

Air System Information

Air System Name VRF	Number of zones 1
Equipment Class TERM	Floor Area 1391.0 ft ²
Air System Type VRF	Location Philadelphia IAP, Pennsylvania

Sizing Calculation Information

Calculation Months Jan to Dec	Zone CFM Sizing Sum of space airflow rates
Sizing Data Calculated	Space CFM Sizing Individual peak space loads

Heating Coil Sizing Data

Max coil load 3.9 MBH	Load occurs at Des Htg
Coil CFM at Des Htg 175 CFM	Ent. DB / Lvg DB 49.6 / 70.0 °F
Max coil CFM 175 CFM	
Water flow @ 20.0 °F drop N/A	

Ventilation Fan Sizing Data

Actual max CFM 175 CFM	Fan motor BHP 0.00 BHP
Standard CFM 175 CFM	Fan motor kW 0.00 kW
Actual max CFM/ft ² 0.13 CFM/ft ²	Fan static 0.00 in wg

Outdoor Ventilation Air Data

Design airflow CFM 175 CFM	CFM/person 14.61 CFM/person
CFM/ft ² 0.13 CFM/ft ²	

Zone Sizing Summary for VRF

Project Name: P4170
Prepared by: ABS ENGINEERING, PLLC

11/22/2017
10:58AM

Air System Information

Air System Name VRF
Equipment Class TERM
Air System Type VRF

Number of zones 1
Floor Area 1391.0 ft²
Location Philadelphia IAP, Pennsylvania

Sizing Calculation Information

Calculation Months Jan to Dec
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
Zone 1	27.7	24.2	76.7 / 66.1	60.9 / 59.9	-	Jul 1700	1.02

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)
Zone 1	6.4	70.0 / 74.2	-	1413	0.000	0.000	175

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)
Zone 1	24.1	Jul 1600	6.0	1391.0

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
Zone 1							
Cellar Mid	1	1.5	Jul 2100	82	0.4	190.0	0.43
Cellar N	1	1.5	Jun 1700	82	0.5	120.0	0.68
Cellar S (MER)	1	1.7	Sep 1500	95	0.5	140.0	0.68
Parlor Dining	1	2.0	Jun 1700	107	0.1	137.0	0.78
Parlor N (Kitch)	1	3.3	Jun 1700	177	1.0	120.0	1.48
Parlor S (Living)	1	3.4	Oct 1500	187	0.5	145.0	1.29
Second Floor Master	1	2.9	Jun 1700	156	0.3	170.0	0.92
Second Floor N (bath)	1	1.9	Jun 0800	103	0.5	67.0	1.54
Second Floor S (Bed 2)	1	3.4	Oct 1500	186	0.4	137.0	1.36
Third Floor	1	4.4	Aug 1500	237	1.7	165.0	1.44

Air System Design Load Summary for VRF

Project Name: P4170
Prepared by: ABS ENGINEERING, PLLC

11/22/2017
10:58AM

	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jul 1700 COOLING OA DB / WB 88.3 °F / 74.0 °F			HEATING DATA AT DES HTG HEATING OA DB / WB 11.6 °F / 10.0 °F		
ZONE LOADS	Details	Sensible (BTU/hr)	Latent (BTU/hr)	Details	Sensible (BTU/hr)	Latent (BTU/hr)
Window & Skylight Solar Loads	201 ft²	9831	-	201 ft²	-	-
Wall Transmission	1349 ft²	578	-	1349 ft²	1868	-
Roof Transmission	409 ft²	252	-	409 ft²	348	-
Window Transmission	201 ft²	268	-	201 ft²	1409	-
Skylight Transmission	0 ft²	0	-	0 ft²	0	-
Door Loads	168 ft²	280	-	168 ft²	1472	-
Floor Transmission	450 ft²	0	-	450 ft²	366	-
Partitions	0 ft²	0	-	0 ft²	0	-
Ceiling	0 ft²	0	-	0 ft²	0	-
Overhead Lighting	1530 W	4810	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1043 W	3435	-	0	0	-
People	12	2372	2275	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	2183	228	10%	546	0
>> Total Zone Loads	-	24008	2503	-	6007	0
Zone Conditioning	-	23351	2503	-	6428	0
Plenum Wall Load	0%	0	-	0	0	-
Plenum Roof Load	0%	0	-	0	0	-
Plenum Lighting Load	0%	0	-	0	0	-
Exhaust Fan Load	175 CFM	0	-	175 CFM	0	-
Ventilation Load	175 CFM	801	1063	175 CFM	3858	0
Ventilation Fan Load	175 CFM	0	-	175 CFM	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	24152	3566	-	10286	0
Heating Coil	-	0	-	-	3861	-
Terminal Unit Cooling	-	24152	3577	-	0	0
Terminal Unit Heating	-	0	-	-	6426	-
>> Total Conditioning	-	24152	3577	-	10286	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		