Time Delay Relays

MCY911 Series

Feature:

- DPDT 12 Amperes rating.

Definition:

Time delay is defined as the controlled period between the functioning of two events. A Time delay relay is a combination of an electromechanical output relay and a control circuit. The control circuit is comprised of solid state components and timing circuits that control operation of the relay and timing range. Typical time delay functions include on-delay, repeat cycle (starting off), interval, off-delay, retriggerable one shot, repeat cycle (starting on), pulse generator, one shot, on / off delay, and memory latch. Each function is explained in the table below. Time delay relays have a broad choice of timing ranges from less than one second to many days. There are many choices of timing adjustments from calibrated external knobs, DIP switches, thumbwheel switches, or recessed potentiometer. The output contacts on the electromechanical output relay are direct wired to the output terminals. The contact load ratings are specified for each specific type of time delay relay.

Understanding the differences between all the functions available in time delay relays can sometimes be a daunting task.
When designing circuits using time delay relays questions such as:

“What initiates a time delay relay?”

“Does the timing start with the application or release of voltage?”

“When does the output relay come on?”

must be asked.

Time delay relays are simply control relays with a time delay built in. Their purpose is to control an event based on time. The difference between relays and time delay relays is when the output contacts open and close: on a control relay, it happens when voltage is applied and removed from the coil; on time delay relays, the contacts will open or close before or after a pre-selected, timed interval.

Typically, time delay relays are initiated or triggered by one of two methods:
- Application of input voltage (On Delay, Interval On, Flasher, Repeat Cycle, Delayed Interval and Interval / Flasher).
- Opening or closing of a trigger signal (Off Delay, Single Shot and Watchdog).

These trigger signals can be one of two designs:
- A control switch (dry contact), i.e., limit switch, push button, float switch, etc.
- Voltage (commonly known as a power trigger).

To help understand, some definitions are important:
Input Voltage : Control voltage applied to the input terminals (see wiring diagrams below). Depending on the function, input voltage will either initiate the unit or make it ready to initiate when a trigger signal is applied.

Trigger Signal : On certain timing functions, a trigger signal is used to initiate the unit after input voltage has been applied. As noted above, this trigger signal can either be a control switch (dry contact switch) or a power trigger (voltage).

Output (Load) : Every time delay relay has an internal relay (usually mechanical) with contacts that open and close to control the load. They are represented by the dotted lines in the wiring diagrams. Note that the user must provide the voltage to power the load being switched by the output contacts of the time delay relay.

The following tables contain both written and visual descriptions on how the common timing functions operate. A Timing Chart shows the relationship between Input Voltage, Trigger Signal (if present) and Output Contacts.

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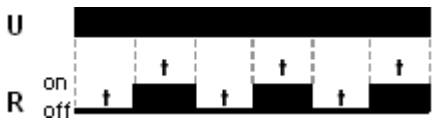
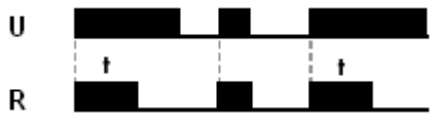
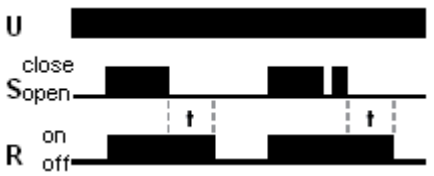
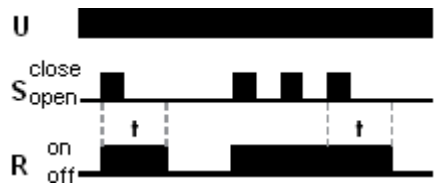
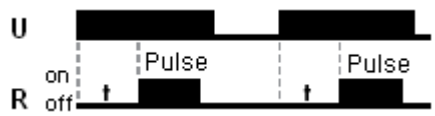
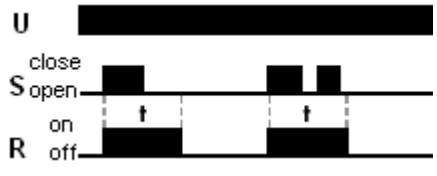
Function Definition Table

Function	Operation	Timing Chart
A. On Delay Power On	When the input voltage **U** is applied, timing delay **t** begins. Relay contacts **R** change state after time delay is complete. Contacts **R** return to their shelf state when input voltage **U** is removed. Trigger switch is not used in this function.	
B. Repeat Cycle Starting Off	When input voltage **U** is applied, time delay **t** begins. When time delay **t** is complete, relay contacts **R** change state for time delay **t**. This cycle will repeat until input voltage **U** is removed. Trigger switch is not used in this function.	
C. Interval Power On	When input voltage **U** is applied, relay contacts **R** change state immediately and timing cycle begins. When time delay is complete, contacts return to shelf state. When input voltage **U** is removed, contacts will also return to their shelf state. Trigger switch is not used in this function.	
D. Off Delay S Break	Input voltage **U** must be applied continuously. When trigger switch **S** is closed, relay contacts **R** change state. When trigger switch **S** is opened, delay **t** begins. When delay **t** is complete, contacts **R** return to their shelf state. If trigger switch **S** is closed before time delay **t** is complete, then time is reset. When trigger switch **S** is opened, the delay begins again, and relay contacts **R** remain in their energized state. If input voltage **U** is removed, relay contacts **R** return to their shelf state.	
E. Retriggerable One Shot	Upon application of input voltage **U**, the relay is ready to accept trigger signal **S**. Upon application of the trigger signal **S**, the relay contacts **R** transfer and the preset time **t** begins. At the end of the preset time **t**, the relay contacts **R** return to their normal condition unless the trigger switch **S** is opened and closed prior to time out **t** (before preset time elapses). Continuous cycling of the trigger switch **S** at a rate faster than the preset time will cause the relay contacts **R** to remain closed. If input voltage **U** is removed, relay contacts **R** return to their shelf state.	
F. Repeat Cycle Starting On	When input voltage **U** is applied, relay contacts **R** change state immediately and time delay **t** begins. When time delay t is complete, contacts return to their shelf state for time delay **t**. This cycle will repeat until input voltage **U** is removed. Trigger switch is not used in this function.	
G. Pulse Generator	Upon application of input voltage **U**, a single output pulse of 0.5 seconds is delivered to relay after time delay **t**. Power must be removed and reapplied to repeat pulse. Trigger switch is not used in this function.	
H. One Shot	Upon application of input voltage **U**, the relay is ready to accept trigger signal **S**. Upon application of the trigger signal **S**, the relay contacts **R** transfer and the preset time **t** begins. During time-out, the trigger signal **S** is ignored. The relay resets by applying the trigger switch **S** when the relay is not energized.	

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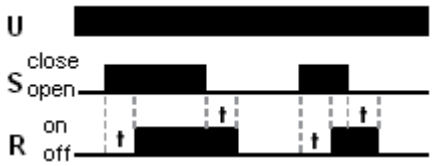
Function Definition Table

Function	Operation	Timing Chart
I. On / Off Delay S Make / Break	Input voltage **U** must be applied continuously. When trigger switch **S** is closed, time delay **t** begins. When time delay **t** is complete, relay contacts **R** change state and remain transferred until trigger switch **S** is opened. If input voltage **U** is removed, relay contacts **R** return to their shelf state.	
J. Memory Latch S Make	Input voltage **U** must be applied continuously. Output changes state with every trigger switch **S** closure. If input voltage **U** is removed, relay contacts **R** return to their shelf state.	

U = Input Voltage, **S** = Trigger Switch, **R** = Relay Contacts, **t** = Time Delay

The MCY911 series is a dual-function, dual-voltage time delay relay that offers a wide timing range. This cost sensitive timer features DIP switches that allow the user to set the function modes and choose between eight separate time scales. The knob on top is used for fine tuning the time setting. This dual adjustment design allows for supreme flexibility and timing accuracy. The dual LEDs allow the user to know when power is present at the coil and when the output is energized.

The MCY911-13O series features both On Delay and Interval functions, in contrast the MCY911-13R series has the capability of handling the Off Delay and Retriggerable One Shot functions.

- Dual voltage coils eliminate the need to specify AC or DC.
- The two LED status indicators; indicate status at a glance. The green LED is on when power is applied to the input terminals. The red LED blinks during timeout and is on when the output is energized.
- Integrated DIP switch simplifies the programming of the functions and timing.
- Colour and appearance designed for high visibility in all environments.

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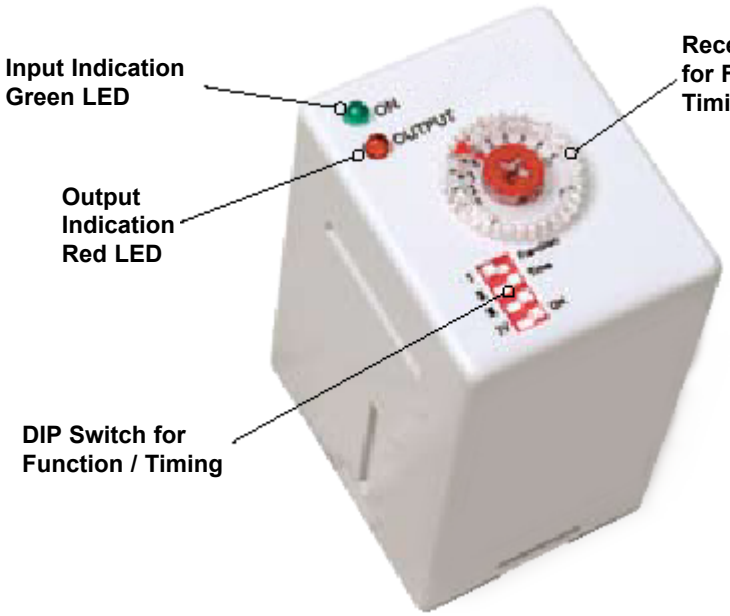

Selecting Time Ranges

Time Range	Digital Switch Position		
	II	III	IV
0.1 to 1 s	OFF	OFF	OFF
1 to 10 s	OFF	OFF	ON
10 to 100 s	OFF	ON	OFF
0.1 to 1 min	OFF	ON	ON
1 to 10 mins	ON	OFF	OFF
10 to 100 mins	ON	OFF	ON
0.1 to 1 hr	ON	ON	OFF
1 to 10 hrs	ON	ON	ON

General Specifications (at 25°C)

Output Characteristics		**Units**	**MCY911-13O**	**MCY911-13R**
Number and Type of Contacts	-	-	DPDT	DPDT
Contact Material	-	-	Silver Alloy	Silver Alloy
Switching Voltage	-	V	240 AC, 50 / 60 Hz	240 AC, 50 / 60 Hz
	-	V	30 DC	30 DC
	-	HP	1/3 at 120 V ac	1/3 at 120 V ac
	-	-	1/2 at 240 V ac	1/2 at 240 V ac
	-	Pilot Duty	B300	B300
Minimum Switching Requirement	-	mA	100	100
Indication	LED	-	Red	Red
Input Characteristics				
-	-	V ac	-	-
Operating Range	% of Nominal	-	80% to 110%	80% to 110%
Maximum Consumption	AC	VA	5	5
	DC	W	2.5	2.5
Indication	LED	-	Green	Green
Timing Characteristics				
Functions Available	-	-	A, C	D, E
Time Scales	-	-	8	8
Tolerance	Mechanical Setting	%	10	10
Repeatability	Constant Voltage and Temperature	%	1	1

General Specifications (at 25°C)

Timing Characteristics		Units	MCY911-13O	MCY911-13R
Reset Time	Max.	ms	150	150
Trigger Pulse Length	Min.	ms	50	50
Performance Characteristics				
Electrical Life	Operations at Rated Current (Resistive)	-	100,000	100,000
Mechanical Life	Unpowered	-	10,000,000	10,000,000
Dielectric Strength	Input to Contacts	V	2,500 AC	2,500 AC
	Between Open Contacts	V	1,000 AC	1,000 AC
Environment				
Ambient Air Temperature Around the Device	Storage	°C	-20 to +85	-20 to +85
	Operation	°C	-20 to +55	-20 to +55
Degree of Protection	-	-	IP 40	IP 40
Weight	-	g	85	85

MCY911-13O / MCY911-13RB

MCY911-13O / MCY911-13RP

Selecting Function

Function MCY911-13O	Digital Switch Position
ON Delay	OFF
Interval	ON
Function MCY911-13R	
OFF Delay	OFF
Retriggerable One Shot	ON

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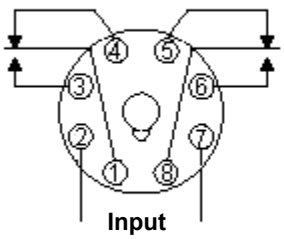
Specification Table

Input Voltage	Timing Range	Contact Configuration	Rated Load Current	Part Number
8 Pin Octal Base - On Delay / Interval				
12 V ac / V dc	0.1 s to 10 hrs	DPDT	12 Amperes	MCY911-13OP-12 A
24 V ac / V dc	0.1 s to 10 hrs	DPDT	12 Amperes	MCY911-13OP-24 A
120 V ac / V dc	0.1 s to 10 hrs	DPDT	12 Amperes	MCY911-13OP-120 A
11 Pin Octal Base - Off Delay / Retriggerable One Shot				
12 V ac / V dc	0.1 s to 10 hrs	DPDT	12 Amperes	MCY911-13RP-12 A
24 V ac / V dc	0.1 s to 10 hrs	DPDT	12 Amperes	MCY911-13RP-24 A
120 V ac / V dc	0.1 s to 10 hrs	DPDT	12 Amperes	MCY911-13RP-120 A
8 Blade Square Base - On Delay / Interval				
24 V ac / V dc	0.1 s to 10 hrs	DPDT	12 Amperes	MCY911-13OB-24 A
120 V ac / V dc	0.1 s to 10 hrs	DPDT	12 Amperes	MCY911-13OB-120 A
11 Blade Square Base - Off Delay / Retriggerable One Shot				
24 V ac / V dc	0.1 s to 10 hrs	DPDT	12 Amperes	MCY911-13RB-24 A
120 V ac / V dc	0.1 s to 10 hrs	DPDT	12 Amperes	MCY911-13RB-120 A

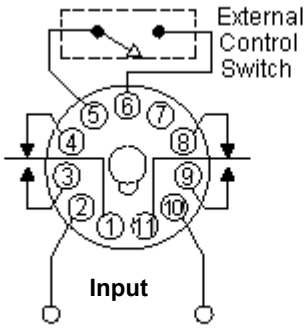
Wiring Diagrams

MCY911-13OP



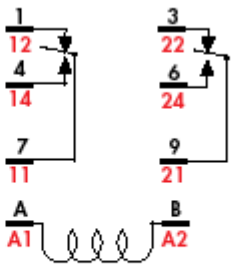
ON Delay

MCY911-13RP



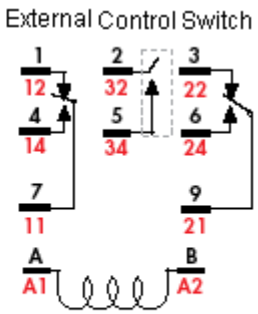
OFF Delay

MCY911-13OB



ON Delay
NEMA
IEC

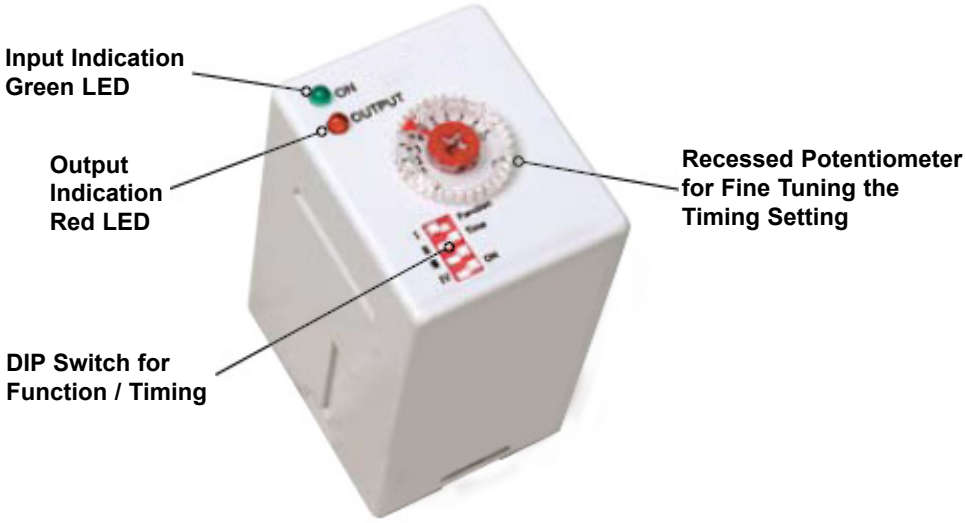
MCY911-13RB



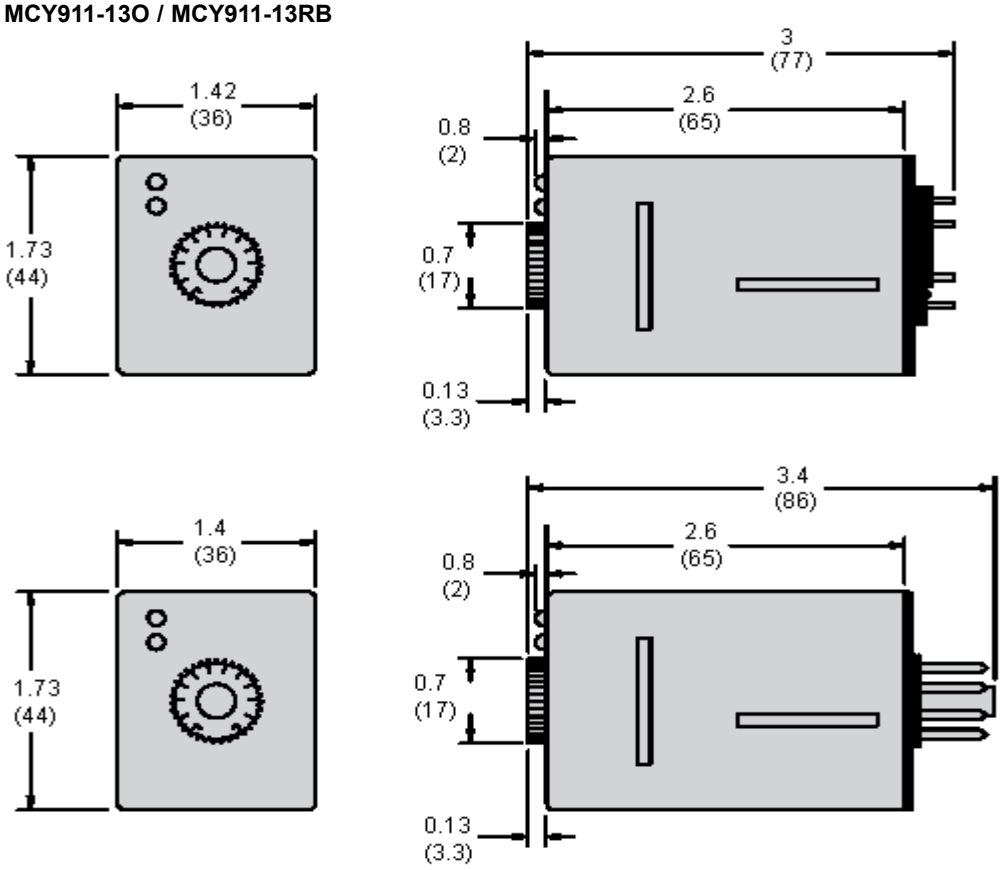
OFF Delay
NEMA
IEC

Time Delay Relays

MCY911 Series



MCY911-13O / MCY911-13RB



Dimensions : Inches (Millimetres)

Note: Terminal Size is 0.187 × 0.02 (4.75 × 0.508).

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