

Installation and Maintenance Manual

Forbes Marshall View Glass

VU50

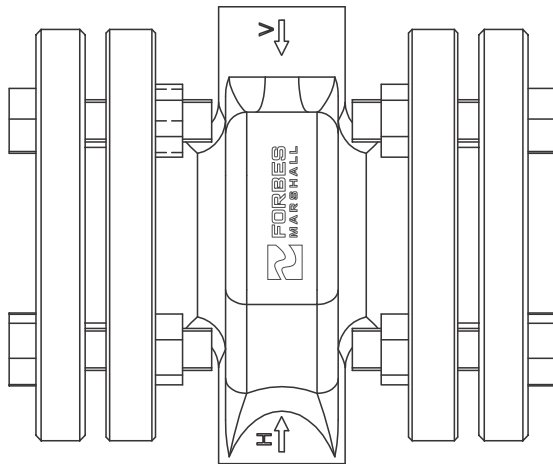


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PLEASE NOTE - Throughout this manual this cautionary symbol is used to describe a potential damage or injury that might occur if the safety considerations are overlooked. This symbol denotes **CAUTION**, **WARNING** or **DANGER**.



1. Preface:

This manual is intended for anyone using, commissioning, servicing, or disposing the below mentioned products safely and efficiently.

Forbes Marshall View Glass [VU50]

Sizes: DN15 (1/2"), DN20 (3/4"), DN25 (1"), DN40 (1 1/2 "), DN50 (2").

PLEASE NOTE:

Throughout this manual the following cautionary symbol is used to describe a potential damage or injury that might occur if the safety considerations are overlooked.

2. Important Safety Notes:



Read this section carefully before installing/operating/maintaining the product. The precautions listed in this manual are provided for personnel and equipment safety. Furthermore, Forbes Marshall accepts no responsibility for accidents or damage occurring as a result of failure to observe these precautions. Note that the product is designed to perform for non-contaminated fluids only. A contamination in the form of chemical, foreign particle etc. can lead to problem with product performance and life of the product.

If these products in compliance with the operating instructions are, properly installed, commissioned, maintained and installed by qualified personnel (refer Section 2.7) the safety operations of these products can be guaranteed. General instructions for proper use of tools and safety of equipments, pipeline and plant construction must also be complied with.

2.1 Intended use:

Check if the product is suitable for intended use/ application by referring to the installation and maintenance instructions, name plates and technical information sheets.

- i) The product is suitable for use as defined in the technical information sheet. In case the need arises to use the product on any other fluid please contact Forbes Marshall for assistance.
- ii) Check for the suitability in conformance to the limiting conditions specified in technical information sheet of the product.
- iii) The correct installation and direction of fluid flow has to be determined.
- iv) Forbes Marshall products are not intended to resist external stresses, hence necessary precautions to be taken to minimize the same.

2.2 Accessibility and Lighting:

Safe accessibility and working conditions are to be ensured prior to working on the product.

2.3 Hazardous environment and media:

The product has to be protected from hazardous environment and check to ensure that no hazardous liquids or gases pass through the product.

2.4 Depressurizing of systems and normalizing of temperature:

Ensure isolation and safety venting of any pressure to the atmospheric pressure. Even if the pressure gauge indicates zero, do not make an assumption that the system has been depressurized.

To avoid danger of burns allow temperature to normalize after isolation.

2.5 Tools and consumables:

Ensure you have appropriate tools and / or consumables available before starting the work. Use of original Forbes Marshall replacement parts is recommended.

2.6 Protective clothing:

Consider for the requirement of any protective clothing for you/ or others in the vicinity for protection against hazards of temperature (high or low), chemicals, radiation, dangers to eyes and face, noise and falling objects

2.7 Permits to work:

All work to be carried out under supervision of a competent person. Training should be imparted to operating personnel on correct usage of product as per Installation and Maintenance instruction. "Permit to work" to be complied with (wherever applicable), in case of absence of this system a responsible person should have complete information and knowledge on what work is going on and where required, arrange to have an assistant with his primary goal and responsibility being safety. "Warning Notices" should be posted wherever necessary

2.8 Handling:

There is a risk of injury if heavy products are handled manually. Analyze the risk and use appropriate handling method by taking into consideration the task, individual, the working environment and the load.

2.9 Freezing:

Provision should be made to protect systems which are not self-draining, against frost damage (in environment where they may be exposed to temperatures below freezing point) to be made.

2.10 Product Disposal:

It is necessary to dispose this product only in accordance with local regulations at the authorized, qualified collecting point specified for equipment's and its parts—Please refer the part details mentioned in the material table of this manual. Please follow all waste disposal guidelines (Management & Handling) as published by local governing authorities in India & abroad.

2.11 Returning products:

Customers and Stockist are reminded that, when returning products to Forbes Marshall they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk.

This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous or potentially hazardous.

3. Brief Product Information:

3.1 Description:

The Forbes Marshall View Glass, VU50, is a novel product that allows you to visualize the flow of steam, water or oil inside pipeline. The visualization of flow will help you diagnose problems occurring in equipment upstream or downstream of the VU50.

VU50 overcomes the problems of poor visibility and improper distinction between vapour and condensate. This new design is ideal for applications in which one wants a clear indication of flow, such as downstream of paper drying cylinders. In DM water lines or for monitoring steam traps and heat exchangers.

The two large windows of oil-lapped toughened borosilicate glass, which resist the etching and sludge build up common to the normal glass used in other sight glasses, further improve visibility in the VU50. The borosilicate glass remains clear preventing the frequent glass replacement, necessary with other sight glasses and the double glass configuration keeps the flow back lit for better viewing.

3.2 Sizes and End Connections:

DN 15, 20, 25, 40 and 50

Socket welded

Screwed BSPT, NPT

Flanged BS 10, DIN (DN25, DN40)

ANSI (C Class 150 and 300)

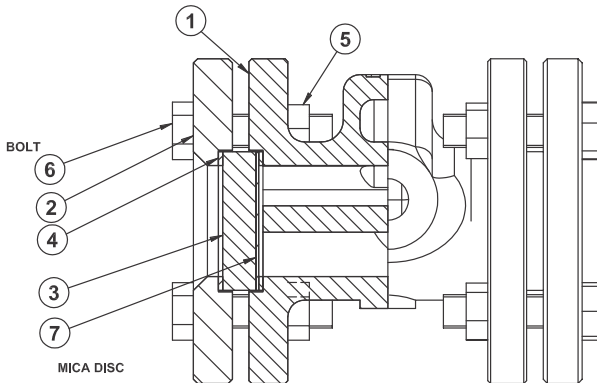


Figure 1: Forbes Marshall View Glass

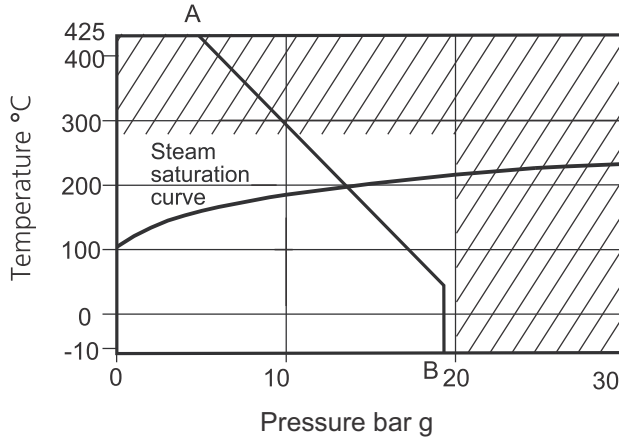
Material:


Sr. No.	Part	Material	Standard
1	Body	Cast steel	ASTM A 216 WCB
2	Flange	Carbon steel	SA 516 Gr.70
3	Toughened Glass	Borosilicate oil-lapped glass	DIN 7080 / 2081
4	Gasket	Reinforced ex-foliated graphite	
5	Nut	-	A 194 Gr.2H
6	Stud Bolt	-	A 194 Gr.2H
7	Mica Disc	Mica	

3.3 Limiting Conditions:

Maximum operating pressure	20 bar g
Maximum operating temperature	250°C
Cold hydraulic test pressure	30 bar g

3.4 Operating Range:



 This product must not be used in this region.
A - B Flanged ANSI 50

3.5 Product Dimension and Drawing:

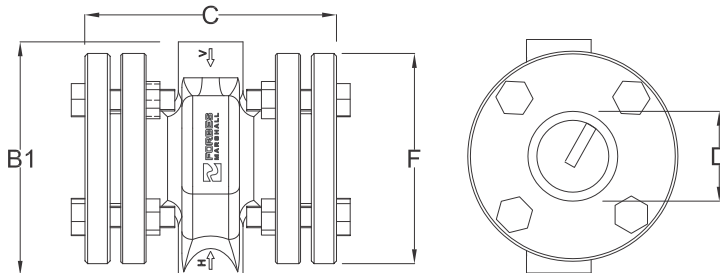


Figure 2: Dimensional Drawing of VU50 - Screwed, Socket Weld Version

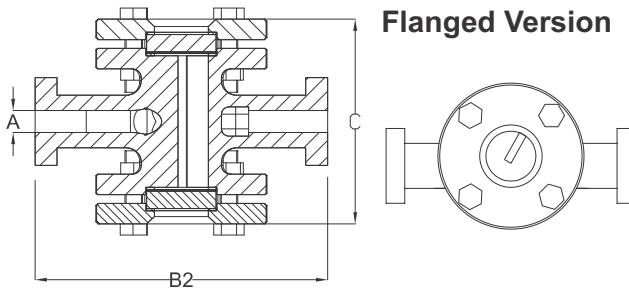


Figure 3: Dimensional Drawing of VU50 - Flanged Version

Dimensions (approx.) in mm and kg:

A	B1	B2	C	D	E	F	Weight
DN 15/20	130	230	132	40	M12	110	8
DN 25	190	290	170	55	M12	135	10
DN 40	206	306	212	70	M16	160	12
DN 50	230	330	232	70	M16	160	14

3.6 Applications:

Condensate Lines:

VU50 can be fitted on a condensate line to monitor steam flowing with the condensate. Because of the improved visibility it offers, VU50 is especially suited for use in lines with high speed flow.

DM Water Lines:

Due to the turbulence effect at the deflector plate, very clear fluids can be monitored using VU50. Thus, a VU50 fitted on a DM water line can indicate flow of DM water

Oil Lines:

The flow of oil and oil vapour can be visualized using VU50.

Heat Exchangers:

Vu50 can be used to check the efficiency of heat exchangers, especially in condensers. A VU50 can be fitted downstream of a condenser and flow of steam indicates a loss of performance in the condenser or a change in coolant conditions.

4. Operation :

Forbes Marshall View Glass VU50 is designed to give you clear visualization of flow conditions with the unique feature of its deflector plate stationed in the sight chamber. Under normal conditions, a pool of condensate forms at the bottom of the sight chamber. When steam is also passing through the pipeline, the steam is guided by the deflector plate into the pool of condensate. The density difference between the steam and condensate causes the pool of condensate to become depressed, thereby indicating flow of vapor. Mica disc provided on the inner surface of the glass protect the view glass from high temperature of fluid passing through it, retains basic strength and increases service life.

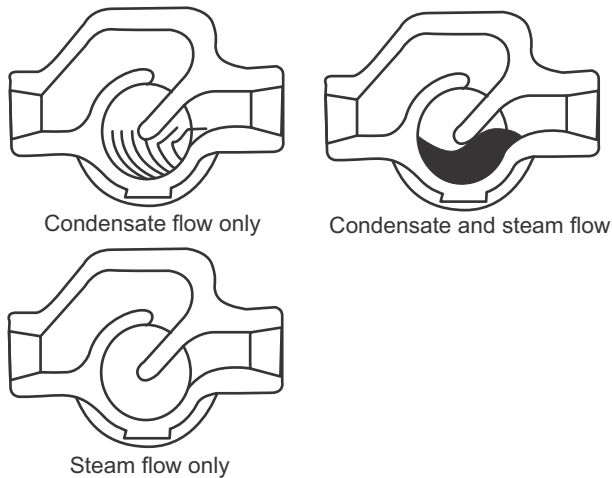


Figure 4: Operation of View Glass

5. Installation Guidelines :



Note: Before implementing any installations observe the 'Important Safety notes' in section 2. Referring to the Installation and Maintenance Instructions, name-plate and Technical Information Sheet, check that the product is suitable for the intended installation.

The arrow with the letter 'H' for horizontal and 'V' for vertical mounting on the casting and on the nameplate indicates the flow direction. (Refer Figure 5) for position of deflector plate. It is necessary to fit the View Glass before inlet of the steam trap (Refer to figure 6).

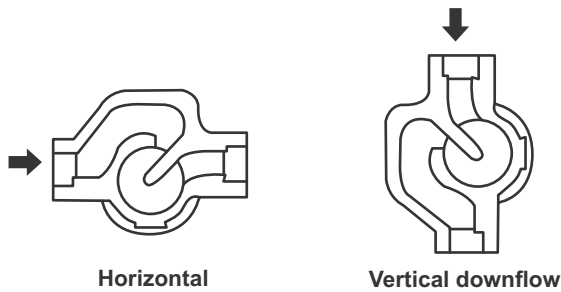


Figure 5 : Installation of View Glass

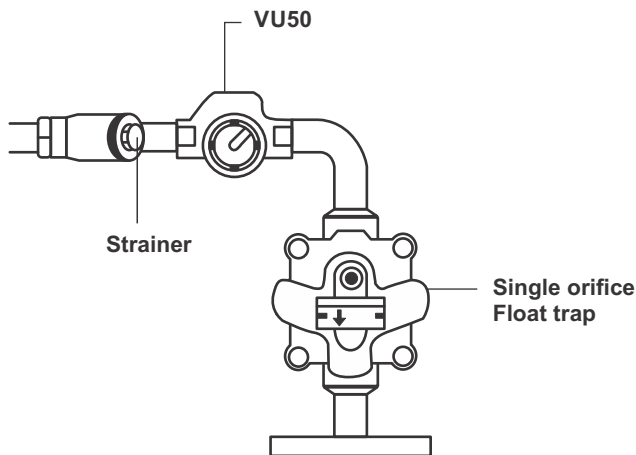


Figure 6: VU50 Installed before the Single Orifice Float trap

6. Maintenance Guidelines: (Refer to Figure 1)



Before undertaking any maintenance on the product it must be isolated from both supply line and return line and any pressure should be allowed to safely normalize to atmosphere.

VU50 is self-operated and does not require human intervention. It also does not require any elaborate or frequent maintenance. However for trouble free service ensure the following.

1. The drain plug must be opened to allow condensate to drain after every shut off. This practice prevents static retention of water, which could otherwise cause formation of rust and stains on the surface of the glass.
2. Regularly clean the glass with a mild detergent to prevent any dirt/dust from setting on the external surface of the glass.

For a detailed maintenance/replacement procedure of the View Glass, please refer to the instructions given in the subsequent sections;

1. Isolate the product upstream of the View Glass
2. Undo the nuts **(5)**.
3. Undo the studs **(6)** from their position, thereby loosening the flange **(2)**.
4. Remove the top gasket **(4)** and clean it. If damaged replace it.
5. Remove the bottom gasket **(4)** and clean it. If damaged replace it.

Use the following tools and torque:

Recommended tightening Torque for BEZEL FLANGE NUT, BOLTS

Size	Torque
DN15, 20	15-20 Nm
DN25, 40, 50	25-30 Nm

7. Available Spares:

ITEM NO.	DESCRIPTION
SPARE-1520VU50-GGKIT	DN15/20 VU50 SPARE TYPE: GLASS & GASKET KIT SPARE CONSISTS OF : GLASS WITH MICA DISC 2 NO.S , GASKET 4 NO.S
SPARE-1520VU50-MDKIT	MICA DISC 2 NO.S , GASKET 4 NO.S
SPARE-25VU50-GGKIT	DN25 VU50 SPARE TYPE: GLASS & GASKET KIT SPARE CONSISTS OF : GLASS WITH MICA DISC 2 NO.S , GASKET 4 NO.S
SPARE-25VU50-MDKIT	DN25 VU50 MICA DISC KIT:-MICA DISC 2 NO.S , GASKET 4 NO.S
SPARE-4050VU50-BCKIT	DN40/50 VU50 SPARE TYPE:BEZEL CAP KIT SPARE CONSISTS OF :BEZEL CAP 2 NO.S
SPARE-4050VU50-GGKIT	GLASS & GASKET KIT SPARE CONSISTS OF : GLASS WITH MICA DISC 2 NO.S , GASKET 4 NO.S
SPARE-4050VU50-GKIT	GASKET KIT SPARE CONSISTS OF :GASKET PACK OF 4 NO.S
SPARE-4050VU50-GLKIT	DN40/50 VU50 SPARE TYPE:GLASS KIT SPARE CONSISTS OF:GLASS PACK OF 2 NO.S
SPARE-4050VU50-MDKIT	DN40/50 VU50 MICA DISC KIT:-MICA DISC 2 NO.S , GASKET 4 NO.S

How to Order:

Example: Forbes Marshall View Glass, Vu50 DN 25 with screwed BSPT connection

How to Order Spares:

Always order spares by using the description given in the column headed "Available Spares" in the user manual.

Warranty Period:

As per the ordering information and agreement in the contract



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