



**TELEDYNE HASTINGS INSTRUMENTS**  
Everywhere you look™

**HFC-D-308A/B** Digital Flow Controller

**HFM-D-306A/B** Digital Flow Meter

**HFM-306** Analog Flow Meter

## FEATURES

- Available Flow Ranges:  
0-2500 slm to 0-10,000 slm (N2)
- Accuracy in Nitrogen  
HFC-D-308  $\pm(0.5\% \text{ Rdg} + 0.2\% \text{ FS})$   
HFM-D-306  $\pm(0.5\% \text{ Rdg} + 0.2\% \text{ FS})$   
HFM-306  $\pm(2\% \text{ FS})$
- Operating Pressure to 300 PSI
- NIST Traceable Calibration
- RS232/RS485 (Digitals Only)
- Totalized Flow (Digitals Only)

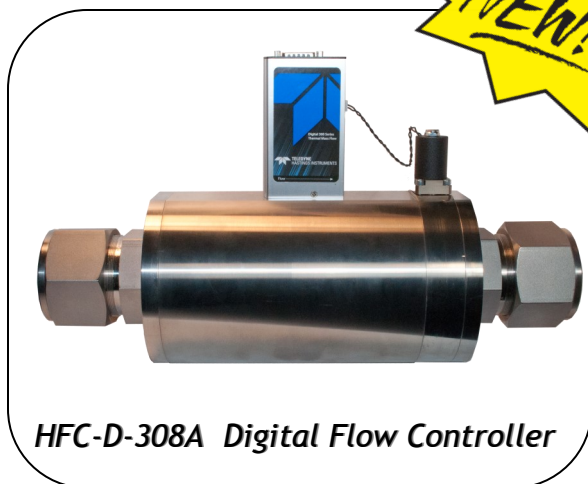
## APPLICATIONS

- Alternate Energy
- Fuel Cell R&D
- Secondary Calibration Reference
- Specialty Gas Delivery
- Custody Transfer

## BENEFITS

- Enhanced Accuracy
- Superior Linearity
- Rapid Settling Time

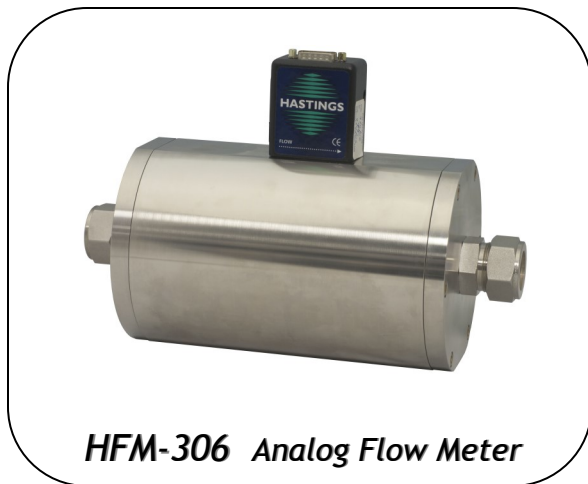
# High Flow Meters & Controllers



**HFC-D-308A** Digital Flow Controller



**Optional Touchscreen Display**



**HFM-306** Analog Flow Meter



**TELEDYNE HASTINGS INSTRUMENTS**  
Everywhere you look™

## Description

Teledyne Hastings Instruments products represent over 70 years of experience in the design and manufacture of gas flow instrumentation. The high flow meters and controllers featured in this document are based on the 300 Series line of flow sensors.

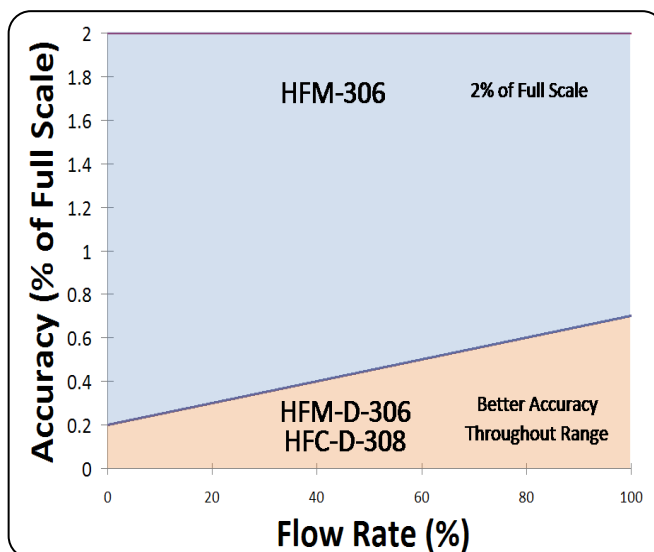
The 300 Series transducer is a patented thermal based flow sensor. This sensor is designed to provide exceptional linear response to changing flow rates. In addition, the electronics associated with the sensor are precisely tuned to give fast response time.

The flow transducer is combined with a laminar flow element to configure the flow meter for the customer. In many flow meters, the major source of error are the non-linearities that occur in the laminar flow element due to entrance and exit effects. However, the 300 Series laminar flow element is designed such that the flow sensing region is far less susceptible to these effects.

There are three models of the high flow 300 Series meters: HFM-306, HFM-D-306A, and the HFM-306B. The HFM-306 version is accurate to better than  $\pm 2.0\%$  of full scale. Instruments are normally calibrated with the appropriate standard calibration gas (air), then a correction factor is used. The digital versions, HFM-D-306A and HFM-D-306B, feature a microprocessor-based circuitry which linearizes the flow response and provides the user with excellent accuracy (see chart). The "B" version is offered with optional color touchscreen display.

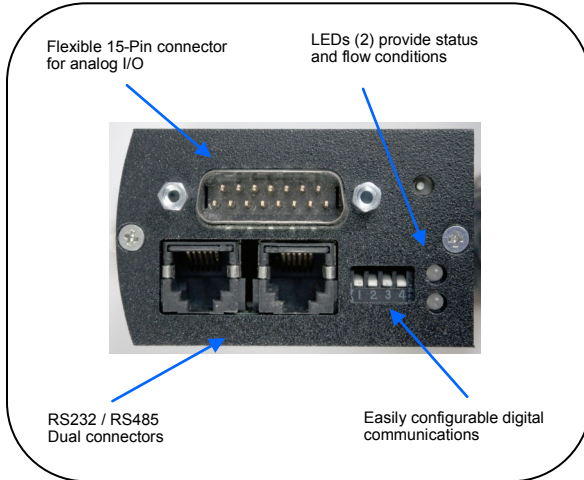
The HFC-D-308A and HFC-D-308B are digital mass flow controllers based on the aforementioned digital flow technology. The digital capability enables the unit to provide fast valve response and flow control which can be optimized for applications up to 10,000 SLM of air flow.

Teledyne Hastings is recognized throughout the world as a leader in high flow instrumentation. Our infrastructure (see photo), metrology capabilities, and employees provide our customers with outstanding service. Our application engineers can help you review your system requirements and work with you to provide a solution.

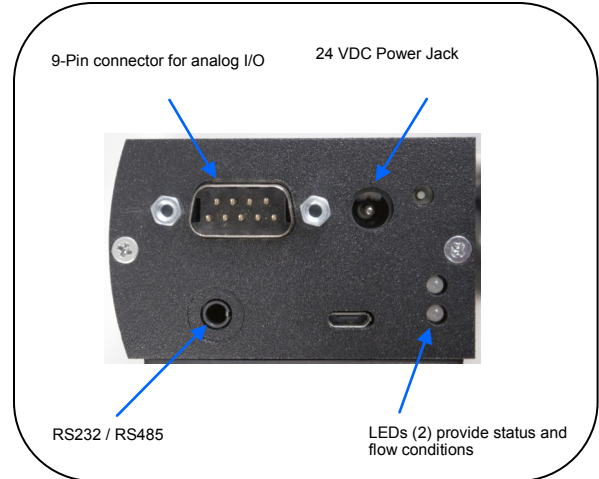


*High Flow Specialists*

## Comparison



**HFM-D-306A** (meter)  
**HFC-D-308A** (controller)



**HFM-D-306B** (meter)  
**HFC-D-308B** (controller)

	A Series	B Series
D-Connector	15-Pin	9-Pin
RS232/485 Connector	Dual RJ	Video Bayonet
Status/Flow LEDs	✓	✓
Color Display/Control Option	—	✓
Compatible with Data Logging Software	✓	✓
Power Jack	—	✓
CE	✓	✓
RoHS	✓	✓

## Specifications & Standards

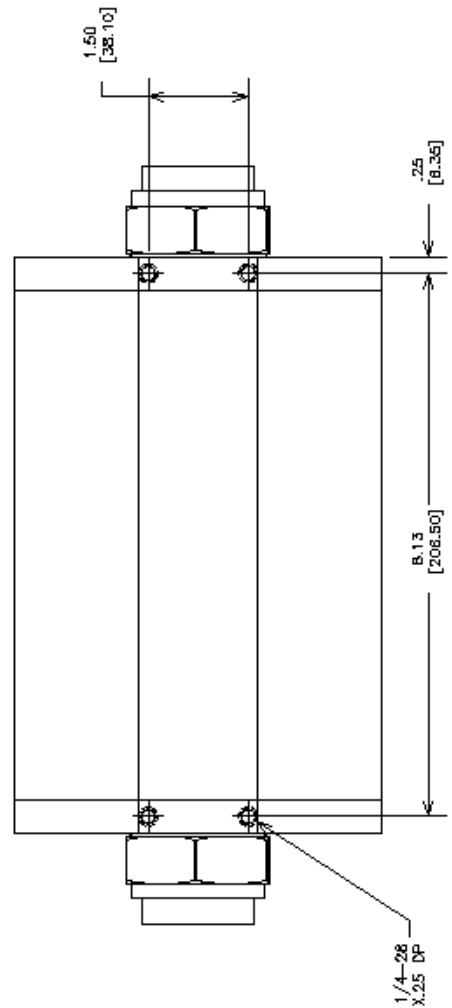
	<i>HFC-D-308A/B</i> <i>Controller</i>	<i>HFM-D-306A/B</i> <i>Meter</i>	<i>HFM-306</i> <i>Meter</i>
<b>Performance</b>			
Full Scale Flow Ranges (N <sub>2</sub> )	2,500 to 10,000 SLM	2,500 to 10,000 SLM	2,500 to 10,000 SLM
Microprocessor-based Enhanced Accuracy and Digital Features	YES	YES	NO
Accuracy	± (0.5% Rdg + 0.2% FS)	± (0.5% Rdg + 0.2% FS)	± 2% FS
Repeatability	± 0.15% of FS	± 0.15% of FS	± 0.15% of FS
Operating Temperature	-20° - 70°C	-20° - 70°C	-20° - 70°C
Warm up time	30 min optimum accuracy 2 min for ± 5% of full scale	30 min optimum accuracy 2 min for ± 5% of full scale	30 min optimum accuracy 2 min for ± 5% of full scale
Temperature Coefficient of Zero	Auto-zero when Valve is Closed	Maximum ±0.2%(FS)/°C (-20—70°C)	Maximum ±0.2%(FS)/°C (-20—70°C)
Temperature Coefficient of Span	Maximum ±0.1%(Rdg)/°C (-20—70°C)	Maximum ±0.1%(Rdg)/°C (-20—70°C)	Maximum ±0.08%(Rdg)/°C (-20—70°C)
Operating Pressure -Maximum	300 psig	300 psig	300 psig
<b>Electrical</b>			
Voltage	11-36 VDC (±12, ±15 acceptable) 15 VDC min. for 0-20 & 4-20 mA	11-36 VDC (±12, ±15 acceptable)	± 15 VDC @ ± 55 mA (3.1W)
Power "A" Series	6.7 W	3.1 W	
Power "B" Series	8.2 W	4.6 W	
<b>Physical</b>			
Weight (approx.)	37 lb (16.8 kg)	29 lb (13.1 kg)	30 lb (13.6 kg)
Wetted Materials	316 SS, 302 SS, Ni 200, Viton® (Optional Buna-N®), Kalrez, PTFE	316 SS, 302 SS, Ni 200, Viton® (Optional Buna-N®), PTFE	316 SS, 302 SS, Ni 200, Viton® (Optional Buna-N®), PTFE

## Standards

- European Pressure Equipment Directive (PED) 97/23/EC
- 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

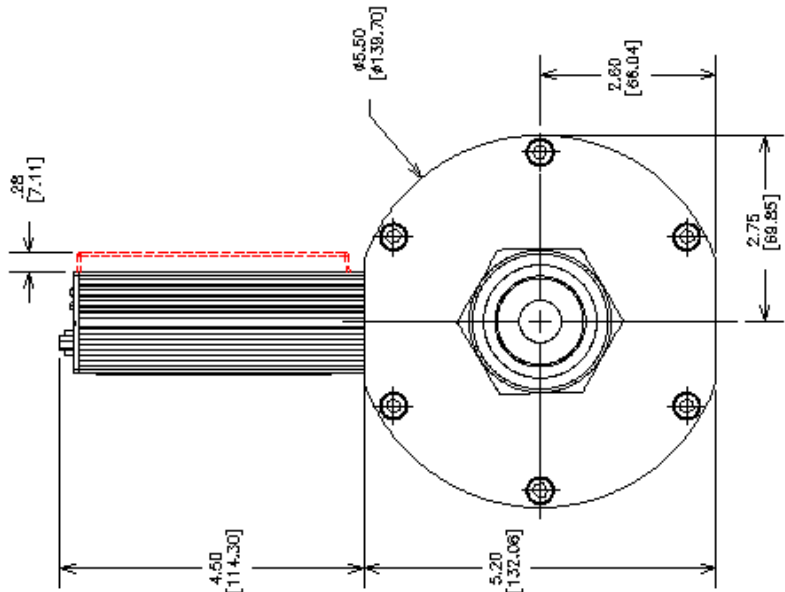
Hastings Instruments reserves the right to change or modify the design of its equipment without any obligation to provide notification of change or intent to change.

Viton® is a registered trademark of DuPont Performance Elastomers  
Kalrez® is a registered trademark of DuPont Performance Elastomers  
Buna-N® is a registered trademark of E.I. DuPont de Nemours & Co.

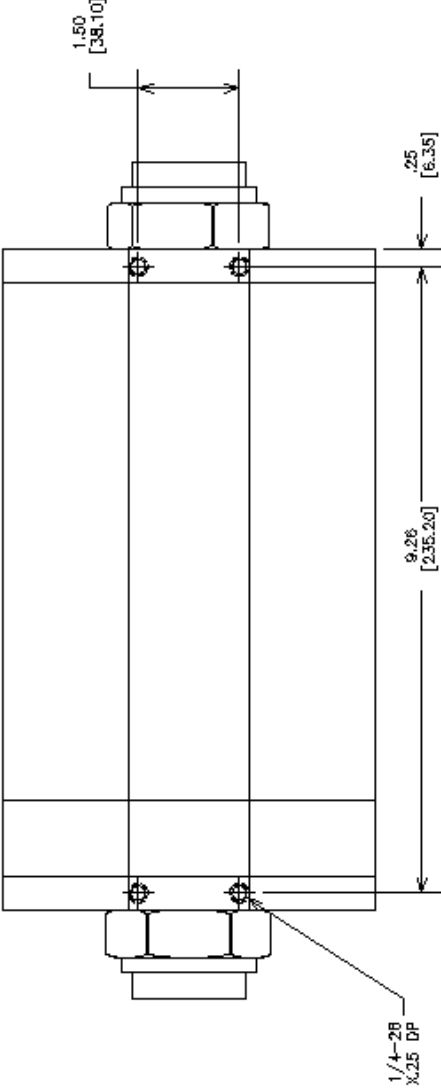
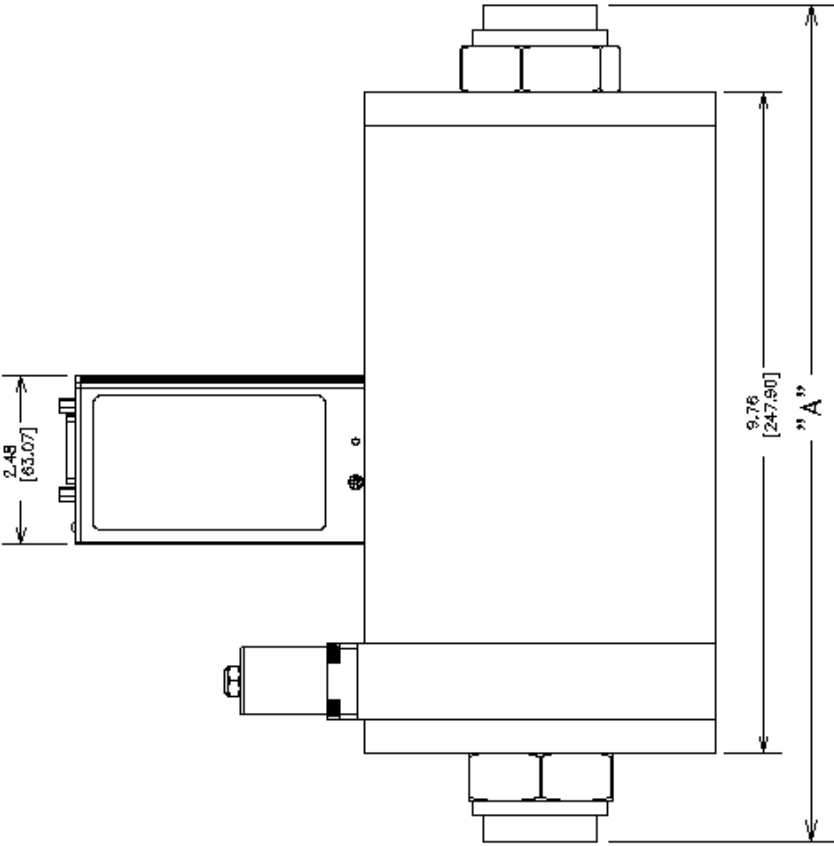


FITTING	DIM "A"
SWAGELOK, 1"	11.66 [296.04]
SWAGELOK, 1 1/2"	12.84 [326.01]
SWAGELOK, 2"	15.45 [397.56]

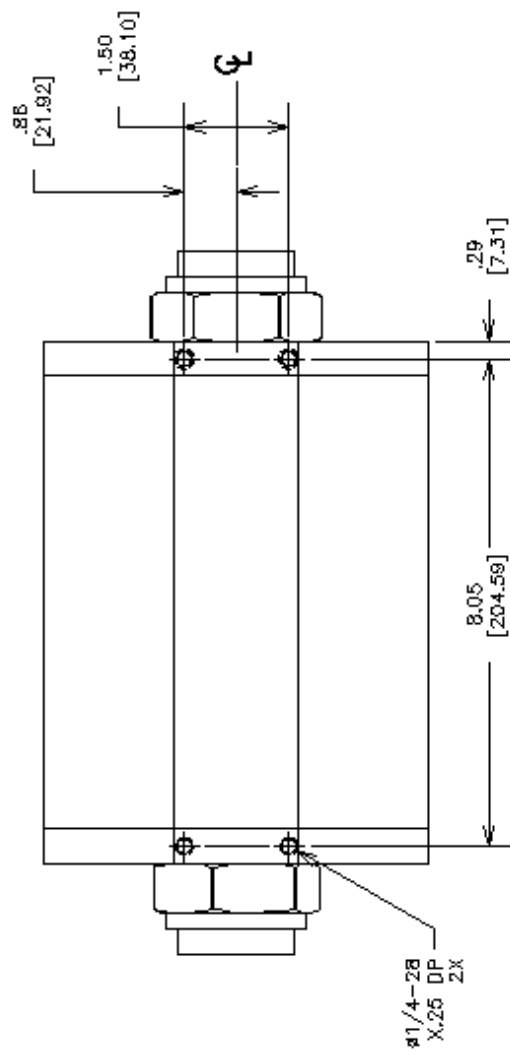
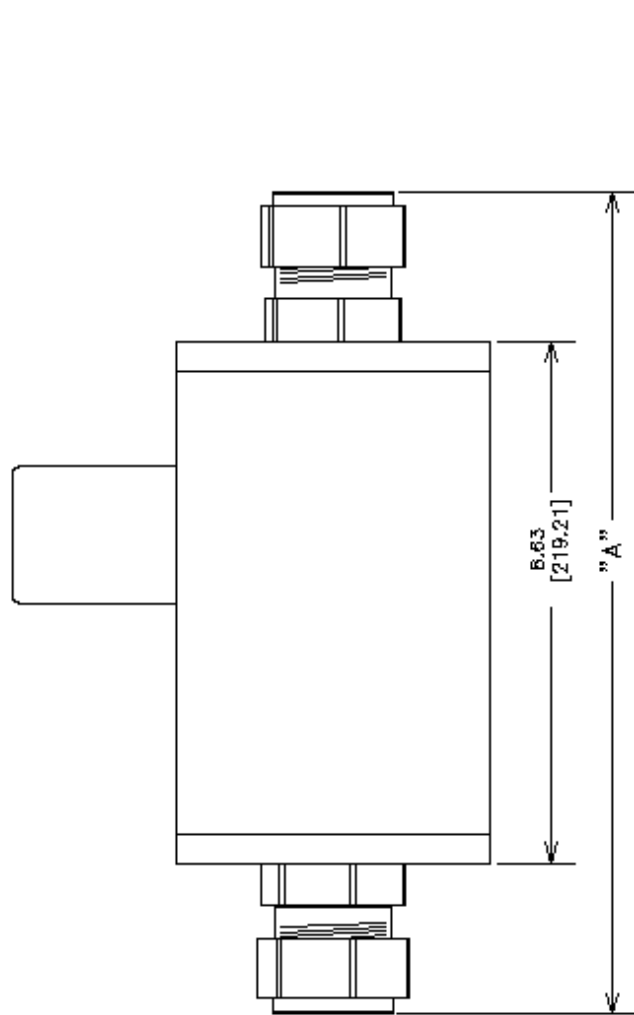
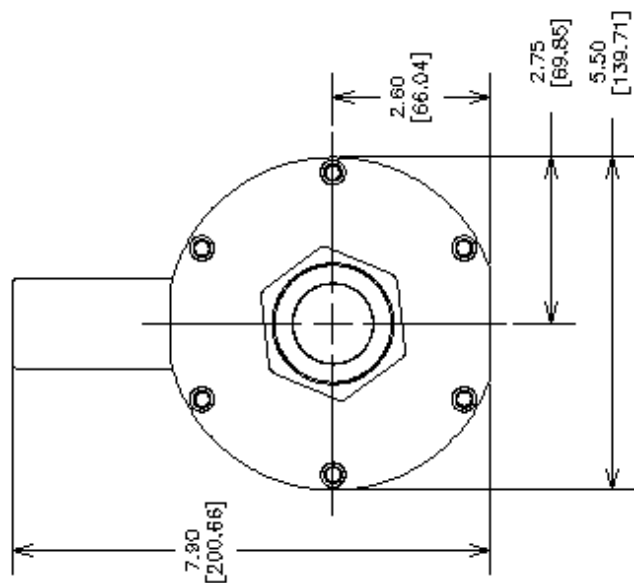
Outline Drawing HFC-D-308 A&B



FITTING	DIM "A"
SWAGELOK, 1"	12.80 [325.12]
SWAGELOK, 1 1/2"	14.72 [373.89]
SWAGELOK, 2"	16.60 [421.64]



Outline Drawing HFM-306



Digital	
01	RS232 (Std)
02	RS485

Model Number		Output	Fittings	Seals	Working Pressure	Calibration Records	Digital	Calibration Type	Display
HFM-D-306B / HFC-D-308B									
Output									
01	0-5 Volt (Std)								
02	0-10 Volt								
03	4-20 mA								
04	0-20 mA								
Fittings									
01	1" Compression								
02	1 1/2" Compression								
03	2" Compression (Std)								
Seals									
01	Viton (Std)	02	Kalrez (Meter only)						
04	Buna-N	03	Neoprene (Meter only)						
Working Pressure									
01	300 psig (Std)								
Calibration Records									
01	1 NIST Traceable Calibration Report (Std)								
02	2 NIST Traceable Calibration Reports								
03	3 NIST Traceable Calibration Reports								
04	4 NIST Traceable Calibration Reports								
05	5 NIST Traceable Calibration Reports								
06	6 NIST Traceable Calibration Reports								
07	7 NIST Traceable Calibration Reports								
08	8 NIST Traceable Calibration Reports								
Digital									
01	RS232 (Std)								
02	RS485								
Calibration Type									
01	NIST 5 Point (Std)								
02	NIST 10 Point								
03	NIST 20 Point								
Display									
01	Touchscreen Display								
02	No Display (Std)								

## Selection Chart

Model Number		Pinout	Output	Fittings	Seals	Pressure	Cal
HFM-306							

Pinout	
01	Pinout H (Std)

Output	
01	0-5 Volt (Std)
02	4-20 mA

Fittings	
01	1" Compression
02	1 1/2" Compression
03	2" Compression (Std)

Seals	
01	Viton (Std)
02	Kalrez
03	Neoprene
04	Buna-N

Pressure	
01	300 psig (Std)

Calibration	
01	NIST 5 Point (Standard)
02	NIST 10 Point
03	NIST 20 Point
04	Curve w/ Polynomial Equation

### Range Information for all Instruments

Each calibration will require  
the following information:

Range \_\_\_\_\_

Flow Units \_\_\_\_\_

Gas \_\_\_\_\_

### For the HFC Instruments also

Upstream Pressure \_\_\_\_\_  
(maximum & minimum)

Downstream Pressure \_\_\_\_\_  
(maximum & minimum)

Does the downstream pressure  
change with flowrate? Y/N \_\_\_\_\_

For volumetric units the standard temperature  
and pressure of the unit is also required  
0°C & 760 Torr will be used when other values  
are not specified

## Power Supplies & Accessories



### *THCD-100 Single Channel Power Supply Meter*

**THCD-100**

Includes brackets, connectors, and backshells



### *24 VDC Switching Power Supply*

**12-01-169**

For use with "B" Series or THCD-100  
(Please specify AC Input Clip)



### *Flow Transducer Cable Part Numbers: Connect Hastings Power Supply to "A" Series Flow Meters & Controllers*

<b>AF-4-AM</b>	4' Cable
<b>AF-25-AM</b>	25' Cable
<b>AF-50-AM</b>	50' Cable
<b>AF-100-AM</b>	100' Cable



### *"A" Series—Serial Communication Cable:*

**CB-RS232-RJ12**

RS232 Cable (9-Pin "D" Female to RJ12)



### *"B" Series—Serial Communication Cable:*

**CB-RS232-TRRS**

RS232 Cable (9-Pin "D" Female to Male TRRS Jack  
8 Ft

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