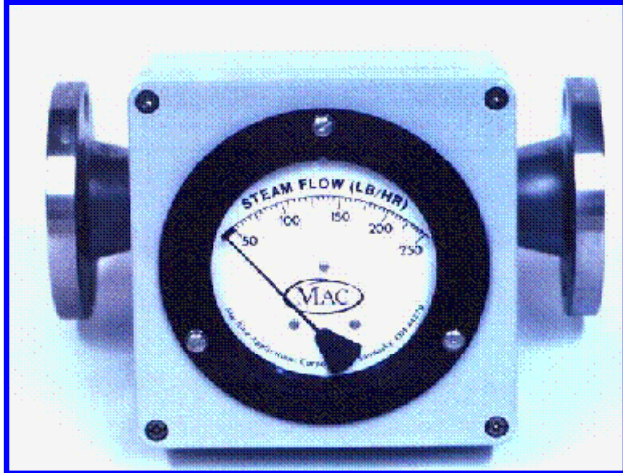


STEAM FLOW METER



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, steam educators, and other applications where steam is exhausted through a pipe manifold or nozzles to near atmospheric pressure.

The mass flow rate of steam is indicated in pounds per hour on an easily understood calibrated panel gauge. Installed in series with the steam piping, the meter is inherently simple and rugged. Fully mechanical in operation, 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 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 characterized by a convergent bellmouth inlet, minimum area throat, and conical diffuser.

Upstream pressure is converted to velocity as steam flows through the converging inlet. The velocity

- Rugged and Reliable
- True Mass Flow Even with Changing Line Pressure
- Stainless Steel Construction
- Affordable
- Simple to Use

increases along the restrictive inlet until sonic velocity is achieved at the nozzle throat. The sonic velocity or speed of sound, is the maximum obtainable speed at which the flow may pass through the nozzle throat. The sonic velocity is converted back to static pressure in the diffuser.

Mass flow rate is strictly proportional to the upstream pressure. Changes in the downstream pressure do not affect upstream conditions. A downstream change in pressure can not be transmitted though the sonic flow conditions existing at the throat.

For the system to operate correctly, a small pressure drop across the nozzle is required. The proprietary inlet, throat, and diffuser 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 steam flow meter is an in-line device which will operate in any flow orientation. If desired, the meter may be reconfigured in the field to a different flow direction.

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

STEAM TO ATMOSPHERE • OPEN TANK APPLICATIONS

Repeatable Results • Saves Energy • Speeds Equipment Start-up

STEAM FLOW METER

SPECIFICATIONS

Rated Pressure	150 PSIG Max.
Ambient Temperature	32°F to 180°F
Absolute Pressure Ratio (Exit to Inlet)	90% Max.
Accuracy	±5% F.S.

ORDERING INFORMATION

Steam flow meters 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 STM. 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).

Example: STM - 1000 -1.5 - F- HR is a steam flow meter with a calibrated scale to 1000 LB/HR, end connections are 1 1/2" Flange, with a horizontal flow direction, downstream to the right.

Standard Meters

(Full Flow at 75PSI)*

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

(Full Flow at 85PSI)*

STM- 125KG-1 -X-XX
STM- 250KG-1 -X-XX
STM- 500KG-1.5-X-XX
STM- 750KG-1.5-X-XX
STM-1250KG-2 -X-XX
STM-1500KG-2.5-X-XX
STM-2500KG-3 -X-XX

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

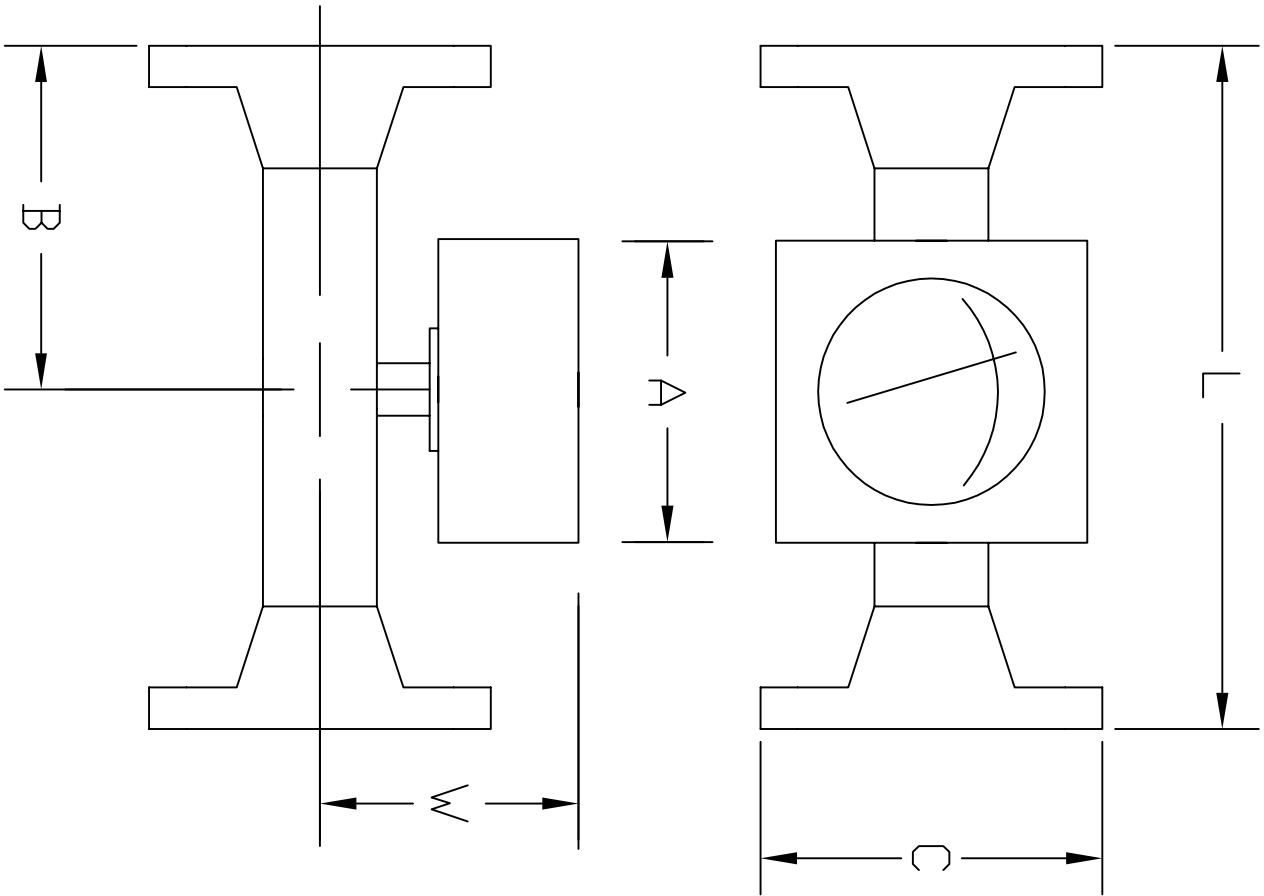
*Refer to Application Sheet



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"



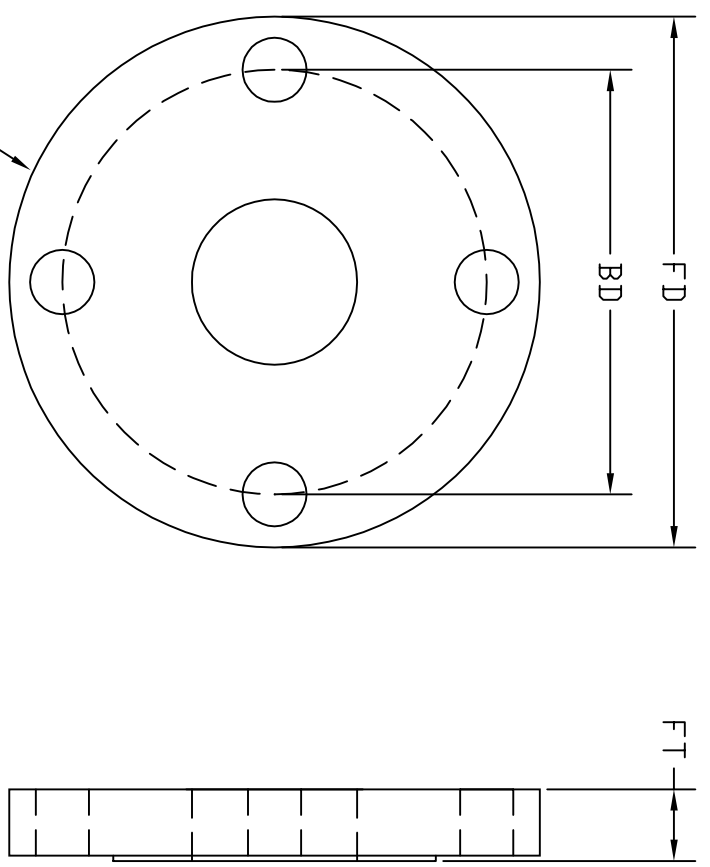
INSTRUMENTS

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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"



MAC INSTRUMENTS

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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		

SHEET 2 OF 2