

# STRAIN GAGE FLOWMETER TARGET

FLOWMETER

## PROVEN

Over 20,000 Strain Gage Target flowmeters installed since 1952.

## VERSATILE

Liquid, gases, superheated and saturated steam from -320 to 500° F and up to 15,000 psi.

## DURABLE

No frictional moving parts. Designed to withstand 100% over range.

## RELIABLE

Tested to over 100 million full-scale flow cycles with no measurable effect on performance.



# AALiant

## Features

### Wide Rangeability

- Easily field modified by replacing target for range changes

### Field Accuracy Calibration

- Verification of flowmeter accuracy without flow testing

### Versatile Mounting Options

- Inline: Flange, MNPT, 37° Flare Tube and more
- Insertion: Fixed, Retractable (hot-tap option) and more

### Rugged Flow Sensor Construction

- All welded construction
- Withstands thermal shock
- Hermetically sealed

### Corrosion-Resistant Wetted Parts

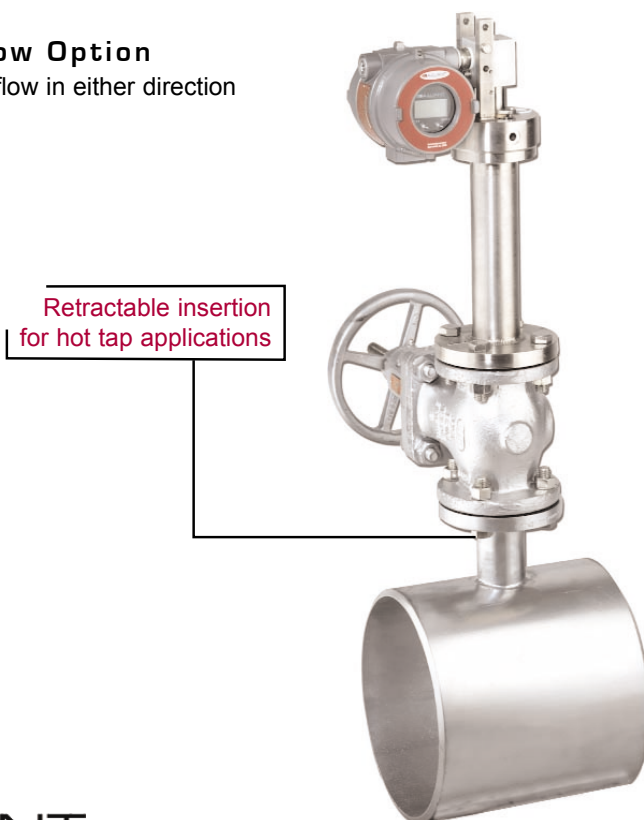
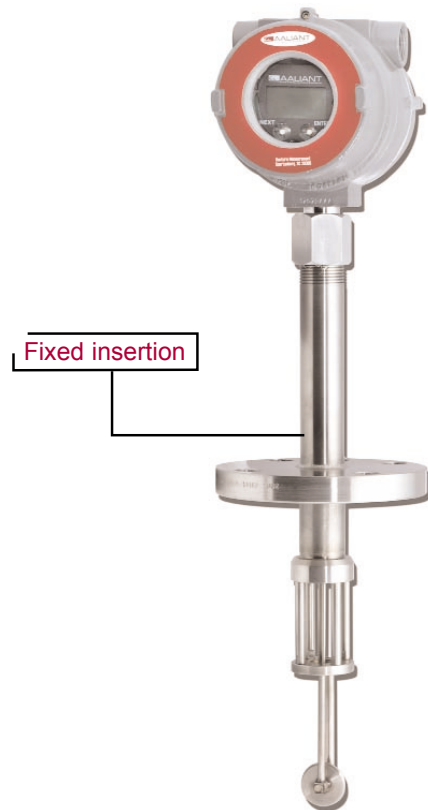
- Stainless Steel
- Hastelloy C-276
- Inconel

### Long Service Life

- Provides years of maintenance-free operation
- Offered with a two-year warranty

### Bi-directional Flow Option

- Accurately measures flow in either direction



## How the Aaliant Strain Gage Target Flowmeter Works

Flow is measured in terms of dynamic force acting on a target (solid disk) in the flow stream. Hermetically sealed, bonded strain gages in a bridge circuit configuration mounted outside the flow stream translate force into an electrical output. This output is proportional to flow rate squared.

### Basic Principle of Operation

$$\text{Force} = C_d A \rho \frac{V^2}{2g}$$

$C_d$  = drag coefficient

A = target area

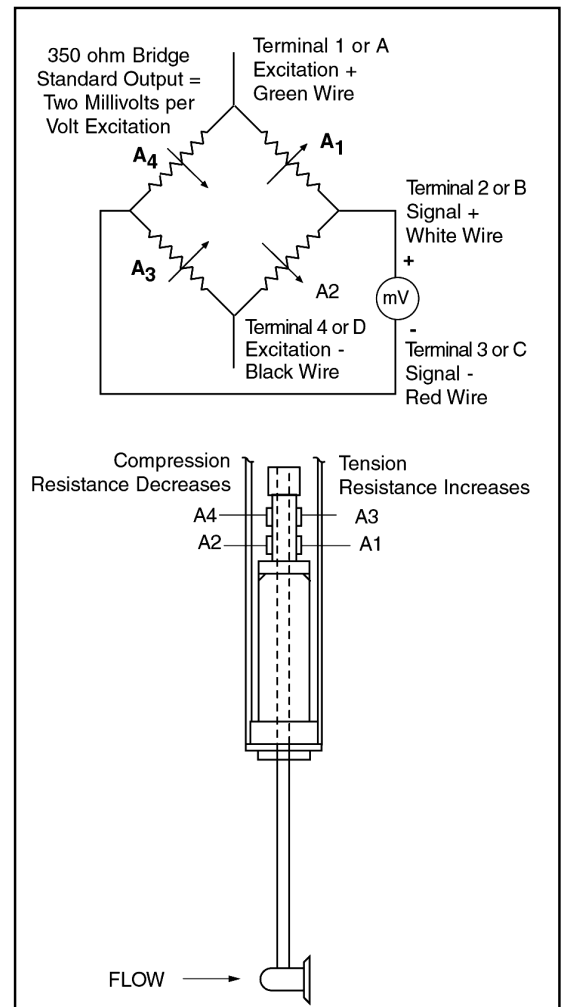
$\rho$  ( $\rho$ ) = fluid density

$\frac{V^2}{2g}$  = velocity head

### How a Bridge Circuit Works

- Forces from the fluid flow are transferred from the target to the sensing tube
- Four interconnected strain gages (attached to the sensing tube—two on forward side of flow, two on reverse side of flow) produce a four-active arm, bridge circuit
- At zero flow, the bridge circuit is balanced and produces zero output
- Flow produces strain on the sensing tube
- The bridge circuit becomes unbalanced, producing an output

### Bridge Circuit Diagram



## Accessories

### Model 1030AP and 1030AW Indicator/Totalizers



The Model 1030 is a microprocessor based flow rate indicator/totalizer with a 4-20 mA output that is proportional to flow rate and RS-485 communications. Flow rate and total can be displayed simultaneously on the 16-character display. The Model 1030 has five control inputs, which when switched to ground, perform specific functions such as resetting the totalizer. Four open collector control outputs may be used to interface with remote devices such as relays, counters, and lights.

### Model 1530AP and 1530AW Mass Flow Computers

The Model 1530 is a microprocessor based, pressure and temperature compensated, mass flow rate indicator/totalizer. A 4-20 mA output that is proportional to the compensated flow rate and RS-485 communications interface with chart recorders, PLCs, and computers. The 16-character display provides one touch indication of compensated flow rate/total, pressure, or temperature. The Model 1530 has two control inputs, which when switched to ground, perform specific functions such as resetting the totalizer. Four open collector control outputs may be used to interface with remote devices such as relays, counters, and lights.



### Model 3030 Batch Controller, Indicator/Totalizer



The Model 3030 is a microprocessor based batch controller/flow rate indicator/totalizer that is capable of single or dual stage batch control. Two process parameters such as batch count and final batch quantity can be displayed simultaneously on the 16-character display. The Model 3030 has five control inputs, which when switched to ground, perform specific functions such as remote batch stop. Four open collector control outputs may be used to interface with remote devices such as relays, counters, and lights.

### Model 7431 and 7437 BTU Calculators

The Model 7431 and Model 7437 BTU calculators are used to measure individual energy consumption in virtually any liquid heating/cooling system such as apartment complexes, office buildings, hospitals, colleges, and universities. The BTU system consist of a Model 7431 or Model 7437 BTU calculator, a supply temperature sensor, a return temperature sensor, and a flowmeter/transmitter.



## Applications

### Gases

- air, natural gas, argon, and more

### Saturated and Superheated Steam

### Cryogenic Liquids from -320° F (-195° C)

- nitrogen, oxygen, carbon dioxide, and more

### Corrosive Liquids

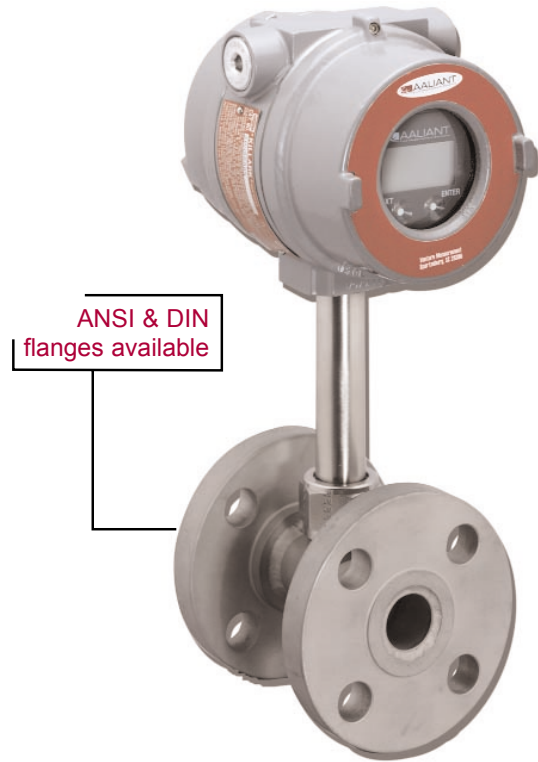
- acetic acid, sodium hydroxide, hydrogen peroxide, and more

### Hydrocarbons

- jet fuel, kerosene, hydraulic fluids, and more

### Water

- deionized, distilled, demineralized, and more



<b>S P E C S</b>	<b>Line Sizes</b>	1/2" to 60" (15mm to 1500mm)
	<b>Operating Pressure</b>	up to 15,000 psig (690 bar)
	<b>Operating Temperature</b>	from - 320° to 500° F (-195° to 260° C)
	<b>Repeatability</b>	± 0.15% of rate
	<b>Accuracy</b>	± 1.0% of rate
	<b>Flow Turndown Ratio</b>	up to 15:1
	<b>Flow Range</b>	0.13 gpm to 230,000 gpm (0.5 l/min to 1,045.6 m <sup>3</sup> /min)
	<b>Power Required</b>	24 VDC with transmitter
	<b>Outputs</b>	4-20mA DC and more
	<b>Approvals</b>	CSA: Class I Div 1 Groups B, C, D CSA: Class I Div 2 Groups A, B, C, D to 299 psig FM: Class I Div 2 Groups A, B, C, D to 299 psig

## Available Options

### Line Sizes

- Insertion: 4 - 60" (100 - 1500mm)
- Inline: 1/2" - 6" (15 - 150mm)
- Sanitary: 3/4" - 4" (20 - 100mm)

### Mounting Connections

- AN 37° Flare Tube Inline
- Flanged Inline
- MNPT Inline
- Wafer Inline
- 4" Flange Mounting Fixed Probe
- 4" Flange Mounting Retractable Probe
- 2" Flange Mounting Fixed Probe
- 2" Flange Mounting Retractable Probe
- MNPT Probe, Flow Switch Only
- Sanitary Tri-Clamp
- Other Mounting Options Available

### Body Material

- Stainless Steel
- Hastelloy C-276
- Inconel

### Transmitters

- Model TWS — Two-wire Signal Transmitter
- Model TWL — Linear two-wire Signal Transmitter
- Model 1060 — Three-wire Microprocessor Transmitter
- Model 1100L & 1100S — Two-wire/local indicator/totalizers
- Model 1050 Strain Gage Transmitter
- SFX 2000 — Two-wire Smart Transmitter (HART compatible)
- Model FS Flow Switch

### Other Options

- Bi-directional
- Submersible
- DIN Connections

## Accessories

### Remote electronics

- Flow rate indicator/totalizer
- Mass flow computer
- Digital batch controller
- Btu calculator

Wafer, flare tube, and  
MNPT mounting available



## Contact Aaliant

### www.aaliant.com

- Locate your local, certified Aaliant distributor
- View/print Installation, Operation, & Maintenance Manuals and Technical Specification Sheets

### Customer Service

- Phone: (800) 778.9251  
(864) 574.3327
- Fax: (864) 574.8063
- E-Mail: sales@aaliant.com

### Application Assistance

- Phone: (864) 574.3327
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