

Data: Julho de 2023

SESC TAGUATINGA

OBRA: SESC TAGUATINGA

PROJETO DE CLIMATIZAÇÃO

MEMÓRIA DE CÁLCULO

Porto Alegre, Julho de 2022.

Data: Julho de 2023

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1. OBJETIVO

Este documento tem por objetivo apresentar a metodologia utilizada e os resultados obtidos no dimensionamento do sistema de ar-condicionado para o SESC Taguatinga.

2. NORMAS APLICÁVEIS

Foram seguidas as recomendações das seguintes normas e entidades nos cálculos apresentados no presente documento:

- ABNT NBR-16401 – Instalações de Ar-Condicionado – Sistemas Centrais e Unitários;
- Portaria nº 3.523, de 28/08/98 do Ministério da Saúde (incluindo resolução 176 de outubro de 2000 e a resolução 9 de janeiro de 2003);
- NBR 10152 - Níveis de Ruído para Conforto Acústico;
- Catálogos, ITs e Recomendações de fabricantes dos materiais e equipamentos;

Estes documentos são complementados pelas normas e artigos abaixo, emitidos por organizações internacionais reconhecidas, não estando limitado a esta lista. São utilizados para situações não previstas nas normas nacionais ou onde, a cargo do projetista ou solicitação do cliente, julgar-se necessário aplicar diretrizes de maior exigência.

- AHRI - Air-Conditioning, Heating and Refrigeration Institute;
- ANSI - American National Standards Institute;
- ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers;
- ASME - American Society of Mechanical Engineers;
- SMACNA - Sheet Metal and Air Conditioning Contractors' National Association;
- Catálogos e Instruções técnicas de fabricantes.

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3. BASES DE CÁLCULO

Na sequência são apresentadas as condições e parâmetros principais utilizados no dimensionamento do sistema de ar condicionado para a edificação em estudo.

3.1 Condições Externas

Os dados climáticos de projeto (*) utilizados nos cálculos foram os seguintes:

Temperatura de bulbo seco (verão).....	34,2 °C
Temperatura de bulbo úmido coincidente (verão).....	26,9 °C

Segue no Apêndice A os parâmetros climáticos e geográficos declarados ao *software* de cálculo de carga térmica.

* Conforme ABNT NBR 16401-1 (Tabela A.5 – Região Centro-Oeste; DF, Brasília). Foram utilizados os dados da capital com o raio mais próxima considerando a Tabela A.7

3.2 Condições Internas

Foi considerada a seguinte condição de temperatura para os ambientes internos climatizados:

Temperatura de bulbo seco.....	24,0 ± 2°C
--------------------------------	------------

3.3 Ar Exterior

Para o dimensionamento do sistema de renovação de ar, consideram-se as taxas de renovação de ar estipuladas pela ANVISA.

- Espaços condicionados: 27 (m³/h)/pessoa;
- Espaços condicionados com alta densidade de pessoas: 17 (m³/h) /pessoa.

3.4 Coeficiente Global de Transferência de Calor (U)

A obtenção dos coeficientes globais de transferência de calor para as superfícies de trocas térmicas com o ambiente externo, dados em W/ (m².K), é demonstrada a seguir.

- Paredes Externas

Consideraram-se para a composição física das paredes externas – com insolação à norte, sul, leste e oeste - os seguintes elementos: Reboco de 2 cm, tijolo furado de 11 cm e novamente reboco de 2 cm. Considera-se também as resistências de convecção interna e externa. Na figura

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3.4.1 são apresentados os parâmetros utilizados na obtenção do coeficiente global de transferência de calor para as paredes externas.

Wall Constructions	
EDUSESC TAGUATINGA CBR ENGENHARIA SS LTDA	07/26/2023 08:56

Parede 15 cm

Wall Details

Outside Surface Color..... Medium
Absorptivity..... 0,675
Overall U-Value 2,366 W/(m²·K)

Wall Layers Details (Inside to Outside)

Layers	Thickness mm	Density kg/m³	Specific Ht. kJ / (kg K)	R-Value (m²·K)/W	Weight kg/m²
Inside surface resistance	0,000	0,0	0,00	0,13000	0,0
Reboco 2cm	20,000	1950,0	1,00	0,01700	39,0
Tijolo Furado 11cm	110,000	985,0	1,00	0,21856	108,4
Reboco 2cm	20,000	1950,0	1,00	0,01700	39,0
Outside surface resistance	0,000	0,0	0,00	0,04000	0,0
Totals	150,000	-		0,42256	186,4

Figura 3.4.1 – Parâmetros para a obtenção do coeficiente U das paredes com insolação à norte, nordeste, noroeste, sul, sudeste, sudoeste, leste e oeste.

O coeficiente U é dado pelo inverso da soma das resistências de condução R, ou seja:

$$U = \frac{1}{\sum R} = \frac{1}{0,42256 (m^2 K)/W} = 2,366 W/m^2 K$$

- Cobertura

Para a obtenção do coeficiente global de transferência de calor para a cobertura, considerou-se a seguinte composição: laje de concreto e telha metálica, além das resistências de convecção e das películas de ar.

Nas figuras 3.4.2 e são apresentados os parâmetros utilizados na obtenção do coeficiente global de transferência de calor para a cobertura.

Roof Constructions	
EDU SESC TAGUATINGA CBR ENGENHARIA SS LTDA	07/26/2023 09:00

Cobertura SUPERIOR

Roof Details

Outside Surface Color Medium
Absorptivity 0,675
Overall U-Value 0,581 W/(m²·K)

Roof Layers Details (Inside to Outside)

Layers	Thickness mm	Density kg/m³	Specific Ht. kJ / (kg K)	R-Value (m²·K)/W	Weight kg/m²
Inside surface resistance	0,000	0,0	0,00	0,17000	0,0
Forro Mineral	15,000	288,3	1,33	0,30200	4,3
Espaço de ar	0,000	0,0	0,00	0,21000	0,0
Telha	1,500	7689,0	0,41	0,00003	11,5
Poliuretano	30,000	35,0	1,67	1,00000	1,1
Telha	1,500	7689,0	0,41	0,00003	11,5
Outside surface resistance	0,000	0,0	0,00	0,04000	0,0
Totals	48,000	-	-	1,72206	28,4

Figura 3.4.2 – Parâmetros para a obtenção do coeficiente U da cobertura sem forro mineral

O coeficiente U é dado pelo inverso da soma das resistências de condução R, ou seja:

$$U = \frac{1}{\sum R} = \frac{1}{1,72206 (m^2 K)/W} = 0,581 W/m^2 K$$

- Janelas

Para o cálculo da carga térmica foram declaradas as janelas com variados tamanhos de cada ambiente, com as mesmas apresentando as seguintes características:

- Vidro simples com 6 mm de espessura;

Na figura 3.4.3 são apresentados os principais parâmetros declarados para as janelas, tais como dimensão, coeficiente de sombra e coeficiente global de transferência de calor.

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Window Constructions	
EDUSEC TAGUATINGA CBR ENGENHARIA SS LTDA	07/26/2023 09:02

JANELA

Window Details:

Detailed Input Sim
Height 0,90 m
Width 1,25 m
Frame Type Aluminum without thermal breaks
Internal Shade Type None
Overall U-Value 6,884 W/(m²·K)
Overall Shade Coefficient 0,880

Glass Details:

Gap Type 6mm Air Space

Glazing	Glass Type	Transmissivity	Reflectivity	Absorptivity
Outer Glazing	6mm clear	0,792	0,079	0,129
Glazing #2	not used	1,000	0,000	0,000
Glazing #3	not used	1,000	0,000	0,000

Figura 3.4.3 – Parâmetros declarados na construção das janelas

3.5 Dissipação de Calor – Equipamentos

Para a dissipação de calor nos ambientes, devido aos equipamentos eletroeletrônicos, considerou-se o *layout* dos ambientes e seguiu-se as informações apresentadas na ABNT NBR 16401-1:2008.

3.6 Dissipação de Calor – Luminárias

Considerou-se uma taxa de 16 W/m² como dissipação de calor das luminárias nos ambientes em análise.

3.7 Dissipação de Calor – Pessoas

Para as taxas de calor sensível e latente dissipada pelas pessoas – conforme o nível de atividade das mesmas – considerou-se os valores recomendados pela ABNT NBR 16401-1:2008.

3.8 População

Para a ocupação dos ambientes do prédio, considerou-se o *layout* fornecido no projeto arquitetônico. Nos ambientes onde o *layout* não foi apresentado, consideraram-se as densidades populacionais recomendadas pela ABNT NBR 16401-1.

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4. CÁLCULO DA CARGA TÉRMICA

O cálculo de carga térmica foi feito através do *software* E-20II da Carrier Company.

4.1 Cargas dos Ambientes

O Apêndice B mostra tabelas de cargas térmicas resumidas, apresentando as cargas individuais de cada ambiente condicionado do prédio.

Nas tabelas são apresentadas todas as cargas discriminadas (vidros, paredes, iluminação, pessoas, equipamentos etc.), assim como os valores totais, permitindo uma perfeita compreensão da carga térmica calculada.

5. SISTEMA DE RENOVAÇÃO DE AR

5.1 Dimensionamento Da Rede De Dutos De Ar Exterior

O dimensionamento da rede de dutos de renovação de ar para os ambientes foi realizado através do Método de Fricção Constante.

5.2 Seleção Ventiladores Ar Exterior

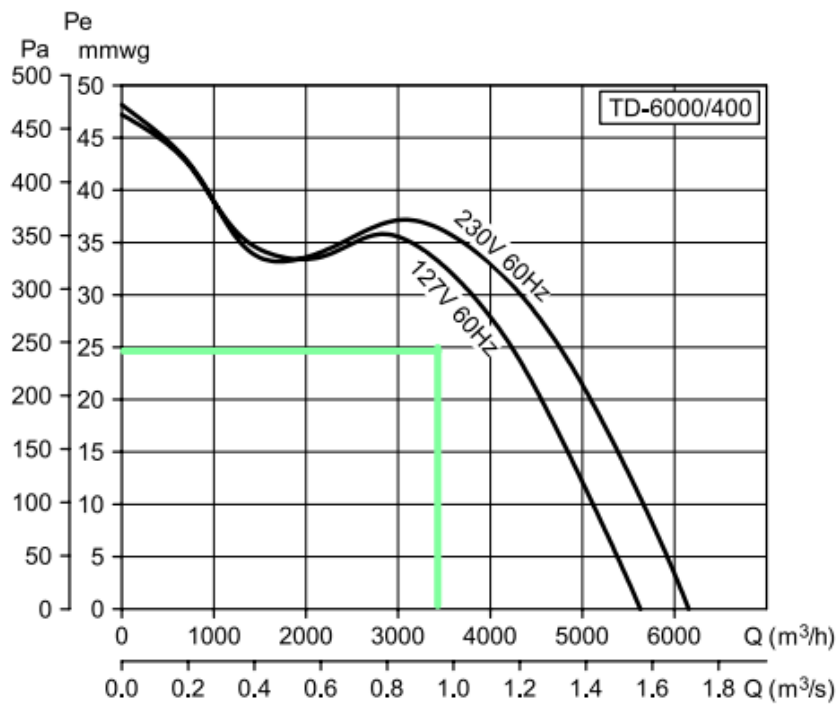
Os ventiladores foram selecionados conforme catálogo técnico, disponibilizado pela fabricante de ventiladores Soler&Palau.

Nas figuras abaixo são apresentadas as curvas de desempenho para as unidades de ventilação selecionadas para a renovação de ar dos ambientes do SESC Taguatinga.

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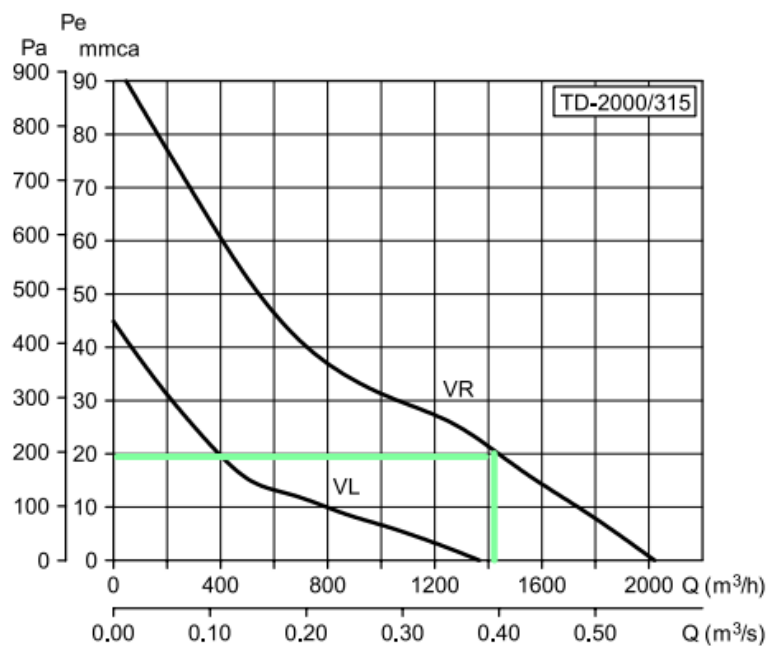
- VL-AE-TE.1

Figura 5.2.1 – Curvas de desempenho do ventilador VL-AE-TE.1



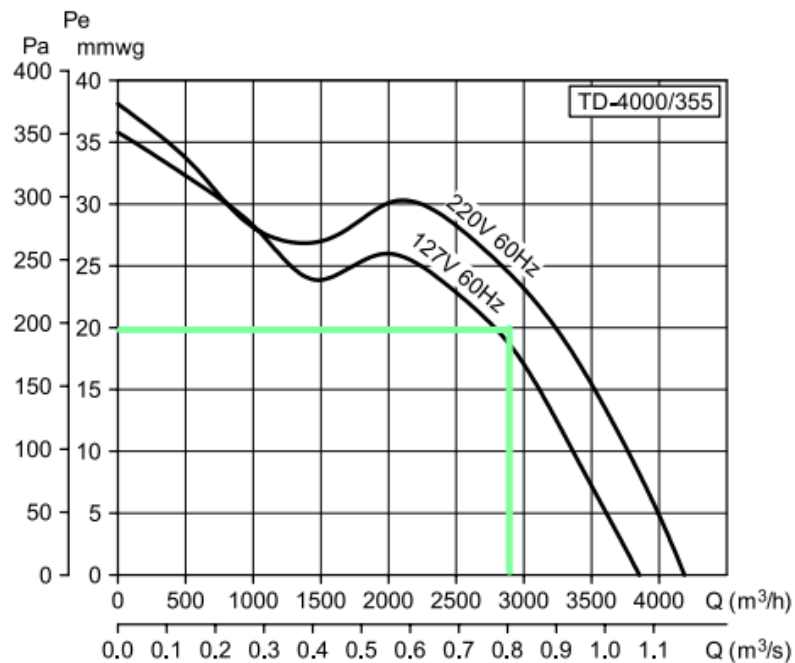
- VL-AE-TE.2

Figura 5.2.2 – Curvas de desempenho do ventilador VL-AE-TE.2



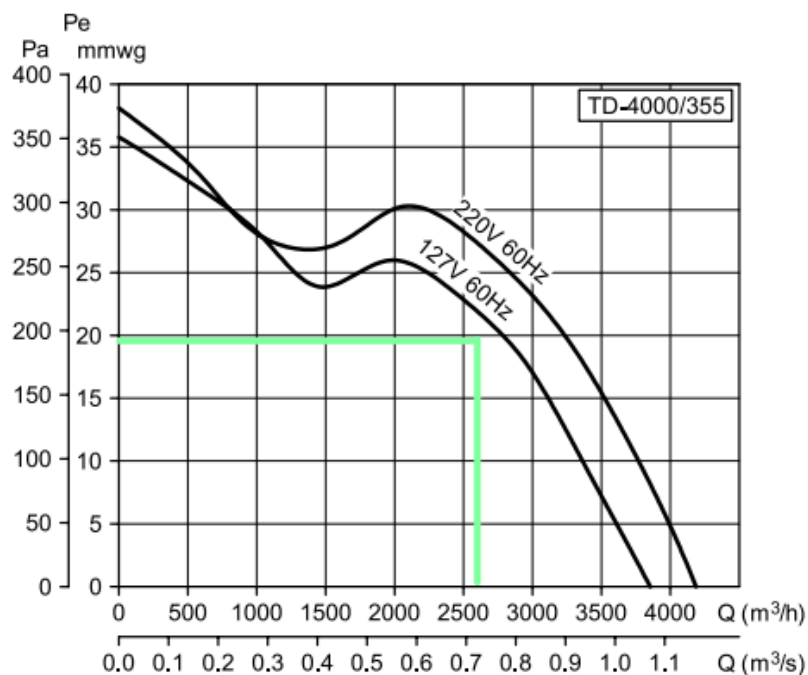
- VL-AE-1P.1 e VL-AE-1P.2

Figura 5.2.3 – Curvas de desempenho dos ventiladores VL-AE-1P.1 e VC-AE-1P.2



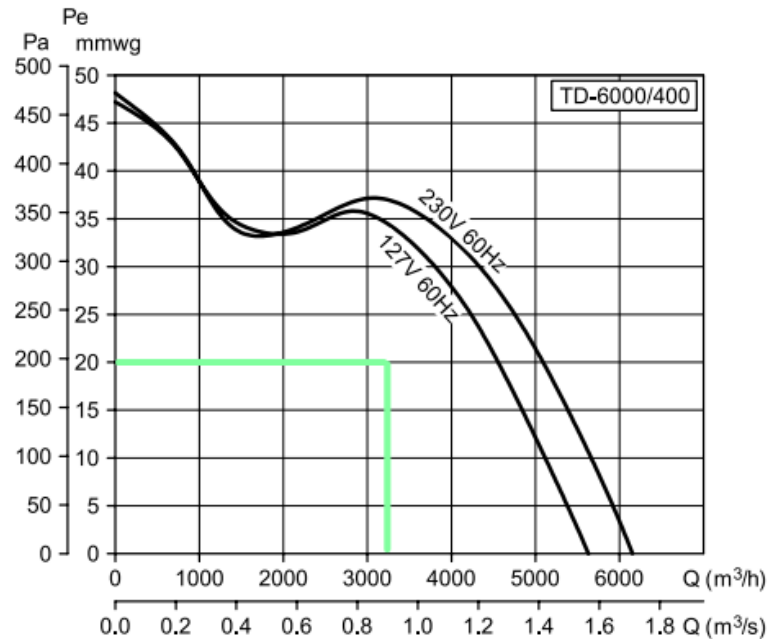
- VL-AE-1P.3 e VL-AE-1P.4

Figura 5.2.4 – Curvas de desempenho dos ventiladores VL-AE-1P.1 e VC-AE-1P.2



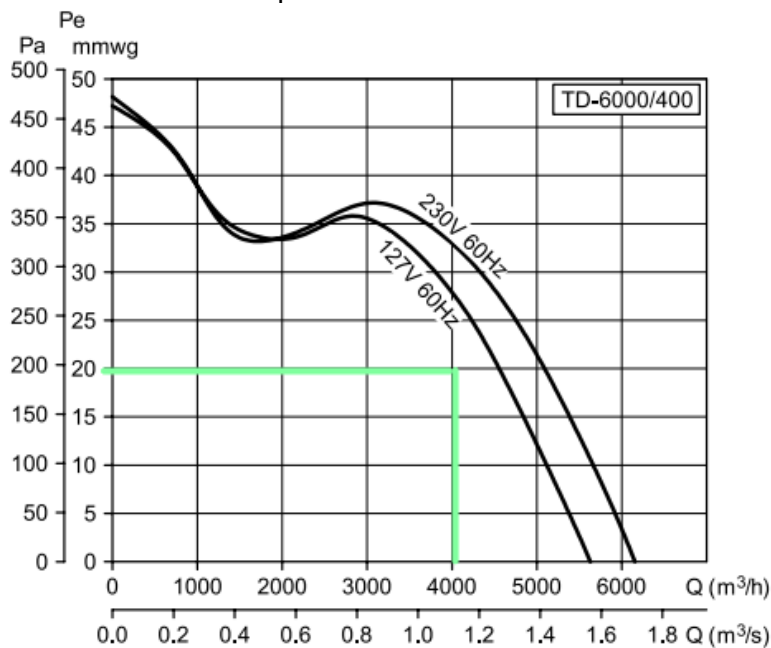
- VL-AE-2P.1 e VL-AE-2P.2

Figura 5.2.5 – Curvas de desempenho dos ventiladores VL-AE-2P.1 e VC-AE-2P.2



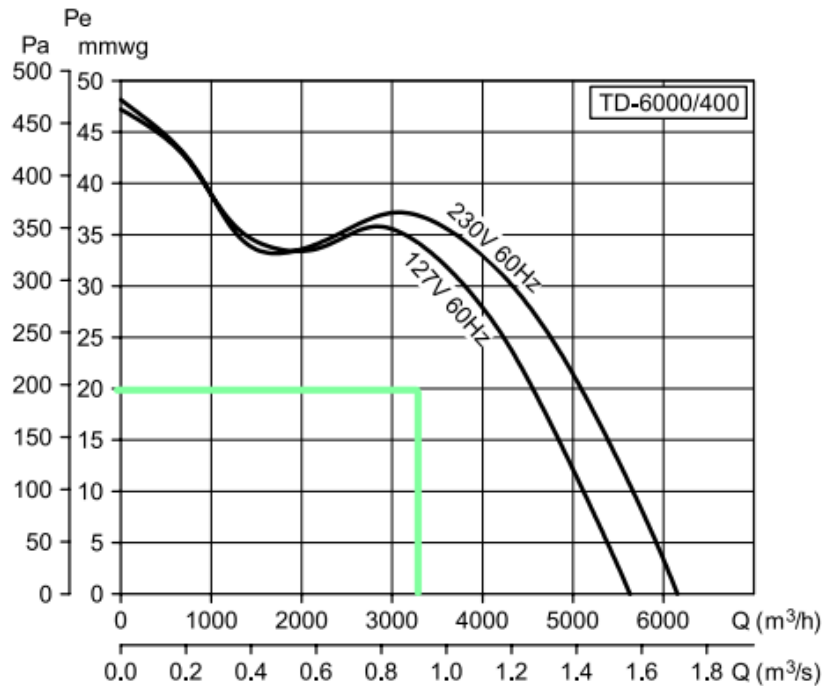
- VL-AE-2P.3 e VL-AE-2P.4

Figura 5.2.6 – Curvas de desempenho dos ventiladores VL-AE-2P.1 e VC-AE-2P.2



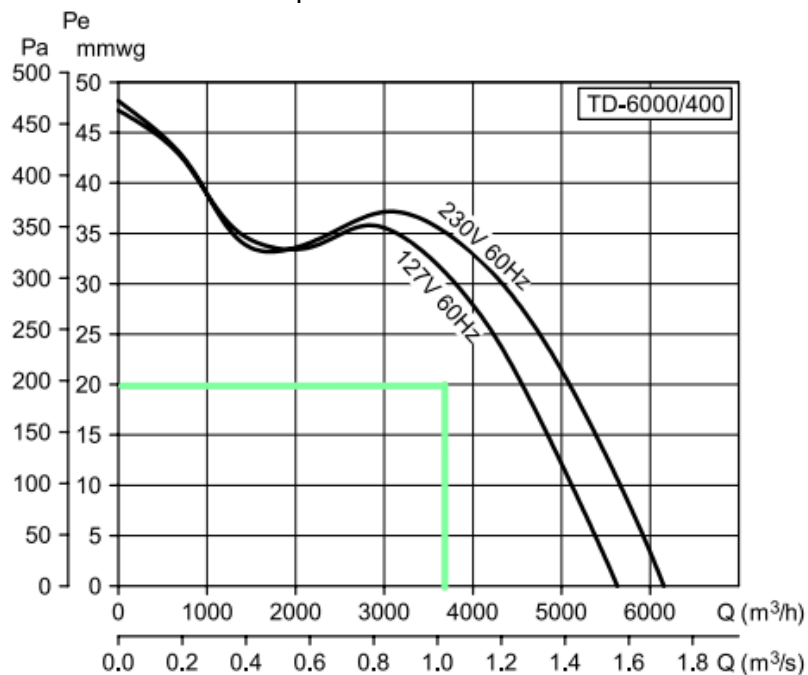
- VL-AE-3P.1 e VL-AE-3P.2

Figura 5.2.7 – Curvas de desempenho dos ventiladores VL-AE-3P.1 e VC-AE-3P.2



- VL-AE-3P.3 e VL-AE-3P.4

Figura 5.2.8 – Curvas de desempenho dos ventiladores VL-AE-3P.1 e VC-AE-3P.2



APÊNDICE A – Parâmetros Climáticos de Projeto

A Figura A mostrada abaixo apresenta os parâmetros climáticos declarados ao *software*.

Design Weather Parameters & MSHGs	
EDU SESC TAGUATINGA CBR ENGENHARIA SS LTDA	07/26/2023 09:36

Design Parameters:

City Name	Brasilia
Location	Brazil
Latitude	-15,9 Deg.
Longitude	47,9 Deg.
Elevation	1060,7 m
Summer Design Dry-Bulb	34,2 °C
Summer Coincident Wet-Bulb	26,9 °C
Summer Daily Range	13,0 K
Winter Design Dry-Bulb	8,9 °C
Winter Design Wet-Bulb	4,3 °C
Atmospheric Clearness Number	1,00
Average Ground Reflectance	0,20
Soil Conductivity	1,385 W/(m K)
Local Time Zone (GMT +/- N hours)	3,0 hours
Consider Daylight Savings Time	Não
Simulation Weather Data	N/A
Current Data is	User Modified
Design Cooling Months	January to December

Figura A – Parâmetros climáticos de projeto utilizados no cálculo das cargas térmicas

Eng. Leandro P. Lindenmeyer

CREA RS 116.761

Eng. Beatriz P. Gluz

CREA RS 217.081

Porto Alegre, Julho de 2023.

CBR Engenharia SS Ltda.

ANEXO A
RELATÓRIO DE CARGA TÉRMICA

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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09:46

Air System Information

Air System Name **VRF 1P**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **19**
Floor Area **615,0** m²
Location **Brasilia, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Air System Information

Air System Name **VRF 1P**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **19**
Floor Area **615,0** m²
Location **Brasilia, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (kW)	Sens Coil Load (kW)	Coil Entering DB / WB (°C)	Coil Leaving DB / WB (°C)	Water Flow @ 5,6 K (L/s)	Time of Peak Coil Load	Zone L/(s·m²)
1P - COORD. PEDAGÓGICA	2,5	1,5	26,9 / 21,0	15,5 / 15,0	-	Jan 1500	10,83
1P - COPA	1,4	1,3	24,7 / 18,1	15,4 / 14,8	-	Jan 1600	33,92
1P - COZINHA	10,4	7,8	25,4 / 19,0	15,4 / 14,8	-	Feb 1600	22,83
1P - LAB. INFORMÁTICA	13,4	7,3	27,7 / 21,7	15,6 / 15,1	-	Jan 1600	12,14
1P - NUTRIÇÃO	3,6	2,3	25,8 / 20,0	15,8 / 15,3	-	Feb 1600	12,95
1P - SALA DE ARTES	9,9	4,5	30,8 / 24,5	15,6 / 15,2	-	Feb 1600	10,08
1P - SALA DE AULA A102	10,5	5,0	30,1 / 23,9	15,7 / 15,3	-	Feb 1500	8,55
1P - SALA DE AULA A103	13,7	7,5	27,8 / 21,7	15,2 / 14,7	-	Jan 1500	11,33
1P - SALA DE AULA A104	11,0	5,4	29,7 / 23,4	15,4 / 14,9	-	Feb 1500	12,43
1P - SALA DE AULA A105	12,5	6,6	28,4 / 22,2	15,3 / 14,8	-	Feb 1500	12,48
1P - SALA DE AULA A106	12,3	6,5	28,5 / 22,3	15,6 / 15,1	-	Feb 1500	12,56
1P - SALA DE AULA B101	15,6	8,3	27,7 / 21,8	15,5 / 15,1	-	Dec 1600	13,59
1P - SALA DE AULA B102	12,1	5,5	30,7 / 24,4	15,4 / 15,0	-	Feb 1600	8,94
1P - SALA DE AULA B103	14,2	7,9	27,0 / 21,1	15,0 / 14,5	-	Jan 1700	12,88
1P - SALA DE AULA B104	13,1	6,2	28,9 / 23,2	15,3 / 14,9	-	Feb 1700	8,72
1P - SALA DE AULA B105	16,4	9,1	27,2 / 21,3	15,4 / 14,9	-	Jan 1700	14,78
1P - SALA DE RECURSO	2,7	1,6	26,2 / 20,4	15,4 / 14,9	-	Jan 1700	11,55
1P - SALA DE RECURSOS	5,8	3,8	25,6 / 19,7	15,3 / 14,8	-	Dec 1600	12,52
1P - SOE	2,1	1,3	25,5 / 19,8	15,6 / 15,1	-	Dec 1500	9,50

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (kW)	Heating Coil Ent/Lvg DB (°C)	Htg Coil Water Flow @11,1 K (L/s)	Fan Design Airflow (L/s)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (L/s)
1P - COORD. PEDAGÓGICA	1,0	17,9 / 25,9	-	121	0,000	0,000	30
1P - COPA	0,3	21,1 / 23,5	-	136	0,000	0,000	0
1P - COZINHA	2,8	19,7 / 23,3	-	733	0,000	0,000	60
1P - LAB. INFORMÁTICA	3,8	17,1 / 23,3	-	565	0,000	0,000	188
1P - NUTRIÇÃO	1,8	19,1 / 26,7	-	220	0,000	0,000	30
1P - SALA DE ARTES	3,2	12,9 / 23,7	-	279	0,000	0,000	188
1P - SALA DE AULA A102	3,7	14,0 / 24,6	-	326	0,000	0,000	188
1P - SALA DE AULA A103	4,8	16,9 / 25,0	-	559	0,000	0,000	188
1P - SALA DE AULA A104	3,4	14,6 / 23,6	-	354	0,000	0,000	188
1P - SALA DE AULA A105	4,2	16,1 / 24,3	-	473	0,000	0,000	188
1P - SALA DE AULA A106	4,3	16,1 / 24,6	-	472	0,000	0,000	188
1P - SALA DE AULA B101	4,5	16,7 / 23,2	-	646	0,000	0,000	225
1P - SALA DE AULA B102	3,9	13,0 / 23,8	-	341	0,000	0,000	225
1P - SALA DE AULA B103	4,1	17,3 / 23,5	-	614	0,000	0,000	188
1P - SALA DE AULA B104	4,7	14,7 / 24,9	-	430	0,000	0,000	225
1P - SALA DE AULA B105	5,6	17,3 / 24,6	-	729	0,000	0,000	225
1P - SALA DE RECURSO	1,1	18,4 / 25,6	-	142	0,000	0,000	28
1P - SALA DE RECURSOS	1,7	19,2 / 23,9	-	344	0,000	0,000	45
1P - SOE	1,0	19,5 / 26,6	-	127	0,000	0,000	14

Zone Sizing Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (kW)	Time of Peak Sensible Cooling Load	Zone Heating Load (kW)	Zone Floor Area (m²)
1P - COORD. PEDAGÓGICA	1,2	Jan 1600	0,7	11,2
1P - COPA	1,4	Jan 1700	0,3	4,0
1P - COZINHA	7,4	Feb 1600	2,3	32,1
1P - LAB. INFORMÁTICA	5,7	Jan 1700	1,3	46,5
1P - NUTRIÇÃO	2,2	Feb 1700	1,5	17,0
1P - SALA DE ARTES	2,8	Jan 1700	0,9	27,7
1P - SALA DE AULA A102	3,3	Jan 1600	1,3	38,1
1P - SALA DE AULA A103	5,6	Jan 1500	2,4	49,3
1P - SALA DE AULA A104	3,6	Feb 1500	1,0	28,5
1P - SALA DE AULA A105	4,7	Feb 1500	1,9	37,9
1P - SALA DE AULA A106	4,7	Feb 1500	1,9	37,6
1P - SALA DE AULA B101	6,5	Jan 1700	1,7	47,5
1P - SALA DE AULA B102	3,4	Jan 1700	1,1	38,1
1P - SALA DE AULA B103	6,2	Jan 1700	1,7	47,7
1P - SALA DE AULA B104	4,3	Feb 1800	1,7	49,3
1P - SALA DE AULA B105	7,3	Jan 1700	2,7	49,3
1P - SALA DE RECURSO	1,4	Jan 1700	0,8	12,3
1P - SALA DE RECURSOS	3,5	Jan 1700	1,2	27,5
1P - SOE	1,3	Jan 1600	0,8	13,4

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m²)	Space L/(s·m²)
1P - COORD. PEDAGÓGICA							
1P - COORD. PEDAGÓGICA	1	1,2	Jan 1600	121	0,7	11,2	10,83
1P - COPA							
1P - CPD	1	1,4	Jan 1700	136	0,3	4,0	33,92
1P - COZINHA							
1P - COZINHA	1	7,4	Feb 1600	733	2,3	32,1	22,83
1P - LAB. INFORMÁTICA							
1P - LAB. INFORMÁTICA	1	5,7	Jan 1700	565	1,3	46,5	12,14
1P - NUTRIÇÃO							
1P - NUTRIÇÃO	1	2,2	Feb 1700	220	1,5	17,0	12,95
1P - SALA DE ARTES							
1P - SALA DE ARTES	1	2,8	Jan 1700	279	0,9	27,7	10,08
1P - SALA DE AULA A102							
1P - SALA DE AULA A102	1	3,3	Jan 1600	326	1,3	38,1	8,55
1P - SALA DE AULA A103							
1P - SALA DE AULA A103	1	5,6	Jan 1500	559	2,4	49,3	11,33
1P - SALA DE AULA A104							
1P - SALA DE AULA A104	1	3,6	Feb 1500	354	1,0	28,5	12,43
1P - SALA DE AULA A105							
1P - SALA DE AULA A105	1	4,7	Feb 1500	473	1,9	37,9	12,48
1P - SALA DE AULA A106							
1P - SALA DE AULA A106	1	4,7	Feb 1500	472	1,9	37,6	12,56
1P - SALA DE AULA B101							
1P - SALA DE AULA B101	1	6,5	Jan 1700	646	1,7	47,5	13,59
1P - SALA DE AULA B102							
1P - SALA DE AULA B102	1	3,4	Jan 1700	341	1,1	38,1	8,94
1P - SALA DE AULA B103							
1P - SALA DE AULA B103	1	6,2	Jan 1700	614	1,7	47,7	12,88
1P - SALA DE AULA B104							
1P - SALA DE AULA B104	1	4,3	Feb 1800	430	1,7	49,3	8,72
1P - SALA DE AULA B105							

Zone Sizing Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m²)	Space L/(s·m²)
1P - SALA DE AULA B105	1	7,3	Jan 1700	729	2,7	49,3	14,78
1P - SALA DE RECURSO							
1P - SALA DE RECURSO	1	1,4	Jan 1700	142	0,8	12,3	11,55
1P - SALA DE RECURSOS							
1P - SALA DE RECURSOS	1	3,5	Jan 1700	344	1,2	27,5	12,52
1P - SOE							
1P - SOE	1	1,3	Jan 1600	127	0,8	13,4	9,50

Ventilation Sizing Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: 1P-COORD. PEDAGÓGICA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - COORD. PEDAGÓGICA									
1P - COORD. PEDAGÓGICA	1	11,2	4,0	121,3	7,50	0,00	0,0	0,0	30,0
Totals (incl. Space Multipliers)				121,3					30,0

2.2 Zone: 1P - COPA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - COPA									
1P - CPD	1	4,0	0,0	135,7	4,70	0,00	0,0	0,0	0,0
Totals (incl. Space Multipliers)				135,7					0,0

2.3 Zone: 1P - COZINHA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - COZINHA									
1P - COZINHA	1	32,1	8,0	732,8	7,50	0,00	0,0	0,0	60,0
Totals (incl. Space Multipliers)				732,8					60,0

2.4 Zone: 1P - LAB. INFORMÁTICA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - LAB. INFORMÁTICA									
1P - LAB. INFORMÁTICA	1	46,5	25,0	564,6	7,50	0,00	0,0	0,0	187,5
Totals (incl. Space Multipliers)				564,6					187,5

2.5 Zone: 1P - NUTRIÇÃO

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - NUTRIÇÃO									
1P - NUTRIÇÃO	1	17,0	4,0	220,1	7,50	0,00	0,0	0,0	30,0
Totals (incl. Space Multipliers)				220,1					30,0

2.6 Zone: 1P - SALA DE ARTES

Ventilation Sizing Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE ARTES									
1P - SALA DE ARTES	1	27,7	25,0	279,3	7,50	0,00	0,0	0,0	187,5
Totals (incl. Space Multipliers)				279,3					187,5

2.7 Zone: 1P - SALA DE AULA A102

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE AULA A102									
1P - SALA DE AULA A102	1	38,1	25,0	325,7	7,50	0,00	0,0	0,0	187,5
Totals (incl. Space Multipliers)				325,7					187,5

2.8 Zone: 1P - SALA DE AULA A103

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE AULA A103									
1P - SALA DE AULA A103	1	49,3	25,0	558,5	7,50	0,00	0,0	0,0	187,5
Totals (incl. Space Multipliers)				558,5					187,5

2.9 Zone: 1P - SALA DE AULA A104

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE AULA A104									
1P - SALA DE AULA A104	1	28,5	25,0	354,2	7,50	0,00	0,0	0,0	187,5
Totals (incl. Space Multipliers)				354,2					187,5

2.10 Zone: 1P - SALA DE AULA A105

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE AULA A105									
1P - SALA DE AULA A105	1	37,9	25,0	473,0	7,50	0,00	0,0	0,0	187,5
Totals (incl. Space Multipliers)				473,0					187,5

2.11 Zone: 1P - SALA DE AULA A106

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE AULA A106									
1P - SALA DE AULA A106	1	37,6	25,0	472,2	7,50	0,00	0,0	0,0	187,5
Totals (incl. Space Multipliers)				472,2					187,5

Ventilation Sizing Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2.12 Zone: 1P - SALA DE AULA B101

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE AULA B101									
1P - SALA DE AULA B101	1	47,5	30,0	645,7	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				645,7					225,0

2.13 Zone: 1P - SALA DE AULA B102

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE AULA B102									
1P - SALA DE AULA B102	1	38,1	30,0	340,7	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				340,7					225,0

2.14 Zone: 1P - SALA DE AULA B103

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE AULA B103									
1P - SALA DE AULA B103	1	47,7	25,0	614,2	7,50	0,00	0,0	0,0	187,5
Totals (incl. Space Multipliers)				614,2					187,5

2.15 Zone: 1P - SALA DE AULA B104

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE AULA B104									
1P - SALA DE AULA B104	1	49,3	30,0	429,7	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				429,7					225,0

2.16 Zone: 1P - SALA DE AULA B105

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE AULA B105									
1P - SALA DE AULA B105	1	49,3	30,0	728,5	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				728,5					225,0

2.17 Zone: 1P - SALA DE RECURSO

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE RECURSO									

Ventilation Sizing Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1P - SALA DE RECURSO	1	12,3	6,0	142,0	4,70	0,00	0,0	0,0	28,2
Totals (incl. Space Multipliers)				142,0					28,2

2.18 Zone: 1P - SALA DE RECURSOS

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SALA DE RECURSOS									
1P - SALA DE RECURSOS	1	27,5	6,0	344,3	7,50	0,00	0,0	0,0	45,0
Totals (incl. Space Multipliers)				344,3					45,0

2.19 Zone: 1P - SOE

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
1P - SOE									
1P - SOE	1	13,4	3,0	127,3	4,70	0,00	0,0	0,0	14,1
Totals (incl. Space Multipliers)				127,3					14,1

Air System Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600 COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 8,9 °C / 4,3 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	55 m²	11399	-	55 m²	-	-
Wall Transmission	220 m²	5818	-	220 m²	6372	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	55 m²	2714	-	55 m²	4127	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	125 m²	584	-	125 m²	808	-
Partitions	584 m²	4046	-	584 m²	6544	-
Ceiling	616 m²	4264	-	616 m²	6898	-
Overhead Lighting	10627 W	8900	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	11250 W	10517	-	0	0	-
People	351	20124	15995	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	6836	1600	10%	2475	0
>> Total Zone Loads	-	75201	17595	-	27223	0
Zone Conditioning	-	72893	17595	-	26349	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	0 L/s	0	-	0 L/s	0	-
Ventilation Load	2607 L/s	25375	64864	2607 L/s	33412	0
Ventilation Fan Load	0 L/s	0	-	0 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	98267	82459	-	59761	0
Terminal Unit Cooling	-	98267	82503	-	0	0
Terminal Unit Heating	-	0	-	-	59761	-
>> Total Conditioning	-	98267	82503	-	59761	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Zone Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1P -COORD. PEDAGÓGICA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	10 m²	267	-	10 m²	283	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	19 m²	130	-	19 m²	211	-
Ceiling	12 m²	85	-	12 m²	138	-
Overhead Lighting	194 W	162	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	234	-	0	0	-
People	4	229	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	111	18	10%	63	0
>> Total Zone Loads	-	1218	198	-	695	0

1P - COPA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	5 m²	139	-	5 m²	145	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	12 m²	74	-	12 m²	129	-
Ceiling	4 m²	26	-	4 m²	45	-
Overhead Lighting	69 W	59	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	941	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	124	0	10%	32	0
>> Total Zone Loads	-	1362	0	-	350	0

Zone Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

07/26/2023
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1P - COZINHA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	869	-	6 m²	-	-
Wall Transmission	30 m²	798	-	30 m²	853	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	6 m²	295	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	32 m²	150	-	32 m²	208	-
Partitions	18 m²	126	-	18 m²	204	-
Ceiling	32 m²	222	-	32 m²	358	-
Overhead Lighting	555 W	465	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	3500 W	3272	-	0	0	-
People	8	491	560	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	669	56	10%	207	0
>> Total Zone Loads	-	7356	616	-	2279	0

1P - LAB. INFORMÁTICA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	56 m²	358	-	56 m²	623	-
Ceiling	47 m²	300	-	47 m²	521	-
Overhead Lighting	804 W	684	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2500 W	2351	-	0	0	-
People	25	1459	1125	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	515	113	10%	114	0
>> Total Zone Loads	-	5668	1238	-	1258	0

Zone Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1P - NUTRIÇÃO	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	20 m²	600	-	20 m²	578	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	17 m²	75	-	17 m²	110	-
Partitions	42 m²	271	-	42 m²	470	-
Ceiling	17 m²	110	-	17 m²	190	-
Overhead Lighting	294 W	250	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	500 W	470	-	0	0	-
People	4	233	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	201	18	10%	135	0
>> Total Zone Loads	-	2209	198	-	1484	0

1P - SALA DE ARTES	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	42 m²	269	-	42 m²	467	-
Ceiling	28 m²	179	-	28 m²	310	-
Overhead Lighting	479 W	408	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	25	1459	1125	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	255	113	10%	78	0
>> Total Zone Loads	-	2804	1238	-	855	0

Zone Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1P - SALA DE AULA A102	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	71 m²	492	-	71 m²	796	-
Ceiling	38 m²	264	-	38 m²	427	-
Overhead Lighting	658 W	551	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	234	-	0	0	-
People	25	1431	1125	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	297	113	10%	122	0
>> Total Zone Loads	-	3269	1238	-	1345	0

1P - SALA DE AULA A103	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	7 m²	1070	-	7 m²	-	-
Wall Transmission	32 m²	868	-	32 m²	934	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	7 m²	357	-	7 m²	538	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	18 m²	123	-	18 m²	197	-
Ceiling	49 m²	345	-	49 m²	552	-
Overhead Lighting	852 W	700	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	25	1401	1125	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	510	113	10%	222	0
>> Total Zone Loads	-	5607	1238	-	2444	0

Zone Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1P - SALA DE AULA A104	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	4 m²	559	-	4 m²	-	-
Wall Transmission	6 m²	188	-	6 m²	185	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	4 m²	179	-	4 m²	269	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	10 m²	70	-	10 m²	112	-
Ceiling	29 m²	200	-	29 m²	319	-
Overhead Lighting	492 W	405	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	25	1401	1125	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	323	113	10%	89	0
>> Total Zone Loads	-	3555	1238	-	974	0

1P - SALA DE AULA A105	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	931	-	6 m²	-	-
Wall Transmission	8 m²	223	-	8 m²	220	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	6 m²	298	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	38 m²	179	-	38 m²	246	-
Partitions	36 m²	249	-	36 m²	399	-
Ceiling	38 m²	265	-	38 m²	424	-
Overhead Lighting	655 W	538	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	25	1401	1125	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	432	113	10%	174	0
>> Total Zone Loads	-	4749	1238	-	1911	0

Zone Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1P - SALA DE AULA A106	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	931	-	6 m²	-	-
Wall Transmission	8 m²	223	-	8 m²	220	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	6 m²	298	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	38 m²	178	-	38 m²	244	-
Partitions	36 m²	249	-	36 m²	399	-
Ceiling	38 m²	263	-	38 m²	421	-
Overhead Lighting	650 W	534	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	25	1401	1125	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	431	113	10%	173	0
>> Total Zone Loads	-	4740	1238	-	1905	0

1P - SALA DE AULA B101	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	7 m²	2061	-	7 m²	-	-
Wall Transmission	10 m²	398	-	10 m²	283	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	7 m²	333	-	7 m²	538	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	17 m²	110	-	17 m²	190	-
Ceiling	48 m²	306	-	48 m²	532	-
Overhead Lighting	821 W	699	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	589	135	10%	154	0
>> Total Zone Loads	-	6482	1485	-	1698	0

Zone Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1P - SALA DE AULA B102	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	49 m²	317	-	49 m²	551	-
Ceiling	38 m²	246	-	38 m²	427	-
Overhead Lighting	658 W	561	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	311	135	10%	98	0
>> Total Zone Loads	-	3420	1485	-	1075	0

1P - SALA DE AULA B103	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	7 m²	2061	-	7 m²	-	-
Wall Transmission	10 m²	398	-	10 m²	283	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	7 m²	333	-	7 m²	538	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	17 m²	110	-	17 m²	190	-
Ceiling	48 m²	307	-	48 m²	534	-
Overhead Lighting	824 W	702	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	25	1459	1125	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	561	113	10%	155	0
>> Total Zone Loads	-	6166	1238	-	1701	0

Zone Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1P - SALA DE AULA B104	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1800			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 31,5 °C / 26,3 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	22 m²	699	-	22 m²	636	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	35 m²	195	-	35 m²	392	-
Ceiling	49 m²	274	-	49 m²	552	-
Overhead Lighting	852 W	737	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	236	-	0	0	-
People	30	1781	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	392	135	10%	158	0
>> Total Zone Loads	-	4314	1485	-	1738	0

1P - SALA DE AULA B105	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	7 m²	2061	-	7 m²	-	-
Wall Transmission	32 m²	972	-	32 m²	934	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	7 m²	333	-	7 m²	538	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	39 m²	253	-	39 m²	440	-
Ceiling	49 m²	318	-	49 m²	552	-
Overhead Lighting	852 W	726	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	665	135	10%	246	0
>> Total Zone Loads	-	7313	1485	-	2711	0

Zone Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1P - SALA DE RECURSO	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	11 m²	305	-	11 m²	318	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	23 m²	145	-	23 m²	252	-
Ceiling	12 m²	79	-	12 m²	138	-
Overhead Lighting	213 W	181	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	6	350	270	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	130	27	10%	71	0
>> Total Zone Loads	-	1426	297	-	779	0

1P - SALA DE RECURSOS	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	5 m²	1374	-	5 m²	-	-
Wall Transmission	5 m²	211	-	5 m²	150	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	5 m²	222	-	5 m²	359	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	26 m²	168	-	26 m²	291	-
Ceiling	28 m²	177	-	28 m²	308	-
Overhead Lighting	475 W	405	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	6	350	270	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	314	27	10%	111	0
>> Total Zone Loads	-	3456	297	-	1219	0

Zone Design Load Summary for VRF 1P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

07/26/2023
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1P - SOE	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	12 m²	327	-	12 m²	347	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	21 m²	143	-	21 m²	232	-
Ceiling	13 m²	93	-	13 m²	150	-
Overhead Lighting	232 W	194	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	234	-	0	0	-
People	3	172	135	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	116	14	10%	73	0
>> Total Zone Loads	-	1278	149	-	802	0

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

07/26/2023
09:44

Air System Information

Air System Name **VRF 2P**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **19**
Floor Area **621,5** m²
Location **Brasilia, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Air System Information

Air System Name **VRF 2P**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **19**
Floor Area **621,5** m²
Location **Brasilia, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (kW)	Sens Coil Load (kW)	Coil Entering DB / WB (°C)	Coil Leaving DB / WB (°C)	Water Flow @ 5,6 K (L/s)	Time of Peak Coil Load	Zone L/(s·m²)
2P - ENFERMARIA	2,6	1,5	26,9 / 21,1	15,5 / 15,1	-	Jan 1500	10,83
2P - COPA	1,5	1,3	24,7 / 18,1	15,4 / 14,8	-	Jan 1600	33,92
2P - LAB CIÊNCIAS	15,2	7,7	29,2 / 22,9	15,5 / 15,1	-	Feb 1500	13,90
2P - LAB. INFORMÁTICA	14,9	7,7	28,0 / 22,2	15,4 / 14,9	-	Dec 1600	15,02
2P - SALA DE AULA A205	14,6	7,5	28,7 / 22,5	15,3 / 14,9	-	Feb 1500	13,69
2P - SALA DE AULA A206	12,2	5,4	30,4 / 24,6	15,2 / 14,9	-	Dec 1600	8,69
2P - SALA DE AULA A207	12,1	5,4	30,6 / 24,6	15,6 / 15,2	-	Dec 1500	8,94
2P - SALA DE AULA A208	14,8	7,6	28,6 / 22,4	15,1 / 14,7	-	Feb 1500	13,88
2P - SALA DE AULA A209	12,1	5,5	30,7 / 24,5	15,5 / 15,1	-	Feb 1600	8,97
2P - SALA DE AULA A210	12,9	6,1	29,7 / 23,7	15,5 / 15,1	-	Feb 1600	10,42
2P - SALA DE AULA B206	12,2	5,4	30,4 / 24,6	15,2 / 14,9	-	Dec 1600	8,69
2P - SALA DE AULA B207	16,9	9,1	27,3 / 21,6	15,4 / 14,9	-	Dec 1600	12,86
2P - SALA DE AULA 208	15,3	8,1	27,8 / 22,0	15,7 / 15,2	-	Dec 1600	16,56
2P - SALA DE AULA B209	12,1	5,5	30,7 / 24,5	15,5 / 15,1	-	Feb 1600	8,97
2P - SALA DE AULA B210	15,3	8,3	27,9 / 21,9	15,8 / 15,3	-	Jan 1600	16,55
2P - SALA DE AULA B211	12,8	5,9	29,2 / 23,5	15,3 / 15,0	-	Feb 1700	10,40
2P - SALA DE RECURSOS	2,8	1,6	26,2 / 20,6	15,4 / 14,9	-	Jan 1700	11,55
2P - SALA DOS PROFESSORES	10,4	5,5	27,7 / 21,9	15,7 / 15,2	-	Dec 1600	15,78
2P - SOE	2,2	1,3	25,5 / 20,0	15,6 / 15,1	-	Dec 1500	9,50

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (kW)	Heating Coil Ent/Lvg DB (°C)	Htg Coil Water Flow @11,1 K (L/s)	Fan Design Airflow (L/s)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (L/s)
2P - ENFERMARIA	1,0	17,9 / 25,9	-	121	0,000	0,000	30
2P - COPA	0,3	21,1 / 23,5	-	136	0,000	0,000	0
2P - LAB CIÊNCIAS	4,7	15,2 / 23,6	-	528	0,000	0,000	248
2P - LAB. INFORMÁTICA	3,9	16,2 / 22,6	-	572	0,000	0,000	225
2P - SALA DE AULA A205	5,1	15,9 / 24,9	-	527	0,000	0,000	225
2P - SALA DE AULA A206	3,8	12,8 / 23,7	-	331	0,000	0,000	225
2P - SALA DE AULA A207	3,8	12,9 / 23,5	-	341	0,000	0,000	225
2P - SALA DE AULA A208	5,0	15,9 / 24,7	-	529	0,000	0,000	225
2P - SALA DE AULA A209	3,9	13,0 / 23,9	-	340	0,000	0,000	225
2P - SALA DE AULA A210	4,4	14,2 / 24,6	-	401	0,000	0,000	225
2P - SALA DE AULA B206	3,8	12,8 / 23,7	-	331	0,000	0,000	225
2P - SALA DE AULA B207	5,0	17,3 / 23,9	-	719	0,000	0,000	225
2P - SALA DE AULA 208	4,7	16,7 / 23,7	-	631	0,000	0,000	225
2P - SALA DE AULA B209	3,9	13,0 / 23,9	-	340	0,000	0,000	225
2P - SALA DE AULA B210	5,1	16,7 / 24,1	-	649	0,000	0,000	225
2P - SALA DE AULA B211	4,4	14,2 / 24,4	-	401	0,000	0,000	225
2P - SALA DE RECURSOS	1,1	18,4 / 25,6	-	142	0,000	0,000	28
2P - SALA DOS PROFESSORES	3,2	16,9 / 23,9	-	434	0,000	0,000	150
2P - SOE	1,0	19,5 / 26,6	-	127	0,000	0,000	14

Zone Sizing Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (kW)	Time of Peak Sensible Cooling Load	Zone Heating Load (kW)	Zone Floor Area (m²)
2P - ENFERMARIA	1,2	Jan 1600	0,7	11,2
2P - COPA	1,4	Jan 1700	0,3	4,0
2P - LAB CIÊNCIAS	5,3	Feb 1500	1,6	38,0
2P - LAB. INFORMÁTICA	5,7	Jan 1700	1,1	38,1
2P - SALA DE AULA A205	5,3	Jan 1600	2,1	38,5
2P - SALA DE AULA A206	3,3	Jan 1700	0,9	38,1
2P - SALA DE AULA A207	3,4	Jan 1700	1,1	38,1
2P - SALA DE AULA A208	5,3	Feb 1700	2,1	38,1
2P - SALA DE AULA A209	3,4	Jan 1700	1,1	37,9
2P - SALA DE AULA A210	4,0	Feb 1800	1,5	38,5
2P - SALA DE AULA B206	3,3	Jan 1700	0,9	38,1
2P - SALA DE AULA B207	7,2	Jan 1700	2,0	55,9
2P - SALA DE AULA 208	6,3	Jan 1700	1,7	38,1
2P - SALA DE AULA B209	3,4	Jan 1700	1,1	37,9
2P - SALA DE AULA B210	6,5	Jan 1700	2,4	39,2
2P - SALA DE AULA B211	4,0	Feb 1800	1,5	38,6
2P - SALA DE RECURSOS	1,4	Jan 1700	0,8	12,3
2P - SALA DOS PROFESSORES	4,4	Jan 1700	1,2	27,5
2P - SOE	1,3	Jan 1600	0,8	13,4

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m²)	Space L/(s·m²)
2P - ENFERMARIA							
2P - ENFERMARIA	1	1,2	Jan 1600	121	0,7	11,2	10,83
2P - COPA							
2P - CPD	1	1,4	Jan 1700	136	0,3	4,0	33,92
2P - LAB CIÊNCIAS							
2P - LAB CIÊNCIAS	1	5,3	Feb 1500	528	1,6	38,0	13,90
2P - LAB. INFORMÁTICA							
2P - LAB. INFORMÁTICA	1	5,7	Jan 1700	572	1,1	38,1	15,02
2P - SALA DE AULA A205							
2P - SALA DE AULA A205	1	5,3	Jan 1600	527	2,1	38,5	13,69
2P - SALA DE AULA A206							
2P - SALA DE AULA A206	1	3,3	Jan 1700	331	0,9	38,1	8,69
2P - SALA DE AULA A207							
2P - SALA DE AULA A207	1	3,4	Jan 1700	341	1,1	38,1	8,94
2P - SALA DE AULA A208							
2P - SALA DE AULA A208	1	5,3	Feb 1700	529	2,1	38,1	13,88
2P - SALA DE AULA A209							
2P - SALA DE AULA A209	1	3,4	Jan 1700	340	1,1	37,9	8,97
2P - SALA DE AULA A210							
2P - SALA DE AULA A210	1	4,0	Feb 1800	401	1,5	38,5	10,42
2P - SALA DE AULA B206							
2P - SALA DE AULA B206	1	3,3	Jan 1700	331	0,9	38,1	8,69
2P - SALA DE AULA B207							
2P - SALA DE AULA B207	1	7,2	Jan 1700	719	2,0	55,9	12,86
2P - SALA DE AULA 208							
2P - SALA DE AULA B208	1	6,3	Jan 1700	631	1,7	38,1	16,56
2P - SALA DE AULA B209							
2P - SALA DE AULA B209	1	3,4	Jan 1700	340	1,1	37,9	8,97
2P - SALA DE AULA B210							
2P - SALA DE AULA B210	1	6,5	Jan 1700	649	2,4	39,2	16,55
2P - SALA DE AULA B211							

Zone Sizing Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
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Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m²)	Space L/(s·m²)
2P - SALA DE AULA B211	1	4,0	Feb 1800	401	1,5	38,6	10,40
2P - SALA DE RECURSOS							
2P - SALA DE RECURSO	1	1,4	Jan 1700	142	0,8	12,3	11,55
2P - SALA DOS PROFESSORE							
2P - SALA DOS PROFESSORE	1	4,4	Jan 1700	434	1,2	27,5	15,78
2P - SOE							
2P - SOE	1	1,3	Jan 1600	127	0,8	13,4	9,50

Ventilation Sizing Summary for VRF 2P

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1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: 2P - ENFERMARIA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - ENFERMARIA									
2P - ENFERMARIA	1	11,2	4,0	121,3	7,50	0,00	0,0	0,0	30,0
Totals (incl. Space Multipliers)				121,3					30,0

2.2 Zone: 2P - COPA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - COPA									
2P - CPD	1	4,0	0,0	135,7	4,70	0,00	0,0	0,0	0,0
Totals (incl. Space Multipliers)				135,7					0,0

2.3 Zone: 2P - LAB CIÊNCIAS

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - LAB CIÊNCIAS									
2P - LAB CIÊNCIAS	1	38,0	33,0	528,2	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				528,2					247,5

2.4 Zone: 2P - LAB. INFORMÁTICA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - LAB. INFORMÁTICA									
2P - LAB. INFORMÁTICA	1	38,1	30,0	572,4	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				572,4					225,0

2.5 Zone: 2P - SALA DE AULA A205

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA A205									
2P - SALA DE AULA A205	1	38,5	30,0	527,2	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				527,2					225,0

2.6 Zone: 2P - SALA DE AULA A206

Ventilation Sizing Summary for VRF 2P

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Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA A206									
2P - SALA DE AULA A206	1	38,1	30,0	331,1	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				331,1					225,0

2.7 Zone: 2P - SALA DE AULA A207

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA A207									
2P - SALA DE AULA A207	1	38,1	30,0	340,5	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				340,5					225,0

2.8 Zone: 2P - SALA DE AULA A208

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA A208									
2P - SALA DE AULA A208	1	38,1	30,0	528,9	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				528,9					225,0

2.9 Zone: 2P - SALA DE AULA A209

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA A209									
2P - SALA DE AULA A209	1	37,9	30,0	340,0	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				340,0					225,0

2.10 Zone: 2P - SALA DE AULA A210

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA A210									
2P - SALA DE AULA A210	1	38,5	30,0	401,3	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				401,3					225,0

2.11 Zone: 2P - SALA DE AULA B206

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA B206									
2P - SALA DE AULA B206	1	38,1	30,0	331,1	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				331,1					225,0

Ventilation Sizing Summary for VRF 2P

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2.12 Zone: 2P - SALA DE AULA B207

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA B207									
2P - SALA DE AULA B207	1	55,9	30,0	719,1	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				719,1					225,0

2.13 Zone: 2P - SALA DE AULA 208

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA 208									
2P - SALA DE AULA B208	1	38,1	30,0	631,0	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				631,0					225,0

2.14 Zone: 2P - SALA DE AULA B209

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA B209									
2P - SALA DE AULA B209	1	37,9	30,0	340,0	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				340,0					225,0

2.15 Zone: 2P - SALA DE AULA B210

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA B210									
2P - SALA DE AULA B210	1	39,2	30,0	648,8	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				648,8					225,0

2.16 Zone: 2P - SALA DE AULA B211

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE AULA B211									
2P - SALA DE AULA B211	1	38,6	30,0	401,4	7,50	0,00	0,0	0,0	225,0
Totals (incl. Space Multipliers)				401,4					225,0

2.17 Zone: 2P - SALA DE RECURSOS

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DE RECURSOS									

Ventilation Sizing Summary for VRF 2P

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2P - SALA DE RECURSO	1	12,3	6,0	142,0	4,70	0,00	0,0	0,0	28,2
Totals (incl. Space Multipliers)				142,0					28,2

2.18 Zone: 2P - SALA DOS PROFESSORE

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SALA DOS PROFESSORE									
2P - SALA DOS PROFESSORE	1	27,5	20,0	433,8	7,50	0,00	0,0	0,0	150,0
Totals (incl. Space Multipliers)				433,8					150,0

2.19 Zone: 2P - SOE

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
2P - SOE									
2P - SOE	1	13,4	3,0	127,3	4,70	0,00	0,0	0,0	14,1
Totals (incl. Space Multipliers)				127,3					14,1

Air System Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600 COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 8,9 °C / 4,3 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	44 m²	9894	-	44 m²	-	-
Wall Transmission	205 m²	5366	-	205 m²	5929	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	44 m²	2183	-	44 m²	3320	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	558 m²	3862	-	558 m²	6247	-
Ceiling	633 m²	4381	-	633 m²	7086	-
Overhead Lighting	10740 W	8994	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	8000 W	7479	-	0	0	-
People	456	26102	20520	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	6826	2052	10%	2258	0
>> Total Zone Loads	-	75087	22572	-	24840	0
Zone Conditioning	-	72738	22572	-	24597	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	0 L/s	0	-	0 L/s	0	-
Ventilation Load	3395 L/s	32853	81363	3395 L/s	43641	0
Ventilation Fan Load	0 L/s	0	-	0 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	105591	103935	-	68238	0
Terminal Unit Cooling	-	105591	103942	-	0	0
Terminal Unit Heating	-	0	-	-	68238	-
>> Total Conditioning	-	105591	103942	-	68238	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Zone Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
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2P - ENFERMARIA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	10 m²	267	-	10 m²	283	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	19 m²	130	-	19 m²	211	-
Ceiling	12 m²	85	-	12 m²	138	-
Overhead Lighting	194 W	162	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	234	-	0	0	-
People	4	229	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	111	18	10%	63	0
>> Total Zone Loads	-	1218	198	-	695	0

2P - COPA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	5 m²	139	-	5 m²	145	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	12 m²	74	-	12 m²	129	-
Ceiling	4 m²	26	-	4 m²	45	-
Overhead Lighting	69 W	59	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	941	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	124	0	10%	32	0
>> Total Zone Loads	-	1362	0	-	350	0

Zone Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2P - LAB CIÊNCIAS	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	931	-	6 m²	-	-
Wall Transmission	8 m²	223	-	8 m²	220	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	6 m²	298	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	36 m²	249	-	36 m²	399	-
Ceiling	38 m²	266	-	38 m²	426	-
Overhead Lighting	657 W	540	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	500 W	464	-	0	0	-
People	33	1849	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	482	149	10%	149	0
>> Total Zone Loads	-	5302	1634	-	1642	0

2P - LAB. INFORMÁTICA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	49 m²	316	-	49 m²	549	-
Ceiling	38 m²	246	-	38 m²	427	-
Overhead Lighting	658 W	561	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2500 W	2351	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	522	135	10%	98	0
>> Total Zone Loads	-	5746	1485	-	1073	0

Zone Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2P - SALA DE AULA A205	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	836	-	6 m²	-	-
Wall Transmission	30 m²	813	-	30 m²	853	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	6 m²	295	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	13 m²	93	-	13 m²	150	-
Ceiling	39 m²	267	-	39 m²	431	-
Overhead Lighting	665 W	557	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	234	-	0	0	-
People	30	1717	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	481	135	10%	188	0
>> Total Zone Loads	-	5293	1485	-	2071	0

2P - SALA DE AULA A206	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	36 m²	229	-	36 m²	399	-
Ceiling	38 m²	246	-	38 m²	427	-
Overhead Lighting	658 W	561	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	302	135	10%	83	0
>> Total Zone Loads	-	3324	1485	-	908	0

Zone Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2P - SALA DE AULA A207	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	49 m²	316	-	49 m²	549	-
Ceiling	38 m²	246	-	38 m²	427	-
Overhead Lighting	658 W	561	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	311	135	10%	98	0
>> Total Zone Loads	-	3419	1485	-	1073	0

2P - SALA DE AULA A208	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	791	-	6 m²	-	-
Wall Transmission	30 m²	879	-	30 m²	853	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	6 m²	278	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	13 m²	86	-	13 m²	150	-
Ceiling	38 m²	246	-	38 m²	427	-
Overhead Lighting	658 W	561	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	483	135	10%	188	0
>> Total Zone Loads	-	5310	1485	-	2066	0

Zone Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2P - SALA DE AULA A209	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	49 m²	315	-	49 m²	548	-
Ceiling	38 m²	244	-	38 m²	424	-
Overhead Lighting	655 W	558	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	310	135	10%	97	0
>> Total Zone Loads	-	3413	1485	-	1069	0

2P - SALA DE AULA A210	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1800			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 31,5 °C / 26,3 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	22 m²	699	-	22 m²	636	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	28 m²	156	-	28 m²	314	-
Ceiling	39 m²	215	-	39 m²	432	-
Overhead Lighting	665 W	575	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	236	-	0	0	-
People	30	1781	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	366	135	10%	138	0
>> Total Zone Loads	-	4028	1485	-	1520	0

Zone Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2P - SALA DE AULA B206	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	36 m²	229	-	36 m²	399	-
Ceiling	38 m²	246	-	38 m²	427	-
Overhead Lighting	658 W	561	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	302	135	10%	83	0
>> Total Zone Loads	-	3324	1485	-	908	0

2P - SALA DE AULA B207	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	8 m²	2405	-	8 m²	-	-
Wall Transmission	12 m²	471	-	12 m²	335	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	8 m²	389	-	8 m²	628	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	20 m²	129	-	20 m²	224	-
Ceiling	56 m²	361	-	56 m²	627	-
Overhead Lighting	966 W	823	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	656	135	10%	181	0
>> Total Zone Loads	-	7219	1485	-	1996	0

Zone Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2P - SALA DE AULA 208	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	7 m²	2061	-	7 m²	-	-
Wall Transmission	10 m²	398	-	10 m²	283	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	7 m²	333	-	7 m²	538	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	17 m²	110	-	17 m²	190	-
Ceiling	48 m²	310	-	48 m²	539	-
Overhead Lighting	658 W	561	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	576	135	10%	155	0
>> Total Zone Loads	-	6334	1485	-	1706	0

2P - SALA DE AULA B209	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	49 m²	315	-	49 m²	548	-
Ceiling	38 m²	244	-	38 m²	424	-
Overhead Lighting	655 W	558	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	310	135	10%	97	0
>> Total Zone Loads	-	3413	1485	-	1069	0

Zone Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2P - SALA DE AULA B210	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	1718	-	6 m²	-	-
Wall Transmission	30 m²	878	-	30 m²	868	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	6 m²	278	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	36 m²	232	-	36 m²	403	-
Ceiling	39 m²	253	-	39 m²	439	-
Overhead Lighting	677 W	577	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	30	1751	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	592	135	10%	216	0
>> Total Zone Loads	-	6513	1485	-	2374	0

2P - SALA DE AULA B211	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1800			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 31,5 °C / 26,3 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	22 m²	699	-	22 m²	636	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	28 m²	156	-	28 m²	314	-
Ceiling	39 m²	215	-	39 m²	432	-
Overhead Lighting	667 W	577	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	236	-	0	0	-
People	30	1781	1350	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	366	135	10%	138	0
>> Total Zone Loads	-	4030	1485	-	1520	0

Zone Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2P - SALA DE RECURSOS	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	11 m²	305	-	11 m²	318	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	23 m²	145	-	23 m²	252	-
Ceiling	12 m²	79	-	12 m²	138	-
Overhead Lighting	213 W	181	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	6	350	270	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	130	27	10%	71	0
>> Total Zone Loads	-	1426	297	-	779	0

2P - SALA DOS PROFESSORES	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	5 m²	1374	-	5 m²	-	-
Wall Transmission	5 m²	211	-	5 m²	150	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	5 m²	222	-	5 m²	359	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	26 m²	168	-	26 m²	291	-
Ceiling	28 m²	177	-	28 m²	308	-
Overhead Lighting	475 W	405	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	20	1167	900	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	396	90	10%	111	0
>> Total Zone Loads	-	4355	990	-	1219	0

Zone Design Load Summary for VRF 2P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2P - SOE	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	12 m²	327	-	12 m²	347	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	21 m²	143	-	21 m²	232	-
Ceiling	13 m²	93	-	13 m²	150	-
Overhead Lighting	232 W	194	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	234	-	0	0	-
People	3	172	135	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	116	14	10%	73	0
>> Total Zone Loads	-	1278	149	-	802	0

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Air System Information

Air System Name **VRF 3P**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **18**
Floor Area **632,3** m²
Location **Brasilia, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Air System Information

Air System Name **VRF 3P**
Equipment Class **TERM**
Air System Type **VRF**

Number of zones **18**
Floor Area **632,3** m²
Location **Brasilia, Brazil**

Sizing Calculation Information

Calculation Months **Jan to Dec**
Sizing Data **Calculated**

Zone L/s Sizing **Sum of space airflow rates**
Space L/s Sizing **Individual peak space loads**

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (kW)	Sens Coil Load (kW)	Coil Entering DB / WB (°C)	Coil Leaving DB / WB (°C)	Water Flow @ 5,6 K (L/s)	Time of Peak Coil Load	Zone L/(s·m²)
3APOIO PEDAGÓGICOP -	2,8	1,6	26,4 / 20,7	15,5 / 15,0	-	Dec 1500	12,40
3P - COORD. PEDAGÓGICA	6,2	4,1	25,7 / 19,8	15,6 / 15,1	-	Dec 1600	13,90
3P - CPD	1,5	1,4	24,7 / 18,1	15,4 / 14,8	-	Jan 1600	35,43
3P - ESPAÇO MAKER	19,3	10,5	27,5 / 21,6	15,4 / 14,9	-	Feb 1500	10,57
3P - SALA A311	16,1	8,5	28,6 / 22,3	15,5 / 15,0	-	Jan 1500	15,86
3P - SALA A312	14,1	6,6	30,2 / 23,9	15,4 / 14,9	-	Feb 1500	11,01
3P - SALA A313	15,6	8,0	28,9 / 22,6	15,6 / 15,1	-	Feb 1500	14,88
3P - SALA A314	14,1	6,6	30,2 / 23,9	15,4 / 14,9	-	Feb 1500	11,01
3P - SALA A315	15,6	8,0	28,9 / 22,6	15,6 / 15,1	-	Feb 1500	14,91
3P - SALA A316	16,3	8,5	28,5 / 22,3	15,3 / 14,8	-	Feb 1500	15,89
3P - SALA B312	18,8	10,3	27,2 / 21,4	15,3 / 14,8	-	Dec 1600	14,52
3P - SALA B313	14,1	6,6	30,2 / 23,9	15,4 / 14,9	-	Feb 1500	11,01
3P - SALA B314	17,8	9,5	27,5 / 21,6	15,2 / 14,8	-	Dec 1600	15,18
3P - SALA B315	14,0	6,5	30,0 / 23,9	15,3 / 14,9	-	Jan 1600	11,05
3P - SALA B316	17,5	9,6	27,7 / 21,6	15,2 / 14,7	-	Jan 1600	18,35
3P - SALA B317	14,6	7,0	29,5 / 23,3	15,3 / 14,8	-	Feb 1600	12,11
3P - SALA DE RECURSOS	2,1	1,4	25,1 / 19,4	15,5 / 15,0	-	Dec 1500	11,09
3P - SOE	2,4	1,5	25,5 / 19,8	15,7 / 15,2	-	Jan 1600	11,08

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (kW)	Heating Coil Ent/Lvg DB (°C)	Htg Coil Water Flow @11,1 K (L/s)	Fan Design Airflow (L/s)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (L/s)
3APOIO PEDAGÓGICOP -	1,1	18,2 / 25,7	-	139	0,000	0,000	30
3P - COORD. PEDAGÓGICA	2,1	19,7 / 24,8	-	382	0,000	0,000	45
3P - CPD	0,4	21,0 / 23,5	-	142	0,000	0,000	0
3P - ESPAÇO MAKER	6,2	17,4 / 24,6	-	816	0,000	0,000	248
3P - SALA A311	5,5	16,0 / 24,5	-	611	0,000	0,000	248
3P - SALA A312	4,6	13,9 / 24,2	-	420	0,000	0,000	248
3P - SALA A313	5,0	15,6 / 23,9	-	567	0,000	0,000	248
3P - SALA A314	4,6	13,9 / 24,2	-	420	0,000	0,000	248
3P - SALA A315	5,0	15,6 / 23,9	-	567	0,000	0,000	248
3P - SALA A316	5,3	15,9 / 24,2	-	605	0,000	0,000	248
3P - SALA B312	5,8	17,4 / 24,1	-	812	0,000	0,000	248
3P - SALA B313	4,6	13,9 / 24,2	-	420	0,000	0,000	248
3P - SALA B314	5,2	16,9 / 23,6	-	730	0,000	0,000	248
3P - SALA B315	4,5	13,8 / 24,0	-	419	0,000	0,000	248
3P - SALA B316	5,7	16,7 / 24,1	-	720	0,000	0,000	248
3P - SALA B317	4,9	14,5 / 24,4	-	467	0,000	0,000	248
3P - SALA DE RECURSOS	1,0	20,0 / 26,6	-	136	0,000	0,000	9
3P - SOE	1,0	19,6 / 26,2	-	148	0,000	0,000	14

Zone Peak Sensible Loads

Zone	Zone	Zone
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Zone Sizing Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Zone Name	Cooling Sensible (kW)	Time of Peak Sensible Cooling Load	Heating Load (kW)	Floor Area (m²)
3APOIO PEDAGÓGICOP -	1,4	Jan 1600	0,8	11,2
3P - COORD. PEDAGÓGICA	3,8	Jan 1600	1,4	27,5
3P - CPD	1,4	Jan 1600	0,4	4,0
3P - ESPAÇO MAKER	8,2	Feb 1600	2,9	77,2
3P - SALA A311	6,1	Jan 1500	2,4	38,5
3P - SALA A312	4,2	Jan 1500	1,4	38,1
3P - SALA A313	5,7	Feb 1500	1,9	38,1
3P - SALA A314	4,2	Jan 1500	1,4	38,1
3P - SALA A315	5,7	Feb 1500	1,9	38,0
3P - SALA A316	6,1	Feb 1600	2,4	38,1
3P - SALA B312	8,2	Jan 1700	2,4	55,9
3P - SALA B313	4,2	Jan 1500	1,4	38,1
3P - SALA B314	7,3	Jan 1700	2,1	48,1
3P - SALA B315	4,2	Jan 1500	1,4	37,9
3P - SALA B316	7,2	Jan 1700	2,7	39,2
3P - SALA B317	4,7	Feb 1700	1,8	38,6
3P - SALA DE RECURSOS	1,4	Jan 1500	0,9	12,3
3P - SOE	1,5	Jan 1500	0,9	13,4

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m²)	Space L/(s·m²)
3APOIO PEDAGÓGICOP -							
3P - APOIO PED.	1	1,4	Jan 1600	139	0,8	11,2	12,40
3P - COORD. PEDAGÓGICA							
3P - COORD. PEDAGÓGICA	1	3,8	Jan 1600	382	1,4	27,5	13,90
3P - CPD							
3P - CPD	1	1,4	Jan 1600	142	0,4	4,0	35,43
3P - ESPAÇO MAKER							
3P - ESPAÇO MAKER	1	8,2	Feb 1600	816	2,9	77,2	10,57
3P - SALA A311							
3P - SALA A311	1	6,1	Jan 1500	611	2,4	38,5	15,86
3P - SALA A312							
3P - SALA A312	1	4,2	Jan 1500	420	1,4	38,1	11,01
3P - SALA A313							
3P - SALA A313	1	5,7	Feb 1500	567	1,9	38,1	14,88
3P - SALA A314							
3P - SALA A314	1	4,2	Jan 1500	420	1,4	38,1	11,01
3P - SALA A315							
3P - SALA A315	1	5,7	Feb 1500	567	1,9	38,0	14,91
3P - SALA A316							
3P - SALA A316	1	6,1	Feb 1600	605	2,4	38,1	15,89
3P - SALA B312							
3P - SALA B312	1	8,2	Jan 1700	812	2,4	55,9	14,52
3P - SALA B313							
3P - SALA B313	1	4,2	Jan 1500	420	1,4	38,1	11,01
3P - SALA B314							
3P - SALA B314	1	7,3	Jan 1700	730	2,1	48,1	15,18
3P - SALA B315							
3P - SALA B315	1	4,2	Jan 1500	419	1,4	37,9	11,05
3P - SALA B316							
3P - SALA B316	1	7,2	Jan 1700	720	2,7	39,2	18,35
3P - SALA B317							
3P - SALA B317	1	4,7	Feb 1700	467	1,8	38,6	12,11
3P - SALA DE RECURSOS							
3P - SALA DE RECURSO	1	1,4	Jan 1500	136	0,9	12,3	11,09
3P - SOE							

Zone Sizing Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m ²)	Space L/(s·m ²)
3P - SOE	1	1,5	Jan 1500	148	0,9	13,4	11,08

Ventilation Sizing Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: 3APOIO PEDAGÓGICOP -

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3APOIO PEDAGÓGICOP -									
3P - APOIO PED.	1	11,2	4,0	138,8	7,50	0,00	0,0	0,0	30,0
Totals (incl. Space Multipliers)				138,8					30,0

2.2 Zone: 3P - COORD. PEDAGÓGICA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - COORD. PEDAGÓGICA									
3P - COORD. PEDAGÓGICA	1	27,5	6,0	382,2	7,50	0,00	0,0	0,0	45,0
Totals (incl. Space Multipliers)				382,2					45,0

2.3 Zone: 3P - CPD

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - CPD									
3P - CPD	1	4,0	0,0	141,7	4,70	0,00	0,0	0,0	0,0
Totals (incl. Space Multipliers)				141,7					0,0

2.4 Zone: 3P - ESPAÇO MAKER

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - ESPAÇO MAKER									
3P - ESPAÇO MAKER	1	77,2	33,0	816,0	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				816,0					247,5

2.5 Zone: 3P - SALA A311

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA A311									
3P - SALA A311	1	38,5	33,0	610,8	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				610,8					247,5

2.6 Zone: 3P - SALA A312

Ventilation Sizing Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
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Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA A312									
3P - SALA A312	1	38,1	33,0	419,6	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				419,6					247,5

2.7 Zone: 3P - SALA A313

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA A313									
3P - SALA A313	1	38,1	33,0	567,0	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				567,0					247,5

2.8 Zone: 3P - SALA A314

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA A314									
3P - SALA A314	1	38,1	33,0	419,6	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				419,6					247,5

2.9 Zone: 3P - SALA A315

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA A315									
3P - SALA A315	1	38,0	33,0	566,6	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				566,6					247,5

2.10 Zone: 3P - SALA A316

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA A316									
3P - SALA A316	1	38,1	33,0	605,3	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				605,3					247,5

2.11 Zone: 3P - SALA B312

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA B312									
3P - SALA B312	1	55,9	33,0	811,9	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				811,9					247,5

Ventilation Sizing Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
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2.12 Zone: 3P - SALA B313

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA B313									
3P - SALA B313	1	38,1	33,0	419,6	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				419,6					247,5

2.13 Zone: 3P - SALA B314

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA B314									
3P - SALA B314	1	48,1	33,0	730,4	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				730,4					247,5

2.14 Zone: 3P - SALA B315

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA B315									
3P - SALA B315	1	37,9	33,0	418,7	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				418,7					247,5

2.15 Zone: 3P - SALA B316

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA B316									
3P - SALA B316	1	39,2	33,0	719,5	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				719,5					247,5

2.16 Zone: 3P - SALA B317

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA B317									
3P - SALA B317	1	38,6	33,0	467,4	7,50	0,00	0,0	0,0	247,5
Totals (incl. Space Multipliers)				467,4					247,5

2.17 Zone: 3P - SALA DE RECURSOS

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SALA DE RECURSOS									

Ventilation Sizing Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
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3P - SALA DE RECURSO	1	12,3	2,0	136,4	4,70	0,00	0,0	0,0	9,4
Totals (incl. Space Multipliers)				136,4					9,4

2.18 Zone: 3P - SOE

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
3P - SOE									
3P - SOE	1	13,4	3,0	148,5	4,70	0,00	0,0	0,0	14,1
Totals (incl. Space Multipliers)				148,5					14,1

Air System Design Load Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600 COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 8,9 °C / 4,3 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	50 m²	10730	-	50 m²	-	-
Wall Transmission	213 m²	5590	-	213 m²	6155	-
Roof Transmission	632 m²	9046	-	632 m²	4488	-
Window Transmission	50 m²	2478	-	50 m²	3768	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	550 m²	3805	-	550 m²	6154	-
Ceiling	634 m²	4386	-	634 m²	7094	-
Overhead Lighting	10926 W	9150	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	7000 W	6544	-	0	0	-
People	444	25415	19980	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	7714	1998	10%	2766	0
>> Total Zone Loads	-	84857	21978	-	30426	0
Zone Conditioning	-	82494	21978	-	30106	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	0 L/s	0	-	0 L/s	0	-
Ventilation Load	3316 L/s	32251	82576	3316 L/s	42526	0
Ventilation Fan Load	0 L/s	0	-	0 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	114745	104554	-	72632	0
Terminal Unit Cooling	-	114745	104596	-	0	0
Terminal Unit Heating	-	0	-	-	72632	-
>> Total Conditioning	-	114745	104596	-	72632	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Zone Design Load Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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3APOIO PEDAGÓGICOP -	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	10 m²	267	-	10 m²	283	-
Roof Transmission	11 m²	160	-	11 m²	79	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	19 m²	130	-	19 m²	211	-
Ceiling	12 m²	85	-	12 m²	138	-
Overhead Lighting	194 W	162	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	234	-	0	0	-
People	4	229	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	127	18	10%	71	0
>> Total Zone Loads	-	1394	198	-	782	0

3P - COORD. PEDAGÓGICA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	5 m²	1343	-	5 m²	-	-
Wall Transmission	5 m²	170	-	5 m²	150	-
Roof Transmission	28 m²	393	-	28 m²	195	-
Window Transmission	5 m²	236	-	5 m²	359	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	26 m²	180	-	26 m²	291	-
Ceiling	28 m²	190	-	28 m²	308	-
Overhead Lighting	475 W	398	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	234	-	0	0	-
People	6	343	270	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	349	27	10%	130	0
>> Total Zone Loads	-	3837	297	-	1434	0

Zone Design Load Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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3P - CPD	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	5 m²	136	-	5 m²	145	-
Roof Transmission	4 m²	57	-	4 m²	28	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	12 m²	80	-	12 m²	129	-
Ceiling	4 m²	28	-	4 m²	45	-
Overhead Lighting	69 W	58	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	935	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	129	0	10%	35	0
>> Total Zone Loads	-	1423	0	-	381	0

3P - ESPAÇO MAKER	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	22 m²	577	-	22 m²	636	-
Roof Transmission	77 m²	1076	-	77 m²	548	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	55 m²	382	-	55 m²	618	-
Ceiling	77 m²	534	-	77 m²	864	-
Overhead Lighting	1334 W	1117	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2000 W	1870	-	0	0	-
People	33	1889	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	745	149	10%	267	0
>> Total Zone Loads	-	8191	1634	-	2933	0

Zone Design Load Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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3P - SALA A311	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	892	-	6 m²	-	-
Wall Transmission	30 m²	790	-	30 m²	853	-
Roof Transmission	39 m²	604	-	39 m²	273	-
Window Transmission	6 m²	298	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	13 m²	94	-	13 m²	150	-
Ceiling	39 m²	270	-	39 m²	431	-
Overhead Lighting	665 W	547	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	33	1849	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	557	149	10%	216	0
>> Total Zone Loads	-	6131	1634	-	2372	0

3P - SALA A312	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	38 m²	597	-	38 m²	270	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	49 m²	343	-	49 m²	549	-
Ceiling	38 m²	267	-	38 m²	427	-
Overhead Lighting	658 W	541	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	33	1849	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	383	149	10%	125	0
>> Total Zone Loads	-	4212	1634	-	1370	0

Zone Design Load Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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3P - SALA A313	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	931	-	6 m²	-	-
Wall Transmission	8 m²	223	-	8 m²	220	-
Roof Transmission	38 m²	584	-	38 m²	270	-
Window Transmission	6 m²	298	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	36 m²	249	-	36 m²	399	-
Ceiling	38 m²	267	-	38 m²	427	-
Overhead Lighting	658 W	541	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	33	1849	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	517	149	10%	176	0
>> Total Zone Loads	-	5692	1634	-	1941	0

3P - SALA A314	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	38 m²	597	-	38 m²	270	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	49 m²	343	-	49 m²	549	-
Ceiling	38 m²	267	-	38 m²	427	-
Overhead Lighting	658 W	541	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	33	1849	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	383	149	10%	125	0
>> Total Zone Loads	-	4212	1634	-	1370	0

Zone Design Load Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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3P - SALA A315	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	931	-	6 m²	-	-
Wall Transmission	8 m²	223	-	8 m²	220	-
Roof Transmission	38 m²	583	-	38 m²	270	-
Window Transmission	6 m²	298	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	36 m²	249	-	36 m²	399	-
Ceiling	38 m²	266	-	38 m²	426	-
Overhead Lighting	657 W	540	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	33	1849	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	517	149	10%	176	0
>> Total Zone Loads	-	5688	1634	-	1938	0

3P - SALA A316	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	869	-	6 m²	-	-
Wall Transmission	30 m²	798	-	30 m²	853	-
Roof Transmission	38 m²	531	-	38 m²	270	-
Window Transmission	6 m²	295	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	13 m²	93	-	13 m²	150	-
Ceiling	38 m²	264	-	38 m²	427	-
Overhead Lighting	658 W	551	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	234	-	0	0	-
People	33	1889	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	552	149	10%	215	0
>> Total Zone Loads	-	6076	1634	-	2364	0

Zone Design Load Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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3P - SALA B312	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	8 m²	2405	-	8 m²	-	-
Wall Transmission	12 m²	471	-	12 m²	335	-
Roof Transmission	56 m²	672	-	56 m²	397	-
Window Transmission	8 m²	389	-	8 m²	628	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	20 m²	129	-	20 m²	224	-
Ceiling	56 m²	361	-	56 m²	627	-
Overhead Lighting	966 W	823	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	33	1926	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	741	149	10%	221	0
>> Total Zone Loads	-	8150	1634	-	2433	0

3P - SALA B313	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	38 m²	597	-	38 m²	270	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	49 m²	343	-	49 m²	549	-
Ceiling	38 m²	267	-	38 m²	427	-
Overhead Lighting	658 W	541	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	33	1849	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	383	149	10%	125	0
>> Total Zone Loads	-	4212	1634	-	1370	0

Zone Design Load Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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3P - SALA B314	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	7 m²	2061	-	7 m²	-	-
Wall Transmission	10 m²	406	-	10 m²	289	-
Roof Transmission	48 m²	577	-	48 m²	341	-
Window Transmission	7 m²	333	-	7 m²	538	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	17 m²	110	-	17 m²	190	-
Ceiling	48 m²	310	-	48 m²	539	-
Overhead Lighting	831 W	708	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	33	1926	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	667	149	10%	190	0
>> Total Zone Loads	-	7332	1634	-	2088	0

3P - SALA B315	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	38 m²	594	-	38 m²	269	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	49 m²	343	-	49 m²	548	-
Ceiling	38 m²	265	-	38 m²	424	-
Overhead Lighting	655 W	538	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	33	1849	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	382	149	10%	124	0
>> Total Zone Loads	-	4203	1634	-	1365	0

Zone Design Load Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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3P - SALA B316	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	1718	-	6 m²	-	-
Wall Transmission	30 m²	878	-	30 m²	868	-
Roof Transmission	39 m²	470	-	39 m²	278	-
Window Transmission	6 m²	278	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	36 m²	232	-	36 m²	403	-
Ceiling	39 m²	253	-	39 m²	439	-
Overhead Lighting	677 W	577	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	33	1926	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	657	149	10%	244	0
>> Total Zone Loads	-	7223	1634	-	2680	0

3P - SALA B317	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	22 m²	660	-	22 m²	636	-
Roof Transmission	39 m²	447	-	39 m²	274	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	28 m²	180	-	28 m²	314	-
Ceiling	39 m²	249	-	39 m²	432	-
Overhead Lighting	667 W	568	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	33	1926	1485	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	427	149	10%	166	0
>> Total Zone Loads	-	4692	1634	-	1822	0

Zone Design Load Summary for VRF 3P

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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3P - SALA DE RECURSOS	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	11 m²	289	-	11 m²	318	-
Roof Transmission	12 m²	193	-	12 m²	87	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	23 m²	158	-	23 m²	252	-
Ceiling	12 m²	86	-	12 m²	138	-
Overhead Lighting	213 W	175	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	2	112	90	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	124	9	10%	80	0
>> Total Zone Loads	-	1369	99	-	875	0

3P - SOE	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	12 m²	316	-	12 m²	347	-
Roof Transmission	13 m²	210	-	13 m²	95	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	0 m²	0	-	0 m²	0	-
Partitions	21 m²	145	-	21 m²	232	-
Ceiling	13 m²	94	-	13 m²	150	-
Overhead Lighting	232 W	190	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	232	-	0	0	-
People	3	168	135	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	136	14	10%	82	0
>> Total Zone Loads	-	1491	149	-	906	0

Dedicated Outdoor Air System (DOAS) Sizing Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

07/26/2023
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Air System Information

Air System Name VRF T
Equipment Class TERM
Air System Type VRF

Number of zones 15
Floor Area 455,8 m²
Location Brasilia, Brazil

Sizing Calculation Information

Calculation Months Jan to Dec
Sizing Data Calculated

Zone L/s Sizing Sum of space airflow rates
Space L/s Sizing Individual peak space loads

NOTE: No other data is applicable for a Terminal Units air system without a Dedicated Outdoor Air System (DOAS).

Zone Sizing Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Air System Information

Air System Name VRF T
Equipment Class TERM
Air System Type VRF

Number of zones 15
Floor Area 455,8 m²
Location Brasilia, Brazil

Sizing Calculation Information

Calculation Months Jan to Dec
Sizing Data Calculated

Zone L/s Sizing Sum of space airflow rates
Space L/s Sizing Individual peak space loads

Terminal Unit Sizing Data - Cooling

Zone Name	Total Coil Load (kW)	Sens Coil Load (kW)	Coil Entering DB / WB (°C)	Coil Leaving DB / WB (°C)	Water Flow @ 5,6 K (L/s)	Time of Peak Coil Load	Zone L/(s·m²)
T - ADM	3,5	2,3	25,9 / 19,9	15,8 / 15,3	-	Feb 1500	8,84
T - ADM 2	3,1	2,1	26,1 / 19,9	15,5 / 14,9	-	Feb 1500	12,66
T - BIBLI	3,0	2,5	25,0 / 18,5	15,2 / 14,6	-	Jan 1600	26,39
T - BIBLIOTECA	22,7	14,2	26,6 / 20,5	15,6 / 15,1	-	Jan 1600	11,29
T - CAIXA	2,3	1,5	26,1 / 20,1	15,5 / 14,9	-	Dec 1500	9,10
T - CEB	1,7	1,6	24,4 / 17,9	15,3 / 14,7	-	Jan 1400	18,19
T - COPA	3,4	2,3	26,0 / 19,9	15,8 / 15,2	-	Feb 1500	10,81
T - CPD	1,8	1,7	24,5 / 17,9	15,3 / 14,7	-	Dec 1700	17,57
T - DIREÇÃO	4,7	2,8	26,9 / 20,8	15,5 / 15,0	-	Dec 1500	11,54
T - FOYER	17,8	8,7	29,6 / 23,3	15,3 / 14,9	-	Feb 1500	5,40
T - REPOGRAFIA	1,5	1,0	26,1 / 20,2	15,5 / 15,0	-	Feb 1600	6,51
T - SALA DE ROBÓTICA	9,6	6,0	26,6 / 20,3	15,2 / 14,7	-	Feb 1600	12,95
T - SALA DOS TEC. DA CUL	2,0	1,3	26,6 / 20,4	15,4 / 14,9	-	Feb 1500	8,94
T - SEC	3,7	2,6	25,9 / 19,5	15,5 / 14,9	-	Feb 1600	13,53
T - SECRETARIA	8,1	5,6	26,1 / 19,7	15,4 / 14,9	-	Jan 1500	11,96

Terminal Unit Sizing Data - Heating, Fan, Ventilation

Zone Name	Heating Coil Load (kW)	Heating Coil Ent/Lvg DB (°C)	Htg Coil Water Flow @11,1 K (L/s)	Fan Design Airflow (L/s)	Fan Motor (BHP)	Fan Motor (kW)	OA Vent Design Airflow (L/s)
T - ADM	1,2	19,2 / 24,2	-	218	0,000	0,000	30
T - ADM 2	0,9	18,9 / 23,4	-	185	0,000	0,000	30
T - BIBLI	1,0	20,1 / 24,1	-	238	0,000	0,000	15
T - BIBLIOTECA	6,8	18,3 / 23,6	-	1207	0,000	0,000	263
T - CAIXA	0,8	18,8 / 24,2	-	131	0,000	0,000	23
T - CEB	0,5	21,0 / 24,1	-	162	0,000	0,000	0
T - COPA	1,2	19,3 / 24,8	-	211	0,000	0,000	30
T - CPD	0,7	20,8 / 24,4	-	172	0,000	0,000	0
T - DIREÇÃO	1,5	17,8 / 24,0	-	230	0,000	0,000	60
T - FOYER	5,5	14,7 / 23,7	-	573	0,000	0,000	300
T - REPOGRAFIA	0,6	18,7 / 25,3	-	86	0,000	0,000	15
T - SALA DE ROBÓTICA	2,6	18,1 / 23,1	-	494	0,000	0,000	113
T - SALA DOS TEC. DA CUL	0,6	18,4 / 23,4	-	107	0,000	0,000	23
T - SEC	0,7	19,3 / 22,1	-	237	0,000	0,000	30
T - SECRETARIA	2,7	19,2 / 24,4	-	493	0,000	0,000	70

Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible (kW)	Time of Peak Sensible Cooling Load	Zone Heating Load (kW)	Zone Floor Area (m²)
T - ADM	2,2	Jan 1600	0,8	24,7
T - ADM 2	1,9	Jan 1600	0,6	14,6
T - BIBLI	2,4	Jan 1700	0,8	9,0

Zone Sizing Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Zone Name	Zone Cooling Sensible (kW)	Time of Peak Sensible Cooling Load	Zone Heating Load (kW)	Zone Floor Area (m²)
T - BIBLIOTECA	12,1	Jan 1700	3,5	106,9
T - CAIXA	1,3	Jan 1700	0,5	14,4
T - CEB	1,6	Jan 1700	0,6	8,9
T - COPA	2,1	Jan 1600	0,9	19,5
T - CPD	1,7	Jan 1700	0,7	9,8
T - DIREÇÃO	2,3	Jan 1600	0,7	19,9
T - FOYER	5,7	Jan 1700	1,6	106,1
T - REPOGRAFIA	0,9	Jan 1600	0,4	13,2
T - SALA DE ROBÓTICA	5,0	Jan 1600	1,3	38,1
T - SALA DOS TEC. DA CUL	1,1	Jan 1600	0,3	12,0
T - SEC	2,4	Feb 1700	0,4	17,5
T - SECRETARIA	4,9	Jan 1500	1,8	41,2

Space Loads and Airflows

Zone Name / Space Name	Mult.	Cooling Sensible (kW)	Time of Peak Sensible Load	Air Flow (L/s)	Heating Load (kW)	Floor Area (m²)	Space L/(s.m²)
T - ADM							
T - ADM DIREITA	1	2,2	Jan 1600	218	0,8	24,7	8,84
T - ADM 2							
T - ADM ESQUERDA	1	1,9	Jan 1600	185	0,6	14,6	12,66
T - BIBLI							
T - BIBLI	1	2,4	Jan 1700	238	0,8	9,0	26,39
T - BIBLIOTECA							
T - BIBLIOTECA	1	12,1	Jan 1700	1207	3,5	106,9	11,29
T - CAIXA							
T - CAIXA	1	1,3	Jan 1700	131	0,5	14,4	9,10
T - CEB							
T - CEB	1	1,6	Jan 1700	162	0,6	8,9	18,19
T - COPA							
T - COPA	1	2,1	Jan 1600	211	0,9	19,5	10,81
T - CPD							
T - CPD	1	1,7	Jan 1700	172	0,7	9,8	17,57
T - DIREÇÃO							
T - DIREÇÃO	1	2,3	Jan 1600	230	0,7	19,9	11,54
T - FOYER							
T - FOYER	1	5,7	Jan 1700	573	1,6	106,1	5,40
T - REPOGRAFIA							
T - REP	1	0,9	Jan 1600	86	0,4	13,2	6,51
T - SALA DE ROBÓTICA							
T - SALA DE ROBÓTICA	1	5,0	Jan 1600	494	1,3	38,1	12,95
T - SALA DOS TEC. DA CUL							
T - SALA DOS TEC. DA CUL	1	1,1	Jan 1600	107	0,3	12,0	8,94
T - SEC							
T - SECRETARIA	1	2,4	Feb 1700	237	0,4	17,5	13,53
T - SECRETARIA							
T - ESPERA	1	4,9	Jan 1500	493	1,8	41,2	11,96

Ventilation Sizing Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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1. Summary

Ventilation Sizing Method Sum of Space OA Airflows

2. Space Ventilation Analysis

2.1 Zone: T - ADM

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - ADM									
T - ADM DIREITA	1	24,7	4,0	218,2	7,50	0,00	0,0	0,0	30,0
Totals (incl. Space Multipliers)				218,2					30,0

2.2 Zone: T - ADM 2

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - ADM 2									
T - ADM ESQUERDA	1	14,6	4,0	184,9	7,50	0,00	0,0	0,0	30,0
Totals (incl. Space Multipliers)				184,9					30,0

2.3 Zone: T - BIBLI

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - BIBLI									
T - BIBLI	1	9,0	2,0	237,5	7,50	0,00	0,0	0,0	15,0
Totals (incl. Space Multipliers)				237,5					15,0

2.4 Zone: T - BIBLIOTECA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - BIBLIOTECA									
T - BIBLIOTECA	1	106,9	35,0	1206,9	7,50	0,00	0,0	0,0	262,5
Totals (incl. Space Multipliers)				1206,9					262,5

2.5 Zone: T - CAIXA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - CAIXA									
T - CAIXA	1	14,4	3,0	131,1	7,50	0,00	0,0	0,0	22,5
Totals (incl. Space Multipliers)				131,1					22,5

2.6 Zone: T - CEB

Ventilation Sizing Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - CEB									
T - CEB	1	8,9	0,0	161,9	7,50	0,00	0,0	0,0	0,0
Totals (incl. Space Multipliers)				161,9					0,0

2.7 Zone: T - COPA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - COPA									
T - COPA	1	19,5	4,0	210,9	7,50	0,00	0,0	0,0	30,0
Totals (incl. Space Multipliers)				210,9					30,0

2.8 Zone: T - CPD

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - CPD									
T - CPD	1	9,8	0,0	172,2	7,50	0,00	0,0	0,0	0,0
Totals (incl. Space Multipliers)				172,2					0,0

2.9 Zone: T - DIREÇÃO

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - DIREÇÃO									
T - DIREÇÃO	1	19,9	8,0	229,6	7,50	0,00	0,0	0,0	60,0
Totals (incl. Space Multipliers)				229,6					60,0

2.10 Zone: T - FOYER

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - FOYER									
T - FOYER	1	106,1	40,0	572,7	7,50	0,00	0,0	0,0	300,0
Totals (incl. Space Multipliers)				572,7					300,0

2.11 Zone: T - REPOGRAFIA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - REPOGRAFIA									
T - REP	1	13,2	2,0	85,9	7,50	0,00	0,0	0,0	15,0
Totals (incl. Space Multipliers)				85,9					15,0

Ventilation Sizing Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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2.12 Zone: T - SALA DE ROBÓTICA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - SALA DE ROBÓTICA									
T - SALA DE ROBÓTICA	1	38,1	15,0	493,5	7,50	0,00	0,0	0,0	112,5
Totals (incl. Space Multipliers)				493,5					112,5

2.13 Zone: T - SALA DOS TEC. DA CUL

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - SALA DOS TEC. DA CUL									
T - SALA DOS TEC. DA CUL	1	12,0	3,0	107,3	7,50	0,00	0,0	0,0	22,5
Totals (incl. Space Multipliers)				107,3					22,5

2.14 Zone: T - SEC

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - SEC									
T - SECRETARIA	1	17,5	4,0	236,8	7,50	0,00	0,0	0,0	30,0
Totals (incl. Space Multipliers)				236,8					30,0

2.15 Zone: T - SECRETARIA

Zone Name / Space Name	Mult.	Floor Area (m²)	Maximum Occupants	Maximum Supply Air (L/s)	Required Outdoor Air (L/s/person)	Required Outdoor Air (L/(s·m²))	Required Outdoor Air (L/s)	Required Outdoor Air (% of supply)	Uncorrected Outdoor Air (L/s)
T - SECRETARIA									
T - ESPERA	1	41,2	15,0	492,8	4,70	0,00	0,0	0,0	70,5
Totals (incl. Space Multipliers)				492,8					70,5

Air System Design Load Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600 COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING DATA AT DES HTG HEATING OA DB / WB 8,9 °C / 4,3 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	24 m²	5872	-	24 m²	-	-
Wall Transmission	87 m²	2523	-	87 m²	2525	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	24 m²	1180	-	24 m²	1794	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	5 m²	73	-	5 m²	110	-
Floor Transmission	456 m²	0	-	456 m²	0	-
Partitions	366 m²	2536	-	366 m²	4102	-
Ceiling	456 m²	3156	-	456 m²	5105	-
Overhead Lighting	7876 W	6596	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	14000 W	13088	-	0	0	-
People	139	7956	6255	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	4298	626	10%	1364	0
>> Total Zone Loads	-	47278	6881	-	15000	0
Zone Conditioning	-	45724	6881	-	14456	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	0 L/s	0	-	0 L/s	0	-
Ventilation Load	1001 L/s	9756	25911	1001 L/s	12814	0
Ventilation Fan Load	0 L/s	0	-	0 L/s	0	-
Space Fan Coil Fans	-	0	-	-	0	-
Duct Heat Gain / Loss	0%	0	-	0%	0	-
>> Total System Loads	-	55480	32792	-	27270	0
Terminal Unit Cooling	-	55480	32829	-	0	0
Terminal Unit Heating	-	0	-	-	27270	-
>> Total Conditioning	-	55480	32829	-	27270	0
Key:	Positive values are clg loads Negative values are htg loads			Positive values are htg loads Negative values are clg loads		

Zone Design Load Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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T - ADM	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	25 m²	0	-	25 m²	0	-
Partitions	43 m²	299	-	43 m²	484	-
Ceiling	25 m²	171	-	25 m²	277	-
Overhead Lighting	427 W	357	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	935	-	0	0	-
People	4	229	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	199	18	10%	76	0
>> Total Zone Loads	-	2191	198	-	837	0

T - ADM 2	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	15 m²	0	-	15 m²	0	-
Partitions	31 m²	211	-	31 m²	342	-
Ceiling	15 m²	101	-	15 m²	163	-
Overhead Lighting	252 W	211	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	935	-	0	0	-
People	4	229	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	169	18	10%	51	0
>> Total Zone Loads	-	1856	198	-	556	0

Zone Design Load Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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T - BIBLI	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	4 m²	1031	-	4 m²	-	-
Wall Transmission	13 m²	428	-	13 m²	382	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	4 m²	167	-	4 m²	269	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	9 m²	0	-	9 m²	0	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	9 m²	58	-	9 m²	101	-
Overhead Lighting	156 W	132	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	235	-	0	0	-
People	2	117	90	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	217	9	10%	75	0
>> Total Zone Loads	-	2384	99	-	827	0

T - BIBLIOTECA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	14 m²	4122	-	14 m²	-	-
Wall Transmission	19 m²	755	-	19 m²	538	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	14 m²	667	-	14 m²	1077	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	107 m²	0	-	107 m²	0	-
Partitions	35 m²	226	-	35 m²	392	-
Ceiling	107 m²	689	-	107 m²	1197	-
Overhead Lighting	1847 W	1573	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	941	-	0	0	-
People	35	2042	1575	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	1101	158	10%	320	0
>> Total Zone Loads	-	12116	1733	-	3524	0

Zone Design Load Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

07/26/2023
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T - CAIXA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	7 m²	200	-	7 m²	208	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	14 m²	0	-	14 m²	0	-
Partitions	7 m²	46	-	7 m²	81	-
Ceiling	14 m²	93	-	14 m²	161	-
Overhead Lighting	249 W	212	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	500 W	470	-	0	0	-
People	3	175	135	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	120	14	10%	45	0
>> Total Zone Loads	-	1316	149	-	495	0

T - CEB	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	10 m²	283	-	10 m²	295	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	9 m²	0	-	9 m²	0	-
Partitions	10 m²	66	-	10 m²	114	-
Ceiling	9 m²	57	-	9 m²	100	-
Overhead Lighting	154 W	131	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	941	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	148	0	10%	51	0
>> Total Zone Loads	-	1626	0	-	560	0

Zone Design Load Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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T - COPA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	20 m²	0	-	20 m²	0	-
Partitions	50 m²	343	-	50 m²	555	-
Ceiling	20 m²	135	-	20 m²	218	-
Overhead Lighting	337 W	282	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	935	-	0	0	-
People	4	229	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	192	18	10%	77	0
>> Total Zone Loads	-	2117	198	-	851	0

T - CPD	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	11 m²	308	-	11 m²	321	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	10 m²	0	-	10 m²	0	-
Partitions	18 m²	115	-	18 m²	200	-
Ceiling	10 m²	63	-	10 m²	110	-
Overhead Lighting	169 W	144	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	941	-	0	0	-
People	0	0	0	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	157	0	10%	63	0
>> Total Zone Loads	-	1729	0	-	694	0

Zone Design Load Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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T - DIREÇÃO	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	20 m²	0	-	20 m²	0	-
Partitions	40 m²	277	-	40 m²	448	-
Ceiling	20 m²	138	-	20 m²	223	-
Overhead Lighting	344 W	288	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	935	-	0	0	-
People	8	458	360	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	210	36	10%	67	0
>> Total Zone Loads	-	2305	396	-	738	0

T - FOYER	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	106 m²	0	-	106 m²	0	-
Partitions	27 m²	177	-	27 m²	307	-
Ceiling	106 m²	684	-	106 m²	1188	-
Overhead Lighting	1833 W	1561	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	500 W	470	-	0	0	-
People	40	2334	1800	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	523	180	10%	149	0
>> Total Zone Loads	-	5749	1980	-	1644	0

Zone Design Load Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

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T - REPOGRAFIA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	13 m²	0	-	13 m²	0	-
Partitions	22 m²	153	-	22 m²	247	-
Ceiling	13 m²	92	-	13 m²	149	-
Overhead Lighting	228 W	191	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	250 W	234	-	0	0	-
People	2	114	90	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	78	9	10%	40	0
>> Total Zone Loads	-	863	99	-	436	0

T - SALA DE ROBÓTICA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	38 m²	0	-	38 m²	0	-
Partitions	71 m²	493	-	71 m²	797	-
Ceiling	38 m²	264	-	38 m²	427	-
Overhead Lighting	658 W	551	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	2500 W	2337	-	0	0	-
People	15	859	675	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	450	68	10%	122	0
>> Total Zone Loads	-	4954	743	-	1346	0

Zone Design Load Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

07/26/2023
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T - SALA DOS TEC. DA CUL	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1600			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 33,8 °C / 26,8 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	0 m²	0	-	0 m²	0	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	12 m²	0	-	12 m²	0	-
Partitions	12 m²	83	-	12 m²	134	-
Ceiling	12 m²	83	-	12 m²	134	-
Overhead Lighting	207 W	174	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	500 W	467	-	0	0	-
People	3	172	135	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	98	14	10%	27	0
>> Total Zone Loads	-	1077	149	-	296	0

T - SEC	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Feb 1700			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 32,9 °C / 26,6 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	0 m²	0	-	0 m²	-	-
Wall Transmission	5 m²	146	-	5 m²	145	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	0 m²	0	-	0 m²	0	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	0 m²	0	-	0 m²	0	-
Floor Transmission	18 m²	0	-	18 m²	0	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	18 m²	113	-	18 m²	196	-
Overhead Lighting	302 W	258	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1500 W	1411	-	0	0	-
People	4	233	180	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	216	18	10%	34	0
>> Total Zone Loads	-	2377	198	-	375	0

Zone Design Load Summary for VRF T

Project Name: EDUSESC TAGUATINGA
Prepared by: CBR ENGENHARIA SS LTDA

07/26/2023
09:49

T - SECRETARIA	DESIGN COOLING			DESIGN HEATING		
	COOLING DATA AT Jan 1500			HEATING DATA AT DES HTG		
	COOLING OA DB / WB 34,2 °C / 26,9 °C			HEATING OA DB / WB 8,9 °C / 4,3 °C		
	OCCUPIED T-STAT 23,9 °C			OCCUPIED T-STAT 21,1 °C		
ZONE LOADS	Details	Sensible (W)	Latent (W)	Details	Sensible (W)	Latent (W)
Window & Skylight Solar Loads	6 m²	892	-	6 m²	-	-
Wall Transmission	22 m²	592	-	22 m²	636	-
Roof Transmission	0 m²	0	-	0 m²	0	-
Window Transmission	6 m²	298	-	6 m²	449	-
Skylight Transmission	0 m²	0	-	0 m²	0	-
Door Loads	5 m²	73	-	5 m²	110	-
Floor Transmission	41 m²	0	-	41 m²	0	-
Partitions	0 m²	0	-	0 m²	0	-
Ceiling	41 m²	289	-	41 m²	461	-
Overhead Lighting	712 W	585	-	0	0	-
Task Lighting	0 W	0	-	0	0	-
Electric Equipment	1000 W	929	-	0	0	-
People	15	840	675	0	0	0
Infiltration	-	0	0	-	0	0
Miscellaneous	-	0	0	-	0	0
Safety Factor	10% / 10%	450	68	10%	166	0
>> Total Zone Loads	-	4947	743	-	1822	0