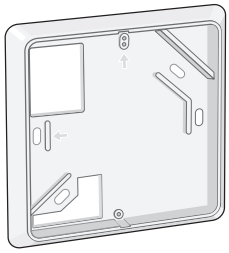
GRANT - Data Brochure

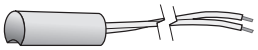
Grant Efficiency Optimiser GEO 360 Sensors

Sensors
06/06



WALL PLATE 95806

The Wall Plate allows for installation of an Indoor Sensor on to an electrical box. The wall plate can be mounted vertical or horizontal and is designed to allow wiring to feed through in both positions. Included with the wall plate are screws for mounting to the electrical box.



UNIVERSAL SENSOR 91746

The Universal Sensor has a zinc sleeve for fast response and a wide operating range. This sensor can be used in a multitude of applications. The sensor is supplied with 1 m (40”) of two conductor wire.

OUTDOOR SENSOR 91629

The Outdoor Sensor includes a 10 kΩ thermistor which provides an accurate measurement of the outdoor temperature. The sensor is protected by a white U.V. resistant PVC plastic enclosure.

INDOOR SENSOR 94107

The Indoor Sensor includes a 10 kΩ thermistor which provides accurate measurement of the indoor temperature. The sensor can be mounted directly on the wall or mounted to an electrical box using the enclosed Wall Plate. The small size makes this sensor visually appealing and less noticeable on the wall.

Definitions

The following defined terms and symbols are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning the life of the product.

⚠ - Warning Symbol: Indicates presence of hazards which can cause severe personal injury, death or substantial property damage if ignored.

Installation - Outdoor Sensor 91629

STEP ONE — GETTING READY

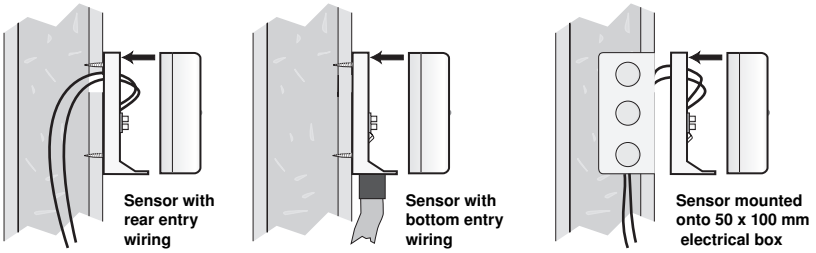
Check the contents of this package. If any of the contents listed are missing or damaged, please contact your place of purchase for assistance.

Type 91629 includes: One Outdoor Sensor, One GEO 360 Sensors Data Brochure

STEP TWO — MOUNTING THE SENSOR

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

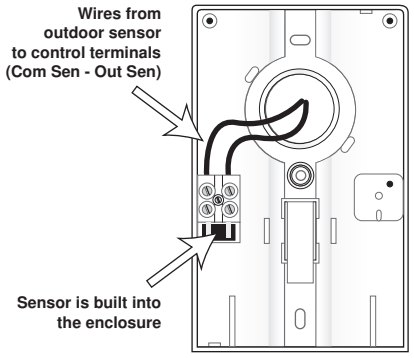
- Remove the screw and pull the front cover off the sensor enclosure.
- The sensor can either be mounted directly onto a wall or a 50 x 100 mm (2” x 4”) electrical box. When the sensor is wall mounted, the wiring should enter through the back or bottom of the enclosure. Do not mount the sensor with the 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 sensor 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 sensor should not be exposed to heat sources such as ventilation or window openings.
- The sensor should be installed at an elevation above the ground that will prevent accidental damage or tampering.

⚠ STEP THREE — WIRING THE SENSOR

- Connect 1.0 mm² - 2 core cable or similar wire to the two terminals provided in the enclosure and run the wires from the sensor to the control. Ensure that all wires are stripped to 9 mm (3/8”). 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.



Installation - Universal Sensor 91746

STEP ONE — GETTING READY

Check the contents of this package. If any of the contents listed are missing or damaged, please contact your place of purchase for assistance.

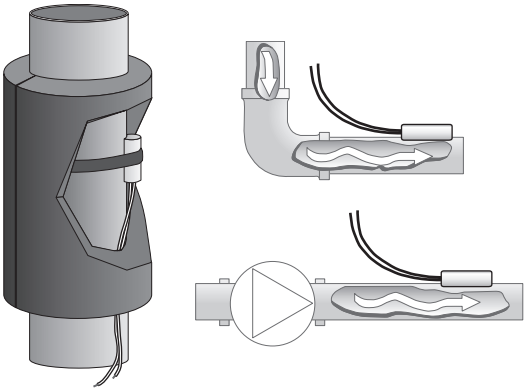
Type 91746 includes: One Universal Sensor, One GEO 360 Sensors Data Brochure

STEP TWO — MOUNTING THE SENSOR

Note: This sensor is designed to mount on a pipe or in a temperature immersion well.

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 effects 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.



⚠ STEP THREE — WIRING THE SENSOR

Caution 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 or the wires can be run in a grounded metal conduit. If using shielded cable, one end of the shield should be connected to the *Com* terminal on the control and the other end should remain free. The shield must not be connected to earth ground.

- It will be necessary to connect 1.0 mm² - 2 core cable to the two sensor wires. Ensure that all wires are stripped to 9 mm (3/8”). Wire nuts can be used to hold the wires together.
- Follow the sensor testing instructions in this brochure and connect the wires to the control.

Installation - Indoor Sensor 94107

STEP ONE — GETTING READY

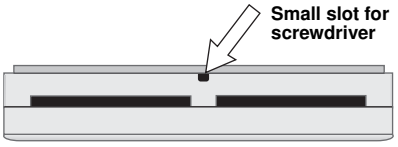
Check the contents of this package. If any of the contents listed are missing or damaged, please contact your place of purchase for assistance.

Type 94107 includes: One Indoor Sensor, One GEO 360 Sensors Data Brochure, One Wall Plate, Two Electrical Box Screws, Two Self Tapping Screws

STEP TWO — REMOVING THE FRONT COVER

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

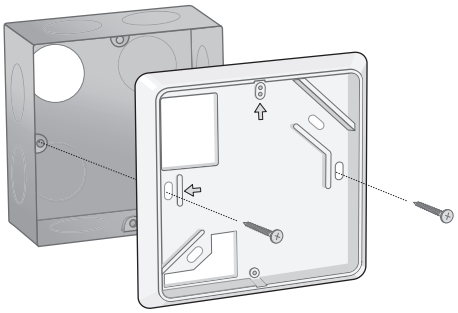
To remove the indoor sensor front cover, place a small screwdriver or similar object into the small hole located in the top of the enclosure. Push the screwdriver against the plastic flap and pull the top of the front cover so that it pivots around the bottom edge of the mounting base.



Top view of Indoor Sensor

STEP THREE — MOUNTING USING AN ELECTRICAL BOX

The Wall Plate is mounted onto an electrical box using the supplied screws. Ensure that at least one of the arrows molded in the plastic points upwards. Also ensure that the electrical box is properly insulated and protected from cold drafts. All required wiring must be pulled through the existing top left hand hole of the wall plate.

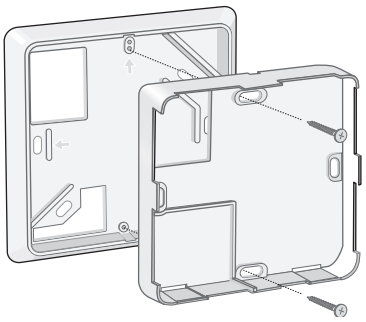


STEP FOUR — MOUNTING THE SENSOR

Electrical Box Mounting

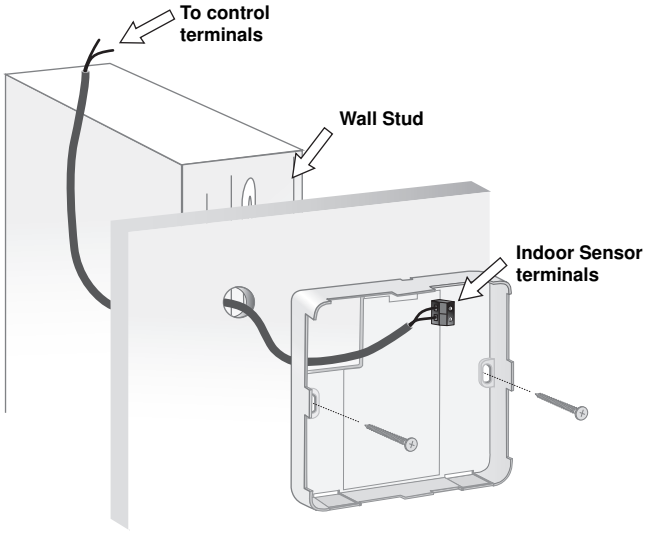
Insert the wiring through the hole provided in the back of the sensor and connect them to the wiring terminals of the GEO 360. Attach the sensor to the wall plate using the supplied screws.

Do not over tighten screws as the plastic molding may strip. The Indoor Sensor should be installed on an interior wall of the desired zone to be controlled. Do not mount the sensor 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.



Surface Mounting

For surface mounting, mount the Indoor Sensor directly to the wall using two 25 mm (#6-1") screws. The screws are inserted through the mounting holes and must be securely fastened to the wall. If possible, at least one of the screws should enter a wall stud.

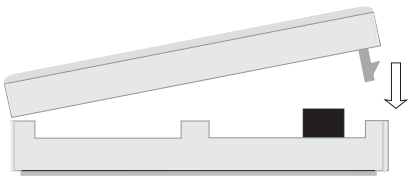


⚠ STEP FIVE — WIRING THE INDOOR SENSOR

Run 1.0 mm^2 - 2 core cable or similar wire between the Indoor Sensor and the terminals on the control. Ensure that all wires are stripped to a length of 9 mm (3/8"). 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 should be connected to the *Com* terminal 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 SIX — INSTALLING THE FRONT COVER

The Indoor Sensor front cover is installed by aligning the hinges on the bottom of the front cover with the bottom of the sensor mounting base. The front cover is then pivoted around the bottom hinge and pushed against the mounting base until it snaps firmly into place.



Sensor Testing Instructions

⚠ A good quality test meter capable of measuring up to 5,000 kΩ (1 kΩ =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 chart below, 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	Temperature		Resistance	Temperature		Resistance	Temperature		Resistance
°C	°F	Ω	°C	°F	Ω	°C	°F	Ω	°C	°F	Ω
-46	-50	490,813	-7	20	46,218	32	90	7,334	71	160	1,689
-43	-45	405,710	-4	25	39,913	35	95	6,532	74	165	1,538
-40	-40	336,606	-1	30	34,558	38	100	5,828	77	170	1,403
-37	-35	280,279	2	35	29,996	41	105	5,210	79	175	1,281
-34	-30	234,196	4	40	26,099	43	110	4,665	82	180	1,172
-32	-25	196,358	7	45	22,763	46	115	4,184	85	185	1,073
-29	-20	165,180	10	50	19,900	49	120	3,760	88	190	983
-26	-15	139,402	13	55	17,436	52	125	3,383	91	195	903
-23	-10	118,018	16	60	15,311	54	130	3,050	93	200	829
-21	-5	100,221	18	65	13,474	57	135	2,754	96	205	763
-18	0	85,362	21	70	11,883	60	140	2,490	99	210	703
-15	5	72,918	24	75	10,501	63	145	2,255	102	215	648
-12	10	62,465	27	80	9,299	66	150	2,045	104	220	598
-9	15	53,658	29	85	8,250	68	155	1,857	107	225	553

Technical Data

OUTDOOR SENSOR 91629

Packaged weight – 160 g, Enclosure E, white PVC plastic
Dimensions – 114 x 73 x 38 mm (4-1/2" H x 2-7/8" W x 1-1/2" D)
Approvals – CE approved
Operating range – -50 to 60°C
Sensor – NTC thermistor, 10 kΩ @ (25°C ±0.2°C), ß=3892

UNIVERSAL SENSOR 91746

Packaged weight – 64 g, zinc sleeve, 250 mm (10"), 20 AWG XPE wire
Dimensions – 9.5 OD x 19 mm (3/8" OD x 3/4")
Approvals – CE approved
Operating range – -50 to 125°C
Sensor – NTC thermistor, 10 kΩ @ (25°C ±0.2°C), ß=3892

INDOOR SENSOR 94107

Packaged weight – 150 g, Enclosure G, white PVC plastic
Dimensions – 73 x 73 x 21 mm (2-7/8" H x 2-7/8" W x 13/16")
Approvals – CE approved
Operating range – -50 to 60°C
Sensor – NTC thermistor, 10 kΩ @ (25°C ±0.2°C), ß=3892
Included – Wall plate 95806, Two M3.5 x 0.6 x 50 mm slotted machine screws, Two #6 x 5/16" self tapping screws

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