MASTECO
Reliable partner in fire protection.

ALARM CHECK VALVES

INSTALLATION AND MAINTENANCE INSTRUCTIONS

GENERAL DESCRIPTION

MASTECO MWAV-1 Alarm Check Valves are swing type waterflow alarm check valves intended for use in automatic wet-pipe fire sprinkler system. They activate the fire alarm via the pressure-actuated alarm switch when the water that is flowing into the system is equivalent to the discharge from one or more sprinklers. With the clapper having rubber facing that sits well with the seat ring, they also prevent water backflow when the water supply is stopped. They can also be fitted with a separately ordered retard chamber for installations subject to variable pressures. The retard chamber provides suitable time delay in order to eliminate potential false alarms due to surges or fluctuating water supply pressures. These Alarm Check Valves are intended to be installed in vertical orientation only.

MASTECO MWAV-1 Alarm Check Valves are designed and manufactured to conform to the requirements of NFPA 13 Standard for the Installation of Sprinkler Systems.

IMPORTANT NOTES

1. To ensure the integrity and proper operation of MASTECO MWAV-1 Alarm Check Valves, installation, operation, testing, care and maintenance shall be carried out in accordance with this instructional material, applicable NFPA standards and/or requirements of authority having jurisdictions.
2. In order to maintain the product listing and approval, install the Alarm Check Valves in conformance to the instructions and notes herein.
3. Contact the installer or manufacturer for any question regarding the proper installation, use, care and maintenance of these products.

PHYSICAL FEATURES

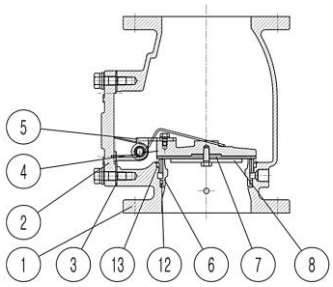

Figure 1 Cross section

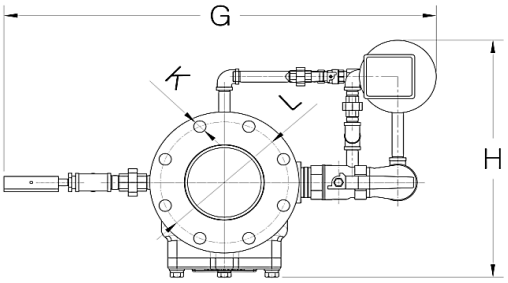

Figure 2 Top view

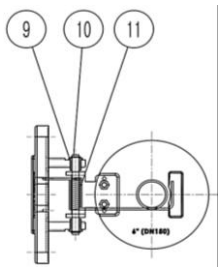

Figure 3 Top view

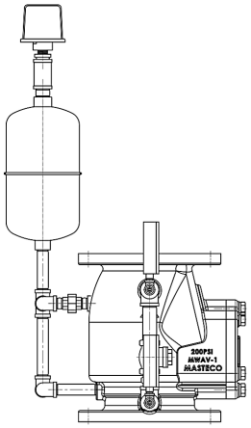

Figure 4 Side view (Left)

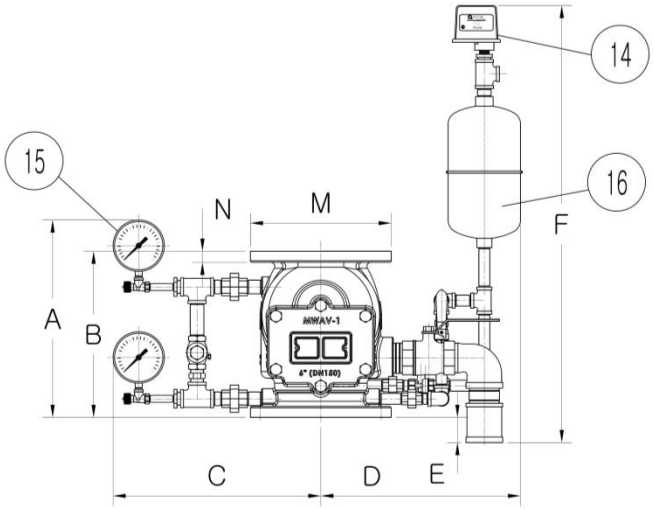

Figure 5 Front view

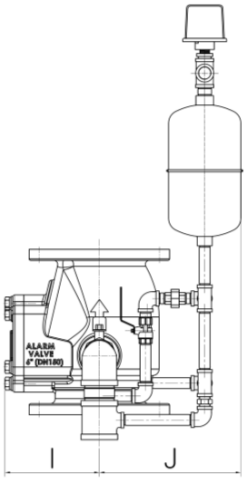

Figure 6 Side view (Right)

DIMENSIONS

Table 1 Dimensions [in(mm)]

Size		A	B	C	D	E
4" (DN100)		14.3(363)	11.0(280)	14.6 (371)	14.7(373) 13.3(338)*	2.2(55.5)
6" (DN150)		15.4(392)	13.0(330)	16.3(413)	15.6(397) 14.3(362)*	2.0(50)
		F	G	H	I	J
4" (DN100)		34.1(867) 18.5(471)*	29.3(744) 27.9(709)*	16.1(408) 15.0(380)*	5.9(149)	10.2(259) 9.1(231)*
6" (DN150)		34.2(868) 18.6(472)*	31.9(810) 30.5(775)*	18.5(470) 17.4(442)*	7.4(188)	11.1(282) 10.4(254)*
		K	L	M	N	
4" (DN100)	ANSI	ϕ 0.75(19)	7.5(190.5)	9(228.6)	0.94(23.9)	
	KS/JIS	ϕ 0.75(19)	6.9(175)	8.3(210)	0.7(18)	
6" (DN150)	ANSI	ϕ 0.88(22)	9.5(241.3)	11.0(279.4)	1.0(25.4)	
	KS/JIS	ϕ 0.91(23)	9.45(240)	11.02(280)	0.88(22)	

* For Option B (See Figure 7)

● Refer to ANSI B16.5 and KS B 1503 / JIS B 2220

PART NAMES & MATERIALS

Table 2 Part names & Materials

Item	Description	Material	Item	Description	Material
1	Body	Ductile Iron	9	Bushing	Brass
2	Cover	Ductile Iron	10	Hinge Pin	Stainless Steel
3	Cover Packing	NBR	11	Spring	Stainless Steel
4	Clapper	Ductile Iron	12	O-ring *	NBR
5	Hinge Plate	Stainless Steel	13	O-ring *	NBR
6	Seat Ring	Stainless Steel	14	Alarm	-
7	Seat	NBR	15	Water Gauge	-
8	Washer	Stainless Steel	16	Retard Chamber	Stainless Steel

* Item No.12 & 13 are designated as AN345 & AN 349 for MASTECO ALARM CHECK VALVE 4" (DN100)

* Item No.12 & 13 are designated as AN359 & AN 362 for MASTECO ALARM CHECK VALVE 6" (DN150)

TECHNICAL DATA

Table 3 Technical Data

Approvals	UL Listed			
Model Name	MWAV-1			
Nominal Valve Size	4” (DN100), 6” (DN150)			
Working Water Pressure Range	20 to 200 psi (140 to 1400 kPa)			
End Connections	Flange x Flange (ANSI, KS/JIS), Groove x Groove (AWWA, KS/JIS)		Both End Connections are available.	
Weight	4” (DN100): 36.8 lb (16.7 kg), 6” (DN150): 62.2 lb (28.2 kg)		For machined Body with Flange x Flange (KS/JIS)	
Installation Position	Vertical			
Hydrostatic Test Pressure	more than 400PSI (2800 kPa)			
Friction Loss	4” (DN100)		6” (DN150)	
	Water flow [gpm]	Net loss [psi]	Water flow [gpm]	Net loss [psi]
	595+	1.01	1351+	0.83

INSTALLATION

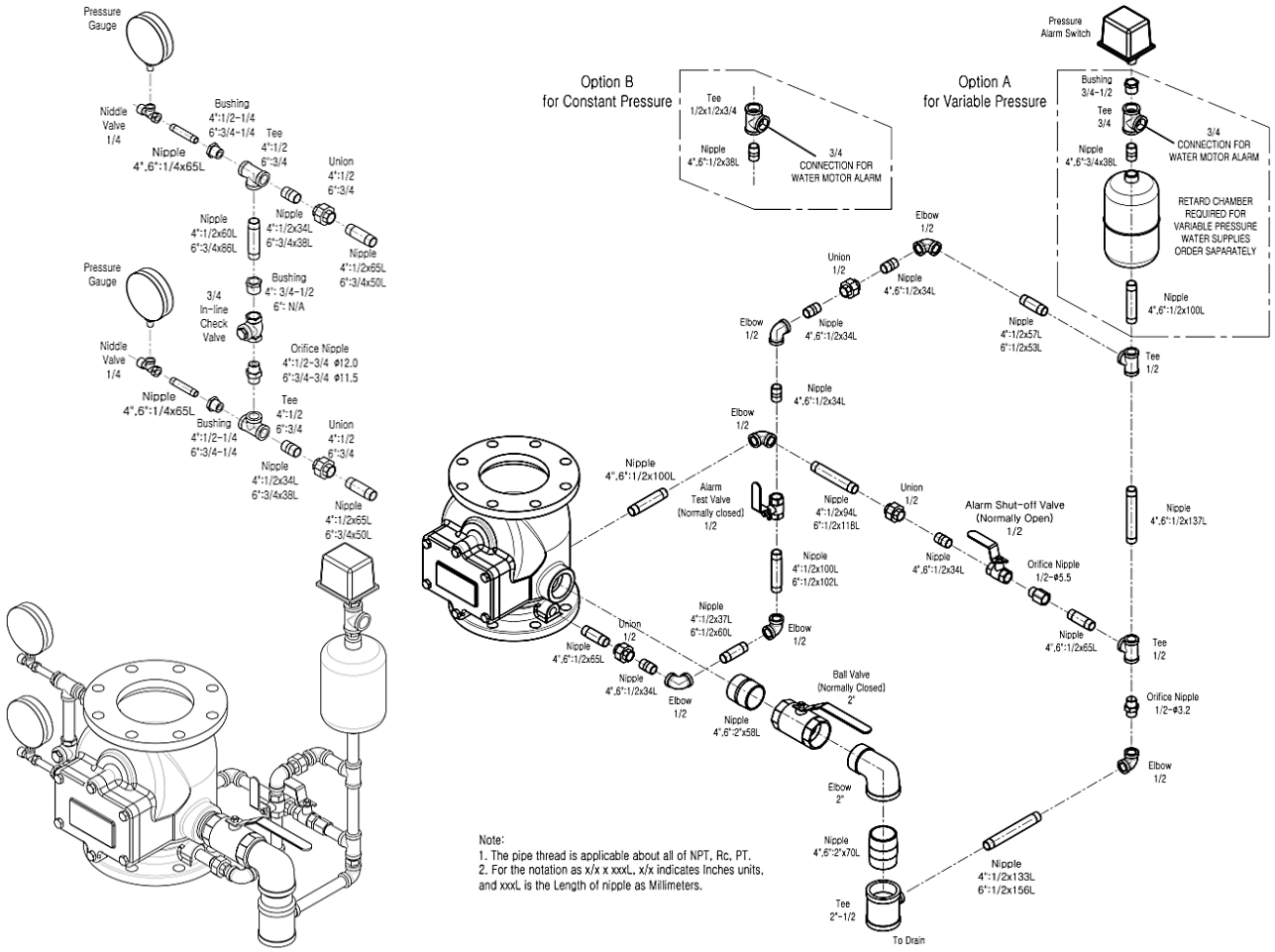

Figure 7 4” (DN100) and 6” (DN150) Alarm Check Valve Vertical Trim

Important Notes

- The MASTECO MWAV-1 Alarm Check Valves must be installed in vertical position with the direction of waterflow going up.
- Install the Alarm Check Valves such that it is readily visible and in easy-to-access locations.
- Avoid installing the Alarm Check Valve in areas subject to freezing temperatures or physical damage.
- Provide suitable piping connection or drainage with sufficient capacity for serving the Alarm Check Valve main drain in discarding large amount of water resulting from draining the system or performing flow test.
- Follow the following instructions to ensure proper operation of the device.

1. Verify that all supplied components, required installation equipment and Alarm Check Valve trim chart (included herein) are available.
2. Apply small amount of pipe thread tape to all male-threaded pipes or nipples. Be careful not to cover any pipe openings and make sure that the interior of all associated components are free from any foreign objects.
3. Install the MWAV-1 Alarm Check Valves and trim according to trim chart shown in Figure 7.

OPERATION

With MASTECO MWAV-1 Alarm Check Valve set for service and the fire sprinkler system at equal and stable pressures there is no flow of water from the water supply to the system. The clapper with its rubber face is held seated on the seat ring by the torsion spring. Upon operation of one or more sprinklers, water from the water supply flows through the Alarm Check Valve causing the clapper to lift off or disengage from the seat ring, into the system piping and to the open sprinklers. Water continuously flowing through the Alarm Check Valve starts to fill the retard chamber and subsequently actuates the alarm switch then instantly followed by fire alarm sound. The fire alarm continues to sound while the clapper remains open. When the flow of water through the Alarm Check Valve stops the clapper closes immediately. The clapper with its rubber face rests seated back on the seat ring preventing backflow of water from the system piping.

For installation subject to variable pressures e.g. as when connected to public water supplies, a transient increase in water supply pressure that is only enough to briefly open the clapper will be unable to cause false alarm. Any water in the alarm line or retard chamber due to such transient surge pressure is automatically drained.

SETTING THE ALARM CHECK VALVE IN SERVICE

Perform the following instructions to set the Alarm Check Valve in service.

Important Notes

Setting the Alarm Check Valve in service may involve activating the alarm. Notify the Authority Having Jurisdiction, central station or fire department receiving the alarm and concerned personnel that the alarm is to be tested.

1. Verify that the Drain Ball Valve and Alarm Test Valve are closed.
2. Verify that the both the supply side and system side pressure gauge Needle Valves (1/4 inch) are open.
3. Close the Alarm Shut-off Valve to prevent the alarm from operating while filling the system with water.
4. Open the Inspector Test Valve (system test valve) in order to vent trapped air from the system while filling with water.
5. Slowly open the water supply main control valve (e.g. OS & Y or other).
6. Continue filling the system until continuous stream of water is discharged from the outlet of system Inspector Test Valve.
7. Close the Inspector Test Valve.
8. Fully open the water supply main control valve. Notice that the pressure readings of both Pressure Gauges are equal and stable, indicating that the system is filled with water.
9. Open the Alarm Shut-off Valve.
10. Verify that all valves are in normal operating position as indicated in Figure 8.
11. Notify the Authority Having Jurisdiction, central station or fire department and concerned personnel that the system is in service.

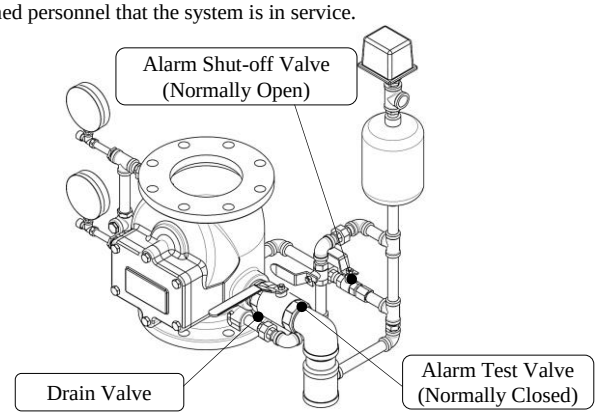

Figure 8 Normal operating position for Setting the Alarm Check Valve in service

INSPECTION, TESTING AND MAINTENANCE

Proper care and maintenance are essential to the proper operation of the Alarm Check Valve. In addition to the specific requirements of NFPA 25 Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems and Authority Having Jurisdiction, the owner shall be responsible for the inspection, testing and maintenance of the device in conformance with all the instructions contained herein.

Draining the System

When the system is to be shut off for maintenance, prior to performing any maintenance of the Alarm Check Valve or any overhead devices of the sprinkler system, water in the system piping must be completely drained. Perform the following instructions in draining the system.

1. Notify the Authority Having Jurisdiction, central station or fire department receiving the alarm and concerned personnel that the system is being shut off or put out of service.
2. Close the water supply main control valve (e.g. OS & Y or other).
3. Open the drain Ball Valve to start draining the system.
4. Open the Inspector Test Valve to enable draining the system completely.

Verify that system is completely drained. This is indicated by steady zero reading of Pressure Gauge at the water supply side (lower pressure gauge) and stoppage of the sound of draining water.

INSPECTION

It is strongly recommended to designate qualified personnel who will perform periodic inspection of the Alarm Check Valve to ensure proper operation of the device.

External Inspection

Perform monthly inspection of the exterior of the Alarm Check Valve and overall trim.

1. Check for any sign of physical damage or leakage. If any leakage is found, perform appropriate corrective measures.
2. Inspect the pressure gauges and verify that normal supply water pressure is indicated.
3. Verify that corresponding swing valves are fully opened or fully closed
4. Inspect that the retarding chamber or alarm drains are not leaking

Internal Inspection

NFPA 25 recommends inspection of the internal components of Alarm Check Valves every 5 years. Verify with Authority Having Jurisdiction for possible more frequent inspection required.

1. Notify the Authority Having Jurisdiction, central station or fire department receiving the alarm and concerned personnel that the system is to be put out of service.
2. Completely drain the system (see instructions in Draining the System).
3. Verify that the pressure in the system is completely released.
4. Loosen the cover bolts using appropriate wrench and remove the Cover/Clapper assembly as shown in Figure 9.
5. Inspect the Seat Ring. Thoroughly clean the Seat Ring such that it is free from any foreign objects that can be lodged in the grooves or holes. In case the Seat Ring is found severely damaged, contact nearest distributor or MASTECO for possible part replacement or appropriate service of the full Alarm Check Valve assembly.
6. Inspect the Seat or Clapper Rubber Facing. Thoroughly clean the Seat such that it is free of dirt and other foreign objects. **NOTE**: Never use solvents or abrasives. In case the Seat is damaged or worn out, it must be replaced.
7. Firmly hold the cover and swing the Clapper towards the cover to test the hinge for freedom of movement and the torsion spring for adequate tension. Replace damaged or worn out parts as necessary.
8. Re-install the Cover/Clapper assembly by sliding it into the Alarm Check Valve in such a way that the Seat or rubber clapper face contacts the Seat Ring.
9. Insert the cover bolts and tighten them using appropriate wrench to corresponding torque values. Careful not to over-tighten.
10. Set the Alarm Check Valve back in service (see Setting the Alarm Check Valve in Service)

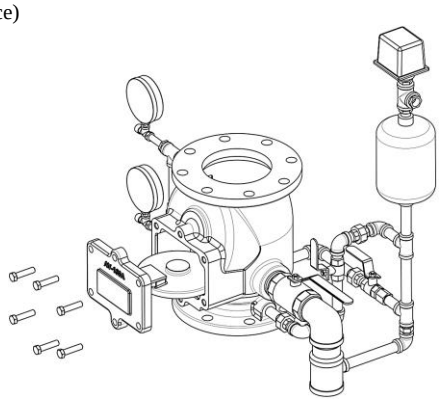

Figure 9 Removal of Cover/Clapper assembly

Table 4 The Torque and Sizes of Cover Bolts

Valve Size	4” (DN 100)	6” (DN 150)
Screw Size	M12 x 40 - P1.75	M14 x 40 – P2.0
Torque Values	90 N▪m	108 N▪m
The number of Bolts	4	6
Reference	KS B 0233	

TESTING

Testing Waterflow Alarm

Proper operation of the Alarm Check Valve when one or more sprinklers are operated in the event of fire is tested using the Inspector Test Valve in conjunction with suitable test orifice that simulates water discharge from the opened sprinkler. Thus, proper operation of the Alarm Check Valve (and alarm device) is confirmed if the alarm sounds when the Inspector Test Valve is opened.

Test Frequency: Quarterly

1. Notify the Authority Having Jurisdiction, central station or fire department receiving the alarm and concerned personnel that the alarm is to be tested.
2. Verify that the Alarm Check Valve is set in service (see Setting the Alarm Check Valve in Service instructions 1 to 10).
3. Open the Inspector Test Valve and verify that the system alarm operates/sounds.
4. Close the Inspector Test Valve and reset the system alarm (in the control panel).
5. Verify that the water in the Retarding Chamber and alarm line is drained properly.
6. Verify that all valves are in normal operating position as indicated in Figure 8.
7. Notify the Authority Having Jurisdiction, central station or fire department and concerned personnel that testing is complete.

Testing The Alarm Device (without reducing the system pressure)

As an alternative, waterflow pressure-actuated electric alarm device can be directly tested by utilizing the flow and pressure from the water supply i.e. below the Clapper via the alarm test line if freezing temperature or other condition prohibits the use of Inspector Test Valve. Note that this method however, only test the alarm device and not the operation of the Alarm Check Valve itself.

Test Frequency: Quarterly

1. Notify the Authority Having Jurisdiction, central station or fire department receiving the alarm and concerned personnel that the alarm is to be tested.
2. Verify that the Alarm Check Valve is set in service (see Setting the Alarm Check Valve in Service instructions 1 to 10).
3. Close the Alarm Shut-off Valve.

4. Open the Alarm Test Valve and verify that the system alarm operates/sounds.
5. Close the Alarm Test Valve and reset the system alarm (in the control panel).
6. Verify that the water in the Retarding Chamber and alarm line is drained properly.
7. Open the Alarm Shut-off Valve and confirm that all other valves are in normal operating position as indicated in Figure 8.
8. Notify the Authority Having Jurisdiction, central station or fire department and concerned personnel that testing is complete.

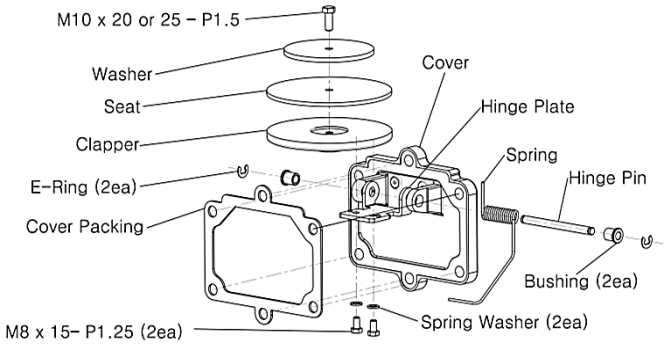

Figure 10 Exploded view of Cover/Clapper assembly

Table 4 The Torque and Sizes of Bolts for Clapper

Valve Size	4" (DN 100)		6" (DN 150)	
Bolt Size	M8 x 15 – P1.25	M10 x 20 – P1.5	M8 x 15 – P1.25	M10 x 25 – P1.5
Torque Values	24 N▪m	24 N▪m	24 N▪m	30 N▪m
The number of Bolts	2	1	2	1
Reference	KS B 0233			

Main Drain Test

To verify that suitable water supply is available for the system or as required by the Authority Having Jurisdiction, main drain test must be performed according to the following instructions.

1. Notify the Authority Having Jurisdiction, central station or fire department receiving the alarm and concerned personnel that the main drain test will be performed.
2. Ensure that suitable drainage sufficient to accommodate full flow of water is available.
3. Verify that the Alarm Check Valve is set in service (see Setting the Alarm Check Valve in Service instructions 1 to 10).
4. Record the pressure reading in the Pressure Gauge at the water supply side (lower pressure gauge).
5. Close the Alarm Shut-off Valve.
6. Fully open the main drain Ball Valve.
7. When the full flow of water has stabilized, record the pressure reading in the Pressure Gauge at the water supply side (lower pressure gauge). This is called residual pressure.
8. Close the main drain Ball Valve slowly.
9. Compare the residual pressure reading from the previous main drain test results. If the pressure readings deviate significantly, take appropriate corrective actions such that proper water supply is restored.
10. Open the Alarm Shut-off Valve and confirm that all other valves are in normal operating position as indicated in Figure 8.
11. Notify the Authority Having Jurisdiction, central station or fire department and concerned personnel that testing is complete and system to set back in service.

MAINTENANCE

NFPA 25 requires that the internal components of Alarm Check Valve be cleaned or repaired as necessary. Perform maintenance of the individual internal components in accordance with the following instructions.

1. Perform Internal Inspection instructions 1 to 7.
2. Completely disassemble the Cover/Clapper assembly as shown in Figure 10 for individual component inspection.

2.1 Remove the Seat (Clapper Rubber Facing). Using appropriate wrench, loosen and remove the bolt, Washer, Seat.

2.2 Remove the Clapper, torsion Spring and Hinge Pin. Remove hinge pin Retaining Rings, to free the Hinge Pin for removal. After the hinge pin is removed, the Clapper and spring can be removed.

3. Inspect each individual components for signs of damage particularly the rubber facing. If significant damage such as cracking or cuts. Replace the component.
4. When the individual component inspection has been completed, reassemble the Cover/Clapper assembly.

4.1 Place Seat (clapper rubber) over the center hub of the Washer.

4.2 Position the Washer (with rubber in place) against Clapper as shown in Figure 10.

4.3 Replace and tighten the button-head socket screw, Sealing Washer, and hex nut, as shown in Figure 10. Do not over-tighten.

4.4 Position the clapper with the hinge holes aligned.

4.6 Insert the hinge pin through the holes at one end of the hinge assembly, re-install the spring (refer to Figure 1 for proper orientation) and continue pushing the pin through the other end.

4.7 Re-install E-ring of the hinge pin.

5. Re-install Cover/Clapper assembly to the Alarm Check Valve Body:

5.1 Verify that the cover packing is in position and that it is in good condition.

5.2 Slide the cover/clapper assembly into the Alarm Check Valve so that the clapper rubber contacts the grooved Seat Ring.

5.3 Replace cover bolts. Use the appropriate wrench to evenly cross-tighten all bolts to the torque values listed in Table 4 for the valve used. Do not over-tighten.

6. Set the Alarm Check Valve back in service (see Setting the Alarm Check Valve in Service)

ORDERING INFORMATION

Model Name: MWAV-1			
Size: (DN100)		Size: 6"(DN150)	
Description		Description	
Body	1ea	Body	1ea
Cover	1ea	Cover	1ea
Cover Packing	1ea	Cover Packing	1ea
Cover Bolt	4ea	Cover Bolt	6ea
Clapper	1ea	Clapper	1ea
Hinge Plate	1ea	Hinge Plate	1ea
Hinge Plate bolt	2ea	Hinge Plate bolt	2ea
Seat Ring	1ea	Seat Ring	1ea
Seat	1ea	Seat	1ea
Washer	1ea	Washer	1ea
Washer bolt	1ea	Washer bolt	1ea
Bushing	2ea	Bushing	2ea
Hinge Pin	1ea	Hinge Pin	1ea
Spring	1ea	Spring	1ea
E-Ring	2ea	E-Ring	2ea
O-Ring – 12	1ea	O-Ring – 12	1ea
O-Ring - 13	1ea	O-Ring - 13	1ea
Alarm	1ea	Alarm	1ea
Water Gauge	2ea	Water Gauge	2ea
Retard Chamber	1ea	Retard Chamber	1ea
Orifice Nipple – 17	1ea	Orifice Nipple – 17	1ea
Orifice Nipple – 18	1ea	Orifice Nipple – 18	1ea
Orifice Nipple - 19	1ea	Orifice Nipple - 19	1ea

PARTS AND SERVICES

For warranty consideration, parts, or other service information, contact nearest authorized distributor. If further assistance is needed, please contact

MASTECO INDUSTRY CO., LTD.
715-12 Gojang-dong, Namdong-gu
405-821, Incheon, Republic of Korea
Tel.: 82-32-811-1301
Email: overseas@masteco.co.kr
Office hours: 8:00 AM – 5:00 PM
Time Zone: GMT + 9

For prompt, efficient service, kindly prepare the following information:
- Model number of the specific component
- Component description obtained from the Parts List
- Year of manufacture when applicable
- Original purchase slip or equivalent evidence of purchase date

LIMITED WARRANTY

MASTECO INDUSTRY CO., LTD. 715-12 Gojan-dong, Namdong-gu, 405-821, Incheon, Republic of Korea, hereby provides a limited warranty against defects in material and workmanship on all MWAV-1 Alarm Check Valve components manufactured by MASTECO INDUSTRY CO., LTD. These components include 1 year warranty which is limited to, at Manufacturer's option, replacement or repair of defective components or refunding the purchase price for such components paid by the Buyer. Within the warranty period, the Buyer has the right to enforce such warranties and obligate the Manufacturer.

The warranty period shall begin on the date of purchase as indicated in the original receipt of purchase or original sales receipt issued by the distributor. This warranty shall not apply if:

A. any component has been altered or modified without the knowledge of warrantor's authorized representative;

B. the product has been subjected to neglect, misuse, abuse or damage or has been installed or operated other than in accordance with the manufacturer's instructional material (MWAV-1-IM-01, Rev. 0.0, Jan2016).

To make a claim against this warranty, contact MASTECO at contact information found above.