

COMMERCIAL
ASW050/1 SENSOR

APPLICATION, OPERATION & MAINTENANCE MANUAL

Part#: 97B0192N01 | Created: July 31, 2026

Models: ASW050, ASW051

For All Tranquility Products using ClimaLink Edge

Revision A



Models:
ASW050,
ASW051

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Attentions, Cautions, and Warnings

This device is designed for use in stationary heating, ventilation, and air-conditioning systems and must not be used outside the specified field of application. Unauthorized modifications are prohibited. The product must not be used in relation with any equipment that, in case of a failure, may threaten humans, animals, or assets.

WARNING

Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

WARNING

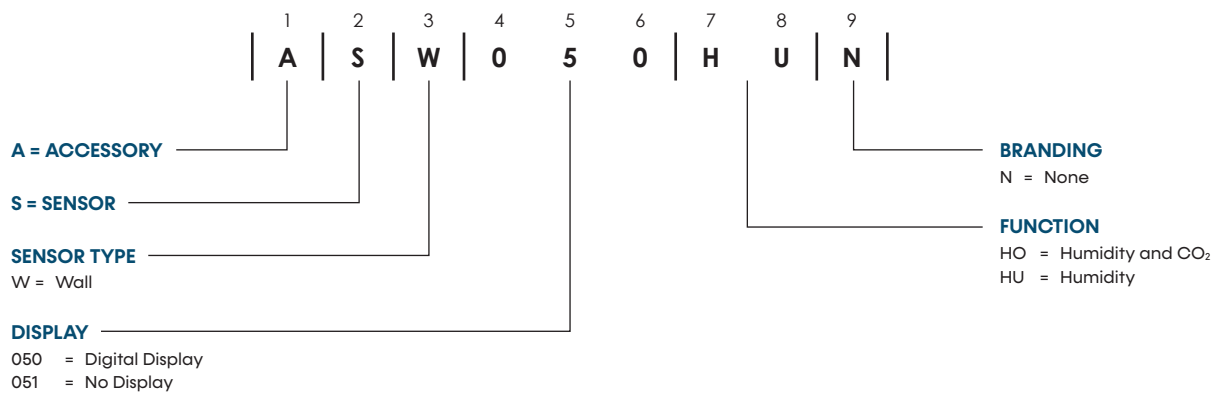
Only authorized specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.

CAUTION

The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Models:
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Model Nomenclature



Overview

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The ASW050/1 Sensors are used for measuring the temperature, humidity, and CO₂ in the room and adjusting temperature and ventilation setpoints. The ASW050 includes a high-contrast ePaper touch display, ensuring the best readability and intuitive operation. The ASW051 offers the same sensing capabilities without an ePaper touch display. With MP-Bus, Modbus RTU and BACnet MS/TP communication, you can seamlessly connect the room operating units to existing third-party controllers and ClimaLink Edge. See the following matrix for details about the features of each sensor.

Sensor Feature Matrix

Sensor	ePaper Touchscreen	CO ₂ Monitoring	Humidity Monitoring
ASW050HUN	●	○	●
ASW050HON	●	●	●
ASW051HUN	○	○	●
ASW051HON	○	●	●

FEATURES

All CO₂ sensors are subject to drift, which is caused by the aging process of the components and requires regular calibration, adjustment, or replacement. The dual-duct technology minimizes this drift by compensating for the majority of the aging effects of the measuring duct through adjustment with a reference duct, making it possible to use dual-channel sensors in applications with 24/7 occupancy. Regular calibration with fresh outdoor air is not necessary with dual-duct sensors. The manufacturer recommends recalibrating the sensor after 5 years of operation.

- The ePaper touch display features high-contrast and intuitive operation illustrating room values
- Setpoint adjustment
- The screen displays CO₂ concentration
- Display temperature setpoints and fan staging or use as a standalone sensor
- The snap cap allows for easy installation and quick commissioning
- The removable spring-loaded terminal saves wiring time and ensures reliable contact
- The low wall-coupling factor provides accurate measurement that is unaffected by wall temperature
- Use BACnet and Modbus for sensor communication with business management systems

SPECIFICATIONS

Electrical Data

- **Nominal voltage:** AC/DC 24V
- **Nominal voltage range:** AC 19.2 - 28.8V/DC 19.2 - 28.8V
- **Power consumption AC:** 1VA
- **Power consumption DC:** 0.5W
- **Electrical connection:** Spring-loaded terminal 0.25 - 1.5 mm²
- **Electrical connection note:** Cable type USA and Canada - CL2 or higher
- **Cable entry:** Back side, top side, or bottom side

Data bus communication

- **Communication:** Modbus RTU BACnet MS/TP

Functional Data

- **Medium:** Air
- **Display:** ePaper touch display, 2.72 x 2.44" (69 x 62 mm)

Measuring Data

- **Measured values:** CO₂, relative humidity, Dew point, and Temperature

CO₂ Specifications

- **Sensing element technology:** Non-dispersive infrared (NDIR) dual channel
- **Measuring range:** 0 - 2000 ppm (default)
- **Accuracy:** ±(50 ppm + 2% of measured value)
- **Long-term stability:** ±20 ppm p.a.

Active Temperature Specification

- **Measuring range:** 32 - 122°F (0 - 50°C) (default)
- **Temperature accuracy:** ±0.3°C @ 25°C (±0.5°F @ 77°F)
- **Wall coupling factor:** 52%

Humidity Specification:

- **Measuring range:** 0 - 100% RH (default)
- **Dew point measuring range:** -58 - 122°F (-50 - 50°C) (default)
- **Accuracy:** ±2% between 0 - 90% RH @ 77°F (25°C)
- **Long-term stability:** ±0.25% RH p.a. @ 77°F (25°C) @ 50% RH

Overview

GENERAL SENSOR INFORMATION

The measuring result is influenced by the thermal characteristics of the wall. A solid concrete wall responds to thermal fluctuations within a room slower than a light-weight structure wall. A room sensor always detects a mixture of air and wall temperature. This means that the radiant heat of the wall, which is important for comfort, is also included in the measurement result.

NOTE: Occurring draft leads to a better carrying-off of dissipative power at the sensor. Temporally limited fluctuations may occur upon temperature measurement.

BUILDUP OF SELF-HEATING BY ELECTRICAL DISSIPATIVE POWER

Temperature sensors with electronic components always have a dissipative power, which affects the temperature measurement of the ambient air. The dissipation in active temperature sensors shows a linear increase with rising operating voltage. Always take the dissipative power into account when measuring temperature.

ASW050 room sensors have adaptive temperature compensation for the entire supply voltage range. This ensures that the ambient temperature is detected with the highest accuracy at all times.

APPLICATION NOTICE FOR HUMIDITY SENSORS

The humidity sensor is extremely sensitive. Touching the sensor element or exposing it to aggressive substances like chlorine, ozone, ammonia, hydrogen peroxide, or ethanol (i.e. as a cleaning agent) may affect the measurement accuracy.

Long-term operation outside the recommended conditions (32 - 122°F [5 - 50°C] and 20 - 80% RH) can result in a temporary offset. After returning into the recommended range, this effect disappears.

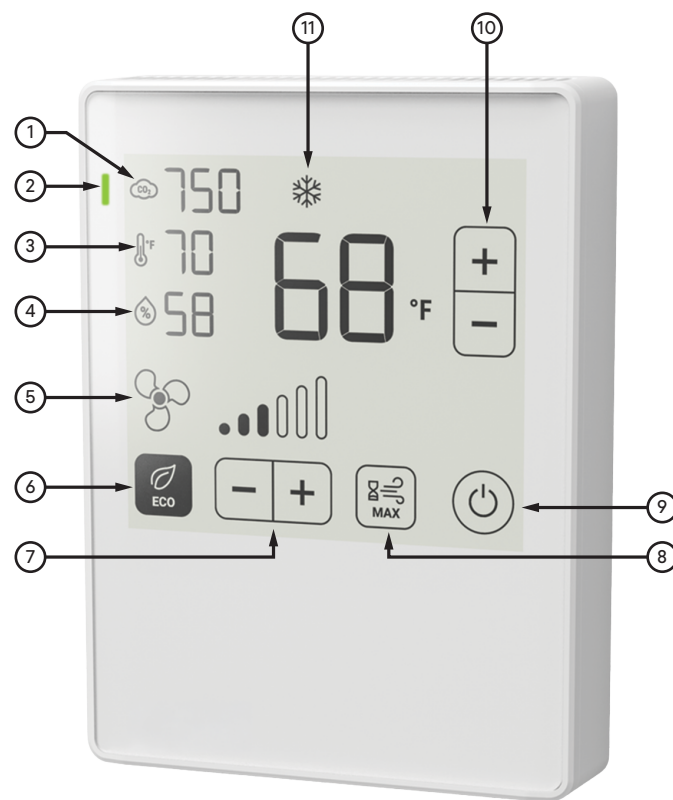
DIGITAL INPUT

You can use the Auxiliary Digital Input with third-party sensors and switches such as window alarms, occupancy detectors, light switches, etc. You can monitor and transmit the input values through BACnet and Modbus communication protocol.

INDICATORS

The ASW050 has an ePaper display that reflects light like normal paper. It is a non-illuminated display with an integrated touch control panel. You can customize the representation on the display depending on the application requirements. By default all actual values and temperature setpoint adjustments are visible on the display.

Icon Descriptions



ID	Description
1	Current CO ₂ concentration
2	CO ₂ TLP (traffic light function - green, yellow, or red)
3	Current temperature
4	Current humidity
5	Fan speed display (six levels)
6	Eco Mode (only displays if Eco Mode is active)
7	Fan speed setpoint adjustment
8	Max Mode (only displays if Max Mode is active)
9	HVAC system status (only displays if the HVAC system is completely off or in building protection mode). If this icon displays, other icons do not display.
10	Setpoint adjustment
11	Mode (cooling mode, heating mode)

Installation and Wiring Diagram

⚠ WARNING

Supply from isolating transformer.

⚠ CAUTION

The wiring of the line for BACnet MS/TP and Modbus RTU is to be carried out in accordance with applicable RS485 regulations.

⚠ CAUTION

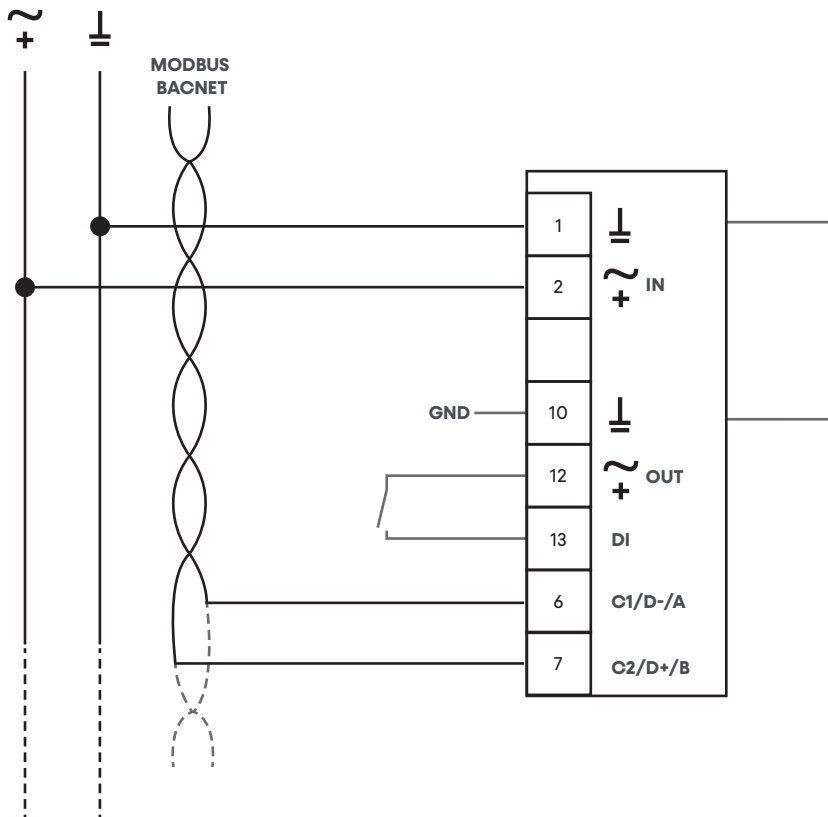
Modbus and BACnet: Supply and communication are not a galvanic dry contact. Connect earth signal of the devices with one another.

INSTALLATION

Reference the ASW050/1 Sensor packaging for mounting and installation instructions. Use the following QR code to download Belimo Assistant 2 app to commission and configure the sensor.



Example Wiring Diagram



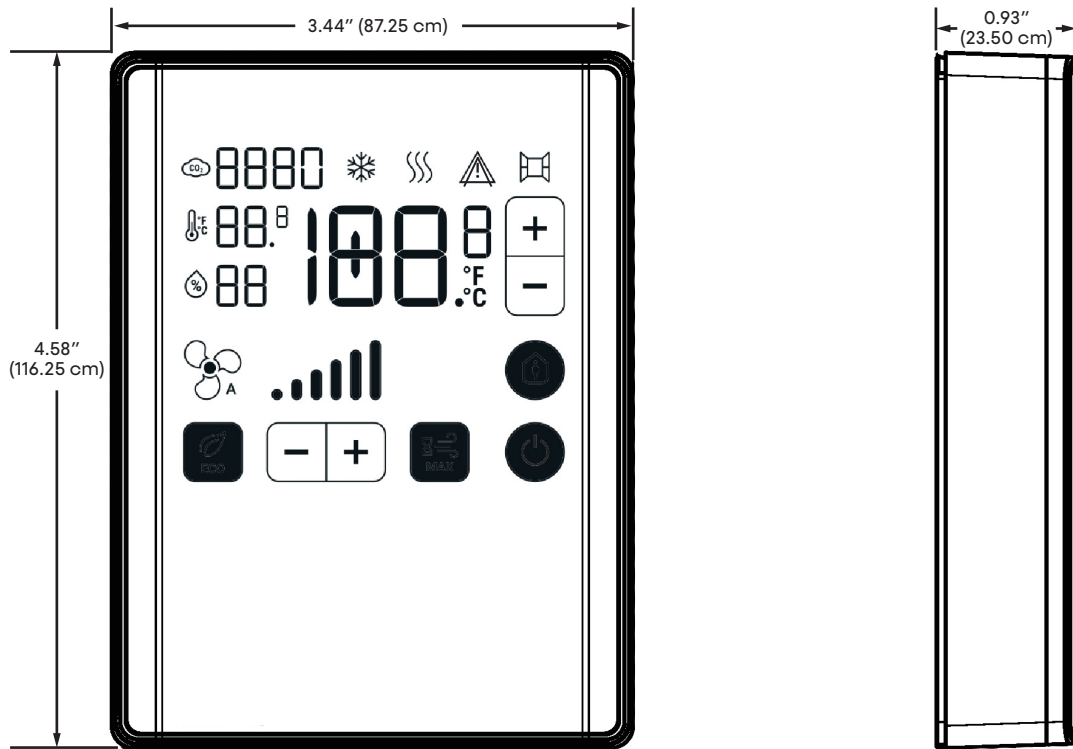
LEGEND

- 1 = GND
- 2 = AC/DC 24V
- 10 = GND
- 12 = AC/DC 24V OUT, MAX 100MA
- 13 = DIGITAL INPUT (OCCUPANCY SWITCH)
- 6 = C1/D-/A
- 7 = C2/D+/B

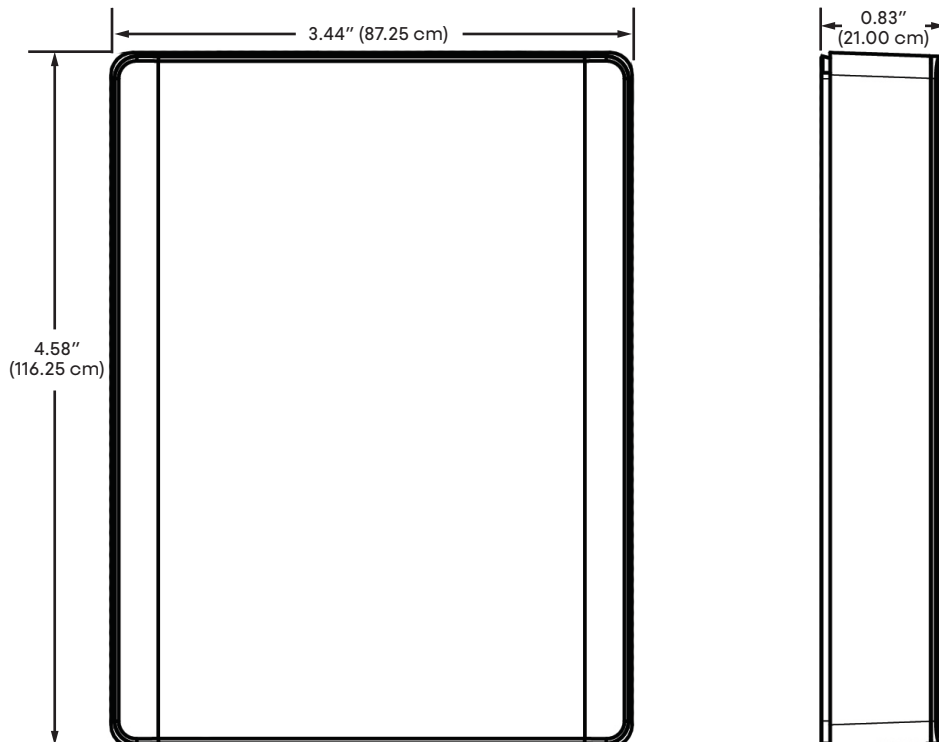
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Dimensions

ASW050 Dimensions



ASW051 Dimensions



Use the Sensor with ClimaLink Edge

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Notes

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Revision History

Date	Section	Description
07/31/26	All	Created



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