

**THE SENSOR  
BOX™**



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BOX™**

**A MODULAR TEMPERATURE SENSOR ASSEMBLY SYSTEM  
FOR THE MAINTENANCE PROFESSIONAL**



**BENEFITS:**

- **Improved process uptime**
- **Reduced expediting & related costs**
- **Fewer emergency orders**
- **Lower inventory**



**APPLIED SENSOR TECHNOLOGIES**  
A DIVISION OF UNITED ELECTRIC CONTROLS

Sensor Box-B-04



## OVERVIEW

If this sounds familiar . . .

- 3:00 PM on a Friday afternoon, and you've just discovered a temperature sensor has failed on an important process.
- The Safety Engineer wants the process shut down, but you're under pressure to keep production moving.
- Of course, you don't have the exact replacement in the stockroom. You're going to spend the rest of the afternoon in "Panic Mode," calling every sensor supplier you can think of, begging for the best delivery at a premium. Not very pretty . . .

*Then the SENSOR BOX™ was developed to help improve your life.*

## FEATURES

The SENSOR BOX™, a rugged toolbox containing all of the parts and tools to quickly and easily build the sensor you urgently need, is:

- **Flexible** - adaptable to most process plants:
  - Power
  - Chemical
  - Pharmaceuticals, Food and Dairy
  - Offshore Oil Production
- **Comprehensive** - It can include a variety of sensor types and hardware of your choice.
- **Self-contained** - Everything you need to build the right product is at your fingertips.
- **Industrial** - The toolbox and tools are rugged, designed for hard duty.
- **Easy to use** - Complete, easy to follow instructions are included.



## APPLICATIONS

Maintenance or instrument technicians can now build a new temperature sensor assembly, install it and the plant can be back up and running in minutes rather than days! The SENSOR BOX™ is designed for any plant where temperature sensors are an important part of the operation, and downtime is not an option.

By using the SENSOR BOX™, you can:

- Greatly reduce expediting and emergency orders
- Reduce your inventory
- Improve equipment uptime
- **Be a hero!**

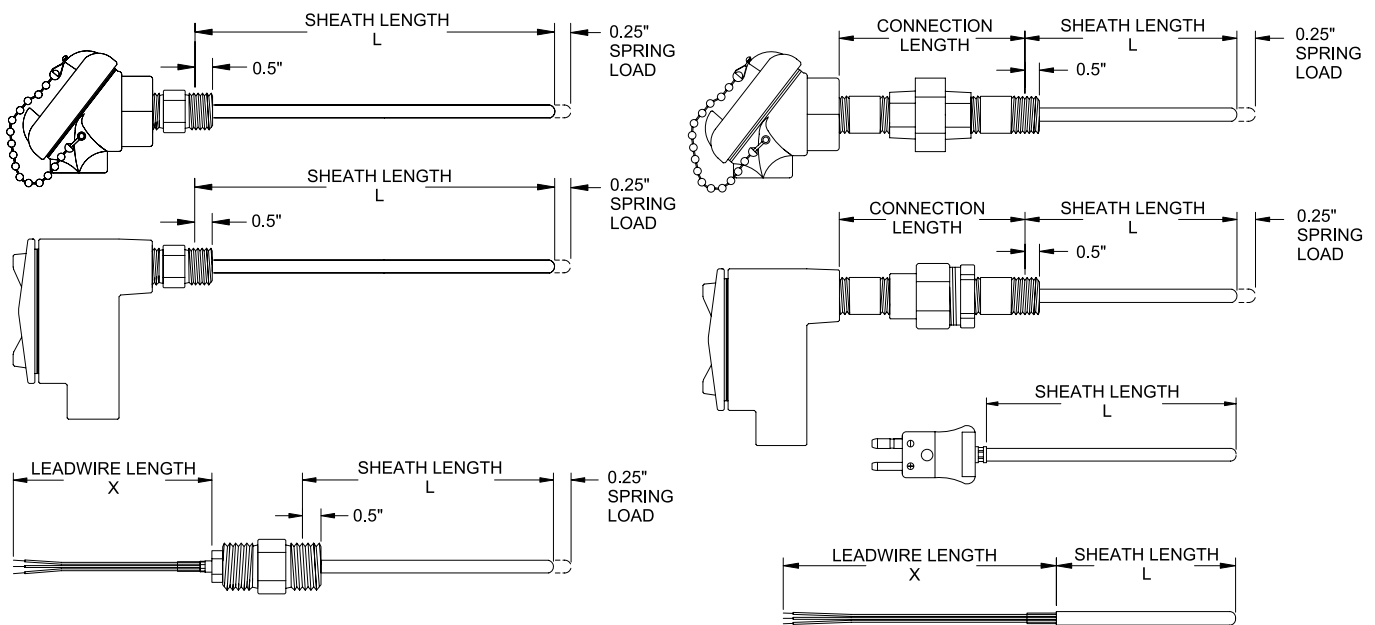
## TECHNOLOGY

One of the challenges in maintaining industrial temperature sensors is the variety. It is difficult for the typical process plant to stock every sensor configuration they might need to replace. Until now.

The SENSOR BOX™ can be your solution to expediting, high inventory and expensive downtime. It is a modular system, consisting of:

- Sensor elements (we call them "pods") - the sensor itself, with leadwire
- Housings - add to the sensor element for protection and mounting
- Hardware - components for spring-loading, heads, unions, etc.
- Tools - crimper, tubing cutter and other tools for building assemblies.

By combining common parts, a relatively small amount of stock can translate into the variety you need – quickly, and without expediting. What can you build with the basic kit, and a few options? **Here are some of the assemblies that can be made with THE SENSOR BOX™:**



### How do you build one?

It's easy as 1-2-3!

1. Determine the dimensions and type of sensor you need
2. Open your SENSOR BOX™ and take out the parts and tools you'll need
3. Measure, cut, crimp and assemble. Install it!

## HOW TO ORDER

The basic SENSOR BOX™ (part number EK1000) comes complete with toolbox, tools and the parts listed below:

Part Number	Description	Quantity
HS2524	Housing, 0.250" OD x 24" long, 316 stainless steel	6
AC1054	Terminal head, aluminum, meets NEMA 4 req's., with a four post ceramic terminal block. 1/2" NPT process x 3/4" conduit	3
AC1087	Spring-loading kit for AC1054 head	6
NC1002	Nipple, 1/2" NPT x 2" long, carbon steel	6
UC1011	Union, 1/2" NPT, carbon steel for NEMA 4 applications	3
TS1092	Wire guide (Bag of 10)	1
Tools	Crimper, tube cutter, screwdriver, tape measure, wire stripper	1 each

In addition, please select any 6 sensor "pods" from the list below to complete your kit.

Part Number	Sensor Description
RT1260	100Ω platinum RTD, 3-wire, Teflon® insulation, max. temp. 400°F
RT1254	100Ω platinum RTD, 3-wire, fiberglass insulation, max. temp. 900°F
MI1113_U	Thermocouple with ungrounded junction, fiberglass leads. See notes below. Specify calibration (J, K, E, T). Example: MI1113KU.
MI1113_G	Thermocouple with grounded junction, fiberglass leads. See notes below. Specify calibration (J, K, E, T). Example: MI1113KG.
MI1113TF_U	Thermocouple with ungrounded junction, Teflon® leads. See notes below. Specify calibration (J, K, E, T). Example: MI1113TFJU.
MI1113TF_G	Thermocouple with grounded junction, Teflon® leads. See notes below. Specify calibration (J, K, E, T). Example: MI1113TFJG.

Ordering Example: EK1000 with (3) RT1260, (2) MI1113JG and (1) MI1113KG pods

### OPTIONAL PARTS AVAILABLE

In addition to the basic EK1000 SENSOR BOX™, there are many additional parts to help customize the system to your specific needs. Some of these are noted below (many others are also available - consult your Master Distributor for availability and ordering instructions).

### SENSOR HOUSINGS

Part Number	Description
HS2512	316 stainless steel, 0.250" OD x 12" long
HS2536	316 stainless steel, 0.250" OD x 36" long
HS2548	316 stainless steel, 0.250" OD x 48" long

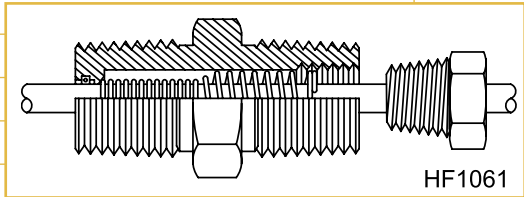
Teflon® is a registered trademark of E.I. Du Pont De Nemours and Company

Notes: Pods with fiberglass leads are rated to 900°F; those with Teflon leads are rated to 400°F. For higher temp., consult UE.

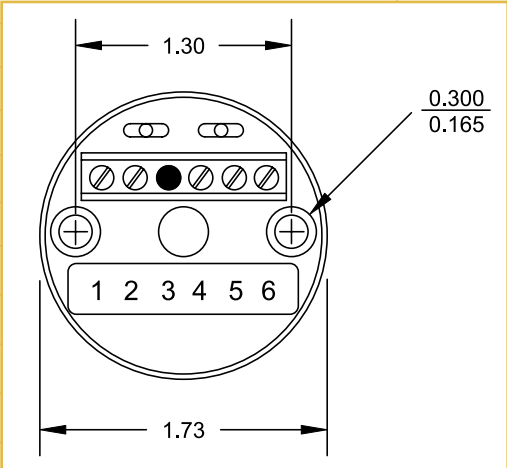
Dual calibration pods are available at a slightly higher cost. Please indicate as -KK, -EE, -JJ or -TT.

**TERMINAL HEADS AND TERMINAL BLOCKS**

Part Number	Description
AC1054	Terminal head, aluminum, meets NEMA 4 req's., w/ terminal block. 750°F max.
AC1083	Terminal head, polypropylene, meets NEMA 4 requirements, 220°F max
AC1086	Terminal head, epoxied aluminum, meets NEMA 4X, w/ terminal block. 750°F max.
AC1093	Terminal head, cast iron, meets NEMA 4 req's., w/ terminal block. 750°F max.
AC1095	Terminal head, aluminum, designed to hold transmitter. No terminal block. 300°F max.
AC1096	Terminal head, stainless steel, with terminal block. 570°F max.
AC1084	Terminal head, Class I, Div. 1, Groups C&D, aluminum. 350°F max.
AC1085	Terminal block, ceramic, 4-post
AC1085-6	Terminal block, ceramic, 6-post
AC1085X-6	Terminal block, phenolic, for explosion-proof head
<b>HARDWARE</b>	
NC1001	1" long carbon steel nipple, 1/2" NPT
NC1002	2" long carbon steel nipple, 1/2" NPT
NC1003	3" long carbon steel nipple, 1/2" NPT
NC1004	4" long carbon steel nipple, 1/2" NPT
NC1006	6" long carbon steel nipple, 1/2" NPT
NS1001	1" long stainless steel nipple, 1/2" NPT
NS1002	2" long stainless steel nipple, 1/2" NPT
NS1003	3" long stainless steel nipple, 1/2" NPT
NS1006	6" long stainless steel nipple, 1/2" NPT
UC1011	1/2" NPT union, carbon steel, for NEMA 4 applications
HF1091	1/2" NPT union, stainless steel, for NEMA 4 applications
AC1090	Spring-loading kit for explosion-proof terminal head
HF1061	Spring-loaded hex fitting
CF1061	Compression fitting, 1/2" NPT x 0.250" OD, 316 stainless
<b>PLUGS &amp; JACKS</b>	
P1062_	Thermocouple plug (J,K,E,T)
J1062_	Thermocouple jack (J,K,E,T)
P1064	RTD plug, 3-pin
J1064	RTD jack, 3-pin
WC	Wire clamp for plug/jack
B1250	Brass crimp insert for plug
<b>TRANSMITTERS</b>	
XM1012	T/C input, non-isolated
XM1002	RTD input, non-isolated
XM1021	Universal-isolated (T/C or RTD)



HF1061





# THE SENSOR BOX™

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## PARTS IN AN EK1000 SENSOR BOX™

(3) carbon steel unions, 1/2" NPT

(6) carbon steel nipples, 1/2" NPT

(3) terminal blocks, ceramic, with mounting screws

(3) NEMA 4 terminal heads, aluminum, with screw cover and chain

**Tools:**  
Special crimper, Tubing cutter, Screwdriver, Wire stripper, Tape measure

A rugged toolbox to hold it all

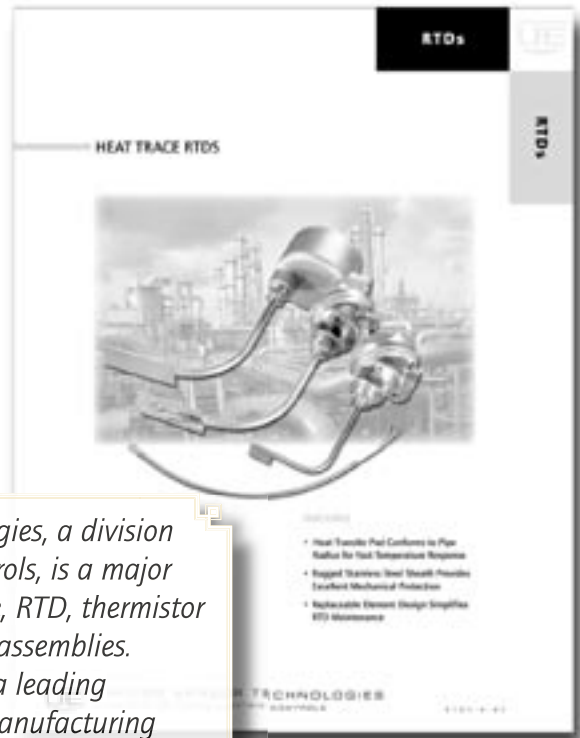
(6) spring-loading kits, with bushings

(6) stainless steel sensor housings, 0.250" OD x 24" long

(6) sensor pods, your choice of J, K, E, or T thermocouples, or 100 ohm RTDs



ALSO AVAILABLE:  
THE SENSOR BOX™ for Sanitary Applications, includes polypropylene heads and sanitary fittings.



*Applied Sensor Technologies, a division of United Electric Controls, is a major manufacturer of thermocouple, RTD, thermistor and other temperature sensor assemblies. ISO 9001:2000 certified and a leading practitioner of JIT and Lean Manufacturing methods, Applied Sensor Technologies has expertise in a wide variety of applications, from low-cost OEM sensors, to gas turbine exhaust, to innovative heat tracing designs. Please request our other catalogs for a more complete overview of our products. Or contact us at the numbers on the back, or visit our website: [www.appliedsensortech.com](http://www.appliedsensortech.com)*



## RECOMMENDED PRACTICES AND WARNINGS

Applied Sensor Technologies recommends careful consideration of the following factors when specifying and installing AST temperature sensors. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, maximum temperature limits stated in literature and on drawings must never be exceeded, even by surges in the system. Operation of the unit up to maximum temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated range. Excessive cycling at maximum temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- Install unit where shock, vibration, electrical noise and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift or instability. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Wire unit according to local and national electrical codes, using appropriate wire size recommended.
- Do not mount unit in ambient temp. exceeding published limits.

## LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 18 months. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

## LIMITATION OF SELLER'S LIABILITY

Seller's liability to Buyer for any loss or claim, including liability incurred in connection with (i) breach of any warranty whatsoever, expressed or implied, (ii) a breach of contract, (iii) a negligent act or acts (or negligent failure to act) committed by Seller, or (iv) an act for which strict liability will be inputted to seller, is limited to the "limited warranty" of repair and/or replacement as so stated in our warranty of product. In no event shall the Seller be liable for any special, indirect, consequential or other damages of a like general nature, including, without limitation, loss of profits or production, or loss or expenses of any nature incurred by the buyer or any third party.

*UE specifications subject to change without notice.*

## U.S. SALES OFFICES

United Electric Controls  
32 Highland Rd.  
South Hampton, NH 03827  
Phone: 603-394-0078  
FAX: 603-394-0175

United Electric Controls  
28 N. Wise Ave.  
Freeport, IL 61032  
Phone: 815-235-3501  
FAX: 815-235-3847

United Electric Controls  
1022 Vineyard Drive  
Conyers, GA 30013  
Phone: 770-483-8400  
FAX: 770-929-8716

United Electric Controls  
5829 Grazing Court  
Mason, OH 45040  
Phone: 513-398-3175  
FAX: 513-398-3076

United Electric Controls  
102 Salazar Court  
Clayton, CA 94517  
Phone: 925-524-0210  
FAX: 925-524-0210

United Electric Controls  
27 Summit Terrace  
Sparta, NJ 07871  
Phone: 973-271-2550  
FAX: 973-729-6099

United Electric Controls  
12630 Summerwood Glen  
Houston, TX 77041  
Phone: 832-243-0119  
FAX: 832-243-0140

## CANADA

EASTERN  
68 Mosley Crescent  
Brampton, Ontario  
Canada L6Y 5C8  
Phone: 905-455-5131  
FAX: 905-455-5131

## INTERNATIONAL OFFICES

BELGIUM  
United Electric Controls-Europe  
G. Van Gervenstraat 19A  
B-9120 Beveren-Waas, Belgium  
Phone: 32-37554-383  
FAX: 32-37552-747

CHINA  
United Electric Controls  
Room 1114, No. 511  
Shenshi Building  
Weihai Road  
Shanghai 200041, P.R. China  
Phone: +8621-6255 8059  
FAX: +8621-6255 8349

GERMANY  
United Electric Controls  
An Der Zentlinde 21  
D-64711 Erbach, Germany  
Phone: 496-062-7400  
FAX: 496-062-7501

MALAYSIA  
United Electric Controls, Far East  
No. 1-2-2, 2nd Floor  
Jalan 4/101C  
Cheras Business Centre  
Batu 5, Jalan Cheras  
56100 Kuala Lumpur, Malaysia  
Phone: 603-9133-4122  
FAX: 603-9133-4155

RUSSIA  
United Electric Controls, Moscow  
Kuusinena str., 19A, Office 310  
Moscow, 125252, Russia  
Phone: +7 (095) 792-88-06  
FAX: +7 (095) 258-92-12

WESTERN  
148 Silver Ridge Close N.W.  
Calgary, Alberta  
Canada T3B 3T4  
Phone: 403-247-3724  
FAX: 403-247-3724



APPLIED SENSOR  
TECHNOLOGIES

A DIVISION OF UNITED ELECTRIC CONTROLS

180 Dexter Avenue, P.O. Box 9143  
Watertown, MA 02471-9143 USA  
Telephone: 617 923-6966 Fax: 617 926-8411  
<http://www.appliedsensortech.com>