

# Installation & Operation Manual

## Indoor Sensor 077

The tekmar Indoor Sensor 077 includes a 10 k $\Omega$  thermistor mounted on a white enamel steel plate to provide an accurate measurement of the indoor temperature. The 077 can be mounted flush onto a standard duplex electrical box. Wiring enters from the back. The 077 can be connected to a 10k Room Temperature Unit (RTU) for remote temperature sensing.



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## **WARNING**



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

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

**Keep this Manual for future reference.**

## Important Safety Information

### **WARNING**



**TO AVOID DEATH, SERIOUS PERSONAL INJURY, PROPERTY DAMAGE, OR DAMAGE TO THE EQUIPMENT:**

- Learn how to properly and safely use the equipment **BEFORE** installing, setting up, using, or servicing.
- Keep the manual available for easy access and future reference.
- Replace missing, damaged, or illegible manual and product labels.
- Read the manual and all product labels and follow all safety and other information.
- Replacement manuals available at [tekmar.com](http://tekmar.com)

## Understanding Safety Information



This safety-alert symbol is shown alone or used with a signal word (DANGER, WARNING, or CAUTION). A pictorial and/or safety message to identify hazards and alert you to the potential for death or serious personal injury.



This pictorial alerts you to the need to read the manual.



This pictorial alerts you to electricity, electrocution, and shock hazards.

### **DANGER**

Identifies hazards which, if not avoided, will result in death or serious injury.

### **WARNING**

Identifies hazards which, if not avoided, could result in death or serious injury.

### **CAUTION**

Identifies hazards which, if not avoided, could result in minor or moderate injury.

### **NOTICE**

Identifies practices, actions, or failure to act which could result in property damage or damage to the equipment.

# Installation – Indoor Sensor 077

## STEP 1

### Check the Contents

Check the contents of this package. If any of the contents listed are missing or damaged, please contact your wholesaler or tekmar sales representative for assistance.

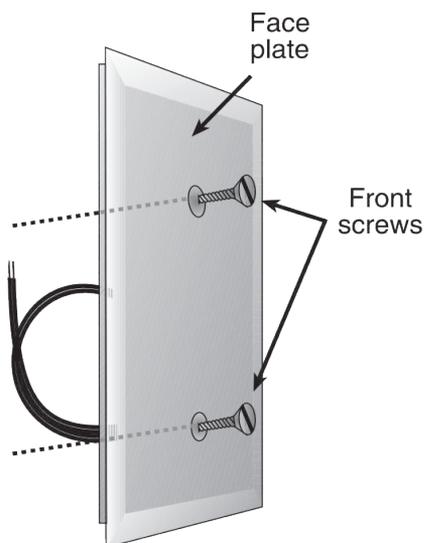
Type 077 includes:

- One Indoor Sensor 077
- One Installation Manual 077\_D
- Two 6-32 x 1" screws

## STEP 2

### Choose a Location

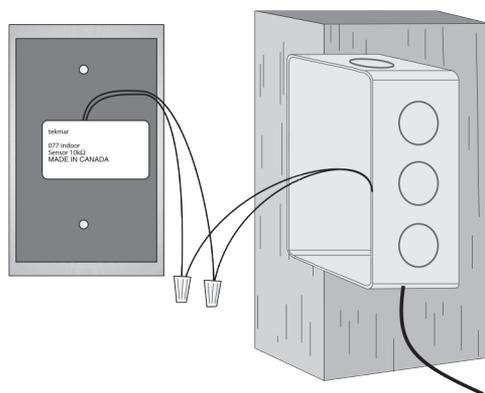
The Indoor Sensor should be installed on an interior wall of the desired zone to be controlled. Do not mount the 077 in a location that may be affected by localized heat sources or cold drafts. It may be necessary to install a draft barrier and / or insulation behind the enclosure in order to prevent air from blowing through the wiring hole and affecting the Sensor reading.



### STEP 3

#### Wiring the Indoor Sensor

Run two conductor 18 AWG or similar wire between the Indoor Sensor and the terminals on the tekmar control. Insert the wires through the hole provided in the back of the indoor sensor enclosure and connect them to the indoor sensor terminal block. Do not run the wires parallel to telephone or power lines. If the indoor sensor wires are located in an area with strong sources of electromagnetic noise, shielded cable or twisted pair should be used or the wires can be run in a grounded metal conduit. If using shielded cable, one end of the shield wire should be connected to the Com-Sen terminals on the control and the other end should remain free. The shield must not be connected to earth ground. Follow the sensor testing instructions in this brochure and connect the wires to the control.



### STEP 4

#### Installing the Sensor Front Cover

Place any extra sensor wire into the electrical box. Secure the front cover of the Indoor Sensor 077 to the electrical box. Ensure the wiring is not pinched or crushed when installing the front plate.

## 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.

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

## Technical Data – Indoor Sensor 077

Literature	D077D
Packaged weight	0.16 lb. (72 g), baked enamel (white) on steel
Dimensions	4½" H x 2⅞" W x ½" D (114 x 73 x 13 mm) ¾" D (5 mm) when installed
Operating range	Splash proof, -60 to 140°F (-50 to 60°C)
Sensor	NTC thermistor, 10 kΩ @ 77°F (25°C ±0.2°C), β=3892
Sensor leads	1' (30 cm) 20 AWG, XPE multi strand
Backing	¼" expanded neoprene gasket
Included	Two 6-32 x 1" screws

# 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.

Any representations or warranties about the Products made by Purchaser to its customers which are different from or in excess of the tekmar Limited Warranty are the Purchaser's sole responsibility and obligation. Purchaser shall indemnify and hold tekmar harmless from and against any and all claims, liabilities and damages of any kind or nature which arise out of or are related to any such representations or warranties by Purchaser to its customers.

The pass-through Limited Warranty does not apply if the returned Product has been damaged by negligence by persons other than tekmar, accident, fire, Act of God, abuse or misuse; or has been damaged by modifications, alterations or attachments made subsequent to purchase which have not been authorized by tekmar; or if the Product was not installed in compliance with tekmar's instructions and / or the local codes and ordinances; or if due to defective installation of the Product; or if the Product was not used in compliance with tekmar's instructions.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHICH THE GOVERNING LAW ALLOWS PARTIES TO CONTRACTUALLY EXCLUDE, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, DURABILITY OR DESCRIPTION OF THE PRODUCT, ITS NON-INFRINGEMENT OF ANY RELEVANT PATENTS OR TRADEMARKS, AND ITS COMPLIANCE WITH OR NON-VIOLATION OF ANY APPLICABLE ENVIRONMENTAL, HEALTH OR SAFETY LEGISLATION; THE TERM OF ANY OTHER WARRANTY NOT HEREBY CONTRACTUALLY EXCLUDED IS LIMITED SUCH THAT IT SHALL NOT EXTEND BEYOND TWENTY-FOUR (24) MONTHS FROM THE PRODUCTION DATE, TO THE EXTENT THAT SUCH LIMITATION IS ALLOWED BY THE GOVERNING LAW.

**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.



**A WATTS Brand**

All specifications are subject to change without notice.

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