



# Installation & Operation Manual

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.

## Installation - Outdoor Sensor 070

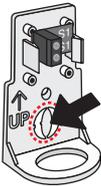
### STEP ONE — MOUNTING THE SENSOR —

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

- The 070 can be mounted directly onto a wall and 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.



Remove cover by sliding upwards away from the base.



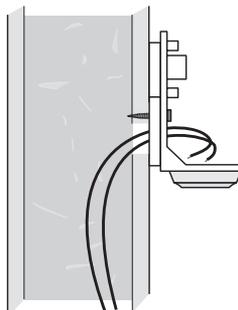
To wire from the back, remove the knock-out in the sensor base.



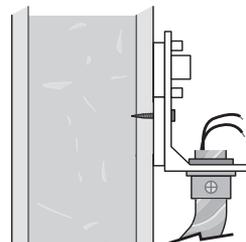
If using conduit, remove the flexible plug from the base bottom.



Attach the base to the wall, soffit or electrical box.



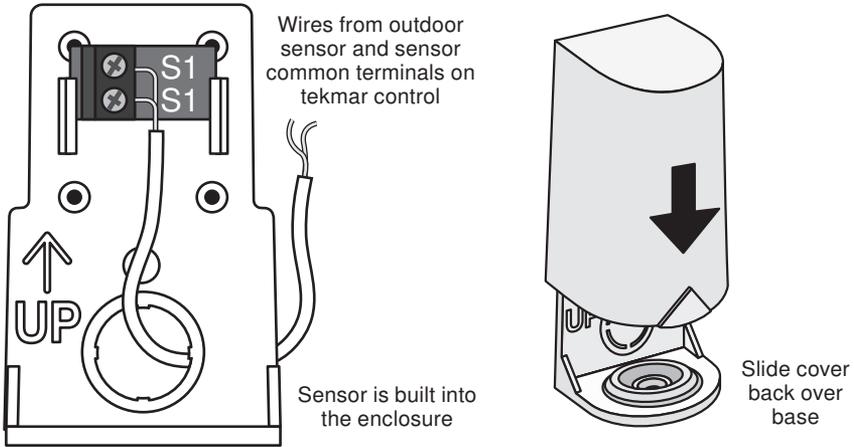
Sensor with wiring from back



Sensor with wiring from bottom

## STEP TWO — WIRING AND 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.



### Sensor Testing Instructions

A good quality test meter capable of measuring up to 5,000 k $\Omega$  (1 k $\Omega$  = 1000 $\Omega$ ) 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 chart on the following page, 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.

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

## Resistance Table

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

## Technical Data

### Outdoor Sensor 070

|                 |   |
|-----------------|---|
| Literature      | 070_D, 070_C  |
| Packaged weight | 0.17 lb. (77 g)                                     |
| Dimensions      | 2-5/8" H x 1-9/16" W x 1-11/16" D (67 x 40 x 43 mm) |
| Enclosure       | White PVC plastic, NEMA type 2                      |
| Operating range | -60 to 140°F (-51 to 60°C)                          |
| Sensor          | NTC thermistor, 10 kΩ @ 77°F (25°C ±0.2°C) β=3892   |

## Limited Warranty and Product Return Procedure

**Limited Warranty** *The liability of tekmar under this warranty is limited. The Purchaser, by taking receipt of any tekmar product ("Product"), acknowledges the terms of the Limited Warranty in effect at the time of such Product sale and acknowledges that it has read and understands same.*

The tekmar Limited Warranty to the Purchaser on the Products sold hereunder is a manufacturer's pass-through warranty which the Purchaser is authorized to pass through to its customers. Under the Limited Warranty, each tekmar Product is warranted against defects in workmanship and materials if the Product is installed and used in compliance with tekmar's instructions, ordinary wear and tear excepted. The pass-through warranty period is for a period of twenty-four (24) months from the production date if the Product is not installed during that period, or twelve (12) months from the documented date of installation if installed within twenty-four (24) months from the production date.

The liability of tekmar under the Limited Warranty shall be limited to, at tekmar's sole discretion: the cost of parts and labor provided by tekmar to repair defects in materials and / or workmanship of the defective product; or to the exchange of the defective product for a warranty replacement product; or to the granting of credit limited to the original cost of the defective product, and such repair, exchange or credit shall be the sole remedy available from tekmar, and, without limiting the foregoing in any way, tekmar is not responsible, in contract, tort or strict product liability, for any other losses, costs, expenses, inconveniences, or damages, whether direct, indirect, special, secondary, incidental or consequential, arising from ownership or use of the product, or from defects in workmanship or materials, including any liability for fundamental breach of contract.

The pass-through Limited Warranty applies only to those defective Products returned to tekmar during the warranty period. This Limited Warranty does not cover the cost of the parts or labor to remove or transport the defective Product, or to reinstall the repaired or replacement Product, all such costs and expenses being subject to Purchaser's agreement and warranty with its customers.

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**Product Warranty Return Procedure** All Products that are believed to have defects in workmanship or materials must be returned, together with a written description of the defect, to the tekmar Representative assigned to the territory in which such Product is located. If tekmar receives an inquiry from someone other than a tekmar Representative, including an inquiry from Purchaser (if not a tekmar Representative) or Purchaser's customers, regarding a potential warranty claim, tekmar's sole obligation shall be to provide the address and other contact information regarding the appropriate Representative.



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