Advanced Power Technologies

**TTC-1000**

Monitor With Confidence™

- Liquid Temperature
- Winding Hotspots
- LTC Differential
- Ambient Temperature
- Load Current
- High-Precision RTDs
- No Calibration Required, Ever.

**Complete Monitoring for Your Power Transformer**

“Smart Grid” Ready
Load Based Pre-Cooling
Track LTC Position for Complete LTC Monitoring
SCADA Communications
Consolidate Alarms with Mini-RTU Capability
Simple to Configure
Highly Cost Effective & Easy to Install

Lifetime Warranty™
TTC-1000
Intelligent Transformer Temperature Control

Available in 2 Mounting Options

Panel Mount - For mounting within the transformer control cabinet.
7.2” W x 3.558” H x 6” D

NEMA 4X Enclosure - For mounting on the exterior of the transformer, typically used for retrofit applications.
15.25” H x 7” W x 5.25” D

As shown on cover

Monitor Critical Temperatures

- Up to 3 Temperature Probes (−35 to 160 °C)
- Set Points for Alarms & Fan Control
- Up to 3 Calculated Winding Hotspot Temperatures
- Monitor Ambient Temperature to Calculate Loss-of-Life
- Up to 2 LTC Differential Temperatures Simultaneously
- Mag-Mount Probes Available

Collect Data & Communicate It

- Temperature, Load, and Min/Max Data Logging
- LTC Position & Differential Temp Data Logging
- Up to 4 Analog Outputs (0 to 1 OR 4 to 20 mA)
- Up to 14 Optically Isolated Digital Inputs for Mini-RTU Functionality
- DNP3.0 Level 1 or MODBUS RTU Communications via Multi-Mode Fiber

Advanced Power Technologies
“On-Line” LTC Monitoring

LTCs are a critical **Point of Failure** on your transformer...

*What is your LTC doing right NOW?*

- **Continuous** LTC Differential Monitoring (-20 to +20 °C)
- Patented **Dual-Algorithm** LTC Condition Monitoring™
  - Protect Against Dangerous “Coking” Contacts
  - Alarm for **Rapid** LTC Heating Events
- Patented **Sensorless** LTC **Position** Monitoring™
  - Know with Certainty Which Taps are Getting Hot
  - Monitor Tap Change Operate Times and Alarm

**Cool** Your Transformer

**With Confidence...**

- Patented **Load Pickup Cooling™**
  - Transformer **PRE-Cooling**
  - Extend Transformer **Life**
  - Longer Short-Term Overloads
  - Sustain Paper Insulation **DP** Levels
  - Ideal for **Wind Farm** Load Cycles
- Up to **8** Form C Relay Outputs
  - Control Fans and Pumps
  - Flexible Logic Programmability
  - Alarm or Trip on High Oil & Winding Temperature
- Monitor your cooling System using **6** Additional Aux CTs

**Additionally...**

- **Exceptional** Customer Service
- Periodic Fan **Exercising**
- Fan Bank **Alternate** Feature
- Built In Self Check
- Dedicated Form B **Device Alarm** Relay
- Easy to use, Excel-Based Setting Templates

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U.S. Patent No.: 6714022, 6222714, 7323852, 7417411 and Patents Pending
### TTC-1000 Model Option Table

**Select One Option from each Feature Matrix**

**Ordering Information**

**TTC-1000**

<table>
<thead>
<tr>
<th>Mounting</th>
<th>U</th>
<th>V</th>
<th>W</th>
<th>X</th>
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**Extra Auxiliary CTs**

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**Analog Outputs, DNP & MODBUS**

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<th>DNP &amp; MODBUS</th>
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<td>3 Analog Outputs</td>
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<tr>
<td>4 Analog Outputs</td>
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<tr>
<td>1 Isolated Analog Output</td>
<td>C</td>
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<tr>
<td>2 Isolated Analog Outputs</td>
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**Multi-Mode Fiber**

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**Form C Relay Outputs**

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**Temperature Probe Channels & Auxiliary CTI**

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<tbody>
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</tr>
<tr>
<td>3 Temperature Probe Channels</td>
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<td></td>
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</tbody>
</table>

**Additional Specifications:**

**Operating Temperature Range:** -50 °C to +85 °C, 95% Relative Humidity (non-condensing)

**Universal Power Supply:** 38 to 290 VDC or 120 VAC

**Winding Temp Measurement Range:** -35 °C to +180 °C

**Temperature Measurement Accuracy:** Average error over entire range ± 1 °C. Absolute error at any temperature ± 1.5 °C for temperatures within the range of 23°C - 160°C. Below 23 °C the error is ± 3.5 °C.

**Output Contact Rating:**
- 30 amps make for 250 msec
- 10 amps continuous at 250VAC

**Optically Isolated Inputs:**
- Operates from 38 to 290 VDC or 24 VAC to 260 VAC
- External wetting voltage required

**Alarm Contact Rating:**
- 0.4 amp continuous at 290 VDC (NEMA)
- 0.15 amp continuous at 290 VDC (Panel)

**Analog Output:**
- Selectable, 0 to 1 mA or 4 to 20 mA
- Maximum load 10,000 Ohms (0 to 1mA), 510 Ohms (4 to 20 mA)

**Communications Interfaces:**
- Front Panel Mounted RS-232
- DB-9 Null Modem Interface

**SCADA Interface:**
- DNP3.0 Level 1 Protocol using half duplex RS-485 interface, Multi-Mode or V/Pin fiber optics.

**Current Measurement Range:** 0 to 50 A

**Surge Withstand/Fast Transient:**
- Relay outputs and station battery inputs
- ANSI C37.90.1

**EMI Withstand:**
- ANSI C37.90.2
- IEC 801-2

**Electrostatic Discharge:**
- Output Pickup Timer and Load Pickup Timer
- 0 to 255 seconds

**Communications Interfaces:**
- F/F 2 form C Outputs

**Timers:**
- Output Pickup Timer
- Load Pickup Timer
- 0 to 255 seconds

**Probe Type:**
- Ambient Temperature Probe (50 ft lead)
- Universal Wall Probe w/ Snap Earrings
- Magnetic Surface Mount Probe
- ANSI C39 Wall Probe w/ Snap Earrings
- Universal Wall Probe lupar Tight Reader
- ANSI/CEI Wall Probe lupar Tight Reader
- 3/16" Wall Probe w/ Snap Earrings
- 1/8" Wall Probe w/ Snap Earrings
- Connector Probe for Dry Types 100-

**Additional Load Length**
- 0.3 ft
- 0.5 ft
- 0.75 ft

**Retrofit Mounting Bracket available for NEMA 4X enclosure option P/N 80001000167:**

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**Advanced Power Technologies**

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