

*HVAC Load Analysis*



**CHVAC** COMMERCIAL  
HVAC LOADS



## Building Summary Loads

Bldg Load Descriptions	Area Quan	Sen Loss	%Tot Loss	Lat Gain	Sen Gain	Net Gain	%Net Gain
Roof	0	0	0,00	0	0	0	0,00
Wall	315	7 460	43,91	0	0	0	0,00
Glass	31	4 713	27,74	0	0	0	0,00
Floor Slab	0	0	0,00	0	0	0	0,00
<b>Skin Loads</b>		<b>12 173</b>	<b>71,65</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0,00</b>
Lighting	0	0	0,00	0	0	0	0,00
Equipment	0	0	0,00	0	0	0	0,00
People	0	0	0,00	0	0	0	0,00
Partition	338	1 224	7,21	0	0	0	0,00
Cool. Pret.	0	0	0,00	0	0	0	0,00
Heat. Pret.	0	0	0,00	0	0	0	0,00
Cool. Vent.	0	0	0,00	0	0	0	0,00
Heat. Vent.	0	0	0,00	0	0	0	0,00
Cool. Infil.	0	0	0,00	0	0	0	0,00
Heat. Infil.	22	1 654	9,73	0	0	0	0,00
Draw-Thru Fan	0	0	0,00	0	0	0	0,00
Blow-Thru Fan	0	0	0,00	0	0	0	0,00
Reserve Cap.	0	0	0,00	0	0	0	0,00
Reheat Cap.	0	0	0,00	0	0	0	0,00
Supply Duct	0	1 296	7,63	0	0	0	0,00
Return Duct	0	642	3,78	0	0	0	0,00
Misc. Supply	0	0	0,00	0	0	0	0,00
Misc. Return	0	0	0,00	0	0	0	0,00
<b>Building Totals</b>		<b>16 989</b>	<b>100,00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0,00</b>

Building Summary	Sen Loss	%Tot Loss	Lat Gain	Sen Gain	Net Gain	%Net Gain
Ventilation	0	0,00	0	0	0	0,00
Infiltration	1 654	9,73	0	0	0	0,00
Pretreated Air	0	0,00	0	0	0	0,00
Zone Loads	13 397	78,86	0	0	0	0,00
Plenum Loads	0	0,00	0	0	0	0,00
Fan & Duct Loads	1 938	11,41	0	0	0	0,00
<b>Building Totals</b>	<b>16 989</b>	<b>100,00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0,00</b>

## Check Figures

Total Building Supply Air (based on a 14° TD):

989 L/s

Total Building Vent. Air (0,00% of Supply):

0 L/s

Total Conditioned Air Space:

240 Sq.m

Supply Air Per Unit Area:

4,1147 L/s/Sq.m

Area Per Cooling Capacity:

0,0000 Sq.m/kW

0,0000 Sq.m/Ton

Cooling Capacity Per Area:

0,0000 kW/Sq.m

0,0000 Tons/Sq.m

Heating Capacity Per Area:

70,71 Watts/Sq.m

Total Heating Required With Outside Air:

16,99 kW

Total Cooling With Outside Air:

0,00 kW

0,00 Tons



### Air Handler #1 Summary Loads

Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.L/s L/s/Sqm	Sen.Gain Clg.L/s L/s/Sqm	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.L/s Act.L/s	Clg.O.A. Req.L/s Act.L/s
1	1 -	10 0 29	1 041 68 6,98	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 178 mm. dia, Diffusers: 1, L/s/runout: 68, Velocity: 2,8 m/s, Pressure drop: 0,130 mm/m							
2	3 -	7 0 21	280 18 2,57	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 102 mm. dia, Diffusers: 1, L/s/runout: 18, Velocity: 2,3 m/s, Pressure drop: 0,193 mm/m							
3	4 -	16 0 49	1 199 79 4,81	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 178 mm. dia, Diffusers: 1, L/s/runout: 79, Velocity: 3,3 m/s, Pressure drop: 0,172 mm/m							
4	5 -	23 0 68	1 349 89 3,92	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 178 mm. dia, Diffusers: 1, L/s/runout: 89, Velocity: 3,7 m/s, Pressure drop: 0,217 mm/m							
5	6 -	14 0 82	571 38 2,74	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 127 mm. dia, Diffusers: 1, L/s/runout: 38, Velocity: 3,1 m/s, Pressure drop: 0,240 mm/m							
6	7 -	19 0 56	1 301 85 4,62	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 178 mm. dia, Diffusers: 1, L/s/runout: 85, Velocity: 3,6 m/s, Pressure drop: 0,202 mm/m							
7	8 -	11 0 34	923 61 5,36	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 178 mm. dia, Diffusers: 1, L/s/runout: 61, Velocity: 2,5 m/s, Pressure drop: 0,103 mm/m							
8	9 -	26 0 79	1 386 91 3,45	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 152 mm. dia, Diffusers: 2, L/s/runout: 46, Velocity: 2,6 m/s, Pressure drop: 0,132 mm/m							
9	10 -	16 0 47	1 043 68 4,39	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 178 mm. dia, Diffusers: 1, L/s/runout: 68, Velocity: 2,8 m/s, Pressure drop: 0,131 mm/m							
10	11 -	20 0 60	1 182 78 3,88	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 178 mm. dia, Diffusers: 1, L/s/runout: 78, Velocity: 3,2 m/s, Pressure drop: 0,167 mm/m							
11	12 -	17 0 50	1 056 69 4,13	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 178 mm. dia, Diffusers: 1, L/s/runout: 69, Velocity: 2,9 m/s, Pressure drop: 0,134 mm/m							
12	13 -	15 0 46	931 61 4,02	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 178 mm. dia, Diffusers: 1, L/s/runout: 61, Velocity: 2,5 m/s, Pressure drop: 0,105 mm/m							



**Air Handler #1 Summary Loads (cont'd)**

Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.L/s L/s/Sqm	Sen.Gain Clg.L/s L/s/Sqm	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.L/s Act.L/s	Clg.O.A. Req.L/s Act.L/s
13	ì àí ñãðää -	47 0 103	2 788 183 3,91	0 0 0,00	0 0 0	None 0 0	None 0 0
Runout duct size: 178 mm. dia, Diffusers: 3, L/s/runout: 61, Velocity: 2,5 m/s, Pressure drop: 0,104 mm/m							
Zone Peak Totals:		240	15 051	0	0		
Total Zones: 13		0	989	0	0	0	0
Unique Zones: 13		724	4,11	0,00	0	0	0
Main trunk duct size: 488 mm. h x 508mm. w, Velocity: 4,6 m/s, Pressure drop: 0,041 mm/m							



## Air Handler #1 Total Load Summary

Air Handler Description: Constant Volume - Proportion  
 Supply Air Fan: Draw-Thru with program estimated horsepower of 0,00 kW  
 Fan Input: 0% motor and fan efficiency with 0 kPa across the fan  
 Outdoor Conditions: -32° DB (System is Heating Only)

Winter: Exhaust controls outside air.

Zone Space sensible loss:	13 397	Watts	
Infiltration sensible loss:	1 654	Watts	22 L/s
Outside Air sensible loss:	0	Watts	0 L/s
Supply Duct sensible loss:	1 296	Watts	
Return Duct sensible loss:	642	Watts	
Return Plenum sensible loss:	0	Watts	
Total System sensible loss:			16 989 Watts

Heating Supply Air: $16\,347 / (.976 \times 1,21 \times 14) =$	989	L/s
Winter Vent Outside Air (0,0% of supply) =	0	L/s

Zone space sensible gain:	0	Watts	
Infiltration sensible gain:	0	Watts	
Draw-thru fan sensible gain:	0	Watts	
Supply duct sensible gain:	0	Watts	
Reserve sensible gain:	0	Watts	
Total sensible gain on supply side of coil:			0 Watts

Cooling Supply Air: $0 / (.976 \times 1,23 \times 0) =$	0	L/s
Summer Vent Outside Air (0,0% of supply) =	0	L/s

Return duct sensible gain:	0	Watts	
Return plenum sensible gain:	0	Watts	
Outside air sensible gain:	0	Watts	0 L/s
Blow-thru fan sensible gain:	0	Watts	
Total sensible gain on return side of coil:			0 Watts
Total sensible gain on air handling system:			0 Watts

Zone space latent gain:	0	Watts	
Infiltration latent gain:	0	Watts	
Outside air latent gain:	0	Watts	
Total latent gain on air handling system:			0 Watts
Total system sensible and latent gain:			0 Watts

## Check Figures

Total Air Handler Supply Air (based on a 14° TD):	989	L/s	
Total Air Handler Vent. Air (0,00% of Supply):	0	L/s	
Total Conditioned Air Space:	240	Sq.m	
Supply Air Per Unit Area:	4,1147	L/s/Sq.m	
Area Per Cooling Capacity:	0,0000	Sq.m/kW	0,0000 Sq.m/Ton
Cooling Capacity Per Area:	0,0000	kW/Sq.m	0,0000 Tons/Sq.m
Heating Capacity Per Area:	70,71	Watts/Sq.m	
Total Heating Required With Outside Air:	16,99	kW	
Total Cooling With Outside Air:	0,00	kW	0,00 Tons



### Zone Detailed Loads (At Zone Peak Times)

Load Description	Unit Quan	U.Fac/ Usage	Conv. S.Gain	Radiant S.Gain	Total S.Gain	Lat. Gain	Htg. Mult.	Htg. Loss
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#### Zone 1-1, Air Handler 1, Group 0, 4,9 x 2,0, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-SW-Type:12	12	0,375	0	0	0		20,612	257
Wall-2-SE-Type:12	6	0,375	0	0	0		20,612	124
Wall-4-NW-Type:12	6	0,375	0	0	0		20,612	124
Partition-3-1	14,7	0,450	0	0	0		3,150	46
Gls-SW-1-0%S	2,3	2,700	0	0	0		132,000	297
Unshaded Beam	2,3		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	1						64,964	58

Sub-total					0	0		906
Safety factors:					+15%	+15%		+15%
Total w/ safety factors:					0	0		1 041

#### Zone 2-3, Air Handler 1, Group 0, 4,2 x 1,7, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-2-SE-Type:12	5	0,375	0	0	0		20,612	105
Partition-1-1	12,6	0,450	0	0	0		3,150	40
Partition-3-1	12,6	0,450	0	0	0		3,150	40
Partition-4-1	5,1	0,450	0	0	0		3,150	16
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	1						64,964	43

Sub-total					0	0		243
Safety factors:					+15%	+15%		+15%
Total w/ safety factors:					0	0		280

#### Zone 3-4, Air Handler 1, Group 0, 4,2 x 3,9, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-NE-Type:12	10	0,375	0	0	0		20,612	213
Wall-2-SE-Type:12	11	0,375	0	0	0		20,612	220
Partition-3-1	12,6	0,450	0	0	0		3,150	40
Partition-4-1	11,7	0,450	0	0	0		3,150	37
Gls-NE-1-0%S	2,3	2,700	0	0	0		132,000	297
Unshaded Beam	2,3		0	0	0			
Gls-SE-1-0%S	1,1	2,700	0	0	0		132,000	139
Unshaded Beam	1,1		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	2						64,964	98

Sub-total					0	0		1 043
Safety factors:					+15%	+15%		+15%
Total w/ safety factors:					0	0		1 199

#### Zone 4-5, Air Handler 1, Group 0, 5,8 x 3,9, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-NE-Type:12	12	0,375	0	0	0		20,612	257
Partition-2-1	11,7	0,450	0	0	0		3,150	37
Partition-3-1	17,4	0,450	0	0	0		3,150	55
Partition-4-1	11,7	0,450	0	0	0		3,150	37
Gls-NE-1-0%S	2,7	2,700	0	0	0		132,000	356
Unshaded Beam	2,7		0	0	0			



### Zone Detailed Loads (At Zone Peak Times) (cont'd)

Load Description	Unit Quan	U.Fac/ Usage	Conv. S.Gain	Radiant S.Gain	Total S.Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Gls-NE-1-0%S	2,3	2,700	0	0	0		132,000	297
Unshaded Beam	2,3		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	2						64,964	135
Sub-total					0	0		1 173
Safety factors:					+15%	+15%		+15%
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Total w/ safety factors:					0	0		1 349

### Zone 5-6, Air Handler 1, Group 0, 3,7 x 3,7, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-SW-Type:12	11	0,375	0	0	0		20,612	229
Partition-2-1	11,1	0,450	0	0	0		3,150	35
Partition-3-1	11,1	0,450	0	0	0		3,150	35
Partition-4-1	11,1	0,450	0	0	0		3,150	35
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	3						64,964	163
Sub-total					0	0		497
Safety factors:					+15%	+15%		+15%
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Total w/ safety factors:					0	0		571

### Zone 6-7, Air Handler 1, Group 0, 5,0 x 3,7, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-SW-Type:12	14	0,375	0	0	0		20,612	281
Wall-2-NW-Type:12	9	0,375	0	0	0		20,612	182
Partition-3-1	15	0,450	0	0	0		3,150	47
Partition-4-1	11,1	0,450	0	0	0		3,150	35
Gls-SW-1-0%S	1,4	2,700	0	0	0		132,000	178
Unshaded Beam	1,4		0	0	0			
Gls-NW-1-0%S	2,3	2,700	0	0	0		132,000	297
Unshaded Beam	2,3		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	2						64,964	110
Sub-total					0	0		1 131
Safety factors:					+15%	+15%		+15%
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Total w/ safety factors:					0	0		1 301

### Zone 7-8, Air Handler 1, Group 0, 3,9 x 2,9, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-NW-Type:12	9	0,375	0	0	0		20,612	195
Wall-2-NE-Type:12	9	0,375	0	0	0		20,612	179
Partition-3-1	11,7	0,450	0	0	0		3,150	37
Partition-4-1	8,700001	0,450	0	0	0		3,150	27
Gls-NW-1-0%S	2,3	2,700	0	0	0		132,000	297
Unshaded Beam	2,3		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	1						64,964	67
Sub-total					0	0		803
Safety factors:					+15%	+15%		+15%
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Total w/ safety factors:					0	0		923



### Zone Detailed Loads (At Zone Peak Times) (cont'd)

Load Description	Unit Quan	U.Fac/ Usage	Conv. S.Gain	Radiant S.Gain	Total S.Gain	Lat. Gain	Htg. Mult.	Htg. Loss
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#### Zone 8-9, Air Handler 1, Group 1, 4,8 x 5,5, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-NE-Type:12	9	0,375	0	0	0		20,612	186
Partition-2-1	16,5	0,450	0	0	0		3,150	52
Partition-3-1	14,4	0,450	0	0	0		3,150	45
Partition-4-1	16,5	0,450	0	0	0		3,150	52
Gls-NE-1-0%S	3,2	2,700	0	0	0		132,000	416
Unshaded Beam	3,2		0	0	0			
Gls-NE-1-0%S	2,3	2,700	0	0	0		132,000	297
Unshaded Beam	2,3		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	2						64,964	157
Sub-total					0	0		1 205
Safety factors:					+15%	+15%		+15%
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Total w/ safety factors:					0	0		1 386

#### Zone 9-10, Air Handler 1, Group 1, 4,0 x 3,9, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-NW-Type:12	10	0,375	0	0	0		20,612	201
Wall-2-NE-Type:12	12	0,375	0	0	0		20,612	241
Partition-3-1	12	0,450	0	0	0		3,150	38
Partition-4-1	11,7	0,450	0	0	0		3,150	37
Gls-NW-1-0%S	2,3	2,700	0	0	0		132,000	297
Unshaded Beam	2,3		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	1						64,964	93
Sub-total					0	0		907
Safety factors:					+15%	+15%		+15%
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Total w/ safety factors:					0	0		1 043

#### Zone 10-11, Air Handler 1, Group 1, 4,0 x 5,0, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-NW-Type:12	11	0,375	0	0	0		20,612	226
Wall-2-SW-Type:12	14	0,375	0	0	0		20,612	281
Partition-3-1	12	0,450	0	0	0		3,150	38
Partition-4-1	15	0,450	0	0	0		3,150	47
Gls-SW-1-0%S	1,4	2,700	0	0	0		132,000	178
Unshaded Beam	1,4		0	0	0			
Gls-NW-1-0%S	1,1	2,700	0	0	0		132,000	139
Unshaded Beam	1,1		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	2						64,964	119
Sub-total					0	0		1 028
Safety factors:					+15%	+15%		+15%
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Total w/ safety factors:					0	0		1 182

#### Zone 11-12, Air Handler 1, Group 1, 4,0 x 4,2, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)



### Zone Detailed Loads (At Zone Peak Times) (cont'd)

Load Description	Unit Quan	U.Fac/ Usage	Conv. S.Gain	Radiant S.Gain	Total S.Gain	Lat. Gain	Htg. Mult.	Htg. Loss
Wall-1-NE-Type:12	12	0,375	0	0	0		20,612	238
Wall-2-SE-Type:12	11	0,375	0	0	0		20,612	226
Partition-3-1	12,6	0,450	0	0	0		3,150	40
Partition-4-1	12	0,450	0	0	0		3,150	38
Gls-NE-1-0%S	1,1	2,700	0	0	0		132,000	139
Unshaded Beam	1,1		0	0	0			
Gls-SE-1-0%S	1,1	2,700	0	0	0		132,000	139
Unshaded Beam	1,1		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	2						64,964	100
Sub-total					0	0		919
Safety factors:					+15%	+15%		+15%
Total w/ safety factors:					0	0		1 056

### Zone 12-13, Air Handler 1, Group 1, 2,6 x 5,9, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-SE-Type:12	7	0,375	0	0	0		20,612	139
Wall-2-SW-Type:12	18	0,375	0	0	0		20,612	362
Partition-3-1	7,8	0,450	0	0	0		3,150	25
Partition-4-1	17,55	0,450	0	0	0		3,150	55
Gls-SE-1-0%S	1,1	2,700	0	0	0		132,000	139
Unshaded Beam	1,1		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	1						64,964	91
Sub-total					0	0		810
Safety factors:					+15%	+15%		+15%
Total w/ safety factors:					0	0		931

### Zone 13-1 à í ñäðää, Air Handler 1, Group 2, 13,0 x 3,6, Construction Type: 1 (Exterior, Light Construction, With Carpet, 10% Glass)

Wall-1-NE-Type:12	39	0,375	0	0	0		20,612	804
Wall-2-SE-Type:12	10	0,375	0	0	0		20,612	205
Wall-3-SW-Type:12	39	0,375	0	0	0		20,612	804
Wall-4-NW-Type:12	10	0,375	0	0	0		20,612	210
Gls-SE-1-0%S	0,9	2,700	0	0	0		132,000	116
Unshaded Beam	0,9		0	0	0			
Gls-NW-1-0%S	0,6	2,700	0	0	0		132,000	83
Unshaded Beam	0,6		0	0	0			
Cool. Infil.AC/hr	0				0	0		
Heat. Infil.AC/hr	3						64,964	204
Sub-total					0	0		2 424
Safety factors:					+15%	+15%		+15%
Total w/ safety factors:					0	0		2 788