EMCO
FLOW SYSTEMS
A Division of Spirax Sarco, Inc.

Hydro-Flow

Commercial Vortex Flow Meters

Model 1200
In-Line

Model 3100
Retractable Insertion

Model 2200
Fixed Insertion

Model 2300
Fixed Insertion
For corrosive fluids, acids, solvents

Hydro-Flow Flow Meters are low-cost, easy to install flow meters designed for commercial HVAC, agriculture, and semiconductor liquid flow applications.

PRODUCT BROCHURE

HYDRO-FLOW

BENEFITS

4 unique models designed to fit specific applications

Superior performance at low cost

Rugged and maintenance-free—no moving parts

Wide flow range – 15:1 turndown; flow rates down to 1 ft/sec (0.30 m/sec)

FEATURES

Microprocessor-based piezo-resistive sensor for accurate and reliable processing

Specifically designed for commercial HVAC, agriculture, and semiconductor water flow applications

Inline and insertion models available

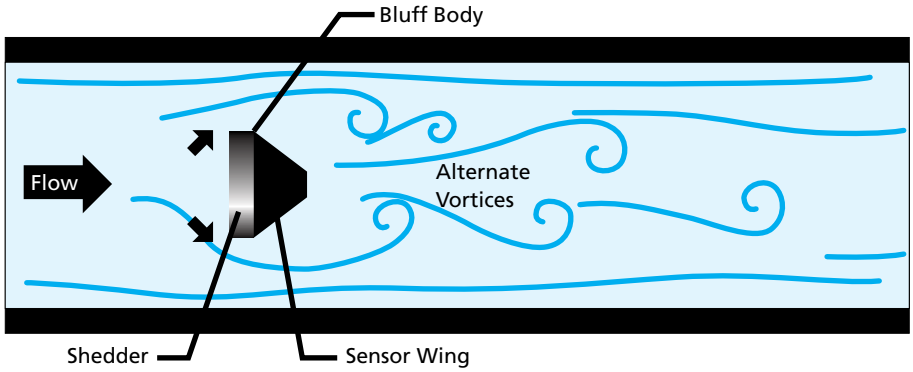
Pulse or 4 to 20 mA Output

Simple design for installation ease

Vortex flow meters have been used in the process industry for more than two decades, and have the ability to measure a wide flow range, with the benefit of a rugged design and no moving parts. The high cost of traditional vortex flow meters had made them impractical for most general water measurement applications. Hydro-Flow draws on over twenty years of experience, creating a new generation of low-cost vortex flow meters specifically designed for commercial HVAC, agriculture, and semiconductor water flow applications.

Superior Technology

The Hydro-Flow Series of vortex flow meters are designed specifically for water flow measurement, containing no moving parts like traditional paddlewheel and impeller-type flow meters. Hydro-Flow features a wide turndown ratio of 15:1, compared to differential pressure flow meters, which have a turndown ratio of only 4:1. Hydro-Flow's unique and proprietary microprocessor-based piezo-resistive vortex sensor can accurately and reliably process vortex signals 25 times smaller than permitted by other technologies, at flow rates as low as 1 foot per second (0.30 meters per second). The result is a flow meter of unequal reliability and performance.



Vortex and the Physical Laws of Flow

As flow passes a bluff body, or obstruction in the flow stream, vortices are alternately formed on either side of the bluff body. According to well-proven physical laws, the frequency at which vortices are alternately formed is directly proportional to the average flow velocity. The vortices create low and high-pressure zones behind the bluff body. A vortex flow meter has a sensing element, which detects these low and high-pressure zones in terms of vortex frequency, and transmits this signal to the vortex flow meter electronics.

Choosing the Right Flow Meter

All Hydro-Flow vortex models are suitable for measuring general water flows, and some are specifically designed to address the unique requirements of specific water flow applications.

Chilled and Hot Water & Water/Glycol Mixtures

Hydro-Flow Models 2200 and 3100 insertion flow meters are recommended for supply, return, and bypass water systems larger than 3.0" (76 mm). These models withstand process temperatures as low as 32°F (0°C) and as high as 160°F (71°C).

Condensate and Hot Water

Hydro-Flow Models 1200, 2200, and 3100 are recommended for measuring condensate. These models withstand process temperatures up to 160°F (71°C). Hydro-Flow's vortex sensor contains no moving parts, therefore, excessive mechanical loads on the flow meter, caused by continuous start-stop flow as condensate is pumped from a holding tank, do not affect the flow meter's accuracy or mechanical reliability. Additionally, possible iron, salt, or other deposits do not affect Hydro-Flow's performance.

Agricultural Water

Hydro-Flow vortex flow meters with standard features, like the NEMA 6-rating and a turndown ratio of at least 15:1, make Hydro-Flow vortex flow meters ideal for control and measurement of water in agricultural applications.

Potable and General Water

All Hydro-Flow vortex flow meters are recommended for domestic potable water and general water applications.

Ultrapure Water, Deionized Water, Acids & Solvents

Hydro-Flow Model 2300 is manufactured from PVDF for flow measurement of ultrapure water, dionized water, acids, solvents, and other corrosive fluids, making it an ideal solution for use in semiconductor and chemical wet processes. This model has no internal crevices or "dead space", eliminating the risk of bacterial growth and contamination. The Model 2300 is designed to retrofit into most +GF+ Signet fittings without modification of the existing piping system.

Fluids Measured

	Model 1200	Model 2200	Model 2300	Model 3100
Chilled & Hot Water Water/Glycol Mixtures		•		•
Condensate and Hot Water	•	•		•
Potable and General Water	•	•	•	•
Agricultrual Water	•	•	•	•
Ultrapure Water			•	
Deionized Water			•	
Acids & Solvents			•	

Line Sizes

Inches	0.5"	0.75"	1"	1.25"	1.5"	2"	2.5	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"
mm	15	20	25	30	40	50	65	75	100	125	150	200	250	300	350	400	450	500
Model 1200			•		•	•	•	•										
Model 2200						•		•	•		•	•	•	•	•	•	•	•
Model 2300	•	•	•	•	•	•	•	•	•	•	•	•						
Model 3100								•	•	•	•	•	•	•	•	•	•	•

Specifications

	Model 1200	Model 2200	Model 2300	Model 3100
Fluids Measured	• Water • Water/Glycol Mixtures • Condensate	• Water • Water/Glycol Mixtures • Condensate	• Water • Ultrapure Water • Deionized Water • Acids & Solvents	• Water • Water/Glycol Mixtures • Condensate
Type	Inline	Fixed Insertion	Fixed Insertion	Retractable Insertion
Available Line Sizes	1 to 3" (25 to 76 mm)	2" (51 mm) 3" (76 mm) 4 to 20" (102 to 508 mm)	0.5 to 8" (13 to 203 mm)	3 to 20" (76 to 508 mm)
Mounting Options				
Thread-o-let	N/A	1.5" NPT (38 mm) (4" & larger only) (102 mm & larger only)	N/A	2" NPT (51 mm)
Saddle	N/A	Steel & PVC (3" & larger only) 76 mm & larger only)	N/A	Steel
Tee Fitting	Brass	Brass (2 and 3" only) (51 and 76 mm only)	CPVC, PVC (0.5 to 1.5" only) (13 to 38 mm only)	N/A
Union Tee Fitting	N/A	N/A	PVDF, PP (0.5 to 2" only) (13 to 51 mm only)	N/A
Flange	N/A	N/A	N/A	N/A
Wafer	N/A	N/A	PVDF, PP (2 to 8" only) (51 to 203 mm only)	
Maximum Process Pressure				
Thread-o-let	N/A	400 psi	N/A	400 psi
Saddle	N/A	300 psi	N/A	300 psi
Tee Fitting	150 psi	150 psi	180 psi	N/A
Union Tee Fitting	N/A	N/A	180 psi	N/A
Wafer	N/A	N/A	200 psi	N/A
Process Temperature	32° to 160°F (0° to 71°C)	32° to 160°F (0° to 71°C)	0° to 160°F (-18° to 71°C)	32° to 160°F (0° to 71°C)
Wet Tap Compatible (Install & remove under pressure)	No	No	No	Yes
Pulse Output	Yes	Yes	Yes	Yes
4 to 20 mA Analog Output Option	Yes	Yes	Yes	Yes
Rate/Total Display Option	Yes	Yes	Yes	Yes
No Output, Display Only	Yes	Yes	Yes	Yes

Model 2200 is designed for retrofit use with 1.5" (38 mm) threaded bushing.

Available Options

Pulse or 4 to 20 mA Output

All Hydro-Flow Series Models can be connected to a control system, such as a building automation system, PLC, or irrigation controller, with either the standard pulse output or the optional 4 to 20 mA analog output.

BTU-121 Energy Monitoring System

Any Hydro-Flow vortex flow meter can gain accurate BTU flow monitoring with the BTU-121 Energy Monitoring System. The add-on system includes one FP-93 flow monitor, and two RTD temperature sensors (Model TEM). The FP-93 is a microprocessor-based instrument that accurately calculates energy, mass, and volume flow rates for water and other liquids. It accepts two RTD temperature inputs and one frequency flow input. A 4 to 20 mA analog output may be assigned to correspond to energy flow, mass flow, temperature, and other process variables. The thermowell mounted TEM platinum resistance sensors are used to measure the temperature of water and other liquids, producing a highly repeatable and exceptionally stable resistance-versus-temperature relationship. Since the overall accuracy of the BTU/Energy measurement is highly dependent on accurate temperature measurements, each supply and return RTD is provided with its own specific temperature calibration coefficients. These values are then factory programmed in the FP-93 to produce precise measurement of temperature and BTU/Energy.

Field-Pro Configuration Program

All Hydro-Flow vortex flow meters are configured at the factory with standard settings. The Field-Pro package enables reconfiguration of flow meters in the field, eliminating the need for factory adjustment. This software allows the user to change measuring units and time values, pipe size information, output settings, full-scale flow rates for output signals, and display settings. The Field-Pro Configuration Program is Windows®-compatible, and must be used with the Field-Pro Communicator, a hardware device which provides the interface between a personal computer and the flow meter.

Hydro-Flow Relay Output Module

The Hydro-Flow Solid State Relay Output Module provides a timed pulse duration output to most irrigation controllers requiring a relay contact input, including Motorola® MIR 5000F-MW, Rainbird® Decoder P/N M51200, and other receiving equipment requiring a pulse width longer than 5 milliseconds.

AC to DC Converter/Power Supplies

When only AC power is available, the AC to DC converter and power supply option is recommended.

Watertight Wiring Connections

For watertight wiring connections, options including the Water-Tight Cable Connector, and Direct Burial Cable Lead Wire are available.

Aluminium enclosure

An Aluminum Electronics Enclosure is available for 1200 and 2200 models of the Hydro-Flow. The enclosure is engineered for harsh environments where liquid is present. A local display is not available with the aluminum enclosure. To order the optional aluminum enclosure for the 1200 or 2200 model Hydro-Flow add AL to the end of the model code when ordering.

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SL-HF-230-03 2M 12/07