

# Outdoor Sensor Assembly (No Humidity Sensor) Installation Instructions

## Description

These instructions are intended for Novar Controls' Sensor Assembly (Part No. 780050000 or 780650000), which comes with an Outdoor Temperature Sensor and an Analog Light Sensor. The assembly does not include a humidity sensor. Instructions for assemblies that include humidity sensors are available in the Documents folder on the Novar Controls Software Library CD.

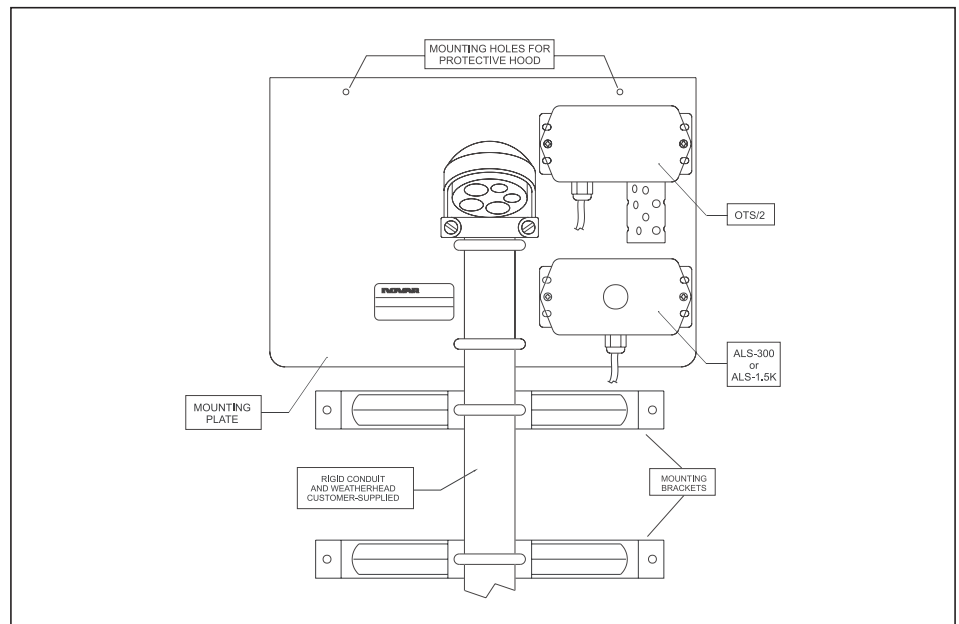
The assembly (Figure 1) is designed to be mounted on a building's roof to monitor outdoor temperatures and light levels. Each assembly is built according to specific customer specifications to ensure that the assembly meets the customer's needs. The sensors are factory-mounted on a metal plate and shipped with a protective hood that must be installed to provide protection from the outdoor elements. The assembly also comes with the following items:

- Mounting Bracket Kit that includes:
  - Sufficient screws and lock washers to assemble the brackets
  - Two “U” bolts with lock washers and nuts
- Hardware kit that includes:
  - Two “U” bolts with lock washers and nuts
  - Two screws for attaching the hood

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**NOTE!** Customers must supply their own 1-inch or 1¼-inch trade size rigid conduit and weatherhead.

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**Figure 1.** Outdoor Sensor Assembly

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## Specifications

### Outdoor Temperature Sensor

Temperature Range:  $-40^{\circ}$  to  $120^{\circ}\text{F}$   
Output: 4 to 20 mA  
Resolution:  $1^{\circ}\text{F}$

### Analog Light Sensors

Analog Output Point: 4–20 mA, two-wire  
Temperature:  $-40^{\circ}$  to  $158^{\circ}\text{F}$  ( $-40^{\circ}$  to  $70^{\circ}\text{C}$ )  
Operating Range: ALS-300: Linear, 0–300 footcandles (19.25–4.25 mA)  
ALS-1.5K: Linear, 0–1500 footcandles (19.25–4.25 mA)

## Mounting the OSA

**NOTE!** The assembly must be mounted facing north. The bottom edge of the assembly must be at least 3 feet away from the building's roof or 1 foot away from the top of the building's parapet.

The following procedure should be used to mount the assembly.

Step	Procedure
1	Determine the length of the customer-supplied conduit required. <ul style="list-style-type: none"><li>■ Measure the distance from the top of the roof or the top of the building's parapet to the point where the conduit is to enter the building.</li><li>■ Add <i>one</i> of the following measurements:<ul style="list-style-type: none"><li>— 3 feet (distance from roof top to bottom of assembly)</li><li>— 1 foot (distance from top of parapet to bottom of assembly)</li></ul></li><li>■ Add the thickness of the wall.</li><li>■ Add approximately 6 inches (to cover the length of conduit bolted directly to the assembly's mounting plate).</li></ul>
2	Bend the conduit at a $90^{\circ}$ angle at the point where it should enter the building.
3	Attach the customer-supplied weatherhead to the conduit.
4	Attach the protective hood to the top edge of the assembly's mounting plate (Figure 2).
5	Feed the wires through the weatherhead and conduit.

*continued*

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Step	Procedure
6	Use the two U bolts supplied in the hardware kit to bolt the conduit to the assembly's mounting plate.
7	Drill a hole through the building's wall large enough to accommodate the conduit.
8	Assemble the mounting brackets. <ul style="list-style-type: none"> <li>■ They should resemble the letter "Y."</li> </ul>
9	Use a U bolt to attach the narrower end of each bracket to the conduit, positioning the brackets on the conduit approximately 1 foot apart.
10	Insert the conduit through the hole drilled in the building's wall.
11	Position the conduit and assembly vertically against the building and mark the location of the bracket mounting holes.
12	Drill holes in the locations marked.
13	Position the brackets against the wall over the mounting holes and insert and tighten screws to secure the assembly against the wall.

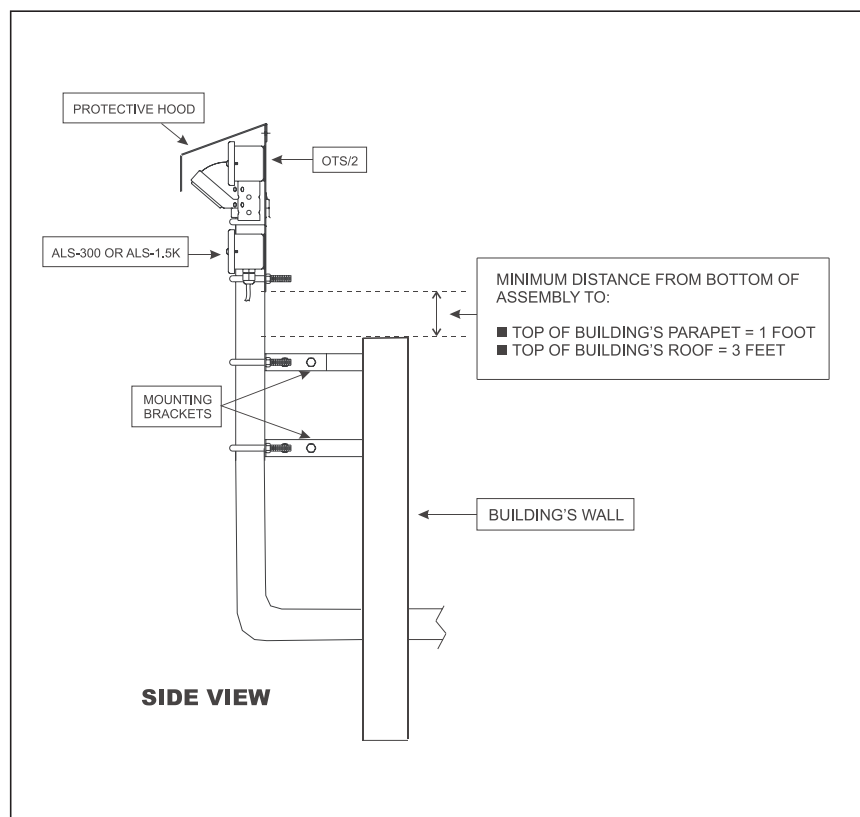


Figure 2. Side views of the OSA

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## Wiring the Sensors

Wiring instructions for each of the sensors that can be ordered with the assembly are provided below. Use the instructions that apply to the sensors ordered.

If the sensor cables are not long enough to reach the controller, two-conductor, shielded cable (Novar Controls WIR-1010, Belden 8761, or equivalent) must be used to extend the sensor cables. To facilitate the wiring process, the assembly cables have been color-coded.

CABLE COLOR	USE
Yellow cable	Light sensor
Blue cable	Temperature sensor

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## Outdoor Temperature Sensors

The following procedure should be used to connect the OTS/2 to the EP/2. For the Savvy<sup>®</sup>, instructions are provided in the *Savvy Baseplate Installation Instructions* (Doc. No. 569064000).

Step	Procedure
1	Connect the black wire to Terminal 3 (-).
2	Connect the white wire to Terminal 4 (+).

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**NOTE!** Although the OTS/2 comes with a shielded cable, only the plus and minus terminals need to be connected on the EP/2 or Savvy terminal strip.

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## Analog Light Sensors

Connect the sensor as indicated in Table 1.

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**NOTE!** Do not make any connections inside the Analog Light Sensor enclosure.

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<b>Table 1. Wiring the Analog Light Sensor</b>	
<b>MODULE</b>	<b>CONNECTIONS</b>
IOM/2, EC/IOM, or Savvy/IOM	Connect the sensor to one of the Class 2, 4- to 20-mA inputs.
EP/2	<p>Connect the sensor to the terminals labeled Outdoor Light Sensor.</p> <ul style="list-style-type: none"> <li>■ Connect the cable's white wire to the positive (+) terminal.</li> <li>■ Connect the cable's shield drain wire to the Shield terminal.</li> <li>■ Connect the cable's black wire to the negative (-) terminal.</li> </ul>
Savvy Transition Board without UL Label	<ul style="list-style-type: none"> <li>■ Connect the cable's white (+) wire to Terminal 62 (not Terminal 58).</li> <li>■ Connect the cable's black (-) wire to Terminal 59 (+).</li> <li>■ Connect the cable's shield wire to Terminal 61.</li> </ul>
Savvy Transition Board with UL Label	<ul style="list-style-type: none"> <li>■ Connect the cable's white (+) wire to Terminal 59 (+).</li> <li>■ Connect the cable's black (-) wire to Terminal 58 (-).</li> <li>■ Connect the cable's shield wire to Terminal 61.</li> </ul>

### Scaling

The sensor regulates a 4- to 20-mA current signal and is scaled in the Novar Controls software. It is linear with the light level, and the current-to-light relationship is inverse.

- ALS-300 sensor range: 0–300 footcandles (19.25 to 4.25 mA)
- ALS-1.5K sensor range: 0–1500 footcandles (19.25 to 4.25 mA)

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## Part Numbers

Table 2 provides the part numbers that should be used to order the necessary Novar Controls parts.

<b>Table 1. Novar Controls Part Numbers</b>		
<b>PRODUCT</b>	<b>MODEL NO.</b>	<b>PART NO.</b>
Outdoor Sensor Assembly with Outdoor Temperature Sensor (OTS/2), Analog Light Sensor (ALS-1.5K), and Mounting Bracket Kit	—	780650000
Outdoor Sensor Assembly with Outdoor Temperature Sensor (OTS/2), Analog Light Sensor (ALS-300), and Mounting Bracket Kit	—	780050000
Two-conductor shielded cable (Belden 8761 equivalent)	WIR-1010	709001000



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