

S, SC

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Timers

Programmable Quartz Timer, Multi-function

Type S 1321

CARLO GAVAZZI



- Programmable microprocessor-based quartz timer with 3-digit 7-segment display
- 22 functions within delay on operate, interval timer, pulse continuity, symmetrical recycler, asymmetrical recycler
- Time ranges: 10 ms to 999 hrs
- Repeatability deviation: $\leq 0.1\%$
- Built-in memory
- Direct connection for NPN sensor
- Output 8 A DPDT relay
- Plug-in type module
- S -housing
- LED-indication for relay and power supply on
- AC or DC power supply

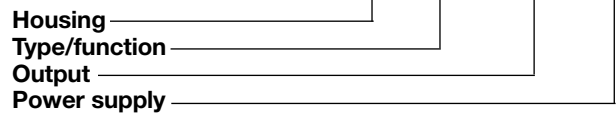
Product Description

Programmable, plug-in, microprocessor-based multi-function time relay with 22 selectable modes of operation and time range from 10 ms to 999 h. Function and time settings

easily read on built-in LED-display. Applicable for most functions where a timer is needed. Controlled by contact, open collector output, sensor or power supply.

Ordering Key

S 1321 166 024



Type Selection

Plug	Output	Time range	Supply: 24 VAC	Supply: 115 VAC	Supply: 230 VAC	Supply: 24 VDC
Circular	DPDT	10 ms - 999 h	S 1321 166 024	S 1321 166 115	S 1321 166 230	S 1321 166 724

Time Specifications

Time ranges	10 ms - 999 h
Repeatability deviation	$\leq 0.1\%$
Time variation Within rated ambient temp.	$\leq 0.004\%/^{\circ}\text{C}$
Reset	
Time and/or relay	Intercon. pins 5 & 7, pin 5 pos., 12 VDC, 6 mA ≥ 10 ms
Pulse duration	Min. 200 ms (not in functions with memory)
Power supply interruption	12 VDC, 10 mA intercon. pins 6 & 7, pin 6 pos.
Sensor supply output	Note: pins 6 & 7 must not be short-circuited

Output Specifications

Output	DPDT relay
Basic electrical insulation	250 VAC (rms) (contacts/elec., contact/contact)
Contact ratings (AgCdO)	μ (micro gap)
Resistive loads AC 1	8 A/250 VAC (2000 VA)
DC 1	0.4 A/250 VDC (100 W)
or	4 A/25 VDC (100 W)
Small inductive loads AC 15	2.5 A/230 VAC
DC 13	5 A/24 VDC
Mechanical life	$\geq 30 \times 10^6$ operations
Electrical life (at max. load) AC 1	$\geq 2.5 \times 10^5$ operations
Operating frequency	≤ 7200 operations/h
Insulation voltages	
Rated insulation voltage	≥ 2.0 kVAC (rms) (cont./elec.)
Rated transient protection volt.	4 kV (1.2/50 μs) (cont./elec.) (IEC 60664)



Supply Specifications

Power supply AC types		Overvoltage cat. III (IEC 0664)
Rated operational voltage through pins 2 & 10	230	230 VAC ± 15%, 45 to 65 Hz
	115	115 VAC ± 15%, 45 to 65 Hz
	024	24 VAC ± 15%, 45 to 65 Hz
Drop-out tolerance		≥ 40 ms
Rated insulation voltage		≥ 2.0 kVAC (rms)
Rated transient protection volt.		4 kV (1.2/50 μs) (line/neutral)
Power supply DC type		Installation cat. III (IEC 60664)
Rated operational voltage	724	24 VDC ± 15% (pin 2/A1 pos.)
Rated insulation voltage		None
Rated transient protection volt.		800 V (1.2/50 μs)
Consumption	AC supply	4 VA
	DC supply	3 W

General Specifications

Power ON delay	< 200 ms
Power OFF delay	min. 200 ms
Indication for	
Power supply ON	LED, green
Output ON	LED, yellow
Environment	
Degree of protection	IP 20 B
Pollution degree	2 (IEC 60664)
Operating temperature	-20° to +50°C (-4° to +122°F)
Storage temperature	-50° to +85°C (-58° to +185°F)
Weight	
AC supply	200 g
DC supply	125 g
Approvals	UL, CSA
CE Marking	Yes
Display	LEDs: 3-digit, 7-segment indicates remaining time 7 mm
Height of digits	
Memory	Selected time and function are stored in RAM module approx. 10 years
Accuracy	0.02%

Mode of Operation

Function 1: Delay on operate, aut. start, no restart, no time reset.

Function 2: Delay on operate, aut. start, no restart, man. time reset.

Function 3: Delay on operate, aut. start, man. restart, no time reset.

Function 4: Delay on operate, aut. start, man. restart, man. time reset.

Function 5: Delay on operate, man. start, man. restart, no time reset.

Function 6: Delay on operate, man. start, man. restart, man. time reset.

Function 7: Delay on operate, man. start, man. restart, no time reset, memory.

Function 8: Delay on operate, man. start, man. restart, man. time reset, memory.

Function 9: Interval timer, aut. start, no restart, no time reset.

Function 10: Interval timer, aut. start, no restart, man. time reset.

Function 11: Interval timer, aut. start, man. restart, no time reset.

Function 12: Interval timer, aut. start, man. restart, man. time reset.

Function 13: Interval timer, man. start, man. restart, no time reset.

Function 14: Interval timer, man. start, man. restart, man. time reset.

Function 15: Interval timer, man. start, man. restart, no time reset, memory.

Function 16: Interval timer, man. start, man. restart, man. time reset, memory.

Function 17: Pulse continuity, aut. start, man. restart, man. time reset.

Function 18: Pulse continuity, man. start, man. restart, man. time reset.

Function 19: Symmetrical/asymmetrical recycler, aut. start, OFF-time first.

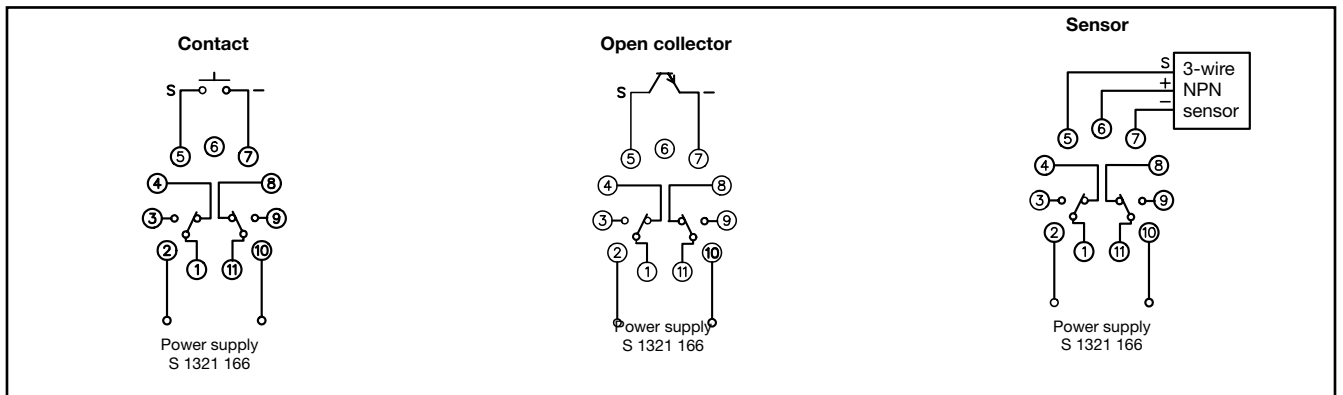
Function 20: Symmetrical/asymmetrical recycler, aut. start, ON-time first.

Function 21: Symmetrical/asymmetrical recycler, aut. start, OFF-time first, memory.

Function 22: Symmetrical/asymmetrical recycler, aut. start, ON-time first, memory.

Note: In function 00 the timer is on standby.

Wiring Diagrams



Function/Time Setting

Programming of function and/or time range

Press FUNC and TIME buttons simultaneously for approx. 3 s. When display shows "--" release switches and press immediately FUNC or TIME respectively for programming function number and/or time.

Programming of function

In programming mode, press TIME to increment right flashing digit. Press FUNC to proceed to next digit and TIME to increment it, etc. Press FUNC to end programming sequence. If a higher number

than 22 is selected for function, the display show "Err". After approx. 3 s the display returns to the last selected function and a new function number can be selected.

Programming of time

In time programming mode, press TIME to increment first flashing digit. Press FUNC to go to next digit. Press TIME again to increment this digit, etc.

To select decimal point, press FUNC and TIME to change position (xxx. or xx.x or x.xx).

To select time range, press FUNC and press TIME to change position of time range indicator on the display (S for seconds, M for minutes, H for hours). Press FUNC to accept.

If a recycler function has been selected, press FUNC to set second time value after the same criteria as above. Finally, press FUNC to end programming sequence.

Status of time/function

During operation the selected function and time values may be read without disturbing the operation.

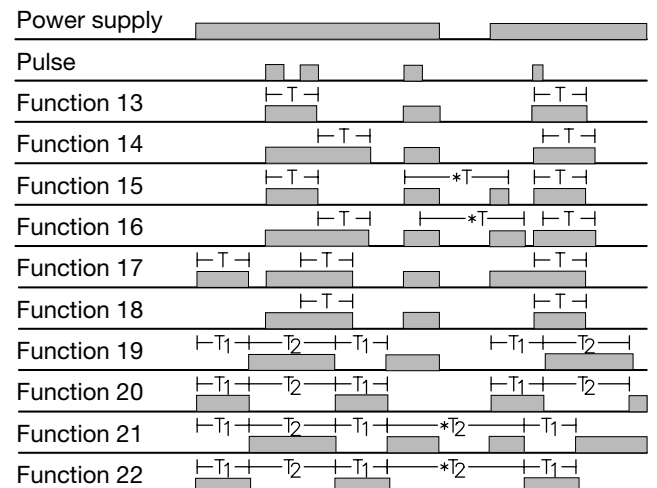
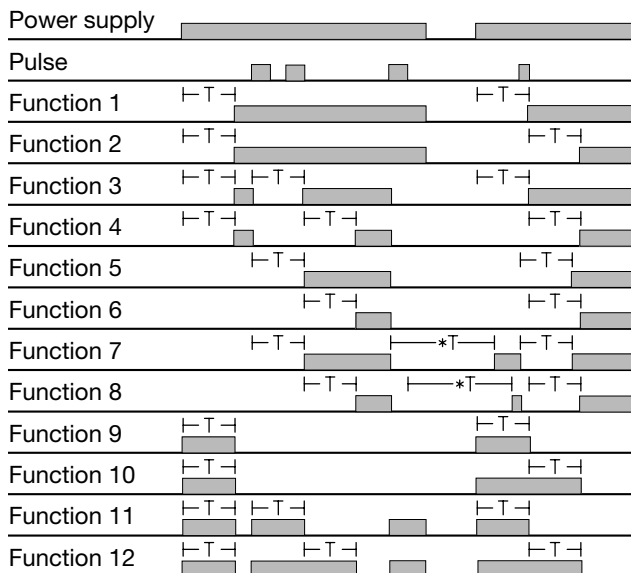
Status of selected function

Press FUNC. The display shows function number. When the button is released, the display returns to current time value.

Status of selected time

Press TIME. The display shows selected time value. For recyclers press TIME twice to read second time range. When the button is released, the display shows selected time range for approx. 3 s before returning to current time value.

Mode of Operation



* Memory whose contents are retained when there is a loss power supply. Counting is continued at reconnection of power supply. One time unit may be lost.

Timers

Digital Multi-function

Type S 1331

CARLO GAVAZZI



- μ P-based digital multi-function timer
- 10 functions within delay on operate, interval timer, symmetrical recycler, recycler with fixed ON time, time period multiplier
- Time ranges: 0.01 s to 99 h
- Digital trigger input for time start and reset
- Time stop input
- Four yellow LEDs each indicating 25% of remaining time
- Connection for NPN sensor
- Plug-in module, S-housing
- Output: 5 A SPDT relay
- LED-indication for relay and power supply ON
- AC or DC power supply

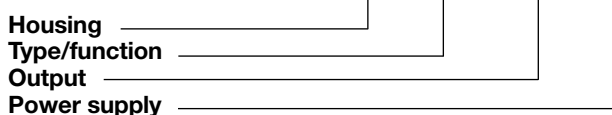
Product Description

Plug-in, μ P-based, multifunction time relay with 10 selectable modes of operation and time ranges from 10 ms to 99 h. Function and time range setting by 3 rotary switches in

the front. Time setting by two digital thumb-wheel switches in the front. Time controlled by contact, open collector output (NPN) or power supply.

Ordering Key

S 1331 156 230



Type Selection

Plug	Output	Supply: 24 VAC	Supply: 115 VAC	Supply: 230 VAC	Supply: 24 VDC
Circular	SPDT	S 1331 156 024	S 1331 156 115	S 1331 156 230	S 1331 156 724

Time Specifications

Time ranges Selectable by rotary switches	0.01 - 0.99 s 0.1 - 9.9 s 1 - 99 s 0.01 - 0.99 m 0.1 - 9.9 m 1 - 99 m 0.01 - 0.99 h 0.1 - 9.9 h 1 - 99 h
Accuracy	$\leq 0.5\%$, ± 20 ms
Repeatability deviation	$\leq 0.01\%$
Time variation within rated ambient temp.	0.008%/°C
Reset	
Time and/or relay	Interconnect pins 5 & 7 24 VDC, 5 mA
Time stop	Interconnect pins 7 & 8 24 VDC, 5 mA
Input interruption	≥ 10 ms
Sensor supply output	Pins 6 & 7, pin 6 positive 24 VDC, 10 mA

Output Specifications

Output	SPDT
Rated insulation voltage	250 VAC (rms) (cont./elect.)
Contact ratings (AgCdO)	μ (micro gap) (IEC 60947-5-1/IEC 60337)
Resistive loads	AC 1 DC 1 5 A, 250 VAC 5 A, 24 VDC
Small inductive loads	AC 15 DC 13 2 A, 250 VAC 3 A, 24 VDC
Mechanical life	$\geq 40 \times 10^6$ operations
Electrical life	10^5 operations (at max. load)
Operating frequency	\leq typ. 50 Hz
Operating time	< 10 ms
Release time (at nom. supply)	< 6 ms
Dielectric strength	
Dielectric (AC rms) test voltage	≥ 2.0 kVAC (rms) (cont./elect.)
Rated impulse withstand voltage	4 kV (1.2/50 μ s) (cont./elect.) (IEC 60664)



Supply Specifications

Power supply AC types	Overvoltage cat. III (IEC 60664)
Rated operational voltage through pins 2 & 10	230 230 VAC ±15%, 45 to 65 Hz
	115 115 VAC ±15%, 45 to 65 Hz
	024 24 VAC ±15%, 45 to 65 Hz
Voltage interruption	≤ 40 ms
Rated insulation voltage	≥ 250 VAC (rms)
Rated operational power	3.0 VA
Rated impulse withstand voltage	4 kV (1.2/50 μs) (line/neutral)
Power supply DC type	Overvoltage cat. III (IEC 60664)
Rated operational volt.	724 24 VDC ±15% (pin 2 pos.)
Rated insulation voltage	None
Rated operational power	1.5 W
Rated impulse withstand voltage	800 V (1.2/50 μs)

General Specifications

Power ON delay	≤ 150 ms
Power OFF delay	≥ 200 ms
Indication for	
Power supply ON	LED, green
Output ON	LED, yellow
Remaining time to elapse	4 LEDs, yellow, 25% each
Environment	
Degree of protection	IP 20 B
Pollution degree	2 (IEC 60664)
Operating temperature	0° to +50°C (+34° to +122°F)
Storage temperature	-50° to +85°C (-58° to +185°F)
Weight	AC supply 200 g
	DC supply 125 g
Approvals	UL, CSA
CE Marking	Yes

Mode of Operation

In connection with all functions automatic start is possible by permanent interconnection of pins 5 & 7.

Function 0: Delay on operate, leading edge, man. start, man. restart, man. time reset.

Function 1: Interval timer, leading edge, man. start, man. restart, man. time reset.

Function 2: Symmetrical recycler, OFF-time first, leading edge, man. start, man. restart, no time reset.

Function 3: Symmetrical recycler, ON-time first, leading edge, man. start, man. restart, no time reset.

Function 4: Delay on operate, trailing edge, man. start, man. restart, man. time reset.

Function 5: Interval timer, trailing edge, man. start, man. restart, man. time reset.

Note: The output relay only operates when the time period is running.

Function 6: Interval timer, trailing edge, man. start, man. restart, man. time reset.

Function 7: Delay on operate, leading edge, man. start, man. restart, man. time reset.

Note: The relay releases on trailing edge, which means the trigger pulse must be of longer duration than the time period.

Function 8: Recycler with fixed ON-time, leading edge, man. start, man. restart, no time reset. Fixed ON-time: approx. 0.5 sec.

Function 9: Time period multiplier, leading edge, man. start, man. restart, man. time reset.

Note: Each pulse input adds the set time the total timing period. Max. time period memory is 256 pulses.

Time stop function: By interconnection of pins 7 & 8 the time function stops, and the output relay remains either released or operated. By disconnection of pins 7 & 8 the remaining time continues to elapse.

Function and Time Setting

Adjustable time setting by two digital thumb-wheel switches (1-99)

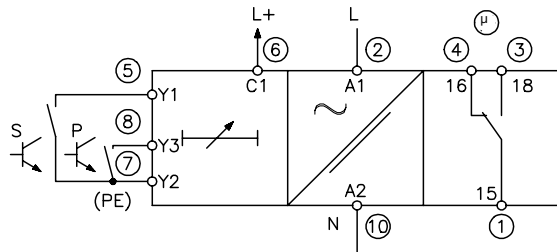
Upper knob: Time period multiplier x 0.01, x 0.1 and x 1.0.

Centre knob: Selection of time range (seconds, minutes and hours).

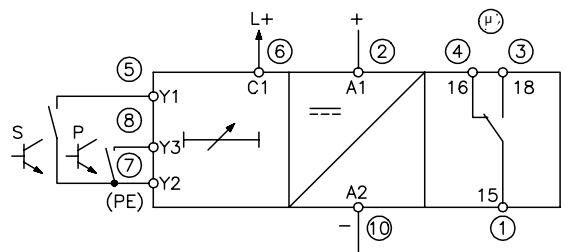
Lower knob: Selection of function.

Wiring Diagrams

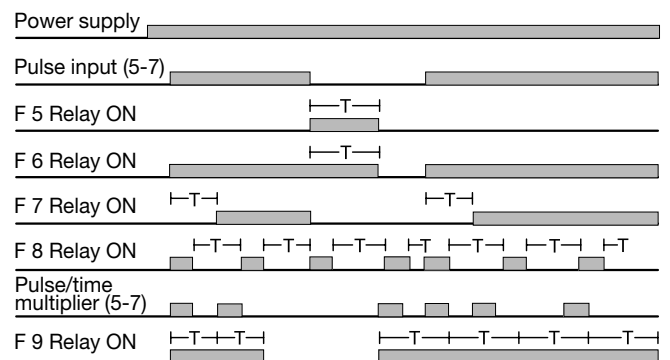
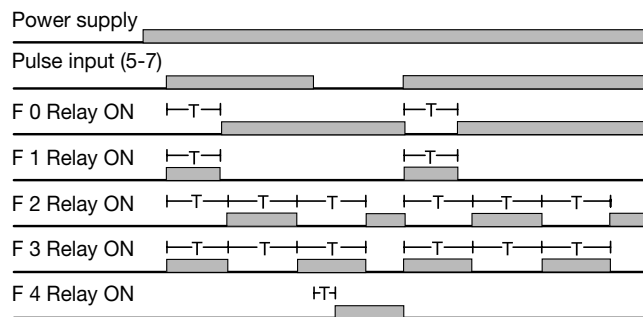
AC



DC



Operation Diagrams



Timers Interval Types SC 210, SC 215

CARLO GAVAZZI



SC 210



SC 215

- One shot at supply on and/or supply off
- Automatic start
- SC 210: Fixed pulse duration: 0.5 s
- SC 215: Knob-adjustable time pulse duration: 0.15 - 3 s
- Output: 8 A DPDT relay
- Plug-in type module
- S-housing
- LED-indication for relay on
- AC or DC power supply

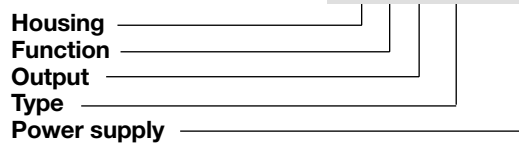
Product Description

Mono-function plug-in, one-shot interval timers featuring 3 modes of operation. Fixed or knob-adjustable pulse time duration. Often used together

with other time relays from Carlo Gavazzi's product range, e.g. in connection with the delay on operate function.

Ordering Key

SC 210 024



Type Selection, Fixed Pulse Duration (0.5 sec.)

Plug	Output	Supply: 24 VAC	Supply: 115 VAC	Supply: 230 VAC	Supply: 24 VDC
Circular	DPDT	SC 210 024	SC 210 115	SC 210 230	SC 210 724

Type Selection, Knob-adjustable Pulse Duration (0.15 - 3 sec.)

Plug	Output	Supply: 24 VAC	Supply: 115 VAC	Supply: 230 VAC	Supply: 24 VDC
Circular	DPDT	SC 215 024	SC 215 115	SC 215 230	SC 215 724

Time Specifications

Pulse duration	SC 210	0.5 s +0.5/-0.2 s
	SC 215	0.15 - 3 s
Time range accuracy		± 20%

Supply Specifications

Power supply AC types		Over voltage cat. III (IEC 664)
Rated operational voltage through pins 2 & 10	230	230 VAC ± 15%, 45 to 65 Hz
	115	115 VAC ± 15%, 45 to 65 Hz
	024	24 VAC ± 15%, 45 to 65 Hz
Drop-out tolerance		≥ 40 ms
Rated insulation voltage		≥ 2.0 kVAC (rms) (supply/elec.)
Rated transient protection volt.		4 kV (1.2/50 μs)(line/neutral)
Power supply DC type		Installation cat. III (IEC 664)
Supply voltage	724	24 VDC ± 15% (pin 2 pos.)
Rated insulation voltage		None
Rated transient protection volt.		800 V (1.2/50 μs)
Consumption	AC supply	2.5 VA
	DC supply	1.5 W

Output Specifications

Output		DPDT relay
Basic electrical insulation		250 VAC (rms) (contacts/elec., contact/contact)
Contact ratings (AgCdO)		μ (micro gap)
Resistive loads	AC 1	8 A/250 VAC (2000 VA)
	DC 1	0.4 A/250 VDC (100 W)
	or	4 A/25 VDC (100 W)
Small inductive loads	AC 15	2.5 A/230 VAC
	DC 13	5 A/24 VDC
Mechanical life		≥ 30 x 10 ⁶ operations
Electrical life (at max. load)		
	AC 1	≥ 2.5 x 10 ⁵ operations
Operating frequency		≤ 7200 operations/h
Insulation voltages		
Rated insulation voltage		≥ 2.0 kVAC (rms) (cont./elec.)
Rated transient protection volt.		4 kV (1.2/50 μs) (cont./elec.) (IEC 664)



General Specifications

Power-on time	SC 210	≥ 1 s
	SC 215	≥ 2 x set pulse duration
Indication for Output ON		LED, red
Environment		IP 20 B
Pollution degree		2 (IEC 664)
Operating temperature		-20° to +50°C (-4° to +122°F)
Storage temperature		-50° to +85°C (-58° to +185°F)
Weight		
AC types		200 g
DC types		125 g
Approvals		UL, CSA
CE Marking		Yes

Mode of Operation

Example 1

Shot at supply ON and supply OFF

If power supply is applied or interrupted for a time period shorter than the pulse duration, the ON- and OFF-pulses can be changed to one pulse.

pulse duration will be extended. Refer to operation diagrams. Interconnect pins 5-6 directly on the socket.

Example 3

Shot only at supply OFF

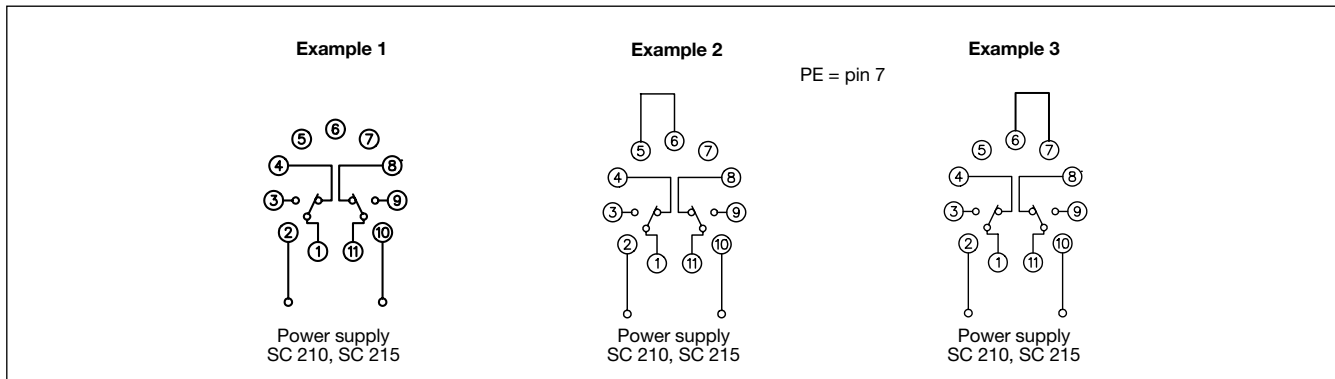
If power supply is interrupted, reapplied, and again interrupted during the pulse period, the pulse duration will be extended. Refer to operation diagram. Interconnect pins 6-7 directly on the socket.

Example 2

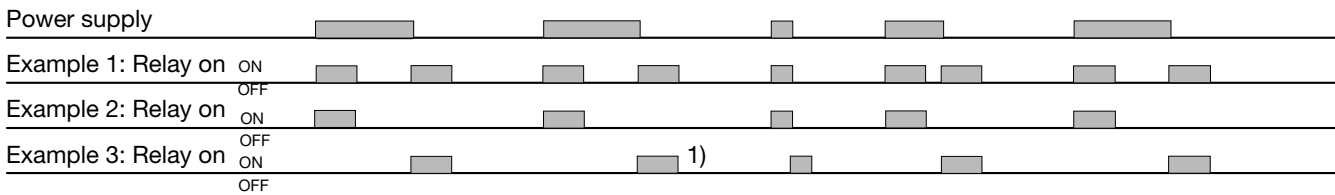
Shot only at supply ON

If power supply is applied, interrupted, and reapplied during the pulse period, the

Wiring Diagrams



Operation Diagrams



1) Time dependent on supply voltage

Time Setting

Knob-adjustable on scale in seconds.

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