

United Electric Controls has a rich history of over 80 years in providing protection for plant assets, people and the environment. Our pressure and temperature instrumentation is designed specifically to meet the rigors of harsh and hazardous alarm and emergency shutdown applications and includes certified safety transmitters per IEC 61508. UE serves the Chemical & Petrochemical, Power, Water & Wastewater and Oil & Gas industries, as well as many other challenging OEM applications.

Call at +1 617-926-1000 to speak to one of our knowledgeable representatives who can help answer many of your application questions. Please visit www.ueonline.com to use our product selector, find one of our 150 worldwide distributors, and for further information about United Electric Controls and its products.



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UE SHORT FORM CATALOG

LEADERS IN SAFETY, ALARM & SHUTDOWN

Electronic and Electromechanical Switches for Vacuum,
Pressure, Differential Pressure, and Temperature

Specialty Transmitters for Functional Safety, Process
Monitoring and Control

Industrial Temperature Sensors





is a privately held corporation headquartered in Watertown, Massachusetts, USA. We are an international manufacturer of durable and reliable pressure and temperature transmitters, switches, and sensors. Focused on providing protection to equipment, processes and personnel in a variety of industrial applications, our products range from simple controls to highly specialized custom designs. Our products perform alarm and emergency shutdown (ESD) functions for our customers, while others provide critical sensor inputs into control systems.

Our reputation for dependable, reliable products since 1931 is a result of innovative design, superior manufacturing techniques, and a corporate focus on uncompromising quality. UE was among the first companies awarded the Shingo prize for excellence in manufacturing, and remains committed to continuous process improvements and the principles of Lean Manufacturing.

INNOVATIVE DESIGN

- Proven specialty transmitters and electronic switches
- Cost-effective solutions that exceed customer requirements
- Fit-for-purpose by application

RAPID DELIVERY

- Lean manufacturing for maximum productivity
- Operational excellence (OpX) reduces waste
- One-piece-flow for optimum manufacturing efficiency

UNCOMPROMISING QUALITY

- ISO 9001 certified
- Customer-first approach through service, delivery and value
- US manufacturing

ENVIRONMENTAL STEWARDSHIP

- Energy management
- Recycling
- Non-toxic manufacturing

GLOBAL PRESENCE

- Worldwide factory support
- More than 150 distributors
- Third-party approvals and international certifications

THREE MANUFACTURING DIVISIONS

- United Electric Controls
- Applied Sensor Technologies
- Precision Sensors



While United Electric Controls works towards full RoHS compliance with all of our products, most equipment and applications that include UE products are in RoHS exempt Category 9. If you are planning to install UE products in equipment that needs to comply, please contact us immediately so we may assist in your compliance goals.



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One Series Safety Transmitter

SIL 2 Certified pressure and temperature transmitter-switch.

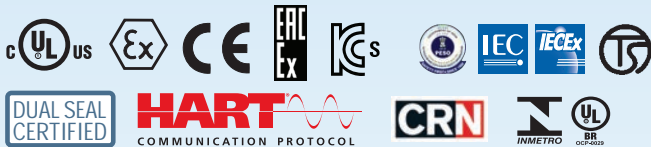


ADVANTAGES:

- Certified for use in SIL 2 Functional Safety Systems per IEC 61508-2010; Capable of SIL 3
- Simplify complex safety systems with SFF = 98.8%
- Improve availability with reduced nuisance trips
- Improve uptime with safety diagnostics
- Connects directly to the final element and/or the safety PLC
- Reacts within 100ms to process upsets

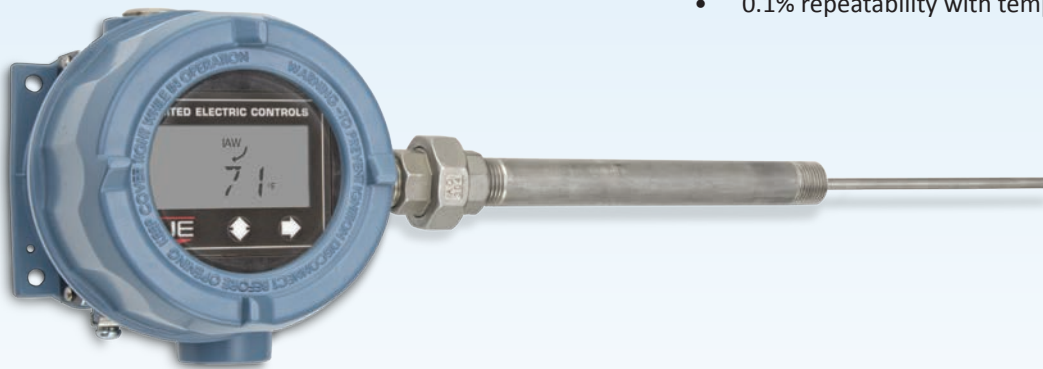
One Series

Explosion-proof electronic pressure and temperature hybrid transmitter-switch for Zone 1 areas.



ADVANTAGES:

- Replace blind mechanical switches
- Increase reliability with smart diagnostics
- Replace a switch, gauge and transmitter
- Easily perform pump staging and optimization
- Start, stop and protect rotating equipment
- Reduce nuisance trips
- 2-wire and loop-powered 4-20 mA models with HART®
- Monitor gage pressure, differential pressure or temperature
- Ideal for plant upgrades and safety interlock applications
- 0.1% repeatability with temperature compensation





12 Series

Dual seal, 316 stainless steel, vibration-resistant hazardous location pressure, differential pressure and temperature electromechanical switch.



ADVANTAGES:

- Dual seal compliant to ANSI 12.27.01 standards and NEC 501.17
- Corrosion-resistant 316 stainless steel construction
- Snap-acting Belleville spring for vibration resistance and set point stability
- Convenient field setting and adjustment
- Hermetically sealed SPDT or DPDT switches
- Ranges to 12,500 psi (860 bar), 150 psid (10 bar d), 650°F (340°C)



TX200 Series

Explosion-proof, hermetically sealed, 316 stainless steel HART® 7 registered or analog (ASIC) pressure transmitter.



ADVANTAGES:

- HART® 7 communication protocol output with enhanced DD's
- ASIC 4-20 mA or 1-5 or 0-10 VDC output
- 5:1 (ASIC) or 10:1 (HART®) pressure range turndown provides multiple ranges while reducing inventory
- Rugged, compact design for control panel or direct process mounting
- Proprietary temperature compensation limits thermal effects on sensor output
- Unique one-piece sensor design for high pressure and hydrogen applications
- Compatible with SCADA and wireless systems
- Ranges to 25,000 psi (1724 bar)



HART
COMMUNICATION PROTOCOL

HART
REGISTERED

120 Series

Rugged explosion-proof pressure, vacuum, differential pressure and temperature electromechanical switch with worldwide agency certifications.



ADVANTAGES:

- Provides primary or secondary (diverse, redundant technology for safety) alarm and emergency shutdown functions
- Single SPDT or DPDT or dual SPDT outputs
- Choice of internal or external adjustment
- Wide selection of sensor materials and ranges
- Wide adjustable deadband models
- Easy to wire via dual electrical conduit openings and terminal block
- Heat tracing models
- Ranges to 6000 psi (410 bar), 500 psid (35 bar d), 650°F (340°C)

117 Series

Compact pressure, vacuum, differential pressure and temperature electromechanical switch for Div. 2, Zone 2 areas.



ADVANTAGES:

- Hazardous location approvals for Class 1, Div. 2, Zone 2
- Hermetically-sealed snap switch, SPDT or DPDT outputs
- Welded stainless steel diaphragm or bellows sensors
- Epoxy-coated type 4X enclosure with captive cover screws
- Terminal block wiring
- Ranges to 3500 psi (240 bar), 500 psid (35 bar d), 640°F (335°C)



100 Series

Single switch, weather-tight, pressure, vacuum, differential pressure, and temperature electromechanical switch.

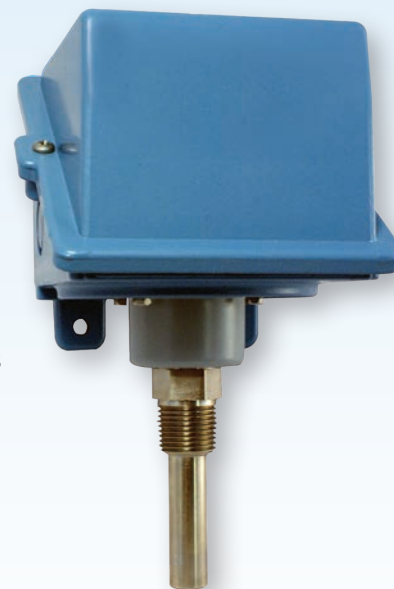
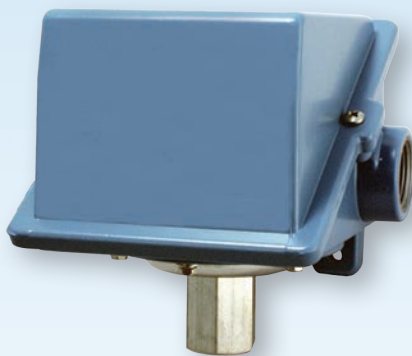


ADVANTAGES:

- Single switch (SPDT or DPDT) output
- Wide variety of pressure sensors for media compatibility
- Epoxy-coated enclosure, designed to meet enclosure type 4X requirements
- Pump switch models with wide adjustable deadband
- Tamper-resistant set point "lock"
- Optional intrinsic safety compliance per ATEX & EAC standards
- Heat tracing models
- Ranges to 5,000 psi (345 bar), 500 psid (35 bar d), 650°F (340°C)

400 Series

Multi-switch, weather-tight pressure, vacuum, differential pressure, and temperature electromechanical switch.



ADVANTAGES:

- One, two or three switch outputs may be separated up to 100% of range
- Epoxy-coated enclosure, designed to meet enclosure type 4X requirements
- Choice of reference dial or multi-turn hex screw for set point adjustment
- Wide selection of ranges including low pressure models with narrow deadbands
- Optional intrinsic safety compliance per ATEX & EAC standards
- Ranges to 6,000 psi (410 bar), 200 psid (10 bar d), 650°F (340°C)

10 Series

Cost-effective, compact, cylindrical pressure switch for OEMs.



ADVANTAGES:

- 1-1/4" diameter and height as small as 3"
- Most models designed to meet enclosure type 4 requirements
- Factory set or field adjustable with tamper-resistant cover
- Choice of 7 electrical terminations
- Variety of options to customize design
- Ranges to 7,500 psi (515 bar)
- Proof pressures up to 12,000 psi (825 bar)

24 Series

Compact, economical differential pressure switch for OEMs.



ADVANTAGES:

- Compact, lightweight corrosion-resistant polyester enclosure
- Designed to meet enclosure type 4 requirements
- Terminal block wiring
- Available with brass or polysulfone (FDA approved) pressure connections
- OEM capabilities include external adjustment knob with or without reference scale
- Ranges to 45 psid (3 bar d)

Visit UE's Product Selector: www.ueonline.com



54 Series

Economical pressure, vacuum and temperature switch for OEMs.



ADVANTAGES:

- Multiple models and options provide OEM design versatility
- Reference scale or multiple-turn hex adjustment versions
- NEMA 1 Lexan enclosure or open frame (skeleton) design
- Choice of single or dual SPDT switch outputs
- Ranges to 6000 psi (410 bar), 650°F (340°C)



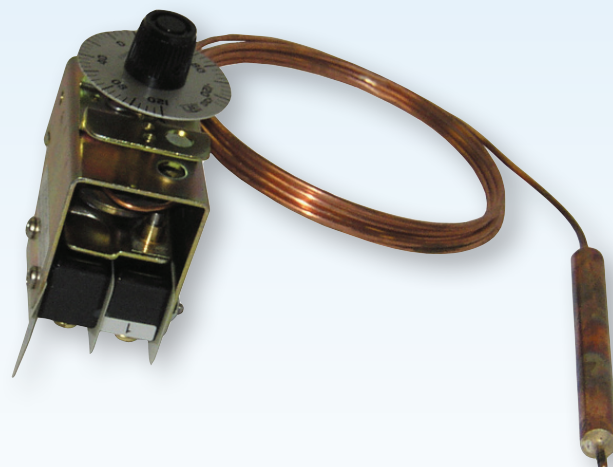
55 Series

Rugged temperature switch with external dial.



ADVANTAGES:

- May be panel or surface mounted with remote measurement for critical temperature alarm, emergency shutdown and control functions.
- Enclosed or open-frame construction
- Single or dual SPDT switch outputs
- Dual switch output versions can be separated up to 100% of range
- Designed to meet enclosure type 4X requirements
- Heat tracing models
- Ranges to 650°F (340°C)



J6 & J21K Series

Industrial pressure and differential pressure switch with sealed metal bellows sensor.



J6



J21K

ADVANTAGES:

- Reliable, sealed and isolated metal bellows sensors
- Welded 316 stainless steel models
- Epoxy-coated enclosure, meeting enclosure 4X requirements
- Single switch (SPDT) output
- J6 (straight pressure) ranges to 6000 psi (410 bar)
- J21K (differential pressure) ranges to 90 psid (6 bar d)

J40 Series

Skeleton (open frame) pressure switch with metal bellows sensor for OEMs.



ADVANTAGES:

- Compact, open frame (skeleton) design for OEM applications
- Brass and phosphor bronze sealed metal bellows sensors
- Easy external adjustment
- Single switch (SPDT) output
- Optional adjustable deadband switch
- Ranges to 300 psi (20 bar)



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800 Series

Indicating temperature switch for industrial heating and cooling applications.



ADVANTAGES:

- Indicating temperature control with remote stainless steel bulb and capillary
- Corrosion-resistant Lexan enclosure
- Single or dual SPDT switch outputs
- Division 1, explosion-proof models for hazardous locations
- Set point repeatability and indication accuracy $\pm 1\%$
- Ranges to 650°F (340°C)



LPS & EASY CAL™

Low pressure switching monitor measures differential pressure with independent high and low limit alarms.



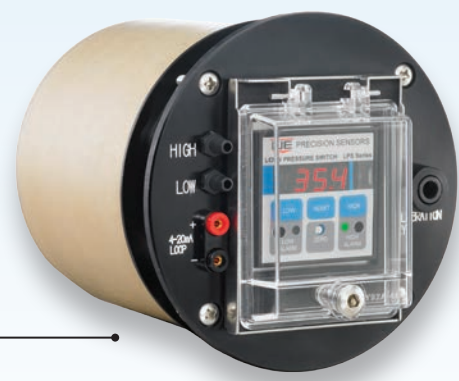
ADVANTAGES:

LPS

- Available ranges from 0.2" wc to 50" wc (50 Pascal to 20KPa)
- Small 1/16 DIN size for easy panel mounting
- LED display of process and high and low alarms
- 4-20 mA or 0-10 VDC analog output
- Removable terminal block for 18/26 AWG wire
- Compliant with UL 508 and CE EN 61326 EMI requirements

EASY CAL™ (Option M11)

- In-place calibration/certification
- Selectable time-delay eliminates nuisance alarm



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APPLIED SENSOR TECHNOLOGIES

DIVISION OF UNITED ELECTRIC CONTROLS

THE SENSOR BOX™

The Sensor Box™ provides the Process customer with an alternative to expediting, emergency orders and large amounts of “dead” inventory. A modular system of sensors, hardware and tools, the Sensor Box™ is used by the maintenance professional to build a variety of temperature sensor assemblies on-site, in minutes. Among the benefits that customers report are:

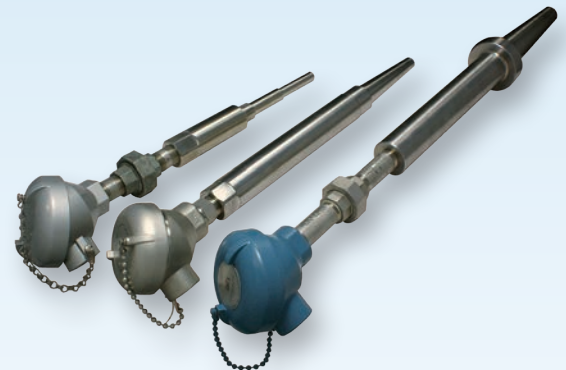
- Greatly reduced expediting, emergency orders and premium charges
- Improved process up-time
- Lower, more flexible inventory

The Sensor Box™ can be customized in many ways to meet your



TEMPERATURE SENSORS

Applied Sensor Technologies is a major manufacturer of thermocouple, RTD, thermistor and other types of temperature sensor assemblies. ISO 9001 certified and a leading practitioner of Lean Manufacturing methods, AST focuses on building high-quality, high-reliability products for the industrial market. Our expertise covers a wide variety of applications, from lab equipment to road-making equipment, from the blast furnace to the blast chiller, and everything in between.



ASSEMBLIES FOR HIGH TEMPERATURE APPLICATIONS

In addition to base-metal thermocouples (types J, K, E and T), we also offer platinum thermocouples in types R, S and B for applications such as vacuum furnaces, where the sensed temperature can be over 2500°F. We combine the sensor with a variety of protection tubes (alumina, silicon carbide, hexoloy and many others) in order to provide the maximum reliability and long-life.



SENSOR PRODUCTS FOR OUR PROCESS & UTILITY CUSTOMERS

We have a broad selection of standard temperature sensors that are designed for general industrial use. From small fast-response designs for engine testing, to 20' long multipoint assemblies for reactors. If you can sketch it, we can probably build it!

Applications:

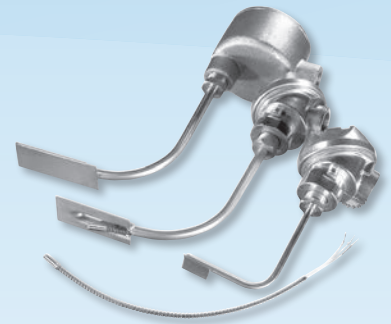
- Heat recovery steam generator (HRSG)
- Boiler tubes
- Diesel engine
- Turbine/reactor temperature sensing



HEAT TRACE RTDs

When you choose our heat trace RTDs, you simplify installation and reduce your maintenance expenses. Designed for use in any pipe or surface temperature measuring application, these sensors have:

- NEMA 4 or explosion-proof heads
- Heat transfer pad with excellent temperature response
- Rugged stainless steel sheaths for excellent mechanical protection
- Replaceable element design for simplified RTD replacement — to replace a faulty element, you simply remove the head cover, disconnect the leads and remove the flexible element. You then insert the new element and reconnect the leads. Your process is up and running in minutes.
- Options include dual RTD sensors, thermocouple sensors and a variety of weld pad and head styles



SENSOR PRODUCTS FOR OEM CUSTOMERS

AST excels in supplying industrial equipment manufacturers with the right temperature sensor to meet their specific need. We can help you develop, and then manufacture, the most cost-effective sensor for the application.

Our strengths include:


- Convenience – when you need assistance, our sales personnel, located worldwide, are available to help
- Cost-Effectiveness – Lean manufacturing drives us to make your product economically and reliably
- Engineering Expertise – When your engineers want to work on a design, they can talk with our engineers
- Responsiveness – we can work together on JIT, kanban and other dock-to-stock strategies to meet your delivery needs

Applications:

- Scientific Instruments – storage and measurement
- Food Equipment – cooking, storing and cleanup
- Medical Equipment – sterilizing, biological storage
- Aerospace – exhaust gas monitoring
- Energy – turbines, generators and fuel cells



SELECTION GUIDE

| PRODUCT SERIES | J6 | 10 | 12 | J21K | 24 | J40 | 54 | 55 | 100 | 117 | 120 | 400 | TX200 | 800 | One Series |
|---|----|----|----|------|----|-----|----|----|-----|-----|-----|-----|-------|-----|------------|
| PAGE | 10 | 8 | 5 | 10 | 8 | 10 | 9 | 9 | 7 | 6 | 6 | 7 | 5 | 11 | 4 |
| VARIABLE | | | | | | | | | | | | | | | |
| Pressure | X | X | X | | X | X | X | | X | X | X | X | X | | X |
| Vacuum | X | | X | | X | X | X | | X | X | X | X | C | | X |
| Differential Pressure | | | X | X | X | | | | X | X | X | X | | | X |
| Temperature | | | X | | | | X | X | X | X | X | X | | X | X |
| ENCLOSURE | | | | | | | | | | | | | | | |
| Open frame | | | | | | X | X | X | | | | | | | |
| Enclosure Type 1 Gen. Purpose | | X | | X | X | | X | | | | | | | X | |
| Enclosure Type 4 Watertight | | X | | | O | | | | | | | | | O | |
| Enclosure Type 4X Watertight | X | | X | O | | | | X | X | X | X | X | X | | X |
| Zone 0, Intrinsically Safe | O | O | O | O | | | | | O | O | O | O | | | X |
| Division 1 Zone 1, Hazardous Location | | | X | | | | | | | | X | | X | X | X |
| Division 2 Zone 2, Hazardous Location | | | X | | | | | | | X | X | | X | X | X |
| OUTPUT | | | | | | | | | | | | | | | |
| Single Switch SPDT | X | X | | X | X | X | X | X | X | | X | X | | X | SPST |
| Dual Switch SPDT | | | | | | | X | X | | | X | X | | X | (2) SPST |
| Triple Switch SPDT | | | | | | | | | | | | X | | | |
| DPDT | | | | | | | | | O | | O | O | | | |
| Dual Switch DPDT | | | | | | | | | | | | O | | | |
| Adjustable Deadband | O | | | O | | O | O | | O | | O | O | | | X |
| Hermetically-Sealed Switch SPDT | | | X | | | | | | | X | O | | | | |
| Hermetically-Sealed Switch DPDT | | | X | | | | | | | O | O | | | | |
| 4 to 20 mA | | | | | | | | | | | | | X | | |
| 4 to 20 mA, HART®  | | | | | | | | | | | | | X | | X |
| 1-5 or 0-10 VDC | | | | | | | | | | | | | X | | |
| SENSORS | | | | | | | | | | | | | | | |
| Welded st/st Diaphragm | | | X | | | | | | X | X | X | X | X | | X |
| Stainless Steel Bellows | X | | | X | | | | | X | X | X | X | | | |
| Elastomer Diaphragm | | X | X | | X | | X | | X | X | X | X | | | |
| Brass/Bronze Bellows | X | | | X | | X | C | | X | X | X | X | | | |
| Piston | X | X | X | | | | X | | X | | X | X | | | |
| Process Alloy | | | O | | | | | | O | O | O | | C | | |
| Local Temperature Mount | | | X | | | | X | | X | X | X | X | | | X |
| Remote Temp. Mount | | | X | | | | X | X | X | X | X | X | | X | X |
| MISCELLANEOUS | | | | | | | | | | | | | | | |
| Terminal Block | | | | | X | | | | | X | X | | | O | X |
| Visual Indication* | | | | | O | | | O | O | | O | O | | X | X |
| Dual Seal Certified | | | X | | | | | | | | | | | | O |
| SIL 2 Certified | | | | | | | | | | | | | | | X** |

* Visual indication may be through a pilot light option or display of process pressure or temperature readings.

Selecting Temperature Sensors see pages 12 and 13 - Applied Sensor Technologies

** One Series Safety Transmitter only

X = Standard

C = Capability, consult factory

O = Available as option

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REGIONAL SALES OFFICES PLEASE VISIT OUR
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RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or 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.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. 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 in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- For all applications, a factory set unit should be tested before use.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- 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 24 months from the date of manufacture by the Seller (36 months for the Spectra 12, TX200 and One Series products; and 18 months for Temperature Sensors. 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 imputed 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.
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