Advanced Ventilation/AC Management Blueprint Documentation

Overview

This Home Assistant blueprint provides intelligent control of fans and air conditioners based on indoor temperature, outdoor conditions, forecasted heatwaves, and window/door sensor status. The system automatically adjusts cooling devices to maintain optimal comfort while being energy-efficient and responsive to environmental conditions.

Features

- **Multi-device support**: Controls various types of fans and AC units
- **Weather forecast integration**: Proactive cooling based on heatwave predictions
- **Window/door awareness**: Prevents energy waste when windows are open
- **Graduated response**: Different cooling levels based on temperature thresholds
- **Outdoor temperature consideration**: Avoids bringing in hot outdoor air

Configuration Options

Required Settings

Room Temperature Sensor

- **Parameter**: `temperature_sensor`
- **Type**: Temperature sensor entity
- **Description**: The primary indoor temperature sensor that triggers all automation logic
- **Requirements**: Must be a sensor entity with temperature device class
- **Example**: `sensor.living_room_temperature`

Device Configuration (All Optional)

On/Off Fan

- **Parameter**: `fan_on_off_entity`
- **Type**: Switch entity
- **Description**: Simple ON/OFF fan control (basic fans, exhaust fans, etc.)
- **Supported devices**: Any switch-controlled fan

- **Behavior**: Turns on when temperature exceeds start threshold, turns off when below stop threshold
- **Example**: `switch.bedroom_fan`

Ceiling Fan

- **Parameter**: `ceiling_fan_entity`
- **Type**: Fan entity or dimmable light entity
- **Description**: Variable speed ceiling fan with graduated speed control
- **Supported devices**:
  - Fan entities with percentage speed control
  - Dimmable light entities controlling fan speed
- **Behavior**: Speed adjusts based on temperature levels (25%, 50%, 75%, 100%)
- **Example**: `fan.living_room_ceiling_fan` or `light.ceiling_fan_controller`

Portable AC 1 (Advanced)

- **Parameter**: `portable_ac_1_entity`
- **Type**: Climate entity
- **Description**: AC unit with comprehensive fan mode options
- **Supported fan modes**: silent, low, medium, high, full, Auto
- **Features**:
  - Full cooling mode control
  - Fan-only mode for air circulation
  - Graduated response based on temperature
- **Example**: `climate.portable_ac_bedroom`

Portable AC 2 (Basic)

- **Parameter**: `portable_ac_2_entity`
- **Type**: Climate entity
- **Description**: AC unit with limited fan mode options
- **Supported fan modes**: auto, low, medium, high
- **Features**: Similar to AC 1 but with fewer fan speed options
- **Example**: `climate.window_ac_living_room`

Temperature Thresholds

Fan Start Threshold

- **Parameter**: `threshold_temp_start_fan`
- **Default**: 24.0°C
- **Range**: 15-30°C (0.5°C steps)
- **Description**: Indoor temperature at which fans begin operating
- **Usage**: Set based on your comfort preference for when air circulation should begin

Fan Stop Threshold

- **Parameter**: `threshold_temp_stop_fan`
- **Default**: 22.0°C
- **Range**: 15-30°C (0.5°C steps)
- **Description**: Indoor temperature at which fans turn off
- **Important**: Should be lower than start threshold to prevent rapid on/off cycling
- **Recommended**: 1-2°C below start threshold

AC High Temperature Threshold

- **Parameter**: `threshold_temp_ac_high`
- **Default**: 26.0°C
- **Range**: 20-35°C (0.5°C steps)
- **Description**: Indoor temperature that activates air conditioners in high cooling mode
- **Usage**: This is your "it's getting too hot" threshold for aggressive cooling

AC Heatwave Threshold

- **Parameter**: `threshold_temp_ac_heatwave`
- **Default**: 22.0°C
- **Range**: 18-25°C (0.5°C steps)
- **Description**: Lower indoor temperature threshold that activates AC when a heatwave is forecasted
- **Purpose**: Proactive cooling to prevent overheating during predicted hot weather
- **Recommended**: 2-4°C below normal AC threshold

Outdoor Conditions (Optional)

Outdoor Temperature Sensor

- **Parameter**: `outdoor_temperature_sensor`
- **Type**: Temperature sensor entity
- **Description**: Monitors actual outdoor temperature
- **Purpose**: Prevents ventilation when outdoor air is hotter than desired
- **Example**: `sensor.outdoor_temperature`

Max Outdoor Temperature for Ventilation

- **Parameter**: `outdoor_temp_max_for_vent`
- **Default**: 25.0°C
- **Range**: 10-30°C (0.5°C steps)
- **Description**: Maximum outdoor temperature that allows ventilation
- **Logic**: Fans won't operate if outdoor temperature exceeds this value
- **Usage**: Prevents bringing hot outdoor air inside

Weather Forecast Integration (Optional)

Weather Forecast Entity

- **Parameter**: `weather_forecast_entity`
- **Type**: Weather entity
- **Description**: Weather integration for heatwave prediction
- **Requirements**: Must provide daily temperature forecasts
- **Example**: `weather.home`, `weather.openweathermap`

Forecasted Heatwave Threshold

- **Parameter**: `forecast_temp_heatwave_threshold`
- **Default**: 30.0°C
- **Range**: 25-40°C (0.5°C steps)
- **Description**: Daily forecasted outdoor temperature that triggers heatwave mode
- **Effect**: Enables proactive cooling at lower indoor temperatures

Window/Door Integration (Optional)

Window/Door Sensor

- **Parameter**: `window_sensor_entity`
- **Type**: Binary sensor entity
- **Supported device classes**: opening, window, door
- **Description**: Monitors window or door open/closed status
- **Purpose**: Prevents AC operation when windows are open (energy efficiency)
- **Example**: `binary_sensor.bedroom_window`

AC Behavior When Window Open

- **Parameter**: `turn_off_ac_on_window_open`
- **Type**: Boolean (True/False)
- **Default**: True
- **Options**:
  - **True**: AC immediately turns OFF when window opens
  - **False**: AC won't start cooling if window is open, but continues running in fan-only mode if already active

Device Behavior Logic

Fan Operation Levels

On/Off Fans

- **ON**: Indoor temp ≥ Fan Start Threshold AND Outdoor temp ≤ Max Outdoor Temp
- **OFF**: Indoor temp < Fan Stop Threshold

Ceiling Fans (Variable Speed)

- **100% Speed**: Indoor temp > AC High Threshold + 2°C
- **75% Speed**: Indoor temp > AC High Threshold
- **50% Speed**: Indoor temp > AC High Threshold - 2°C
- **25% Speed**: Indoor temp > AC High Threshold - 4°C
- **OFF**: Indoor temp < Fan Stop Threshold

AC Operation Modes

Priority Logic (Highest to Lowest)

1. **Window Open**: AC turns off or stops cooling (based on setting)

2. **Heatwave + Threshold**: Cooling at medium fan speed
3. **Temperature-based cooling**: Graduated response based on indoor temperature
4. **Fan-only mode**: Air circulation without cooling
5. **Off**: Below minimum threshold

AC Cooling Levels

- **Full/High Speed**: Indoor temp > AC High Threshold + 2°C
- **High Speed**: Indoor temp > AC High Threshold
- **Medium Speed**: Indoor temp > AC High Threshold - 1°C
- **Low Speed**: Indoor temp > AC High Threshold - 2°C
- **Fan Only**: Indoor temp between (AC High Threshold - 3°C) and Fan Stop Threshold
- **Off**: Indoor temp < Fan Stop Threshold

Setup Recommendations

Basic Setup (Minimal Configuration)

1. Configure room temperature sensor
2. Set fan start/stop thresholds based on comfort
3. Add one cooling device (fan or AC)

Advanced Setup (Full Features)

1. Configure all relevant devices
2. Set up outdoor temperature sensor
3. Configure weather forecast integration
4. Add window/door sensors for energy efficiency
5. Fine-tune all temperature thresholds

Threshold Configuration Tips

- **Fan thresholds**: Start 1-2°C above your comfort temperature
- **AC thresholds**: Set 2-4°C above fan start threshold
- **Heatwave threshold**: Set 2-4°C below normal AC threshold
- **Outdoor max**: Set to local comfort level (typically 22-28°C)

Troubleshooting

Common Issues

- **Devices not responding**: Verify entity IDs are correct and devices are available
- **Rapid cycling**: Ensure stop thresholds are lower than start thresholds
- **AC not starting**: Check window sensor status and outdoor temperature limits
- **Weather integration not working**: Verify weather entity provides forecast data

Testing

- Use Home Assistant's automation trace feature to debug logic
- Monitor entity states during temperature changes
- Test window sensor integration by manually opening/closing windows

Energy Efficiency Features

- **Outdoor temperature awareness**: Prevents ventilation with hot outdoor air
- **Window sensor integration**: Stops AC operation when windows are open
- **Graduated response**: Uses appropriate cooling level for current conditions
- **Heatwave prediction**: Proactive cooling prevents system overload during peak heat

Compatibility

Supported Integrations

- **Climate entities**: Any Home Assistant climate integration
- **Fan entities**: Standard fan platforms with percentage control
- **Weather entities**: Most weather integrations with forecast data
- **Binary sensors**: Standard door/window sensors

Device Requirements

- **Temperature sensors**: Must report in Celsius with numeric values
- **Climate devices**: Must support hvac_mode and fan_mode services
- **Fan devices**: Must support percentage control or dimmer functionality