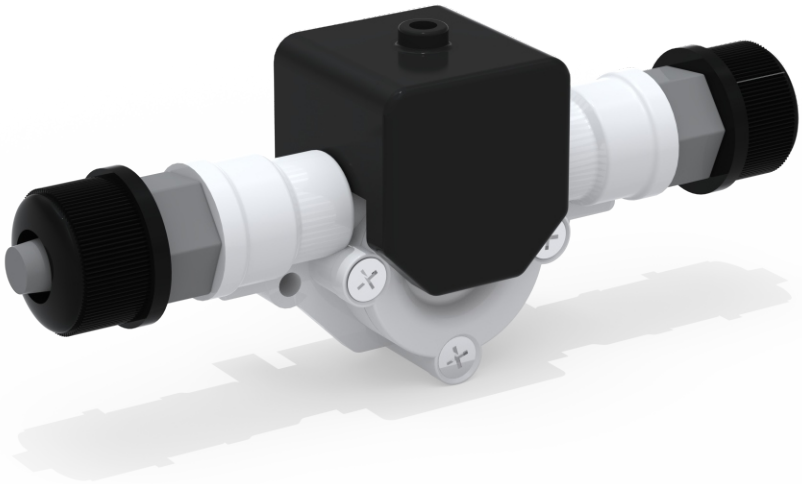
MICRO-FLO

FLOW VERIFICATION SYSTEM (FVS)
INSTRUCTION MANUAL



Electronic Flow Verification

Are you sure the pump is actually pumping?

Empty chemical tank, clogged injection fitting, lost prime, an other problems can prevent a metering pump from actually injecting chemical - even though the pump is in good working order.

Blue-White®

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Installation Options

The Micro Flow FVS (Flow Verification Sensor) is designed to give you many installation options.

The sensor can be installed:

- Directly on the pumphead of a Blue-White pump (see next page).
- Anywhere on the discharge side of a diaphragm pump.
- Anywhere on the suction side of a peristaltic pump.

The wiring for the sensor can be connected directly to a Blue-White pump. The pump will stop pumping if the sensor detects no flow. A relay will then close allowing for remote alarm indication or initiation of a back-up injector pump.

The Micro Flow FVS can be connected directly to many Blue-White injector pumps (see table below). The sensor will verify that chemical injection has actually occurred. The pumps sophisticated electronics continuously monitor the sensor. If chemical should fail to inject, the pump will stop and an alarm relay will close - allowing for remote alarm indication and/or initiation of a back-up injector pump.

Installation Guideline

Recommended sensor mounting locations differ from diaphragm pump to peristaltic pump.

Diaphragm pump installation; the sensor should be mounted on the discharge (outlet) side of the pumphead. The sensor can be mounted directly on the pumphead or anywhere along the tubing on the discharge side of the pump.

Peristaltic pump installation; the sensor should be mounted on the suction (inlet) side of the pumphead.

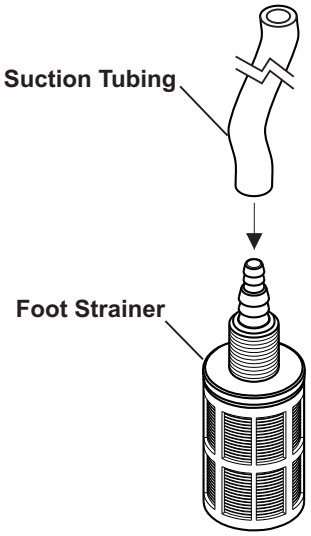
A-100NV
Peristaltic Pump

Blue-White FVS compatible metering pumps:

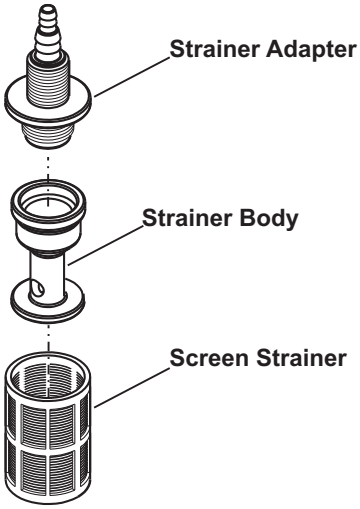
Pump Series	Pump Type	Pump Description	Pump Shut-Down Time*	FVS Installation Location
A-100NV	Peristaltic	Variable speed	User programmable (up to 256 seconds)	Suction side of pump head
A-100NA	Peristaltic	Fixed speed timer controlled	6 seconds	Suction side of pump head
A-100NF	Peristaltic	Fixed speed timer controlled	6 seconds	Suction side of pump head
CD1	Diaphragm	Variable speed	User programmable (up to 20 seconds)	Discharge side of pump head
MD1	Diaphragm	Variable speed	User programmable (up to 20 seconds)	Discharge side of pump head
A1	Peristaltic	Variable speed	User programmable (up to 20 seconds)	Suction side of pump head
M1	Peristaltic	Variable speed	User programmable (up to 20 seconds)	Suction side of pump head

* Pump Shut-Down Time = If chemical should fail to inject in the amount of time specified, the pump will automatically shut-down, also triggering an alarm relay.

Your flow verification sensorpackage includes a Foot Strainer (see diagram below). This strainer will prevent any small particles from entering and clogging the Micro Body. Diaphragm pumps will require a strainer and a check valve. The part number for the strainer that includes a check valve is C-340A. Blue-White peristaltic pumps do not require a check valve.

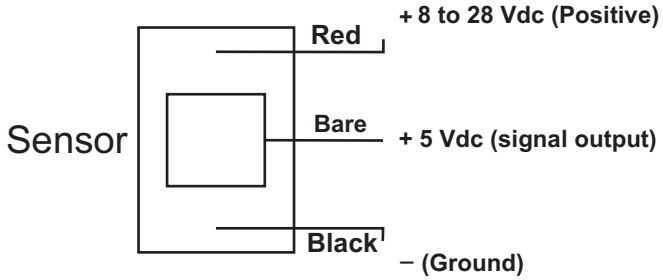


Part Number C-340X



Exploded View

Wiring Diagram



(True digital Square-wave output)

Sensor connections:
Input voltage (vdc) 8 to 28 vdc
Output voltage (v) “high state” 4 80 v dc min (5 vdc normal)
Output voltage (v) “low state” 0 2v dc max

K-Factors (pulses per fluid volume)

Body Size	Flow Range (ml/min)	Pulses per Gallon	Pulses per Liter
1	30-300	181,336	47,909
2	100-1000	81,509	21,535
3	200-2000	42,051	13,752
4	300-3000	25,153	6,646
5	500-5000	15,737	4,157
6	700-7000	9,375	2,477

Body Size	K-Factor	Flow Range (ml/min)	Rate 1	Rate 2	Total 1	Total 2
1	181336	30-300	12.520	XXXX.X	.2082	XXXX.X
2	81509	100-1000	27.862	XXXX.X	.4644	XXXX.X
3	42051	200-2000	5.400	XXXXX	.0900	XXXXX
4	25153	300-3000	9.028	XXXXX	.1500	XXXXX
5	15737	500-5000	14.4307	XXXXX	.2403	XXXXX
6	9375	700-7000	24.224	XXXXX	.4035	XXXXX

Useful formulas

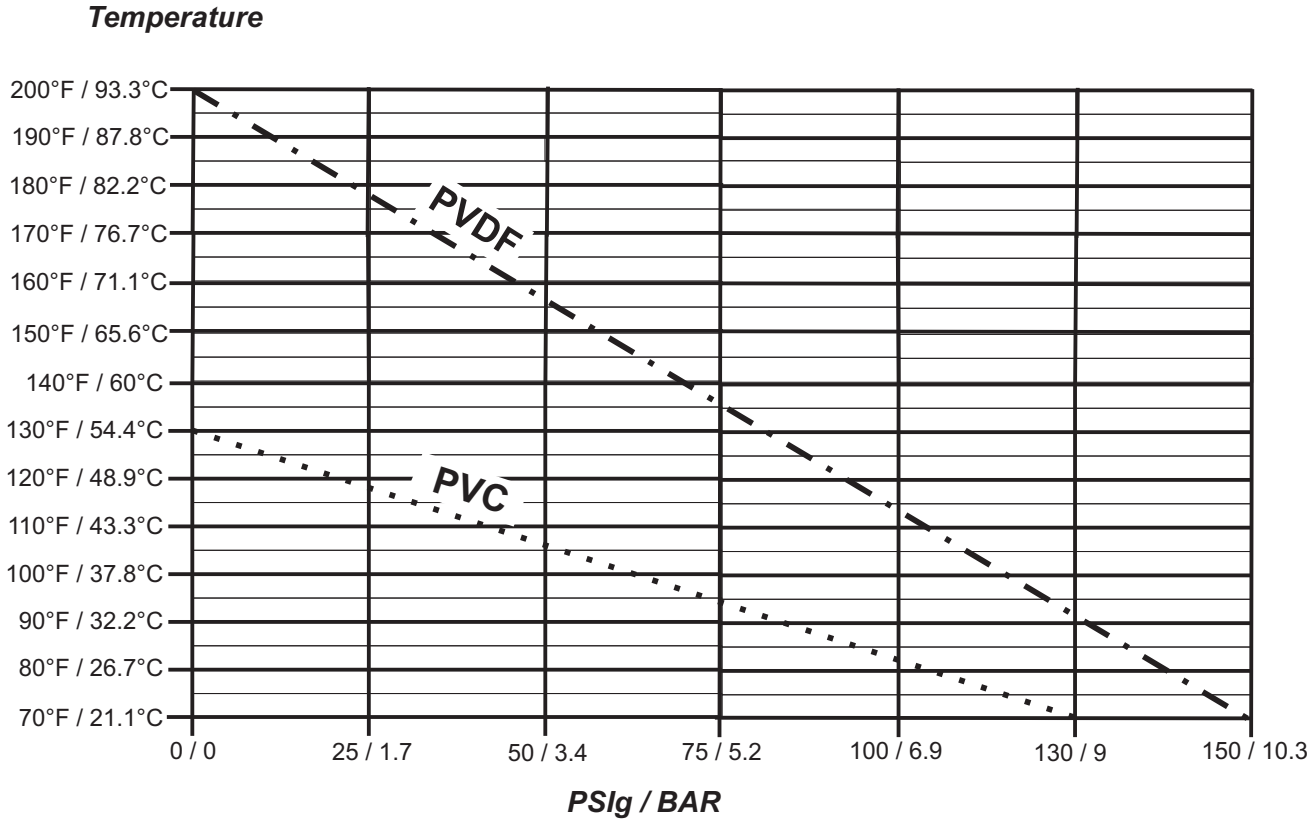
60 / K = rate scale factor

rate scale factor x Hz = flow rate in volume per minute

1 / K = total scale factor

total scale factor x n pulses = total volume

Temperature vs. Pressure



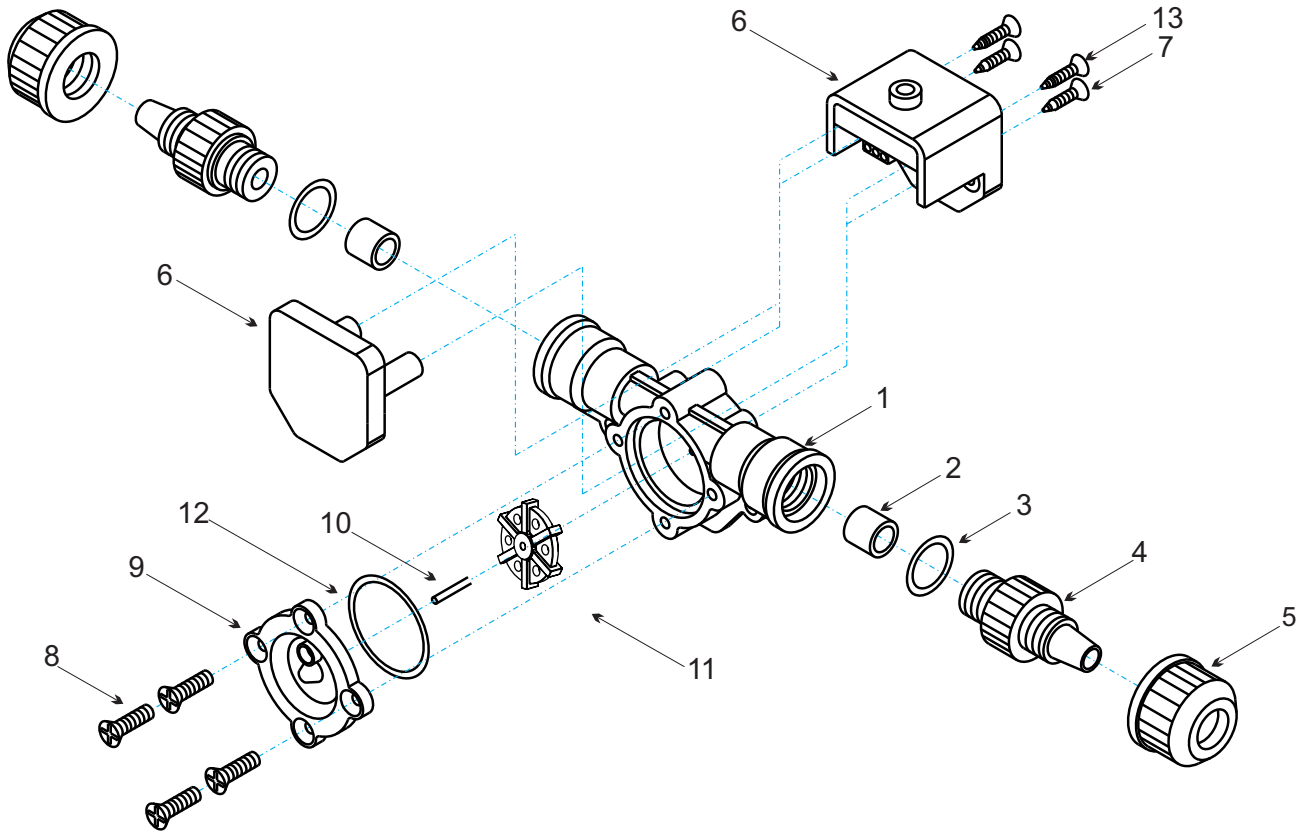
Pressure and Temperature

Pressure and temperature limits are inversely proportional. At the maximum suggested pressure the temperature should approach 70°F / 21.1°C. At the maximum suggested temperature the pressure should approach zero psi. We cannot guarantee our flowmeters will not be damaged either at or below the suggested limits simply because of many factors which influence meter integrity; stress resulting from meter misalignment, damage due to excessive vibration and/or deterioration caused by contact with certain chemicals as well as direct sunlight. These situations and others tend to reduce the strength of the materials from which the meters are manufactured.

Application Note

Although meters may be suitable for other chemicals, Blue-White cannot guarantee their suitability. It is the responsibility of the user to determine the suitability of the flowmeter in their application.

Exploded View and Parts List



Item	Description	Catalog number	Quantity
1.	Micro-Body .031 30-300ml/min	76001-705	1
	.062 100-1000ml/min	76001-301	
	.093 200-2000ml/min	76001-302	
	.125 300-3000ml/min	76001-706	
	.156 500-5000ml/min	76001-304	
	.187 700-7000ml/min	76001-305	
2.	Tubing, PVC	76001-299	2
3.	O-Ring, Viton	90003-012	2
4.	Adapter .250” F/NPT, PVC	76000-137	2
	Adapter .125” F/NPT, PVC	76000-456	
	Adapter .375” Tubing Connection, PVDF	90002-038	
	Adapter .250” Tubing Connection, PVDF	90002-042	
	Adapter .500” ID Hose Barb, PVC	76001-360	
	Adapter .500” F/NPT, PVC	76001-359	
	Adapter .500” M/NPT, PVC	76001-358	
5.	Tube Nut	90002-305	2
6.	Sensor Assembly	71010-182	1
7.	Screws, SS	90011-113	2
8.	Screws, SS	90011-190	4
9.	Lens Cap, PVDF	90002-228	1
10.	Axel, PVDF	90007-592	1
11.	Paddle, PVDF	90002-229	1
12.	O-Rng, FKM	90003-143	1
13.	Screws, #4x.50 Phil Blk	90011-178	2

NOTE: The “Exploded View” drawing illustrates assembly of the FVS (Flow Verification Sensor) If your FVS needs to be cleaned refer to this drawing when reassembling the unit.

BLUE-WHITE LIMITED WARRANTY

Your Blue-White product is a quality product and is warranted for a specific time from date of purchase (proof of purchase is required). The product will be repaired or replaced at our discretion. Failure must have occurred due to defect in material or workmanship and not as a result of operation of the product other than in normal operation as defined in the product manual. Warranty status is determined by the product's serial label and the sales invoice or receipt. The serial label must be on the product and legible. The warranty status of the product will be verified by Blue-White or a factory authorized service center.

Variable Area and Digital Flow meters are warranted for 1 year from date of purchase (proof of purchase is required). The flow meter will be repaired or replaced at our discretion. The S6A ultrasonic flow meter is warranted for 2 years from date of purchase (proof of purchase is required). The flow meter will be repaired or replaced at our discretion.

WHAT IS NOT COVERED

- Freight to the factory, or service center.
- Products that have been tampered with, or in pieces.
- Damage resulting from misuse, carelessness such as chemical spills on the enclosure, abuse, lack of maintenance, or alteration which is out of our control.
- Damage by faulty wiring, power surges or acts of nature.
- Damage that occurs as a result of: meter misalignment, improper installation, over tightening, use of non- recommended chemicals, use of non-reccomended adhesives or pipe dopes, excessive heat or pressure, or allowing the meter to support the weight of related piping.

BLUE-WHITE does not assume responsibility for any loss, damage, or expense directly or indirectly related to or arising out of the use of its products. Failure must have occurred due to defect in material or workmanship and not as a result of operation of the product other than in normal operation as defined in the manual.

Warranty status is determined by the product's serial label and the sales invoice or receipt. The serial label must be on the product and legible. The warranty status will be verified by Blue-White or a factory authorized service center.

PROCEDURE FOR IN WARRANTY REPAIR

Warranty service must be performed by the factory or an authorized service center. Contact the factory or local repair center to obtain a RMA (Return Material Authorization) number. It is recommended to include foot strainer and injection/check valve fitting since these devices may be clogged and part of the problem. Decontaminate, dry, and carefully pack the product to be repaired. Please enclose a brief description of the problem and proof of purchase. Prepay all shipping and insurance cost. COD shipments will not be accepted. Damage caused by improper packaging is the responsibility of the sender. When In-Warranty repair is completed, the factory pays for return shipping to the dealer or customer.

PRODUCT USE WARNING

Blue-White products are manufactured to meet the highest quality standards in the industry. Each product instruction manual includes a description of the associated product warranty and provides the user with important safety information. Purchasers, installers, and operators of Blue-White products should take the time to inform themselves about the safe operation of these products. In addition, Customers are expected to do their own due diligence regarding which products and materials are best suited for their intended applications. BLUE-WHITE is pleased to assist in this effort but does not guarantee the suitability of any particular product for any specific application as Blue-White does not have the same degree of familiarity with the application that the customer/end user has. While BLUE-WHITE will honor all of its product warranties according to their terms and conditions, Blue-White shall only be obligated to repair or replace its defective parts or products in accordance with the associated product warranties.

BLUE-WHITE SHALL NOT BE LIABLE EITHER IN TORT OR IN CONTRACT FOR ANY LOSS OR DAMAGE WHETHER DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL, ARISING OUT OF OR RELATED TO THE FAILURE OF ANY OF ITS PARTS OR PRODUCTS OR OF THEIR NONSUITABILITY FOR A GIVEN PURPOSE OR APPLICATION.

CHEMICAL RESISTANCE WARNING

BLUE-WHITE offers a wide variety of wetted parts. Purchasers, installers, and operators of Blue-White products must be well informed and aware of the precautions to be taken when injecting or measuring various chemicals, especially those considered to be irritants, contaminants or hazardous. Customers are expected to do their own due diligence regarding which products and materials are best suited for their applications, particularly as it may relate to the potential effects of certain chemicals on Blue-White products and the potential for adverse chemical interactions. Blue-White tests its products with water only. The chemical resistance information included in this instruction manual was supplied to BLUE-WHITE by reputable sources, but Blue-White is not able to vouch for the accuracy or completeness thereof. While BLUE-WHITE will honor all of its product warranties according to their terms and conditions, Blue-White shall only be obligated to repair or replace its defective parts or products in accordance with the associated product warranties.

BLUE-WHITE SHALL NOT BE LIABLE EITHER IN TORT OR IN CONTRACT FOR ANY LOSS OR DAMAGE, WHETHER DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL, ARISING OUT OF OR RELATED TO THE USE OF CHEMICALS IN CONNECTION WITH ANY BLUE-WHITE PRODUCTS.

Users of electrical and electronic equipment (EEE) with the WEEE marking per Annex IV of the WEEE Directive must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to them for the return, recycle, recovery of WEEE and minimize any potential effects of EEE on the environment and human health due to the presence of hazardous substances. The WEEE marking applies only to countries within the European Union (EU) and Norway. Appliances are labeled in accordance with European Directive 2002/96/EC. Contact your local waste recovery agency for a Designated Collection Facility in your area.

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