

# Turbine HA

## UNIVERSAL<sup>®</sup> Flow Monitors Ultra-Precise Liquid Flow Measurement

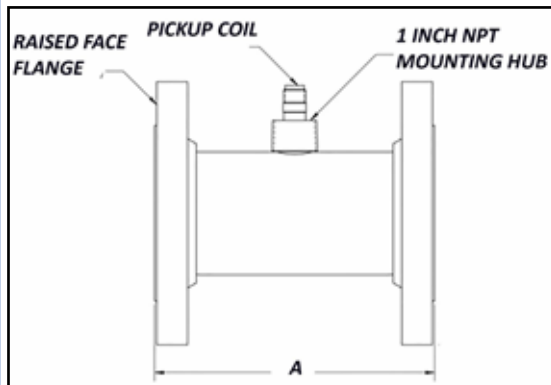
Specifically engineered to meet the strict standards required for custody transfer, the High Accuracy Meter delivers +/- 0.5% accuracy and +/- 0.1 % repeatability for low viscosity applications.

Every flow meter has a unique K-factor and is documented by means of NIST-traceable factory, independent laboratory, or bench calibration processes.

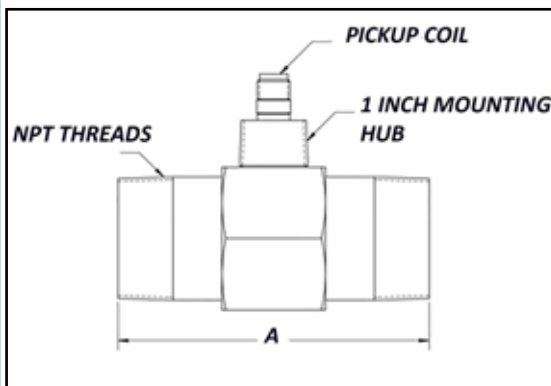


**HA HIGH ACCURACY TURBINE**

### INSTALLATION DRAWING



**FLANGED HA**



**MALE HA**

### Performance Data

<b>Calibration</b>	+/- 0.5% over standard flow range
<b>Repeatability</b>	+/- 0.1% over standard flow range
<b>Linearity</b>	+/- 0.5% over standard flow range
<b>Operating Temperature</b>	-450° F to +450° F
<b>Connection</b>	NPT or RF Flanged (150 & 300 lb)
<b>Flow Rate</b>	1 to 12000 GPM
<b>Materials</b>	
<b>Meter Body</b>	316 stainless steel
<b>Rotor</b>	17-4PH, Nickel 200
<b>Bearings</b>	Ball Bearing, Tungsten Carbide Sleeve
<b>Certifications</b>	NIST, CRN
<b>Additional Information</b>	Full line of economical Retrofit Kits are available

### Installation

1. Magnetic pickup coils included with each turbine meter at no extra charge
2. Turbine meter is linear and accurate over its designed operating range
3. Minimum recommended piping installation: 10 diameters upstream & 5 diameters
4. Locate valves or chokes downstream
5. For best meter performance and to avoid bearing wear, do not exceed maximum rated flow for long periods of time
6. Consult factory for warranty details

**HOW TO ORDER** Select appropriate symbols and build a model code number, as in example shown:

**EXAMPLE 1: HA0050 - N**

Part Number	End Connection Size (in)	Flow in GPM		Flow in LPM		A Dimension Inches
		Min	Max	Min	Max	
HA0050	1/2" x 1/2" Male NPT	1	10	4	38	3
HA0050-F150	1/2" x 1/2" with 150 LB RF flange	1	10	4	38	5
HA0050-F300	1/2" x 1/2" with 300 LB RF flange	1	10	4	38	5
HA0075	3/4" x 3/4" Male NPT	2.5	30	9	110	3.25
HA0075-F150	3/4" x 3/4" with 150 LB RF flange	2.5	30	9	110	5.5
HA0075-F300	3/4" x 3/4" with 300 LB RF flange	2.5	30	9	110	5.5
HA0100	1" X 1" Male NPT	4	60	15	225	3.5
HA0100-F150	1" X 1" with 150 LB RF flange	4	60	15	225	5.5
HA0100 -F300	1" X 1" with 300 LB RF flange	4	60	15	225	5.5
HA0125	1 1/4" X 1 1/4" Male NPT	6	93	23	350	3.875
HA0125-F150	1 1/4" X 1 1/4" with 150 LB RF flange	6	93	23	350	6
HA0125 -F300	1 1/4" X 1 1/4" with 300 LB RF flange	6	93	23	350	6
HA0150	1 1/2" X 1 1/2" Male NPT	8	130	30	490	4.375
HA0150-F150	1 1/2" X 1 1/2" with 150 LB RF flange	8	130	30	490	6
HA0150 -F300	1 1/2" X 1 1/2" with 300 LB RF flange	8	130	30	490	6
HA0200	2" X 2" Male NPT	15	225	55	850	4.75
HA0200-F150	2" X 2" with 150 LB RF flange	15	225	55	850	6.5
HA0200 -F300	2" X 2" with 300 LB RF flange	15	225	55	850	6.5
HA0300	3" x 3" Male NPT	40	650	150	2460	10
HA0300-F150	3" x 3" with 150 LB RF flange	40	650	150	2460	10
HA0300 -F300	3" x 3" with 300 LB RF flange	40	650	150	2460	10
HA0400-F150	4" x 4" with 150 LB RF flange	75	1250	280	4700	12
HA0400 -F300	4" x 4" with 300 LB RF flange	75	1250	280	4700	12
HA0600-F150	6" x 6" with 150 LB RF flange	200	2900	750	11000	14
HA0600 -F300	6" x 6" with 300 LB RF flange	200	2900	750	11000	14
HA0800-F150	8" X 8" with 150 LB RF flange	330	5200	1250	19700	16
HA0800 -F300	8" X 8" with 300 LB RF flange	330	5200	1250	19700	16
HA1000-F150	10" x 10" with 150 LB RF flange	650	8000	2500	30300	20
HA1000 -F300	10" x 10" with 300 LB RF flange	650	8000	2500	30300	20
HA1200-F150	12" x 12" with 150 LB RF flange	900	12000	3400	45500	24
HA1200 -F300	12" x 12" with 300 LB RF flange	900	12000	3400	45500	24

STANDARD OUTPUTS WITH NO DIGITAL VISUAL OR PROGRAMMABLE FLOW MONITOR	SYMBOL
Standard mag pickup sine wave good to 30 ft	N
In a Y Enclosure (conduit box)	NY
Hi Temp Magnetic Pick-up (-100F to +450F)	M
In a Y Enclosure (conduit box)	MY
Square wave Magnetic Pick-up with Pre-Amplifier (requires power)	P
In a Y Enclosure (conduit box)	PY
4-20 mA Analog Transmitter in Y Enclosure	X
Want 20 mA at lower than max possible? Express as % of max flow eg. 50% is X50	X50

Note: Y Enclosure is UL rated, Class I, Groups A, B, C & D Class II Groups E, F & G; CSA

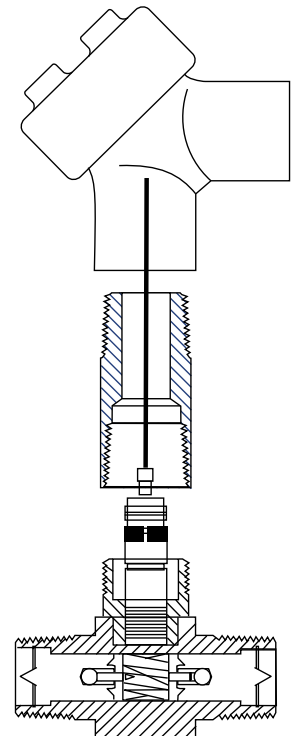
**EXAMPLE 2: HA0100 - FML250-P-SM**

PROGRAMMABLE FLOW MONITOR WITH DIGITAL VISUAL READOUT MOUNTED ON THE FLOW METER		
Added flow meter control box (see FML250 literature) with visual display and programming		
Note: units are pre-set with unit K-factor		
On unit mounting options fixed and on a swivel for better visibility		
Standard Pulse Output	FML250-P	FML250-P-SM
4-20mA Loop Output (4)	FML250-P4	FML250-P4-SM
Linearization (2-40 point)	FML250-PL	FML250-PL-SM
Pulse, 4-20mA, Linearization	FML250-P4L	FML250-P4L-SM
Temperature Compensation	FML250-PTC	FML250-PTC-SM

Note: FML250 Enclosure is NEMA 4 – CSA/UL

Note: Select with your maximum flow at 50% to 100% of the max flow listed above to have sufficient rangeability.

Note: These meters are typically ordered with attached flow monitor display (See FML250 data sheet).  
By putting this FML250 part number at the end of the model selected, it will come installed on the meter and pre-configured for k factor Eg. HA0300-FML250-P-SM.



**Y ENCLOSURE MOUNTED ON HA METER**



**FML ENCLOSURE MOUNTED ON HA METER**