Application Note: 3054

Kumo Station

Application Guide

Introduction

This application note is intended to illustrate the steps required for interlocking kumo station™ with third party equipment that is being used to perform any of the following tasks: Backup heat, Humidification, Dehumidification, Ventilation, and Hydronic heat.

Table of Contents

Required Parts & Accessories

- x1 [Kumo Station](#) for each job site.

- x1 [Wireless Interface 1](#) or [Wireless Interface 2](#) for each indoor unit.

- x1 [Wireless Temperature and Humidity Sensor](#) or [MHK2 Controller](#) for each indoor unit using the Humidification, Dehumidification, or Ventilation function.
  - Also recommended for Backup heat and Hydronic heat to increase accuracy.

- x1 [Outdoor Air Temperature Sensor](#) if using Hydro-air, Hydronic, or Backup heat.

- x1 24 VAC Transformer *(field supplied)*.

Important Notes

- Local building codes supersede any instructions in this document.
- Always power down the indoor unit before performing any work.
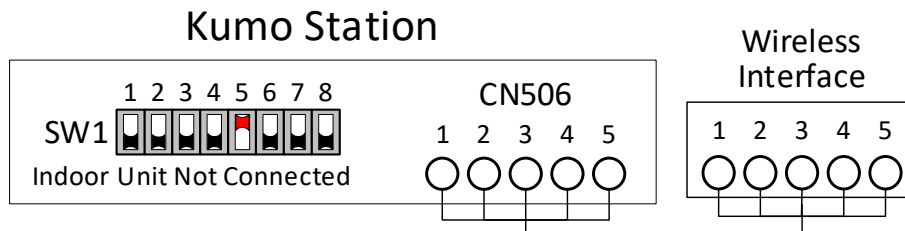
Hardware Installation
Wireless Interface, Wireless Sensor, Indoor Fan Interlock

Instructions

1. Connect a Wireless Interface to the CN105 connector of each indoor unit, and complete the setup process for each interface in the Kumo Cloud app. Do not proceed any further until all interfaces have been connected to the indoor units and commissioned in the app.
   - See pages 3-13 of the Install Guide for detailed instructions.

2. Connect a Wireless Indoor Temperature Sensor or MHK2 Controller to each indoor unit.
   - See pages 22-25 of the Install Guide for detailed instructions on the Wireless Sensor.
   - See Application Note 3052 for detailed instructions on the MHK2 Controller.

3. If interlocking the indoor fan with third party equipment, then follow the steps below. This is typically done when using a backup heater, or humidifier that requires airflow.
   a. Leave dipswitch SW1-5 OFF (default setting).
   b. Connect a Wireless Interface to CN506.
   c. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and the other end to CN105 on the indoor unit. This cable is included in the box.
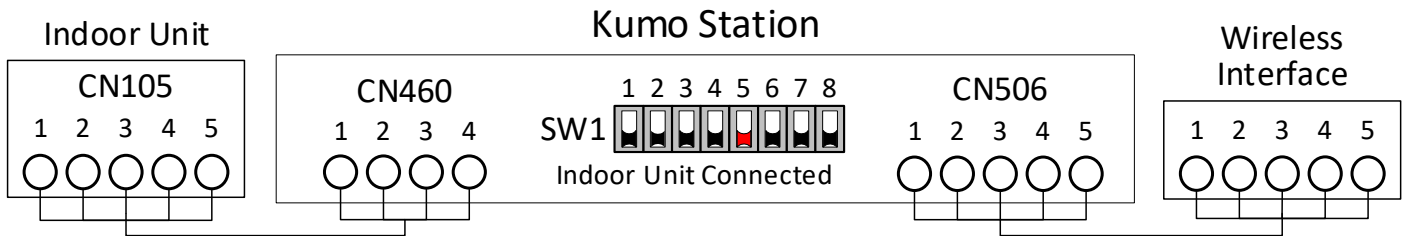
4. If not interlocking the indoor fan with third party equipment, then turn dipswitch SW1-5 ON, and connect a Wireless Interface to CN506.

Hardware Installation
Outdoor Air Sensor, 24 VAC Power Supply, Wet Contacts

Instructions

5. Install an Outdoor Air Temperature Sensor if installing any of the following backup heaters: Electric Heat Strips, Electric Baseboard heat, Hydro-air heat, Hydronic Baseboard heat. Otherwise, proceed to Step 6 below.
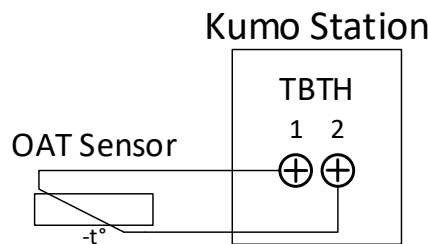
6. Connect a 24 VAC power supply to TB24 as shown below.
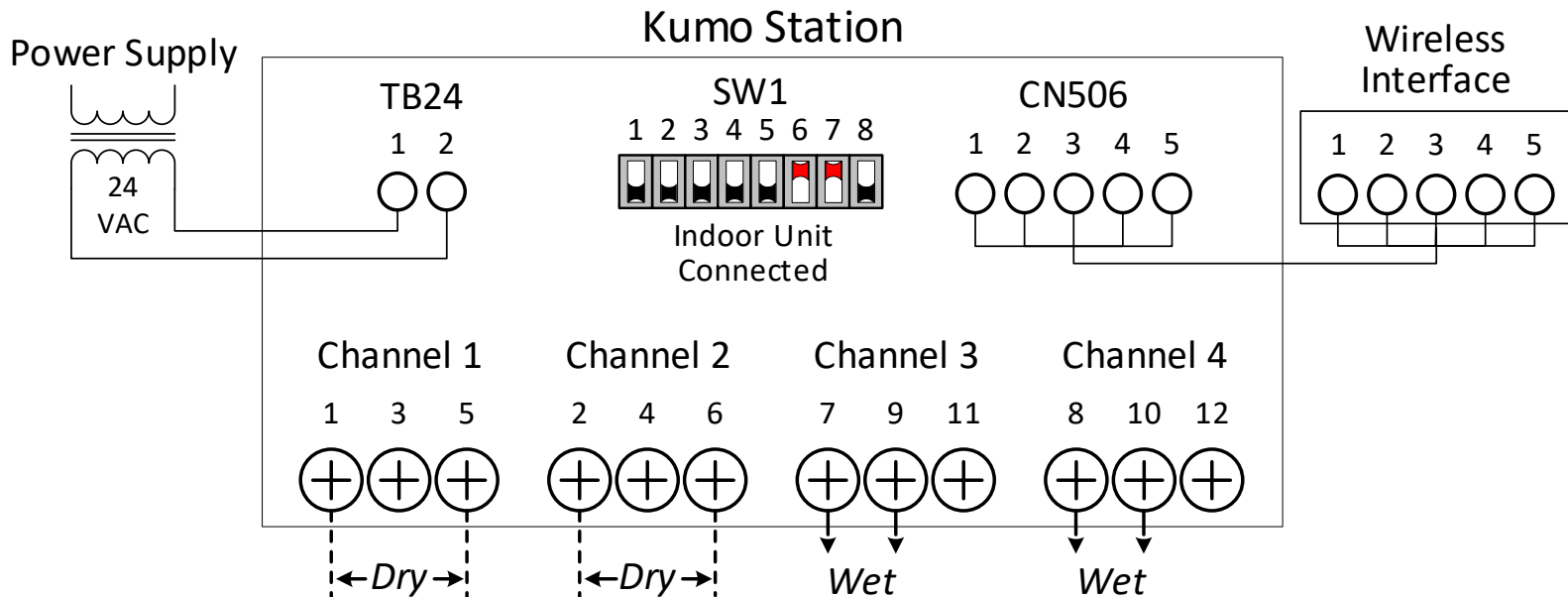
7. If using Wet contacts, then follow the steps below. If not, then proceed to the next page. Enable the Wet contacts by turning on the following dipswitches as shown above:
    *   SW1-6 for Channel 3 and SW1-7 for Channel 4
    *   Connect the third party device to terminals 7-9 on Channel 3, or 8-10 on Channel 4.
    *   See pages 10-11 of the kumo station Install Manual for more information.

Hardware Installation
Equipment Interlock, Testing, Dipswitch Settings

Instructions
7. Connect the third party equipment to channels 1, 2, 3, and 4.
8. Verify that the equipment is being properly (de)energized by manually turning the channels ON and OFF, then set the channels to the desired position.
    - Note: the AUTO position allows for the system to be controlled by Kumo Cloud, and for the channels to be to be configured as normally closed or open via dipswitch settings.
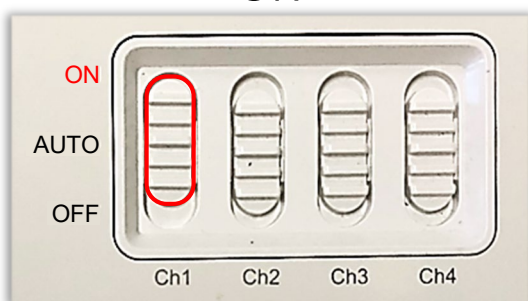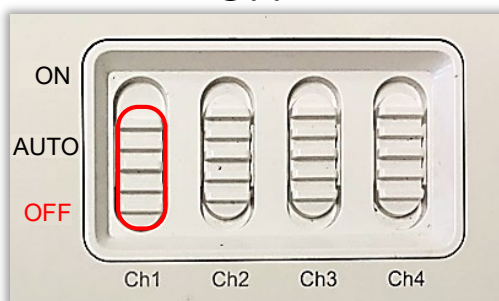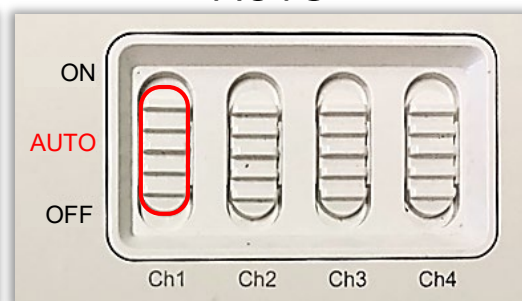
9. Set the default position of each channel to normally closed or normally open, and to wet contact or dry contact, by configuring the dipswitches as shown in the chart below.

Switch No.	ON	OFF
SW 1-1	CH1 Normally Closed	CH1 Normally Open
SW 1-2	CH2 Normally Closed	CH2 Normally Open
SW 1-3	CH3 Normally Closed	CH3 Normally Open
SW 1-4	CH4 Normally Closed	CH4 Normally Open
SW 1-5	Indoor Unit Connected	Indoor Unit Not Connected
SW 1-6	CH3 Wet Contact	CH3 Dry Contact
SW 1-7	CH4 Wet Contact	CH4 Dry Contact
SW 1-8	Do Not Use	

Application #1
Electric Heat Strips

Instructions

1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box.
2. Leave dipswitch SW1-5 OFF (default setting).
3. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21-22 of the Install Guide.

Important Notes

- Electric Heat Strips can be configured by selecting the "Backup heat" option in the app.
- When using Electric Heat Strips in very cold climates, it's recommended to add a fail-safe so that the water pipes do not freeze or burst. Please see this page for more details.

Kumo Station

- SW1-5 OFF to interlock indoor unit with Electric Heat Strips (*required*)
- SW1-6/7 ON to enable Wet contacts (*optional*)

Required with Electric Heat Strips

![Mitsubishi Electric - Cooling & Heating]

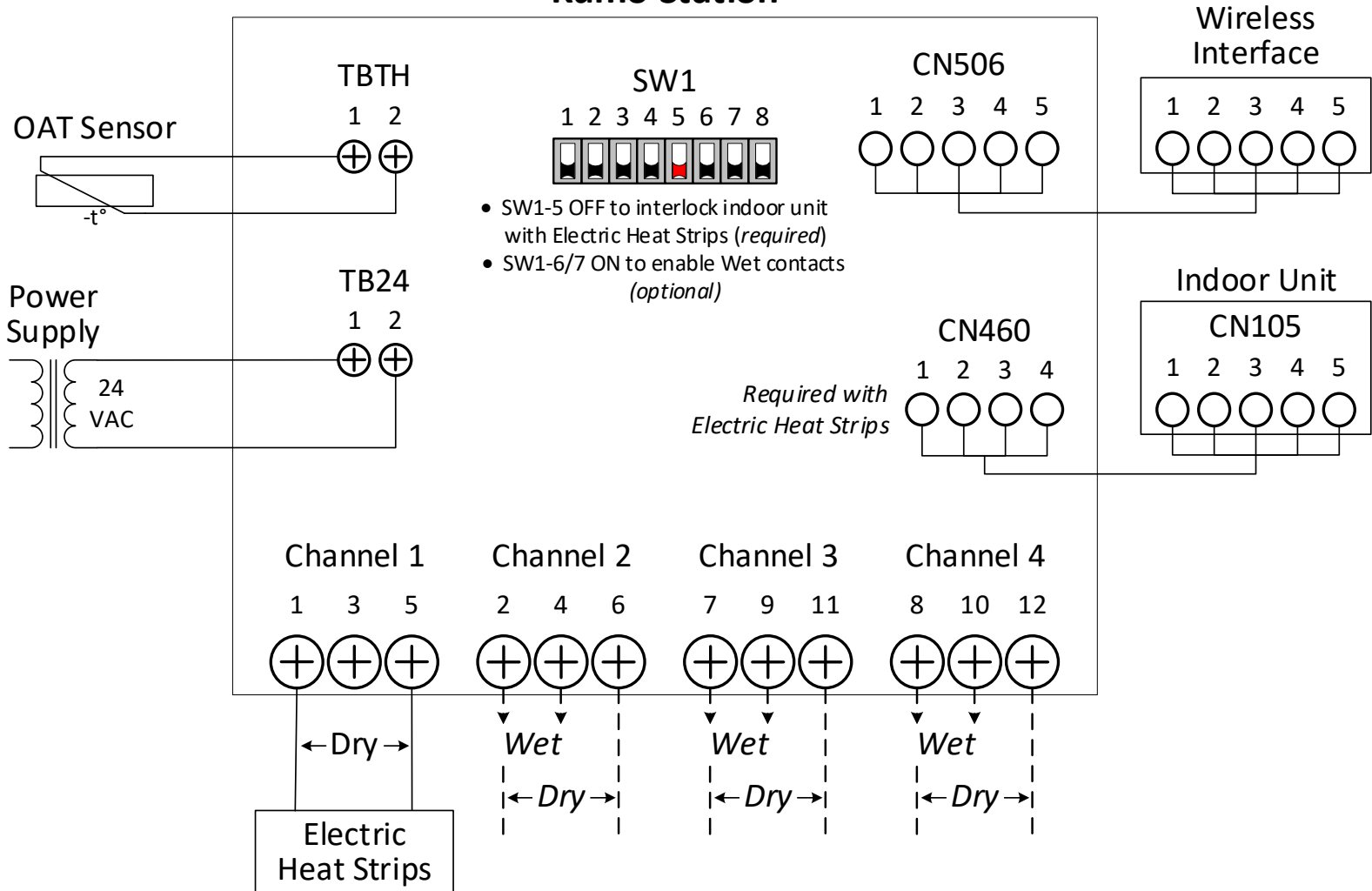# Application #2
Electric Heat Strips, Ventilation

Instructions
1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box.
2. Leave dipswitch SW1-5 OFF (default setting).
3. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21-22, and 26 of the Install Guide.

Important Notes
- Electric Heat Strips can be configured by selecting the "Backup heat" option in the app.
- When using Electric Heat Strips in very cold climates, it's recommended to add a fail-safe so that the water pipes do not freeze or burst. Please see this page for more details.

Kumo Station

OAT Sensor

TBTH
1 2

SW1
1 2 3 4 5 6 7 8
- SW1-5 OFF to interlock indoor unit with Electric Heat Strips (required)
- SW1-6/7 ON to enable Wet contacts (optional)

CN506
1 2 3 4 5

Wireless Interface
1 2 3 4 5

Power Supply
24 VAC

TB24
1 2

CN460
1 2 3 4
Required with Electric Heat Strips

Indoor Unit
CN105
1 2 3 4 5

Channel 1
1 3 5
←Dry→
Electric Heat Strips

Channel 2
2 4 6
←Dry→
Ventilation (optional)

Channel 3
7 9 11
Wet
|←Dry→|

Channel 4
8 10 12
Wet
|←Dry→|

![Mitsubishi Electric Cooling & Heating logo]

Application #3
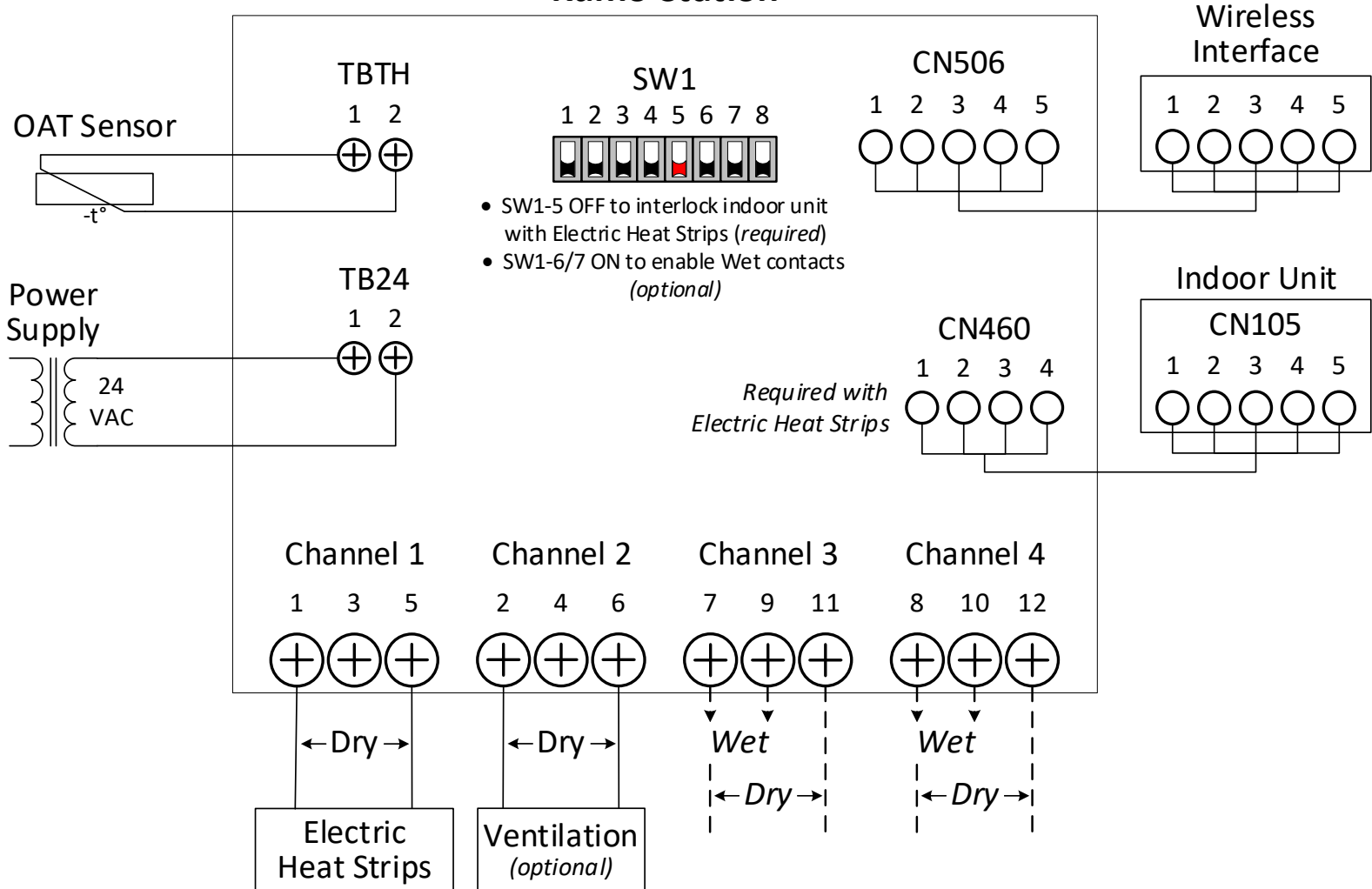## Electric Heat Strips, Humidification, Ventilation

Instructions

1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box.
2. Leave dipswitch SW1-5 OFF (default setting).
3. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21-22, and 25-26 of the Install Guide.

Important Notes

- Electric Heat Strips can be configured by selecting the "Backup heat" option in the app.
- When using Electric Heat Strips in very cold climates, it's recommended to add a fail-safe so that the water pipes do not freeze or burst. Please see this page for more details.

Kumo Station
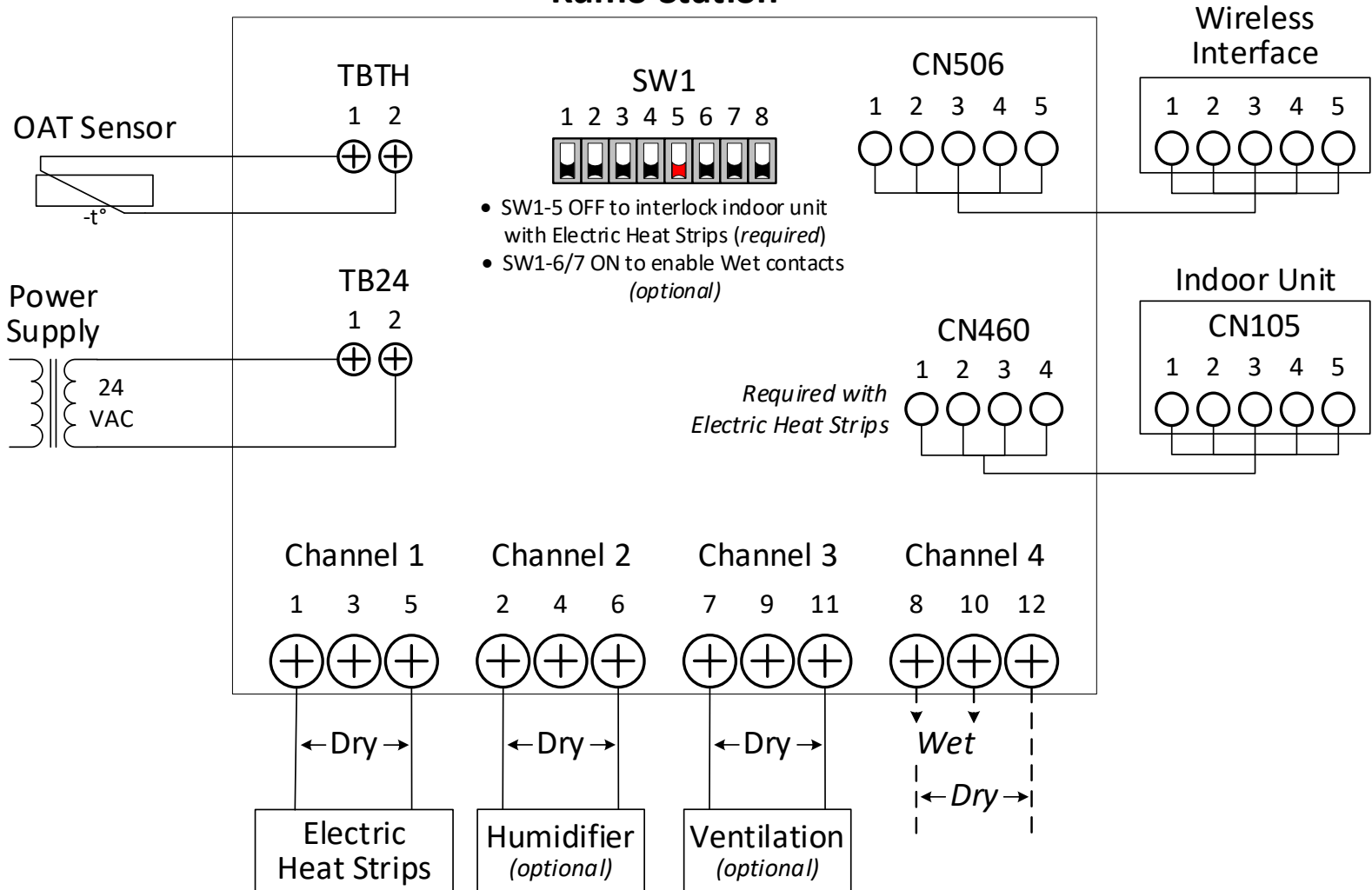
Application #4
Backup Heat

Instructions

1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box.
2. Leave dipswitch SW1-5 OFF (default setting).
3. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21-22 of the Install Guide.

Important Notes

• Examples of Backup Heat include boilers, radiators, baseboard and floor heaters.
• When using Electric Heat Strips in very cold climates, it's recommended to add a fail-safe so that the water pipes do not freeze or burst. Please see this page for more details.

Kumo Station
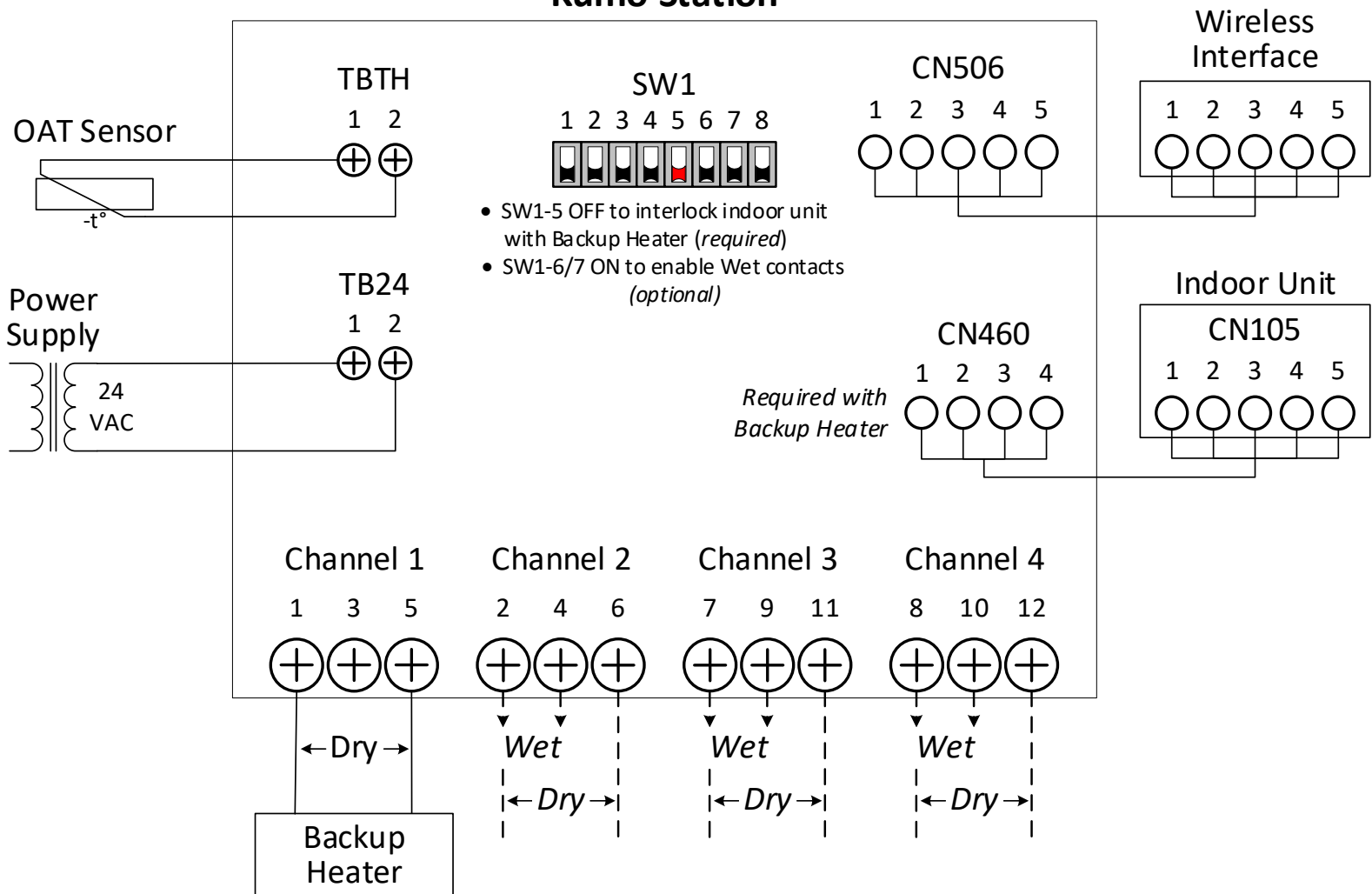
Application #5
Backup Heat, Ventilation

Instructions

1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box.
2. Leave dipswitch SW1-5 OFF (default setting).
3. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21-22, and 26 of the Install Guide.

Important Notes

- Examples of Backup Heat include boilers, radiators, baseboard and floor heaters.
- When using Electric Heat Strips in very cold climates, it's recommended to add a fail-safe so that the water pipes do not freeze or burst. Please see this page for more details.

Kumo Station

- SW1-5 OFF to interlock indoor unit with Backup Heater (*required*)
- SW1-6/7 ON to enable Wet contacts (*optional*)

OAT Sensor
-t°

Power Supply
24 VAC

TBTH 1 2

TB24 1 2

SW1 1 2 3 4 5 6 7 8

CN506 1 2 3 4 5

CN460 1 2 3 4
Required with Backup Heater

Wireless Interface 1 2 3 4 5

Indoor Unit
CN105 1 2 3 4 5

Channel 1 1 3 5
Channel 2 2 4 6
Channel 3 7 9 11
Channel 4 8 10 12

←Dry→ ←Dry→ *Wet* *Wet*
|←Dry→| |←Dry→|

Backup Heater

Ventilation *(optional)*

Application #6
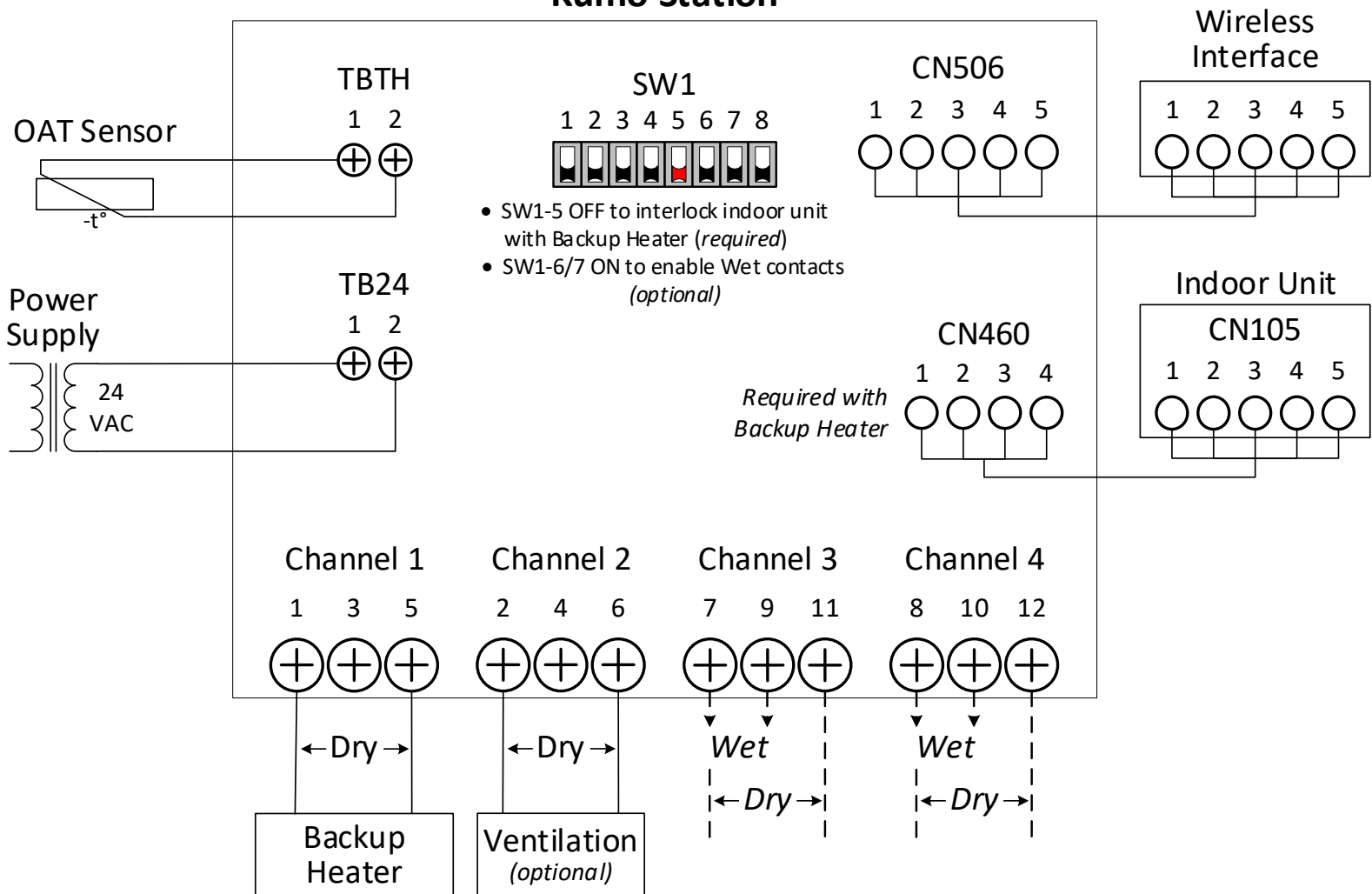## Backup Heat, Humidification, Ventilation

Instructions

1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box.
2. Leave dipswitch SW1-5 OFF (default setting).
3. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21-22, and 25-26 of the Install Guide.

Important Notes

- Examples of Backup Heat include boilers, radiators, baseboard and floor heaters.
- When using Electric Heat Strips in very cold climates, it's recommended to add a fail-safe so that the water pipes do not freeze or burst. Please see this page for more details.

Kumo Station

OAT Sensor
-t°

Power Supply
24 VAC

TBTH
1 2

TB24
1 2

SW1
1 2 3 4 5 6 7 8
- SW1-5 OFF to interlock indoor unit with Backup Heater (*required*)
- SW1-6/7 ON to enable Wet contacts (*optional*)

CN506
1 2 3 4 5

CN460
1 2 3 4
Required with Backup Heater

Wireless Interface
1 2 3 4 5

Indoor Unit
CN105
1 2 3 4 5

Channel 1
1   3   5
←Dry→
Backup Heater

Channel 2
2   4   6
←Dry→
Humidifier (*optional*)

Channel 3
7   9   11
←Dry→
Ventilation (*optional*)

Channel 4
8   10   12
Wet
|←Dry→|

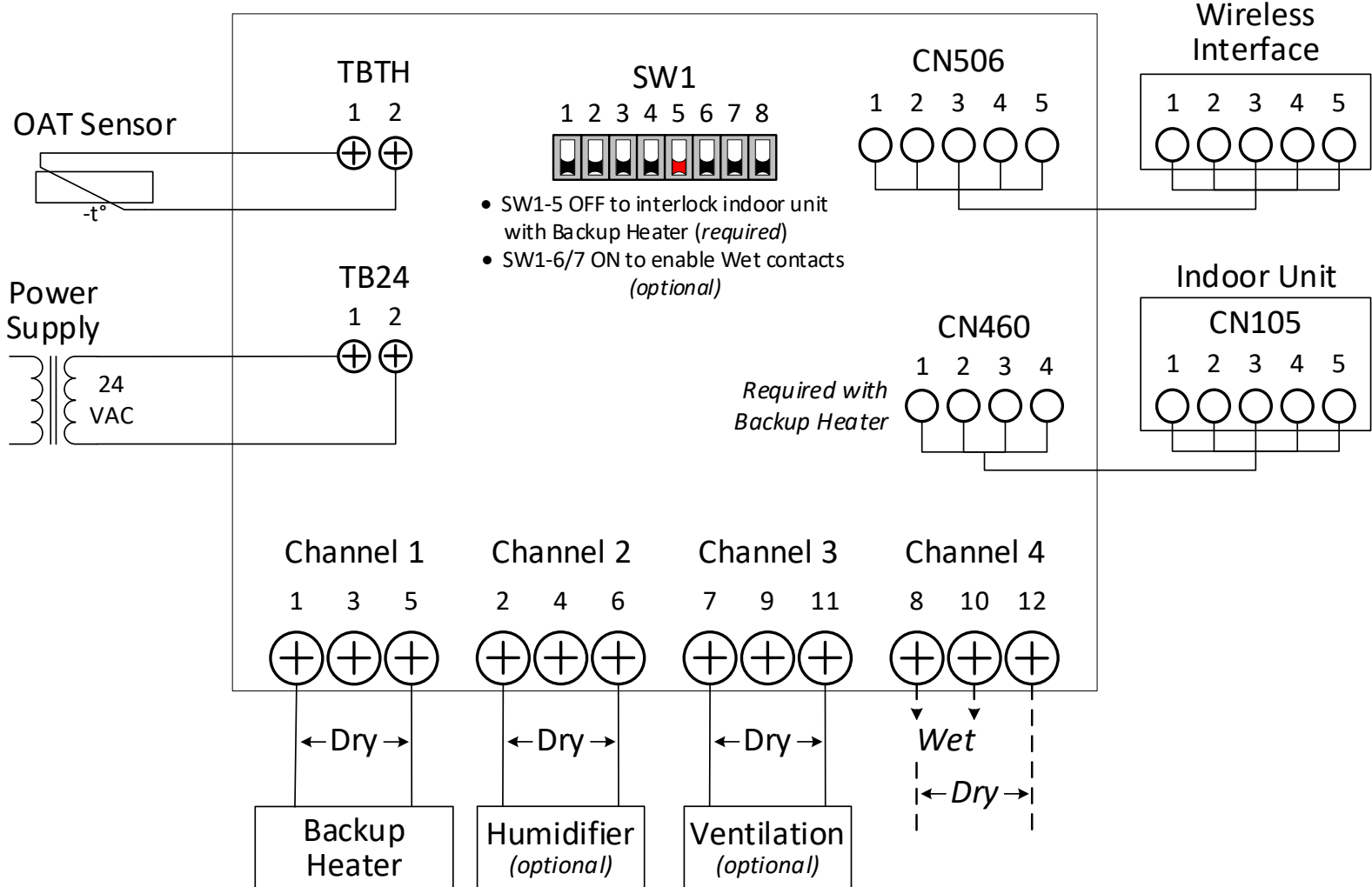# Application #7
Hydro-air, Ventilation

Instructions
1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box.
2. Leave dipswitch SW1-5 OFF (default setting).
3. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21, and 26-27 of the Install Guide.

Important Notes
- Hydro-air settings can be configured by selecting the "Hydronic heat" option in the app.
- When using a Hydro-air system in very cold climates, it's recommended to add a fail-safe so that the water pipes do not freeze or burst. Please see this page for more details.

Kumo Station

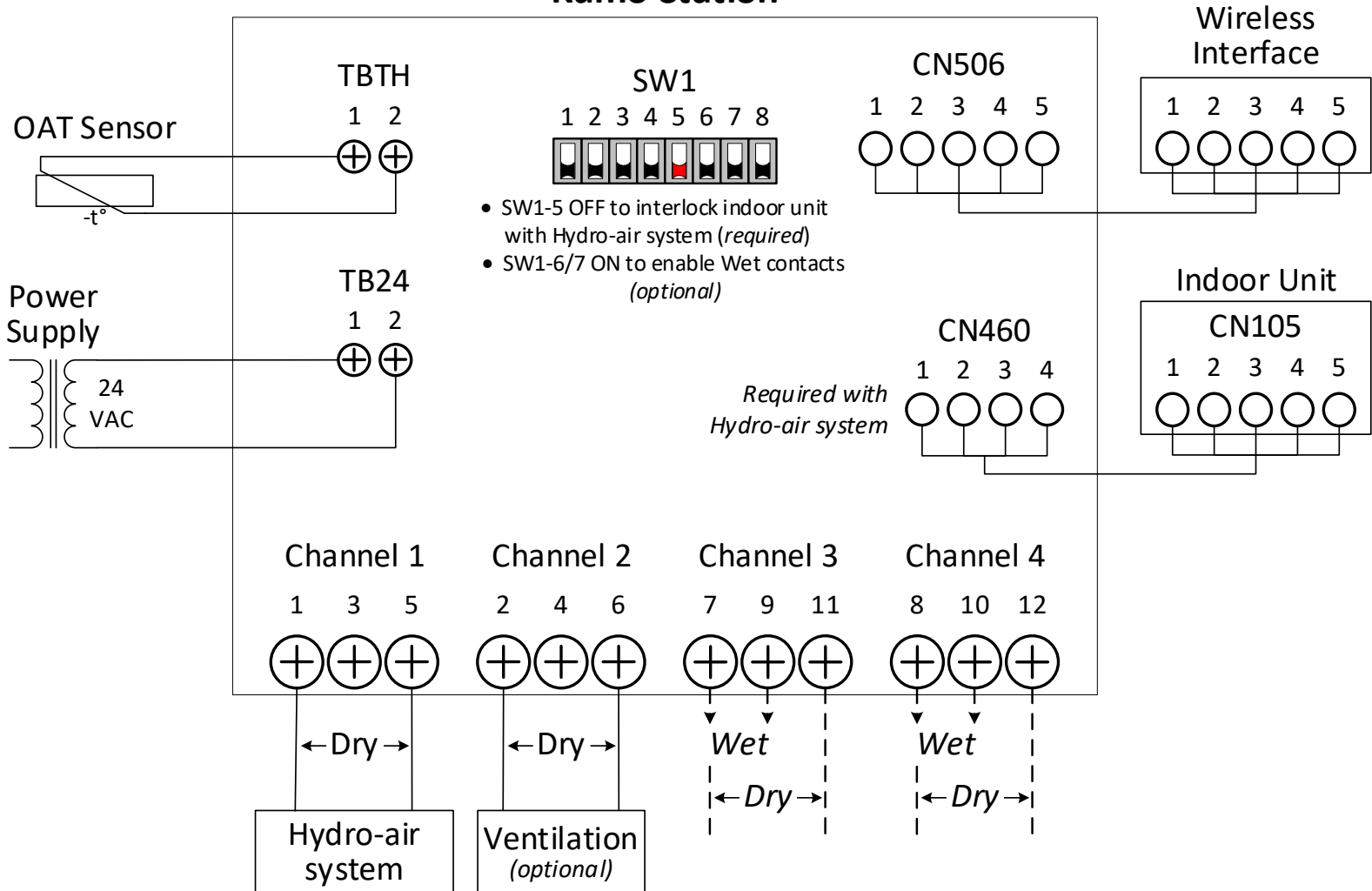# Application #8
Hydro-air, Backup Heat, Ventilation

Instructions
1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box.
2. Leave dipswitch SW1-5 OFF (default setting).
3. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21-22, and 26-27 of the Install Guide.

Important Notes
- Hydro-air settings can be configured by selecting the "Hydronic heat" option in the app.
- When using a Hydro-air system in very cold climates, it's recommended to add a fail-safe so that the water pipes do not freeze or burst. Please see this page for more details.

Kumo Station

OAT Sensor
-t°

TBTH
1 2

SW1
1 2 3 4 5 6 7 8
- SW1-5 OFF to interlock indoor unit with Hydro-air system (*required*)
- SW1-6/7 ON to enable Wet contacts (*optional*)

CN506
1 2 3 4 5

Wireless Interface
1 2 3 4 5

Power Supply
24 VAC

TB24
1 2

CN460
1 2 3 4
Required with Hydro-air system

Indoor Unit
CN105
1 2 3 4 5

Channel 1
1   3   5
←Dry→

Channel 2
2   4   6
←Dry→

Channel 3
7   9   11
←Dry→

Channel 4
8   10   12
Wet
|←Dry→|

Hydro-air system

Backup Heat (*optional*)

Ventilation (*optional*)
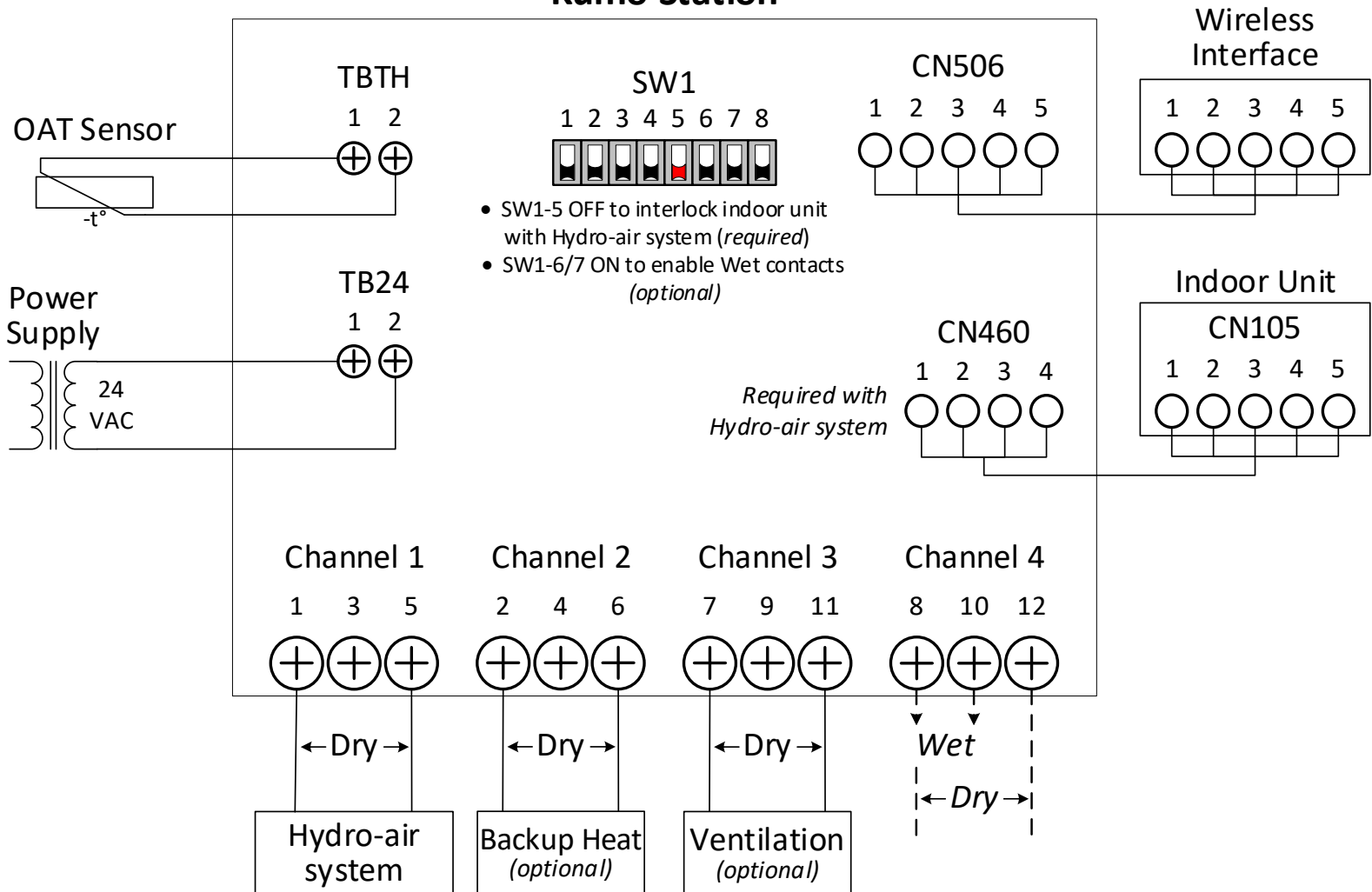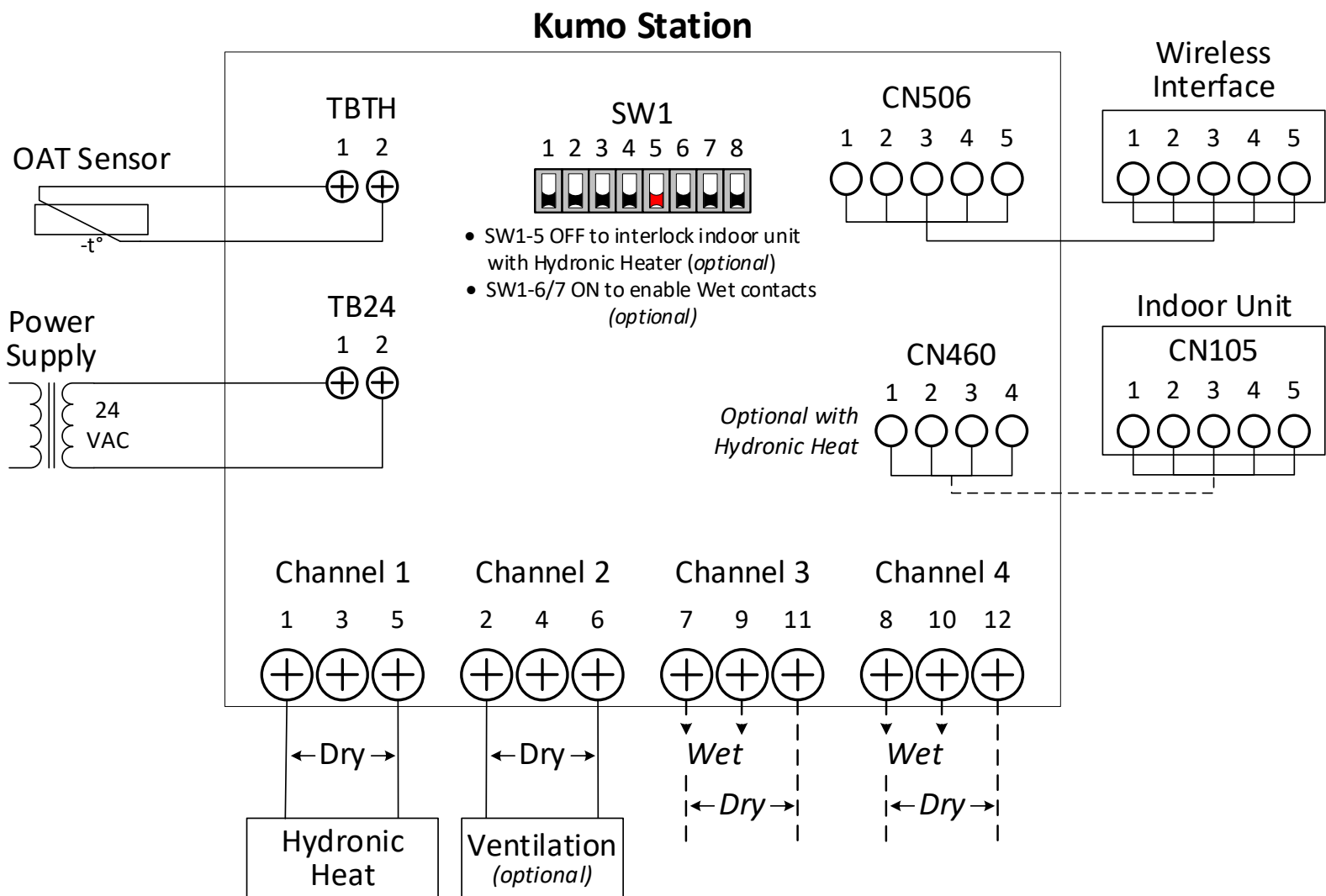
Application #9
Hydronic Heat, Ventilation

Instructions

1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box. Note that this step is optional when using Hydronic Heat.
2. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21, and 26-27 of the Install Guide.

Important Note

• When using Hydronic heat in very cold climates, it's recommended to add a fail-safe so that the water pipes do not freeze or burst. Please see this page for more details.

Kumo Station

- SW1-5 OFF to interlock indoor unit with Hydronic Heater (*optional*)
- SW1-6/7 ON to enable Wet contacts (*optional*)
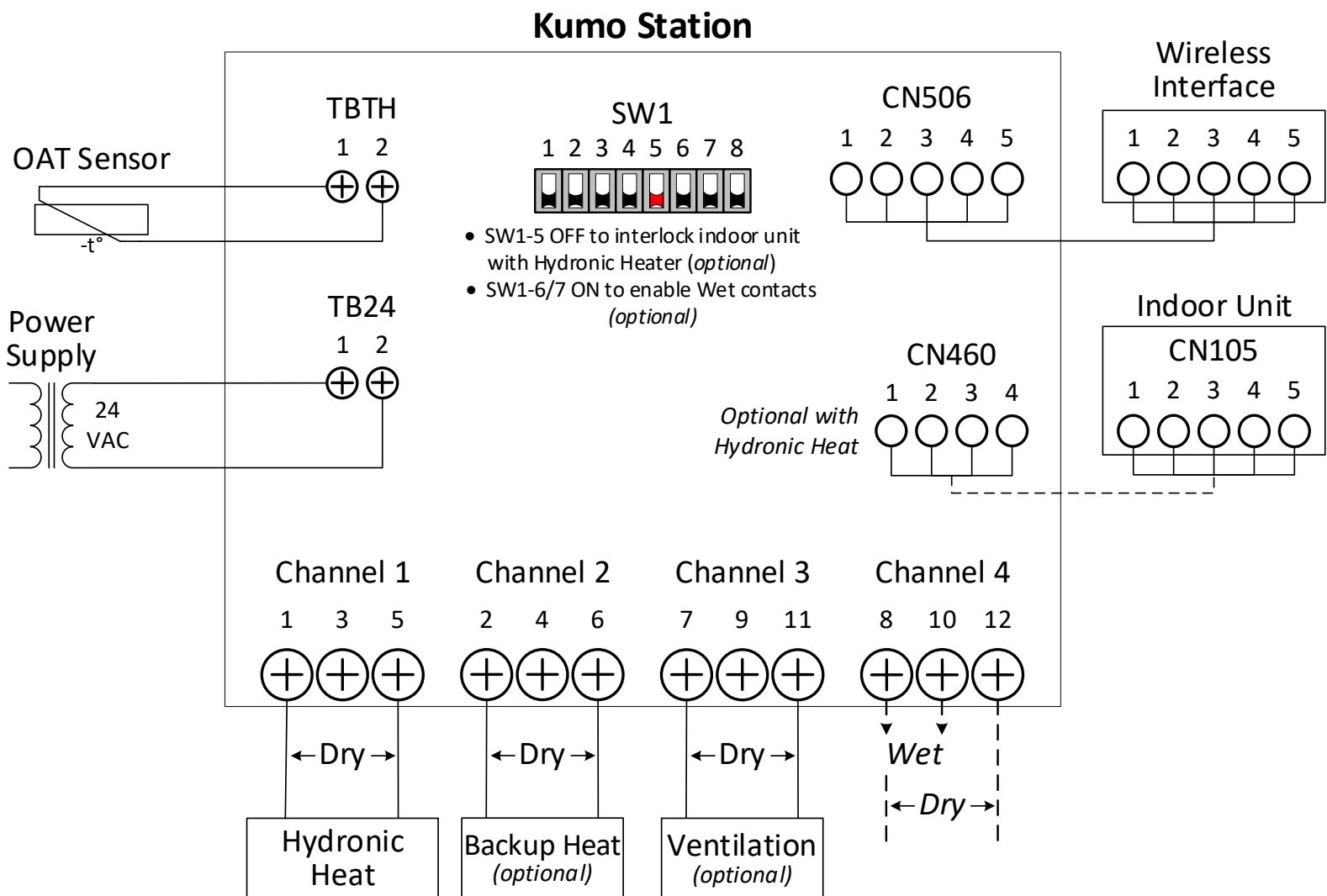
Application #10
Hydronic Heat, Backup Heat, Ventilation

Instructions

1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box. Note that this step is optional when using Hydronic Heat.
2. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21-22, and 26-27 of the Install Guide.

Important Note

- When using Hydronic heat in very cold climates, it's recommended to add a fail-safe so that the water pipes do not freeze or burst. Please see this page for more details.

Kumo Station

- SW1-5 OFF to interlock indoor unit with Hydronic Heater (*optional*)
- SW1-6/7 ON to enable Wet contacts (*optional*)

Optional with Hydronic Heat

Channel 1 — ←Dry→ — Hydronic Heat
Channel 2 — ←Dry→ — Backup Heat (*optional*)
Channel 3 — ←Dry→ — Ventilation (*optional*)
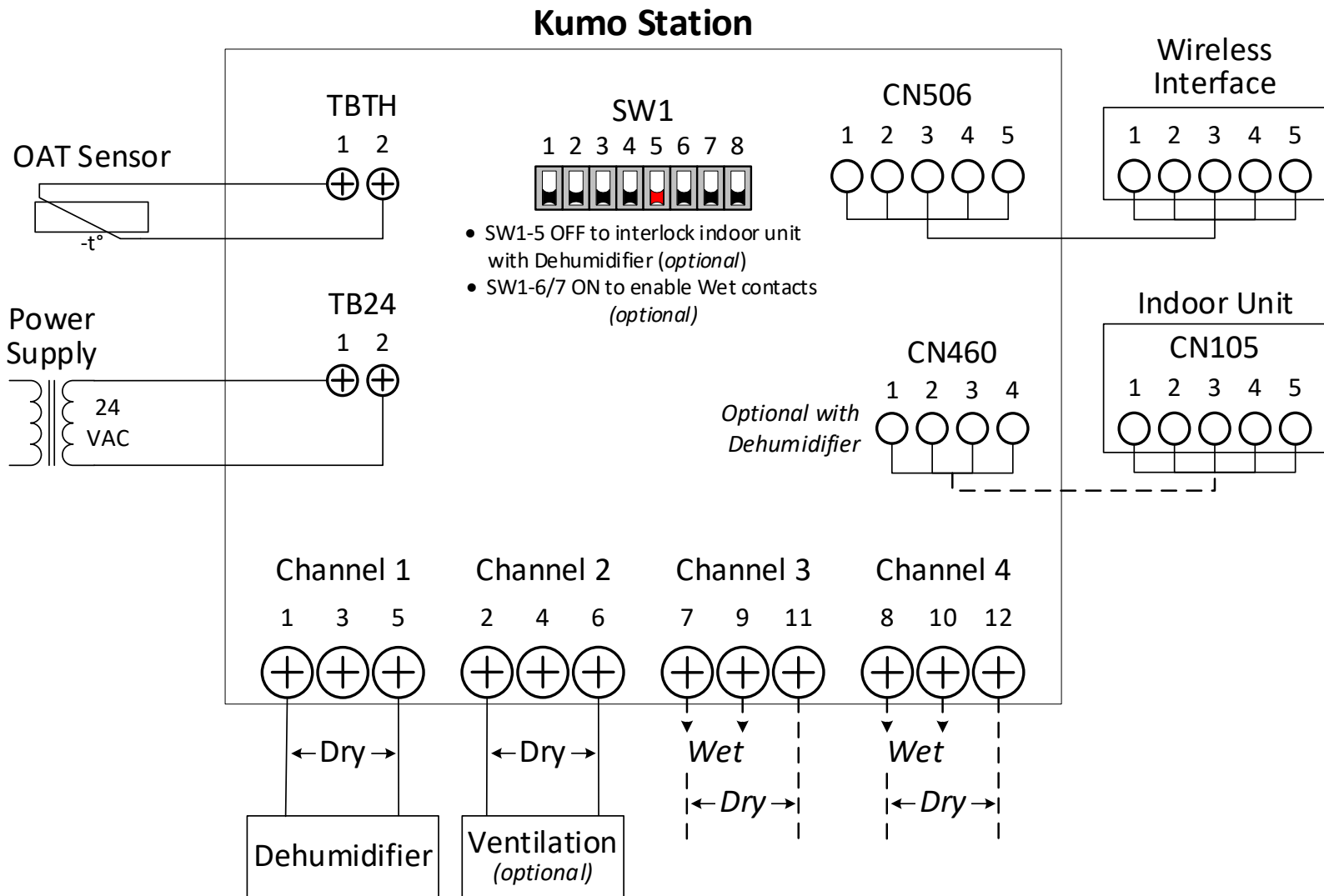Channel 4 — Wet / ←Dry→

Application #11
Dehumidification, Ventilation

Instructions

1. Connect one end of the Equipment Controller Cable to CN460 on the Kumo Station, and connect the other end to CN105 on the indoor unit. This cable is included in the box. Note that this step is optional when using a Dehumidifier.
2. Install the remaining components below, and configure the desired settings in the kumo cloud® app by following the instructions on pages 21, 24, and 26 of the Install Guide.

Kumo Station

- SW1-5 OFF to interlock indoor unit with Dehumidifier (*optional*)
- SW1-6/7 ON to enable Wet contacts (*optional*)

Application Note
Fail-safe for all forms of supplemental and backup heat

Overview
A fail-safe is a control configuration which automatically energizes the equipment when the primary heating source has failed, usually in an attempt to prevent the home's water pipes from freezing and bursting during extended unoccupied periods.

Instructions
1. Connect a SPDT temperature sensor to the heater control as shown in the diagram below.
   • Use this catalog as a reference for commonly used SPDT temperature sensors.
2. Lower the set point to the desired backup setting (varies with application).

Sequence of Operations
The SPDT Temp. Sensor will close in the ON position when the room temperature falls below set point, and close in the OFF position when the room temperature rises above set point.

Kumo Station

- SW1-5 OFF to interlock indoor unit with Backup Heater (*required*)
- SW1-6/7 ON to enable Wet contacts *(optional)*