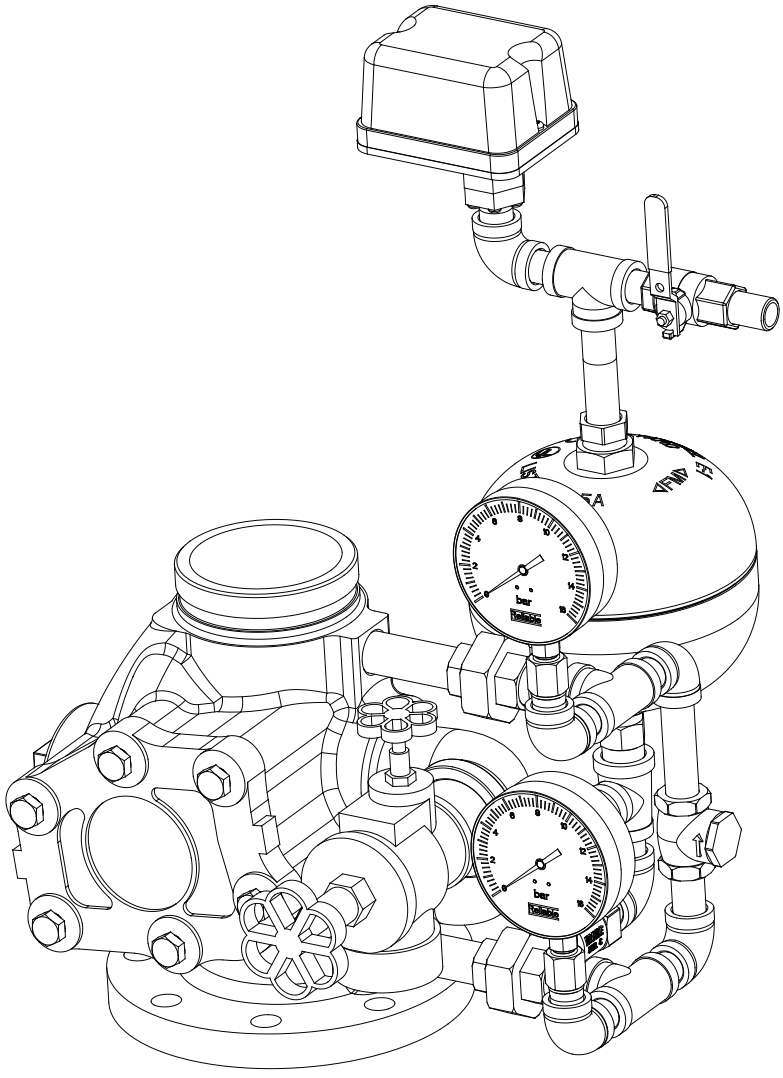
Bulletin 422 Rev. A

Reliable®

Model E Alarm Check Valve

Instructions for Installation, Operation, Care and Maintenance

DN100, DN150, DN200 SIZE
Model E with E2 Euro Trim



The Reliable Automatic Sprinkler Co., Inc., 103 Fairview Park Drive, Elmsford, New York 10523

General

Reliable Model E Alarm Valves are installed in the main supply to a wet pipe system. Variable pressure water supply requires the use of variable pressure trim and a retarding chamber. Constant pressure water supplies do not require the use of retarding chamber.

Valve Description

1. Rated working pressure 10,0 bar (175 psig)
2. Factory hydrostatic test pressure 24,2 bar (350 psig)
3. End and trim connections –
   A. Metric flanged inlet and outlet
      - 100 and 150 mm valve plain face flanges mate with DIN 2501 NF-E-29-282, ISO 2084 NP10 and NP16 and BS4504 NP16.
      - 200 mm valve raised flanges mate with DIN 2501, ISO 2084 NP16 and BS4504 NP16.
      - Threaded openings per BS21-1957, Rp2, ISO 7/1 drain, 20mm (¾") NPT alarm section connection.
      - Color – Red

   B. Metric flange inlet with US grooved outlet
      - 100 and 150 mm valve plain face flanges mate with DIN 2501 NF-E-29-282, ISO 2084 NP10 and NP16 and BS4504 NP16.
      - 200 mm valve raised flanges mate with DIN 2501, ISO 2084 NP16 and BS4504 NP16.
      - Threaded openings per BS21-1957, Rp2, ISO 7/1 drain, 20mm (3/4") NPT alarm section connection.
      - Outlet groove per ANSI/AWWA C606.

   C. US Grooved inlet and outlet
      - Inlet and outlet grooved per ANSI/AWWA C606
      - Threaded openings per BS21-1957, Rp2, ISO 7/1 drain, 20mm (3/4") NPT alarm section connection.
      - Color - Red

Grooved Dimensions									
Valve Size		Outlet Dia.		Groove Dia.		Groove Width		Face to Groove Dim.	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
4	100	4.500	114.0	4.334	110.1	3/8	9.5	5/8	16
6	150	6.625	168.0	6.455	164.0	3/8	9.5	5/8	16
8	200	8.625	219.0	8.441	214.0	7/16	11	3/4	19

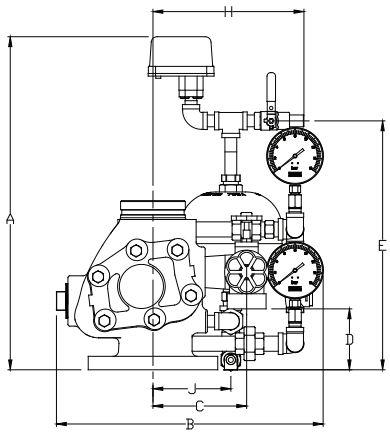
Metric Flange Dimensions in Millimeters							
Valve Size	Bolt Circle Dia.	Bolt Hole Dia.	Raised Dia.	Face Ht.	Flange Outside Dia.	Flange Thickness	No. Bolts
100mm	180	18.3	–	–	229	23.8	8
150mm	241	22.2	–	–	279	25.4	8
200mm	295	22.2	268	3	343	28.6	12

4. Face to Face Dimension:
   - 100mm (4") – 299mm (11 ¾")
   - 150mm (6") – 343mm (13 ½")
   - 200mm (8") – 368mm (14 ½")
5. Friction loss – Expressed in Equivalent Length of Pipe, Based on Hazen & Williams formula with C = 120.

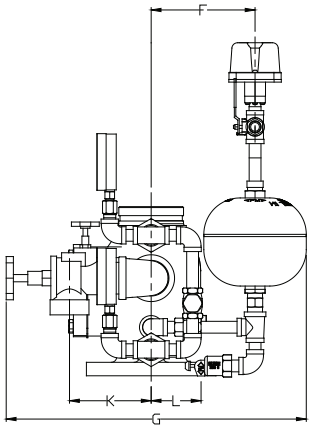
	Equivalent Length
• 100mm	5.18m (17')
• 150mm	8.23m (27')
• 200mm	8.84m (29')

6. Installation measurements, refer to Fig.1.

Installation Measurements in Millimeter											
Valve	A	B	C	D	E	F	G	H	J	K	L
100 MM	394 MM	254 MM	102 MM	318 MM	546 MM	114 MM	343 MM	191 MM	191 MM	191 MM	191 MM
150 MM	400 MM	269 MM	103 MM	343 MM	552 MM	140 MM	343 MM	191 MM	191 MM	191 MM	191 MM
200 MM	413 MM	299 MM	113 MM	365 MM	565 MM	171 MM	343 MM	191 MM	191 MM	191 MM	191 MM



Euro Trim – Front Elevation



Euro Trim – Right View

422_ET_FG01A

Fig. 1

Trim Description

The Reliable Model E2 Euro Alarm Trim is shipped in various easy to handle pre-assembled segments. These segments speed installation and make it virtually impossible to trim the valve incorrectly. This trim provides a Rp2, outlet for draining the sprinkler system, a VdS approved alarm pressure switch and a 20mm (¾" NPT) connection for a mechanical sprinkler alarm (the VdS approved Reliable Model C Mechanical Sprinkler Alarm is recommended for this application). The drain section has been fitted with a Test and Drain valve that allows the testing of the Model E Valve and alarm system without operating the sprinkler system. This trim can be configured to meet the needs of the following applications:

- **Constant Pressure, Basic Trim**
  This trim set is used where the water supply pressure does not vary. An elevated tank that supplies water is a suitable example of a constant pressure supply.
- **Variable Pressure, Optional Trims**
  This trim is used where the water supply pressure varies. A retard chamber, 2,5 mm orifice restriction and ½" x 2" (13mm x 50mm) long galvanized nipple replaces the ½" x 10" (13m x 254mm) long galvanized nipple preceding the VdS approved pressure switch to minimize false alarms during supply pressure surges.

Ordering Information – Specify:

- Valve size - 100mm, 150mm or 200mm.
- Type of trim - Constant Pressure or Variable Pressure.
- Optional Equipment: Model C Mechanical Sprinkler Alarm.

Legend for Fig. 2

A. Test and Drain Valve
B. Alarm shutoff Valve
C. No-Loss Connectors
D. Ball Drip Valve
E. Alarm pressure switch
F. Bypass check valve

Model E Alarm Valve Operation

The normal positions of the Model E Alarm Valve parts are shown in (Refer to Fig. 3).

Flow of water in the system piping resulting from the discharge through one or more fused automatic sprinklers causes the clapper (4) to rise off the valve's seat (3) and permits water from the supply piping to enter the system. The movement of the clapper (4) on the hinge pin (8) uncovers the groove in Seat (3) and allows water to flow through the groove into the alarm line and to the retard chamber if installed. (Refer to Fig. 2).

Continual flow of water fills the retard chamber and flows to mechanical and/or electrical alarms. A small amount of water will also flow out of the ball drip valve.

When the water ceases to flow through the alarm valve, the clapper (4) returns to its seat thus stopping the flow of water to the alarm line. At the same time the restriction and drain orifices allow the alarm line to drain through the drip valve.

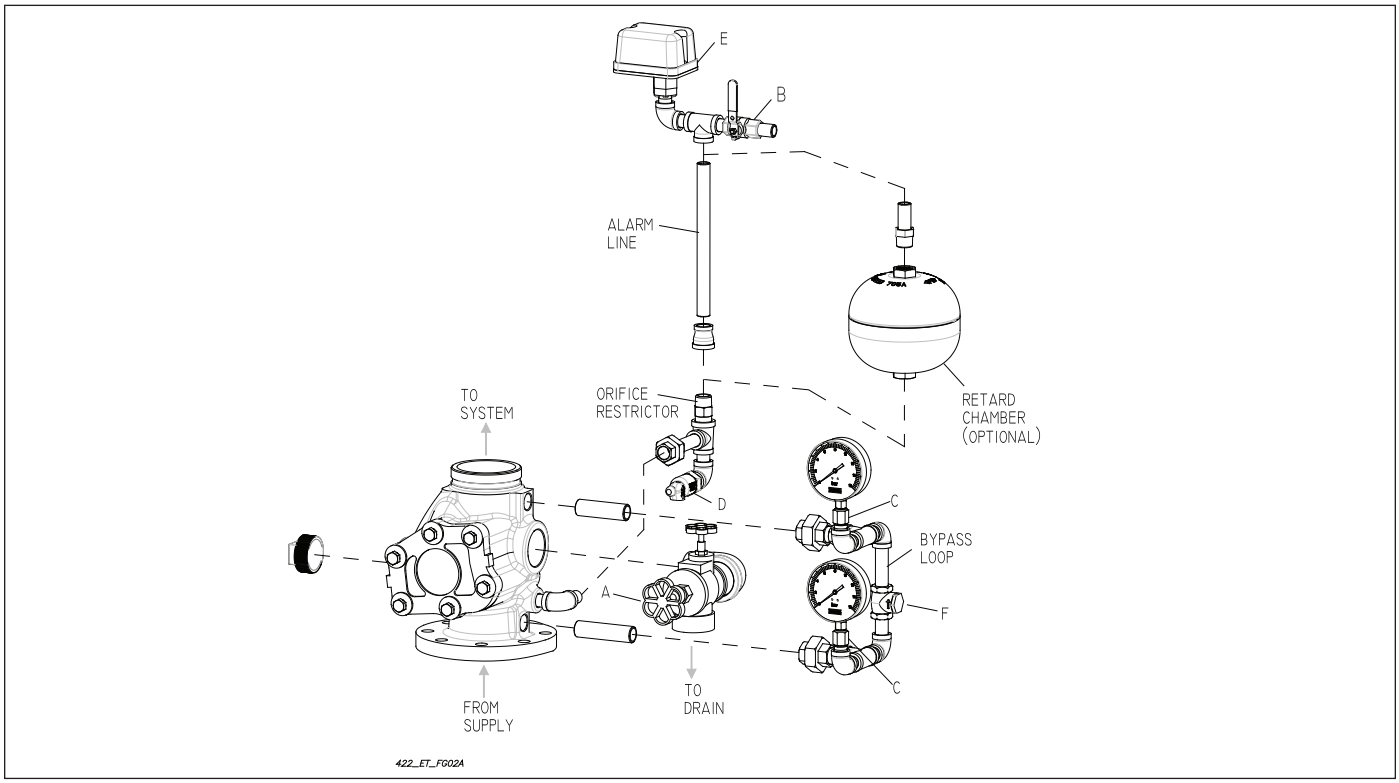


Fig. 2

System Design Considerations

Virtually all sprinkler system piping contains confined air. When a water hammer or pressure surge occurs in the water supply piping, it conpresses any present air. While this compression is occurring, the clapper may be lifted from the valve's seat.

When designing a sprinkler system, care must be taken so that the configuration of the piping network does not trap large pockets of air. Whenever the duration of a lifted clapper is a substantial, a false alarm condition can occur.

When a system design does permit large pockets of air to exist, an intermittent alarm condition can occur when the inspector's test connection is opened. Initially, the water discharge from the open test connection is produced by the expanding pockets of compressed air in the system pushing out the water. Eventually, the system pressure drops below the supply pressure and the clapper opens (producing an alarm) thereby allowing a surge of new water into the system. This surge increases system pressure while compressing again the air trapped in the pockets. When this surge of water ends, the clapper closes (stopping the alarm) even though water has continuously flowed from the inspector's test connection. This cycle will consistently repeat and produce intermittent alarms when air pockets are large.

Intermittent alarm conditions can usually be prevented by one or more of the following remedies:

1. Install a small air vent valve at/near the peak of each high elevation point in the sprinkler system. The inspector's test connection can seve as this air vent in some cases.
2. While filling the system piping, flow water into the system very slowly to allow water flowing into branch lines sufficient time to expel the air before water in the main lines cover the openings to branch lines.
3. Flow water into the system with the inspector's test connection and other vent valves in the full open position. After air is expelled from vent valves and they are closed, install a plug in each vent valve outlet to prevent an accidental discharge of water.

Variable Pressure Equipment

The Reliable Model E Alarm Valve with E2 Trim minimizes false alarms with two of its features:

1. The bypass line (Refer to Fig. 2) with check valve allows surges water supply to the system side of the alarm valve's clapper without lifting the clapper off its seat. Repeated surges build up an effective excess pressure in the system, which steadies the clapper and reduces false alarms.
2. The retard chamber with restriction and drain orifice allow intermittent flows to be drained before they can fill the chamber and pass through to operate the electrical and /or mechanical alarms.

Constant Pressure Equipment

The operation of this equipment is the same as described for the Variable Pressure Equipment, except that due to the water supply being constant, the retard chamber and restricted orifice are not required. The water passed through the grooves in the seat of the alarm valve and flows directly to operate the electrical and mechanical alarms.

System Set up

Verify that all trim parts are installed according to Fig. 2 and that there are no leaks. Close the Test and Drain valve A, and the alarm shutoff valve B. Slowly open the main water control valve a few turns until water fills the sprinkler pipe system at a moderate speed. Check the piping system for leaks during and after the filling process. When both gauges in the trim indicate the preset operating pressure and the flow of water has stopped, fully open the main water control valve and secure it in this position. After this the pipe system must be vented carefully. Open the alarm shutoff valve B and drain any water present in the alarm line by depressing the plunger of the Ball Drip valve D.

The wet alarm valve station is operational when:

- Main water control valve and alarm shutoff valve B are open.
- The Test and Drain valve A is closed.
- Both gauges indicate the preset operating pressure.
- Drip valve D does not leak.
- No alarm is present at the central fire alarm system.

Restoring Operational Readiness

Following a Fire

After the authorized personnel has confirmed that the fire is extinguished and has given the instruction to shut off the sprinkler system, close the main water control valve and drain the piping system by opening Test and Drain valve A. Shut off the sprinkler pump, if present, according to the instructions for use. Replace any opened and/or damaged sprinklers with the same type sprinklers from the spare stock (replenish spare stock). Reset any alarms and restore operational readiness according to the "System Setup" section.

Monitoring and Trials

The sprinkler system must be monitored by the prescribed checks according to VdS 2092.

Conducting the Weekly Trial Alarm

Disable electric alarm and/or inform the alarm receiver(s) of the trial alarm. After this, trigger the wet alarm valve station by opening the Test and Drain valve A until the mechanical alarm sounds. After this close the Test and Drain valve A again and drain the alarm line by depressing the plunger of the Ball Drip valve D. After this reset the electrical alarms and enable the fire alarm system. Inform the alarm receiver(s) that operational readiness has been restored.

Maintenance

Perform maintenance on Model E wet alarm valve at least annually. Worn or defective parts must be replaced. Usually any trouble will be shown by one or more of the following symptoms:

- Mechanical sprinkler alarm (water motor) not operating. Refer to Reliable Technical Bulletin 613 for corrective measures.

- False Alarms: Refer to the "False Alarms" section of this bulletin.
- Intermittent Alarms: Refer to the "System Design Considerations "section of this bulletin.

Alarm Valve (Refer to Fig.3)

Note: To minimize downtime, the following parts should be on hand before the valve is dissembled:

1. Seat Installation Wrench: 200mm-Part Number 6881280000; 150mm-Part Number 6881280000; 100mm-Part Number 6881240000.
2. Clapper rubber facing: Item 5.
3. Seat "O" rings: Items 9 and 10.
   a. Drain the system by opening the Test and Drain valve A (Refer to Fig.2).
   b. Remove the cover (2), shaft pipe plug (14). hinge pin (8) and clapper assembly (4).
      Note: Hold down the spring (13) when removing the hinge pin (8).
   c. Carefully inspect for the following:
      1. Damage to the clapper's rubber facing. Inspect the surface for imbedded foreign matter. Replace the facing if it is found damaged. Be certain that the clapper and clapper clamping ring surfaces are thoroughly cleaned before assembling with a new facing.)
      2. Damage to the seat surface. Clean the seat thoroughly. Inspect for any nicks in the seat or other foreign matter lodged in the seat groove. If the seat or other parts of valve are found to be severely damaged, an authorized Reliable distributor should be contacted.
   d. To replace the seat "O" rings
      1. Using the seat wrench, unscrew the seat. Use care to avoid damaging the seat's surface.
      2. Remove "O" rings, items 9 and 10, (Refer to Fig. 3) Thoroughly clean the "O" ring grooves and sealing surfaces. Inspect for damage and/or foreign material.
      3. Apply a light coat of lubricant to the new "O" rings and install into proper grooves. Use care to avoid stretching, twisting or other damage to "O" rings.
      4. After checking that the "O" rings are correctly installed, carefully reinstall the seat and tighten securely with the wrench.
   e. To reassemble the alarm valve:
      1. Replace the clapper assembly on the seat. Insert the hinge pin (8) in the valve and pass it through one of the bearings of the clapper. (4) Press and hold spring (13) securely in position between the clapper arm bearings and push the clapper arm shaft through the spring coils to the far side of the valve - Replace the shaft pipe plug (14).
      2. Lift the toe of clapper – verify its proper seating, and no binding when the clapper is lifted.
      3. Replace the cover (2), being sure that the cover gasket (11) is in position and bolts and nuts are securely tightened.
      4. Close the Test and Drain valve A (Refer to Fig. 2) Slowly open and seal the main water control valve. Be sure that valve B is sealed in open position.

Contact the installing contractor or Reliable if any difficulties are experienced. Should replacement parts be needed, use only genuine Reliable made parts. When ordering, specify part number, name, size, model and serial number of the unit.

False Alarms

False alarms are generally caused by pressure surges in the water supply and can occur if the system loses its effective excess pressure (Refer to the "System Setup" section). A visual indication of this condition is given by similar readings on the system and supply pressure gauges. Loss of system pressure can occur as a result of: a leaking test and drain valve, leakage at the alarm valve's brass seat, leakage between the valve's clapper and its mating rubber facing, leakage at any pipe joint downstream in the sprinkler system, or leakage at the bypass check valve. (Refer to Figs. 2 & 3).

In order to find and correct a leak through the bypass check valve, proceed as follows (Refer to Fig. 2):

a. Close the main water control valve. Cycle the test and drain valve A to relieve the pressure between the main water control valve and alarm valve's clapper. Return the test and drain valve A to the open position when done. Open the lower union of the bypass loop and pull it away from the alarm valve. A steady leak at the union indicates the bypass check valve has foreign matter under its seat or the alarm valve's clapper rubber facing needs replacing (Refer to Fig. #3).
b. If the bypass check valve is leaking, repair or replace it.
c. Restore the system. (Refer to the "System Setup" section of this bulletin).

False alarms may also be caused by a clogged alarm line that is not draining properly. Depress the plunger of the ball drip valve D to ensure that there is no residual water pressure in the line.

Intermittent Alarms

Intermittent alarms are the result of excessive confined air trapped in the sprinkler system piping. To correct this problem, fill the system slowly while venting air at all system openings. When the system is fully pressurized, vent the air at all of the system's high points also including the sprinkler connections if necessary.

Contact the installing contractor or Reliable if any difficulties are experienced. Should replacement parts be needed, use only genuine Reliable made parts. When ordering, specify part number, name, size, model and serial number of the unit.

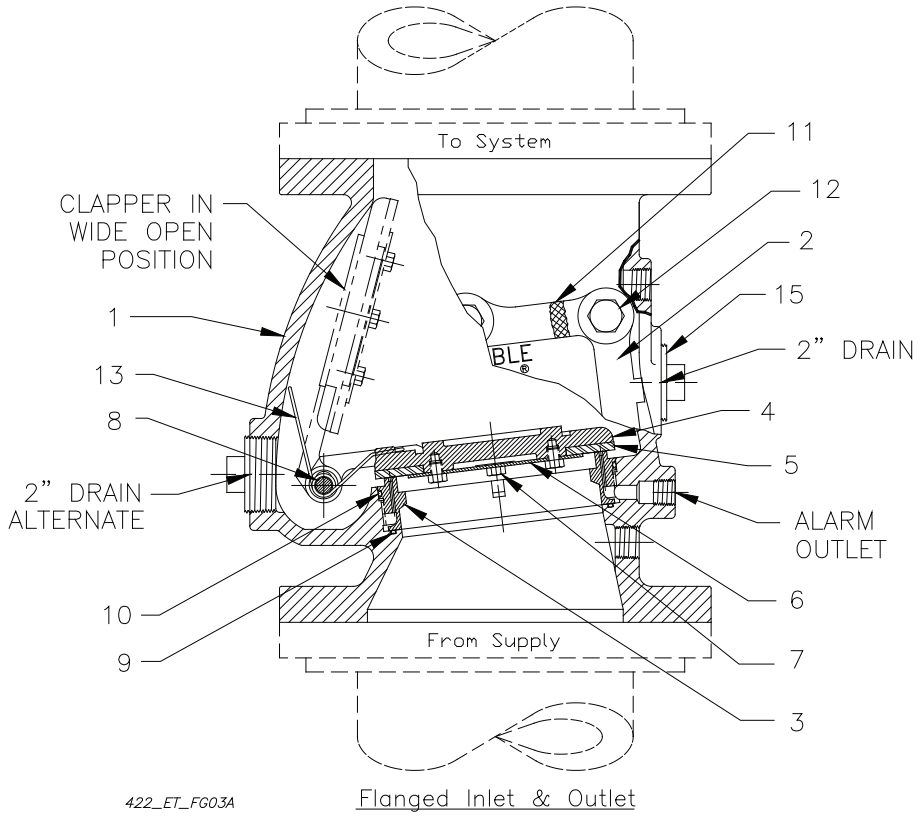


Fig. 3

Item No.	Part Name	Part Number			Quantity		
		100mm	150mm	200mm	100mm	150mm	200mm
1	Body, Metric Flanged	91006130	91006131	91006132	1	1	1
	Body Metric FLG X Groove Outlet	91006154	91006186	91006188	1	1	1
	Body Grooved Inlet x Grooved Outlet	91006162	91006161	91006160	1	1	1
2	Cover	92116124	92116126	92116128	1	1	1
3	Seat	96016124	96016126	96016128	1	1	1
4	Clapper & Bushing Assembly	71020424	71020626	71020828	1	1	1
5	Clapper Rubber Facing & Clamping Ring Assembly	93416104	93416106	93416108	1	1	1
6	Clamping Ring	93406124	93406126	93406128	1	1	1
7	Clamping Ring Screws or Nut	94906124	95306126	95306126	1	4	5
8	Hinge Pin	94906124	95606126	95606126	1	1	1
9	Seat "O" Ring	95436124	95436126	95436128	1	1	1
10	Seat "O" Ring	95406124	95446126	95446128	1	1	1
11	Cover Gasket	93706124	93706126	93706128	1	1	1
12	Cover Bolts	91106124	91106126	91106128	1	1	1
13	Clapper Spring	96406124	96406124	96406124	6	6	6
14	Shaft Pipe Plug (Not Shown)	98604402	98604402	98604402	1	1	1
15	Drain Plug	95200020	95200020	95200020	1	1	1
–	Euro Retard Chamber Kit	6303000523	6303000523	6303000523	–	–	–

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Productsmanufactured and distributed by Reliable have been protecting life and property for over 90 years, and are installed and serviced by the most highly qualified and reputable sprinkler contractors located throughout the United States, Canada and foreign countries.

Manufactured by

Reliable®

The Reliable Automatic Sprinkler Co., Inc.
(800) 431-1588 Sales Offices
(800) 848-6051 Sales Fax
(914) 829-2042 Corporate Offices
www.reliablesprinkler.com Internet Address

Recycled Paper

Revision lines indicate updated or new data.

EG. Printed in U.S.A 06/10 P/N 9999970298