# THYRO-PX DC SERIES

DIGITAL SCR RECTIFIER
UP TO 1800 AMPS DC

The Thyro-PX® DC series SCR rectifiers are designed and enhanced for all DC rectifier applications to develop solutions with the highest degree of reliability and state-of-the-art driven technology.

## PRODUCT HIGHLIGHTS

- Modular stack system in B6C configuration, suitable to design B12C; B18C DC systems
- Input 3-phase AC max 690 V for 4.5 MW power rating 18 pulses (Available on request)
- Modular stack DC current highest 1800 A air cooled B6C
- Take advantage of existing Thyro-PX controller card architecture
- Advanced automation capabilities
- Easy integration and configuration for B12C; B18C application
- Multiple I/O and I/O module options
- Available Thyro-Tool Pro PC software via micro-USB interface

## TYPICAL APPLICATIONS

- Electrolyzer
- Hydrogen electrolyzer
- Water purification
- DC heating elements
- DC supply for crystal growing

## AT A GLANCE

### Air-cooled Rectifier Type

**Modular 6 pulses stack (B6C) extendable for 12 and 18 pulses parallel operation for higher power and less DC ripple**

### Accuracy

**Constant current and/or voltage regulation with ±1% accuracy**

### AC Input Voltage and DC Output Voltage Rating

**AC: 230 to 500 VAC [-20 to +10%] (in preparation 690 VAC [-20 to +10%])**

**DC Bus Voltage: 650 VDC (in preparation 960 VDC)**

### Type DC Current Range

**1000 A; 1250 A; 1800 A**

### Control Modes

**Setpoint settings 0 to 100%**
**Phase-angle firing (VAR)**

### Fieldbus Communications

**Ethernet/IP®, EtherCAT®**
**PROFIBUS®, PROFINET®**
**Modbus TCP/IP®**

## MODEL SPECIFICATIONS

| Thyro-PX DC Model | | |
|---|---|---|
| **Thyro-PX 3PX 500 to 1000 HF DC** | **Thyro-PX 3PX 500 to 1250 HF DC** | **Thyro-PX 3PX 500 to 1800 HF DC** |
| Three-phase controlled rectifier | Three-phase controlled rectifier | Three-phase controlled rectifier |
| Phase-angle firing (VAR) | Phase-angle firing (VAR) | Phase-angle firing (VAR) |

## TECHNICAL SPECIFICATIONS

| Electrical Data | | |
|---|---|---|
| $I_{DC}$ | Maximum DC current ($T_{AMBIENT}$ = 35°C; no overload) | 1000 A; 1250 A; 1800 A |
| $V_{AC}$ | Maximum AC voltage (±10%) | 184 to 550 VAC |
| $V_{BUS}$ | DC Bus voltage | 650 VDC |
| $P_{TOTAL}$ | Maximum stack power at rated voltage 500 VAC | 675 kW; 844 kW; 1215 kW |
| $P_{LOSS}$ | Stack power loss ($T_{AMBIENT}$ = 35°C) | 3.3 kW; 4.3 kW; 5.3 kW |

| Environmental | | |
|---|---|---|
| Altitude | Installation altitude without derating | 1000 m |
| Protection | IEC 60529 | IP00 |
| Pollution Degree | EN 50178 | 2 |
| **Fan Data** | | |
| Axial Ventilator | | EZQ 25/2 |
| Fan Voltage ($V_{FAN}$) | | 230 or 110 VAC |
| Fan Frequency ($f_{FAN}$) | | 50/60 Hz |
| Fan Maximum Input Current ($I_{FAN}$) | | 0.70/0.81 A |
| Fan Power ($P_{FAN}$) | | 160/182 W |

| Stack Protection | | |
|---|---|---|
| **RC Circuit** | | |
| Type | RC in parallel | RC47 |
| R | Resistance (11W) | 47 Ω |
| C | Capacitance | 0.22 µF |
| **PT 1000 for Thermal Monitoring** | | |
| $T_S$ | Switching and alarm temperature monitor programable | 85°C (Factory setting switch off) |
| | Including semiconductor fuse for each thyristor with fuse monitoring switch | |

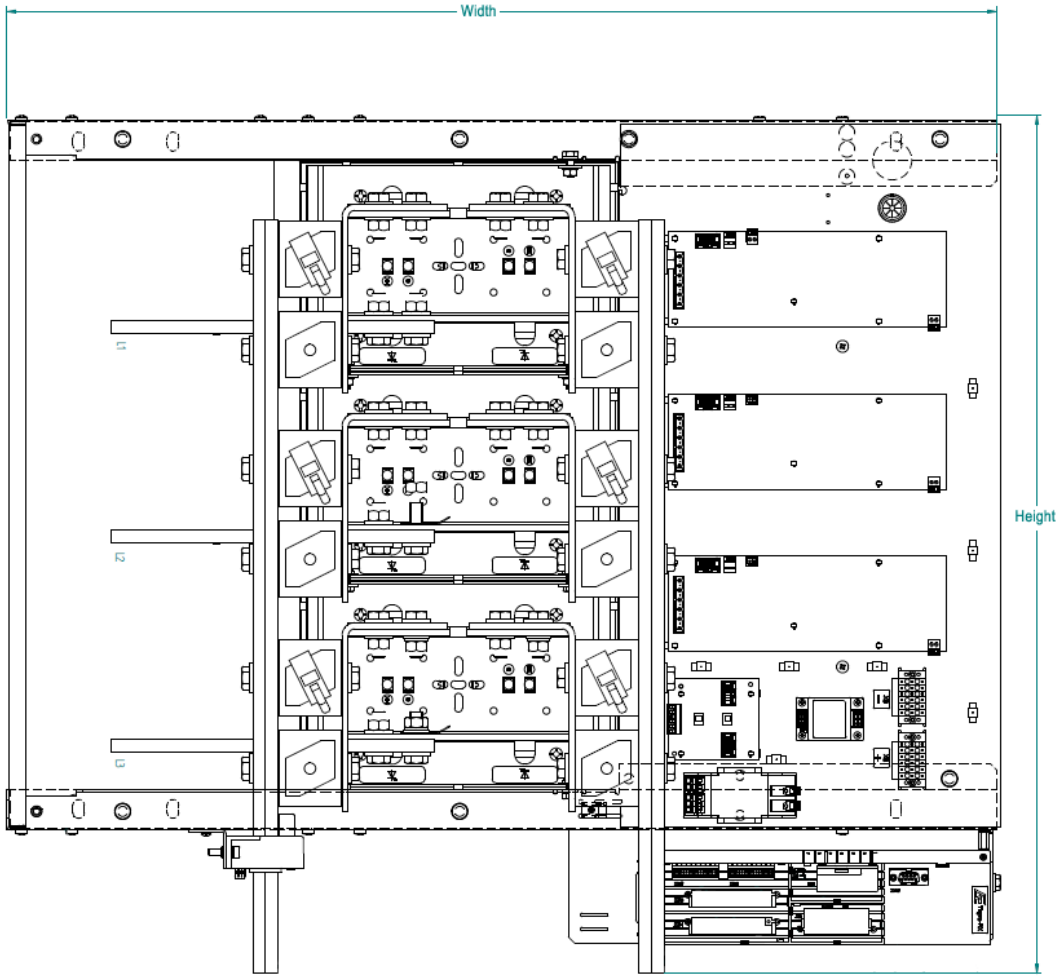
## TECHNICAL SPECIFICATIONS

| Control Unit | |
|---|---|
| **Connectors** | |
| RS-232 (Powered) | 9-pin subminiature-D socket (for Thyro-Touch display connection) |
| Anybus Module (Optional) | Varies by anybus module, according to the bus standard (not included) |
| USB | Micro-USB (connector and cable not included) for connection of Thyro-Tool Pro software for parameter setting and monitoring |
| Analog I/O (Slot 1 to 4) | Included 9-pin, plug-in, screw terminal block, 0.14 to 1.5 mm² (30 to 14 AWG) |
| Analog and Digital I/O 2 (X52) | Included 9-pin, plug-in, screw terminal block, 0.14 to 1.5 mm² (30 to 14 AWG) |
| I/O Bus | RJ-45 (connector and cable not included) |
| 24 VDC <= 1.5 A Auxiliary Power Supply Input | Included 2-pin, plug-in, screw terminal block, 0.14 to 1.5 mm² (30 to 14 AWG)<br>To be provided externally |
| 3 Relays (K1 to K3) | Included 3-pin, plug-in, screw terminal block, 0.14 to 1.5 mm² (30 to 14 AWG)<br>Free adjustable switching configuration |
| Analog Inputs | 0(4) mA - 20 mA, $R_i$ = ca. 250 Ω / max 24 mA. Max open-circuit voltage = 24 V |
| | 0(1) V to 5 V, $R_i$ = ca. 6.6 kΩ / max 12 V |
| | 0(2) V to 10 V, $R_i$ = ca. 11.1 kΩ / max 12 V |
| Analog Outputs | Signal level 0 to 10 V, 0 to 20 mA or 4 to 20 mA. The max burden voltage is 10 V.<br>Short-circuit proof. |
| Precision | U-control: Better than ±1.0% |
| | I-control: Better than ±1.0% |
| | P-control: Better than ±2.0% |
| Limitations | Voltage limitation $U_{rms}$ |
| | Current limitation $I_{rms}$ = default setting |
| | Effective power limitation |
| | Peak current limitation |

## MECHANICAL SPECIFICATIONS

| Mechanical Data | |
|---|---|
| Dimensions (H x W x D) | 787 x 522 x 683 mm (30.98 x 20.53 x 26.87 in) |
| Weight | 94 to 110 kg |

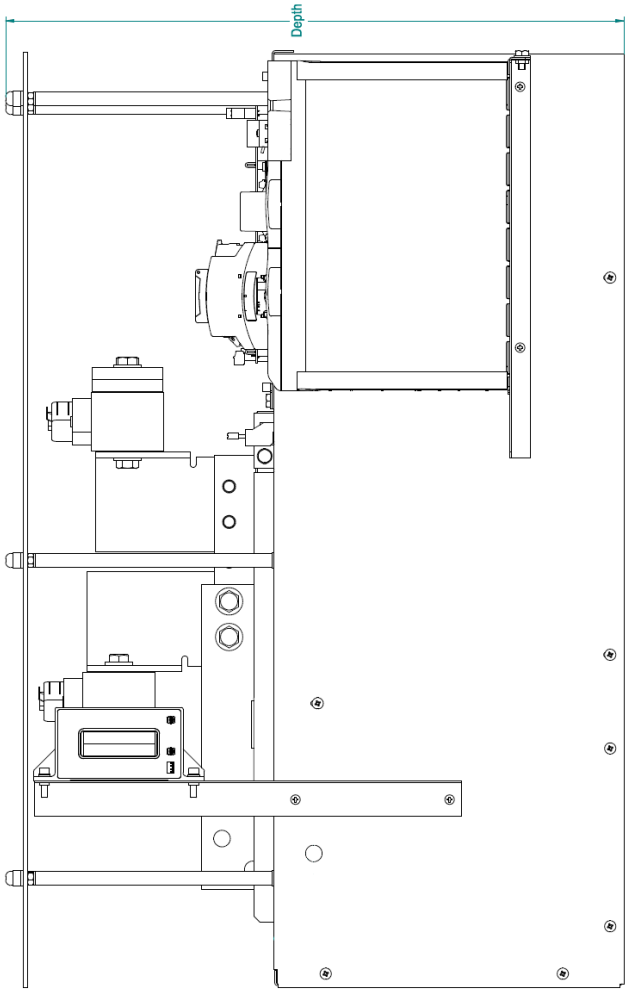
Front View without Cover



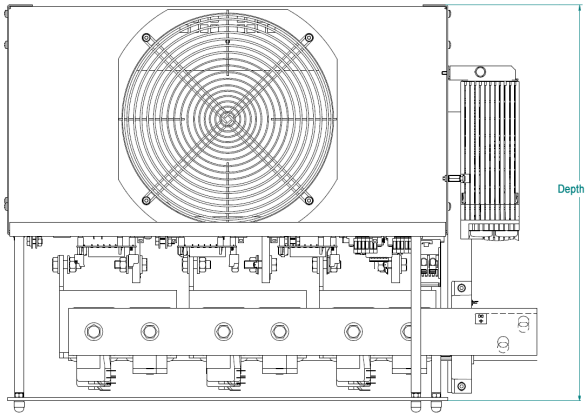

2000555311 Thyro-PX 3PX 500-1000 HF DC / 2000555312 Thyro-PX 3PX 500-1250 HF DC is equipped with single fuse.
2000555313 Thyro-PX 3PX 500-1800 HF DC is equipped with parallel fuse.

## MECHANICAL SPECIFICATIONS

Side View




Top View



## STANDARD OPTIONS

| Options | |
|---|---|
| Transformer Damping Unit | Used for the reduction of commutation-overvoltages for B6C-Thyristor configurations with up to 1000 V supply voltage. |
| Anybus Digital Interface Card | Ethernet/IP®, EtherCAT® PROFIBUS®, PROFINET®, Modbus TCP/IP® |
| Thyro-Touch Modular Display | Multi-color, multi-language, touch screen display, and menus for Thyro-PX DC 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 DC 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 |
| Easy start feature for easy Thyro-PX commissioning | |
| English, German, and additional languages upon request | |

## ORDERING INFORMATION

| Model | Description |
|---|---|
| 2000555311 | Thyro-PX 3PX 500 to 1000 HF DC |
| 2000555312 | Thyro-PX 3PX 500 to 1250 HF DC |
| 2000555313 | Thyro-PX 3PX 500 to 1800 HF DC |

## ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

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