1. IMPORTANT SAFEGUARDS

**WARNING**

**ELECTRIC SHOCK HAZARD:** Read and understand all instructions before installing, servicing or operating this controller. Failure to do so could result in equipment or property damage as well as personal injury and even death.

**HIGH VOLTAGE** is used in the operation of this equipment; **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Learn the areas containing high-voltage connections when installing or operating this equipment.

**WARNING**

Be careful not to contact high-voltage connections when installing or operating this equipment. Before working inside the equipment, turn power off and ground all points of high potential before touching them.

**WARNING**

**ELECTRIC SHOCK HAZARD:** Any installation involving control equipment must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code or local governing electrical code/authority, to eliminate shock hazard.

**CAUTION**

The owner/installer must provide all necessary safety and protection devices and follow all current electrical wiring standards and regulations. Failure to do so may compromise the integrity of the controller and/or cause product failure resulting in a safety risk to operational and service personnel.

**CAUTION**

This controller utilizes a heat sink which is designed to cool the unit during operation. Under no circumstance should air flow around the controller be compromised in any way. Failure to do so may result in the overheating of the controller, product failure, product temperatures and even fire.

**WARNING**

During continuous operation, the heat sink can reach very high temperatures, and keeps a high temperature even after the unit is turned off due to its high thermal inertia.

2. INSTALLATION

**Input & Output Connections: CTF-Xtra 25 – 60 Amp Models**

**Top view WITHOUT Modbus Option**

<table>
<thead>
<tr>
<th>Key HB</th>
<th>Key HB</th>
</tr>
</thead>
<tbody>
<tr>
<td>J3, J4</td>
<td>RJ10 connectors RS485 serial line</td>
</tr>
<tr>
<td>Address x 1</td>
<td>Address x 10</td>
</tr>
</tbody>
</table>

**Top view WITH Modbus Option**

<table>
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<th>Key HB</th>
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<tr>
<td>J3, J4</td>
<td>RJ10 connectors</td>
</tr>
<tr>
<td>Switch for serial line</td>
<td>Address x 1</td>
</tr>
</tbody>
</table>

**Recommended Wire Gauges**

<table>
<thead>
<tr>
<th>CTF-Xtra Current Terminal</th>
<th>Cable Wire</th>
<th>Wire Terminal</th>
<th>Tightening Torque / Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>25A</td>
<td>3/L1, 2/T1, PE</td>
<td>4 mm²</td>
<td>10 AWG</td>
</tr>
<tr>
<td>40A</td>
<td>3/L1, 2/T1, PE</td>
<td>10 mm²</td>
<td>10 AWG</td>
</tr>
<tr>
<td>50A</td>
<td>3/L1, 2/T1, PE</td>
<td>10 mm²</td>
<td>7 AWG</td>
</tr>
<tr>
<td>60A</td>
<td>3/L1, 2/T1, PE</td>
<td>16 mm²</td>
<td>5 AWG</td>
</tr>
</tbody>
</table>

**NOTE:** Cables must be Copper “Stranded Wire” or “Compact-Stranded Wire” type with max. operating temp. 60/75°C.

**Installation Wiring Note:**

Use the extra rapid fuses as indicated in the CTF-Xtra Hardware Instruction Manual PK535, according to the wiring schematic examples and controller rating. Additionally, the applications with solid state units require a safety automatic switch to disengage the load power line during certain alarm events.

**EMC Filter**

EMC Filters are required in Phase Angle firing mode. The filter model and current level depend on the configuration and load used. The power filter MUST be connected as close as possible to the CTF. You can use a filter connected between the power line and CTF or an LC group connected between the CTF output and the load.
### 3. INSTALLATION CONSIDERATIONS: DIMENSIONS & WEIGHTS, MOUNTING & SPACING REQUIREMENTS

<table>
<thead>
<tr>
<th>Model</th>
<th>Length (in.)</th>
<th>Width (in.)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTF-Xtra 25</td>
<td>4.4</td>
<td>1.7</td>
<td>970</td>
</tr>
<tr>
<td>CTF-Xtra 40 &amp; 50</td>
<td>4.4</td>
<td>1.7</td>
<td>1100</td>
</tr>
<tr>
<td>CTF-Xtra 60</td>
<td>4.4</td>
<td>4.4</td>
<td>1500</td>
</tr>
</tbody>
</table>

### 4. DERATING CURVES

- **CTF-025 & CTF-040**
- **CTF-050 & CTF-060**

### 5. GENERAL TECHNICAL DATA & SPECIFICATIONS

#### LOAD, FIRING, DIAGNOSTICS & RATINGS

**OVERVIEW**
- **Trigger Mode**
  - ZC: Zero Crossing, with constant cycle time (variable in range 1-200ms)
  - DP: Dead Time, with variable cycle time (optimized for each model)
- **Feedback Mode**
  - Voltage feedback proportional to RMS voltage value on load useful to compensate possible variations in line voltage.
  - Current feedback bound to RMS current value on load to compensate variations in line voltage and variations in load impedance.
- **Diagnosis**
  - Detection of shorted load (Excess Absence of line voltage, HI alarm (partial break of load)

#### FUNCTION OPTIONS

- **OPTIONS**
  - Timed Soft-Start firing ramp, with or without peak current control
  - Soft Start firing ramp specific to inductive types
  - Timed Auto-off ramp
  - Limitation of RMS current in load
  - S-90 Delay: Triggering for firing inductive loads in ZC & DP/DT modes.
  - 0-90° Delay-Triggering for firing inductive loads in ZC & BF/DOT modes.
  - Absence of SCR current when under load.
  - Overtemperature alarm

#### GENERAL DATA

- **Max. rated voltage**
  - 480 Vac
- **Non-repetitive voltage**
  - 1200 Vac
- **Rated Freuquency**
  - 60 Hz
- **Radar Current**
  - CTF-025 & CTF-040: 25A
  - CTF-050 & CTF-060: 35A
- **Maximum Surge Current**
  - 50A (at 10 ms)
- **Critical di/dt OFF-state (minimum)**
  - 1.000 V/us
- **Nominal Imipulse Voltage**
  - 4.000 V

#### OVERVIEW
- **WARNING**: Max. Permissible Inductance loop impedance is 550 μh

### 6. FUSES & FUSE HOLDERS

#### Fuses & Fuse Holders

**Fuses**
- 50A: 1,600 A²s
- 9.5W
- 22x58

**Fuse Holders**
- PK538: 30A@600V
- 32A@890V