

# TURBINE FLOWMETERS BY HOFFER

Perfecting Measurement™



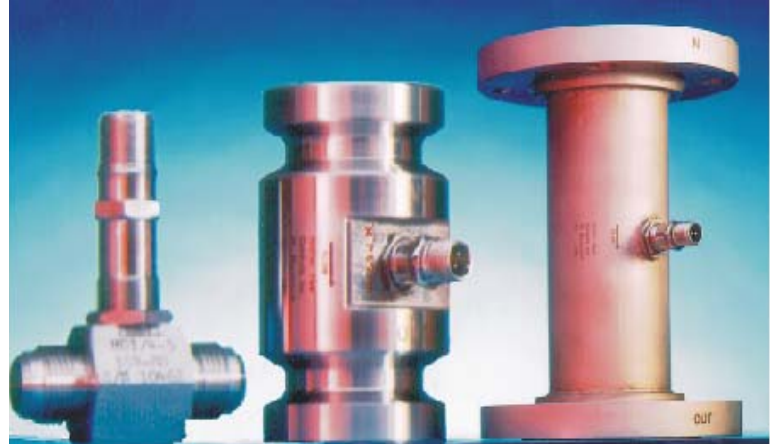
## HO SERIES Turbine Flowmeters for Gas Service

Product Bulletin HO-G-110M

### TECHNICAL DATA SHEET

#### OUTSTANDING FEATURES

- Low cost.
- Outstanding accuracy.
- Provides wide flow ranges.
- Wide variety of process connections available.\*
- Operate over a wide range of temperatures and pressures.
- Exclusive use of hybrid ceramic ball bearings provide superior life.



\*MS Flared or Flanged end connections are best suited due to the even transition at the connections.

**GAS SIZE SELECTOR CHART FOR STANDARD HO SERIES TURBINE FLOWMETERS**

Flowmeter Size Diameter (inches)	Repeatable Range**		Repeatable Range**	
	Based on a Gas Density of 1#/Ft <sup>3</sup>		Based on a Gas Density of .25#/Ft <sup>3</sup>	
	Magnetic Coil (ACF/M)	MCP Coil (ACF/M)	Magnetic Coil (ACF/M)	MCP Coil (ACF/M)
1/2 x 1/4	N/A	.15 – 3.5	N/A	.3 – 3.5
1/2 x 3/8	N/A	.3 – 5	N/A	.6 – 5
5/8	N/A	.5 – 10	N/A	1 – 10
3/4	N/A	.6 – 20	N/A	1.2 – 20
1	2.5 – 43	.8 – 43	5 – 43	1.6 – 43
1¼	3.5 – 100	1.25 – 100	7 – 100	2.5 – 100
1½	5.0 – 120	1.75 – 120	10 – 120	3.5 – 120
2	10 – 200	3.5 – 200	20 – 200	7 – 200
2½	15 – 500	5 – 500	30 – 500	10 – 500
3	20 – 600	7.5 – 600	40 – 600	15 – 600
4	30 – 1100	N/A	60 – 1100	N/A
5	40 – 1800	N/A	80 – 1800	N/A
6	50 – 3000	N/A	100 – 3000	N/A
8	100 – 4800	N/A	200 – 4800	N/A
10	150 – 7500	N/A	300 – 7500	N/A
12	200 – 12000	N/A	400 – 12000	N/A

This chart is for quick reference only and not for final size. Calculate using actual service conditions.

\*\*Lower limit of flow range is dependent on user's operating density.

#### SPECIFICATIONS

**Overrange:** 150% of maximum flow (intermittently).

**Available Turn Down Range:** Dependent on gas density at user's operating conditions.

**Linearity:** ±1% of reading typical. \*\*\*

**Repeatability:** ±0.25% over tabulated repeatable range.

*Note: Performance enhancement techniques are routinely applied to produce wider linear and useable flow ranges. This technique is also used to improve linearity and repeatability. Consult the applications group at Hoffer with your requirements.*

**Available Temperature Range:** -450°F to +300°F continuous (to +400°F intermittent heat). Dependent on bearing/coil selection.

**End Fittings:** MS flared and flanged styles are recommended. Other types available on request.

**Bearing Styles:** Self-lubricating, ceramic hybrid ball bearings.

**Materials:** 316/316L dual rated stainless steel standard. Consult with applications group for corrosive applications. Broad material list available.

\*\*\*Linearity is density-dependent for a given meter. Consult factory for details.

# GAS TURBINE FLOWMETER MODEL NUMBERING SYSTEM

MODEL HO (A) X (B) - (C) - (D) - (E/F/G) - (H) - (I)

**A. End Fitting Size**

**B. Flowmeter Size**

**C. Blade Angle (See Note 1)**

**D. Bearing Type**

(BP) Self-lubricating, **ceramic** hybrid ball bearings, sizes 1/4" thru 1".  
 (CB) Self-lubricating, **ceramic** hybrid ball bearings, sizes 1-1/4" thru 12".

**E. Pickup Coils**

(1M) One Magnetic Coil  
 (2M) Two Magnetic Coils  
 (1MC3PA) One RF Coil  
 (2MC3PA) Two RF Coils  
 (1MC3PAHT) One High Temp RF coil  
 (2MC3PAHT) Two High Temp RF coils  
 (1HTM) High Temperature Magnetic Coil  
 (2HTM) Two High Temperature Magnetic Coils  
 (1ISM) Intrinsically Safe Mag Coil  
 (2ISM) Two Intrinsically Safe Mag Coils  
 (1ISM-ATEX) One ISM ATEX coil  
 (2ISM-ATEX) Two ISM ATEX coils  
 \_(RP\_) Redi-Pulse Coil (See Redi-Pulse Technical Data Sheet RP-XXX)  
 \_(\_) Intrinsically Safe Redi-Pulse Coil (See I.S. Redi-Pulse Technical Data Sheet IRP-XXX)  
 (P) Pigtail or Flying Leads, Add-P and the Length of leads after any coil except the high temperature coils.  
 (-ATEX) Add after coil part no. when using ATEX enclosure mounted on meter.

**F. Coil Spacing, Mechanical Degrees Apart**

( ) Factory Assigned. Spacing required when meter has two pickup coils. If second coil not required skip option (F).

**G. Riser and Explosion-Proof Coil Enclosures**

(X) 1" MNPT riser, welded to body. Required for all types of enclosures.  
 (X-ATEX) 3/4" MNPT riser, welded to the body.  
 (XE2) 1" MNPT riser with E2 enclosure. (See Chart)\*  
 (X-ATEX)E2 3/4" MNPT riser with E2 enclosure. (See Chart)\*  
 (X8S) 8" Long S/S 1" MNPT riser. (For fluid temperatures below -40°F (-40°C) or above +140°F +60°C).  
 (X8S-ATEX) 8" Long S/S 3/4" MNPT riser. (For fluid temperatures below -40°F (-40°C) or above +140°F +60°C).

**\*E2 EXPLOSION-PROOF/FLAME-PROOF ENCLOSURE WITH 3/4" FNPT MOUNT AND 3/4" CABLE ENTRY RATINGS:**

FM: CLASS I, DIV. 1, GR. ABCD, CLASS II/III, DIV. 1, GR. EFG, TYPE 4X  
 CSA: CLASS I, DIV. 1, GR. ABCD, CLASS II, DIV. 1, GR. EFG, CLASS III, TYPE 4X EX D IIC, CLASS I, ZONE 1, IP 66  
 ATEX: EX II 2GD Ex d tD IIC, IP66/68  
 IEC: EX D IIC IP68

**H. End Fitting Types**

(MS) 37 Deg. Male Flare Per MS33656  
 (NPT) Male National Pipe Thread (See Note 3 below)  
 (F\_) Raised Face Flange per ANSI (See Chart \*\*)  
 (DN\_/PN\_CS/SS) DN=Metric size, PN=Flange pressure rating (in DIN std.) and select material  
 (W\_) Wafer Style Body (Use 1, 3, 6, 9, 15 or 25 after "W" to indicate flange weight wafer meter will be used with)

**\*\*Pressure Rating/Flange Material**  
 Include "F", number indicating pressure rating, and flange material. (i.e., -F1SS-)

<b>Select one:</b>	<b>Select One:</b>
(1) 150# Flanges	(SS) Stainless Steel
(3) 300# Flanges	(CS) Carbon Steel
(4) 400# Flanges	
(6) 600# Flanges	<b>Note:</b> 316/316L SS flanges are standard, add-304 at end of model # if 304 flanges are required.
(9) 900# Flanges	
(15) 1500# Flanges	
(25) 2500# Flanges	

**I. Special Features**

(CE) CE Mark - Required for Europe.  
 (PED-CE) PED Mark - Required for Europe.  
 (SEP-CE) Sound engineering practice.  
 (PT) 1/4" FNPT Pressure Tap (AGA Compliant).  
 (PG) Premier Gas turbine for improved accuracy of ±0.5%, requires actual or natural gas calibration. Please see HO-PG-100 for more information.  
 (SP) Any special features that are not covered in the model number, use a written description of -SP.  
 (EXP) CSA Explosion-Proof Certification. (See Chart)\*\*\*  
 (X) No Special Features

**\*\*\* CLASS I, DIV. 1, GR. ABCD; CLASS I, DIV. 2, GR. ABCD; CLASS II, DIV. 1, GROUPS EFG**  
 CANADA: CLASS I, ZONE 1 & 2, Ex d II C  
 USA: CLASS I, ZONE 1 & 2, AEx d II C

**Notes:**

- Blade Angle determined by density, assigned by factory or use of gas sizing program.
- Turbine sizes 1/4" through 3/4" must be equipped with MC3PA coil. 1" through 3" may be recommended for MC3PA coil depending on gas density and desired turndown range.
- NPT not recommended for gas service due to possible uneven transition at NPT connections.

Request HO-L-110 Technical Data Sheet for complete specifications for HO Series for Liquid Service.



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The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

The quality system covering the design, manufacture and testing of our products is certified to International Standard ISO 9001.

