Atlanta_Eff_ExtrmSum_RB_2004_TypOcc_TypBehav_NoTES_05052022_111704_Pass

Pass

24-Jul-2024

Commuication delay: Pass (evaluated period: 6:01-20:00)
Maximum delay: 20 sec
Average delay: 10.0119 sec

Simulation data completeness: Pass
SimData: 1441
Measurements: 1441
OccupantMatrix: 1441
SupvCtrlSig: 1441
EPlusOutput: 2880

Hardware missing data: Pass
processData2 random missing: Pass
processData2 continuous missing: Pass
scaledData2 random missing: Pass
scaledData2 continuous missing: Pass
rawData2 random missing: Pass
rawData2 continuous missing: Pass

Emulation accuracy: Pass (evaluated period: 6:15 - 19:59)

z1_ahu1 temperature emulation accuracy: Pass
Criteria: RMSE <= 0.56 °C
RMSE: 0.043473 °C
NRMSE: 0.0018404
Simulated Mean: 23.6213 °C
Emulated Mean: 23.6196 °C

z2_ahu1 temperature emulation accuracy: Pass
Criteria: RMSE <= 0.56 °C
RMSE: 0.078442 °C
NRMSE: 0.0031073
Simulated Mean: 25.2449 °C

Emulated Mean: 25.2428 °C

z1_ahu2 temperature emulation accuracy: Pass
Criteria: RMSE <= 0.56 °C
RMSE: 0.088317 °C
NRMSE: 0.0035432
Simulated Mean: 24.9256 °C
Emulated Mean: 24.9245 °C

z2_ahu2 temperature emulation accuracy: Pass
Criteria: RMSE <= 0.56 °C
RMSE: 0.1198 °C
NRMSE: 0.0046749
Simulated Mean: 25.6271 °C
Emulated Mean: 25.6311 °C

Outdoor air temperature emulation accuracy: Pass
Criteria: RMSE <= 0.56 °C
RMSE: 0.074742 °C
NRMSE: 0.0023072
Simulated Mean: 32.3952 °C
Emulated Mean: 32.3943 °C

z1_ahu1 humidity ratio emulation accuracy: Pass
Criteria: RMSE <= 0.001 kg/kg
RMSE: 0.00015672 kg/kg
NRMSE: 0.016489
Simulated Mean: 0.0095044 kg/kg
Emulated Mean: 0.0095121 kg/kg

z2_ahu1 humidity ratio emulation accuracy: Pass
Criteria: RMSE <= 0.001 kg/kg
RMSE: 0.00021394 kg/kg
NRMSE: 0.02323
Simulated Mean: 0.0092095 kg/kg
Emulated Mean: 0.0092596 kg/kg

z1_ahu2 humidity ratio emulation accuracy: Pass
Criteria: RMSE <= 0.001 kg/kg
RMSE: 0.00020998 kg/kg
NRMSE: 0.023526
Simulated Mean: 0.0089257 kg/kg
Emulated Mean: 0.0089433 kg/kg

z2_ahu2 humidity ratio emulation accuracy: Pass
Criteria: RMSE <= 0.001 kg/kg

RMSE: 0.00021639 kg/kg
NRMSE: 0.023639
Simulated Mean: 0.0091541 kg/kg
Emulated Mean: 0.0091603 kg/kg

Outdoor air relative humidity accuracy: Pass
Criteria: % of timesteps with emulated relative humidity outside the 10%RH range of the simulated relative humidity <= 10%
Result: % of timesteps with emulated relative humidity outside the 10%RH range of the simulated relative humidity = 0%
RMSE: 0.51088 %RH
NRMSE: 0.010076
Simulated Mean: 50.7003 %RH
Emulated Mean: 50.6952 %RH

z1_ahu1 sensible load emulation accuracy: Pass
RMSE: 21.6468 W
NRMSE: 0.008106
Simulated Mean: 2670.4675 W
Emulated Mean: 2673.4283 W

z2_ahu1 sensible load emulation accuracy: Pass
RMSE: 12.9238 W
NRMSE: 0.0088855
Simulated Mean: 1454.4833 W
Emulated Mean: 1455.0495 W

z1_ahu2 sensible load emulation accuracy: Pass
RMSE: 23.7481 W
NRMSE: 0.017304
Simulated Mean: 1372.4025 W
Emulated Mean: 1374.113 W

z2_ahu2 sensible load emulation accuracy: Pass
RMSE: 39.518 W
NRMSE: 0.01002
Simulated Mean: 3943.9479 W
Emulated Mean: 3946.7592 W

z1_ahu1 latent load emulation accuracy: Pass
RMSE: 136.0286 W
NRMSE: 0.29604
Simulated Mean: 459.4925 W
Emulated Mean: 471.688 W

z2_ahu1 latent load emulation accuracy: Pass
RMSE: 70.0979 W
NRMSE: 0.57653
Simulated Mean: 121.5861 W
Emulated Mean: 138.8079 W

z1_ahu2 latent load emulation accuracy: Pass
RMSE: 87.5514 W
NRMSE: 0.77543
Simulated Mean: 112.9069 W
Emulated Mean: 122.8324 W

z2_ahu2 latent load emulation accuracy: Pass
RMSE: 192.8733 W
NRMSE: 0.38768
Simulated Mean: 497.5035 W
Emulated Mean: 505.217 W

System performance: Pass (evaluated period: 7:00 - 19:59)

Z1AHU1(Zn3) zone temperature control: Pass
Zone temperature is 1 °C higher than the setpoint for 0 timesteps
Zone temperature is 1 °C lower than the setpoint for 0 timesteps

Z2AHU1(Zn4) zone temperature control: Pass
Zone temperature is 1 °C higher than the setpoint for 0 timesteps
Zone temperature is 1 °C lower than the setpoint for 0 timesteps

Z1AHU2(Zn1) zone temperature control: Pass
Zone temperature is 1 °C higher than the setpoint for 0 timesteps
Zone temperature is 1 °C lower than the setpoint for 0 timesteps

Z2AHU2(Zn2) zone temperature control: Pass
Zone temperature is 1 °C higher than the setpoint for 0 timesteps
Zone temperature is 1 °C lower than the setpoint for 0 timesteps

AHU1 supply air temperature control: Warning
AHU supply air temperature is 1 °C higher than the setpoint for 110 timesteps

AHU2 supply air temperature control: Pass
AHU supply air temperature is 1 °C higher than the setpoint for 6 timesteps

AHU1 static pressure control: Pass
AHU static pressure is 25 Pa lower than the setpoint for 1 timesteps

AHU2 static pressure control: Pass
AHU static pressure is 25 Pa lower than the setpoint for 15 timesteps

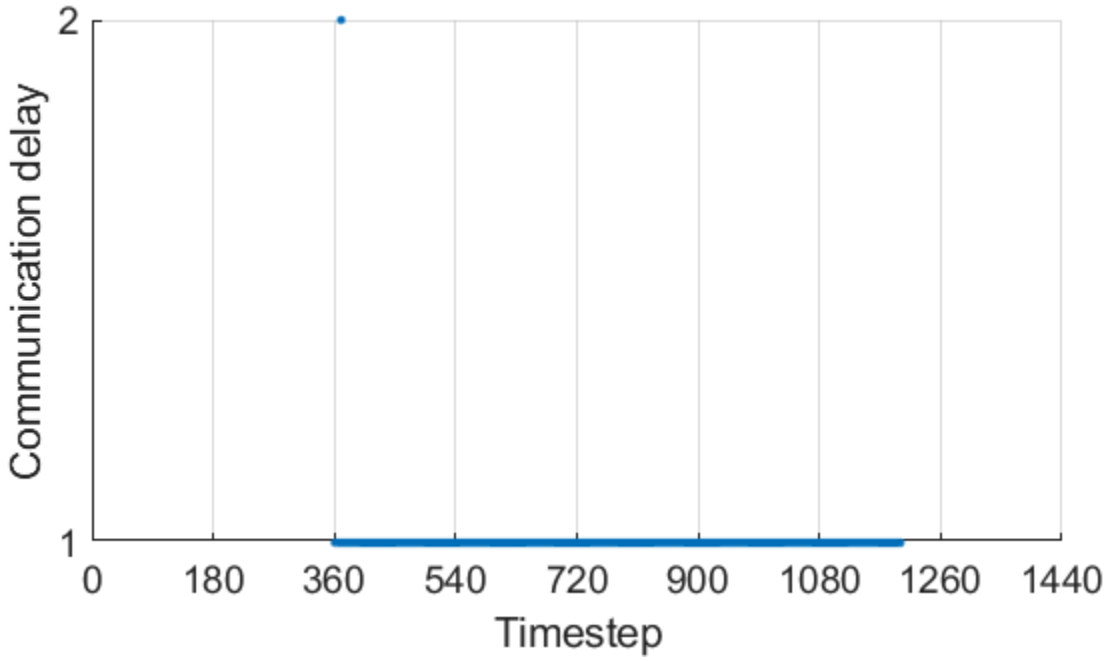
Chiller 1 supply temperature control: Pass
Chiller 1 is on for 44 timesteps
Chilled water supply temperature is 0.5 °C higher than the setpoint for 11 timesteps

Chiller 2 supply temperature control: Pass
Chiller 2 is on for 789 timesteps
Chilled water supply temperature is 0.5 °C higher than the setpoint for 39 timesteps

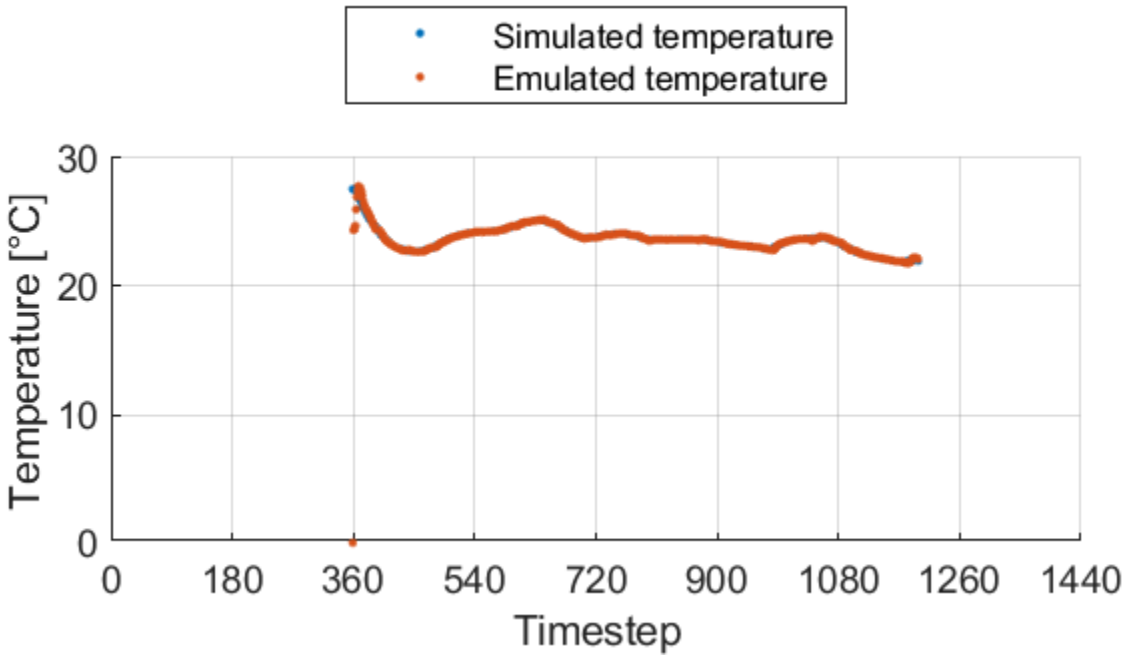
Chilled water seoncdary-loop differential pressure control: Pass
Chilled water seoncdary-loop differential pressure is 13.8 kPa lower than the setpoint for 17 timesteps

Plots

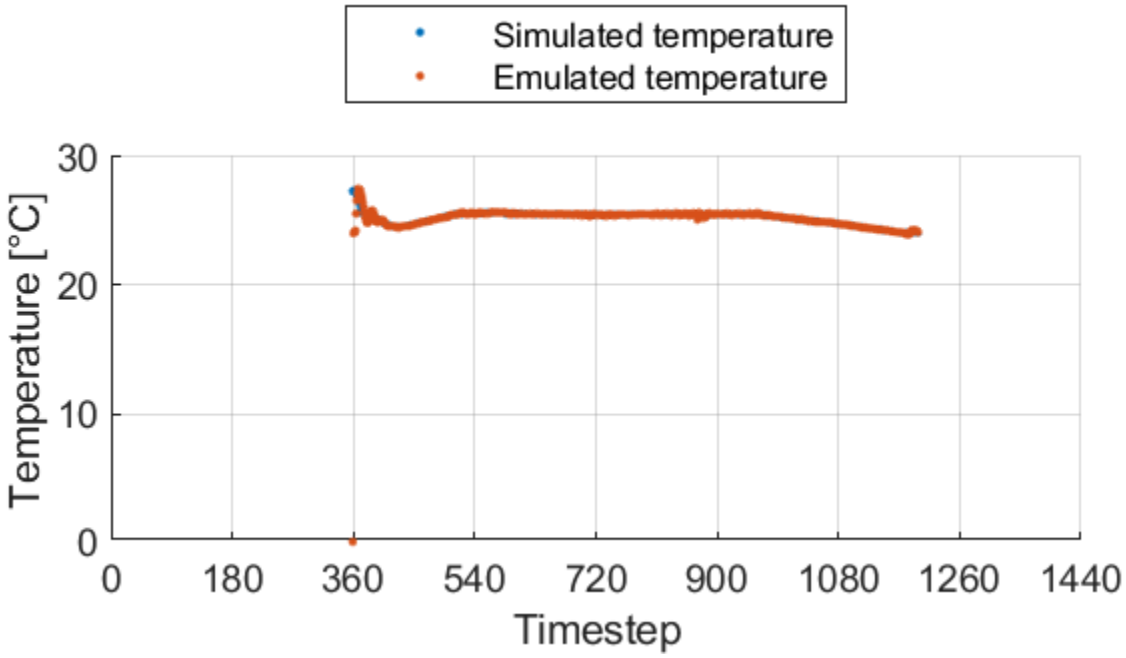
Communication delay



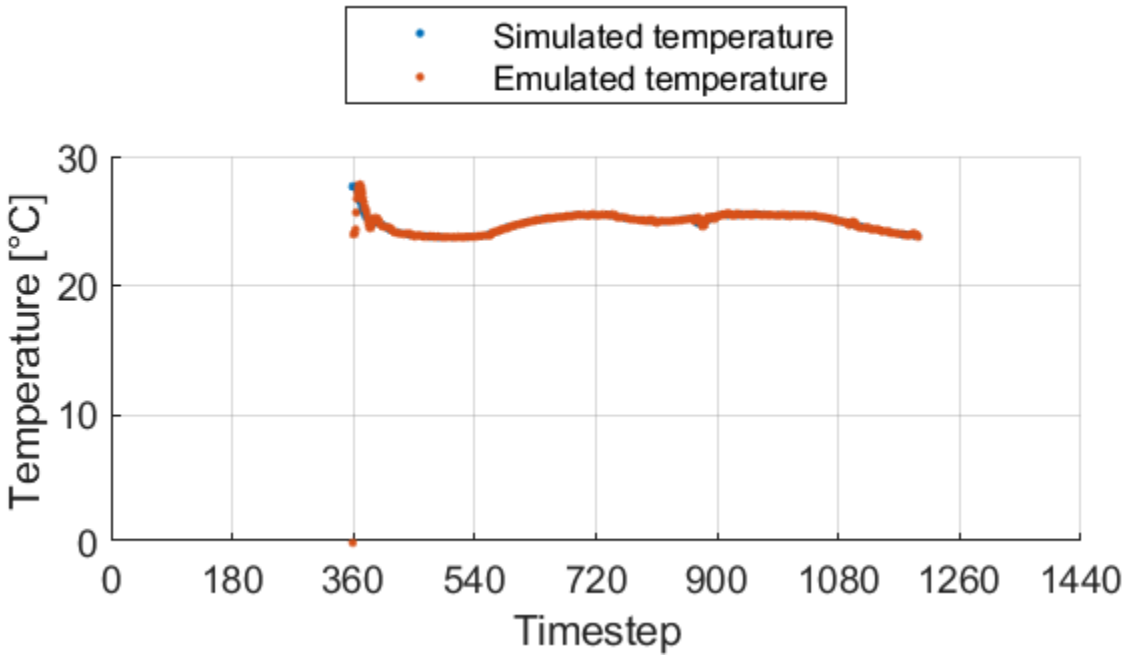
T_z1_ahu1 emulation accuracy



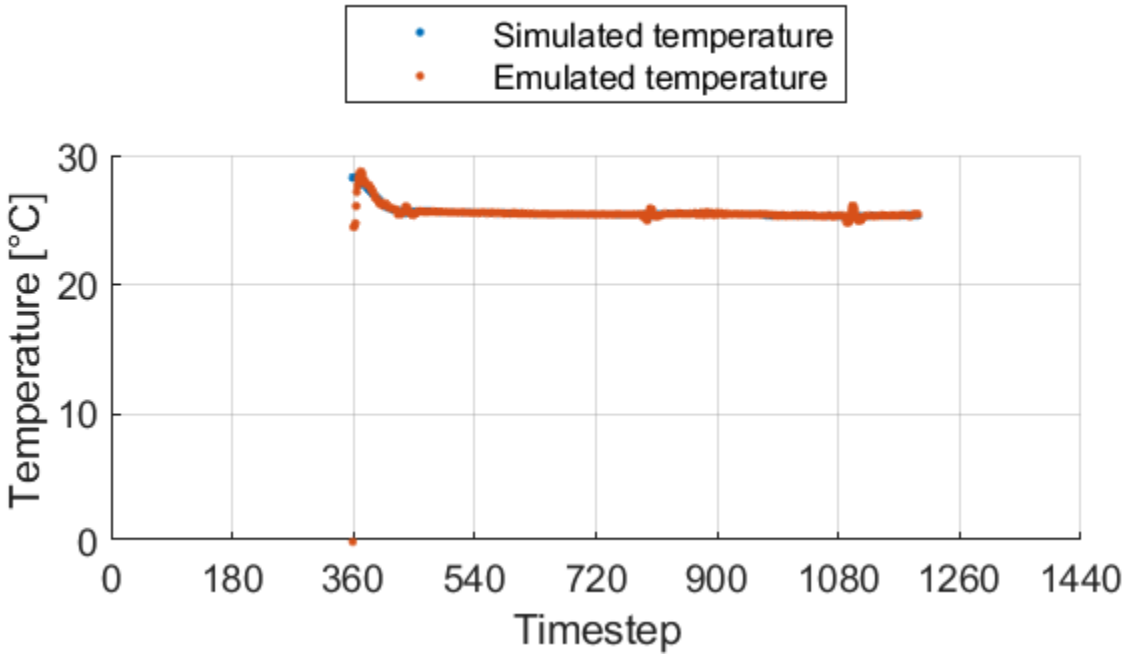
T_z2_ahu1 emulation accuracy



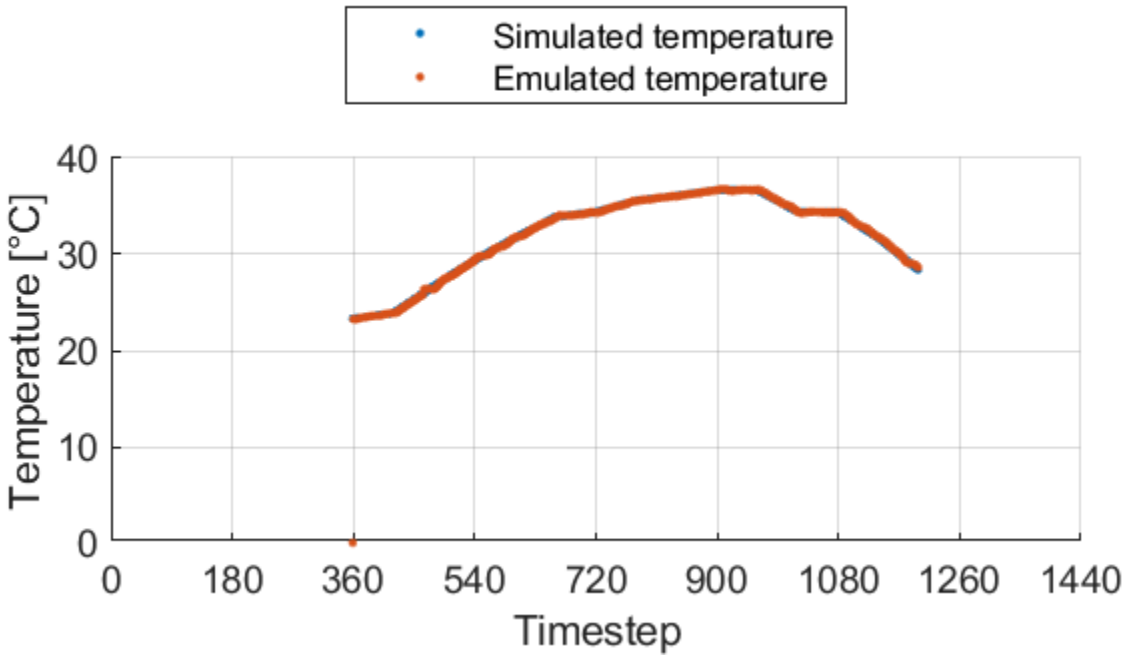
T_z1_ahu2 emulation accuracy



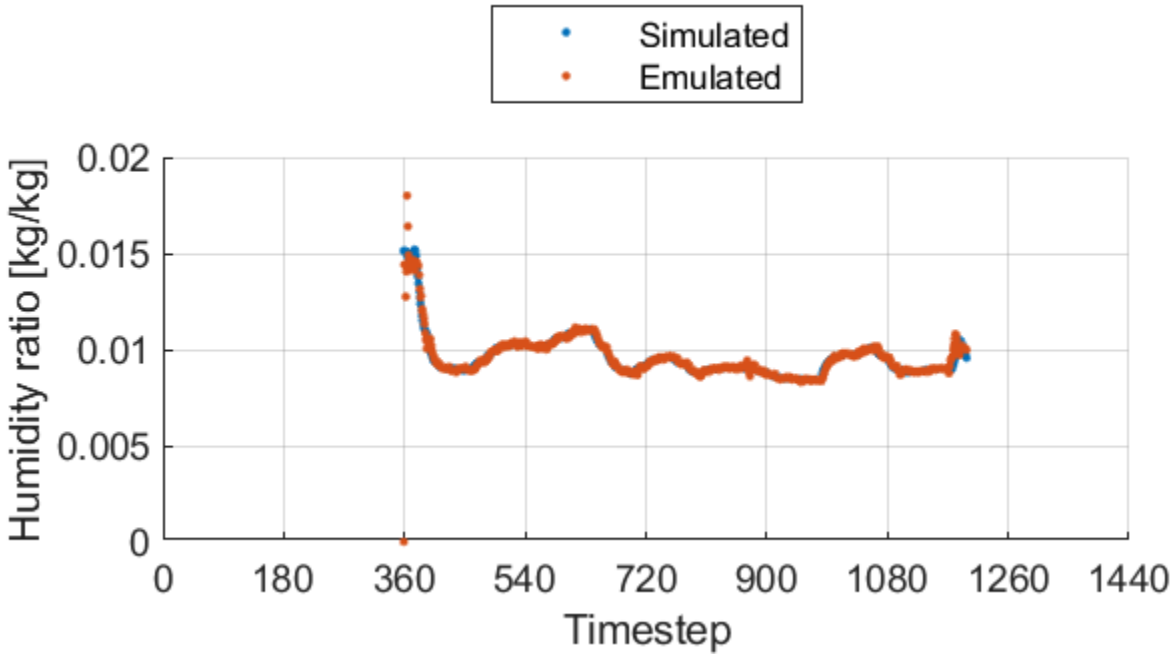
T_z2_ahu2 emulation accuracy



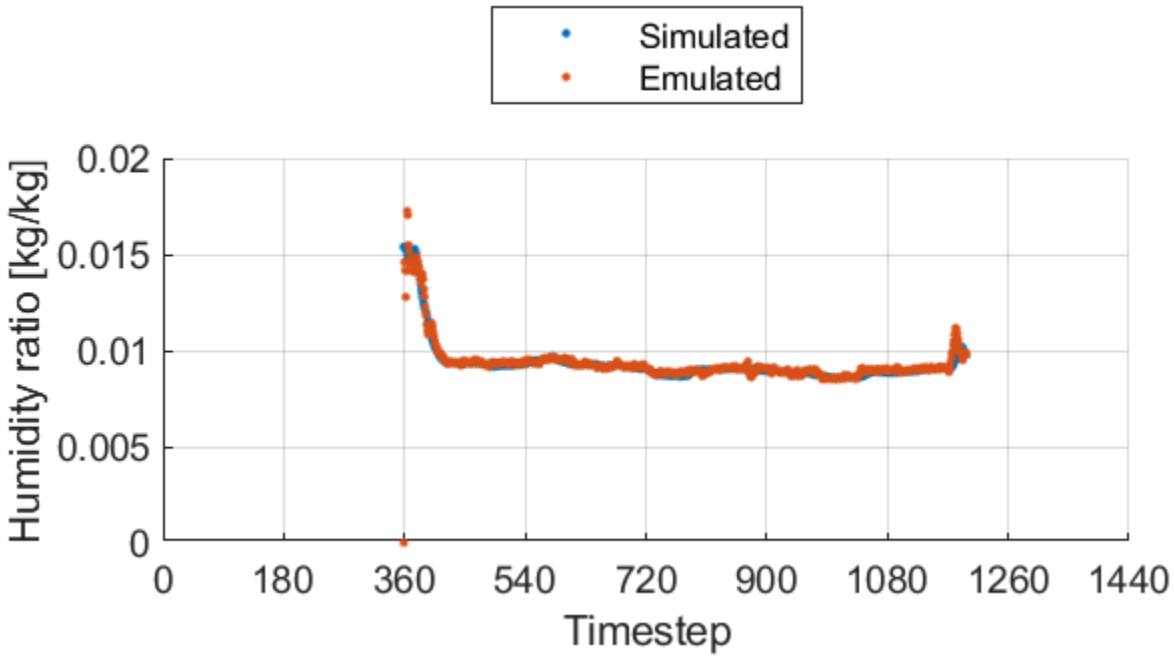
T_out emulation accuracy



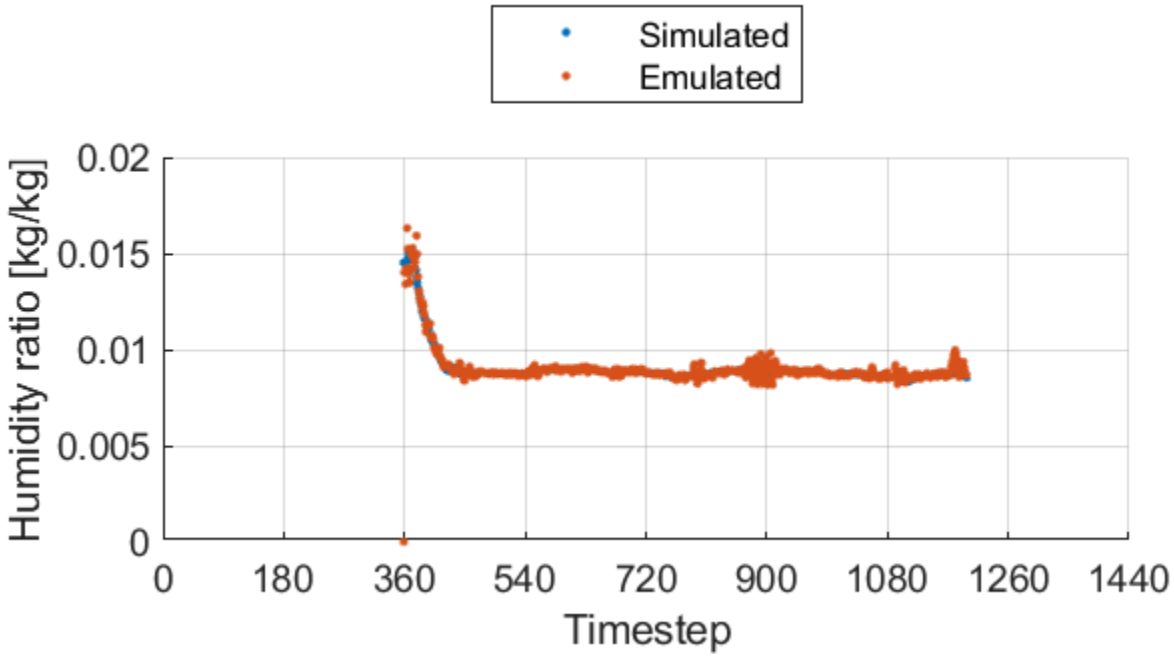
w_z1_ahu1 emulation accuracy



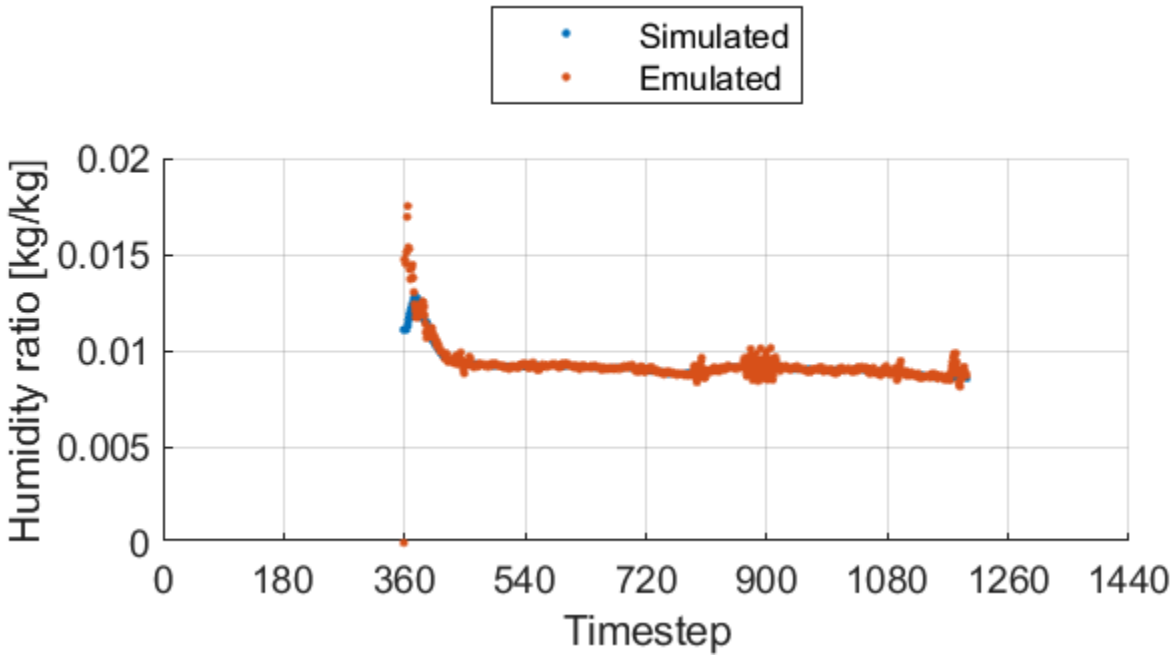
w_z2_ahu1 emulation accuracy



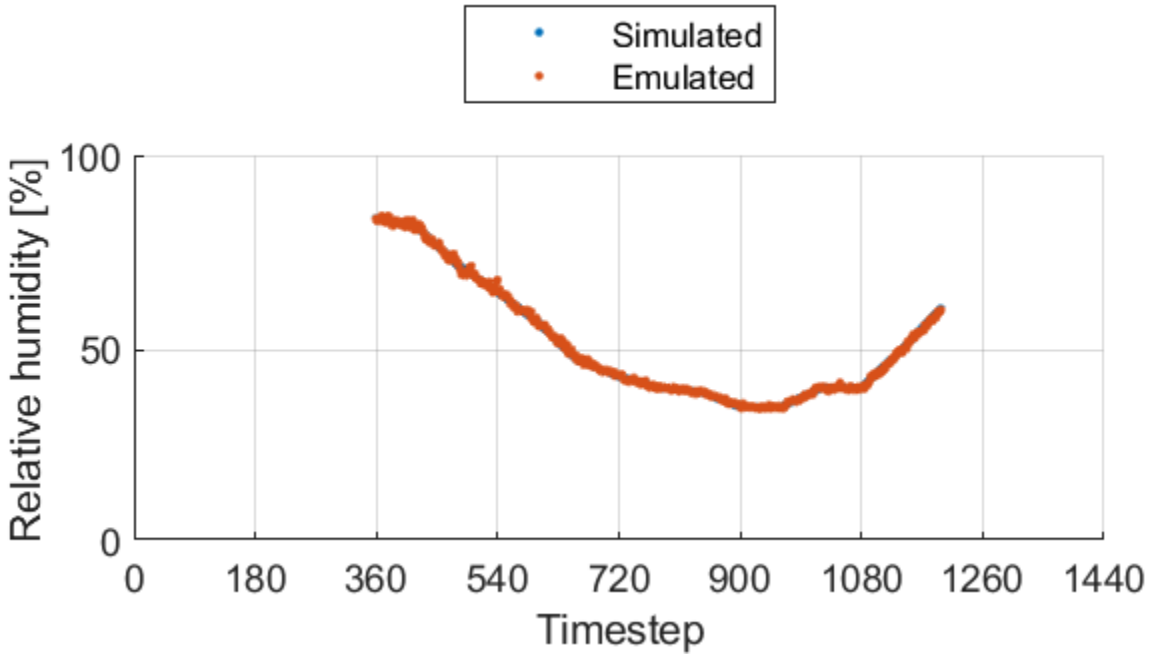
w_z1_ahu2 emulation accuracy



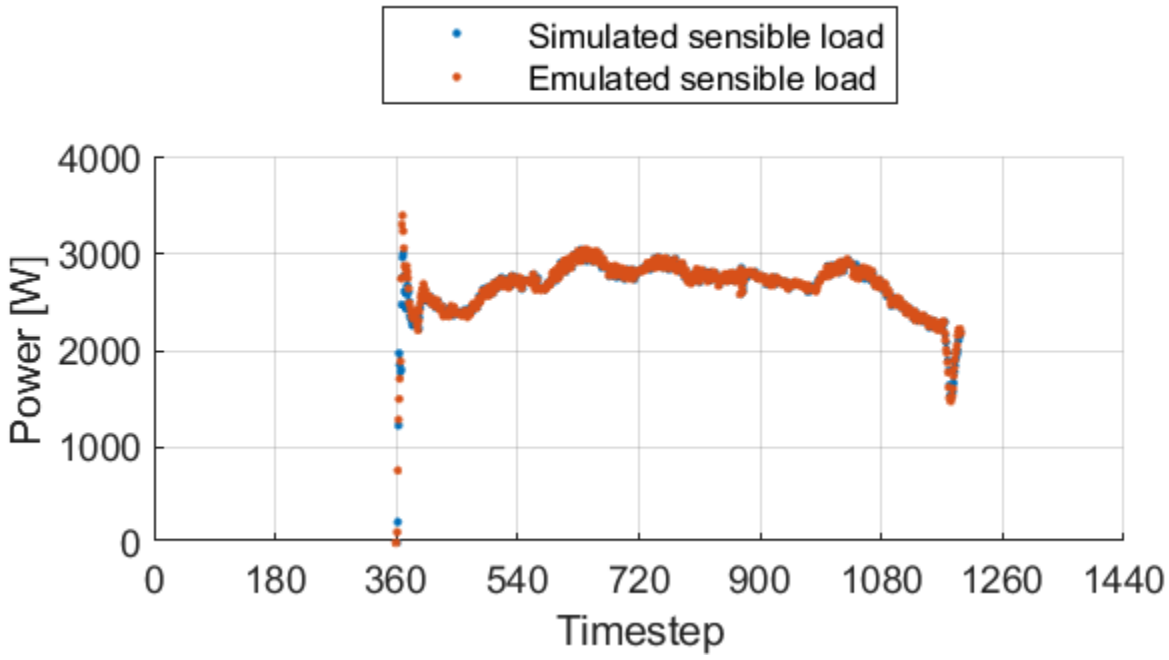
w_z2_ahu2 emulation accuracy



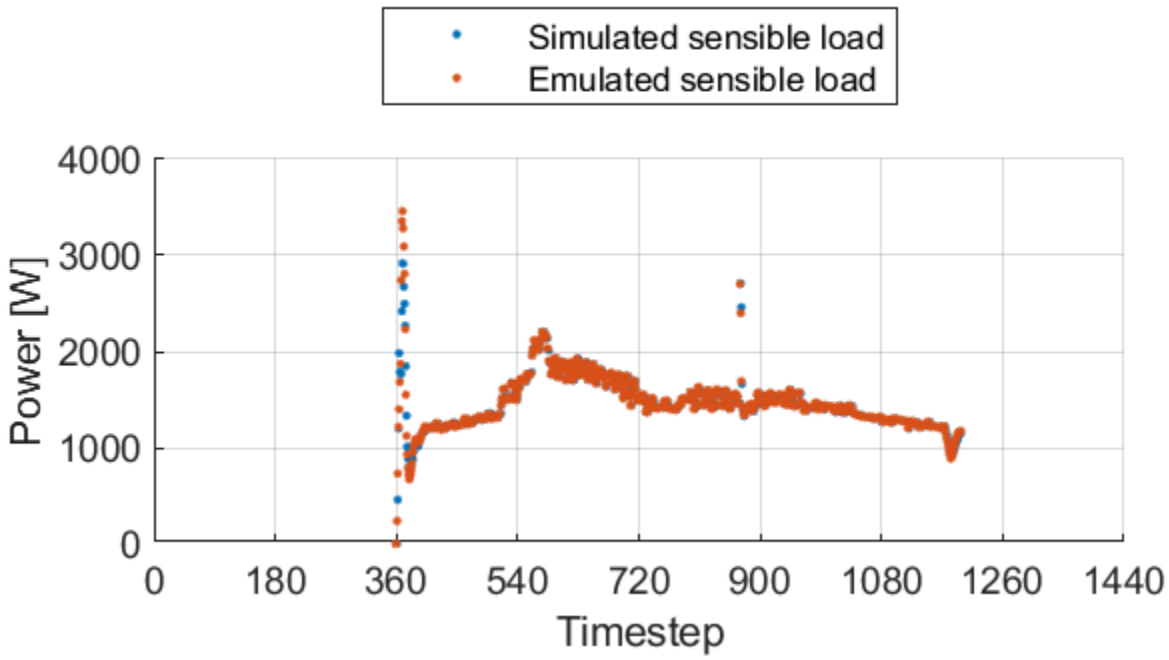
RH_out emulation accuracy



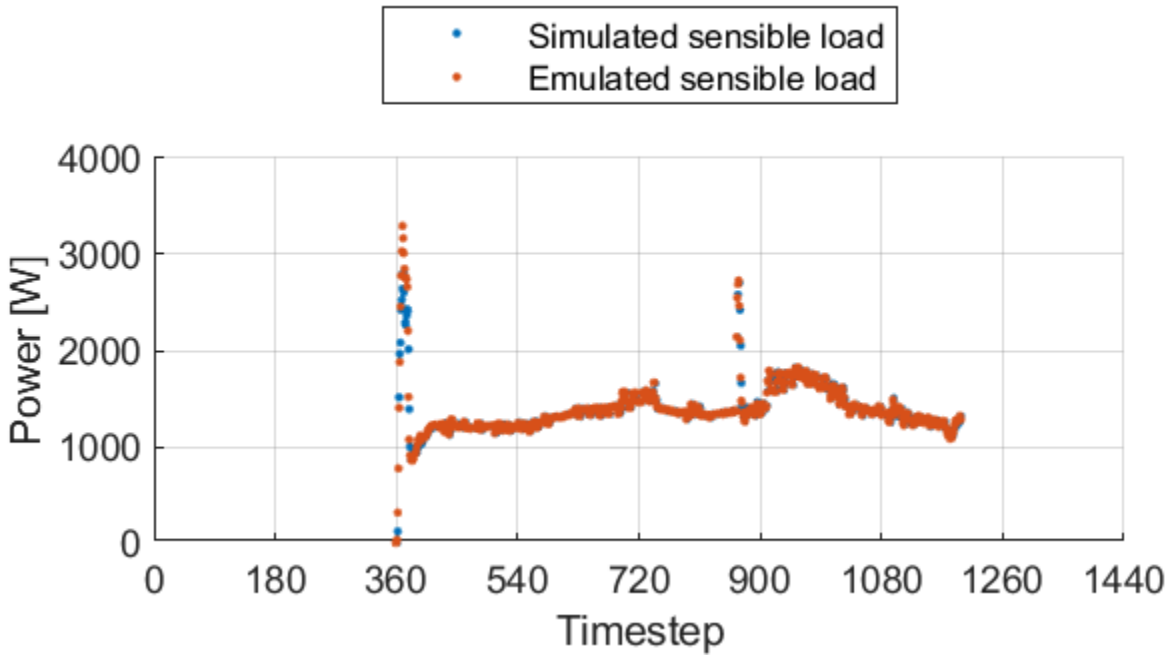
z1_ahu1 sensible load emulation accuracy



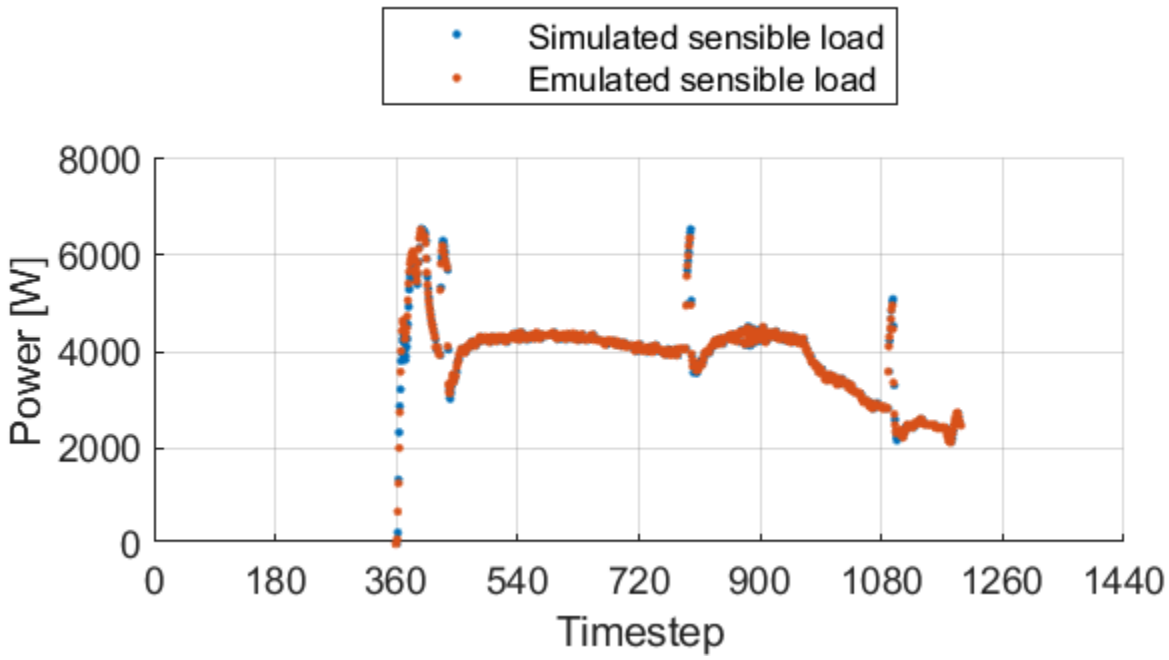
z2_ahu1 sensible load emulation accuracy



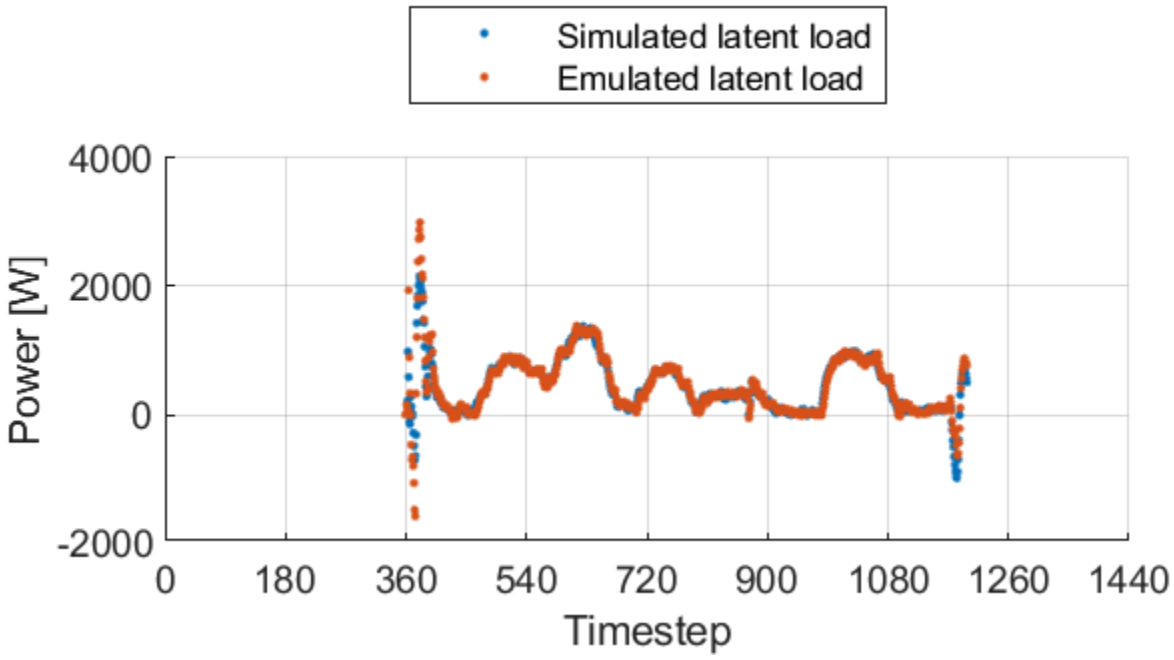
z1_ahu2 sensible load emulation accuracy



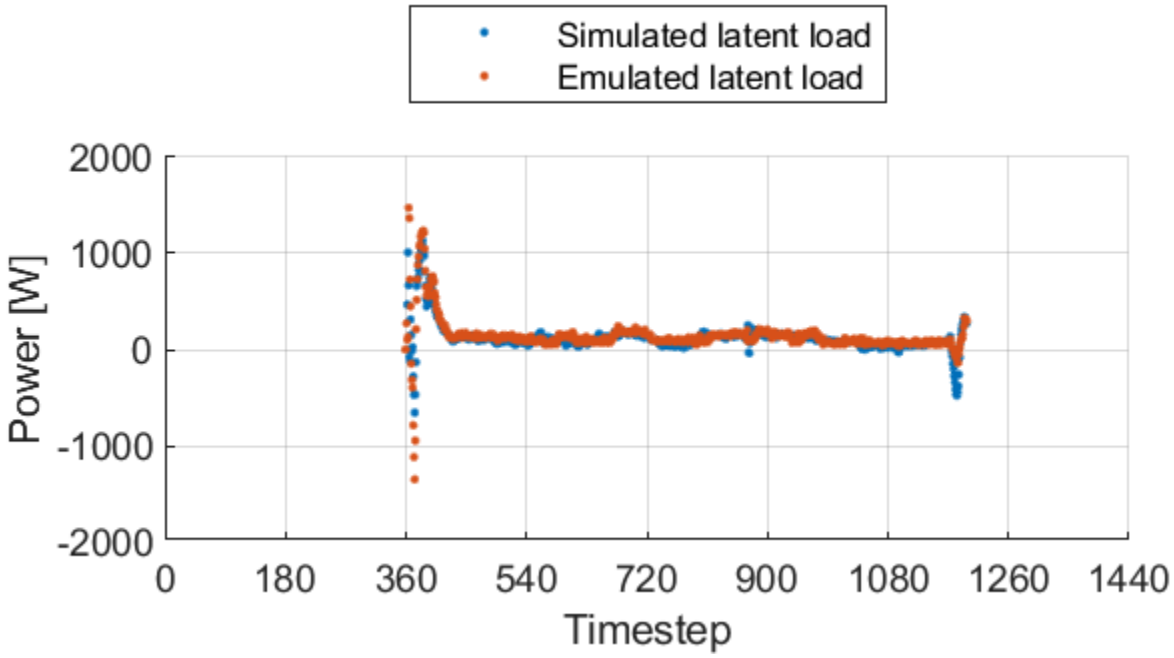
z2_ahu2 sensible load emulation accuracy



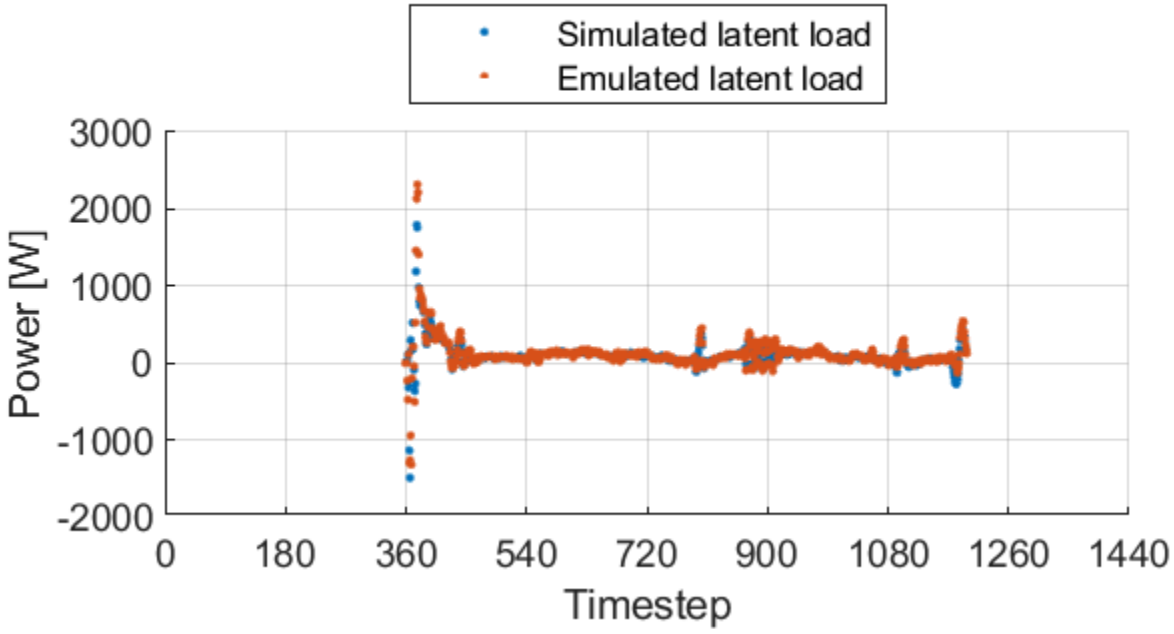
z1_ahu1 latent load emulation accuracy



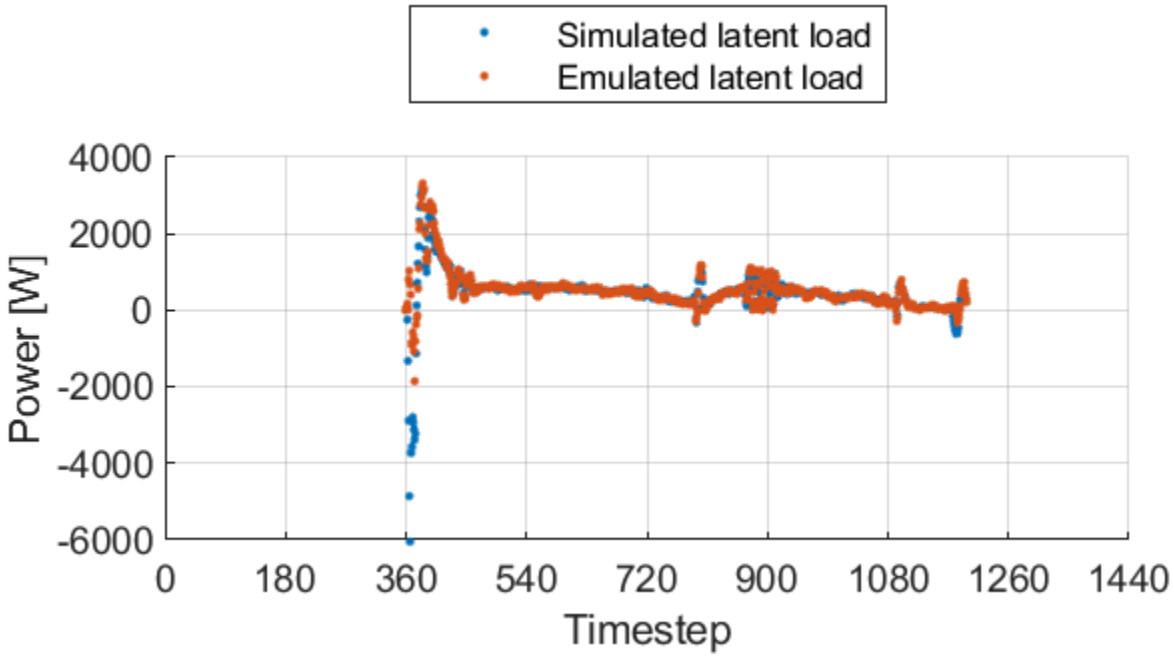
z2_ahu1 latent load emulation accuracy



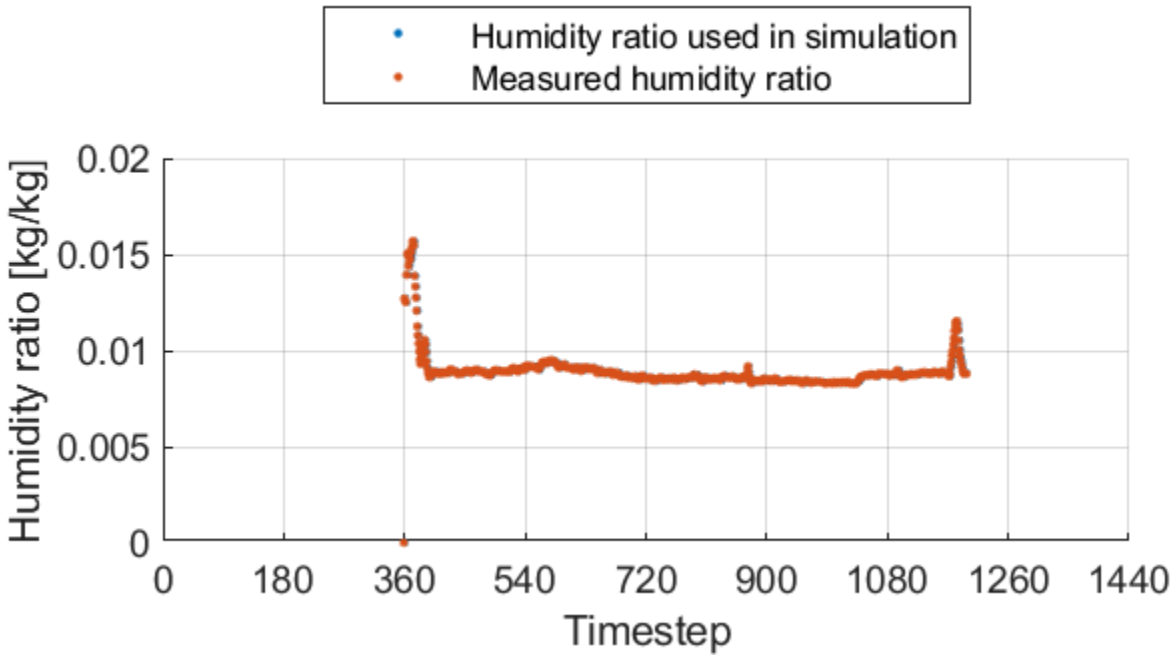
z1_ahu2 latent load emulation accuracy



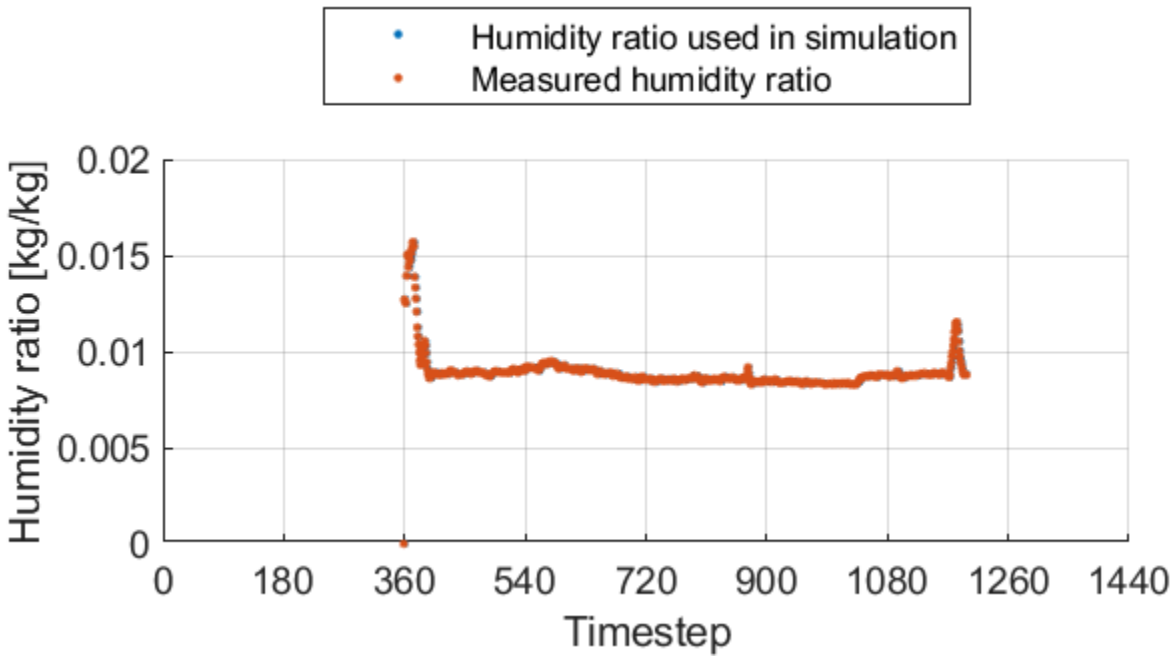
z2_ahu2 latent load emulation accuracy



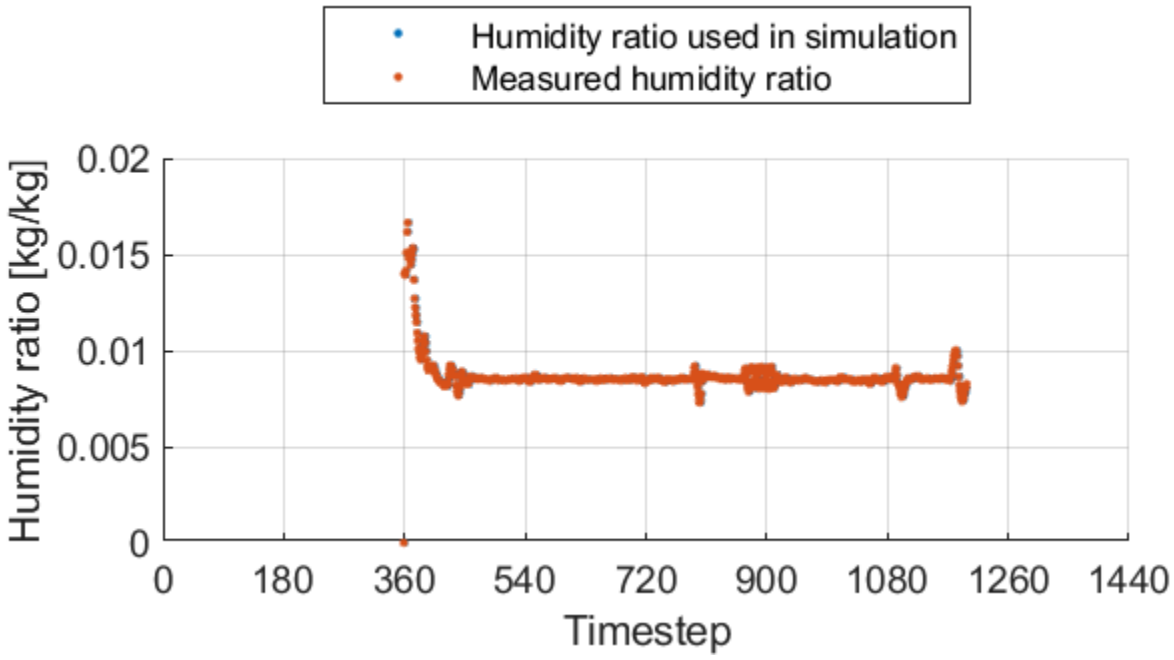
w_sup_vav1_ahu1 emulation accuracy



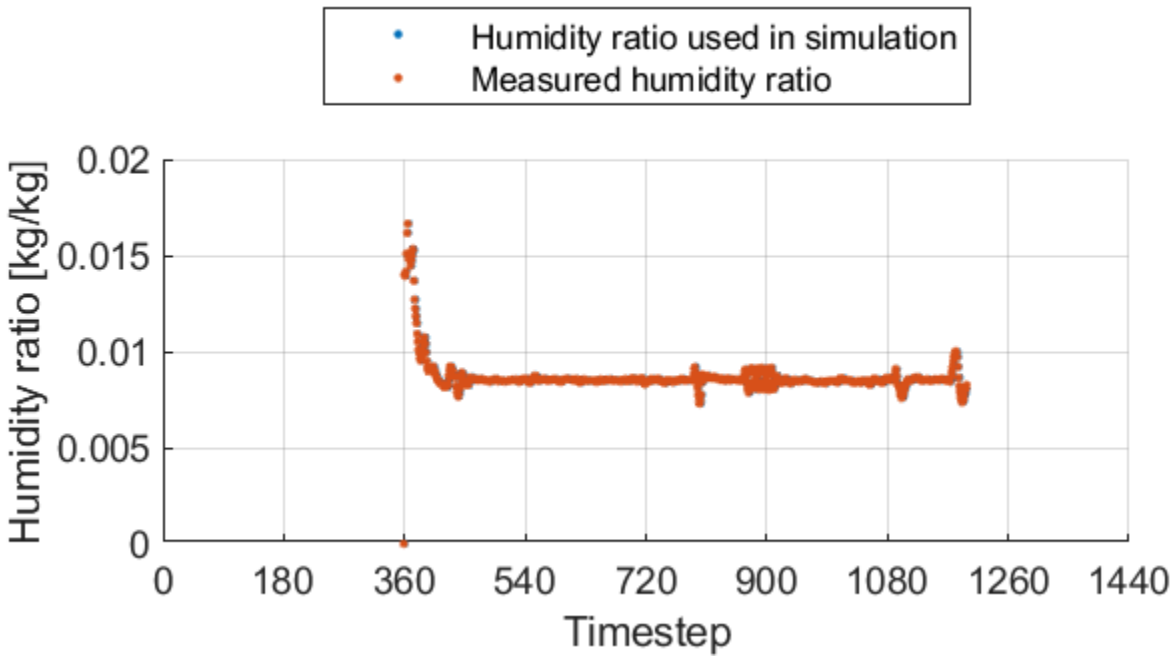
w_sup_vav2_ahu1 emulation accuracy



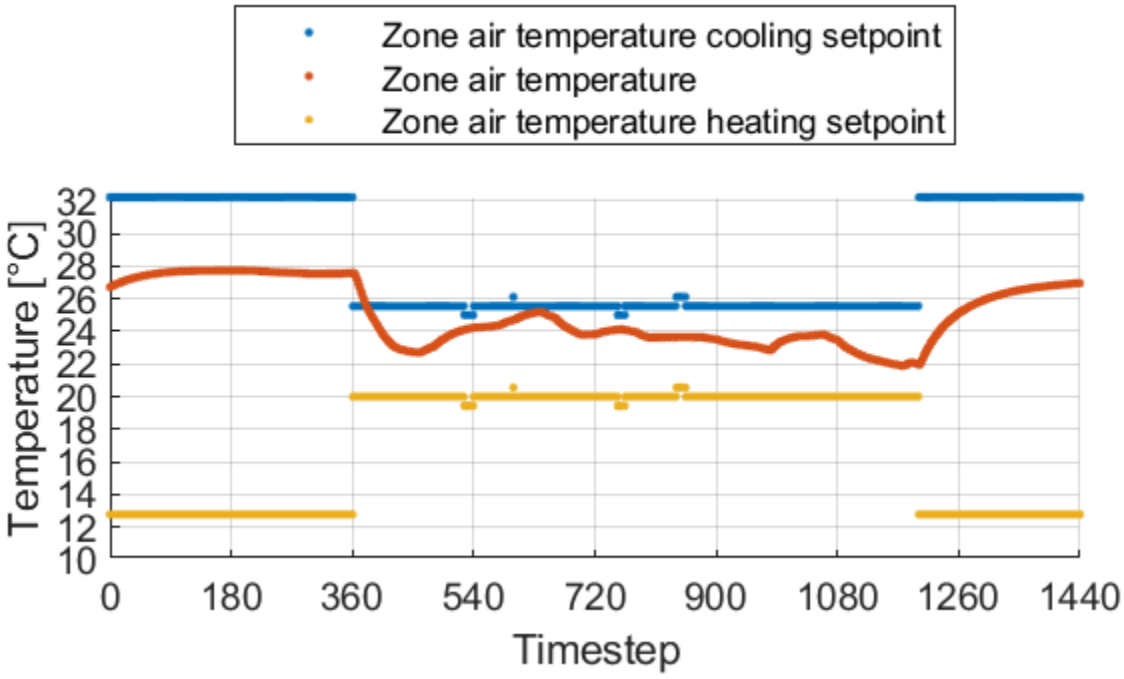
w_sup_vav1_ahu2 emulation accuracy



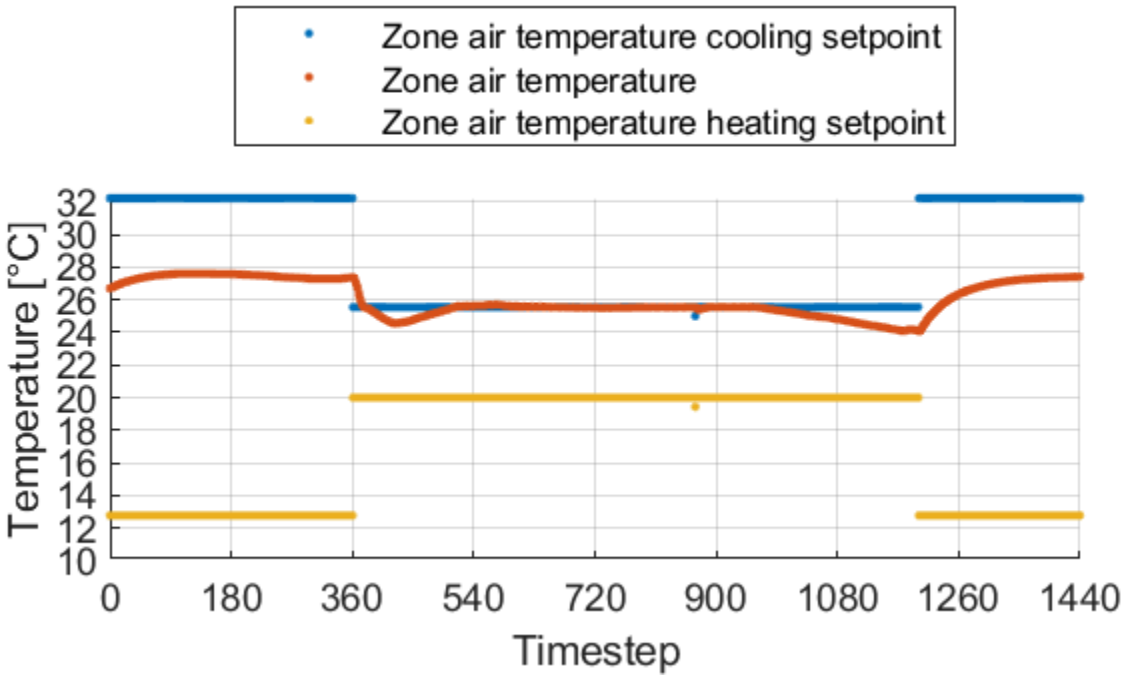
w_sup_vav2_ahu2 emulation accuracy



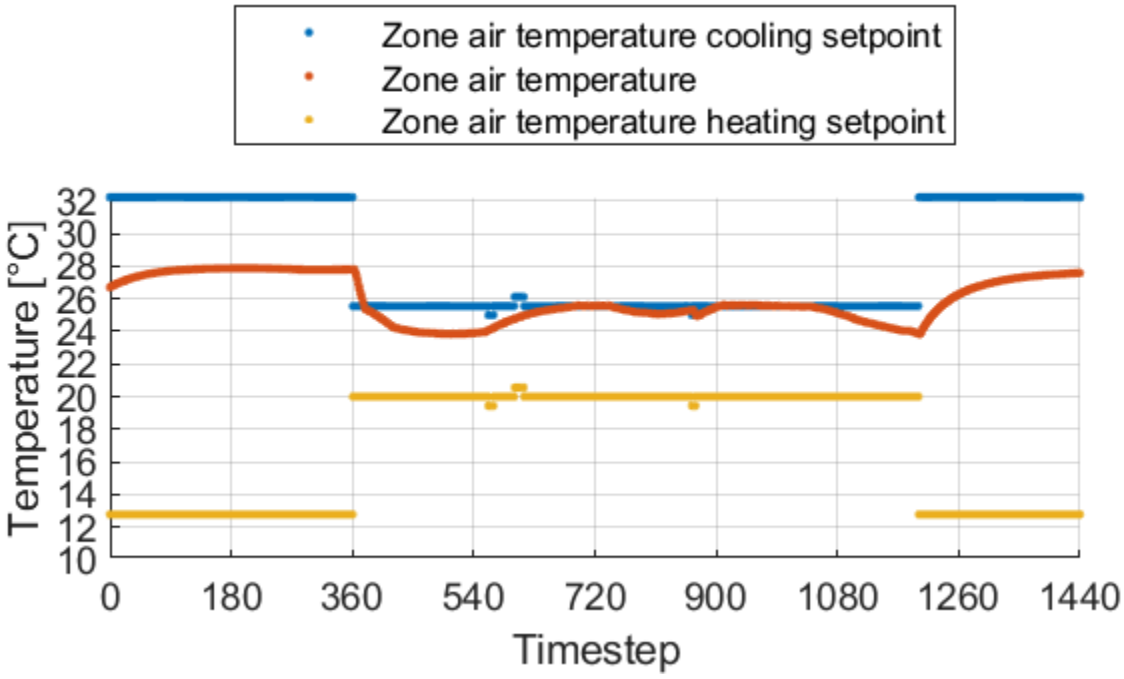
z1_ahu1 zone air temperature control



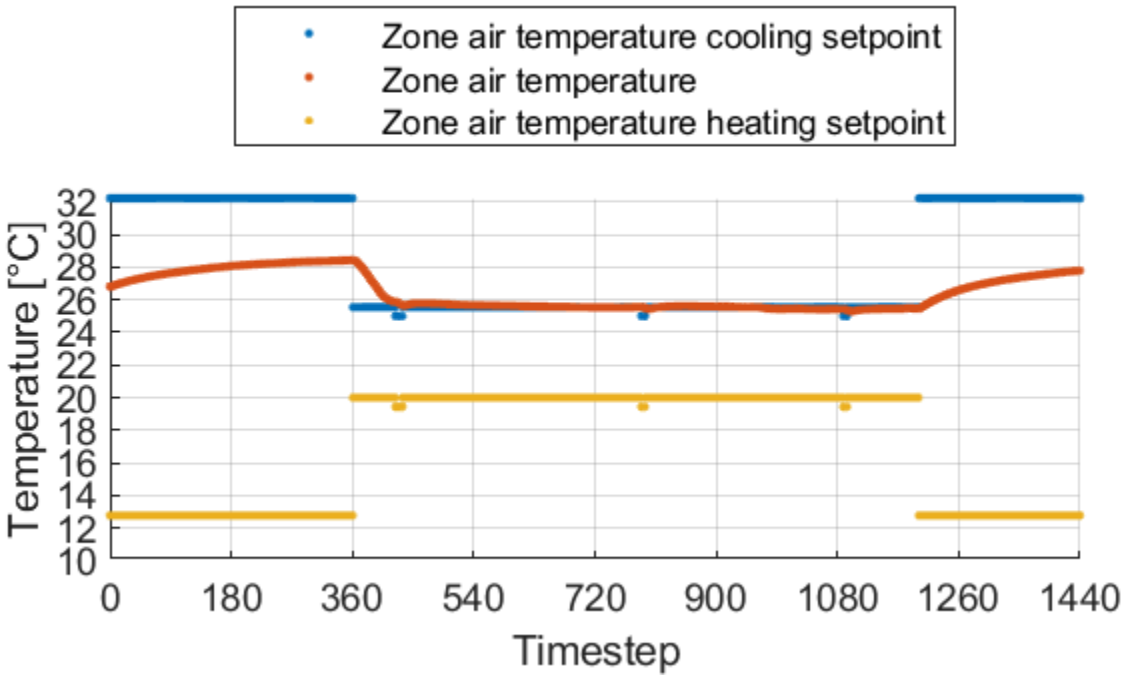
z2_ahu1 zone air temperature control



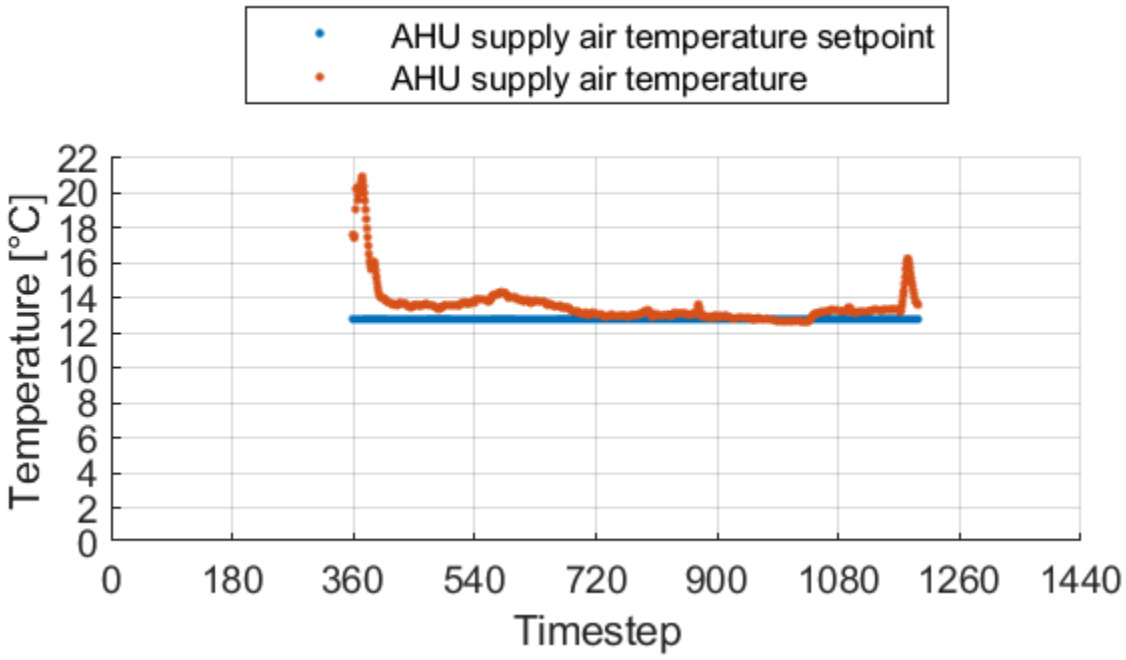
z1_ahu2 zone air temperature control



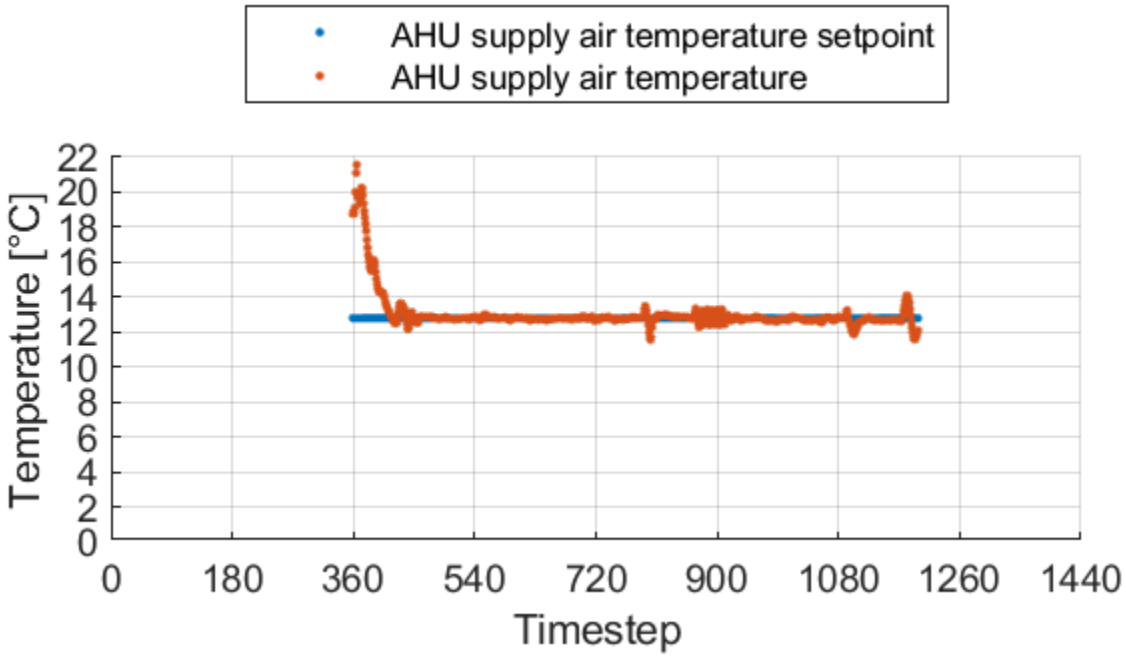
z2_ahu2 zone air temperature control



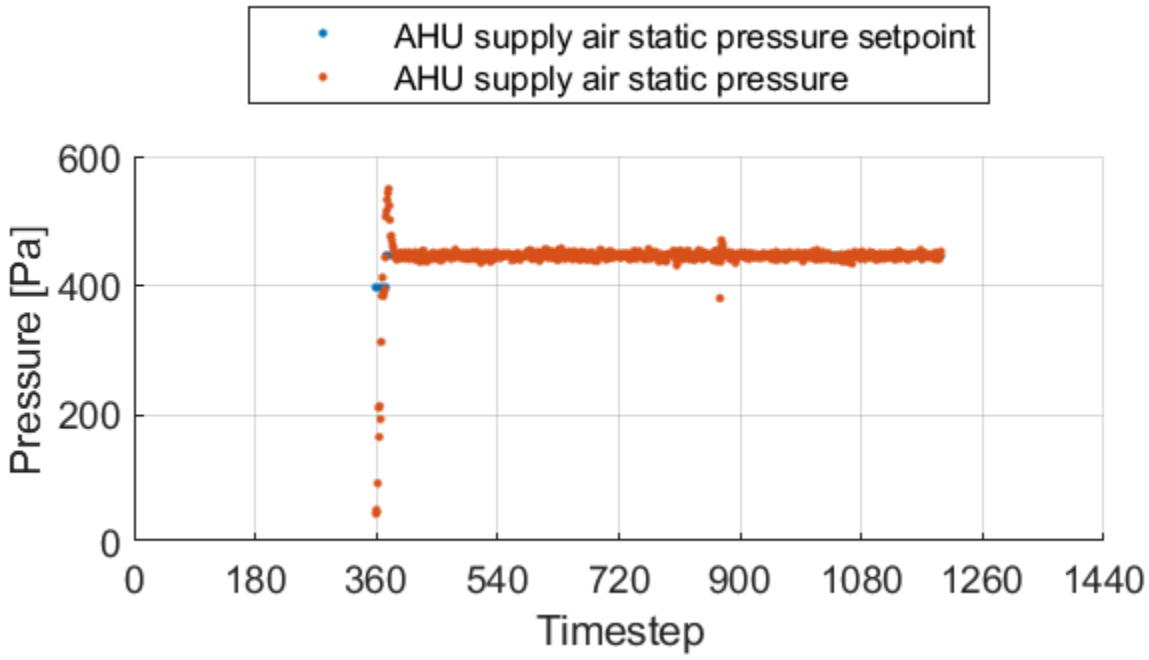
ahu1 supply air temperature control



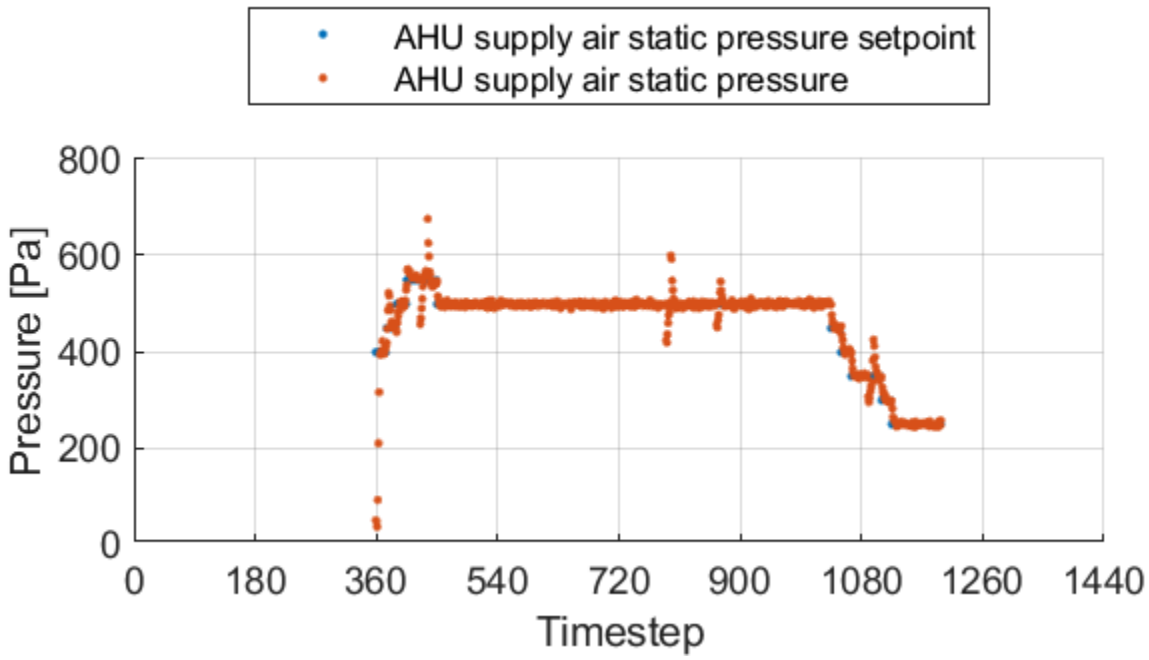
ahu2 supply air temperature control



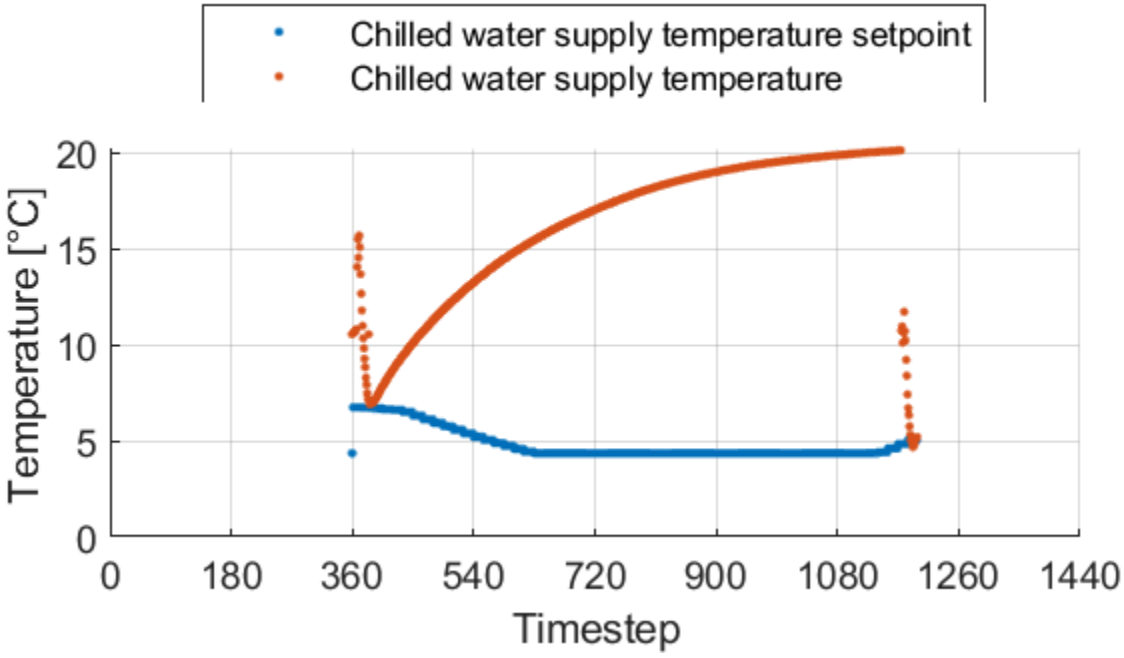
ahu1 supply air static pressure control



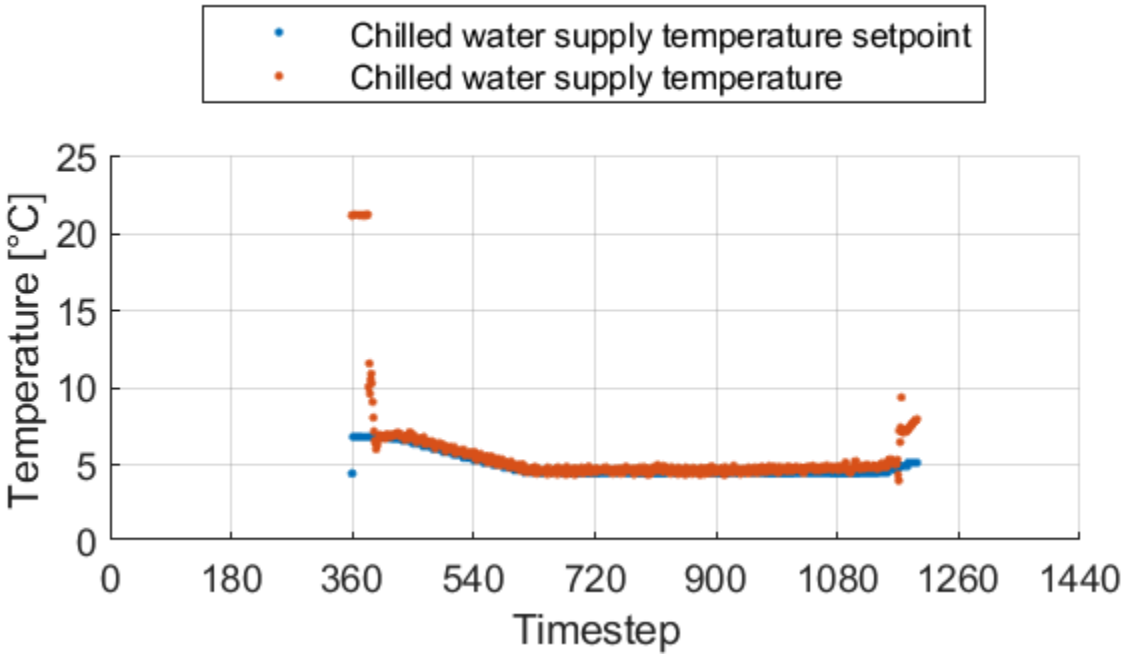
ahu2 supply air static pressure control



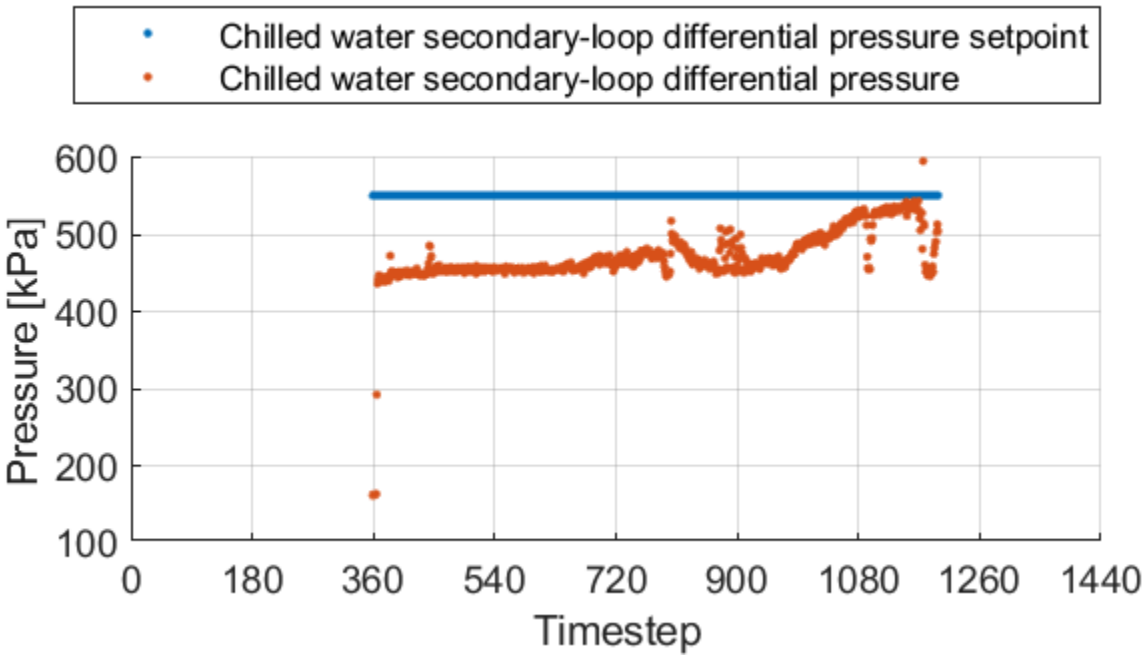
Chiller 1 water supply temperature control



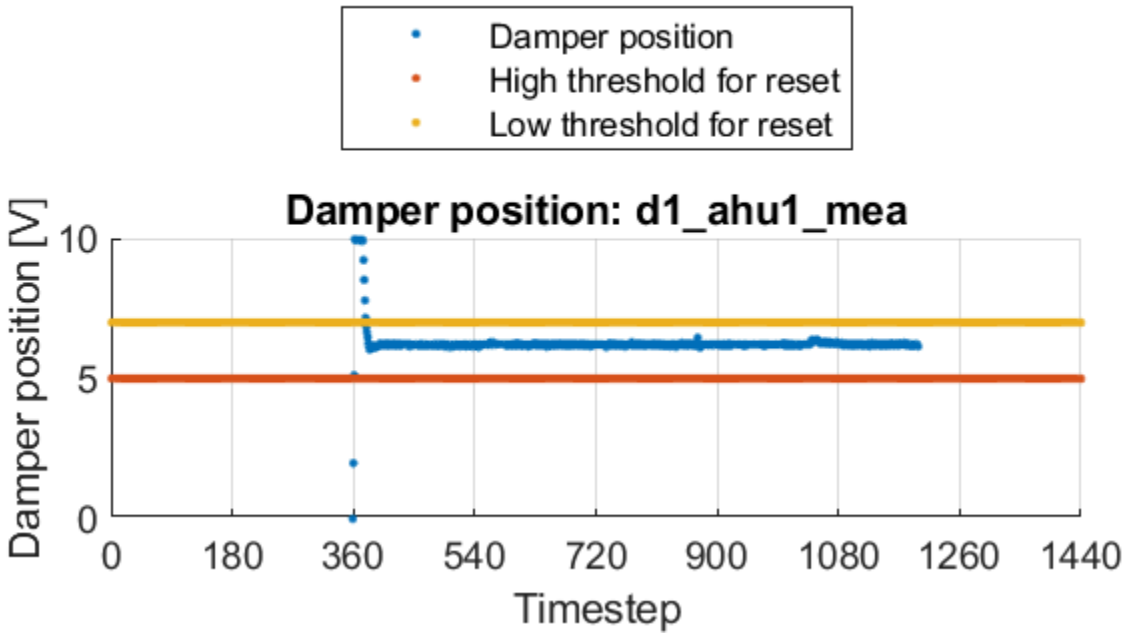
Chiller 2 water supply temperature control



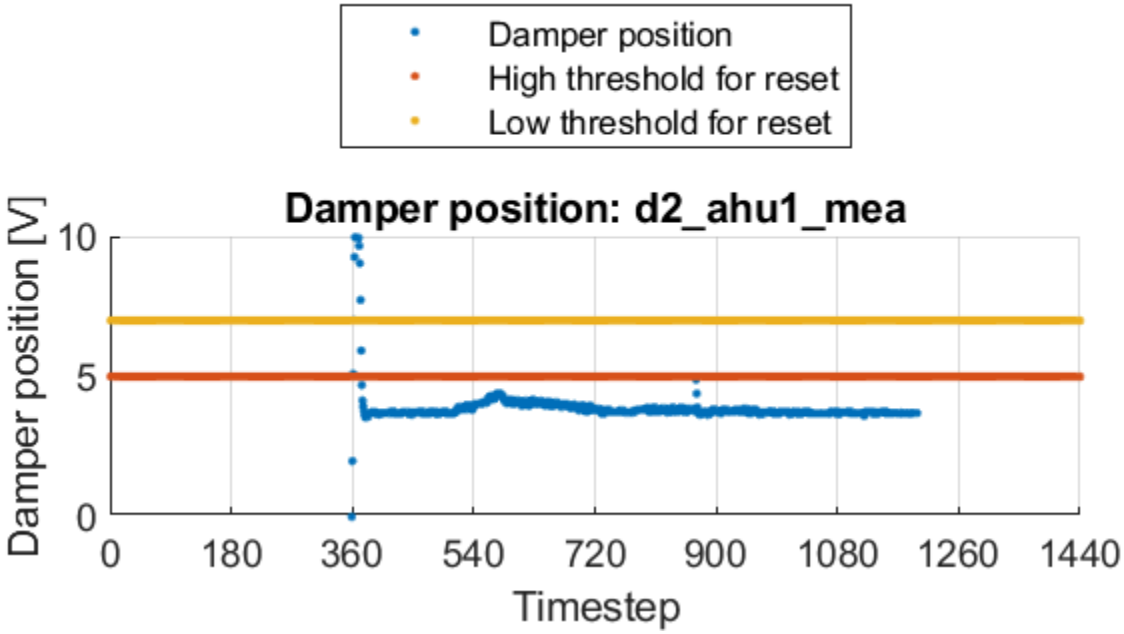
Chilled water secondary-loop differential pressure control



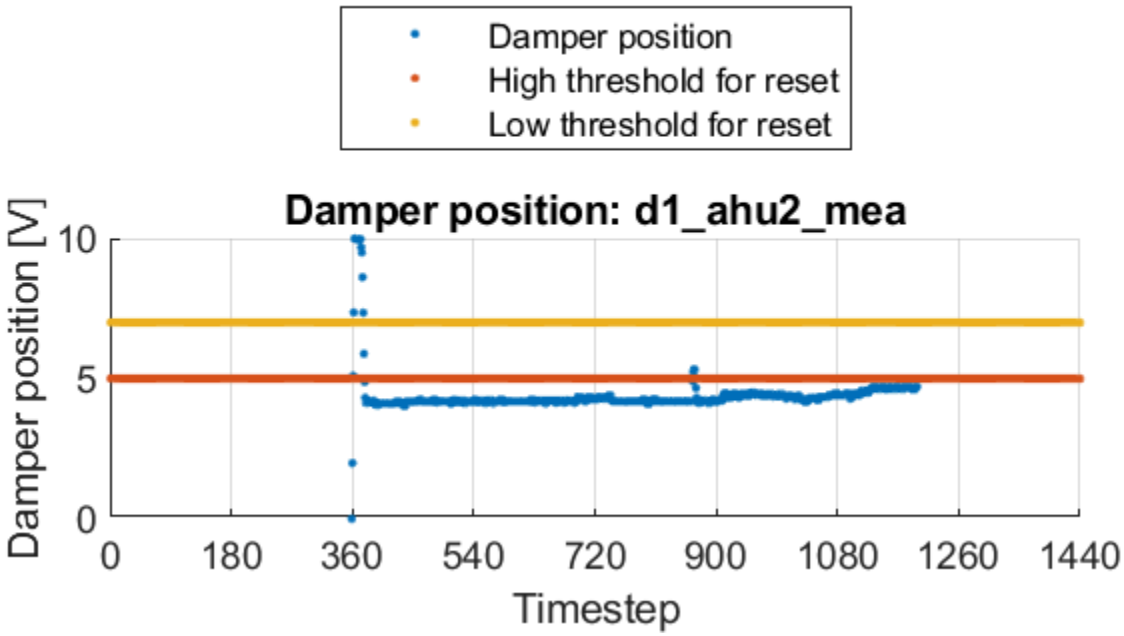
d1_ahu1_mea zone vav damper control



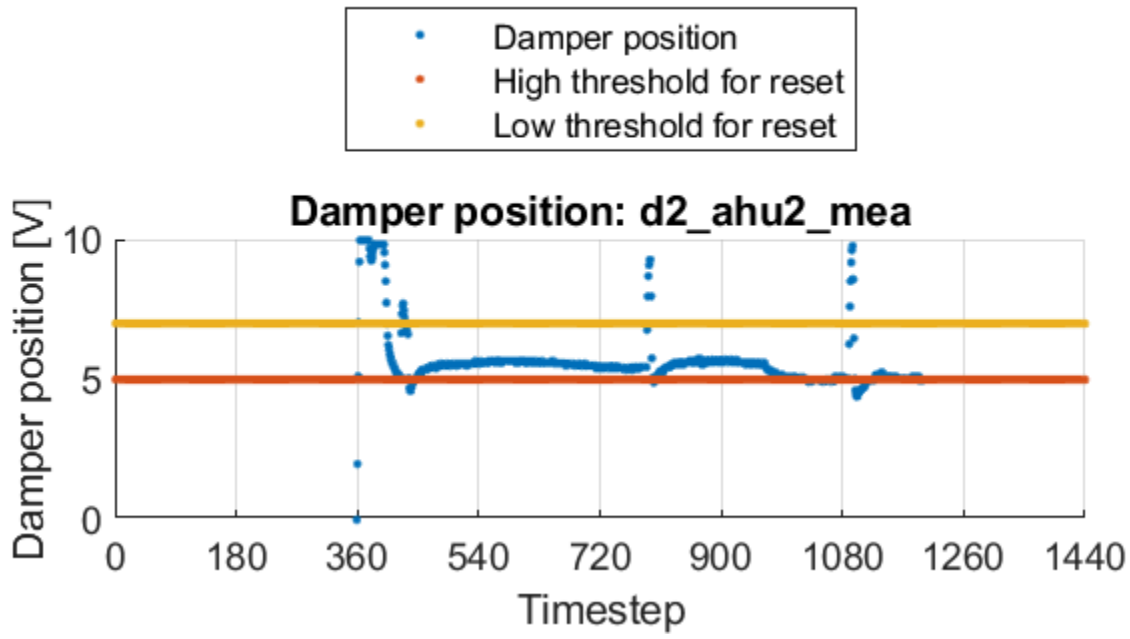
d2_ahu1_mea zone vav damper control



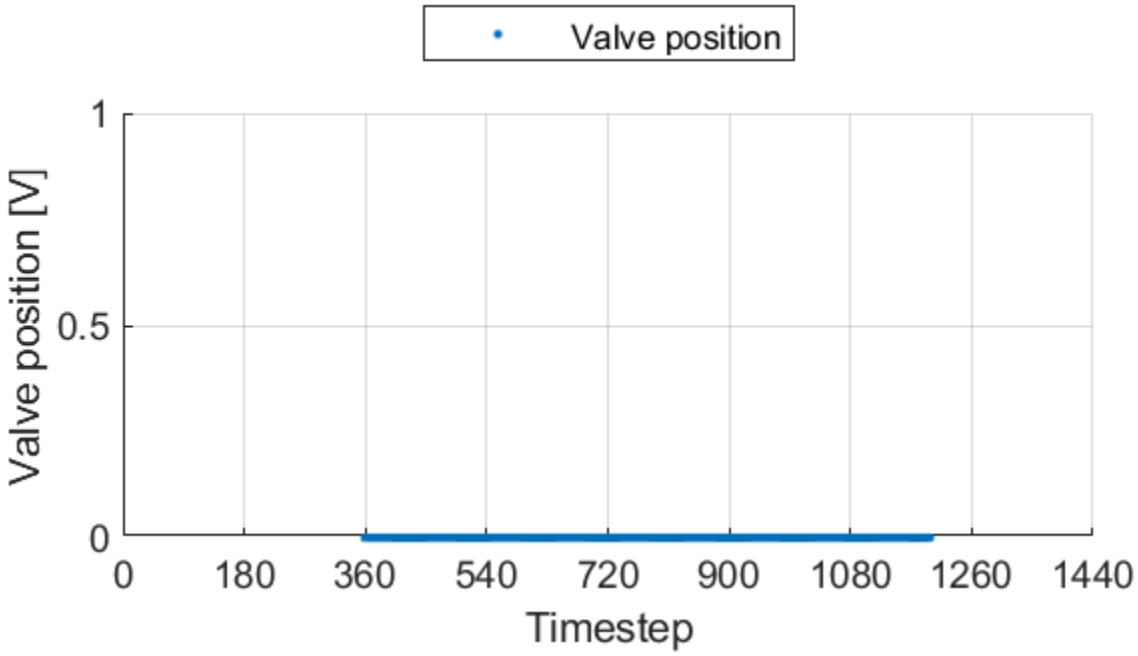
d1_ahu2_mea zone vav damper control



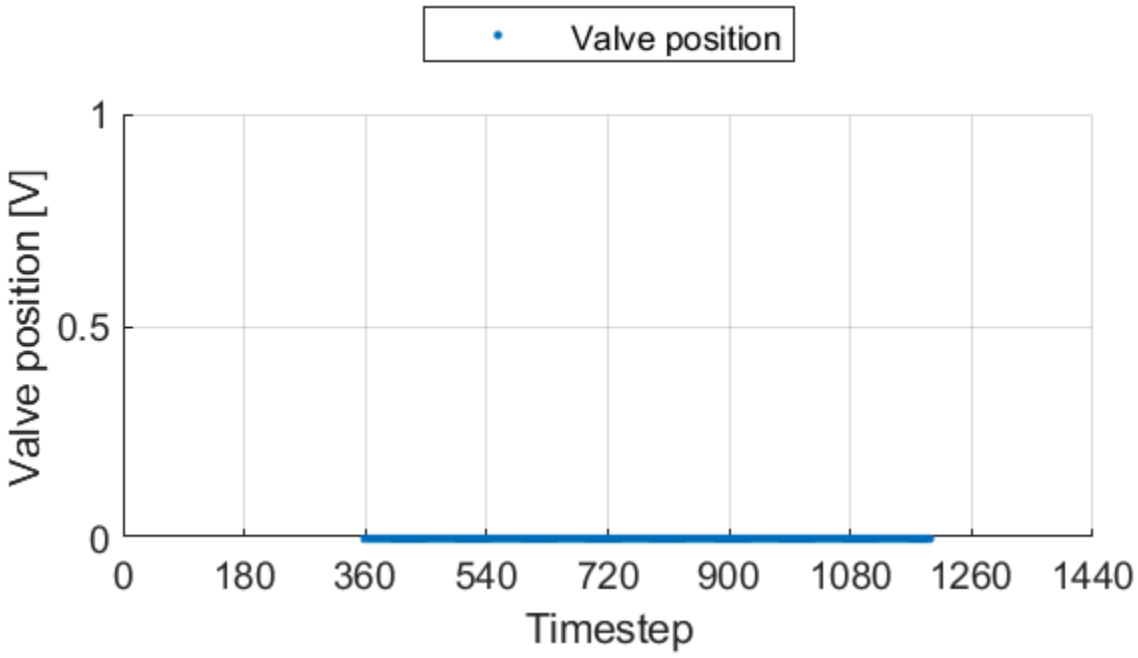
d2_ahu2_mea zone vav damper control



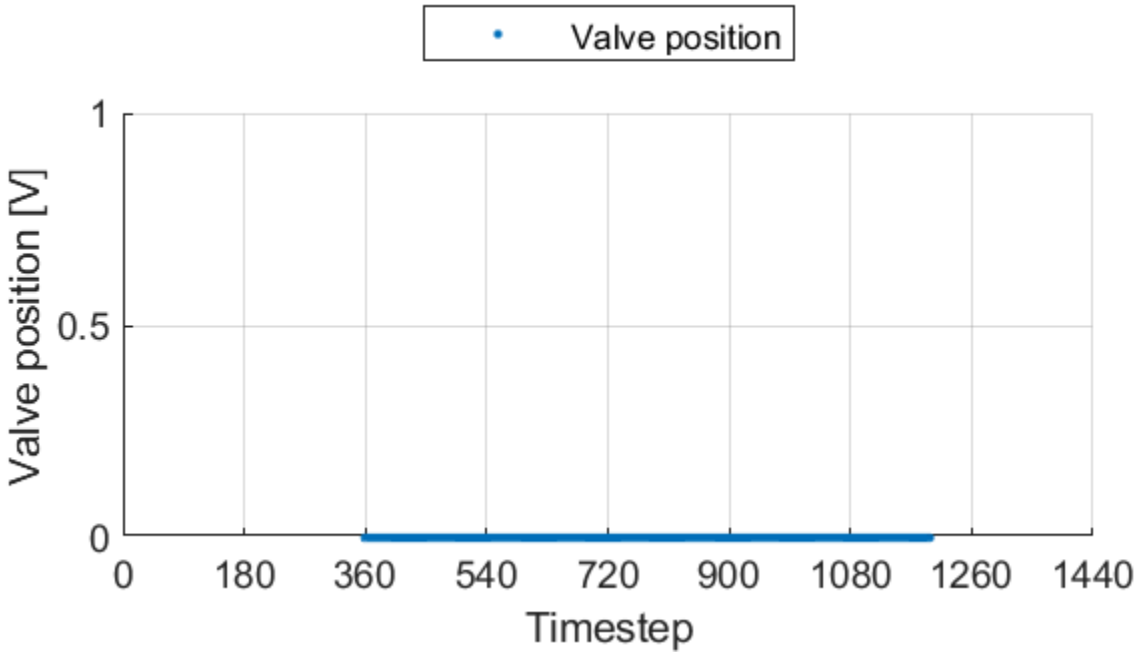
rh1_ahu1_mea zone vav reheat valve control



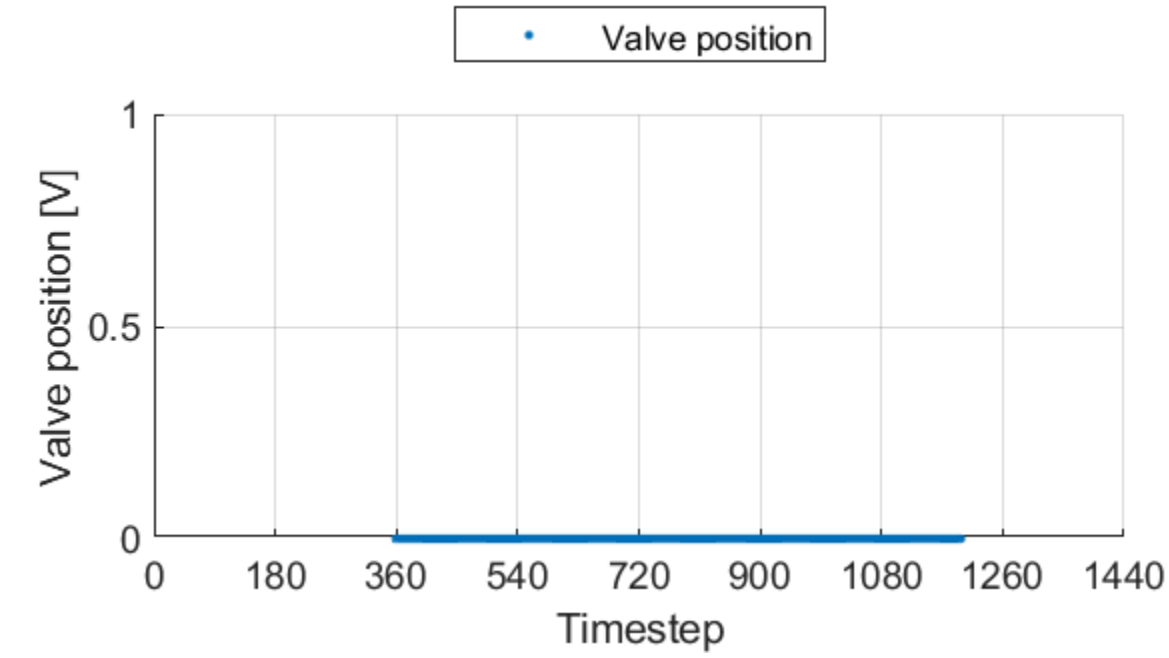
rh2_ahu1_mea zone vav reheat valve control



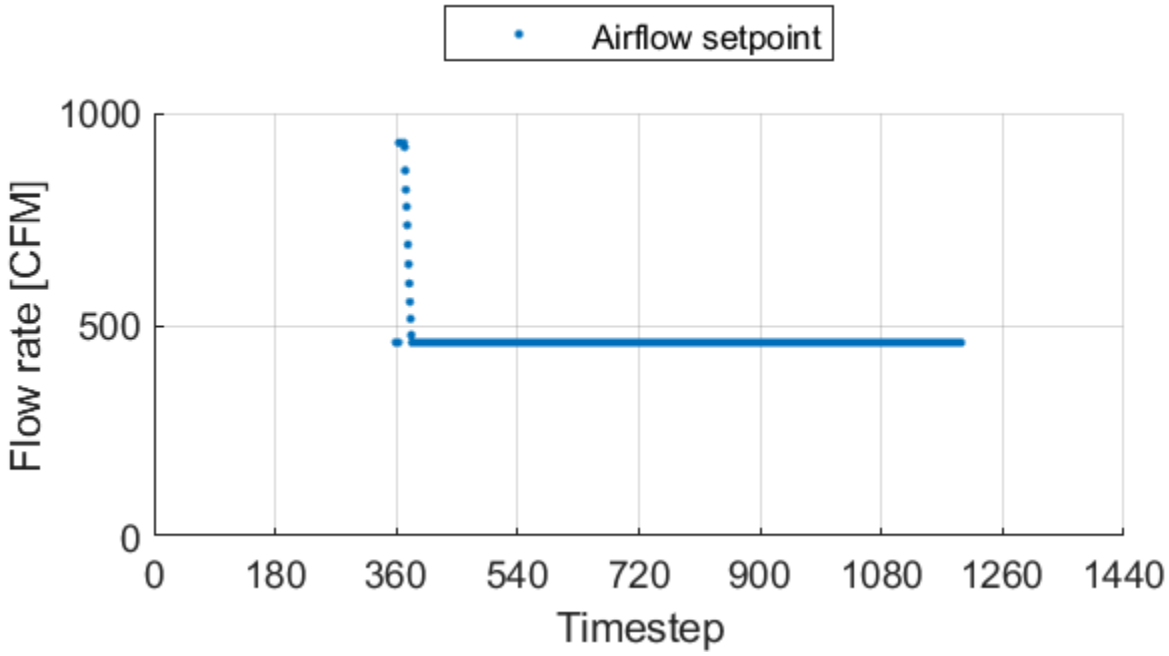
rh1_ahu2_mea zone vav reheat valve control



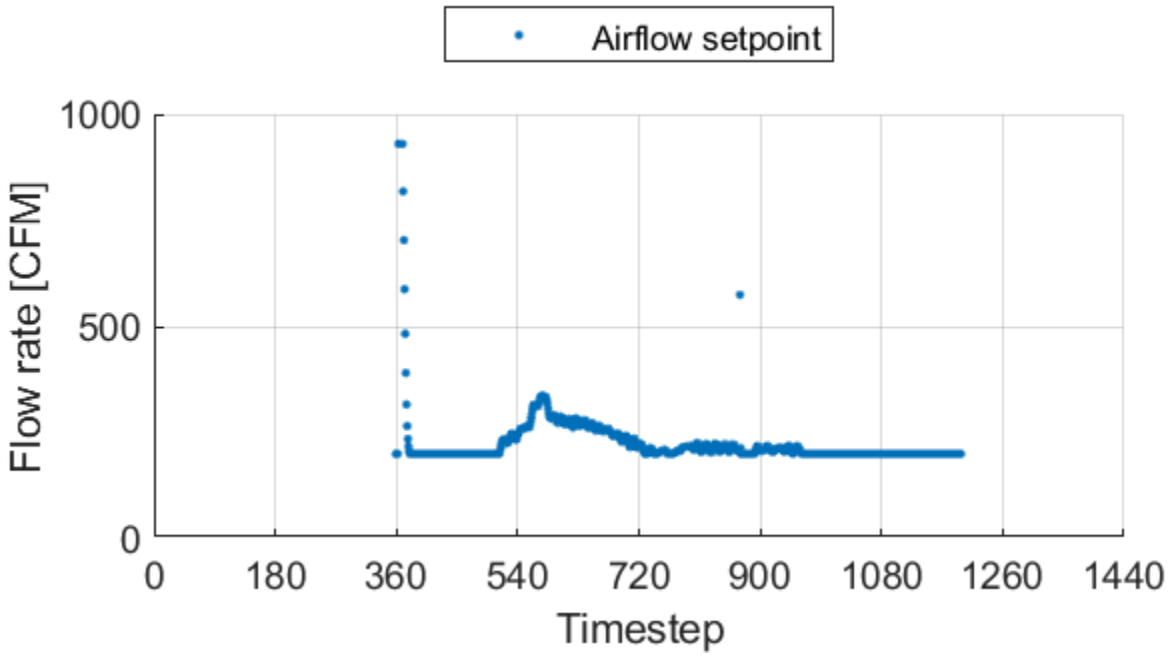
rh2_ahu2_mea zone vav reheat valve control



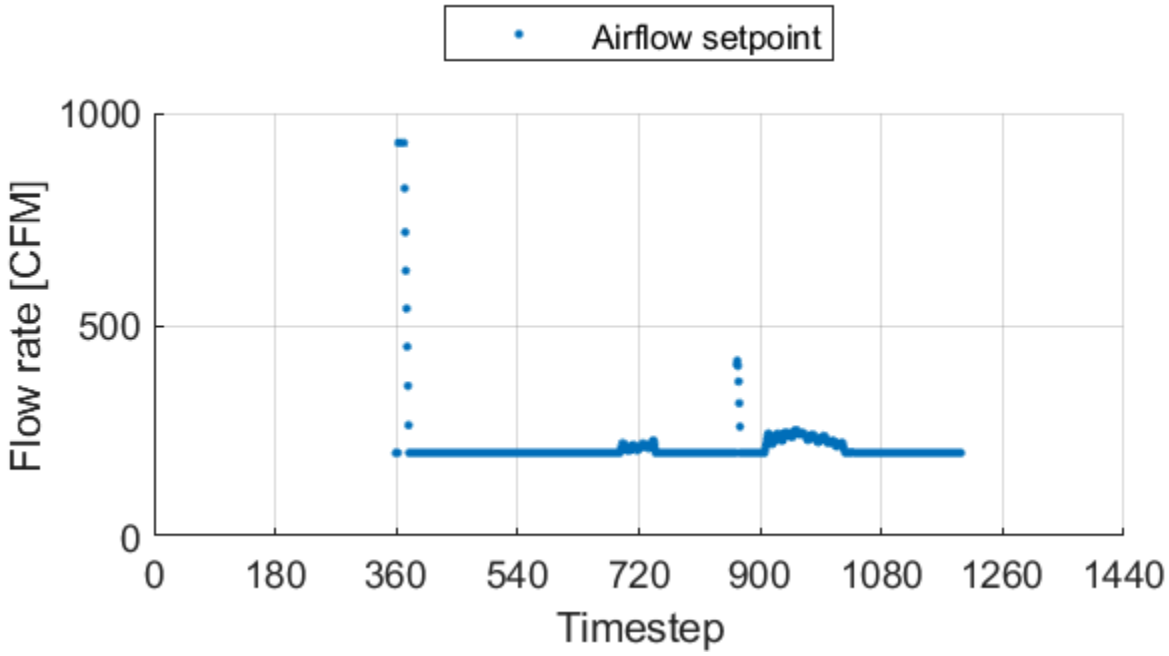
vav1_ahu1 zone vav airflow setpoint



vav2_ahu1 zone vav airflow setpoint



vav1_ahu2 zone vav airflow setpoint



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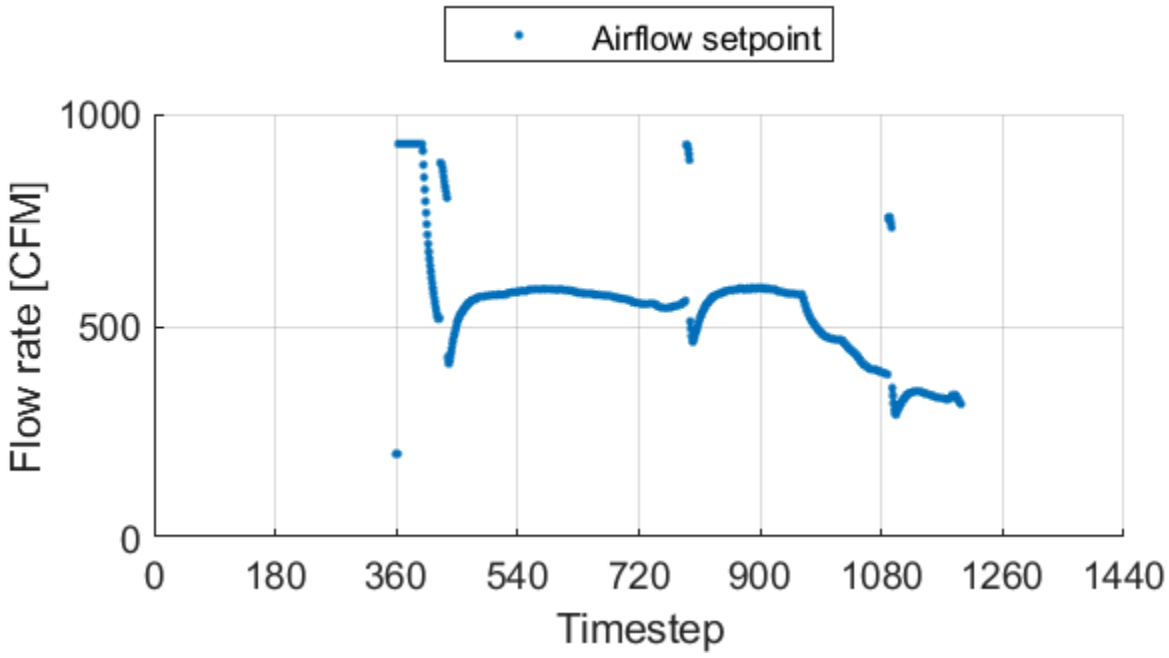
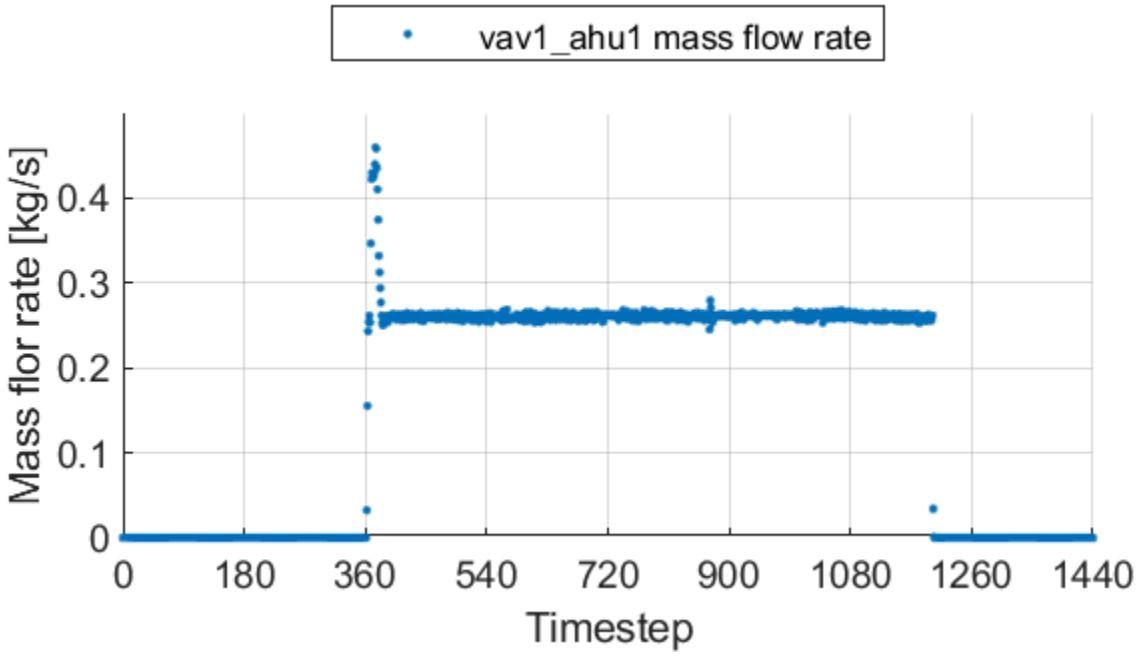
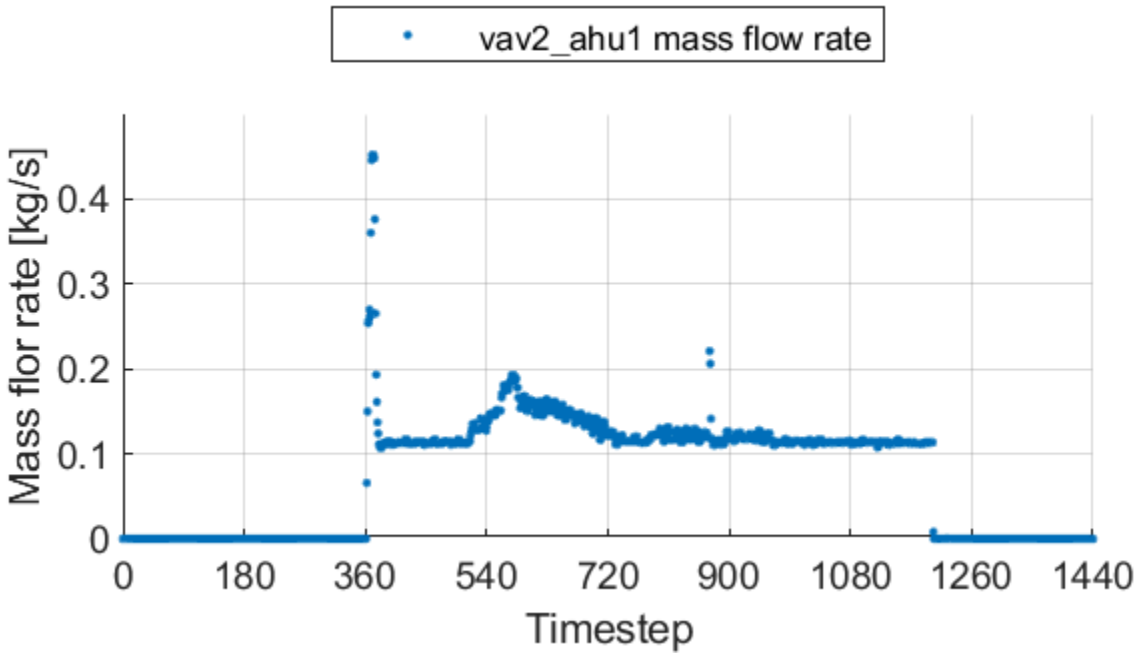


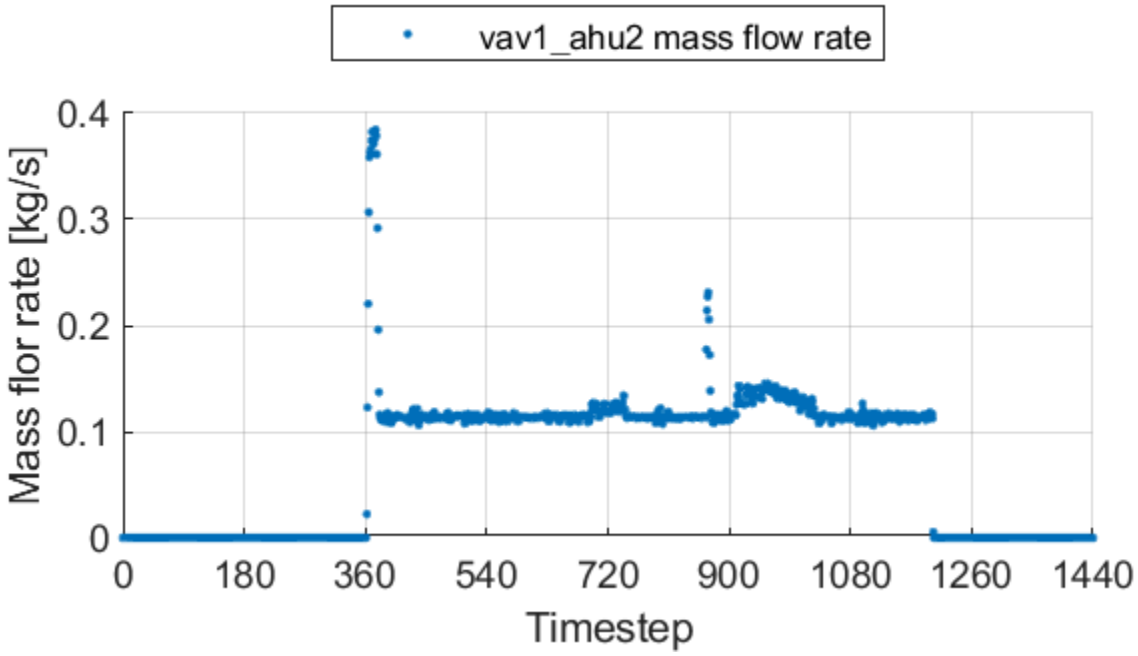
vav1_ahu1 zone vav discharge air mass flow rate



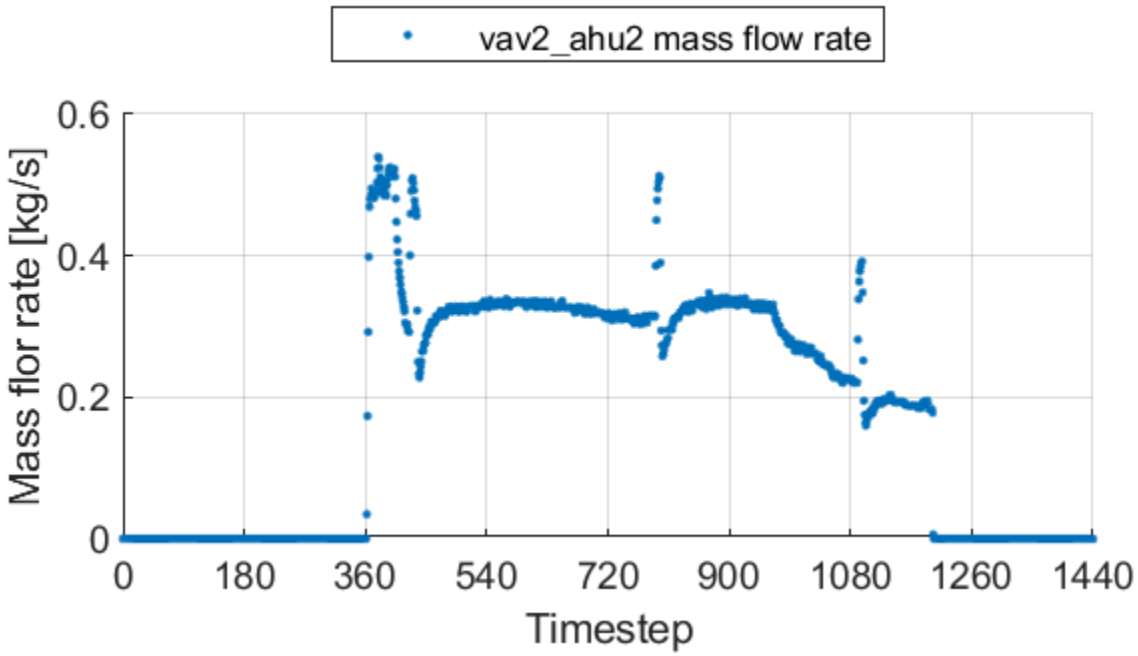
vav2_ahu1 zone vav discharge air mass flow rate



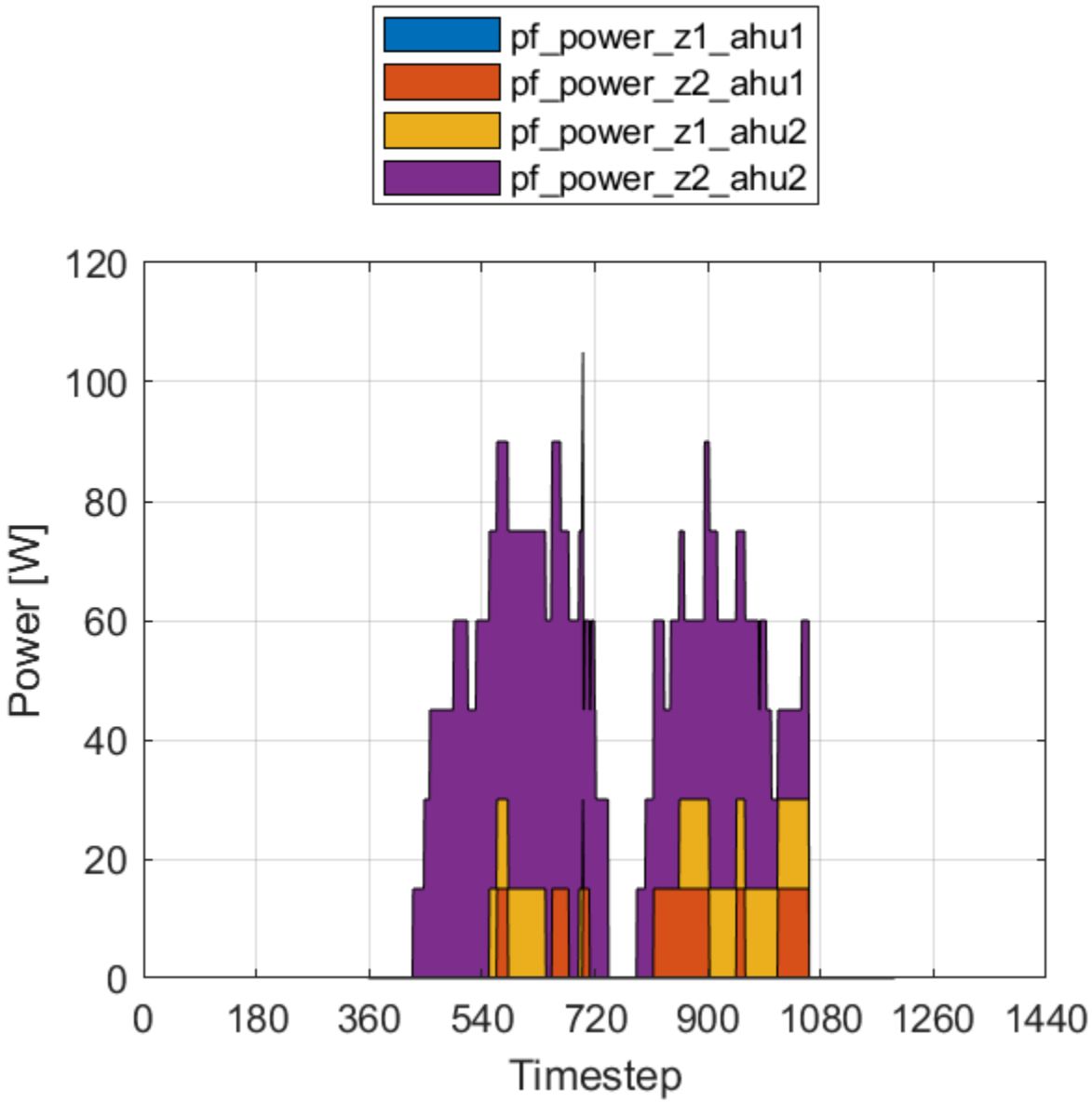
vav1_ahu2 zone vav discharge air mass flow rate



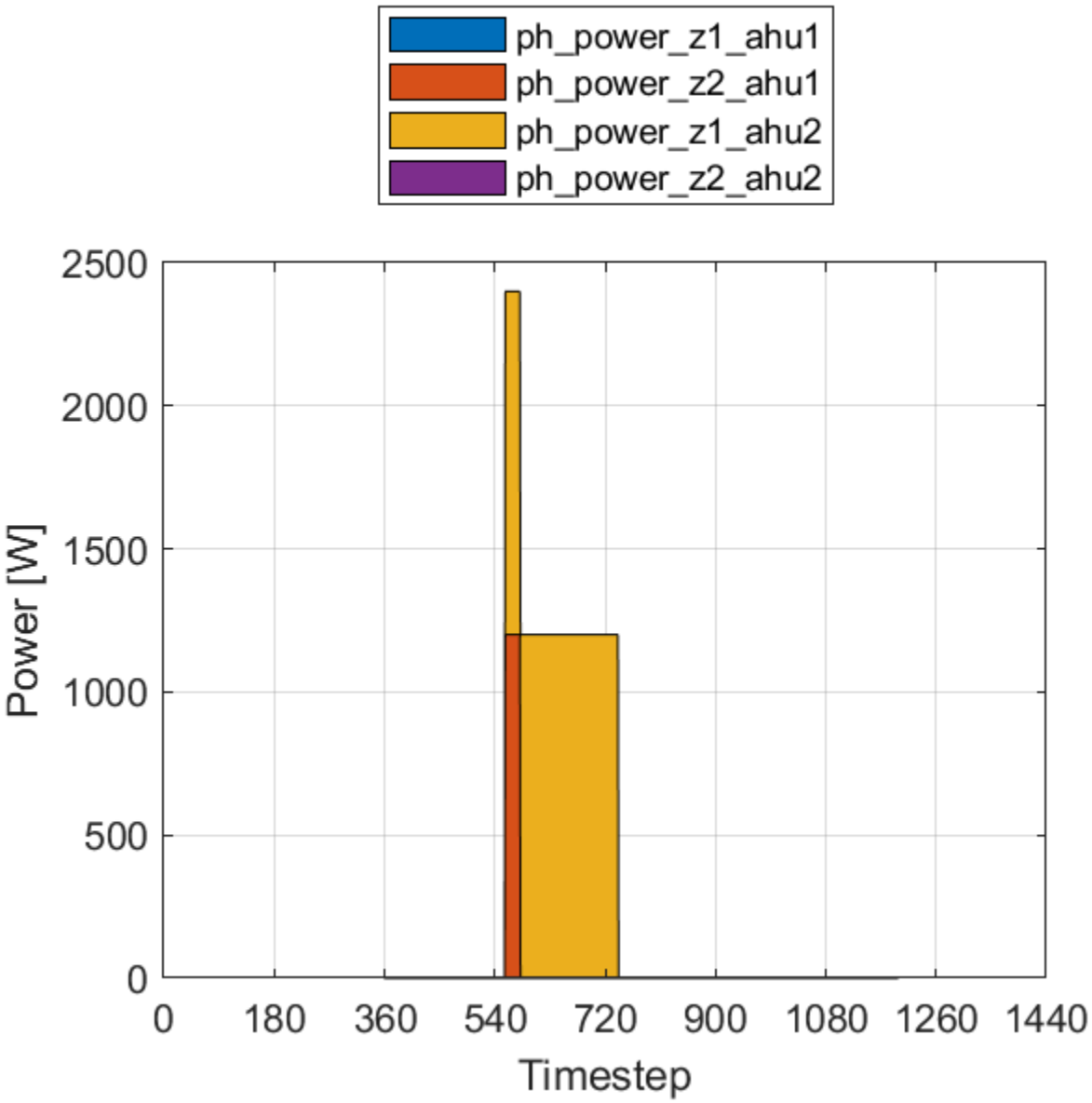
vav2_ahu2 zone vav discharge air mass flow rate



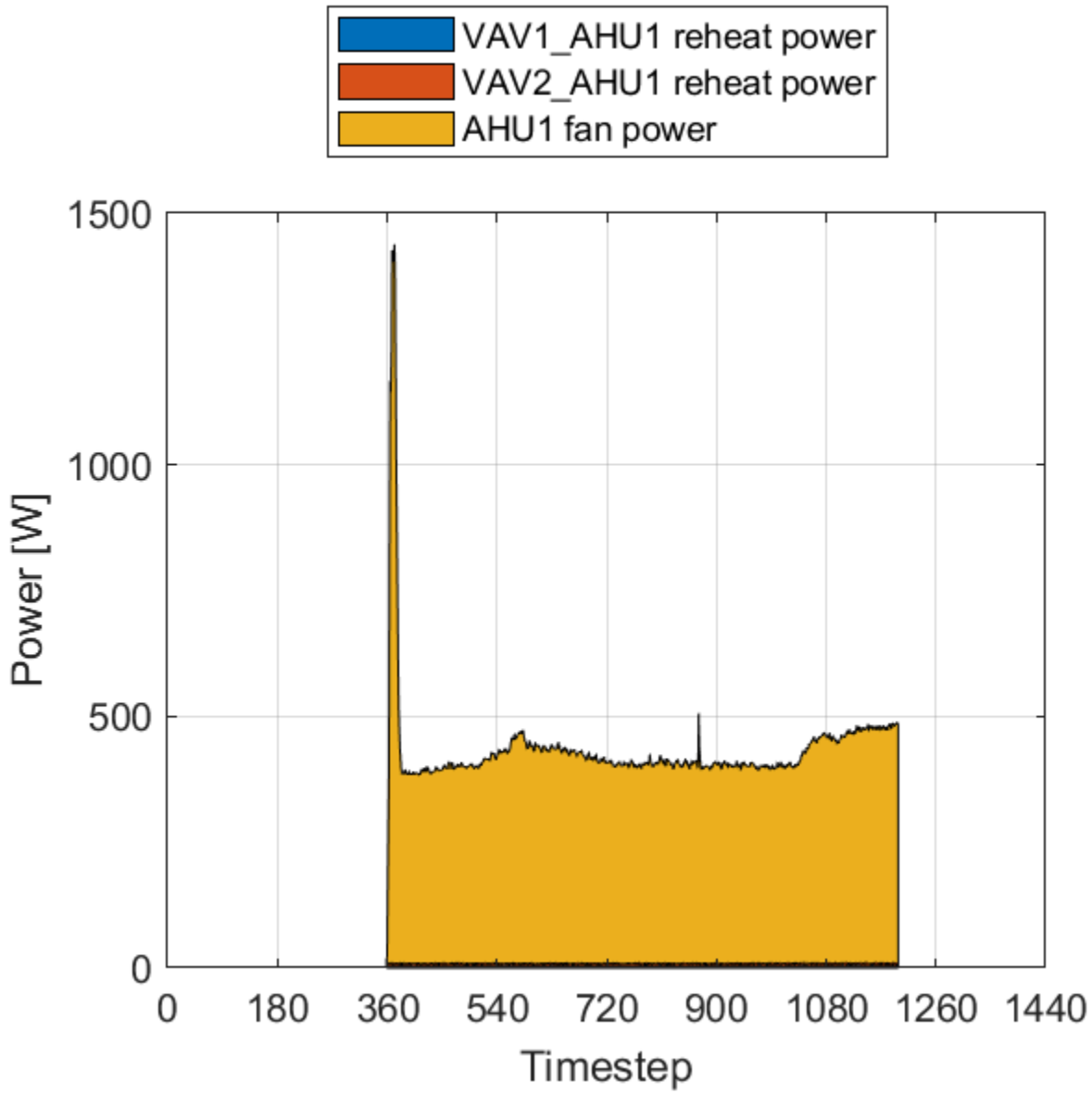
personal fan power



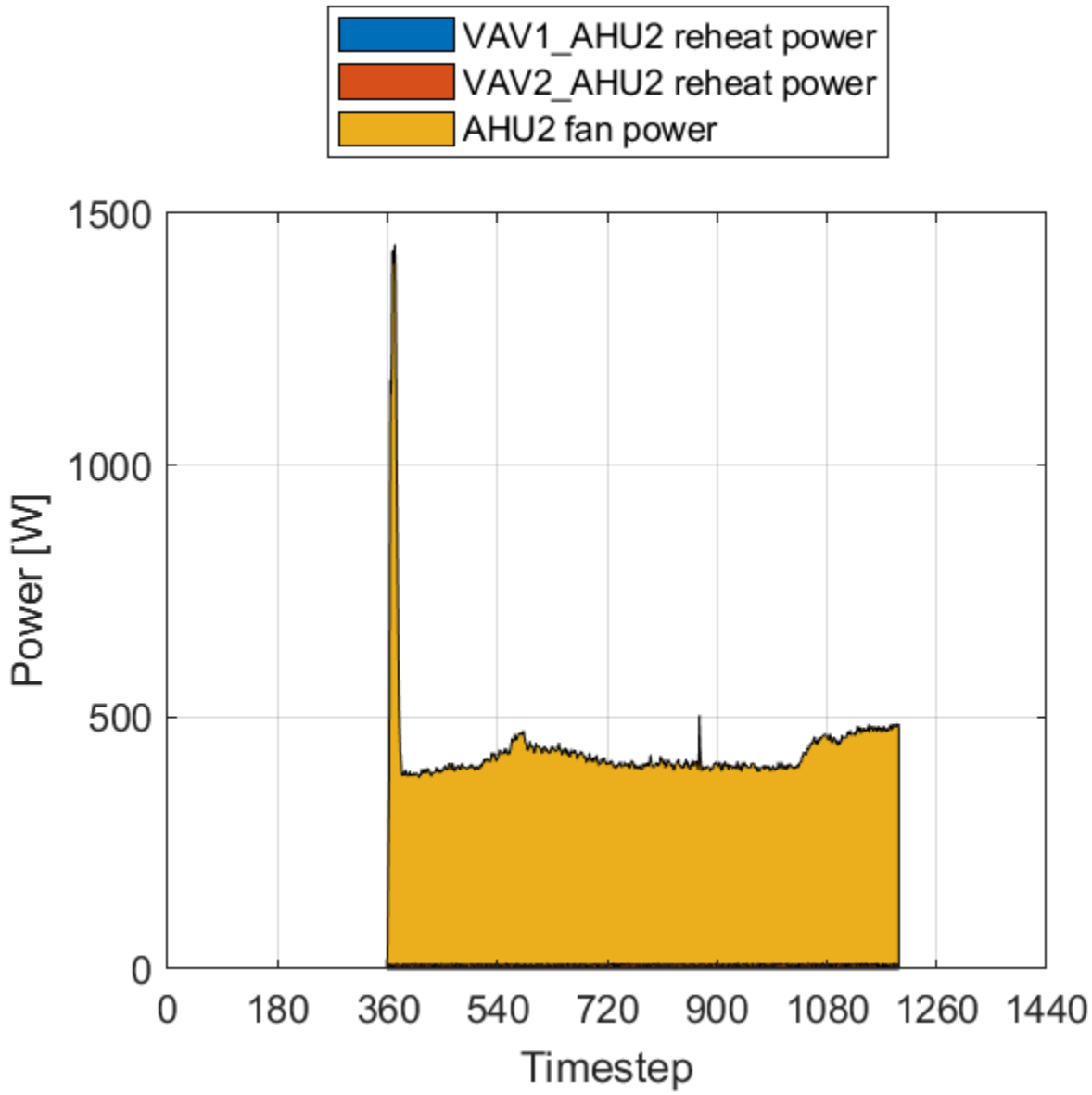
personal heater power



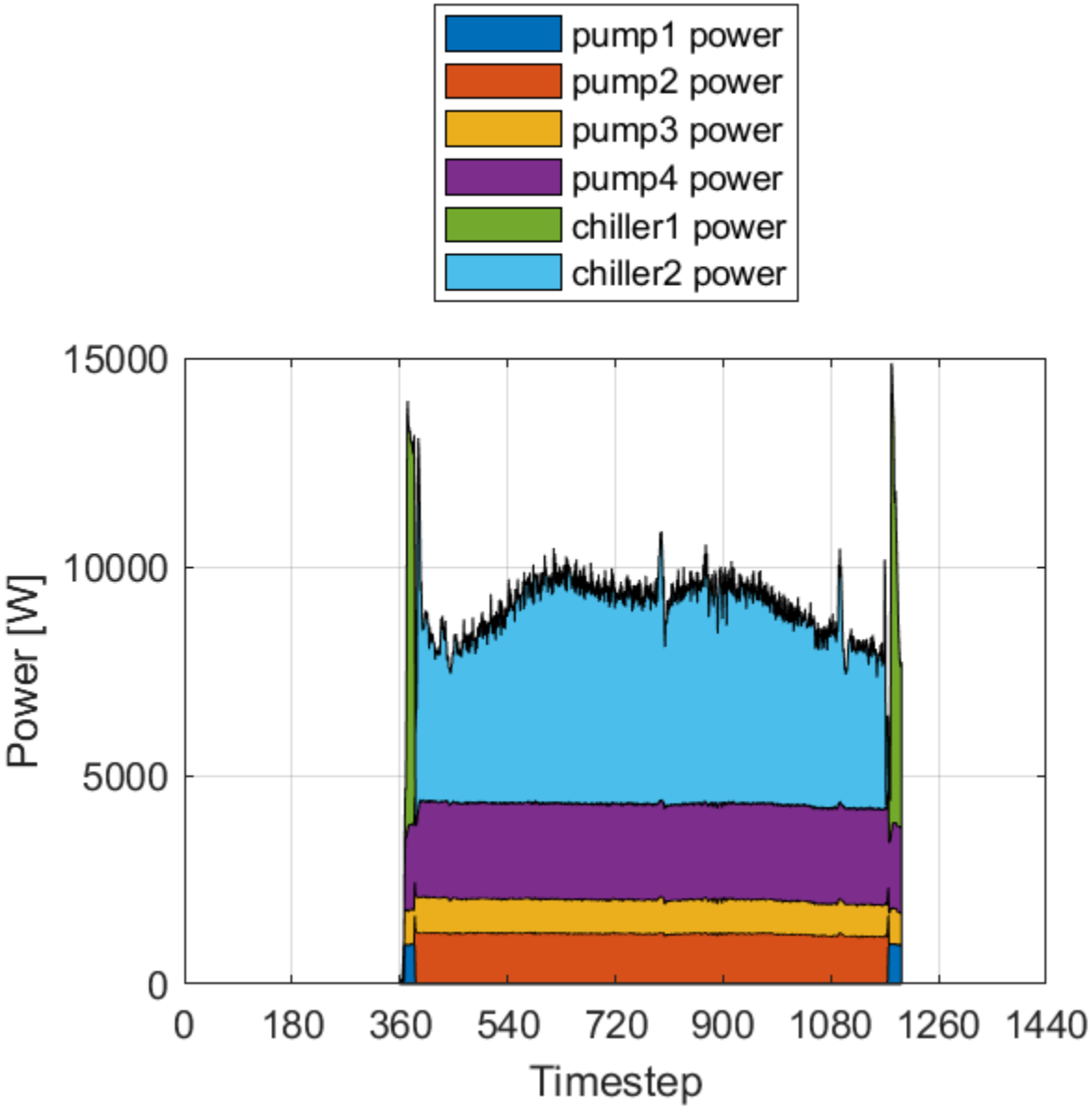
AHU1 airside power



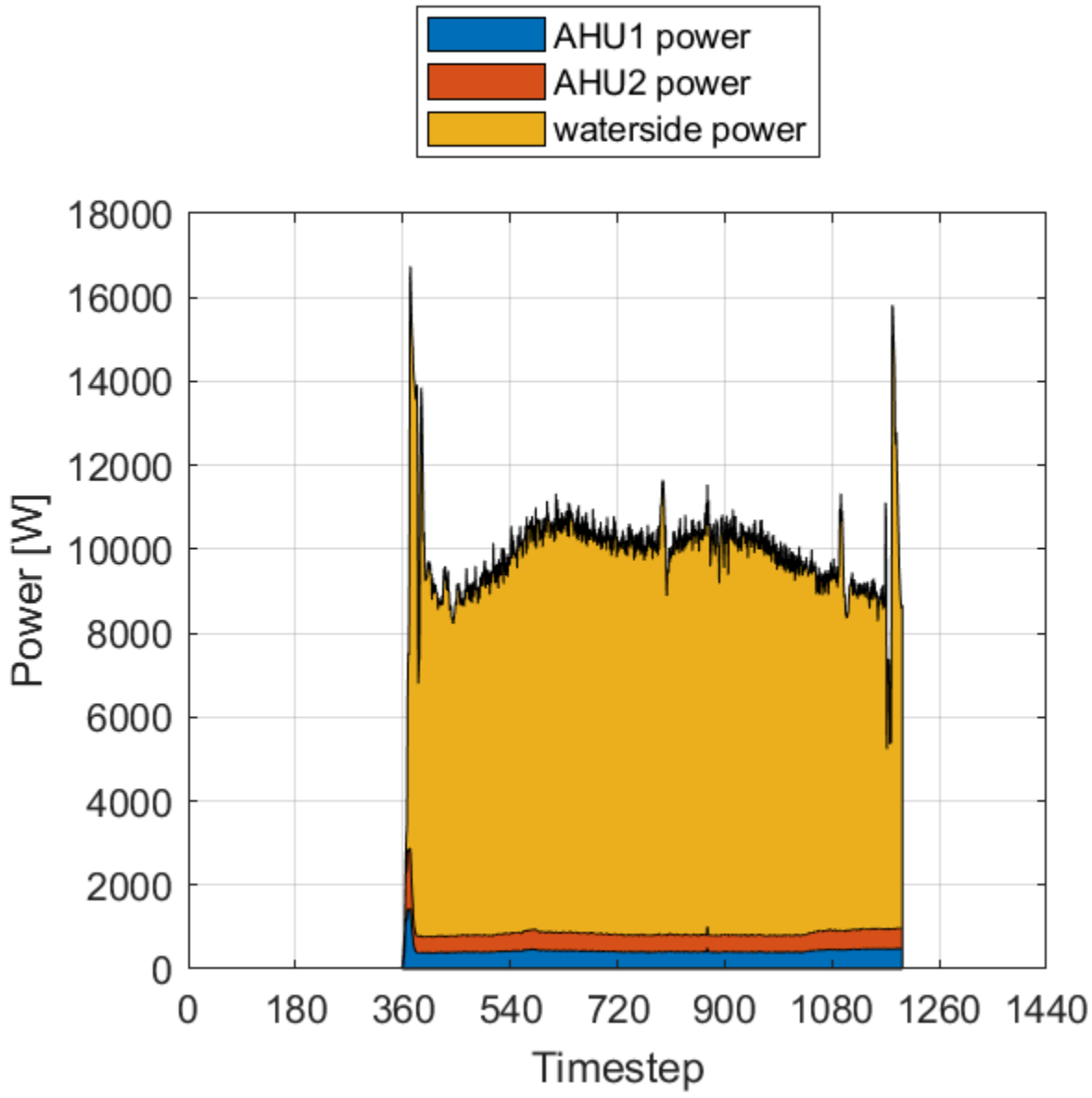
AHU2 airside power



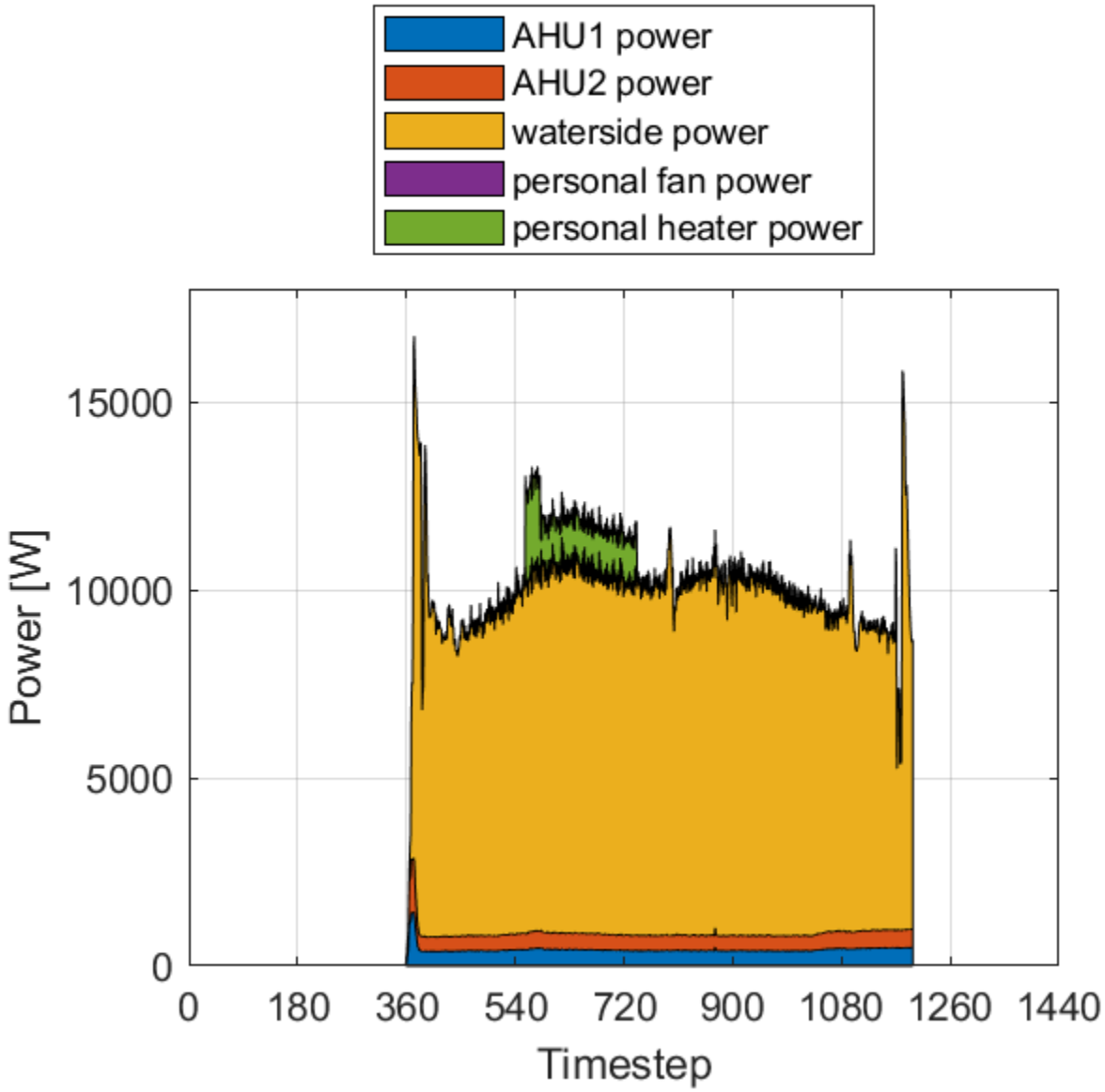
HVAC waterside power



Total HVAC power



Total power


AHU1 power
AHU2 power
waterside power
personal fan power
personal heater power
Power [W]
15000
10000
5000
0
0
180
360
540
720
900
1080
1260
1440
Timestep