

National TAB

Project: Indian Hill Elementary School
Address: 6100 Drake Road Cincinnati, OH 45243

Asset: AHU-1

Area: ELEMENTARY SCHOOL ADDITION

Unit Data	
Manufacturer	MILLER PICKING
Model Number	MPI-123X228
Serial Number	TCLM181720
Configuration	VERTICAL
No. Pre Filters / Size	(16) 24X24X4
No. Pre Filters / Size	(4) 12X24X4

Supply Side

Motor Data X6	
Motor MFG	BALDOR
Horsepower / RPM	10.5 / 3500
Rated Volts / Phase	460 / 3
Rated Amperage / SF	17.5 / 1.15

Test Data		
	Design	Actual
Total CFM	35000	33948
Min OA CFM	17500	17244
VFD Speed		48 hz
RL Voltage	460	373 vfd
RL Amperage		81 vfd
Motor B.H.P.	58.8	49.1

Performance Data		
	Design	Actual
Suction S.P.		-3.09
Discharge S.P.		2.8
Total SP	7.00	5.89
CW Coil P.D.		0.65
HW Coil P.D. &		0.11
Pre Filters P.D.		0.63
Total ESP		3.38
System 2/3 stpt		1.35

OA Flow Station K-Factor = 1.175

Return Side

Motor Data X6	
Motor MFG	BALDOR
Horsepower / RPM	4.5 / 1706
Rated Volts / Phase	460 / 3
Rated Amperage / SF	6.7 / 1.15

Test Data		
	Design	Actual
Total CFM	35000	32668
Min EX CFM	17500	16879
VFD Speed		55 hz
RL Voltage	460	399 vfd
RL Amperage		30 vfd
Motor B.H.P.	24.38	20.25

Performance Data		
	Design	Actual
Suction S.P.		-0.58
Discharge S.P.		1.08
Total SP		1.76

Notes:

Values reported above during "Full Flow Testing" are with the relief damper 100% open, return air damper 30% open, outside air damper 100% open.

EA Flow Station K-Factor = 0.958

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Asset: Single Duct VAV's

Asset	Area Served	Type	Size	Design Max CFM	Actual Max CFM	Design Min CFM	Actual Min CFM	Design Heat CFM	Actual Heat CFM	Ak (max)
VAV-1	303	VAV	12	1300	1274	1100	1126	1200	1284	2.01
VAV-2	304 / 306	VAV	12	1450	1487	1200	1224	1300	1313	2.237
VAV-3	318 / 319	VAV	14	2000	2033	1575	1515	1650	1701	1.936
VAV-4	324	VAV	12	1400	1479	1100	1108	1200	1220	2.190
VAV-5	313	VAV	10	970	1004	400	416	500	512	1.427
VAV-6	302	VAV	12	1600	1680	800	822	900	917	1.92
VAV-7	314	VAV	10	875	923	400	411	500	508	2.786
VAV-8	317	VAV	4	130	134	75	78	100	106	1.651
VAV-9	311 / 312	VAV	8	225	225	150	152	175	186	2.291
VAV-10	310	VAV	14	2500	2569	2000	2080	2100	2124	1.682
VAV-11	326	VAV	24x16	8300	8670	8000	8036	8000	8045	2.446
VAV-12	326	VAV	24x16	8000	8381	8000	8094	8000	8101	1.883
VAV-13	329 / 330	VAV	4	265	252	75	74	100	106	0.645
VAV-14	320	VAV	14	2000	2082	1500	1544	1600	1604	2.115
VAV-15	322	VAV	6	150	152	75	79	100	107	3.184
VAV-16	315	VAV	12	1400	1474	1100	1109	1200	1231	2.207
VAV-17	316	VAV	12	1400	1409	1100	1126	1200	1211	2.219
VAV-18	331	VAV	16	3390	3474	2600	2626	2600	2639	3.039
VAV-19	333 / 334	VAV	6	325	334	230	234	250	255	4.652
VAV-20	302	VAV	8	400	412	200	209	300	311	1.816
VAV-21	305	VAV	6	300	309	50	55	100	104	2.856
VAV-22	332	VAV	6	300	295	150	152	175	179	2.832

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Asset: SUPPLY

Asset	Area Served	Type	Size	DESIGN CFM	Prelim CFM	FINAL CFM	% to design
V1-1	303	S8	8	165	184	169	1.02
V1-2	303	S8	8	160	172	152	0.95
V1-3	303	S8	8	160	195	158	0.99
V1-4	303	S8	8	165	198	155	0.94
V1-5	303	S8	8	165	184	159	0.96
V1-6	303	S8	8	160	180	162	1.01
V1-7	303	S8	8	160	188	154	0.96
V1-8	303	S8	8	165	166	165	1.00
VAV-1				1300		1274	0.98
V2-1	306	S8	8	165	196	161	0.98
V2-2	306	S8	8	160	187	164	1.03
V2-3	304	S8	8	150	188	158	1.05
V2-4	306	S8	8	160	195	162	1.01
V2-5	306	S8	8	165	181	169	1.02
V2-6	306	S8	8	165	177	170	1.03
V2-7	306	S8	8	160	184	170	1.06
V2-8	306	S8	8	160	182	164	1.03
V2-9	306	S8	8	165	188	169	1.02
VAV-2				1450		1487	1.03
V3-1	318	S8	8	250	278	252	1.01
V3-2	318	S8	8	225	295	226	1.00
V3-3	318	S8	8	225	217	240	1.07
V3-4	318	S8	8	250	310	255	1.02
V3-5	318	S8	8	250	286	262	1.05
V3-6	318	S8	8	225	312	230	1.02
V3-7	318	S8	8	225	245	217	0.96
V3-8	318	S8	8	250	295	248	0.99
V3-9	319	S9	6	100	171	103	1.03
VAV-3				2000		2033	1.02

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Asset: SUPPLY

Asset	Area Served	Type	Size	DESIGN CFM	Prelim CFM	FINAL CFM	% to design
V4-1	324	S10	10	280	333	297	1.06
V4-2	324	S10	10	280	326	284	1.01
V4-3	324	S10	10	280	315	306	1.09
V4-4	324	S10	10	280	308	301	1.08
V4-5	324	S10	10	280	284	291	1.04
VAV-4				1400		1479	1.06
V5-1	313	SG	10x6	200	224	208	1.04
V5-2	313	SG	10x6	190	248	194	1.02
V5-3	313	SG	10x6	190	237	192	1.01
V5-4	313	SG	10x6	190	216	199	1.05
V5-5	313	SG	10x6	200	205	211	1.06
VAV-5				970		1004	1.04
V6-1	302	SG	12X6	160	184	165	1.03
V6-2	302	SG	12X6	160	192	174	1.09
V6-3	302	S8	8	160	175	168	1.05
V6-4	302	S8	8	160	184	172	1.08
V6-5	302	S8	8	160	184	165	1.03
V6-6	302	S8	8	160	195	162	1.01
V6-7	302	S8	8	160	192	160	1.00
V6-8	302	S8	8	160	176	168	1.05
V6-9	302	S8	8	160	85	175	1.09
V6-10	302	S8	8	160	122	171	1.07
VAV-6				1600		1680	1.05
V7-1	314	S8	8	175	192	182	1.04
V7-2	314	S8	8	175	222	178	1.02
V7-3	314	S8	8	175	216	188	1.07
V7-4	314	S8	8	175	205	185	1.06
V7-5	314	S8	8	175	228	190	1.09
VAV-7				875		923	1.05



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Asset: SUPPLY

Asset	Area Served	Type	Size	DESIGN CFM	Prelim CFM	FINAL CFM	% to design
V11-1	328	S8	S8	150	204	158	1.05
V11-2	326	SG	16X8	500	525	507	1.01
V11-3	326	SG	16X8	500	685	512	1.02
V11-4	326	SG	16X8	500	712	527	1.05
V11-5	326	SG	16X8	500	458	531	1.06
V11-6	326	SG	16X8	500	629	514	1.03
V11-7	326	SG	16X8	500	514	526	1.05
V11-8	326	SG	16X8	500	679	541	1.08
V11-9	326	SG	16X8	500	452	505	1.01
V11-10	326	SG	16X8	500	841	528	1.06
V11-11	326	SG	16X8	500	623	517	1.03
V11-12	326	SG	16X8	500	751	511	1.02
V11-13	326	SG	16X8	500	426	540	1.08
V11-14	326	SG	16X8	500	548	523	1.05
V11-15	326	SG	16X8	500	623	536	1.07
V11-16	326	SG	16X8	500	544	533	1.07
V11-17	326	SG	16X8	500	558	521	1.04
V11-18	327	S8	S8	150	40	140	0.93
VAV-11				8300		8670	1.04

NOTES: [1] VAV DESIGNED FOR 8000 CFM, DIFFUSER TOTAL IS 8300 CFM.



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Asset: SUPPLY

Asset	Area Served	Type	Size	DESIGN CFM	Prelim CFM	FINAL CFM	% to design
V12-1	326	SG	16X8	500	722	526	1.05
V12-2	326	SG	16X8	500	841	512	1.02
V12-3	326	SG	16X8	500	696	541	1.08
V12-4	326	SG	16X8	500	722	526	1.05
V12-5	326	SG	16X8	500	632	518	1.04
V12-6	326	SG	16X8	500	548	523	1.05
V12-7	326	SG	16X8	500	692	537	1.07
V12-8	326	SG	16X8	500	587	524	1.05
V12-9	326	SG	16X8	500	557	518	1.04
V12-10	326	SG	16X8	500	629	539	1.08
V12-11	326	SG	16X8	500	713	526	1.05
V12-12	326	SG	16X8	500	655	544	1.09
V12-13	326	SG	16X8	500	488	511	1.02
V12-14	326	SG	16X8	500	629	505	1.01
V12-15	326	SG	16X8	500	592	512	1.02
V12-16	326	SG	16X8	500	555	519	1.04
VAV-12				8000		8381	1.05
V13-1	335	SG	6X6	75	52	70	0.93
V13-2	330	SG	6X6	75	43	71	0.95
V13-3	329	S8	8	115	67	111	0.97
VAV-13				265		252	0.95

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Asset	Area Served	Type	Size	DESIGN CFM	Prelim CFM	FINAL CFM	% to design
V14-1	320	S8	8	210	237	201	0.96
V14-2	320	S8	8	210	224	211	1.00
V14-3	320	S8	8	210	226	231	1.10
V14-4	320	S8	8	205	256	223	1.09
V14-5	320	S8	8	205	228	224	1.09
V14-6	320	S8	8	205	212	207	1.01
V14-7	321	S8	6	125	160	126	1.01
V14-8	320	S8	8	210	217	226	1.08
V14-9	320	S8	8	210	230	220	1.05
V14-10	320	S8	8	210	206	213	1.01
VAV-14				2000		2082	1.04
V15-1	322	S8	8	150	189	152	1.01
VAV-15				150		152	1.01
V16-1	315	S8	8	200	240	208	1.04
V16-2	315	S8	8	200	216	219	1.10
V16-3	315	S8	8	200	253	211	1.06
V16-4	315	S8	8	200	212	205	1.03
V16-5	315	S8	8	200	223	216	1.08
V16-6	315	S8	8	200	238	206	1.03
V16-7	315	S8	8	200	230	209	1.05
VAV-16				1400		1474	1.05
V17-1	316	S8	8	200	185	210	1.05
V17-2	316	S8	8	200	172	205	1.03
V17-3	316	S8	8	200	196	192	0.96
V17-4	316	S8	8	200	162	199	1.00
V17-5	316	S8	8	200	155	187	0.94
V17-6	316	S8	8	200	148	206	1.03
V17-7	316	S8	8	200	189	210	1.05
VAV-17				1400		1409	1.01

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Project: Indian Hill Elementary School
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Asset: EF-1

Area: RR 122B

Unit Data	
MFG	
Model Num	
Serial Num	
Type	CEILING

Motor Data	
Motor MFG	
Frame	
Horsepower	45W
Motor Rpm	
Phase	1
Voltage (rated)	115
Amperage (rated)	
Service Factor	

Test Data		
	Design	Actual
CFM	70	
Fan RPM	900	
RL Voltage	115	
RL Amperage		
Suction ESP		
Total ESP	0.625	

08/04/2023 No ceiling or fan installed yet

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Project: Indian Hill Elementary School
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Asset: EF-2

Area: KILN RM 305

Unit Data	
MFG	COOK
Model Num	90ACE
Serial Num	108SK28311-01/0003701
Type	CRE DNBLAST

Motor Data	
Motor MFG	COOK
Frame	48
Horsepower	0.167
Motor Rpm	1725
Phase	1
Voltage (rated)	115
Amperage (rated)	2.36
Service Factor	1

Test Data		
	Design	Actual
CFM	300	287
RL Voltage	115	120
RL Amperage		1.9
Suction ESP		-0.62
Total ESP	0.5	0.62

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Project: Indian Hill Elementary School
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Asset: EF-4

Area: JANITORS CLOSET

Unit Data	
MFG	COOK
Model Num	GEMINI 140
Serial Num	NA
Type	CEILING

Test Data		
	Design	Actual
CFM	70	69
RL Voltage	115	119
RL Amperage		0.3

Motor Data	
Motor MFG	COOK
Frame	48
Horsepower	71W
Motor Rpm	NA
Phase	1
Voltage (rated)	115
Amperage (rated)	0.4
Service Factor	1

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Project: Indian Hill Elementary School
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Asset: EF-5

Area: 3-D PRINTER CABINET

Unit Data	
MFG	COOK
Model Num	101ACE
Serial Num	108SK28311-01/0002101
Type	CRE DNBLAST

Motor Data	
Motor MFG	US MOTORS
Frame	48
Horsepower	0.125
Motor Rpm	1725
Phase	1
Voltage (rated)	120
Amperage (rated)	1.9
Service Factor	1

Test Data		
	Design	Actual
CFM	100	109
RL Voltage	115	120
RL Amperage		1.1
Suction ESP		-0.27
Total ESP	0.625	0.27

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Project: Indian Hill Elementary School
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Asset: HWP-1

Service: HOT WATER

Unit Data	
	Actual
MFG	ARMSTRONG
Model Num	DE4300
Serial Num	1022172106
Service	HW LOOP
Pump RPM	1845
GPM/Head	320 / 100
Impellar Diameter	6.18

Motor Data	
	Actual
Motor MFG	ARMSTRONG
Frame	215
Horsepower	15.0
Motor RPM	3545
Phase	3
Voltage	460
Amperage	19
Service Factor	1.15
Efficiency	89
Power Factor	90

Test Data		
	Design	Actual
Pump Off Pressure (ft)		22.5 ft
Valve Open GPM		309.7
Valve Open Diff (ft)		106.8 ft
Discharge Pressure (ft)		124.4 ft
Suction Pressure (ft)		17.6 ft
Total Head Pressure (ft)		106.8 ft
Final GPM		309.7
Motor Frequency (HZ)		60
RL Voltage		452 VFD
RL Amperage		17.7 VFD
BHP	11.87	13.9

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Project: Indian Hill Elementary School
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Asset: HWP-2

Service: HOT WATER

Unit Data	
	Actual
MFG	ARMSTRONG
Model Num	DE4300
Serial Num	1022173062
Service	HW LOOP
Pump RPM	1845
GPM/Head	320 / 100
Impellar Diameter	6.18

Motor Data	
	Actual
Motor MFG	ARMSTRONG
Frame	215
Horsepower	15.0
Motor RPM	3545
Phase	3
Voltage	460
Amperage	19
Service Factor	1.15
Efficiency	89
Power Factor	90

Test Data		
	Design	Actual
Pump Off Pressure (ft)		22.5 ft
Valve Open GPM		313.5
Valve Open Diff (ft)		104.2 ft
Discharge Pressure (ft)		121.3 ft
Suction Pressure (ft)		17.1 ft
Total Head Pressure (ft)		104.2 ft
Final GPM		313.5
Motor Frequency (HZ)		60
RL Voltage		456 vfd
RL Amperage		16.8 vfd
BHP	11.87	13.2



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Asset: HW CIRCUIT SETTERS Service: HOT WATER

Asset	Location	MFG	Size	Type	Design GPM	Setting	Delta P	Final GPM	% to Design
VAV-22	332	GRISWOLD	0.75	AUTO	0.85	2-32 PSI	12.8 PSI	0.85	100%
VAV-18	331	GRISWOLD	2	AUTO	12.69	2-32 PSI	6.9 PSI	12.69	100%
VAV-13	335	GRISWOLD	0.75	AUTO	0.49	2-32 PSI	10.9 PSI	0.49	100%
VAV-12	326	GRISWOLD	2	AUTO	39.06	2-32 PSI	3.9 PSI	39.06	100%
VAV-11	326	GRISWOLD	2	AUTO	39.06	2-32 PSI	5.5 PSI	39.06	100%
VAV-9	302	GRISWOLD	0.75	AUTO	0.85	2-32 PSI	20.5 PSI	0.85	100%
VAV-10	302	GRISWOLD	1	AUTO	10.25	2-32 PSI	18.8 PSI	10.25	100%
VAV-19	302	GRISWOLD	0.75	AUTO	1.22	2-32 PSI	18.5 PSI	1.22	100%
VAV-2	302	GRISWOLD	1	AUTO	6.35	2-32 PSI	17.9 PSI	6.35	100%
VAV-21	302	GRISWOLD	0.75	AUTO	0.49	2-32 PSI	22.4 PSI	0.49	100%
VAV-1	302	GRISWOLD	1	AUTO	5.86	2-32 PSI	16.6 PSI	5.86	100%
VAV-20	302	GRISWOLD	0.75	AUTO	1.46	2-32 PSI	17.2 PSI	1.46	100%
VAV-6	302	GRISWOLD	1	AUTO	4.39	2-32 PSI	22.5 PSI	4.39	100%
VAV-16	314	GRISWOLD	1	AUTO	5.86	2-32 PSI	16.2 PSI	5.86	100%
VAV-5	324	GRISWOLD	0.75	AUTO	2.44	2-32 PSI	16.6 PSI	2.44	100%
VAV-17	314	GRISWOLD	1	AUTO	5.86	2-32 PSI	12.8 PSI	5.86	100%
VAV-4	324	GRISWOLD	1	AUTO	5.86	2-32 PSI	13.2 PSI	5.86	100%
VAV-8	314	GRISWOLD	0.75	AUTO	0.49	2-32 PSI	15.9 PSI	0.49	100%
VAV-15	JAN	GRISWOLD	0.75	AUTO	0.49	2-32 PSI	11.6 PSI/	0.49	100%
VAV-14	320	GRISWOLD	1	AUTO	7.81	2-32 PSI	14.4 PSI	7.81	100%
VAV-3	318	GRISWOLD	1	AUTO	8.06	2-32 PSI	13.5 PSI	8.06	100%
VAV-7	314	GRISWOLD	0.75	AUTO	2.44	2-32 PSI	12.2 PSI	2.44	100%

Asset: HW CIRCUIT SETTERS Service: CHILLED WATER

Asset	Location	MFG	Size	Type	Design GPM	Setting	Delta P	Final GPM	% to Design
AHU-1	401	GRISWOLD	3	AUTO	45.00	2-32 PSI	2.9 PSI	45.00	100%
AHU-1	401	GRISWOLD	3	AUTO	45.00	2-32 PSI	2.5 PSI	45.00	100%
AHU-1	401	GRISWOLD	3	AUTO	45.00	2-32 PSI	2.2 PSI	45.00	100%
				Total	135.00			135.00	100%



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Asset: CHW CIRCUIT SETTERS Service: CHILLED WATER

Asset	Location	MFG	Size	Type	Design GPM	Setting	Delta P	Final GPM	% to Design
AHU-1	401	GRISWOLD	3	AUTO	119.0	2-32 PSI	7.2 PSI	119.0	100%
AHU-1	401	GRISWOLD	3	AUTO	119.0	2-32 PSI	8.4 PSI	119.0	100%
AHU-1	401	GRISWOLD	3	AUTO	119.0	2-32 PSI	6.6 PSI	119.0	100%
				Total	357.0			357.0	100%