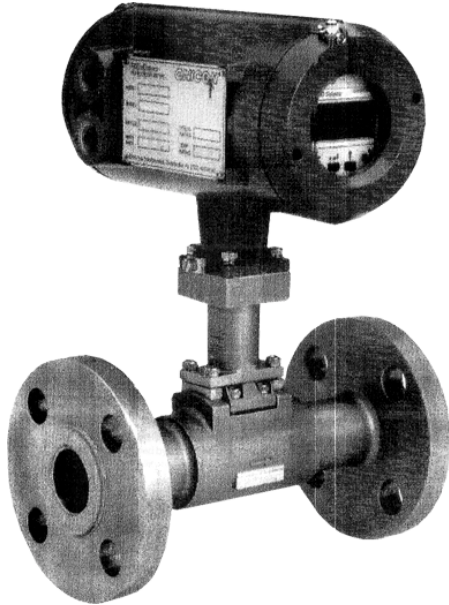




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## F-2200 Series Steam Meter

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### F-2200 Series Steam Meter

### Vortex Mass Flow Meter for Saturated Steam

**Accurate cost effective mass flow measurement  
for saturated steam in a [single instrument](#)**

#### \* DESCRIPTION

The ONICON F-2200 Series Steam Meter is designed for accurate, cost effective mass flow measurement of saturated steam. Utilizing advanced vortex sensing technology, the F-2200 is equipped with internal density compensation providing highly accurate direct mass flow measurement. Operating as a loop powered device, each meter provides a 4-20mA analog output, a scaled pulse output, and a built-in local display.

ONICON's F-2200 Series Steam Meter offer a simplified, cost effective alternative to the use of expensive mass flow computers and a dramatic improvement in accuracy, especially when compared to uncompensated meters.

#### \* FEATURES

**Provides Direct Mass Flow Measurement for Saturated Steam** - the use of a precision platinum RTD and the ability to perform complex density calculations allow the meter to provide a direct mass flow measurement without the need for a separate mass flow computer with external temperature and pressure transmitters.

**Highly Accurated** - mass flow measurement accuracy for saturated steam exceeds 1.5% of reading in the most common pipe sizes.

**Simple Installation and Commissioning** - loop powered design simplifies wiring and signal processing. Additionally, each meter is factory programmed and ready for use upon delivery. The built-in user interface provides access to all programming functions, including a comprehensive self diagnostic capability. This self diagnostic function can detect bi-phase flow and flow rates outside the programmed operating parameters. It can also identify common installation problems.

**State-of-the-Art Vortex Flow Sensing** - the use of titanium in the construction of the shedder bar offers both improved durability and improved sensitivity. Titanium is stronger, lighter and more flexible than steel. Durability is improved by using a stronger more flexible material. Lighter weight and increased flexibility also improve the ability to sense the lower amplitude vortices associated with low velocity flow.

**Advanced Signal Processing Enhances Accuracy** - every meter is supplied with advanced filtering algorithms. These algorithms allow the meter to establish continuous real-time norms for signal strength and quality. Sudden changes to the anticipated strength or quality of the incoming signal is rejected as noise. Additional signal processing cancels out the effect of common mode noise. Common mode noise is the type of noise most often associated with vibration in the piping system.

**\* CALIBRATION**

**Individually Calibrated and Programmed for Each Application** - every meter undergoes a 5 point calibration from 0-250 ft/sec. In addition, each meter is individually programmed using application specific data supplied by the customer.

**\* SPECIFICATIONS**

**Accuracy\***

1"-8" Diameter

Volumetric Flow: ± 1% of Reading

Mass Flow : ± 1.5% of Reading

3/8"-3/4" Diameter

Volumetric Flow: ± 2% of Reading

Mass Flow : ± 2.5% of Reading

\* Applies to entire operating range, see table below

**Sensing Method**

Vortex shedding using a titanium shedder body with integral piezoelectric pressure sensors and an integral 1000 ohm platinum RTD.

**Meter Size Range**

3/8" to 8" diameter

**Maximum Temperature**

Medium : 464 F

Ambient : 140 F

**Process Connections**

Standard : ANSI Class 300 flanges

Optional : ANSI Class 600 flanges

**Pressure Loss**

Varies with meter size, density and flow rate.

Please contact ONICON for detailed information

**Output Signals Provided**

Rate : Loop powered 4-20mA signal for massflow

Total : Scaled pulse output, open collector

**Supply Voltage**

Standard (loop powered, 2 wire connection):

14 to 36 volts DC, 20mA maximum

**Materials**

Housing:

3/8" to 4" : Stainless Steel, 316L

6" to 8" : Stainless steel, 304

Vortex Shedding Body: Unalloyed Titanium

Seal for Shedding Body: Inconel, Nickel Plate

Electronics Enclosure: Cast Aluminum, NENA4X

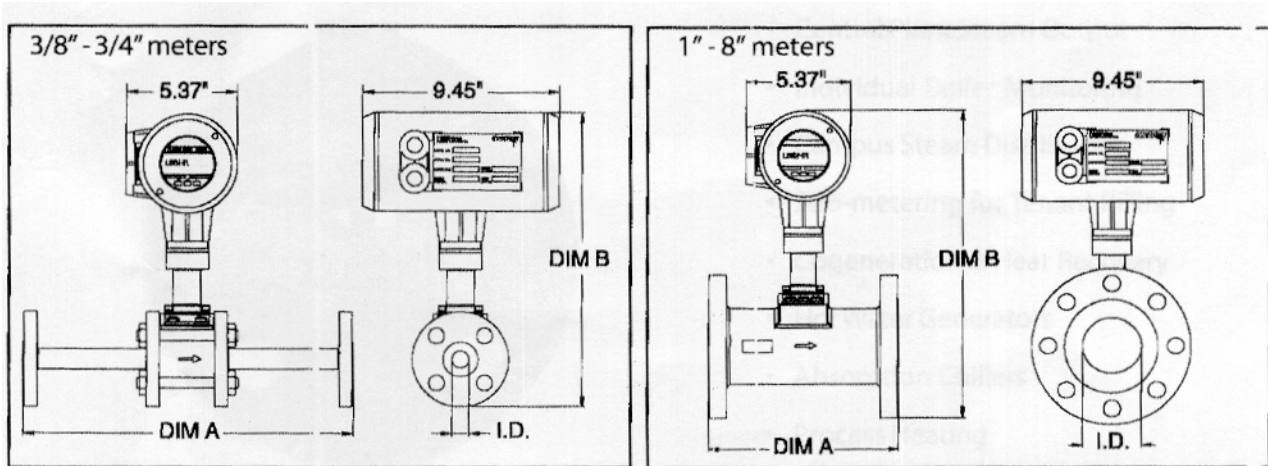
**Display**

2 Line Dotmatrix LCD

Specifications are subject to change without notice.

**\* FLOW RANGES (lbs/hr) FOR SATURATED STEAM** at various pressures (psig) and densities (lb/ft<sup>3</sup>)

Meter Size	Model Number	ID	15 PSIG		30 PSIG		50 PSIG		75 PSIG		100 PSIG		150 PSIG			
			0.072 lbs/ft <sup>3</sup>		0.106 lbs/ft <sup>3</sup>		0.150 lbs/ft <sup>3</sup>		0.204 lbs/ft <sup>3</sup>		0.257 lbs/ft <sup>3</sup>		0.363 lbs/ft <sup>3</sup>			
inches		inches	min	max	min	max	min	max	min	max	min	max	min	max	min	max
3/8"	F-2204	0.50	12.4	85.3	16.1	108	20.5	128	25.6	149	30.3	168	39.2	199	634	273
1/2"	F-2205	0.59	14.5	119	18.8	151	23.9	179	29.8	209	35.4	235	45.7	279		381
3/4"	F-2208	0.82	20.2	235	26.2	296	33.3	352	41.6	411	49.3	461	63.8	548		750
1"	F-2210	1.05	31.3	383	40.5	563	51.6	797	64.4	1083	76.4	1219	98.8	1448		1982
1-1/2"	F-2215	1.61	73.5	898	95.1	1321	121	1869	151	2541	179	2860	232	3398		4650
2"	F-2220	2.07	122	1486	157	2184	200	3091	250	4203	297	4730	383	5621		7692
3"	F-2230	3.07	267	3268	346	4803	441	6798	550	9243	652	10402	843	12360		16914
4"	F-2240	4.03	461	5632	596	8278	759	11716	948	15930	1124	17928	1453	21302		29151
6"	F-2260	6.07	1045	12771	1352	18772	1722	26568	2149	36123	2549	40653	3295	48306		66103
8"	F-2280	7.98	1806	22068	2337	32437	2976	45909	3713	62420	4405	70248	5693	83471		114225

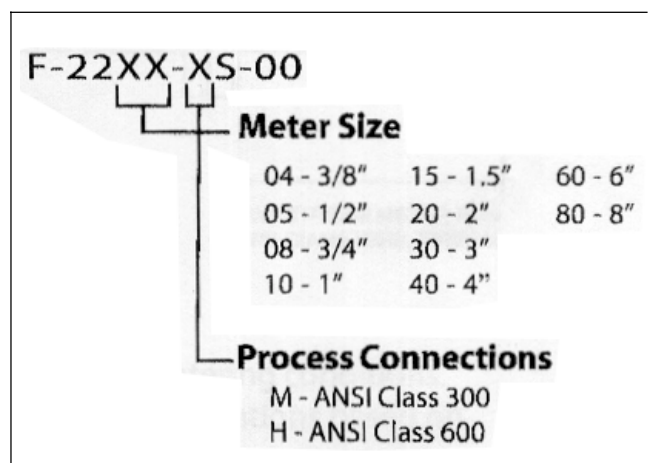


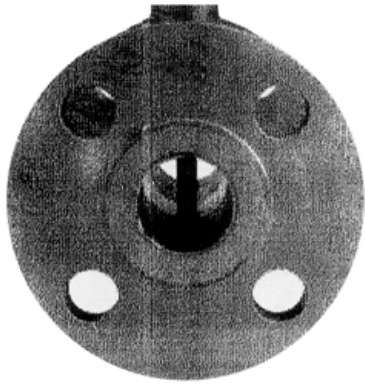
Meter Size	Model	Diameters			Approximate Meter Weight lbs	Approximate Shipping Weight lbs
		ID	A	B		
		inch	inch	inch		
3/8"	F-2204	0.50	32.50	17.96	30.3	45
1/2"	F-2205	0.59	38.00	18.00	30.9	46
3/4"	F-2208	0.82	52.20	18.13	32.8	48
1"	F-2210	1.05	9.84	17.58	14.8	30
1-1/2"	F-2215	1.61	9.84	18.64	21.1	37
2"	F-2220	2.07	9.84	18.96	24.0	40
3"	F-2230	3.07	9.84	20.60	43.9	62
4"	F-2240	4.03	9.84	21.89	61.1	80
6"	F-2260	6.07	9.84	24.64	94.2	160
8"	F-2280	7.98	11.81	27.37	159.2	250

**\* ORDERING INFORMATION**

ONICON is committed to providing you with quality products that meet your needs. Our sales engineers will work with you to perform a detailed application review for each order. This review will ensure that we provide the best, most cost effective, product for your application. It will also allow us to avoid any potential applications problems and deliver a product that is ready to use right out of the box.

**During the review process we will need to identify and confirm the following information :** pipe size, operating pressure (psig), design maximum flow rate (lbs/hr), minimum flow rate (lbs/hr), and system pressure rating (psi).



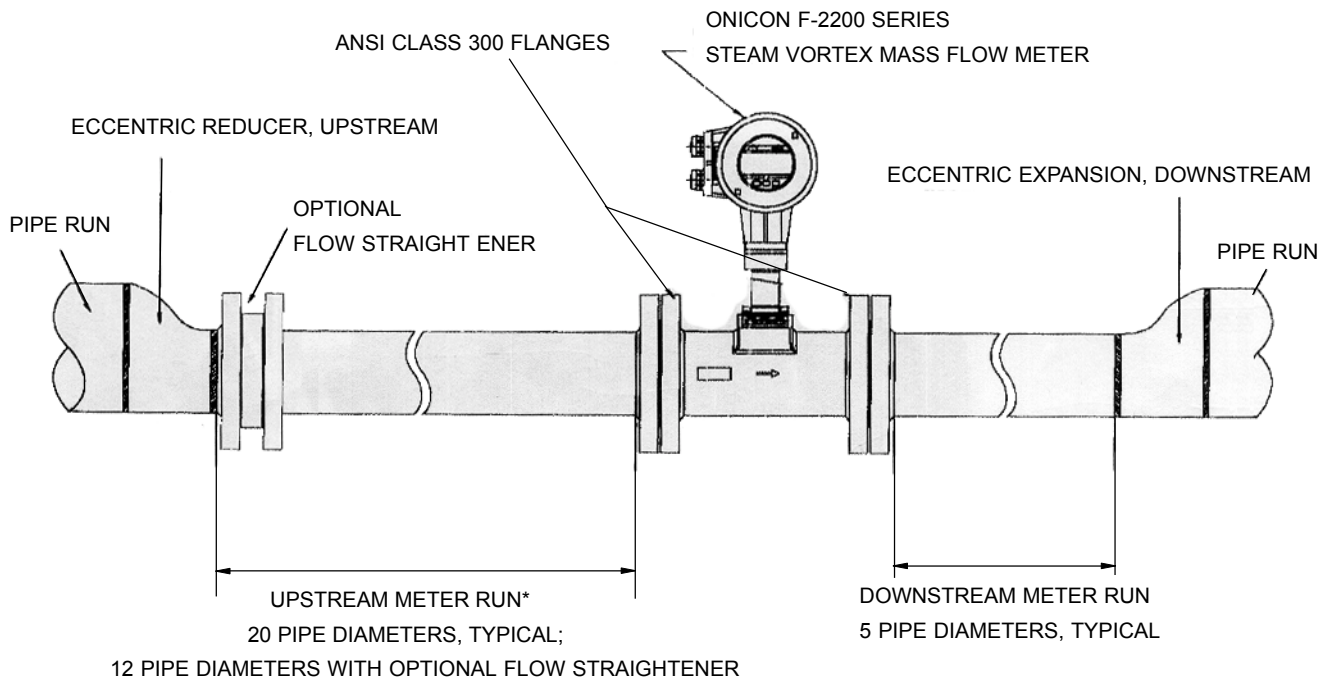


**\* APPLICATIONS**

- Central Plant Steam Output
- Individual Boiler Monitoring
- Campus Steam Distribution
- Sub-metering for Tenant Billing
- Cogeneration & Heat Recovery
- Hot Water Generators
- Absorption Chillers
- Process Heating

The use of titanium in the construction of the shedder bar offers both improved durability and improved sensitivity.

**\* TYPICAL STEAM INSTALLATION DRAWING**



\* Upstream meter run requirements vary according to entering conditions. Please see installation manual for installation recommendations based on specific piping configurations.