



# Synergy Test and Balance

2611 Waterfront Parkway, Ste. 340 | Indianapolis, IN 46214 | Tel. (317) 222-1828

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## Company Information and Qualifications



2611 Waterfront Parkway, Suite 340  
Indianapolis, IN 46214  
[www.synergycab.com](http://www.synergycab.com)

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# Synergy Test and Balance

## Company Information and Qualifications

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# Synergy Test and Balance

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## **Introduction**

Synergy Test and Balance was formed in 2011 to provide independent, third party Test and Balance services. From then until 2012 we balanced 14 projects and established a portfolio of work allowing us to apply for certification through the Associated Air Balance Council (AABC), which we successfully completed in 2013. To date we have balanced over 300 projects.

The TAB experience of our personnel goes much deeper than Synergy's corporate history. Cheryl Yates' association with the Test and Balance field goes back many years. More recently she has focused on finance and business development and has now combined that experience with her engineering background to become president of Synergy Test and Balance. As can be seen in our staff resumes Todd Yates and Glenn Miller Jr. have combined TAB experience of nearly 60 years prior to the founding of Synergy Test and Balance. They have balanced some of the most complex facilities in the region, as well as many smaller projects. With this background we can provide a full range of Test and Balance services including:

- Test and Balance for Air systems
- Test and Balance for Hydronic systems
- Duct leakage testing
- Sound testing
- Vibration testing

We provide TAB services in Indiana, Kentucky, Tennessee, West Virginia and the surrounding areas.

## **Contact Information**

Our office is located at 2611 Waterfront Parkway, Suite 340 in Indianapolis, IN.

Contact:

Cheryl Yates, President  
[Cheryl@synergycab.com](mailto:Cheryl@synergycab.com)  
Office: 317 222-1828  
Fax: 317 451-8079  
[www.synergycab.com](http://www.synergycab.com)



**Associated Air Balance Council**

## *Annual Membership Certificate*

*Awarded to*

**Synergy Test and Balance, Inc.**

*as a member in good standing of the Associated Air Balance Council for the year*

**2020**

*This member has met all requirements for membership and is entitled to all rights and privileges of AABC certification. This certificate is renewable on an annual basis and expires December 31, 2020.*



Benjiman J. Link, *President*

Raymond R. Bert, *Executive Director*





## **Associated Air Balance Council**

### **Annual Certificate**

*Awarded to*

**Glenn Miller**

**Synergy Test and Balance, Inc.**

*In recognition of his qualifications as a*

***Certified Test and Balance Engineer***

*under the rules, regulations, and requirements of the Associated Air Balance Council. The above named is fully authorized to perform total system balance in accordance with the standards as established by the AABC and as a member of the Associated Air Balance Council for the year*

**2020**

*This registration number **13-04-38** is fully recognized by the bylaws and charter of this professional association. Certification is renewable on an annual basis after examination of the agency's record for the preceding year. This certificate expires December 31, 2020.*



Benjiman J. Link, President

Raymond R. Bert, Executive Director



## **Associated Air Balance Council**

### **Annual Certificate**

*Awarded to*

**V. Todd Yates**

**Synergy Test and Balance, Inc.**

*In recognition of his qualifications as a*

***Certified Test and Balance Engineer***

*under the rules, regulations, and requirements of the Associated Air Balance Council. The above named is fully authorized to perform total system balance in accordance with the standards as established by the AABC and as a member of the Associated Air Balance Council for the year*

**2020**

*This registration number **97-06-34** is fully recognized by the bylaws and charter of this professional association. Certification is renewable on an annual basis after examination of the agency's record for the preceding year. This certificate expires December 31, 2020.*



Benjiman J. Link, President

Raymond R. Bert, Executive Director



**Associated Air Balance Council**

*hereby certifies that*

**Todd Miller**

*has met all requirements and passed the necessary examination  
to perform testing and balancing as an AABC*

*Certified Test & Balance Technician*

*under the supervision of a certified test and balance engineer for*

**Synergy Test and Balance, Inc.**

*This registration number 05-02-19 is only recognized under the  
auspices of the above named AABC member agency. This certificate  
expires December 31, 2020 and is renewable on an annual basis.*

Benjiman J. Link, President

Raymond R. Bert, Executive Director



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## Cheryl Yates, President

### **EDUCATION**

BSME, University of Kentucky  
Masters in Math Education, University of Kentucky

### **INDUSTRY EXPERIENCE BEGINNING** 1992

### **CERTIFICATIONS**

Engineer in Training (EIT)

### **AFFILIATIONS**

Associated Air Balance Council (AABC)  
AABC Commissioning Group (ACG)  
American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)  
United States Green Building Council (USGBC)

### **EXPERIENCE**

Facility Commissioning Group, Inc. (2008 – Present)  
Synergy Test and Balance, Inc. Indianapolis, IN (2011-Present)

Hardin County School District – North Middle School  
Defense Supply Center Columbus – Building #20  
Indianapolis Public Schools – Floro Torrence Elementary School #83  
Kentucky Community and Technical College System  
Franklin County Public School – Franklin County Alternative School  
VAMC Louisville Robley Rex – Construct Chilled Water Distribution  
Indianapolis Public Schools – Thomas A. Edison Key Learning Community School #47  
Indianapolis Public Schools – Charles Warren Fairbanks Elementary School #105  
Indianapolis Public Schools – Arlington Woods Elementary School #99  
Indianapolis Public Schools – Ralph Waldo Emerson Elementary School #58  
Indianapolis Public Schools – Ernie Pyle Elementary School #90  
Indianapolis Public Schools – Margaret McFarland Middle School #112  
Ameresco – Kentucky Horse Park Visitor Center & Museum Assessments



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## Glenn Miller, Jr., Vice President

**EDUCATION** AAS, Paducah Community College, Studies at MSU

**INDUSTRY EXPERIENCE BEGINNING** 1991

### **CERTIFICATIONS/TRAINING**

AABC Test and Balance Technician (TBT) #12-06-03 (2003-2011)  
AABC Test and Balance Engineer (TBE) #13-04-38  
ACG Commissioning Authority (CxA) #1214-1254  
OSHA 10 Hour and 30 Hour Occupational Safety and Health  
USEC/HAZMAT Training (24 Hours)  
NES/Operator Training (Scissor Lift and Boom Lift)

### **AFFILIATIONS**

Associated Air Balance Council (AABC)  
AABC Commissioning Group (ACG)  
United States Green Building Council (USGBC)

### **EXPERIENCE**

Thermal Balance, Inc. Lexington, KY (1991-2011)  
Facility Commissioning Group, Inc. Lexington, KY (2011-Present)  
Synergy Test and Balance, Inc. Indianapolis, IN (2011-Present)

Hardin County School District – North Middle School  
Defense Supply Center Columbus – Building #20  
Floro Torrence Elementary School #83  
Kentucky Community and Technical College System  
Franklin County Public School – Franklin County Alternative School  
VAMC Louisville Robley Rex – Construct Chilled Water Distribution  
Thomas A. Edison Key Learning Community School #47  
Charles Warren Fairbanks Elementary School #105  
Arlington Woods Elementary School #99  
Ralph Waldo Emerson Elementary School #58  
Ernie Pyle Elementary School #90  
Margaret McFarland Middle School #112  
Ameresco – Kentucky Horse Park Visitor Center & Museum Assessments





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## V. Todd Yates

**EDUCATION** BSME, University of Kentucky

**INDUSTRY EXPERIENCE BEGINNING** 1991

**CERTIFICATIONS**

PE in the Commonwealth of Kentucky #20447  
PE in the State of Tennessee #001906392  
PE in the State of Indiana #PE10001131  
PE in the State of Alabama #27716-E  
AABC Test and Balance Engineer (TBE) #97-06-34  
ACG Commissioning Authority (CxA) #1004-042  
USGBC LEED Accredited Professional, LEED AP BD+C

**AFFILIATIONS**

Associated Air Balance Council (AABC)  
AABC Commissioning Group (ACG)  
American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)  
United States Green Building Council (USGBC)

**EXPERIENCE**

Thermal Balance, Inc. Lexington, KY (1992-2008)  
Facility Commissioning Group, Inc. Lexington, KY (1999-Present)  
Synergy Test and Balance, Inc. Indianapolis, IN (2011-Present)

Floro Torrence Elementary School #83  
Thomas A. Edison Key Learning Community School #47  
Arlington Woods Elementary School #99  
Ralph Waldo Emerson Elementary School #58  
Ernie Pyle Elementary School #90  
Margaret McFarland Middle School #112  
Bartholomew Consolidated School Corporation – Columbus East and North High Schools  
Purdue University – Lilly Hall Phases V, VI and VII  
Purdue University – Marriott Hall  
Purdue University – Roger B. Gatewood Mechanical Engineering Building  
Jonathan Jennings Elementary School #109  
Lexmark Buildings 32 and 35 TAB  
UK Anderson Tower Lab  
IUPUI – Neuroscience Research Building  
IU Health – Neuroscience Center of Excellence  
IUB – Jacobs School of Music East Studio Building



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## Todd Miller

**EDUCATION** Associate Degree in Arts, West Kentucky Community & Technical College  
Graduate, Universal Technical Institute

**INDUSTRY EXPERIENCE BEGINNING** 2016

**CERTIFICATIONS/TRAINING**

AABC Test and Balance Technician (TBT) #05-02-19  
OSHA 10 Hour Occupational Safety and Health

**EXPERIENCE**

Facility Commissioning Group, Inc. Lexington, KY (2016-Present)  
Synergy Test and Balance, Inc. Indianapolis, IN (2016-Present)

Bullitt County Public Schools – Maryville Elementary School, Shepherdsville, KY  
Bullitt County Public Schools – Mt. Washington Elementary School, Shepherdsville, KY  
Danville Public Library – Additions and Renovations, Danville, IN  
Fort Campbell – Blanchfield Army Community Hospital Repair/Renwal OR/SPD/SDS, Fort Campbell, KY  
Fort Knox – Buildings 1474, 1475, 2373 and 2374, Fort Knox, KY  
Hancock County Schools – Hancock County High School, Hancock, IN  
Hyatt Place – Bowling Green, Bowling Green, KY  
Indiana University Bloomington – Assembly Hall Mark Cuban Center, Bloomington, IN  
Indiana University Bloomington – Swain East/West Renovation BP#2, Bloomington, IN  
Jefferson County Public Schools – Waggener High School Renovation Phase 1, Louisville, KY  
Jefferson County Public Schools – YPAS HVAC Renovation & Elevator Addition, Louisville, KY  
Madison County Public Library – Richmond Branch Addition and Renovation, Richmond, KY  
Oldham County Schools – Camden Station Elementary School, Crestwood, KY  
Scott County Schools – Great Crossing High School, Georgetown, KY  
Scott County Schools – Creekside Elementary School, Georgetown, KY  
Toyota of Bowling Green, Bowling Green, KY  
Tru by Hilton Hotel – Brooks, KY  
United Healthcare – Tenant Improvements, Indianapolis, IN  
University of Louisville – Physicians Pediatric Ambulatory Care Center, Lexington, KY  
VAMC Lexington – 5th Floor Main Addition, Lexington, KY  
Vincennes Community Schools – Vigo Elementary School Renovation, Vincennes, IN  
Warrick County School Corporation – Tecumseh Middle and High School, Warrick, IN  
Western Kentucky University – Hilltopper Hall, Bowling Green, KY



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## Jeremy VanLue

**EDUCATION** Area 31 Career Center HVAC

**INDUSTRY EXPERIENCE BEGINNING** 2001

**CERTIFICATIONS/TRAINING**

Type Universal Certification #2192624 with the Air-Conditioning & Refrigeration Institute

Certified Technician with Control Solutions/Cinergy, Inc.

Certified Technician with Tridium, Inc.

Certified Technician with Honeywell, Inc.

NEBB Technician Training

OSHA 10 Hour Occupational Safety and Health

**EXPERIENCE**

Facility Commissioning Group, Inc. Lexington, KY (2018-Present)

Synergy Test and Balance, Inc. Indianapolis, IN (2018-Present)

Brownsburg High School Renovation and Addition

Indiana University Bloomington - Foster Quadrangle Residence Hall Renovation

Indiana University Bloomington - Swain East and West Renovations BP#2

Indiana University Bloomington - Ernie Pyle Hall Renovation

Indiana University Bloomington - Auxiliary Library Facility Expansion #3

Ivy Tech Community College - Glick Technology Center HVAC Upgrades

MSD of Washington Township - Eastwood Middle School

Selah House Phase 1

VAMC Indianapolis - Expand Specialty Care

West Lafayette Community School Corporation - New Elementary School



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## Corey Thomasson

### **EDUCATION**

Redland High School, Paducah, KY

### **INDUSTRY EXPERIENCE BEGINNING 2017**

### **EXPERIENCE**

Facility Commissioning Group, Inc. Lexington, KY (2017-Present)

Synergy Test and Balance, Inc. Indianapolis, IN (2017-Present)

CFSB – Southside Banking Center, Paducah, KY

Crane Buiding 2540 Renovation, Crane, IN

Crane Building 41, Crane, IN

Fort Campbell – Blanchfield Army Community Hospital Repair/Renwal OR/SPD/SDS, Fort Campbell, KY

Humana Conference Center – Second Floor Renovation, Louisville, KY

Greenwood Community School Corporation – Greenwood Middle School, Greenwood, IN

Jefferson County Public Schools – Medora Elementary School HVAC Renovations, Louisville, KY

Jefferson County Public Schools – Waggener High School Renovation Phase 1, Louisville, KY

Laurel County Correctional Center, London, KY

Madison County Public Library – Richmond Branch Addition and Renovation, Richmond, KY

Oldham County Schools – Camden Station Elementary School, Crestwood, KY

Powell County Detention Center, Stanton, KY

Rockcastle High School – HVAC/Roof Replacement, Mt. Vernon, KY

Scott County Schools – Great Crossing High School, Georgetown, KY

Scott County Schools – Performance Contract – Eastern Elementary and High School, Georgetown, KY

Western Kentucky University – Hilltopper Hall, Bowling Green, KY

West Lafayette Community School Corporation – New Elementary School, West Lafayette, IN

United Healthcare – Tenant Improvements, Indianapolis, IN

University of Louisville – Physicians Pediatric Ambulatory Care Center, Lexington, KY

Vincennes Community Schools – Vigo Elementary School Renovation, Vincennes, IN



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## Shane Catron

### **EDUCATION**

BS Telecommunications, University of Kentucky  
AA, Bluegrass Community & Technical College

### **INDUSTRY EXPERIENCE BEGINNING 2011**

### **CERTIFICATIONS/TRAINING**

Kentucky Electrical License #EE64580  
OSHA 10 Hour Occupational Safety and Health

### **EXPERIENCE**

Facility Commissioning Group, Inc. Lexington, KY (2016-Present)  
Synergy Test and Balance, Inc. Indianapolis, IN (2016-Present)

Brownsburg High School – Renovation and Addition, Brownsburg, IN  
Bullitt County Public Schools – Maryville Elementary School, Shepherdsville, KY  
Bullitt County Public Schools – Mt. Washington Elementary School, Shepherdsville, KY  
Clark County Public Schools – Gym and Athletic Complex, Winchester, KY  
Greenwood Community School Corporation – Greenwood Middle School, Greenwood, IN  
Jefferson County Public Schools – YPAS HVAC Renovation & Elevator Addition, Louisville, KY  
KCTCS – Southeast Kentucky Career & Technical Center – New Education Alliance Center  
Laurel County Correctional Center, London, KY  
MSD Lawrence Township – Harrison Hill Elementary School, Indianapolis, IN  
Oldham County Detention Center, LaGrange, KY  
Owen County Lower Elementary School, Owentown, KY  
Powell County Detention Center, Stanton, KY  
Scott County Schools – Great Crossing High School, Winchester, KY  
University of Kentucky – Cancer Services Improve Clinical/Ambulatory Services, Lexington, KY  
University of Kentucky – College of Medicine Library Renovation, Lexington, KY  
University of Kentucky – Improve Clinical/Ambulatory Services Brachytherapy, Lexington, KY  
University of Kentucky – Neonatal Intensive Care Unit – PEDS ENDO/PICU, Lexington, KY  
University of Kentucky – Pavilion A 11<sup>th</sup> Floor, Lexington, KY  
University of Louisville – Physicians Pediatric Ambulatory Care Center, Lexington, KY  
VAMC Lexington – 5th Floor Main Addition, Lexington, KY  
VAMC James H. Quillen – Building 8 Renovation, Johnson City, TN  
Washington County Courts – Additions and Renovations, Salem, IN  
West Lafayette Community School Corporation – New Elementary School, West Lafayette, IN





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## Tim Blubaugh

**INDUSTRY EXPERIENCE BEGINNING** 2019

### **EXPERIENCE**

Facility Commissioning Group, Inc. Lexington, KY (2019-Present)

Synergy Test and Balance, Inc. Indianapolis, IN (2019-Present)

Ball State University - VSTOP & Immersive Learning Office Suite, Muncie, IN

Banker's Life Fieldhouse - Expansion Project, Indianapolis, IN

Brownsburg High School – Renovation and Addition, Brownsburg, IN

Crane Building 143 - Office Renovations, Crane, IN

Friendship House Connector Building Addition Phase #2, West Lafayette, IN

Hamilton North Public Library - Renovation and Expansion, Cicero, IN

Hendricks Regional Health - Avon Campus Survey, Danville, IN

Indiana State Police Post - HVAC Renovation, Pendleton, IN

Miami Correctional Facility - Medium G and J Housing RTU Replacement, Fulton, IN

MSD of Warren Township - Lowell Elementary School Additions & Renovations, Indianapolis, IN

Tippecanoe County Courthouse - 5th Floor HVAC Renovation, Lafayette, IN

USPS Bedford, IN - HVAC Upgrade, Bedford, IN

Wayne Township Fire Station No. 15, Indianapolis, IN

# Synergy Test and Balance Overall Projects List



2611 Waterfront Parkway, Suite 340

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Phone (317) 222-1828

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#	Project Name	Location
1	Hardin County School District - North Middle School	Radcliff, KY
2	Defense Supply Center Columbus - Building #20	Columbus, OH
3	Floro Torrence Elementary School #83	Indianapolis, IN
4	Kentucky Community and Technical College System	Versailles, KY
5	Franklin County Public School - Franklin County Alternative School	Frankfort, KY
6	VAMC Louisville Robley Rex - Construct Chilled Water Distribution	Louisville, KY
7	Thomas A. Edison Key Learning Community School #47	Indianapolis, IN
8	Charles Warren Fairbanks Elementary School #105	Indianapolis, IN
9	Arlington Woods Elementary School #99	Indianapolis, IN
10	Ralph Waldo Emerson Elementary School #58	Indianapolis, IN
11	Ernie Pyle Elementary School #90	Indianapolis, IN
12	Margaret McFarland Middle School #112	Indianapolis, IN
13	Ameresco - Kentucky Horse Park Visitor Center & Museum Assessments	Lexington, KY
14	Lew Wallace Elementary School #107	Indianapolis, IN
15	Theodore Potter Elementary School #74	Indianapolis, IN
16	Ashland Community and Technical College - Goodpaster Building TAB Work	Ashland, KY
17	Washington Irving Elementary School #14	Indianapolis, IN
18	Lexmark Buildings 32 & 35 TAB	Lexington, KY
19	University of Kentucky - Anderson Tower Lab 012	Lexington, KY
20	Lexmark Building 32 - Room 8-E-2-3	Lexington, KY
21	Elizabethtown Community & Technical College AHU TAB	Elizabethtown, KY
22	Carlisle County Middle School - 2014 Gym Reno	Bardwell, KY
23	BCSC - Columbus North High School Unit Ventilators	Columbus, IN
24	LCBE - Livingston County Middle School	Burna, KY
25	Park Plaza - Mariah's Restaurant	Bowling Green, KY
26	Park Plaza - Pagoda Asian Café	Bowling Green, KY
27	Park Plaza - Tres Molinos Mexican Grille	Bowling Green, KY
28	Park Plaza - 6-4-3 Sports Bar	Bowling Green, KY
29	Park Plaza - Brick & Basil Pizzeria	Bowling Green, KY
30	Crane Building 3173	Crane, IN
31	Crane Building 3168 Option 1a	Crane, IN
32	Crane Building 3168 Option 1b	Crane, IN
33	Crane Building 3168 Option 1c	Crane, IN
34	AJ Properties	Bowling Green, KY
35	VAMC - Memphis Building 1A	Memphis, TN
36	Indian Hills Christian Church	Danville, KY

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#	Project Name	Location
37	Lexmark Fumehoods Project #14440	Lexington, KY
38	MCBE - South Marshall Middle School	Benton, KY
39	VAMC - 5th Floor Main Addition	Lexington, KY
40	Henderson Community College - Welding Lab Relocation	Henderson, KY
41	PETSENSE #363	Hopkinsville, KY
42	Marshall County High School - Freshman Wing Air Handler Replacement	Benton, KY
43	WKU-USDA Food Animal Environmental System Offices/Labs	Bowling Green, KY
44	Western Baptist Hospital - Doctors Office Building #3	Paducah, KY
45	BKD -Office Finish Out	Bowling Green, KY
46	ITCC - Lawrenceburg Campus Addition/Renovation	Lawrenceburg, IN
47	LFUCG - Community Action Center Reroof	Lexington, KY
48	LFUCG - Coroner Office Reroof	Lexington, KY
49	Fort Campbell - Blanchfield Army Community Hospital Repair/Renewal OR/SPD/SDS	Fort Campbell, KY
50	GE Aviation	Lafayette, IN
51	Store-It-All	Owensboro, KY
52	VAMC - Renovate Research Building 19	Louisville, KY
53	Jackson Purchase Medical Center - MOB 3rd Floor	Mayfield, KY
54	UK - Patterson Hall	Lexington, KY
55	Bowling Green Metalforming - Kitchen-Cafeteria Expansion	Bowling Green, KY
56	Grissom Air Reserve Base - Renovate Fuel Vehicle Maintenance B421	Grissom ARB, IN
57	Greenwood Community School Corporation - Greenwood Middle School	Greenwood, IN
58	Todd County Career Path Institute - New Facility	Elkton, KY
59	James H. Quillen VAMC Renovate Building 8	Mountain Home, TN
60	VAMC AHU Upgrades Phase 4	Louisville, KY
61	Alcoa Plant 2 AHU TAB	Laporte, IN
62	Murray Sate University - Waterfield Library	Murray, KY
63	Meijer Owensboro Store #288	Owensboro, KY
64	IMS Hulman Terrace Renovation	Indianapolis, IN
65	Jefferson County Public Schools - Greenwood Elementary School	Louisville, KY
66	Mammoth Cave National Park - Renovate and Rehabilitate Systems - Mammoth Cave Hotel	Mammoth Cave, KY
67	VAMC 7 North Halls and Walls	Louisville, KY
68	Bradie M. Shrum Lower Elementary School - HVAC Renovations	Salem, IN

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#	Project Name	Location
69	Danville Public Library - Additions and Renovations	Danville, IN
70	Springs Valley Community Schools - Main Gym VRF HVAC	French Lick, IN
71	Community Schools of Frankfort - Frankfort High School Additions/Renovations	Frankfort, IN
72	Union County Schools - HVAC Projects	Union County (mult)
73	Fort Campbell - High School	Fort Campbell, KY
74	Bullitt County Public Schools - Mt. Washington Elementary School Additions and Renovations	Mt. Washington, KY
75	North Lawrence Community Schools - 2016 HVAC Improvements	Bedford, IN
76	Jefferson County Public Schools - YPAS HVAC Renovation & Elevator Addition	Louisville, KY
77	Oldham County Detention Center	LaGrange, KY
78	Lutheran Hospital - Lutheran Orthopedic & Spine Center - Operating Rooms	Fort Wayne, IN
79	Washington County Courts - Additions and Renovations	Salem, IN
80	Indiana University Bloomington - Informations & Computing Building Luddy Hall	Bloomington, IN
81	Walton Verona - Elementary School - Renovation	Walton, KY
82	Kroger Store #E783	Ashland, KY
83	Indiana University Bloomington - Assembly Hall Mark Cuban Center	Bloomington, IN
84	Warrick County School Corporation - Tecumseh Middle and High School	Lynnville, IN
85	Lincoln Village Youth Development Center	Elizabethtown, KY
86	Terre Haute Regional Hospital - Power Distribution Systems Upgrade	Terre Haute, IN
87	Bullitt County Public Schools - Maryville Elementary School Addition and Renovation	Louisville, KY
88	University of Kentucky - Neonatal Intensive Care Unit	Lexington, KY
89	Hyatt Place - Bowling Green	Bowling Green, KY
90	Arby's Restaurant - Benton	Benton, KY
91	Grissom Air Reserve Base - Renovate Maintenance Union and Logistics Facility B670	Grissom ARB, IN
92	University of Kentucky - Pavilion A 11th Floor	Lexington, KY
93	University of Kentucky - Anderson Tower Material Science Lab Survey	Lexington, KY
94	United Healthcare - Tenant Improvements	Indianapolis, IN
95	Toyota of Bowling Green	Bowling Green, KY
96	Crane Building 41	Crane, IN

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#	Project Name	Location
97	Meijer Richmond Store #155	Richmond, IN
98	Jefferson County Public Schools - Medora Elementary School HVAC Renovation	Louisville, KY
99	CFSB - Southside Banking Center	Paducah, KY
100	Hopkinsville Retail - Tenant Improvements	Hopkinsville, KY
101	University of Louisville - Physicians Pediatric Ambulatory Care Center	Louisville, KY
102	Boone County Schools - Central Office Annex Building	Hebron, KY
103	Humana Conference Center - 2nd Floor Renovation	Louisville, KY
104	Crane Building 2540 Renovation	Crane, IN
105	Indiana University Bloomington - Quadrangle Residence Hall Renovation	Bloomington, IN
106	Jac-Cen-Del Community School Corporation - Jac-Cen-Del Elementary School Renovation	Osgood, IN
107	Owen County Lower Elementary School Renovation and Addition	Owenton, KY
108	The Heritage Group - The Center	Indianapolis, IN
109	MSD Lawrence Township - Harrison Hill Elementary School Renovations and Addition	Indianapolis, IN
110	West Lafayette Community School Corporation - New Elementary School	West Lafayette, IN
111	Hart County Public Library	Munfordville, KY
112	University of Kentucky - Memorial Coliseum Locker Room Renovation	Lexington, KY
113	Indiana University Bloomington - Swain East and West Renovations BP#2	Bloomington, IN
114	Western Kentucky University - Hugh Poland Hall - Air Survey	Bowling Green, KY
115	Powell County Detention Center	Stanton, KY
116	John Hardin High School - Athletic Facilities	Elizabethtown, KY
117	Indiana University Bloomington - Ernie Pyle Hall Renovation	Bloomington, IN
118	Scott County Schools - Great Crossing High School	Georgetown, KY
119	Brownsburg High School Renovation and Addition	Brownsburg, IN
120	Indiana University Bloomington - Auxiliary Library Facility Expansion #3	Bloomington, IN
121	Catalent Pharma Solutions - Suites 1010 and 1011	Winchester, KY
122	Blue Iguana Car Wash	Louisville, KY
123	Biolife Plasma Services 2017 Retrofit	Kokomo, IN
124	Asahi Bluegrass Forge - Water Distribution	Richmond, KY
125	Star Bank Carmel - Branch Remodel	Carmel, IN



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#	Project Name	Location
126	Jefferson County Public Schools - Waggener High School Phase 1 HVAC Renovation	Louisville, KY
127	Greater Lafayette Commerce Renovation	Lafayette, IN
128	University of Kentucky - College of Medicine Library Renovation	Lexington, KY
129	Fresenius Kidney Care - Pleasure Ridge Park	Louisville, KY
130	Murray State University - Test and Balance Services MUR- 240B-18	Murray, KY
131	Western Kentucky University - Hilltopper Hall	Bowling Green, KY
132	Community Schools of Frankfort - Frankfort High School Additions/Renovations Phase 2	Frankfort, IN
133	University of Kentucky - Improve Clinical/Ambulatory Services	Lexington, KY
134	Christian County Kentucky Farm Bureau	Hopkinsville, KY
135	Norton Cancer Institute - OBC Cancer Center AHU's	Louisville, KY
136	University of Kentucky - Funkhouser 210 Kitchen Renovation	Lexington, KY
137	Tru by Hilton Hotel - Bowling Green	Bowling Green, KY
138	Blue Grass Airport Rental Car Facilities	Lexington, KY
139	Frazier Museum - CUBE and Park Project	Louisville, KY
140	Frazier Museum - KY Bourbon Trail Experience 3rd Floor Fit-	Louisville, KY
141	Estron Chemical - New Laboratory Facility	Calvert City, KY
142	Glenn Ridge Health Campus	Louisville, KY
143	Mission BBQ Clarksville	Clarksville, IN
144	Decatur County Sheriff's Office and Detention Center	Greensburg, IN
145	Lake Forest Village Retirement Community	Louisville, KY
146	Audubon Hospital Endo Room 005	Louisville, KY
147	Bennett and Bloom Eye Care Centers - Clinic Build Out	Louisville, KY
148	SugarCreek - Hall 3 Survey	Cambridge City, IN
149	Build A Bear Workshop - Paddock Shops Louisville	Louisville, KY
150	Rockcastle High School HVAC/Roof Replacement	Mt. Vernon, KY
151	Hancock County Schools - Hancock County High School	Lewisport, KY
152	Catalent Pharma Solutions - 1012 Fluid Bed Dryer	Winchester, KY
153	Sonic Drive-In Store #4440	Nicholasville, KY
154	Northside Baptist Church	Almo, KY
155	Shogun Restaurant Build-Out	Owensboro, KY
156	Tractor Supply Company - Elizabethtown	Elizabethtown, KY
157	Kenton County School District - Hinsdale Elementary School Secure Entry Addition Phase 1	Edgewood, KY
158	Jefferson County Public Schools - Eastern High School Concession Building	Louisville, KY

# Synergy Test and Balance Overall Projects List



2611 Waterfront Parkway, Suite 340

Indianapolis IN 46214

Phone (317) 222-1828

Fax (317) 451-8079

#	Project Name	Location
159	University of Kentucky - Neonatal Intensive Care Unit - BP-5 PEDS ENDO/PICU	Lexington, KY
160	Davis Drug Compounding Rooms	Paducah, KY
161	Vickery Rose Retirement Community	Roswell, GA
162	Norton Children's Hospital - 3rd Floor NICU East Renovation	Louisville, KY
163	Flaherty & Collins - Bliss Artisan Build-Out	New Albany, IN
164	Home 2 Suites by Hilton Hotel - Clarksville	Clarksville, IN
165	Tru by Hilton Hotel - Brooks	Brooks, KY
166	KCTCS - Southeast Kentucky C&TC - New Education Alliance Center	Middlesboro, KY
167	VAMC Indianapolis - Expand Specialty Care	Indianapolis, IN
168	Monticello Bank - Glasgow	Glasgow, KY
169	Boone National Guard Center - Wellman Armory Interior Renovation	Frankfort, KY
170	Zaxby's - Shepherdsville	Shepherdsville, KY
171	Paducah Public Schools - Paducah Innovation Hub	Paducah, KY
172	Kirklands - Middletown Commons	Louisville, KY
173	Louisville Jefferson County Metro Government - Fire Department Headquarters Ph.1 Renovation	Louisville, KY
174	Southern Recycling	Bowling Green, KY
175	Ivy Tech Community College - Glick Technology Center HVAC Upgrades	Indianapolis, IN
176	US Lexington Armed Forces Reserve Center - KY043 HVAC-Plumbing Resets	Lexington, KY
177	Best Western Plus - Clarksville	Clarksville, IN
178	North Spencer School Corporation - New Administration	Lincoln City, IN
179	Life Stance - Springhurst Plaza	Louisville, KY
180	Wing-Stop Louisville	Louisville, KY
181	Oliver Winery Production Facility Phase 1	Marion, IN
182	Hendricks Regional Health YMCA	Avon, IN
183	Spencer County Public Schools - Spencer County High School Academic and Athletics Buildings	Taylorsville, KY
184	Carpenters Christian Church	Harrodsburg, KY
185	Staybridge Suites (#19131)	Louisville, KY
186	KY Soybean Promotion Board - Office Building	Princeton, KY
187	Reidland Farley - Fire Station	Reidland, KY
188	RiverPark Place III	Louisville, KY
189	Jefferson County Public Schools - Dupont Manual High School Phase 1 HVAC Renovation	Louisville, KY

# Synergy Test and Balance Overall Projects List



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Indianapolis IN 46214

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#	Project Name	Location
190	Commonwealth Bank & Trust - St. Matthews Branch Renovation	Louisville, KY
191	Tractor Supply Company - Benton	Benton, KY
192	Holiday Inn Express - Hopkinsville	Hopkinsville, KY
193	Selah House Phase 1 Remodel	Anderson, IN
194	MSD of Washington Township - Eastwood Middle School	Indianapolis, IN
195	University of Kentucky - Transformer Vault H10053	Lexington, KY
196	Home 2 Suites by Hilton Hotel - Lexington	Lexington, KY
197	Lyric at Norton Commons Garage	Prospect, KY
198	Indiana University Bloomington - Wright Quad Dining Room 100	Prospect, KY
199	Brownsburg Community School Corporation - 2019 Summer Projects	Brownsburg, IN
200	University of Kentucky - Alpha Gamma Rho Fraternity	Lexington, KY
201	Indiana University Bloomington - Multidisciplinary Eng and Sci Hall Drone Lab Renovation	Bloomington, IN
202	North Daviess Community Schools - North Daviess High School Renovations	Elnora, IN
203	Rockcastle Regional Hospital - Dental Office	Mt. Vernon, KY
204	Jefferson County Public Schools - Iroquois High School Culinary Arts Renovation	Louisville, KY
205	The Heritage Group - The Center Fume Hood	Indianapolis, IN
206	Harbor Freight Tools - Hopkinsville	Hopkinsville, KY
207	Oldham County Schools - Camden Station Elementary School	Crestwood, KY
208	Magoffin County Public Library	Sayerlsville, KY
209	Which Wich Superior Sandwiches Store #684	New Albany, IN
210	Johnston & Murphy - Fayette Mall	Lexington, KY
211	Russell Neighborhood Health Center - Park Duvalle Community Health Clinic	Louisville, KY
212	Bullitt County Public Library - Nichols Branch Library	West Point, KY
213	East Bernstadt Middle School and Library Renovations	East Bernstadt, KY

# Synergy Test and Balance Overall Projects List



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#	Project Name	Location
214	Monroe County CSC - Binford Elementary School Chiller Replacement	Bloomington, IN
215	Greater Clark County Schools - New Downtown Elementary School	Jeffersonville, IN
216	Crane Building 143 - Office Renovations	Crane, IN
217	Vincennes Community Schools - Vigo Elementary School Renovation	Jeffersonville, IN
218	Woodford Reserve Distillery - Tract III Barrel Warehouses 303/304	Midway, KY
219	Louisville International Airport - Ticketing Level 2 – Pre-Test Readings	Louisville, KY
220	Rivergreen Water Recycling - Wastewater Treatment and Receiving Facility Phase 1	Louisville, KY
221	University of Kentucky - Sanders Brown 216 Cold Room	Lexington, KY
222	Tippecanoe County Courthouse - 5th Floor HVAC Renovation	Lafayette, IN
223	Hamilton North Public Library - Renovation and Expansion	Cicero, IN
224	City of Versailles - Versailles Police Department Facility	Versailles, KY
225	Ross Dress for Less - Paducah	Paducah, KY
226	Murray State University - Alexander Hall Boiler Replacement	Paducah, KY
227	TriCo WRRF Pretreatment Building 1	Zionsville, IN
228	Saint Joseph East Hospital - OR/PACU Survey	Lexington, KY
229	Cass County Sheriff Office - Addition and Renovation Phase 1	Logansport, IN
230	Polo Club at Hamburg Place	Lexington, KY
231	CVS - #06700	Sullivan, IN
232	University of Kentucky - Pavilion A - Interventional Services Fitup	Lexington, KY
233	Pagliai's Pizza	Princeton, KY

# Synergy Test and Balance Overall Projects List



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#	Project Name	Location
234	McCracken County Board of Education - Lone Oak Middle School	Paducah, KY
235	Fort Knox - Buildings 1474, 1475, 2373 and 2374	Fort Knox, KY
236	Concord Community Schools - Concord Beickman Performing Arts Center	Concord, IN
237	Alexandria Community School Corporation Monroe Schools	Alexandria, IN
238	Beecher Terrace Lifelong Wellness Building Phase 1	Louisville, KY
239	Monroe County Community School Corp. - Tri-North Middle School	Bloomington, IN
240	Marshall County Schools - Bus Garage	Benton, KY
241	First Savings Bank - North Shore Building	Jeffersonville, IN
242	Miami Correctional Facility - Medium J Housing RTU Replacement	Fulton, IN
243	University of Kentucky - Gluck Equine Research Building Suite 406 Renovation	Lexington, KY
244	University of Kentucky - Cancer Services Improve Clinical/Ambulatory Services	Lexington, KY
245	University of Kentucky - Kentucky Clinic Pharmacy Renovation	Lexington, KY
246	Bracken County Middle School - Concession/Restroom Addition	Brooksville, KY
247	LFUCG - Bell House Replacement of Hydronic Fan Coil Units	Lexington, KY
248	Brown-Forman - New Security Operations Center Howard Building	Louisville, KY
249	First and Farmers National Bank	Somerset, KY
250	MCCSC Broadview Learning Center Boiler Replacement	Bloomington, IN
251	LFUCG - Fire Station No. 24	Lexington, KY
252	Fort Knox Jordan Dental Clinic Building 2724 Renovation	Fort Knox, KY
253	Madison County Public Library - Richmond Branch Addition and Renovation	Richmond, KY



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#	Project Name	Location
254	Club Champion Golf	Louisville, KY
255	Central State Hospital Bingham Building – Decomp and Autopsy	Louisville, KY
256	Department of Criminal Justice Training - Chiller Funderburk HVAC Replacement	Richmond, KY
257	Wolfe County Board of Education - Wolfe County Middle School HVAC Renovation	Campton, KY
258	St. Patrick Church - St. Patrick School Renovation Phase 1	Louisville, KY
259	Scott County - Performance Contract - Eastern Elementary and High School	Georgetown, KY
260	Nothing Bundt Cakes - Louisville	Louisville, KY
261	Taylor County Justice Center - DOAS Replacement and Controls Upgrade	Campbellsville, KY
262	Scott County Board of Education - Creekside Elementary School	Georgetown, KY
263	Qualitus Pharma Solutions - Hyderabad	South Bend, IN
264	MCCSC - University Elementary School Boiler & Chiller Replacement	Bloomington, IN
265	University of Louisville - Student Activities Center Renovation AHU-1	Louisville, KY
266	Lyon County Public Schools - Lyon County Elementary School Cooling Tower	Eddyville, KY
267	Scott County Board of Education - Stamping Ground Elementary Classroom Addition	Georgetown, KY
268	Amazon Delivery Station DKY1	Louisville, KY
269	Frankfort Regional Medical Center - UPS800 Pharmacy Renovation	Frankfort, KY
270	Boone County Schools - Learning Support Services	Florence, KY
271	Baptist Health Lexington - Beaumont Centre MOB	Lexington, KY
272	Brownsburg Community School Corporation - Brownsburg High School Senior Academy AHU's	Brownsburg, IN
273	Laurel County Correctional Center	London, KY

# Synergy Test and Balance Overall Projects List



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#	Project Name	Location
274	Abraham Lincoln - Boyhood Home and Tavern Phases 2 & 3	Hodgenville, KY
275	Clark County Public Schools - George Rogers Clark High School - Gym and Athletic Complex	Winchester, KY
276	Toyota Motor Manufacturing - Power Train 1 Bay Expansion	Georgetown, KY
277	Beecher Terrace Lifelong Wellness Building Phase 2	Louisville, KY
278	Citizens Deposit Bank	Kevil, KY
279	Center Grove Community School Corporation - Center Grove High School Natatorium	Greenwood, IN
280	Hunt Brother's Pizza - Paris	Paris, KY
281	Patti's 1880 Settlement - Restaurant and Gift Shop	Grand Rivers, KY
282	Patti's 1880 Settlement - Candy Shop Addition AD-4	Grand Rivers, KY
283	Kentucky State University - Old Young Hall Dormitory	Frankfort, KY
284	Best Western - Elizabethtown	Elizabethtown, KY
285	University of Kentucky - Improve Good Samaritan Hospital MRI Suite Renovation BP1	Lexington, KY
286	Hardin County Water District #2 - Nolin River Watershed Sewer Infrastructure	Glendale, KY
287	Rockcastle Regional Hospital and Respiratory Care Center - O.R. and I.C.U Addition and Renovations	Mt. Vernon, KY
288	Madisonville Community College - Allied Health Building Boiler Replacement	Madisonville, KY
289	4th Street Apartments - Louisville	Louisville, KY
290	Norton Hospital - Air Coils	Louisville, KY
291	Kentucky Utilities - Kevil Operations Center	Kevil, KY
292	AMR - Coldstream Research	Lexington, KY
293	Scott County Schools - Great Crossing High School Athletic Complex	Georgetown, KY

# Synergy Test and Balance Overall Projects List



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#	Project Name	Location
294	Nicholas County Judicial Center	Carlisle, KY
295	MSD of Warren Township - Lowell Elementary School Additions & Renovations	Indianapolis, IN
296	Good Samaritan - Center of Therapy and Sports Performance	Vincennes, IN
297	Department of Criminal Justice Training - Training Labs and Classroom Renovation	Richmond, KY
298	Indiana Memorial Union - Food And Dining Services Renovation	Bloomington, IN
299	Yorktown Communtiy Schools - Yorktown Middle & Elementary Schools	Yorktown, IN
300	Boss Hogg's Restaurant	Benton, KY
301	Fort Knox - Buildings 1378 and 1384 HVAC Replacement	Fort Knox, KY
302	Wayne County - Area Technology Center	Monticello, KY
303	Mayfield Independent Schools - Mayfield Independent High School Renovation	Mayfield, KY
304	Morgan County Area Technology Center Renovation & Addition	West Liberty, KY
305	Torrid - Jefferson Mall	Louisville, KY
306	Louisville Muhammad Ali International Airport BP#01 Tenant Fit-Up & Renovation	Louisville, KY



# Synergy Test and Balance

2611 Waterfront Parkway, Ste. 340 | Indianapolis, IN 46214 | Tel. (317) 222-1828

## References

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# Synergy Test and Balance

2611 Waterfront Parkway, Ste. 340 | Indianapolis, IN 46214 | Tel. (317) 222-1828

## **Test and Balance Procedures for Air Systems**

1. Obtain up-to-date specifications, drawings, and equipment submittals of the complete mechanical systems to be balanced. Compare installed equipment to design and check for completeness of installation.
2. Equipment Checks:
  - A. Check fan housings, coils, louvers and filters to ensure they are clean and free of foreign material.
  - B. Examine drives for proper belt tension and alignment.
  - C. Check fan for proper rotation.
  - D. Check automatic dampers for proper operation and position.
  - E. Check that manual dampers are in the open and locked position.
  - F. This agency will not continue the test and balance if conditions are observed that are hazardous to the air system. Such conditions will be reported before proceeding further.
3. Determine total airflow:
  - A. Airflow quantity of the fan will be determined by Pitot-tube traverse, unless impractical to do so. When the quantity cannot be obtained by Pitot-tube traverse, the sum of the outlet quantities will be used as the total CFM of the fan.
4. Adjust Outlets:
  - A. Test and adjust diffusers, registers, and grilles to distribution pattern and design requirements. Special attention will be given to avoiding drafts and noise where possible when adjustments are made.
  - B. Permanently mark or record final position of damper.
5. Variable air volume (VAV) system:
  - A. Adjust and calibrate the VAV flow rate controllers to the required minimum and maximum CFM.
  - B. Record correction factors or flow coefficients.
6. Air Handler Unit data tested and recorded:
  - A. Manufacturer
  - B. Model Number
  - C. Serial Number
  - D. Size or Type
  - E. Fan CFM
  - F. Outlet CFM
  - G. Return CFM
  - H. Outside Air CFM
  - I. Fan RPM
  - J. Static Pressure Profile





# Synergy Test and Balance

2611 Waterfront Parkway, Ste. 340 | Indianapolis, IN 46214 | Tel. (317) 222-1828

- K. Motor Manufacturer
- L. Motor Horsepower
- M. Motor RPM
- N. Motor Volts and Phase
- O. Motor Service Factor
- P. Overloads
- Q. Motor Sheave
- R. Fan Sheave
- S. Belts

7. Air balance procedures will be in accordance with AABC Standards.



# Synergy Test and Balance

2611 Waterfront Parkway, Ste. 340 | Indianapolis, IN 46214 | Tel. (317) 222-1828

## **Test and Balance Procedures for Hydronic Systems**

1. Obtain up-to-date specifications, drawings, and equipment submittals of the complete mechanical systems to be balanced. Compare installed equipment to design and check for completeness of installation.
2. Equipment Checks:
  - A. Strainers and piping are free from debris, cleaned and flushed.
  - B. Balancing devices are set to the full open position.
  - C. Construction strainer baskets replaced with permanent baskets.
  - D. System filled to the proper level and the pressure reducing valve set.
  - E. Automatic and manual air vents installed and air is purged from the system.
  - F. Water expansion tanks are at the proper level.
  - G. Valves, flow meters and temperature/pressure taps installed correctly, accessible and functional.
  - H. Terminal coils installed, piped correctly, and accessible.
  - I. Pumps properly aligned, grouted and anchored.
  - J. Verify correct pump rotation.
  - K. This agency will not continue the test and balance if conditions are observed that are hazardous to the water system. Such condition shall be reported before proceeding further.
3. Determine total water flow:
  - A. Using "pump shutoff head" and its operating curve verify pump impeller size where practical.
  - B. Adjust pump to design flow and record data.
4. Adjust flow measuring devices:
  - A. If flow measuring devices are used, test and set design water flow to boilers, chillers and cooling towers.
  - B. Measure and adjust main and branch flow measuring devices to the required flow.
  - C. Measure and adjust connected terminal units to design flow.
  - D. Record data from flow measuring devices.
  - E. Permanently mark or record final position of balancing valve.
5. Pump data tested and recorded:
  - A. Manufacturer
  - B. Model
  - C. Serial number
  - D. Impeller size
  - E. TDH (FT. HD.)
  - F. GPM
  - G. Discharge and Suction Pressures at full flow



# Synergy Test and Balance

2611 Waterfront Parkway, Ste. 340 | Indianapolis, IN 46214 | Tel. (317) 222-1828

- H. Discharge and Suction Pressures at block off (where possible)
  - I. Motor Manufacturer
  - J. Motor Horsepower
  - K. Motor RPM
  - L. Motor Volts and Phase
  - M. Overloads
6. Hydronic balance procedures will be in accordance with AABC Standards.



# Synergy Test and Balance

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## **Duct Leakage Test Procedures**

1. Obtain up-to-date specifications, drawings, and equipment submittals of the complete duct systems to be tested. Compare installed duct to design and check for completeness of installation. Confirm duct test requirements from project specifications.
2. Determine Maximum Allowable Leakage:
  - A. Calculations are done for either of two typical specifications: percentage of system flow, or leakage class.
  - B. Calculate total duct system surface area if leakage class is used.
3. Determine Which Orifice Plate to Use:
  - A. The proper plate is the one where the maximum allowable leakage falls between the minimum and maximum leakage at the system static pressure (refer to manufacturer orifice plate chart).
  - B. Install orifice plate (refer to operating instructions).
4. Connect Flexible Duct:
  - A. Connect flexible duct to orifice tube and confirm a sealed tight connection.
  - B. Connect flexible duct to duct system and confirm a sealed tight connection.
5. System Test Pressure Connection:
  - A. Drill a hole at least 3 feet away from the flex duct connection of the duct system.
  - B. Insert the pressure tubing from the "DUCT SYSTEM" gage so that 6 to 12 inches of tubing is inside the duct system.
6. Obtaining System Test Pressure:
  - A. Prior to starting the blower shut the inlet slide gate.
  - B. Turn the blower on and slowly open the inlet slide gate to obtain the system test pressure. Take care to avoid over-pressurization.
  - C. When system static pressure has been reached tighten the set-screw on the inlet slide gate.
7. Determining the Leakage Rate:
  - A. While system test pressure is being maintained note the pressure reading of the "ORIFICE TUBE" gage.
  - B. Refer to the calibration certificate to determine the leakage rate that corresponds to the gage reading.
  - C. Report test data on Duct Leakage report form.



# Synergy Test and Balance

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## **Sound Test Procedures**

1. Obtain up-to-date specifications, drawings, and equipment submittals of the complete mechanical systems to be tested. Compare installed equipment to design and check for completeness of installation.
2. The test area must be cleared of all persons except test personnel.
3. The test area will be furnished in its normal manner. Items affecting room sound absorption, such as drapes, furniture, carpeting, etc., will be in place.
4. Indoor tests will be performed when outside noise levels are near minimum.
5. Microphones will be placed in the test area at the height from the floor and distance from reflective surfaces that is specified in the manufacturer's instructions.
6. Measure the sound pressure level with the equipment running.
7. Measure the sound pressure level with the equipment off.
8. Calculate the difference between the two readings. If the level of the total noise measured is less than 2 dB higher than the background noise, the level of the background noise is too high for an accurate measurement. If the difference is between 2 dB and 10 dB a correction may be necessary. No correction will be required if the difference is greater than 10 dB.
9. Sound measurements will be performed in accordance with AABC Standards.



# Synergy Test and Balance

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## **Vibration Test Procedures**

1. Obtain up-to-date specifications, drawings, and equipment submittals of the complete mechanical systems to be tested. Compare installed equipment to design and check for completeness of installation.
2. Confirm that there is no construction or other activity in progress that will interfere with the test.
3. Confirm that construction equipment that might interfere with the test is turned off.
4. Confirm that building vibration sources, such as an elevator, that might interfere with the test is off.
5. Clean the equipment being tested of grease, oil, or other substance that might cause slippage or improper contact of the vibration transducer.
6. Position the vibration transducer according to the manufacturer's instructions and where it will not interfere with the operation of the equipment being tested.
7. Test equipment under actual operating conditions and record data.
8. Vibration measurements will be performed in accordance with AABC Standards.





## TAB Equipment Log

2611 Waterfront Parkway, Suite 340  
Indianapolis, IN 46214  
(317) 536-2618

<u>Type</u>	<u>Model #</u>	<u>Serial #</u>
<b>Synergy TAB Equipment</b>		
Herman Sticht Contact Tachometer	2302	730551 252
Herman Sticht Contact Tachometer	2302	386379 252
Shortridge 1x4 Capture Top	1x4	N/A
Shortridge Flow Hood	Flow Hood 8405	M89454
Shortridge Flow Hood	Flow Hood 8403	
Shortridge ADM	ADM-870	M89809
Shortridge ADM	ADM-870	M00432
ALNOR Hydronic Manometer with red and blue hoses fittings and reducers	HM670	71128096
Airflow Instrumentation Anemometer	LCA 6000	A14288
24" Pitot Tube	160-24	N/A
36" Pitot Tube	160-36	N/A
48" Pitot Tube	160-48	N/A
60" Pitot Tube	160-60	N/A
Clamp Meter	CAT III Fluke 30	73300981



PROJECT #:  
PROJECT NAME:  
SYSTEM:  
LOCATION:



DATE:

TECHNICIAN:

**AIR HANDLER DATA**

	DESIGN	INSTALLED	
MANUFACTURER			
MODEL #			
SERIAL #	-----		
SIZE OR TYPE			
FAN CFM			ACTUAL
OUTLET CFM			
RETURN AIR CFM			
OUTSIDE AIR CFM			
FAN RPM			
STATIC PRESSURE (IN. W.C.)	-----	-----	
SUCTION S.P. (IN. W.C.)	-----	-----	
DISCHARGE S.P. (IN. W.C.)			
MOTOR MANUFACTURER			
MOTOR HORSEPOWER			
MOTOR RPM			
MOTOR VOLTS PHASE	Φ	Φ	Φ
MOTOR AMPS			
MOTOR SERVICE FACTOR			
OVERLOADS	-----		
MOTOR SHEAVE	-----		
FAN SHEAVE	-----		
BELTS NO.	-----		

REMARKS:

(1)

(2)

(3)

(4)

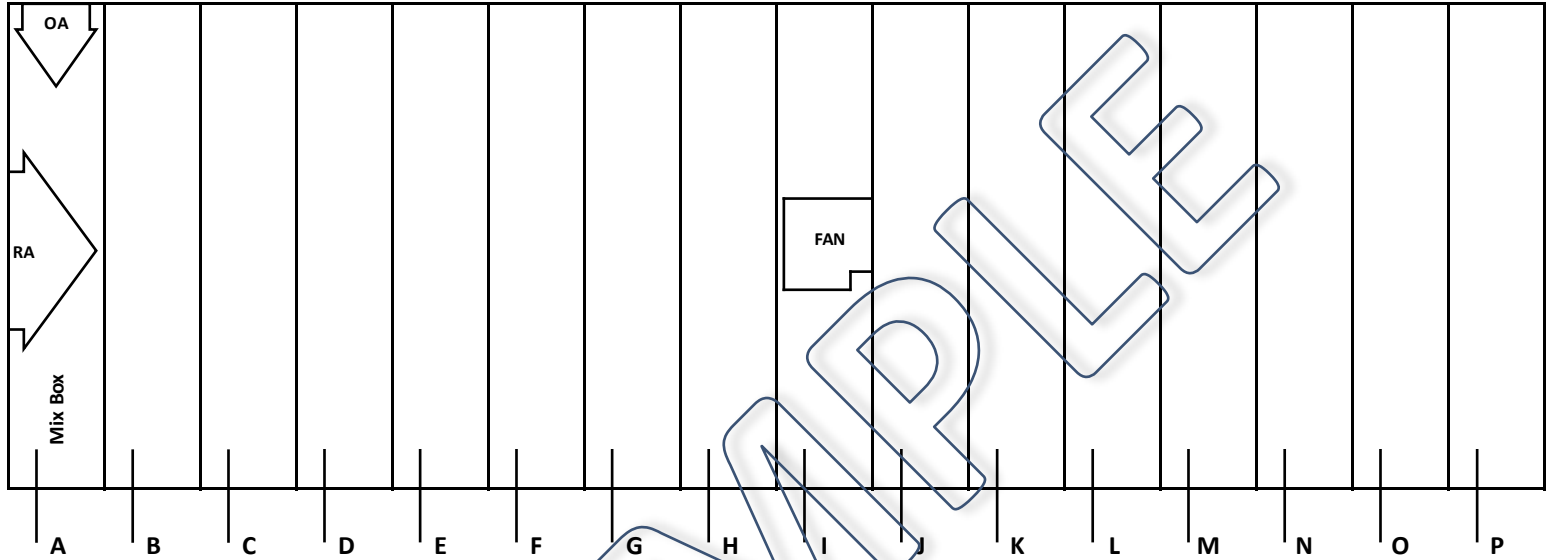
(5)



PROJECT #:  
PROJECT NAME:  
SYSTEM:  
LOCATION:



DATE:  
TECHNICIAN:  
STATIC PRESSURE PROFILE



A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P

REMARKS:

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_
- (5) \_\_\_\_\_





**DATE:**  
**TECHNICIAN:**  
**TERMINAL UNIT DATA**

[illegible]

TYPE: 1 - CONSTANT, 2 - VARIABLE, 3 - FAN POWERED (PARALLEL), 4 - FAN POWERED (SERIES), 5 - DUAL DUCT

REMARKS:

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_
- (5) \_\_\_\_\_







PROJECT #:  
PROJECT NAME:  
SYSTEM:  
LOCATION:



DATE:  
TECHNICIAN:  
ENERGY RECOVERY UNIT

MANUFACTURER	
MODEL NUMBER	
SERIAL NUMBER	

	SUPPLY FAN		EXHAUST FAN	
	DESIGN	ACTUAL	DESIGN	ACTUAL
FAN CFM				
OUTLET CFM				
FAN RPM				
STATIC PRESSURE				
DISCHARGE S.P.				
SUCTION S.P.				
DELTA SP ACROSS ARC				
MOTOR MANUFACTURER				
MOTOR HORSEPOWER				
MOTOR RPM				
MOTOR VOLTS/PHASE	Φ	Φ	Φ	Φ
MOTOR AMPS				
MOTOR SERVICE FACTOR				
OVERLOADS				
MOTOR SHEAVE				
FAN SHEAVE				
BELTS NO.				

REMARKS:

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_
- (5) \_\_\_\_\_



PROJECT #:  
PROJECT NAME:  
SYSTEM:  
LOCATION:



DATE:  
TECHNICIAN:  
FAN TEST DATA

FAN NO.								
LOCATION								
AREA SERVED								
MANUFACTURER								
MODEL NO.								
	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL
FAN CFM								
RPM								
HORSEPOWER								
VOLTS/PHASE	Φ	Φ	Φ	Φ	Φ	Φ	Φ	Φ
AMPS								
OUTLET CFM								

FAN NO.								
LOCATION								
AREA SERVED								
MANUFACTURER								
MODEL NO.								
	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL
FAN CFM								
RPM								
HORSEPOWER								
VOLTS/PHASE	Φ	Φ	Φ	Φ	Φ	Φ	Φ	Φ
AMPS								
OUTLET CFM								

REMARKS:

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_
- (5) \_\_\_\_\_



PROJECT #:  
PROJECT NAME:  
SYSTEM:  
LOCATION:



DATE:  
TECHNICIAN:  
PUMP DATA

PUMP NO.	
MANUFACTURER	
SIZE	
IMPELLER	
SERVICE	

TEST DATA	GPM	FT. HD.	BHP
DESIGN			
ACTUAL			
DISCHARGE			
SUCTION			
$\Delta P \times 2.307$			

BLOCK OFF	
DISCHARGE	
SUCTION	
$\Delta P \times 2.307$	

MOTOR MFG	
HORSEPOWER	
RPM	
VOLTS	$\Phi$
ACTUAL VOLTS	$\Phi$
AMPS	
ACTUAL AMPS	
OVERLOADS	

PUMP NO.	
MANUFACTURER	
SIZE	
IMPELLER	
SERVICE	

TEST DATA	GPM	FT. HD.	BHP
DESIGN			
ACTUAL			
DISCHARGE			
SUCTION			
$\Delta P \times 2.307$			

BLOCK OFF	
DISCHARGE	
SUCTION	
$\Delta P \times 2.307$	

MOTOR MFG	
HORSEPOWER	
RPM	
VOLTS	$\Phi$
ACTUAL VOLTS	$\Phi$
AMPS	
ACTUAL AMPS	
OVERLOADS	

REMARKS:

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_
- (5) \_\_\_\_\_





PROJECT #:  
PROJECT NAME:  
SYSTEM:  
LOCATION:



DATE:  
TECHNICIAN:  
AIR COOLED CHILLER DATA

UNIT NUMBER	
MANUFACTURER	
CAPACITY	
MODEL NUMBER	
SERIAL NUMBER	

UNIT NUMBER	
MANUFACTURER	
CAPACITY	
MODEL NUMBER	
SERIAL NUMBER	

COOLER	DESIGN	ACTUAL
Entering Water Temp		
Leaving Water Temp		
Pressure Drop Ft.		
GPM		

COOLER	DESIGN	ACTUAL
Entering Water Temp		
Leaving Water Temp		
Pressure Drop Ft.		
GPM		

CONDENSER	DESIGN	ACTUAL
Entering Air Temp		

CONDENSER	DESIGN	ACTUAL
Entering Air Temp		

ELECTRICAL	DESIGN	ACTUAL
Compressor Volts		
Compressor Amps		
Fan Volts	Φ	Φ
Fan Amps		

ELECTRICAL	DESIGN	ACTUAL
Compressor Volts		
Compressor Amps		
Fan Volts	Φ	Φ
Fan Amps		

SAMPLE

REMARKS:

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_
- (5) \_\_\_\_\_



PROJECT #:  
PROJECT NAME:  
SYSTEM:  
LOCATION:



DATE:  
TECHNICIAN:  
HOT WATER BOILER DATA

UNIT NUMBER	
LOCATION	
SERVICE	
RATING BTU HOUR	
MANUFACTURER	
MODEL NUMBER	
SERIAL NUMBER	

SECONDARY HOT WATER	DESIGN	ACTUAL
Entering Water Temp		
Leaving Water Temp		
Pressure Drop Ft.		
GPM		
Control Setting		

UNIT NUMBER	
LOCATION	
SERVICE	
RATING BTU HOUR	
MANUFACTURER	
MODEL NUMBER	
SERIAL NUMBER	

SECONDARY HOT WATER	DESIGN	ACTUAL
Entering Water Temp		
Leaving Water Temp		
Pressure Drop Ft.		
GPM		
Control Setting		

UNIT NUMBER	
LOCATION	
SERVICE	
RATING BTU HOUR	
MANUFACTURER	
MODEL NUMBER	
SERIAL NUMBER	

SECONDARY HOT WATER	DESIGN	ACTUAL
Entering Water Temp		
Leaving Water Temp		
Pressure Drop Ft.		
GPM		
Control Setting		

UNIT NUMBER	
LOCATION	
SERVICE	
RATING BTU HOUR	
MANUFACTURER	
MODEL NUMBER	
SERIAL NUMBER	

SECONDARY HOT WATER	DESIGN	ACTUAL
Entering Water Temp		
Leaving Water Temp		
Pressure Drop Ft.		
GPM		
Control Setting		

REMARKS:

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_
- (5) \_\_\_\_\_





PROJECT #:  
PROJECT NAME:  
SYSTEM:  
LOCATION:



DATE:  
TECHNICIAN:  
COOLING COIL DATA

SYSTEM								
LOCATION								
SERVICE								
MANUFACTURER								
	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL
CFM								
GPM								
COIL P.D. FT.								
E.W.T. °F								
L.W.T. °F								
L.A.T. DB °F								
AIR MBH								
WATER MBH								

SYSTEM								
LOCATION								
SERVICE								
MANUFACTURER								
	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL
CFM								
GPM								
COIL P.D. FT.								
E.W.T. °F								
L.W.T. °F								
L.A.T. DB °F								
AIR MBH								
WATER MBH								

REMARKS:

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_
- (5) \_\_\_\_\_



PROJECT #:  
PROJECT NAME:  
SYSTEM:  
LOCATION:



DATE:  
TECHNICIAN:  
HEATING COIL DATA

SYSTEM								
LOCATION								
SERVICE								
MANUFACTURER								
	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL
CFM								
GPM								
COIL P.D. FT.								
E.W.T. °F								
L.W.T. °F								
L.A.T. DB °F								
AIR MBH								
WATER MBH								

SYSTEM								
LOCATION								
SERVICE								
MANUFACTURER								
	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL
CFM								
GPM								
COIL P.D. FT.								
E.W.T. °F								
L.W.T. °F								
L.A.T. DB °F								
AIR MBH								
WATER MBH								

REMARKS:

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_
- (5) \_\_\_\_\_



PROJECT #:  
PROJECT NAME:  
SYSTEM:  
LOCATION:



DATE:  
TECHNICIAN:  
DIRECT EXPANSION COOLING COIL DATA

SYSTEM								
LOCATION								
SERVICE								
MANUFACTURER								
	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL
CFM								
E.A.T. DB °F								
E.A.T. WB °F								
L.A.T. DB °F								
L.A.T. WB °F								
MBH								

SYSTEM								
LOCATION								
SERVICE								
	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL	DESIGN	FINAL
CFM								
E.A.T. DB °F								
E.A.T. WB °F								
L.A.T. DB °F								
L.A.T. WB °F								
MBH								

REMARKS:

- (1) \_\_\_\_\_
- (2) \_\_\_\_\_
- (3) \_\_\_\_\_
- (4) \_\_\_\_\_
- (5) \_\_\_\_\_



# Synergy Test and Balance

2611 Waterfront Parkway, Ste. 340 | Indianapolis, IN 46214 | Tel. (317) 222-1828

## **Abbreviation and Acronyms**

1.	AHU .....	Air Handling Unit
2.	BHP .....	Brake Horsepower
3.	BTU .....	British Thermal Unit
4.	BTUH.....	British Thermal Unit Per Hour
5.	CC .....	Cooling Coil
6.	CL .....	Center Length
7.	CB.....	Circuit Breaker
8.	CD .....	Ceiling Diffuser
9.	CFM.....	Cubic Feet Per Minute
10.	CW.....	Chilled Water
11.	DAT .....	Discharge Air Temperature
12.	Db .....	Decibel
13.	DD .....	Direct Drive
14.	DTR .....	Dual Temperature Coil
15.	EA .....	Exhaust Air
16.	EAR .....	Exhaust Air Register
17.	EAT.....	Entering Air Temperature
18.	EWT.....	Entering Water Temperature
19.	ER.....	Exhaust Register
20.	EF .....	Exhaust Fan
21.	ERU .....	Energy Recovery Unit
22.	ESP .....	External Static Pressure
23.	FD .....	Fire Damper
24.	FH.....	Fume Hood
25.	FLA .....	Full Load Amps
26.	FO.....	Fully Open
27.	FPM .....	Feet Per Minute
28.	FX .....	Fixed
29.	GF.....	Gas Furnace
30.	G-F .....	Grease Filter
31.	GPM .....	Gallons Per Minute
32.	HC .....	Heating Coil
33.	HP.....	Horsepower
34.	Hz .....	Hertz
35.	HW.....	Hot Water
36.	INA.....	Information Not Available
37.	INACC .....	Inaccessible
38.	KW.....	Kilowatt
39.	LAT .....	Leaving Air Temperature
40.	LWT .....	Leaving Water Temperature
41.	MAU.....	Make-up Air Unit
42.	MAX.....	Maximum
43.	MBH.....	Thousand British Thermal Units Per Hour



# Synergy Test and Balance

2611 Waterfront Parkway, Ste. 340 | Indianapolis, IN 46214 | Tel. (317) 222-1828

## **Abbreviation and Acronyms**

44.	MD .....	Manual Damper
45.	MIN .....	Minimum
46.	MTR.....	Motor
47.	NA.....	Not Applicable
48.	NC .....	Noise Criterion
49.	ND .....	No Design
50.	NI.....	Not Installed
51.	NL .....	Not Listed
52.	NR .....	Not Running
53.	NS.....	Not Specified
54.	NW.....	Not Wired
55.	OA .....	Outside Air
56.	OD .....	Outside Diameter
57.	PD.....	Pitch Diameter
58.	PSI.....	Pounds per Square Inch
59.	RA.....	Return Air
60.	RAG.....	Return Air Grille
61.	RF.....	Return Fan
62.	RHC.....	Reheat Coil
63.	RND .....	Round
64.	RPM.....	Revolutions Per Minute
65.	RR .....	Return Register
66.	SA.....	Supply Air
67.	SAG .....	Supply Air Grille
68.	SAR .....	Supply Air Register
69.	SF .....	Safety Factor
70.	SF .....	Supply Fan
71.	SLOT .....	Slot Diffuser
72.	SP .....	Static Pressure
73.	SR.....	Supply Register
74.	TP .....	Thermally Protected
75.	TSP.....	Total Static Pressure
76.	V .....	Volt
77.	VD.....	Volume Damper
78.	VFD .....	Variable Frequency Drive
79.	WB.....	Wet Bulb
80.	WC.....	Water Column
81.	ZD.....	Zone Damper