

Zone Sizing Summary for VAV Rooftop

Project Name: HAP50-Example
Prepared by: Carrier Corporation

10/29/2016
09:51AM

Air System Information

Air System Name **VAV Rooftop**
Equipment Class **PKG ROOF**
Air System Type **VAV**

Number of zones **9**
Floor Area **9559.0** ft²
Location **Chicago IAP, Illinois**

Sizing Calculation Information

Calculation Months **May to Nov**
Sizing Data **Calculated**

Zone CFM Sizing **Peak zone sensible load**
Space CFM Sizing **Individual peak space loads**

Zone Terminal Sizing Data

Zone Name	Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM/ft ²	Reheat Coil Load (MBH)	Reheat Coil Water gpm @ 20.0 °F	Zone Htg Unit Coil Load (MBH)	Zone Htg Unit Water gpm @ 20.0 °F	Mixing Box Fan Airflow (CFM)
D101 - Classroom	449	449	0.49	15.6	-	0.0	-	269
D102 - Classroom	449	449	0.49	15.6	-	0.0	-	269
D103 - Classroom	449	449	0.49	15.6	-	0.0	-	269
D104 - Classroom	455	449	0.50	18.6	-	0.0	-	363
D106 - Classroom	513	449	0.57	19.5	-	0.0	-	392
D107 - Classroom	487	449	0.54	15.6	-	0.0	-	269
D108 - Music Room	893	813	0.42	28.9	-	0.0	-	508
D113 - West Corridor	145	79	0.14	4.5	-	0.0	-	102
D114 - South Corridor	126	69	0.14	3.9	-	0.0	-	89

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
D101 - Classroom	9.3	Jun 1600	8.5	907.5
D102 - Classroom	9.3	Jun 1600	8.5	907.5
D103 - Classroom	9.3	Jun 1600	8.5	907.5
D104 - Classroom	9.6	Aug 1700	11.5	907.5
D106 - Classroom	10.8	Aug 1700	12.4	907.5
D107 - Classroom	10.3	Jun 1700	8.5	907.5
D108 - Music Room	18.8	Aug 1700	16.1	2140.0
D113 - West Corridor	3.1	Jun 1600	3.2	1054.0
D114 - South Corridor	2.7	Jun 1600	2.8	920.0

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
D101 - Classroom							
D101 - Typical Classroom	1	9.3	Jun 1600	449	8.5	907.5	0.49
D102 - Classroom							
D101 - Typical Classroom	1	9.3	Jun 1600	449	8.5	907.5	0.49
D103 - Classroom							
D101 - Typical Classroom	1	9.3	Jun 1600	449	8.5	907.5	0.49
D104 - Classroom							
D104 - Classroom	1	9.6	Aug 1700	455	11.5	907.5	0.50
D106 - Classroom							
D106 - Classroom	1	10.8	Aug 1700	513	12.4	907.5	0.57
D107 - Classroom							
D107 - Classroom	1	10.3	Jun 1700	487	8.5	907.5	0.54

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Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
<i>D108 - Music Room</i>							
D108 - Music Room	1	16.0	Aug 1700	760	10.3	1781.0	0.43
D109 - Practice Room	1	0.6	Aug 1700	27	1.6	65.0	0.42
D110 - Storage	1	0.5	Aug 1600	22	1.5	120.0	0.18
D111 - Office	1	1.8	Jun 1700	85	2.7	174.0	0.49
<i>D113 - West Corridor</i>							
D113 - West Corridor	1	3.1	Jun 1600	145	3.2	1054.0	0.14
<i>D114 - South Corridor</i>							
D114 - South Corridor	1	2.7	Jun 1600	126	2.8	920.0	0.14

Zone Sizing Summary for 4P Fan Coils with DOAS

Project Name: HAP50-Example
Prepared by: Carrier Corporation

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Air System Information

Air System Name **4P Fan Coils with DOAS**
Equipment Class **TERM**
Air System Type **4P-FC**

Number of zones **9**
Floor Area **9559.0** ft²
Location **Chicago IAP, Illinois**

Sizing Calculation Information

Calculation Months **May to Nov**
Sizing Data **Calculated**

Zone CFM Sizing **Sum of space airflow rates**
Space CFM Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (MBH)	Sens Coil Load (MBH)	Coil Entering DB / WB (°F)	Coil Leaving DB / WB (°F)	Water Flow @ 10.0 °F (gpm)	Time of Peak Coil Load	Zone CFM/ft ²
D101 - Classroom	18.4	10.3	75.0 / 68.4	60.2 / 59.8	3.68	Aug 0700	0.73
D102 - Classroom	18.4	10.3	75.0 / 68.4	60.2 / 59.8	3.68	Aug 0700	0.73
D103 - Classroom	18.4	10.3	75.0 / 68.4	60.2 / 59.8	3.68	Aug 0700	0.73
D104 - Classroom	19.7	11.3	75.8 / 68.5	60.0 / 59.5	3.95	Aug 0800	0.75
D106 - Classroom	19.3	11.3	75.1 / 68.3	60.7 / 60.2	3.87	Aug 0700	0.82
D107 - Classroom	18.0	12.9	75.9 / 66.2	58.6 / 57.9	3.61	Aug 1600	0.78
D108 - Music Room	37.4	26.5	75.9 / 66.0	58.0 / 57.3	7.48	Aug 1500	0.66
D113 - West Corridor	9.3	6.2	76.5 / 67.0	58.9 / 58.2	1.85	Jun 1500	0.32
D114 - South Corridor	8.0	5.4	76.5 / 67.1	59.0 / 58.3	1.60	Jun 1500	0.32

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (MBH)	Heating Coil Ent/Lvg DB (°F)	Htg Coil Water Flow @20.0 °F (gpm)	Fan Design Airflow (CFM)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (CFM)
D101 - Classroom	7.6	70.1 / 81.0	0.76	663	0.098	0.078	449
D102 - Classroom	7.6	70.1 / 81.0	0.76	663	0.098	0.078	449
D103 - Classroom	7.6	70.1 / 81.0	0.76	663	0.098	0.078	449
D104 - Classroom	10.5	70.0 / 84.6	1.05	681	0.101	0.080	449
D106 - Classroom	11.4	70.0 / 84.5	1.14	743	0.110	0.087	449
D107 - Classroom	7.7	70.1 / 80.4	0.77	711	0.105	0.083	449
D108 - Music Room	15.0	70.1 / 80.2	1.50	1405	0.208	0.165	804
D113 - West Corridor	3.1	70.0 / 78.7	0.31	336	0.050	0.039	79
D114 - South Corridor	2.7	70.0 / 78.7	0.27	294	0.043	0.034	69

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (MBH)	Time of Peak Sensible Cooling Load	Zone Heating Load (MBH)	Zone Floor Area (ft ²)
D101 - Classroom	11.9	Jun 1600	8.5	907.5
D102 - Classroom	11.9	Jun 1600	8.5	907.5
D103 - Classroom	11.9	Jun 1600	8.5	907.5
D104 - Classroom	12.2	Jun 1600	11.5	907.5
D106 - Classroom	13.3	Aug 1700	12.4	907.5
D107 - Classroom	12.7	Jun 1700	8.5	907.5
D108 - Music Room	24.6	Aug 1600	16.1	2140.0
D113 - West Corridor	6.0	Jun 1500	3.2	1054.0
D114 - South Corridor	5.3	Jun 1500	2.8	920.0

Zone Sizing Summary for 4P Fan Coils with DOAS

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Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (MBH)	Time of Peak Sensible Load	Air Flow (CFM)	Heating Load (MBH)	Floor Area (ft ²)	Space CFM/ft ²
<i>D101 - Classroom</i>							
D101 - Typical Classroom	1	11.9	Jun 1600	663	8.5	907.5	0.73
<i>D102 - Classroom</i>							
D101 - Typical Classroom	1	11.9	Jun 1600	663	8.5	907.5	0.73
<i>D103 - Classroom</i>							
D101 - Typical Classroom	1	11.9	Jun 1600	663	8.5	907.5	0.73
<i>D104 - Classroom</i>							
D104 - Classroom	1	12.2	Jun 1600	681	11.5	907.5	0.75
<i>D106 - Classroom</i>							
D106 - Classroom	1	13.3	Aug 1700	743	12.4	907.5	0.82
<i>D107 - Classroom</i>							
D107 - Classroom	1	12.7	Jun 1700	711	8.5	907.5	0.78
<i>D108 - Music Room</i>							
D108 - Music Room	1	20.8	Aug 1600	1161	10.3	1781.0	0.65
D109 - Practice Room	1	0.8	Aug 1700	59	1.6	65.0	0.91
D110 - Storage	1	0.8	Jun 1500	58	1.5	120.0	0.48
D111 - Office	1	2.3	Jun 1700	127	2.7	174.0	0.73
<i>D113 - West Corridor</i>							
D113 - West Corridor	1	6.0	Jun 1500	336	3.2	1054.0	0.32
<i>D114 - South Corridor</i>							
D114 - South Corridor	1	5.3	Jun 1500	294	2.8	920.0	0.32