



## Vision Turbine Meters

Models BV1000, BV2000 and BV3000  
for Low Viscosity and Non-Aggressive Liquids

### DESCRIPTION

The Vision Turbine Meters comply with the lead-free provisions of the Safe Drinking Water Act. Available models include meters that are:

- Bisphenol A (BPA)-free
- BV1000 and BV2000 certified to NSF/ANSI/CAN 61 and 372

The meters are designed for flow measurement of low-viscosity, aggressive and non-aggressive liquids alike, including demineralized water, alkaline solutions, oils, salad oil, fuel/fuel consumption, beverages, water solutions and coolants.

- The BV1000 flow range is 0.026...0.65 gpm (0.1...2.5 lpm)
- The BV2000 flow range 0.13...9.2 gpm (0.5...35 lpm)
- The BV3000 flow range 1.32...17.17 gpm (5...65 lpm)

The meter is especially suitable for washing machines, dishwashers, coffee machines, laser cooling plants, solar solutions, bakery machines, steam cooking machines in large kitchen plants, and CD or DVD cleaning.

### INSTALLATION

#### Guidelines

- Check compatibility of liquid with the meter material.
- Install a 20...40 micron filter in front of the meter, if needed, to remove solid ingredients. Do not use on fluids with fibrous content or contamination.
- Install sensor into properly cleaned pipeline only.
- Check electrical connection according to the electrical wiring plan.
- Prior to installation, confirm system versus sensor specifications.
- Filter the system to 20...40 microns prior to the sensor, and minimize pulses/water hammer effects to prevent unit damage.
- Observe the arrow on the bottom of the unit for correct inlet and outlet port. Sensor can be mounted in any horizontal, vertical, or skewed orientation.
- Correctly installed, the sensor works maintenance-free.



#### Installing 1/4 in. and 3/8 in. NPT Units

1. Apply a small amount of thread sealant (Permatex "No More Leaks"®) or Teflon® tape to male threads.

**NOTE:** Make sure that the sealant does not enter into the turbine and bearing internal area.

2. Hand tighten unit in place.
3. Turn an additional 1/4 turn to seal. If the seal leaks, turn an additional 1/4 turn or until the leak stops. Do not exceed one additional turn total beyond hand tightening.

#### Installing G 1/4 in. and G 3/8 in. Units

The G 1/4 in. and G 3/8 in. units mate with a flat face seal washer, similar to a garden hose arrangement. This arrangement requires no sealants; hand tightening should be sufficient for sealing.

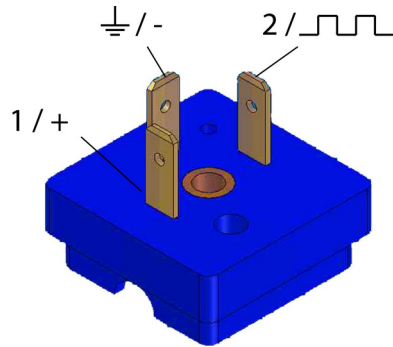
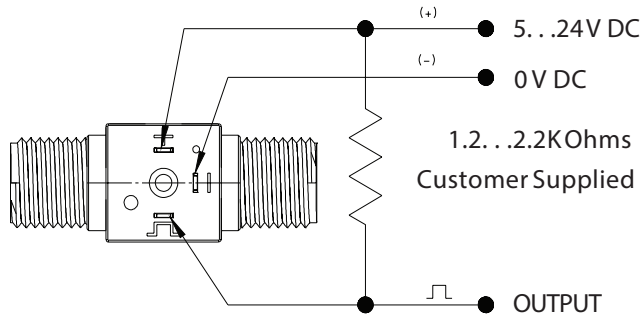


## ELECTRICAL CONNECTIONS

### Output Signal

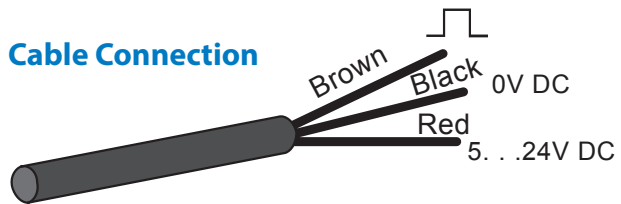
The output signal is a square wave signal where the frequency is proportional to the flow rate. An external, user-supplied pull-up resistor is required to ensure that the open collector will sink less than 20 mA. Applying a current greater than 20 mA may damage the sensor.

### Wiring Diagram



| With DIN Connector |                 |
|--------------------|-----------------|
| Function           | DIN Termination |
| V+                 | 1               |
| -                  | ⊕               |
| Output             | 2               |

### Cable Connection



## SPECIFICATIONS

| Model                         | BV1000                                                                                                                                                     | BV2000                                                                               |                    |                    |                    |                    |                    | BV3000                                |  |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------------------------|--|
|                               | 025*                                                                                                                                                       | 050                                                                                  | 075                | 100                | 150                | 250                | 350                | 650                                   |  |
| Flow Range                    | 0.026...<br>0.65 gpm                                                                                                                                       | 0.13...<br>1.3 gpm                                                                   | 0.13...<br>2.0 gpm | 0.26...<br>2.7 gpm | 0.26...<br>4.0 gpm | 0.26...<br>6.6 gpm | 0.53...<br>9.2 gpm | 1.32...17.17 gpm                      |  |
|                               | 0.1...2.5 lpm                                                                                                                                              | 0.5...5 lpm                                                                          | 0.5...7.5 lpm      | 1...10 lpm         | 1...15 lpm         | 1...25 lpm         | 2...35 lpm         | 5...65 lpm                            |  |
| K-factor for Trogamid Housing | 83,270 ppg                                                                                                                                                 | 26100 ppg                                                                            | 17800 ppg          | 12500 ppg          | 8300 ppg           | 3785 ppg           | 2840 ppg           | 795 ppg                               |  |
|                               | 22,000 ppl*                                                                                                                                                | 6900 ppl                                                                             | 4700 ppl           | 3300 ppl           | 2200 ppl           | 1000 ppl           | 750 ppl            | 210 ppl                               |  |
| DN mm                         | 5 mm                                                                                                                                                       | 6 mm                                                                                 | 8 mm               | 6 mm               | 8 mm               | 8 mm               | 8 mm               | 12 mm                                 |  |
| Operating Pressure            | 362.5 psi (25 bar)                                                                                                                                         |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Burst Pressure                | 1450 psi (100 bar)                                                                                                                                         |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Inlet / Outlet Ports          | 1/4 in. NPT<br>or G 1/4 in.<br>(BSPP)                                                                                                                      | 3/8 in. NPT<br>or<br>G 3/8 in. (BSPP)                                                |                    |                    |                    |                    |                    | 3/4 in. NPT<br>or<br>G 3/4 in. (BSPP) |  |
| Operating Temperature         | - 4...212° F (- 20...100° C)                                                                                                                               |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Accuracy                      | ± 3% of reading                                                                                                                                            |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Repeatability                 | < 0.50 % under the same operating conditions                                                                                                               |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Viscosity                     | up to 16 cSt                                                                                                                                               |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Electrical Connection         | Round cable LiYY 3 x 0.25 mm <sup>2</sup> with free cable ends<br>or<br>*3-pin (2.8 x 0.5) mini DIN connector, EN 60529<br>* Mating connector is included. |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Filter                        | 20...40 microns recommended                                                                                                                                |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Input Power                   | 5...24V DC                                                                                                                                                 |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Power Consumption             | ~ 1.6 mA                                                                                                                                                   |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Output (Hz)                   | NPN sinking open collector                                                                                                                                 |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Output Current                | Max. 20 mA (Pull-up resistor required. See wiring diagram in User Manual.)                                                                                 |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Materials                     | Housing                                                                                                                                                    | Trogamid (NSF/ANSI/CAN 61 and 372 certified)                                         |                    |                    |                    |                    |                    | —                                     |  |
|                               | Turbine                                                                                                                                                    | Brass CuZn38Al-C (complies with lead-free provisions of the Safe Drinking Water Act) |                    |                    |                    |                    |                    | —                                     |  |
|                               | Bearings                                                                                                                                                   | PPS Ferrite<br>Graphite/PTFE                                                         |                    |                    |                    |                    |                    |                                       |  |
| Weight                        | ~0.35 oz<br>(10 g)                                                                                                                                         | ~ 0.53 oz (15 g)                                                                     |                    |                    |                    |                    |                    | ~ 1.23 oz (35 g)                      |  |
| Approvals                     | KTW-BWGL; NSF/ANSI/CAN 61 and 372 for BV1000 and BV2000                                                                                                    |                                                                                      |                    |                    |                    |                    |                    |                                       |  |
| Certifications                | RoHS and CE compliant                                                                                                                                      |                                                                                      |                    |                    |                    |                    |                    |                                       |  |

\* The previous generation of Model 025 had a K-factor of 18,500 ppl.

## Pressure Drop Chart

|                                                   | Type |     | Part Number |       |       |      |       |      |       |      |      |      |      |      |       |      |      |      |      |
|---------------------------------------------------|------|-----|-------------|-------|-------|------|-------|------|-------|------|------|------|------|------|-------|------|------|------|------|
|                                                   | gpm  | lpm | 025         |       | 050   |      | 075   |      | 100   |      | 150  |      | 250  |      | 350   |      | 650  |      |      |
|                                                   | —    | —   | psi         | bar   | psi   | bar  | psi   | bar  | psi   | bar  | psi  | bar  | psi  | bar  | psi   | bar  | psi  | bar  |      |
| Pressure Drop Δp with Water Flow at 68° F (20° C) | 0.13 | 0.5 | 0.29        | 0.02  | —     | —    | —     | —    | —     | —    | —    | —    | —    | —    | —     | —    | —    | —    |      |
|                                                   | 0.26 | 1   | 0.73        | 0.05  | <0    | <0   | <0    | <0   | <0    | <0   | <0   | <0   | <0   | <0   | <0    | <0   | <0   | <0   |      |
|                                                   | 0.40 | 1.5 | 2.18        | 0.15  | —     | —    | —     | —    | —     | —    | —    | —    | —    | —    | —     | —    | —    | —    |      |
|                                                   | 0.53 | 2   | 3.63*       | 0.25* | <0    | <0   | 0.87  | 0.06 | <0    | <0   | 0.73 | 0.05 | <0   | <0   | <0    | <0   | —    | —    |      |
|                                                   | 1.32 | 5   | —           | —     | 1.74  | 0.12 | 2.90  | 0.20 | 0.73  | 0.05 | 2.90 | 0.20 | 0.73 | 0.05 | 0.73  | 0.05 | 0.00 | 0.00 |      |
|                                                   | 2.64 | 10  | —           | —     | 5.80  | 0.40 | 10.15 | 0.70 | 2.90  | 0.20 | 5.80 | 0.40 | 2.47 | 0.17 | 2.18  | 0.15 | 0.14 | 0.01 |      |
|                                                   | 3.96 | 15  | —           | —     | 13.05 | 0.90 | —     | —    | 5.80  | 0.40 | —    | —    | 3.92 | 0.27 | 3.63  | 0.25 | 0.29 | 0.02 |      |
|                                                   | 5.28 | 20  | —           | —     | 18.85 | 1.30 | —     | —    | 10.15 | 0.70 | —    | —    | 6.96 | 0.48 | 6.53  | 0.45 | 0.72 | 0.05 |      |
|                                                   | 6.60 | 25  | —           | —     | —     | —    | —     | —    | —     | —    | —    | —    | 9.43 | 0.65 | 8.70  | 0.60 | 1.02 | 0.07 |      |
|                                                   | 7.93 | 30  | —           | —     | —     | —    | —     | —    | —     | —    | —    | —    | —    | —    | 13.34 | 0.92 | 1.59 | 0.11 |      |
|                                                   |      | 35  | —           | —     | —     | —    | —     | —    | —     | —    | —    | —    | —    | —    | —     | —    | —    | 2.03 | 0.14 |
|                                                   |      | 40  | —           | —     | —     | —    | —     | —    | —     | —    | —    | —    | —    | —    | —     | —    | —    | 2.61 | 0.18 |
|                                                   |      | 45  | —           | —     | —     | —    | —     | —    | —     | —    | —    | —    | —    | —    | —     | —    | —    | 3.34 | 0.23 |
|                                                   |      | 50  | —           | —     | —     | —    | —     | —    | —     | —    | —    | —    | —    | —    | —     | —    | —    | 4.06 | 0.28 |
|                                                   | 55   | —   | —           | —     | —     | —    | —     | —    | —     | —    | —    | —    | —    | —    | —     | —    | 4.93 | 0.34 |      |
|                                                   | 60   | —   | —           | —     | —     | —    | —     | —    | —     | —    | —    | —    | —    | —    | —     | —    | 5.80 | 0.40 |      |
|                                                   | 65   | —   | —           | —     | —     | —    | —     | —    | —     | —    | —    | —    | —    | —    | —     | —    | 6.82 | 0.47 |      |

\*Value applies to 0.66 gpm (2.50 lpm)

## OPERATION GUIDELINES

- Do not exceed the specific indications.
- The Vision Series meter is a volumetric measuring device. Any air/gas in the liquid will be included in measured volume.
- Correctly installed, the sensor is maintenance free.
- Do not blow out the turbine flow meter with compressed air. This may damage the bearings.

### **Control. Manage. Optimize.**

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