5. Compare both readings with previously recorded or normal readings. (If this was the first test conducted, record and save readings for future reference.)

If recorded readings vary from previous readings, the cause should be determined.

Troubleshooting

Some possible causes for abnormal readings:

1. Partially or totally closed system control valves.
2. Clogged or frozen water mains.
3. Serious leaks at valves or mains.

Trip Testing Valve

There are two method of trip testing the Model A Dry Pipe Valve. One method is the *partial flow test*, in which the valve is tested for function without the full flow of water into the system. This test should be conducted annually. The second method is the *full flow test*, in which the function of the complete system is tested. This test should be conducted at least once every three years. The two methods are outlined below.

Note: Conduct a main drain test before any trip testing to flush any scale or foreign material from piping.

Trip Test - Partial Flow

1. Close the system control valve. Reopen valve slightly to provide enough pressure to raise the clapper to the latched position when the valve is tripped.
2. Open valve (E, Fig. 1) and allow air to discharge from system piping. Observe air pressure gauge (P, Fig. 1) and record the pressure at which the valve trips.
3. When valve trips, quickly close the system control valve and open the main drain valve (A).
4. Reset the valve following the instructions given under "Set Up and Resetting Valve."

Trip Test - Full Flow

This test requires a timing devise that displays time in seconds.

1. Open system inspector's test valve (not shown), and start the timing device. Observe and record the time required for full flow of water to reach inspector's test valve.
2. When full flow is observed, close the system control valve and open the main drain valve (A).
3. Restore system to service following the instructions given under "Set Up and Resetting Valve." Compare readings obtained during trip testing with previously recorded or normal readings. (If this was the first test conducted, record and save readings for future reference.)

If recorded readings vary from previous readings, the cause should be determined.

Troubleshooting

Some possible causes for abnormal readings:

1. Lower or higher air pressure in system than previously recorded.
2. Lower or higher supply water pressure than previously recorded.
3. Malfunctioning quick opening device (if installed).

MAINTENANCE AND SERVICE

Water Supply

All requirements of NFPA standards must be met. All valves controlling water supply to the dry pipe valve should be fully open and locked or sealed in that position. All control valves should be examined at least once a week, to ensure that they are open.

Air Supply

Air pressure on the dry pipe system should be checked each week to ensure that normal pressure is being maintained.

Priming Water Level - Check and Adjust

The priming water should be inspected quarterly and maintained at the proper level above the dry pipe seat.

To check priming water level, close the valve controlling the water supply to the dry pipe valve and draw off system water pressure by opening the drain valve (A, Fig. 1), then open valve E (Fig. 1). If water flows, draw water off slowly; close valve E after flow ceases.

If no water flows into drip cup, bleed air pressure from system through valve E. Add priming water to correct level and reset system according to steps 8 through 13 under "Set Up and Resetting Valve."

Each time the valve is opened for service, the seat ring nuts (15, Fig.3) should be checked and torqued to 10 ft-lb.

In cold weather, the valve enclosure should be properly heated to a minimum of 40F (5°C) and the heating equipment kept in safe and working order.

All low points in the dry pipe system should be drained periodically to remove any accumulation of water due to condensation.

Occasionally, push the plunger on the velocity drip check valve (H, Fig. 1) to ensure that the check ball is free and no water has accumulated in the intermediate chamber of the dry pipe valve.

Leaks

Water leaking from the velocity drip check indicates a leak at either the water and/or the air seat. To service, perform steps 1-3 under "Set Up and Resetting Valve." Inspect clapper diaphragm for cuts or surface defects. Also inspect air and water seat rings for nicks or defects. Check torque of seat ring nuts and tighten as needed. If no defects are found, reset the valve following steps 4-14 under "Set Up and Resetting Valve."

If the leak recurs, replace the clapper diaphragm. If valve continues to leak, replace the seat ring.

(continued on page 5)

NOTICE

Where difficulty in performance is experienced, the manufacturer or the manufacturer's authorized representative shall be contacted if any field adjustment is to be made.

Connection Legend	
Connection No.	Description
C1	Main Drain
C2	To System Air Supply
C3	To Water Motor Alarm

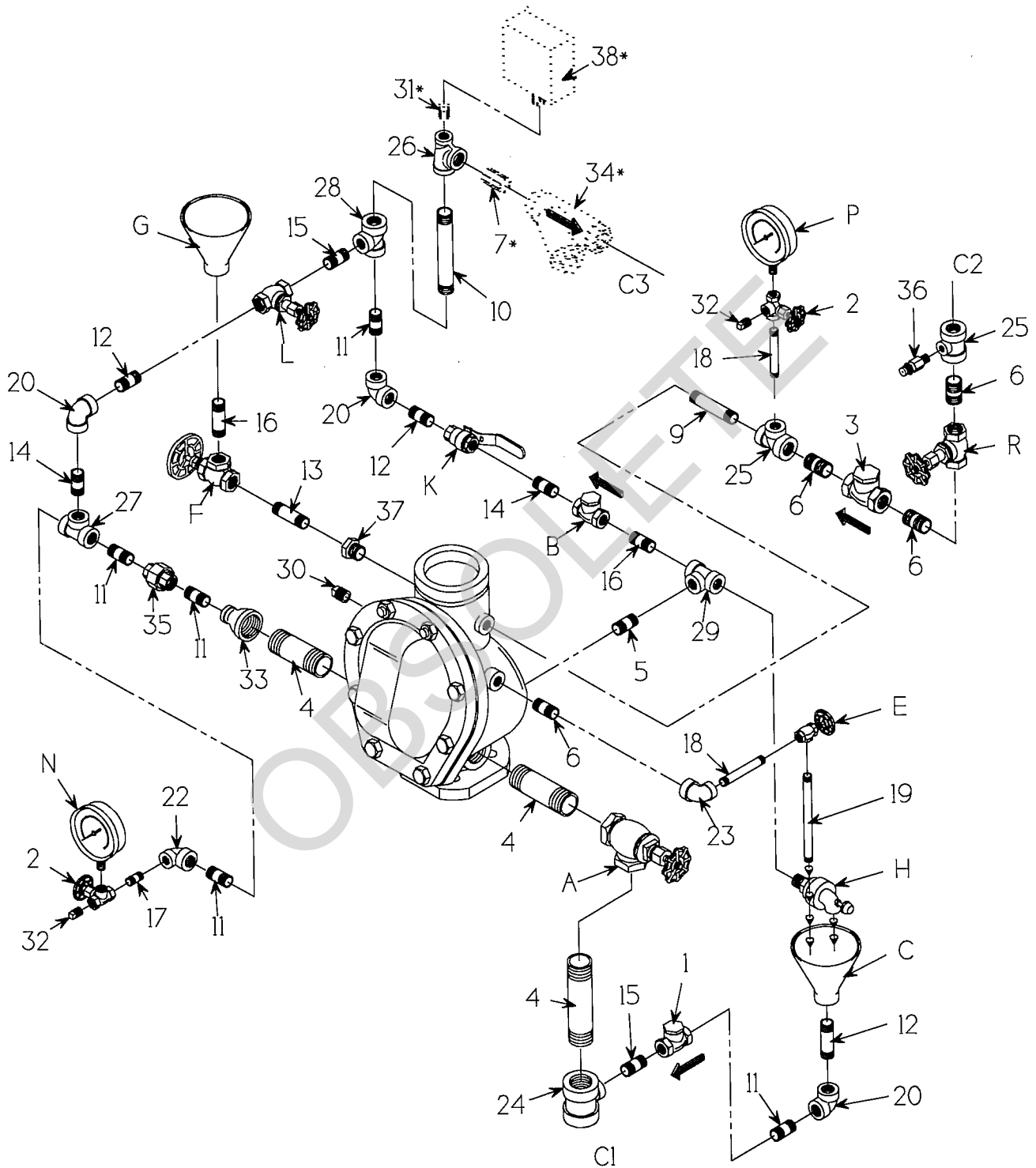


Figure 1 - 4" Model A Dry Pipe Valve Trim Diagram (P.N. 1206)

Trim List - 4" Dry Pipe Valve (Part No. 1206)

Item	Qty.	Part No.	Description
A	1	1186-3	2" Bronze Angle Valve
B	1	1189-1	1/2" Bronze Check Valve with 1/8" Hole
C	1	1295	Drip Cup
E	1	1186-4	1/4" Bronze Angle Valve
F	1	1186-5	1/2" Bronze Angle Valve
G	1	1295	Priming Cup
H	1	1133-1	1/2" Velocity Drip Check
K	1	1190-1	1/2" Bronze Ball Valve
L	1	1188-2	1/2" Bronze Globe Valve
N	1	1192-1	Water Gauge
P	1	1192-1	Air Gauge
R	1	1188-3	3/4" Bronze Globe Valve
1	1	1187-2	1/2" Bronze Swing Check Valve
2	2	1191-1	1/4" Bronze 3-Way Valve
3	1	1187-1	3/4" Bronze Swing Check Valve
4	3	1194-3	2" x 4" Nipple
5	1	1204-1	1" x Close Nipple
6	4	1195-3	3/4" x Close Nipple
*7	1	1195-6	3/4" x Close Galvanized Nipple
9	1	1195-14	3/4" x 4" Nipple
10	1	1195-15	3/4" x 8-1/2" Nipple
11	5	1196-1	1/2" x Close Nipple
12	3	1196-3	1/2" x 1-1/2" Nipple
13	1	1196-4	1/2" x 2" Nipple
14	2	1196-2	1/2" x 2-1/2" Nipple
15	2	1196-7	1/2" x 3" Nipple
16	2	1196-5	1/2" x 4" Nipple
17	1	1197-4	1/4" x Close Nipple
18	2	1197-6	1/4" x 5" Nipple
19	1	1197-11	1/2" x 7-1/2" Nipple
20	3	1198-2	1/2" Elbow
22	1	1043-1	1/2" x 1/4" Reducing Elbow
23	1	1043-4	3/4" x 1/4" Reducing Elbow
24	1	1113-1	2" x 2" x 1/2" Reducing Tee
25	2	1113-10	3/4" x 3/4" x 1/4" Reducing Tee
26	1	1113-11	3/4" x 1/2" x 3/4" Red. Tee Galv.
27	1	1199-2	1/2" Tee
28	1	1113-4	3/4" x 1/2" x 1/2" Reducing Tee
29	1	1113-13	1/2" x 1/2" x 1/2" Tee
30	1	1203-3	3/4" Pipe Plug
*31	1	1203-4	1/2" Pipe Plug Galvanized
32	2	1203-1	1/4" Pipe Plug
33	1	1202-5	2" x 1/2" Reducing Coupler
*34	1	1193-1	3/4" Y Strainer
35	1	1201-2	1/2" Union
36	1	1291-1	1/4" Relief Valve
37	1	1200-5	3/4" x 1/2" Hex. Red. Bushing
*38	1	1259-71	Alarm Pressure Switch (optional)

*Shown for information only. Not a part of standard trim.

Operating Tests

Operating tests of dry pipe valves, including any quick opening devices, should be made following NFPA guidelines. This work should be done by a qualified person with the approval of or under the observation of the authority having jurisdiction.

At the time of such tests, the valve should be thoroughly cleaned and properly reset. Perform any necessary service, such as renewing rubber parts, adjusting gauges and alarm devices, or connecting piping and quick opening devices.

Quick Opening Devices

The operation of quick opening devices can be tested either with or without operating the dry pipe valve itself. The manufacturer's instructions for testing, repairing, and resetting should be followed carefully.

Water Flow Alarm Devices

Water flow alarm devices should be tested at regular intervals. The ball valve controlling the flow of water to the alarm device should be sealed in the open position.

WARNING

After testing or servicing is completed, ensure that all valves controlling the system water supplies are open and locked or sealed for normal operation.

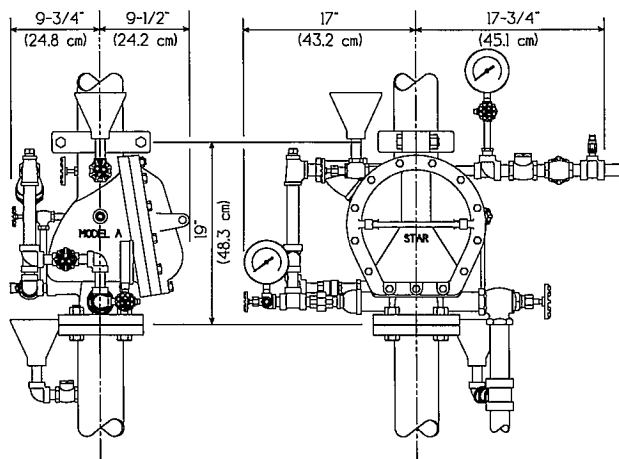


Figure 2 - Installation Dimensions

Parts List - 4" Model A Dry Pipe Valve (P.N. 1086)

Item	Qty.	Part No.	Description
1	1	1039	Valve Body
2	1	1045	Valve Cover
3	1	1003-4	Clapper Arm
*4	1	1147-20	Seat "O-Ring" Gasket, Inner
5	1	1052-01	Air and Water Seat
6	8	1019-3	Seat Hex Nuts 5/16"-18
7	8	1018-3	Seat Stud 5/16"-18 x 5/16"
*8	1	1056	Cover Gasket
9	2	1023-3	Cover Stud, 5/8"-11 x 2-3/4"
10	3	1020-6	5/8"-11 x 2-3/4" Hex Cap Screw
11	8	1020-5	Cover Cap Screw, 5/8"-11 x 2"
12	2	10037-3	5/8"-11 Nut
13	1	1051	Hinge Pin
*14	1	1147-21	Seat "O-Ring" Gasket, Outer
*15	1	1055	Clapper Diaphragm
16	1	1053	Retaining Ring
17	8	1014-4	Retaining Ring Machine Screws
18	1	1048	Latch
19	1	1049	Latch Pin
20	2	1007-1	Latch Cotter Pin
21	1	1050	Clapper Pin
22	2	1007-3	Clapper Cotter Pin
23	1	1054	Clapper

* Asterisked items are included in Repair Kit No. 1667-41

TECHNICAL DATA**Maximum Working Pressure**

175 psi (12 bar)

FlangeStandard 11" (280 mm) flange diameter
Available in ANSI or PN-16 (4 holes)**Note:** Does not meet 8-hole requirement of PN-16.**Groove**

Compatible with all groove type coupling devices which are approved/listed for fire protection service.

ORDERING INFORMATION

Please specify:

- 4" Model A Dry Pipe Valve
With ANSI Flange (P.N. 1086-01)
With PN-16 (4 holes) (P.N. 1086-02)
- 4" Model A Dry Pipe Valve Trim (P.N. 1206)
- Quantity
- Air Compressor
- Air Maintenance Device (P.N. 1622)
- Water Motor Alarm (P.N. 5495)
- Alarm Pressure Switch (P.N. 1259-71)
- Low Air Pressure Switch (P.N. 1259-72)

SHIPPING INFORMATION**Valve**

Weight: 144 lbs. (65 kg)

Basic Trim

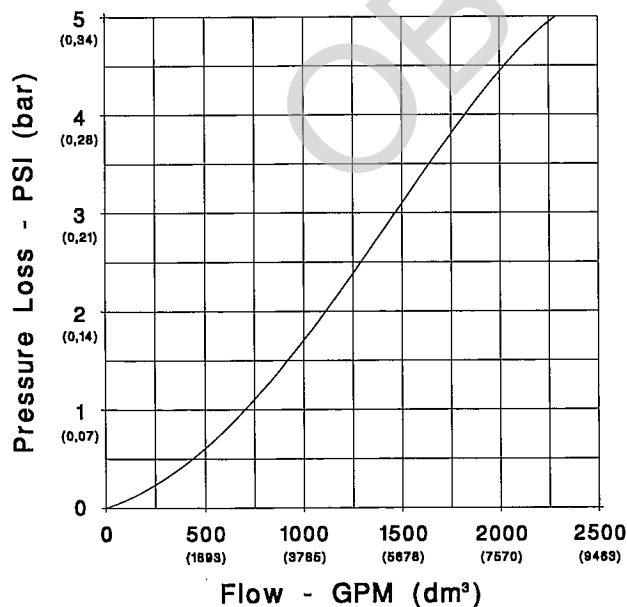
Weight: 35 lbs. (16 kg)

AVAILABILITY AND SERVICE

Star Sprinkler Inc. products and devices are available worldwide through a network of independent distributors. For information, please write to Star Sprinkler or call **1-800-558-5236** for the name and address of the Star distributor nearest you.

WARRANTY

Seller warrants for a period of one year from date of shipment (warranty period) that the products furnished hereunder will be free from defects in material and workmanship.

**Pressure Loss Graph - 4" Dry Pipe Valve**

