INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Figures F992-D and F992H-D Combination Vacuum Breaking and Air Release Valves for Water

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GA INDUSTRIES
A VAG-Group Brand

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Manual Number IOM-992.01 070925

WARNING: Cancer and Reproductive Harm – www.Prop65Warnings.ca.gov

Section 1

INSTALLATION, OPERATION and MAINTENANCE

Figure F992-D and F992H-D
Vacuum Breaking and Air Release Valves for Water

INTRODUCTION
This manual provides information to install, operate and maintain GA Industries dual body combination air valves to ensure a long service life. The valve is ruggedly constructed to provide many decades of dependable service with minimal maintenance.

CAUTION
The valve is NOT recommended for use with toxic, corrosive, or flammable fluids.

The Shop Order (SO) Number, Figure Number, size, and pressure rating are stamped on a nameplate attached to the valve. Please refer to the SO number when ordering parts.

DESCRIPTION OF OPERATION
The Figure F992-D consists of two individual valves assembled and piped together at the factory as shown in Figure 1. The Figure 992-D is a Figure F990-D vacuum breaking valve combined with a Figure 920 air release valve while the Figure 992H-D is a Figure F990-D combined with a Figure 920H air air release valve.

The Figure 992-D has a maximum working pressure of 150 PSI while the Figure F992H-D has maximum working pressure of 300 PSI.

When the pressure inside the valve is atmospheric, the vacuum breaking valve is held closed by the internal compression spring and the air release valve is open. As water enters the valves, air is released through the air release valve's orifice until water rises sufficiently to lift the float and close the orifice. Internal pressure assists to hold the vacuum breaking valve closed.

The air release valve automatically opens when sufficient air has collected in the valve then closes after it has been released through its orifice.

The vacuum breaking valve remains closed as long as the internal pressure is at or above atmospheric pressure. It will start to open when the internal pressure falls about ½ PSI below atmospheric pressure and open as far as needed to admit air at the rate necessary to limit the vacuum. As the internal pressure returns to atmospheric and air is no longer entering the valve, the helical compression spring will push the vacuum breaking valve's disc closed.

As the system re-pressurizes, the air that was drawn into the system is slowly released through the air release valve's small orifice. When all the air has been released water will lift the float inside the air release valve and close the valve's orifice

RECEIVING AND STORAGE
Inspect the valve upon receipt for damage during shipment. Carefully unload all valves to the ground without dropping.

Valves should remain in a clean, dry, and weather protected area until installed. After completion of shop testing the valve is drained of the test water but a small residual amount could remain so the valve should be protected from freezing during storage.

INSTALLATION
The valve is typically installed at high points in the system where air naturally rises during filling and in operation and a vacuum first form during draining.

The vacuum breaking and air release valve is installed on top of the pipeline in a vertical orientation with an isolating valve between the pipeline and the air valve. Depending on the operating conditions, brief spillage may occur as the valve closes so proper drainage should be provided.

Prior to installation ensure all debris, packing material or other foreign material has been removed from the valve.

If installed outdoors, below ground in a vault or in an unheated area, adequate freeze protection must be provided.

The valve should be installed with sufficient clearance to permit maintenance and removal of internal components.

The Figures 992-D and 992H-D are supplied with ANSI Class 125/150 flat faced flanged pipeline connection. Flat-faced flanged valves should be mated with flat-faced flanges and full-face gaskets. If ring gaskets are used the bolt material shall be ASTM A307 Grade B (or equivalent). Higher strength bolting should only be used with full-face gaskets.

Lower heavy valves using slings or chains around the valve body and/or the lifting eyes. DO NOT LIFT BY THE AIR RELEASE VALVE. Lubricate the bolts or studs and insert around flange. Lightly tighten bolts until gaps are eliminated. Torque bolts in an alternating pattern in graduated steps. If leakage occurs wait 24 hours and re-torque the bolts but do not compress the gasket more than 50% or exceed bolt maximum torque rating.

START-UP
The valve does not require any calibration or adjustment prior to start-up.

PREVENTATIVE MAINTENANCE
No routine lubrication or adjustments are needed.

REPAIR INSTRUCTIONS
Instructions for the inspection, troubleshooting and repair of the two valves utilized in the GA Industries Figure F992-D and F992H-D are provided in the sections for each valve.

REPLACEMENT PARTS
Genuine replacement parts are available from your local GA Industries representative or from the factory:

VAG USA, LLC
234 Clay Avenue
Mars, PA 16046 USA
Telephone: 724-776-1020
Fax: 724-776-1254
E-mail: quotes-ga@vag-group.com

Please have the nameplate data available when ordering parts.

WARRANTY:
The Warranty for GA Industries valves is included in our Terms and Conditions which can be found here: https://gaindustries.com/terms

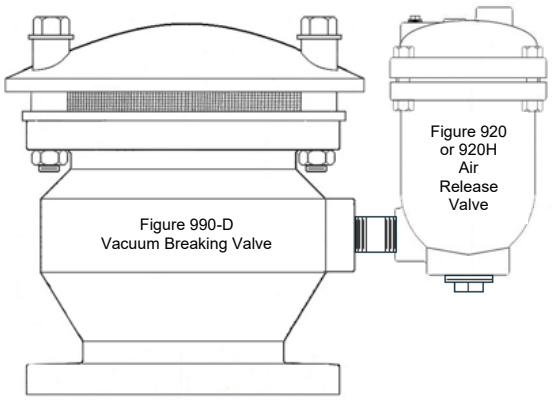

Figure 992-D and 992H-D

Section 2

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Figure F990-D
Vacuum Breaking Valve for Clean Water

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Manual Number F990-IOM-070825

WARNING: Cancer and Reproductive Harm – www.Prop65Warnings.ca.gov

INTRODUCTION

This manual will provide the information to properly install, operate and maintain the valve to ensure a long service life. GA Industries Vacuum Breaking Valves are ruggedly constructed to provide years of trouble-free operation with minimal maintenance.

These Vacuum Breaking Valves are not intended for use with fluids containing suspended solids such as wastewater and sewage. There are other types of GA Industries valves that are suitable for such applications.

CAUTION

The valve is NOT recommended for use with compressed air or other gases.

CAUTION

Vacuum Breaking Valves are not intended for used with hazardous, flammable, or toxic fluids.

The Shop Order (SO) Number, Figure Number, size and pressure rating are stamped on a nameplate attached to the valve. Please refer to the SO number when ordering parts.

DESCRIPTION OF OPERATION

The function of the Figure F990-D Vacuum Breaking Valve is to start to open to admit air into a pipeline in large volumes whenever the line pressure falls to approximately 0.25 psi below atmospheric to protect the pipeline.

The main valve body is basically a rubber seated silent check. The valve is normally closed held shut by the internal water pressure. The helical compression spring also acts to keep the valve disc closed. Whenever the pipeline falls approximately ½ PSI below atmospheric pressure, atmospheric will push the valve disc open compressing the spring permitting the air to enter the pipeline in large volumes. Once the air stops entering the pipe, the spring will return the valve disc to the closed position.

The valve disc and the compression spring behind it are the only moving parts.

RECEIVING AND STORAGE

Inspect the valve upon receipt for damage during shipment. Carefully unload all valves to the ground without dropping.

The valves should remain in a clean, dry and weather protected area until installed. For long term storage (greater than 6 months) the rubber surfaces of the seat should be coated with a non-toxic lubricant such as "SuperLube" made by Synco Chemical. Do not expose the rubber parts to sunlight or ozone.

VALVE CONSTRUCTION

The Figure F990-D is supplied with a flange that is faced and drilled per ANSI B16.1 Class 125.

The valve has an iron body and either bronze or stainless-steel internal metal components. The valve seals drop tight when the plug mates with a replaceable rubber O-ring retained in a dove-tail groove in the seat. The seat in Figure 990 valve is retained in the body by screws for transportation and installation in the pipeline. However, once installed, the seat is retained by the mating flange. Do not remove the upstream piping/flange while the downstream system is pressurized, or the seat may be dislodged from the body. Refer to Page 4 for details of construction and parts location.

INSTALLATION

GA Industries vacuum breaking valves must be correctly installed for proper operation.

The valve must be installed on a standard ANSI B16.1 Class 125 or ANSI B16.5 Class 150 flat faced flange. The inside diameter of the mating flange must be the same or smaller as the inside diameter of the valve's seat for proper seat retention.

If the mating inlet flange has an expanded inside diameter (such as cement lined pipe or slip-on pipe flange) a support ring meting the above dimensions must be installed between the pipe flange and the valve.

CAUTION

Valve and system damage may occur if mating inlet flange does not overlap valve seat.

Full face red rubber flange gaskets are recommended.

The flange bolt material shall be ASTM A307 Grade B (or equivalent). Higher strength bolting should only be used with full-face gaskets.

Lower heavy valves using slings or chains around the valve body and/or the lifting eye.

Lubricate the bolts or studs and insert around flange. Lightly tighten bolts until gaps are eliminated. Torque bolts in an alternating pattern in graduated steps. If leakage occurs wait 24 hours and re-torque the bolts but do not compress the gasket more than 50% or exceed bolt maximum torque rating.

If installed outdoors, below ground in a vault or in an unheated area, adequate freeze protection must be provided.

PREVENTIVE MAINTENANCE

GA Industries Figure F990-D Vacuum Breaking Valves require no scheduled lubrication, adjustment, or preventive maintenance.

A periodic inspection should be performed to listen for leakage when the pump is shut down and the valve is closed. If leakage is evident, isolate the valve, remove it from the pipeline and inspect seating surfaces for wear or damage.

TROUBLESHOOTING

- Valve Leakage
  Verify the inside diameter of the inlet flange gasket overlaps the seat and body.

  Verify the seat is flush with the flange face. If the seat has lifted above the flange face mating flange and gasket are not properly retaining the seat. Inspect seating surface and rubber O-ring for wear and/or damage. Replace as needed.

- Valve Does Not Pass Flow
  Verify there's no debris in the valve preventing it from opening.

WARNING

Removing the valve from the line or disassembling the valve while there is pressure in the valve body may result in injury or damage to the valve

DISASSEMBLY

The valve should be removed from the line before disassembly. A skilled technician with proper tools should perform all work. No special tools are required.

Remove the cowl nuts (13), washers (11), bolts (10), cowl (9), screen (12), and retainer (8). Set the valve body on a flat, stable surface on two wooden boards with the bronze seat end pointing down. The boards should be placed outboard of the bronze seat to allow the seat to freely drop out of the valve body onto a surface that will not impart damage.

Place a metal rod on top of the poppet's stem inside the bushing (Figure 1). Hit the end of the rod with a hammer until the seat, poppet, spring and bushing drop out of the valve body.

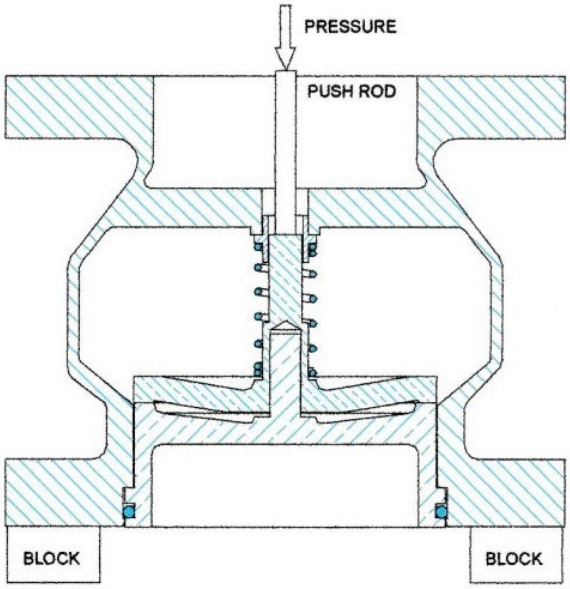

Figure 1

DO NOT LIFT THE VALVE BY THE SEAT SPOKES

Inspect the seat surface. Superficial marks and discoloration are normal but replace the seat if it is gouged or has grooves indicating the valve had been leaking.

Inspect the disc for damage, especially the upper and lower stem to ensure they have not worn unevenly. If they are not round, it can lead to misalignment and leakage so the disc should be replaced. The rubber seat (6) is retained in a "dovetail" groove in the seat (2) and can be pulled out if damaged. Inspect all parts for wear and damage. Replace damaged parts.

REASSEMBLY
Reassembly is performed in reverse order from disassembly. Clean all parts especially the threaded, seating and sealing surfaces before reassembling valve. Worn parts should be replaced.

Sit valve body (1) on a flat, stable surface. Install bushing (4) and place spring (5) over the bushing (4). Install new rubber seat (6) into dovetail groove in body seat (2). Lubricate and install a new seat O-Ring (7) in the groove on the OD of the disc. Lubrication is necessary to facilitate reassembly without damage to the O-ring.

Align and install seat stem into disc. Press down on the seat until it pops into the body and is flush with the body flange face. For large valves, place a wooden board across the disc and hit squarely with a hammer or mallet until the disc pops into the body.

Install screen, cowl, cowl bolts, washers and nuts.

Install valve with new gasket, tighten flange bolts, carefully introduce pressure and check for leaks.

REPLACEMENT PARTS
Genuine replacement parts are available from your local VAG/GA Industries representative or from the factory:

VAG USA, LLC
234 Clay Avenue
Mars, PA 16046 USA
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Fax: 724-776-1254
E-mail: quotes-ga@vag-group.com

Please have the nameplate data available when ordering parts.

WARRANTY
The Warranty for GA Industries valves is included in our Terms and Conditions which can be found here: https://gaindustries.com/terms

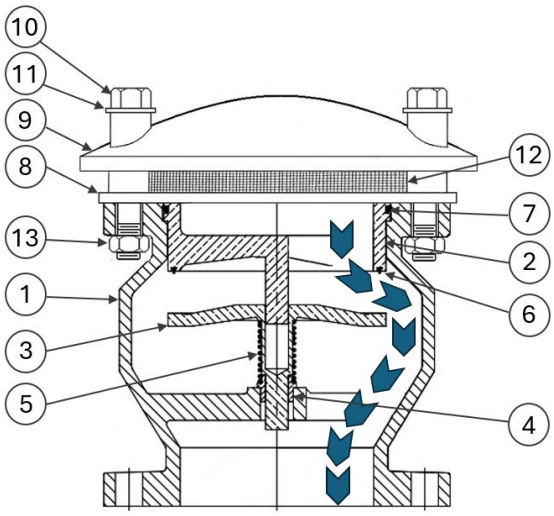

Figure 990-D

(Shown in Open Position

Vacuum Breaker Valve

Item	Description	Standard Material
1	Body	Ductile Iron
2	Body Seat	Bronze
3	Disc	Bronze
4	Bushing	Bronze or SS
5	Spring	Stainless Steel
6	Rubber Seat	EPDM Rubber
7	Seat O-Ring	EPDM Rubber
8	Retainer	Steel
9	Cowl	Steel
10	Cowl Bolts	Steel or SS
11	Cowl Washer	Steel or SS
12	Screen	Stainless Steel
13	Nuts	Steel or SS

Section 3

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Figure 920

1” & 2” Compound Lever Air Release Valves

Drawing EAR-7003

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Manual Number 920-IOM 022420 Rev C

INSTALLATION, OPERATION
INSTALLATION, OPERATION and MAINTENANCE
Figure 920 Air Release Valves

INTRODUCTION

This manual will provide the information to properly install, operate and maintain the valve to ensure a long service life. The Air Release Valve is ruggedly constructed to provide years of trouble-free operation with minimal maintenance.

These Air Release Valves are not intended for use with fluids containing suspended solids such as wastewater and sewage. The GA Industries Figure 925, 927 or 929 Air Release Valves are recommended for such applications.

CAUTION

The valve is NOT recommended for use with toxic fluids, fuels or fluids containing hazardous gases

CAUTION

The valve will not function if used at a pressure higher than the maximum working pressure indicated on the nameplate.

The Shop Order (SO) Number, Figure Number, size and pressure rating are stamped on a nameplate attached to the valve. Please refer to the SO number when ordering parts.

DESCRIPTION OF OPERATION

The Air Release Valve is designed to automatically vent air that has accumulated within the valve. These valves are usually installed at high points in the system where air tends to collect. The valve as shipped is ”normally open” and will vent air through its orifice at the top of the valve. The float rises when water enters the valve and closes the orifice. Air from the system accumulates in the valve forcing the water level down until the float drops and opens the venting orifice. As air is released the water level rises lifting the float and re-closing the valve.

This sequence occurs as often as necessary to release air that has collected in the valve.

RECEIVING AND STORAGE

Inspect the valve upon receipt for damage during shipment. Carefully unload all valves to the ground without dropping.

The valves should remain in a clean, dry and weather protected area until installed. For long term storage (greater than 6 months) the rubber surfaces of the seat should be coated with a non-toxic lubricant such as "SuperLube" made by Synco Chemical. Do not expose the rubber parts to sunlight or ozone.

INSTALLATION

The Figure 920 is standard with NPT screwed connections. An optional flange pipeline connection is available on special order.

Consult the drawings of record to verify the configuration supplied and installed.

The valve must be installed in an upright vertical orientation, normally at a high point in the system.

If installed outdoors, below ground in a vault or in an unheated area, adequate freeze protection must be provided. Some discharge of water may occur during operation so the valve outlet should be piped to an adequate drain.

An isolating valve should be installed between the valve and the pipeline or system to facilitate maintenance.

Carefully screw threaded end valves onto pipe nipple using compatible thread sealant. Tighten valve using wrench flats. DO NOT OVER-TIGHTEN.

Flat-faced flanged valves should be mated with flat-faced flanges and full-face gaskets. If ring gaskets are used the bolt material shall be ASTM A307 Grade B (or equivalent). Higher strength bolting should only be used with full-face gaskets.

Lower heavy valves over the mating flange using slings or chains around the valve body. Lubricate the bolts or studs and insert around flange. Lightly tighten bolts until gaps are eliminated. Torque bolts in an alternating pattern in graduated steps. If leakage occurs wait 24 hours and re-torque the bolts but do not compress the gasket more than 50% or exceed bolt maximum torque rating.

VALVE CONSTRUCTION

The standard Figure 920 Air Release Valve has a cast iron body, stainless steel float and linkage mechanism and a rubber seat. Optional materials such as ductile iron body can be provided for higher working pressures. Refer to the List of Materials submitted for the order if non-standard materials were provided.

Refer to Page 4 for details of construction and parts location.

The body (1) has an inlet connection at the bottom where the valve attaches to the system and a smaller outlet connection at the top through which air leaves the valve.

WARNING

Removing the valve from the line or disassembling the valve while there is pressure in the valve body may result in injury or damage to the valve

PREVENTIVE MAINTENANCE

Figure 920 Air Release Valves require no scheduled lubrication, adjustment or preventive maintenance.

A periodic visual inspection should be performed to ensure the outlet piping is not obstructed and to verify there is no fluid leakage.

TESTING

Valve operation can be easily tested. Close the inlet isolation valve and remove or loosen the pipe plug nearest the inlet to drain the water from the valve. The float should drop as the water leaves the valve. NOTE: A ball or gate valve can be installed in place of the pipe plug to facilitate testing.

Replace or tighten the pipe plug and slowly open the inlet isolating valve. The valve should float closed and seat tightly.

TROUBLESHOOTING

- Valve Does Not Close / Fluid Leakage

  Verify debris has not collected on the seat preventing tight closure

  Verify rubber orifice button and/or orifice seating surfaces are not damaged

  Verify float has buoyancy

  Verify linkage mechanism operates freely without binding or sticking

  Verify the pressure at the valve inlet is at least 10 PSI

- Valve Does Not Open

  Verify debris in the valve is not preventing the float from freely falling when fluid is drained from valve

  Verify linkage mechanism operates freely without binding or sticking

  Verify the pressure at the valve inlet does not exceed the maximum working pressure

DISASSEMBLY

While small valves may be more easily serviced by removing it from the line, all valves can be serviced while the body remains connected to the pipeline. A skilled technician with proper tools should perform all work. No special tools are required.

First ensure there is no pressure within the valve. Remove the cover bolts and nuts (16 & 17) and lift off cover (2) with float and linkage attached. It may be necessary to pry the cover off. Be careful no to damage or lose O-ring (21).

Remove the two spring pins connecting the lever arm (5) and float arm (6) to the bracket (3). The float and linkage will be free from the cover.

Remove the spring pin connecting the pivot link (12) to the float arm (6) and remove the float screw (13) and lockwasher (9). Remove the hex nut (8) and lockwasher (9) and unscrew the orifice button (7) from the lever arm (5).

Remove the bracket screw (4) to remove the leverage bracket (3). Using a hex socket remove the orifice (20) from the cover.

Inspect all parts for wear and damage. Minor scratches and dents in the float are normal. Some floats may contain sand for added weight but if water is detected replace the float. Carefully clean the orifice of scale. Replace damaged parts.

REASSEMBLY

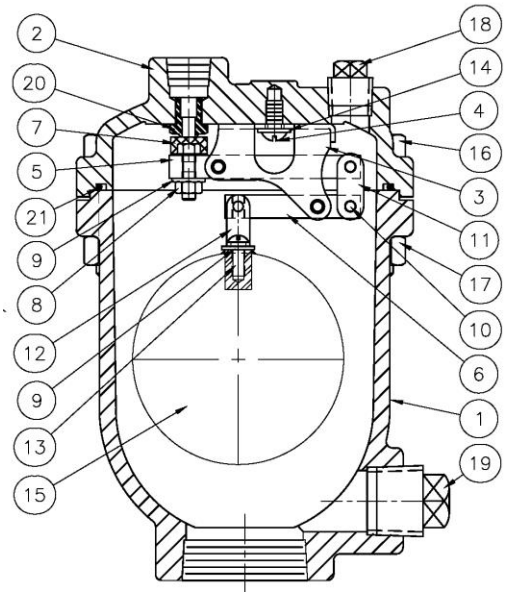
Clean all parts especially seating and sealing surfaces before reassembling valve. Worn parts should be replaced during re-assembly.

Apply Loctite© PST thread sealant to orifice (20) and thread into cover. Torque to maximum 22 ft-lbs.

Thread orifice button (7) all the way into lever arm (5) and install hex nut (8) and lockwasher (9) but do not tighten. Connect the lever arm (5) and float arm (6) to the bracket (3) using two spring pins.

Adjust the orifice button (7) so that the end of the lever arm (5) nearest the orifice button is about 1/16" (1.6mm) farther from the cover than the opposite end when the orifice button (7) is gently resting on the orifice (20). Secure by tightening hex nut (8)

Secure float (15) to pivot link (12) using screw (13) and lockwasher (9). Attach pivot link (12) to float arm (6) using spring pin. Verify free movement of linkage mechanism and that the orifice button (7) presses against the orifice (3) when the float is lifted and pulls away when falls.



Lubricate and place O-ring (21) in cover (2) and carefully place cover (2) on body (1) ensuring o-ring is retained. Install the cover bolts (16) and nuts (17) and tighten in an alternating pattern.

Carefully introduce pressure and check for leaks

REPLACEMENT PARTS

Genuine replacement parts are available from your local VAG/GA Industries representative or from the factory:

VAG USA, LLC
234 Clay Avenue
Mars, PA 16046 USA
Telephone: 724-776-1020
Fax: 724-776-1254
E-mail: quotes-ga@vag-group.co

Please have the nameplate data available when ordering parts.

REPAIR KITS

Soft Goods Kit A920 (Part Number 2-80-11000-005) includes Items 7, 8, 9 and 21.

Linkage Kit AL920 (Part Number 2-80-11000-081) includes Items 3, 4, 5, 6, 10, 11,12 and 14

WARRANTY:

The Warranty for GA Industries valves is included in our Terms and Conditions which can be found here: https://gaindustries.com/terms

PARTS LIST

Item	Name	Material
1.	Body	Cast Iron
2.	Cover	Cast Iron
3.	Bracket	316 Stainless Steel
4.	Bracket Screw	304 Stainless Steel
5.	Lever Arm	316 Stainless Steel
6.	Float Arm	316 Stainless Steel
7.	Orifice Button	Buna-N/Stainless Steel
8.	Hex Nut	304 Stainless Steel
9.	Lock Washer	302 Stainless Steel
10.	Spring Pin	302 Stainless Steel
11.	Valve Link	316 Stainless Steel
12.	Pivot Link	316 Stainless Steel
13.	Float Screw	304 Stainless Steel
14.	Lock Washer	302 Stainless Steel
15.	Float Ball	316 Stainless Steel
16.	Cover Bolts	Zinc Plated Steel
17.	Cover Nuts	Zinc Plated Steel
18.	Pipe Plug	Steel
19.	Pipe Plug	Cast Iron
20.	Orifice	316 Stainless Steel
21.	O-Ring	Buna-N Rubber