ANNEX D1 CALIBRATION CERTIFICATES FOR DUST MONITORING EQUIPMENT

TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

Location ID: AM1		Date of Calibration:	14-Feb-25
Name and Model :	TISCH HVS Model TE-5170	Next Calibration Date:	14-Apr-25
		Operator:	P.F.Yeung

CONDITIONS

	1019	Corrected Pressure (mm Hg)	764.3
Temperature (^{o}C)	18.0	Temperature (K)	291

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.08315
Model:	TE-5025A	Qstd Intercept	-0.04938
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H20(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	5.6	5.6	11.2	1.654	54	54.81	Slope= 30.803
13	4.7	4.7	9.4	1.518	48	48.72	Intercept= 3.1088
10	3.2	3.2	6.4	1.256	42	42.63	Corr. Coeff.= 0.9963
7	2.2	2.2	4.4	1.046	34	34.51	
5	1.3	1.3	2.6	0.809	28	28.42	

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

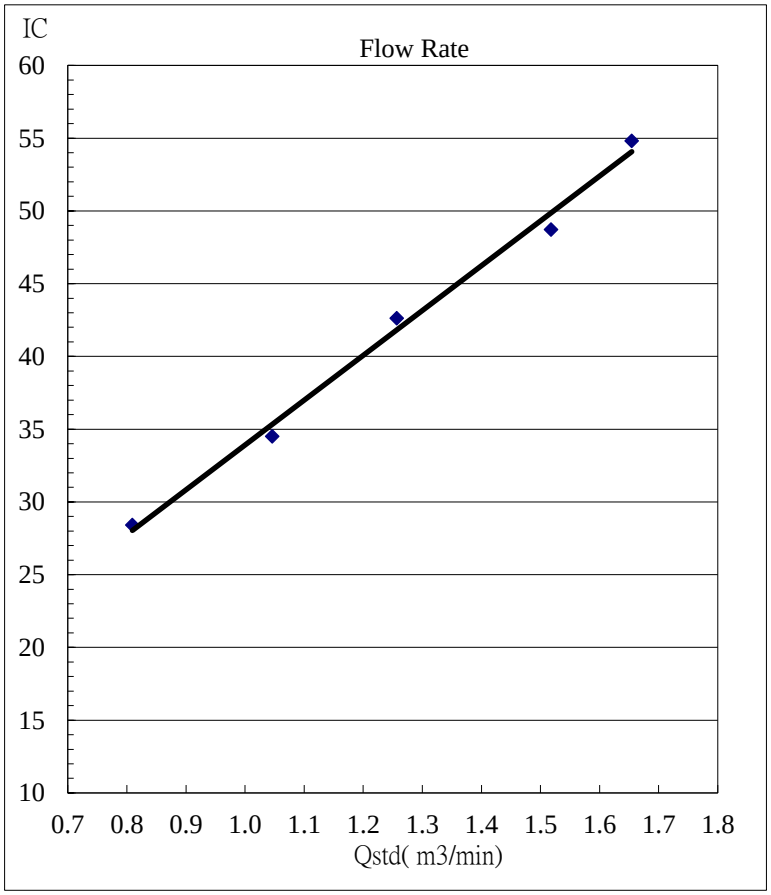
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

Location ID: AM2		Date of Calibration:	14-Feb-25
Name and Model :	TISCH HVS Model TE-5170	Next Calibration Date:	14-Apr-25
		Operator:	P.F.Yeung

CONDITIONS

Sea Level Pressure (hpa)	1019	Corrected Pressure (mm Hg)	764.3
Temperature (^{o}C)	18.0	Temperature (K)	291

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.08315
Model:	TE-5025A	Qstd Intercept	-0.04938
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H20(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	6.6	6.6	13.2	1.794	53	53.80	Slope= 28.312
13	5.2	5.2	10.4	1.595	48	48.72	Intercept= 3.469
10	3.8	3.8	7.6	1.367	42	42.63	Corr. Coeff.= 0.9987
7	2.5	2.5	5.0	1.113	35	35.53	
5	1.5	1.5	3.0	0.868	27	27.41	

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

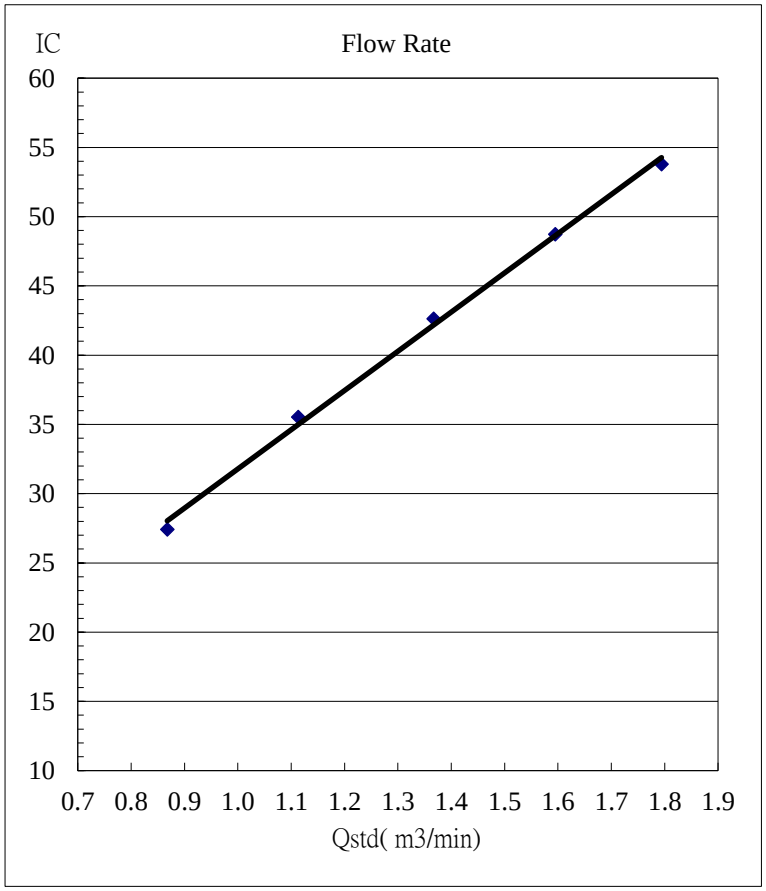
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

Location ID: AM3		Date of Calibration:	14-Feb-25
Name and Model :	TISCH HVS Model TE-5170	Next Calibration Date:	14-Apr-25
		Operator:	P.F.Yeung

CONDITIONS

Sea Level Pressure (hpa)	1019	Corrected Pressure (mm Hg)	764.3
Temperature (^{o}C)	18.0	Temperature (K)	291

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.08315
Model:	TE-5025A	Qstd Intercept	-0.04938
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H20(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	5.9	5.9	11.8	1.698	58	58.87	Slope= 26.234
13	4.6	4.6	9.2	1.502	53	53.80	Intercept= 14.767
10	3.2	3.2	6.4	1.256	48	48.72	Corr. Coeff.= 0.9941
7	2.1	2.1	4.2	1.022	42	42.63	
5	1.4	1.4	2.8	0.839	35	35.53	

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

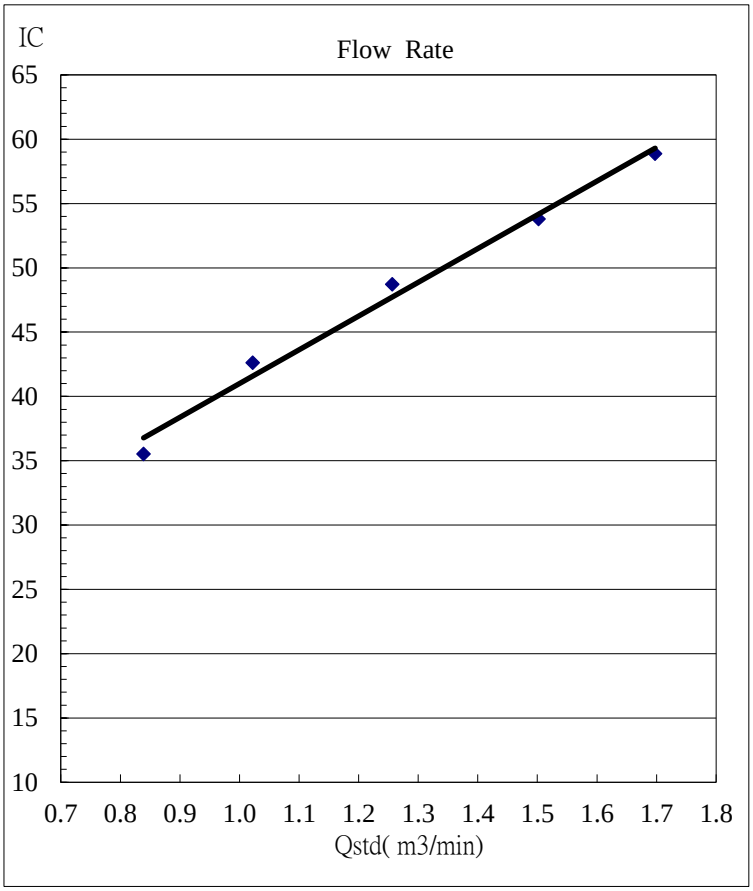
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

Location ID: AM4		Date of Calibration:	14-Feb-25
Name and Model :	TISCH HVS Model TE-5170	Next Calibration Date:	14-Apr-25
		Operator:	P.F.Yeung

CONDITIONS

Sea Level Pressure (hpa)	1019	Corrected Pressure (mm Hg)	764.3
Temperature (^{o}C)	18.0	Temperature (K)	291

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.08315
Model:	TE-5025A	Qstd Intercept	-0.04938
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H20(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	6.5	6.5	13.0	1.781	57	57.86	Slope= 30.302
13	5.2	5.2	10.4	1.595	51	51.77	Intercept= 3.414
10	3.7	3.7	7.4	1.349	43	43.65	Corr. Coeff.= 0.9984
7	2.5	2.5	5.0	1.113	36	36.54	
5	1.5	1.5	3.0	0.868	30	30.45	

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

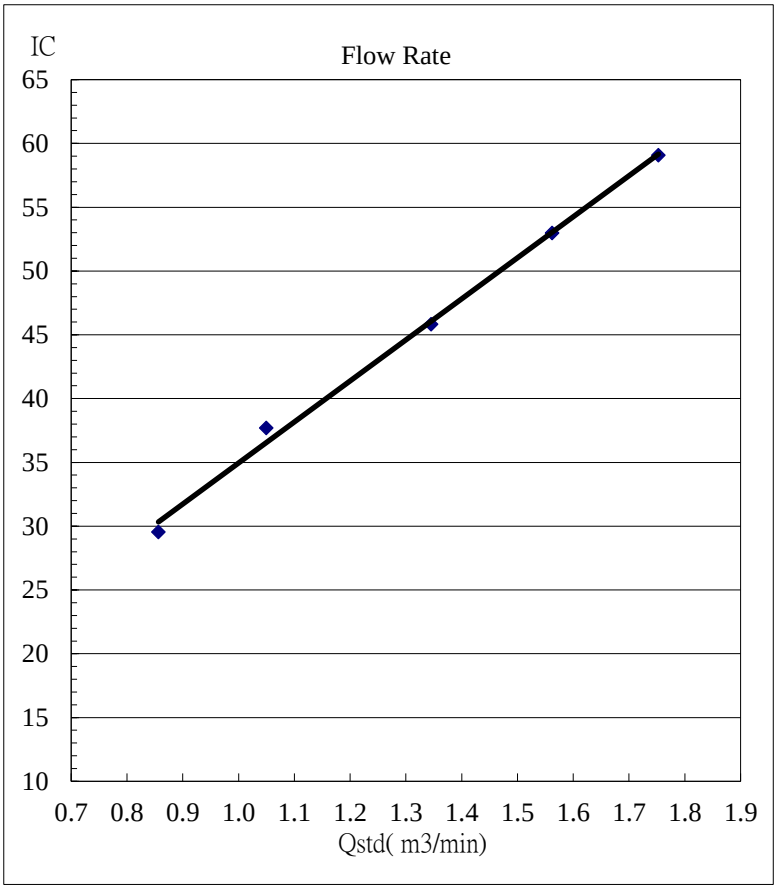
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

Location ID: AM1		Date of Calibration:	9-Apr-25
Name and Model : TISCH HVS Model TE-5170		Next Calibration Date:	9-Jun-25
		Operator:	P.F.Yeung

CONDITIONS

	1013	Corrected Pressure (mm Hg)	759.8
Temperature (^{o}C)	25.0	Temperature (K)	298

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.08315
Model:	TE-5025A	Qstd Intercept	-0.04938
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H20(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	5.0	5.0	10.0	1.542	52	52.01	Slope= 32.896
13	4.0	4.0	8.0	1.382	45	45.01	Intercept= 0.2523
10	2.9	2.9	5.8	1.180	38	38.00	Corr. Coeff.= 0.9960
7	1.9	1.9	3.8	0.960	32	32.00	
5	1.4	1.4	2.8	0.827	28	28.00	

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

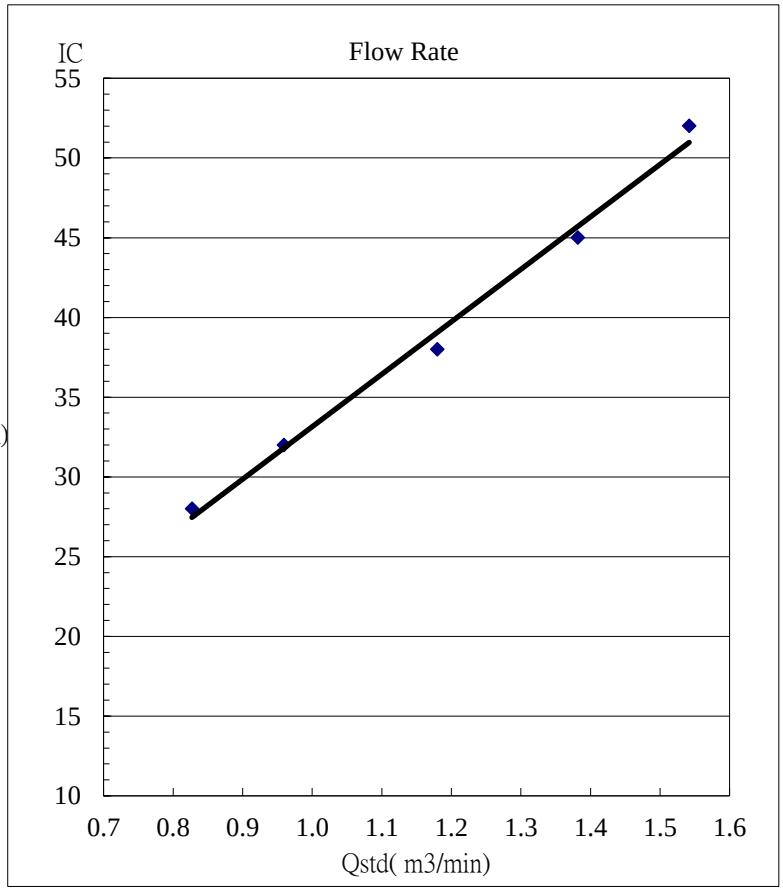
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

Location ID: AM2		Date of Calibration:	9-Apr-25
Name and Model :	TISCH HVS Model TE-5170	Next Calibration Date:	9-Jun-25
		Operator:	P.F.Yeung

CONDITIONS

Sea Level Pressure (hpa)	1013	Corrected Pressure (mm Hg)	759.8
Temperature (^{o}C)	25.0	Temperature (K)	298

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.08315
Model:	TE-5025A	Qstd Intercept	-0.04938
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H20(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	5.9	6.0	11.9	1.680	55	55.01	Slope= 28.738
13	5.0	5.0	10.0	1.542	50	50.01	Intercept= 6.645
10	3.6	3.5	7.1	1.303	45	45.01	Corr. Coeff.= 0.9961
7	2.4	2.3	4.7	1.065	38	38.00	
5	1.5	1.4	2.9	0.841	30	30.00	

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

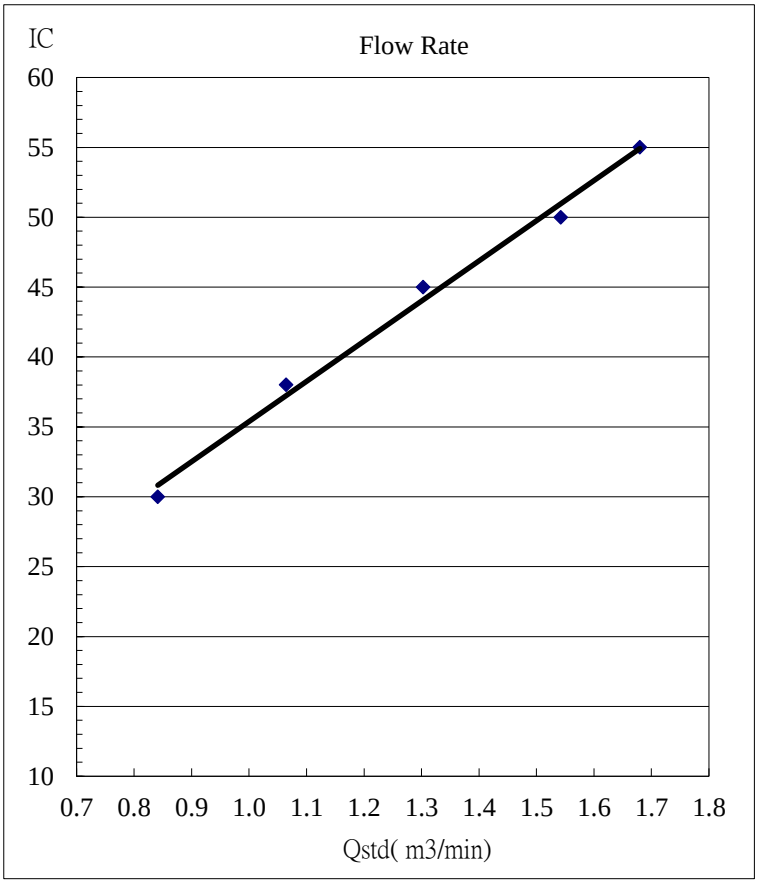
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

Location ID: AM3		Date of Calibration:	9-Apr-25
Name and Model :	TISCH HVS Model TE-5170	Next Calibration Date:	9-Jun-25
		Operator:	P.F.Yeung

CONDITIONS

Sea Level Pressure (hpa)	1013	Corrected Pressure (mm Hg)	759.8
Temperature (^{o}C)	25.0	Temperature (K)	298

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.08315
Model:	TE-5025A	Qstd Intercept	-0.04938
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H20(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	5.8	5.8	11.6	1.659	57	57.01	Slope= 31.353
13	4.4	4.4	8.8	1.448	51	51.01	Intercept= 5.3438
10	3.5	3.5	7.0	1.294	46	46.01	Corr. Coeff.= 0.9995
7	2.2	2.2	4.4	1.031	38	38.00	
5	1.3	1.3	2.6	0.798	30	30.00	

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

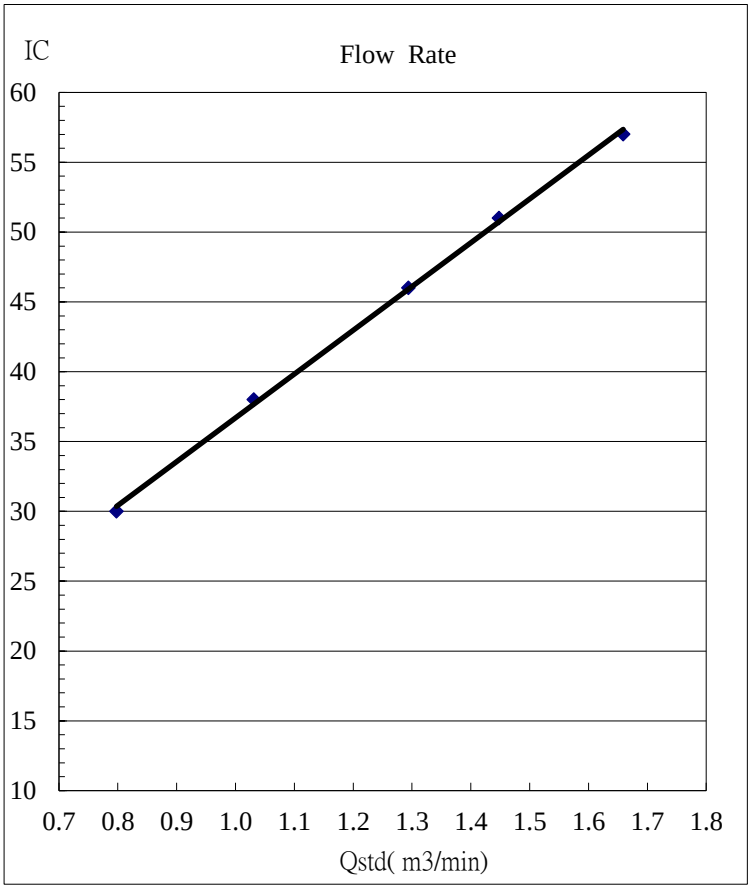
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

Location ID: AM4		Date of Calibration:	9-Apr-25
Name and Model :	TISCH HVS Model TE-5170	Next Calibration Date:	9-Jun-25
		Operator:	P.F.Yeung

CONDITIONS

Sea Level Pressure (hpa)	1013	Corrected Pressure (mm Hg)	759.8
Temperature (^{o}C)	25.0	Temperature (K)	298

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.08315
Model:	TE-5025A	Qstd Intercept	-0.04938
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H20(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	5.9	6.0	11.9	1.680	57	57.01	Slope= 31.260
13	4.9	4.9	9.8	1.527	51	51.01	Intercept= 4.1528
10	3.5	3.5	7	1.294	45	45.01	Corr. Coeff.= 0.9983
7	2.4	2.3	4.7	1.065	38	38.00	
5	1.4	1.5	2.9	0.841	30	30.00	

Calulations:

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure