



CERTIFICATE OF CALIBRATION

TSI Instruments Ltd, Stirling Road, Cressex Business Park
High Wycombe Bucks HP12 3ST England
Tel: (Int +44) (UK 0) 1494 459200 Fax: (Int +44) (UK 0) 1494 459700 <http://www.tsi.com>

ENVIRONMENT CONDITION		
TEMPERATURE	69.7 (21.0)	°F (°C)
RELATIVE HUMIDITY	36	%RH
BAROMETRIC PRESSURE	29.27 (994.1)	inHg (hPa)

MODEL	9350-03
SERIAL NUMBER	93501532001
CUSTOMER INST ID	13955

<input checked="" type="checkbox"/> AS LEFT	<input checked="" type="checkbox"/> IN TOLERANCE
<input type="checkbox"/> AS FOUND	<input type="checkbox"/> OUT OF TOLERANCE

AEROTRAK CALIBRATION KIT			
MEASUREMENT VARIABLE	SYSTEM ID	DATE LAST CALIBRATED	CALIBRATION DUE DATE
FLOWMETER	40401012003	23/06/2015	23/06/2016
FLOWMETER	40430742007	15/07/2015	15/07/2016
REFERENCE	72010930001	16/09/2015	16/03/2016

PARTICLE STANDARDS				
PARTICLE SIZE	STANDARD UNCERTAINTY	STANDARD DEVIATION	LOT NO.	EXPIRATION DATE
0.296 µm	0.003 µm	0.0053 µm	40134	31/01/2017
0.508 µm	0.0045 µm	0.0079 µm	42468	30/01/2018
0.994 µm	0.0075 µm	0.010 µm	41942	30/04/2016
3.06 µm	0.01 µm	0.03 µm	42788	30/12/2016
5.02 µm	0.015 µm	0.06 µm	42730	30/12/2016
9.64 µm	0.06 µm	0.15 µm	44112	31/01/2018

TSI does hereby verify that the calibration performed on the above described instrument meets the requirements of ISO 21501-4, TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the United States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI is registered to ISO 9001:2008.



CALIBRATED

March 1, 2016

DATE



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SIZE CALIBRATION AND VERIFICATION OF SIZE SETTING

NOMINAL PARTICLE SIZE	GAIN STAGE	DIGITAL CUTPOINT	EXPANDED UNCERTAINTY
0.3 μm	A	15	3.6%
0.5 μm	A	645	3.6%
1 μm	A	1850	3.6%
3 μm	B	914	3.5%
5 μm	B	2165	3.5%
10 μm	B	6846	3.6%

COUNTING EFFICIENCY

PARTICLE SIZE	ACTUAL	ALLOWABLE RANGE	PASS/FAIL
0.3 μm	52%	50% \pm 20	Pass
0.5 μm	92%	100% \pm 10	Pass

SIZE RESOLUTION

PARTICLE SIZE	MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.5 μm	4.7%	< 15%	Pass

FALSE COUNT RATE

SAMPLE TIME (MIN)	SAMPLED (L)	MEASURED COUNTS (n)	CONCENTRATION ($\#/M^3$)	95% U.C.I. ($\#/M^3$)	ALLOWABLE RANGE ($\#/M^3$)	PASS/FAIL
15	750	0	0.00	4.0	\leq 4.0	Pass

SAMPLING FLOW RATE (L/MIN)

NOMINAL	ACTUAL	ERROR	ALLOWABLE RANGE	PASS/FAIL
50.0	50	0.0%	\pm 5%	Pass

SAMPLING TIME †

MEASURED	ALLOWABLE RANGE	PASS/FAIL
< + 0.1%	\pm 1%	Pass

RESPONSE RATE †

MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.0067%	\leq 0.5%	Pass

MAXIMUM PARTICLE CONCENTRATION †

25000000 $\#/m^3$ @ 10% Coincidence Loss
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† Tested and verified during product development

CALIBRATION INTERVAL

CALIBRATION DATE	EXPIRATION DATE
March 1, 2016	March 1, 2017