

Series Included

Solid State

FSU1000.....	.104
FS126, FS127, FS146, FS147.....	.104
FS143, FS152, FS162.....	.105
FS200.....	.105
FS300.....	.106
FS400.....	.106
AF.....	.107

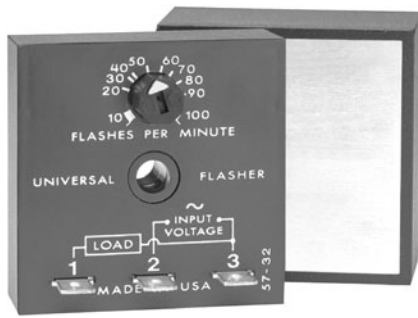
Relay

FS500.....	.107
------------	------

Chasers

SC3.....	.108
SC4.....	.108

Flashers



The FSU1000 incorporates an onboard adjustable flash rate of 10 to 100 FPM and a universal input voltage in one device. Its circuitry is encapsulated and is capable of controlling loads of up to 20A. The versatility of the FSU1000 makes it ideal for applications where various flash rates and operating voltages are required.

Operation

When input voltage is applied to terminal 2 and the load (lamp), the load energizes steadily. When input voltage is applied to terminal 3, the output flashes.

Optional Low Current Switch (S1)

This low current switch could be a limit switch or contact. While open, the operator sees the load (lamp) ON and operating. When the limit switch closes, the load (lamp) flashes to attract attention.

For more information see:

- Appendix A, page 164 for Flasher (NC) function.
- Appendix B, page 165, Figure 4 for dimensional drawing.
- Appendix C, page 168, Figure 1 for connection diagram.

Features:

- All solid state - no moving parts or contacts
- Onboard adjustable flash rate
- Loads up to 20A
- High inrush up to 200A
- Universal voltage 24 to 240VAC

Approvals:

Auxiliary Products:

- **Female quick connect:**
P/N: P1015-13 (AWG 10/12)
P/N: P1015-64 (AWG 14/16)
P/N: P1015-14 (AWG 18/22)
- **Quick connect to screw adaptor:**
P/N: P1015-18

Available Models:

- FSU1000
- FSU1003
- FSU1004

Order Table:

Rating	Inrush Rating	Part Number
1A	10A	FSU1000
6A	60A	FSU1003
10A	100A	FSU1004
20A	200A	FSU1005

Specifications

Technical Data

Operation ON/OFF recycling solid-state flasher (continuous duty)
Flash Rate Adjustable 10 - 100 FPM
ON/OFF Ratio \approx 50%
Input
Range/Frequency 24 to 240VAC/50/60Hz
Output
Load Type Inductive, resistive, or incandescent
Maximum Load Rating 1, 6, 10, or 20A steady state
Inrush 10 times steady state current

Mechanical

Mounting* Surface mount with one #10 (M5 x 0.8) screw
Dimensions 2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)
Termination 0.25 in. (6.35 mm) male quick connect terminals

Protection

Circuitry Encapsulated

Environmental

Operating / Storage Temperature . . -20° to 60°C (240VAC +50°C) / -40° to 85°C
Weight 1A units: \approx 2.4 oz (68 g)
 \geq 6A units: \approx 3.9 oz (111 g)

*Units rated \geq 6A must be bolted to a metal surface using the included heat sink compound. The maximum mounting surface temperature is 90°C.



The FS100 Series (low amp) may be used to control inductive, incandescent or resistive loads. This series offers a 1A (fullwave) or a 2A (halfwave) steady state, 10A inrush solid-state output and may be ordered with an input voltage of 24 or 120VAC. The FS100 Series offers a factory fixed flash rate of 75 FPM or may be ordered with a fixed, custom flash rate ranging from 45 to 150 FPM. Ideal for OEM applications where cost is a factor.

Operation

Upon application of input voltage, the T2 OFF time begins. At the end of the OFF time, the T1 ON time begins and the load energizes. At the end of T1, T2 begins and the load de-energizes. This cycle repeats until input voltage is removed.

Reset: Removing input voltage resets the output and the sequence to T2.

For more information see:

- Appendix A, page 164 for Flasher (OFF First) function.
- Appendix B, page 165, Figure 12 for dimensional drawing.
- Appendix C, page 168, Figure 2 for connection diagram.

Features:

- Fixed flash rate 75 FPM
- Custom flash rate 45 - 150 FPM
- 1 or 2A output
- 24 or 120VAC
- Small size: 1.5 x 0.94 in. (38 x 23.9 mm)

Approvals:

Available Models:

FS126	FS126RC-90
FS126-45	FS127
FS126-60	FS146
FS126RC	FS146RC

Order Table:

Input	Output Rating	Output Type	Load Type*	Part Number
120VAC	1A	AC, Fullwave	A	FS126
120VAC	1A	AC, Fullwave	B	FS126RC
120VAC	2A	AC, Halfwave	A	FS127
24VAC	1A	AC, Fullwave	A	FS146
24VAC	1A	AC, Fullwave	B	FS146RC
24VAC	2A	AC, Halfwave	A	FS147

***Load Type:**

- A-Incandescent & Resistive
- B-Incandescent, Resistive & Inductive

Add the suffix "-##" to any part number to indicate the custom flash rate.

Specifications

Technical Data

Operation OFF/ON solid-state flasher (continuous duty)
Flash Rate Factory fixed at 75 FPM \pm 20%
Custom Flash Rates Available From 45 - 150 FPM \pm 20%
ON/OFF Ratio \approx 50%
Input
Voltage 24, 120VAC, \pm 15%
AC Line Frequency 50/60Hz
Output
Output Fullwave AC or Halfwave rectified AC
Load Type Incandescent, resistive, or inductive
(Choose RC suffix for inductive loads)

Maximum Load Rating Fullwave: 1A steady state
Halfwave: 2A steady state
Inrush 10A

Mechanical

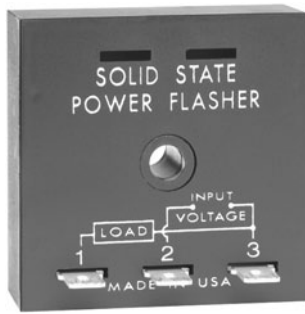
Mounting Removable mounting bracket, use one #8 (M4 x 0.7) screw
Connection/Wires 18 AWG (0.82mm²) wires 6 in. (15.2cm)
Dimensions 1.5 x 0.94 in. (38.1 x 23.9 mm)

Protection

Circuitry Encapsulated

Environmental

Operating / Storage Temperature . . -20° to 60°C / -40° to 85°C
Humidity 95% relative, non-condensing
Weight \approx 1.1 oz (31 g)



The FS100 Series (medium amp) may be used to control inductive, incandescent, or resistive loads. Input voltages of 24, 120, or 230VAC are available. Factory fixed flash rate of 90 FPM or may be ordered with a fixed, custom flash rate ranging from 10 to 300 FPM. Encapsulation provides protection against shock, vibration, and humidity. This group of solid-state flashers has proven reliability with years of use throughout the world.

Operation

Upon application of input voltage, the T2 OFF time begins. At the end of the OFF time, the T1 ON time begins and the load energizes. At the end of T1, T2 begins and the load de-energizes. This cycle repeats until input voltage is removed.

Reset: Removing input voltage resets the output and the sequence to T2.

For more information see:

- Appendix A, page 164 for Flasher (OFF First) function.
- Appendix B, page, 165, Figure 1 for dimensional drawing.
- Appendix C, page 168, Figure 3 for connection diagram.

Order Table:

Input Voltage	Rating	Part Number
24VAC	3A	FS143
120VAC	3A	FS152
230VAC	3A	FS162

Add the suffix "-##" to any part number to indicate the custom flash rate.

Specifications

Technical Data

Operation	OFF/ON solid-state flasher (continuous duty)
Flash Rate	Fixed at 90 FPM ±10%
Custom Flash Rates	10 - 300 FPM ±10%
ON/OFF Ratio	≅ 50%

Input

Voltage/Frequency 24, 120, or 230VAC ±15%/50/60 Hz

Output

Load Type Inductive, resistive, or incandescent
Output Fullwave AC, solid state, SPST

Maximum Load Rating	3A steady state
Inrush	10 times steady state current

Mechanical

Mounting	Surface mount with one #10 (M5 x 0.8) screw
Dimensions	2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals

Protection

Circuitry Encapsulated

Environmental

Operating / Storage Temperature	-20° to 60°C / -40° to 85°C
Weight	≅ 2.2 oz (62 g)

Features:

- Fixed at 90 FPM
- Custom flash rate 10 - 300 FPM
- Switches inrush currents up to 30A
- 24, 120, or 230VAC input voltages
- Totally solid state & encapsulated

Approvals:   

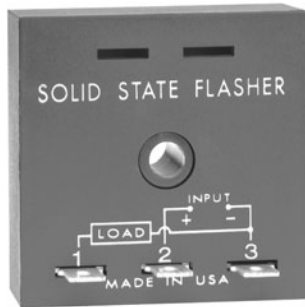
Auxiliary Products:

- **Female quick connect:**
P/N: P1015-64 (AWG 14/16)
- **Quick connect to screw adaptor:**
P/N: P1015-18
- **Mounting bracket:** P/N: P1023-6
- **DIN rail:** P/N: C103PM (Al)
- **DIN rail adaptor:** P/N: P1023-20

Available Models:

FS143	FS152-60
FS152	FS162
FS152-30	FS162-30
FS152-50	

If desired part number is not listed, please call us to see if it is technically possible to build.



The FS200 Series may be used to control inductive, incandescent, or resistive loads. Input voltages of 12, 24, 36, 48, or 110VDC are available. Factory fixed flash rate of 90 FPM or may be ordered with a fixed custom flash rate ranging from 10 to 180 FPM. Encapsulation provides protection against shock, vibration, and humidity. Uniform performance, high inrush current capability, and low RFI, make this series ideal for general industrial applications.

Operation

Upon application of input voltage, the T2 OFF time begins. At the end of the OFF time, the T1 ON time begins and the load energizes. At the end of T1, T2 begins and the load de-energizes. This cycle repeats until input voltage is removed.

Reset: Removing input voltage resets the output and the sequence to T2.

For more information see:

- Appendix A, page 164 for Flasher (OFF First) function.
- Appendix B, page, 165, Figure 1 for dimensional drawing.
- Appendix C, page 168, Figure 4 for connection diagram.

Order Table:

Input Voltage	Rating	Part Number
12VDC ±20%	3A	FS219
24VDC ±20%	3A	FS224
36VDC ±20%	1A	FS236
48VDC ±15%	0.75A	FS248
110VDC ±15%	0.25A	FS290

Specifications

Technical Data

Operation	OFF/ON solid-state flasher (continuous duty)
Flash Rate	Fixed at 90 FPM ±10%
Custom Flash Rate	10 - 180 FPM
ON/OFF Ratio	≅ 50%

Input

Voltage 12, 24, 36, 48, or 110VDC

Output

Load Type Inductive, resistive, or incandescent
Maximum Load Rating 0.25 - 3A steady state
OFF State Leakage Current
12 & 24VDC ≤ 250 μA

Inrush	10 times steady state current
--------	-------------------------------

Mechanical

Mounting	Surface mount with one #10 (M5 x 0.8) screw
Dimensions	2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals

Protection

Circuitry Encapsulated

Environmental

Operating / Storage Temperature	-20° to 60°C / -40° to 85°C
Weight	≅ 2.2 oz (62 g)

Features:

- Fixed at 90 FPM
- Custom flash rate 10 - 180 FPM
- 3A, SPST output contact
- 12 to 110VDC input voltages in 5 ranges
- Totally solid state & encapsulated
- 0.25 in. (6.35 mm) male quick connects

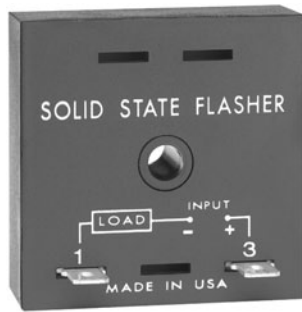
Auxiliary Products:

- **Female quick connect:**
P/N: P1015-64 (AWG 14/16)
- **Quick connect to screw adaptor:**
P/N: P1015-18
- **Mounting bracket:** P/N: P1023-6
- **DIN rail:** P/N: C103PM (Al)
- **DIN rail adaptor:** P/N: P1023-20

Available Models:

FS224

If desired part number is not listed, please call us to see if it is technically possible to build.



The FS300 Series of solid-state flashers were specifically designed to operate lamp loads. Their two-terminal series connection feature makes installation easy. The high immunity to line noise and transients makes the FS300 Series ideal for moving vehicle applications. All solid-state construction means reliability and long life. The FS300 Series offers a factory fixed flash rate of 75 FPM or may be ordered with a fixed, custom flash rate ranging from 60 to 150 FPM.

Operation

Upon application of input voltage, the T2 OFF time begins. At the end of the OFF time, the T1 ON time begins and the load energizes. At the end of T1, T2 begins and the load de-energizes. This cycle repeats until input voltage is removed.

Reset: Removing input voltage resets the output and the sequence to T2.

For more information see:

Appendix A, page 164 for Flasher (OFF First) function.
Appendix B, page 165, Figure 1 for dimensional drawing.
Appendix C, page 168, Figure 5 for connection diagram.

Order Table:

Input	Maximum Current Load	Part Number
12VDC ±20%	2.5A	FS312
24VDC ±20%	1.5A	FS324
36VDC ±20%	1A	FS336
48VDC ±15%	0.75A	FS348
72VDC ±15%	0.5A	FS372
110VDC ±15%	0.25A	FS390

Specifications

Technical Data

Operation.....OFF/ON recycling solid-state flasher (continuous duty)
Flash Rate.....Fixed at 75 FPM ±10%
Custom Flash Rates.....60 - 150 FPM
ON/OFF Ratio.....≥ 50%
Input
Voltage.....12, 24, 36, 48, 72, & 110VDC
Output
Load Type.....Incandescent or resistive
Maximum Load Rating.....0.25 - 2.5A steady state
Inrush.....10 times steady state current

Mechanical

Mounting.....Surface mount with one #10 (M5 x 0.8) screw
Dimensions.....2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)
Termination.....0.25 in. (6.35 mm) male quick connect terminals
Protection
Circuitry.....Encapsulated
Environmental
Operating / Storage Temperature.....-20° to 60°C / -40° to 85°C
Humidity.....95% relative, non-condensing
Weight.....≈ 2.2 oz (62 g)

Features:

- All solid state - no moving parts or contacts
- High surge capability - designed to operate incandescent lamp loads
- High noise & transient protection
- Two-terminal series connection
- Encapsulated - protects against shock, vibration, & humidity

Auxiliary Products:

- **Female quick connect:**
P/N: P1015-64 (AWG 14/16)
- **Quick connect to screw adaptor:**
P/N: P1015-18
- **Mounting bracket:** P/N: P1023-6
- **DIN rail:** P/N: C103PM (Al)
- **DIN rail adaptor:** P/N: P1023-20

Available Models:

FS312
FS324
FS336
FS390



The FS400 Series is a low leakage AC flasher designed to control LED, or resistive loads. This series offers a solid-state output and may be ordered with an input voltage of 24V to 240VAC, in two ranges. It offers a factory fixed flash rate of 75 FPM or may be ordered with a fixed, custom flash rate ranging from 45 to 150 FPM. The FS400 is the perfect solution for LED lamp flashing.

Operation

Upon application of input voltage, the output energizes and the ON time begins. At the end of the ON time, the output de-energizes and the OFF time begins. At the end of the OFF time, the output energizes and the cycle repeats as long as input voltage is applied.

Reset: Removing input voltage resets the output and the flash sequence.

For more information see:

Appendix A, page 164 for Flasher (ON First) function.
Appendix B, page 165, Figure 12 for dimensional drawing.
Appendix C, page 168, Figure 6 for connection diagram.

Order Table:

Input Voltage	Output Rating	Part Number
120 to 240VAC	0.5A	FS491
24VAC	1A	FS421

Specifications

Technical Data

Operation.....ON/OFF solid-state flasher (continuous duty)
Flash Rate.....Fixed at 75 FPM ±20%
Custom Flash Rates.....45 - 150 FPM ±20%
ON/OFF Ratio.....≥ 50%
Input
Voltage.....24, or 120 - 240VAC
Tolerance.....± 15%
AC Line Frequency.....50/60Hz
Output
Load Type.....LED or resistive
Output.....Bridge Rectifier & FET
Maximum Load Rating
120VAC to 240VAC.....0.5A steady state; 5A inrush
24VAC.....1A steady state; 10A inrush

Max. Load Leakage Current.....250µA
Voltage Drop.....2V typical
Mechanical
Mounting.....Surface mount with one #8 (M4 x 0.7) screw
Dimensions.....1.5 x 0.94 in. (38.1 x 23.9 mm)
Protection
Surge.....IEEE C62.41 - 1991 Level A
Circuitry.....Encapsulated
Environmental
Operating / Storage Temperature.....-20° to 60°C / -40° to 85°C
Humidity.....95% relative, non-condensing
Weight.....≈ 1.1 oz (31 g)

Features:

- Low leakage for LED lamps
- Fixed flash rate at 75 FPM
- Custom flash rate 45 - 150 FPM
- 0.5 or 1A, solid-state output
- 24V to 240VAC in 2 ranges
- Small size: 1.5 x 0.94 in. (38 x 23.9 mm)

Approvals:

Available Models:

FS491



The FS500 Series flash rate is adjustable from 10 to 100 FPM. A locknut is provided to hold selected flash rate. The long-life electronic circuit combined with a quality electromechanical relay provides flexibility and reliability in most applications.

Operation

Upon application of input voltage, the output relay is energized and the ON time begins. At the end of the ON time, the output relay de-energizes and the OFF time begins. At the end of the OFF time, the output is energized and the cycle repeats as long as input voltage is applied. Reset: Removing input voltage resets the output and the sequence.

For more information see:
Appendix A, page 164 for Flasher (ON First-DPDT) function.
Appendix B, page 165, Figure 9 for dimensional drawing.
Appendix C, page 168, Figure 8 for connection diagram.

Order Table:

Input Voltage	Part Number
12VDC	FS512
24VAC/DC	FS524
120VAC/DC	FS590
230VAC	FS599

Specifications

Technical Data	
Operation	ON/OFF recycling flasher with adjustable flash rate
Flash Rate	Adjustable from 10 - 100 operations per minute (guaranteed range)
ON/OFF Ratio	≈ 50%
Input	
Input Voltage	12VDC, 24VAC/DC, 120VAC/DC, 230VAC
Tolerance	12VDC & 24VDC/AC .....-15% - 20%
	120 - 230VAC/DC .....-20% - 10%
AC Line Frequency	50/60Hz
Output	
Load Type	Electromechanical relay

Form	.....DPDT
Rating	.....10A resistive @ 120/240VAC & 28VDC; 1/3 hp @ 120/ 240VAC
Mechanical	
Mounting	.....Plug-in socket
Dimensions	.....3.62 x 2.39 x 1.78 in. (91.6 x 60.7 x 45.2 mm)
Termination	.....Octal 8-pin plug-in
Protection	
Isolation Voltage	.....≥ 1500V RMS input to output
Polarity	.....DC units are reverse polarity protected
Environmental	
Operating / Storage Temperature	.....-20° to 60°C / -30° to 85°C
Weight	.....≈ 5.8 oz (164 g)

Features:

- Solid-state circuitry - relay output
- Industrial standard octal plug-in
- Adjustable flash rate 10 - 100 FPM
- 10A, DPDT output contacts

Approvals:   (some models)

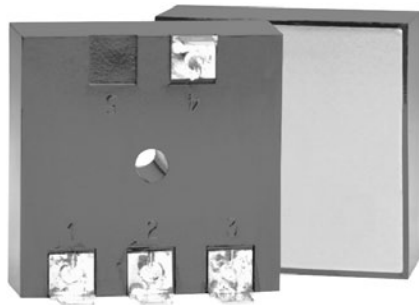
Auxiliary Products:

- **Panel mount kit:** P/N: BZ1
- **Octal 8-pin socket:** P/N: NDS-8
- **Hold-down clips (sold in pairs):** P/N: PSC8 (NDS-8)
- **DIN rail:** P/N: C103PM (AI)

Available Models:

FS512
FS524
FS590

If desired part number is not listed, please call us to see if it is technically possible to build.



The AF Series offers a high inrush capacity of up to 200A. These devices exceed mechanical type relays in both performance and lifespan. The AF Series is constructed with no moving parts to arc, wear, and eventually fail; 100 million operations are typical. Circuitry is encapsulated to provide protection against vibration and moisture, making the AF Series ideal for outdoor applications.

Operation

Upon application of input voltage T1 begins, Load 1 is ON and Load 2 is OFF. At the end of T1, T2 begins and Load 2 is now ON and Load 1 is OFF. At the end of T2, T1 repeats and this sequence continues until input voltage is removed. The duration of T1 and T2 is approximately equal.

Reset: Removing input voltage resets the flasher.

For more information see:
Appendix A, page 164 for Flasher (Alternating) function.
Appendix B, page 166, Figure 13 for dimensional drawing.
Appendix C, page 168, Figure 7 for connection diagram.

Order Table:

AF	X	X	X
Input Voltage	Output Rating	Flash Rate (flashes per min.)	
-1 - 24VAC	-1 - 6A	-1 - 10	
-2 - 120VAC	-2 - 10A	-2 - 30	
-3 - 230VAC	-3 - 20A	-3 - 60	
		-4 - 90	
		-5 - 120	
		-6 - 140	
		-Blank - Custom Flash Rate	

Features:

- Alternately flashes two high current loads
- High surge capacity - up to 200A
- Small size - 2 x 2 x 1.30 in. (50.8 x 50.8 x 33 mm)
- Totally solid state & encapsulated

Auxiliary Products:

- **Female quick connect:** P/N: P1015-13 (AWG 10/12)
P/N: P1015-64 (AWG 14/16)
P/N: P1015-14 (AWG 18/22)
- **Quick connect to screw adaptor:** P/N: P1015-18

Available Models:

AF213
AF223
AF232
AF233

If desired part number is not listed, please call us to see if it is technically possible to build.

Specifications

Technical Data	
Operation	.....Alternating solid-state flasher rated (continuous duty)
Flash Rate	.....Factory fixed at 10, 30, 60, 90, 120, or 140 flashes per min. ±10%.
Custom Flash Rate	.....10 - 140 FPM
Ratio	.....≈ 50%
Input	
Input Voltage/Frequency	.....24, 120, or 230VAC ±15% / 50/60Hz
Output	
Load Type	.....Incandescent or resistive
Maximum Load Rating	......6, 10, & 20A steady state

Inrush	.....10 times steady state current
Mechanical	
Mounting*	.....Surface mount with one #10 (M5 x 0.8) screw
Dimensions	.....2 x 2 x 1.30 in. (50.8 x 50.8 x 33 mm)
Protection	
Circuitry	.....Encapsulated
Environmental	
Operating / Storage Temperature	.....-20° to 60°C / -40° to 85°C
Humidity	.....95% relative, non-condensing
Weight	.....≈ 2.9 oz (82 g)
*Must be bolted to metal surface using the included heat sink compound. The maximum mounting surface temperature is 90°C.	



The SC3/SC4 Series are solid-state 3 or 4 channel, chasers designed for sequential three or four circuit flashing of incandescent lamp loads. Unlike electromechanical chasers, there are no contacts to arc, wear, and eventually fail. Fixed or adjustable rates of 30 to 300 operations per minute.

Operation

Sequential 3 or 4 circuit flashing of incandescent loads with equal time delays for each load. Upon application of input voltage, Load 1 is energized. At the end of the time delay, Load 1 de-energizes and Load 2 energizes. At the end of the time delay, Load 2 de-energizes and Load 3 energizes. This cycle continues until input voltage is removed.

Reset: Removing input voltage resets the unit and cycle.

For more information see:


Appendix A, page 164 for Flasher (Chasing) function.

Appendix B, page 166, Figure 14 for dimensional drawing.

Appendix C, page 168, Figure 9 for connection diagram.

Features:

- Sequential 3 or 4 circuit flashing of incandescent loads
- Fixed or adjustable at 30 - 300FPM
- 1A steady state output
- 24, 120, or 230VAC input voltage
- Totally solid state - encapsulated

Approvals: 

Auxiliary Products:

- **Quick connect to screw adaptor:**
P/N: P1015-18
- **Female quick connect:**
P/N: P1015-13 (AWG 10/12)
P/N: P1015-64 (AWG 14/16)
P/N: P1015-14 (AWG 18/22)

Available Models:

SC3120F30

If desired part number is not listed, please call us to see if it is technically possible to build.

Order Table:

<u>SC3 (3 outputs)</u>	<u>X</u>	<u>X</u>
<u>SC4 (4 outputs)</u>	<u>Input Voltage</u>	<u>Rate</u>
	-24 - 24VAC	-A - Adjustable (30 - 300)
	-120 - 120VAC	-F - Fixed*
	-230 - 230VAC	

*If Fixed is selected, insert (30 - 300) operations per minute.

Specifications

Technical Data		Protection	Encapsulated
Operation	Sequential 3 or 4 circuit flashing of incandescent lamp loads. Fixed or adjustable rates.	Circuitry	≥ 2000V RMS terminals to mounting surface
Rate	Adjustable: 30 - 300 operations per minute Fixed: 30 - 300 operations per minute (±10%)	Dielectric Breakdown	≥ 100 MΩ
Input		Insulation Resistance	≥ 100 MΩ
Voltage	24, 120, or 230VAC ±15%	Environmental	
AC Line Frequency	50/60 Hz	Operating / Storage Temperature	-20° to 60°C / -40° to 85°C
Output		Humidity	95% relative, non-condensing
Type	Solid state	Weight	≈ 5.4 oz (153 g)
Rating	1A steady state per output		
Mechanical			
Mounting	Surface mount with two #6 (M3.5 x 0.6) screws		
Termination	0.25 in. (6.35 mm) male quick connect terminals		
Dimensions	3.5 x 2.5 x 1.22 in. (88.9 x 63.5 x 31 mm)		