Installation & Operation Manual

Outdoor Sensor 070

The Outdoor Sensor 070 provides accurate measurement of the outdoor air temperature. Many controls and thermostats can connect to the 070 to measure and display the outdoor temperature.

⚠ 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.

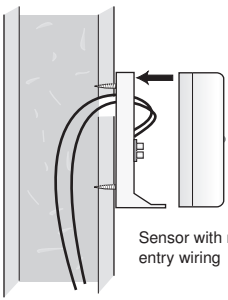
Failure to read and follow all safety and use information can result in personal injury, property damage, or damage to the equipment.

Keep this Manual for future reference.

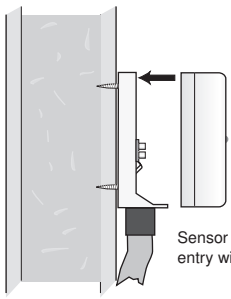
Mounting the Outdoor Sensor

The temperature sensor (thermistor) is built into the 070 enclosure.

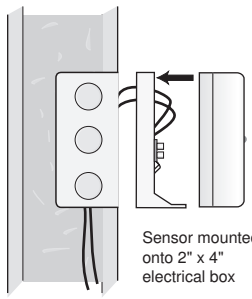
- Remove the screw and pull the front cover off the sensor enclosure.
- The 070 can either be mounted directly onto a wall or a 2" x 4" electrical box. When the 070 is wall mounted, the wiring should enter through the back or bottom of the enclosure. Do not mount the 070 with the conduit knockout facing upwards as rain could enter the enclosure and damage the sensor.
- In order to prevent heat transmitted through the wall from affecting the sensor reading, it may be necessary to install an insulating barrier behind the enclosure.
- The 070 should be mounted on a wall which best represents the heat load on the building (a northern wall for most buildings and a southern facing wall for buildings with large south facing glass areas). The 070 should not be exposed to heat sources such as ventilation or window openings.
- The 070 should be installed at an elevation above the ground that will prevent accidental damage or tampering.



Sensor with rear entry wiring



Sensor with bottom entry wiring



Sensor mounted onto 2" x 4" electrical box

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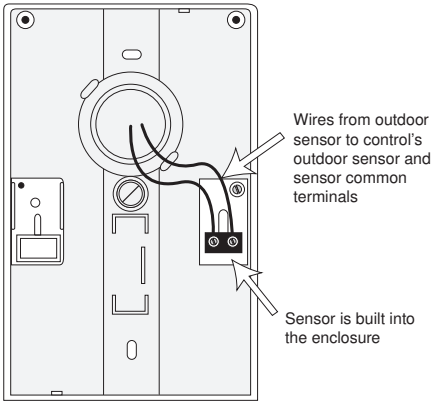
Wiring & Testing the Sensor

- Connect 18 AWG or similar wire to the two terminals provided in the enclosure and run the wires from the 070 to the control. Do not run the wires parallel to telephone or power cables. If the sensor wires are located in an area with strong sources of electromagnetic interference (EMI), shielded cable or twisted pair should be used or the wires can be run in a grounded metal conduit. If using shielded cable, the shield wire should be connected to the Com terminal on the control and not to earth ground.
- Follow the sensor testing instruction in this brochure and connect the wires to the control.
- Replace the front cover of the sensor enclosure.



⚠ CAUTION

Do not apply voltage to a sensor at any time as damage to the sensor may result.

Sensor Testing Instructions

A good quality test meter capable of measuring up to 5,000 kΩ (1 kΩ = 1000Ω) is required to measure the sensor resistance. In addition to this, the actual temperature must be measured with either a good quality digital thermometer, or if a thermometer is not available, a second sensor can be placed alongside the one to be tested and the readings compared.

First measure the temperature using the thermometer and then measure the resistance of the sensor at the control. The wires from the sensor must not be connected to the control while the test is performed. Using the Temperature vs. Resistance Table, estimate the temperature measured by the sensor. The sensor and thermometer readings should be close. If the test meter reads a very high resistance, there may be a broken wire, a poor wiring connection or a defective sensor. If the resistance is very low, the wiring may be shorted, there may be moisture in the sensor or the sensor may be defective. To test for a defective sensor, measure the resistance directly at the sensor location.

Temperature vs. Resistance Table

Temperature		Resistance	Temperature		Resistance
°F	°C	Ω	°F	°C	Ω
-50	-46	490,813	-25	-32	196,358
-45	-43	405,710	-20	-29	165,180
-40	-40	336,606	-15	-26	139,402
-35	-37	280,279	-10	-23	118,018
-30	-34	234,196	-5	-21	100,221

Temperature vs. Resistance Table Continued

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

Technical Data

Outdoor Sensor 070	
Literature	ES-WR-Outdoor_Sensor-070, IOM-WR-Outdoor_Sensor-070
Packaged weight	0.4 lb. (180 g)
Dimensions	4-1/2" H x 2-7/8" W x 1-1/2" D (73 x 114 x 38 mm)
Enclosure	White PVC plastic, NEMA type 2
Approvals	CSA C US
Operating range	-58 to 140°F (-50 to 60°C)
Sensor	NTC thermistor, 10 kΩ @ 77°F (25°C ±0.2°C) ß=3892

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.

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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.

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A Watts Water Technologies Company

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