

# THYRO-PX SERIES

DIGITAL THYRISTOR SCR POWER CONTROLLER  
UP TO 2900 AMPS



## AT A GLANCE

The Thyro-PX® series are modular, easy-to-use premier performance SCR power controllers for heating elements, resistive loads and transformer loads, in heating, melting, drying, and forming applications.

### PRODUCT HIGHLIGHTS

- Comprehensive operating and control modes to minimize harmonic distortion and utility costs
- High-efficiency, wear-free design with integrated soft starting for usage with downstream transformers
- Premier performance control accuracy to maximize end-process repeatability
- Multi-zone capability that independently controls multiple single-phase loads from a single controller
- Wide communication protocol flexibility for simple integration into Rockwell™ PAC via certified AOP
- Wide performance range with rated currents up to 2900 A and rated voltages up to 690 V
- Intuitive performance and status feedback via a modular, integrated touch screen display or PC tool

### TYPICAL APPLICATIONS

- Transformer loads, resistive loads, and heating elements in electric furnaces used for glass, metals, and ceramics manufacture
- Heat tracing for piping and process elements in chemical, petro-chemical, and oil processing
- Extruder and plastic press heating, IR drying, and automotive applications

### Phase Type

1, 2, and 3-phase power controller

### Accuracy

±0.5% voltage or current  
±1% power

### AC Input Line Voltage Rating

230 to 500 V [-20 to +10%]  
690 V [-20 to +10%]

### Type Current Range

16 to 2900 A

### Control Modes

Zero cross firing (TAKT)  
Phase-angle firing (VAR)  
Voltage sequence control (VSC)  
Soft start, soft down

### Communications

Ethernet/IP®, EtherCAT®  
PROFIBUS®, PROFINET®  
Modbus RTU®, Modbus TCP/IP®  
DeviceNET™

PRODUCT SPECIFICATIONS

| THYRO-PX Model               |   |                              |
|------------------------------|---|------------------------------|
| Thyro-PX 1PX                 | Thyro-PX 2PX  | Thyro-PX 3PX                 |
| One-phase power controller   | Two-phase power controller for three-phase economic circuit   | Three-phase power controller |
| Full wave switch (TAKT)      | Full wave switch (TAKT)   | Full wave switch (TAKT)      |
| Phase-angle firing (VAR)     | —   | Phase-angle firing (VAR)     |
| THYRO-PX Series              |   |                              |
| Control Accuracy             | ±0.5% voltage or current, ±1% power   |                              |
| Load Types                   | Resistive loads, transformer loads, and loads with large $R_{warm}/R_{cold}$ up to factor 20 (MOSI starting mode)                 |                              |
| Operating Modes              | TAKT: full frequency package control  |                              |
|                              | VAR: phase-angle firing   |                              |
|                              | VSC_VAR: voltage sequence control with phase-angle firing   |                              |
| Control Types                | U-voltage, $U^2$ -voltage, I-current, $I^2$ -current, P-power, without regulation   |                              |
| Set Point Input              | Up to 3 analog inputs (freely configurable), control start/finish can be set as desired between 0 (4) to 20 mA; 0 (1) to 10 (2)V. |                              |
| Actual Value Outputs         | 3 measuring values for optional display of U, I, and P; can be set as desired between 0 to 20 mA; 0 to 10 V                       |                              |
| Load Circuit/Self-Monitoring | Provided  |                              |
| Operation/Fault Indicators   | Via 3 fault signaling relays and status/diagnostic LEDs, freely configurable  |                              |
| Fuse                         | Integrated semiconductor fuse   |                              |

ELECTRICAL SPECIFICATIONS

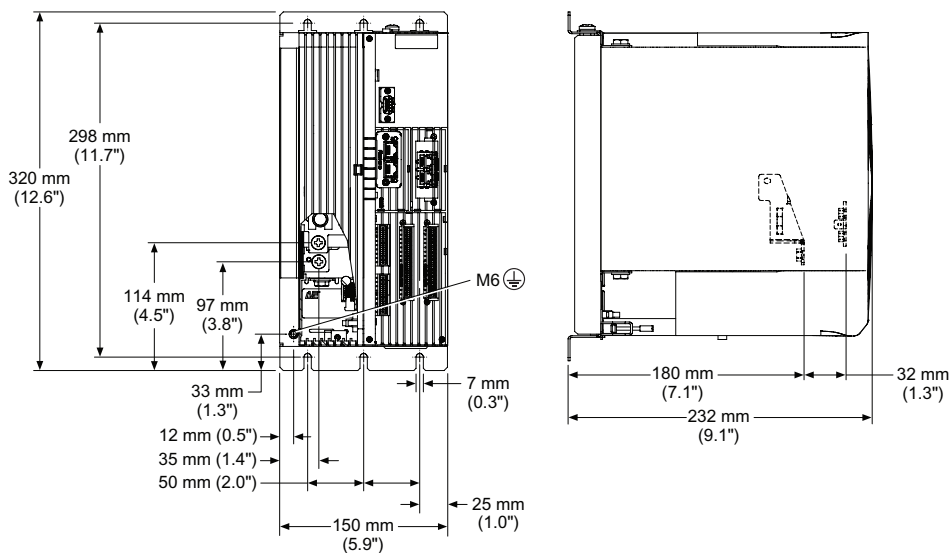
|                            |  |
|----------------------------|--|
| Rated Connection Voltage   | 500 V type: 230 V -20% up to 500 V +10%            |
|                            | 690 V type: 500 V -20% up to 690 V +10%            |
| Frequency                  | All types, 45 to 65 Hz                             |
| Control Voltage            | AC min 90 to max 265 V; alternative DC 24 V (±10%) |
| Ventilator (HF Types Only) | 230 V, 50 to 60 Hz; optional 115 VAC, 50 to 60 Hz  |

| Environmental       |  |
|---------------------|--|
| Ambient Temperature | Up to 35°C (95°F) by external fan cooling (for HF types, with integrated fan) with rated current |
|                     | Up to 45°C (113°F) by passive convection cooling with rated current                              |
|                     | At higher temperatures, operation is permissible with reduced current limits.                    |
|                     | Max 40°C (104°F) for UL applications   |
| Storage Temperature | -25 to +55°C (-13 to 131°F)  |
| Humidity Class      | DIN EN 50178 Tab. 7  |
| Site Altitude       | Up to 1000 m (3281 ft) above sea level at nominal load; above 1000 m (3281 ft), on request       |

| Regulatory     |  |
|----------------|--|
| Certifications | CE marked for EU LV Directive 2014/35/EU and 2004/108/EC |
|                | UL Certified, UL 508A (100 kVA short circuit test)       |

**MECHANICAL SPECIFICATIONS**

**Thyro-PX 1PX, 500 V Type Voltage**

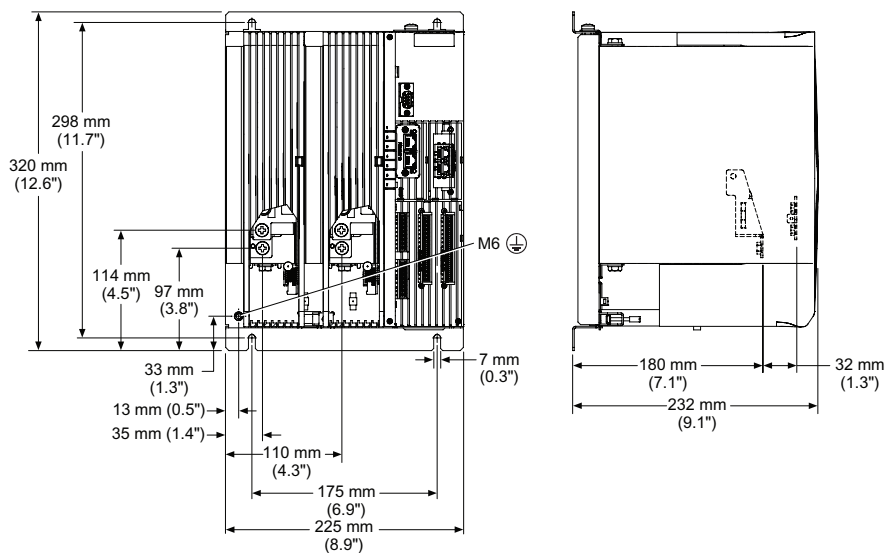


Design may change when using a fan and/or rated current > 350 A

| Dimensions       |       |      |        |      |       |      |        |       |
|------------------|-------|------|--------|------|-------|------|--------|-------|
| Type Current (A) | Width |      | Height |      | Depth |      | Weight |       |
|                  | mm    | in   | mm     | in   | mm    | in   | kg     | lb    |
| 16               | 150   | 5.9  | 320    | 12.6 | 232   | 9.1  | 6      | 13.2  |
| 37               | 150   | 5.9  | 320    | 12.6 | 232   | 9.1  | 6      | 13.2  |
| 75               | 150   | 5.9  | 320    | 12.6 | 232   | 9.1  | 6      | 13.2  |
| 110              | 150   | 5.9  | 320    | 12.6 | 232   | 9.1  | 6      | 13.2  |
| 130              | 200   | 7.9  | 320    | 12.6 | 232   | 9.1  | 8      | 17.6  |
| 170              | 200   | 7.9  | 320    | 12.6 | 232   | 9.1  | 8      | 17.6  |
| 280              | 200   | 7.9  | 370    | 14.6 | 232   | 9.1  | 9      | 19.8  |
| 350              | 175   | 6.9  | 501    | 19.7 | 340   | 13.4 | 15     | 33.1  |
| 495              | 175   | 6.9  | 501    | 19.7 | 340   | 13.4 | 15     | 33.1  |
| 650              | 175   | 6.9  | 501    | 19.7 | 340   | 13.4 | 15     | 33.0  |
| 780              | 242   | 9.5  | 787    | 31   | 505   | 19.9 | 35     | 77.2  |
| 1000             | 242   | 9.5  | 787    | 31   | 505   | 19.9 | 35     | 77.2  |
| 1500             | 242   | 9.5  | 787    | 31   | 505   | 19.9 | 35     | 77.2  |
| 2100             | 522   | 20.5 | 577    | 22.7 | 445   | 17.5 | 50     | 110.2 |
| 2900             | 593   | 23.3 | 577    | 22.7 | 473   | 18.6 | 62     | 136.7 |

MECHANICAL SPECIFICATIONS (CONTINUED)

Thyro-PX 2PX, 500 V Type Voltage

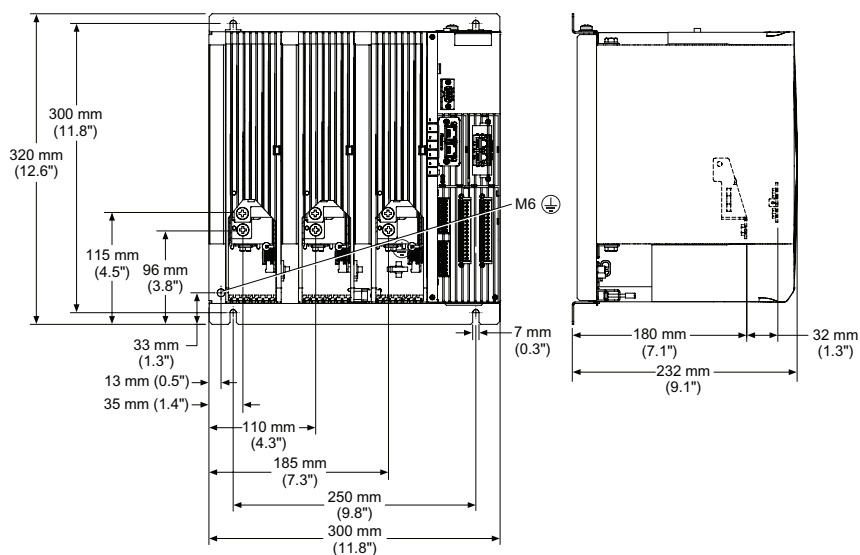


Design may change when using a fan and/or rated current > 350 A

| Dimensions       |       |      |        |      |       |      |        |       |
|------------------|-------|------|--------|------|-------|------|--------|-------|
| Type Current (A) | Width |      | Height |      | Depth |      | Weight |       |
|                  | mm    | in   | mm     | in   | mm    | in   | kg     | lb    |
| 16               | 225   | 8.9  | 320    | 12.6 | 232   | 9.1  | 10     | 22.0  |
| 37               | 225   | 8.9  | 320    | 12.6 | 232   | 9.1  | 10     | 22.0  |
| 75               | 225   | 8.9  | 320    | 12.6 | 232   | 9.1  | 10     | 22.0  |
| 110              | 225   | 8.9  | 320    | 12.6 | 232   | 9.1  | 10     | 22.0  |
| 130              | 325   | 12.8 | 320    | 12.6 | 232   | 9.1  | 12     | 26.5  |
| 170              | 325   | 12.8 | 320    | 12.6 | 232   | 9.1  | 12     | 26.5  |
| 280              | 325   | 12.8 | 415    | 16.3 | 232   | 9.1  | 15     | 33.1  |
| 350              | 261   | 10.3 | 501    | 19.7 | 340   | 13.4 | 22     | 48.5  |
| 495              | 261   | 10.3 | 501    | 19.7 | 340   | 13.4 | 22     | 48.5  |
| 650              | 261   | 10.3 | 501    | 19.7 | 340   | 13.4 | 22     | 48.5  |
| 780              | 410   | 16.1 | 787    | 31.0 | 505   | 19.9 | 54     | 119.0 |
| 1000             | 410   | 16.1 | 787    | 31.0 | 505   | 19.9 | 54     | 119.0 |
| 1500             | 410   | 16.1 | 787    | 31.0 | 505   | 19.9 | 54     | 119.0 |
| 2100             | 550   | 21.7 | 837    | 33.0 | 445   | 17.5 | 84     | 185.2 |
| 2750             | 593   | 23.3 | 837    | 33.0 | 474   | 18.7 | 107    | 235.9 |

MECHANICAL SPECIFICATIONS (CONTINUED)

Thyro-PX 3PX, 500 V Type Voltage



Design may change when using a fan and/or rated current > 350 A

| Dimensions       |       |      |        |      |       |      |        |       |
|------------------|-------|------|--------|------|-------|------|--------|-------|
| Type Current (A) | Width |      | Height |      | Depth |      | Weight |       |
|                  | mm    | in   | mm     | in   | mm    | in   | kg     | lb    |
| 16               | 300   | 11.8 | 320    | 12.6 | 232   | 9.1  | 14     | 30.9  |
| 37               | 300   | 11.8 | 320    | 12.6 | 232   | 9.1  | 14     | 30.9  |
| 75               | 300   | 11.8 | 320    | 12.6 | 232   | 9.1  | 14     | 30.9  |
| 110              | 300   | 11.8 | 320    | 12.6 | 232   | 9.1  | 14     | 30.9  |
| 130              | 450   | 17.7 | 320    | 12.6 | 232   | 9.1  | 17     | 37.5  |
| 170              | 450   | 17.7 | 320    | 12.6 | 232   | 9.1  | 17     | 37.5  |
| 280              | 450   | 17.7 | 414    | 16.3 | 232   | 9.1  | 20     | 44.1  |
| 350              | 348   | 13.7 | 525    | 20.7 | 340   | 13.4 | 30     | 66.1  |
| 495              | 348   | 13.7 | 525    | 20.7 | 340   | 13.4 | 30     | 66.1  |
| 650              | 348   | 13.7 | 525    | 20.7 | 340   | 13.4 | 30     | 66.1  |
| 780              | 575   | 22.6 | 787    | 31.0 | 505   | 19.9 | 74     | 163.1 |
| 1000             | 575   | 22.6 | 787    | 31.0 | 505   | 19.9 | 74     | 163.1 |
| 1500             | 575   | 22.6 | 787    | 31.0 | 505   | 19.9 | 74     | 163.1 |
| 1850             | 550   | 21.7 | 1094   | 43.1 | 445   | 17.5 | 119    | 262.3 |
| 2600             | 593   | 23.3 | 1094   | 43.1 | 474   | 18.7 | 152    | 335.1 |

MECHANICAL SPECIFICATIONS (CONTINUED)

Thyro-PX 1PX, 690 V Type Voltage

| Dimensions       |       |      |        |      |       |      |        |       |
|------------------|-------|------|--------|------|-------|------|--------|-------|
| Type Current (A) | Width |      | Height |      | Depth |      | Weight |       |
|                  | mm    | in   | mm     | in   | mm    | in   | kg     | lb    |
| 80               | 200   | 7.9  | 320    | 12.6 | 232   | 9.1  | 8      | 17.6  |
| 200              | 200   | 7.9  | 370    | 14.6 | 232   | 9.1  | 9      | 19.8  |
| 300              | 175   | 6.9  | 501    | 19.7 | 340   | 13.4 | 15     | 33.1  |
| 500              | 175   | 6.9  | 501    | 19.7 | 340   | 13.4 | 15     | 33.1  |
| 780              | 242   | 9.5  | 787    | 31.0 | 505   | 19.9 | 35     | 77.2  |
| 1400             | 242   | 9.5  | 787    | 31.0 | 505   | 19.9 | 35     | 77.2  |
| 2000             | 522   | 20.6 | 577    | 22.7 | 445   | 17.5 | 50     | 110.2 |
| 2600             | 593   | 23.3 | 577    | 22.7 | 473   | 18.6 | 62     | 136.7 |

Thyro-PX 2PX, 690 V Type Voltage

| Dimensions       |       |      |        |      |       |      |        |       |
|------------------|-------|------|--------|------|-------|------|--------|-------|
| Type Current (A) | Width |      | Height |      | Depth |      | Weight |       |
|                  | mm    | in   | mm     | in   | mm    | in   | kg     | lb    |
| 80               | 325   | 12.8 | 320    | 12.6 | 232   | 9.1  | 12     | 26.5  |
| 200              | 325   | 12.8 | 415    | 16.3 | 232   | 9.1  | 15     | 33.1  |
| 300              | 261   | 10.3 | 501    | 19.7 | 340   | 13.4 | 22     | 48.5  |
| 500              | 261   | 10.3 | 501    | 19.7 | 340   | 13.4 | 22     | 48.5  |
| 780              | 410   | 16.1 | 787    | 31.0 | 505   | 19.9 | 54     | 119.0 |
| 1400             | 410   | 16.1 | 787    | 31.0 | 505   | 19.9 | 54     | 119.0 |
| 1850             | 550   | 21.7 | 837    | 33.0 | 445   | 17.5 | 84     | 185.2 |
| 2400             | 593   | 23.3 | 837    | 33.0 | 474   | 18.7 | 107    | 235.9 |

Thyro-PX 3PX, 690 V Type Voltage

| Dimensions       |       |      |        |      |       |      |        |       |
|------------------|-------|------|--------|------|-------|------|--------|-------|
| Type Current (A) | Width |      | Height |      | Depth |      | Weight |       |
|                  | mm    | in   | mm     | in   | mm    | in   | kg     | lb    |
| 80               | 450   | 17.7 | 320    | 12.6 | 232   | 9.1  | 17     | 37.5  |
| 200              | 450   | 17.7 | 414    | 16.3 | 232   | 9.1  | 20     | 44.1  |
| 300              | 348   | 13.7 | 525    | 20.7 | 340   | 13.4 | 30     | 66.1  |
| 500              | 348   | 13.7 | 525    | 20.7 | 340   | 13.4 | 30     | 66.1  |
| 780              | 575   | 22.6 | 787    | 31.0 | 505   | 19.9 | 74     | 163.1 |
| 1400             | 575   | 22.6 | 787    | 31.0 | 505   | 19.9 | 74     | 163.1 |
| 2000             | 550   | 21.7 | 1094   | 43.1 | 445   | 17.5 | 119    | 262.3 |
| 2200             | 593   | 23.3 | 1094   | 43.1 | 474   | 18.7 | 152    | 335.1 |

INTERFACE

|                            |  |
|----------------------------|--|
| Status LEDs [Programmable] | Multiple color status LEDs for parameters:                                       |
|                            | ON/READY   |
|                            | LIMIT  |
|                            | PULSE LOCK   |
|                            | FAULT  |
|                            | POWER CONTROLLER 1 STATUS  |
|                            | POWER CONTROLLER 2 STATUS  |
|                            | POWER CONTROLLER 3 STATUS  |
| Control Interface          | RS-232 for Thyro-Tool Pro PC software connection or optional Thyro-Touch display |
|                            | Micro USB connector for Thyro-Tool Pro PC software connection                    |
|                            | 9-pin digital I/O connector (6 digital inputs)                                   |
|                            | 9-pin analog I/O connector (3 analog inputs, 3 analog outputs)                   |
| Communication Modules      | 1 module slot for supported Anybus® digital communication protocols              |
| dASM Interface Card        | Digital and dynamic working mains load optimization                              |

## STANDARD OPTIONS

| Options                           |   |
|-----------------------------------|---|
| Digital I/O Interface Card        | 9 digital inputs and 3 digital outputs  |
| Analog and Digital Interface Card | 4 digital inputs  |
|                                   | 3 digital outputs   |
|                                   | 3 analog inputs   |
| Anybus Digital Interface Card     | Ethernet/IP®, EtherCAT® PROFIBUS®, PROFINET®, Modbus RTU®, Modbus TCP/IP®, DeviceNET™   |
| Thyro-Touch Modular Display       | Multi-color multi-language, touch screen display, and menus for Thyro-PX configuration with integrated SD memory card and process data recorder |
| Thyro-Tool Pro PC Software        | PC software for commissioning, visualization, configuration, and trending   |

### Thyro-Touch Modular Display

With an integrated process data recorder, the optional Thyro-Touch unit enables intuitive operation of Thyro-PX power controllers via touch display.



| Features   |                           |
|--|---------------------------|
| Large 2.8" touch display for menu-driven operation   |                           |
| Multiple display modes   | Bar chart                 |
|  | Line chart                |
|  | Actual values (numerical) |
|  | Data logger               |
| Integrated SD card to load or save data  |                           |
| Long-term data recording of up to 6 process parameters, as well as status messages                                     |                           |
| Analysis via Thyro-Touch tool (on PC):   | Long-term line-chart data |
|  | Status messages           |
|  | PDF export                |
| EasyStart feature for easy Thyro-PX commissioning  |                           |
| Integrated low-energy Bluetooth® feature   |                           |
| Retrofits into existing Thyro-PX standard units (downward compatible to LBA-2 and LBA with limited parameter settings) |                           |
| English, German, and additional languages upon request   |                           |

## ACCESSORIES

|                                |   |
|--------------------------------|---|
| Cabinet Installation Kit (SEK) | Enables cabinet door or panel installation          |
|                                | Can be used with all Thyro-Touch and LBA-2 adapters |



**ORDERING INFORMATION**

| Model    | Description  |
|----------|--|
| Thyro-PX | Modular Digital Thyristor SCR Power Controller with current range to 2900 A, ±0.5% Voltage or Current Accuracy |

| Code | Phase Type   |
|------|--|
| 1PX  | Single phase power controller for single phase operation   |
| 2PX  | Two phase power controller for three phase economic circuits or 2 single phase loads (multi-zone mode) |
| 3PX  | Three phase power controller for three phase operation or 3 single phase loads (multi-zone mode)       |

| Code | AC Input Line Voltage   |
|------|---|
| 500  | Type Voltage 500 V unit: 230 V -20% to +10% [184 V to 550 V]  |
| 690  | Type Voltage 690 V units: 500 V -20% to +10% [400 V to 759 V] |

| Code  | Type Current, TC | Apparent Power [kVA] |      |      |
|---|------------------|----------------------|------|------|
|   |                  | 1PX                  | 2PX  | 3PX  |
| <b>Available with all Phase type option codes and 500 V Type /Voltage</b> |                  |                      |      |      |
| 16  | TC = 16 A        | 8                    | 14   | 14   |
| 37  | TC = 37 A        | 18                   | 32   | 32   |
| 75  | TC = 75 A        | 38                   | 65   | 65   |
| 110   | TC = 110 A       | 55                   | 95   | 95   |
| 130   | TC = 130 A       | 65                   | 112  | 112  |
| 170   | TC = 170 A       | 85                   | 147  | 147  |
| 280   | TC = 280 A       | 140                  | 242  | 242  |
| 350   | TC = 350 A       | 175                  | 303  | 303  |
| 495   | TC = 495 A       | 248                  | 429  | 429  |
| 650   | TC = 650 A       | 325                  | 563  | 563  |
| 780   | TC = 780 A       | 390                  | 675  | 675  |
| 1000  | TC = 1000 A      | 500                  | 866  | 866  |
| 1500  | TC = 1500 A      | 750                  | 1300 | 1300 |
| <b>Available only with Phase Type Option 1PX and 500 V Type Voltage</b>   |                  |                      |      |      |
| 2100  | TC = 2100 A      | 1050                 |      |      |
| 2900  | TC = 2900 A      | 1450                 |      |      |
| <b>Available only with Phase Type Option 2 PX and 500 V Type Voltage</b>  |                  |                      |      |      |
| 2000  | TC = 2000 A      |                      | 1732 |      |
| 2750  | TC = 2750 A      |                      | 2381 |      |
| <b>Available only with Phase Type Option 3 PX and 500 V Type Voltage</b>  |                  |                      |      |      |
| 1850  | TC = 1850 A      |                      |      | 1602 |
| 2600  | TC = 2600 A      |                      |      | 2251 |

ORDERING INFORMATION (CONTINUED)

| Code   | Type Current, TC   | Apparent Power [kVA] |      |      |
|--|--|----------------------|------|------|
| <b>Available with all Phase Type Option Codes and 690 V Type Voltage</b> |  |                      |      |      |
| 80   | TC = 80 A  | 55                   | 95   | 95   |
| 200  | TC = 200 A   | 138                  | 239  | 239  |
| 300  | TC = 300 A   | 207                  | 358  | 358  |
| 500  | TC = 500 A   | 345                  | 597  | 597  |
| 780  | TC = 780 A   | 538                  | 932  | 932  |
| 1400   | TC = 1400 A  | 966                  | 1673 | 1673 |
| <b>Available Only with Phase Type Option 1 PX and 690 V Type Voltage</b> |  |                      |      |      |
| 2000   | TC = 2000 A  | 1380                 |      |      |
| 2600   | TC = 2600 A  | 1794                 |      |      |
| <b>Available Only with Phase Type Option 2 PX and 690 V Type Voltage</b> |  |                      |      |      |
| 1850   | TC = 1850 A  |                      | 2210 |      |
| 2400   | TC = 2400 A  |                      | 2868 |      |
| <b>Available Only with Phase Type Option 3 PX and 690 V Type Voltage</b> |  |                      |      |      |
| 1700   | TC = 1700 A  |                      |      | 2031 |
| 2200   | TC = 2200 A  |                      |      | 2629 |
| <b>Code</b>  | <b>Integrated Semiconductor Fuse</b>                       |                      |      |      |
| H  | Integrated semiconductor fuse [REQUIRED]                   |                      |      |      |
| <b>Code</b>  | <b>Forced Air Cooling Via Integrated Fan<sup>1</sup></b>   |                      |      |      |
| F  | 230 VAC forced air cooling via integrated fan [REQUIRED]   |                      |      |      |
| <b>Code</b>  | <b>Additional Options<sup>2</sup></b>                      |                      |      |      |
| C09  | PCB conformal coating                                      |                      |      |      |
| C10  | 115 VAC forced air cooling via integrated fan <sup>1</sup> |                      |      |      |

<sup>1</sup> Not available with TC options < 170 A

<sup>2</sup> Choose as many as required.

