

IMPACTO DE DISPOSITIVOS DE SOMBREAMENTO EXTERNOS E
MURO NA VENTILAÇÃO NATURAL E NO DESEMPENHO TÉRMICO
DE UMA HABITAÇÃO DE INTERESSE SOCIAL TÉRREA

ANEXO II: ANÁLISE DE FUNCIONAMENTO
(Outros recursos gráficos)

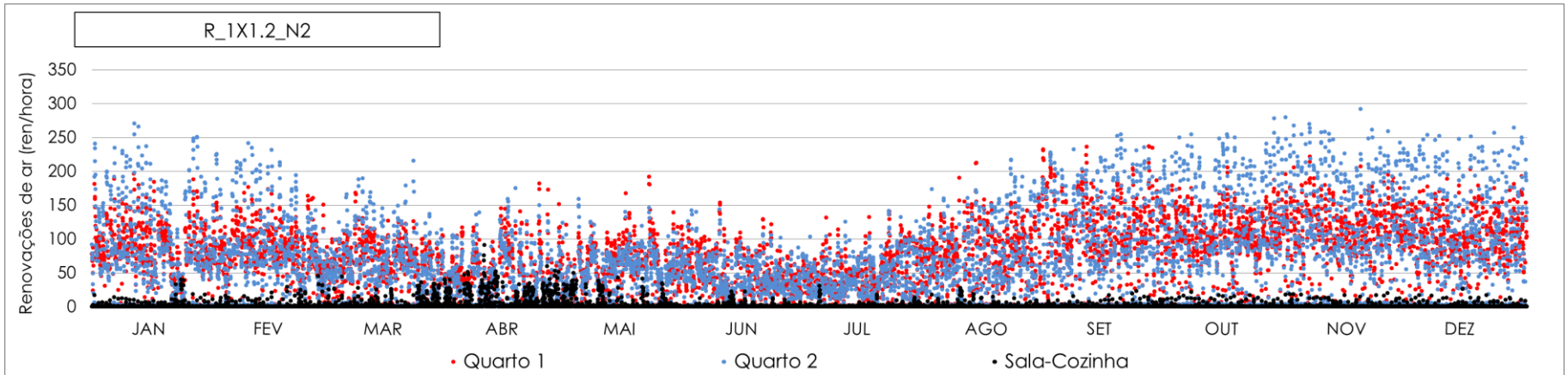
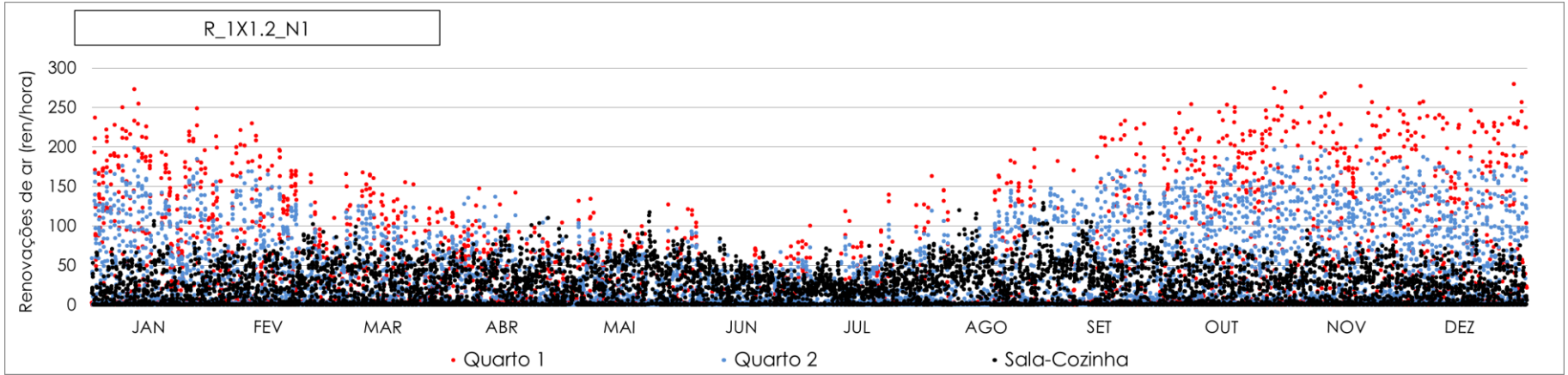


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arquitetura e urbanismo
usp são carlos

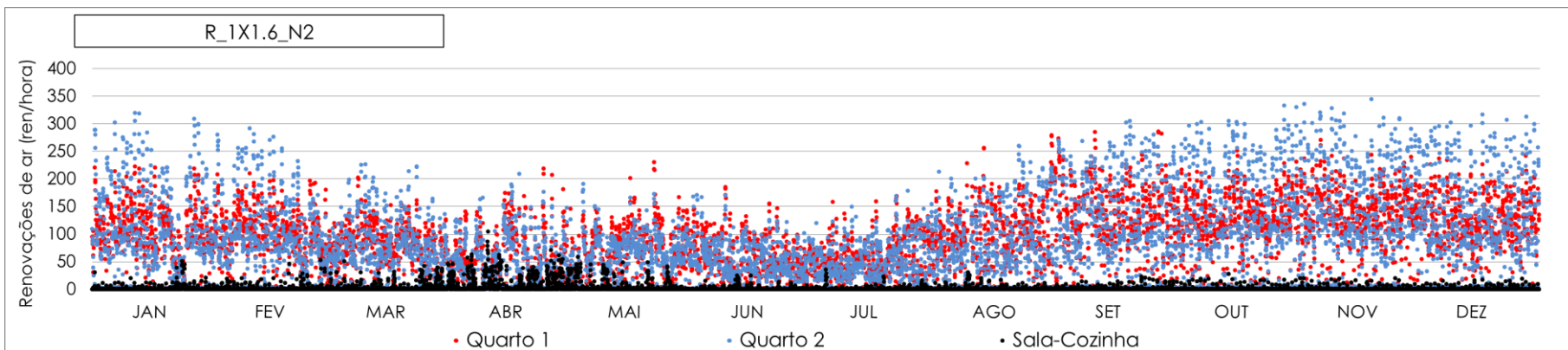
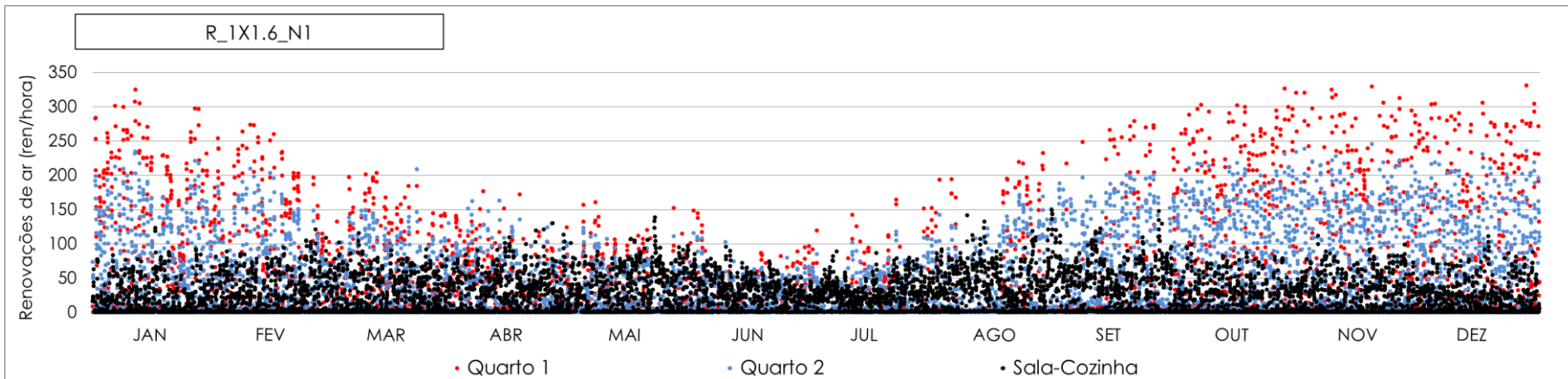
HÉCTOR FABIÁN MARÍN CASTAÑO
Profa. Dra. KARIN MARIA SOARES CHVATAL

TAXA DE RENOVAÇÃO DE AR PARA
TODOS AMBIENTES DURANTE UM ANO
PARA OS CASOS SEM ELEMENTOS
EXTERNOS PARA OS TRÊS TAMANHOS
DE JANELA

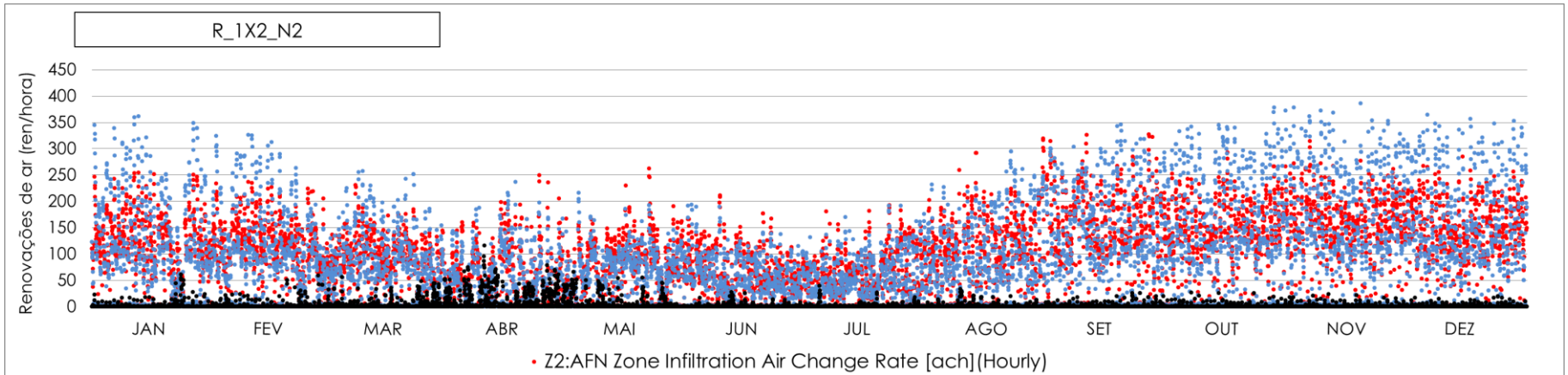
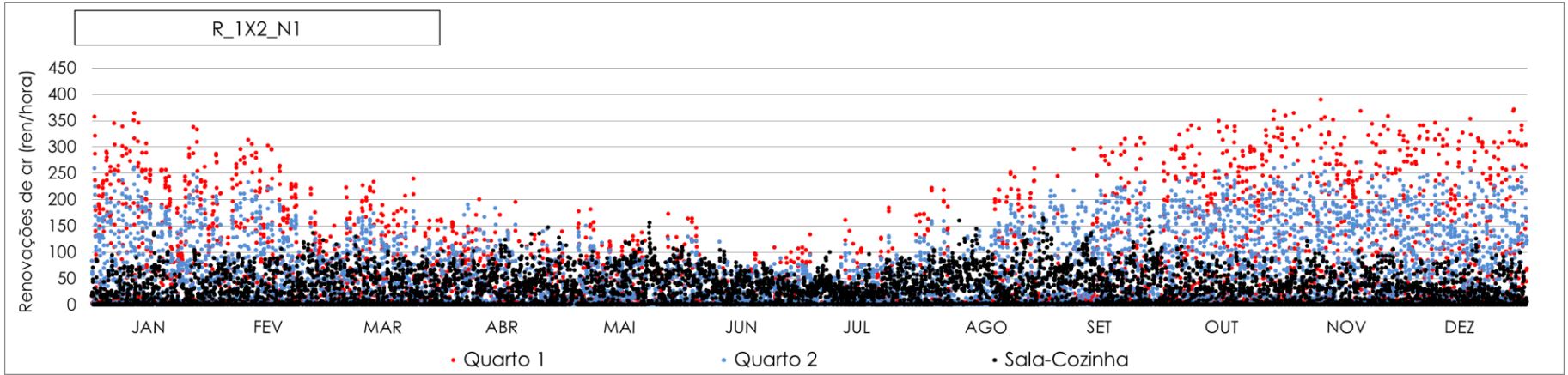
JANELAS MENORES 1X1.2



JANELAS INTERMEDIÁRIAS 1X1.6

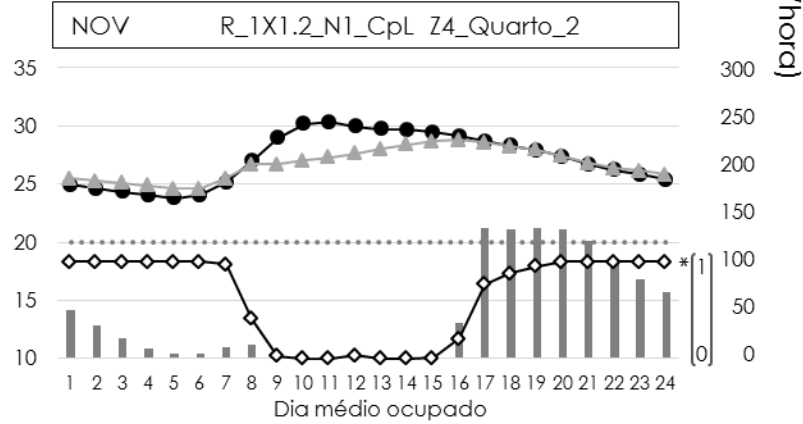
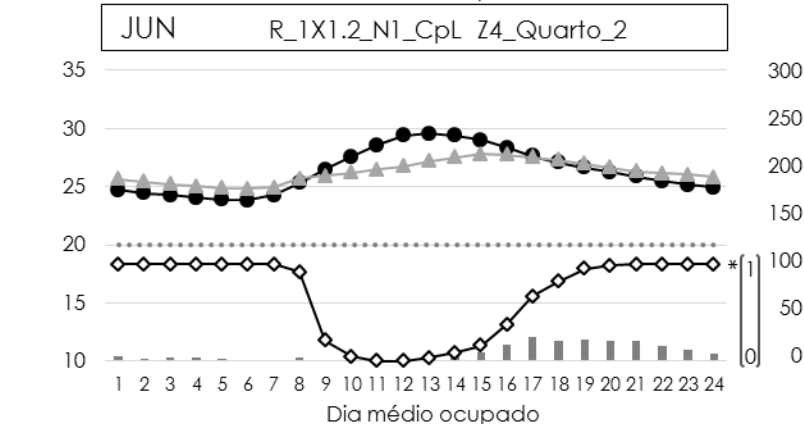
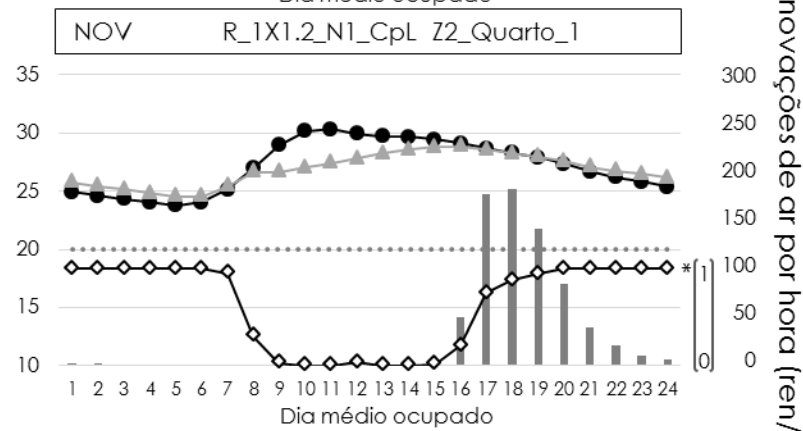
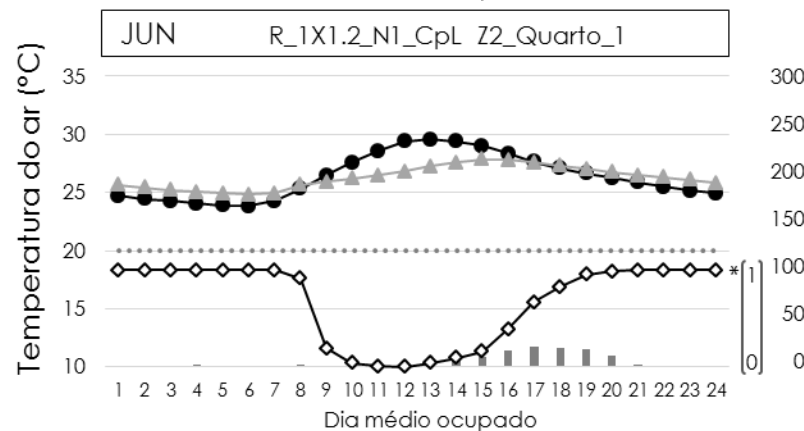
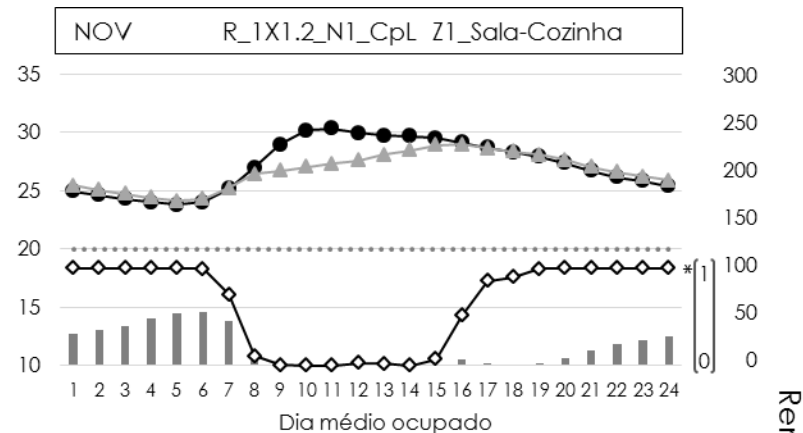
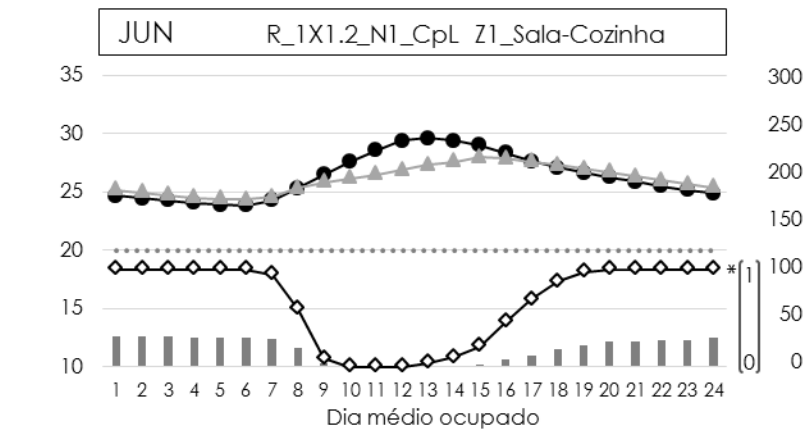


JANELAS MAIORES 1X2



VALORES MÉDIOS HORÁRIOS PARA
AS TEMPERATURAS DO AR EXTERNA E
INTERNA, TAXA DE RENOVAÇÃO DE
AR, E FATOR DE ABERTURA DA
JANELA PARA CADA CASO E PARA
DOIS MESES
(JUNHO E NOVEMBRO)

R_1X1.2_N1

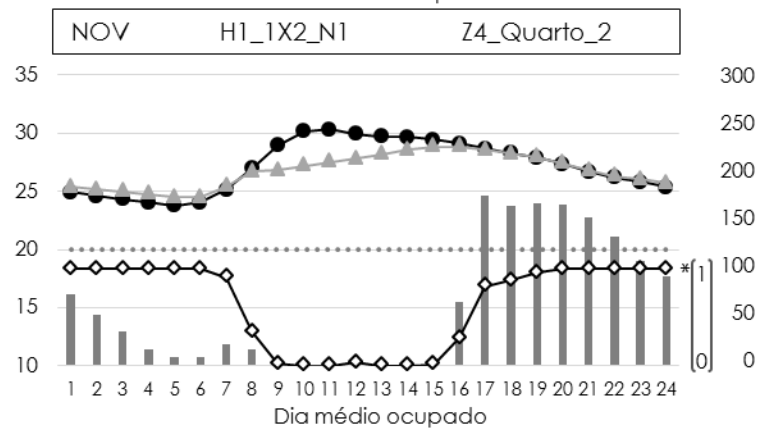
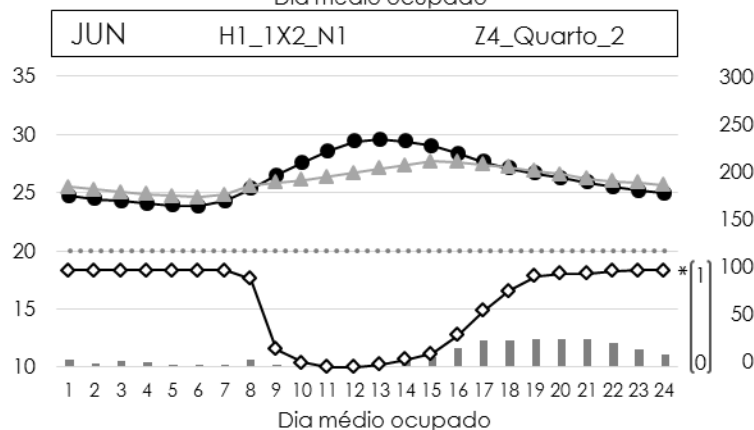
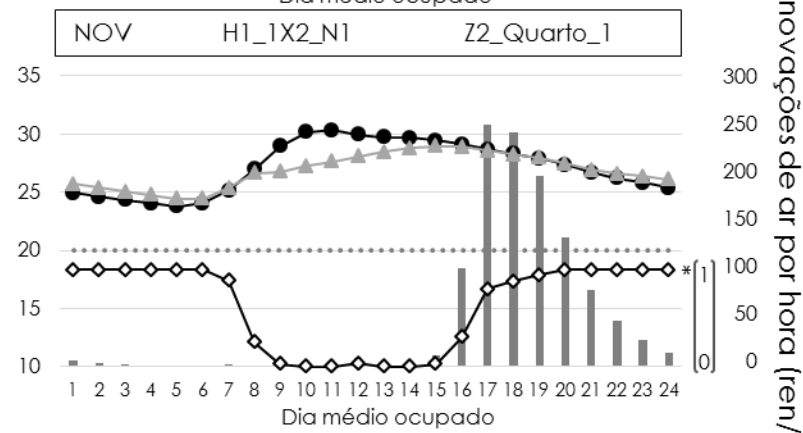
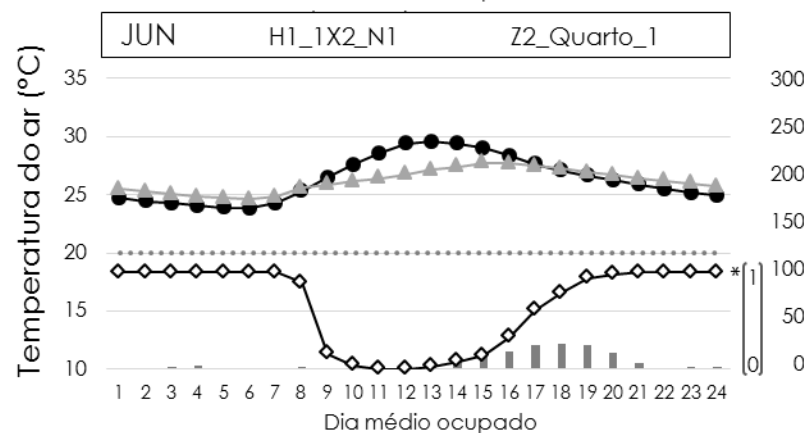
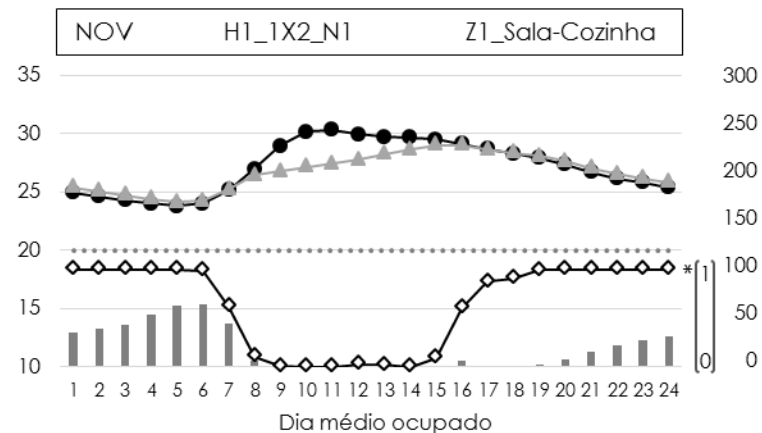
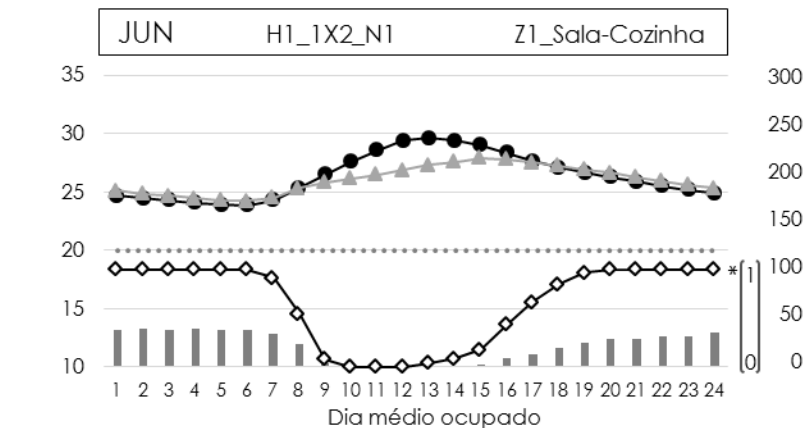


Renovações de ar por hora (ren/hora)

■ Renovações de ar por hora
 ▲ Ti
 ● Te
 Tcontrole
 ◇ * Fator de abertura (0-1)

■ Renovações de ar por hora
 ▲ Ti
 ● Te
 Tcontrole
 ◇ * Fator de abertura (0-1)

H1_1X1.2_N1

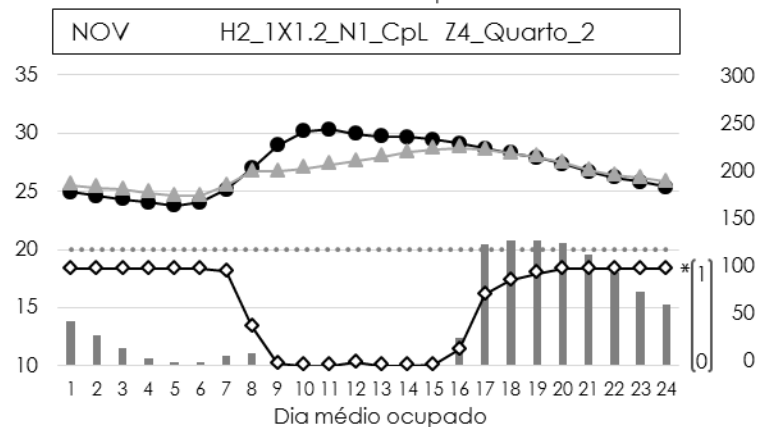
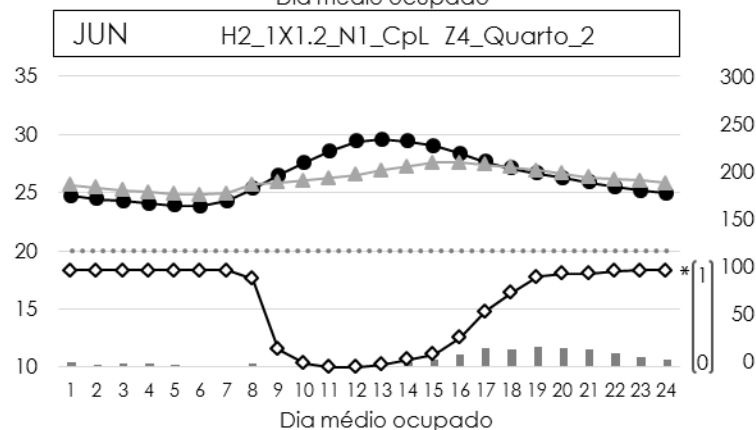
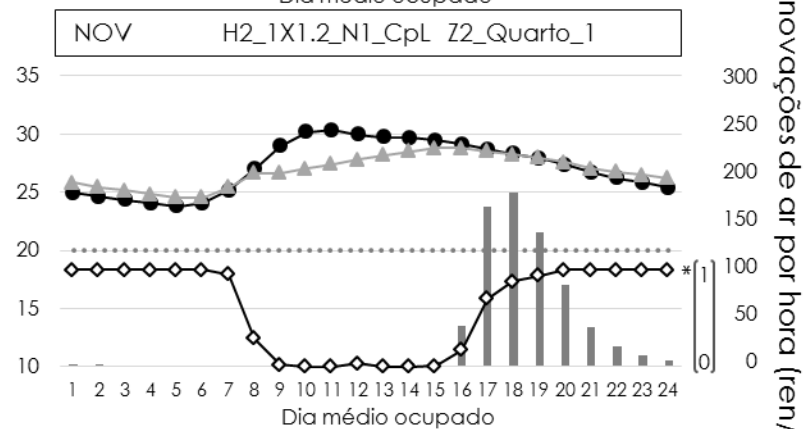
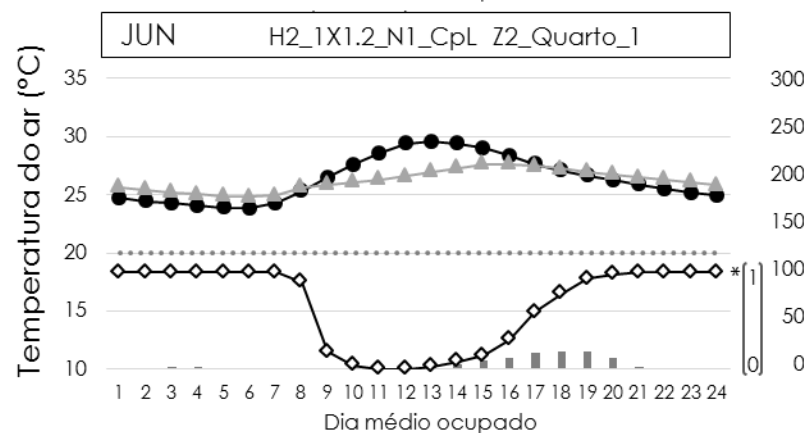
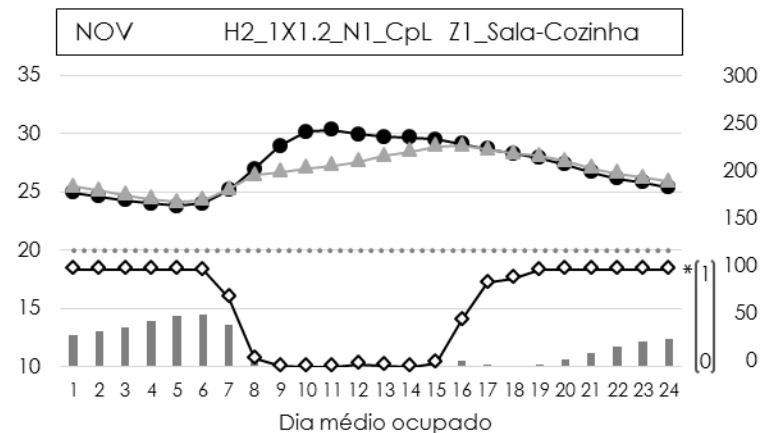
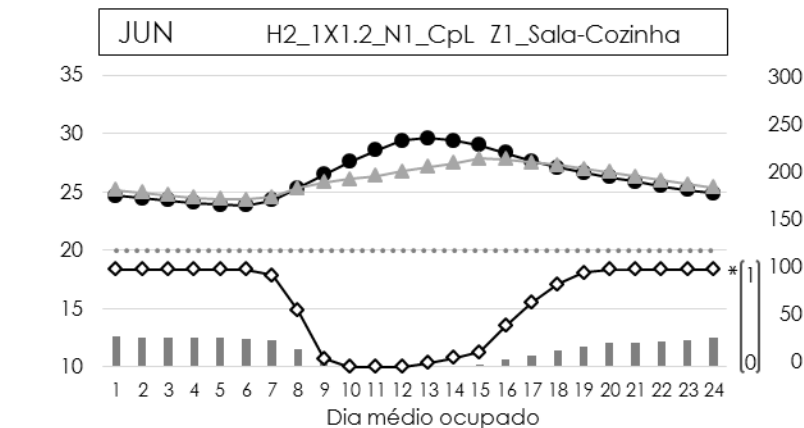


Renovações de ar por hora (ren/hora)

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

H2_1X1.2_N1

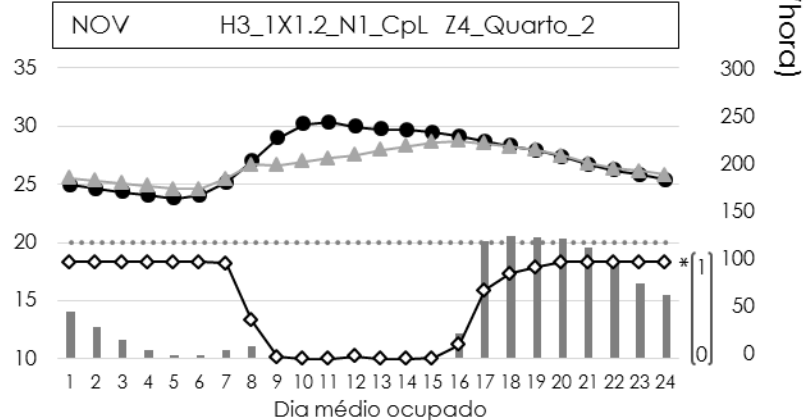
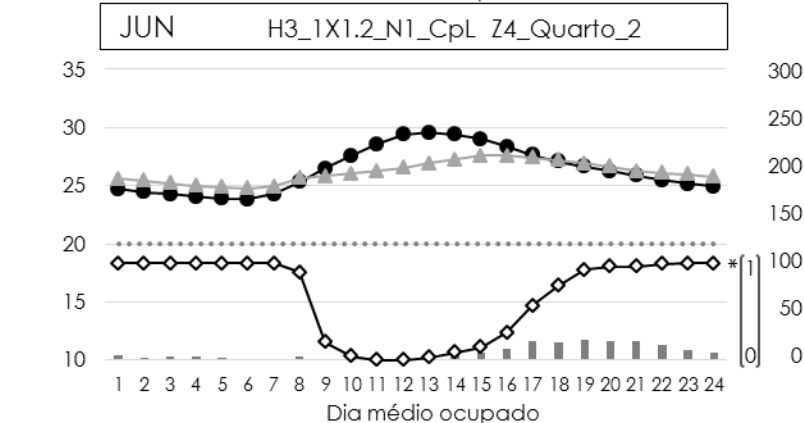
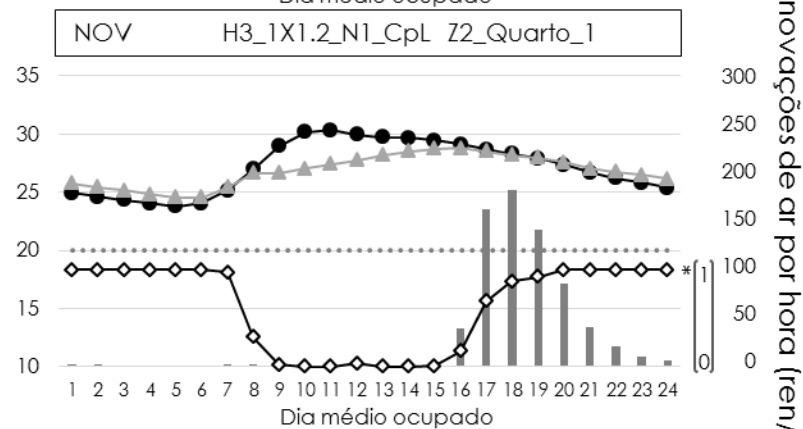
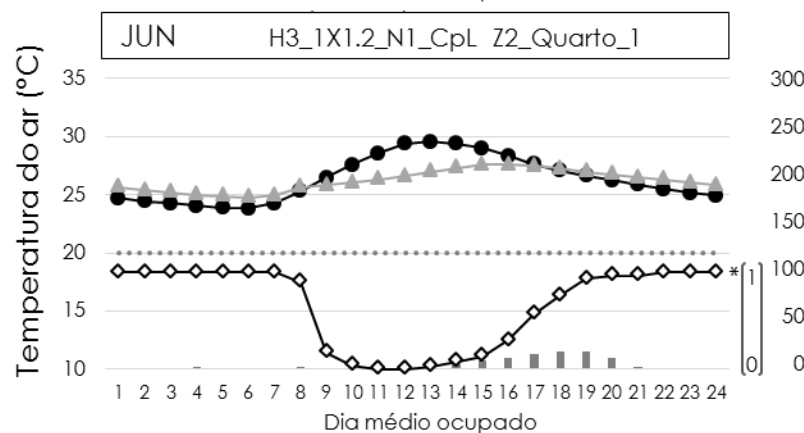
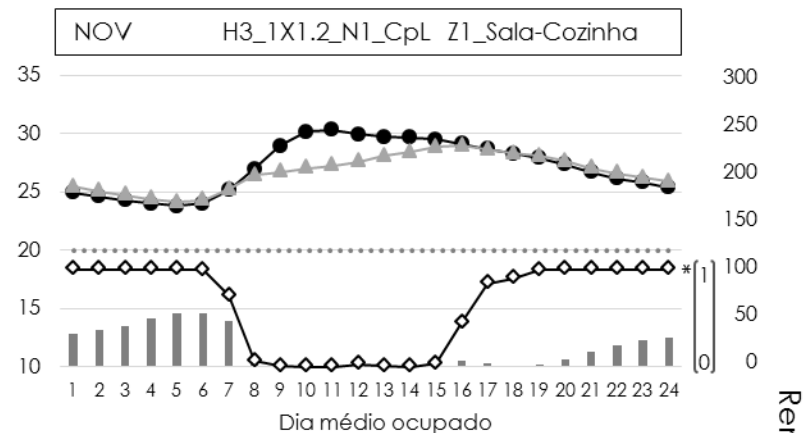
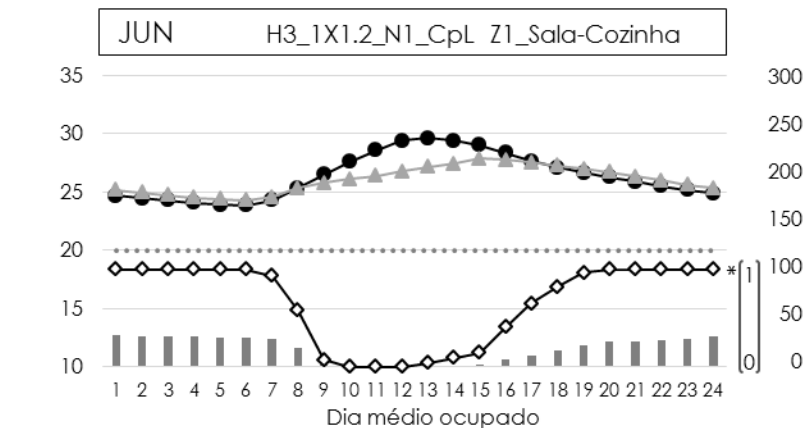


■ Renovações de ar por hora
 ▲ Ti
 ◆ * Fator de abertura (0-1)
 ● Te
 Tcontrole

■ Renovações de ar por hora
 ▲ Ti
 ◆ * Fator de abertura (0-1)
 ● Te
 Tcontrole

Renovações de ar por hora (ren/hora)

H3_1X1.2_N1

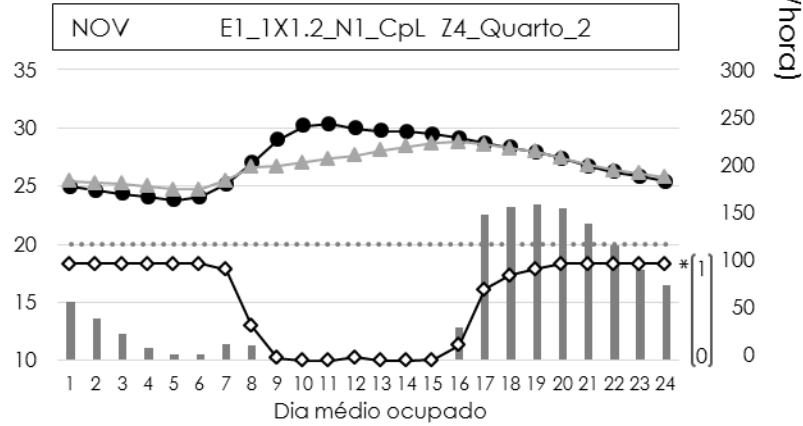
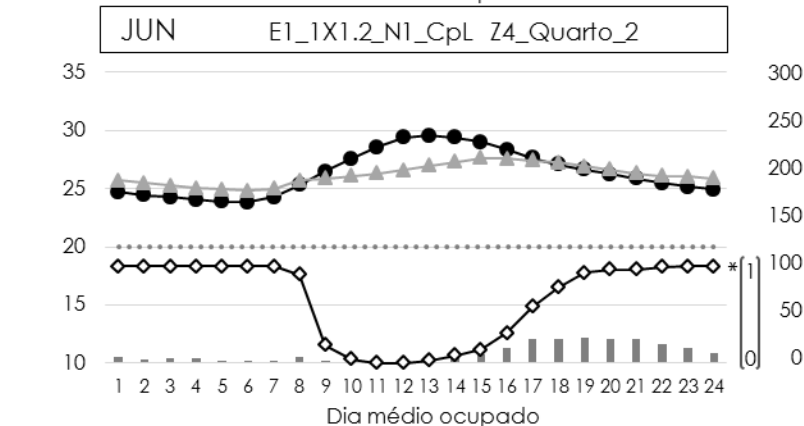
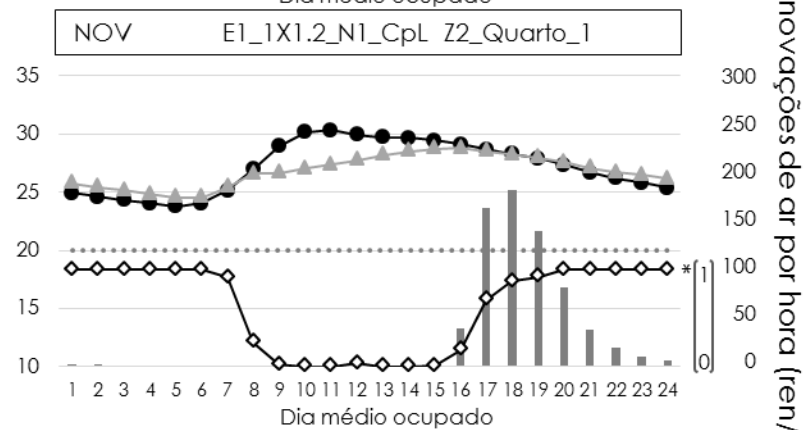
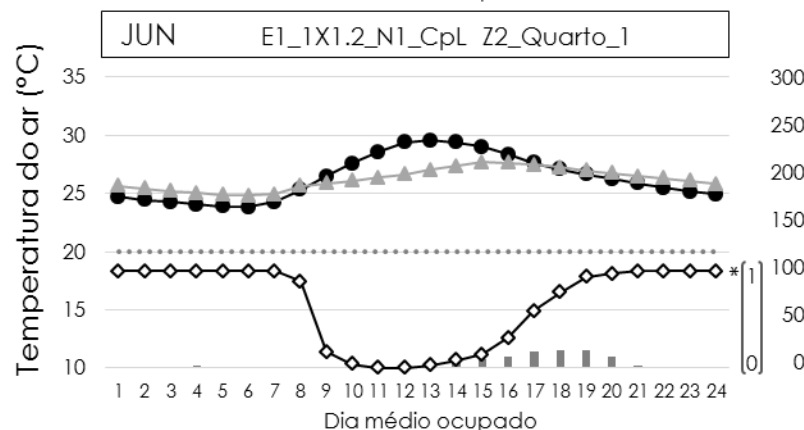
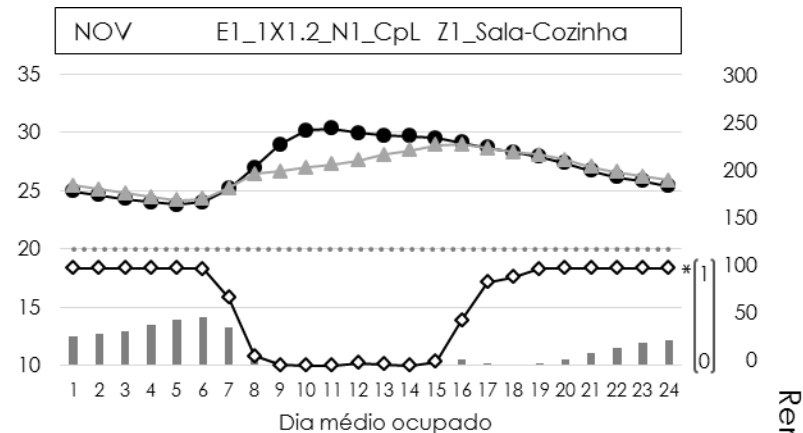
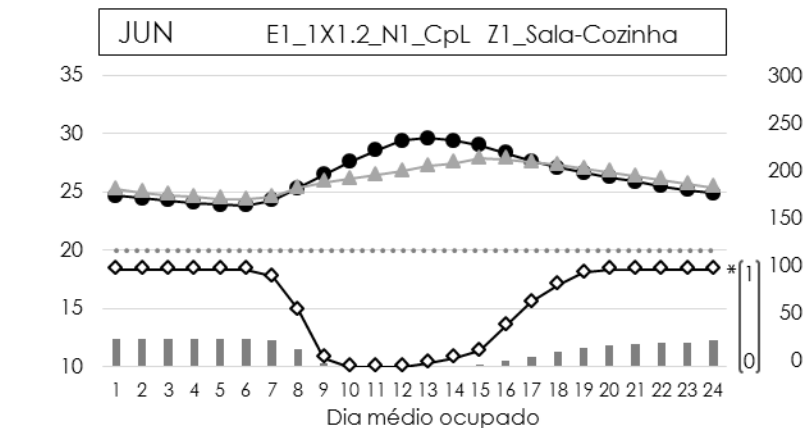


Renovações de ar por hora (ren/hora)

Renovações de ar por hora (grey bars)
 Ti (dashed line with grey triangles)
 Te (solid line with black circles)
 Tcontrol (dotted line)
 *Fator de abertura (0-1) (line with open diamonds)

Renovações de ar por hora (grey bars)
 Ti (dashed line with grey triangles)
 Te (solid line with black circles)
 Tcontrol (dotted line)
 *Fator de abertura (0-1) (line with open diamonds)

E1_1X1.2_N1

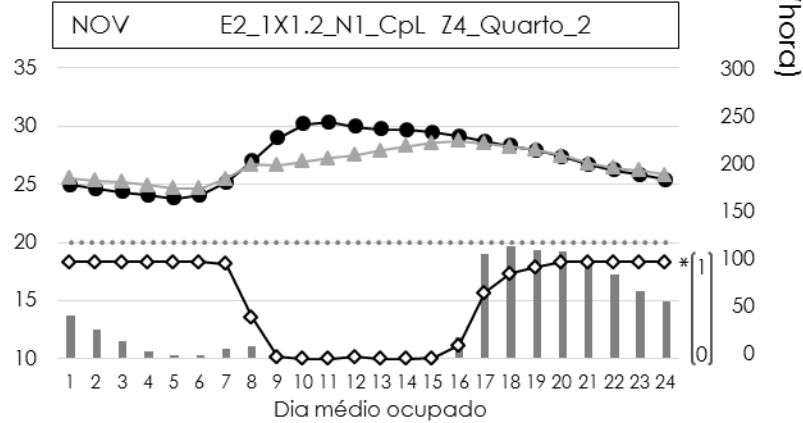
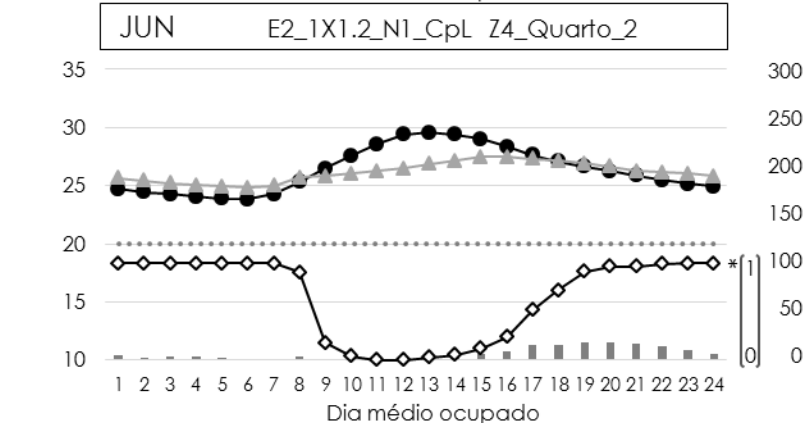
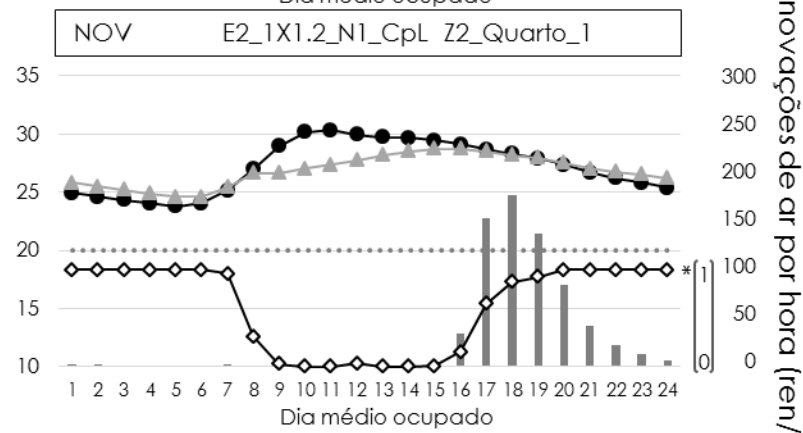
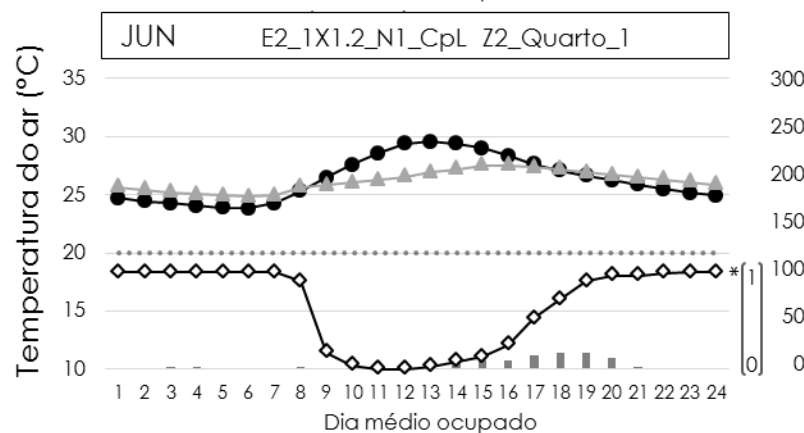
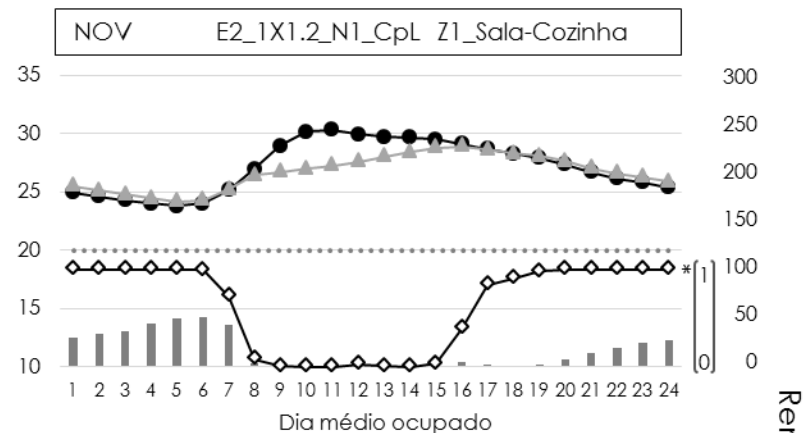
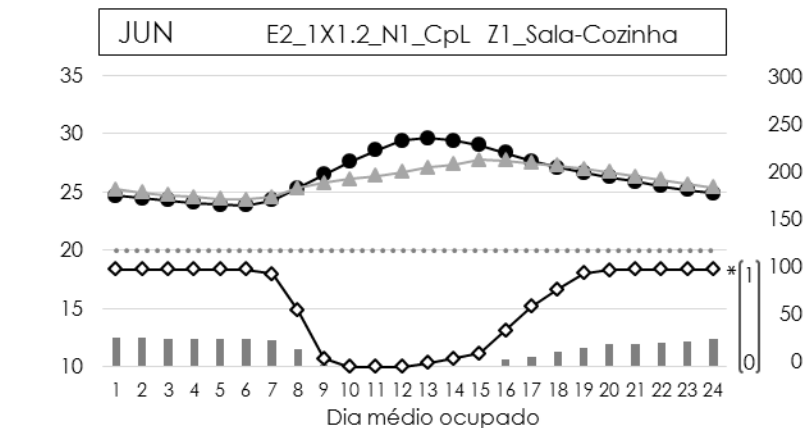


■ Renovações de ar por hora
 ▲ Ti
 ● Te
 Tcontrole
 ◇ * Fator de abertura (0-1)

■ Renovações de ar por hora
 ▲ Ti
 ● Te
 Tcontrole
 ◇ * Fator de abertura (0-1)

Renovações de ar por hora (ren/hora)

E2_1X1.2_N1

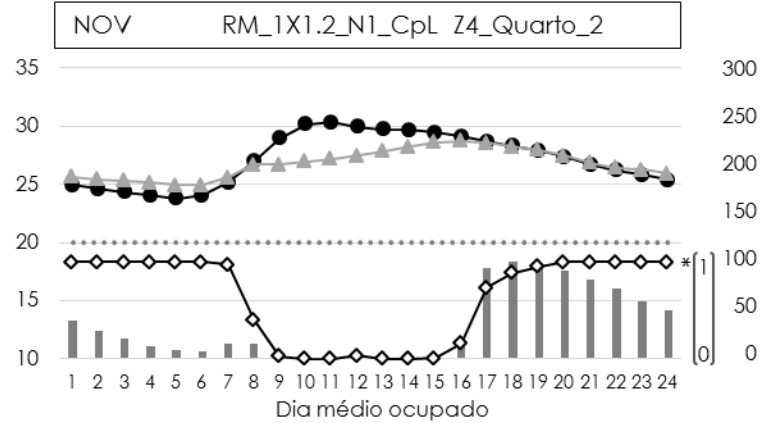
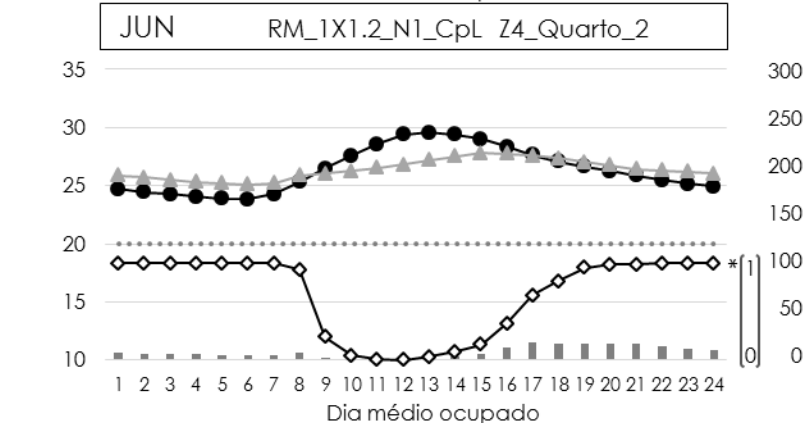
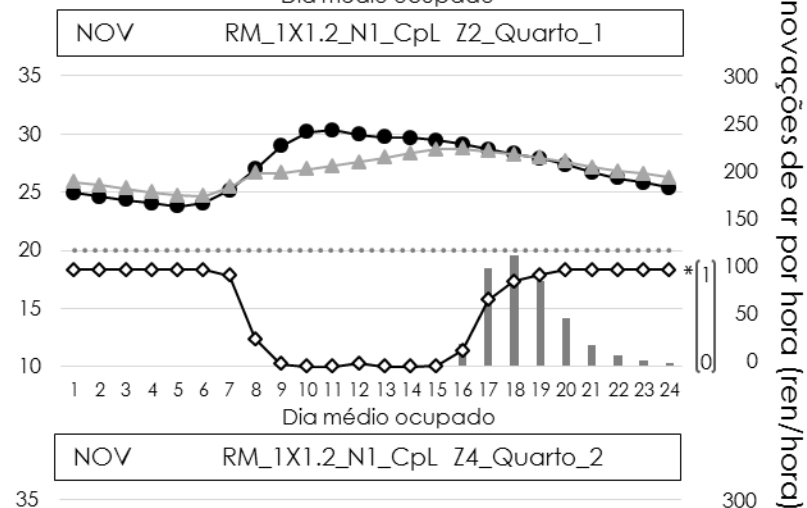
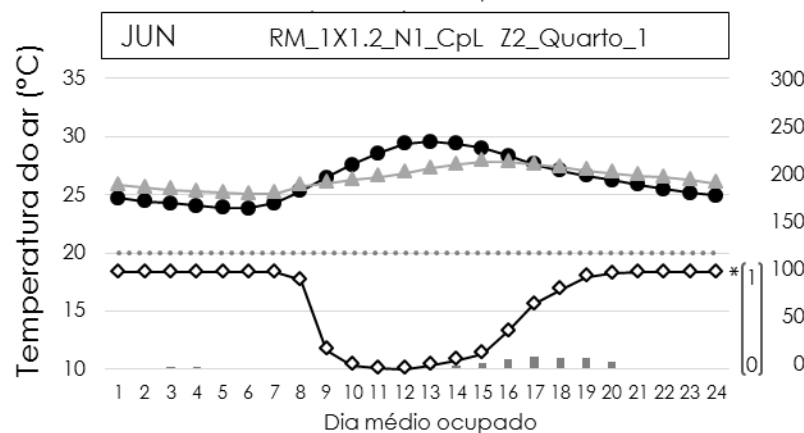
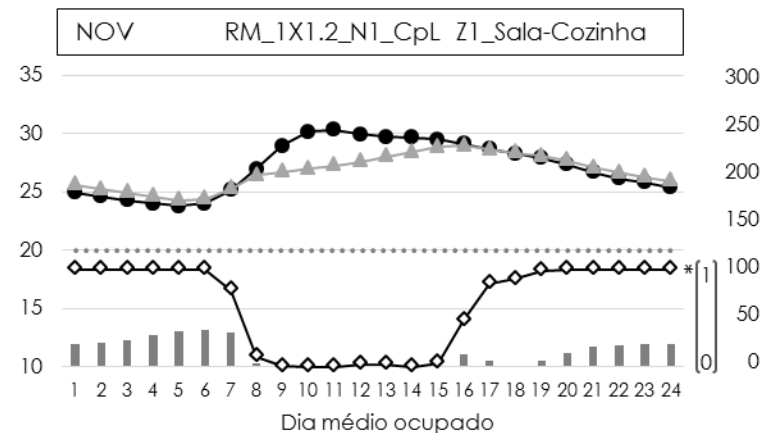
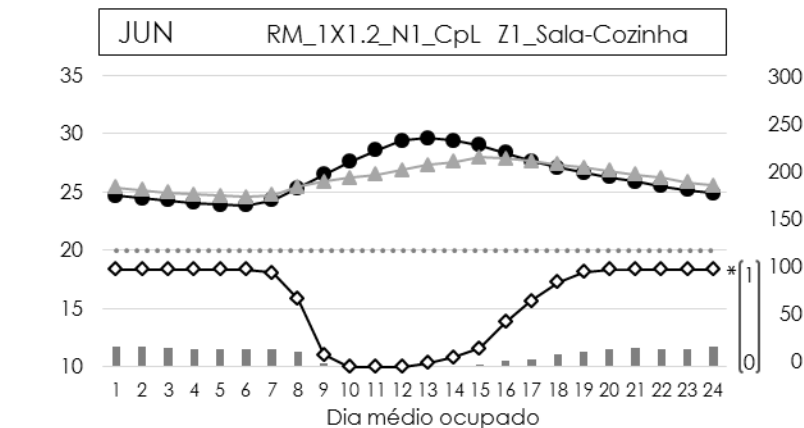


Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrol

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrol

Renovações de ar por hora (ren/hora)

RM_1X1.2_N1

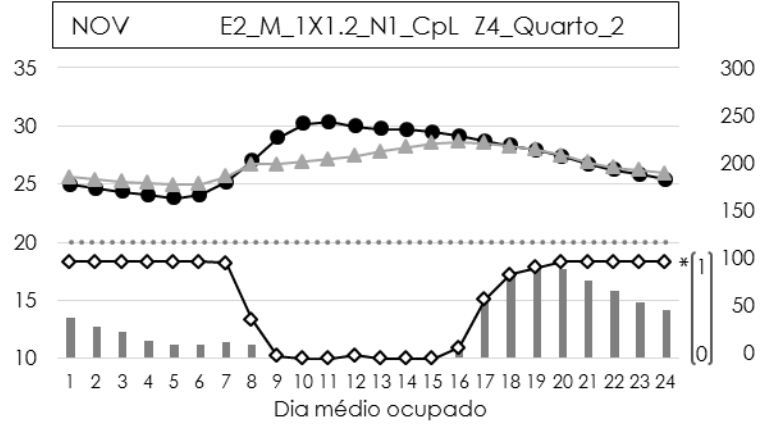
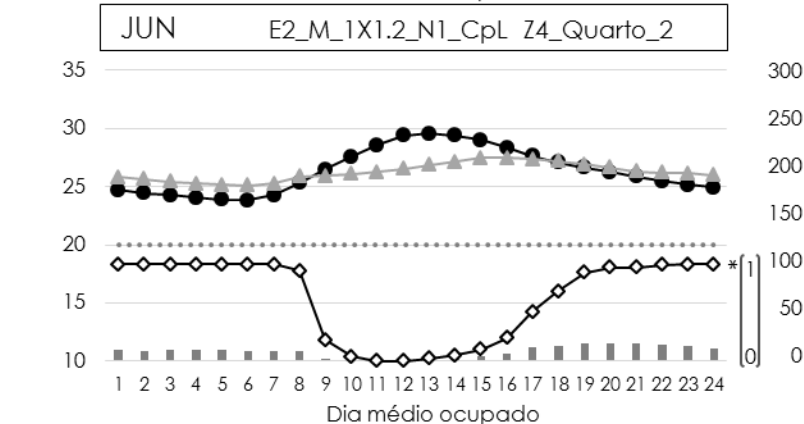
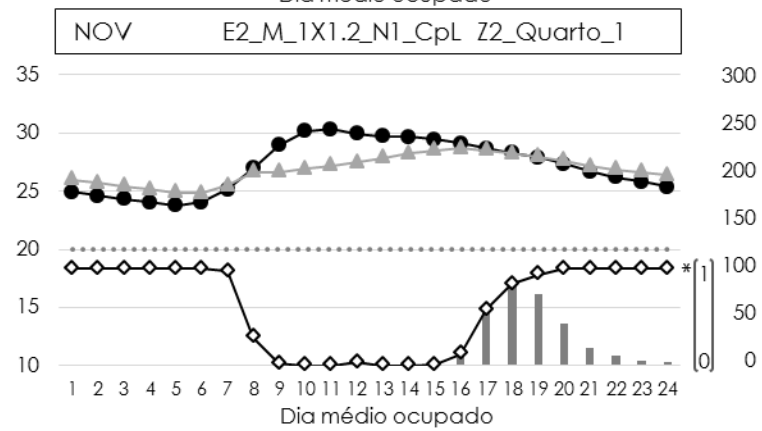
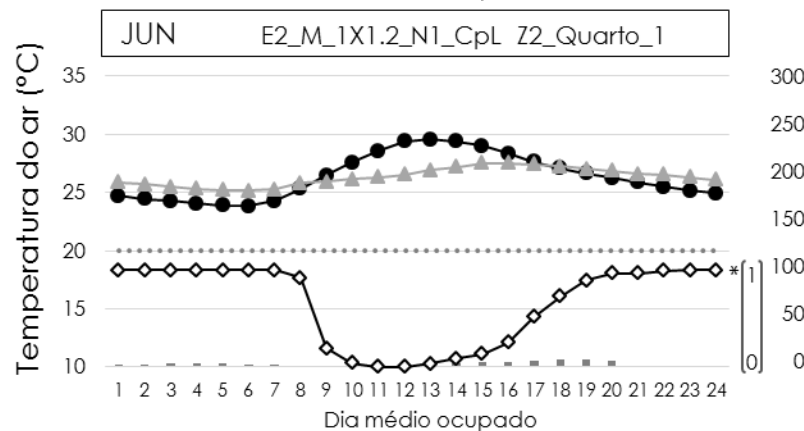
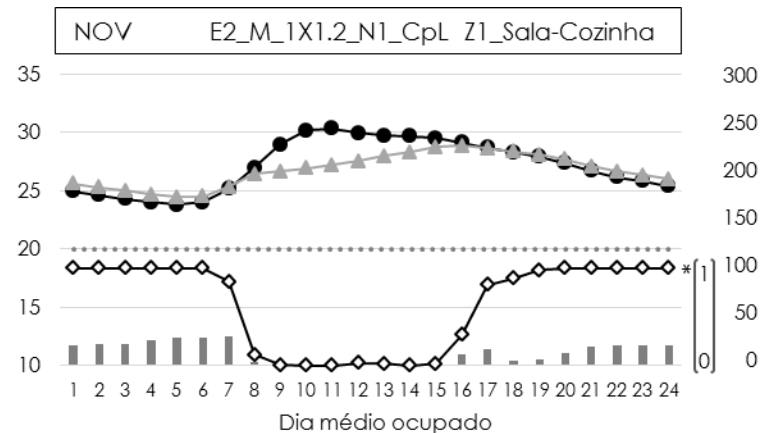
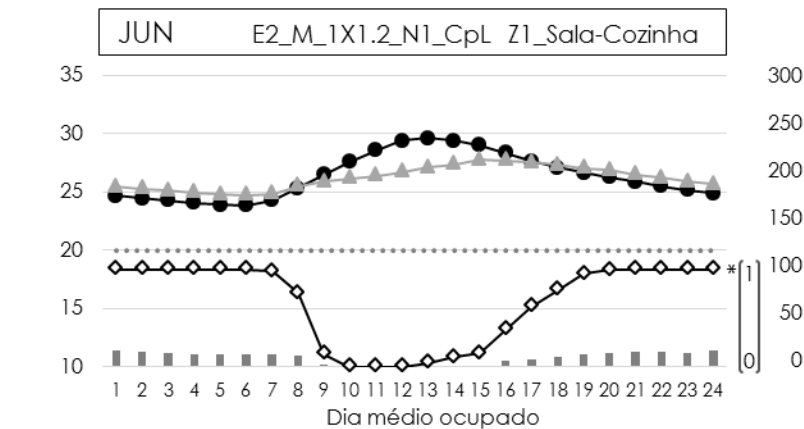


■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrole
 ◇ * Fator de abertura (0-1)

■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrole
 ◇ * Fator de abertura (0-1)

Renovações de ar por hora (ren/hora)

E2_M_1X1.2_N1

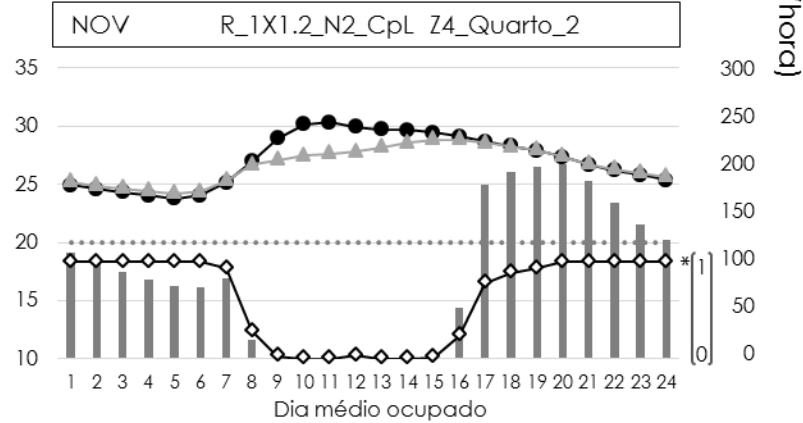
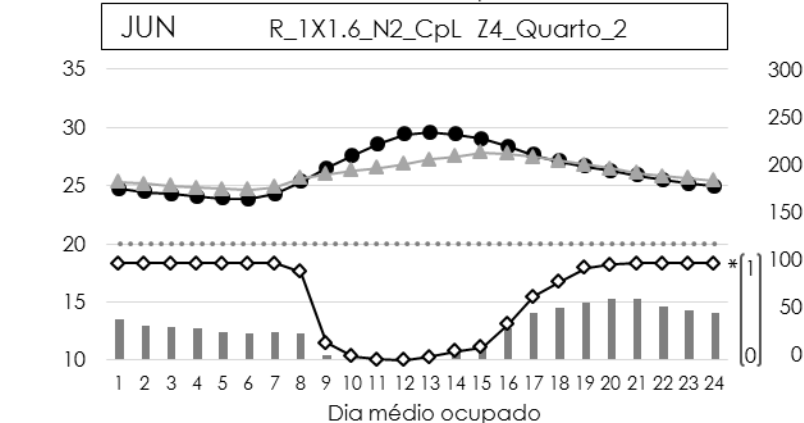
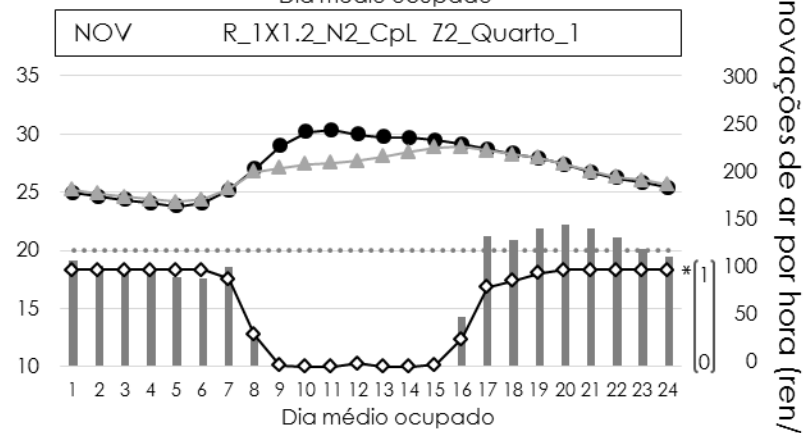
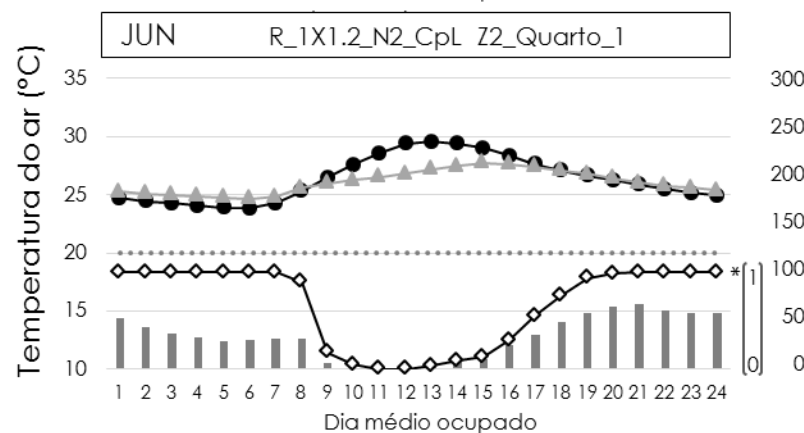
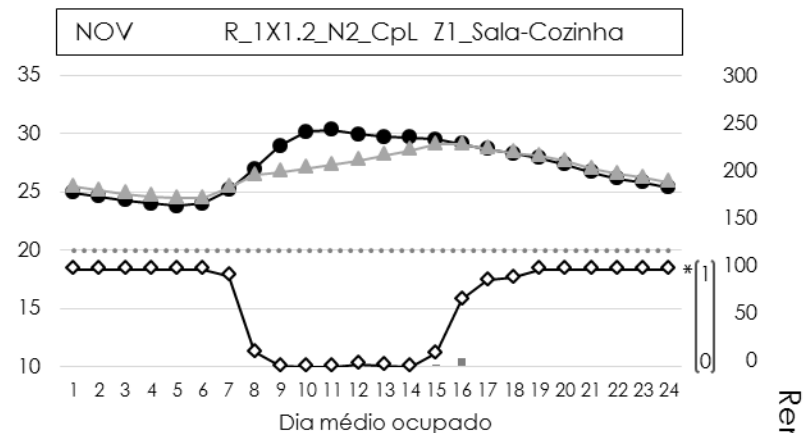
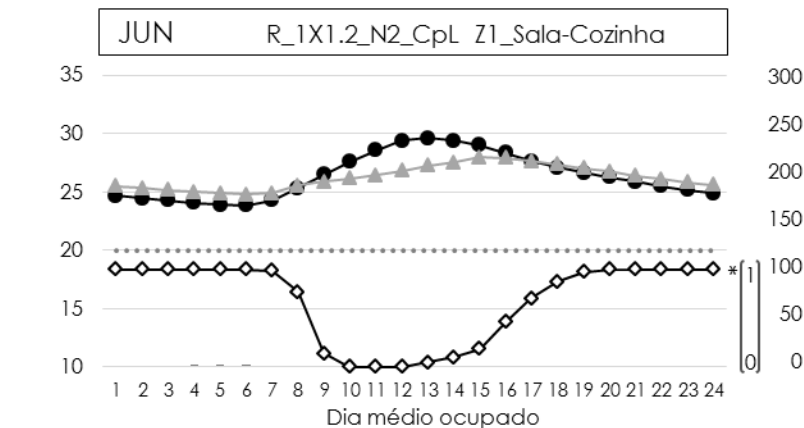


Renovações de ar por hora (ren/hora)

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

R_1X1.2_N2

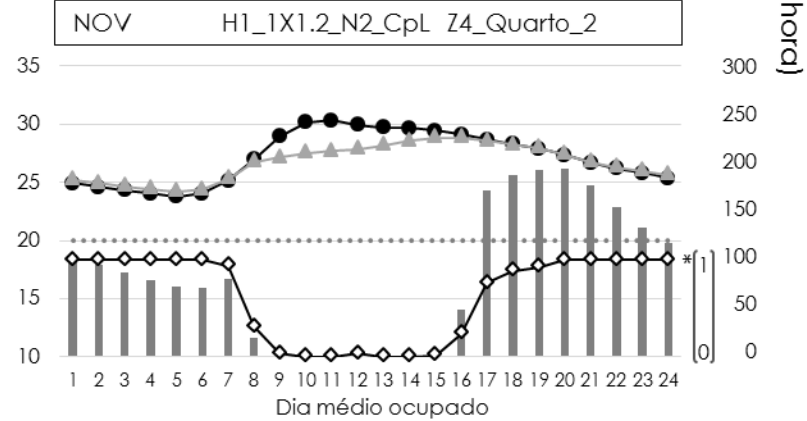
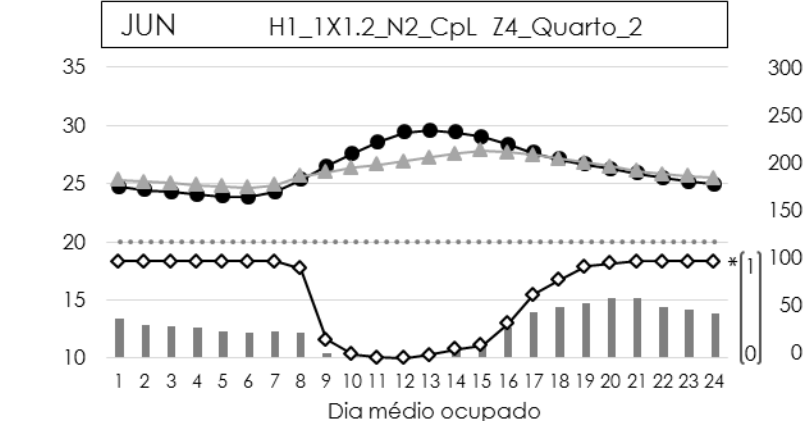
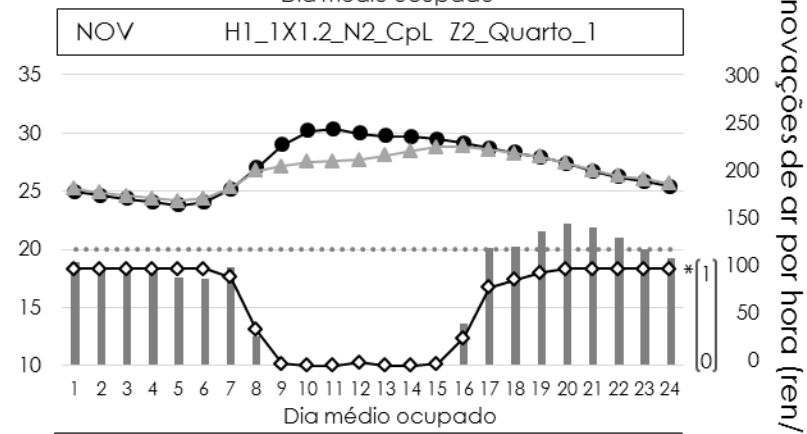
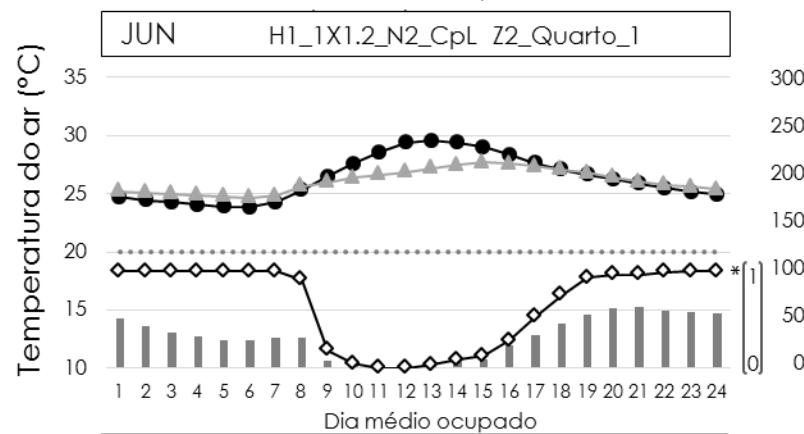
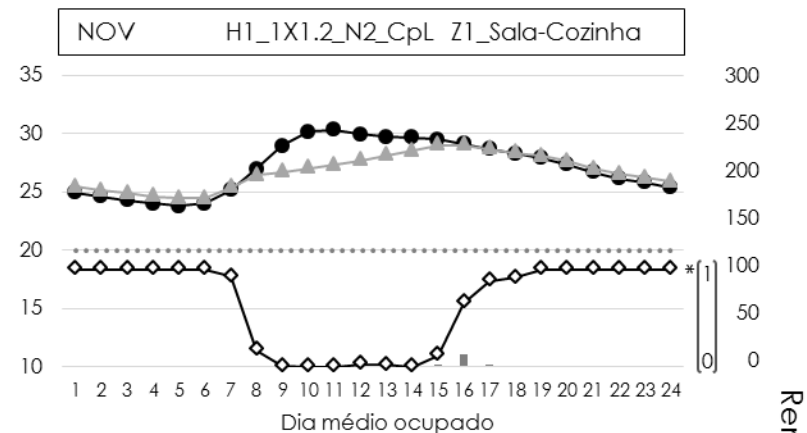
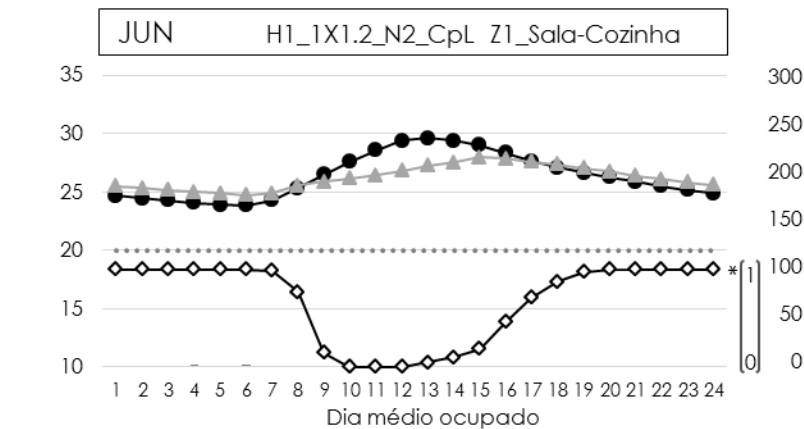


■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrol
 ◇ * Fator de abertura (0-1)

■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrol
 ◇ * Fator de abertura (0-1)

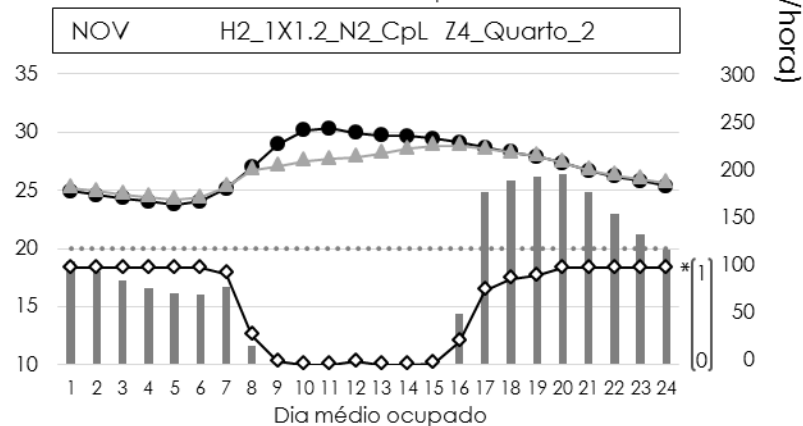
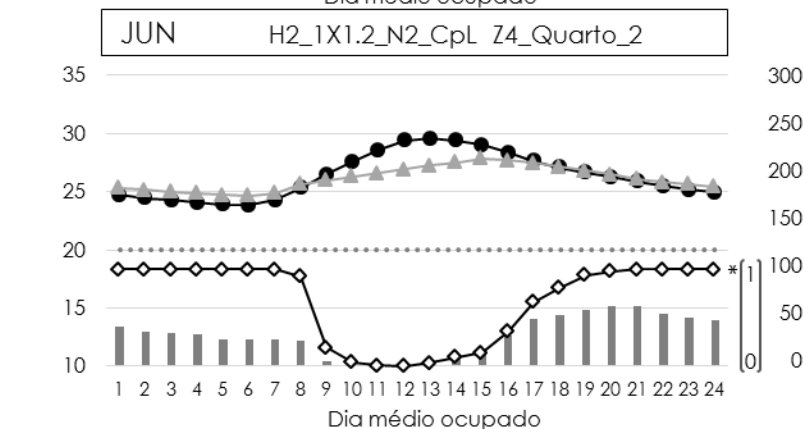
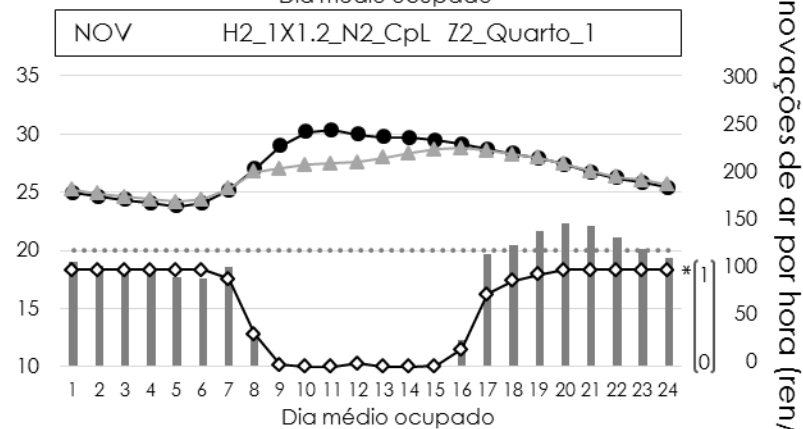
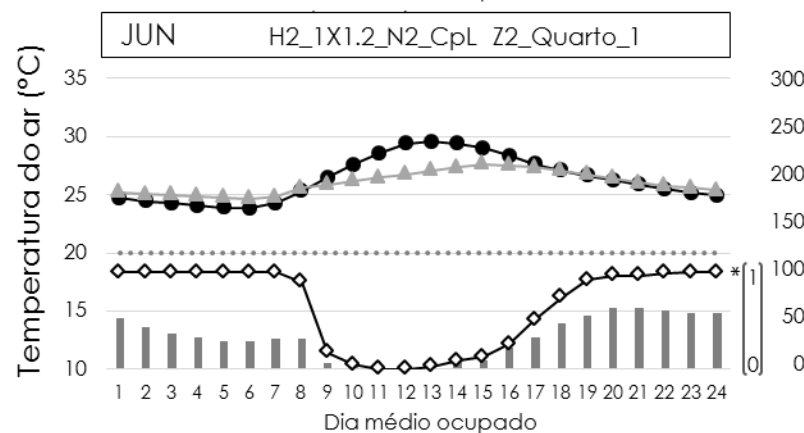
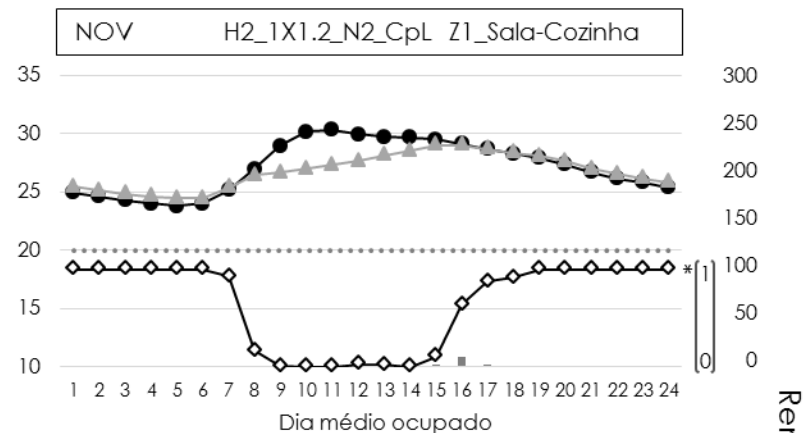
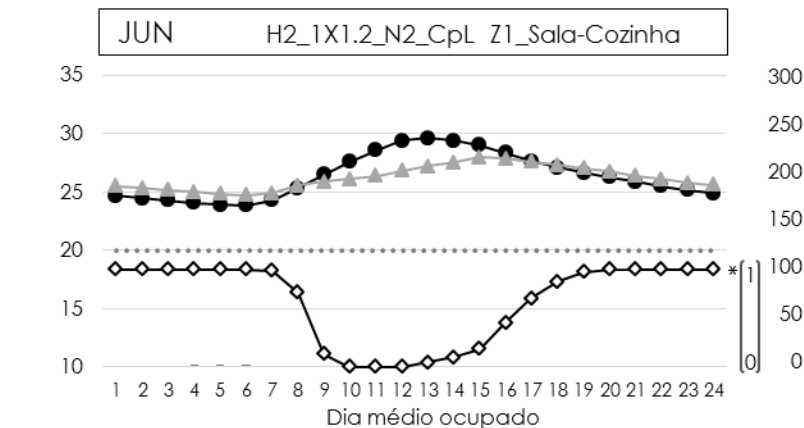
Renovações de ar por hora (ren/hora)

H1_1X1.2_N2



Renovações de ar por hora (ren/hora)

H2_1X1.2_N2

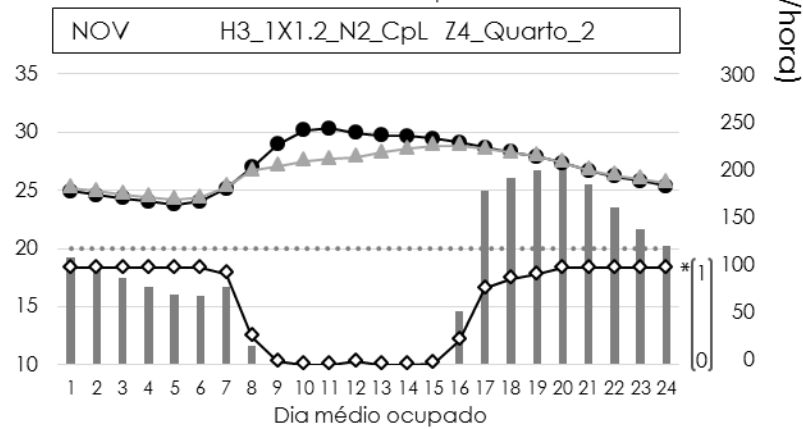
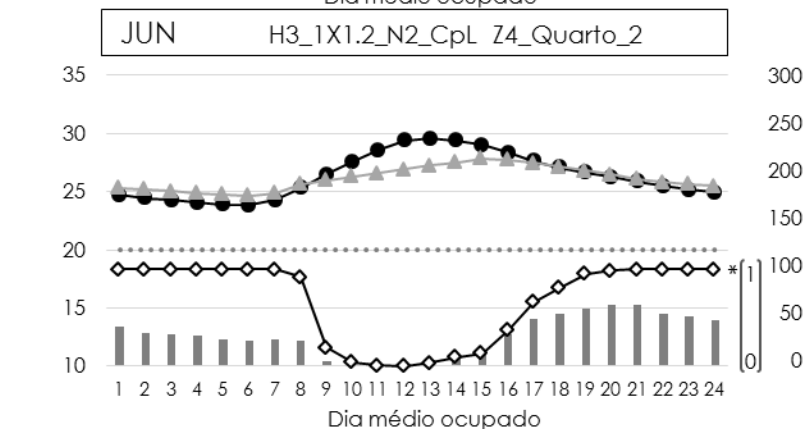
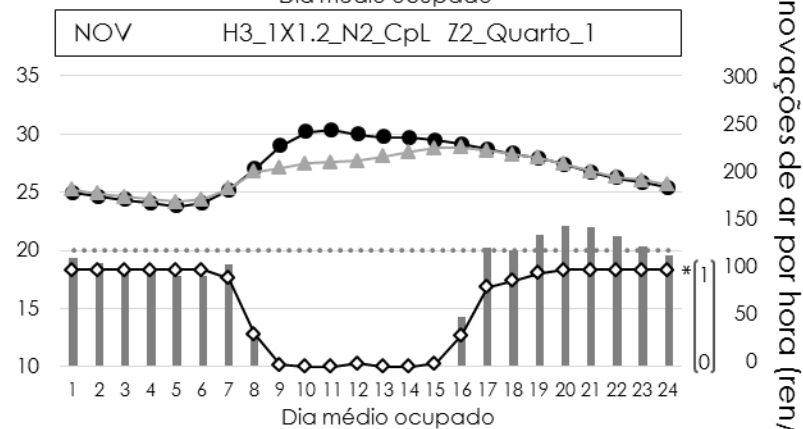
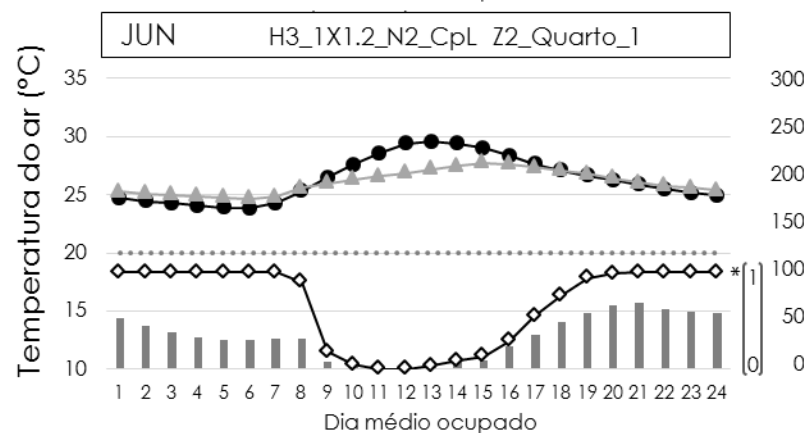
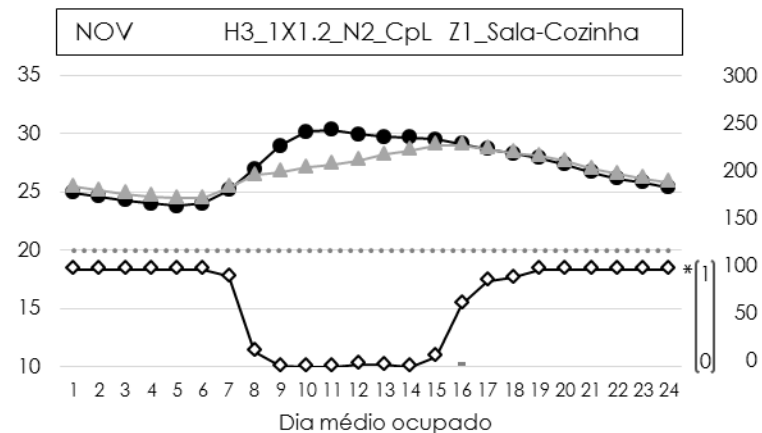
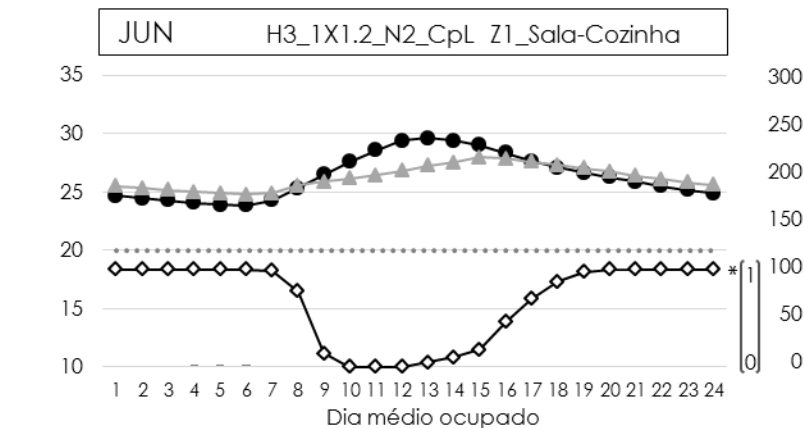


■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrole
 ◇ * Fator de abertura (0-1)

■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrole
 ◇ * Fator de abertura (0-1)

Renovações de ar por hora (ren/hora)

H3_1X1.2_N2

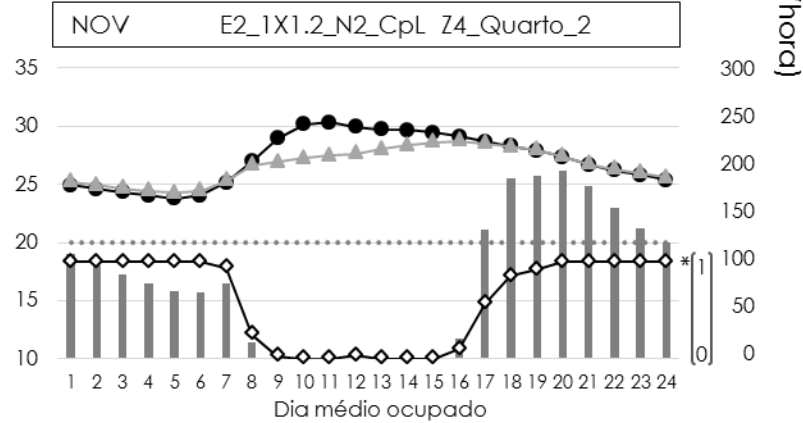
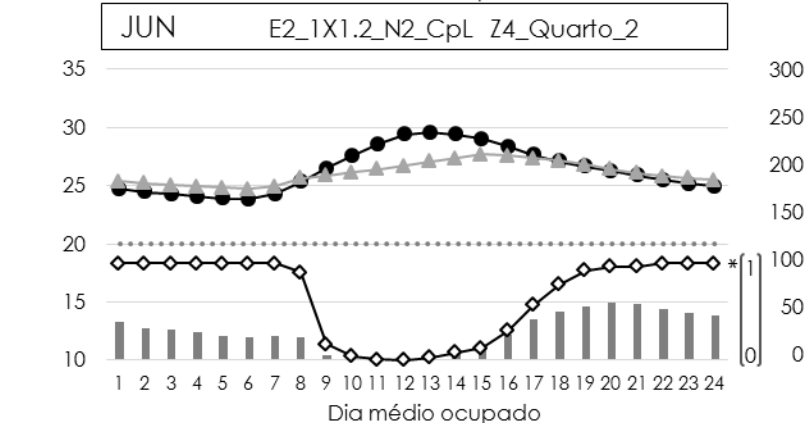
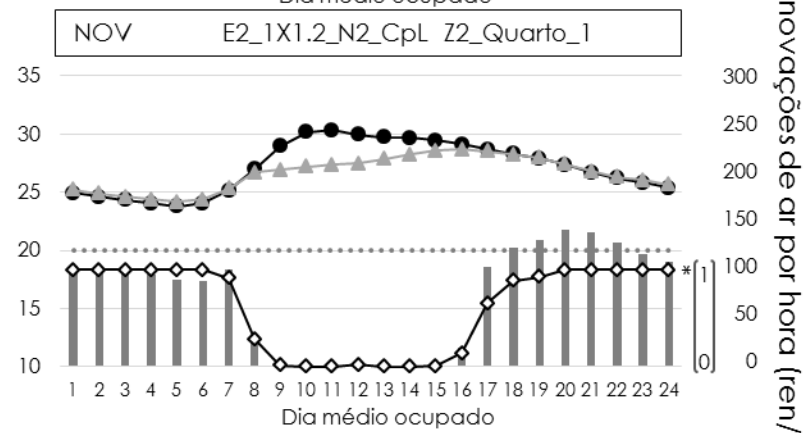
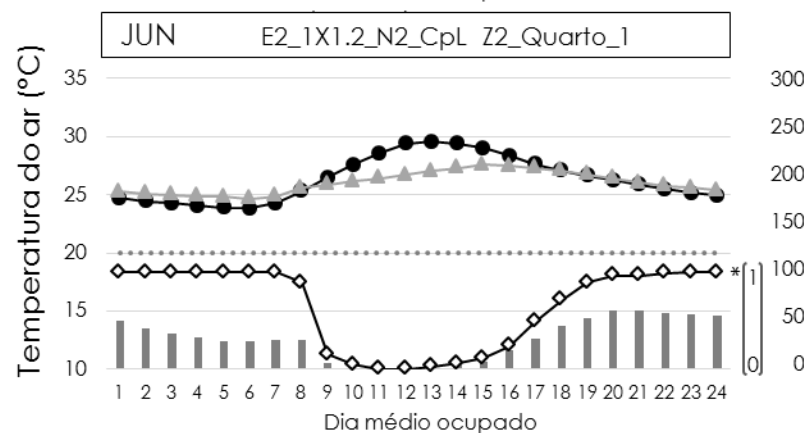
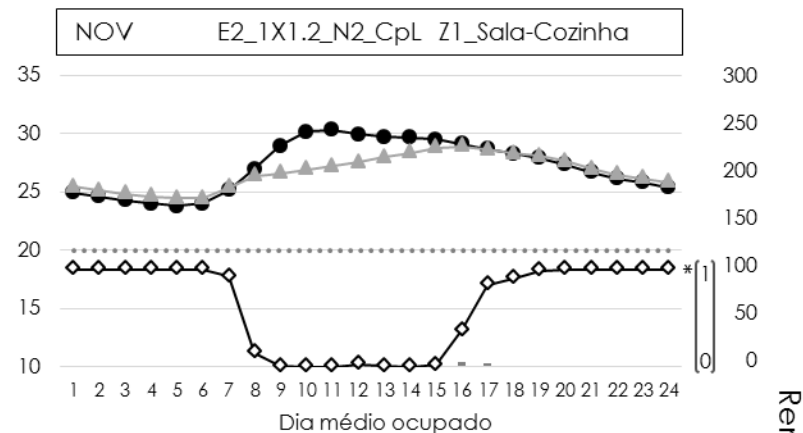
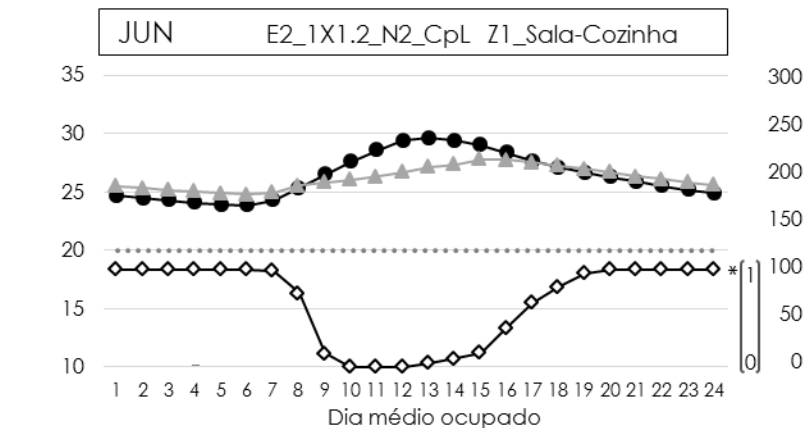


■ Renovações de ar por hora
 ▲ Ti
 ◇ * Fator de abertura (0-1)

■ Renovações de ar por hora
 ▲ Ti
 ◇ * Fator de abertura (0-1)

Renovações de ar por hora (ren/hora)

E2_1X1.2_N2

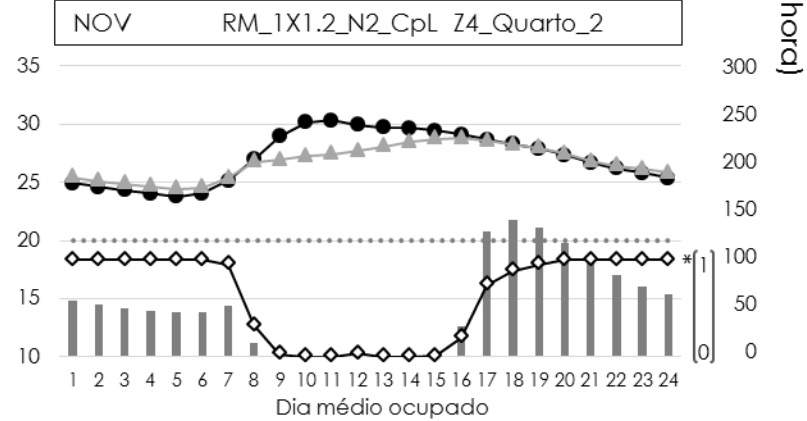
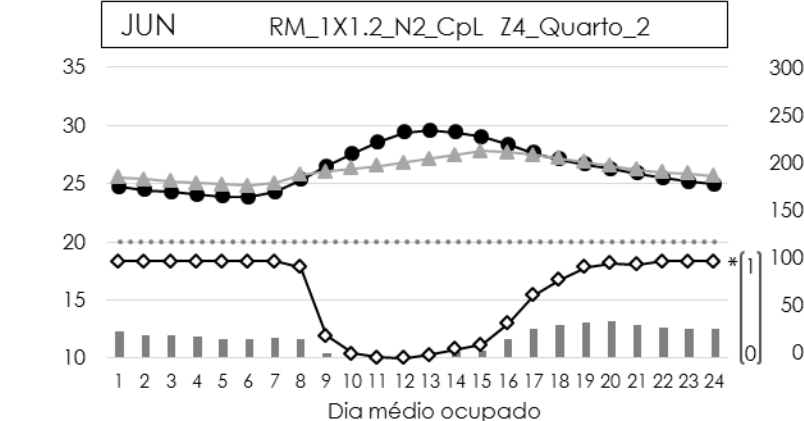
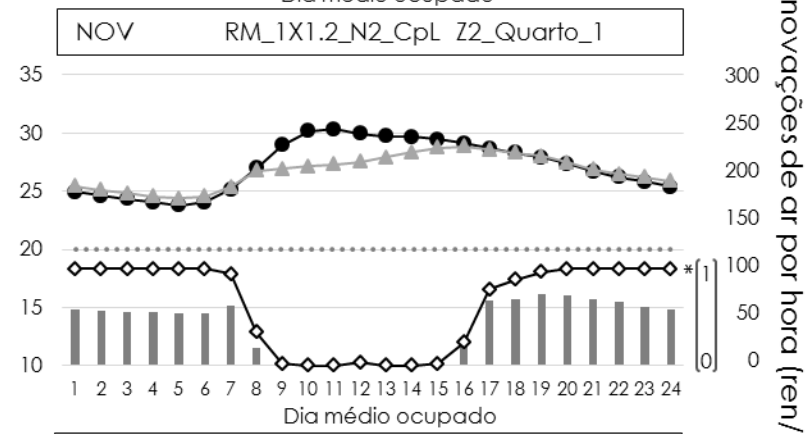
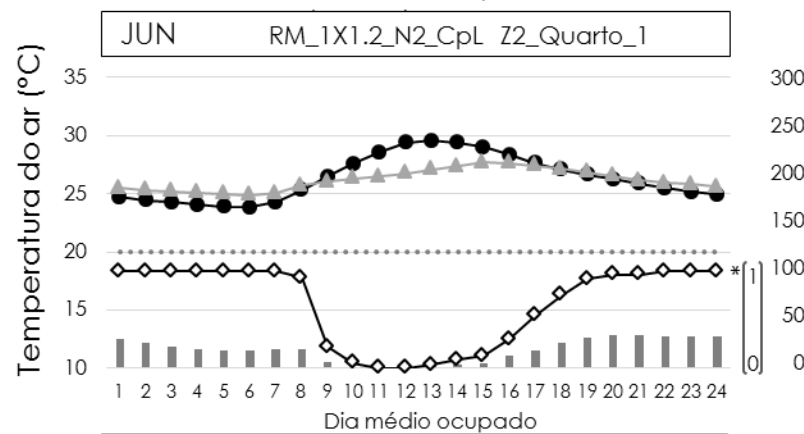
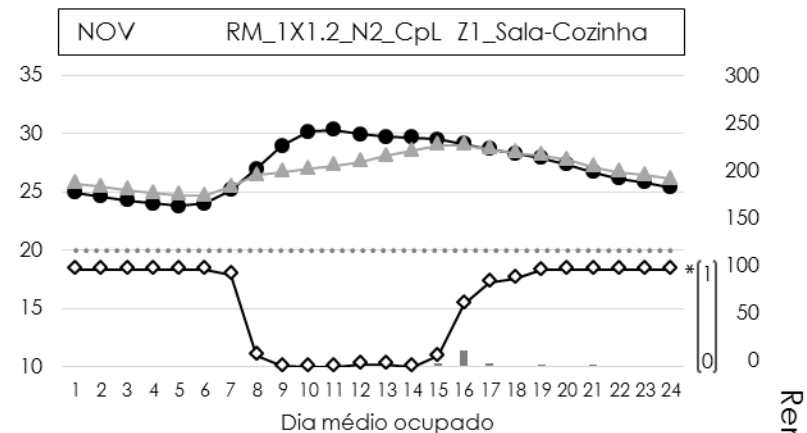
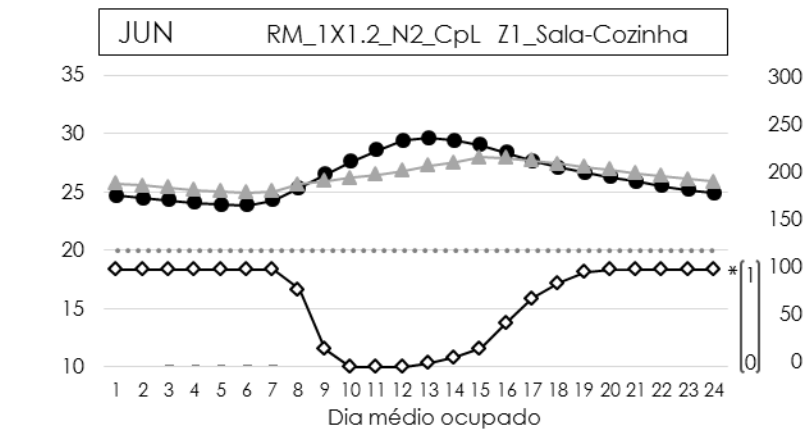


■ Renovações de ar por hora
 ▲ Ti
 ◇ * Fator de abertura (0-1)

■ Renovações de ar por hora
 ▲ Ti
 ◇ * Fator de abertura (0-1)

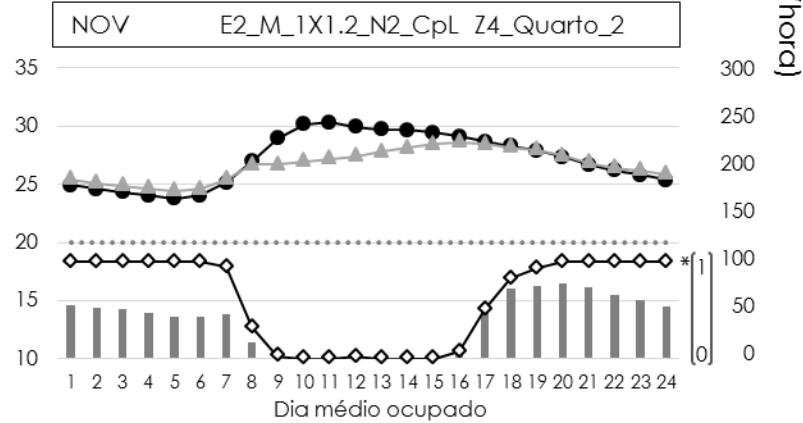
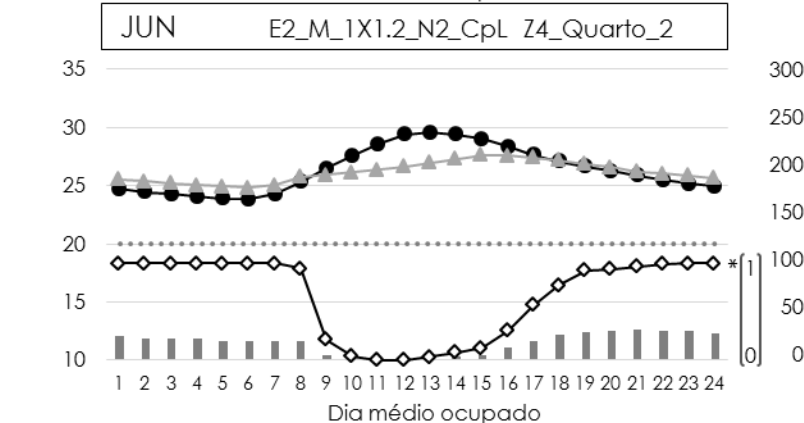
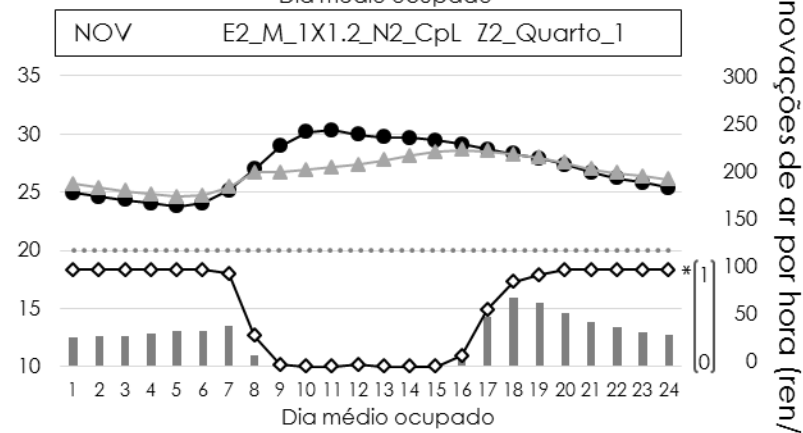
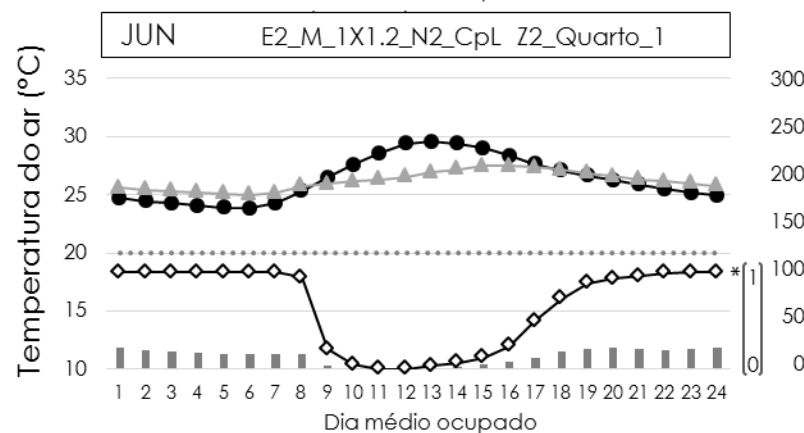
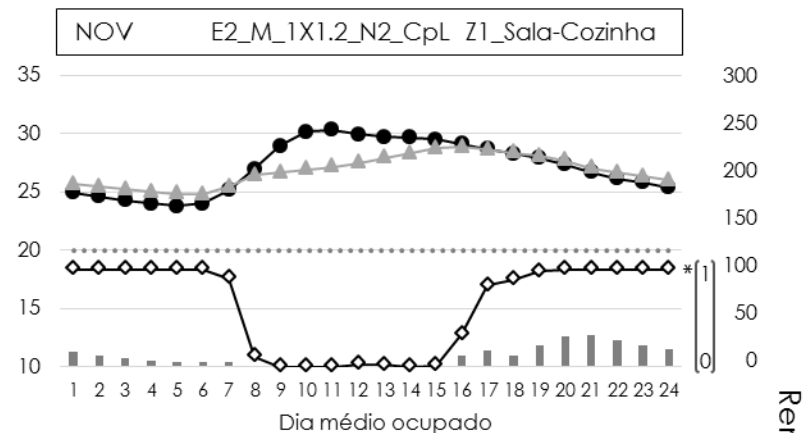
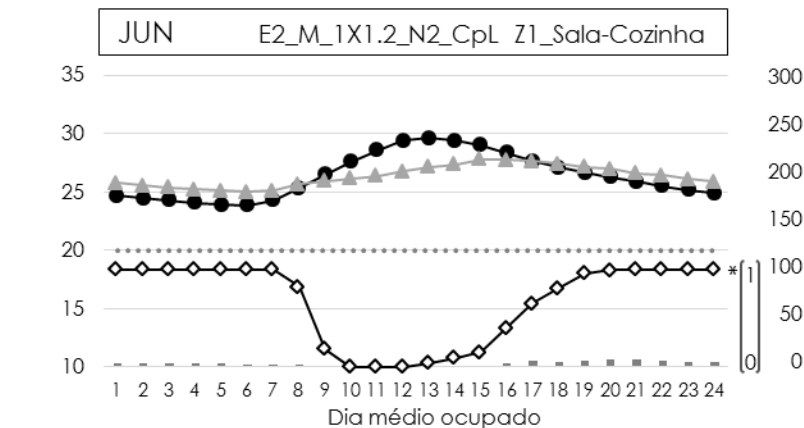
Renovações de ar por hora (ren/hora)

RM_1X1.2_N2



Renovações de ar por hora (ren/hora)

E2_M_1X1.2_N2

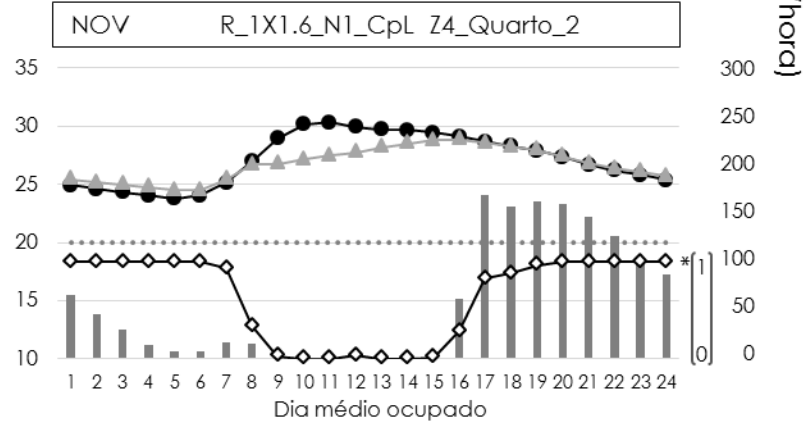
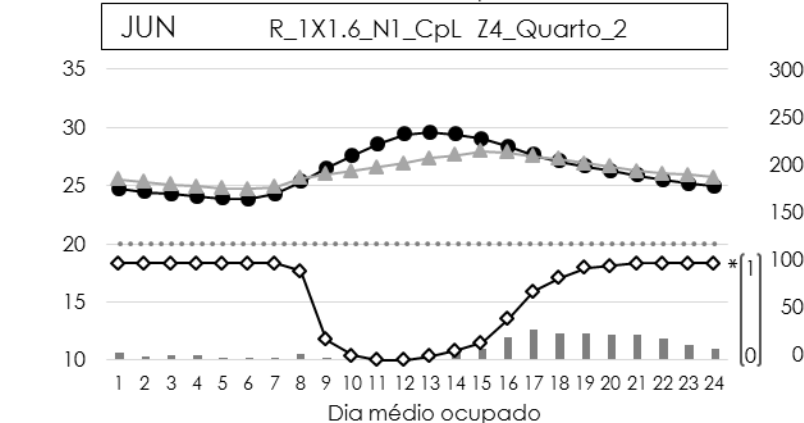
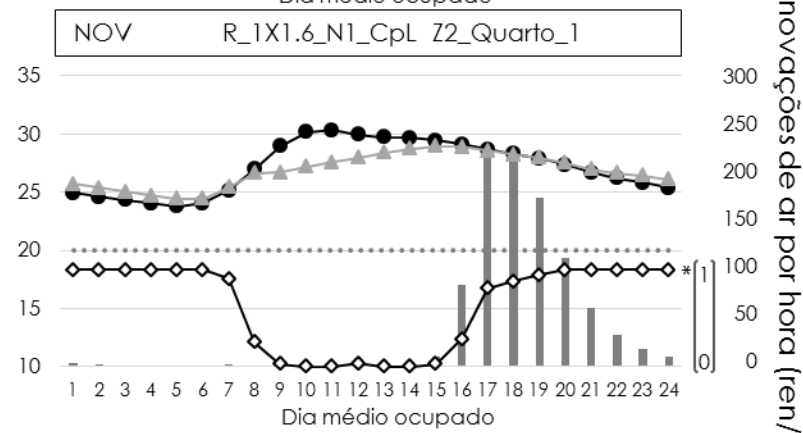
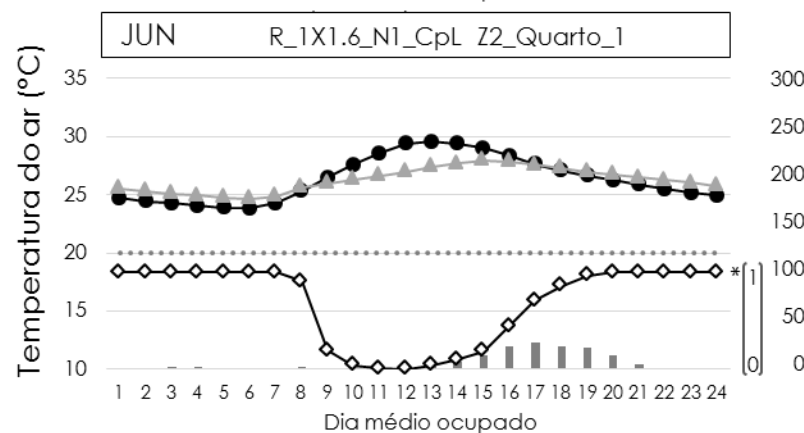
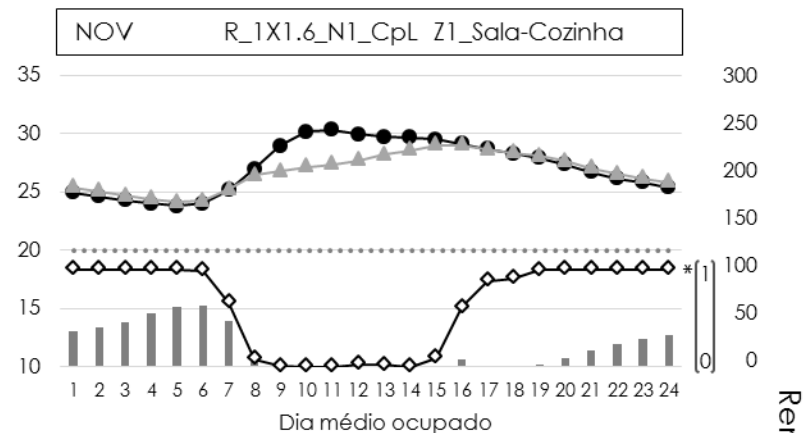
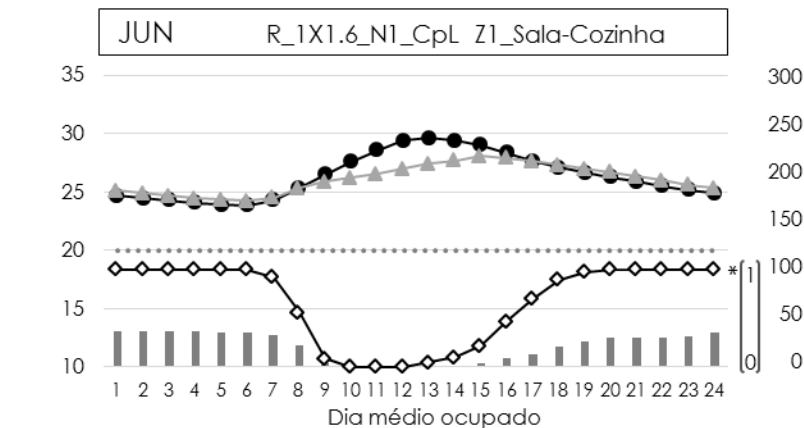


Renovações de ar por hora (ren/hora)

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

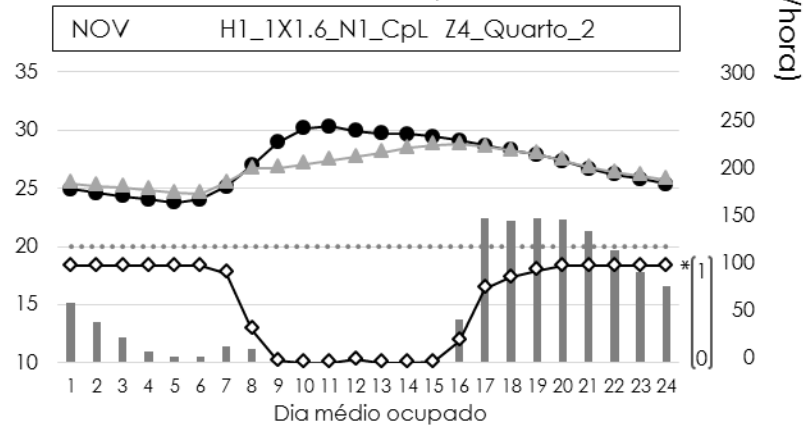
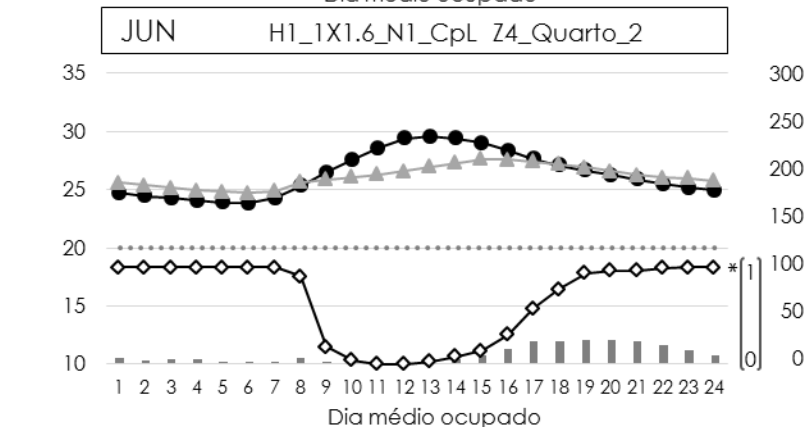
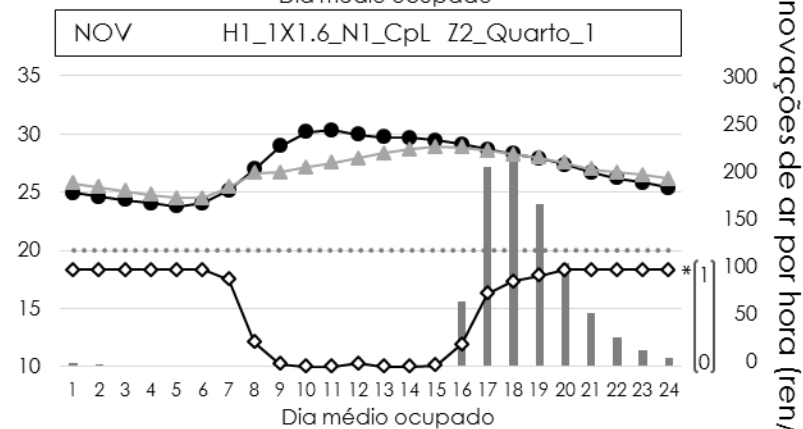
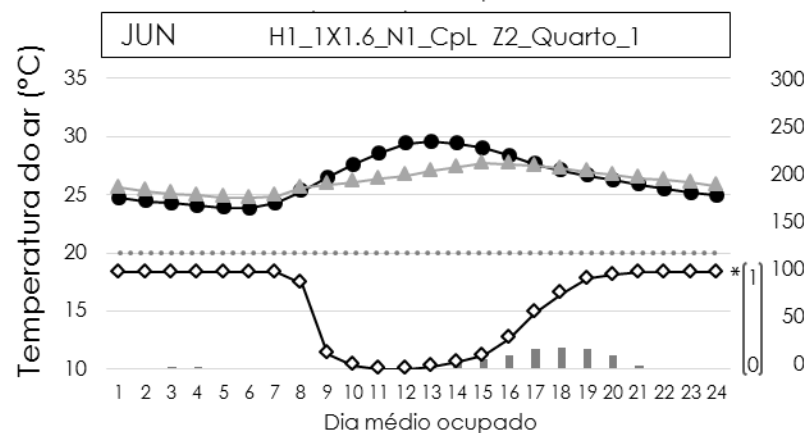
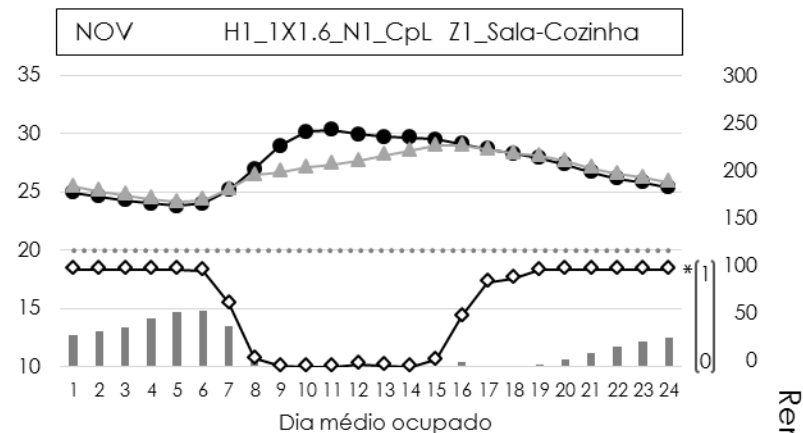
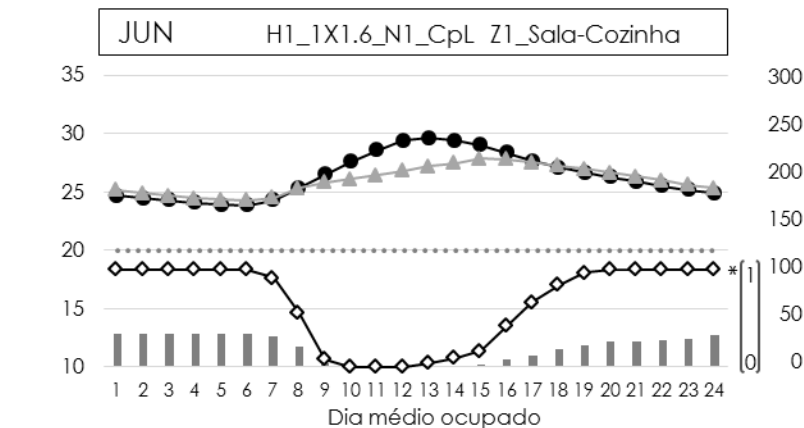
Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

R_1X1.6_N1



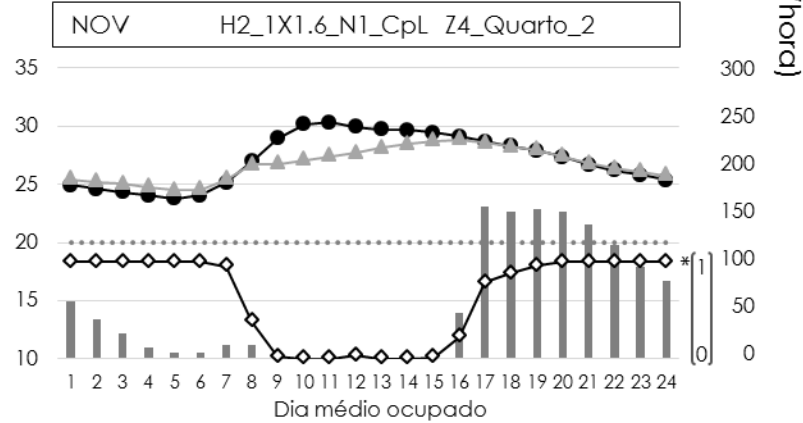
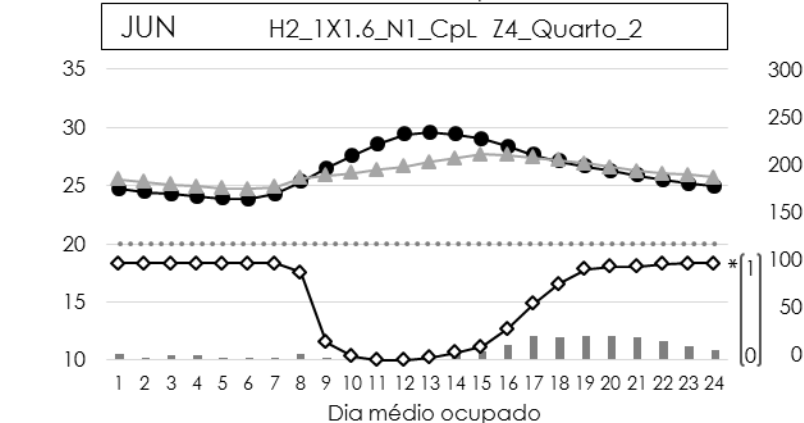
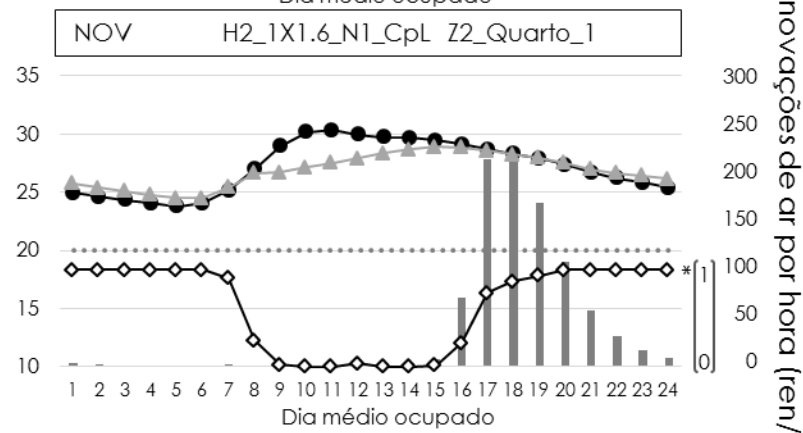
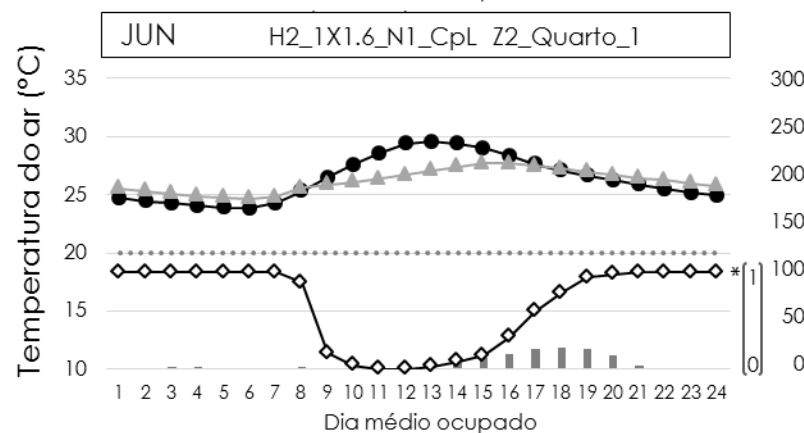
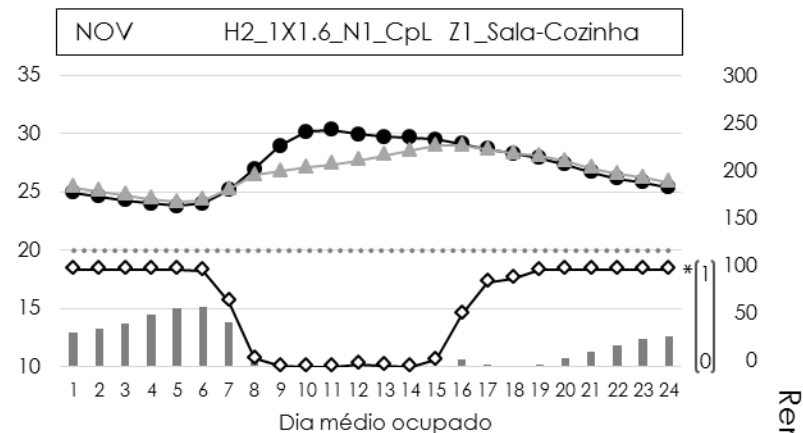
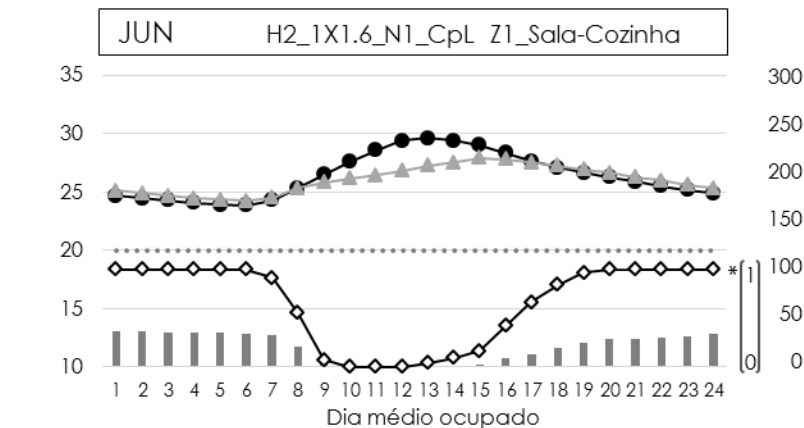
Renovações de ar por hora (ren/hora)

H1_1X1.6_N1



Renovações de ar por hora (ren/hora)

H2_1X1.6_N1

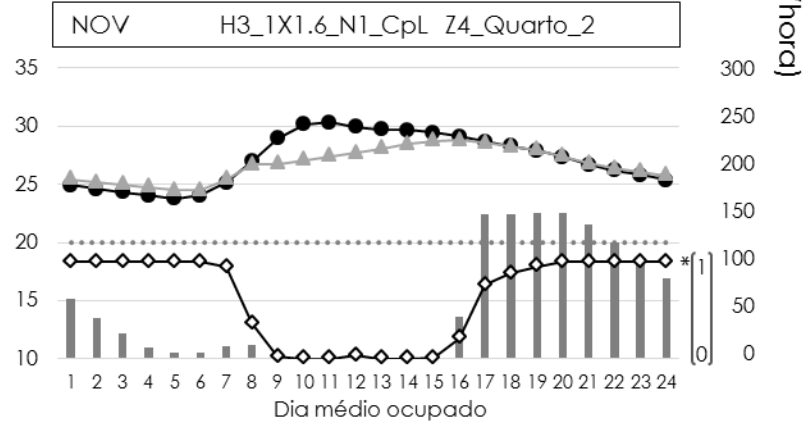
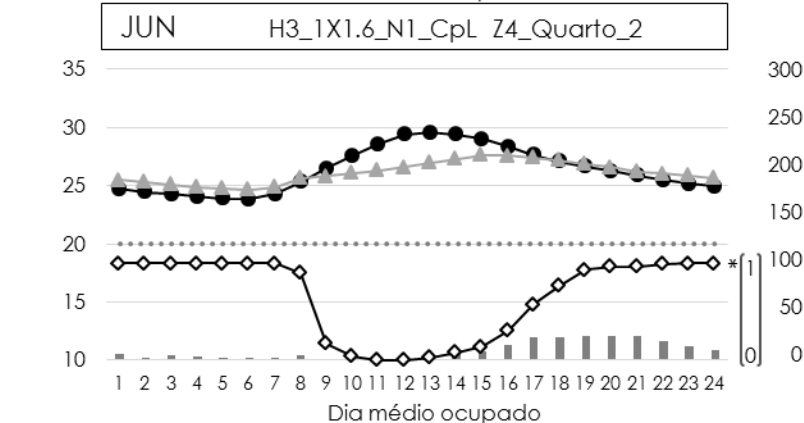
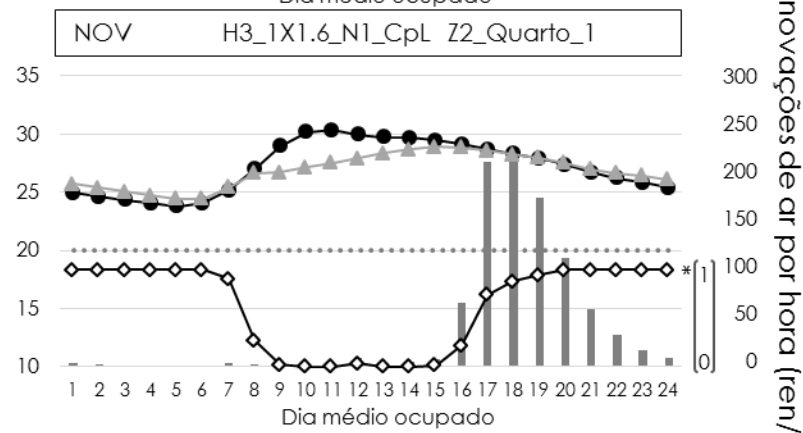
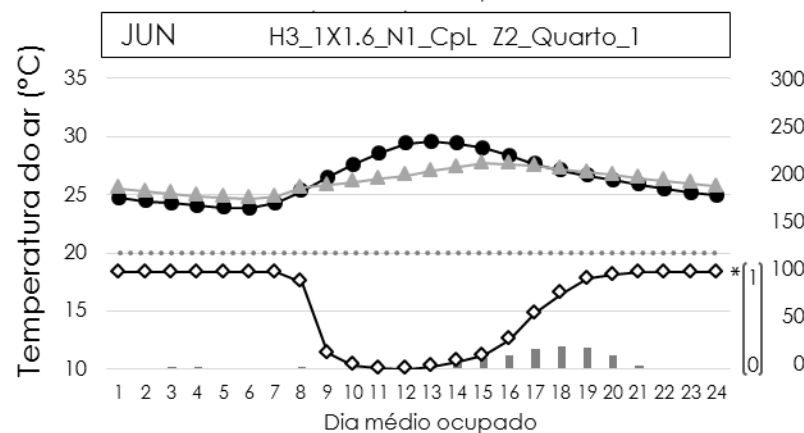
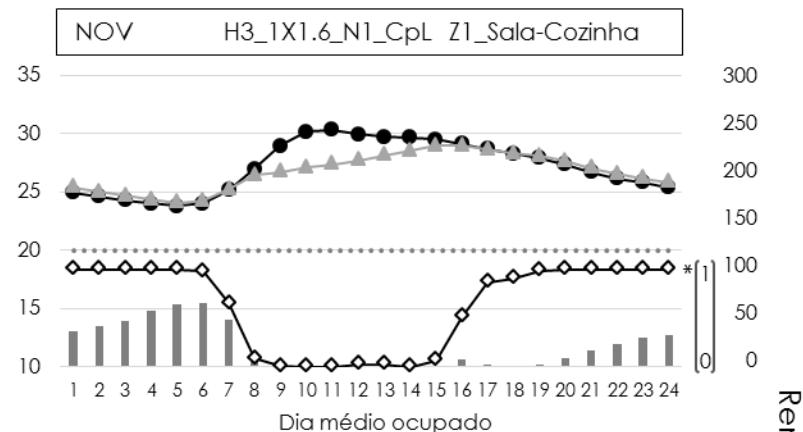
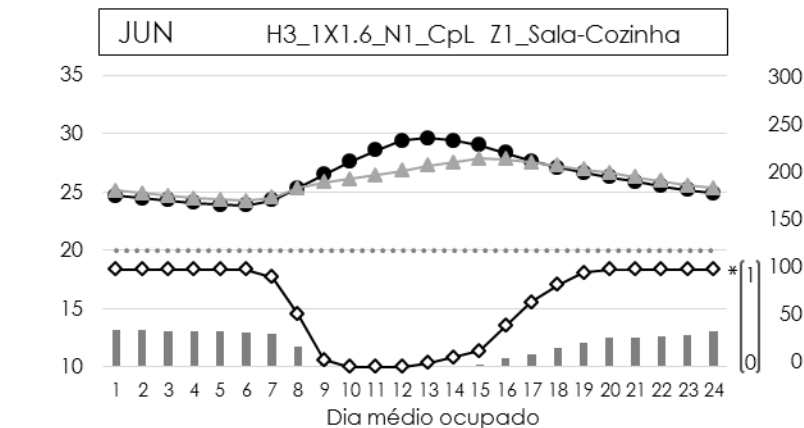


Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

Renovações de ar por hora (ren/hora)

H3_1X1.6_N1

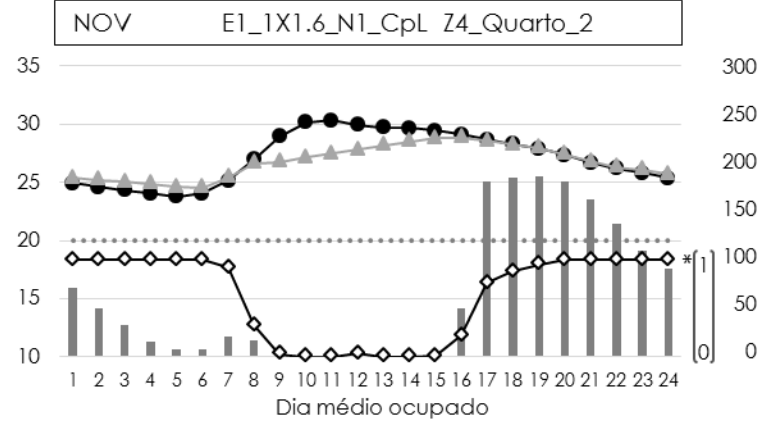
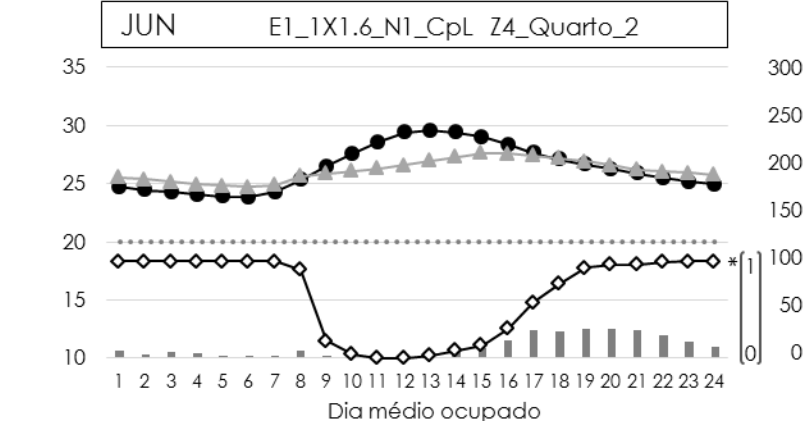
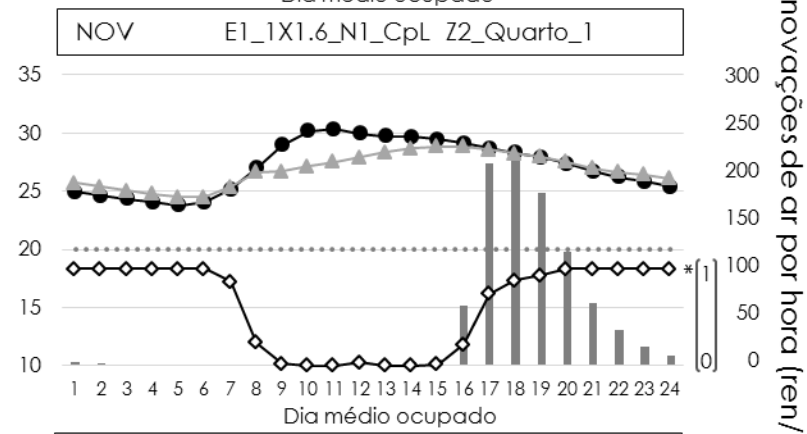
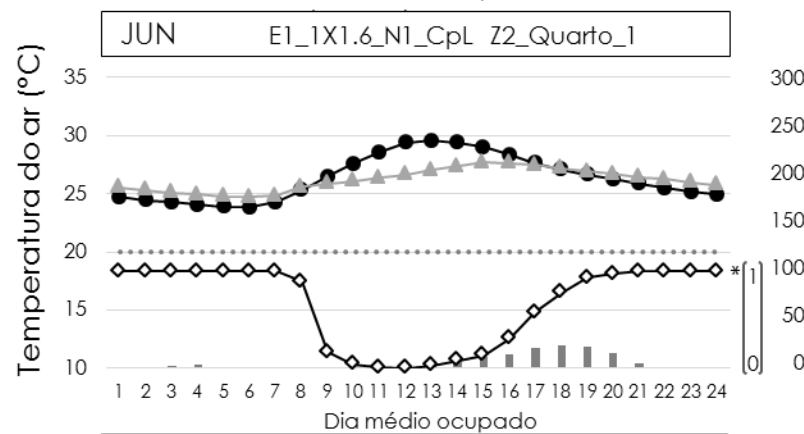
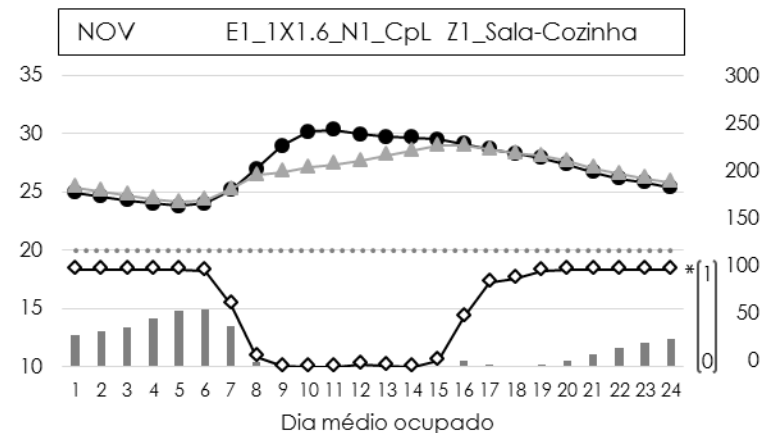
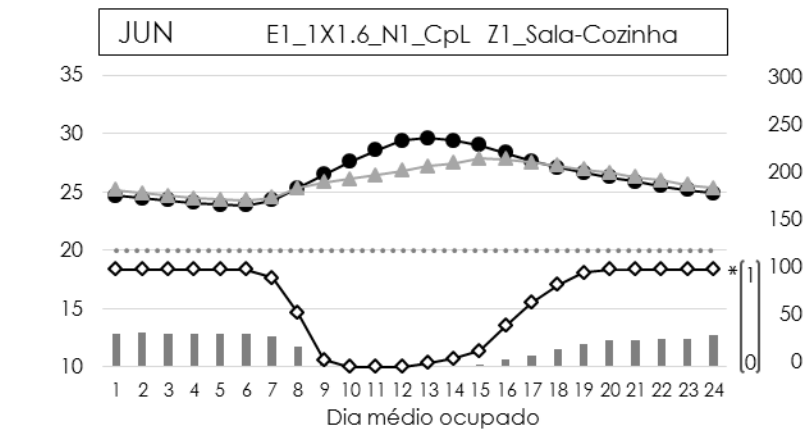


Renovações de ar por hora Te
Ti Tcontrol
* Fator de abertura (0-1)

Renovações de ar por hora Te
Ti Tcontrol
* Fator de abertura (0-1)

Renovações de ar por hora (ren/hora)

E1_1X1.6_N1

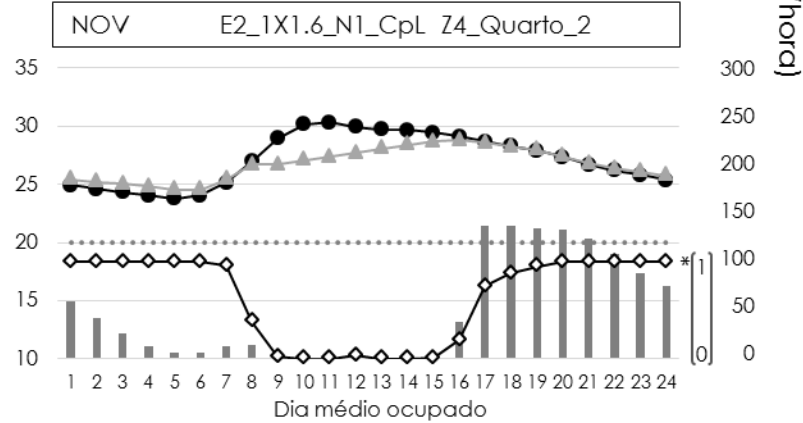
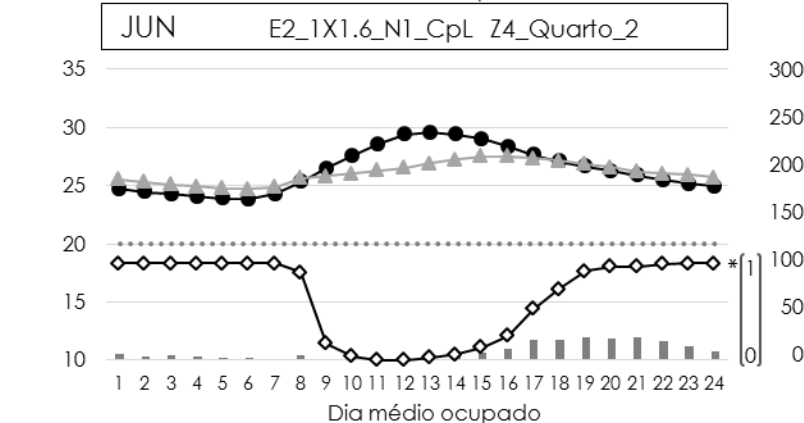
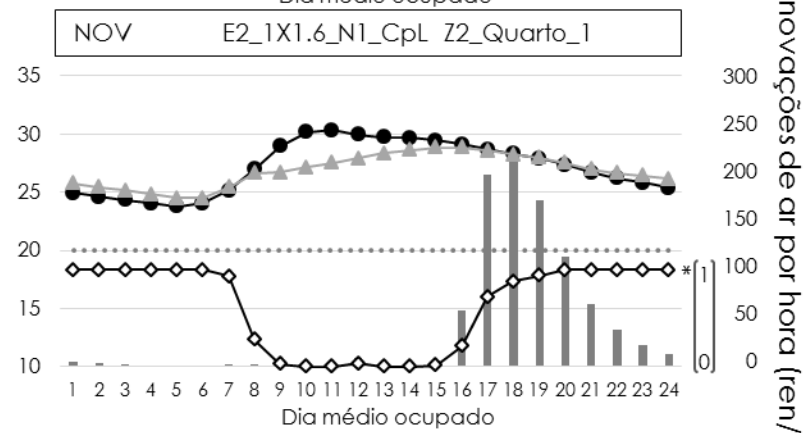
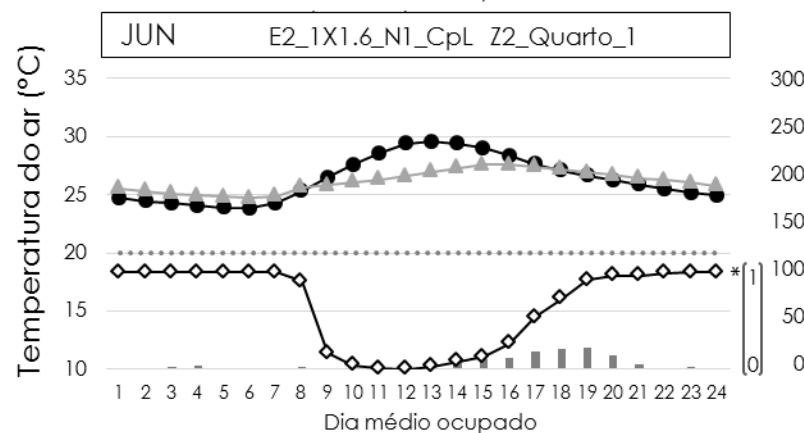
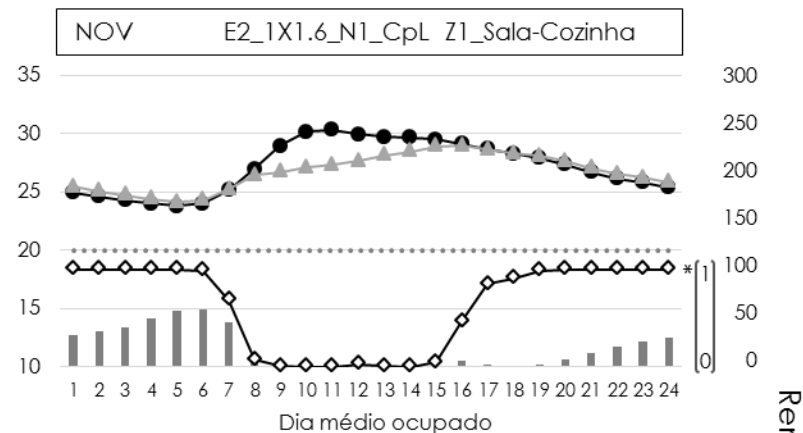
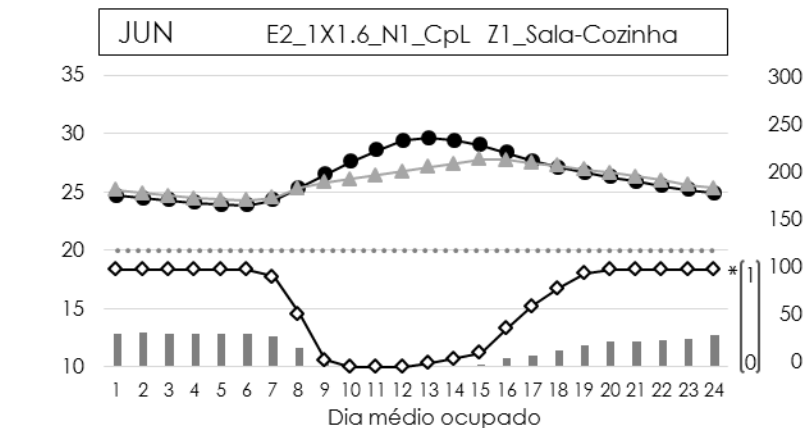


■ Renovações de ar por hora
 ▲ Ti
 —◇— * Fator de abertura (0-1)

■ Renovações de ar por hora
 ▲ Ti
 —◇— * Fator de abertura (0-1)

Renovações de ar por hora (ren/hora)

E2_1X1.6_N1

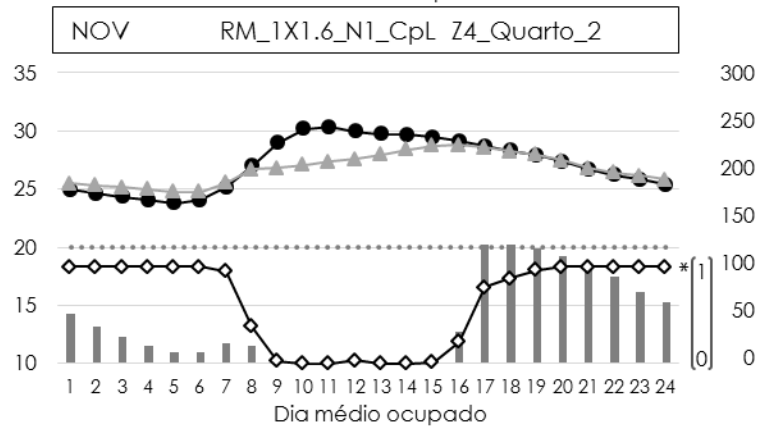
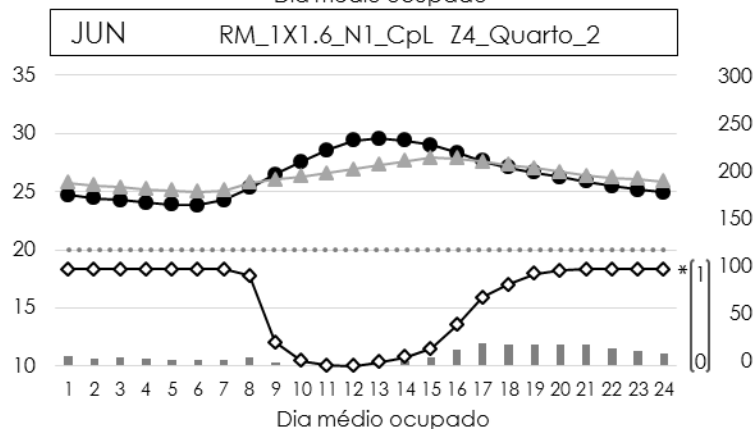
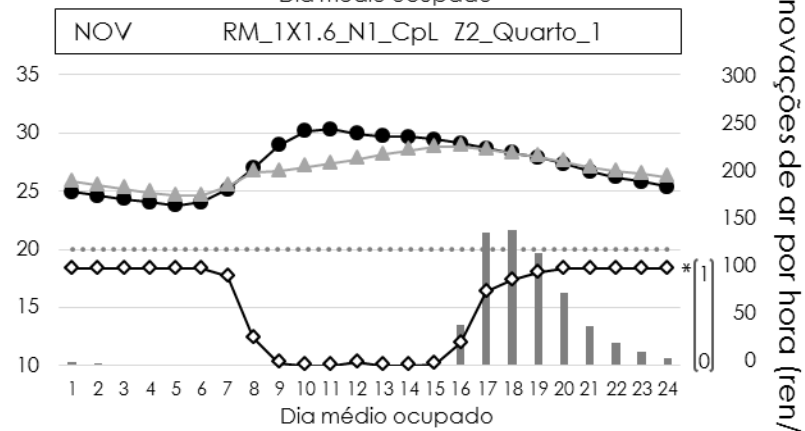
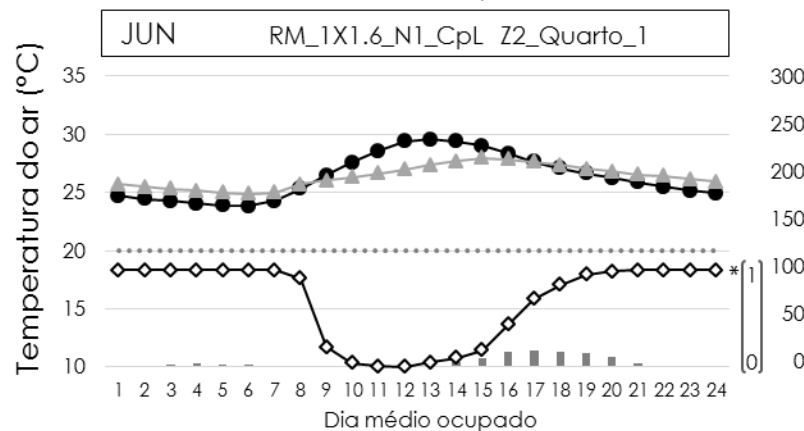
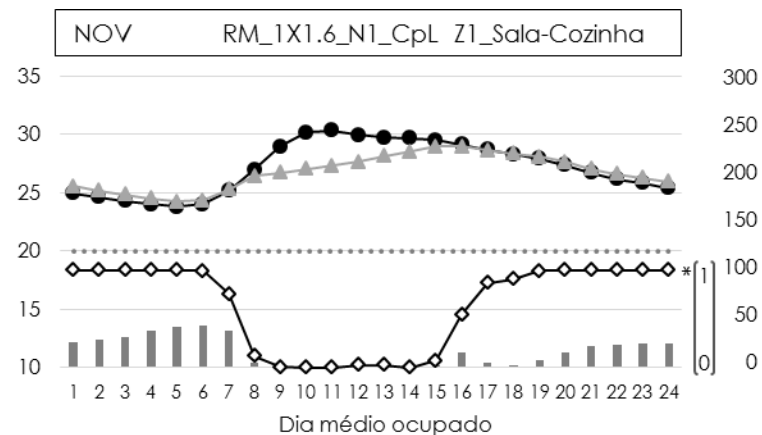
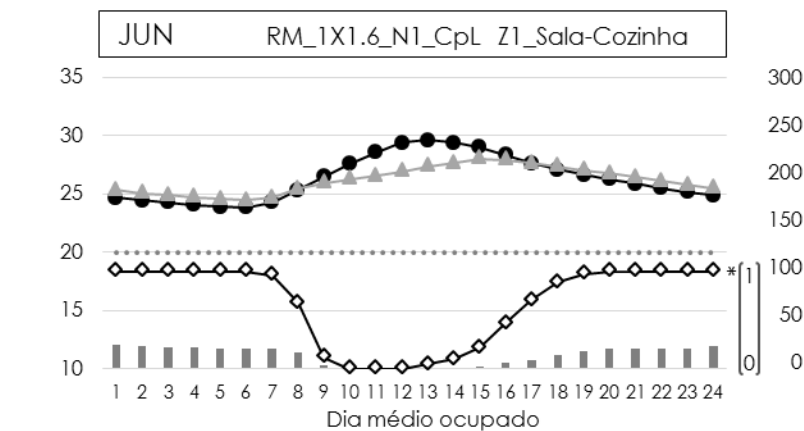


Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

Renovações de ar por hora (ren/hora)

RM_1X1.6_N1

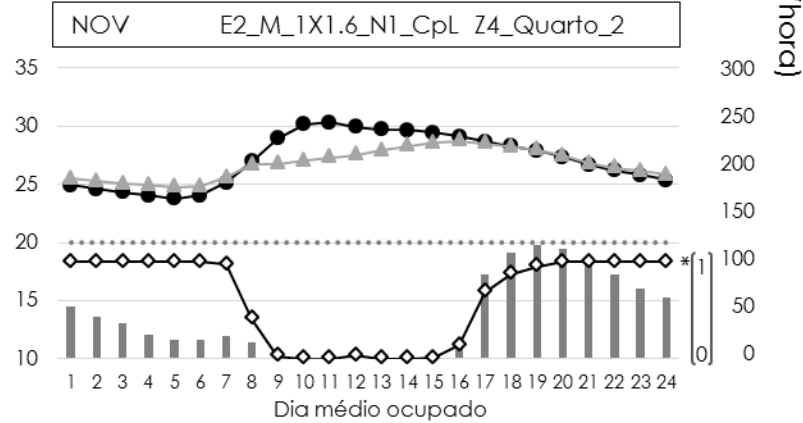
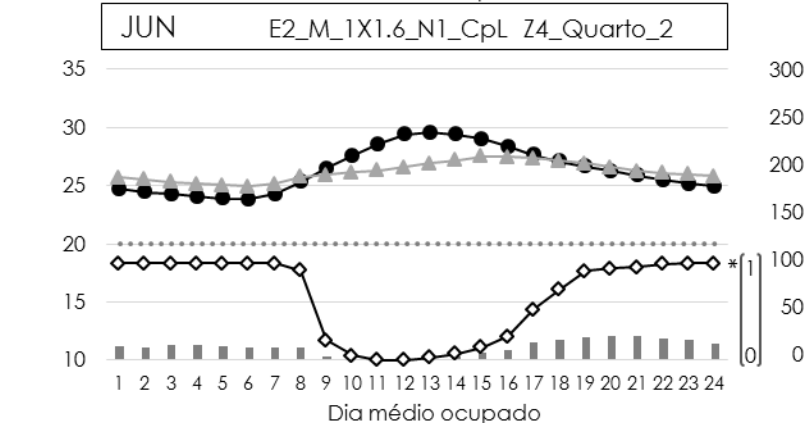
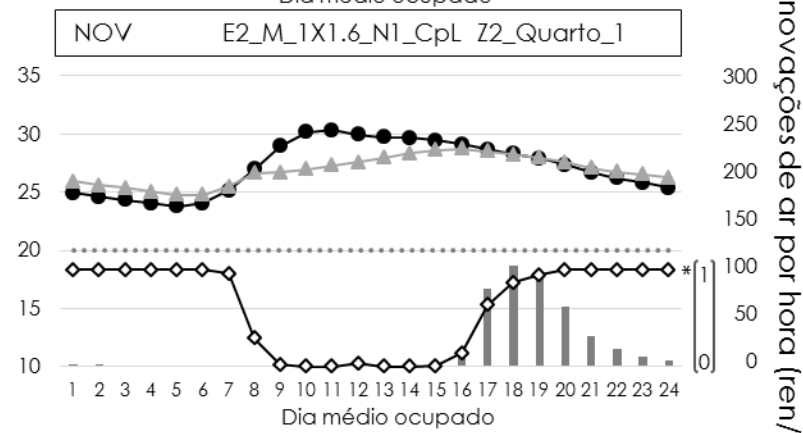
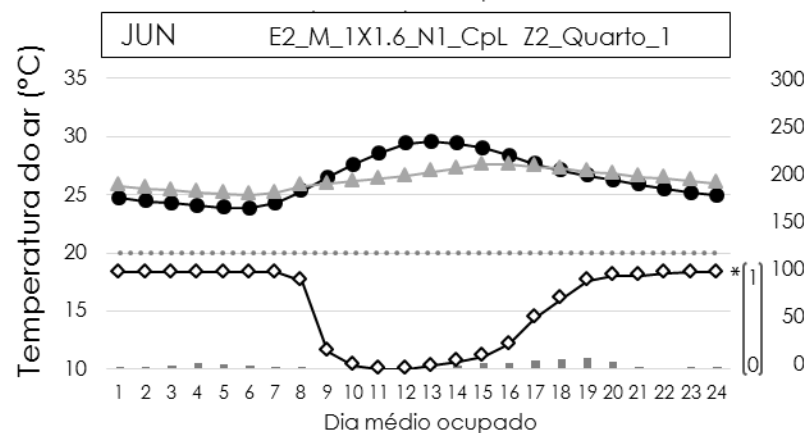
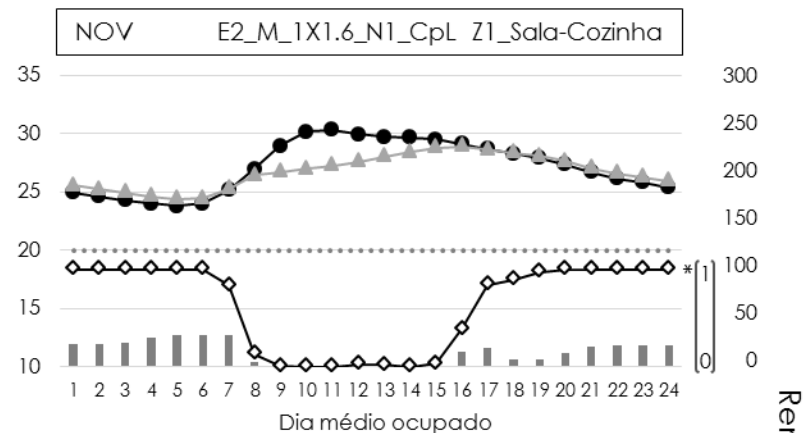
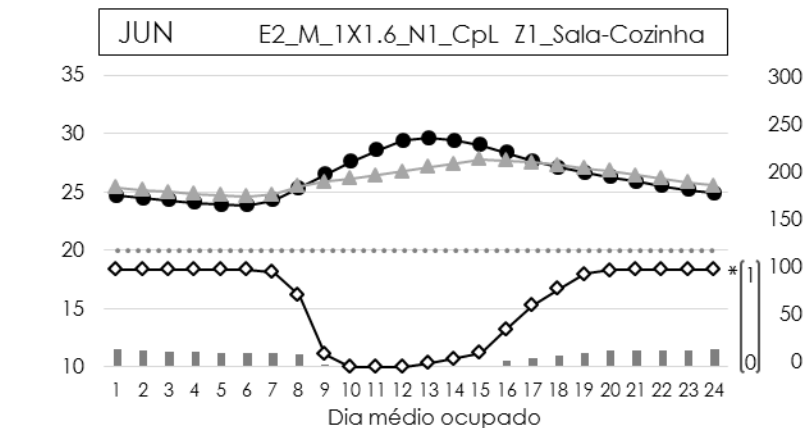


Renovações de ar por hora ● Te
 Ti Tcontrol
 * Fator de abertura (0-1)

Renovações de ar por hora ● Te
 Ti Tcontrol
 * Fator de abertura (0-1)

Renovações de ar por hora (ren/hora)

E2_M_1X1.6_N1

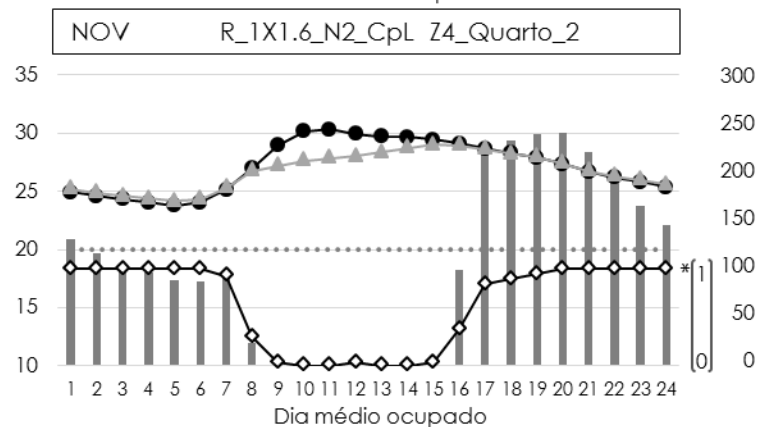
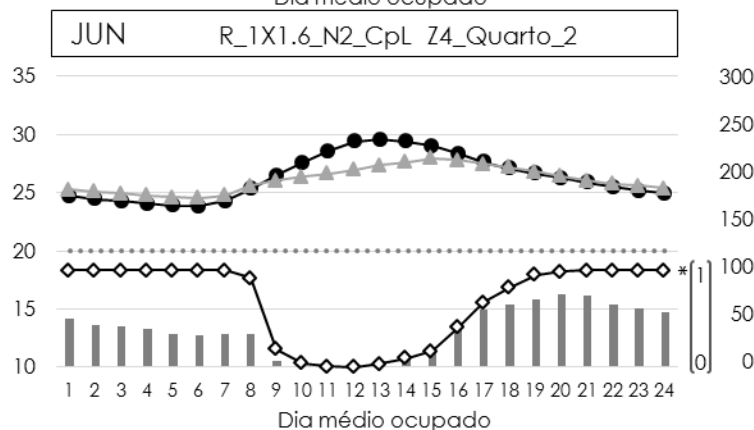
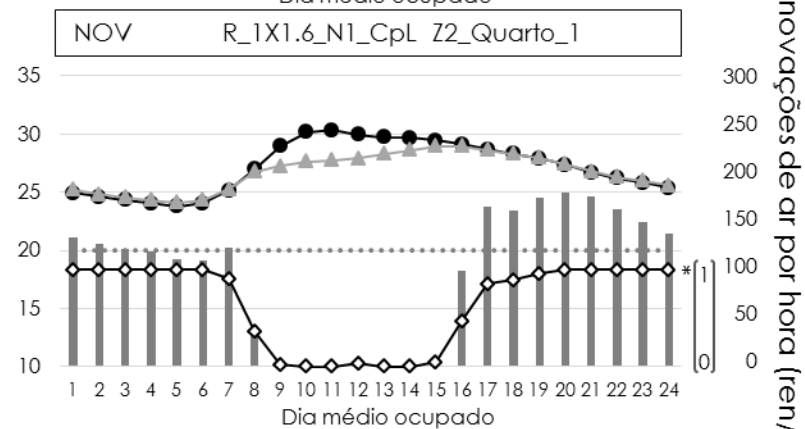
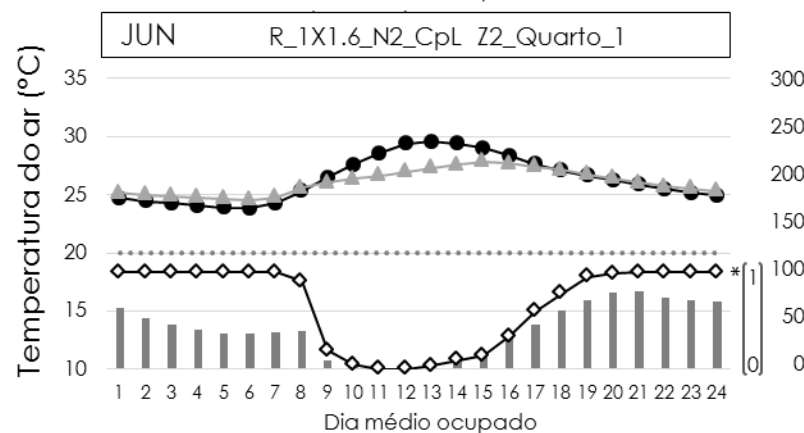
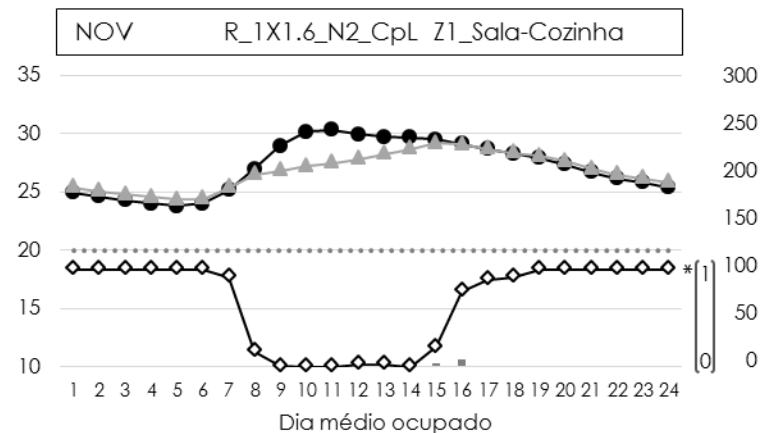
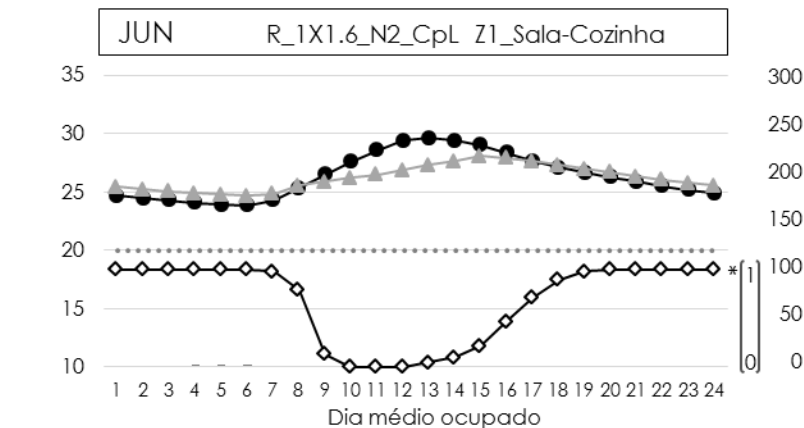


Renovações de ar por hora (ren/hora)

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

R_1X1.6_N2

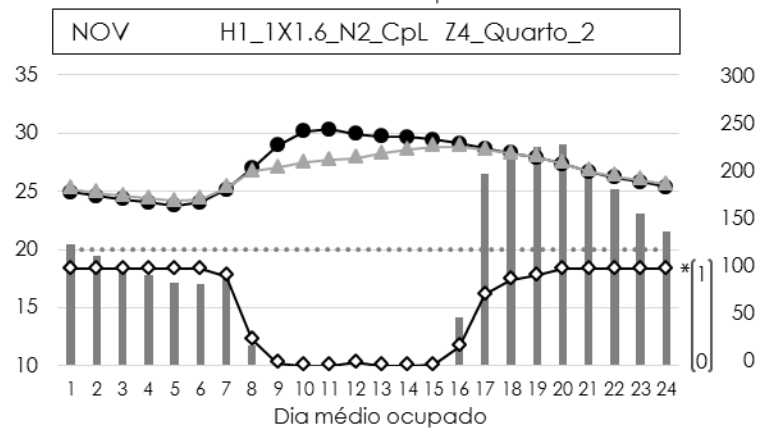
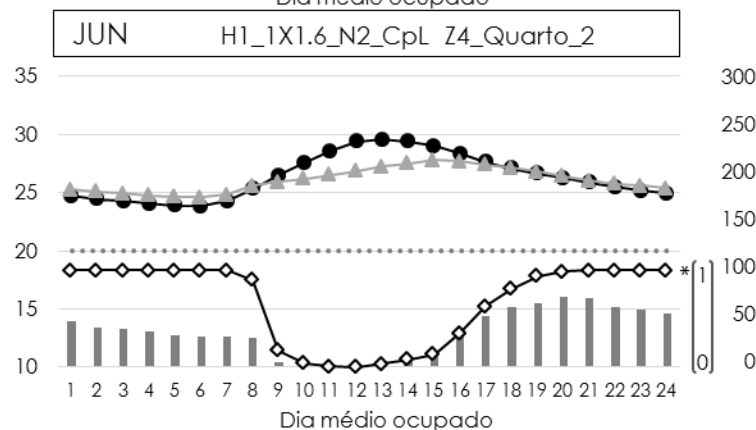
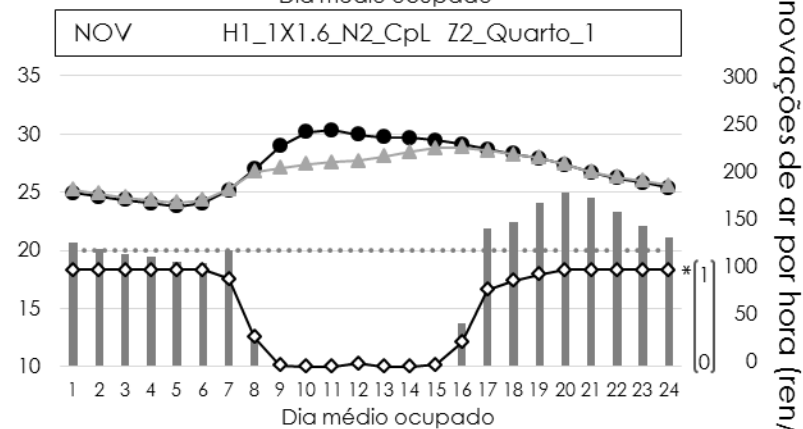
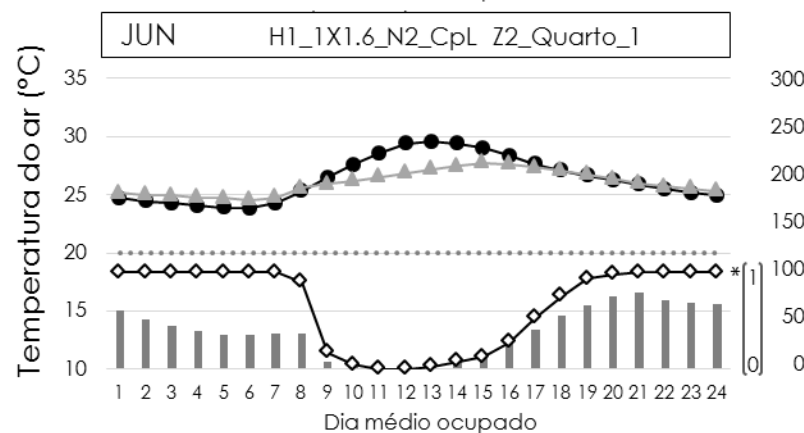
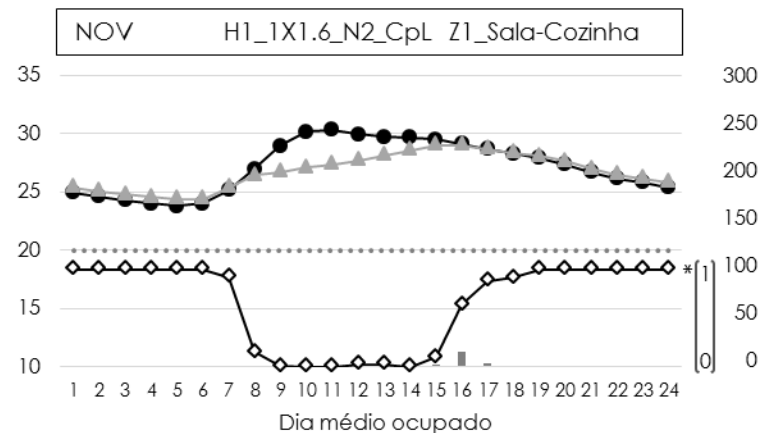
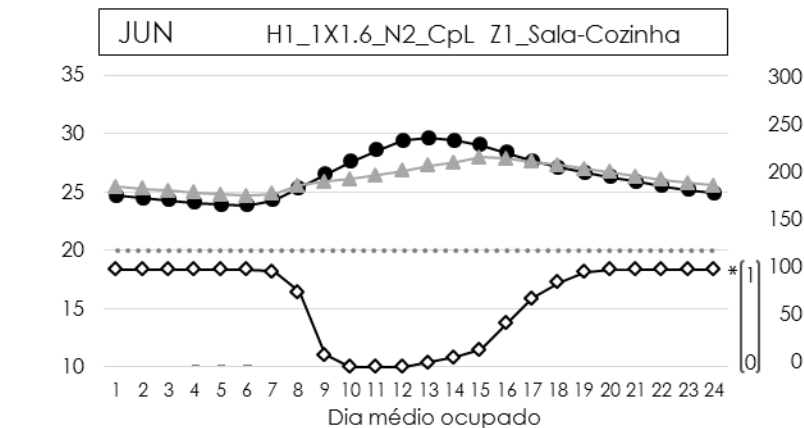


Renovações de ar por hora
 Ti
 * Fator de abertura (0-1)
 Te
 Tcontrole

Renovações de ar por hora
 Ti
 * Fator de abertura (0-1)
 Te
 Tcontrole

Renovações de ar por hora (ren/hora)

H1_1X1.6_N2

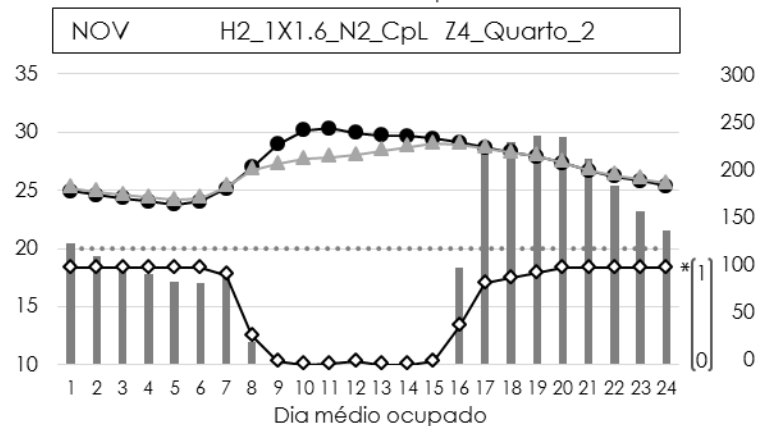
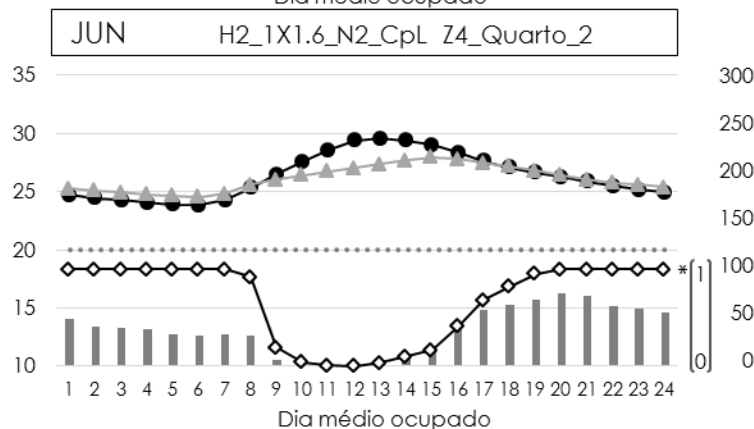
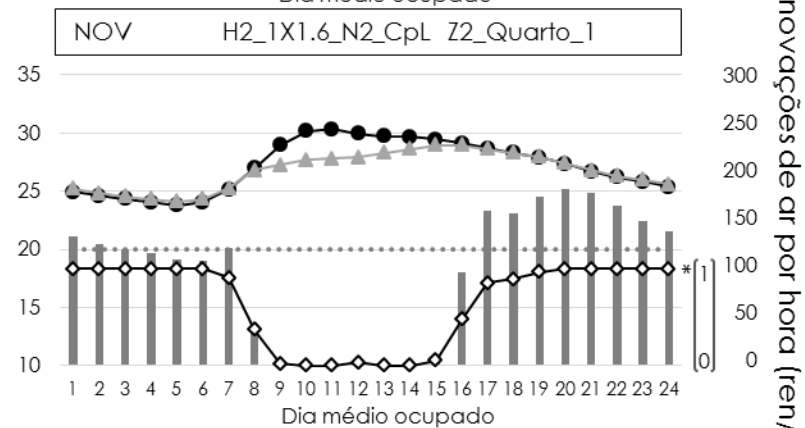
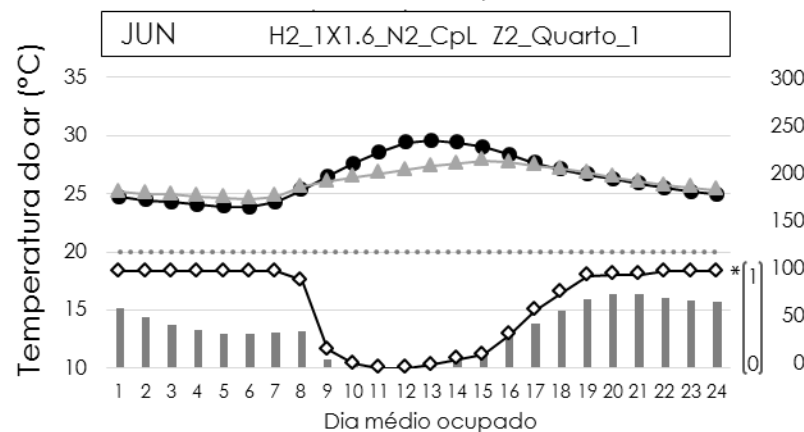
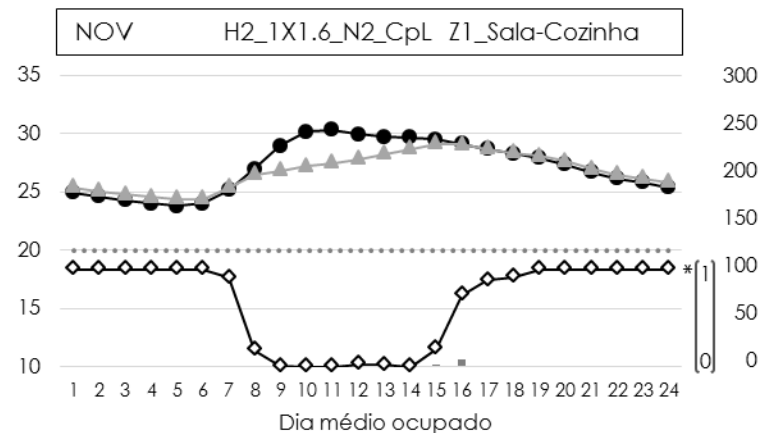
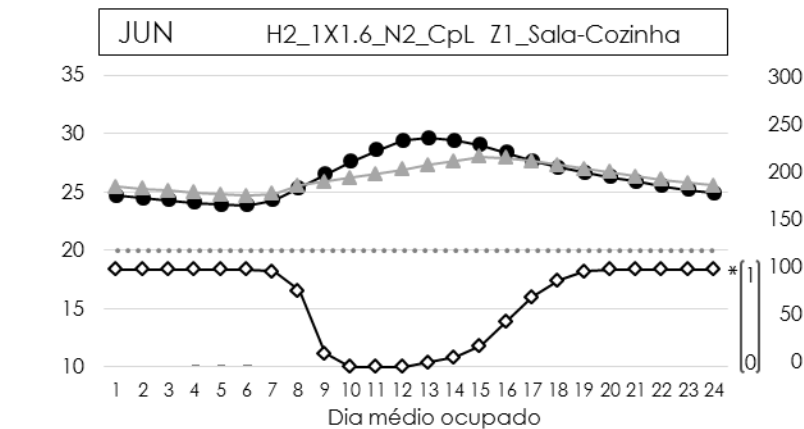


■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrol
 ◇ * Fator de abertura (0-1)

■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrol
 ◇ * Fator de abertura (0-1)

Renovações de ar por hora (ren/hora)

H2_1X1.6_N2

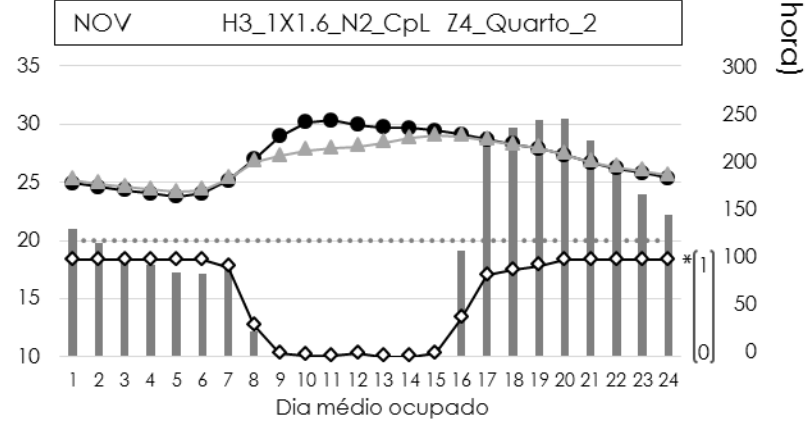
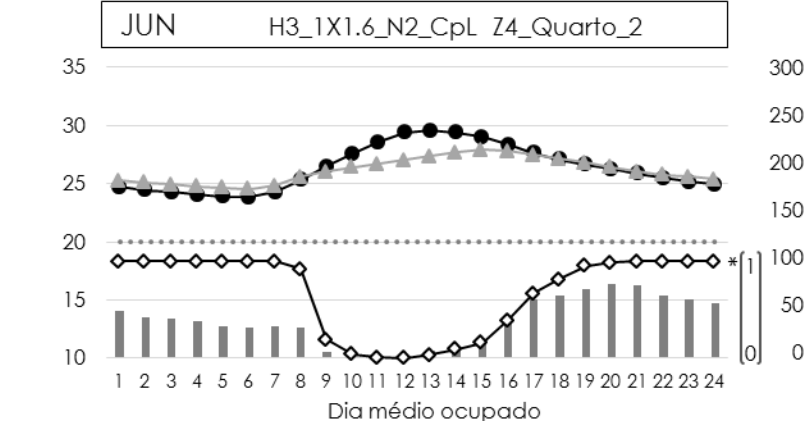
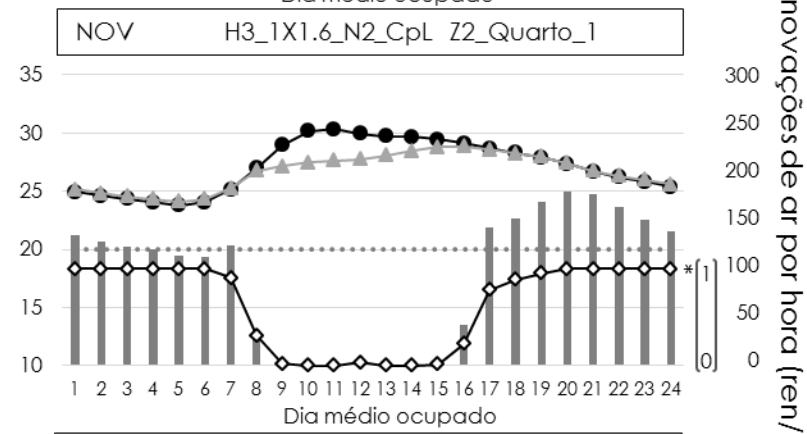
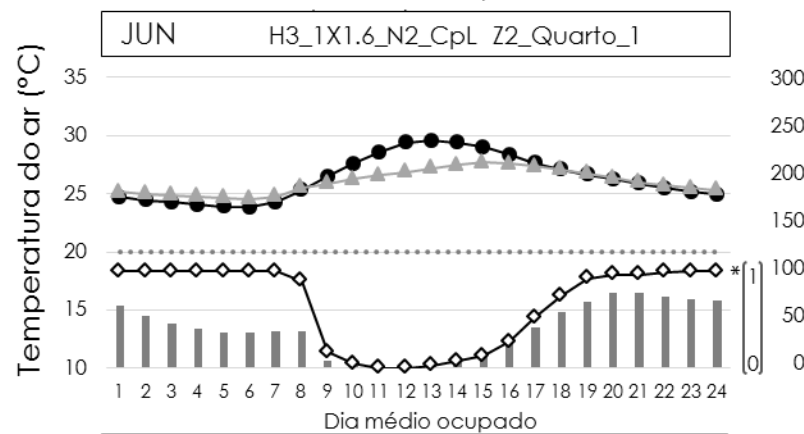
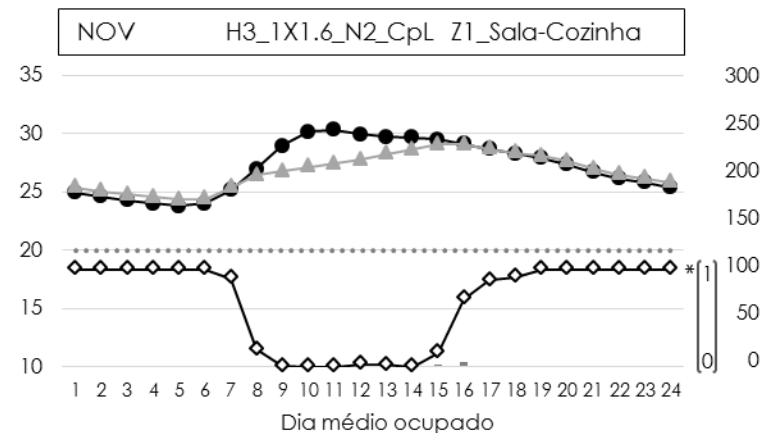
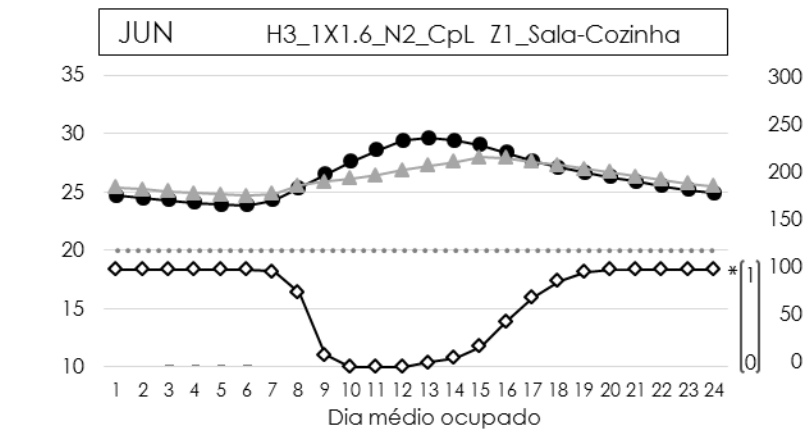


Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

Renovações de ar por hora (ren/hora)

H3_1X1.6_N2

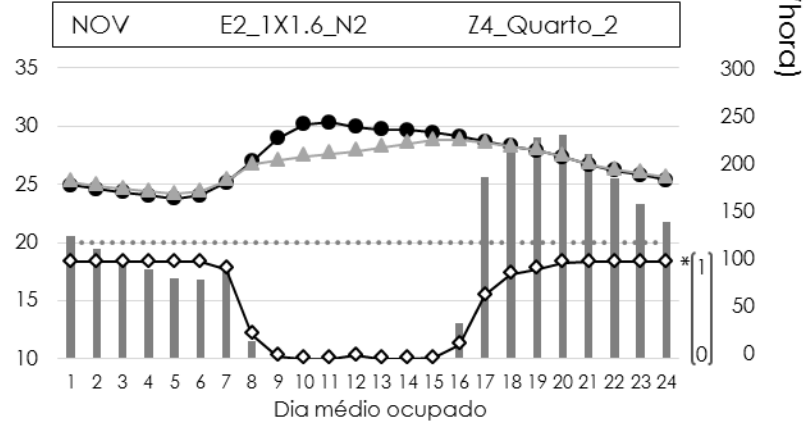
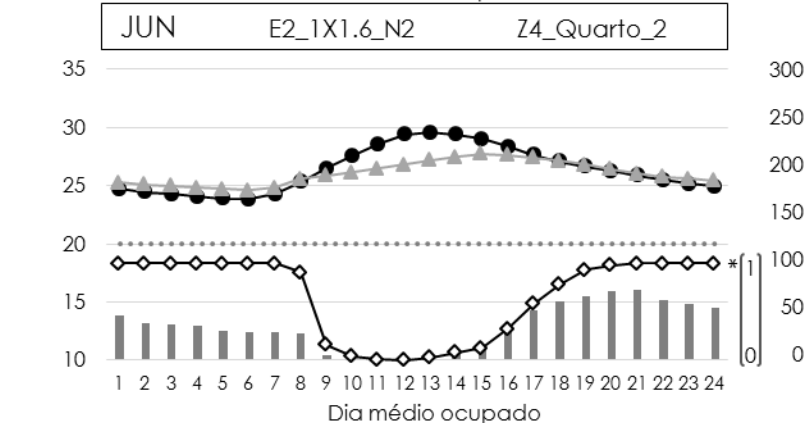
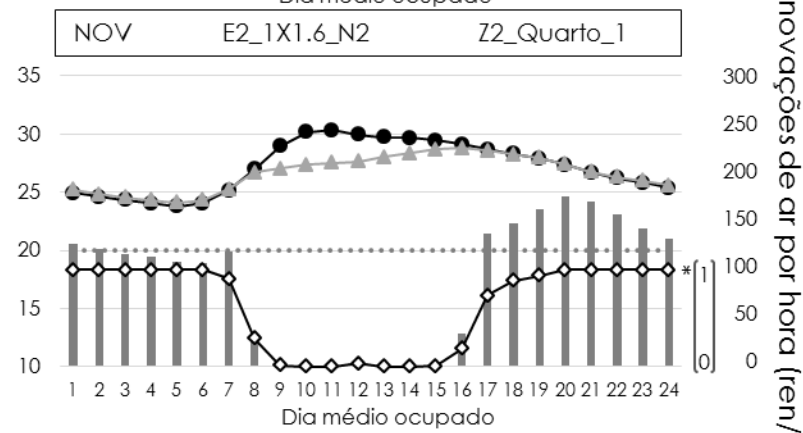
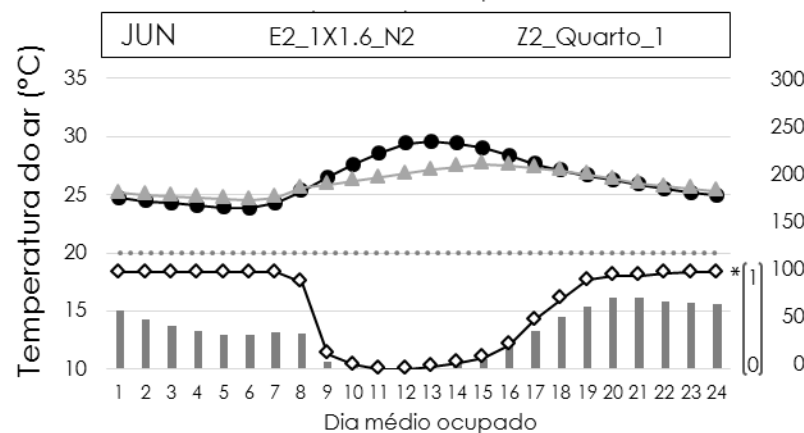
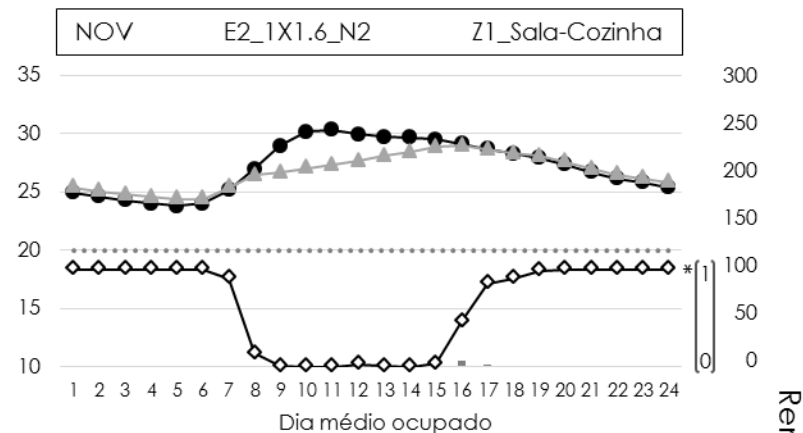
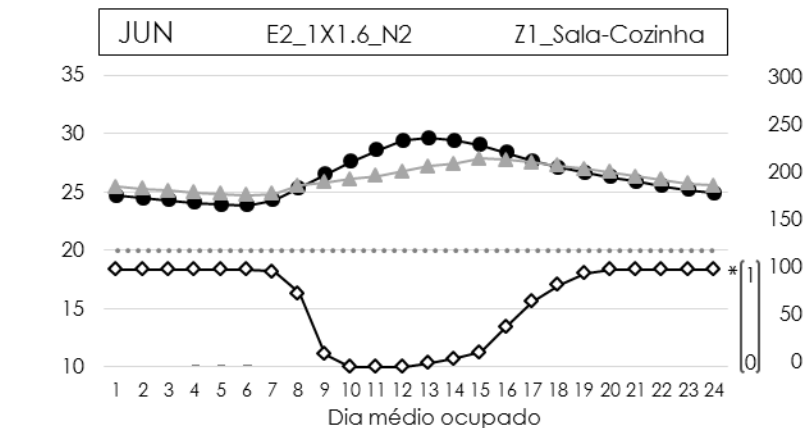


■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrole
 ◇ * Fator de abertura (0-1)

■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrole
 ◇ * Fator de abertura (0-1)

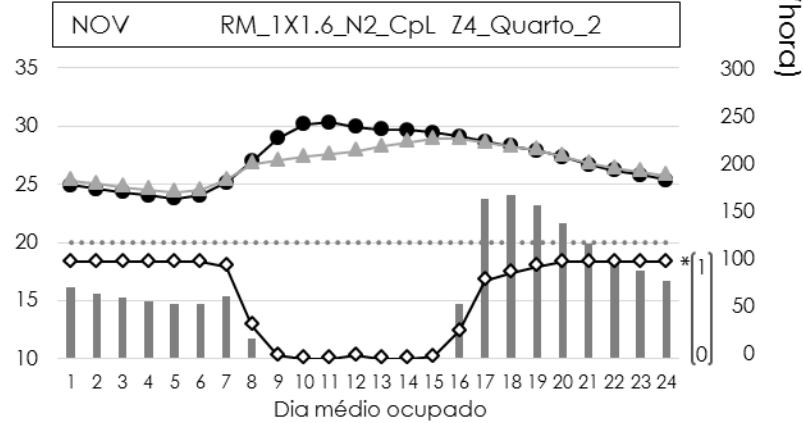
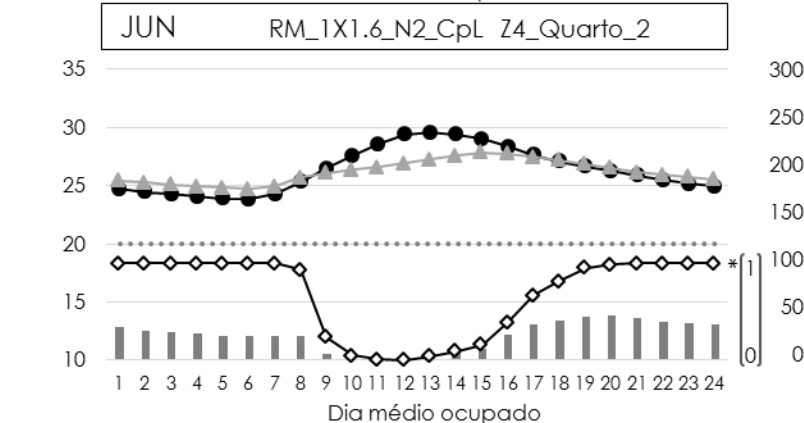
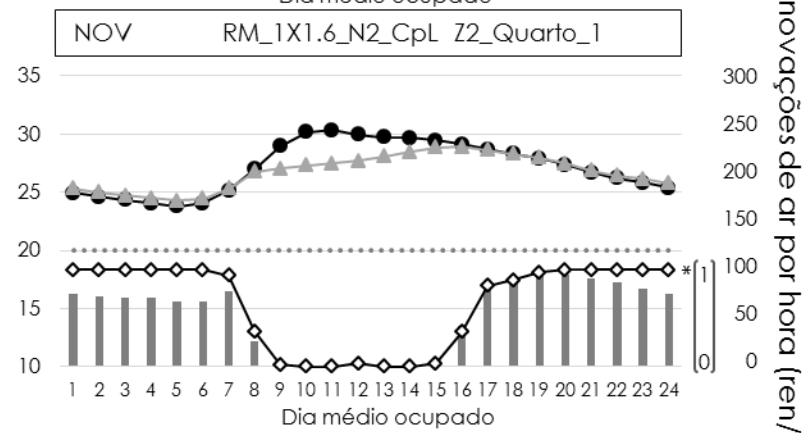
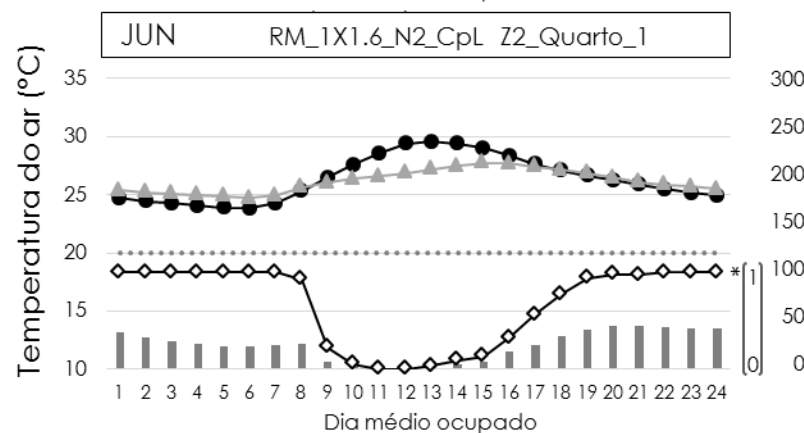
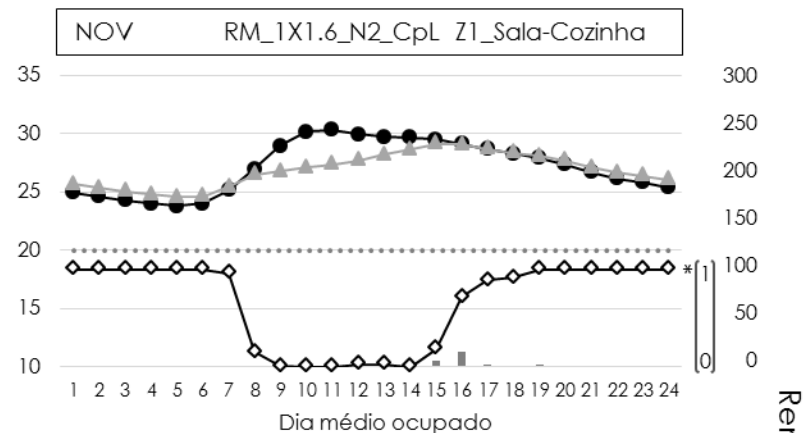
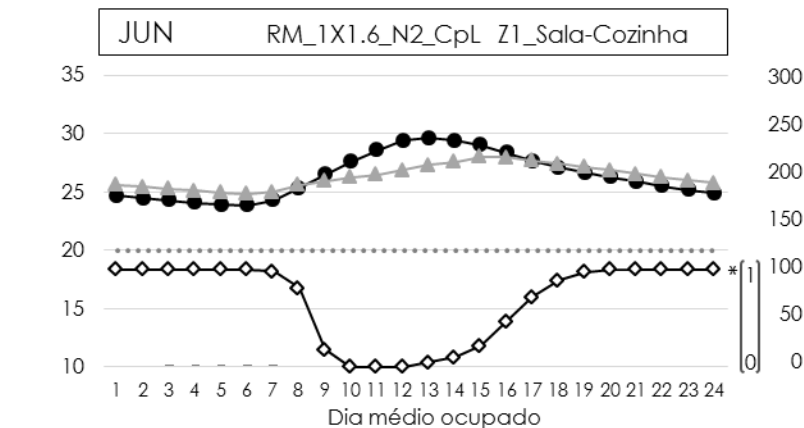
Renovações de ar por hora (ren/hora)

E2_1X1.6_N2



Renovações de ar por hora (ren/hora)

RM_1X1.6_N2

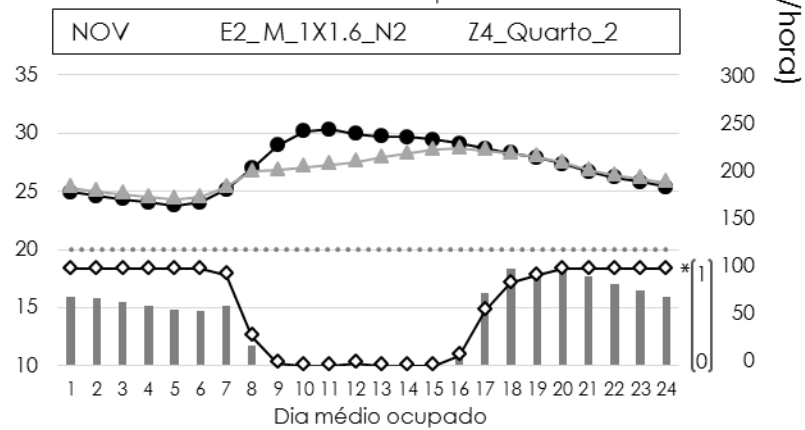
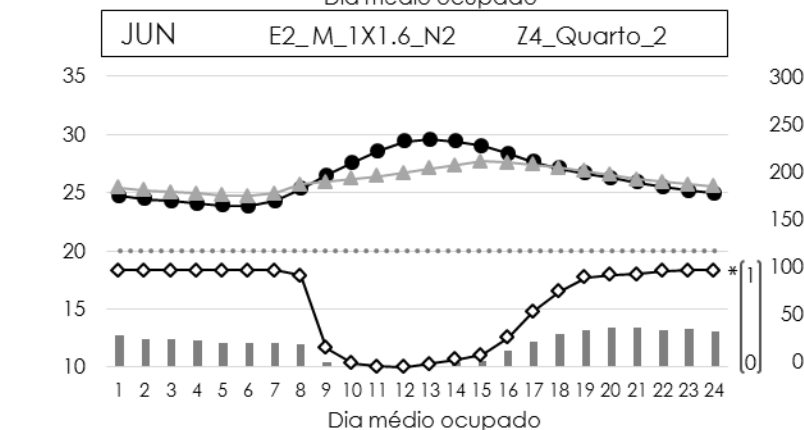
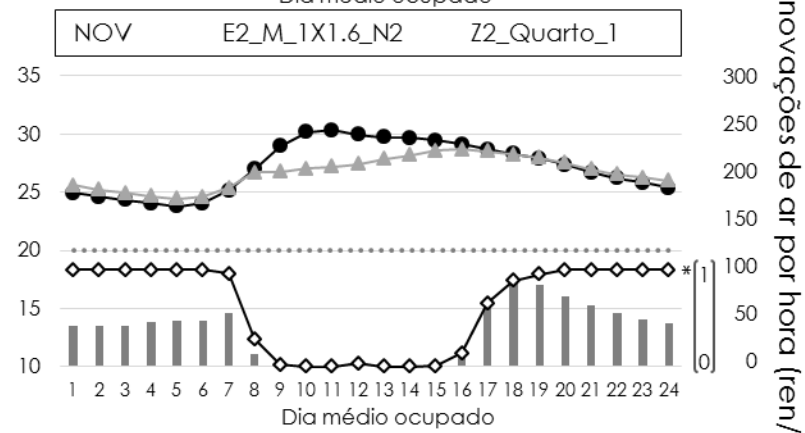
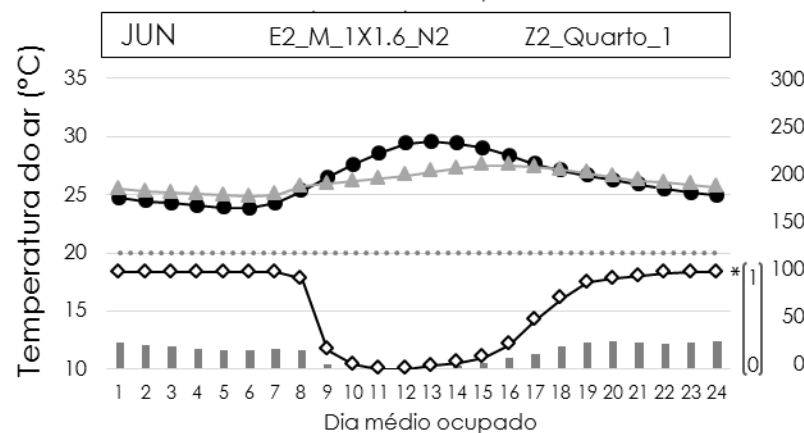
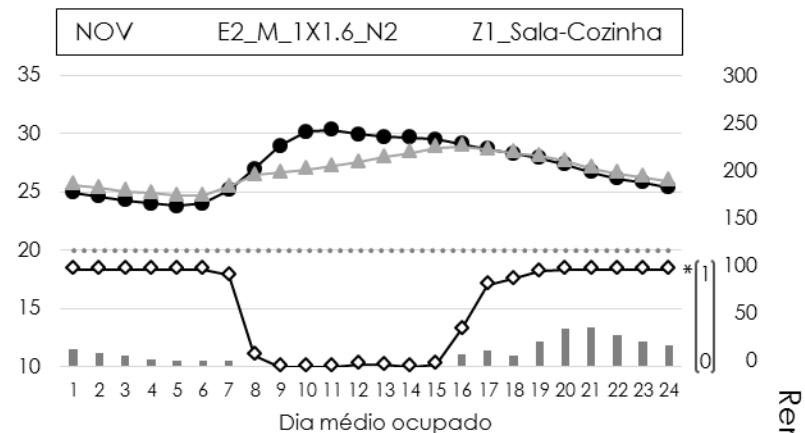
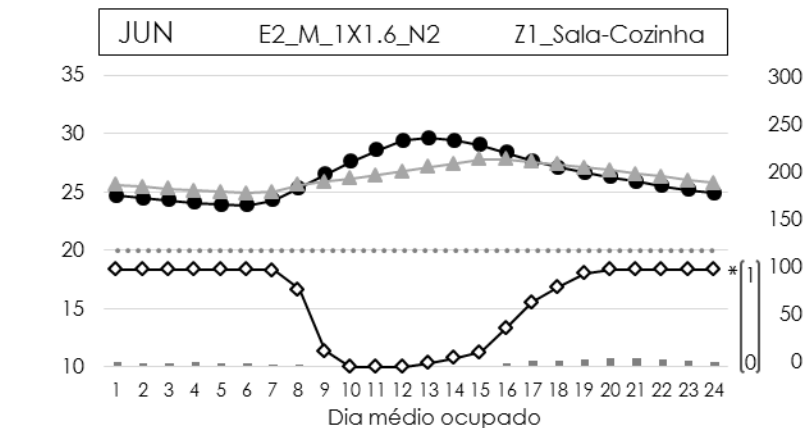


■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrole
 ◇ * Fator de abertura (0-1)

■ Renovações de ar por hora ● Te
 ▲ Ti Tcontrole
 ◇ * Fator de abertura (0-1)

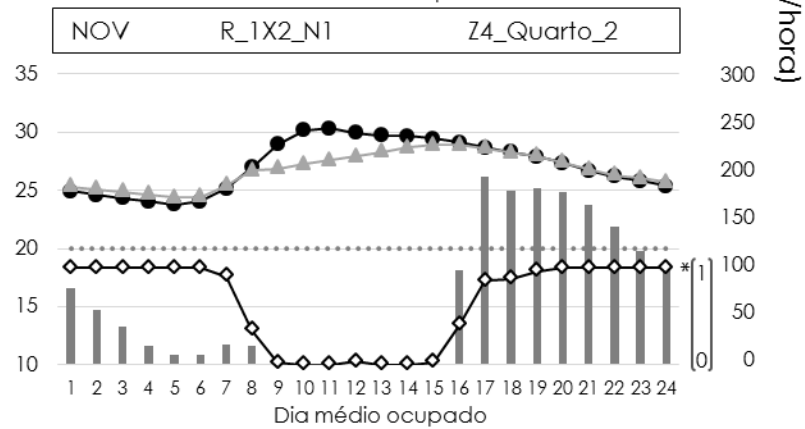
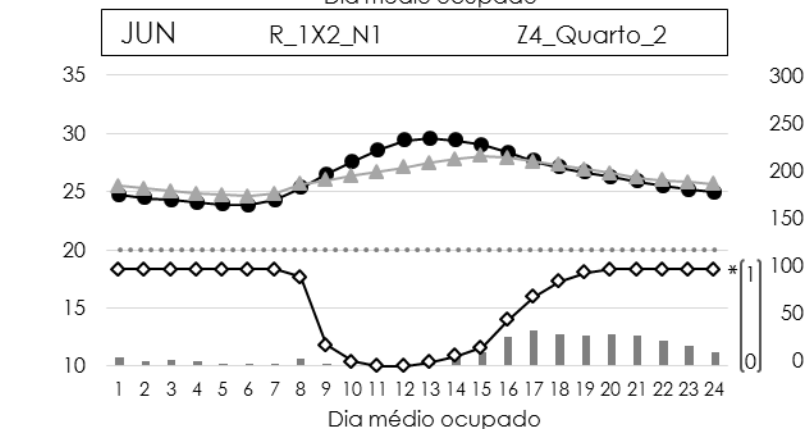
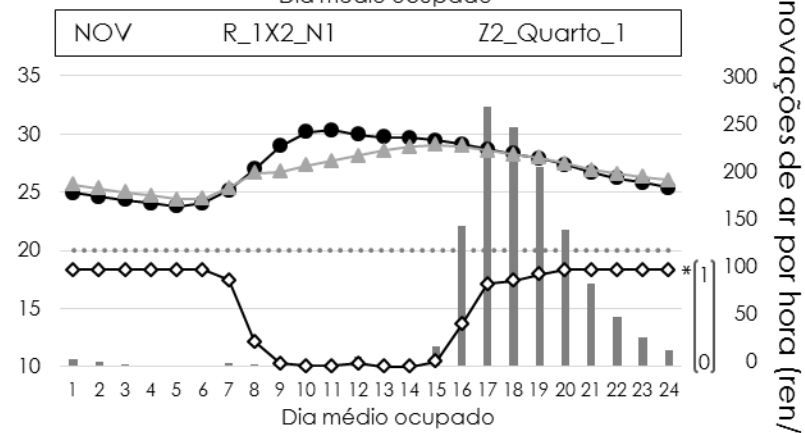
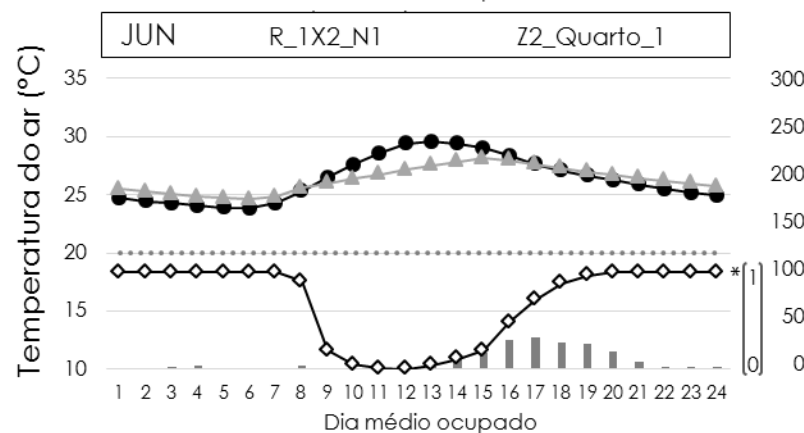
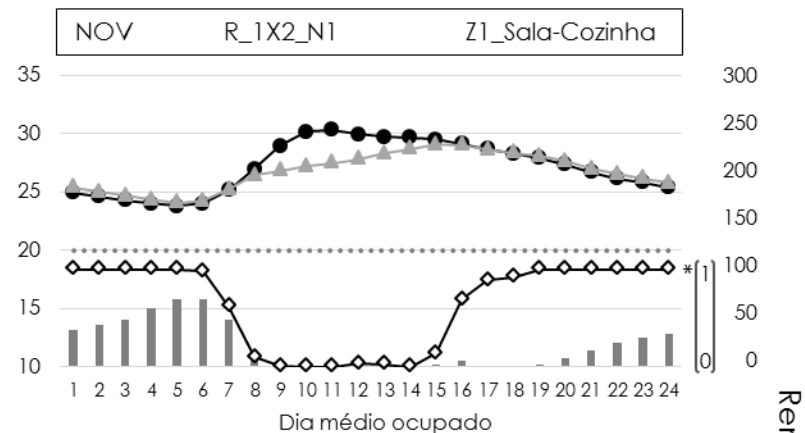
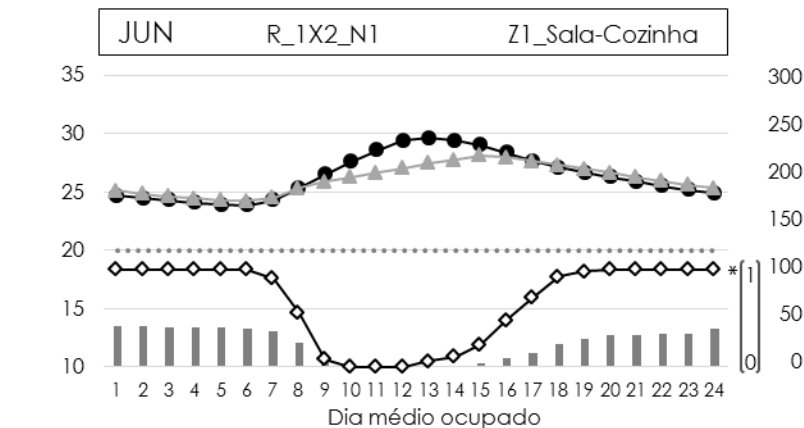
Renovações de ar por hora (ren/hora)

E2_M_1X1.6_N2



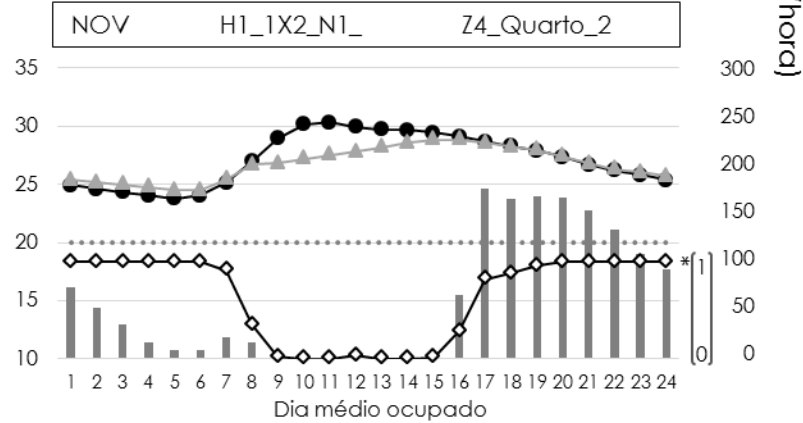
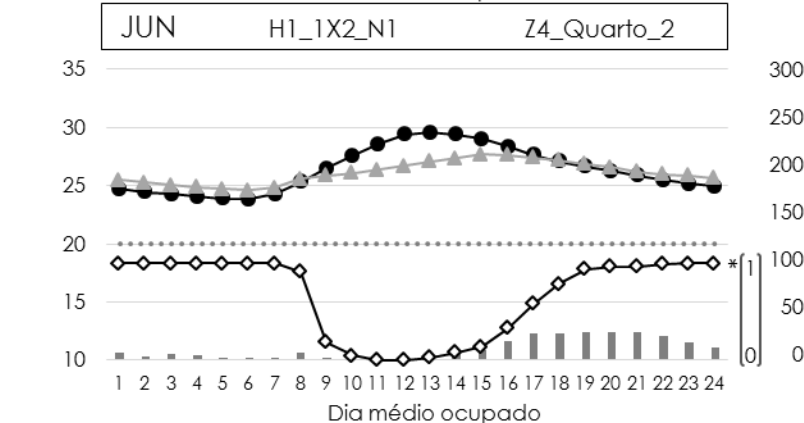
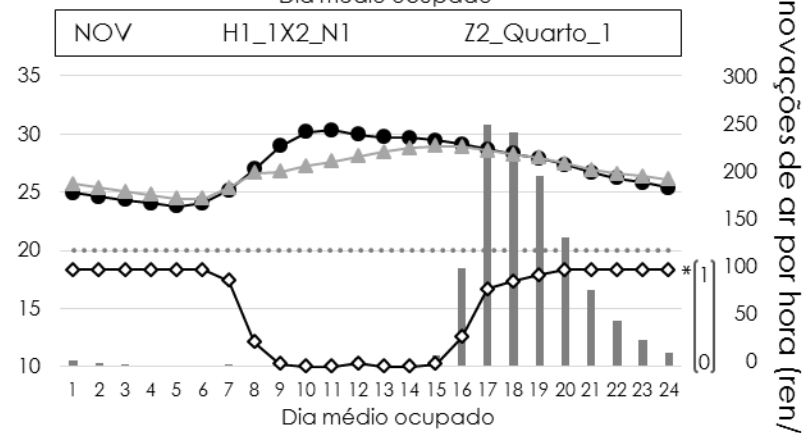
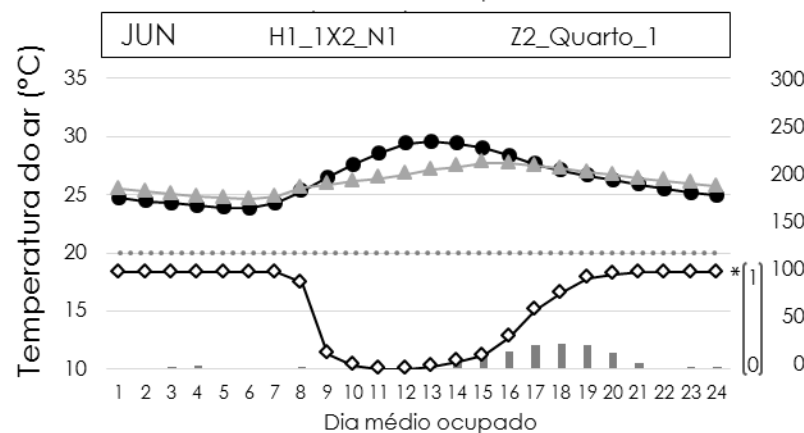
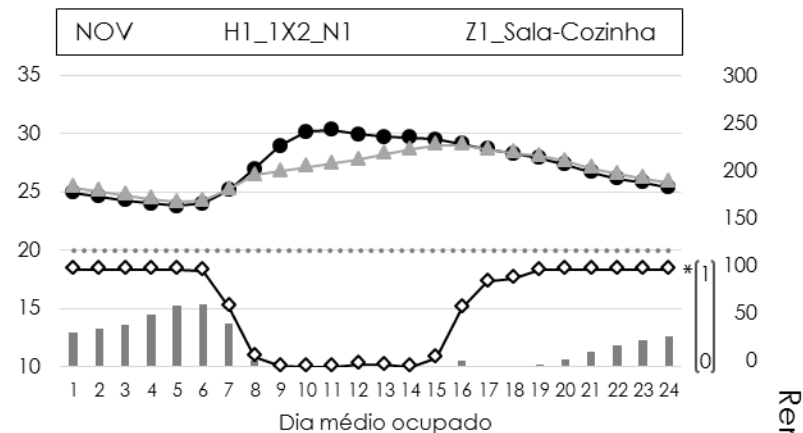
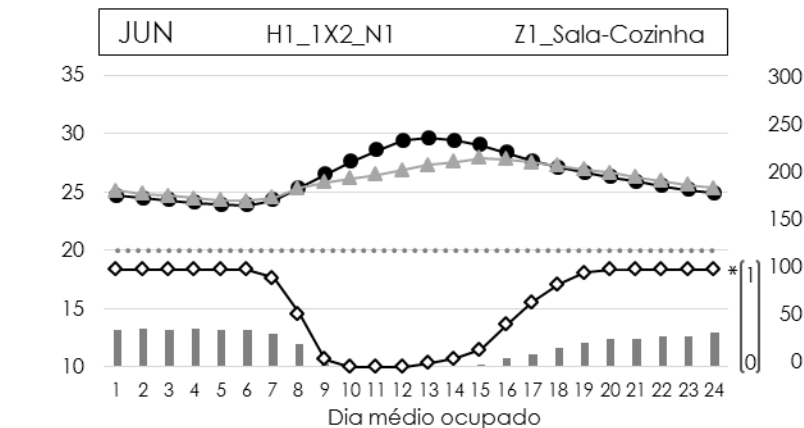
Renovações de ar por hora (ren/hora)

R_1X2_N1



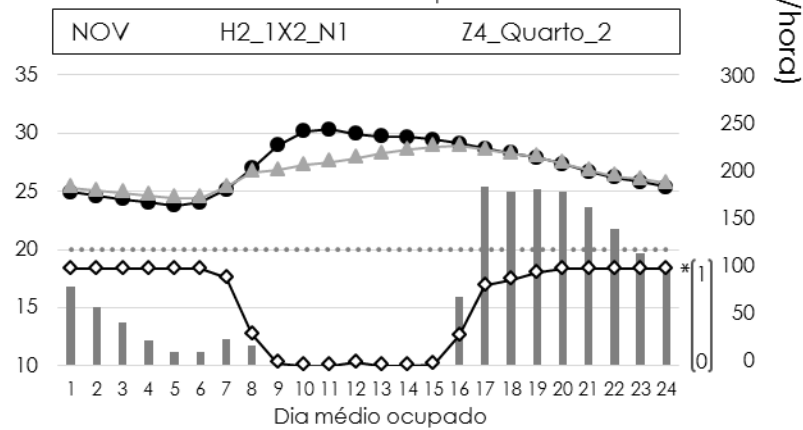
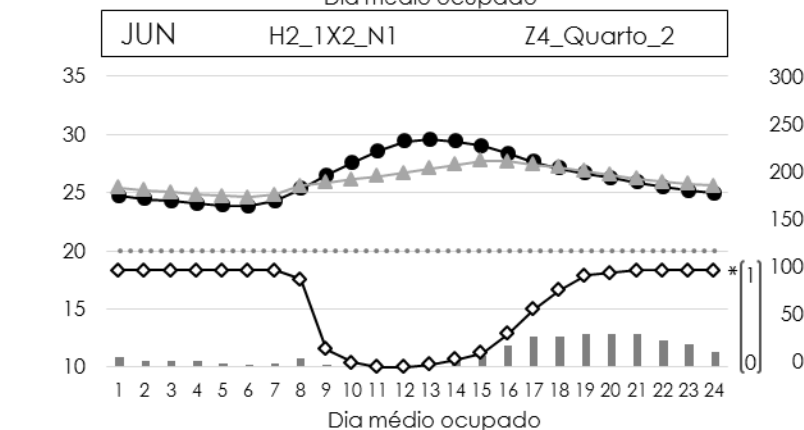
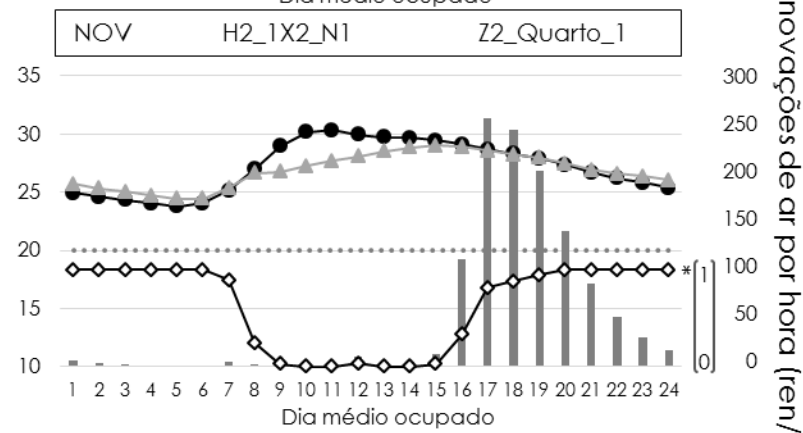
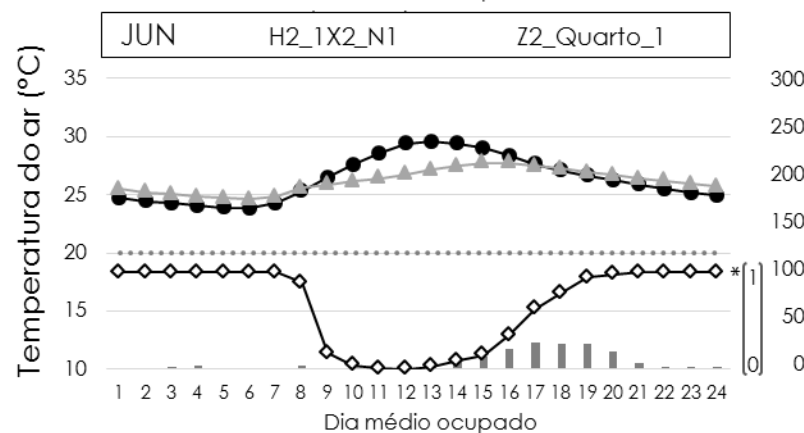
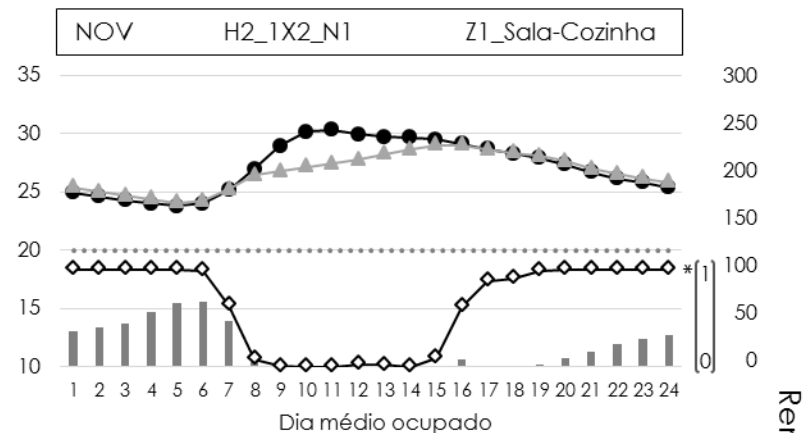
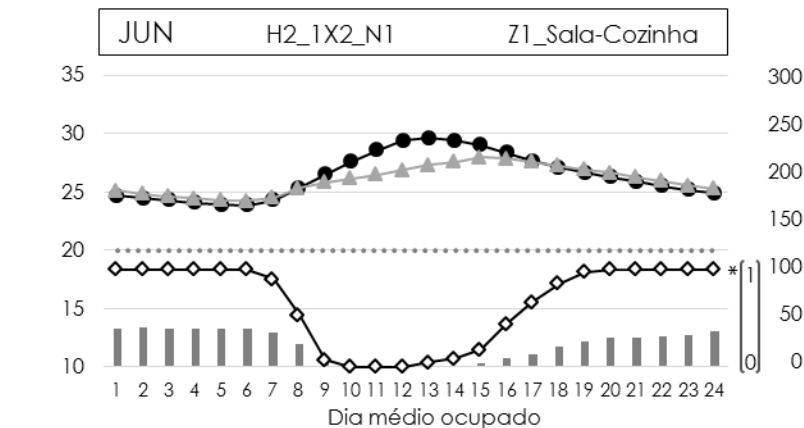
Renovações de ar por hora (ren/hora)

H1_1X2_N1



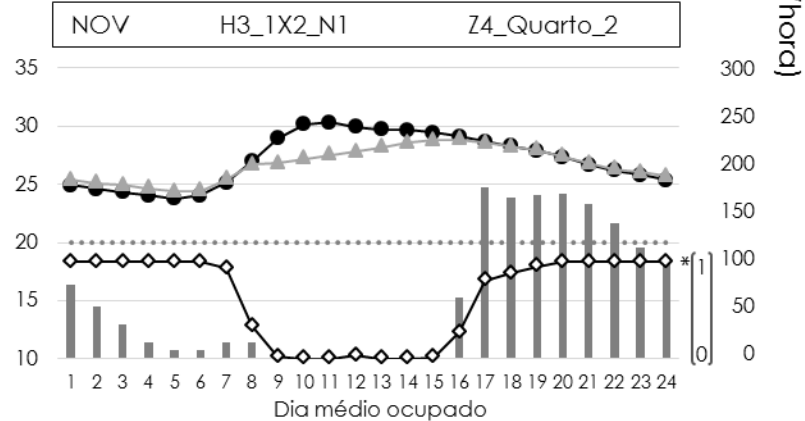
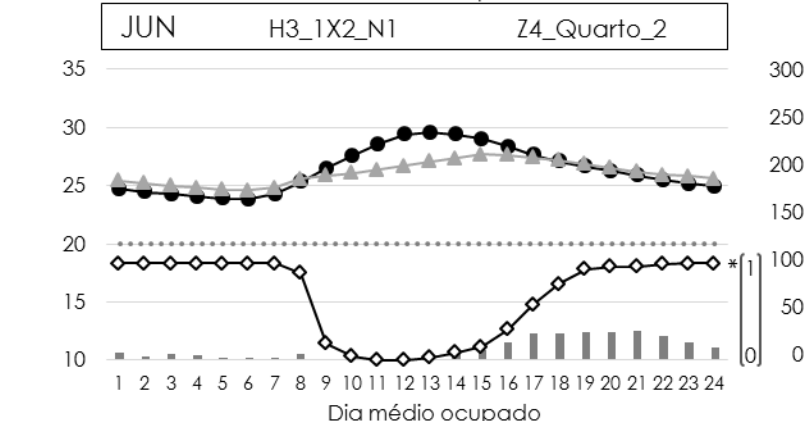
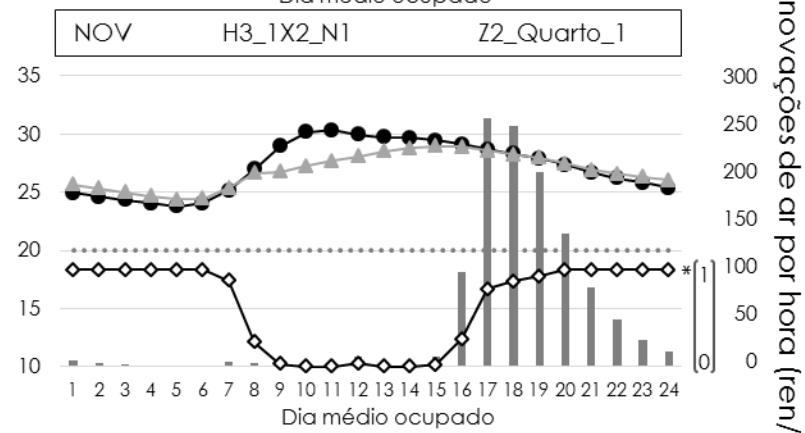
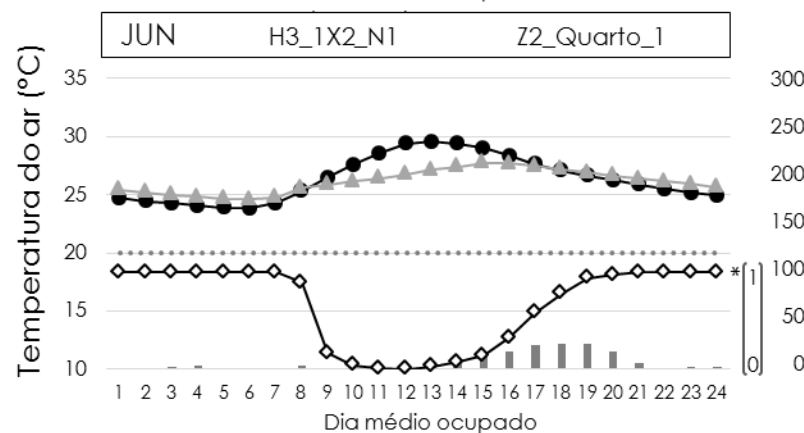
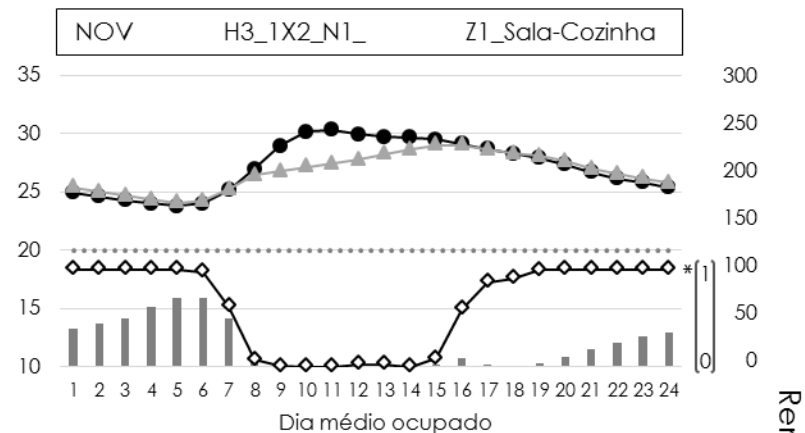
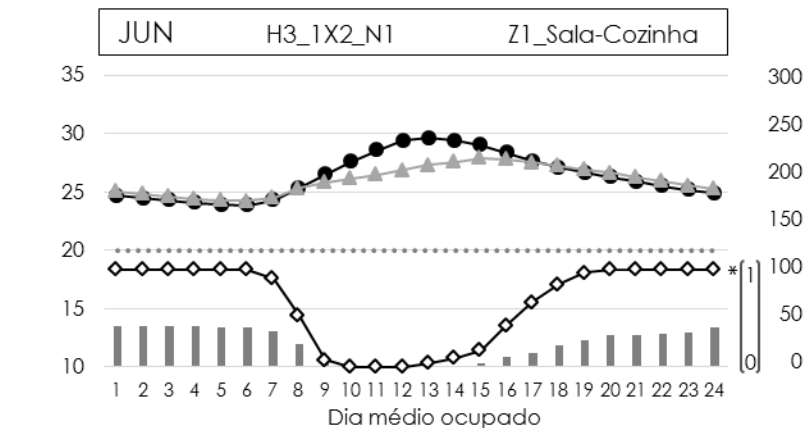
Renovações de ar por hora (ren/hora)

H2_1X2_N1



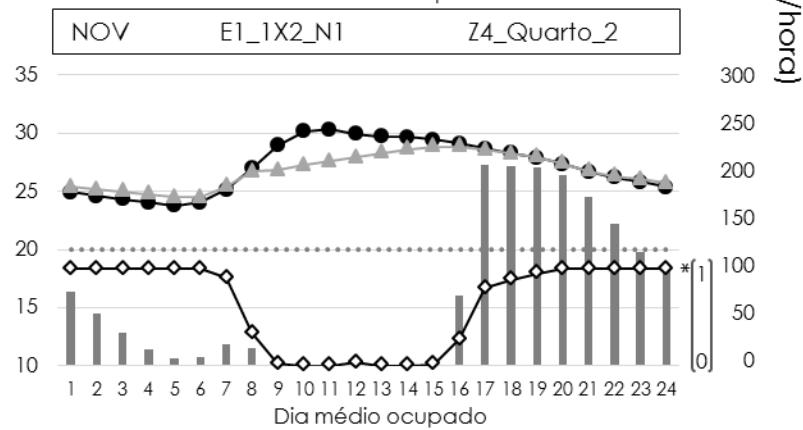
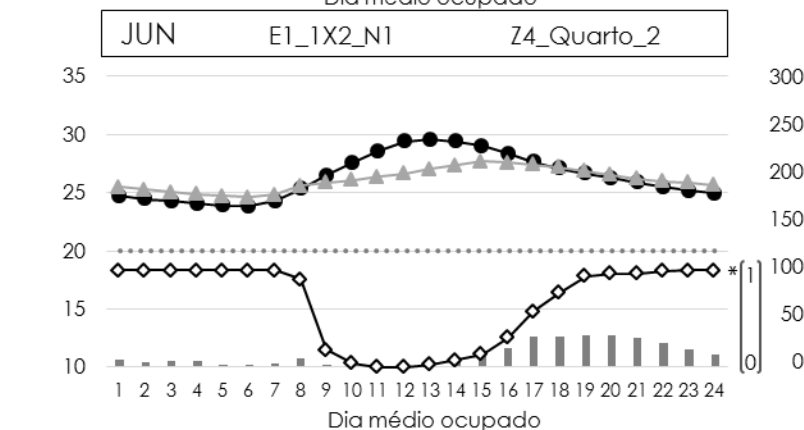
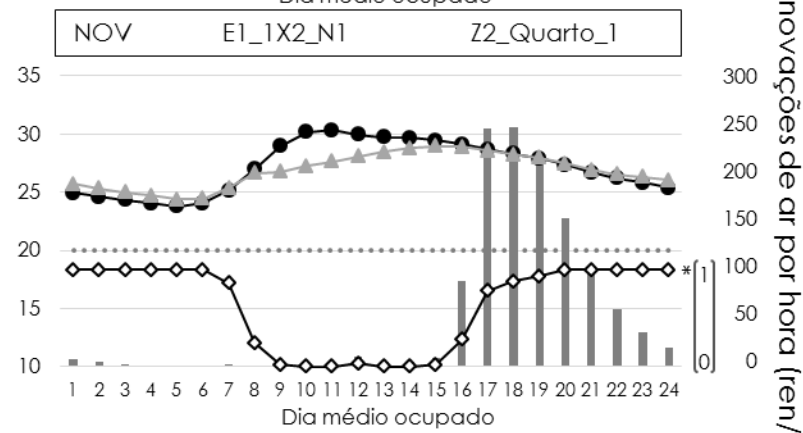
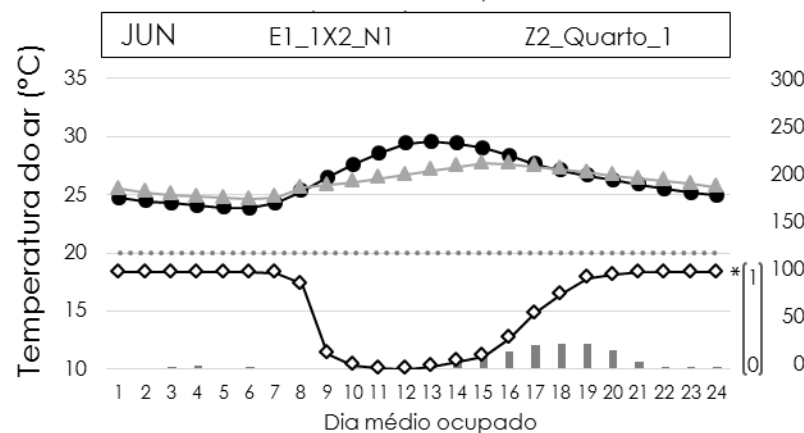
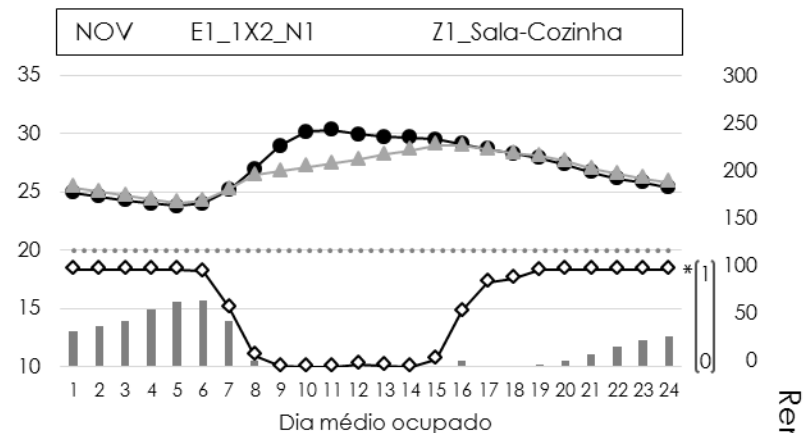
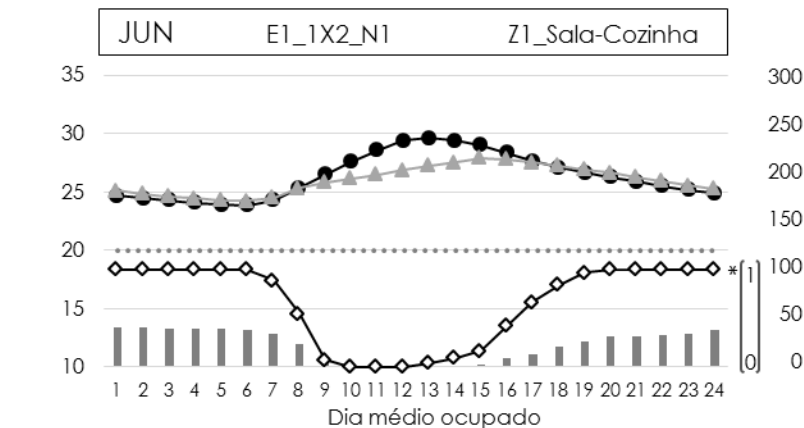
Renovações de ar por hora (ren/hora)

H3_1X2_N1



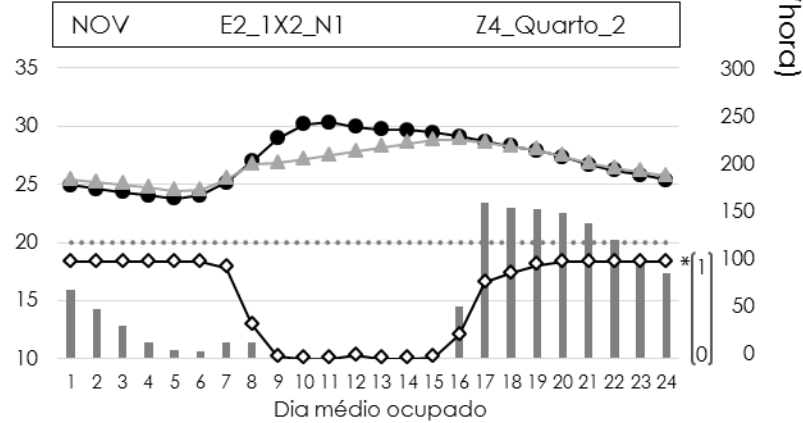
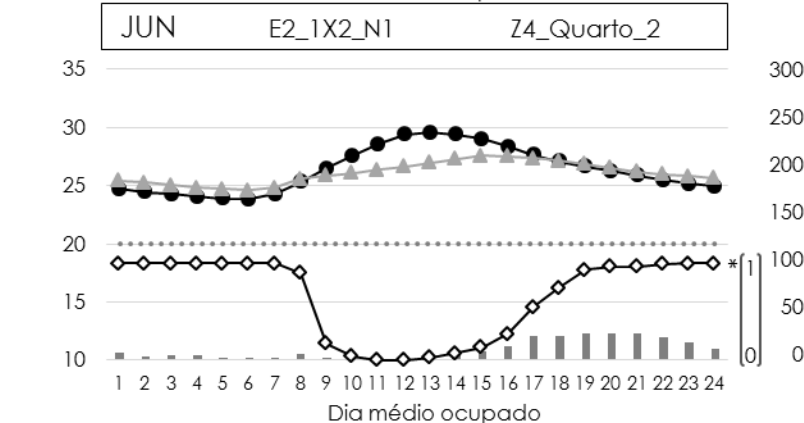
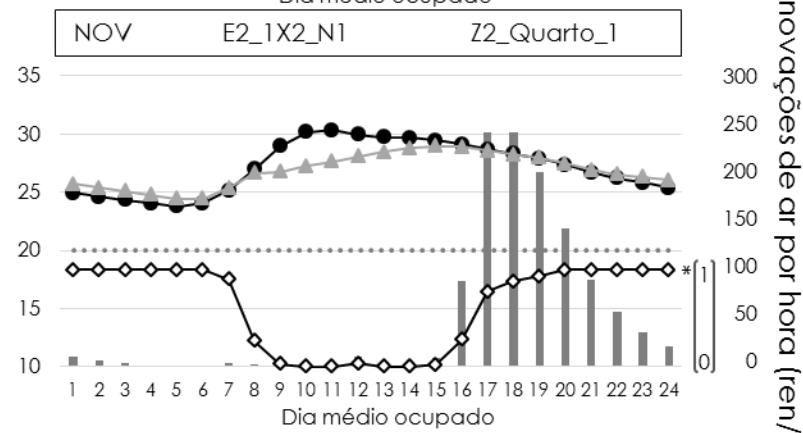
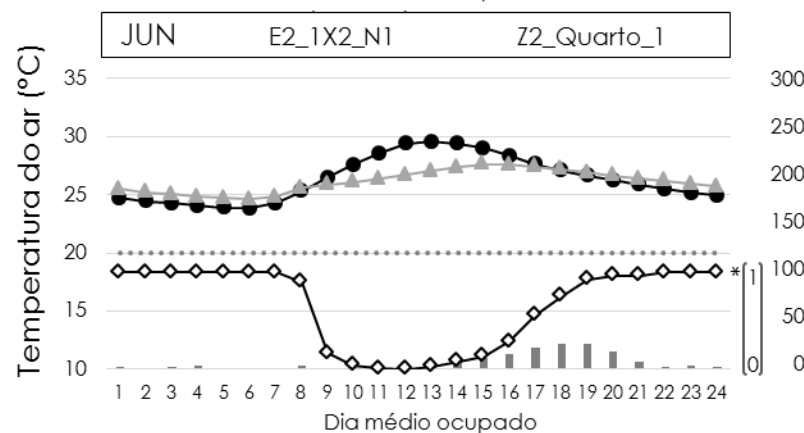
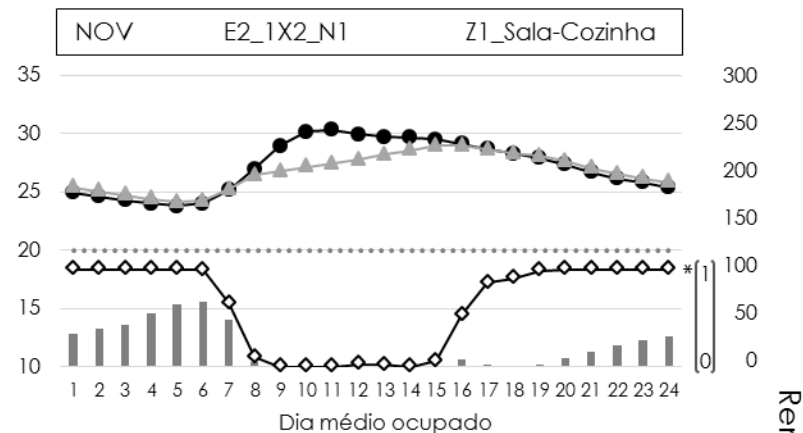
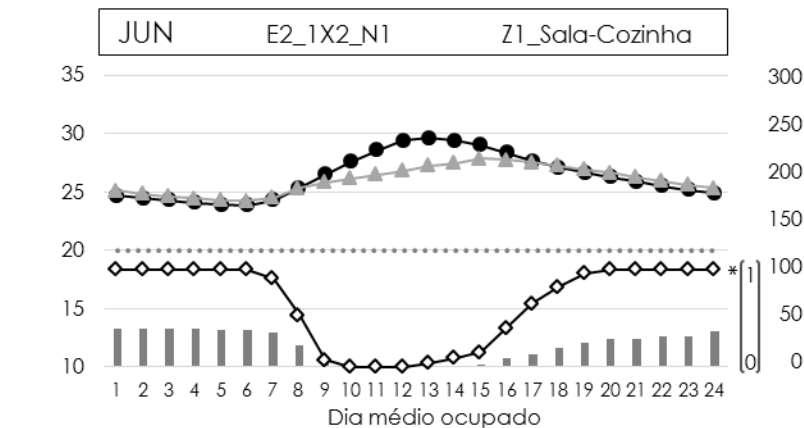
Renovações de ar por hora (ren/hora)

E1_1X2_N1



Renovações de ar por hora (ren/hora)

E2_1X2_N1



Renovações de ar por hora

Ti

* Fator de abertura (0-1)

Te

Tcontrole

Renovações de ar por hora

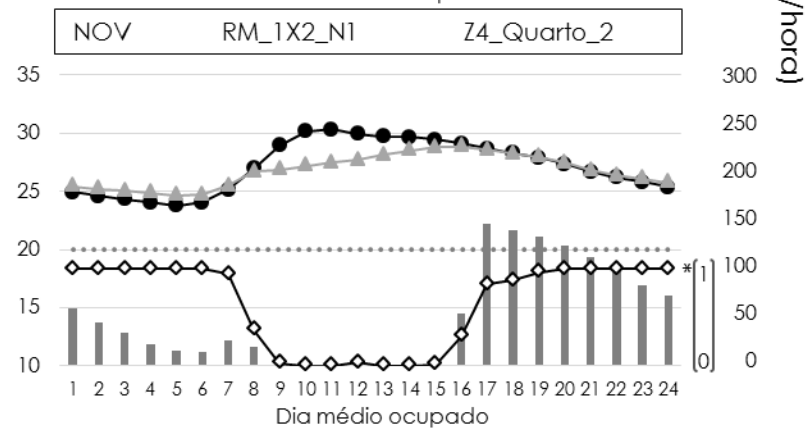
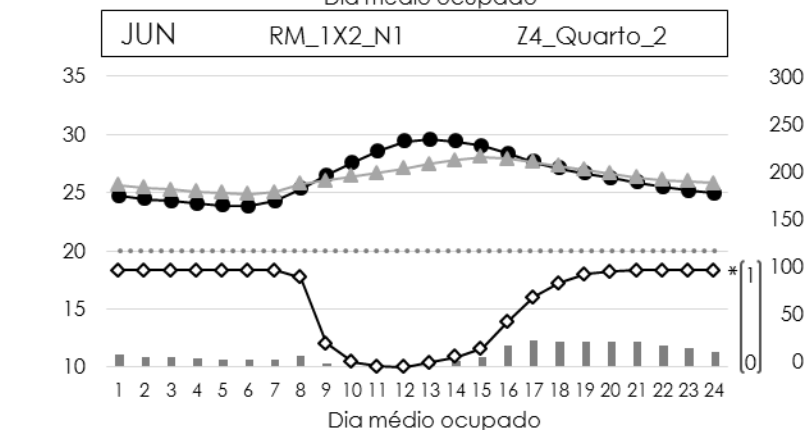
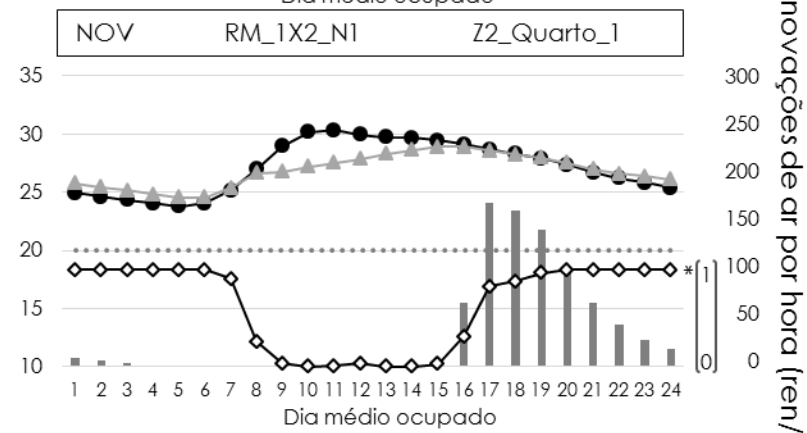
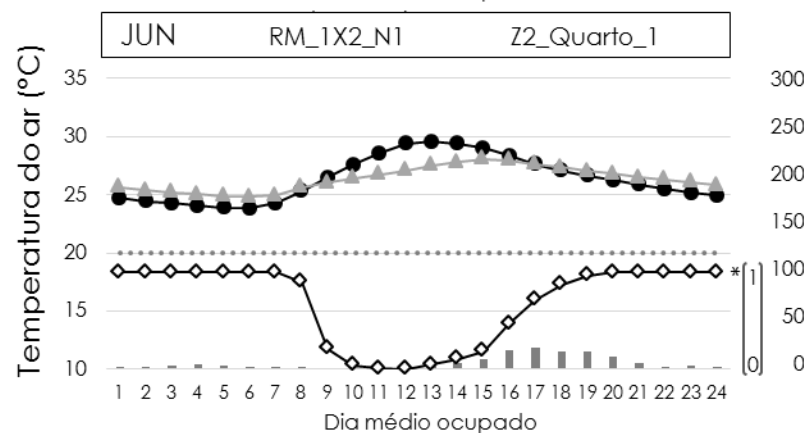
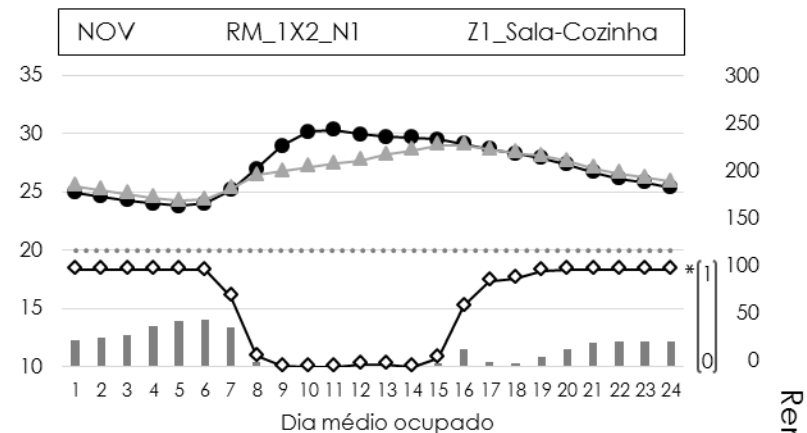
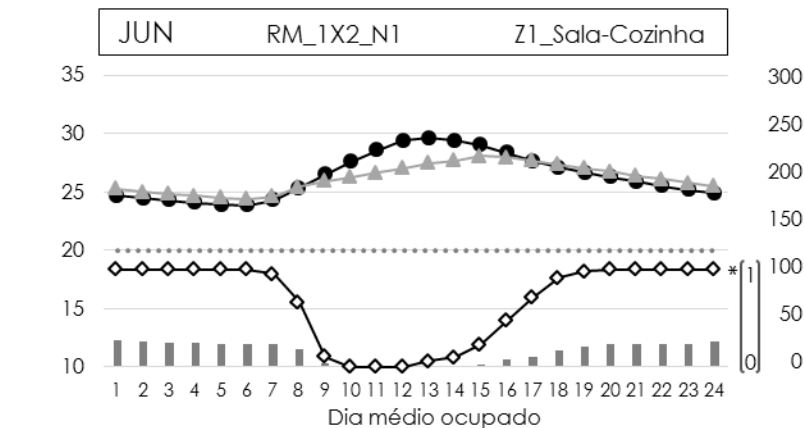
Ti

* Fator de abertura (0-1)

Te

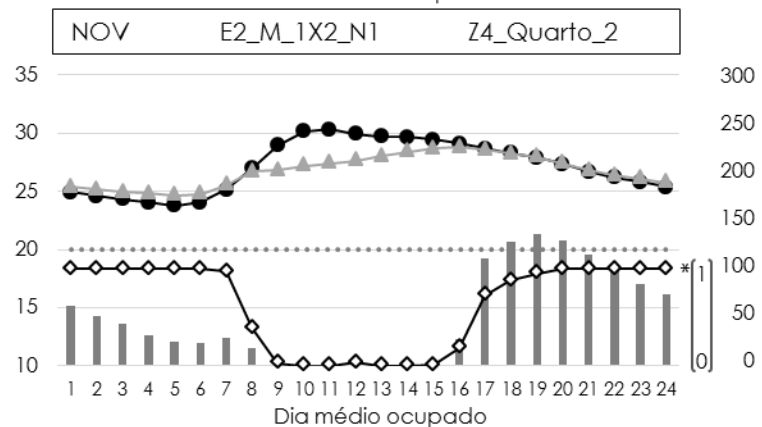
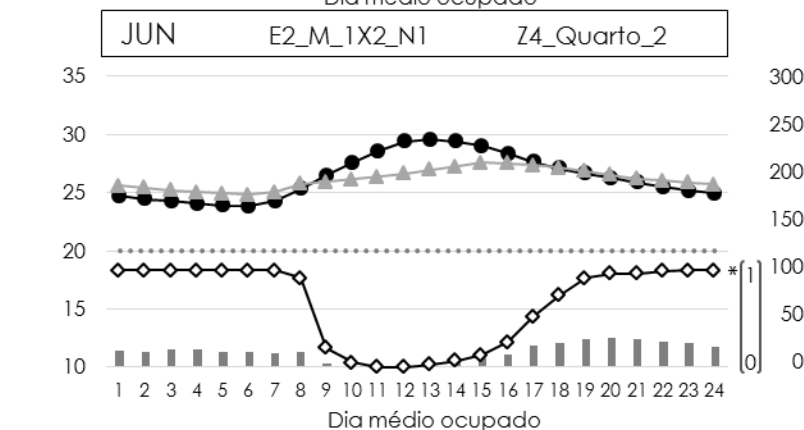
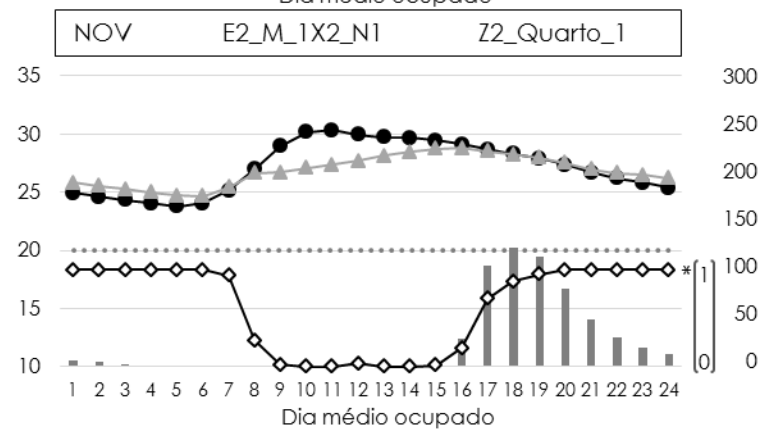
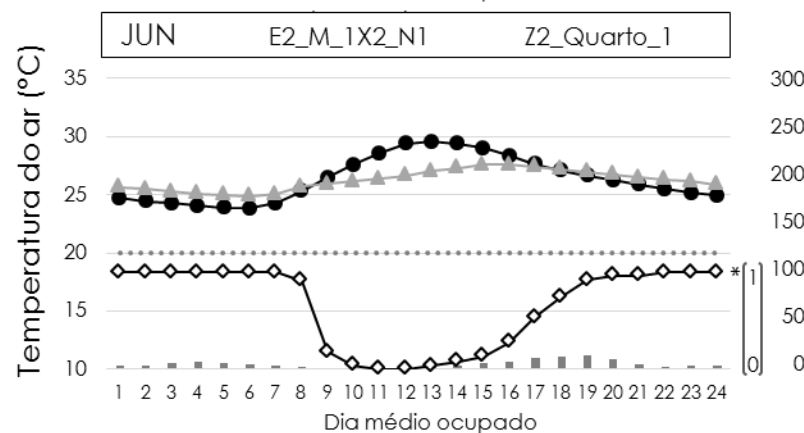
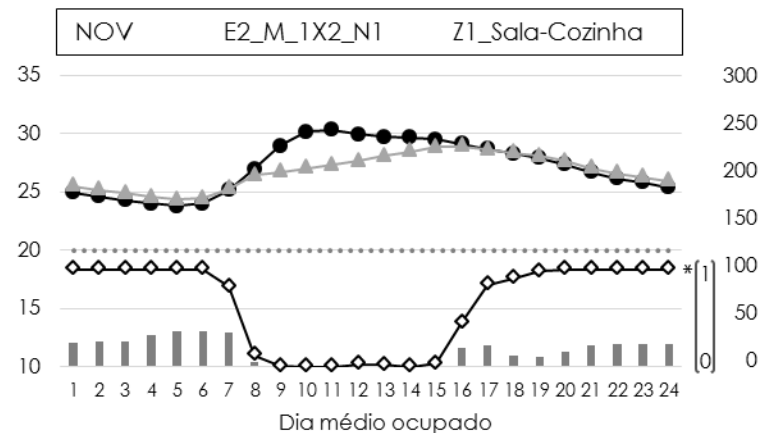
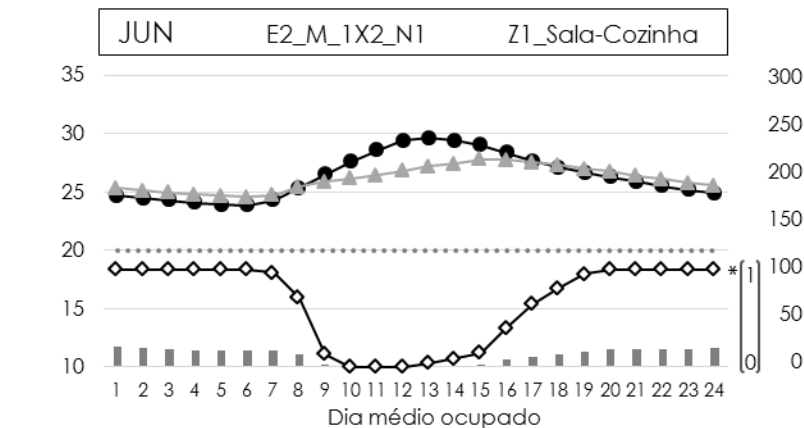
Tcontrole

RM_1X2_N1



Renovações de ar por hora (ren/hora)

E2_M_1X2_N1

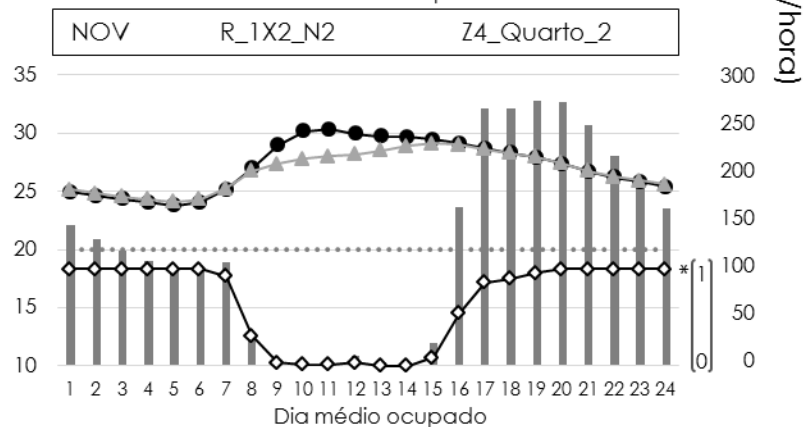
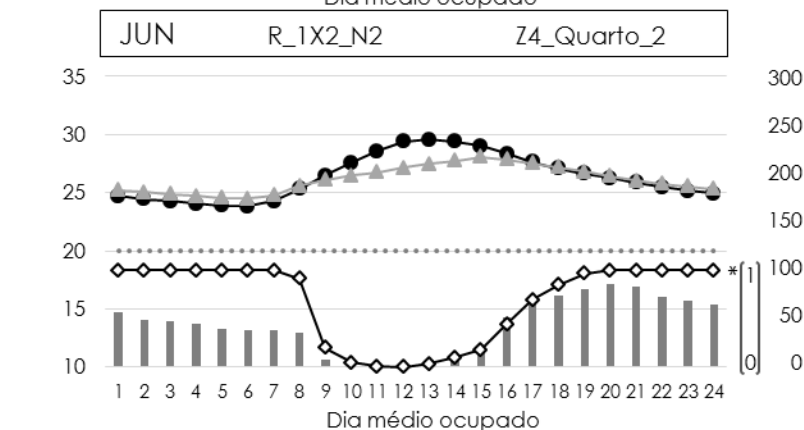
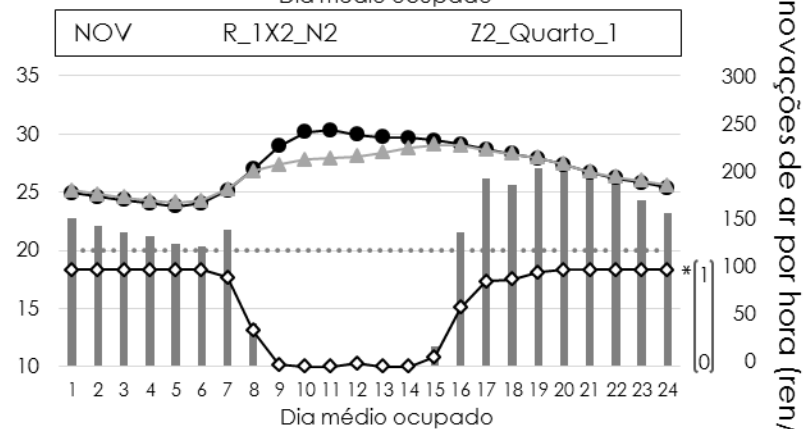
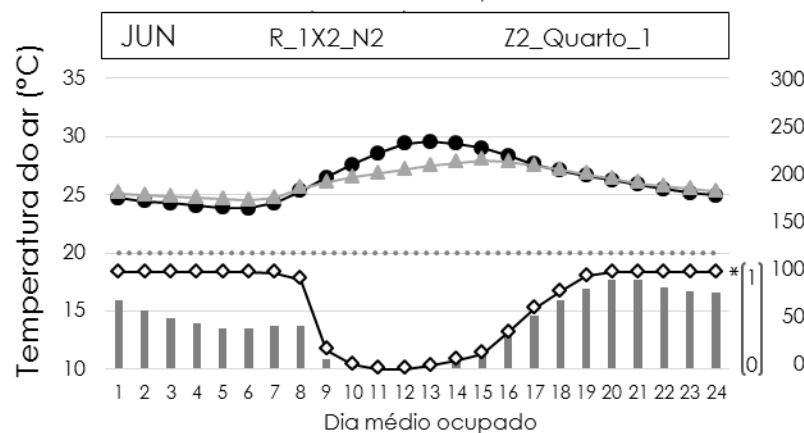
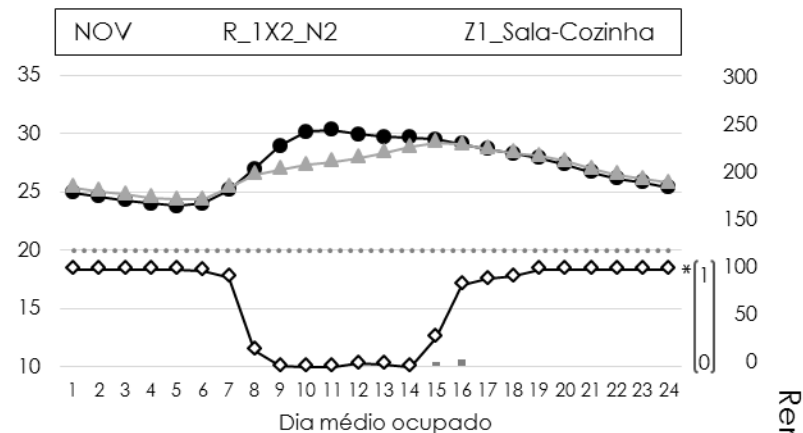
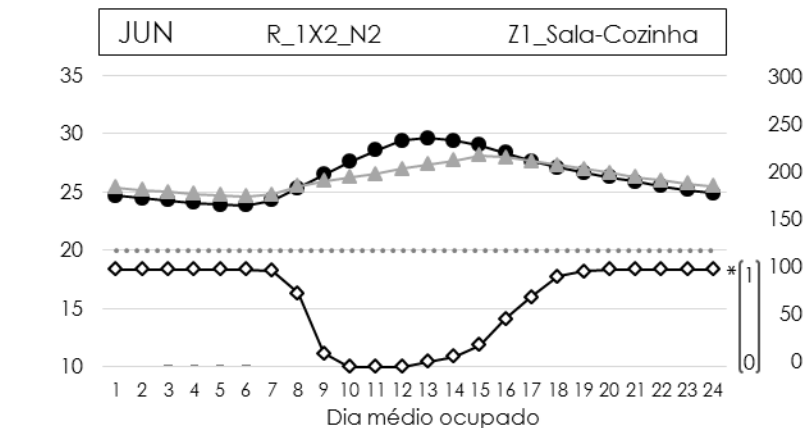


Renovações de ar por hora (ren/hora)

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrol

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrol

R_1X2_N2



Renovações de ar por hora

Ti

* Fator de abertura (0-1)

Te

Tcontrol

Renovações de ar por hora

Ti

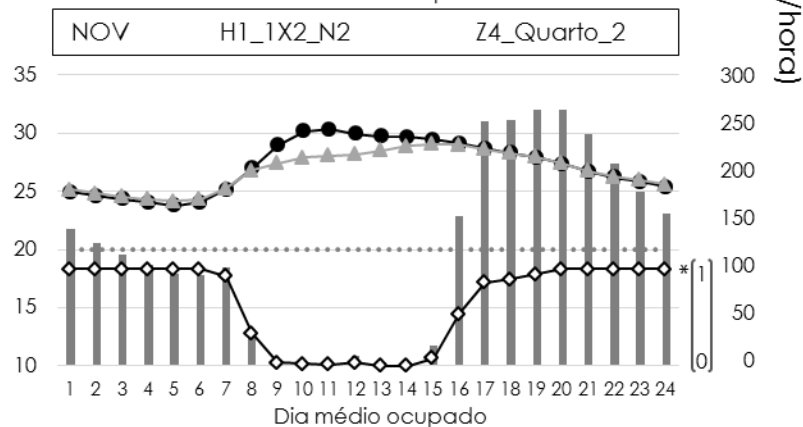
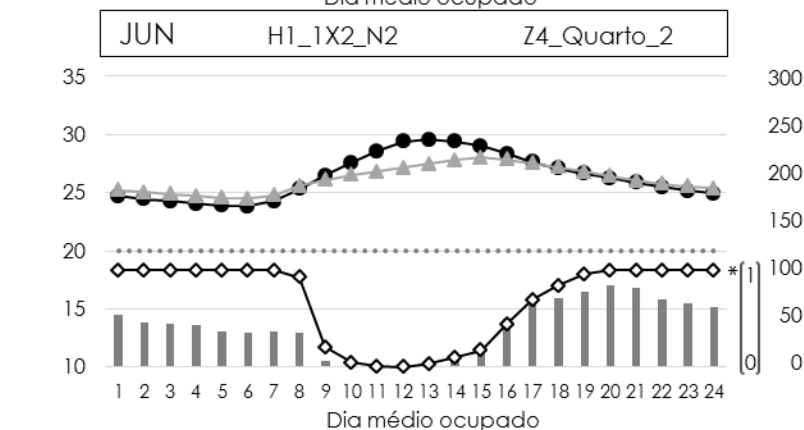
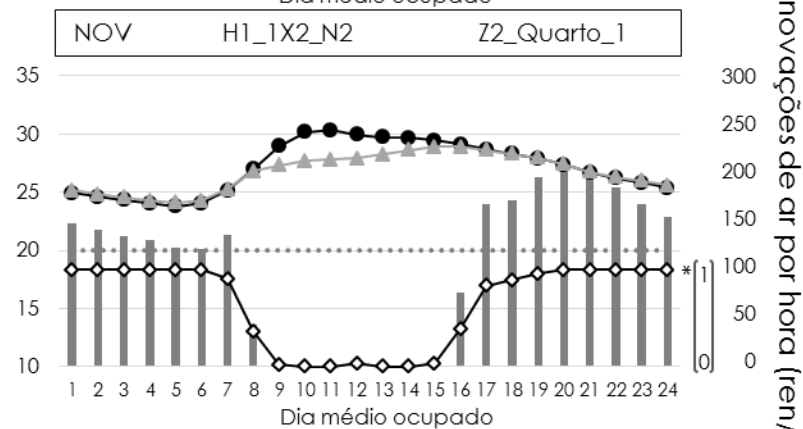
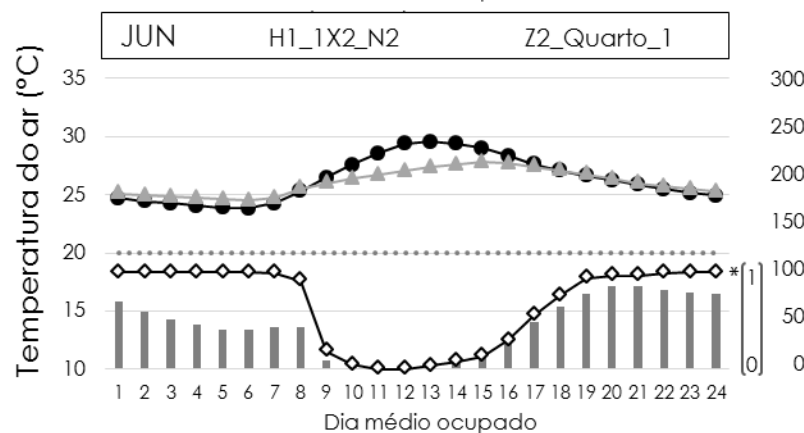
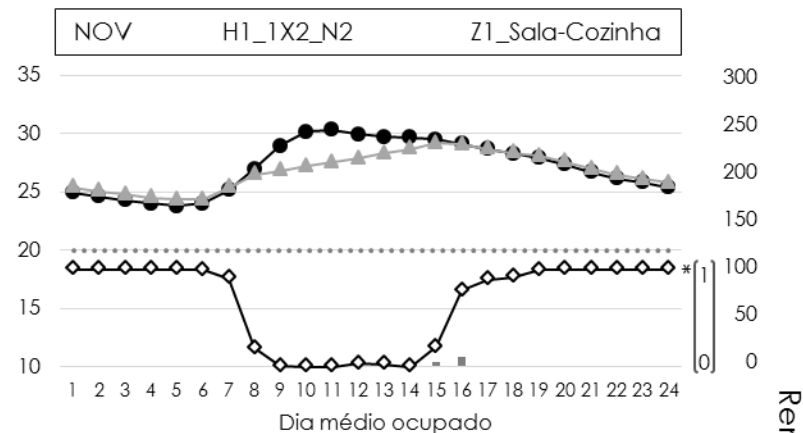
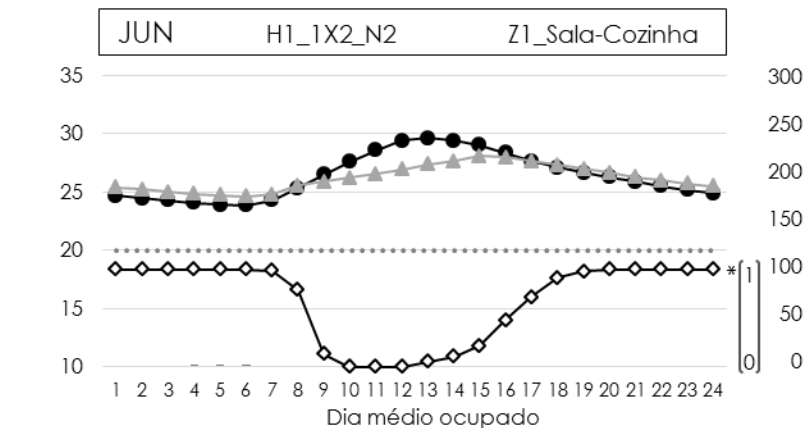
* Fator de abertura (0-1)

Te

Tcontrol

Renovações de ar por hora (ren/hora)

H1_1X2_N2



Renovações de ar por hora

Ti

* Fator de abertura (0-1)

Te

Tcontrol

Renovações de ar por hora

Ti

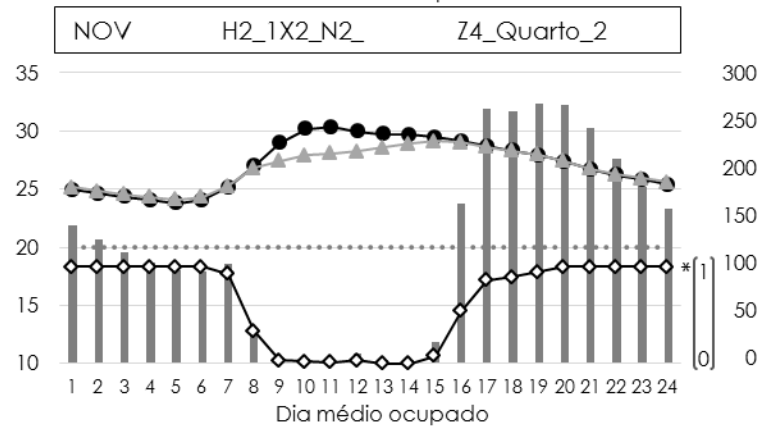
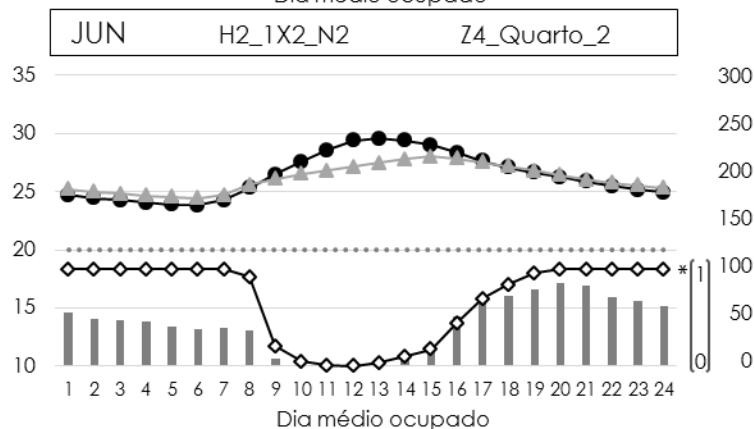
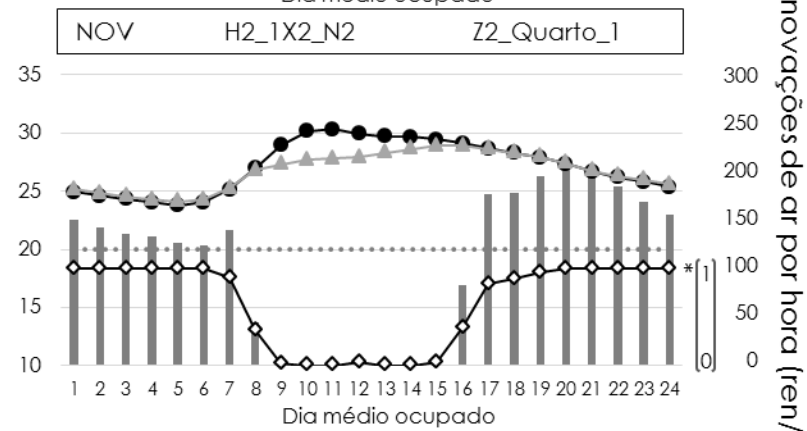
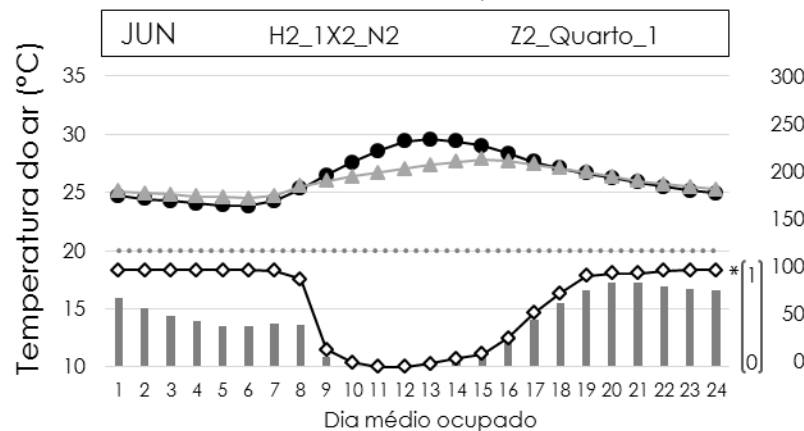
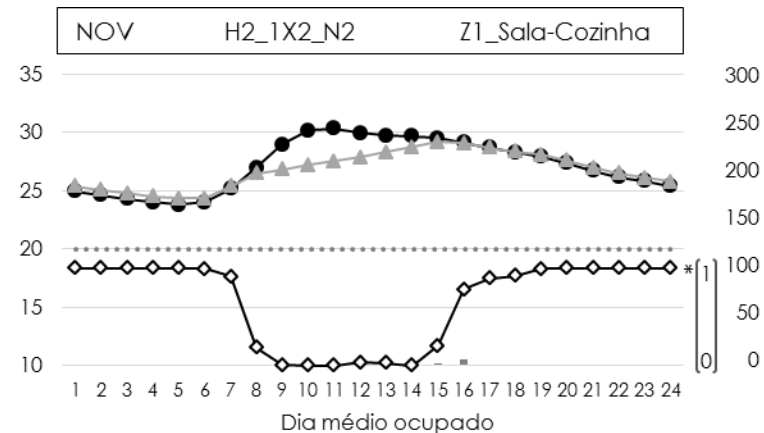
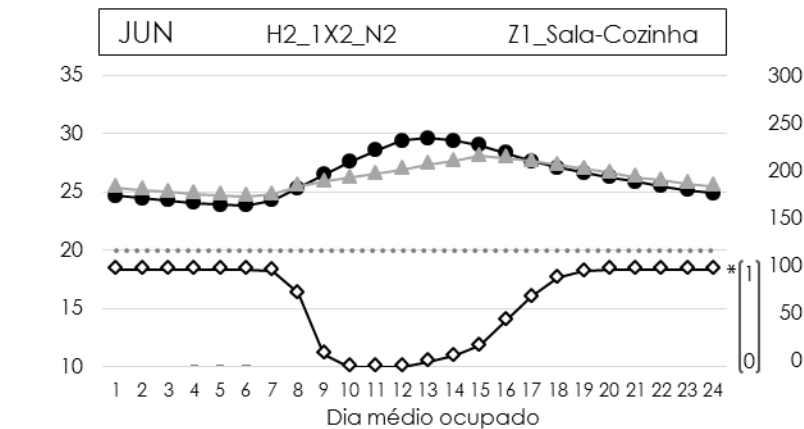
* Fator de abertura (0-1)

Te

Tcontrol

Renovações de ar por hora (ren/hora)

H2_1X2_N2



Renovações de ar por hora

Ti

* Fator de abertura (0-1)

Te

Tcontrol

Renovações de ar por hora

Ti

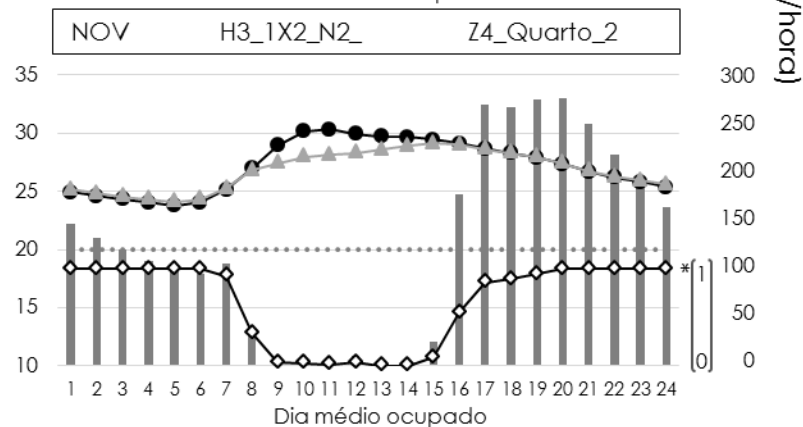
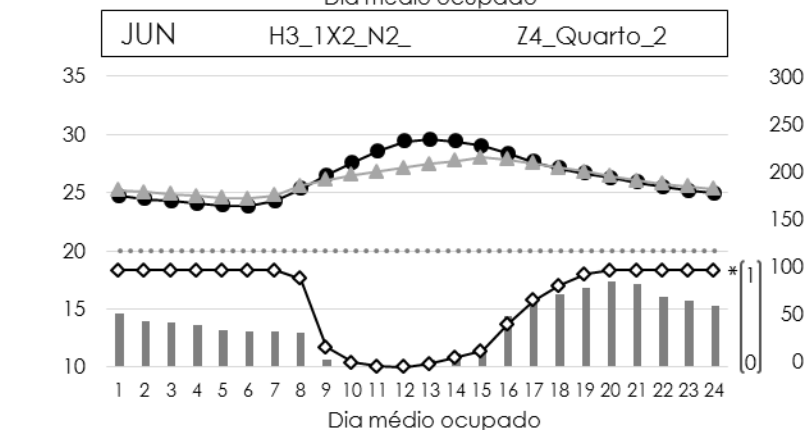
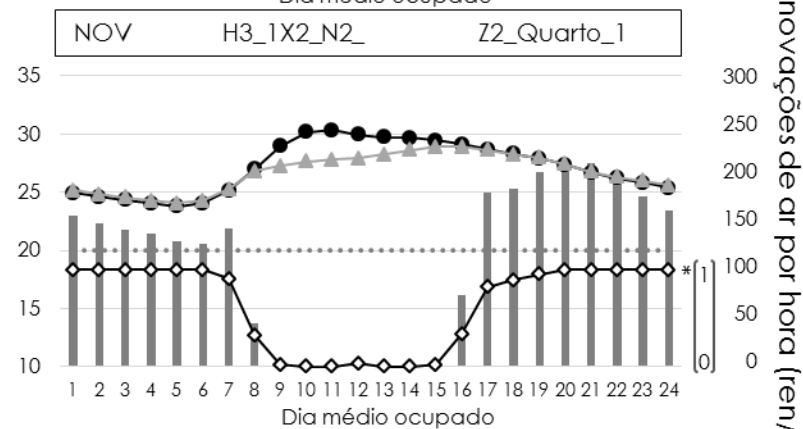
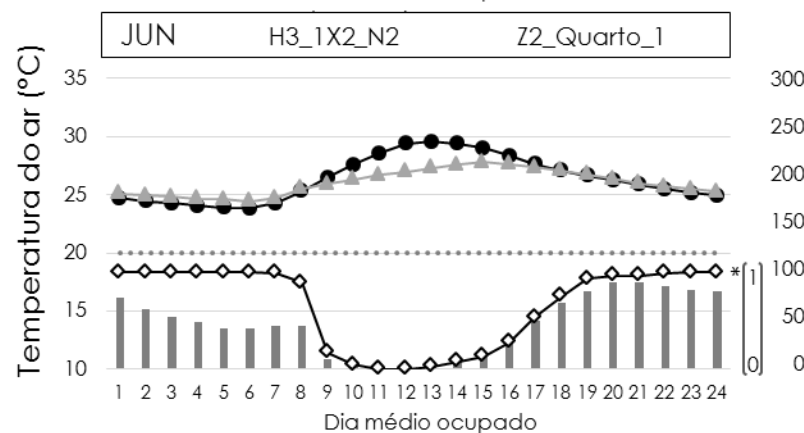
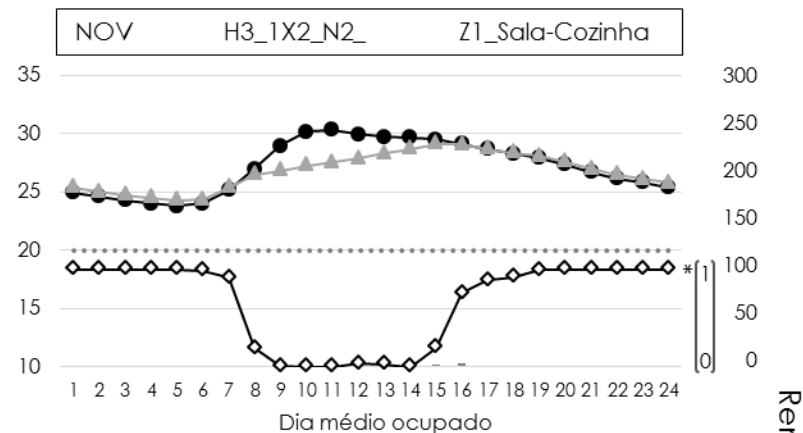
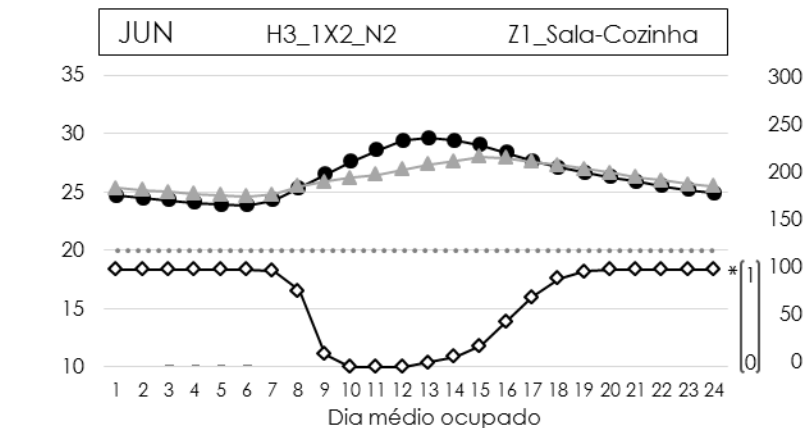
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Te

Tcontrol

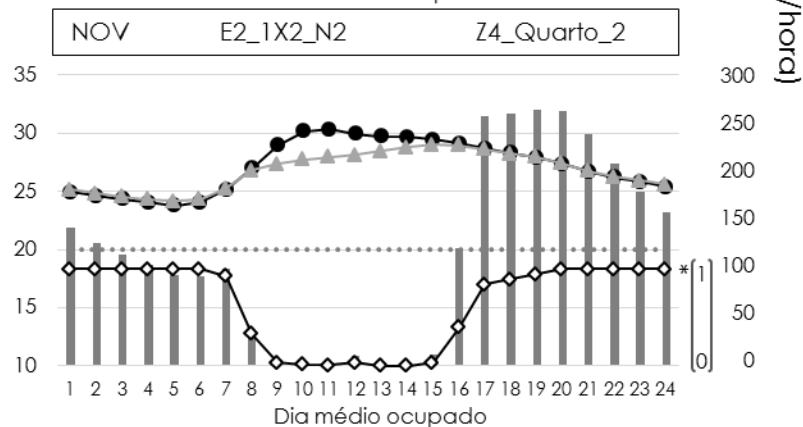
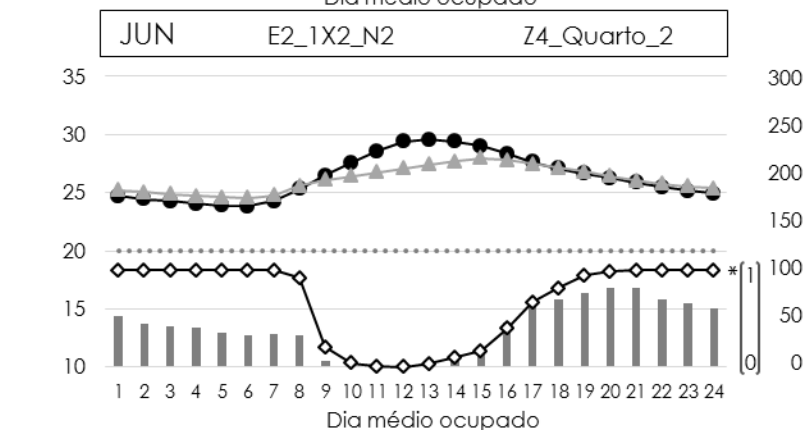
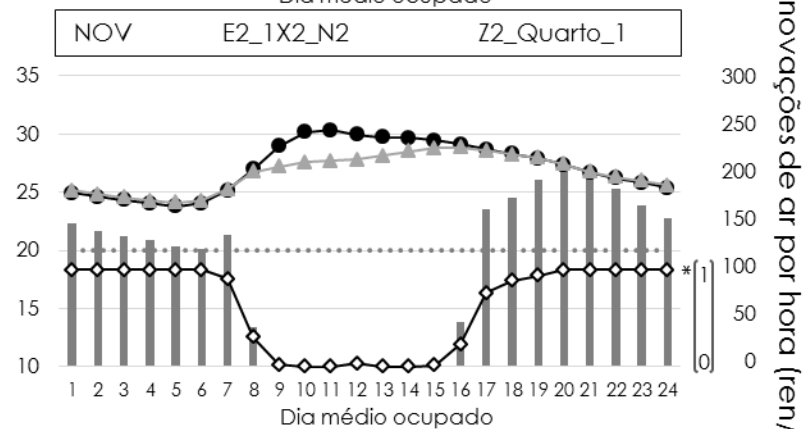
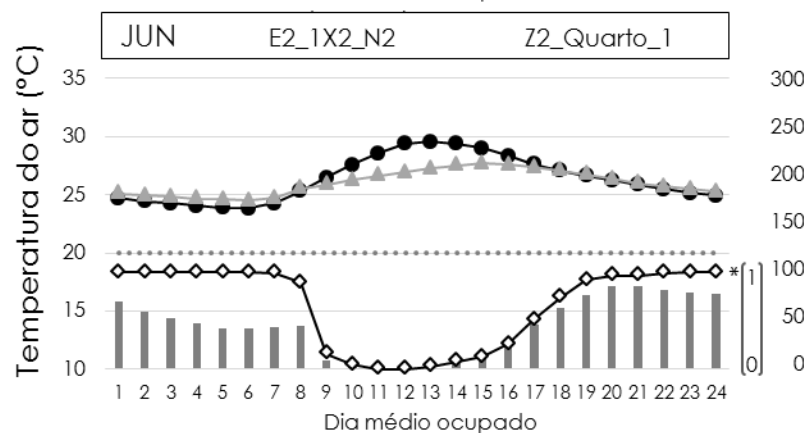
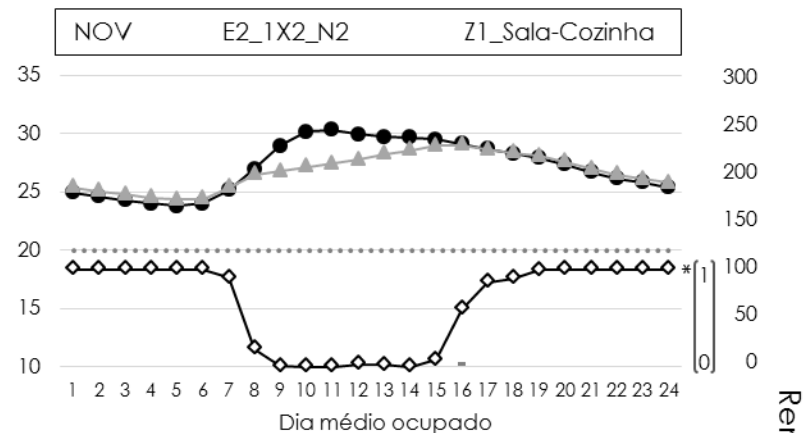
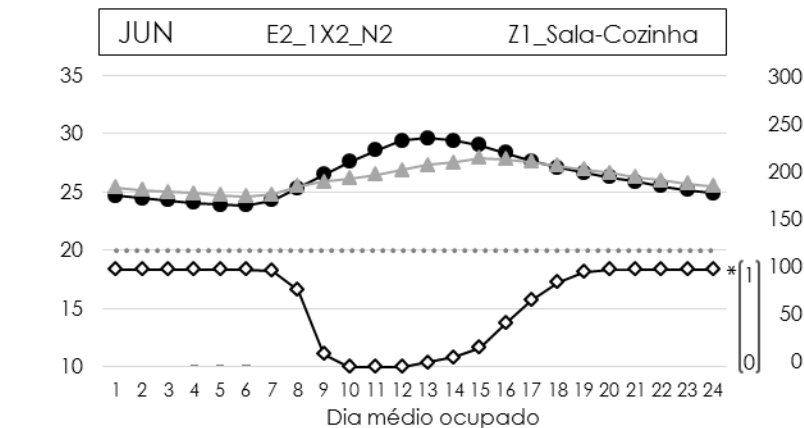
Renovações de ar por hora (ren/hora)

H3_1X2_N2



Renovações de ar por hora (ren/hora)

E2_1X2_N2



Renovações de ar por hora

Ti

* Fator de abertura (0-1)

Te

Tcontrol

Renovações de ar por hora

Ti

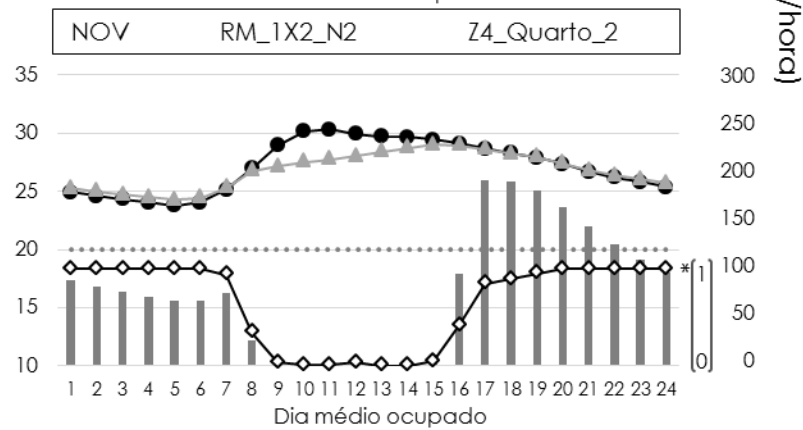
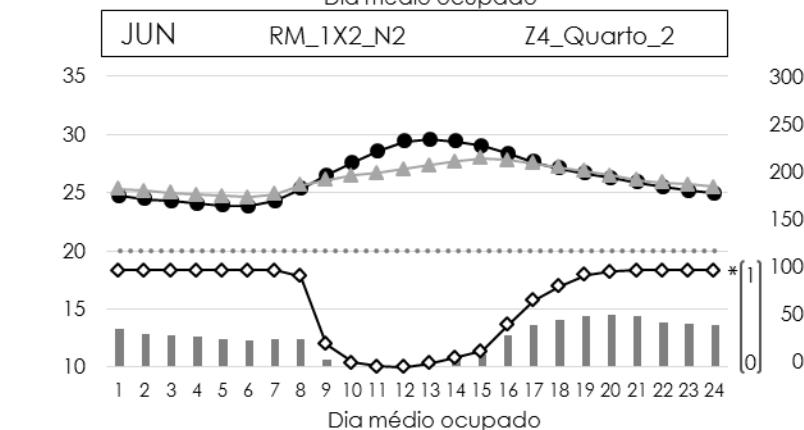
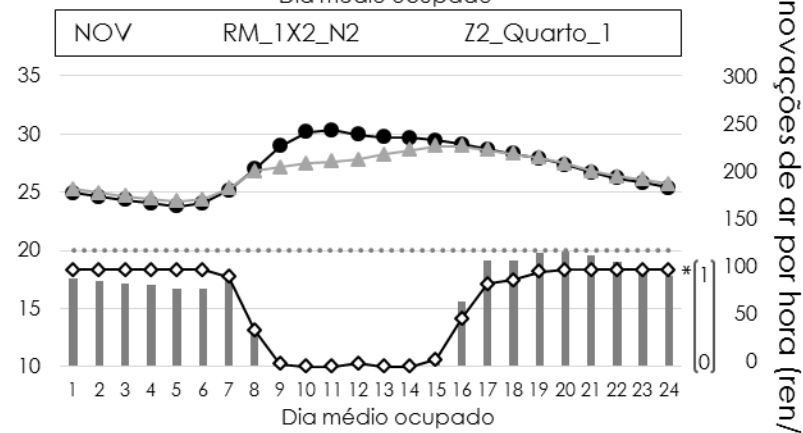
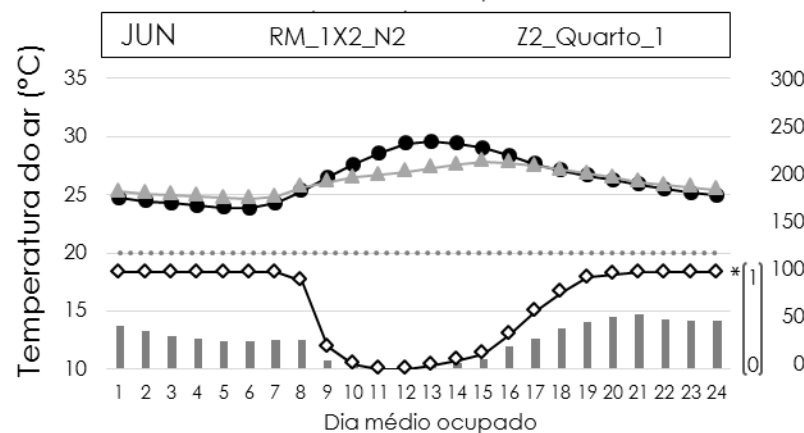
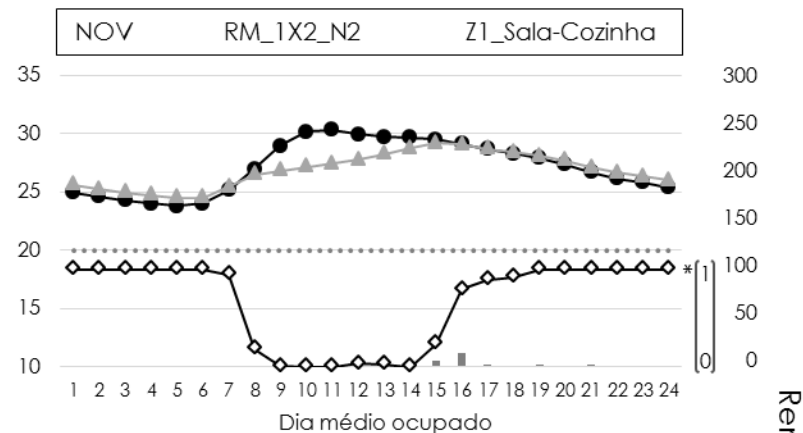
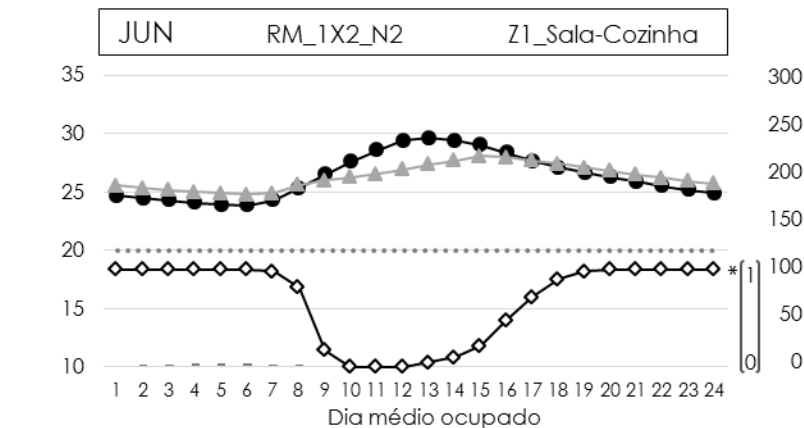
* Fator de abertura (0-1)

Te

Tcontrol

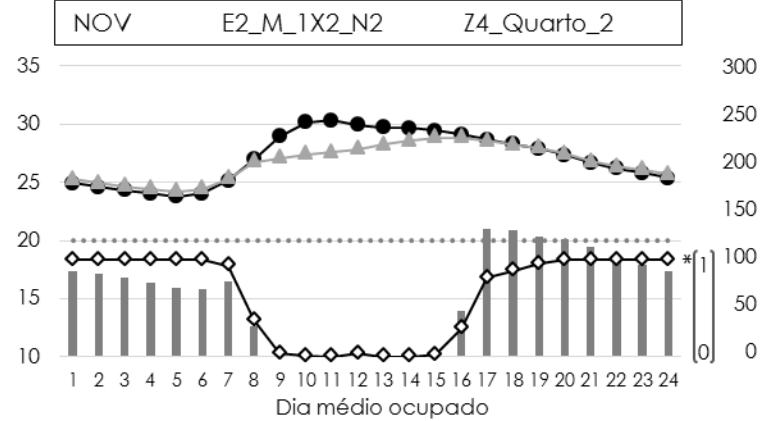
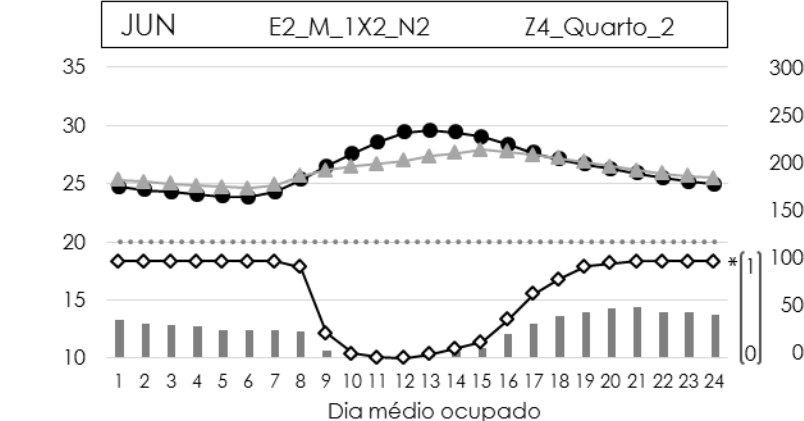
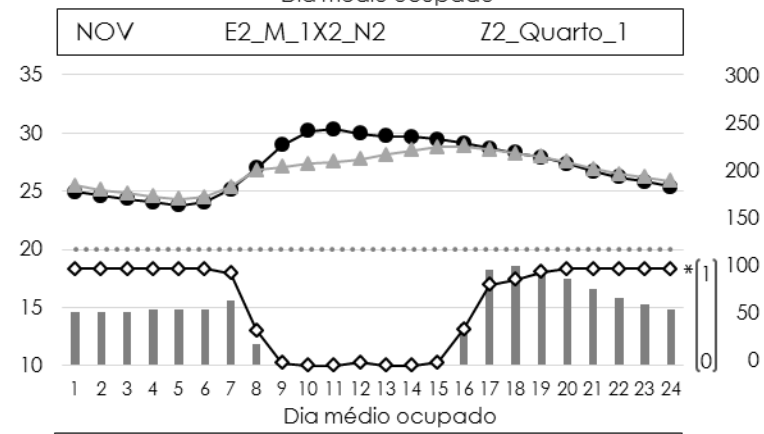
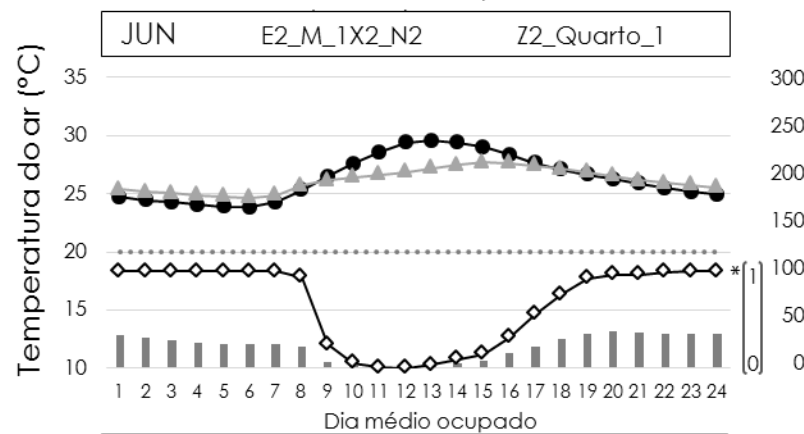
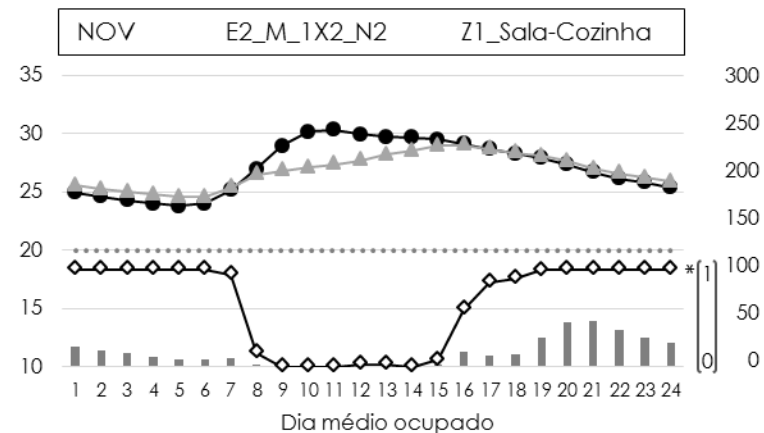
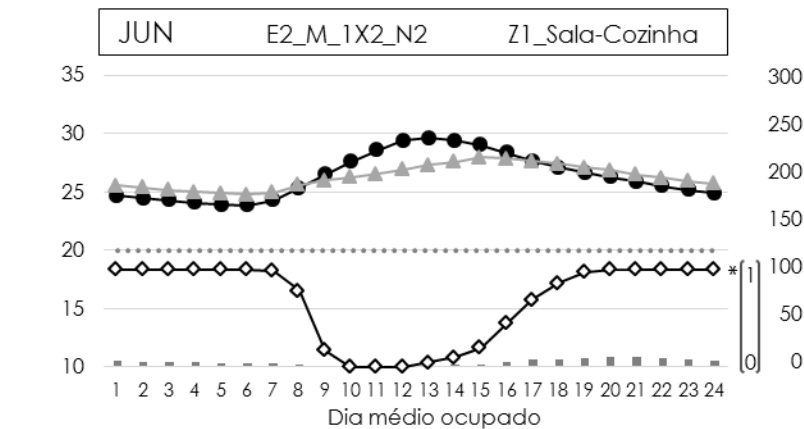
Renovações de ar por hora (ren/hora)

RM_1X2_N2



Renovações de ar por hora (ren/hora)

E2_M_1X2_N2



Renovações de ar por hora (ren/hora)

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

Renovações de ar por hora
Ti
* Fator de abertura (0-1)
Te
Tcontrole

COMPARAÇÃO ENTRE CADA CASO
DOS ÍNDICES DE CONFORTO
ASHRAE 55 COM ACEITAÇÃO DE 80%
PARA AS TRÊS ZONAS TÉRMICAS

1X1.2_N1

	Ch° Calor 80% Z1_ Sala- Cozinha	Ch° Frio 80% Z1_ Sala- Cozinha	Ch° Calor 80% Z2_Quarto_1	Ch° Frio 80% Z2_Quarto_1	Ch° Calor 80% Z4_Quarto_2	Ch° Frio 80% Z4_Quarto_2
R 1X1.2 N1	6.9	0.0	2.2	0.0	2.0	0.0
RM 1X1.2 N1	5.2	0.0	1.4	0.0	1.4	0.0
H1 1X1.2 N1	5.6	0.0	0.7	0.0	0.6	0.0
H2 1X1.2 N1	5.8	0.0	0.8	0.0	0.6	0.0
H3 1X1.2 N1	5.4	0.0	0.6	0.0	0.5	0.0
E1 1X1.2 N1	5.5	0.0	0.7	0.0	0.7	0.0
E2 1X1.2 N1	4.6	0.0	0.5	0.0	0.3	0.0
E2 M 1X1.2 N1	3.5	0.0	0.1	0.0	0.1	0.0

1X1.2_N2

	Ch° Calor 80% Z1_ Sala- Cozinha	Ch° Frio 80% Z1_ Sala- Cozinha	Ch° Calor 80% Z2_Quarto_1	Ch° Frio 80% Z2_Quarto_1	Ch° Calor 80% Z4_Quarto_2	Ch° Frio 80% Z4_Quarto_2
R 1X1.2 N2	23.7	0.0	3.2	0.0	4.9	0.0
RM 1X1.2 N2	19.0	0.0	1.2	0.0	2.4	0.0
H1 1X1.2 N2	17.3	0.0	2.8	0.0	4.6	0.0
H2 1X1.2 N2	16.9	0.0	0.9	0.0	4.5	0.0
H3 1X1.2 N2	17.3	0.0	3.3	0.0	5.1	0.0
E2 1X1.2 N2	4.5	0.0	0.1	0.0	0.4	0.0
E2 M 1X1.2 N2	3.0	0.0	0.0	0.0	0.2	0.0

1X1.6_N1

	Ch° Calor 80% Z1_ Sala- Cozinha	Ch° Frio 80% Z1_ Sala- Cozinha	Ch° Calor 80% Z2_Quarto_1	Ch° Frio 80% Z2_Quarto_1	Ch° Calor 80% Z4_Quarto_2	Ch° Frio 80% Z4_Quarto_2
R 1X1.6 N1	10.0	0.0	5.1	0.0	4.8	0.0
RM 1X1.6 N1	7.4	0.0	3.4	0.0	3.2	0.0
H1 1X1.6 N1	7.6	0.0	1.8	0.0	1.4	0.0
H2 1X1.6 N1	7.9	0.0	2.0	0.0	1.7	0.0
H3 1X1.6 N1	7.5	0.0	1.7	0.0	1.3	0.0
E1 1X1.6 N1	7.2	0.0	1.5	0.0	1.4	0.0
E2 1X1.6 N1	6.5	0.0	1.4	0.0	1.0	0.0
E2 M 1X1.6 N1	4.6	0.0	0.5	0.0	0.4	0.0

1X1.6_N2

	Ch° Calor 80% Z1_ Sala- Cozinha	Ch° Frio 80% Z1_ Sala- Cozinha	Ch° Calor 80% Z2_Quarto_1	Ch° Frio 80% Z2_Quarto_1	Ch° Calor 80% Z4_Quarto_2	Ch° Frio 80% Z4_Quarto_2
R 1X1.6 N2	34.2	0.0	8.5	0.0	10.9	0.0
RM 1X1.6 N2	27.3	0.0	3.8	0.0	5.6	0.0
H1 1X1.6 N2	17.8	0.0	2.6	0.0	4.1	0.0
H2 1X1.6 N2	25.7	0.0	8.3	0.0	10.7	0.0
H3 1X1.6 N2	20.6	0.0	2.9	0.0	10.6	0.0
E2 1X1.6 N2	6.9	0.0	0.9	0.0	1.9	0.0
E2 M 1X1.6 N2	4.3	0.0	0.1	0.0	0.4	0.0

1X2_N1

	Ch° Calor 80% Z1_ Sala- Cozinha	Ch° Frio 80% Z1_ Sala- Cozinha	Ch° Calor 80% Z2_Quarto_1	Ch° Frio 80% Z2_Quarto_1	Ch° Calor 80% Z4_Quarto_2	Ch° Frio 80% Z4_Quarto_2
R 1X2 N1	14.0	0.0	9.4	0.0	9.1	0.0
RM 1X2 N1	10.0	0.0	6.1	0.0	5.9	0.0
H1 1X2 N1	10.1	0.0	3.5	0.0	3.2	0.0
H2 1X2 N1	10.7	0.0	4.0	0.0	3.7	0.0
H3 1X2 N1	10.0	0.0	3.4	0.0	3.1	0.0
E1 1X2 N1	9.1	0.0	2.7	0.0	2.7	0.0
E2 1X2 N1	8.8	0.0	2.9	0.0	2.4	0.0
E2 M 1X2 N1	6.1	0.0	1.2	0.0	1.1	0.0

1X2_N2

	Ch° Calor 80% Z1_ Sala- Cozinha	Ch° Frio 80% Z1_ Sala- Cozinha	Ch° Calor 80% Z2_Quarto_1	Ch° Frio 80% Z2_Quarto_1	Ch° Calor 80% Z4_Quarto_2	Ch° Frio 80% Z4_Quarto_2
R 1X2 N2	47.7	0.0	15.8	0.0	18.8	0.0
RM 1X2 N2	37.5	0.0	7.9	0.0	10.6	0.0
H1 1X2 N2	30.2	0.0	7.7	0.0	17.3	0.0
H2 1X2 N2	30.2	0.0	7.9	0.0	17.4	0.0
H3 1X2 N2	26.9	0.0	6.6	0.0	18.0	0.0
E2 1X2 N2	10.8	0.0	3.2	0.0	10.3	0.0
E2 M 1X2 N2	9.4	0.0	3.1	0.0	5.3	0.0

COMPARAÇÃO ENTRE CADA CASO
DOS ÍNDICES DE CONFORTO
ASHRAE 55 COM ACEITAÇÃO DE 90%
PARA AS TRÊS ZONAS TÉRMICAS

1X1.2_N1

	Ch° Calor 90% Z1_ Sala- Cozinha	Ch° Frio 90% Z1_ Sala- Cozinha	Ch° Calor 90% Z2_Quarto_1	Ch° Frio 90% Z2_Quarto_1	Ch° Calor 90% Z4_Quarto_2	Ch° Frio 90% Z4_Quarto_2
R 1X1.2 N1	395.6	-5.8	274.5	-0.6	260.4	-0.4
RM 1X1.2 N1	369.4	-2.3	238.5	0.0	231.9	0.0
H1 1X1.2 N1	357.6	-5.6	220.1	-0.5	209.7	-0.3
H2 1X1.2 N1	362.3	-5.7	226.9	-0.5	215.2	-0.3
H3 1X1.2 N1	355.2	-6.0	217.8	-0.6	205.9	-0.5
E1 1X1.2 N1	359.7	-5.6	223.5	-0.5	217.9	-0.2
E2 1X1.2 N1	319.4	-5.3	201.6	-0.4	189.6	-0.3
E2 M 1X1.2 N1	302.2	-0.6	173.2	0.0	167.5	0.0

1X1.2_N2

	Ch° Calor 90% Z1_Sala- Cozinha	Ch° Frio 90% Z1_Sala- Cozinha	Ch° Calor 90% Z2_Quarto_1	Ch° Frio 90% Z2_Quarto_1	Ch° Calor 90% Z4_Quarto_2	Ch° Frio 90% Z4_Quarto_2
R 1X1.2 N2	551.6	-1.4	305.7	-2.1	316.3	-1.4
RM 1X1.2 N2	518.5	-0.2	265.4	-0.7	272.1	-0.4
H1 1X1.2 N2	496.6	-1.4	297.6	-2.1	313.1	-1.2
H2 1X1.2 N2	489.7	-1.5	237.0	-2.1	311.2	-1.3
H3 1X1.2 N2	495.9	-1.4	308.3	-2.1	321.1	-1.2
E2 1X1.2 N2	323.1	-1.0	178.4	-2.1	185.2	-1.0
E2 M 1X1.2 N2	300.1	0.0	153.2	-0.2	151.3	-0.2

1X1.6_N1

	Ch° Calor 90% Z1_ Sala- Cozinha	Ch° Frio 90% Z1_ Sala- Cozinha	Ch° Calor 90% Z2_Quarto_1	Ch° Frio 90% Z2_Quarto_1	Ch° Calor 90% Z4_Quarto_2	Ch° Frio 90% Z4_Quarto_2
R 1X1.6 N1	447.1	-6.6	356.9	-1.2	333.7	-1.0
RM 1X1.6 N1	409.7	-3.1	300.6	-0.2	289.4	0.0
H1 1X1.6 N1	393.4	-6.5	271.4	-1.1	253.3	-0.8
H2 1X1.6 N1	400.7	-6.7	281.8	-1.2	262.7	-0.9
H3 1X1.6 N1	390.3	-6.9	268.0	-1.3	248.2	-1.1
E1 1X1.6 N1	385.0	-6.3	260.5	-1.1	251.0	-0.7
E2 1X1.6 N1	352.7	-6.2	248.4	-0.9	229.2	-0.8
E2 M 1X1.6 N1	324.2	-1.1	201.9	0.0	196.0	0.0

1X1.6_N2

	Ch° Calor 90% Z1_Sala- Cozinha	Ch° Frio 90% Z1_Sala- Cozinha	Ch° Calor 90% Z2_Quarto_1	Ch° Frio 90% Z2_Quarto_1	Ch° Calor 90% Z4_Quarto_2	Ch° Frio 90% Z4_Quarto_2
R 1X1.6 N2	637.2	-2.0	398.0	-2.7	413.9	-1.9
RM 1X1.6 N2	589.7	-0.4	334.5	-1.4	347.8	-0.9
H1 1X1.6 N2	496.3	-1.8	277.5	-2.7	290.7	-1.7
H2 1X1.6 N2	573.4	-1.9	398.6	-2.6	416.1	-1.7
H3 1X1.6 N2	526.0	-2.2	278.0	-2.7	412.9	-1.7
E2 1X1.6 N2	361.7	-1.6	223.9	-2.7	234.8	-1.5
E2 M 1X1.6 N2	324.4	-0.1	180.3	-0.8	180.7	-0.9

1X2_N1

	Ch° Calor 90% Z1_ Sala- Cozinha	Ch° Frio 90% Z1_ Sala- Cozinha	Ch° Calor 90% Z2_Quarto_1	Ch° Frio 90% Z2_Quarto_1	Ch° Calor 90% Z4_Quarto_2	Ch° Frio 90% Z4_Quarto_2
R 1X2 N1	502.3	-7.2	450.5	-1.7	418.9	-1.5
RM 1X2 N1	454.1	-3.8	374.8	-0.4	357.3	-0.1
H1 1X2 N1	432.4	-7.1	329.1	-1.6	303.0	-1.3
H2 1X2 N1	442.1	-7.3	344.2	-1.7	316.1	-1.5
H3 1X2 N1	428.9	-7.5	324.2	-1.8	296.1	-1.6
E1 1X2 N1	414.4	-7.0	302.5	-1.6	287.9	-1.3
E2 1X2 N1	389.3	-6.8	302.2	-1.5	274.6	-1.3
E2 M 1X2 N1	349.8	-1.6	235.2	0.0	230.1	0.0

1X2_N2

	Ch° Calor 90% Z1_Sala- Cozinha	Ch° Frio 90% Z1_Sala- Cozinha	Ch° Calor 90% Z2_Quarto_1	Ch° Frio 90% Z2_Quarto_1	Ch° Calor 90% Z4_Quarto_2	Ch° Frio 90% Z4_Quarto_2
R 1X2 N2	728.3	-2.4	503.5	-3.1	521.2	-2.2
RM 1X2 N2	666.8	-0.8	414.9	-1.8	432.3	-1.4
H1 1X2 N2	608.0	-2.4	368.0	-3.1	510.1	-2.1
H2 1X2 N2	608.1	-2.6	370.4	-3.1	512.4	-2.3
H3 1X2 N2	581.7	-2.7	341.2	-3.2	521.5	-2.1
E2 1X2 N2	421.2	-2.2	272.8	-3.1	405.7	-1.9
E2 M 1X2 N2	412.9	-0.3	328.0	-1.4	344.5	-1.3