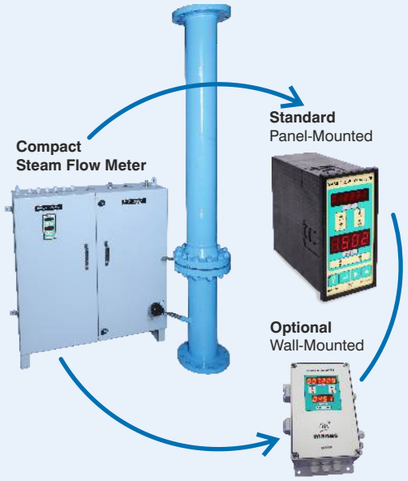
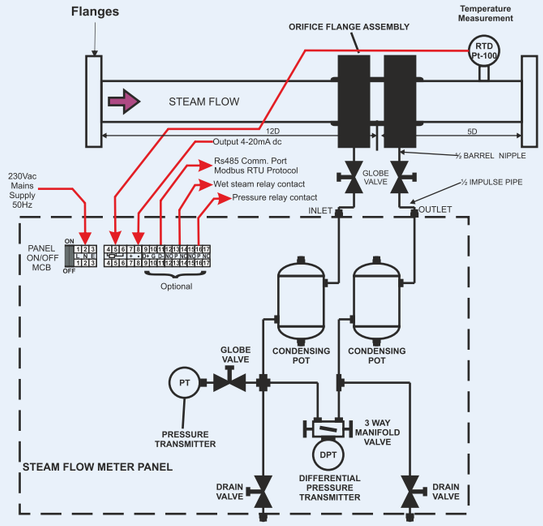
SCHEMATIC DIAGRAM FOR STEAM FLOW METER



SCHEMATIC ARRANGEMENT FOR STEAM FLOW METER



ORDERING INFORMATION

Sample code explained: 01 - 80NB - 01 - 01 - MS/CS - IBR - SFT200P - RS4 -1L - U

01	Service	
	Steam	: 01
	Hot Water/Feed Water	: 02
	Thermic Fluids	: 03

80NB	Line Size	
	25NB	: 1"
	40NB	: 1 ½"
	50NB	: 2"
	80NB	: 3"
	100NB	: 4"
	150NB	: 6"
	200NB	: 8"
	250NB	: 10"
	Any Other	: AO

01	End Connection	
	SORF ANSI 150	: 01
	Any Other	: 02

01	Orifice Flanges	
	WNRF ASA 300	: 01
	Any Other	: 02

MS/CS	MOC of Meter	
	Stainless Steel 304	: SS 304
	Stainless Steel 316	: SS 316
	Mild/Carbon Steel	: MS/CS

IBR	IBR Certification	
	IBR	: IBR
	Non IBR	: NIBR

SFT200P	Computing Unit	
	Steam Flow Totalizer	: SFT200P/W
	Liquid Mass Flow Totalizer	: LMFT
	Heat Energy Meter	: HET-100L
	Flow Totalizer	: FIT-100D

RS4	Communication	
	RS 485	: RS4
	RS 232	: RS2

1L	Logging Facility	
	Logging	: 1L
	Extended Logging	: 2L

U	Power Supply	
	Universal	: U
	Any Other	: Z

Due to continuous development specifications are subject to change without prior notice.

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STEAM FLOW METER SFMc - 150

INTRODUCTION

The SFMc-150 flow meter is applicable for measuring flow rates of saturated and superheated steam, mass flow rates of Boiler feed Water in closed conduits. It is best suited for applications where affordability, reliability and ruggedness are of prime concerns. It can be used as heat energy transfer meter to measure thermal energy using various fluids which are being used as the heat transfer medium. In conventional system of measurement, the differential pressure generated by orifice plate is measured by DP transmitter. The output from DP transmitter after square rooting is accepted as proportional to flow rate. This assumption is true only when the density is constant. Unfortunately density of compressible fluid is never constant. The density of compressible fluid changes with line pressure and line temperature. Thus, introducing errors in flow rate measurement.

PRINCIPLE OF OPERATION

As per BS 1042/ ISO: 5167 standard, the equation for mass flow when measured with orifice states:

$Qm^{cc} \sqrt{p}. \sqrt{\Delta P}$

Where,

Qm = mass flow rate

p = instantaneous density

ΔP = differential pressure

Thus by measuring the line pressure and temperature and using relevant algorithms instantaneous density can be found.

By knowing the correct density one can compute the accurate flow rate. The further operation of integration, square rooting is similar to ordinary totaliser.

PRINCIPAL ADVANTAGES

- Online density compensation possible because of the online pressure and temperature measurement
- Various sizes of orifice assemblies available accurate design calculations, with or without IBR approval as per application
- Sturdy, rugged field mounting type of pressure and DP transmitter is supplied with standard end connection
- Online display of compensated mass flow rate, density, temperature and output of DP transmitter is offered. LED indication for status of steam (saturated or superheated) is provided
- User friendly. No need to feed all the complicated orifice constants since the system i intelligent enough to calculate
- Isolated 4-20mA dc output proportional to compensated flow rate
- Disconnection of DPT, PT and Temperature sensor is indicated by error message
- Complete system engineered to suit your requirement
- Standard System and highly reliable
- Calibration of RTD, DP transmitter, pressure transmitter is easy and inexpensive
- No moving Parts
- No wiring connections are required during installation
- Installation is easy and suitable, because very little care at site during installation to avoid the leakages

APPLICATIONS

- Engineering and Automation
- Textiles
- Chemical / Pharmaceutical
- Food and Drugs
- Petrochemicals
- Fertilizers
- Steel / Aluminum
- Sugar Factories / Distilleries

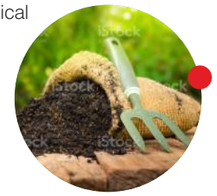
FEATURES OF STEAM FLOW METER

- Easy user friendly programming
- Password protected for all modes except display mode.
- Computer/Printer Interfacing with RS 232/RS 485 port with MODBUS RTU
- Fault indication indicated by different error codes
- Overflow indicated by blinking display up to 3000 readings (for more readings consult factory)
- Data logging facility with 3450/ 6900 number of reading is available
- Linear or square root operation
- Universal power supply
- Suitable for Saturated &/or Superheated Steam
- Two alarm setting configured on pressure input
- Steam status indication (Saturated/ Superheated)
- Pressure and temperature offsets generated by site condition can be compensated
- Mass flow calculation as per ASME algorithm

SECTORS

Chemical / Pharmaceutical

Petrochemicals



Fertilizers

SPECIFICATIONS*

SFMc - 150

Service	: Saturated and superheated steam, Hot Water, Thermic Fluids in closed Pipes
Size	: 1" to 10"
Type of flow element	: Orifice type.
MOC of flow element	: SS 316
End Connection	: SORF flange
MOC of flanges	: M.S/C.S/S.S
Flange Rating	: Class 150 (Other on request)
Orifice Flange assembly	: WNRF Class 300
DPT	: With Display
Data logging	: Every hour 3370 Logs
Comm. Port	: RS485, RS232 (optional)
Comm. Protocol	: MODBUS , RTU
Design Standard	: BS : 1042/ ISO : 5167
Accuracy	: ±2.5% to 3% of actual reading
Typical turndown	: 10:3 (Std) 10:1 (Contact to Factory)
Density compensation	: Online monitoring and compensation of density
Temperature	: Up to 600°C
Pressure	: 22 Kg/cm2 Max. (if pressure is above : consult factory)
Power Supply	: 85 to 265 VAC @ 50HZ
Ingress Protection	: IP65 Equivalent

COMPARISON WITH VOTEX FLOWMETER

PARAMETER	ORIFICE	VORTEX
Well established standards	Available	Not Available
Suitability for high pressure and temperature application	Most Suitable	Seal fails in majority of cases after certain duration
Installation	Easy to install	Critical and expensive because of Requirement of specially machined pipe lengths
Existing pipeline modifications for installation	No modification required	Design is based on velocity and not on line size. As a result customer line size and selected flow meter size may differ
Recalibration of transmitter	Easy and can be done in house	Has to be done on a flow-rig and hence is expensive
Effects on resolution due to increase in line size	No effect	Resolution decreases with increase in line size
Suitability for low velocity measurement	Suitable	Stops the measurement
Durability	No moving parts and hence no wear and tear and virtually maintenance free	Diaphragm based sensor and hence is prone to wear and tear