

Installation & Operation Manual

Universal Sensor 082

The Universal Sensor 082 is a 10 k Ω temperature sensor designed to be strapped onto a pipe. It can be used with select Watts Radiant control sensor inputs, but is most commonly used to monitor supply and return water temperatures. This product has a brass sleeve for fast response, a wide operating range, an indent to allow for pipe strap on installation, and 8 ft (2.4 m) of 2-conductor wire.

⚠ 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.

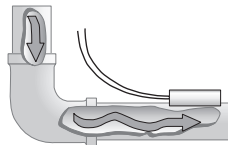
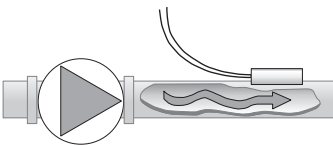
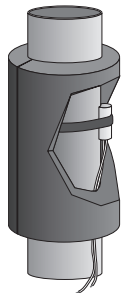
NOTICE

These sensors are designed to mount on a pipe or in a temperature immersion well.

Mounting the Sensor

The Universal Sensor can be strapped directly to the pipe using the cable tie provided. Insulation should be placed around the sensor to reduce the effect of air currents on the sensor measurement.

The Universal Sensor should be placed downstream of a pump or after an elbow or similar fitting. This is especially important if large diameter pipes are used as the thermal stratification within the pipe can result in erroneous sensor readings. Proper sensor location requires that the fluid is thoroughly mixed within the pipe before it reaches the sensor.



⚠ CAUTION

Do not run sensor wires parallel to telephone or power cables. If the sensor wires are located in an area with strong sources of electromagnetic interference, 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 or Com Sen terminal on the control and not to earth ground.

Wiring & Testing the Sensor

- If the supplied wire is not long enough to make a connection to the control, 18 AWG or similar wire can be connected with appropriately sized wiring connectors.
- Follow the sensor testing instruction in this brochure.
- Connect the two wires from the 082 to the sensor and common terminals on the control.

⚠ 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 k Ω (1 k Ω = 1000 Ω) 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	-20	-29	165,180
-45	-43	405,710	-15	-26	139,402
-40	-40	336,606	-10	-23	118,018
-35	-37	280,279	-5	-21	100,221
-30	-34	234,196	0	-18	85,362
-25	-32	196,358	5	-15	72,918

Temperature vs. Resistance Table Continued

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

Technical Data

Universal Sensor 082

Literature	ES-WR-Universal_Sensor-082, IOM-WR-Universal_Sensor-082
Packaged weight	0.1 lbs (50 g)
Dimensions	3/8" OD x 3/4" (9.5 mm OD x 19 mm)
Sensor material	Brass sleeve, 8' (2438 mm) 20 AWG, 300V PVC insulated zipcord
Approvals	CSA C US
Operating range	-58 to 221°F (-50 to 105°C)
Sensor	NTC thermistor, 10 kΩ @ 77°F (25°C ±0.2°C) β=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.

WattsRadiant[™]

A Watts Water Technologies Company

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