SMFD2/4-NH3

VISUAL FLOW MONITOR SYSTEM FOR ANHYDROUS AMMONIA

Installation and Operation Manual

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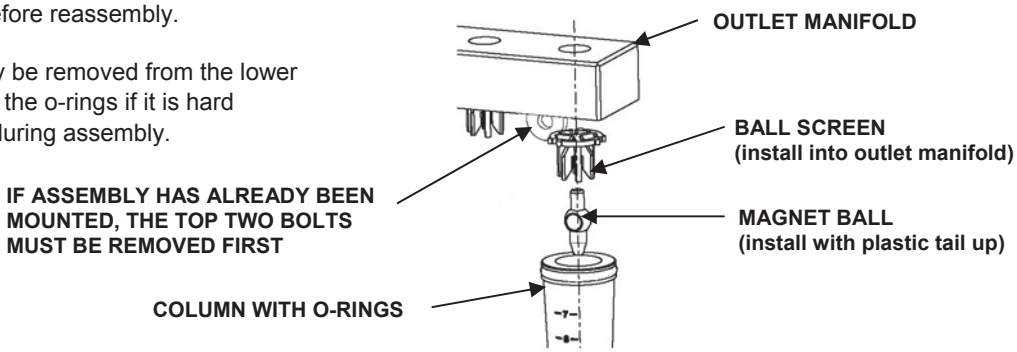
THE ORIGINAL INTENT OF THIS PRODUCT DOES NOT INCLUDE USE WHERE THE MAXIMUM ALLOWED PRESSURE OR TEMPERATURE IS EXCEEDED, AND IT DOES NOT INCLUDE APPLICATIONS UTILIZING FLUIDS THAT ARE NOT COMPATIBLE WITH THE PRODUCT'S COMPONENT MATERIALS. DO NOT USE THIS PRODUCT WITH FLAMMABLE OR COMBUSTIBLE FLUIDS SUCH AS GASOLINE, KEROSENE, DIESEL, ETC... FAILURE TO FOLLOW THIS NOTICE MAY RESULT IN SERIOUS INJURY AND/OR PROPERTY DAMAGE AND WILL VOID THE PRODUCT WARRANTY. IF IN DOUBT ABOUT YOUR APPLICATION, CONTACT YOUR STOCKING DEALER OR THE CDS-JOHN BLUE TECHNICAL STAFF AT 1-800-253-2583.

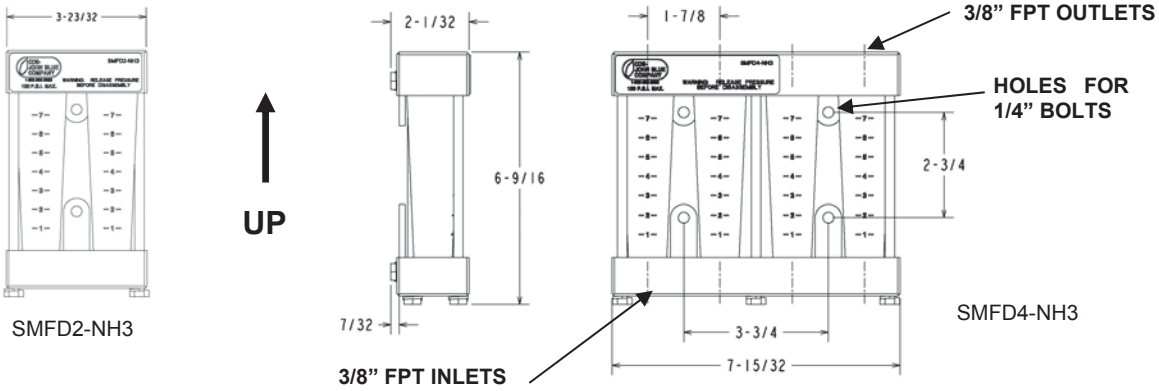
Installation:

1. Select the proper ball using the table below, and if a change is necessary first loosen the long bolts holding the inlet and outlet manifolds together. ** *The balls supplied are ready for use with LBMS, so do not replace the balls with those from the LBMS kit – see the note on page 2.* ** Remove the outlet manifold and replace the balls. That the ball screen should be placed in the outlet manifold before reassembly.

Note: The column(s) may be removed from the lower manifold if desired. Lube the o-rings if it is hard to install the manifold(s) during assembly.



2. The monitors need to be mounted vertically with the outlet at the top (see figure) using the bolt holes provided. A mounting bracket may be made out of strip steel or angle (see hole spacing below). The monitors may also be mounted onto the CDS-John Blue Liquid Blockage Monitor sensors. Install fittings into the manifolds using a sealant suitable for use with NH3.



Use with Liquid Blockage Monitor System:

Note: This system is already equipped with magnetic balls, so you do not need to replace them with the balls from the LBMS system. This is important because two of the balls supplied in the LBMS system (the yellow and green balls) are made of Delrin, which cannot be used with anhydrous ammonia. The orange ball may be used if required.

Note to the Owner

The Visual Flow Monitor System should be inspected annually for any wear or damage to any of the components in order to ensure proper operation. Enter the date of installation in the space provided for future reference. This information will be required for ordering replacement parts or servicing your Visual Flow Monitor System.

CDS – John Blue Engineering Department constantly improves its products. We reserve the right to make design and specification changes without notice.

DATE OF INSTALLATION: _____

Ball Selection:

Note: The ambient temperature and plumbing factors make a huge difference in how much vapor is in the system, and consequently where the balls float in the NH3 stream. Two tables are provided below to help you begin with ball selection, but note that there are so many variables that you may have to make changes after experimentation to suit your exact needs.

Standard/Warm temperature application: Appreciable % of vapor in the stream

BALL FLOW RATE TABLE (LBMS) FOR NH3 (SHOWING GPM PER ROW)			
Visagage Level	WHITE MAGNET BALL SMPT-0090	RED MAGNET BALL SMPT-0091	*OPTIONAL*: BLACK MAGNET BALL SMPT-0095
7	0.60	1.65	2.10
6	0.50	1.30	1.90
5	0.30	1.10	1.55
4	0.21	0.87	1.25
3	0.16	0.70	1.00
2	0.13	0.52	0.80
1	0.11	0.42	0.60

GPM per Row Calculation:
= (GPA x MPH x Spacing) / 5940
= (lbsN/AC x 0.236 x MPH x Spacing) / 5940
= (lbsNH3/AC x 0.194 x MPH x Spacing) / 5940

Example application:
17row, 30", 6mph, 40 GPA = 1.2 GPM
Use Red magnet ball – floats at approx. level 5

Very cold temperature application: Theoretical 100% liquid stream

BALL FLOW RATE TABLE (LBMS) FOR NH3 (SHOWING GPM PER ROW)			
Visagage Level	ORANGE MAGNET BALL SMPT-0057 (*Optional* - supplied with LBMS)	WHITE MAGNET BALL SMPT-0090	RED MAGNET BALL SMPT-0091
7	1.25	2.20	6.00
6	0.95	1.85	4.65
5	0.65	1.10	4.00
4	0.47	0.75	3.20
3	0.35	0.58	2.55
2	0.25	0.45	1.90
1	0.15	0.42	1.55

Operating Instructions:

1. Maximum allowed pressure in the monitor is 100 psi.
2. The clear columns of the flow monitor are made of TPX. The other materials in the assembly are polypropylene (balls and ball screen), nylon (balls), Buna-N (O-rings), and aluminum (manifolds). Testing has shown that the system works well with typical concentrations of N-Serve, but you must check for compatibility when using NH3 additives. Columns may be replaced periodically if required.
3. During use, the balls in each column should be approximately even. If they are not, check the lines for blockage or restriction.
4. If the balls are at the very top of the monitor during operation, it is recommended to change to another ball to lower its operating level to something that is readable.

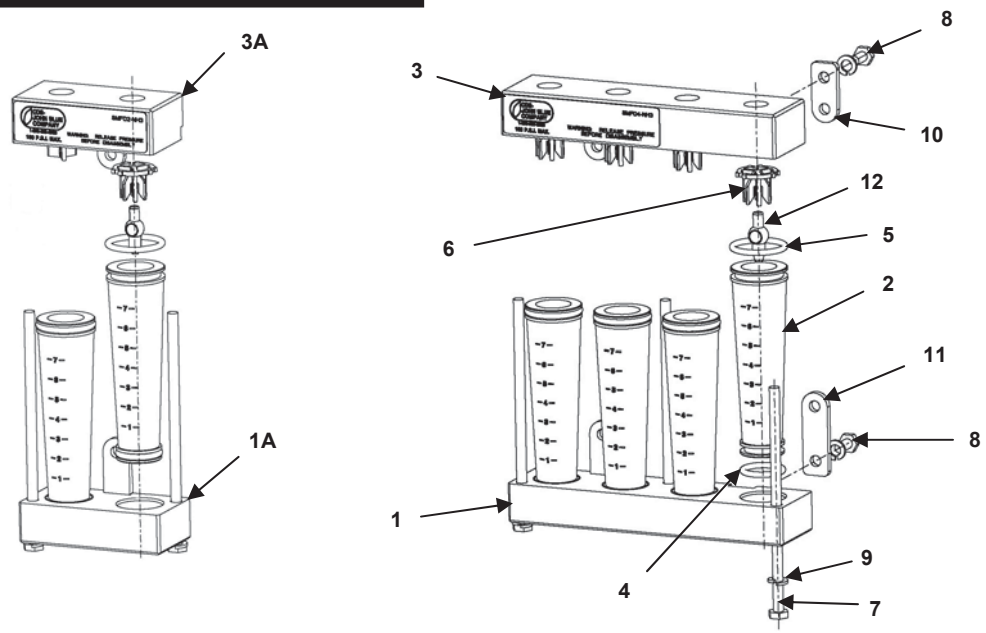
WARNINGS:

- Safety equipment such as gloves, goggles, etc. should be worn at all times while performing any repairs or maintenance to the assembly. A careful operator is the best insurance against an accident.
- Only qualified and responsible people should operate equipment, and only use approved anhydrous ammonia equipment.
- Check all valves, fittings, hose clamps, etc. for tightness and soundness before admitting anhydrous ammonia to the system. Only use components with materials that are compatible with anhydrous ammonia.
- Do not attempt to service or disconnect the assembly without first closing the tank outlet valve and completely bleeding all hoses and cavities of anhydrous ammonia.
- If anhydrous ammonia contacts the skin or eyes, the affected area should be promptly and thoroughly flushed with water, following all appropriate guidelines. See a physician in all severe cases of anhydrous ammonia burns.

Storage and Cleaning:

1. After use, flush the monitor columns for a few minutes with a solution that will neutralize any additives that may have been used (*refer to that manufacturer's instructions)*. The columns may be disassembled to ease cleaning.
2. Although the flow monitor's columns have an additive to increase UV resistance, to prolong their life it is suggested that you protect the flow monitors from sunlight during storage.

Parts Breakdown:



Item	Description	Part #
1	INLET MANIFOLD – 4 PORT – ALUMINUM	SMPT-0069
1A	INLET MANIFOLD – 2 PORT – ALUMINUM	SMPT-0083
2	COLUMN – TPX	SMPT-0071
3	OUTLET MANIFOLD – ALUMINUM	SMPT-0070
3A	OUTLET MANIFOLD – 2 PORT – ALUMINUM	SMPT-0084
4	#212 BUNA O-RING	SMPT-0074
5	#217 BUNA O-RING	SMPT-0075
6	BALL SCREEN – POLYPROPYLENE	SMPT-0078
7	¼"-20 X 5-3/4" LG. HHCS - SS	SMPT-0076
8	¼"-20 X ½" LG. HHCS -SS	SMPT-0077
9	¼" SPLIT LW - SS	93022
10	SHORT MOUNTING TAB – SS	SMPT-0073
11	LONG MOUNTING TAB – SS	SMPT-0072
12	BALL – WHITE MAGNET – NYLON 6/6 (included in box)	SMPT-0090
	BALL – RED MAGNET – NYLON 6/6 (installed at factory)	SMPT-0091
	OPTIONAL LOW FLOW BALL – ORANGE MAGNET – POLYPROPYLENE	SMPT-0057
	OPTIONAL HIGH FLOW BALL – BLACK MAGNET – NYLON 6/6	SMPT-0095

LIMITED WARRANTY

THIS WARRANTY IS IN LIEU OF ALL OTHER WRITTEN OR EXPRESS WARRANTIES AND REPRESENTATIONS. ANY IMPLIED WARRANTIES INCLUDING MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO THIS WRITTEN WARRANTY. CDS-JOHN BLUE COMPANY SHALL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES.

Use of this product for any purpose other than its original intent, abuse of the product, and/or any modification to the original product is strictly prohibited by the manufacturer, CDS-John Blue Company. Any modification to the product should be approved by CDS-John Blue Company prior to use. CDS-John Blue Company will deny Warranty claims and liability in any situation involving misuse, abuse or modification.

Each new machine or component manufactured by CDS-John Blue Company through original buyer is warranted by CDS-John Blue Company to buyer and to any party or parties to whom buyer may resell, lease or lend the equipment to be free from defects in material and workmanship under normal use and service. This obligation of CDS-John Blue Company under this warranty is limited to the repair or replacement of defective parts or correction of improper workmanship of any parts of such equipment which shall within one year from the date of CDS-John Blue's original delivery thereof, be returned to CDS-John Blue's factory, transportation charges prepaid and which CDS-John Blue Company shall determine to its satisfaction upon examination thereof to have been thus defective. When it is impractical to return the defective parts of such equipment to CDS-John Blue's factory, then CDS-John Blue shall have no liability for the labor cost involved in repairing or replacing any such parts and shall be liable solely for supplying the material necessary to replace or repair the defective parts, provided that prior thereto CDS-John Blue Company shall have determined to its satisfaction that any such parts are thus defective.

This warranty shall not apply to any equipment which shall have been repaired or altered outside CDS-John Blue's factory in any way so as to affect its durability, nor which has been subjected to misuse, abuse, negligence or accident, or operated in any manner other than in accordance with operating instructions provided by CDS-John Blue Company. This warranty does not extend to repairs made necessary by the use of inferior or unsuitable parts or accessories, or parts or accessories not recommended by CDS-John Blue Company.

CDS-John Blue Company makes no warranties in respect to parts, accessories or components not manufactured by CDS-John Blue Company, same ordinarily being warranted separately by their respective manufacturers.

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