

## Ordering Information:

CODE	SERVICE
01	AIR
02	BIOGAS
03	LPG
04	CNG
05	O2
06	CO2
07	NITROGEN
08	ANY OTHER GAS
CODE	LINE SIZE
25 NB	DN 25 : 1"
40 NB	DN 40 : 1½"
50 NB	DN 50 : 2"
80 NB	DN 80 : 3"
100 NB	DN 100 : 4"
150 NB	DN 150 : 6"
200 NB	DN 200 : 8"
CODE	FLANGE / END CONNECTION
ANSI150	ANSI 150
BS10 E	BS10 TABLE E
BS10 F	BS10 TABLE F
DIN2633	DIN2633
ANY OTHER	ANY OTHER
CODE	MOC OF METER
SS 304	STAINLESS STEEL 304
SS 316	STAINLESS STEEL 316
MS/CS	MILD/ CARBON STEEL
CODE	MOUNTING
INT	INTEGRAL MOUNTING
RW	REMOTE WALL MOUNTING
RP	REMOTE PANEL MOUNTING
CODE	COMMUNICATION
RS4	RS 485
RS2	RS232
CODE	LOGGING FACILITY
1L	LOGGING
2L	EXTENDED LOGGING
CODE	POWER SUPPLY
U	UNIVERSAL
Z	ANY OTHER

GFMc-150 01 50NB ASI150 SS 304 INT RS4 1L U SAMPLE ORDERING INFORMATION

# manas

a name that spells trust.....

An ISO 9001 : 2008 Company



## COMPACT GAS FLOW METER

### GFMc-150

- Mass flow measurement of Bio Gas, LPG, Natural Gas, CNG, Compressed air & other compressed gases in closed conduits.
- Available in sizes from 1" to 8"
- On – line density compensation.
- Easy Installation and commissioning



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## Compact Gas flow meter.

### INTRODUCTION:

The GFMc-150 flow meter is applicable for measuring flow rates of Bio-gas, LPG, Compressed air and other compressed gases in closed conduits. It is best suited for applications where affordability, reliability and ruggedness are of prime concerns.

In conventional system of measurement, the differential pressure generated by orifice plate is measured by DP transmitter. The output of 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:

$$Q_m \propto \sqrt{\rho} \cdot \sqrt{\Delta P}$$

Where,

$Q_m$  = mass flow rate.

$\rho$  = instantaneous density.

$\Delta P$  = 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:

1. Online density compensation possible because of the online pressure and temperature measurement.
2. Various sizes of orifice assemblies available with accurate design calculations.
3. Online display of compensated mass flow rate, density, temperature & output of DP transmitter is offered.
4. Disconnection of DPT, PT and Temperature sensor is indicated by error message.
5. Complete system engineered to suit your requirement.
6. Standard System and highly reliable.
7. Calibration of RTD, DP transmitter, pressure transmitter is easy and inexpensive.
8. No moving Parts.
9. No wiring connections are required during installation.
10. Installation is easy and suitable.

### SCHEMATIC DIAGRAM:

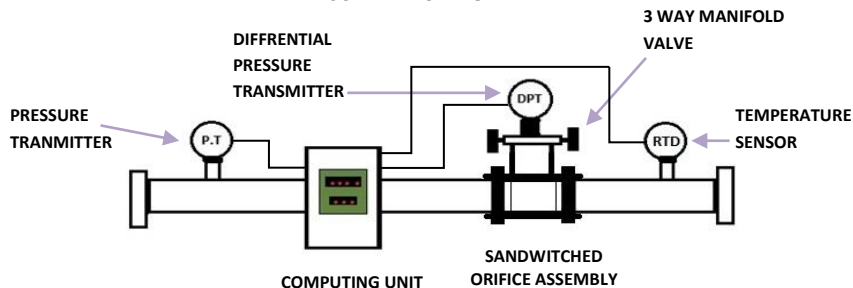


FIG: SCHEMATIC ARRANGEMENT FOR GFMc-150

## Compact Gas flow meter.

### MANAS MAKE COMPACT ORIFICE ASSEMBLY:

- The COMPACT ORIFICE ASSEMBLY is flow element capable of adapting to DP transmitter to make a complete flow metering transmitting device without the need of separate impulse piping, isolation valve.
- Available in sizes from 1" to 8".

### APPLICATIONS:

Compact GFM is most suitable for measuring compressed air consumption, Biogas and LPG consumption in various industries.

Following are some of the application areas of the meter:

- Automotive Industry
- Textile industry
- Steel Industry
- Environmental Industry
- Industries consuming LPG or CNG
- Industries consuming Nitrogen, Oxygen Or CO2

### SPECIFICATIONS:

- |                          |                                                                    |
|--------------------------|--------------------------------------------------------------------|
| 1. Service               | : Bio Gas, LPG, Natural Gas, CNG & Compressed air in closed Pipes. |
| 2. Size                  | : 1" to 8"                                                         |
| 3. Type of flow element  | : Differential flow element.                                       |
| 4. MOC of flow element   | : SS 316                                                           |
| 5. End Connection        | : SORF flange                                                      |
| 6. MOC of flanges        | : M.S/C.S/S.S                                                      |
| 7. Flange Rating         | : Class 150 (OTHER ON REQUEST)                                     |
| 8. DPT                   | : With Display                                                     |
| 9. Data logging          | : 4900 readings or 9800 readings (optional).                       |
| 10. Comm. Port           | : RS485, RS232 (optional).                                         |
| 11. Comm. Protocol       | : MODBUS, RTU                                                      |
| 12. Design Standard      | : BS: 1042/ ISO : 5167                                             |
| 13. Accuracy             | : $\pm 2.5\%$ of actual reading                                    |
| 14. Typical turndown     | : 10:3                                                             |
| 15. Density compensation | : Online monitoring and compensation of density                    |
| 16. Gas Temperature      | : Up to 70°C                                                       |
| 17. Power Supply         | : 85 to 265 VAC @ 50Hz                                             |

\* Specifications are subjected to change without prior notice

### Comparison with Vortex flow meter

Sr. No.	Parameter	Orifice	Vortex
1.	Well established standards	Available	Not Available
2.	Suitability for high pressure & temperature application	Most suitable	Seal fails in majority of cases after certain duration.
3.	Installation	Easy to install	Critical & expensive because of Requirement of special machined pipe lengths.
4.	Existing pipe line modifications for installation	No modifications required.	Design is based on velocity & not on line size. As a result customer line size & selected flow meter size may differ.
5.	Recalibration of transmitter	Easy & can be done in house	Has to be done on a flow-rig and hence is expensive
6.	Changes in Pressure, Temperature	Taken care during density compensation	Not be taken care of.
7.	Effects on resolution due to increase in line size	No effect.	Resolution decreases with increase in line size.
8.	Suitability for low velocity measurement	Suitable	Stops the measurement.
9.	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.