

Annex D1

Calibration Certificates for Dust Monitoring Equipment

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location ID: AM1	Date of Calibration:	24-Oct-23
Name and Model : TISCH HVS Model TE-5170	Next Calibration Date:	23-Dec-23
	Operator:	P.F.Yeung

CONDITIONS

Sea Level Pressure (hpa)	1016	Corrected Pressure (mm Hg)	762.1
Temperature (°C)	20.6	Temperature (K)	299

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.06918
Model:	TE-5025A	Qstd Intercept	-0.04220
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H2O(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION Slope= 32.550 Intercept= 4.006 Corr. Coeff.= 0.9915
18	5.6	5.7	11.3	1.645	56	56.00	
13	4.0	3.9	7.9	1.379	51	51.00	
10	3.1	3.0	6.1	1.214	44	44.00	
7	2.1	2.0	4.1	0.999	36	36.00	
5	1.4	1.3	2.7	0.814	30	30.00	

Calculations:

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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:

$$1/m(I[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

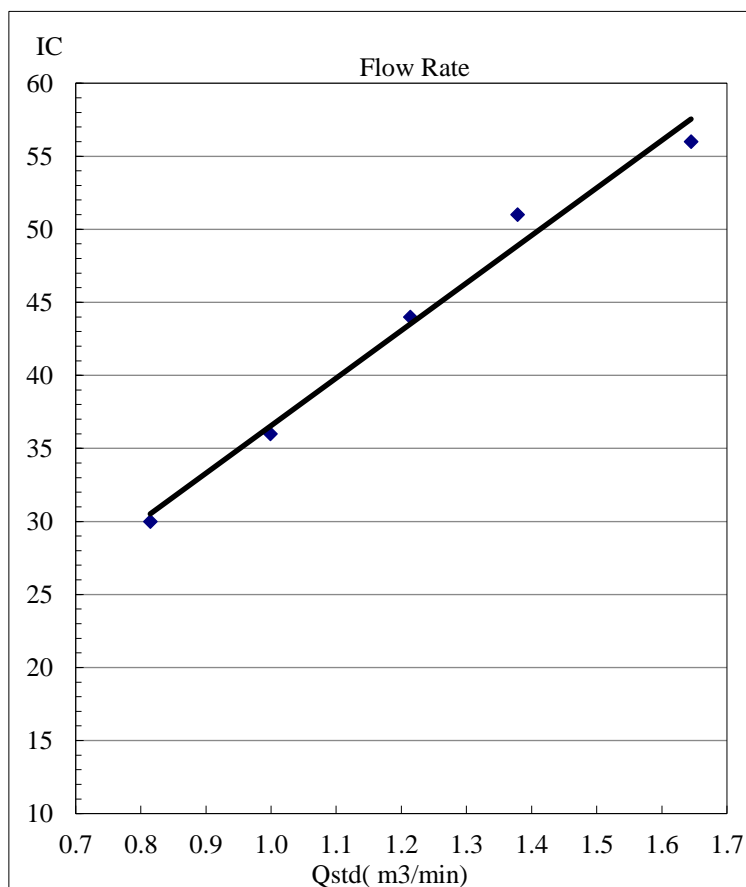
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location ID: AM2	Date of Calibration:	24-Oct-23
Name and Model : TISCH HVS Model TE-5170	Next Calibration Date:	23-Dec-23
	Operator:	P.F.Yeung

CONDITIONS

Sea Level Pressure (hpa)	1016	Corrected Pressure (mm Hg)	762.1
Temperature (°C)	26.0	Temperature (K)	299

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.06918
Model:	TE-5025A	Qstd Intercept	-0.04220
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H2O(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	6.0	5.9	11.9	1.687	53	53.00	Slope= 25.811 Intercept= 10.384 Corr. Coeff.= 0.9935
13	4.4	4.3	8.7	1.446	48	48.00	
10	3.0	3.0	6.0	1.204	43	43.00	
7	2.0	2.0	4.0	0.987	36	36.00	
5	1.3	1.3	2.6	0.800	30	30.00	

Calculations:

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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:

$$1/m(I[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

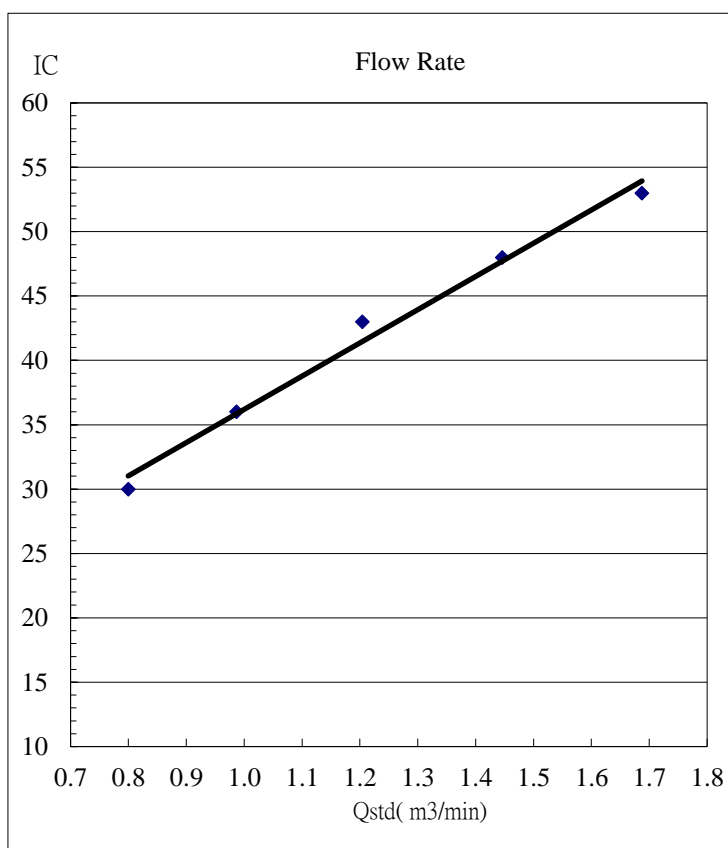
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location ID: AM3	Date of Calibration:	24-Oct-23
Name and Model : TISCH HVS Model TE-5170	Next Calibration Date:	23-Dec-23
	Operator:	P.F.Yeung

CONDITIONS

Sea Level Pressure (hpa)	1016	Corrected Pressure (mm Hg)	762.1
Temperature (°C)	26.0	Temperature (K)	299

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.06918
Model:	TE-5025A	Qstd Intercept	-0.04220
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H2O(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	5.9	5.8	11.7	1.673	57	57.00	Slope= 27.980 Intercept= 10.675 Corr. Coeff.= 0.9964
13	4.6	4.5	9.1	1.478	52	52.00	
10	3.2	3.2	6.4	1.243	46	46.00	
7	2.1	2.1	4.2	1.011	40	40.00	
5	1.3	1.3	2.6	0.800	32	32.00	

Calculations:

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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:

$$1/m(I[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

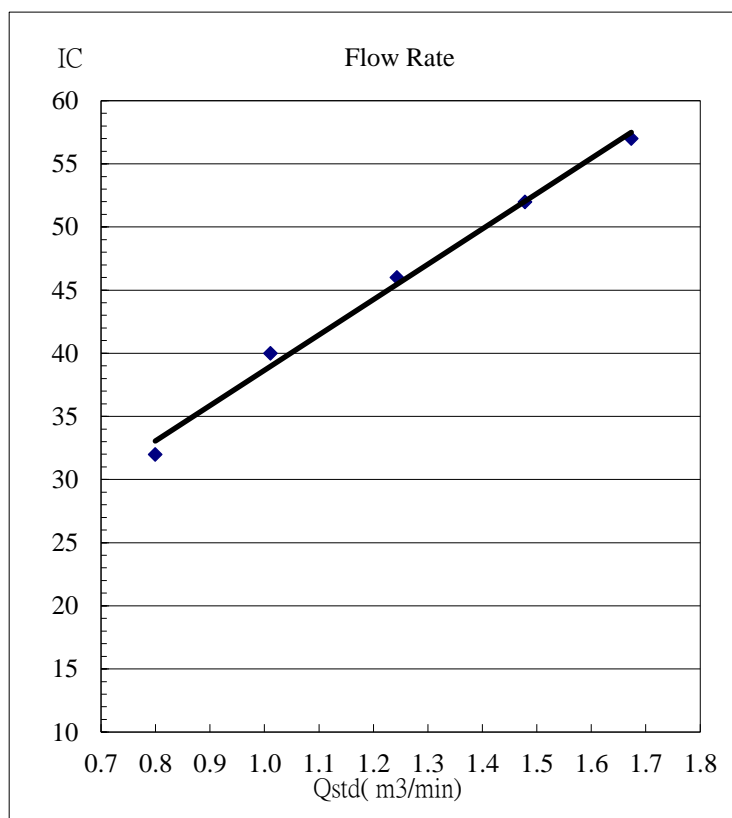
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location ID: AM4	Date of Calibration:	24-Oct-23
Name and Model : TISCH HVS Model TE-5170	Next Calibration Date:	23-Dec-23
	Operator:	P.F.Yeung

CONDITIONS

Sea Level Pressure (hpa)	1016	Corrected Pressure (mm Hg)	762.1
Temperature (°C)	26.0	Temperature (K)	299

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.06918
Model:	TE-5025A	Qstd Intercept	-0.04220
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H2O(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	6.1	6.2	12.3	1.715	58	58.00	Slope= 31.691 Intercept= 3.979 Corr. Coeff.= 0.9991
13	4.8	4.8	9.6	1.518	52	52.00	
10	3.5	3.5	7.0	1.299	46	46.00	
7	2.4	2.4	4.8	1.079	38	38.00	
5	1.4	1.4	2.8	0.829	30	30.00	

Calculations:

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

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:

$$1/m(I[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

