

# THYRO-S

DIGITAL THYRISTOR SWITCH  
8 TO 350 A



The highly efficient Thyro-S<sup>®</sup> thyristor switch delivers accurate, reliable, switch-free performance. Connect to bus systems, use as a stand-alone unit, or use in combination with all established two-point controllers - PLCs or computer systems. With simple mounting, minimal space requirements, quick commissioning, and safe operation, Thyro-S switches are seamlessly integrated into various applications. Status LEDs provide a quick overview of system status and load percentage.

## PRODUCT HIGHLIGHTS

- Ideal for Ohmic or transformer type loads
- Easily install with compact unit footprint and simplified mounting design
- Optimize load control with up to five control methods and three operating modes
- Customizable faults, alarms, status, limits, set points for easy integration to existing control systems
- Scalable PLC/PAC integration for closed-loop, thermal process control; optional system interface connection to bus module

## 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, petrochemical and oil processing
- Extruder and plastic press heating, IR drying and automotive applications

## AT A GLANCE

### Phase Type

1, 2, and 3-phase

### AC Input Line Voltage Rating

230V to 500V [-57% to +10%]  
or 230V to 500V [-15% to +10%]  
depending on configuration

### Type Current Range

8 to 350 A

### Control Modes

On-Off Switch

### Communications

Ethernet/IP<sup>®</sup>, Profibus<sup>®</sup>,  
Profinet<sup>®</sup>, Modbus RTU<sup>®</sup>,  
Modbus TCP/IP<sup>®</sup>, DeviceNET<sup>™</sup>,  
CANopen<sup>®</sup>

**PRODUCT SPECIFICATIONS**

Thyro-S Model		
Thyro-S 1S	Thyro-S 2S	Thyro-S 3S
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 Modes: On-Off Switch	Operating Mode: On-Off Switch	Operating Mode: On-Off Switch
Thyro-S Series		
Load Types	Ohmic loads and transformer loads	
Relay Output	1 changeover contact (H RLP3 type only)	
Fuse	Integrated semiconductor fuse	
Model ...H 3		
Set Points	Set Point 1: Logical input DC 0 to 24V, $R_i > 3.3\text{ k}\Omega$ ON $> 3\text{ V}$	
	Set Point 2: System interface, connection to automation system via optional bus module	
Model ...H RLP3 (additional to H 3 features)		
Load Monitoring	Via an adjustable response threshold	
Relay Output	Max. contact load 250 V, 6 A, 180 W, 1500 VA	
Analog Output	Signal level 0(2)-10 V / 0(4)-20 mA	
External Supply	24 V DC/AC, connected upon demand	
Load Types	Ohmic load employed at $R_{warm}/R_{cold}$ ratio of up to 6 (only deployed for H RL3 and H RLP3)	

**ELECTRICAL SPECIFICATIONS**

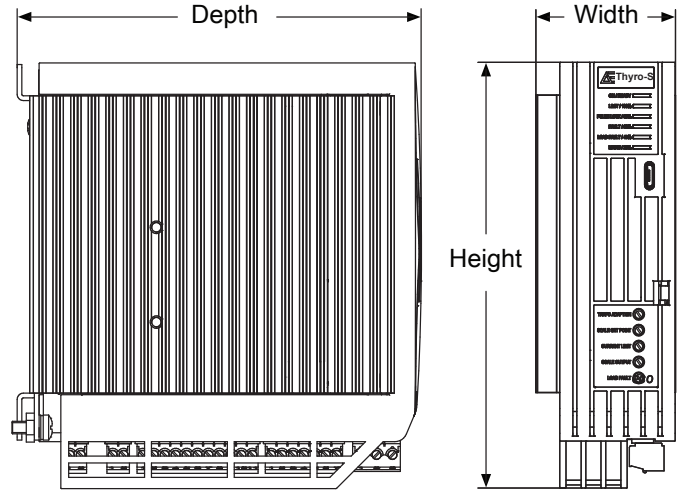
Rated Voltages	...H 3	...H RLP3
	230 V -15% +10%	230 V-15% +10%, 230 V -57% combined with 24 V input
	400 V -15% +10%	400 V-15% +10%, 400 V -57% combined with 24 V input
	500 V -15% +10%	500 V -15% +10%, 500 V -57% combined with 24 V input
Frequency	For all types from 47 to 63 Hz. Max frequency change 5% per half-wave	
Ventilator (F Type only)	230 V, 50 to 60 Hz; optional 115VAC, 50 to 60 Hz	

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)
	Canadian National Standard C22.2 No. 14-95
	ISO 9001 Quality Standards

MECHANICAL SPECIFICATIONS

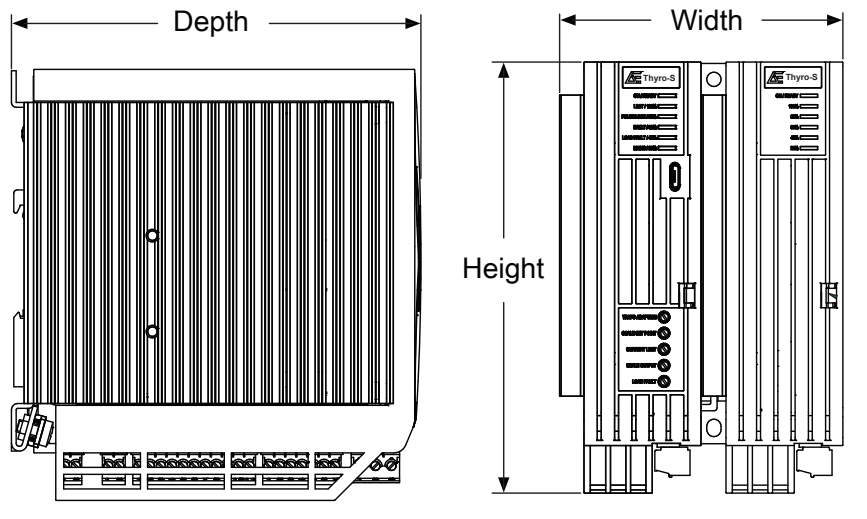
Thyro-S 1S H 3/H RLP3



Dimensions									
Type Current (A)	Width		Height		Depth		Weight		
	mm	in	mm	in	mm	in	kg	lb	
8	45	1.8	136	5.4	129	5.1	0.7	1.5	
16	45	1.8	136	5.4	129	5.1	0.7	1.5	
30	45	1.8	136	5.4	129	5.1	0.7	1.5	
45	52	2.0	203	8.0	184	7.2	1.7	3.8	
60	52	2.0	203	8.0	184	7.2	1.7	3.8	
100	75	3.0	203	8.0	193	7.6	1.9	4.2	
130	125	4.9	320	12.6	241	9.5	4	8.8	
170	125	4.9	320	12.6	241	9.5	4	8.8	
280	125	4.9	370	14.6	241	9.5	5	11.0	
350	125	4.9	400	15.8	261	10.3	8.4	18.5	
280	125	4.9	370	14.6	241	9.5	5	11.0	
350	125	4.9	400	15.8	261	10.3	8.4	18.5	

MECHANICAL SPECIFICATIONS (CONTINUED)

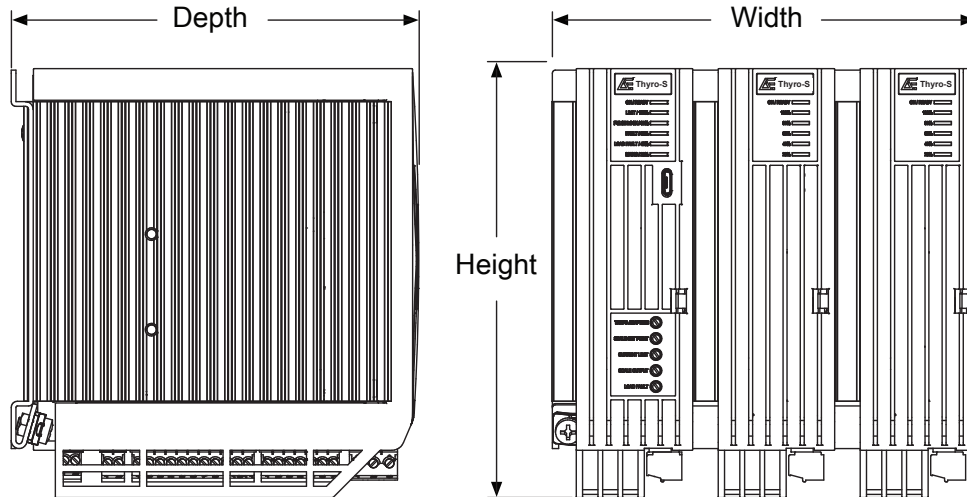
Thyro-S 2S H 3/H RLP3



Dimensions								
Type Current (A)	Width		Height		Depth		Weight	
	mm	in	mm	in	mm	in	kg	lb
8	89	3.5	136	5.4	129	5.1	1.4	3.1
16	89	3.5	136	5.4	129	5.1	1.4	3.1
30	89	3.5	136	5.4	129	5.1	1.4	3.1
45	104	4.1	203	8.0	184	7.2	3.4	7.5
60	104	4.1	203	8.0	184	7.2	3.4	7.5
100	150	5.9	203	8.0	193	7.6	3.8	8.4
130	250	9.8	320	12.6	241	9.5	8.0	17.6
170	250	9.8	320	12.6	241	9.5	8.0	17.6
280	250	9.8	393	15.5	241	9.5	11.0	24.3
350	250	9.8	430	16.9	261	10.3	16.7	36.9

MECHANICAL SPECIFICATIONS (CONTINUED)

Thyro-S 3S H 3/H RLP3



Dimensions									
Type Current (A)	Width		Height		Depth		Weight		
	mm	in	mm	in	mm	in	kg	lb	
8	135	5.3	136	5.4	129	5.1	.1	4.6	
16	135	5.3	136	5.4	129	5.1	.1	4.6	
30	135	5.3	136	5.4	129	5.1	.1	4.6	
45	156	6.1	203	8.0	184	7.2	5.1	11.2	
60	156	6.1	203	8.0	184	7.2	5.1	11.2	
100	225	8.9	203	8.0	193	7.6	5.7	12.5	
130	375	14.8	320	12.6	241	9.5	12.0	26.5	
170	375	14.8	320	12.6	241	9.5	12.0	26.5	
280	375	14.8	393	15.5	241	9.5	15.0	33.1	
350	375	14.8	430	16.9	261	10.3	25.5	56.2	

INTERFACE

Status LEDs	Multiple color status LEDs for parameters:
	ON / READY
	LIMIT / 100%
	PULSE LOCK / 80%
	FAULT / 60%
	LOAD FAULT / 40%
	MAINS / 20%
Control Interface	Micro-USB connector for Thyro-Tool Pro PC software connection
10-pin DIP Switch	Multiple device configuration DIP switches for parameters:
	Operating Mode: (Full-wave switch)
	Analog Output function (H RLP3 type only): Load Voltage, Current or Power
	Analog Output range (H RLP3 type only): 0(2)-10V; 0(4)-20mA
Front Panel Potentiometers	Three externally accessible multi-turn potentiometers to configure parameters:
	First Half-wave Phase Angle (Transformer applications)
	Scale Output
	Load Monitoring

STANDARD OPTIONS

Options	
USB to Micro-USB cable	For connection to Thyro-Tool Pro software visualization and commissioning
Thyro-Tool Pro PC software	PC software for commissioning, visualization, configuration, and trending
Communications bus module	Optional bus module for Profibus® DPV1, Modbus® RTU, DeviceNet™, Profinet®, Modbus® TCP, Ethernet/IP®

## ORDERING INFORMATION

Model	Description
Thyro-S	Digital Thyristor Switch with current range to 350 Amps

Code	Phase Type
1S	Single phase power controller for single phase operation
2S	Two phase power controller for three phase operation (economic three phase circuit)
3S	Three phase power controller for three phase operation

Code	AC Input Line Voltage
230	Type Voltage 230 V : 'H3' type: 230 V -57% to +10% [99 V to 253 V] OR 'H RLP3' type: 230 V -15% to +10% <sup>1</sup>
400	Type Voltage 400 V : 'H3' type: 400 V -57% to +10% [172 V to 440 V] OR 'H RLP3' type: 400 V -15% to +10% <sup>1</sup>
500	Type Voltage 500 V : 'H3' type: 500 V -57% to +10% [215 V to 550 V] OR 'H RLP3' type: 500 V -15% to +10% <sup>1</sup>

Code	Type Current, TC	Apparent Power [kVA]		
		1S	2S	3S
<b>Available only with Phase Type Option 1S and 230 V Type Voltage</b>				
8	TC = 8 A	3.2		
16	TC = 16 A	3.7		
30	TC = 30 A	6.9		
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		
280	TC = 280 A	64		
350	TC = 350 A	80		
<b>Available with all Phase Type Options and 400 V Type Voltage</b>				
8	TC = 8 A	3.2	6	6
16	TC = 16 A	6.4	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	118	118
280	TC = 280 A	112	194	194
350	TC = 350 A	140	242	242

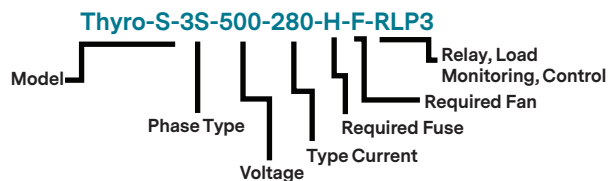
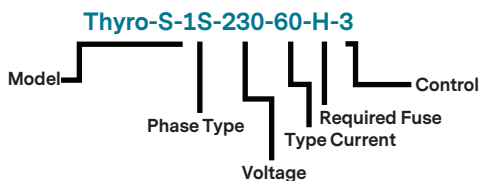


**ORDERING INFORMATION (CONTINUED)**

Code	Type Current, TC	Apparent Power [kVA]		
		1S	2S	3S
Available with all Phase Type Options and 500 V Type Voltage				
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
<b>Code</b> Integrated Semiconductor Fuse				
H	Integrated semiconductor fuse [REQUIRED]			
<b>Code</b> Forced Air Cooling Via Integrated Fan <sup>1</sup>				
F	230 VAC forced air cooling via integrated fan [REQUIRED]			
<b>Code</b> Relay, Load Monitoring, Control				
3	Standard V, V <sup>2</sup> control modes			
RLP3	24V DC/AC power supply, signaling relay, load monitoring, analog output, current limit, V, V <sup>2</sup> , I, I <sup>2</sup> , P control modes			
<b>Code</b> Additional Options <sup>2</sup>				
C09	PCB conformal coating			
C10	115 VAC forced air cooling via integrated fan <sup>1</sup>			

<sup>1</sup> Not available with TC options < 230 A

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





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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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