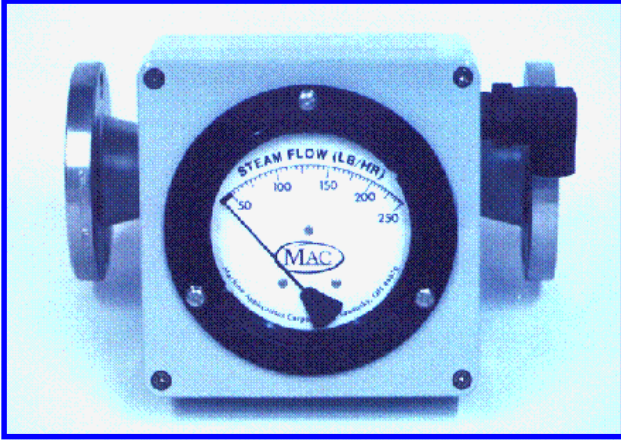


STEAM FLOW RATE TRANSMITTER



DESCRIPTION

Designed for the accurate measurement and control of process steam for end-of-the-run applications: steam injection to process ovens, atmospheric blanchers, sparging tanks, direct steam to product tanks, and other applications where steam is exhausted through a pipe manifold or nozzles to near atmospheric pressure.

The steam flow rate transmitter will supply an analog output signal suitable for driving remote digital indicators, chart recorders, or closing the loop to a process controller. Analog output signals may be specified as 0-5VDC, 4-20mA, or 0-20mA. A pressure transducer with additional signal conditioning electronics is packaged within the transmitter housing to provide a linear signal proportional to mass flow rate over the full rate range. Mass flow rate is metered from zero flow to full scale capacity. In addition, a calibrated panel gauge is included for local indication of the steam flow rate.

Electrical connections are made through a watertight connector on the enclosure. Control power and signal wires connect to numbered screws inside the connector cover. The connector will thread to liquid-tight electrical conduit.

Installed in series with the steam piping, the transmitter is inherently simple and rugged. There are no moving parts to maintain or replace. There are no obstructions in the steam flow path.

Internal wetted parts are manufactured from 300

- Analog Output Signals
0-5VDC, 4-20mA, 0-20mA
- Fully Calibrated
- Mechanical Panel Gauge
- Stainless Steel Construction
- Affordable and Reliable
- Easy to Install

series stainless steel for long-term durability and corrosion resistance. Metering components were selected to withstand demanding industrial use including continuous operation, repeated chemical washdown, and outdoor applications.

PRINCIPLE OF OPERATION

Operating on critical flow principles, the meter design incorporates a proprietary venturi flow nozzle. Upstream pressure is converted to velocity as steam flows through the converging venturi inlet. The velocity increases until the sonic velocity, or speed of sound, is achieved at the nozzle throat. At sonic flow conditions, changes in downstream pressure do not affect the mass flow rate of steam through the transmitter.

The steam flow rate transmitter does NOT require calibration at a fixed upstream operating pressure. Differential pressure is NOT measured. Mass flow rate is strictly proportional to the pressure at the inlet of the critical flow venturi.

For the system to operate correctly, a small pressure drop across the nozzle is required. The proprietary design is such that the exit pressure may be as high as 90% of the inlet pressure for acceptable operation. Steam to atmosphere and open tank applications easily meet these operating conditions.

CONFIGURATION

The transmitter is an in-line device which will operate in any flow orientation. If desired, the transmitter may be reconfigured in the field to a different flow

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Repeatable Results • Eliminates Guesswork • Saves Energy • Speeds Equipment Start-

STEAM FLOW RATE TRANSMITTER

direction.

The steam flow rate is controlled by throttling on the inlet side of the transmitter. Manual and specialty control valves, or pressure regulators may be used as pressure reducing devices.

SPECIFICATIONS

Rated Pressure	150 PSIG Max.	Analog Output Signals	0-5VDC, 4-20mA, 0-20mA
Ambient Temperature	40°F to 140°F	Power	24VDC Nominal, 50mA Max.
Absolute Pressure Ratio (Exit to Inlet)	90% Max.	Accuracy	±5% F.S.

ORDERING INFORMATION

Steam flow rate transmitters are described by indicating the following combination of product features.

(Product Code)-(Steam Capacity LB/HR)-(Pipe Size)-(End Connections)-(Flow Direction)

Product Code is STMT. End Connections selections are either P for NPT (female) or F for Flange

(raised face). Flow Direction selections are VD (vertical down), VU (vertical up), HR (horizontal right), or HL (horizontal left). Analog Signal selections are 005 for 0-5VDC, 020 for 0-20mA, and 420 for 4-20mA.

Example: STMT - 1000 -1.5 - F- HR - 420 is a steam flow rate transmitter with a full scale capacity of 1000 LB/HR, end connections are 1 1/2" Flange, with a horizontal flow direction, downstream to the right. The analog output signal is specified as 4 to 20mA.

Standard Transmitters

(Full Flow at 75PSI)*

STMT- 250-1 -X-XX
STMT- 500-1 -X-XX
STMT-1000-1.5-X-XX
STMT-1500-1.5-X-XX
STMT-2500-2 -X-XX
STMT-3000-2.5-X-XX
STMT-5000-3 -X-XX

(Full Flow at 85PSI)*

STMT- 125KG-1 -X-XX
STMT- 250KG-1 -X-XX
STMT- 500KG-1.5-X-XX
STMT- 750KG-1.5-X-XX
STMT-1250KG-2 -X-XX
STMT-1500KG-2.5-X-XX

When required, non-standard capacities, special construction, or other optional features can be provided. Consult the factory for special configurations.

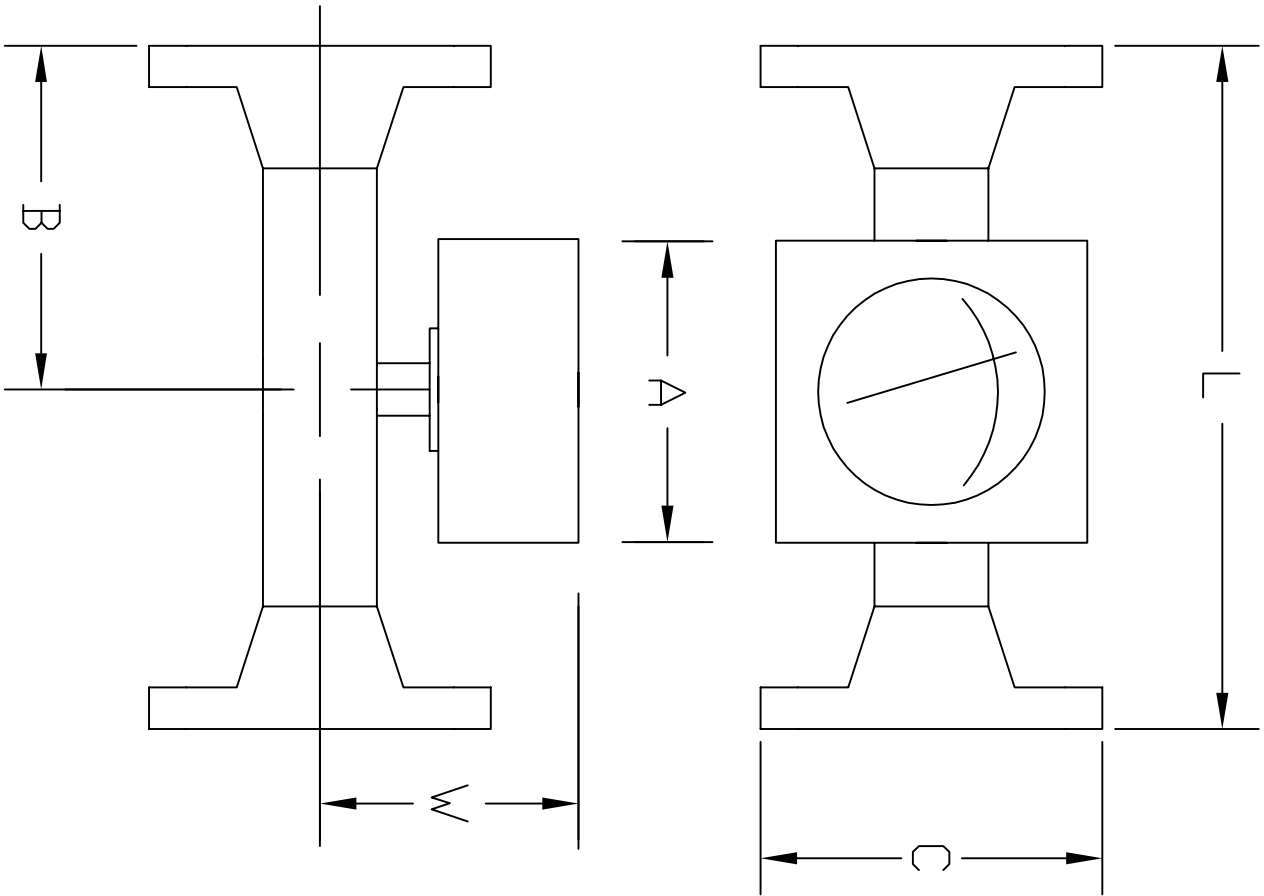
*Refer to Application Sheet.



A DIVISION OF

Machine Application Corporation

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www.macinstruments.com



LB/HR	KG/HR	PIPE/ FLANGE SIZE	A	B	C	L	W
250	125	1"	7.09"	5.3"	4.25"	10.625"	5.76"
500	250	1"	7.09"	5.3"	4.25"	10.625"	5.76"
		1.5"	7.09"	5.3"	5"	11.25"	5.98"
1000	500	1.5"	7.09"	5.3"	5"	11.25"	5.98"
		2"	7.09"	5.3"	6"	11.25"	6.51"
1500	750	1.5"	7.09"	5.60"	5"	11.25"	6.58"
2000	1000	1.5"	7.09"	5.80"	5"	11.25"	6.58"
2500	1250	2"	7.09"	4.90"	6"	13.00"	6.51"
3000	1500	2.5"	7.09"	3.38"	7"	16.00"	6.98"
5000	2500	3"	7.09"	4.90"	7.5"	18.00"	7.38"



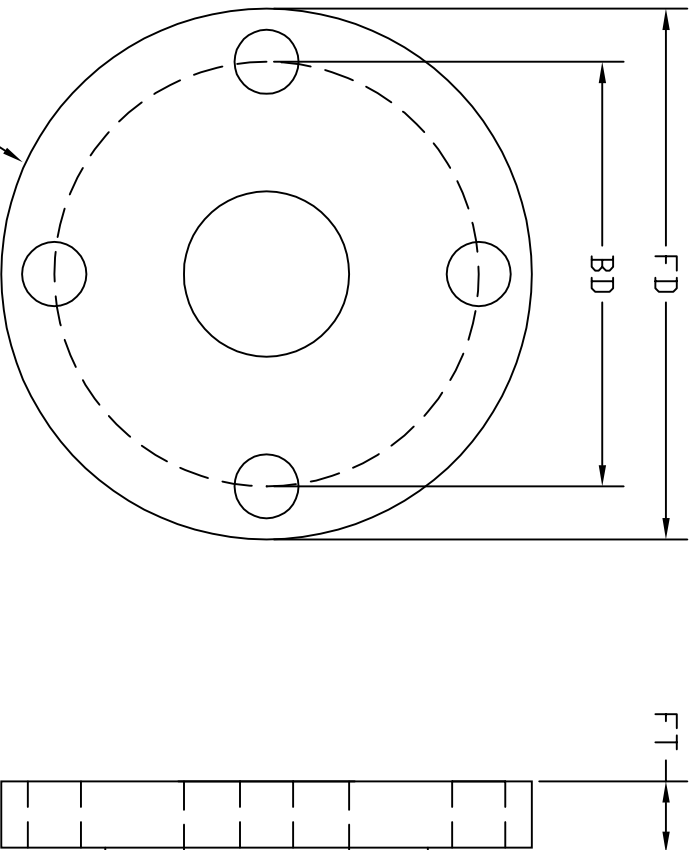
INSTRUMENTS

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TITLE
 MAC 200 STM STEAM FLOW METERS
 WITH FLANGES OUTLINE DRAWING

DRAWN	SCW	SIZE	DRAWING NUMBER	REVISION
CHECKED			200/00/0001	B
APPROVED	JGW	A		

STEAM FLOW METER PIPE FLANGE



LB/HR	KG/HR	FLANGE SIZE	FT	FD	BD	# OF BOLT HOLES	BOLT SIZE
250	125	1"	9/16"	4.25"	3.125"	4	1/2"
500	250	1"	9/16"	4.25"	3.125"	4	1/2"
500	250	1.5"	11/16"	5"	3.875"	4	1/2"
1000	500	1.5"	11/16"	5"	3.875"	4	1/2"
1000	500	2"	3/4"	6"	4.75"	4	5/8"
1500	750	1.5"	11/16"	5"	3.875"	4	1/2"
2000	1000	1.5"	11/16"	5"	3.875"	4	1/2"
2500	1250	2"	3/4"	6"	4.75"	4	5/8"
3000	1500	2.5"	7/8"	7"	5.5"	4	5/8"
5000	2500	3"	15/16"	7.5"	6"	4	5/8"



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TITLE
 MAC 200 STM WITH PIPE FLANGES
 OUTLINE DRAWING (FLANGE DIMENSIONS)

DRAWN	SCW	SIZE	DRAWING NUMBER	REVISION
CHECKED			200/00/0001-2	
APPROVED	JGW	A		