

# INERTIAL FILTER PROBE

**BALDWIN**<sup>TM</sup> - Series



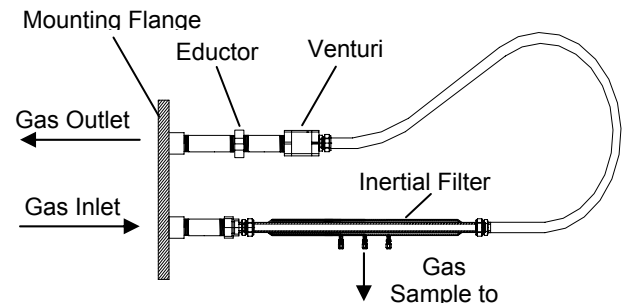
### Successful Installations:

- Before & After ESPs
- Before & After Wet Scrubbers
- Before & After FGDs
- At the stack for final effluent from coal burning

The basic principle of operation of the inertial filter is to accelerate the particulate material contained in the process gas in a vector direction with sufficient velocity to prevent the particles from sticking to the walls of the sampling tube and extract a gas sample to be transported to a gas analyzer.

An eductor is used to generate a high velocity (70-100 feet per second) axial gas flow through the inertial filter. The flow rate is dependent upon the gas density, temperature, diameter of the sampling tube, absolute pressure, and particulate loading. Particles in the high velocity stream continue to travel in the straight vector direction, and the sample stream is withdrawn at a very low filter face velocity (0.006 feet per second) separating the sample stream from the initial particulate material.

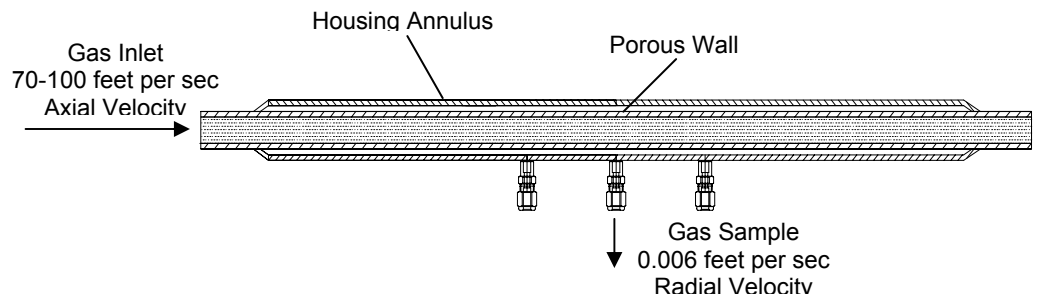
### Inertial Probe Assembly



Particles entrained in the high velocity axial gas flow are prevented from depositing on or penetrating into the porous filter wall by the ballistic effect of particle inertia. The low radial velocity also inhibits particles from penetrating the porous wall.

Compressed air is used as motive force air to the eductor and controlled with a needle valve. A venturi flowmeter, which will measure 100-400 liters per minute, is located between the inertial filter and the eductor. This

### Inertial Filter



flowmeter is used to measure the high velocity axial gas flow and to monitor flowrate. The pressure differential on the flowmeter is fed to a magnehelic or optional transducer board that converts the pressure to a 4-20mA signal.

While the filter is on-stream, sample flow continues without interruption so that representative samples are furnished on a continuous basis. The housing annulus has very low volume to minimize sample dwell time and assure fresh samples. Analyzer response lag time is minimized yielding timely analysis of process conditions.



Perma Pure LLC  
P.O. Box 2105, 8 Executive Drive  
Toms River, NJ 08754  
[www.permapure.com](http://www.permapure.com)

Tel: 732-244-0010  
Tel: 800-337-3762 (toll free US)  
Fax: 732-244-8140  
Email: [info@permasure.com](mailto:info@permasure.com)

v4.11

# INERTIAL FILTER PROBE



## Application

The Baldwin™-Series Inertial Filter Probe is designed for high particulate gas sampling, such as coal boiler applications, and is especially well suited for mercury monitoring. In mercury monitoring applications, all of the stainless steel components that come in contact with the gas sample stream are Durinert®+ coated to prevent mercury reduction thereby maintaining the original vapor-phase concentrations of elemental and oxidized mercury.



## General Specifications (All Models)

Enclosure	Insulated NEMA Type 12
Sample Pump	Single-head aluminum TFE coated
Stinger Probe	18 inch standard (other lengths available)
Ambient Temp Range	+33-104°F (1-40°C)
Heated Enclosure Temp	400°F (204°C)
Voltage	110 VAC, 50/60Hz

## Model Specifications

3000 Series	Model 3200	Model 3300	Model 3500
Filter ID	¼ in.	⅜ in.	½ in.
Mounting	4 in. flange	4 in. flange	6 in. flange
Max Sample Flow Rate	1 LPM	2 LPM	3 LPM
Max Stack Sample Draw Rate	60 LPM	160 LPM	260 LPM
Power	2200 Watts	2200 Watts	2500 Watts
Dimensions	16x20x14 in. HWD 41x51x36 cm HWD	16x24x14 in. HWD 41x61x36 cm HWD	12x36x18 in. HWD 31x91x46 cm HWD
Weight (approx)	100 lbs 45 kg	110 lbs 50 kg	130 lbs 59 kg

## Options Available

- Durinert®+ coating
- Pressure transducer (replaces minihelic)
- Heated stinger probe
- Blowback assembly
- Ammonia converter
- Diluter

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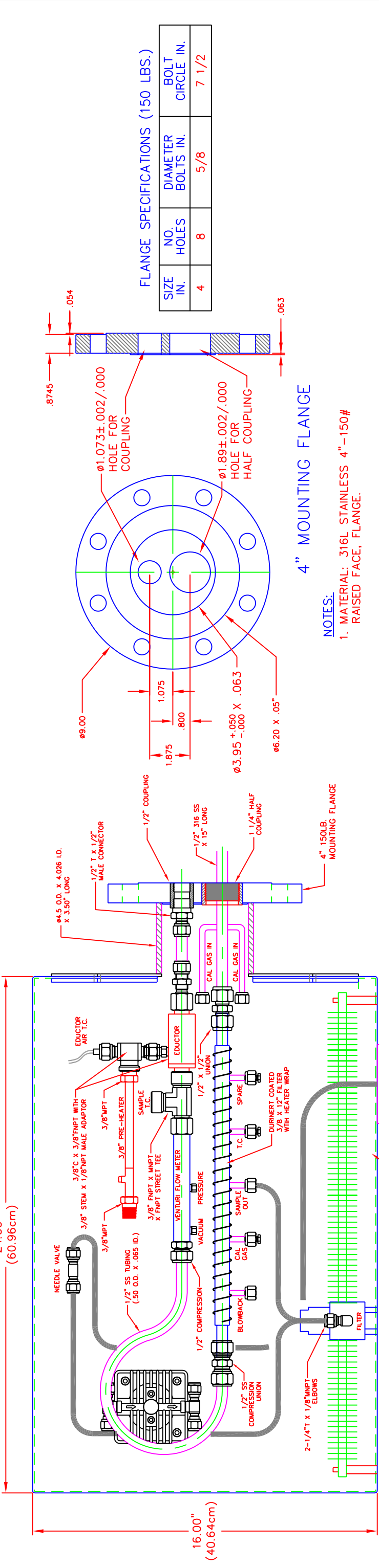


Perma Pure LLC  
P.O. Box 2105, 8 Executive Drive  
Toms River, NJ 08754  
[www.permapure.com](http://www.permapure.com)

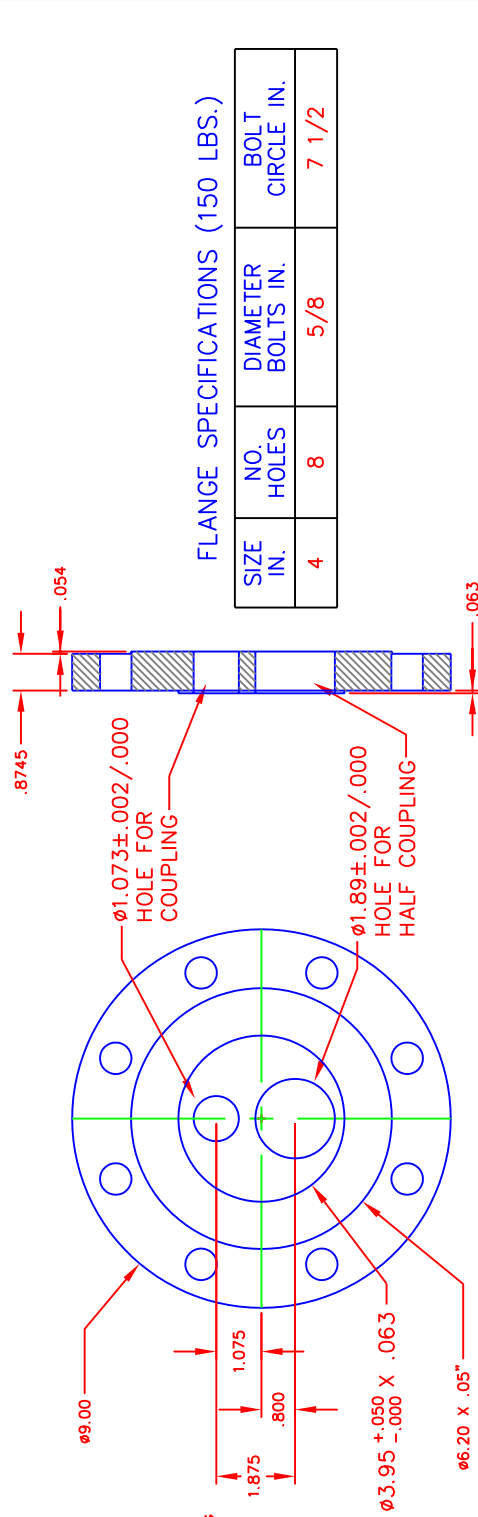
Tel: 732-244-0010  
Tel: 800-337-3762 (toll free US)  
Fax: 732-244-8140  
Email: [info@permature.com](mailto:info@permature.com)

REV#	DATE	DESCRIPTION	DRAWN	APPROVED
0	00/00/00	INITIAL DRAWING	RAW	RAW

1	2	3	4	5	6	7	8
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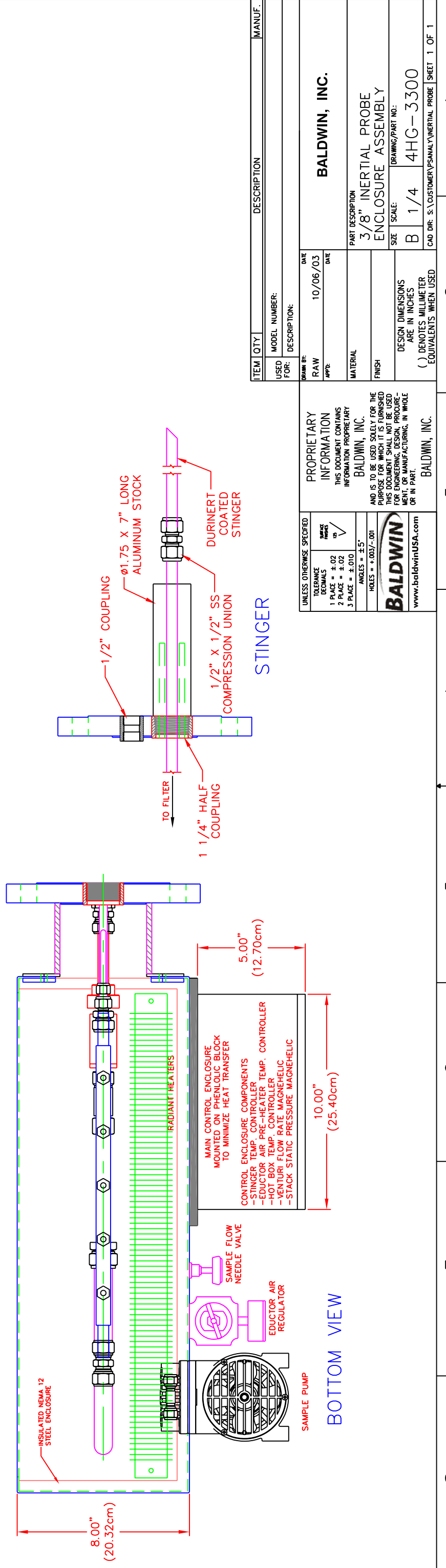
DOOR SIDE VIEW



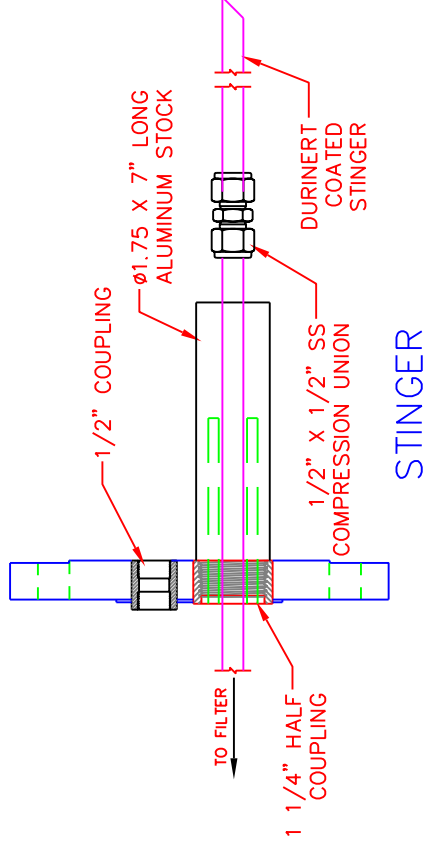
4" MOUNTING FLANGE

- NOTES:
- MATERIAL: 316L STAINLESS 4" - 150# RAISED FACE, FLANGE.

SIZE IN.	NO. HOLES	DIAMETER BOLTS IN.	BOLT CIRCLE IN.
4	8	5/8	7 1/2



BOTTOM VIEW



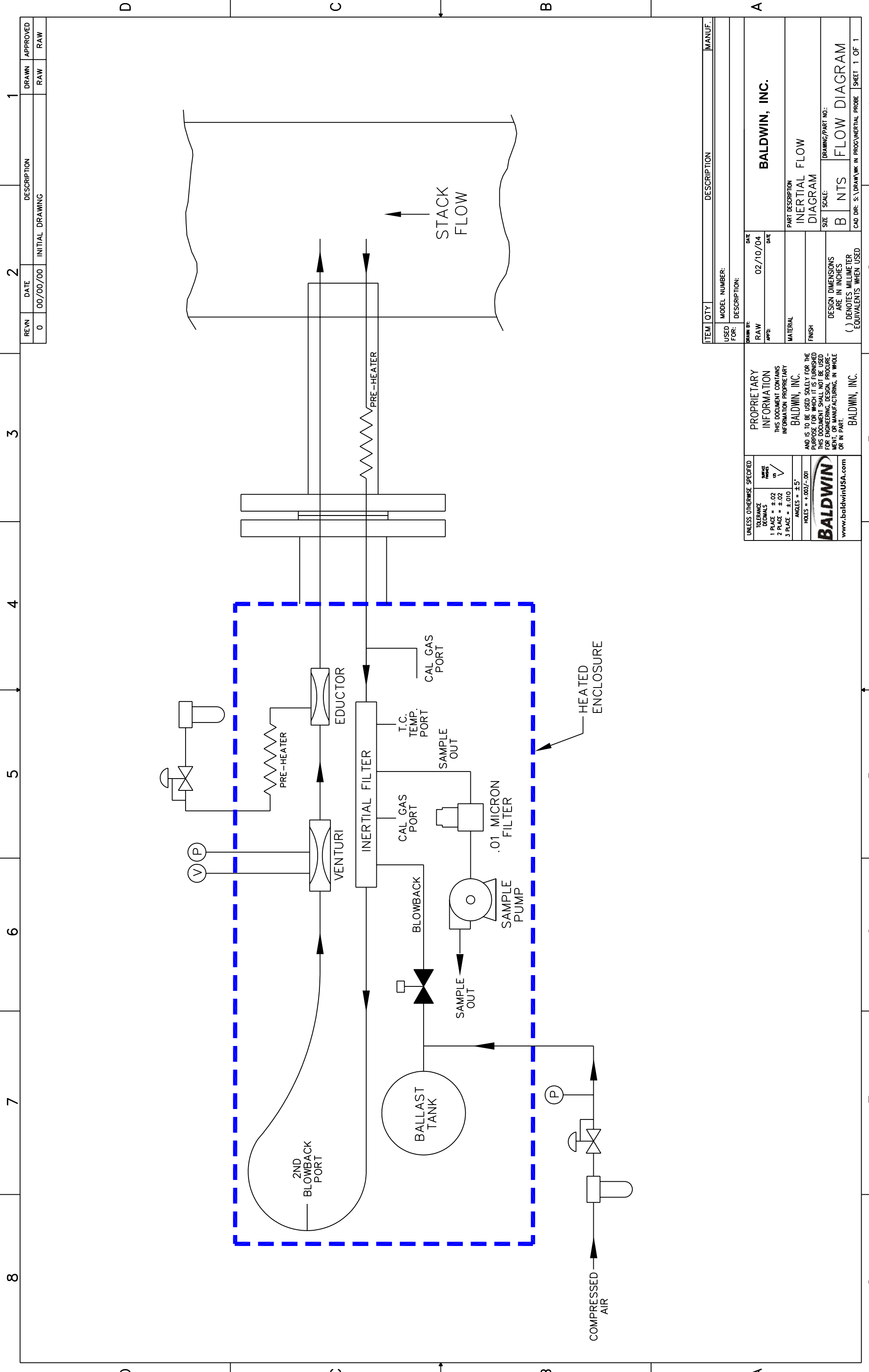
STINGER

ITEM	QTY	DESCRIPTION	DATE	MANUF.
USED FOR:		MODEL NUMBER:	10/06/03	
RAW APPR:		DESCRIPTION:		
MATERIAL:				
FINISH:				
PART DESCRIPTION		BALDWIN, INC.		
3/8" INERTIAL PROBE ENCLOSURE ASSEMBLY				
SIZE	B 1/4	DRAWING/PART NO.	4HG-3300	
SCALE:		CAD DIR:	S:\CUSTOMER\PSM\AL\INERTIAL PROBE	
DESIGN DIMENSIONS ARE IN INCHES		SHEET 1 OF 1		
() DENOTES MILLIMETER EQUIVALENTS WHEN USED				

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UNLESS OTHERWISE SPECIFIED	ANGLE = ±5°
TOLERANCE DECIMALS	HOLES = +.003/- .001
1 PLACE = ±.02	
2 PLACE = ±.01	
3 PLACE = ±.005	





REV#	DATE	DESCRIPTION	DRAWN	APPROVED
0	00/00/00	INITIAL DRAWING	RAW	RAW

ITEM	QTY	DESCRIPTION	MANUF.
USED FOR:			
MODEL NUMBER:			
DESCRIPTION:			
RAW	DATE	DATE	
APP'D	02/10/04		
PART DESCRIPTION			
BALDWIN, INC.			
INERTIAL FLOW DIAGRAM			
SIZE			
B NTS			
DRAWING/PART NO.:			
FLOW DIAGRAM			
DESIGN DIMENSIONS ARE IN INCHES			
() DENOTES MILLIMETER EQUIVALENTS WHEN USED			
CAD DIR: S:\DRAWING IN PROG\INERTIAL PROBE			
SHEET 1 OF 1			

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UNLESS OTHERWISE SPECIFIED	
TOLERANCE DECIMALS	±.02
1 PLACE	±.02
2 PLACE	±.010
3 PLACE	±.010
ANGLES	±.5°
HOLES	+0.001/-0.001

