



## CERTIFICATE OF CALIBRATION

Beckman Coulter certifies that the calibration performed complies with the requirements of ISO 21501-4:2018(E) standard, as requested by the customer. The reported As-Calibrated uncertainties with a confidence level of 95% are  $\pm 6.0\%$  related to size accuracy,  $\pm 2.4\%$  related to flow rate,  $\pm 2.8\%$  related to size resolution,  $\pm 8.6\%$  related to 50% counting efficiency and  $\pm 5.6\%$  related to 100% counting efficiency, respectively.

The accuracy of the standards & equipment used for the calibration are traceable to the US National Institute of Standards and Technology (NIST). A record of all work performed is maintained by Beckman Coulter in compliance with ISO 9001. This certificate may not be reproduced other than in full. Calibration certificates without a watermark & an authorized signature are not valid.

### General Information

#### Manufacturer/Lab

Hach Company  
5600 Lindbergh Drive  
Loveland, CO 80539

#### Customer Name

Q PLUS

### Instrument Information

<u>Counter Model</u>	3411	<u>Station ID</u>	Rhenium	<u>Temperature</u>	22.8 °C
<u>Part Number</u>	2088800-05	<u>Calibration Date</u>	2022-23-יו'	<u>Relative Humidity</u>	48.0 %
<u>Counter Serial</u>	1903523001	<u>Calibration Due</u>	2023-23-יו'	<u>Pressure</u>	99.6 kPa
<u>Sensor Model</u>	AIR	<u>RA Number</u>	RHE#100951	<u>Nominal Flow</u>	28.3 LPM
<u>Sensor Serial</u>	1903523001			<u>Laser Current</u>	N/A
<u>Procedure</u>	WI-2170			(Reference Only)	

### Performance Information

<u>Test Name</u>	<u>Test Result</u>	<u>Criteria</u>	<u>Pass/Fail</u>
ISO-21501 Flow	28.2 LPM	$\pm 5\%$	Pass
Noise 1a	34.1 mV	Reference Only	N/A
Noise 1b	7.9 mV	Reference Only	N/A
Peak to Valley 1a	4:1	N/A	N/A
Peak to Valley 1b	0:1	N/A	N/A
ISO-21501 False Count Rate	0.0 particles in 0.42 m <sup>3</sup>	7.1 particles in 1.00 m <sup>3</sup>	Pass

### Calibration Equipment

<u>Type</u>	<u>Model</u>	<u>Serial</u>	<u>Cal Due Date</u>
PHA	Core Counter PHA	0907418016	2023-27-יו'
Flow Meter	4043 H	4043 2035 006	2022-31-אוק'
Oscilloscope	TDS 1212B	C100404	2022-01-נוב'
Laminar Flow	irgel	12104	2023-31-יו'

Standard Calibration  
1903523001.06.23.2022

FSE : Dror Moshe

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Calibration Information							
Channel	Size (µm)	Calibrated (mV)	Threshold (mV)	Particle Size (µm)	Mfg	Lot Number	Expiration Date
1a	0.1	155.27	155.27	0.1	Thermo	219479	2022-30-נוב
1b	0.1	144.29	144.29	0.1	Thermo	219479	2022-30-נוב
2	0.2	7.69	4.62	0.203	Thermo	227575	2023-31-ינו
3	0.3	100.9	98.72	0.303	Thermo	244496	2024-30-ספט
4	0.5	177.86	172.6	0.51	Thermo	240944	2024-31-מאי
5	1.0	679.93	643.22	1.036	Thermo	245568	2024-31-אוק
6	5.0	7016.58	6938.17	5.049	Thermo	235600	2024-31-ינו



## SUPPLEMENTAL DATA

### General Information

Manufacturer/Lab  
Hach Company  
5600 Lindbergh Drive  
Loveland, CO 80539

Customer Name  
Q PLUS

### Instrument Information

Customer Serial NA  
Counter Model 3411  
Part Number 2088800-05  
Counter Serial 1903523001  
Sensor Model AIR  
Sensor Serial 1903523001  
Procedure WI-2170

Station ID Rhenium  
Calibration Date 2022-23-יוני  
Calibration Due 2023-23-יוני  
RA Number RHE#100951

Temperature 22.8 °C  
Relative Humidity 48.0 %  
Pressure 99.6 kPa  
Nominal Flow 28.3 LPM  
Laser Current N/A  
Cal Voltage 0.836 V

### Supplemental Information

Standard Calibration  
1903523001.06.23.2022

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## AS RECEIVED DATA

**General Information**

Manufacturer/Lab  
 Hach Company  
 5600 Lindbergh Drive  
 Loveland, CO 80539

Customer Name  
 Q PLUS

**Instrument Information**

Counter Model 3411  
Part Number 2088800-05  
Counter Serial 1903523001  
Sensor Model AIR  
Sensor Serial 1903523001

Station ID Rhenium  
Calibration Date 2022-23-יו  
Calibration Due 2023-23-יו  
RA Number RHE#100951  
Procedure WI-2170

Temperature 22.8 °C  
Relative Humidity 48.0 %  
Pressure 99.6 kPa  
Nominal Flow 28.3 LPM  
Laser Current N/A

**As Received Information**

<u>Test Name</u>	<u>As Received</u>	<u>As Calibrated</u>	<u>Deviation (%)</u>	<u>Criteria (%)</u>	<u>Pass/Fail</u>
Flow	28.1 LPM	28.2 LPM	0.71	±5	Pass
1A Noise	38.5 mV	34.1 mV	12.90	---	N/A
1B Noise	10.7 mV	7.9 mV	35.44	---	N/A
Zero Count	PASS	---	---	---	N/A

**Channel Information**

<u>Channel</u>	<u>Size (µm)</u>	<u>Calibrated (mV)</u>	<u>Pulse (mV)</u>	<u>As Received (mV)</u>	<u>As Received Size (µm)</u>	<u>Deviation(%)</u>	<u>Criteria(%)</u>	<u>Pass/Fail</u>
1a	0.1	155.27	155.27	160.0	0.101	1.00	±15.00	Pass
1b	0.1	144.29	144.29	147.6	0.1	0.00	±15.00	Pass
2	0.2	4.62	7.69	8.0	0.203	1.50	±15.00	Pass
3	0.3	98.72	100.9	100.0	0.301	0.33	±15.00	Pass
4	0.5	172.6	177.86	177.0	0.509	1.80	±15.00	Pass
5	1.0	643.22	679.93	679.0	1.035	3.50	±15.00	Pass
6	5.0	6938.17	7016.58	7366.0	5.267	5.34	±15.00	Pass