English
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IMPORTANT NOTE: For the most up-to-date version of this manual, please visit www.h2flow.net

FLOWVIS® *Digital*

Signal Converter

Operating Manual

North American version (English)

www.h2flow.net
Tel: 888-635-0296 (Toll Free) OR (+1) 419-841-7774 (International)

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1. description

The FlowVis Digital Signal Converter (FV-D-SC) is a variation of FlowVis Digital which allows the user to interface more easily with external equipment, such as automation systems, chemical feeders, heaters, and VFDs. FV-D-SC is intended primarily for the Automation, OEM, and End-User market. The product's primary function is to linearize the ordinarily non-linear scaling of the FlowVis Digital sensor. FV-D-SC maintains the same unrivaled accuracy seen in other FlowVis and FlowVis Digital models.

FV-D-SC is housed in a rugged NEMA 4X corrosion proof fiberglass enclosure, ensuring it can be used in any environment, no matter how harsh.

Even with the ability to install FlowVis in tight spaces and with almost zero straight pipe requirements, it can sometimes be difficult to install the device in a location that makes it easy to read. FV-D-SC solves this problem by allowing you to connect FlowVis to an automation system for remote monitoring of the flow rate.

FlowVis Digital also includes a 4-20 mA output that can be interfaced to Variable Frequency Drives, such as H2flow's Eco-Flow in order to achieve constant flow control.

⚠ **IMPORTANT INSTALLATION NOTE** ⚠ Installers should read the section 'Advanced Setup' prior to installation. This section details the need for a Windows-PC with internet connection to complete an advanced setup.

⚠ **IMPORTANT INSTALLATION NOTE** ⚠ FLOWVIS® DIGITAL IS NSF 50 CERTIFIED FOR INDOOR USE ONLY.

2. compatibility

FlowVis Digital Signal Converter is designed to be included (as an option) with a new FlowVis installation. Alternatively, it can be retrofitted to most existing FlowVis. See the compatibility chart on page 9 of this document to confirm that FV-D-SC is compatible with your FlowVis.

3. safety information

ALL CONNECTIONS MUST BE MADE BY A QUALIFIED ELECTRICIAN. ELECTRIC SHOCK CAN CAUSE SERIOUS INJURY OR EVEN DEATH.

a) **Electrical:** FV-D-SC utilizes a 100-240VAC to 12VDC power supply that needs to be plugged into a standard receptacle. The power supply cord should be firmly inserted into the receptacle, and a plug restraining clamp should be added, if any of the FlowVis Digital Signal Converter's outputs are being interfaced to other equipment such as VFD's, Heaters, Chemical Feeders or any safety related equipment.

b) **Mechanical:** The FV-D-SC sensor housing should only be secured to the FlowVis lid using the two extra long 1" (25mm) stainless steel Phillips head screws provided.

4. what's included

FlowVis Digital Singal Converter includes:

Fig 1.0 100-240VAC to 12VDC Power Supply (with interchangable international adapters for export markets)

Fig 1.1 NEMA 4X enclosure with cable glands

Fig 1.2 Sensor with standard cable

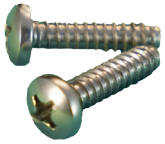


Fig 1.3 x2 extended length lid screws

5. pre-installation

This section only applies to FlowVis models that are 2.5" and below OR, FV-3 and FV-4 that were provided prior to November 2020. This section covers two scenarios for installing the FlowVis Digital system:

a) Install FlowVis Digital Sensor and Signal Converter to a new OR existing FlowVis unit for 1.5"/DN40, 2"/DN50, or 2.5"/DN65 pipe. If this section applies to you, please refer to Installation section 6.1 before proceeding to Installation section 6.3.

b) Install FlowVis Digital Sensor and Signal Converter to a 3"/DN80 or 4"/DN100 FlowVis that was manufactured before November 2020. If this section applies to you, please refer to Installation section 6.2 before proceeding to Installation section 6.3. If your FlowVis 3"/DN80 or 4"/DN100 was manufactured after March 2020, please proceed directly to Installation section 6.3.

Note: To confirm the manufacturing date of your FV-3 (DN80) or FV-4 (DN100), look at the 2-digit code on the side of the FlowVis lid and confirm that it is equal to or greater (later) than HT18. For example HT18 is greater (later) than HT17. If the code on your FlowVis lid is less than (before) HT18, a new, compatible lid assembly will be required. Please contact H2flow for assistance in determining the appropriate lid assembly for your installation.

6. installation

6.1. Replacing the flapper & indicator assembly in 1.5”(DN40) 2” (DN50) and 2.5” (DN65) installations

For the FV-D-SC to function, it is necessary that the red indicator arm has a magnet installed. FlowVis models on FlowVis models FV-15, FV-15-L, FV-C-M-DN40, FV-2, FV-2-L, FV-C-M-DN50, FV-25, FV-25-L, and FV-C-M-DN65 manufactured prior to February 2025 are not equipped with a pre-installed magnet. For these units, it will be necessary to contact H2flow Controls to obtain a replacement indicator arm. Replacing the indicator is a simple procedure that will take less than 2 minutes; however, it is important to reassemble the unit exactly as shown below.

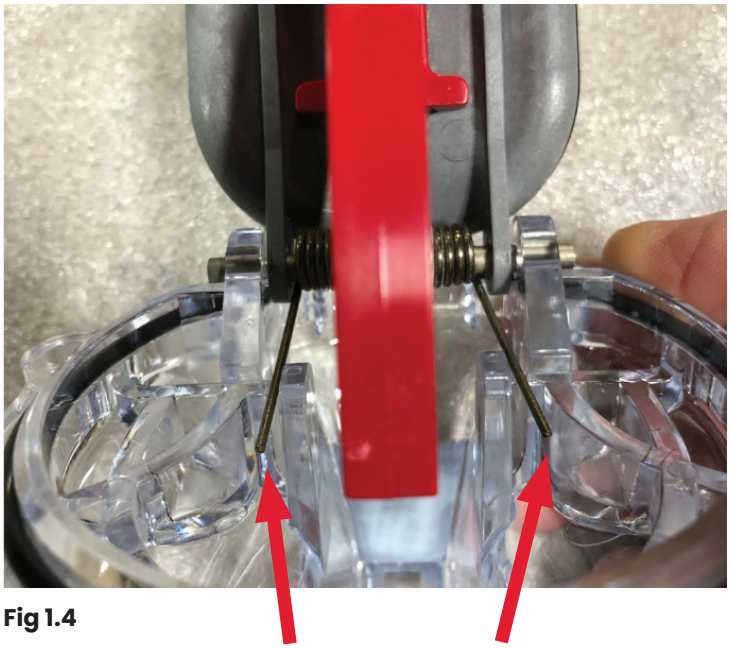


Fig 1.4

Procedure:

1. Release each of the two spring legs from the location tabs - this will remove the tension from the spring. See Fig.1.4 above.
2. Slide the Hasteloy pivot pin to completely remove it from the lid.
3. Discard the existing gray Flapper with its attached red indicator.
4. Pay attention to the orientation of the spring when reassembling the unit.
5. Install the new Flapper and Indicator following a reversal of the disassembly procedure. Note, you may find it easier to place the spring’s legs over their location tabs before sliding the pin.
6. Proceed to Section 6.2 to complete the installation of FlowVis Digital Signal Converter..

Fig 1.5

6.2. Installing FV-D-SC to an existing (pre- November 2020) 3"(DN80) or 4" (DN100) FlowVis

1. Remove the screws from the existing lid of the FlowVis unit and remove the lid assembly.
2. It is not uncommon for the FlowVis lid to be retained by a vacuum suction after the 8 screws have been removed. **Under no circumstances should you try to leverage the lid off with a screwdriver or similar device.** Instead, momentarily open a valve that is either upstream or downstream to release the vacuum.
3. Ensure that the new lid assembly has a code on the side of the lid that is equal to or greater than HT16. For example HT16 is greater (later) than HT15.
4. Ensure that the o-ring on the underside of the new lid assembly is undamaged, lubricated with silicone (such as Boss 820), and is in-place without twists.
5. Carefully lower the lid onto the Tee, making sure that the o-ring stays in place. Also make sure that its orientation is correct; the top of the FlowVis scale should be toward the direction of flow.
6. Referring to Fig.1.6 (right), identify the required side of the FlowVis to mount the FlowVis sensor, ensuring that the sensor is fully seated and the screw holes line-up with those on the FlowVis lid assembly.
7. Place 6 of the 8 FlowVis screws in the lid assembly, and use the 2 longer screws provided with your FlowVis Digital Signal Converter (Fig.1.3 on page 4) in the holes for the sensor. Do not tighten.
8. Using a hand Phillips-head screwdriver, slowly tighten the screws in a diagonal pattern, per the diagonal sequence shown in Fig.1.7. Do not fully tighten one screw before proceeding to the next, i.e., pull them down slowly multiple times to avoid stressing and cracking the lid. Screws should be tightened to a final torque of 25 in./lbs. or 2.8 Nm. **Disclaimer: Under no circumstances should the screws in the FlowVis lid assembly or sensor be tightened with an electric screwdriver in the 'drill' setting. This can result in a cracked lid or sensor and will void the product warranty.**
9. Proceed to section 6.3 to complete the wiring of your FlowVis Digital Signal Converter.

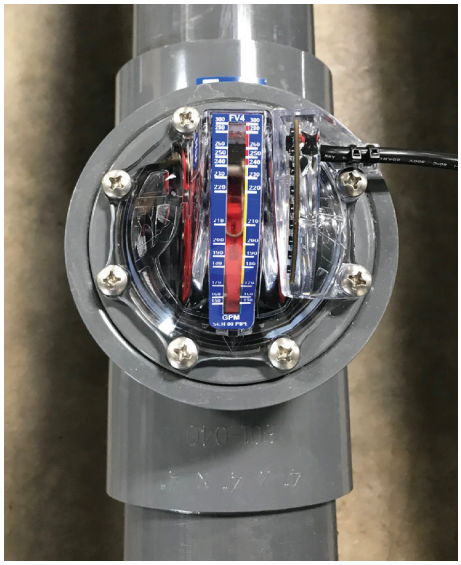


Fig 1.6

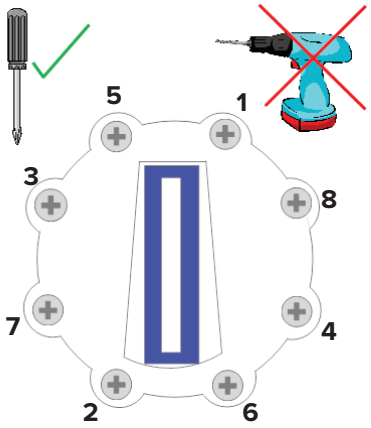


Fig 1.7

6.3. Installing FlowVis Digital to a new or existing (post- November 2020) FlowVis

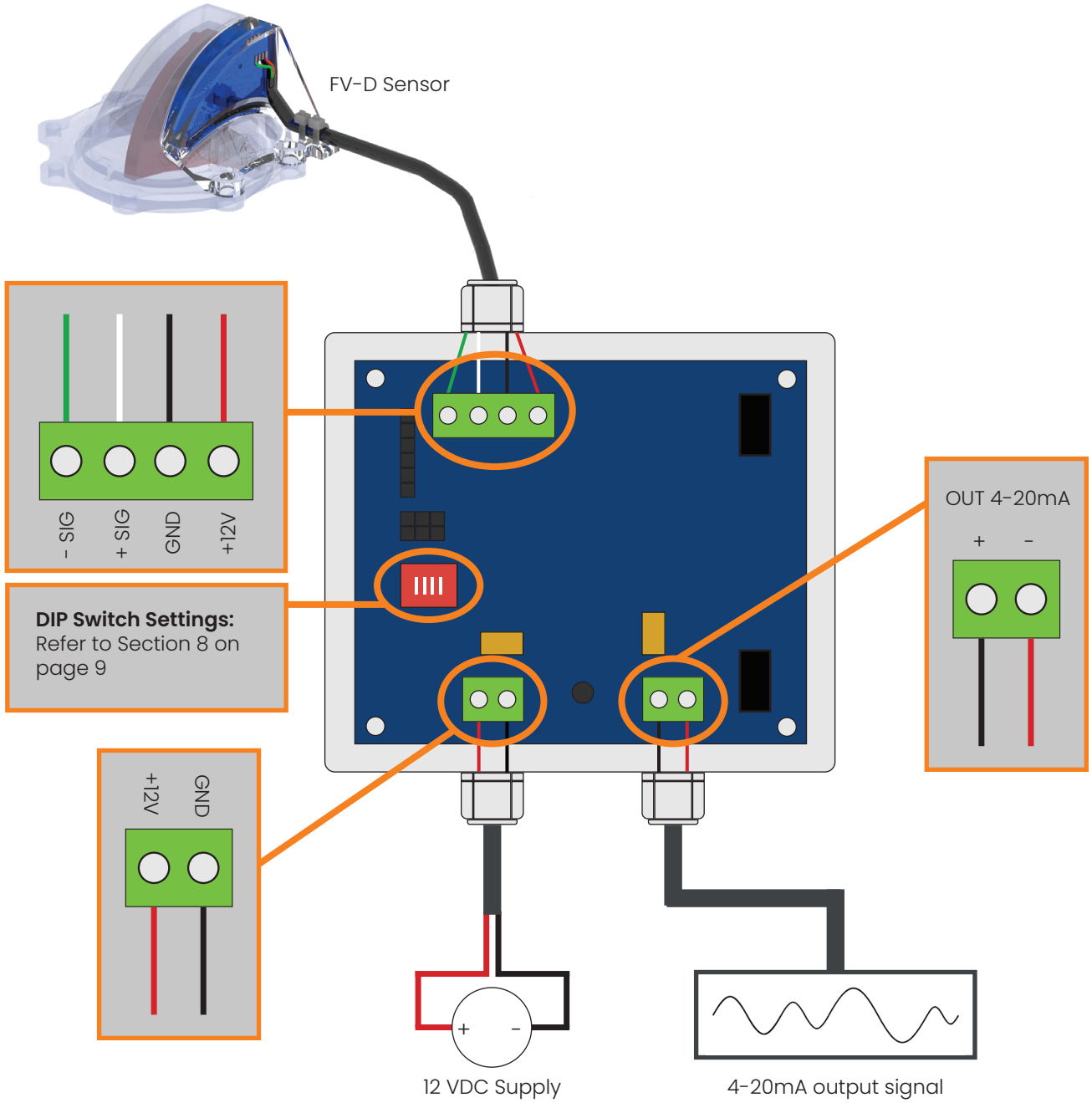
PLEASE NOTE: If you are installing FV-D-SC to either, a) an existing 1.5"(DN40), 2", or 2.5"(DN50/65), please refer to section 6.1, or b) an FV-3 (DN80) or FV-4 (DN100) that was manufactured before November 2020, please refer to section 6.2 of this manual before proceeding with section 6.3.

1. Check the contents of your FV-D-SC box to ensure that they comply with the components shown on page 4 of this document
2. Unless previously done in section 6.2, remove the two FlowVis lid screws that will align with the hole mounting tabs for the sensor (refer to Fig.1.6 on pg. 6).
3. Mount the sensor, ensuring that it is fully seated and the screw holes line-up with those on the FlowVis lid assembly (see Fig.1.6).
4. Place the 2 extended screws provided with your FlowVis Digital Signal Converter (Fig.1.3 on page 4) in the holes for the sensor and using a hand Phillips-head screwdriver, slowly tighten the screws. Do not fully tighten either screw before proceeding to the next, i.e., pull them down slowly, multiple times to avoid stressing and cracking the sensor. Screws should be tighteneed to a final torque of 25 in./lbs. or 2.8 Nm. **Disclaimer: Under no circumstances should the screws in the FlowVis lid assembly or sensor be tightened with an electric screwdriver in the 'drill' setting. This can result in a cracked lid or sensor, and will invalidate the product warranty.**
5. Mount the FlowVis Digital Signal Converter enclosure in a location that is a) close enough to the FlowVis flow meter for the sensor cable length (including any extension cables you may have purchased), and b) close enough to a 100-240VAC receptacle to allow the power supply to connect. **Note:** The power supply output (12VDC) cable has a total length of 10 feet / 3M, but can be extended up to a total length of 24 feet / 8M. It is essential that its polarity is maintained. Good electrical practices should be used when extending this cable.
6. Connect the Power Supply low voltage (12VDC) output to the FV-D-SC (see wiring diagrams on page 8).
7. Connect the Sensor to the FV-D-SC using either the standard-length cables provided or the extension cable (if purchased).
8. **Disclaimer: The sensor-to-Signal Converter cables <u>MUST NOT</u> be cut or spliced in any way. Doing so will invalidate the product warranty. If these cables are longer than needed, we suggest coiling the excess cable and tying with a zip-tie.**
9. Plug in the Power Supply and ensure that the blue light on the sensor is on (not flashing). If the blue light is flashing, please refer to section 6.4.
10. If being used, connect 4-20 mA output to external equipment such as a VFD (see Fig.1.8).
11. Proceed to the Programming section.

6.4. Sensor/blue light is flashing

A blue LED is visible when looking at the sensor. A flashing blue LED indicates that the FlowVis does not have a magnet installed. All FlowVis models that are 3" (DN80) and larger that were manufactured after November 2020 had this magnet installed. If your application involves a unit that is ≥3" (DN80), and the sensor light is flashing, it is apparent that your FlowVis unit was manufactured before this date. Please contact H2flow to find a solution. If your FlowVis model is for a 2.5" (DN65) or smaller, and the blue sensor light is flashing, please contact H2flow to obtain a replacement flapper/indicator for your unit.

7. wiring



7.1. Important Setup Notes

1. Program the receiving device to scale the 4-20mA signal to the flow range of the specific FlowVis model that is being used. 4mA will represent the lowest indicated flow rate while 20mA represents the highest indicated flow rate on the FlowVis scale.
2. Ensure that the DIP switches are set to the appropriate FlowVis model.
3. 12 VDC, 0.2 A supply.

8. DIP switch settings

FlowVis Model	Pipe Size	DIP Switch Position			
		1	2	3	4
FV-15; FV-M-d50	1.5" & d50	ON	OFF	OFF	OFF
FV-2; FV-M-d63	2" & d63	OFF	ON	OFF	OFF
FV-25; FV-M-d75	2.5" & d75	ON	ON	OFF	OFF
FV-3; FV-M-d90	3" & d90	OFF	OFF	ON	OFF
FV-4; FV-M-d110	4" and d110	ON	OFF	ON	OFF
FV-6; FV-M-d160	6" and d160	OFF	ON	ON	OFF
FV-8; FV-M-d200	8" and d200	ON	ON	ON	OFF

9. specifications

Display Enclosure

Enclosure Material ..... Polycarbonate
Rating ..... NEMA 4X / IP66
Dimensions ..... 4.5" x 3.5" x 2.1" / 115mm x 90mm x 50mm (HxWxD)

Sensor

Sensor Housing Material ..... Polycarbonate (clear)
Cable ..... 26.25 ft. (8M) long

Power Supply

Power Connection ..... Receptacle style
Power Source ..... 100-240VAC, 0.4 Amps
Power Output ..... 12 VDC, 1.0 Amps
Low Voltage Cable Length ..... 10' (3M)

Analog Output (4-20mA)

Format/type ..... Analog, 4-20 mA
Scale ..... 4 mA = zero flow, 20 mA = max flow rate limit of installed FlowVis
Maximum Load ..... 250 ohms

Accuracy

Flow Rate Accuracy ..... >97.9% for all FlowVis models

Environmental

Operating Temperature ..... 32 to 122°F (0 to 50°C)
Storage Temperature ..... -4 to 140°F (-20 to 60°C)
Rated for ..... Indoor or outdoor use

10. warranty

IMPORTANT, PLEASE READ AND KEEP THIS DOCUMENT ON RECORD.

Definition

H2flow Controls, Inc., warrants the FlowVis® product for 3-years from its date of supply from H2flow Controls, Inc. or its stocking Distributor. In the event that the product experiences a premature failure due to defective workmanship or materials, H2flow will, at its discretion, replace either the failed component(s) or the complete FlowVis Digital unit. H2flow shall not be responsible for third-party labor or any consequential losses. Damage caused by improper installation, misuse or exposure to corrosive chemicals, will not be covered by this warranty.

Eligibility

This warranty extends to the original purchaser only or to the end-user client of an H2flow Controls Inc. authorized affiliate.

How to obtain service

To obtain service under the terms of this warranty, the customer is required to notify H2flow Controls Inc. before the expiration of the warranty period and to return the item in accordance with H2flow Controls Inc's product return policy. Any product returned for warranty repair must be accompanied by a full fault report specifying the symptoms and the conditions under which the fault occurs. Should H2flow Controls Inc. incur additional cost as a result of a failure to complete the appropriate paperwork, an administrative charge may be levied.

Exclusions

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate care. H2flow Controls Inc. shall not be obligated to provide service under this warranty if:

a) damage has been caused by a failure to make a full and proper inspection of the product (as described by the documentation enclosed with the product at the time of shipment) on initial receipt of the product following shipment;

b) damage has been caused by the attempts of individuals, other than H2flow Controls Inc. staff to repair or service the product;

c) damage has been caused by the improper use of the product, including but not limited to, the cracking or breakage of a FlowVis Digital sensor or FlowVis lid due to the over-tightening of lid screws, damage to the FlowVis Digital LCD display screen due to misuse or excessive exposure to chemicals, use or installation in an outdoor, wet or 'washdown' type environment, the splicing or cutting of cables or wires unless explicitly instructed to do so during the installation process.

Charges

Under cover of this warranty, H2flow Controls Inc. will pay the carriage and insurance charges for the shipment of defective product back to H2flow Controls Inc. and for its return to the client's original site of dispatch except when:

a) H2flow Controls Inc's product return policy has not been followed.

b) product failure is caused by any of the exclusions described at paragraph 4 above, when the customer will be liable for the full cost of the repair (parts and labor) plus all carriage and insurance costs to and from H2flow Controls Inc's premises.

c) the product is damaged in transit and a contributory cause is inadequate packaging. It is the customer's responsibility to ensure that the packaging used to return equipment to H2flow Controls Inc. is the same, or has equivalent protective qualities, to that used to ship the product to the customer in the first instance. Any damage resulting from the use of inadequate packaging will nullify H2flow Controls Inc's obligations under this warranty.

Should the customer's product be damaged in transit following a repair at H2flow Controls Inc's site, a full photographic record of the damage must be obtained (packaging and the product) to support any claim for recompense. Failure to present this evidence may limit H2flow Controls Inc's obligations under this warranty.

THIS WARRANTY IS GIVEN BY H2FLOW CONTROLS INC. IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY, NON INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE. H2FLOW CONTROLS INC SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES. WE SPECIFICALLY DISCLAIM ANY AND ALL WARRANTIES TO CUSTOMERS OF THE CUSTOMER. THE CUSTOMER'S SOLE REMEDY FOR ANY BREACH OF WARRANTY IS THE REPAIR OR REPLACEMENT, AT H2FLOW CONTROLS INC'S DISCRETION, OF THE FAILED PRODUCT.

11. notes

H2flow Controls, Inc., 7629 New West Rd., Toledo, OH 43617 U.S.A.
Tel: 888-635-0296 (Toll Free) OR (+1) 419-841-7774 (International) • Fax: 419-517-9900
For international sales and service, please visit our website: www.h2flow.net