

# THYRO-PX DC SERIES

DIGITAL SCR RECTIFIER  
UP TO 1800 AMPS DC



The Thyro-PX<sup>®</sup> 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  $\pm 1\%$  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<sup>®</sup>, EtherCAT<sup>®</sup>  
PROFIBUS<sup>®</sup>, PROFINET<sup>®</sup>  
Modbus TCP/IP<sup>®</sup>

## 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 ( $T_{AMBIENT} = 35^{\circ}C$ ; no overload)	1000 A; 1250 A; 1800 A
$V_{AC}$	Maximum AC voltage ( $\pm 10\%$ )	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 ( $T_{AMBIENT} = 35^{\circ}C$ )	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 $\Omega$
C	Capacitance	0.22 $\mu F$
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	

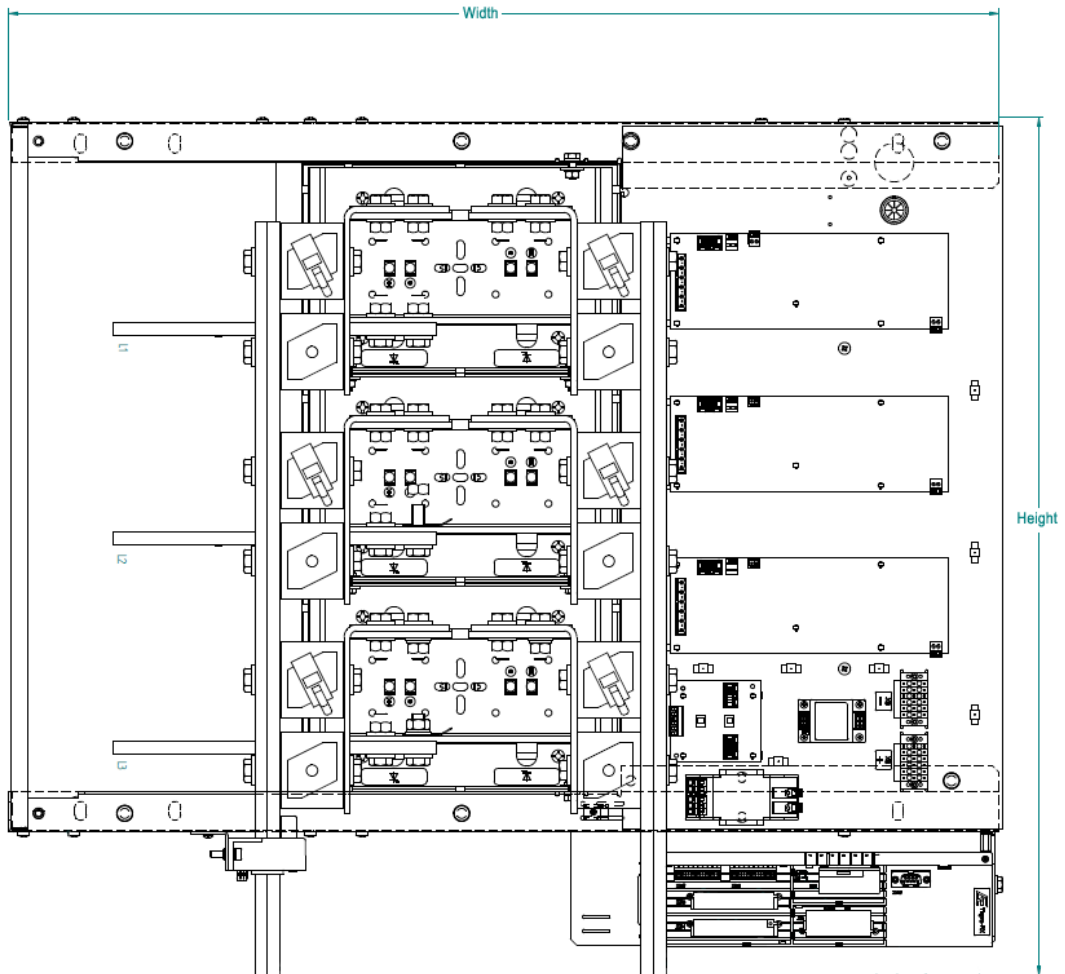
TECHNICAL SPECIFICATIONS

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 mm <sup>2</sup> (30 to 14 AWG)
Analog and Digital I/O 2 (X52)	Included 9-pin, plug-in, screw terminal block, 0.14 to 1.5 mm <sup>2</sup> (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 mm <sup>2</sup> (30 to 14 AWG) To be provided externally
3 Relays (K1 to K3)	Included 3-pin, plug-in, screw terminal block, 0.14 to 1.5 mm <sup>2</sup> (30 to 14 AWG) Free adjustable switching configuration
Analog Inputs	0(4) mA - 20 mA, R <sub>i</sub> = ca. 250 Ω / max 24 mA. Max open-circuit voltage = 24 V
	0(1) V to 5 V, R <sub>i</sub> = ca. 6.6 kΩ / max 12 V
	0(2) V to 10 V, R <sub>i</sub> = 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. 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 <sub>rms</sub>
	Current limitation I <sub>rms</sub> = 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

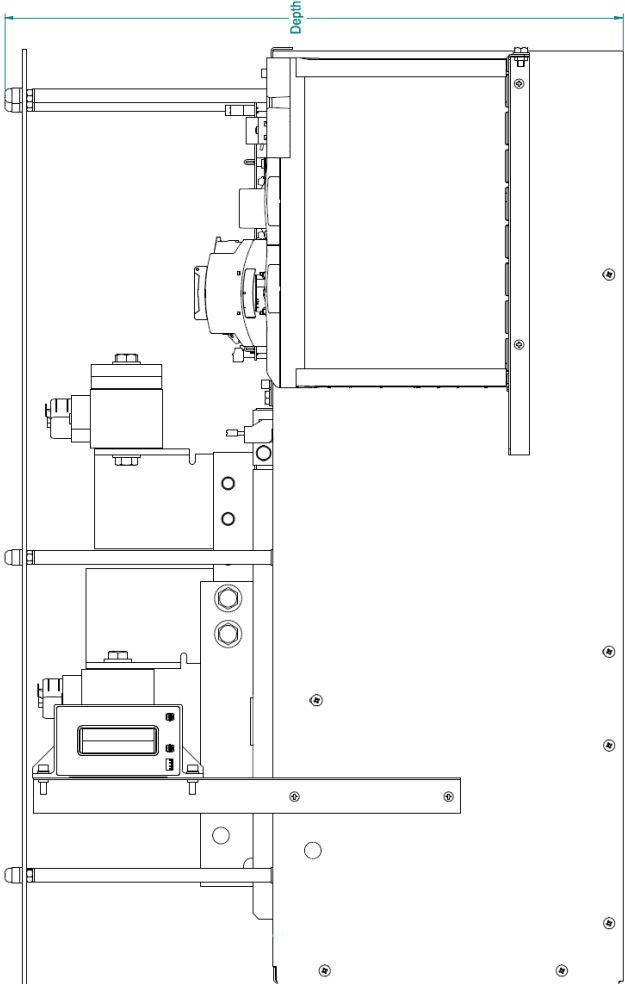
Front View without Cover



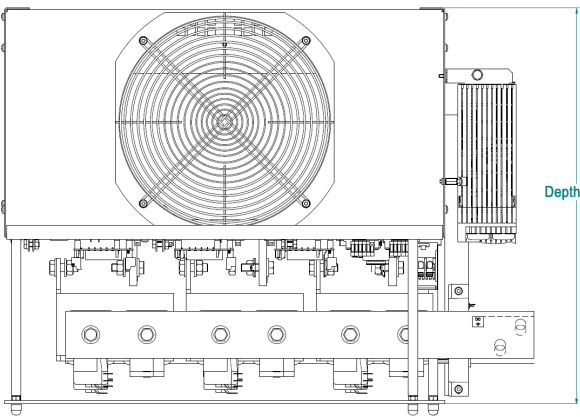
2000555311 Thyro-PX 3PX 500-1000 HF DC / 2000555312 Thyro-PX 3PX 500-1250 HF DC is equipped with single fuse.  
 2000555313 Thyro-PX 3PX 500-1800 HF DC is equipped with parallel fuse.

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
200055311	Thyro-PX 3PX 500 to 1000 HF DC
200055312	Thyro-PX 3PX 500 to 1250 HF DC
200055313	Thyro-PX 3PX 500 to 1800 HF DC



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## 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.

PRECISION | POWER | PERFORMANCE

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