

LIMITED WARRANTY

The DS-8 is warranted against defects in workmanship and materials for two years from date of sale. This warranty does not apply to damage resulting from accident, misuse, or alteration nor where connected voltage is more than 5% above the configured operating voltage, nor to equipment improperly installed or wired or maintained in violation of this Owner's Manual. No other written or oral warranty applies. No employee, agent, dealer or other person is authorized to give any warranties on behalf of ASE.

The customer shall be responsible for all costs incurred in the removal or reinstallation and shipping of the product for repairs. Within the limitations of this warranty, inoperative units should be returned, freight prepaid, to ASE, and we will repair or replace, at our option, at no charge to you with return freight paid by ASE. It is agreed that such repair or replacement is the exclusive remedy available from ASE and that ASE IS NOT RESPONSIBLE FOR DAMAGES OF ANY KIND, INCLUDING INCIDENTAL AND CONSEQUENTIAL DAMAGE. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above exclusion may not apply to you. The warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



AUTOMATED SYSTEMS ENGINEERING, INC.
2519 E SAINT VRAIN ST
COLORADO SPRINGS, COLORADO 80909
PHONE: 719.599.7477 FAX: 719.599.7482
Visit us on the Internet at: www.goase.com

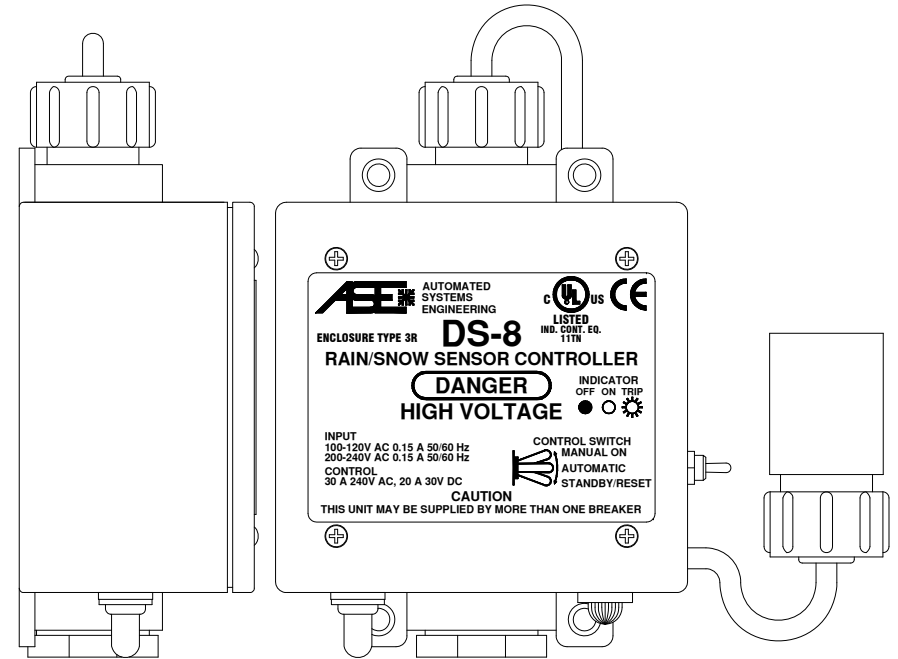


CAUTION: Read all instructions carefully before installation.
Save this Installation Manual for future reference.

DS-8

RAIN/SNOW SENSOR CONTROLLER

INSTALLATION MANUAL



Manufactured By

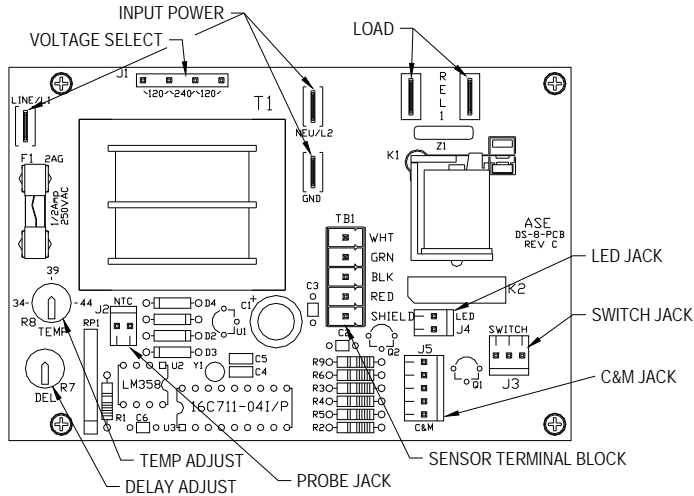


**AUTOMATED
SYSTEMS
ENGINEERING**

2519 East Saint Vrain St Colorado Springs, Colorado 80909

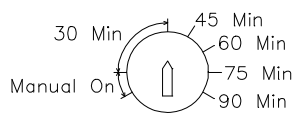
General Safety Instructions

1. **THIS UNIT SHOULD BE INSTALLED, OPENED, AND REPAIRED BY QUALIFIED PERSONNEL ONLY!**
2. To avoid shock hazard do not open the front cover with power connected to the DS-8 or any controlled equipment.
3. Confirm that the power selection jumpers are properly set prior to applying power.
4. Never apply power to a DS-8 while any part is missing or damaged.
5. To avoid fire hazard replace fuse F1 with a 1/2 Amp 250 VAC 2AG fast acting fuse ONLY.



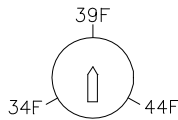
Setting the Adjustments

The DS-8 is specifically designed for snow and freezing rain detection only. This section explains the functions of the adjustments. Trigger temperature is adjustable from 34°F (1.1°C) - 44°F (6.6°C) using the temperature adjust (TEMP) control. When ambient air temperature is below this trigger point precipitation is assumed to be snow or freezing rain. When above the trigger temperature, precipitation is assumed to be rain and the sensor will **not** trigger.



"Delay Off" refers to the drying cycle timer of the DS-8. The timer allows the DS-8 to dry the heated surface through evaporation once precipitation has stopped. The drying cycle reduces the chance of moisture left behind refreezing into ice. This timer is restarted by each precipitation detection.

Therefore, the DS-8 will continue to operate as long as precipitation is detected, then for the Delay Off period once precipitation has stopped. The Delay Off time can be adjusted from 30-90 minutes (30 minutes to 5 hours if so marked on the front cover) using the delay adjust (DEL) control. Note the "Manual On" function at the low end of the Delay Adjust control. The relay will close when this area is entered and open when exited.



Detecting Both Rain & Snow

The DS-8 is designed primarily for snow detection but it is possible to trigger the unit on detection of any precipitation. Unplugging the temperature probe from the probe jack will simulate continuous freezing temperature detection. Any precipitation, rain or snow, which lands on the moisture sensor will trigger the unit, no matter what the ambient temperature may be. Note, however, that the unit cannot be configured for detection of rain only. Consider the DS-2B for this application.

Moisture Grid Maintenance & Replacement

It is recommended that the DS-8 be powered down and the grid wiped clean with clear water at least once every 4 months. Heavy deposits may be removed using a non-metallic scouring pad (Scotch-Brite™ or equivalent.) However, after a number of years, the corrosive elements left behind when water is evaporated out of the moisture grid will eventually damage the grid rings. The moisture grid can be easily replaced by ordering and installing a new MG-3 "Moisture Grid Assembly". Reference the "Moisture Sensor Mounting & Termination" section for information on replacing the moisture grid.

Preseason Testing

It is always a good idea to test the operation of the DS-8 prior to the winter season. Procure some clean water and, if the outdoor temperature is above the trigger point, a can of spray component cooler (Radio Shack Part #64-4321 or equivalent.) Clean the moisture grid following the procedure outlined above and allow it to dry. Apply power to the DS-8 and confirm that the lamp shows a steady indication. Drip some of the water onto the moisture grid, and then spray the temperature sensor protruding from the base of the DS-8 enclosure with the component cooler. Once the temperature sensor has reached the trigger point with water still present on the grid the DS-8 will activate. The user should hear the internal control relay close and the indicator will begin flashing. Proper operation has now been confirmed. To clear the Delay-Off timer place the override switch into "Standby/Reset", and then back to "Automatic."

*Need Indoor Monitoring & Control?
Take a Look at the ASE CDP-2*



Simple Installation & Operation at a Competitive Price
Visit www.goase.com for more information

Manual Override Switch Operation

An override switch mounted on the side is provided for testing and special operational requirements. Placing the switch in the "Automatic" position will allow the sensor to operate normally, activating the controlled equipment as needed. Placing the switch in "Manual On" will close the load relay, activating the controlled equipment. The "Standby/Reset" position prohibits triggering of the unit, clears any active delay timer, and opens the load relay. In order to reduce excessive runtime for the heater the "Manual On" mode will remain in effect for a maximum of 40 hours, then return to "Automatic" mode even if the switch is still in the "Manual On" position. You may put the DS-8 back into "Manual On" mode by switching to "Automatic", then back to "Manual On". This will restart the 40 hour timer.

If the override switch is placed in "Manual On" for less than 2 seconds, then switched back to "Automatic" the controller will execute one delay off cycle. This can be used to clear a frost or hail buildup without the danger of leaving the system in a continuous "Manual On" condition. "Standby/Reset" can still be used to clear this delay off cycle.

External Control/Monitor Operation

An external control/monitor jack is provided on the DS-8. Order the optional CS-1 control/monitor cable to access this feature. The external controls operate in the same manner as the manual override switch. Connecting Black to White will activate the "Manual On" function. Connecting Green to White will activate the "Standby/Reset" function. The Red/Orange leads are connected to an internal low power monitor relay. This relay, rated at 24 VAC/VDC at 400 ma, will close with the load relay and can be used to externally monitor activation of the sensor. The DS-8 can be directly connected to the ASE CDP-2 or DP-7B indoor control/status display panels.

Pin	Color	Function
1	Green	Standby/Reset
2	Black	Manual On
3	Orange	Deice On Mon
4	Red	Deice On Mon
5	White	Return

Power & Activation Indicator

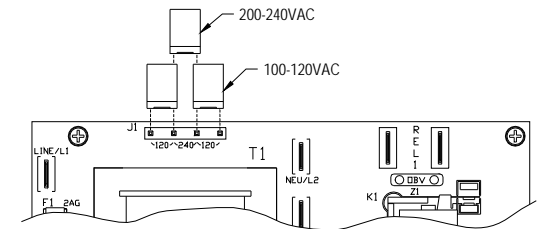
A yellow lamp is mounted on the base of the DS-8 to indicate operational status. If this lamp is OFF the DS-8 is not receiving power. If this lamp is steady ON the DS-8 is powered but not triggered. If this lamp is FLASHING the DS-8 is both powered on and has activated the deicing system. Note that, even though snow may have stopped, the DS-8 indicator may be flashing indicating the system is on. The indicator will continue to flash during the Delay-Off drying cycle.

"Tweaking" the Adjustments

The DS-8 is shipped with the TEMP and DEL adjustments in the center position, representing 39°F (3.9°C) and 30 minutes of Delay-Off time respectively. Depending on local conditions the user may find that fine adjustment of the controls may provide more satisfactory operation. If the sensor does not trigger during very wet snows the trigger temperature may need to be adjusted higher. Conversely, if the user notices false triggers during cold rains that do not freeze, the trigger temperature may need to be lowered. The Delay-Off time can also be adjusted to provide clean melt-off without excessive running time. Fine adjustment can both save operating expense and provide more reliable operation. However, to keep reliability high, always make adjustments in small increments.

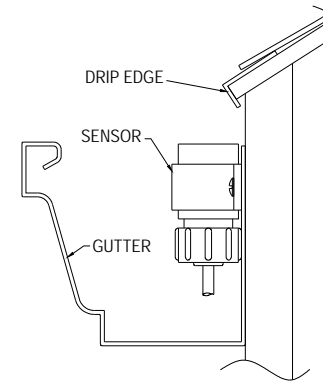
Voltage Selection, Power & Load Connection

The DS-8 requires a 100-120VAC or 200-240VAC power source. Install the voltage select jumpers as shown. Power consumption for the DS-8 is 15 Watts, 50-60 Hz. The controlled load is switched by the load relay through the "Load Connection" points. The load relay is rated for 30 Amps/240 VAC. Suggested wiring diagrams are included in this manual



but always consult local electrical codes for the wire color and size for both power and load connections. The DS-8 can be mounted by screwing the conduit hub onto an appropriate size conduit or by using the mounting holes in each corner of the enclosure. **DO NOT DRILL HOLES THROUGH THE ENCLOSURE FOR MOUNTING!** This can allow water into the enclosure causing a potential shock or fire hazard.

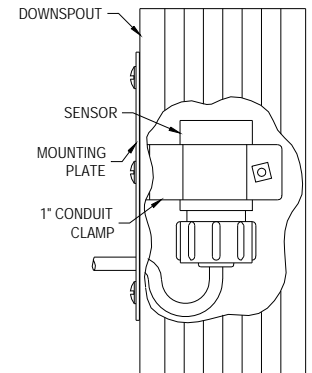
Moisture Sensor Mounting & Termination



The remote DS-8 moisture sensor may be mounted in a number of ways depending on the application. The unit operates at a safe 24 VAC and can withstand immersion in water. For roof and gutter deicing applications the sensor head may be mounted in the gutter against the fascia board with a 1" "C"-style conduit clamp. Allow part of the sensor grid to be exposed to snowfall. This allows the sensor to initially trigger when snow starts falling and remain triggered as long as the roof/gutter heater continues to drip melted snow buildup from the roof edge when temperatures are below freezing. Detection can also be achieved by installing the sensor head inside and near the top of the downspout using a 1" conduit hanger

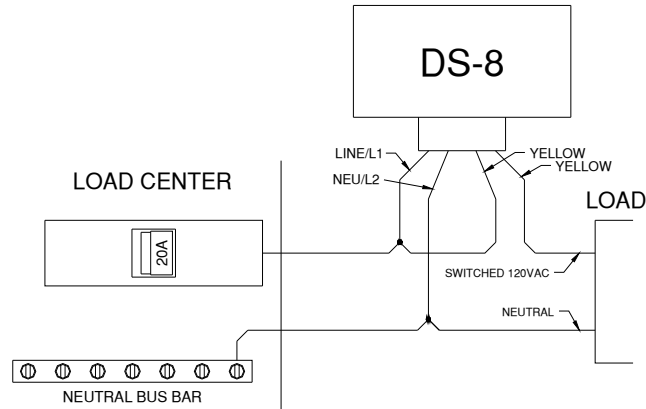
and mounting plate. As water is melted in the gutter it will run down the downspout, hitting and retriggering the sensor.

Ten feet of cable is pre-terminated to the sensor head. This cable may be shortened on the controller end as required. **Do not add additional cable to the interface.** Erratic operation may result. Strip the outer insulation and shield from the cable and terminate each conductor following the color code printed on the circuit board. The bare drain wire should be installed into the terminal marked "Shield". Two cable ties are also included. Wrap these ties securely around the cable in the enclosure to provide additional strain relief between the flexible enclosure gland and the free end of the cable.

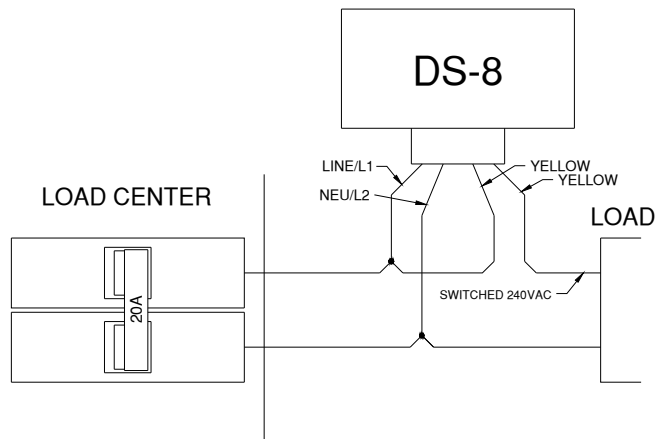


Typical Load Wiring

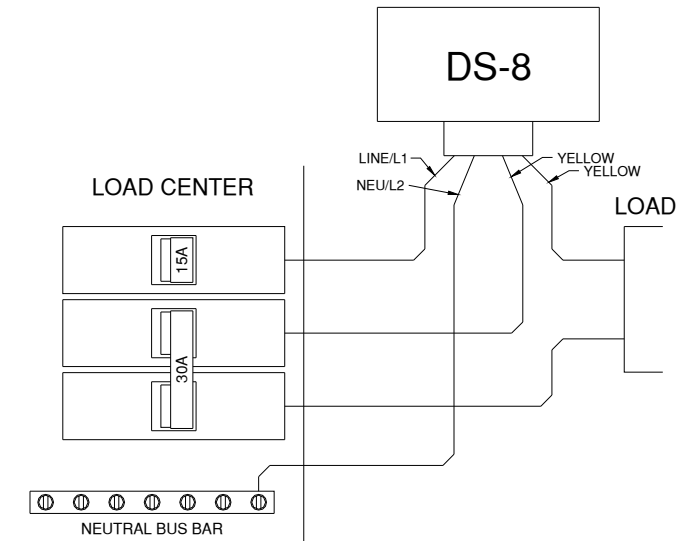
The two load leads of the DS-8 do not supply power directly to your load. The relay inside the DS-8, like a switch or thermostat, is used to switch a voltage of your choice. While not as convenient as directly supplying power for the load this allows you to operate the DS-8 from one voltage while controlling a load of a different voltage without adding an external relay or contactor. For example, the DS-8 can be powered from 120VAC but can directly control a 24VAC signal for a boiler system or 240VAC for heating wire. The following diagrams show some possible wiring schemes for connecting the DS-8 to your load. Your load may be a direct connection to a heater, a contactor, or a control voltage. For clarity the safety GROUND leads are **not** shown.



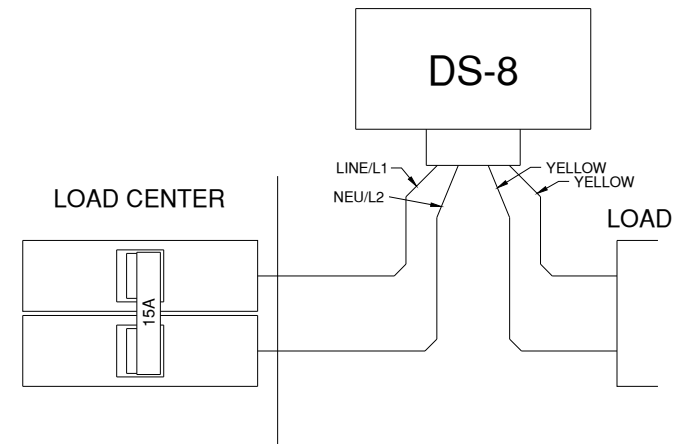
120VAC In, 120VAC Load Shared Feed (Strap DS-8 for 120VAC Power)



240VAC In, 240VAC Load Shared Feed (Strap DS-8 for 240VAC Power)



120VAC In, 240VAC Load Separate Feed (Strap DS-8 for 120VAC Power)



240VAC In, Thermostat-Style Control (Strap DS-8 for 240VAC Power)

These are just some of the possible wiring schemes that can be used to connect the DS-8 to your load for control. The DS-8 should always be strapped for the voltage that is connected to **Line/L1** and **Neu/L2**. Remember, these are only suggestions. **You should always check with a qualified electrician to insure conformance with local electrical codes!**