Units of GAS Flow Rate

DigiFLO Flow Rate sensors measure True Volumetric Gas Flow Rate in units of Litters per Minute (LPM). By using gas temperature and pressure, Volumetric Flow Rate can be converted to other units such as SLPM, Etc.

F[SLPM]: SLPM units of Flow Rate, practiced in USA, define what shall be a Flow Rate of a given gas stream at T_{gas}, P_{gas} temperature & pressure, if it changed to pressure of 1atm (14.696psia) and temperature of 70°F (294.26K).

F[NLPM]: NLPM units of Flow Rate, practiced in Europe, define what shall be a Flow Rate of a given gas stream at T_{gas}, P_{gas} temperature & pressure, if it changed to pressure of 1atm (101.325 kPa) and temperature of 0°C (273.15K).

Conversion from LPM to SLPM (USA):

$$F[SLPM] = F[LPM] \times (294.26 / T_{gas}) \times (P_{gas} / 14.696)$$

Conversion from LPM to NLPM(Europe):

$$F[NLPM] = F[LPM] \times (273.15 / T_{gas}) \times (P_{gas} / 14.696)$$

P_{gas} – Absolute gas pressure in Psia
T_{gas} – Gas Temperature in K

Mass Flow Rate in g/m [grams per minute]

Conversion from F[LPM] to F[g/m]:

F[g/m] = F[LPM] x ρ

ρ is the gas density in units of grams per litter [g/L]

The formula for gas density is given by:

$$\rho = \frac{p}{R \cdot T}$$

Where:

ρ is the gas density in g / l.

p is pressure in KPA.

T is temperature in Kelvins; $0^{o}C=273.15K$

1ATM=101.325 KPA=14.696 PSI

R is the specific gas constant. R = 8.314 / MW (MW is gas molecular weight).