DISAI Automatic Systems

Advanced Energy

THYRO-AX SERIES

DIGITAL THYRISTOR SCR POWER CONTROLLER UP TO 350 A

Compact, easy to use advanced 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
- Low THD (total harmonic distortion) for improved power utilization
- Advanced performance control accuracy to maximize end process repeatability
- Wide communication protocol flexibility for integration into multiple communication formats
- Rockwell™ PAC via certified AOP
- Wide performance range with rated currents up to 350 A and rated voltages up to 600 A
- Intuitive performance and status feedback via an 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

AT A GLANCE

Phase Type

1, 2, and 3-phase power controller

Accuracy

±1.5% voltage or current

±1.5% power

AC Input Line Voltage Rating

24 to 600 V [+10%]

Type Current Range

16 to 350 A

Control Modes

Zero cross firing (TAKT)

Phase-angle firing (VAR)

Quick TAKT Mode (QTM)

Soft start, soft down

Communications

Ethernet/IP®, EtherCAT®
PROFIBUS®, PROFINET®

Modbus RTU®, Modbus TCP/IP®

DeviceNET™

Internal USB

PRODUCT SPECIFICATIONS

Thyro-AX Model		
Thyro-AX 1A	**Thyro-AX 2A**	**Thyro-AX 3A**
1-phase version for 1-phase load between 2-phases or for 1-phase connected to the neutral phase	2-phase version for 3-phase load in cost-saving 3-phase circuit	3-phase version for 3-phase load
Operating Mode: TAKT, VAR, QTM, SWITCH	Operating Mode: TAKT, SWITCH	Operating Mode: TAKT, VAR, SWITCH

Model ...F	
Functional Features	Forced ventilation
Model ...H RLP2	
Set point inputs	2 set point inputs, 2 digital inputs and 1 switch input
	Input of analog set point, signal intervals, each of: 0(4) - 20 mA / 0(1) - 5 V / 0(2) - 10 V
	Control input for switch operation mode - dual point control is possible (UOn = 3 to 24 V)
	Digital set point is provided by the process computer or bus system
Control types	U_{eff} / U^2_{eff} / I_{eff} / I^2_{eff} / P
Load monitoring	Via an adjustable response threshold
Limitations	Current limitation I_{eff} current peak limitation to $\hat{I} = 3 \times I_{nom}$ for operation mode VAR
Relay output	Exchanger, max. contact load 250 V, 4 A, 180 W, 1500 VA
Analog output	3 analog outputs each with signal levels of 0(2) - 10 V / 0(4) - 20 mA, max. compliance voltage 10 V
External supply	85 to 265 V (47 to 63 Hz)
Operational display	Via LEDs and relay output (exchanger, indications adjustable)

ELECTRICAL SPECIFICATIONS

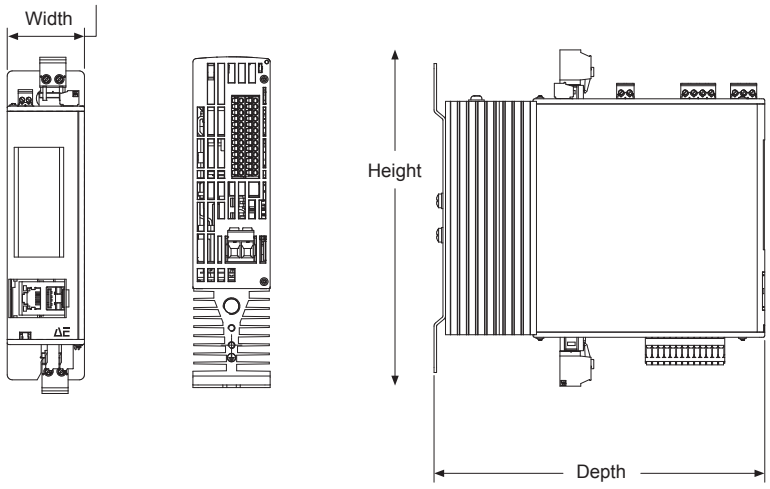
Rated Voltage	230 V: 24 to 253 V
	400 V: 24 to 440 V
	500 V: 24 to 550 V
	600 V: 24 to 660 V
Network Frequency	All types from 47 to 63 Hz
	Frequency change: 5% per half-wave
Rated Current	16, 30, 45, 60, 100, 130, 170, 230, 280, and 350 A
Load Types	Ohmic loads employed at a Rwarm/Rcold-ratio up to 6; limitation of 3 x I_{nom}
	Transformer loads
Main Load	Internal network load optimization for the operating modes QTM and TAKT
	Interface for external network load optimization available, e.g. Thyro-Power Manager

Environmental Specifications	
Ambient Temperature	Up to 35°C (95°F) by external fan cooling (for F 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	5% to 95% relative humidity
Site Altitude	Up to 2000 m (6562') above sea level

Regulatory Approvals	
Certifications	CE conformity
	UL Certified, UL 508A (100 kA short circuit test), accredited 8 to 350 A
	Canadian National Standard C22.2 No. 14
	ISO 9001 Quality Standards

MECHANICAL SPECIFICATIONS

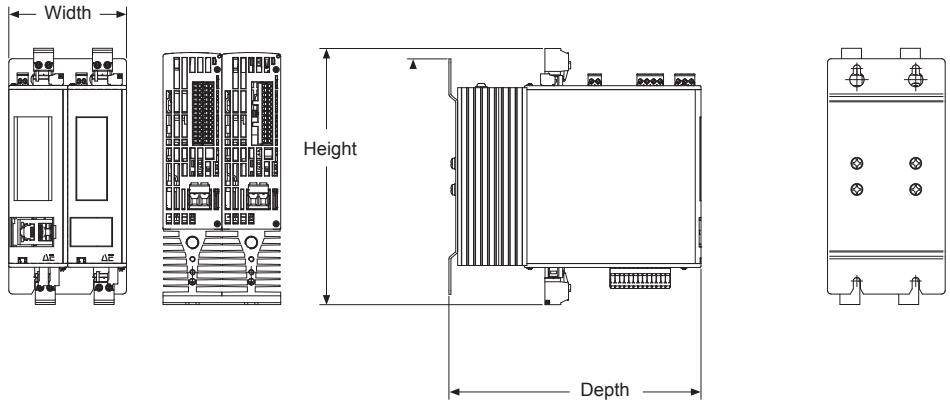
Thyro-AX 1A ... H RLP2



Dimensions								
Type Current (A)	Width		Height		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
16	45	1.8	196	7.7	193	7.6	1.1	2.4
30	45	1.8	196	7.7	193	7.6	1.1	2.4
45	52	2.0	276	10.9	238	9.4	2.2	4.9
60	52	2.0	276	10.9	238	9.4	2.2	4.9
100	54	2.1	276	10.9	238	9.4	2.8	6.2
130	129	5.1	361	14.2	283	11.1	7.8	17.2
170	129	5.1	361	14.2	283	11.1	7.8	17.2
230	129	5.1	373	14.7	283	11.1	8.3	18.3
240	129	5.1	373	14.7	283	11.1	8.3	18.3
280	129	5.1	373	14.7	283	11.1	8.3	18.3
350	129	5.1	373	14.7	283	11.1	8.3	18.3

MECHANICAL SPECIFICATIONS (CONTINUED)

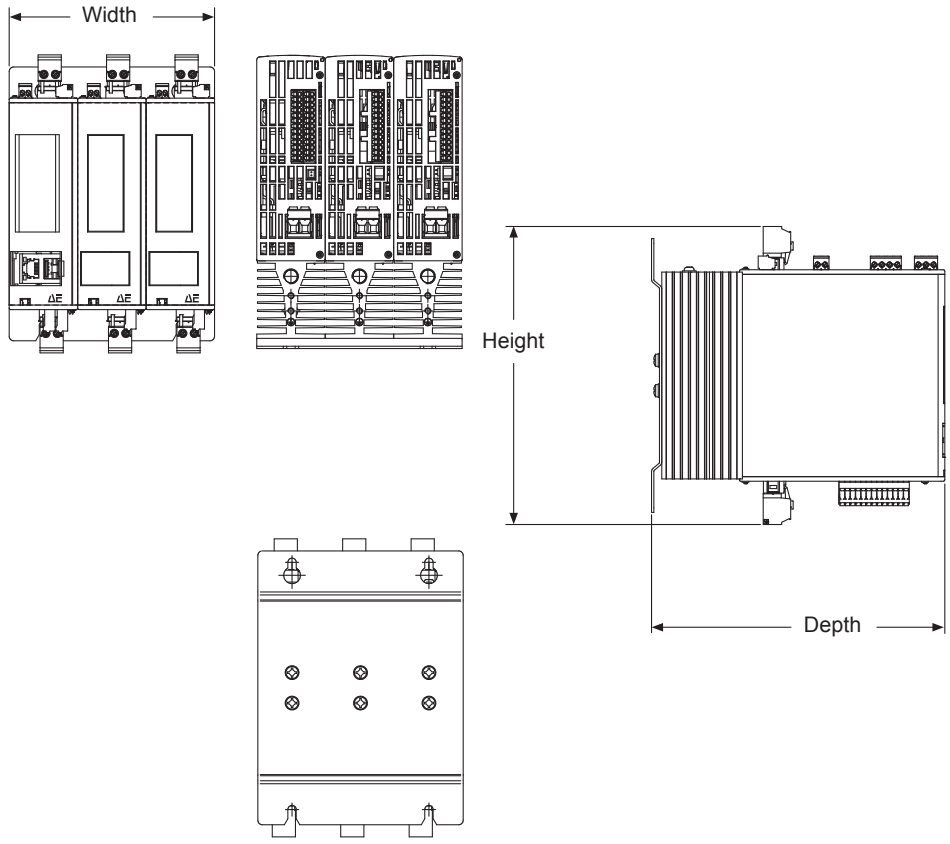
Thyro-AX 2A ... H RLP2



Dimensions								
Type Current (A)	Width		Height		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
16	90	3.5	196	7.7	193	7.6	2.2	4.9
30	90	3.5	196	7.7	193	7.6	2.2	4.9
45	108	4.3	276	10.9	238	9.4	4.4	9.7
60	108	4.3	276	10.9	238	9.4	4.4	9.7
100	110.2	4.3	276	10.9	238	9.4	5.6	12.3
130	254	10.0	361	14.2	283	11.1	15.6	34.4
170	254	10.0	361	14.2	283	11.1	15.6	34.4
230	254	10.0	373	14.7	283	11.1	16.6	36.6
240	254	10.0	373	14.7	283	11.1	16.6	36.6
280	254	10.0	373	14.7	283	11.1	16.6	36.6
350	254	10.0	373	14.7	283	11.1	16.6	36.6

MECHANICAL SPECIFICATIONS (CONTINUED)

Thyro-AX 3A ... H RLP2



Dimensions								
Type Current (A)	Width		Height		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
16	135	5.3	196	7.7	193	7.6	3.3	7.3
30	135	5.3	196	7.7	193	7.6	3.3	7.3
45	164	6.5	276	10.9	238	9.4	6.6	14.6
60	164	6.5	276	10.9	238	9.4	6.6	14.6
100	164	6.5	276	10.9	238	9.4	8.4	14.6
130	379	14.9	361	14.2	283	11.1	23.4	51.6
170	379	14.9	361	14.2	283	11.1	23.4	51.6
230	379	14.9	373	14.7	283	11.1	24.9	54.9
240	379	14.9	373	14.7	283	11.1	24.9	54.9
280	379	14.9	373	14.7	283	11.1	24.9	54.9
350	379	14.9	373	14.7	283	11.1	24.9	54.9

INTERFACE

Thyro-AX Integral Display	High brightness touch screen display and menus for Thyro-AX configuration with USB upload/download capabilities
Control Interface	USB connector for stand-alone parameter upload/download and Thyro-Tool Pro PC software connection
Analog and Digital Interface Card	One digital input
	Three digital outputs
	Two analog inputs

STANDARD OPTIONS

Options	
USB to RS-232 adapter cable	For connection to Thyro-Tool Pro software visualization and commissioning
Thyro-Tool Pro PC software	PC software for commissioning, visualization, configuration, and trending

Thyro-AX Integral Display

The Thyro-AX incorporates a large, high visibility integral touch-screen display, enabling intuitive setup, commissioning and operation of Thyro-AX power controllers.

Features	
Large touch display for menu-driven operation	
Multiple display modes	Load Type
	Operating Mode
	Control Mode
	Data logger
	Monitoring
	Parameter save / load
	Limits
Analysis via Thyro-Touch tool (on PC):	Long-term line-chart data
	Status messages
	PDF export
EasyStart feature for easy Thyro-AX set-up and commissioning	

ORDERING INFORMATION

Model	Description
Thyro-AX	Modular Digital Thyristor SCR Power Controller with current range to 350 Amps, ±1.5% Voltage or Current Accuracy

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

Code	AC Input Line Voltage
230	Type Voltage 230 V unit: 24V to 230 V +10% [24 V to 253 V]
400	Type Voltage 400 V units: 24 V to 400 V +10% [24 V to 440 V]
500	Type Voltage 500 V unit: 24 V to 500 V +10% [24 V to 550 V]
600	Type Voltage 600 V units: 24 V to 600 V +10% [24 V to 660 V]

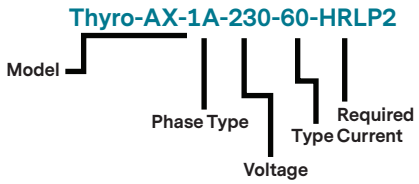
Code	Type Current, TC	Apparent Power [kVA]		
Available with Phase Type Option 1A and 230 V Type Voltage		1A	2A	3A
16	TC = 16 A	3		
30	TC = 30 A	7		
45	TC = 45 A	10		
60	TC = 60 A	14		
100	TC = 100 A	23		
130	TC = 130 A	30		
170	TC = 170 A	39		
230	TC = 230 A	53		
280	TC = 280 A	64		
350	TC = 350 A	80		
Available with all Phase Type Options and 400 V Type Voltage		1A	2A	3A
16	TC = 16 A	6	11	11
30	TC = 30 A	12	21	21
45	TC = 45 A	18	31	31
60	TC = 60 A	24	41	41
100	TC = 100 A	40	69	69
130	TC = 130 A	52	90	90
170	TC = 170 A	68	117	118
230	TC = 230 A	92	159	159
280	TC = 280 A	112	194	194
350	TC = 350 A	140	242	242

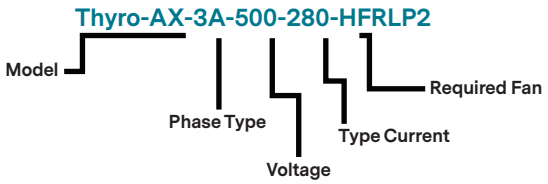
ORDERING INFORMATION (CONTINUED)

Code	Type Current, TC	Apparent Power [kVA]		
Available with all Phase Type Options and 500 V Type Voltage		**1A**	**2A**	**3A**
16	TC = 16 A	8	14	14
30	TC = 30 A	15	26	26
45	TC = 45 A	22	39	39
60	TC = 60 A	30	52	52
100	TC = 100 A	50	86	86
130	TC = 130 A	65	112	112
170	TC = 170 A	85	147	147
230	TC = 230 A	115	199	199
280	TC = 280 A	140	242	242
350	TC = 350 A	175	303	303
Available with all Phase Type Options and 600 V Type Voltage		**1A**	**2A**	**3A**
45	TC = 45 A	27	47	47
60	TC = 60 A	36	62	62
100	TC = 100 A	60	104	104
130	TC = 130 A	78	135	135
170	TC = 170 A	102	176	176
240	TC = 240 A	138	239	239
350	TC = 350 A	210	363	363
Code	**Integrated Semiconductor Fuse**			
H	Integrated semiconductor fuse [REQUIRED]			
Code	**Forced Air Cooling Via Integrated Fan[1]**			
F	230 VAC forced air cooling via integrated fan [REQUIRED]			
Code	**Relay, Load Monitoring, Control**			
RLP2	Signaling relay, Load monitoring and additional power control [REQUIRED]			
Code	**Additional Options[2]**			
C09	PCB conformal coating			
C10	115 VAC forced air cooling via integrated fan[1]			

1 Not available with TC options < 230 A

2 Choose as many as required.





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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