Metering orifice test data

P_{inlet} = pressure read from pressure transducer #1 (psi)
P_n = pressure read from pressure transducer #2 (psi)
T = ambient temperature (F) (taken when pressure transducer #2 stabilizes)
t = duration of oxygen flow (s)

P_{inlet} = _____ (do not adjust during trials)

Trial #1

P_1 = _____ T_1 = _____ t_1 = _____

Trial #2

P_2 = _____ T_2 = _____ t_2 = _____

Trial #3

P_3 = _____ T_3 = _____ t_3 = _____

Mass calculator based on experimental data

Given

English	Metric
$V_{recievingtank} := 490in^3$	$V_{recievingtank} = 8.03L$
$P_{ambient} := 14.696psi$	$P_{ambient} = 1.013 \times 10^5 Pa$
	$R := 260 \frac{J}{kg \cdot K}$

Input data (enter test data in yellow fields):

$P_{inlet} := 1000psi$	$P_{inlet} = 6.895 \times 10^6 Pa$
$P_1 := 320psi$	$P_1 = 2.206 \times 10^6 Pa$
$P_2 := 416psi$	$P_2 = 2.868 \times 10^6 Pa$
$P_3 := 512psi$	$P_3 = 3.53 \times 10^6 Pa$

Convert Fahrenheit to Kelvin

$T_1 := 65$ in fahrenheit	$T_{K1} := \left[\left(\frac{T_1 - 32}{9}\right) \cdot 5 + 273.15\right] \cdot 1K$	$T_{K1} = 291.483K$
$T_2 := 65$ in fahrenheit	$T_{K2} := \left[\left(\frac{T_2 - 32}{9}\right) \cdot 5 + 273.15\right] \cdot 1K$	$T_{K2} = 291.483K$
$T_3 := 65$ in fahrenheit	$T_{K3} := \left[\left(\frac{T_3 - 32}{9}\right) \cdot 5 + 273.15\right] \cdot 1K$	$T_{K3} = 291.483K$

$t_1 := 10s$

$t_2 := 13s$

$t_3 := 16s$

calculationg mass (m) and mass flow rate (m_{dot}) for the trials:

$$m_1 := V_{recievingtank} \frac{P_1}{R \cdot T_{K1}} \qquad m_1 = 0.234\,kg \qquad m_{dot1} := \frac{m_1}{t_1} \qquad m_{dot1} = 0.023\,\frac{kg}{s}$$

$$m_2 := V_{recievingtank} \frac{P_2}{R \cdot T_{K2}} \qquad m_2 = 0.304\,kg \qquad m_{dot2} := \frac{m_2}{t_2} \qquad m_{dot2} = 0.023\,\frac{kg}{s}$$

$$m_3 := V_{recievingtank} \frac{P_3}{R \cdot T_{K3}} \qquad m_3 = 0.374\,kg \qquad m_{dot3} := \frac{m_3}{t_3} \qquad m_{dot3} = 0.023\,\frac{kg}{s}$$

Plot resulsts: