1050 SERIES POWER CONTROL UNITS
Digital SCR Power Controllers

FEATURES
- State of the art “Book shelf style” packaging
- Direct temperature control
- Color touch screen for display interface
- Built in high speed network capability
- Integrated i²T fuse within touch proof package
- Single display capability for multiple controllers
- Expandable I/O interface for sophisticated system applications
- Web browser, product hosted, configuration tool
- Micro SD memory card for configuration file storage

INCREDIBLE FEATURES…at an affordable cost!
General Description

The Spang Power Electronics 1051, 1052, and 1053 Controllers are products based on Spang’s 1050 control design.

The 1050 product family is well-suited for a wide variety of AC power applications. The 1050 product family are multi-processor-based designs that drive SCRs which feed a variety of industrial heating loads.

The design features:
- Short circuit protection
- Local or remote (networked) operation
- A variety of user-definable inputs and outputs
- The precise regulation of power, voltage, current, temperature, or open loop (duty cycle).

The Spang 1050 power controller series represent the next generation of power control for AC applications that require dependability, flexibility and unmatched performance.

Standard Features

The Spang 1050 Power Controller products offer the following standard features:

- **Flexibility.** Configurable operating modes, ratings, limits, external inputs, and setpoints. It also offers multiple firing modes for variable load types within the standard hardware package; i.e. phase angle and zero-crossover (burst firing) for direct or transformer coupled loads. For more information, reference the instruction manual for the specific 1050 product type and configuration options.

- **On-Board Diagnostics.** Fault and alarms memory (ten fault buffers and ten alarm buffers) provides data for analysis that may indicate a need for process modification, troubleshooting or preventative maintenance.

- **Computerized Setup and Calibration.** Web-based configuration application for setup, calibration, monitoring, control and diagnostics

- **Mechanical Design.** Touch-proof packaging prevents unintentional contact with hazardous voltage. A book-shelf style mechanical design allows efficient use of panel space when integrated into multi-unit system configurations.

- **Advanced Process and Fault Monitoring.** Real-time monitor of voltage, current, power, temperature (optional) and fault / alarm conditions. Real-time adjustment of the setpoint.

- **Network Interface, allowing for remote control and monitoring of the 1050 using Ethernet MODBUS TCP supplied with the standard controller.**

Optional Features

The optional features available for the 1050 power controllers allow further feature set customization to meet unique application requirements:

- **Expanded I/O, including remote voltage, current and temperature (thermocouple) feedback as well as additional digital and analog I/O.**

- **Network Interface, allowing for remote control and / or monitoring of the 1051 power controller.**

  Optional network interfaces:
  
  I. DeviceNet
  II. Profibus
  III. Profinet
  IV. Ethernet MODBUS TCP (optional card available when universal port is used for display connection).
  V. ETHERNET/IP

- **Local or Remote Display (LDC).** Color touch-screen LCD display allows the user to control and monitor unit setpoints, output, and status.
Ordering Information

**NETWORK TYPE**
- 0: No Network Comm.
- D: DeviceNet
- P: PROFIBUS
- N: PROFINET
- E: Ethernet/MODBUS TCP
- I: Ethernet/IP

**PRODUCT SERIES**
- 1: Single Phase (1PH) / 2-SCR, 1-Leg Fused
- 2: Three Phase (3PH) / 4-SCR, 2-Leg Fused
- 3: Three Phase (3PH) / 6-SCR, 3-Leg Fused

**CURRENT RATING**
- 15 Amp: 0 0 1 5
- 25 Amp: 0 0 2 5
- 50 Amp: 0 0 5 0
- 100 Amp: 0 1 0 0
- 200 Amp: 0 2 0 0
- 300 Amp: 0 3 0 0
- 400 Amp: 0 4 0 0
- 600 Amp: 0 6 0 0

**AUXILIARY I/O OPTION**
- 0: No auxiliary I/O
- T: Auxiliary I/O board with thermocouple option
- TLV: Auxiliary I/O board / with thermocouple option / low voltage feedback

**LOCAL DIGITAL CONTROL**
- 0: No Display
- 1: Local Display
- 2: Remote Display

**NETWORK REDUNDANCY**
- 0: Single Network Card
- R: Redundant Network Card

**CUSTOM CONFIGURATION**
- 00: Standard Configuration
- XX: For Future Use

**CONTROL POWER**
- 1: 115V, Single Phase, 50/60 Hz.
- 2: 230V, Single Phase, 50/60 Hz.

**MULTI-UNIT CONFIGURABILITY**

**Bus Communications - Ethernet Network**

**Add Wireless Access to the Ethernet Network**

*UL / cUL pending.*
## Technical Specifications

<table>
<thead>
<tr>
<th><strong>Input voltage</strong></th>
<th>20 to 600 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input line frequency</strong></td>
<td>47 to 63 Hz.</td>
</tr>
<tr>
<td><strong>Control power</strong></td>
<td>115VAC or 230VAC, 50/60 Hz.</td>
</tr>
<tr>
<td><strong>Output voltage rating</strong></td>
<td>0 to 600 VAC maximum</td>
</tr>
<tr>
<td><strong>Output current ratings</strong></td>
<td>See ordering information.</td>
</tr>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>0 to 50°C ambient</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>Up to 95% non-condensing</td>
</tr>
<tr>
<td><strong>Max Elevation</strong></td>
<td>1,000 m. above sea level</td>
</tr>
<tr>
<td><strong>Cooling</strong></td>
<td>Fan power above 50A PCU; either 115VAC or 230VAC, 50/60 Hz</td>
</tr>
<tr>
<td><strong>Regulation</strong></td>
<td>± 1%</td>
</tr>
<tr>
<td><strong>Analog control reference</strong></td>
<td>One (1) configurable voltage (0-10 V), current (4-20 mA), or potentiometer; 12 bit A/D conversion</td>
</tr>
<tr>
<td><strong>Temperature reference (optional)</strong></td>
<td>One (1) thermocouple input; 24 bit A/D conversion</td>
</tr>
<tr>
<td><strong>Digital control reference</strong></td>
<td>PC based configuration application, Remote Display, or network communications card</td>
</tr>
<tr>
<td><strong>Input voltage and current feedback (internal)</strong></td>
<td>Contains voltage and current feedbacks for input voltage and current</td>
</tr>
<tr>
<td><strong>Output voltage feedback (internal)</strong></td>
<td>Contains voltage feedback for output voltage</td>
</tr>
<tr>
<td><strong>Relay contact</strong></td>
<td>One (1) Normally Open (N.O.) and One (1) Normally Closed (N.C.), “Form C” type – configurable functionality</td>
</tr>
<tr>
<td><strong>Analog outputs</strong></td>
<td>Standard: Two (2) configurable voltage (0-5 V) or current (4-20 mA). Optional: Four (4) more; same configurable functionality.</td>
</tr>
<tr>
<td><strong>Analog interface isolation</strong></td>
<td>Differential inputs for sink or source signals. Sourcing outputs, commons are tied common and ground referenced.</td>
</tr>
<tr>
<td><strong>Digital inputs</strong></td>
<td>Standard: Enable / Inhibit, Remote / Local, Two (2) configurable inputs as alarm, fault, timed alarm, timed fault, fault reset, or output on. Optional: Two (2) more; same configurable functionality</td>
</tr>
<tr>
<td><strong>Digital outputs</strong></td>
<td>Standard: One (1) Form-C with dry-type contacts configurable as alarms, faults, no fault, OK to Run, or Run (firing output). Optional: Three (3) open-collector outputs; same configurable functionality</td>
</tr>
<tr>
<td><strong>LED indicators</strong></td>
<td>HEARTBEAT 1 &amp; 2 – flashing Green indicates processors are running ENABLE – steady Green indicates ‘Unit Enabled’ RUN – steady Green indicates ‘Output On’ ALARM – steady Yellow indicates alarm FAULT – steady Red indicates fault</td>
</tr>
<tr>
<td><strong>Universal comm. / configuration port</strong></td>
<td>Ethernet port for PC based browser access, Display connection, or Ethernet MODBUS TCP network com</td>
</tr>
<tr>
<td><strong>Over temperature monitoring</strong></td>
<td>One (1) internally mounted thermal sensor.</td>
</tr>
<tr>
<td><strong>Short circuit protection</strong></td>
<td>Integrally mounted fuse SCCR: 100kA @ 50/60Hz 3rd party, laboratory tested design.</td>
</tr>
<tr>
<td><strong>Transient voltage protection</strong></td>
<td>RC networks across the SCRs (no MOVs)</td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td>IP20 with appropriately sized (user installed) power cable through power cable access holes.</td>
</tr>
<tr>
<td><strong>Network connectivity</strong></td>
<td>Ethernet MODBUS TCP is provided as a standard network interface. Optional network communication interfaces available are DeviceNet, Profinet, Ethernet MODBUS TCP, or Ethernet/IP</td>
</tr>
<tr>
<td><strong>Certifications</strong></td>
<td>UL, cUL, CE, RoHS, WEEE</td>
</tr>
</tbody>
</table>
# Physical Dimensions: 15 - 200 Amp

<table>
<thead>
<tr>
<th>Product</th>
<th>Amperage</th>
<th>W</th>
<th>MW</th>
<th>H</th>
<th>MH</th>
<th>D</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>1051</td>
<td>15 – 200A</td>
<td>5.06</td>
<td>2.95</td>
<td>13.82</td>
<td>13.22</td>
<td>8.21</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[129]</td>
<td>[75]</td>
<td>[351]</td>
<td>[336]</td>
<td>[209]</td>
<td>[6.5]</td>
</tr>
<tr>
<td>1052*</td>
<td>15 – 200A</td>
<td>10.14</td>
<td>8.04</td>
<td>13.82</td>
<td>13.22</td>
<td>8.92</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[258]</td>
<td>[204]</td>
<td>[351]</td>
<td>[336]</td>
<td>[227]</td>
<td>[6.5]</td>
</tr>
<tr>
<td>1053</td>
<td>15 – 200A</td>
<td>10.14</td>
<td>8.04</td>
<td>13.82</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>[258]</td>
<td>[204]</td>
<td>[351]</td>
<td>[336]</td>
<td>[227]</td>
<td>[6.5]</td>
</tr>
</tbody>
</table>

*1052* = Design / layout does not include the center phase shown above.

Note: All dimensions to ±(1) mm.
### Physical Dimensions: 300 - 400 Amp

**Product** | **Amperage** | **W** (Inches) | **MW** (Inches) | **H** (Inches) | **MH** (Inches) | **D** (Inches) | **Z** (Inches)
--- | --- | --- | --- | --- | --- | --- | ---

*1052* = Design / layout does not include the center phase shown above.

Note: All dimensions to ±(1) mm.
### Physical Dimensions: 600 Amp

<table>
<thead>
<tr>
<th>Product</th>
<th>Amperage</th>
<th>W [mm]</th>
<th>MW [mm]</th>
<th>H [mm]</th>
<th>MH [mm]</th>
<th>D [mm]</th>
<th>Z [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1051*</td>
<td>600A</td>
<td>6.31</td>
<td>2.95</td>
<td>19.41</td>
<td>18.50</td>
<td>12.48</td>
<td>0.35</td>
</tr>
<tr>
<td>1052*</td>
<td>600A</td>
<td>12.59</td>
<td>9.24</td>
<td>19.41</td>
<td>18.50</td>
<td>12.48</td>
<td>0.35</td>
</tr>
<tr>
<td>1053</td>
<td>600A</td>
<td>18.89</td>
<td>15.53</td>
<td>19.41</td>
<td>18.50</td>
<td>12.48</td>
<td>0.35</td>
</tr>
</tbody>
</table>

1051* / 1052* = Dimensional reference locations similar to the 1053 shown above.

Note: All dimensions to ±(1) mm.
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For more information, visit us at www.spangpower.com