

# TELEDYNE HASTINGS

## HIGH CAPACITY FLOWMETERS AND CONTROLLERS

# INSTRUMENTS

### Models HFM-305, HFC-307

#### FEATURES

- Range — 1000-2500 slm (Air Equivalent); Higher Flows Available
- $\pm 1.0\%$  of Full-Scale Accuracy<sup>1</sup>
- Rapid Settling Times:  
HFM-305  $\leq 0.4$  seconds  
HFC-307  $\leq 2.0$  seconds
- Operating Pressures to 500 PSI
- NIST Traceable Calibration

#### APPLICATIONS

- Gas Blending
- Research
- R&D and Process Flows
- Pollution Monitoring



HFM-305



HFC-307

#### DESIGN FEATURES

Teledyne Hastings Instruments (THI) products represent over 55 years of experience in the design and manufacture of mass flow products. The 300 Series is a culmination of this experience with patented technologies that make these the finest flowmeters and controllers available today.

The THI Mass Flow 300 Series products are designed to accurately measure mass flow without corrections or compensations for gas pressure and temperature. They are accurate to better than  $\pm 1.0\%$  of full scale. THI mass flow instruments do not require any periodic maintenance under normal operating conditions with clean gases. No damage will occur from the use of moderate overpressures (~500 psi) or overflows. Instruments are normally calibrated with the appropriate standard calibration gas (air), then a gas conversion factor (GCF) is used to adjust the output for the intended gas. Special calibrations for other gases, such as oxygen, helium and argon, are available upon special order.

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 linear 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 removable/replaceable sensor module. (4) The unit has very fast settling times.

# MODELS HFM-305/HFC-307

## DESIGN FEATURES (cont)

### Optional Features

Fittings—VCR<sup>®</sup>, VCO<sup>®</sup> and Swagelok<sup>®</sup>  
Cleaned for oxygen service

### Accessories

Power supplies/readouts  
Flow totalizers  
Alarm set points  
Interconnecting cables

\*Note: After changing components, instruments require recalibration to meet accuracy specifications.

## COMMON SPECIFICATIONS HFM-305/HFC-307

<b>Accuracy<sup>1</sup></b>	± 1.0% of F.S.
<b>Repeatability</b>	± 0.07% of F.S.
<b>Maximum Operating Pressure</b>	500 psi
<b>Pressure Coefficient</b>	0.015%/psi (N <sub>2</sub> ) (0-500 psig)
<b>Leak Integrity</b>	< 1x10 <sup>-9</sup> sccs He
<b>Temperature Coefficient (zero)</b>	< 0.079%/°C of F.S. (0-60°C)
<b>Temperature Coefficient (span)</b>	< 0.092%/°C of reading (15-50°C)
<b>Standard Output</b>	0-5 VDC
<b>Optional Output</b>	4-20 mA
<b>Connector</b>	15-pin subminiature D
<b>Attitude Sensitivity of Zero</b>	< 0.2% of F.S. (N <sub>2</sub> @ 19.7 psia)
<b>Attitude Sensitivity of Span</b>	< 0.06% of reading (N <sub>2</sub> @ 19.7 psia)

## SPECIFICATIONS HFM-305

<b>Settling Time</b>	≤ 0.4 sec (0% to 100% F.S.)
<b>Power Requirement</b>	±15 VDC @ ±55 mA
<b>Wetted Materials</b>	302 SS, 316 SS, Nickel 200
<b>Weight (approx.)</b>	8.2 lb (3.72 kg)

## SPECIFICATIONS HFC-307

<b>Settling Time</b>	≤ 2.0 sec (10% to 100% F.S.)
<b>Power Requirement</b>	±15 VDC @ ±150 mA
<b>Wetted Materials</b>	302 SS, 316 SS, Nickel 200, Viton, Kalrez <sup>®</sup> (valve seat)
<b>Setpoint Input</b>	0-5 VDC (standard)/4-20 mA (optional)
<b>Weight (approx.)</b>	15.3 lb (6.94 kg)

*Teledyne 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.*

<sup>1</sup>See Product Manual for critical information on instrument accuracy and the use of GCFs (gas conversion factors). Stated accuracy is for nitrogen or other gas specific calibration and use with this gas only.

Kalrez<sup>®</sup> is a registered trademark of Dupont Dow Elastomers L.L.C.

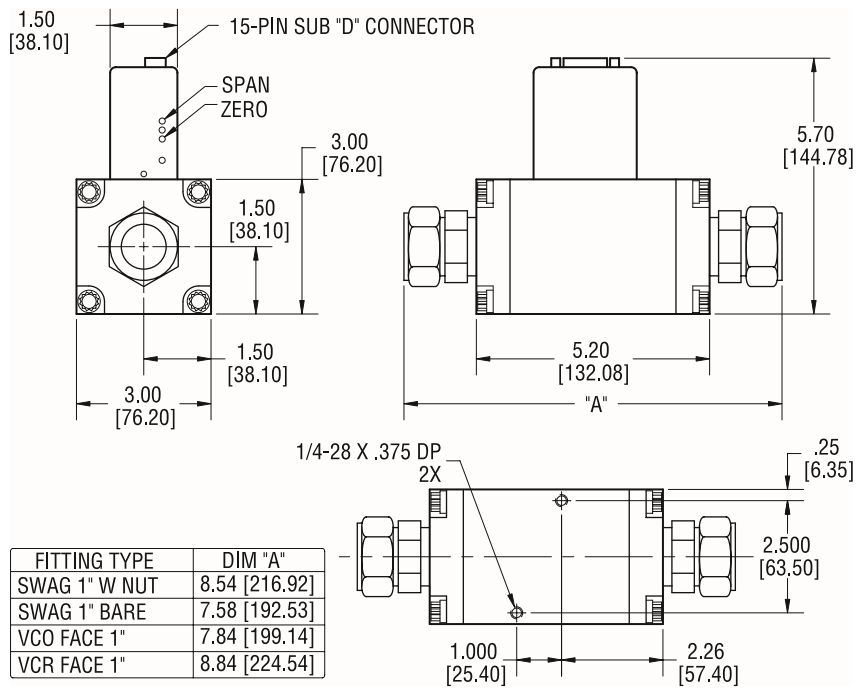
Swagelok<sup>®</sup> is a registered trademark of Crawford Company.

VCR<sup>®</sup> is a registered trademark of Cajon Company.

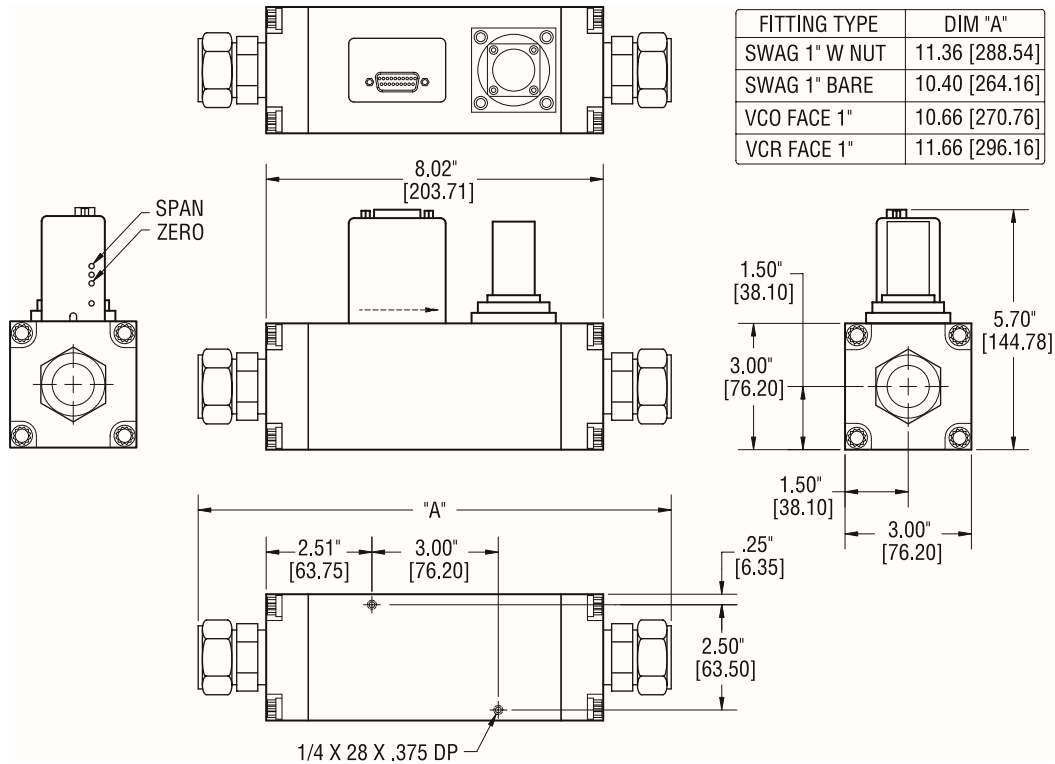
VCO<sup>®</sup> is a registered trademark of Cajon Company.

Viton<sup>®</sup> is a registered trademark of Dupont Dow Elastomers L.L.C.

## Model HFM-305



## Model HFC-307



# MODELS HFM-305/HFC-307

## Selection Chart

Typical instrument ordering/options number:

Model No.	Circuit Board	Output	Fittings	Seals	Pressure	Calibration Type
HFM-305	01	01	02	01	01	01

Order No.	Options
<b>Circuit Board</b>	
01	Pinout H (Standard)
02	Pinout U
03	Pinout M
<b>Output</b>	
01	0-5 Volts (Standard)
02	4-20mA

Order No.	Options
<b>Fittings</b>	
01	1" VCR®
02	1" Swagelok (Standard)
03	1" VCO®
<b>Seals</b>	
01	Viton (Standard)
02	Kalrez®
03	Neoprene
04	Buna N

Order No.	Options
<b>Pressure</b>	
01	500 psi (Standard)
<b>Calibration Type</b>	
01	NIST 5 Point (Standard)
02	NIST 10 Point
03	NIST 20 Point
04	Curve

**Range Information**  
 Range \_\_\_\_\_  
 Flow Units \_\_\_\_\_  
 Gas \_\_\_\_\_  
 Standard Conditions\* \_\_\_\_\_  
 \*Referenced to standard temperature and pressure (0°C and 760 Torr, respectively).

## Selection Chart

Typical instrument ordering/options number:

Model No.	Circuit Board	Output	Fittings	Seals	Pressure	Calibration Type
HFC-307	01	01	02	01	01	01

Order No.	Options
<b>Circuit Board</b>	
01	Pinout H (Standard)
02	Pinout U
03	Pinout M
<b>Output</b>	
01	0-5 Volts (Standard)
02	4-20mA
03	I/O 4-20mA

Order No.	Options
<b>Fittings</b>	
01	1" VCR®
02	1" Swagelok (Standard)
03	1" VCO®
<b>Seals</b>	
01	Viton (Standard)
02	Kalrez®
03	Neoprene
04	Buna N

Order No.	Options
<b>Pressure</b>	
01	500 psi (Standard)
<b>Calibration Type</b>	
01	NIST 5 Point (Standard)
02	NIST 10 Point
03	NIST 20 Point
04	Curve

**Range Information**  
 Range \_\_\_\_\_  
 Flow Units \_\_\_\_\_  
 Gas \_\_\_\_\_  
 Upstream Pressure \_\_\_\_\_  
 Downstream Pressure \_\_\_\_\_  
 Is downstream pressure dependent on flow resistance? Y/N \_\_\_\_\_  
 Standard Conditions\* \_\_\_\_\_  
 \*Referenced to standard temperature and pressure (0°C and 760 Torr, respectively).

Your Customer Service Representative



**TELEDYNE INSTRUMENTS**  
*Hastings Instruments*  
 A Teledyne Technologies Company

Telephone: (757) 723-6531  
 Toll Free: (800) 950-2468  
 Fax: (757) 723-3925  
 World Wide Web: <http://www.teledyne-hi.com>  
 E-mail: [hastings\\_instruments@teledyne.com](mailto:hastings_instruments@teledyne.com)  
 P.O. Box 1436  
 Hampton, VA 23661