

# Autonics Solid State Relay SRPH1 SERIES INSTRUCTION MANUAL



Thank you for choosing our Autonics product. Please read the following safety considerations before use.

## Safety Considerations

- ⚠ Please observe all safety considerations for safe and proper product operation to avoid hazards.
- ⚠ symbol represents caution due to special circumstances in which hazards may occur.
- Warning** Failure to follow these instructions may result in serious injury or death.
- Caution** Failure to follow these instructions may result in personal injury or product damage.

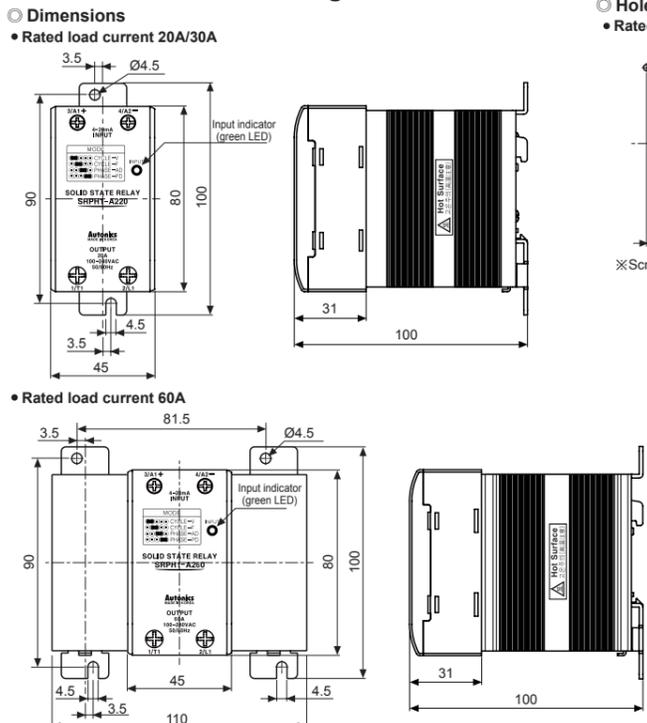
## Warning

- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.) Failure to follow this instruction may result in fire, personal injury, or economic loss.
- Install on a device panel or DIN rail to use.** Failure to follow this instruction may result in electric shock or fire.
- Do not connect, repair, or inspect the unit while connected to a power source.** Failure to follow this instruction may result in electric shock or fire.
- Check 'Connections' before wiring.** Failure to follow this instruction may result in fire.
- Do not disassemble or modify the unit.** Failure to follow this instruction may result in electric shock or fire.

## Caution

- Use the unit within the rated specifications.** Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent.** Failure to follow this instruction may result in electric shock or fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.** Failure to follow this instruction may result in fire or explosion.
- Keep metal chip, dust, and wire residue from flowing into the unit.** Failure to follow this instruction may result in fire or product damage.
- Since leakage current still flows right after turning off the power or in the output OFF status, do not touch the load terminal.** Failure to follow this instruction may result in electric shock.

## Dimensions & Mounting



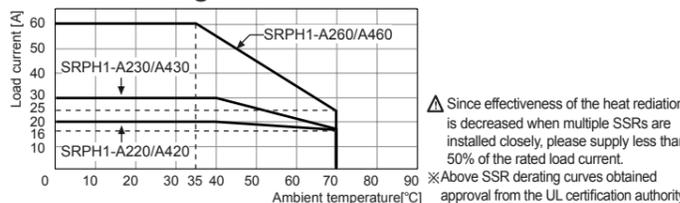
⚠ The above specifications are subject to change and some models may be discontinued without notice.  
 ⚠ Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

## Ordering Information

SRP	H	1	-	A	2	30	Rated load current (resistive load)	20	20A
							Rated load voltage	60	60A
							Rated input current	2	100-240VAC
							Control phase	4	200-480VAC
							Type	A	4-20mA Analog input
							Item	1	Single phase
								H	Integrated heatsink type
								SRP	Solid State Relay (analog input type)

Model	Rated load current	Rated load voltage	Model	Rated load current	Rated load voltage
SRPH1-A220	20A	100-240VAC	SRPH1-A420	20A	200-480VAC
SRPH1-A230	30A		SRPH1-A430	30A	
SRPH1-A260	60A		SRPH1-A460	60A	

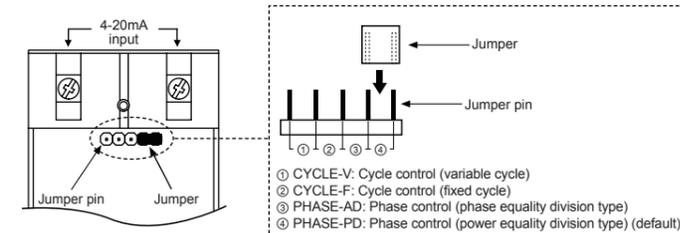
## SSR Derating Curve



⚠ Since effectiveness of the heat radiation is decreased when multiple SSRs are installed closely, please supply less than 50% of the rated load current.  
 ⚠ Above SSR derating curves obtained approval from the UL certification authority.

## Operation Setting

- Detach front cover**  
Press front cover connection 4 parts at right and left side with (-) driver, and front cover is detached.  
⚠ Before detaching front cover, you must cut off load current and input.
- Jumper pin setting**  
Operation mode is decided by jumper position.  
After changing operation mode, re-supply input signal.



## Specifications

### Input

Rated input current	4-20mA
Max. allowable input current	50mA
Pick-up current	Min. 4.2mA
Static off current	Max. 0.2mA
Power factor	Min. 0.9 (max. 25° of difference between voltage phase and current phase)
Start-up time	60Hz: 200ms, 50Hz: 250ms
Operation time	60Hz: 16.6ms, 50Hz: 20ms
Operation mode*1	Phase control (phase equality division type, power equality division type) Cycle control (fixed cycle, variable cycle)

\*1: You can change operation mode by jumper pin.  
 Default is Phase control (power equality division type).

### Output

Rated load voltage range	100-240VACrms~ (50/60Hz)			200-480VACrms~ (50/60Hz)			
Allowable load voltage range	90-264VACrms~ (50/60Hz)			200-528VACrms~ (50/60Hz)			
Rated load current	Resistive load (AC-51)*1	20Arms	30Arms	60Arms	20Arms	30Arms	60Arms
Min. load current	0.5Arms			0.5Arms			
Max. 1 cycle surge current (60Hz)	300A	500A	1000A	300A	500A	1000A	
Max. non-repetitive surge current (I <sup>2</sup> t, t=8.3ms)	350A <sup>2</sup> s	1000A <sup>2</sup> s	4000A <sup>2</sup> s	350A <sup>2</sup> s	1000A <sup>2</sup> s	4000A <sup>2</sup> s	
Peak voltage (non-repetitive)	600V			1000V			
Leakage current (Ta=25°C)	Max. 10mArms (240VAC~/60Hz)			Max. 10mArms (480VAC~/60Hz)			
Output on voltage drop [Vpk] (max. load current)	Max. 1.6V						
Static off-state dv/dt	500V/μs						

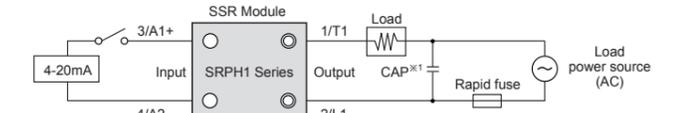
\*1: AC-51 are utilization category at IEC60947-4-3.

### General specifications

Phase control (phase equality division type)	5 to 99%
Phase control (power equality division type)	10 to 99%
Frequency reading function	Yes
Dielectric strength (Vrms)	4000VAC 50/60Hz for 1min (input-output, input/output-case)
Insulation resistance	Over 100MΩ (at 500VDC megger)
Vibration	0.75mm amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 hour
Indicator	Input indicator: green LED
Environment	Ambient temp. -20 to 70°C, storage: -20 to 100°C (The rated load current capacity is different depending on ambient temperature. Refer to 'SSR Derating Curve'.) Ambient humi. 45 to 85%RH, storage: 45 to 85%RH
Input terminal connection	Min. 1×0.5mm <sup>2</sup> (1×AWG20), max. 1×1.5mm <sup>2</sup> (1×AWG6) or 2×1.5mm <sup>2</sup> (2×AWG16)
Output terminal connection	Min. 1×1.5mm <sup>2</sup> (1×AWG16), max. 1×16mm <sup>2</sup> (1×AWG6) or 2×6mm <sup>2</sup> (2×AWG10) ⚠ Use wires compliant with load current capacity to connect to the terminal.
Input terminal fixed torque	0.75 to 0.95N·m
Output terminal fixed torque	1.6 to 2.2N·m
Approval	CE, UL, VDE
Unit weight	• Rated load current 20A/30A: Approx. 410g • Rated load current 60A: Approx. 680g

⚠ Environment resistance is rated at no freezing or condensation.  
 ⚠ For wiring the terminal, round terminal must be used.

## Connections



\*1: As above connection, connect a capacitor. It is proper to EMC.  
 CAP: Load voltage 100-240VAC→1μF/250VAC  
 Load voltage 200-480VAC→0.47μF/500VAC

⚠ Use terminals of size specified below.

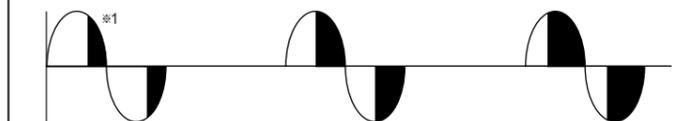
Terminal type	Input	Output
	a Min. 3.5mm	Min. 5.0mm
	b Max. 7.0mm	Max. 12.0mm

## Operation Mode

### Phase control

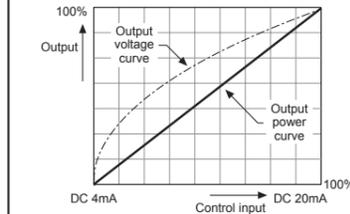
#### Output waveform of phase control

• When control input signal is 25% • When control input signal is 50% • When control input signal is 75%



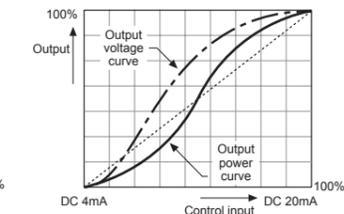
\*1: The black parts of output waveform are output on the load.

#### Power equality division type



Controls output power which is proportional to control input (4-20mA) level.

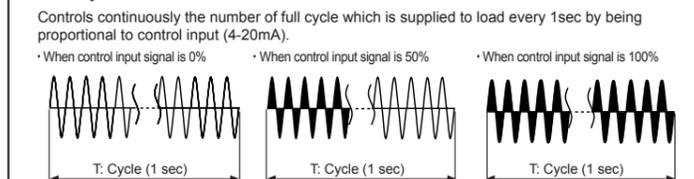
#### Phase equality division type



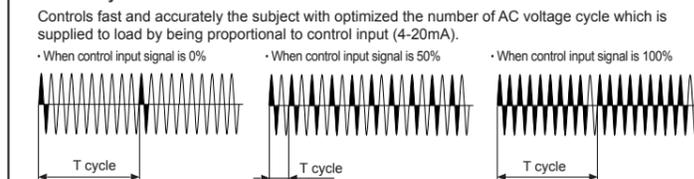
Controls phase angle which is proportional to control input (4-20mA) level.

### Cycle control

#### Fixed cycle



#### Variable cycle



## Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Install the unit in the well ventilated place.
- Ground to the heat sink, panel, or DIN rail.  
Failure to follow this instruction may result in electric shock.
- While supplying power to the load or right after turning off the power of the load, do not touch the body and heat sink.  
Failure to follow this instruction may result in a burn due to the high temperature.
- In order to protect the product from the short-circuit current of the load, use rapid fuse of which I<sup>2</sup>t is under the 1/2 of SSR I<sup>2</sup>t. When short-circuited, replace the fuse to those of same specification with the used rapid fuse.
- Install dummy resistance in parallel with the load, to keep the sum of current flowing in the load and dummy resistance being over SSR minimum load current.
- Do not use near the equipment which generates strong magnetic force or high frequency noise.
- This unit may be used in the following environments.
  - ① Indoors (in the environment condition rated in 'Specifications')
  - ② Altitude max. 2,000m
  - ③ Pollution degree 2
  - ④ Installation category III

## Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connectors/Socket
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System(Fiber, Co., Nd:YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometers/Pulse(Rate) Meters
- Display Units
- Sensor Controllers

**Autonics Corporation**  
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