TURBINE FLOWMETERS BY

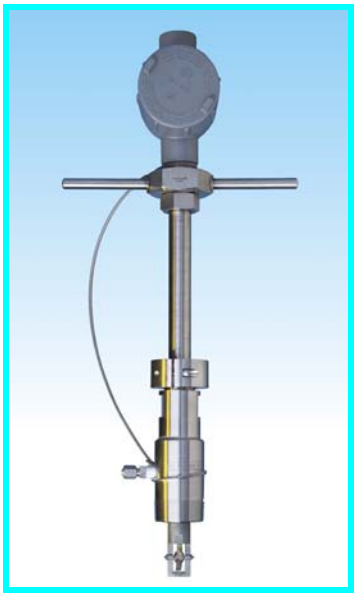
HOFFER

The Turbine Flowmeter Company

HP PROFILE INSERTION SERIES
Turbine Flowmeters
for Liquids and Gases
Product Bulletin HP-104B

TECHNICAL DATA SHEET

FEATURES



- Low cost.
- Low pressure drop.
- Wide flow turndown ranges for both liquids and gases.
- Outstanding accuracy.
- Applications from 4" to 72" pipe diameters. Specials upon request.
- Process connection flexibility.
- May be installed or removed from active line without stopping service.
- -20 to +400°F standard operating temperature range with Viton Seal.

THEORY OF OPERATION

The Hoffer HP Series of Insertion Turbine Flowmeters are designed for measuring liquid and gas flow in medium to large diameter pipes with accuracies inherent in the turbine flowmeter at a substantially lower price than in-line flowmeters.

Several versions are available including fixed, adjustable, bi-directional and high pressure. In addition a number of process fittings and materials of construction may be supplied to suit the demand of various applications.

SPECIFICATIONS: LIQUIDS

Linear Flow Ranges:	Minimum Usable Flow Ranges:
5 to 50 FPS.	0.25 FPS with 2" Rotor.
2 to 20 FPS.	0.5 FPS with 1½" Rotor.
1 to 10 FPS.	

LINEARITY: ±1% in 10:1 Flow Turndown Ratios.
Any turndown range with a minimum of 1 FPS and

SPECIFICATIONS: GASES

Linear Flow Ranges:	Minimum Usable Flow Ranges:
25 to 250 FPS.	Dependent on gas density.
10 to 100 FPS.	Consult factory.

LINEARITY: ±2% in 10:1 Flow Turndown Ratios (Typical).
Turndown ratio is dependent on gas density.

GENERAL SPECIFICATIONS LIQUIDS AND GASES

REPEATABILITY: ±.25% Standard.

MAX. OPERATING PRESSURE:
150 PSI low pressure adjustable model.
2500 PSI fixed model.**
2500 PSI high pressure adjustable model.**

** *(Dependent on process connection and temperature).*

BEARING TYPES: Ceramic Hybrid Ball Bearings, Tungsten Carbide and Hard Carbon Composite Sleeve Bearings.

MATERIALS: Stem, housing and rotor support are 316 stainless steel. Stem guide materials - brass (standard). Standard seal is Viton, with others available. Rotor - nickel 200, 430 stainless steel, 17.4 stainless steel (standard).

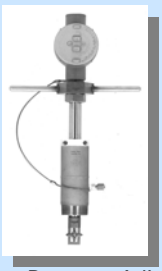
OUTPUT SIGNAL: (MAGNETIC COIL)* Output level - 10 mV RMS minimum.
Wave shape - sinusoidal.
DC resistance of sense coil - 2000 OHMS.
Coil - variable reluctance type.

The NPT adjustable insertion flowmeter handle is used to align the flowmeter to the proper orientation. The flowmeter stem is graduated in inches to aid in insertion depth and has a pickup coil located within the interior. The standard adjustable insertion flowmeter with a 1½" rotor assembly can mount through an isolation valve allowing removal and re-positioning without interrupting the pipeline flow. This type of installation is accomplished through a hot tap technique. The insertion flowmeter with a 2" rotor can also be installed through an isolation valve. The fixed insertion flowmeter is similar to the adjustable type except a mounting flange is welded directly to the stem. This economy version may not be used for hot tap applications.

The bi-directional insertion flowmeter has the capability to detect the direction of flow by using two low drag magnetic pickup coils positioned to generate a quadrature output signal compatible with Hoffer electronic flow measurement systems. This type of installation may also be accomplished through hot tap techniques.

*(Also available with flanged process connection).


*NPT/High Pressure Adjustable


*NPT/Low Pressure Adjustable


Fixed Flanged


Bi-Directional

ORDERING INFORMATION

Basic Model Number HP-B- (__) - (__) - (___min - ___max) - (__) - (__) - (__) - (__) - (__) - (__) - (__) - (__) - (__)

Rotor Size

(1½)	1½" Rotor
(2)	2" Rotor. Must use 2" for bi-directional flow (BF) option.

Blade angle for *gas applications only*. ***(See Note 3)***

Minimum Flow & Maximum Flow for *liquid applications only.* (In FPS)

End Fitting

(2NPT)	2" NPT Male Pipe
(3NPT)	3" NPT Male Pipe
(2F1SS)	2" 150# RF 316 S.S. Flange
(2F3SS)	2" 300# RF 316 S.S. Flange
(2F6SS)	2" 600# RF 316 S.S. Flange
(3F1SS)	3" 150# RF 316 S.S. Flange
(3F3SS)	3" 300# RF 316 S.S. Flange
(3F6SS)	3" 600# RF 316 S.S. Flange

Bearing Type

(CB)	Ceramic Hybrid Ball Bearing must be used for *gas applications* and may be used for some clean *liquid applications*.
(T)	Tungsten Carbide Sleeve available for *liquid applications only.*
(C)	Hard Carbon Composite Sleeve available for *liquid applications only.*

Pickup Coils

(1M)	One Magnetic Coil.
(1MC3PA)	One RF Coil.
(1MC2PAHT)	One High Temp 6" Pigtail RF Coil.
(1HTM)	One High Temperature Mag Coil.
(1ISM)	Intrinsically Safe Mag Coil.
1(RP____)	Redi-Pulse Coil (See Redi-Pulse Technical Data Sheet RP-XXX).
1(_____)	Intrinsically Safe Redi-Pulse Coil (See I.S. Redi-Pulse Technical Data Sheet IRP-XXX).

Explosion-Proof Coil Junction Enclosures

(3/0)	Enclosure with flat cover for coil junction terminal block.
(3H/O)	Enclosure and dome cover for ACC7, ACC18B, ACC27 and all Style 1 signal conditioners.
(4/O)	Enclosure with flat cover for ACC17B, ACC32, ACC35B, ACC42 and all Style 2 signal conditioners.
(4H/O)	Enclosure with dome cover for ACC96.
(3B/0)	Enclosure with dome cover for Style 1 signal conditioners to meet Group B.
(4B/0)	Enclosure with dome cover for Style 2 signal conditioners to meet Group B.

Bi-Directional Flow

(BF)	Bi-Directional flow, must use 2" Rotor and 3" end fittings. (Supplied with calibration in both forward and reverse flow directions).

Stem Length dependent on line size, height of riser and length of isolation valve. Assigned by factory.

Adjustable or Fixed

(AL)	Adjustable Low Pressure, 150# max. working pressure.
(AH)	Adjustable High Pressure, working pressure dependent on flange rating.
(F)	Fixed (Flange Only)

Special Features

(CE)	CE Mark Required for Europe.
(PED-CE)	PED-CE Mark Required for Europe.
(SP)	Any features that are not covered in the model number, use written description of the –SP.

Insert (X) in model number for every option not specified.

Notes:
1. Optional isolation valves are available.
2. Standard seals are Viton, others available.
3. Blade angle determined by density/assigned by factory.
4. 2" size rotor is recommended to obtain lowest flow rate possible.

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

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