

**tekmar®**



**D 082**

## Universal Sensor 082

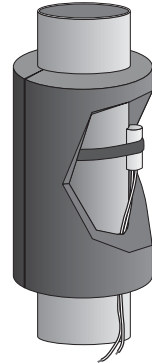
The tekmar Universal Sensor 082 has a brass sleeve for fast response and a wide operating range. This sensor can be used in a multitude of applications. The 082 is supplied with 8 ft (2438 mm) of two conductor wire.

## Installation - Universal Sensor 082

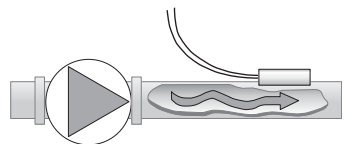
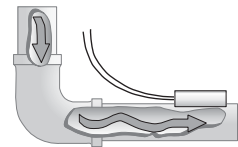
### STEP ONE — MOUNTING THE SENSOR

**NOTE:** These sensors are 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 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.



## STEP TWO ——— WIRING AND TESTING 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.

- If a Universal Sensor Enclosure 080 is used to mount the 082, follow the installation instructions provided in the Data Brochure D080.
- Without the Universal Sensor Enclosure 080, it may be necessary to connect 18 AWG wire to the two sensor wires. Wire nuts can be used to hold the wires together.
- Follow the sensor testing instructions given in this brochure and then connect the wires to the control.

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

## Technical Data

### UNIVERSAL SENSOR 082

Literature	D082
Packaged weight	0.12 lb. (55 g)
Enclosure	Brass sleeve, 8' (2438 mm) 20 AWG PVC insulated wire
Dimensions	3/8" OD x 3/4" (9.5 OD x 20 mm)
Approvals	CSA C US
Operating range	-60 to 221°F (-51 to 105°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.

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.



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