No: MC-01

SUBMITTAL COVERSHEET
Nanuet UFSD –Phase 3 Projects

Architect:
KSQ Architects
215 W 40th Street,15th Floor
New York, NY 10018

Owner:
Nanuet Union Free School District
101 Church Street
Nanuet, NY 10954

Construction Manager:
Jacobs
One Penn Plaza, 54th floor
New York, NY 10019

Contractor: Joe Lombardo Plumbing & Heating of Rockland Inc

Contract: Ron Lombardo

Address: 321 Spook Rock Road Suite 109A
Suffern, New York 10901

Telephone: 845-357-6537

Fax: 845-357-8529

School Name: Nanuet Union Free School District Phase 3 Bond Projects @ Barr Middle School & Nanuet High School

Type of Submittal:

Re-submittal: [ ] No [ ] Yes

[ ] Shop Drawings **[ ]** Product Data **[ ]** Schedule **[ ]** Sample **[ ]** _____
[ ] Test Report **[ ]** Certificate **[ ]** Color Sample **[ ]** Warranty **[ ]** _____

Submittal Description: testing and balancing

Product Name:

Manufacturer:

Subcontractor/ Supplier: DL FLOWTECH

References:

Spec. Section No.: 230593

Drawing No(s):

Paragraph:

Rm. or Detail No(s):

Architect's/ Engineer's Review Stamp	Contractor Review Statement: These documents have been checked for accuracy and coordinated with job conditions and Contract requirements by this office and have been found to comply with the provisions of the Contract Documents. Ronald J. Lombardo 10.9.23 Name: Date: Company Name: Joe Lombardo Plumbing & Heating of Rockland Inc.

Remarks:

HVAC Testing and Balancing Submittal

Customer: Lombardo Plumbing & Heating

Project: Nanuet Union Free School District

October 29, 2023

Table of Contents

About the Company

In 1982 dL Flow Tech Inc. began with one person, founder Dennis LaVopa. We initially focused on providing quality TAB (Testing Adjusting Balancing) to contractors in the lower Hudson Valley. As time passed, dL Flow Tech grew not only in size but in experience, credibility, and reputation in the competitive HVAC industry. We expanded our business across the Tri-State region by building and maintaining strong relationships with quality contractors and engineers. We also increased the services offered from air and hydronic TAB, to sound measurement, retro commissioning, fire damper testing, duct leakage testing, pipe thickness testing and blower door testing. It has always been the focus of dL Flow Tech to not only maintain technical certifications but to always maintain relationships with clients who appreciate our work ethic. Always stressing the importance of quality, and client service, we have earned a reputation for trustworthy service for over three decades. While celebrating the past 38 years of service, we look forward to the changes and challenges in the future. Technology advances have led to improvements in safety and comfort within occupied environments. At the same time, the need for tighter environmental controls in public spaces, residences, and especially in mission critical areas such as health-care facilities, keeps increasing. As the industry changes and continues to move forward, we have not forgotten the basic business principles that brought us to where we are today. Credibility, honesty, and attentiveness to our customer's needs will always be our driving force. dL Flow Tech Co. continues to strive for excellence by maintaining its reputation for hard work and dependability. For more information about our company please visit our web site at ***www.dlflowtech.com.***

Services:

- HVAC Test and Balance of Air and Hydronics
- HVAC Full System Survey's
- Duct Leakage Testing (Residential and Commercial)
- Blower Door Testing (Residential and Commercial)
- Sound Testing
- Fire Damper Testing
- Pipe Thickness Testing
- Data Logging

Professional Organization Membership

- ASHRAE: American Society of Heating, Refrigeration, Air Conditioning Engineers
- CCA: Construction Contractors Association
- SMACNA: Sheet Metal Air Conditioning Contractors, National Association
- NEBB: National Environmental Balancing Bureau
- TABB: Testing, Adjusting and Balancing Bureau

dL Flow Tech Team

- CEO/President: Dennis LaVopa
- Field Manager: Greg Lombardi (NEBB Certified)
  Luke Fountain (NEBB Certified)
- Michael Cassese (Certified Technician)
- Steve Michael (Certified Technician)
- Kevin Obrien (Certified Technician)
- Michael Landsman (TAB Technician)
- Mandrell Narine (TAB Technician)
- Abby Macur (TAB Technician)

Notable Work History

New Construction

Project: Thomas Jefferson Hall - US Military Academy West Point, NY
Year: 2008
Customer: J. Kokolakis Contracting, Inc.
Description: 141,000 sq ft new library at west point campus with state of the art mechanical and control systems

Project: Regeneron Landmark at Eastview, 735 & 745 Old Saw Mill River Rd. Tarrytown, NY
Year: 2009
Customer: LJ Coppola Mechanical
Description: 230,000 sq ft. state-of-the-art complex is one of the largest corporate facilities to be built in Westchester County in recent years. The new facilities offer environmentally friendly design features, including a white roof to reflect heat, a high efficiency HVAC system, building layouts for laboratories and offices to maximize day lighting, a courtyard located between buildings that maximizes permeable surfaces to reduce water runoff, and extensive use of sustainable materials such as bamboo flooring and low volatility organic compounds

Project: New Research & Development Facility: Avon Products Inc. new $100m global research and development center in Suffern, NY
Owner: Avon Products, Inc.
Year: 2004
Address: 1 Avon Place Suffern, NY
Customer: Skanska
Description: Test and Balance of 14 exhaust fans including dust collector system and fume hoods. Room pressurization, larger air handling units, 400 VAV boxes, along with the buildings hot water and chilled water systems and Duct Leakage Testing

Project: New Geo Chemistry Building – Columbia University
Year: 2007
Customer: Torcon Construction
Description: 67,000 square feet, two stories tall and houses more than 70 offices and 30 state-of-the-art laboratories for scientists, students and support staff

Project: The Hackley School Center for Wellness.
Customer: DP Wolff
Year: 2017
Description: The 115,000-sq-ft, two-story Walter C. Johnson Center for Health & Wellness was designed to be an athletic facility as well as the campus center for all students.

Project: Center for Science & Computation Bard College, Annandale on Hudson, NY 12504:
Customer: Ashley Mechanical Inc.
Year: 2005-2006
Description: A new 42,000 square-foot facility housing state-of-the-art science and computer laboratories, hi-tech classrooms, and a new 80-person auditorium

Project: SUNY Purchase Residence Hall:
Year: 2006
Description: New 96,000 square-foot residence hall designed as a 'college-town'. The four-story facility has 314 new beds, with a space for a bookstore, restaurant and student-related retail spaces. Exhaust fans, air handlers, hot water system, pumps, boilers, fan coil units. LEED Certified

Project: US Tobacco, Stamford CT
Year: 2007
Customer: ABM Heating and Air Conditioning
Description: Test and Balance a large multi-floor office space.

Project: DEP East of Hudson Commissioning: Valhalla, NY
Year: 2007
Customer: Turner Construction
Description: Commission new construction at the DEP new state of the art Green Facility in Valhalla, NY.

Project: Middletown High School $130 million project
Proj#44-10-00-01-0-002-018
Middletown, NY
Customer: Bertussi Plumbing and Heating
Year: 2006
Description: Test and Balance new fan coils, pumps, chillers, boilers, AHU's, RTU's, UV's, exhaust fans

Project: Marist College
Hancock Center
Poughkeepsie, NY
Customer: Ashley Mechanical Inc
Year 2010
Description: Test and balance of HVAC systems for new state of the art $35 million, 57,000-square-foot facility.

Project: Northern Westchester Hospital
Emergency Expansion Project
Mt. Kisco, NY
Customer: Northern Westchester Hospital Center
Year 2010
Description: Test and balance of HVAC systems in addition to commissioning for new emergency room wing.

Project: Metro North Design and Construction Service for the Harmon Shop
Customer LJ Coppola
Year: 2009
Description: Test and balance f HVAC equipment for new coach shop, a locomotive shop, and a wheel true facility.

Project: NYC Transit Authority Bus Depot and Central Maintenance Facility
48-05 Grand Ave
Maspeth, NY 11378
Customer: Granite Construction Northeast, Inc.
Year: 2009
Description: NYCT Grand Ave Depot & Central Maintenance Facility was ranked #13 in the country for largest construction projects awarded, with a cost over $250 million.
The Grand Avenue Bus Depot and Maintenance Facility in Maspeth is located on 5.5 acres and covers over 550,000 sq. ft. It is a state-of-the-art and environmentally friendly facility.

Project: Armed Forces Reserve Center Fort Hamilton, NY Training Building
Customer: Nelson Air Device
Year: 2010
Description: The project includes the 123,000-sf center, a 3,500-sf maintenance training building, and classrooms and arms rooms to support National Guard units and active-duty personnel.

Project: The New Stamford Hospital Center
Customer: Bonland Industries
Year: 2016
Description: Full TAB of an 11-story, 640,000-square-foot medical facility that will replace the hospital's aging main building on Shelburne Road.

Project: Mt Pleasant Expansion Regeneron North Campus 785 (South) and 795 (North)
Customer: AMX mechanical
Year: 2014
Description: The project added two new buildings with 300,000 square feet of laboratory and office space to the Regeneron complex at the Landmark at Eastview in the Town of Mount Pleasant in Westchester County, New York

Project: West Point Elementary School
Customer: Grundman Mechanical
Year: 2019
Description: New Multi-Story 95,000 sq ft. Elementary School located at West Point NY - Completed October 2019

Project: The New Vassar Hospital
Customer: Walsh Construction
Year: 2021
Description: Eight level 750,000 square feet half-billion-dollar project, with 264 patient rooms, 30 intensive care rooms, a dozen surgical suites, and a 66-room emergency department.

Project: Legoland New York
Customer: Thomas Kempton
Year: 2021
Description: 500 acre theme park consisting of multiple buildings throughout including restaurants and a new 250 bed hotel.

Project: Pepsi R&D Facility
Customer: Grodsky Mechanical
Year: 2019
Description: A brand new state of the art 3 story research and development building. 122,000 square foot of laboratory office and amenities.

Survey/ Retro Commission:

Project: Daronco Courthouse
White Plains, NY
Discovery Phase Testing
Customer: City of White Plains
Year: 2009
Description: Provide report of discovery phase investigation and data for your consulting mechanical engineer's review and recommendations.

Project: Park West High School
525 W 50th St.
New York, NY
Customer: New York City Schools
Year: 2008
Description: Working with contractors and engineers performing Discovery Phase Testing and troubleshooting of problem systems

Project: Benedictine Hospital
Customer: Benedictine Hospital Kingston NY
Year: 2008
Description: Discovery phase testing of prior to construction of major project which combines the use of two hospitals.

Project: New York Catholic Center
E 55th & 56th St.
New York NY
Customer: OLA Consulting Engineers
Year: 2008
Description: Trouble shooting problem air handlers in a 20-floor high rise building.

Project: Pepsi Concentrate and R&D LEED Discovery Phase Testing
350 Columbus Ave
Valhalla, NY
Customer: OLA Consulting Engineers
Year: 2009
Description: Test and evaluate approximately 70 Fans (exhaust and supply) for engineers during LEED accreditation.

Project: CIBA - BASF Specialty Chemicals
540 White Plains, RD
Tarrytown, NY
Customer: CIBA - BASF Specialty Chemicals
Year 2010
Description: Rebalance of all existing systems at 540 White Plains Rd.

Project: New York Medical College BSB Survey
Customer: M/E Engineers
Year 2021
Description: Complete survey of HVAC system serving the 122,000 square foot BSB building in order to assist design engineers for renovation project.

Project: North Rockland CSD
Customer: NRCSD
Year 2020
Description: Complete survey and balance of HVAC systems serving 11 buildings across the school district prior to the opening of the 2020 school year.

Project: MTA Buildings NYC
Customer: Goldman Copeland
Year 2020
Description: Survey outside air and exhaust airflow in 14 buildings across the 5 NYC boroughs.

Project: Herbert Lehman High School
Customer: NYC CSD
Year 2020
Description: Work with a team **to** test, troubleshoot and adjust airflows throughout on existing AHU's prior to the opening of school.

Project: Putnam Norther Westchester BOCES
Customer: PNWB
Year 2020
Description: Work with engineers to survey existing systems and adjust as needed prior to the opening of the 2020 school year.

Clients List

At dL Flow Tech we value our relationships with contractors, building owners and engineers. We strive to be client based. We want to maintain positive relationships and be part of a team, not just a one-time company. Over 40years we have built relationships with some of the best in the business.

- ABM HVAC: Hawthorne, NY
- Agency Construction: Mamaroneck, NY
- Ahearn Holtzman Inc. Port Chester, NY
- Albert Einstein College of Medicine: Bronx, NY
- American Heating and Cooling: Poughkeepsie, NY
- AMX Contracting: Pleasantville, NY
- AMI Services: Newburgh, NY
- Aptar: Congers NY
- AP Mechanical: Hawthorne NY
- Armistead Mechanical: Newburgh, NY
- Ashley Mechanical Inc.: Kingston, NY
- Atlantic Westchester: Bedford Hills, NY
- BASF Specialty Chemicals: Tarrytown NY
- Bertussi Plumbing and Heating: Pearl River, NY
- Bonland Industries: Wayne NJ
- Burke Rehabilitation: White Plains, NY
- Caremount Medical: Mt Kisco, NY
- Carey and Walsh: Hawthorne, NY
- CB Strain Mechanical Contractors: Poughkeepsie, NY
- CBK Consulting Engineers: Hopewell Junction NY
- C&F Consulting Engineers: White Plains NY
- Clean Air Quality Service: Hawthorne, NY
- Culinary Institute of America: Poughkeepsie, NY
- CRE Mechanical: Pearl River, NY
- Crothall Project Services Group, Lynbrook, NY
- Collado Engineering PC: Tarrytown, NY
- Columbia University Lamont Doherty: Palisades, NY
- DJ Air Conditioning: Marlboro, NY
- East Ramapo CSD: East Ramapo NY
- Elmsford Sheet Metal: Cortland, NY
- Grundman Mechanical: Hawthorne NY
- Goldman Copeland: New York NY
- Ginsburg Development Companies
- Hauser Brothers: Orangeburg, NY
- H&S Mechanical: Elizabeth NJ
- ICM Mechanical: Yonkers NY
- J&M HVAC: New Rochelle, NY
- Johnson Controls: Albany, NY
- Lawrence Hospital (NYP): Bronxville, NY
- LJ Coppola Inc.: Brewster, NY
- Lombardo Plumbing and Heating: Suffern, NY
- Markley Mechanical: Peekskill, NY

- Marist College: Poughkeepsie, NY
- MDS HVAC-R: Walden, NY
- Mengler Mechanical: Brewster, NY
- Montefiore Nyack Hospital Center: Nyack, NY
- Montefiore Medical Center, Bronx, NY
- New York City Schools: Long Island City, NY
- M/E Engineering: Schenectady NY
- Northern Dutchess Hospital: Poughkeepsie NY
- North Rockland CSD: North Rockland NY
- Northern Westchester Hospital Center: Mt Kisco, NY
- NYP Hudson Valley Hospital Center: Peekskill, NY
- Orange Regional Medical Center: Middletown, NY
- OLA Consulting Engineers: Hawthorne, NY
- Pomarico Design: Newburgh NY
- Phelps Memorial Hospital: Sleepy Hollow, NY
- Premier Comfort: Peekskill, NY
- Putnam NW BOCES: Yorktown NY
- Rockland County BOCES
- S&O Construction: Pleasant Valley NY
- S&L Plumbing: Port Chester NY
- Southeast Mechanical: Brewster, NY
- Southport Associates Engineering: Ridgefield CT
- Skanska USA
- St Johns Riverside Hospital: Yonkers NY
- St. Luke's Hospital: Newburgh and Cornwall NY
- Sarracco Mechanical Service: Stamford, CT
- Taconic Heating and Cooling: Cortlandt Manor NY
- Tietjen Venegas Consulting Engineers: Rye NY
- Titan Mechanical Services: Port Chester, NY
- Trane Co: Latham, NY
- Thermodynamics: Peekskill NY
- Thermodynamix: Ossining NY
- Unity Mechanical: Briarcliff, NY
- Vassar College: Poughkeepsie NY
- Vassar Medical Center (Nuvance): Poughkeepsie NY
- Westchester County Department of Public Works: White Plains, NY
- Westchester Medical Center: Valhalla, NY
- Westchester Surgery Center: Mt Kisco, NY
- Whiting Turner Construction
- White Plains Hospital Center: White Plains NY

Instrumentation

Instrumentation meets or exceeds the standards set by NEBB, calibration certificates are available upon request.

Rotating Measurement	0-500 RPM	=/- 2%	=/- 5RPM	Lazer Tachometer B59B8005 PLT 500
Air	-40 to 240 deg. F	+/- 1% of Reading	.2 deg. F	Shortridge / ADM 860 / M90266
Immersion	-40 to 240 deg. F	+/- 1% of Reading	.2 deg. F	Shortridge/ ADM 860 / M90266
Water	-40 to 240 deg. F	+/- 1% of Reading	.2 deg. F	Omega Model / 450 / 692478
Electrical Measurement	0-600 VAC 0-100 AMPS	+/- 2% of Reading	1 Volt .1 Amps	Fluke Electrical Tester T5600
Air Pressure Measurement	0-19" WG	+/- 5% of Reading	0.01- in wg < 1 in wg	Shortridge / AMD-860 / M90266
Air Velocity Measurement	50-3000 fpm	+/- 1% of reading	20 fpm	Alnor / Rotating Van Anemometer RVA+ / 312216
Humidity Measurement	10 to 90% RH	2% of reading	1%	Checkit Digital Psych/ 622
Air Volume	100 to 2000 cfm	+/- 5% of reading	Digital 1 cfm	Shortridge / AMD 860 / M90266
Pitot Tube	**18**	NA	NA	Dwyer / 160-18 3/16 std pitot
	24	NA	NA	Dwyer / 160-24 3/16 std pitot
	36	NA	NA	Dwyer / 160-36 3/16 std pitot
	60	NA	NA	Dwyer / 160-60 3/16 std pitot
Hydronic Pressure Measurment	-30" Hg to 60 psi	+/-1% of reading	.5 psi	Shortridge / HDM-300 / W 93092
	0 to100 psi	+/-1% of reading	1 psi	Shortridge / HDM-300 / W 93092
	0 to 200 psi	+/-1% of reading	2.5 psi	Shortridge / HDM-300 / W 93092
Hydronic Differencial Pressure Measurment	0-100 in. w.g.	+/- 2% of reading	1 in. w.g.	Shortridge / HDM-300 / W 93092
	0-100 ft. w.g.	+/- 2% of reading	1 ft. w.g	Shortridge / HDM-300 / W 93092

Firm Certification

DL FLOW TECH, INC.

HAS MET ALL REQUIREMENTS FOR NEBB CERTIFIED STATUS IN THE FOLLOWING DISCIPLINE

Testing, Adjusting and Balancing of Environmental Systems

2582

NEBB Certification Number

March 31, 2024

Expiration Date

NEBB President

NEBB President-Elect

Firm Certification

DL FLOW TECH, INC.

HAS MET ALL REQUIREMENTS FOR NEBB CERTIFIED STATUS IN THE FOLLOWING DISCIPLINE

Sound Measurement

2582

NEBB Certification Number

March 31, 2024

Expiration Date

NEBB President

NEBB President-Elect

Firm Certification

DL FLOW TECH, INC.

HAS MET ALL REQUIREMENTS FOR NEBB CERTIFIED STATUS IN THE FOLLOWING DISCIPLINE

Whole Building Technical Commissioning of New Construction

2582

NEBB Certification Number

March 31, 2024

Expiration Date

NEBB President

NEBB President-Elect

Certification

GREGORY FRANCIS LOMBARDI

HAS MET ALL REQUIREMENTS FOR NEBB CERTIFIED PROFESSIONAL STATUS IN THE FOLLOWING DISCIPLINE

Testing, Adjusting and Balancing of Environmental Systems

This Certificate, as well as individual affiliation with a NEBB Certified Firm and associated NEBB Certification Stamp are REQUIRED to provide a NEBB Certified Report. Participation in the NEBB Quality Assurance Program requires the Certificant be affiliated with a NEBB Certified Firm

CP-24386

NEBB Certification Number

March 31, 2023

Expiration Date

NEBB President

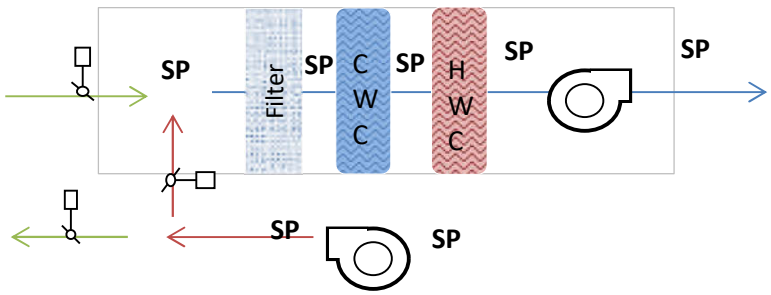
NEBB President-Elect

Equipment Summary

Fan #	Service	Rated CFM	Connected Load	Operating CFM	% of Design	Remarks
Air Handlers						
Return Fans						
Air Apparatus						
Exhaust Fans						

Performance Data

☐ New ☐ Exist ☐ Refurb	Supply Fan		Return /EF	
System				
Service				
Location				
Manufacturer				
Model				
Sheave Position				
Speed Control				
System SP Set Point			NA	
	RATED	***OPERATING***	***RATED***	***OPERATING***
Connected Load /Diversity				
Fan CFM				
Return CFM				
Outside Air CFM				
Exhaust Air CFM				
Total Static				
External Static Pressure				
Fan RPM				
Motor Manuf. / HP				
RPM				
Line Voltage				
Amperage				
Phase				
Brake HP				
Power Factor				
Motor Efficiency				
Service Factor				
Frame				
Remarks:				



OSA Damper Pos. _____

OSA % of SA _____

flow tech

Date: 1/7/2021

Sheet: Air Apparatus

	☐ New ☐ Exist ☐ Refurb		☐ New ☐ Exist ☐ Refurb		☐ New ☐ Exist ☐ Refurb		☐ New ☐ Exist ☐ Refurb	
System								
Service								
Location								
Manufacturer								
Model/Size								
Fan Type								
Sheave Position								
Speed Control								
	Design	***Actual***	***Design***	***Actual***	***Design***	***Actual***	***Design***	***Actual***
Fan CFM								
Return CFM								
Outside Air CFM								
Fan Discharge SP								
Fan Suction SP								
Unit Inlet SP								
External SP								
Total SP								
Fan RPM								
	Design	***Actual***	***Design***	***Actual***	***Design***	***Actual***	***Design***	***Actual***
Motor Manuf./HP								
Motor RPM								
Line Voltage								
Phase								
Amperage								
Service Factor								
Remarks:								

flow tech

Date: 1/7/2021

Sheet: EF

	☐ New ☐ Exist ☐ Refurb	☐ New ☐ Exist ☐ Refurb	☐ New ☐ Exist ☐ Refurb	☐ New ☐ Exist ☐ Refurb
Fan Number				
Location				
Service				
Manufacturer				
Model/Size				
Fan Type				
Horsepower				
Safety Factor				
Volts/Phase				
Rated Amperage				
Actual Amperage				
Sheave Position				
Design Fan RPM				
Actual Fan RPM				
Design Static Pressure				
Actual Static Pressure				
Required CFM				
Actual CFM				
Remarks:				

Zone	Internal Duct Size	Eff Area	Design FPM	Actual FPM	Design CFM	Actual CFM	SP	Remarks

Unit ID	Required CFM	Operating Max CFM	*Operating Min CFM*	% of Design

Terminal Box Performance Data

Terminal Box	System	Box Size	Box Fan
Design Max CFM	Actual Max CFM	Address	
Design Min. CFM	Actual Min. CFM	Cal. Factor	
Min			

#	Location - RM#	Size	Type	AK	Design		Maximum		Remarks
					FPM	CFM	FPM	CFM	

Remarks:

Date: 1/7/2021

Sheet: DS AK

Sys	DWG	Location -	Rm #	No	Size	Type	Ak	Design		Final		% of	Remarks
								FPM	CFM	FPM	CFM	Des	

Date: 1/7/2021

Sheet: Ex DSAK

Sys	DWG	Location -	Rm #	No	Size	Type	Ak	Design		Final		% of	Remarks
								FPM	CFM	FPM	CFM	Des	

Location	Unit Size	No	Supply CFM	Design OSA	% OSA	Fan Speed	Computer Setpoint	Remarks
Unit Vent Minimum Outside Air Test Procedure *(for typical units)*								
1) Fan speed is set to design CFM according to the MFG's fan performance table.								
2) The outside air damper is indexed fully closed (100% return) and a return air velocity is taken.								
3) The outside air damper is then indexed until the return velocity is reduced to achieve the proper OSA percentage.								
4) The OSA computer setpoint and fan speed is then logged.								

Pump Summary

Pump #	Service	Required GPM	Operating GPM	% of Design	Remarks

Pump Performance Data

Pump No	
Manufacturer	
Size	
Impeller	
Service	

	GPM	FT HD	BHP
Design			
Valve Open		0	
Discharge			
Suction			
dP	0	X 2.31 =	0.00

Pump Shut-off Head	GPM	FT HD	BHP
		0	
Discharge			
Suction			
dP	0	X 2.31 =	0.00

Final	GPM	FT HD	BHP
		0	#DIV/0!
Discharge			
Suction			
dP	0	X 2.31 =	0.00
System Static Head	PSI		
Discharge Valve set @			
VFD set @			
System dP Set Point			

Motor Mfg	
Frame	
HP	
RPM	

	Design	Actual
Amps		
Voltage / Phase		

Remarks:

Pump No.					
Manufacturer					
Model/Size					
Impeller					
Service					
Motor MFG.					
Horsepower					
Frame					
RPM					
Voltage/Phase					
Service Factor					
Rated Amps					
Actual Amps					
Design GPM					
Pump GPM					
Design FT. HD					
Pump FT. HD					
Remarks					

					Design	Delivered		Dial	
Location	Terminal	No.	Type	Size	GPM	GPM	dP	Setting	Remarks
						FT HD			

					Design		Delivered			
Location	Terminal	No.	Type	Size	GPM	dP	GPM	dP	Dial	Remarks
						Inches		Inches		

						Design		Automatic Flow Limiting Valve		
Location	Rm. #	Terminal	No.	Type	Size	GPM	dP	GPM	dP	Remarks
							Range		Actual	
							PSI		PSI	

Date: 1/7/2021

Sheet: Port

Instrument Used: Panametric PT 878 Non-Invasive Ultrasonic Meter

Location	Pipe Size	Material	Schedule	Transducer Space	Design GPM	Actual FPS	Actual GPM	Remarks

Date: 1/7/2021

Sheet: HX

HX #	
Manufacturer	
Model	
Serial Number	
Service	

HX #	
Manufacturer	
Model	
Serial Number	
Service	

Primary	DESIGN	ACTUAL
Ent./Lvg. Water Press		
Water Press. dP (psi)		
Ent./Lvg. Water Temp.		
Water Temp dT		
GPM		

Primary	DESIGN	ACTUAL
Ent./Lvg. Water Press		
Water Press. dP (psi)		
Ent./Lvg. Water Temp.		
Water Temp dT		
GPM		

Secondary	DESIGN	ACTUAL
Ent./Lvg. Water Press		
Water Press. dP (psi)		
Ent./Lvg. Water Temp.		
Water Temp dT		
GPM		

Secondary	DESIGN	ACTUAL
Ent./Lvg. Water Press		
Water Press. dP (psi)		
Ent./Lvg. Water Temp.		
Water Temp dT		
GPM		

Test Conditions:	ACTUAL
Outside Air Temp.	
Remarks:	

Test Conditions:	ACTUAL
Outside Air Temp.	
Remarks:	

Date: 1/7/2021

Sheet: Chiller Report

Chiller #	
Chiller Manufacturer	
Model	
Serial Number	
Capacity	

EVAPORATOR	DESIGN	ACTUAL
Ent./Lvg. Water Press		
Evap. Water Press. dP (psi)		
Ent./Lvg. Water Temp.		
Water Temp dT		
GPM		

CONDENSER	DESIGN	ACTUAL
Ent./Lvg. Water Press		
Cond. Water Press. dP (psi)		
Ent./Lvg. Water Temp.		
Water Temp dT		
GPM		

Test Conditions:	ACTUAL
Outside Air Temp.	
Operating Load	
# of Chillers Running	
Remarks:	

Chiller #	
Chiller Manufacturer	
Model	
Serial Number	
Capacity	

EVAPORATOR	DESIGN	ACTUAL
Ent./Lvg. Water Press		
Evap. Water Press. dP (psi)		
Ent./Lvg. Water Temp.		
Water Temp dT		
GPM		

CONDENSER	DESIGN	ACTUAL
Ent./Lvg. Water Press		
Cond. Water Press. dP (psi)		
Ent./Lvg. Water Temp.		
Water Temp dT		
GPM		

Test Conditions:	ACTUAL
Outside Air Temp.	
Operating Load	
# of Chillers Running	
Remarks:	

CT #	
Manufacturer	
Model	
Serial Number	
Service	

	DESIGN	ACTUAL
GPM		
Ent./Lvg. Water Temp.		
Water Temp dT		

Test Conditions:	ACTUAL
Outside Air Temp.	
Remarks:	

CT #	
Manufacturer	
Model	
Serial Number	
Service	

	DESIGN	ACTUAL
GPM		
Ent./Lvg. Water Temp.		
Water Temp dT		

Test Conditions:	ACTUAL
Outside Air Temp.	
Remarks:	

Date: 1/7/2021

Sheet: Terminal

			Alternate No 1			Alternate No 2			Alternate No 3					
Unit ID	Service	Design GPM	Design Delta P	Ent. Wtr. Pr.	Lvg. Wtr. Pr.	Design Delta T	EWT	LWT	Design Delta T	EAT	LAT	Actual Delta P	Actual Delta T	Remarks

Note: Use one of the above alternate methods

Outside Air Temperature °

Code	Remarks
AS Reqt'd	Final airflow has been adjusted to suit requests of occupants
ABV CLG	Register (ETC) is located above ceiling line
BKN DPR	Volume Damper (VD), Face Damper (OPD), Splitter Damper (SD) is broken/stuck
CC	Ceiling conflict; kinked flex duct causing low flow
DD	Unit is direct drive; no adjustment can be made without a speed controller.
DD on HI	Direct drive fan set to High, medium (MED) or low (LO)
DT	Duct Traverse
DLF	DL Flow Tech Inc.
FACE	Velocity taken at the balance point
HDW MSG	Volume or splitter damper hardware is missing
Inline	Fan is an inline fan; Actual RPM can not be obtained
Long Flex	Flexible duct configuration and length is probable cause for low flow
Locked	No key available at time of balance
Max Flow	Maximum flow achievable
MAN OPN'D	Temporarily opened manually to set
New outlet	Outlet not shown on contract drawing; no CFM given; CFM assigned by DLF
Noisey	Register (ETC) has been set low to reduce objectionable air noise.
NPA	No provision to adjust; requires installation of volume damper / face damper
NI	Outlet not installed
NW	Device not working
TP	Test point location for duct traverse and/or static pressure
PT	Poor take -off / inlet flex to VAV box causing turbulence / probable cause for low flow
RAW	Raw opening -- Ductwork and collar is installed; register (etc.) is missing; tap is balanced high to compensate.
Set High	Set high due to missing register and/or to maintain total room flow (etc).
T'stat REV	The t'stat is reverse or opposite of design
T'stat LOC	T'stat not in area served
VD FO	Volume Dampers are in their maximum open position
VD FC	Volume Dampers are in their full closed position
VAV	Variable air volume box
CAV	Constant Volume Box
FPVAV	Fan powered variable air volume box
Register Types	
CD	Ceiling Diffuser
CR	Ceiling Register
EC	Egg Crate Type register
ER	Exhaust Register
FH	Fume Hood
LD	Linear Diffuser
LT	Light Troffer
WMS	Wire Mesh Screen
TR	Top Register
BR	Bottom Register
RAW	Raw opening
No CC	Flow metering device not installed, temp/pressure differential across elements used to determine flow.
Simulated flow	Where available pump or fan capacity is less than the total flow requirements, flow temporarily restricted to other parts.