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TIME DELAY RELAYS

The largest selection of time delay relays known since 1968 for its reliable designs that provide long service lives with low maintenance costs. Versatile multifunction time delay relays give you the option of choosing among functions and time delay ranges to ensure that you receive the perfect timer to fit your needs. Electromechanical relay-output time delay relays are available with a number of different functions and assure isolation between input and output, as well as no voltage drop across output contact. Solid-state time delay relays have no moving parts to arc and wear out over time, giving them a lifespan of up to 100x that of a relay-output timer. In addition, all solid state time delay relays are fully encapsulated to protect against shock, vibration, humidity, etc.

For More Information…
and to download our HVAC Timer Application Guide, visit
Littelfuse.com/timedelayrelays

TIMER FUNCTION GUIDE

Selecting a Timer's Function

Selecting one of the five most common timing functions can be as easy as answering three questions on the chart below. If you have trouble answering these questions, try drawing a connection diagram that shows how the timer and load are connected. Time diagrams and written descriptions of the five most popular functions, plus other common functions. Instantaneous contacts, accumulation, pause timing functions, and flashing LED's are included in some units to expand the versatility of the timer. These expanded operations are explained on the product's catalog page. Time diagrams are used on these pages along with text and international symbols for functions.

Function Selection Guide

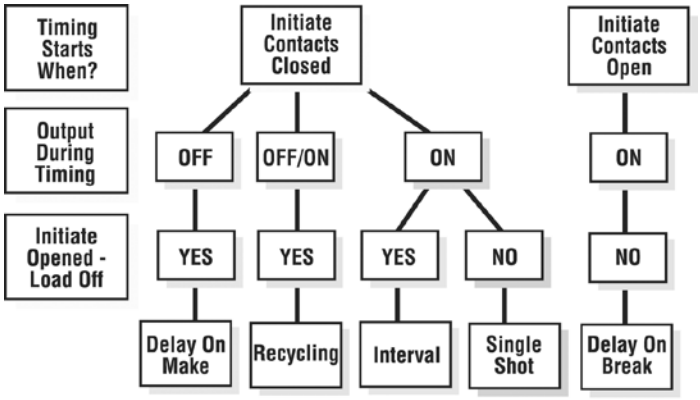
Selection Questions

1) The timing starts when the initiate (starting) contacts are:
A) Closed **B)** Opened

2) What is the status of the output (or load) during timing?
A) On **B)** Off **C)** On/Off

3) Will the load de-energize (or remain de-energized) if the initiate (starting) contacts are opened during timing?
A) Yes **B)** No

THE FIVE MOST USED FUNCTIONS



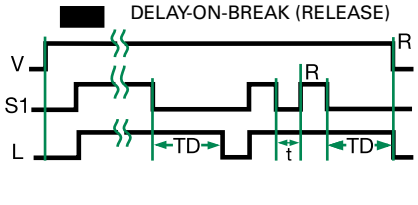
Understanding Time Diagrams

Time diagrams are used to show the relative operation of switches, controls, and loads as time progresses. Time begins at the first vertical boundary. There may be a line indicating the start of the operation or it may just begin with the transition of the device that starts the operation. Each row in the time diagram represents a separate component. These rows will be labeled with the name of the device or its terminal connection numbers. In a bistable or digital system, the switches, controls, or loads can only be ON or OFF. The time lines are drawn to represent these two possible conditions. Vertical lines are used to define important starting or ending points in the operation.

The example to the right is the most common type of time diagram in use in North America. It shows the energizing of loads, and the closing of switches and contacts by an ascending vertical transition of the time line. Opening switches or contacts or de-energizing loads are represented by descending vertical transitions.

TIME DIAGRAM

Example:



V = Voltage R = Reset S1 = Initiate Switch TD = Time Delay
t = Incomplete Time Delay L = Load = Undefined Time

International Timing Function Symbols

- = Delay-on-Make; ON-delay
- = Delay-on-Break; OFF-delay
- = Delay-on-Make and Break; ON and OFF-delay
- = Interval; Impulse-ON
- = Trailing Edge Interval; Impulse-OFF
- = Single Shot; Pulse Former
- = Flasher - ON Time First; Recycling Equal Times - ON First
- = Flasher - OFF Time First; Recycling Equal Times - OFF First
- = Recycling - Unequal Times; Pulse Generator
- = Recycling - Unequal Times Starting with ON or OFF
- = Delay-on-Make and Interval; Single Pulse Generator

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TRDU SERIES

8-PIN

11-PIN

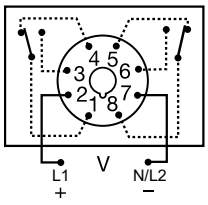
Description

The TRDU Series is a versatile universal time delay relay with 21 selectable single and dual functions. The dual functions replace up to three timers required to accomplish the same function. Both the function and the timing range are selectable with switches located on the face of the unit. Two LED's indicate input voltage and output status. This device offers full 10A isolated relay output contacts in either SPDT or DPDT. The TRDU replaces hundreds of part numbers, thereby, reducing your stock inventory requirements.

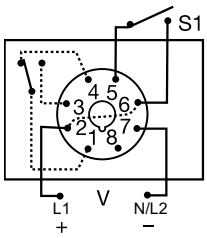
21 Functions

Five switches are provided to set one of 10 single or 11 dual modes of operation.

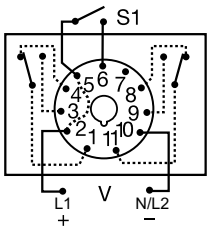
Wiring Diagram



8-PIN DPDT



8-PIN SPDT



11-PIN DPDT

V = Voltage
S1 = Initiate Switch

For dimensional drawing see: Appendix, page 512, Figure 20.

Ordering Information

MODEL	INPUT VOLTAGE	BASE CONNECTION
TRDU120A1	120VAC	8-pin, DPDT*
TRDU120A2	120VAC	8-pin, SPDT
TRDU120A3	120VAC	11-pin, DPDT
TRDU12D1	12VDC	8-pin, DPDT*
TRDU12D2	12VDC	8-pin, SPDT
TRDU230A2	230VAC	8-pin, SPDT
TRDU24A1	24VAC/DC	8-pin, DPDT*
TRDU24A2	24VAC/DC	8-pin, SPDT
TRDU24A3	24VAC/DC	11-pin, DPDT

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*Limited to 9 operating functions in 8-pin DPDT units.

Features & Benefits

FEATURES	BENEFITS
21 timing functions	Replace hundreds of parts and reduce stocking requirements
Microcontroller based	Repeat Accuracy + / - 0.1%
User selectable time delay	Timing settings are switch selectable 0.1s - 1,705h in eight ranges for added flexibility
Isolated 10A, SPDT or DPDT output contacts	Allows control of loads for AC or DC voltages
LED indicators	Provides visual indication of input voltage and relay status

Accessories

BZ1 Front Panel Mount Kit
Provides an easy method of through-the-panel mounting of 8- or 11-pin plug-in timers, flashers, and other controls.

NDS-8 Octal 8-pin Socket
8-pin 35mm DIN rail or surface mount. Surface mounted with two #6 screws or snaps onto a 35 mm DIN rail. Uses PSC8 hold-down clips.

NDS-11 11-pin Socket
11-pin 35mm DIN rail or surface mount. Surface mounted with two #6 screws or snaps onto a 35 mm DIN rail. Uses PSC11 hold-down clips.

PSC8 or PSC11 Hold-down Clips
Securely mounts plug-in controls in any position. Provides protection against vibration. Use PSC8 with NDS-8 Octal Socket or PSC11 with NDS-11 Socket. Sold in sets of two.

C103PM (AL) DIN Rail
35 mm aluminum DIN rail available in a 36 in. (91.4 cm) length.

TRDU SERIES

Specifications

Time Delay

Type	Microcontroller
Range: Switch Selectable**	Single Functions: 0.1s - 1,705h in 8 ranges Dual Functions: 0.1s - 3,100m each in 8 ranges
Adjustments	Multiplier: 3 position DIP switches select 0.1, 1, 10, or 100 in s or m
Setting Accuracy	±1% or 50ms, whichever is greater
Repeat Accuracy	±0.1% or 20ms, whichever is greater
Timing Functions	Five switches are provided to set one of twenty-one single or dual functions
Reset Time	≤ 50ms
Initiate Time	120VAC: 75ms
Time Delay vs Temp. & Voltage	±1%

Indication

Two LEDs indicate	**1)** Input voltage applied **2)** Output relay status

Input

Voltage	12VDC, 24VAC/DC, 120VAC, or 230VAC
Tolerance	
12VDC & 24VAC/DC	-15% - 20%
120 & 230VAC	-20% - 10%
AC Line Frequency	50/60Hz
Power Consumption	24 to 230V ≤ 3W; 12VDC ≤ 2W

Output

Type	Electromechanical relay
Form	SPDT or DPDT
Rating	10A resistive @ 120/240VAC & 28 VDC; 1/3 hp @ 120/240VAC
Life	Mechanical – 1 x 10^7; Electrical – 1 x 10^6

Protection

Isolation Voltage	≥ 1500V RMS input to output
Insulation Resistance	≥ 100 MΩ
Polarity	DC units are reverse polarity protected

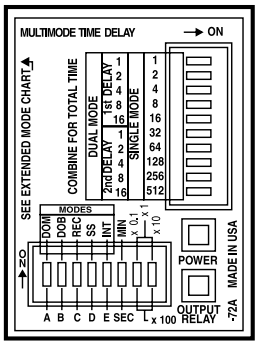
Mechanical

Mounting	Plug-in socket
Dimensions	**H** 76.7 mm (3.1"); **W** 60.7 mm (2.39"); **D** 45.2 mm (1.78")
Termination	Octal 8-pin plug-in or magnal 11-pin plug-in

Environmental

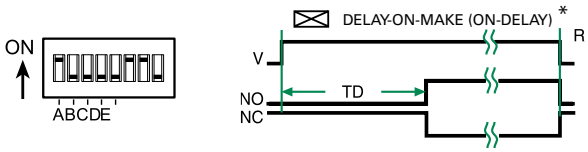
Operating/Storage Temperature	-20° to 65°C / -40° to 85°C
Weight	≅ 5.8 oz (164 g)

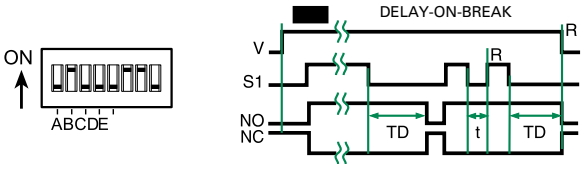
**For CE approved applications, power must be removed from the unit when a switch position is changed.

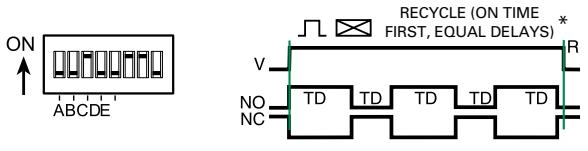


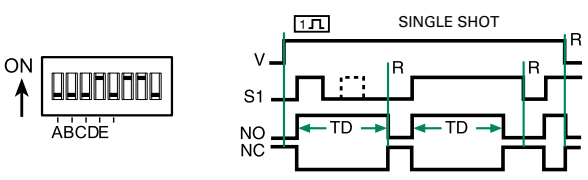
Function Diagrams

Single Functions

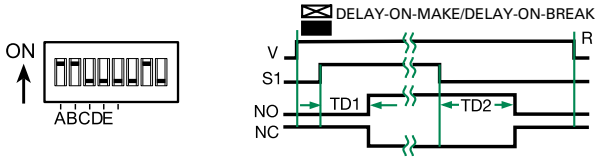


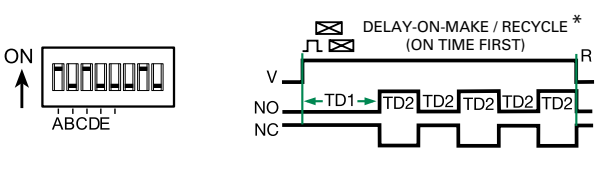


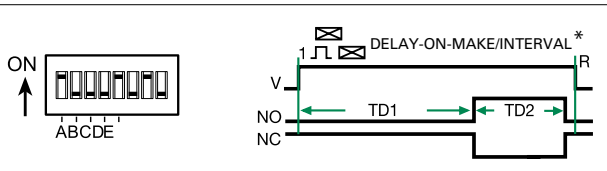


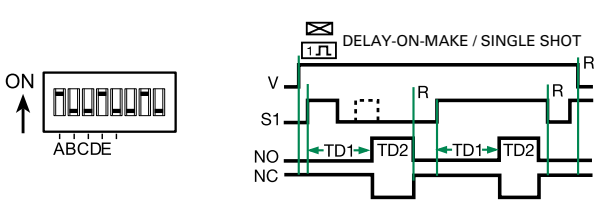


Dual Functions









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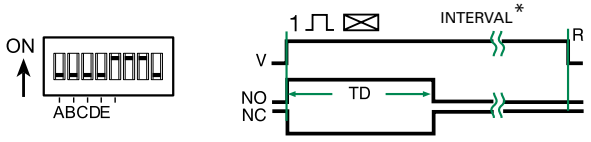
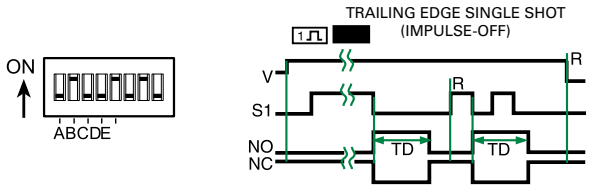
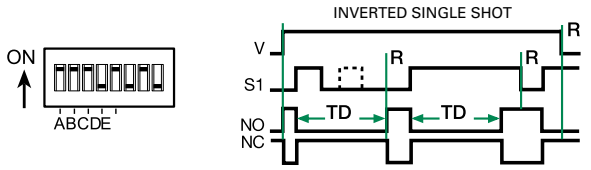
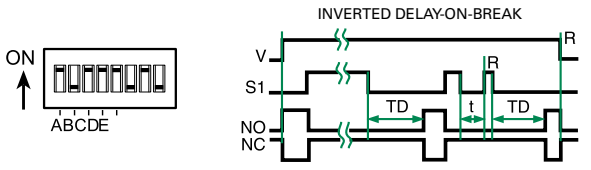
TRDU SERIES

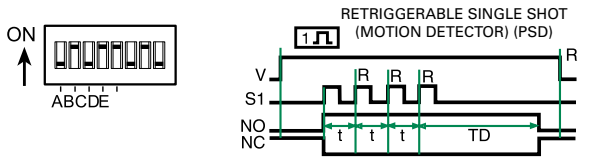
Single Functions

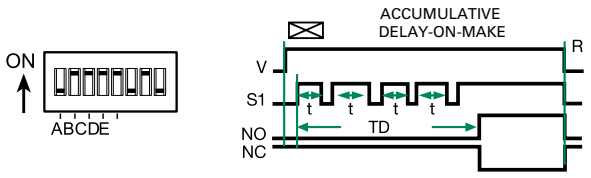




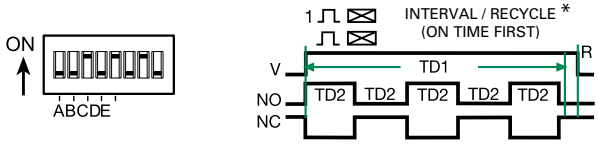


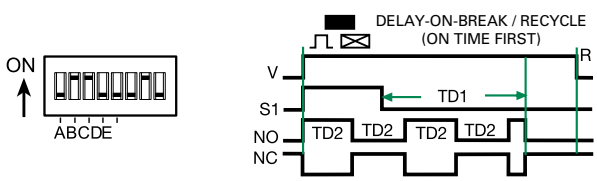


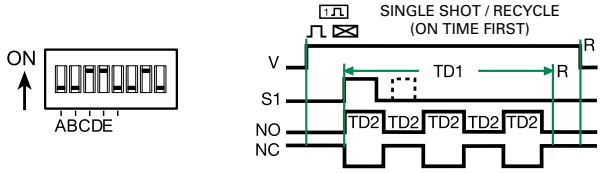


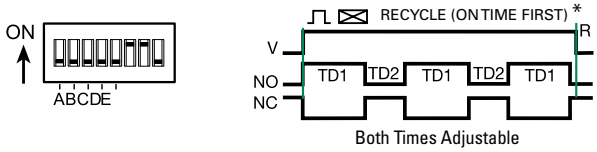


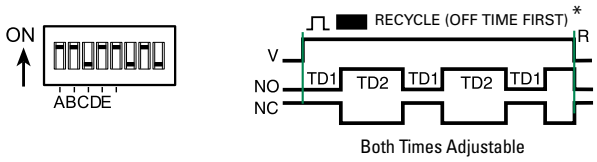
Dual Functions

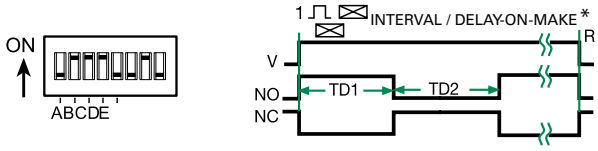


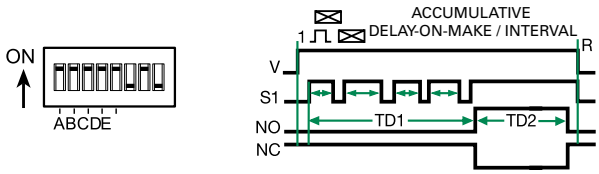












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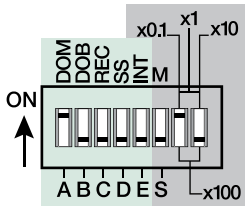


5 Switches for Function Selection

3 Switches for Time Delay Range

LEGEND

V = Voltage
R = Reset
S1 = Initiate Switch
NO = Normally Open Contact
NC = Normally Closed Contact
TD,TD1,TD2 = Complete Time Delay
t = Partial Time Delay
DOM = Delay-on-Make
DOB = Delay-on-Break
REC = Recycle
SS = Single Shot
INT = Interval
M = Minutes
S = Seconds
—⟋— = Undefined time

* 9 Functions included in the 8 pin DPDT models

NOTE: The time delay range is the same for both functions when dual functions are selected.

12 TIME DELAY RELAYS

TRU SERIES

Knob Adjustable Universal Time Delay Relay

8-PIN

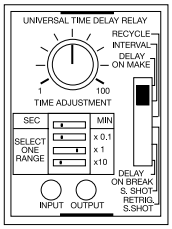
11-PIN

Description

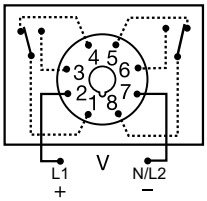
The TRU Series is a multifunction, knob adjustable, Universal Time Delay Relay. It includes six of the most popular timing functions selected by a slide switch. The time delay is knob adjustable and the time delay range is switch selectable. The repeat accuracy is + 0.1%. Both function and time range can be selected on the top face of the unit. In addition to multifunctioning and multiple time ranges, the TRU Series features universal input voltage; 19 to 264VAC and 19 to 30VDC and full 10A output relay. The TRU Series can directly replace up to 1000 competitive time delay relay models.

Operation

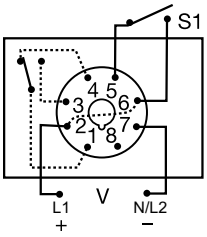
A six position slide switch selects delay-on-make, interval, single shot, recycling (ON time first, equal recycle delays), delay-on-break, and retriggerable single shot. 8-pin DPDT base wiring is limited to delay-on-make, interval, and recycling functions. All six functions are available in the 8-pin SPDT and 11-pin DPDT versions.



Wiring Diagram



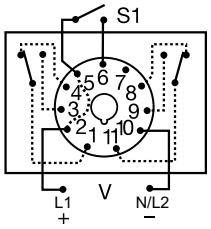
8-PIN DPDT
Delay-on-Make
Interval
Recycling



8-PIN SPDT
Delay-on-Make
Interval
Single Shot
Recycling
(ON Time First, Equal Recycle Delays)
Delay-on-Break
Retriggerable Single Shot

V = Voltage
S1 = Initiate Switch

Relay contacts are isolated



11-PIN DPDT
Delay-on-Make
Interval
Single Shot
Recycling
(ON Time First, Equal Recycle Delays)
Delay-on-Break
Retriggerable Single Shot

For dimensional drawing see: Appendix, page 512, Figure 21.

Features & Benefits

FEATURES	BENEFITS
Microcontroller based	Repeat Accuracy + / - 0.1% or + / - 20ms, whichever is greater
6 time ranges (0.1s to 1,000m)	Broad range will satisfy most requirements
Knob adjustable time delay	Allows user to fine tune time delay based on application needs
Universal input voltage	Makes it versatile for use in most applications
Multifunction	Provides the most common standard timing functions
LED Indicators	Provide visual indication of input voltage and relay status
10A isolated output contacts	Allows control of loads for AC or DC voltages

Ordering Information

MODEL	INPUT VOLTAGE	BASE WIRING	FUNCTIONS
TRU1	19 to 264VAC; 19 to 30VDC	8-pin DPDT	3
TRU2	19 to 264VAC; 19 to 30VDC	8-pin SPDT	6
TRU3	19 to 264VAC; 19 to 30VDC	11-pin DPDT	6

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TRU SERIES

Accessories

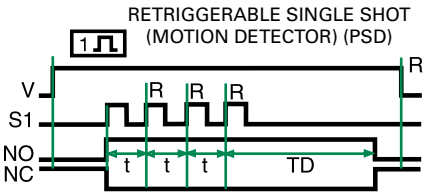
BZ1 Front Panel Mount Kit
Provides an easy method of through-the-panel mounting of 8- or 11-pin plug-in timers, flashers, and other controls.

NDS-8 Octal 8-pin Socket
8-pin 35mm DIN rail or surface mount. Rated at 10A @ 300VAC. Surface mounted with two #6 (M 3.5 x 0.6) screws or snaps onto a 35 mm DIN rail. Uses PSC8 hold-down clips.

NDS-11 11-pin Socket
11-pin 35mm DIN rail or surface mount. Rated at 10A @ 300VAC. Surface mounted with two #6 (M 3.5 x 0.6) screws or snaps onto a 35 mm DIN rail. Uses PSC11 hold-down clips.

PSC8 or PSC11 Hold-down Clips
Securely mounts plug-in controls in any position. Provides protection against vibration. Use PSC8 with NDS-8 Octal Socket or PSC11 with NDS-11 Socket. Sold in pairs.

Function Diagram



V = Voltage
S1 = Initiate Switch
NO = Normally Open Contact
NC = Normally Closed Contact
t = Incomplete Time Delay
TD = Time Delay
R = Reset

Specifications

Time Delay	
Type	Digital integrated circuitry
Range	
Switch Selectable*	0.1s - 1000m in 6 ranges: **1)** 0.1 - 10s **2)** 1 - 100s **3)** 10 - 1000s **4)** 0.1 - 10m **5)** 1 - 100m **6)** 10 - 1000m
Adjustments	
Multiplier	4 position DIP switch selects x0.1, x1, x10, and sec. or min.
Time Setting	Onboard knob adjustment with 1 - 100 reference dial
Two LEDs indicate	**1)** Input voltage applied **2)** Output relay status
Repeat Accuracy	±0.1% or ±20ms, whichever is greater
Reset Time	≤ 300ms
Time Delay vs Temp. & Voltage	±2%
Input	
Voltage - Universal Input Range	19 to 264VAC and 19 to 30VDC
AC Line Frequency	50/60Hz
Output	
Type	Electromechanical relay
Form	SPDT or DPDT, isolated
Rating	10A resistive @ 120/240VAC & 28VDC; 1/3 hp @ 120/240VAC
Life	Mechanical - 1 x 10^7; Electrical - 1 x 10^6
Protection	
Transient	38 joules
Isolation Voltage	≥ 1500V RMS input to output
Polarity	DC units are reversed polarity protected
Mechanical	
Mounting	Plug-in socket
Dimensions	**H** 87.3 mm (3.44"); **W** 60.7 mm (2.39"); **D** 45.2 mm (1.78")
Termination	Octal 8-pin plug-in or magnal 11-pin plug-in
Environmental	
Operating/Storage Temperature	-20° to 65°C / -30° to 85°C
Weight	≅ 6 oz (170 g)

* For CE approved applications, power must be removed when a switch position is changed.

ASQU / ASTU SERIES


ASQU


ASTU

Description

The ASQU and ASTU Series of 17.5 mm, knob adjustable, universal solid-state timers offer multiple functions, voltages, and time delay ranges. Choose one of 5 functions and 4 time delay ranges via 4 selection switches located on face of the unit. Adjustment through the time range is accomplished by an onboard knob.

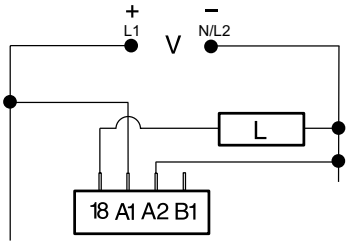
The ASQU Series has quick connect terminals and the ASTU Series has terminal blocks.

Features & Benefits

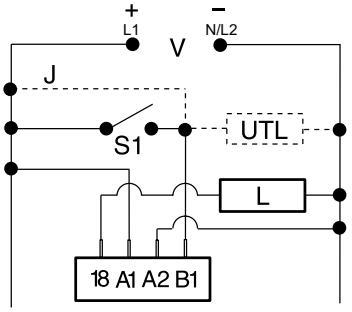
FEATURES	BENEFITS
Universal AC or DC voltage	Choose from 24 to 240VAC or 9 to 110VDC models
Compact 17.5mm size	Allows for high rail density
Microcontroller based	Repeat Accuracy + / -1%
Multifunction: 5 timing functions	Reduce stocking requirements
Knob Adjustable Time Delay	Field adjustable delay ranging from 0.1s - 100m
0.7A steady, 10A inrush solid-state output	Provides 100 million operations in typical conditions.
Mounting fasteners lincluded	Each unit ships with both surface and DIN rail quick mount adapters
Watchdog circuitry	Self monitoring and self correcting for improved performance

Wiring & Adjustment Diagrams

DELAY-ON-MAKE & RECYCLING



SINGLE SHOT, INTERVAL & DELAY-ON-BREAK



V = Voltage
L = Load
J= Wire Required for Interval Operation
S1= Initiate Switch
UTL = Optional Untimed Load

ADJUSTMENTS

DOM	A B
SS	A B
R	A B
DOB	A B

DOM = Delay-on-Make
SS = Single Shot/Interval
R = Recycling
DOB = Delay-on-Break

R	M	S
0.1-10s	X1s	C E D F
1-100s	X10s	C E D F
10-1000s	X100s	C E D F
1-100m	X10m	C E D F

R = Range
M = Multiplier
S = Setting

For dimensional drawing see: Appendix, page 512, Figure 22.

Accessories

P1015-13 (AWG 10/12), **P1015-64** (AWG 14/16), **P1015-14** (AWG 18/22) **Female Quick Connect**
These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.

P0500-178 Surface Mount Adapter
P0500-179 DIN Rail Mount Adapter
For use with the ASxx/DSxx Series timers.

Ordering Information

MODEL	INPUT VOLTAGE	CONNECTION
ASQUA3	24 to 240VAC	Quick Connects
ASQUD3	9 to 110VDC	Quick Connects
ASTUA3	24 to 240VAC	Terminal Blocks
ASTUD3	9 to 110VDC	Terminal Blocks

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ASQU / ASTU SERIES

Specifications

Time Delay

Type	Microcontroller based with ceramic resonator and watchdog circuitry
Adjustment	Knob with dial; 2 switches select 1 of 4 multipliers
Range*	0.1 - 10s, 1 - 100s, 10 - 1000s, 1 - 100m
Repeat Accuracy	±1% or ±50ms, whicheer is greater
Tolerance (Factory Calibration)	±2% or ±50ms, whichever is greater
Reset Time	≤ 300ms
Initiate Time	Single Shot & Delay-on-Break: ≤ 32ms
Time Delay vs Temp. & Voltage	±2%, or ±50ms, whichever is greater

Input

Voltage	AC: 24 to 240VAC; -20% - 10% DC: 9 to 110VDC; -0% - 20% @ -25°C 9.4 to 110VDC; -0% - 20% @ -40°C
AC Line Frequency/DC Ripple	50/60Hz / ≤ 10%

Output

Type	Solid state
Form	NO
Rating	0.7A steady state, 10A inrush
Voltage Drop	AC ≅ 2.5V @ 0.7A; DC ≅ 1.5V @ 0.7A

Protection

Surge	IEEE C62.41-1991 Level A
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000V RMS terminals to mounting surface
Polarity	DC units are reverse polarity protected

Mechanical

Mounting	Two base adaptors are available
DIN Rail	Snap on to 32 mm DIN 1 & 35 mm DIN 3 rail
Surface	Two #6 (M3.5 x 0.6) screws or quick mount fasteners
Dimensions	**H** 76.2 mm (3.0"); **W** 17.52 mm (0.69"); **D** 61.2 mm (2.41")
Termination	
ASQU	0.25 in. (6.35 mm) male quick connect terminals
ASTU	0.197 in. (5 mm) push-on terminal blocks for up to #14 AWG (2.5 mm²) wire

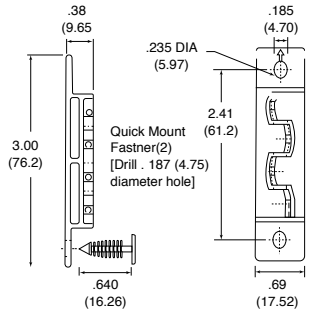
Environmental

Operating/Storage Temperature	-40° to 60°C / -40° to 85°C
Humidity	95% relative, non-condensing
Weight	≅ 4 oz (113 g)

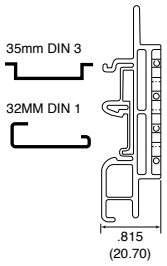
*For CE approved applications, power must be removed from the unit when a switch position is changed.

Mounting Diagrams

P0500-178
SURFACE MOUNT
Inches (Millimeters)



P0500-179
DIN RAIL MOUNT
Inches (Millimeters)



DSQU / DSTU SERIES


DSQU


DSTU

Description

The DSQU and DSTU Series of 17.5 mm, DIP switch adjustable, universal solid-state timers offer multiple functions, voltages, and time delay ranges. Choose one of 5 functions and 4 time delay ranges via 4 selection switches located on face of the unit. Six switches adjust the time delay through the selected range.

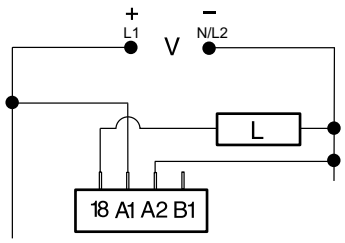
The DSQU Series has quick connect terminals and the DSTU Series has terminal blocks.

Features & Benefits

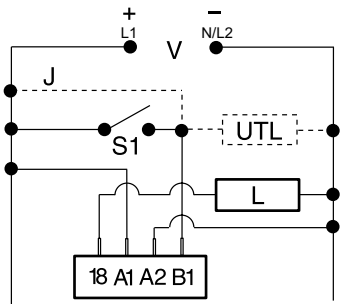
FEATURES	BENEFITS
Universal AC or DC voltage	Choose from 24 to 240VAC or 9 to 110VDC models
Compact 17.5mm size	Allows for high rail density
Microcontroller based	Repeat Accuracy + / -1%
Multifunction: 5 timing functions	Reduce stocking requirements
DIP switch adjustable time delay	Field adjustable delay ranging from 0.1s - 63m
0.7A steady, 10A inrush solid-state output	Provides 100 million operations in typical conditions.
Mounting fasteners included	Each unit ships with both surface and DIN rail quick mount adapters
Watchdog circuitry	Self monitoring and self correcting for improved performance

Wiring & Adjustment Diagrams

DELAY-ON-MAKE & RECYCLING



SINGLE SHOT, INTERVAL & DELAY-ON-BREAK



V = Voltage
L = Load
J= Wire Required for Interval Operation
S1= Initiate Switch
UTL = Optional Untimed Load

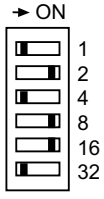
ADJUSTMENTS

DOM	A ▮□ B ▮□
SS	A □▮ B ▮□
R	A □▮ B □▮
DOB	A ▮□ B □▮

DOM = Delay-on-Make
SS = Single Shot/Interval
R = Recycling
DOB = Delay-on-Break

R	M	S	I
0.1-6.3s	X0.1s	C ▮□ E D ▮□ F	0.1s
1-63s	X1s	C ▮□ E D □▮ F	1s
10-630s	X10s	C ▮□ E D ▮□ F	10s
1-63m	X1m	C ▮□ E D □▮ F	1m

R = Range
M = Multiplier
S = Setting
I = Increments of time



Add switches in ON position
TD = 2+8+16=26

Accessories

P1015-13 (AWG 10/12), **P1015-64** (AWG 14/16), **P1015-14** (AWG 18/22) **Female Quick Connect**
These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.

P0500-178 Surface Mount Adapter
P0500-179 DIN Rail Mount Adapter
For use with the ASxx/DSxx Series timers.

Ordering Information

MODEL	INPUT VOLTAGE	CONNECTION
DSQUA3	24 - 240VAC	Quick Connects
DSQUD3	9 - 110VDC	Quick Connects
DSTUA3	24 - 240VAC	Terminal Blocks
DSTUD3	9 - 110VDC	Terminal Blocks

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For dimensional drawing see: Appendix, page 512, Figure 22.

DSQU / DSTU SERIES

Specifications

Time Delay

Type	Microcontroller based with ceramic resonator and watchdog circuitry
Adjustment	6 switches adjust the time delay; 2 switches select 1 of 4 multipliers
Range*	x0.1s = 0.1 - 6.3s in 0.1s increments x1s = 1 - 63s in 1s increments x10s = 10 - 630s in 10s increments x1m = 1 - 63m in 1m increments
Repeat Accuracy	±0.1% or ±20ms, whichever is greater
Setting Accuracy	±2% or ±50ms, whichever is greater
Reset Time	≤ 300ms
Initiate Time	Single Shot & Delay-on-Break: ≤ 32ms
Time Delay vs Temp. & Voltage	±2% or ±50ms, whichever is greater

Input

Voltage	AC: 24 to 240VAC; -20% - 10% DC: 9 to 110VDC; -0% - 20% @ -25°C 9.4 to 110VDC; -0% - 20% @ -40°C
AC Line Frequency/DC Ripple	50/60Hz / ≤ 10%

Output

Type	Solid state
Form	NO
Rating	0.7A steady state, 10A inrush
Voltage Drop	AC ≅ 2.5V @ 0.7A; DC ≅ 1.5V @ 0.7A

Protection

Surge	IEEE C62.41-1991 Level A
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000V RMS terminals to mounting surface
Polarity	DC units are reverse polarity protected

Mechanical

Mounting	Two base adaptors are available
DIN Rail	Snap on to 32 mm DIN 1 & 35 mm DIN 3 rail
Surface	Two #6 (M3.5 x 0.6) screws or quick mount fasteners
Dimensions	**H** 76.2 mm (3.0"); **W** 17.52 mm (0.69"); **D** 61.2 mm (2.41")
Termination	
DSQU	0.25 in. (6.35 mm) male quick connect terminals
DSTU	0.197 in. (5 mm) push-on terminal blocks for up to #14 AWG (2.5 mm^2) wire

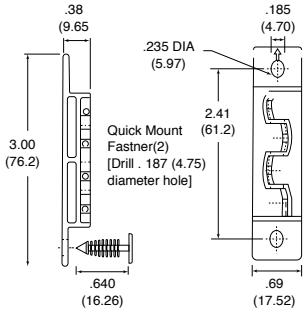
Environmental

Operating/Storage Temperature	-40° to 60°C / -40° to 85°C
Humidity	95% relative, non-condensing
Weight	≅ 4.2 oz (119 g)

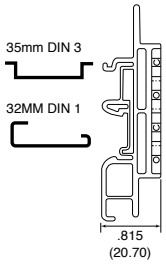
*For CE approved applications, power must be removed from the unit when a switch position is changed.

Mounting Diagrams

P0500-178
SURFACE MOUNT
Inches (Millimeters)



P0500-179
DIN RAIL MOUNT
Inches (Millimeters)



T10 SERIES

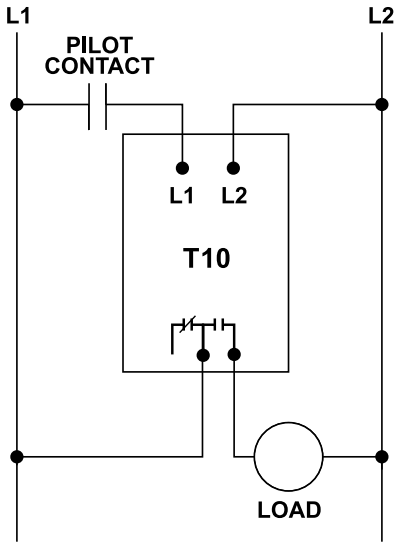
Solid-State On-Delay Timer

Description

The T10 Series on-delay timer is a solid-state electronic device that provides accurate and reliable timing for control circuits up to 460VAC. The T10 features a user-selectable time delay from 6 seconds to 10 minutes (0.5 to 12 seconds on the T10S400 model) and SPDT output contacts. When power is applied to the T10, it immediately begins its timing cycle. During this time, the indicator LED alternates between red and green and the output contacts remain inactive. When the timing cycle is complete, the indicator LED turns solid green and the output contacts are activated. The output contacts will remain activated until power is removed from the T10.

The SPDT contact ratings are 480V @ 240VAC on the 115V and 230V models, and 470VA @ 600VAC on the 460V model.

Wiring Diagram



For dimensional drawing see: Appendix page 509, Figure 6.

Features & Benefits

- Status LED
- 600V control relay on 460V models

Specifications

Input Characteristics

Frequency	50*/60Hz

Functional Characteristics

Timing Range	
T10100, T10200, T10400	6 seconds to 10 minutes
T10S400	0.5 seconds to 12 seconds
Repeat Accuracy	
Fixed Condition	±1%

Output Characteristics

Output Contact Rating (SPDT)	
Pilot Duty	
T10100, T10200	480VA @ 240VAC
T10400, T10S400	470VA @ 600VAC

General Characteristics

Maximum Input Power	5 W
Terminal	
Torque	7 in.-lbs.
Wire Size	12-18AWG

Safety Marks

UL	UL508 (File #E68520)
Dimensions	**H** 74.4 mm (2.93"); **W** 133.9 mm (5.27"); **D** 74.9 mm (2.95")
Weight	0.94 lb. (15.04 oz., 426.38 g)
Mounting Method	#8 screws

*Note: 50Hz will increase all delay timers by 20%.

Ordering Information

MODEL	LINE VOLTAGE	DESCRIPTION
T10120	115VAC	0.1 to 10 minute range, 240 VAC rated output contacts
T10200	230VAC	0.1 to 10 minute range, 240 VAC rated output contacts
T10400	460VAC	0.1 to 10 minute range, 600 VAC rated output contacts
T10S400	460VAC	0.5 to 12 second range, 600 VAC rated output contacts

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ERDM SERIES

Description

The ERDM Series is a combination of digital electronics and a reliable electromechanical relay. These devices offer a DPDT relay output for relay logic circuits, and isolation of input to output voltages. Cost effective for OEM applications, such as random starting, sequencing ON, switch de-bouncing, anti-short cycling, and other common delay-on-make applications.

Operation (Delay-on-Make)

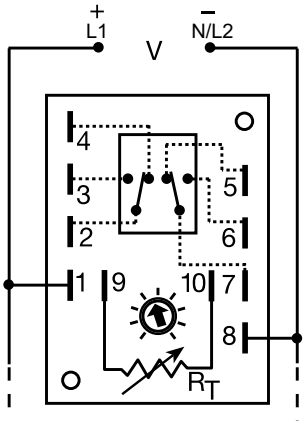
Upon application of input voltage, the time delay begins. The output is de-energized before and during the time delay. At the end of the time delay, the output energizes and remains energized until input voltage is removed.

Reset: Removing input voltage resets the time delay and output.

Features & Benefits

FEATURES	BENEFITS
Digital integrated circuitry with electromechanical relay	Repeat Accuracy + / - 0.5%
Isolated 10A, DPDT output contacts	Allows control of loads for AC or DC voltages
Encapsulated	Protects against shock, vibration, and humidity

Wiring Diagram



V = Voltage

A knob, or terminals 9 & 10 are only included on adjustable units. Relay contacts are isolated.

R_T is used when external adjustment is ordered.

For dimensional drawing see: Appendix, page 512, Figure 25.

Accessories

P1004-16, P1004-16-XVersa-Pot
Panel mountable, industrial potentiometer recommended for remote time delay adjustment.

P1015-64 (AWG 14/16) **Female Quick Connect**
These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.

P1015-18 Quick Connect to Screw Adapter
Screw adapter terminal designed for use with all modules with 0.25 in. (6.35 mm) male quick connect terminals.

Ordering Information

MODEL	INPUT VOLTAGE	ADJUSTMENT	TIME DELAY	MODEL	INPUT VOLTAGE	ADJUSTMENT	TIME DELAY
ERDM123	12VDC	Onboard knob	0.1 - 10s	ERDM422	120VAC	Onboard knob	0.1 - 5s
ERDM126	12VDC	Onboard knob	0.6 - 60s	ERDM423	120VAC	Onboard knob	0.1 - 10s
ERDM128	12VDC	Onboard knob	0.1 - 10m	ERDM425	120VAC	Onboard knob	0.3 - 30s
ERDM222	24VAC	Onboard knob	0.1 - 5s	ERDM427	120VAC	Onboard knob	0.1 - 5m
ERDM4130S	120VAC	Fixed	30s	ERDM429	120VAC	Onboard knob	0.2 - 15m
ERDM4210	120VAC	Onboard knob	1 - 100m				

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ERDM SERIES

Specifications

Time Delay

Type	Digital integrated circuitry
Range	0.1s - 500m in 11 adjustable ranges or 0.1s - 1000m fixed
Adjustment	Fixed, onboard or external adjust
Repeat Accuracy	±0.5%
Tolerance (Factory Calibration)	≤ ±10%
Recycle Time	≤ 150ms
Time Delay vs Temp. & Voltage	≤ ±2%

Input

Voltage	12, 24, or 120VDC; 24, 120, or 230VAC
Tolerance	
12VDC & 24VDC/AC	-15% - 20%
120VAC/DC & 230VAC	-20% - 10%
AC Line Frequency	50/60 Hz

Output

Type	Isolated relay contacts
Form	DPDT
Rating	10A resistive @ 120/240VAC & 28VDC; 1/3 hp @ 120/240VAC
Life	Mechanical - 1 x 10^7; Full Load - 1 x 10^6

Protection

Isolation Voltage	≥1500V RMS input to output
Insulation Resistance	≥100 MΩ
Polarity	DC units are reverse polarity protected

Mechanical

Mounting	Surface mount with two #6 (M3.5 x 0.6) screws
Dimensions	**H** 88.9 mm (3.5"); **W** 63.5 mm (2.5"); **D** 43.2 mm (1.7")
Termination	0.25 in. (6.35 mm) male quick connect terminals

Environmental

Operating/Storage Temperature	-40° to 65°C / -40° to 85°C
Weight	≅ 5.7 oz (162 g)

Selection Guides

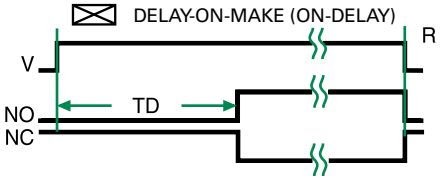
R_T Selection Chart						
Desired Time Delay* Seconds						R_T
1	2	3	4	5	6	Megohm
0.1	0.1	0.1	0.2	0.3	0.6	0.0
0.19	0.6	1	1.7	3	6	0.1
0.28	1.1	2	3.2	6	12	0.2
0.37	1.6	3	4.7	9	18	0.3
0.46	2.1	4	6.2	12	24	0.4
0.55	2.6	5	7.7	15	30	0.5
0.64	3.0	6	9.2	18	36	0.6
0.73	3.5	7	10.7	21	42	0.7
0.82	4.0	8	12.2	24	48	0.8
0.91	4.5	9	13.7	27	54	0.9
1.0	5.0	10	15	30	60	1.0

* When selecting an external R_T add at least 20% for tolerance of unit and the R_T.

R_T Selection Chart					
Desired Time Delay* Minutes					R_T
7	8	9	10	11	Megohm
0.1	0.1	0.2	1	10	0.0
0.6	1	1.7	10	50	0.1
1.1	2	3.2	20	100	0.2
1.6	3	4.7	30	150	0.3
2.1	4	6.2	40	200	0.4
2.6	5	7.7	50	250	0.5
3.0	6	9.2	60	300	0.6
3.5	7	10.7	70	350	0.7
4.0	8	12.2	80	400	0.8
4.5	9	13.7	90	450	0.9
5.0	10	15	100	500	1.0

* When selecting an external R_T add at least 20% for tolerance of unit and the R_T.

Function Diagram

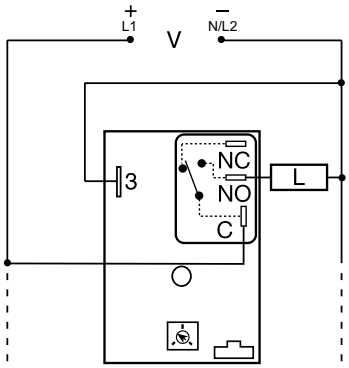


V = Voltage
NO = Normally Open Contact
NC = Normally Closed Contact
TD = Time Delay
R = Reset
—⌇— = Undefined Time

HRDM SERIES

Delay-on-Make Timer

Wiring Diagram



NO = Normally Open
L = Load
C = Common, Transfer Contact

NOTE: A knob, or terminals 4 & 5 are only included on adjustable units. R_T is used when external adjustment is ordered. Relay contacts are not isolated.

For dimensional drawing see: Appendix, page 512, Figure 17.

Ordering Information

MODEL	INPUT VOLTAGE	ADJUSTMENT	TIME DELAY
HRDM120	12VDC	Onboard	0.1 - 10s
HRDM3112S	24VDC	Fixed	12s
HRDM413M	120VAC	Fixed	3m
HRDM415M	120VAC	Fixed	5m

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Description

The HRDM Series combines an electromechanical relay output with microcontroller timing circuitry. It offers 12 to 230V operation in five ranges and factory fixed, onboard, or external adjustable time delays with a repeat accuracy of ±0.5%. The output contact rating allows for direct operation of heavy loads, such as compressors, pumps, blower motors, heaters, etc. This series is ideal for OEM applications where cost is a factor.

Operation (Delay-on-Make)

Upon application of input voltage, the time delay begins. The output is de-energized before and during the time delay. At the end of the time delay, the output relay energizes and remains energized until input voltage is removed.

Reset: Removing input voltage resets the time delay and output.

Features & Benefits

FEATURES	BENEFITS
Microcontroller based	Repeat Accuracy + / - 0.5%
Compact, low cost design	Allows flexibility for OEM applications
Isolated, 30A, SPDT, NO output contacts	Allows direct operation of heavy loads: compressors, pumps, blower moters, heaters.
Encapsulated	Protects against shock, vibration, and humidity

Accessories

P1004-95, P1004-95-X Versa-Pot
Panel mountable, industrial potentiometer recommended for remote time delay adjustment.

P1023-6 Mounting bracket
The 90° orientation of mounting slots makes installation/removal of modules quick and easy.

P0700-7 Versa-Knob
Designed for 0.25 in (6.35 mm) shaft of Versa-Pot. Semi-gloss industrial black finish.

P1015-13 (AWG 10/12), **P1015-64** (AWG 14/16) **Female Quick Connect**
These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.

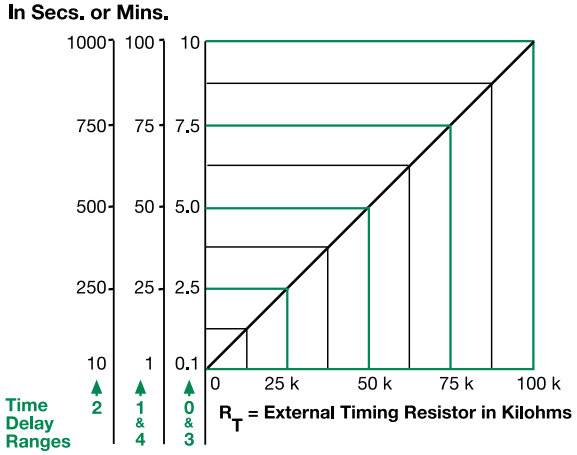
P1015-18 Quick Connect to Screw Adapter
Screw adapter terminal designed for use with all modules with 0.25 in. (6.35 mm) male quick connect terminals.

C103PM (AL) DIN Rail
35 mm aluminum DIN rail available in a 36 in. (91.4 cm) length.

P1023-20 DIN Rail Adapter
Allows module to be mounted on a 35 mm DIN type rail with two #10 screws.

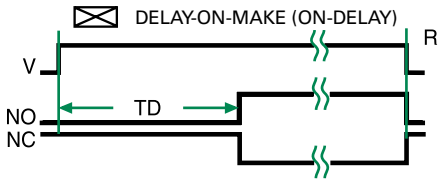
HRDM SERIES

External Resistance vs. Time Delay



This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the RT terminals; as the resistance increases the time delay increases.
When selecting an external RT, add the tolerances of the timer and the RT for the full time range adjustment.
Examples: 1 to 50 S adjustable time delay, select time delay range 1 and a 50 K ohm RT. For 1 to 100 S use a 100 K ohm RT.

Function Diagram



V = Voltage
NO = Normally Open Contact
NC = Normally Closed Contact
TD = Time Delay
R = Reset
—⌇— = Undefined Time

Specifications

Time Delay

Type	Microcontroller circuitry
Range	0.1s - 100m in 5 adjustable ranges or fixed
Repeat Accuracy	±0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	±1%, ±5%
Reset Time	≤ 150ms
Time Delay vs Temp. & Voltage	±2%

Input

Voltage	12 or 24VDC; 24, 120, or 230VAC
Tolerance	
12VDC & 24VDC	-15% - 20%
24 to 230VAC	-20% - 10%
AC Line Frequency	50/60 Hz
Power Consumption	AC ≤ 4VA; DC ≤ 2W

Output

Type		Electromechanical relay	
Form		Non-isolated, SPDT	
Ratings		**SPDT-NO**	**SPDT-NC**
General Purpose	**125/240VAC**	30A	15A
Resistive	**125/240VAC**	30A	15A
	28VDC	20A	10A
Motor Load	**125VAC**	1 hp*	1/4 hp**
	240VAC	2 hp**	1 hp**
Life		Mechanical - 1 x 10^6; Electrical - 1 x 10^5, *3 x 10^4, **6,000	

Protection

Surge	IEEE C62.41-1991 Level A
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000V RMS terminals to mounting surface
Insulation Resistance	≥ 100 MΩ
Polarity	DC units are reverse polarity protected

Mechanical

Mounting	Surface mount with one #10 (M5 x 0.8) screw
Dimensions	3 x 2 x 1.5 in. (76.7 x 51.3 x 38.1mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals

Environmental

Operating/Storage Temperature	-40° to 60°C / -40° to 85°C
Humidity	95% relative, non-condensing
Weight	≅ 3.9 oz (111 g)

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KRDM SERIES

Description

The KRDM Series is a compact time delay relay measuring only 2 in. (50.8 mm) square. Its solid-state timing circuit provides excellent repeat accuracy and stability. Encapsulation protects against shock, vibration, and humidity. The KRDM Series is a cost effective approach for OEM applications that require small size, isolation, reliability, and long life.

Operation (Delay-on-Make)

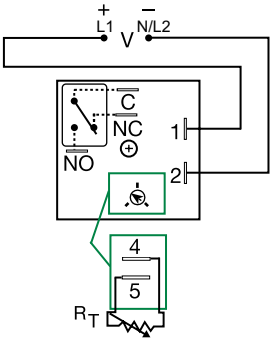
Upon application of input voltage, the time delay begins. The output is de-energized before and during the time delay. At the end of the time delay, the output relay energizes and remains energized until input voltage is removed.

Reset: Removing input voltage resets the time delay and output.

Features & Benefits

FEATURES	BENEFITS
Microcontroller based	Repeat Accuracy + / - 0.5%
Compact, low cost design	Allows flexibility for OEM applications
Isolated, 10A, SPDT output contacts	Allows control of loads for AC or DC voltages
Encapsulated	Protects against shock, vibration, and humidity

Wiring Diagram



V = Voltage
C = Common, Transfer Contact
NO = Normally Open
NC = Normally Closed

A knob is supplied for adjustable units, or R_T terminals 4 & 5 for external adjust. See external adjustment vs time delay chart. Relay contacts are isolated.

For dimensional drawing see: Appendix, page 512, Figure 16.

Accessories

P1004-95, P1004-95-X Versa-Pot
Panel mountable, industrial potentiometer recommended for remote time delay adjustment.

P1023-6 Mounting bracket
The 90° orientation of mounting slots makes installation/removal of modules quick and easy.

P0700-7 Versa-Knob
Designed for 0.25 in (6.35 mm) shaft of Versa-Pot. Semi-gloss industrial black finish.

Ordering Information

MODEL	INPUT VOLTAGE	ADJUSTMENT	TIME DELAY	MODEL	INPUT VOLTAGE	ADJUSTMENT	TIME DELAY
KRDM1110S	12VDC	Fixed	10s	KRDM4110M	120VAC	Fixed	10m
KRDM1130S	12VDC	Fixed	30s	KRDM4110S	120VAC	Fixed	10s
KRDM120	12VDC	Onboard knob	0.1 - 10s	KRDM4145S	120VAC	Fixed	45s
KRDM121	12VDC	Onboard knob	1 - 100s	KRDM420	120VAC	Onboard knob	0.1 - 10s
KRDM2110M	24VAC/DC	Fixed	10m	KRDM421	120VAC	Onboard knob	1 - 100s
KRDM215M	24VAC/DC	Fixed	5m	KRDM424	120VAC	Onboard knob	1 - 100m
KRDM220	24VAC/DC	Onboard knob	0.1 - 10s	KRDM430	120VAC	External	0.1 - 10s
KRDM221	24VAC/DC	Onboard knob	1 - 100s	KRDM433	120VAC	External	0.1 - 10m
KRDM223	24VAC/DC	Onboard knob	0.1 - 10m	KRDM6115M	230VAC	Fixed	15m
KRDM310.2S	24VDC	Fixed	0.2s				

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KRDM SERIES

Accessories

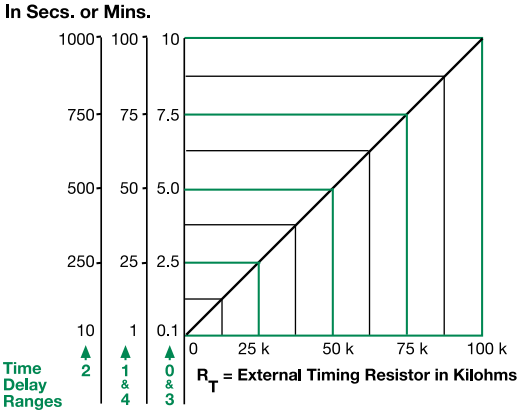
P1015-13 (AWG 10/12), **P1015-64** (AWG 14/16)
Female Quick Connect
These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.

P1015-18 Quick Connect to Screw Adapter
Screw adapter terminal designed for use with all modules with 0.25 in. (6.35 mm) male quick connect terminals.

C103PM (AL) DIN Rail
35 mm aluminum DIN rail available in a 36 in. (91.4 cm) length.

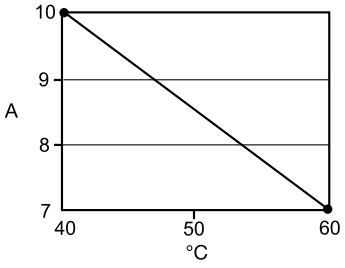
P1023-20 DIN Rail Adapter
Allows module to be mounted on a 35 mm DIN type rail with two #10 screws.

External Resistance vs. Time Delay



This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the RT terminals; as the resistance increases the time delay increases.
When selecting an external RT, add the tolerances of the timer and the RT for the full time range adjustment.
Examples: 1 to 50 S adjustable time delay, select time delay range 1 and a 50 K ohm RT. For 1 to 100 S use a 100 K ohm RT.

Output Current / Ambient Temperature



Specifications

Time Delay

Range	0.1s - 100m in 5 adjustable ranges or fixed
Repeat Accuracy	±0.5% or 20ms, whichever is greater
Tolerance (Factory Calibration)	≤ ±5%
Recycle Time	≤ 150ms
Time Delay vs Temp. & Voltage	≤ ±5%

Input

Voltage	12, 24 or 110VDC; 24, 120 or 230VAC
Tolerance	
12VDC & 24VAC/DC	-15% - 20%
110VDC 120 & 230VAC	-20% - 10%
AC Line Frequency/DC Ripple	50/60 Hz / ≤ 10%
Power Consumption	AC ≤ 2VA; DC ≤ 2W

Output

Type	Isolated relay contacts
Form	SPDT
Rating (at 40°C)	10A resistive @ 125VAC; 5A resistive @ 230VAC & 28VDC; 1/4 hp @ 125VAC
Max. Switching Voltage	250VAC
Life (Operations)	Mechanical - 1 x 10^7; Electrical - 1 x 10^5

Protection

Circuitry	Encapsulated
Isolation Voltage	≥ 1500V RMS input to output
Insulation Resistance	≥ 100 MΩ
Polarity	DC units are reverse polarity protected

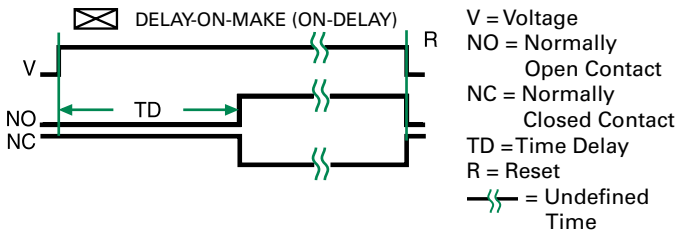
Mechanical

Mounting	Surface mount with one #10 (M5 x 0.8) screw
Dimensions	**H** 50.8 mm (2.0"); **W** 50.8 mm (2.0"); **D** 30.7 mm (1.21")
Termination	0.25 in. (6.35 mm) male quick connect terminals

Environmental

Operating/Storage Temperature	-20° to 60°C / -40° to 85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.6 oz (74 g)

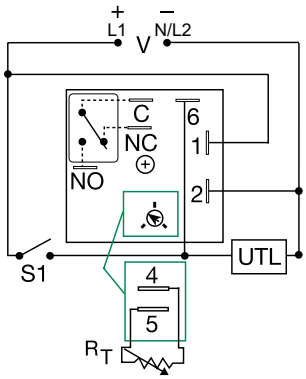
Function Diagram



12
TIME DELAY RELAYS

KRPS SERIES

Wiring Diagram



V = Voltage
C = Common, Transfer Contact
NC = Normally Closed
NO = Normally Open
S1 = Initiate Switch
UTL = Untimed Load

A knob is supplied for adjustable units, or R_T terminals 4 & 5 for external adjust. See external adjustment vs. time delay chart. The untimed load is optional. S1 is not used for some functions.

For dimensional drawing see: Appendix, page 512, Figure 16.

Ordering Information

MODEL	INPUT VOLTAGE	ADJUST.	TIME DELAY	FUNCTION
KRPS4160MM	120VAC	Fixed	60m	Delay-on-Make
KRPS913MB	230VAC	Fixed	3m	Delay-on-Break
KRPSA10.1SFT	24 - 240VAC/DC	Fixed	0.1s	Alternating
KRPSA21RE	24 - 240VAC/DC	Onboard	0.1 - 10s	Recycling, On Time First
KRPSA22B	24 - 240VAC/DC	Onboard	1 - 100s	Delay-on-Break
KRPSA24M	24 - 240VAC/DC	Onboard	0.1 - 10m	Delay-on-Make
KRPSD10.1SF	12 to 48VDC	Fixed	0.1s	Leading Edge Flip-Flop
KRPSD21B	12 to 48VDC	Onboard	0.1 - 10s	Delay-on-Break
KRPSD21M	12 to 48VDC	Onboard	0.1 - 10s	Delay-on-Make
KRPSD22M	12 to 48VDC	Onboard	1 - 100s	Delay-on-Make
KRPSD22S	12 to 48VDC	Onboard	1 - 100s	Single Shot
KRPSD25S	12 to 48VDC	Onboard	1 - 100m	Single Shot

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Description

The KRPS Series is a factory programmed time delay relay available with 1 of 15 functions and measures only 2 inches square. The KRPS offers a wide range of fixed, onboard, or externally adjustable time delays. The output relay contacts offer a full 10A rating with complete isolation. Its microcontroller timing circuit provides excellent repeat accuracy and stability. Encapsulation protects against shock, vibration, and humidity. The KRPS Series is a cost effective approach for OEM applications that require small size, isolation, accuracy, and long life. Special time ranges and functions are available.

Features & Benefits

FEATURES	BENEFITS
Microcontroller based	Repeat Accuracy + / - 0.5%
Compact design	Allows flexibility for OEM applications
Isolated, SPDT, 10A output	Allows control of loads for AC or DC voltages
Encapsulated	Encapsulated to protect against shock, vibration, and humidity

Accessories

P1004-95, P1004-95-X Versa-Pot
Panel mountable, industrial potentiometer recommended for remote time delay adjustment.

P0700-7 Versa-Knob
Designed for 0.25 in (6.35 mm) shaft of Versa-Pot. Semi-gloss industrial black finish.

P1015-64 (AWG 14/16)
Female Quick Connect
These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.

P1015-18 Quick Connect to Screw Adapter
Screw adapter terminal designed for use with all modules with 0.25 in. (6.35 mm) male quick connect terminals.

C103PM (AL) DIN Rail
35 mm aluminum DIN rail available in a 36 in. (91.4 cm) length.

P1023-20 DIN Rail Adapter
Allows module to be mounted on a 35 mm DIN type rail with two #10 screws.

KRPS SERIES

Specifications

Time Delay

Type	Microcontroller circuitry
Range	0.1s - 1000h in 9 adjustable ranges or fixed
Repeat Accuracy	±0.5% or 20ms, whichever is greater
Tolerance (Factory Calibration)	≤ ±2%
Reset Time	≤ 150ms
Initiate Time	≤ 40ms; ≤ 750 operations per minute
Time Delay vs Temp. & Voltage	≤ ±2%

Input

Voltage	12 to 48VDC; 24 to 240VAC/DC
Tolerance	
12 to 48VDC	-15% - 20%
24 to 240VAC/DC	-20% - 10%
AC Line Frequency/DC Ripple	50/60Hz / ≤ 10%
Power Consumption	AC ≤ 2VA; DC ≤ 2W

Output

Type	Isolated relay contacts
Form	SPDT
Rating (at 40°C)	10A resistive @ 125VAC 5A resistive @ 230VAC & 28VDC 1/4 hp @ 125VAC
Max. Switching Voltage	250VAC
Life (Operations)	Mechanical - 1 x 10^7; Electrical - 1 x 10^5

Protection

Circuitry	Encapsulated
Isolation Voltage	≥ 1500V RMS input to output
Insulation Resistance	≥ 100 MΩ
Polarity	DC units are reverse polarity protected

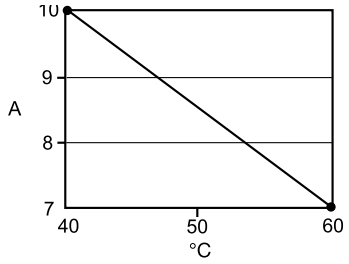
Mechanical

Mounting	Surface mt. with one #10 (M5 x 0.8) screw
Dimensions	**H** 50.8 mm (2.0"); **W** 50.8 mm (2.0"); **D** 30.7 mm (1.21")
Termination	0.25 in. (6.35 mm) male quick connects

Environmental

Operating/Storage Temperature	-40° to 60°C / -40° to 85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.6 oz (74 g)

Output Current/Ambient Temperature



Timer Functions

Operation (Delay-on-Make)

Upon application of the input voltage, the dime delay begins. The output relay is de-energized before and during the time delay. At the end of the time delay, the put energizes and remains energized until input voltage is removed.

Reset: Removing input voltage resets the time delay and output.

Operation (Delay-on-Break)

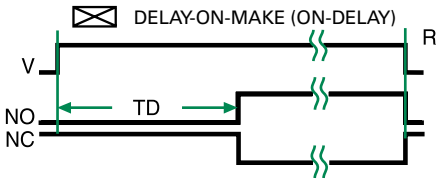
Input voltage must be applied before and during timing. Upon closure of the initiate switch, the output relay energizes. The time delay begins when the initiate switch is opened. The output remains energized during timing. At the end of the time delay, the output de-energizes. The output will energize if the initiate switch is closed when input voltage is applied.

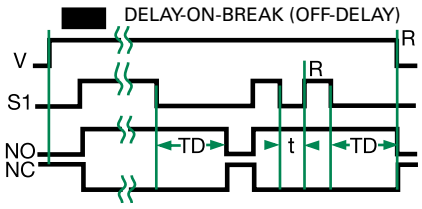
Reset: Re-closing the initiate switch during timing resets the time delay. Removing input voltage resets the time delay and output.

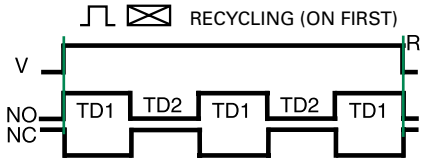
Operation (Recycling)

Upon application of input voltage, the output relay 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 time delays, and returns the sequence to the first delay.





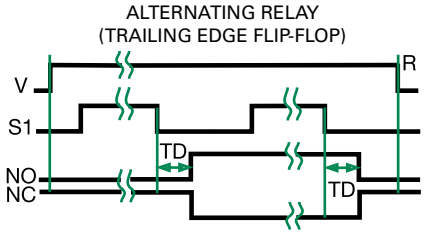


KRPS SERIES

Operation (Alternating)

Input voltage must be applied at all times for proper operation. The operation begins with the output relay de-energized. Closing S1 enables the next alternating operation. When S1 opens (trailing edge triggered), the time delay begins. At the end of the time delay, the output energizes and remains energized until S1 is (re-closed and) re-opened. Then the output relay de-energizes and remains until S1 opens again. Each time S1 opens the time delay occurs and the output transfers.

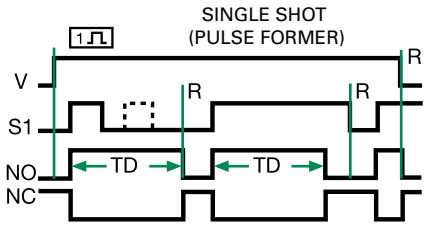
Reset: Removing input voltage resets the output and the time delay.



Operation (Single Shot)

Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch, the output (relay or solid state) energizes and the time delay begins. At the end of the delay, the output de-energizes. Opening or re-closing the initiate switch during timing has no effect on the time delay. Note (for most single shot timers): If the initiate switch is closed when input voltage is applied, the output energizes and the time delay begins.

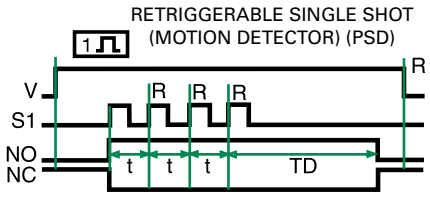
Reset: Reset occurs when the time delay is complete and the initiate switch is opened. Removing input voltage resets the time delay and output.



Operation (Retriggerable Single Shot, Motion Detector)

Input voltage must be applied prior to and during timing. The output relay is de-energized. When the initiate switch S1 closes momentarily or maintained, the output energizes and the time delay begins. Upon completion of the delay, the output de-energizes.

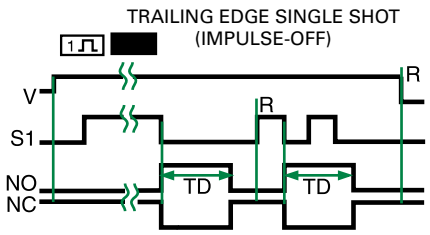
Reset: Re-closing S1 resets the time delay and restarts timing. Removing input voltage resets the time delay and output.



Operation (Trailing Edge Single Shot, Impulse-OFF)

Input voltage must be applied before and during timing. When the initiate switch S1 opens, the output relay energizes. At the end of the time delay, the output de-energizes. Re-closing and opening S1 during timing has no affect on the time delay. The output will not energize if S1 is open when input voltage is applied.

Reset: Reset occurs when the time delay is complete and S1 is closed. Removing input voltage resets the time delay and output.



LEGEND

V = Voltage
R = Reset
T1 = ON Time
T2 = OFF Time
S1 = Initiate Switch
NO = Normally Open Contact
NC = Normally Closed Contact
t = Incomplete Time Delay
TD, TD1, TD2 = Time Delay
C = Count
P = Pulse Duration
—≀— = Undefined Time

KSD1 SERIES

Delay-on-Make Timer

Description

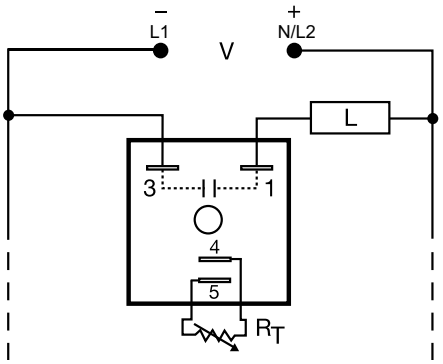
The KSD1 Series features two-terminal, series-connection with the load. The KSD1 Series is an ideal choice for delay-on-make timing applications. This series is designed for general purpose commercial and industrial applications where a small, cost effective, reliable solid-state timer is required. The factory calibration for fixed time delays is within 5% of the target time delay. The repeat accuracy, under stable conditions, is 0.5% of the selected time delay. This series is designed for popular AC and DC voltages. Time delays of 0.1 seconds to 1000 minutes are available in 6 ranges. The output is rated 1A steady and 10A inrush. The modules are totally solid state and encapsulated to protect the electronic circuitry.

Operation (Delay-on-Make)

Upon application of input voltage, the time delay begins. The output is de-energized before and during the time delay. At the end of the time delay, the output energizes and remains energized until input voltage is removed.

Reset: Removing input voltage resets the time delay and output.

Wiring Diagram



Load may be connected to terminal 3 or 1.

R_T is used when external adjustment is ordered.

For dimensional drawing see: Appendix, page 512, Figure 16.

Features & Benefits

FEATURES	BENEFITS
Microcontroller based	Repeat Accuracy + / - 0.5%, + / -5% time delay accuracy
Compact, low cost design	Allows flexibility for OEM applications
1A Steady solid-state output, 10A inrush	Provides 100 million operations in typical conditions.
Totally solid state and encapsulated	No moving parts to arc and wear out over time and encapsulated to protect against shock, vibration, and humidity

Accessories

P1004-95, P1004-95-X Versa-Pot
Panel mountable, industrial potentiometer recommended for remote time delay adjustment.

P1023-6 Mounting bracket
The 90° orientation of mounting slots makes installation/removal of modules quick and easy.

P0700-7 Versa-Knob
Designed for 0.25 in (6.35 mm) shaft of Versa-Pot. Semi-gloss industrial black finish.

P1015-64 (AWG 14/16)
Female Quick Connect
These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.

Ordering Information

MODEL	INPUT VOLTAGE	ADJUSTMENT	TIME DELAY
KSD11120S	12VDC	Fixed	20s
KSD1123	12VDC	External	0.1 - 10m
KSD1230	24VAC	Onboard	0.1 - 10s
KSD1320	24VDC	External	0.1 - 10s
KSD1412S	120VAC	Fixed	2s
KSD14130S	120VAC	Fixed	30s
KSD1420	120VAC	External	0.1 - 10s
KSD16130S	230VAC	Fixed	30s

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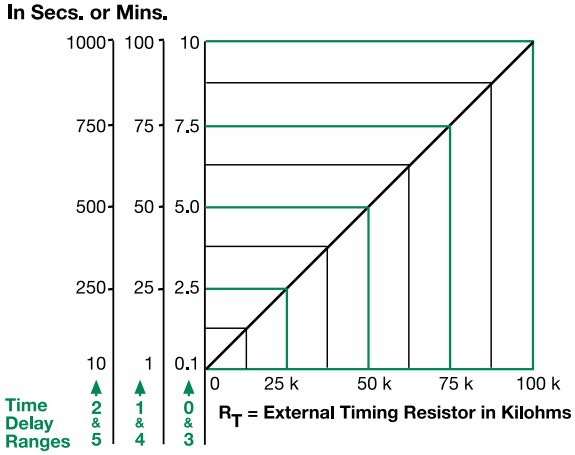
KSD1 SERIES

Accessories

C103PM (AL) DIN Rail
35 mm aluminum DIN rail available in a 36 in. (91.4 cm) length.

P1023-20 DIN Rail Adapter
Allows module to be mounted on a 35 mm DIN type rail with two #10 screws.

External Resistance vs. Time Delay

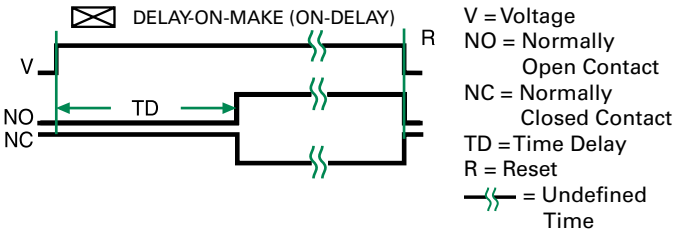


This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the R_T terminals; as the resistance increases the tie delay increases.

When selecting an external R_T, add the tolerances of the timer and the R_T for the full time range adjustment.

Examples: 1 to 50 S adjustable time delay, select time delay range 1 and a 50 K ohn R_T. For 1 to 100 S use a 100 K ohm R_T.

Function Diagram



Specifications

Time Delay

Range	0.1s - 1000m in 6 adjustable ranges or fixed
Repeat Accuracy	±0.5% or 20ms, whichever is greater
Tolerance (Factory Calibration)	≤ ±5%
Recycle Time	≤ 150ms
Time Delay vs. Temperature & Voltage	≤ ±10%

Input

Voltage	24, 120, or 230VAC; 12 or 24VDC
Tolerance	±20%
AC Line Frequency	50/60 Hz

Output

Type	Solid state
Form	NO, open during timing
Maximum Load Current	1A steady state, 10A inrush at 60°C
Minimum Holding Current	≤ 40mA
OFF State Leakage Current	≅ 7mA @ 230VAC
Voltage Drop	≅ 2.5V @ 1A

Protection

Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000V RMS terminals to mounting surface
Insulation Resistance	≥ 100 MΩ
Polarity	DC units are reverse polarity protected

Mechanical

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

Environmental

Operating/Storage Temperature	-40° to 60°C / -40° to 85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

KSDU SERIES

Description

The KSDU Series are encapsulated solid-state, delay-on-make timers that combine digital timing circuitry with universal voltage operation. The KSDU Series is factory fixed from 0.1s to 10,230s and does not include the DIP switch. These series are excellent choices for process control systems and OEM equipment.

Operation (Delay-on-Make)

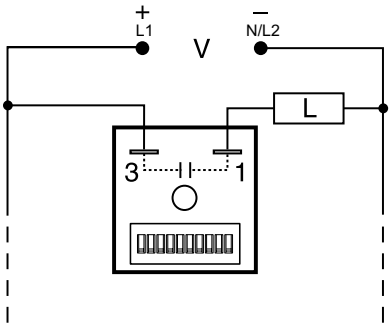
Upon application of input voltage, the time delay begins. The output is de-energized before and during the time delay. At the end of the time delay, the output energizes and remains energized until input voltage is removed.

Reset: Removing input voltage resets the time delay and output.

Features & Benefits

FEATURES	BENEFITS
Universal Voltage	24 to 240VAC/DC in 2 ranges
Digital Integrated Circuitry	Repeat accuracy + / - 5%
1A Steady, 10A inrush solid-state output	Provides 100 million operations in typical conditions.
Totally solid state and encapsulated	No moving parts to arc and wear out over time and encapsulated to protect against shock, vibration, and humidity
2 terminal design	Provides series connection for easy installation

Wiring Diagram



V = Voltage
L = Load

Load may be connected to terminal 3 or 1.

KSDU is fixed.

For dimensional drawing see: Appendix, page 512, Figure 16.

Accessories

P1023-6 Mounting bracket
The 90° orientation of mounting slots makes installation/removal of modules quick and easy.

P1015-64 (AWG 14/16) **Female Quick Connect**
These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.

P1015-18 Quick Connect to Screw Adapter
Screw adapter terminal designed for use with all modules with 0.25 in. (6.35 mm) male quick connect terminals.

C103PM (AL) DIN Rail
35 mm aluminum DIN rail available in a 36 in. (91.4 cm) length.

P1023-20 DIN Rail Adapter
Allows module to be mounted on a 35 mm DIN type rail with two #10 screws.

Ordering Information

MODEL	INPUT VOLTAGE	ADJUSTMENT	TIME DELAY
KSDU8120	24 to 120VAC/DC	Fixed	20s
KSDU811200	24 to 120VAC/DC	Fixed	1200s

If you don't find the part you need, call us for a custom product 800-843-8848