



# TELEDYNE HASTINGS INSTRUMENTS

## HFM-306 (Flow meter)

- Available flow ranges:  
0-2500 slm to 0-8000 slm (N<sub>2</sub>)

### FEATURES

- Rapid Settling Times
- Operating Pressure to 300 PSI
- NIST Traceable Calibration

### APPLICATIONS

- Delivery Systems
- R&D and Process Flows
- Petrochemical
- Fuel Cell

### DESCRIPTION

Teledyne Hastings Instruments (THI) products represent over 60 years of experience in the design and manufacture of flow instrumentation. The 300 Series is a culmination of this experience with patented technologies that make these the finest flow meters and controllers available today.

The THI Mass Flow 300 Series meters and controllers are designed to accurately measure mass flow without corrections or compensations for gas pressure and temperature.

The HFM-306 version is accurate to better than  $\pm 3.0\%$  of full scale. THI mass flow instruments do not require any periodic maintenance under normal operating conditions with clean gas.

In the HFM-306, this pressure drop is measured in an annular region around the laminar flow shunt after the entrance effects and before the exit effect occur. This vastly improves the linearity of the flow divider and minimizes the large changes in linearity that typically occur when the specific gravity of the flowing medium changes.

The HFM-306 includes a flow straightening section which helps establish well defined flow for higher accuracy.

Instruments are normally calibrated with the appropriate standard calibration gas (air), then a correction factor is used.

# HFM-306, High Capacity Meter



The 300 Series products contain a number of features that set them apart from other, available instruments:

1. They are inherently linear; no linearization circuitry is employed. Should recalibration in the field be desired (a calibration standard is required), the customer needs to simply set the zero and span points.
2. The output signal is usable for very large overflows and will not come back on scale when a flow an order of magnitude over the full scale flow rate is measured.
3. The instrument incorporates a replaceable sensor module.
4. The unit has very fast settling times.

For a full explanation, please see the 300 Series white paper on [www.teledyne-hi.com](http://www.teledyne-hi.com)

When viewing the electronic version of this Product Bulletin, use this link:

<http://www.teledyne-hi.com/tech-papers/Flow-Reading.pdf>

The heart of the instrument is a high speed thermal transfer sensor and a linear laminar flow shunt assembly. The sensor has been optimized to minimize the thermal transfer time in order to speed up the flow response.

## Specifications & Standards

### Performance

### HFM-306

Full Scale Flow Ranges (N <sub>2</sub> )	2500 to 8000 SLM
Accuracy <sup>1</sup>	± 3% full scale
Repeatability	± 0.2% of F.S.
Operating Temperature	0° - 60°C
Warm up time	30 min optimum accuracy 2 min for ± 5% of full scale
Settling Time/Response Time	< 0.4 seconds (0% to 100% F.S.)
Temperature Coefficient of Zero	< 0.079%/°C of F.S. (0-60°C)
Temperature Coefficient of Span	< 0.092%/°C of reading (15-50°C)
Operating Pressure -Maximum	300 psig
Pressure Coefficient of Span	< 0.015% of reading /psi (N <sub>2</sub> , 0-300 psig)
Attitude Sensitivity of Zero	< 0.2% of F.S. (N <sub>2</sub> @ 19.7 psia)
<b>Electrical</b>	
Power Requirements	± 15 VDC @ ± 55 mA
<b>Physical</b>	
Weight (approx.)	38 lb (17 kg)
Wetted Materials	316 SS, 302 SS, Ni 200, Viton® (Optional Kelrez®, Neoprene®, Buna-N®)

1. See Note in Flow Range/Gas Selection section

## Standards

- EN61010-1 Safety of Electrical Equipment for Measurement, Control and Laboratory Use
- EN 61326:1997/A2:2000 Radiated Emissions (Note: for Mounted Electronics ONLY)
- EN 61326:1997/A2:2000 Conducted Emissions
- EN 61000-4-2:1995/A2:2000 Electrostatic Discharge
- EN 61000-4-3:1995/A2:2000 Radiated RF Immunity
- EN 61000-4-4:1995/A2:2000 Electrical Fast Transient/Burst
- EN 61000-4-6:1996/A2:2000 Conducted RF
- EN 61000-4-8:1993/A2:2000 Magnetic Field
- EN 61000-4-9:1994/A2:2000 Voltage Dips

## Accessories

- 1 Cleaning for O<sub>2</sub> service
- 2 Power Supplies/Readouts available with  
Flow Totalizer  
Alarm Set Points
- 3 Interconnect Cables

## Flow Range / Gas Selection

The density of gases changes with changing temperature. The **standard temperature and pressure (STP)** must be specified. The resultant units-of-measure for mass flow are either **standard** liters per minute (SLM) or **standard** cubic feet per minute (SCFM), etc

When ordering or requesting a quotation, please provide the following information

**STP** - \_\_\_\_\_ Ex: 0 ° C and 760 Torr  
20 ° C and 760 Torr  
70 ° F and 760 Torr

**Units** - \_\_\_\_\_ Ex: SLM (Std Ltrs/Min)  
SCFM (Std Ft<sup>3</sup>/Min)  
SCCM (Std Cm<sup>3</sup>/Min)  
Lbs/Hr

**FS Range** \_\_\_\_\_ Ex: 0—100 SLM

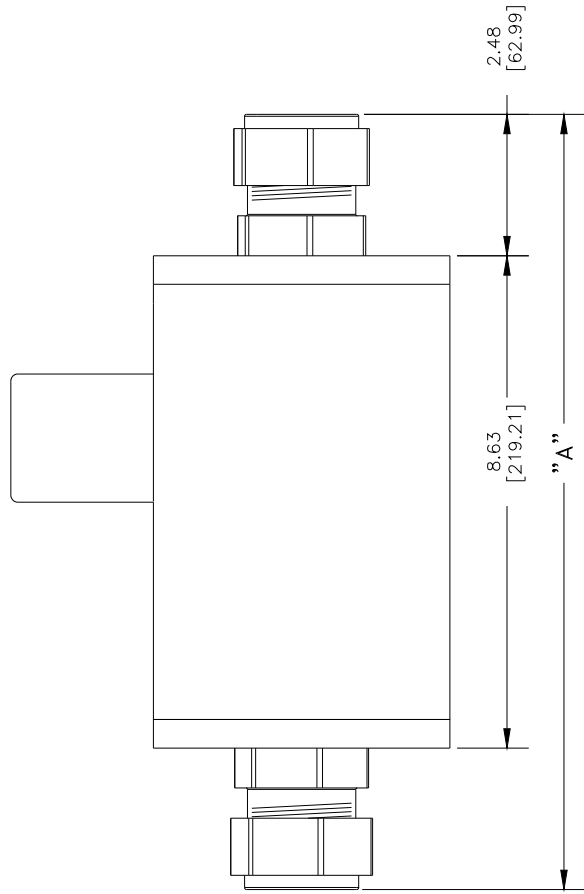
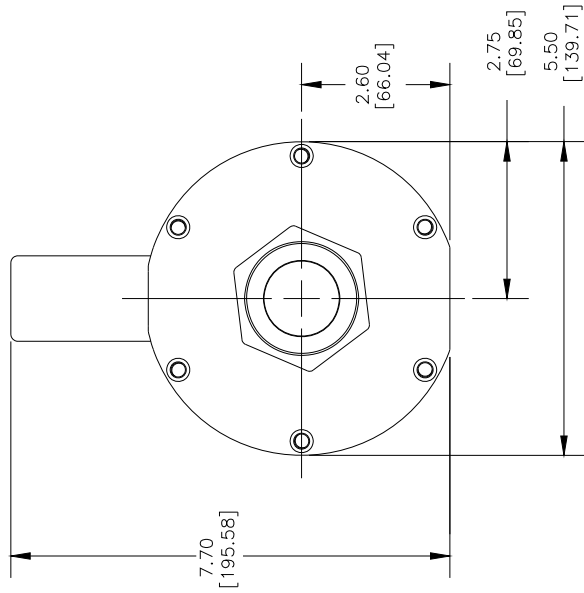
**Gas** - \_\_\_\_\_ Ex: Air  
Hydrogen

*Note: All instruments are calibrated with Nitrogen or Air. A gas conversion factor is used to convert the flow rate to the desired gas. Accuracy may vary when gases other than nitrogen or air are used.*

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Kalrez® is a registered trademark of DuPont Dow Elastomers  
Teflon® is a registered trademark of E.I. DuPont de Nemours & Co.  
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HFM-306 Outline Drawing



FITTING	DIM "A"
SWAGELOK, 1"	11.66 [296.04]
SWAGELOK, 1 1/4"	12.84 [326.01]
SWAGELOK, 2"	15.46 [392.56]

# Selection Chart

Model No.		Circuit. Board	Output	Fittings	Seals	Pressure	Cal
HFM-306							
Order No.	Options						
<b>Connector</b>							
01	Pinout "H" (Std)						
02	Pinout "U"						
<b>Output</b>							
01	0-5 Volts (Std)						
02	4-20 mA						
<b>Fittings</b>							
01	1" Swagelok						
02	1½" Swagelok						
03	2" Swagelok (Std)						
<b>Seals</b>							
01	Viton® (Std)						
02	Kalrez®						
03	Neoprene						
04	Buna-N®						
<b>Pressure</b>							
01	300 psig (Std)						
<b>Calibration</b>							
01	Nist 5 point (Std)						
02	Nist 10 point						
03	Nist 20 point						
04	Curve Request						