Table - 2 : Calculation of Uncertainty

FLOW ELEMENT	: **Mass Flowmeter**	
SIZE	: 3" NB	
TAG NO.	05FT35	
MAKE	: MicroMotion	
MODEL NO. (Sensor)	: DS 300 S156	
SL. NO. (Sensor)	: 120154	
MODEL NO. (Transmitter)	: RFT 9739F1SU	
SL. NO. (Transmitter)	: 1519557	
METER K	: 360.00	pulses/kg
FLOW RANGE	: 100.000	T/hr.
FLOW CAL FACTOR	: 471.155.13	
CALIBRATING FLUID	: WATER	
DATE OF CALIBRATION	: 01.05 to 02.05.2007	

Sl No.	Qa T/hr	Error %	erl(x) %
1	99.260	0.062	0.0043
2	99.305	0.064	0.0043
3	20.435	-0.079	0.0053
4	20.431	-0.067	0.0053
5	30.205	-0.064	0.0044
6	30.223	-0.062	0.0044
7	40.157	-0.042	0.0036
8	40.106	-0.039	0.0036
9	50.418	-0.046	0.0030
10	50.453	-0.052	0.0030
11	60.578	-0.037	0.0026
12	60.573	-0.045	0.0026
13	69.528	-0.004	0.0026
14	69.532	-0.007	0.0026
15	79.631	0.011	0.0029
16	79.592	0.012	0.0029
17	79.611	0.016	0.0029
18	79.634	0.011	0.0029
19	79.640	0.022	0.0029
20	89.899	0.035	0.0036
21	89.454	0.012	0.0035
22	89.689	0.034	0.0035
23	98.970	0.050	0.0043
x_m	y_m	n	
65.5358	-0.0094	23.00	
Sy	Sxx	A	B
0.01226	1.45E+04	**-0.11710**	**0.00164**

Standard Uncertainty of best fit, Us =	**0.005**	%
Expanded Uncertainty in % Error, Ue =	**0.012**	%

Table. 3 : Uncertainty Budget

FLOW ELEMENT : **Mass Flowmeter**
SIZE : 3" NB
TAG NO. 05FT35
MAKE : MicroMotion
MODEL NO. (Sensor) : DS 300 S156
SL. NO. (Sensor) : 120154
MODEL NO. (Transmitter) : RFT 9739F1SU
SL. NO. (Transmitter) : 1519557
METER K : 360.00 pulses/kg
FLOW RANGE : 100.00 T/hr
FLOW CAL FACTOR : 471.155.13
CALIBRATING FLUID : WATER
DATE OF CALIBRATION : 01.05 to 02.05.2007

Source of uncertainty	Estimates Xi	Unit	Limits	Divisor	Probability Distribution Type A or B	Standard uncertainty	Partial derivative	Sensitivity Coefficient	Uncertainty contribution	Degree of Freedom
ρ air	1.128	kg/m^3	4.74E-04	2.00	Type B, Normal	2.37E-04	dQ/dair	2.425E-02	5.746E-06	∞
ρ wt	8000	kg/m^3	4.00E-01	2.00	Type B, Normal	2.00E-01	dQ/dwt	4.854E-07	9.709E-08	∞
W(Mass)	1629.850	kg.	3.21E-02	1.41	Type B, Normal	2.27E-02	dQ/dW	1.692E-02	3.843E-04	∞
Readability	0.001	kg	5.00E-04	1.22	Type B, Rtglr	4.08E-04	dQ/dW	1.692E-02	6.905E-06	∞
time	59.17461	sec	3.73E-04	2.00	Type B, Normal	1.87E-04	dQ/dt	-4.659E-01	-8.689E-05	∞
Readability	1.00E-05	sec	5.00E-06	1.73	Type B, Rtglr	2.89E-06	dQ/dt	-4.659E-01	-1.345E-06	∞
Timing Error	59.174612	sec	2.02E-03	2.00	Type B, Normal	1.01E-03	dQ/dt	-4.659E-01	-4.711E-04	∞
Flowrate	27.5723	Kg/s							6.142E-04	
Flowrate	27.5723	Kg/s	-	-	Type B, Normal	6.14E-04		1.000E+00	6.142E-04	∞
Pulse	587733	Pulses	8.23E-02	2.00	Type B, Normal	4.11E-02	dE/dN	1.704E-04	7.012E-06	∞
Readability	1.0000	Pulses	5.00E-01	1.73	Type B, Rtglr	2.89E-01	dE/dN	1.704E-04	4.926E-05	∞
Error	-	-	-	-	Type A	5.25E-03		1.000E+00	5.254E-03	21
Repeatability	-	-	-	-	Type A	2.12E-03		1.000E+00	2.124E-03	4

Combined stanadard uncertainty = 0.006 %
Effective Degree of freedom = 25
(Calculated Value)

From the student's distribution table, for confidence level of 95.45 and above said effective degrees of freedom, the coverage factor, k = 2.110

Expanded uncertainty U_E = 0.012 %