

Installation & Operation Manual

Snow Sensor 095

Introduction

The Snow Sensor 095 is an aerial mounted sensor that detects falling snow and allows a Watts Radiant Snow Melting Control 653 or 654 to automatically start the snow melting equipment. System stop is provided by the control's timer or by manual disable. The Snow Sensor mounts to a nominal 1/2" (16 mm) metal or PVC conduit or pole. The sensor is well suited to adding automatic start to an existing snow melt system.

For use with Watts Radiant Snow Melting Controls type: 653 or 654



⚠ WARNING

It is your responsibility to ensure that this sensor is safely installed according to all applicable codes and standards. Watts Radiant is not responsible for damages resulting from improper installation and/or maintenance.



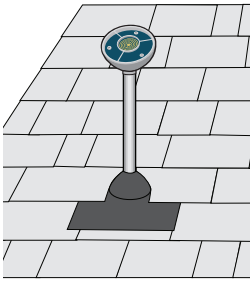
Read this Manual **BEFORE** using this equipment.

Failure to read and follow all safety and use information can result in personal injury, property damage, or damage to the equipment.

Keep this Manual for future reference.

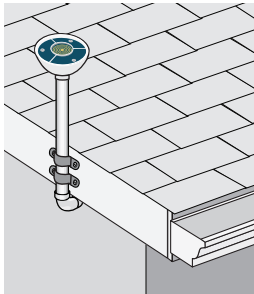
Step 1 - Choosing a Location for the Sensor

The sensor should be installed outside on a nominal 1/2" (16 mm) PVC or rigid metal conduit pole either on a roof or to the side of the snow melting surface. The sensor must be located away from trees, building overhangs or other locations that may interfere with falling snow. Avoid installing in locations where the sensor may be vandalized. It is best to point the front face of the sensor in the direction of any prevailing wind.



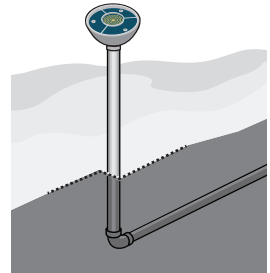
Roof Mounted

Ensure water-proof installation with flashing boot or similar method



Roof Mounted

Conduit fastened to fascia board



Ground Mounted

Conduit run underground with a pole above surface

Step 2 - Rough In Wiring

Install a nominal 1/2" (16 mm) PVC or metal conduit from the Snow Melting Control to the chosen sensor location. Pull 4 conductor 18 AWG wire from the sensor location to the control location through the conduit. The maximum wire length between the sensor and the control is 500' (150 m).

If using PVC conduit, do not run the wires parallel to telephone or power lines. If the sensor wires are located in an area with strong sources of electromagnetic noise, shielded cable or twisted pair should be used. If using shielded cable, one end of the shield wire should be connected to the Com terminal on the Snow Melting Control and the other end should remain free. The shield must not be connected to earth ground.

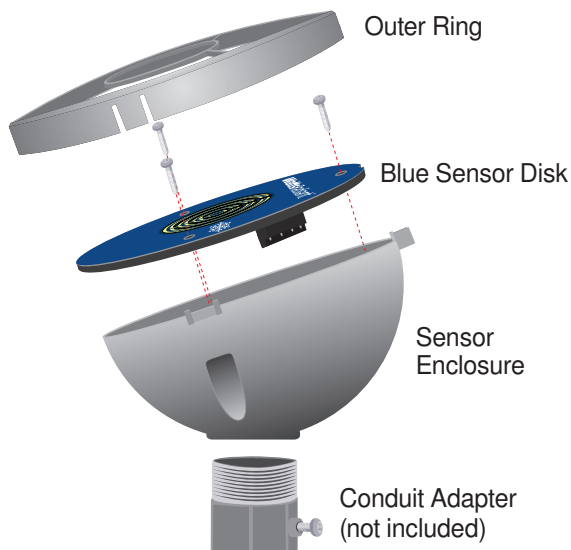
⚠ WARNING

Metal conduit in roof mounted installations must be grounded.

Step 3 - Disassembly

1. Remove the outer ring by pulling up on the three catches.
2. Remove the three screws.
3. Remove the blue sensor disk from the sensor enclosure.

Avoid scratching any part of the surface of the blue sensor disk. Scratches will result in corrosion not covered by warranty.



Step 4 - Painting the Sensor

The sensor enclosure is made of an off-white plastic material that is UV stable. The plastic enclosure may be spray painted to match the color of the building. **Do not paint the blue sensor disk as this will damage the sensor.**

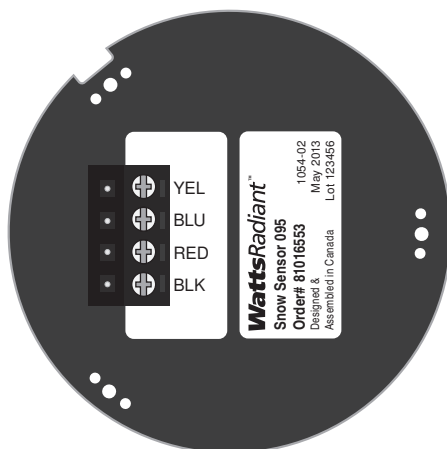
Step 5 - Mounting

The conduit pole can be either PVC plastic or rigid metal. The conduit pole should be mounted plumb using a level.

- When using PVC plastic conduit a nominal 1/2" (16mm) PVC male terminal adapter with locknut is recommended.
 - When using rigid metal, a nominal 1/2" (16mm) rigid metal conduit adapter with set screw is recommended.
1. Pull the 4 conductor wire through the conduit.
 2. Install the sensor body with conduit adapter to the conduit. For PVC conduit use PVC cement adhesive. For rigid metal conduit, tighten the set screw until the conduit adapter is firmly attached to the conduit.
 3. Fish the 4 conductor wire through the sensor body and place on top of the conduit adapter. Point the sensor body towards the prevailing wind direction, if any. Thread the locknut onto the conduit adapter and screw until tight.

Step 6 - Wiring

Remove the wiring terminal block by pulling up from the blue sensor disk. Connect the 4 conductor wire to the yellow (YEL), blue (BLU), red (RED) and black (BLK) wiring terminations. If the installed 4 conductor cable uses a different color code, then make a note of the wire color versus the wiring terminal color names. Push the wiring terminal plug onto the pins of the blue sensor disk. At the Snow Melting Control location, connect the corresponding wires to the yellow, blue, red and black wire terminations.



Step 7 - Assembly

1. Align the blue sensor disk Watts Radiant logo with the highest point of the sensor enclosure body. The blue sensor disk has a notch that ensures the sensor is installed in the correct position.
2. Insert the three screws into the holes and screw them until tight. Do not over tighten.
3. Align the three notches of the outer ring with the sensor body and push down until each of the three corners have snapped on tight.

Maintenance

The sensor is installed in a harsh environment. Accumulation of dirt on the surface of the sensor may affect snow detection. The sensor should be checked on a periodic basis and, when necessary, cleaned.

1. Remove the outer ring by pulling up on the three catches.
2. A cloth with warm soapy water can be used to clean any dirt.
3. Rinse with water.
4. Align the three notches of the outer ring with the sensor body and push down until each of the three corners have snapped on tight.

Testing and Troubleshooting

If the Snow Melt Control shows an error message describing a sensor failure, perform the following test procedure:

- The 4 conductor wires at the sensor should be disconnected.
- Use a good quality electrical testing meter with an ohm scale range of 0 to 2,000,000 Ohms.

Using the ohmmeter and standard testing practices, measure the resistance between:

1. The yellow (YEL) and black (BLK) wiring terminals to measure a 10 k Ω sensor and use the Temperature vs. Resistance Table to calculate the approximate temperature reading. Measure the surface temperature of the 095 blue sensor disk and compare versus the yellow to black temperature reading.
2. Measure the resistance between the blue (BLU) and black (BLK) wiring terminals. When the sensor surface is clean and dry, the reading should be 2,000,000 Ohms. When the sensor surface is wet it should be between 10,000 and 300,000 Ohms.
3. Measure the resistance between the red (RED) and black (BLK) wiring terminals. This reading should be between 45 to 47 Ohms.

If resistance readings are outside of the normal operating range, the sensor has failed. Contact your wholesaler or Watts Radiant sales representative for assistance.

Temperature vs. Resistance Table

Temperature		Resistance	Temperature		Resistance
°F	°C	Ω	°F	°C	Ω
-50	-46	490,813	90	32	7,334
-45	-43	405,710	95	35	6,532
-40	-40	336,606	100	38	5,828
-35	-37	280,279	105	41	5,210
-30	-34	234,196	110	43	4,665
-25	-32	196,358	115	46	4,184
-20	-29	165,180	120	49	3,760
-15	-26	139,402	125	52	3,383
-10	-23	118,018	130	54	3,050
-5	-21	100,221	135	57	2,754
0	-18	85,362	140	60	2,490
5	-15	72,918	145	63	2,255
10	-12	62,465	150	66	2,045
15	-9	53,658	155	68	1,857
20	-7	46,218	160	71	1,689
25	-4	39,913	165	74	1,538
30	-1	34,558	170	77	1,403
35	2	29,996	175	79	1,281
40	4	26,099	180	82	1,172
45	7	22,763	185	85	1,073
50	10	19,900	190	88	983
55	13	17,436	195	91	903
60	16	15,311	200	93	829
65	18	13,474	205	96	763
70	21	11,883	210	99	703
75	24	10,501	215	102	648
80	27	9,299	220	104	598
85	29	8,250	225	107	553

Technical Data

Snow Sensor 095 *Air*

Literature	ES-WR-Snow_Sensor-095, IOM-WR-Snow_Sensor-095
Packaged weight	0.4 lbs (180 g)
Dimensions	1-15/16" H x 3-5/32" OD (50 mm H x 80 mm OD)
Enclosure	White PVC plastic, UV stable, NEMA type 1
Operating range	-40 to 122°F (-40 to 50°C)
Compatible equipment	Watts Radiant Electric Snow Melting Control 653 and Watts Radiant Snow Melting Control 654

NOTICE

The Snow Sensor 095 must be operated by a Watts Radiant Snow Melting Control 653 or 654, or a compatible tekmar Snow Melting Control. Operation of the sensor by other control systems may result in electrolysis failures not covered by the sensor warranty.

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
For more information: www.watts.com/prop65

Hydronic System Electronic Controls and Thermostats Limited Warranty

Watts Radiant (the Company) warrants its hydronic system electronic controls and thermostats (the Product) to be free from defects in materials and workmanship under normal usage for a period of one year from the documented date of installation of the Product. In the event of defects within the warranty period, the Company will replace the Product without charge. This remedy is the sole and exclusive remedy for breach of warranty. This warranty is transferable to subsequent owners.

Under this Limited Warranty, the Company will provide the following:

In order to make a claim, you must:

- (a) Provide the Company with sufficient details relating to the nature of the defect, the installation, the history of operation, and any repairs that may have been made.
- (b) At the Company's discretion and at the owner's expense, ship the Product to the Company or the Company's local representative or distributor.
- (c) Provide proof that the Product was installed in accordance with the applicable Product Installation Manual and any special written design or installation guidelines by the Company for this project.
- (d) Provide proof that the Product was installed in accordance with the National Electrical Code (NEC) or the Canadian Electrical Code (CEC), and all applicable local building and electrical codes.
- (e) Provide a retail sales receipt or proof of purchase.

The following are not covered by this Limited Warranty:

- (a) Any incidental or consequential damage, including inconvenience, loss of time or loss of income.
- (b) Any labor or materials required to repair or replace the Product that are not authorized in writing by the Company.
- (c) Any labor or materials required to remove, repair or replace materials other than the Products.
- (d) Any freight or delivery costs related to the Product or any related electrical products.

Watts Radiant assumes no responsibility under this Limited Warranty for any damage to the Product caused by any trades people, visitors on the job site, or damage caused as a result of post-installation work. This Limited Warranty shall be invalidated by any abuse, misuse, misapplication or improper installation of the Products. The staff at the Company is available to answer any questions regarding the proper installation or application of the Product at this toll-free phone number: 800-276-2419 (USA/International) or 888-208-8927 (Canada). If you are ever in doubt about the correct installation procedure to follow, or if the Product appears to be damaged, you must call us before proceeding with the installation or proposed repair.

WATTS RADIANT DISCLAIMS ANY WARRANTY NOT PROVIDED HEREIN, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. WATTS RADIANT FURTHER DISCLAIMS ANY RESPONSIBILITY FOR SPECIAL, INDIRECT, SECONDARY, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM OWNERSHIP OR USE OF THIS PRODUCT, INCLUDING INCONVENIENCE OR LOSS OF USE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE FACE OF THIS DOCUMENT. NO AGENT OR REPRESENTATIVE OF WATTS RADIANT HAS ANY AUTHORITY TO EXTEND OR MODIFY THIS WARRANTY UNLESS SUCH EXTENSION OR MODIFICATION IS MADE IN WRITING BY A CORPORATE OFFICER.

Some states/provinces do not allow the exclusion or limitation of incidental or consequential damages and some states/provinces do not allow limitations on how long implied warranties may last. Therefore, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state or province to province. SO FAR AS IS CONSISTENT WITH APPLICABLE STATE/PROVINCIAL LAW, ANY IMPLIED WARRANTIES THAT MAY NOT BE DISCLAIMED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF MANUFACTURE.

Effective: May 1, 2013. This warranty applies to all Products purchased after this date.

WattsRadiant[™]

A Watts Water Technologies Company

USA: Springfield, MO • Tel. (800) 276-2419 • Fax: (417) 864-8161 • www.wattsradiant.com

Canada: Burlington, ONT. • Tel. (905) 332-4090 • Fax: (905) 332-7068 • www.watts.ca