

Autonics

Solid State Relay

SRPH1 SERIES

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

※Please keep these instructions and review them before using this unit.

※Please observe the cautions that follow;

Warning Serious injury may result if instructions are not followed.
Caution Product may be damaged, or injury may result if instructions are not followed.

※The following is an explanation of the symbols used in the operation manual.

Caution: Injury or danger may occur under special conditions.

Warning

- In case of using this unit with machinery(Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention equipment, etc) which may cause damages to human life or property, it is required to install fail-safe device.
It may cause a fire, human injury or damage to property.
- Install the unit on a panel.
It may give an electric shock.
- Do not connect, inspect or repair when power is on.
It may give an electric shock.
- Do not disassemble the case. Please contact us if it is required.
It may cause an electric shock or a fire.

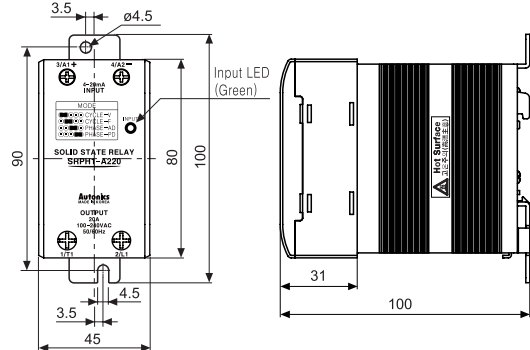
Caution

- This unit shall not be used outdoors.
It might shorten the life cycle of the product or give an electric shock.
- Please observe the rated specifications.
It might shorten the life cycle of the product and cause a fire.
- In cleaning unit, do not use water or an oil-based detergent and use dry towels.
It may cause an electric shock or a fire.
- Do not use this unit in place where there are flammable or explosive gas, humidity, direct ray of the light, radiant heat, vibration and impact etc.
It may cause a fire or an explosion.
- Do not inflow dust or wire dregs into the unit.
It may cause a fire or a malfunction.
- Do not touch SSR output terminals right after power switch OFF.
It may cause an electric shock due to an electric charge in snubber circuit.

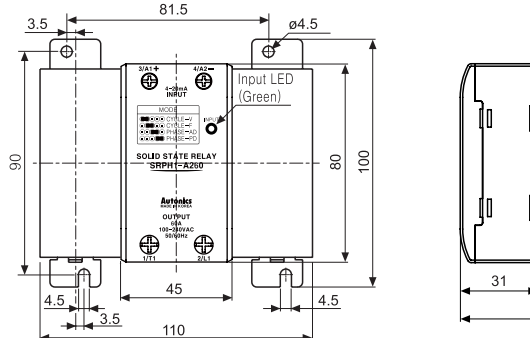
Dimensions & Mounting

Dimensions

- 20A/30A Rated load current

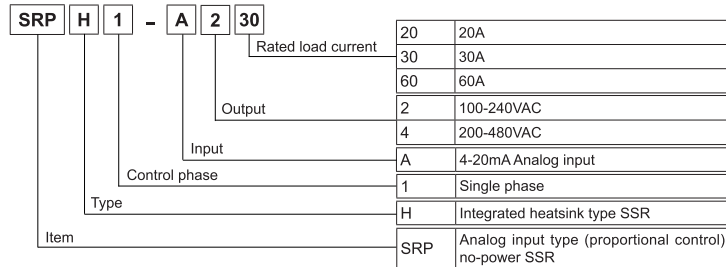


- 60A Rated load current



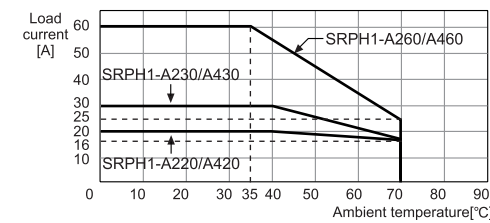
※The above specifications are subject to change and some models may be discontinued without notice.

Ordering information



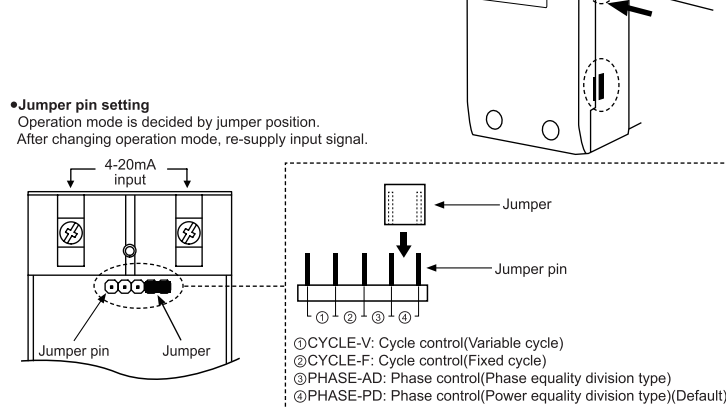
Model	Rated load current	Load voltage	Model	Rated load current	Load voltage
SRPH1-A220	20A	100-240VAC	SRPH1-A420	20A	200-480VAC
SRPH1-A230	30A		SRPH1-A430	30A	
SRPH1-A260	60A		SRPH1-A460	60A	

SSR Derating curve



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.



①CYCLE-V: Cycle control(Variable cycle)
②CYCLE-F: Cycle control(Fixed cycle)
③PHASE-AD: Phase control(Phase equality division type)
④PHASE-PD: Phase control(Power equality division type)(Default)

Specification

Input

4-20mA analog input	
Max. allowable input current	50mA
Pick-up current	4.2mA
Static off current	0.2mA
Power factor	Min. 0.9 (Max. 25° of difference between voltage phase and current phase)
Input LED	Green
Start-up time	60Hz: 600ms, 50Hz: 250ms
Operation time	60Hz: 16.6ms, 50Hz: 20ms
Operation mode ^{※1}	Cycle control(Fixed cycle, Variable cycle) Phase control(Phase equality division type, Power equality division type)

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

Output

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

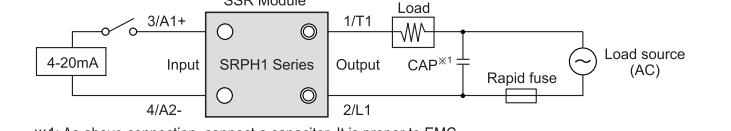
General specification

Certification	UL508, CSA22.2 No.14, IEC/EN 60947-4-3
Type of the coordination of conditional short-circuit current	type 1
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	Min. 100MΩ (at 500VDC megger)
Vibration	10 to 55Hz double amplitude 0.75mm in each X, Y, Z direction for 1 hour
Environ-ment	Ambient temperature -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 humidity 45 to 85%RH, Storage: 45 to 85%RH
Input terminal connection	Min. 1×0.5mm ² (1×AWG 20) Max. 1×1.5mm ² (2×AWG 16) or 2×1.5mm ² (2×AWG 16)
Output terminal connection	Min. 1×1.5mm ² (1×AWG 16) Max. 1×16mm ² (1×AWG 6) or 2×6mm ² (2×AWG 10) ※Connect appropriate cable for the load current capacity to output terminal.
Input terminal fixed torque	0.75 to 0.95N·m
Output terminal fixed torque	1.6 to 2.2N·m
Unit weight	SRPH1-A220, SRPH1-A230 SRPH1-A420, SRPH1-A430: Approx. 410g SRPH1-A260, SRPH1-A460: Approx. 680g

※Condition for use in Environment is no freezing or condensation.

※For wiring the terminal, an O-ring terminal must be used.

Connection

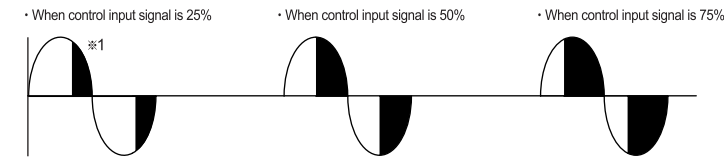


※1: As above connection, connect a capacitor. It is proper to EMC.
CAP: Load voltage 100-240VAC→1uF/250VAC, Load voltage 200-480VAC→0.47uF/500VAC

Operation mode

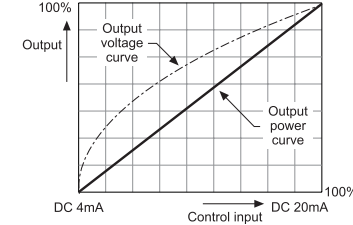
Phase control

Output waveform of phase control



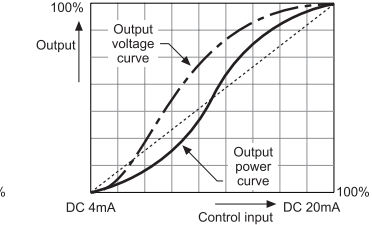
※1: The black parts of output waveform are output on the load.

Power equality division type



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

Phase equality division type

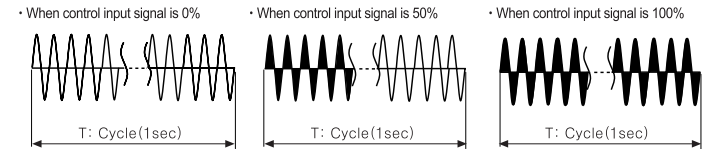


Controls phase angle which is proportional to control input (4-20mA) level.

Cycle control

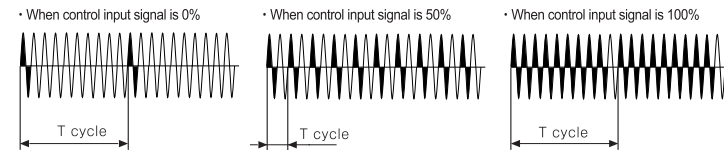
Fixed cycle

Controls continuously the number of full cycle which is supplied to load every 1sec. by being proportional to control input (4-20mA).



Variable cycle

Controls fast and accurately the subject with optimized the number of AC voltage cycle which is supplied to load by being proportional to control input (4-20mA).



Caution for using

- Ventilate for smooth convection current. If not, congested heat transfer may cause product failure or malfunction.
- For mounting multiple SSR, please keep certain installation intervals for heat prevention. For horizontal installation(when the heights of input part and output part are equal), it is recommended to apply less than 50% of the rated load current.
- Make sure do not touch the heatsink or the unit body while power is supplied or right after load power is turned OFF. If not, it may cause a burn.
- Connect the proper cable for the rated load current with output terminal.
- Use rapid fuse of which I²t is under 1/2 of SSR I²t in order to protect the unit from load's short-circuit current.
- In case of a short-circuit please replace the fuse with a 1/2 of SSR I²t value specified semiconductor protective type.
- In case that load's current is lower than SSR min. load current, connect dummy resistance to the load in parallel so as to make load's current higher than SSR min. load current.
- Make sure that the screw on output terminal is tightly fastened. Using the unit with loose bolt may cause product failure or malfunction.
- Do not touch the load's terminal even if output is OFF. It may cause an electric shock.
- The input of the 4-20mA should be supplied by the insulated and limited voltage/current or by Class 2 power supply.
- Avoid following environments to install
 - ①Where temperature/humidity is beyond the specification
 - ②Where dew condensation occurs due to temperature change
 - ③Where inflammable or corrosive gas exists
 - ④Where direct rays of light exist
 - ⑤Where severe shock, vibration or dust exists
 - ⑥Where near facilities generating strong magnetic forces or electric noise
- Installation environment
 - ①It shall be used indoor
 - ②Altitude Max. 2,000m
 - ③Pollution Degree 2
 - ④Installation Category III

※It may cause malfunction if above instructions are not followed.

Major products

- Photoelectric sensors
- Fiber optic sensors
- Door sensors
- Door side sensors
- Area sensors
- Proximity sensors
- Pressure sensors
- Rotary encoders
- Connector/Sockets
- 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, CO₂, Nd:YAG)
- Laser welding/soldering system
- Temperature controllers
- Temperature/Humidity transducers
- SSR/Power controllers
- Counters
- Timers
- Panel meters
- Tachometer/Pulse(Rate)meters
- Display units
- Sensor controllers

Autonics Corporation
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