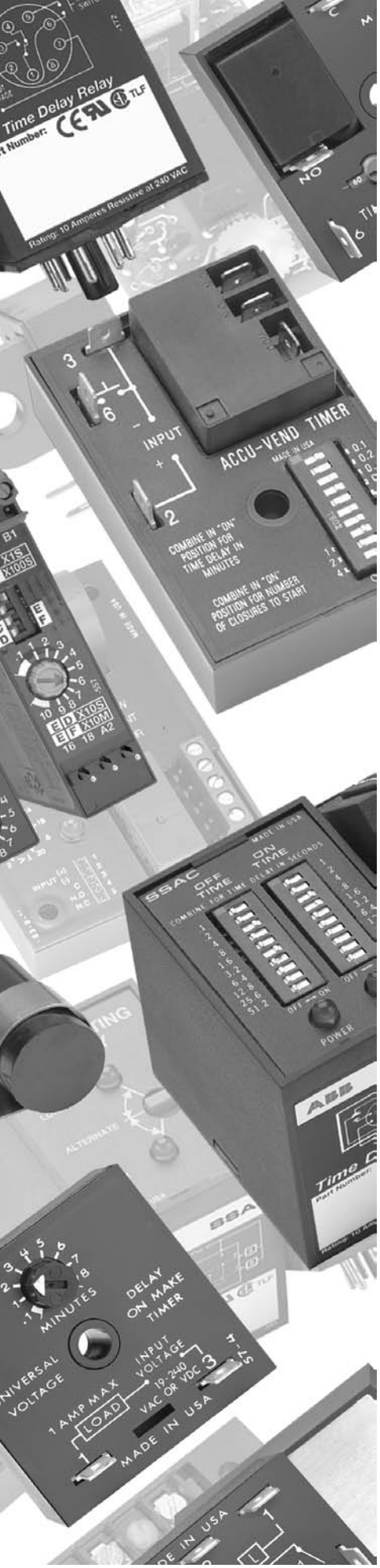


Section 5
Dedicated Timers

Note: DIN Rail Mounting Product pages are not included in this catalog.
Go to: www.ssac.com/sg5.pdf
Click on the Product Name
(ie: CT-SDS) to open the catalog page.
[Adobe Acrobat Reader is required]

Single Function




Delay on Make (ON Delay)
Relay Output 5.2
Solid State Output 5.16
DIN Rail Mounting.....see Note above
Delay on Make, Normally Closed
Solid State Output 5.34
Delay on Break (OFF Delay)
Relay Output 5.42
Solid State Output 5.54
DIN Rail Mounting.....see Note above
True Delay on Break (without auxiliary voltage)
Relay Output .....see Note above
Solid State Output .....see Note above
Single Shot (Pulse Former)
Relay Output 5.70
Solid State Output 5.84

Single Shot, Retriggerable (Watchdog, Zero Speed)
Relay Output 5.96
DIN Rail Mounting.....see Note Above
Trailing Edge Interval
DIN Rail Mounting..... see Note Above
Interval (Impulse ON)
Relay Output 5.100
Solid State Output 5.108
DIN Rail Mounting..... see Note above
Recycling & Percentage
Relay Output 5.126
Solid State Output 5.138
Recycling Flashers
DIN Rail Mounting..... see Note above

Sequencer

SQ3 & 4 -- Solid State Output 5.154

Dual Function

Delay on Make/Delay on Break
TDMB -- Plug-In.....5.156
DIN Rail Mounting
CT-MXS.xx ..... see Note above
Delay on Make/Interval
ESD5 -- Solid State.....5.158

HVAC Timers

Solid State Output
TAC1 -- Anti Short Cycle Random Start ..5.160
T2D -- Anti Short Cycle, Random Start ...5.162
TAC4 -- Bypass Timing.....5.164
TA -- Anti Short Cycle (DOB).....5.166
TL -- Anti Short Cycle (DOB).....5.168
CT -- Fan Delay.....5.170

Vending Timers

HRV -- Relay Output 5.172
THC/THS -- Solid State Output 5.94
KSPU -- Solid State Output.....5.176
NHPU -- Solid State Output.....5.178

Star Delta Motor Starting

DIN Rail Mounting
CT-SDS .....see Note above
CT-SDE .....see Note above
CT-YDE .....see Note above

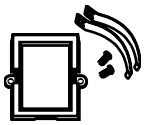
Single Shot, Interval (Pulse Former)
TDSL, TDS, TDSH Digi-Set
Time Delay Relay

- Switch Settable Time Delay
- Three Time Ranges from 100 ms ... 10,230 s
- +/-0.1% Repeat Accuracy
- +/-2% Setting Accuracy
- SPDT or DPDT, 10 A Output Contacts
- LED Indication

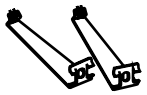
Approvals: ***

***8 pin models used in combination with P1011-6 socket only.

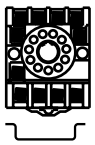
Accessories



Panel mount kit
P/N: **BZ1**



Hold down clips
P/Ns:
PSC8 (NDS-8)
PSC11 (NDS-11)



11 pin socket
P/N: **NDS-11**

Octal
8 pin socket
P/N: **NDS-8**

Octal socket
for UL Listing
P/N: **P1011-6**

See accessory pages for specifications.

Description

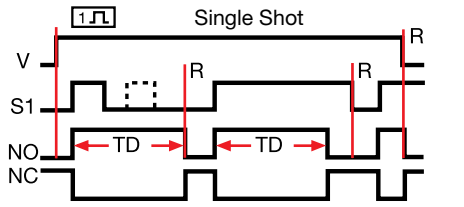
The TDS Series combines accurate digital circuitry with isolated 10 A rated DPDT or SPDT relay contacts in an 8 or 11 pin plug-in package. The TDS Series features DIP switch selectable time delays ranging from 100 milliseconds to 10,230 seconds in three ranges. The TDS Series is the product of choice for custom control panel and OEM designers.

Operation

Input voltage must be applied to the input before and during timing. Upon momentary or maintained closure of the initiate switch (leading edge triggered), the output relay energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output will energize if the initiate switch is closed when input voltage is applied.

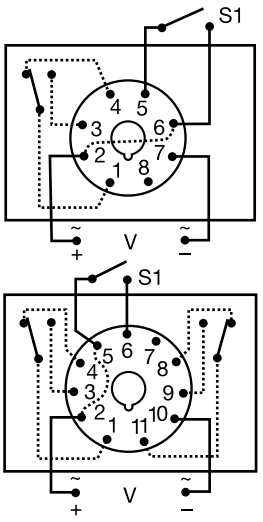
Reset: Reset occurs when the time delay is complete and the initiate switch is opened. Loss of input voltage resets the time delay and output.

Function



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

Connection



8 Pin Octal
SPDT

11 Pin
DPDT

S1 = Initiate Switch

Relay contacts are isolated. Dashed lines are internal connections.

Ordering Table

X Series/Time Range
- **TDSL** - 0.1... 102.3 s in 0.1 s increments
- **TDS** - 1 ... 1023 s in 1 s increments
- **TDSH** - 10 ... 10,230 s in 10 s increments

X Input
- **12D** - 12 V DC
- **24A** - 24 V AC
- **24D** - 24 V DC/28 V DC
- **110D** - 110 V DC
- **120A** - 120 V AC
- **230A** - 230 V AC

X LED*
- **L**

X Type of Plug/Output Form
- **D** - 11 Pin Plug, DPDT
- Blank - Octal (8 Pin) Plug, SPDT

Example P/N: **TDS120AL**

* Note: LED not available in 12 V DC

TDS02B01 07.07.04

Single Shot, Interval (Pulse Former)
TDSL, TDS, TDSH Digi-Set
Time Delay Relay

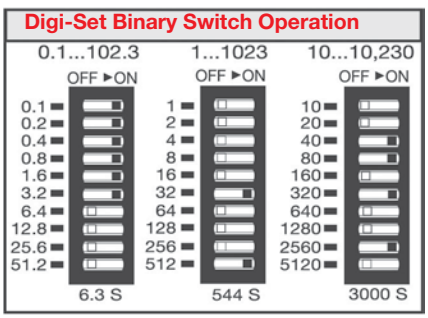
Technical Data

Time Delay		
Type		Digital integrated circuitry
Range**		0.1 ... 102.3 s in 0.1 s increments 1 ... 1023 s in 1 s increments 10 ... 10,230 s in 10 s increments
Repeat Accuracy		+/-0.1% or 20 ms, whichever is greater
Setting Accuracy		+/-2% or 50 ms, whichever is greater
Reset Time		≤ 50 ms
Recycle Time		≤ 150 ms
Time Delay vs. Temperature & Voltage		+/-5%
Indicator		LED glows during timing; relay is energized
Initiate Time		≤ 60 ms
Input		
Voltage		12, 24, or 110 V DC; 24, 120, or 230 V AC
Tolerance	12 V DC & 24 V DC/AC	-15% ... +20%
	110 ... 230 V AC/DC	-20% ... +10%
Frequency		50 ... 60 Hz
Power Consumption		≤ 3.25 W
Output		
Type		Electromechanical relay
Form		SPDT & DPDT
Rating		10 A resistive at 120/240 V AC & 28 V DC; 1/3 hp at 120/240 V AC
Life		Mechanical -- 1 x 10^7; Electrical -- 1 x 10^6
Protection		
Isolation Voltage		≥ 1500 V RMS input to output
Polarity		DC units are reverse polarity protected
Mechanical		
Mounting		Plug-in socket
Package		3.2 x 2.4 x 1.8 in. (81.3 x 60.7 x 45.2 mm)
Termination		Standard octal plug (8 Pin) or 11 Pin plug-in
Environmental		
Operating Temperature		-20°C ... +65°C
Storage Temperature		-30°C ... +85°C
Weight		≅ 6 oz (170 g)

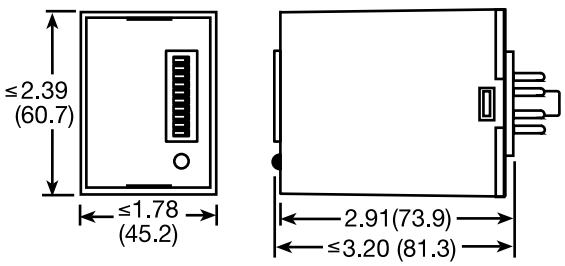
**For CE approved applications, power must be removed from the unit when a switch position is changed.

5

Digi-Set Binary Switch Operation



Mechanical View



Inches (Millimeters)

Single Shot, Interval (Pulse Former)
TRS Series
Time Delay Relay

- Knob Adjustable Time Delays
- Fixed or Adjustable Delays From 0.05 ... 600 s in Ranges
- Analog Circuitry +/-2% Repeat Accuracy
- AC and DC Operating Voltages are Available
- 10 A, Isolated SPDT and DPDT Contacts

Approvals: **

** 8 pin models used in combination with P1011-6 socket only.

Description

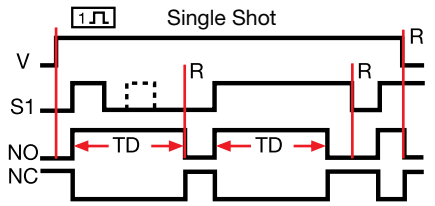
The TRS Series combines a 10 A isolated electromechanical relay output with analog timing circuitry. False trigger of the TRS by a transient is unlikely because of the complete isolation of the circuit from the line prior to initiation. The initiate contact is common to one side of the line and may be utilized to operate other loads. Installation is easy due to the TRS's industry standard 8 or 11 pin plug-in base wiring.

Operation

Input voltage must be applied to the input before and during timing. Upon momentary or maintained closure of the initiate switch (leading edge triggered), the output energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. Applying input voltage with the initiate switch closed will energize the load and begin the time delay.

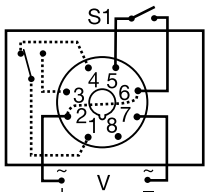
Reset: Reset occurs when the time delay is complete and the initiate switch is opened. Loss of input voltage resets the time delay and output.

Function

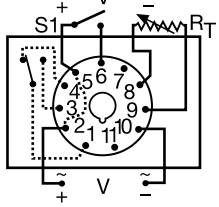


V = Voltage S1 = Initiate Switch
TD = Time Delay R = Reset
NO = Normally Open NC = Normally Closed

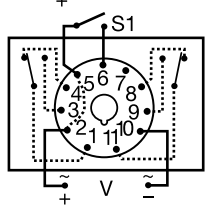
Connection



8 Pin Octal SPDT



11 Pin SPDT



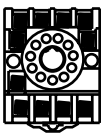
11 Pin DPDT

S1 = Initiate Switch

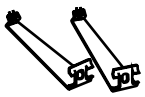
Relay contacts are isolated. Dashed lines are internal connections.
R_T is used when external adjustment is ordered.

Accessories

Octal socket for UL Listing
P/N: **P1011-6**

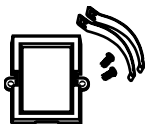


11 pin socket
P/N: **NDS-11**



Hold down clips
P/Ns:
PSC8 (NDS-8)
PSC11 (NDS-11)

Octal
8 pin socket
P/N: **NDS-8**



Panel mount kit
P/N: **BZ1**

See accessory pages for specifications.

Ordering Table

TRS Series

X Input
- **24A** - 24 V AC
- **24D** - 24 V DC/ 28 V DC
- **110D** - 110 V DC
- **120A** - 120 V AC
- **230A** - 230 V AC

X Adjustment and Output Form
- **1** - Fixed, Octal, SPDT
- **10** - Fixed, 11 Pin, DPDT
- **2** - Knob Adjust, Octal, SPDT
- **3** - Lock Shaft Adjust, Octal, SPDT
- **4** - Knob Adjust, 11 Pin, DPDT
- **7** - Ext. Adjust, 11 Pin, SPDT without Potentiometer

X Time Tolerance
- **X** - +/-20%
- **Y** - +/-10%
- **Z** - +/- 5%

X Time Delay * (Seconds)

0.05 ... **1**	2 ... **180**
0.05 ... **2**	7 ... **240**
0.05 ... **3**	7 ... **300**
0.1 ... **5**	7 ... **360**
0.1 ... **10**	7 ... **420**
1 ... **30**	7 ... **480**
1 ... **60**	7 ... **600**
2 ... **120**	

*If Fixed Delay is selected, insert delay [**0.05** ... **600**] in seconds

Example P/N: **TRS120A2Y30** Fixed: **TRS24D10Z1**

TRS02B01 07.07.04

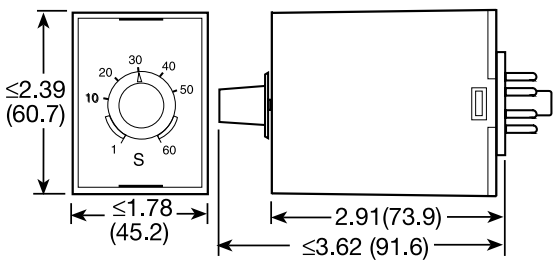
Single Shot, Interval (Pulse Former)
TRS Series
Time Delay Relay

Technical Data

Time Delay		
Type		Analog circuitry
Range		50 ms ... 10 m in 15 adjustable ranges or fixed
Repeat Accuracy		+/-2% or 20 ms, whichever is greater
Fixed Time Tolerance & Setting Accuracy		+/-5, 10, or 20%
Initiate Time		≤ 70 ms
Reset Time		≤ 75 ms
Recycle Time		≤ 250 ms
Time Delay vs. Temperature & Voltage		≤+/-10%
Input		
Voltage		24 or 110 V DC; 24, 120, or 230 V AC
Tolerance	24 V DC/AC	-15% ... +20%
	110 ... 230 V AC/DC	-20% ... +10%
Frequency		50 ... 60 Hz
Power Consumption		≤ 3.25 W
Output		
Type		Electromechanical relay
Form		Isolated SPDT or DPDT
Rating		10 A resistive at 120/240 V AC & 28 V DC; 1/3 hp at 120/240 V AC
Life		Mechanical: 1 x 10^7; Electrical: 1 x 10^6
Protection		
Insulation Resistance		≥ 100 MΩ
Isolation Voltage		≥ 1500 V RMS between input & output terminals
Polarity		DC units are reverse polarity protected
Mechanical		
Mounting		Plug-in socket
Termination		8 Pin octal or 11 Pin plug-in
Package		3.62 x 2.39 x 1.78 in. (91.6 x 60.7 x 45.2 mm)
Environmental		
Operating Temperature		-20°C ... +65°C
Storage Temperature		-30°C ... +85°C
Weight		≅ 6 oz (170 g)

5

Mechanical View

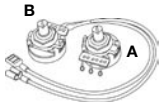


Inches (Millimeters)

R_T Selection Chart	
Time Delay*	
Range	R_T
Seconds	Megohm
0.05...1	1.0
0.05...2	2.0
0.05...3	3.0
0.1...5	5.0
0.1...10	3.0
1...30	1.5
1...60	3.0
2...120	2.0
2...180	3.0
7...240	1.5
7...300	2.0
7...360	2.0
7...420	3.0
7...480	3.0
7...600	5.0

* When selecting an external R_T add at least 15...30% for tolerance of unit and the R_T.

Accessories



External adjust potentiometer
P/Ns:
P1004-XX (fig. A)
P1004-XX-X (fig. B)

Versa-knob
P/N: **P0700-7**

External R_T P/N Selection Table		
Figure	Value	Part Number
A	1 M ohm	P1004-16
A	1.5 M ohm	P1004-15
A	2 M ohm	P1004-14
A	3 M ohm	P1004-12
A	5 M ohm	P1004-13
B	1 M ohm	P1004-16-X
B	1.5 M ohm	P1004-15-X
B	2 M ohm	P1004-14-X
B	3 M ohm	P1004-12-X
B	5 M ohm	P1004-13-X

Single Shot (Pulse Former)
PRLS Series
Time Delay Relay

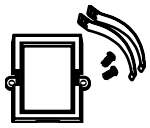
TEN YEAR 10 WARRANTY

5

- Knob Adjustable Time Delay Relay
- Electronic Circuit with Electromechanical Relay
- Popular AC & DC Operating Voltages
- Industry Standard Octal Plug-in Connection
- Time Delays to 600 s in 6 Ranges
- +/-2% Repeat Accuracy
- +/-10% Factory Calibration
- LED Indication
- 10 A Rated SPDT Relay Output

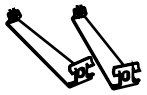
Approvals:

Accessories



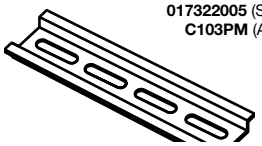
Panel mount kit
P/N: **BZ1**

Octal
8 pin socket
P/N: **NDS-8**



Hold down clips
P/N: **PSC8**

DIN rail P/Ns:
017322005 (Steel)
C103PM (Al)



See accessory pages for specifications.

Description

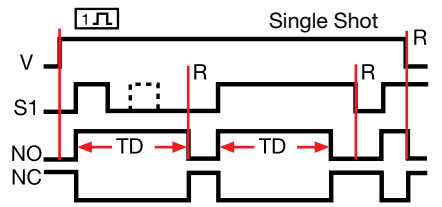
The PRLS Series is designed for use on non-critical timing applications. It offers low cost knob adjustable timing control, full 10 A relay output, and onboard LED indication. The knob adjustment provides a guaranteed time range of up to 10 minutes in 6 ranges. The onboard LED indicates whether or not the unit is timing (flashing LED) as well as the status of the output.

Operation

Input voltage must be applied to the input at all times prior to and during timing. Upon closure of the initiate switch (momentary or maintained) the output contacts transfer and the time delay is initiated. The LED flashes during timing. At the end of the delay, the output contacts revert to their original position. If the initiate switch is reclosed during timing, the time delay will not be affected. Applying input voltage with the intiate switch closed will energize the load and begin the time delay.

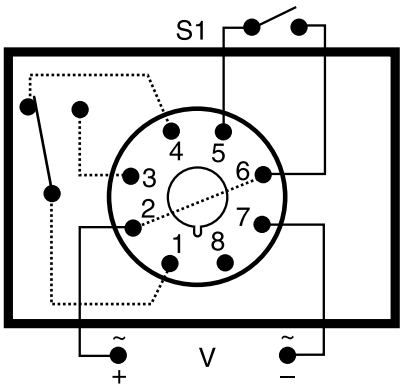
Reset: Reset occurs when the time delay is complete and the initiate switch is opened. Loss of input voltage resets the time delay and output.

Function



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

Connection



Relay contacts are isolated. Dashed lines are internal connections.

Ordering Table

PRLS Series	X Input	X Adjustment	X Time Delay *
	1 - 12 V DC	1 - Factory Fixed	1 - 0.05 ... 3 s
	2 - 24 V AC	2 - Adjustable	2 - 0.1 ... 10 s
	3 - 24 V DC		3 - 1 ... 60 s
	4 - 120 V AC		4 - 2 ... 180 s
	5 - 110 V DC		5 - 7 ... 480 s
	6 - 230 V AC		6 - 7 ... 600 s

Example P/N: PRLS422 Fixed – PRLS2160

*If Fixed Delay is selected, insert delay [0.05...600] in seconds.

PRLS2B01 07.01.04

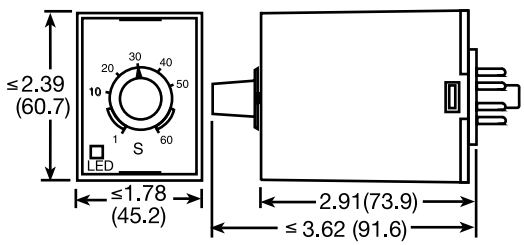
Single Shot (Pulse Former)
PRLS Series
Time Delay Relay

Technical Data

Time Delay		
Type		Analog circuitry
Range		0.05 ... 600 s in 6 adjustable ranges or fixed
Repeat Accuracy		+/-2% or 20 ms, whichever is greater
Tolerance		Knob Adjust: Guaranteed range Fixed: +/-10%
Reset Time		≤ 75 ms
Recycle Time		≤ 250 ms
Time Delay vs. Temperature & Voltage		≤ +/-10%
Input		
Voltage		24, 120, or 230 V AC; 12, 24, or 110 V DC
Tolerance	12 V DC & 24 V DC/AC	-15% ... +20%
	110 ... 230 V AC/DC	-20% .... +10%
Line Frequency		50 ... 60 Hz
Power Consumption		≤ 2.25 W
Output		
Type		Electromechanical relay
Form		Isolated SPDT
Rating		10 A resistive at 28 V DC; 10 A resistive at 240 V AC; 1/3 hp at 120 & 240 V AC
Life		Mechanical--1x10^7; Electrical--1x10^6
Protection		
Surge		IEEE C62.41-1991 Level A
Isolation Voltage		≥ 1500 V RMS input to output
Insulation Resistance		≥ 100 MΩ
Polarity		DC units are reverse polarity protected
Indication		
Type		LED
Operation		Output Energized & Timing--Flashing
Mechanical		
Mounting		Plug-in socket
Package		3.62 x 2.39 x 1.78 in. (91.6 x 60.7 x 45.2 mm)
Termination		Octal plug-in (8 pin)
Environmental		
Operating Temperature		-20°C ... +65°C
Storage Temperature		-30°C ... +85°C
Weight		≅ 6 oz (170 g)

5

Mechanical View



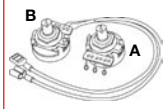
Inches (Millimeters)

Single Shot
HRDS Power-Time
Time Delay Relay

- 30 A SPDT N.O. Output Contacts
- 12 ... 230 V Operation in 5 Ranges
- Encapsulated Circuitry
- Delays from 100 ms ...100 m in 5 ranges
- +/-0.5% Repeat Accuracy
- Fixed, External, or Onboard Adjustment

Approvals:

Accessories



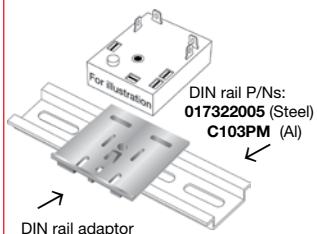
External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)

Mounting bracket
P/N: **P1023-6**

Female quick connect P/Ns:
P1015-64 (AWG 14/16)
P1015-13 (AWG 10/12)

Quick connect to screw adaptor
P/N: **P1015-18**

Versa-knob
P/N: **P0700-7**



DIN rail P/Ns:
017322005 (Steel)
C103PM (Al)

DIN rail adaptor
P/N: **P1023-20**

See accessory pages for specifications.

Description

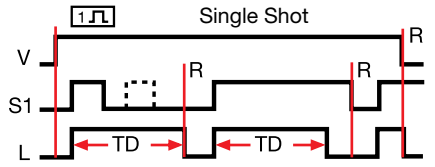
The HRDS Series combines an electromechanical relay output with microcontroller timing circuitry. It offers 12 to 230 V operation in five ranges and factory fixed, external, or onboard adjustable time delays with a repeat accuracy of +/-0.5%. The output contact rating allows for direct operation of heavy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

Operation

Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch, the output relay energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output will energize if the initiate switch is closed when input voltage is applied.

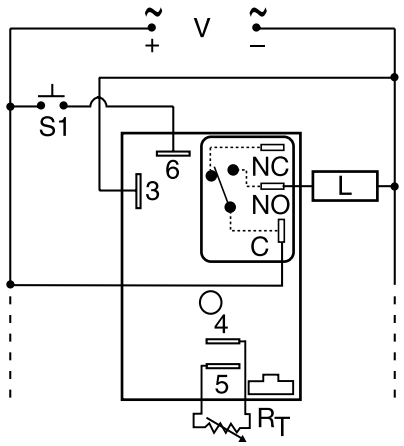
Reset: Reset occurs when the time delay is complete and the initiate switch is opened. Loss of input voltage resets the time delay and output.

Function



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

Connection



NO = Normally Open S1 = Initiate Switch
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. Dashed lines are internal connections.

Ordering Table

HRDS Series	X Input	X Adjustment	X Time Tolerance	X Time Delay *
	1 - 12 V DC	1 - Fixed	A - +/-1%	0 - 0.1 ... 10 s
	2 - 24 V AC	2 - Onboard Knob	Blank - +/-5%	1 - 1 ... 100 s
	3 - 24 V DC	3 - External Adjust		2 - 10 ... 1000 s
	4 - 120 V AC			3 - 0.1 ... 10 m
	6 - 230 V AC			4 - 1 ... 100 m

Example P/N: HRDS421 Fixed – HRDS41A0.5S

* If Fixed Delay is selected, insert delay [0.1 … 1000] followed by (S) sec. or [0.1 ... 100] (M) min.

HRDSGen 10.03.05

Single Shot
HRDS Power-Time
Time Delay Relay

Technical Data

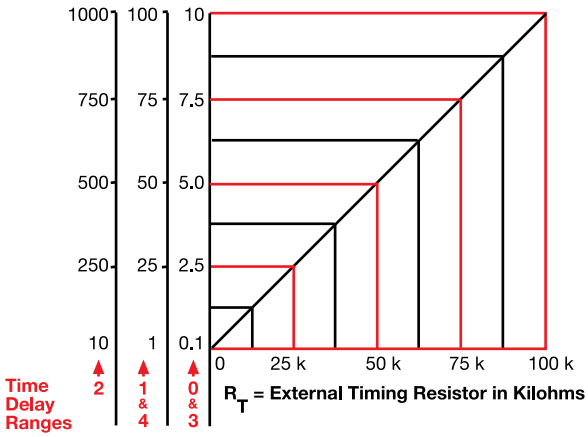
Time Delay		
Type		Microcontroller circuitry
Range		100 ms ... 100 m in 5 adjustable ranges or fixed
Repeat Accuracy		+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)		+/-1%, +/-5%
Reset Time		≤ 150 ms
Initiate Time		≤ 20 ms
Time Delay vs. Temperature & Voltage		+/-2%
Input		
Voltage		12 or 24 V DC; 24, 120, or 230 V AC
Tolerance	12 V DC & 24 V DC	-15% ... +20%
	24 ... 230 V AC	-20% ... +10%
Line Frequency		50 ... 60 Hz
Power Consumption		AC ≤ 4 VA; DC ≤ 2 W
Output		
Type		Electromechanical relay
Form		SPDT, non-isolated

Ratings:		SPDT-N.O.	SPDT-N.C.
General Purpose	125/240 V AC	30 A	15 A
Resistive	125/240 V AC	30 A	15 A
	28 V DC	20 A	10 A
Motor Load	125 V AC	1 hp*	1/4 hp**
	240 V AC	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	≥ 2000 V 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
Package	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°C ... +60°C/-40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 3.9 oz (111 g)

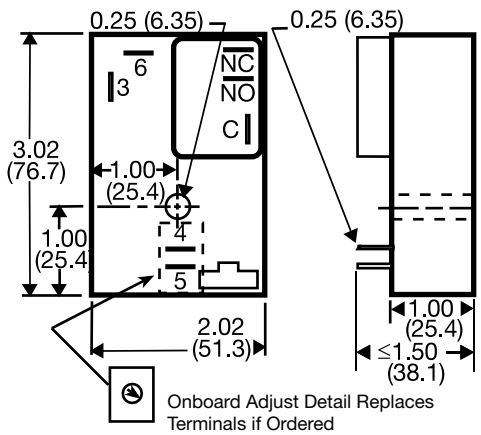
External Resistance vs Time Delay

In Secs. or Mins.



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.

Mechanical View



Inches (Millimeters)

5

Interval or Single Shot
ERDI Econo-Timer
Time Delay Relay

- Knob or External Adjust or Factory Fixed
- Delays from 0.1 s ... 1000 m in 11 ranges
- +/-0.5% Repeat Accuracy
- +/- 10% Factory Calibration
- Encapsulated Digital Circuitry
- 10 A, Isolated, DPDT Output Contacts

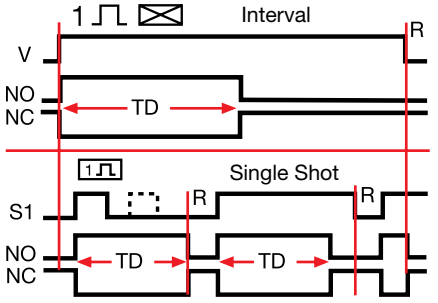
Approvals: cULus

Description
Econo-Timers are a combination of digital electronics and an electromechanical relay. DPDT relay output for relay logic circuits, and isolation of input to output voltages. For applications such as interval on, pulse shaping, minimum run time, etc. The ERD Series are encapsulated to protect the circuitry from shock, vibration and humidity.

Operation - Interval
Upon application of input voltage, time delay begins, and output relay energizes. At the end of time delay, output de-energizes until input voltage is removed.
Reset: Removing input voltage resets the time delay and the output.

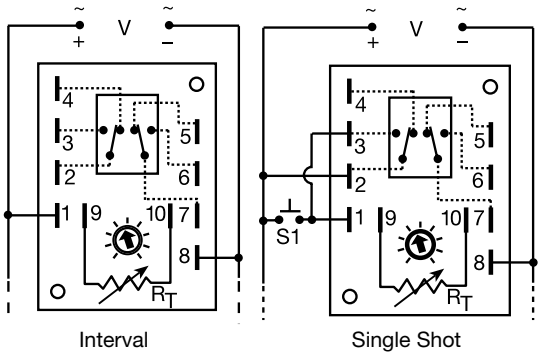
Operation - Single Shot
Input voltage must be applied before & during timing. Upon momentary or maintained closure of initiate switch, output relay energizes for time delay. At the end of the delay, output de-energizes. Opening or reclosing initiate switch during timing has no affect on time delay. Output will energize if initiate switch is closed when input voltage is applied.
Reset: Reset occurs when time delay is complete & initiate switch is opened. Loss of input voltage resets time delay & output.

Function



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

Connection

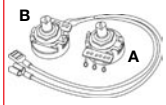


2-3 & 7-6 are Normally Open Contacts (NO)
2-4 & 7-5 are Normally Closed Contacts (NC)

A knob, or terminals 9 & 10 are included on adjustable units. Relay contacts are isolated. Dashed lines are internal connections.

R_T is used when external adjustment is ordered.

Accessories



External adjust potentiometer
P/Ns:
P1004-16 (fig A)
P1004-16-X (fig B)

Female quick connect
P/N:
P1015-64(AWG 14/16)

Quick connect to screw adaptor
P/N: **P1015-18**

Versa-knob
P/N: **P0700-7**

See accessory pages for specifications.

Ordering Table

ERDI Series	X Input	X Adjustment	X Time Delay *
	-1 - 12 V DC	-1 - Factory Fixed	-1 - 0.1 ... 1 s
	-2 - 24 V AC	-2 - Knob on Unit	-2 - 0.1 ... 5 s
	-3 - 24 V DC	-3 - External Adjust	-3 - 0.1 ... 10 s
	-4 - 120 V AC		-4 - 0.2 ... 15 s
	-5 - 120 V DC		-5 - 0.3 ... 30 s
	-6 - 230 V AC		-6 - 0.6 ... 60 s
			-7 - 0.1 ... 5 m
			-8 - 0.1 ... 10 m
			-9 - 0.2 ... 15 m
			-10 - 1 ... 100 m
			-11 - 10 ... 500 m

*If Fixed Delay is selected, insert delay [0.1...1000] followed by (S) sec. or (M) min.

Example P/N: ERDI426 Fixed – ERDI410.1S

ERDI2B11 01.04.05

Technical Data

Time Delay		
Type		Digital integrated circuitry
Range		100 ms ... 500 m in 11 adjustable ranges, 100 ms ... 1000 m fixed
Adjustment		Knob, external adjust, or fixed
Repeat Accuracy		+/-0.5%
Tolerance (Factory Calibration)		≤ +/-10%
Reset Time		≤ 150 ms
Time Delay vs. Temperature & Voltage		≤ +/-2%
Input		
Voltage		12, 24, or 120 V DC; 24, 120, or 230 V AC
Tolerance	12 V DC & 24 V DC/AC	-15% ... +20%
	120 V DC/AC & 230 V AC	-20% ... +10%
Line Frequency		50 ... 60 Hz
Output		
Type		Isolated relay contacts
Form		Double pole double throw (DPDT)
Rating		10 A resistive at 120/240 V AC & 28 V DC; 1/3 hp at 120/240 V AC
Life		Mechanical--1 x 10^7; Electrical--1 x 10^6
Protection		
Isolation Voltage		≥ 1500 V 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
Package		3.5 x 2.5 x 1.7 in. (88.9 x 63.5 x 43.2 mm)
Termination		0.25 in. (6.35 mm) male quick connect terminals
Operating / Storage Temperature		-40°C ... +65°C / -40°C ... +85°C
Weight		≅ 5.7 oz (162 g)

5

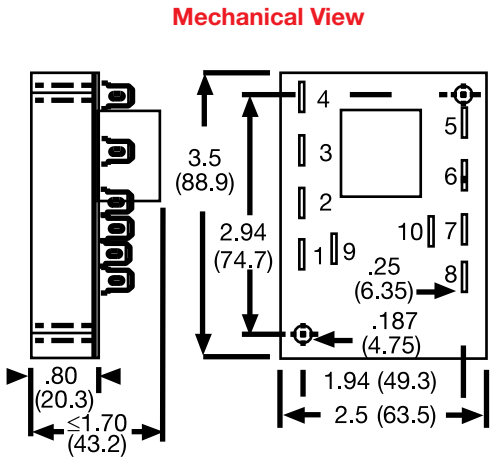
R_T Selection Chart						
Desired Time Delay*						R_T
Seconds						
1	2	3	4	5	6	Megohm
0.1	0.1	0.1	0.2	0.3	0.6	0.0
0.19	0.6	1	1.7	3	6	0.1
0.28	1.1	2	3.2	6	12	0.2
0.37	1.6	3	4.7	9	18	0.3
0.46	2.1	4	6.2	12	24	0.4
0.55	2.6	5	7.7	15	30	0.5
0.64	3.0	6	9.2	18	36	0.6
0.73	3.5	7	10.7	21	42	0.7
0.82	4.0	8	12.2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

Mechanical View



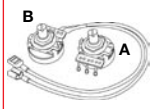
Inches (Millimeters)

Single Shot (Pulse Former)
ORS Series
Time Delay Relay

- Low Cost Open PCB Construction
- Momentary or Maintained Initiation
- 10 A DPDT or SPDT Relay Contacts
- Delays From 50 ms ... 300 s in 5 Ranges
- +/-2% Repeat Accuracy
- +/-10% Factory Calibration

Approvals:

Accessories



External adjust potentiometer
P/Ns:
P1004-12 (fig A)
P1004-12-X (fig B)

Female quick connect
P/N:
P1015-64 (AWG 14/16)

Quick connect to screw adaptor
P/N: **P1015-18**

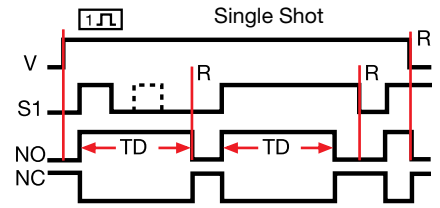
Versa-knob
P/N: **P0700-7**

See accessory pages for specifications.

Description
The ORS Series open PCB construction offers the user good economy without sacrificing performance and reliability. The output relay is available in isolated 10 A double pole double throw or single pole double throw forms. The time delay may be ordered as factory fixed, onboard knob, or external adjustment. All connections are 0.25 in. (6.35 mm) male quick connect terminals.

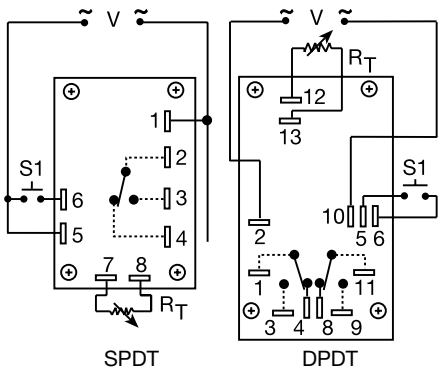
Operation
Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch (leading edge triggered), the output relay energizes for a measured interval of time. At the end of the time delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output will energize if the initiate switch is closed when input voltage is applied.
Reset: Reset occurs when the time delay is complete and the initiate switch is opened. Loss of input voltage resets the time delay and output.

Function



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

Connection



Relay contacts are isolated. Dashed lines are internal connections.

R_T is used when external adjustment is ordered.

Ordering Table

ORS Series

X	Input
24A	24 V AC
120A	120 V AC
230A	230 V AC

X	Adjustment
1	Fixed
2	Adj. on Unit
3	External Adjust

X	Time Delay *
1	0.05 ... 3 s
2	0.5 ... 30 s
3	0.6 ... 60 s
4	1.2 ... 120 s
5	3.0 ... 300 s

X	Output Form
Blank	SPDT
D	DPDT

Example P/N: ORS120A21 Fixed – ORS120A1200D

*If Fixed Delay is selected, insert delay [0.05...300] in seconds.

ORS02B01 07.02.04

Single Shot (Pulse Former)
ORS Series
Time Delay Relay

Technical Data

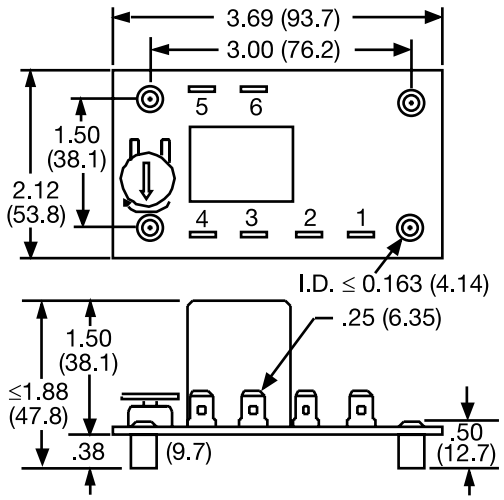
Time Delay		
Type		Analog circuitry
Range		0.05 ... 300 s in 5 adjustable ranges or fixed
Repeat Accuracy		+/-2% or 20 ms, whichever is greater
Tolerance (Factory Calibration)		Adjustable: Guaranteed range Fixed: +/-10%
Reset Time		≤ 50 ms
Initiate Time		≤ 70 ms
Time Delay vs. Temperature & Voltage		≤ +/-10%
Input		
Voltage		24, 120, or 230 V AC
Tolerance	24 V AC	-15% ... +20%
	120 & 230 V AC	-20% ... +10%
Line Frequency		50 ... 60 Hz
Power Consumption		2.25 W
Output		
Type		Electromechanical relay
Form		Isolated SPDT or DPDT
Rating		10 A resistive at 120/240 V AC & 28 V DC; 1/3 hp at 120/240 V AC
Life		Mechanical--1x10^7; Electrical--1x10^6
Protection		
Isolation Voltage		≥1500 V RMS input to output
Mechanical		
Mounting		Surface mount with four #6 (M3.5 x 0.6) screws
Termination		0.25 in. (6.35 mm) male quick connect terminals
Environmental		
Operating Temperature		-20°C ... +65°C
Storage Temperature		-30°C ... +85°C
Weight		≅ 2.7 oz (77 g)

5

R_T Selection Chart					
Desired Time Delay* Seconds					R_T
1	2	3	4	5	Megohm
0.05	0.5	0.6	1.2	3.0	0.0
0.5	5.0	10	20	50	0.5
1.0	10	20	40	100	1.0
1.5	15	30	60	150	1.5
2.0	20	40	80	200	2.0
2.5	25	50	100	250	2.5
3.0	30	60	120	300	3.0

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

Mechanical View



Inches (Millimeters)

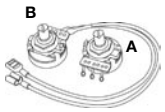
Note: SPDT shown. DPDT is the same size. Terminal location is different.

Single Shot (Pulse Former)
KRDS Digi-Timer
Time Delay Relay

- Compact Time Delay Relay
- +/-0.5% Repeat Accuracy
- Isolated 10 A SPDT Output Contacts
- Onboard or External Adjustment or Fixed Time Delay
- Delays from 100 ms...1000 m in 6 Ranges
- +/-5% Factory Calibration
- Input Voltages from 12...230 V in 5 Ranges

Approvals:

Accessories



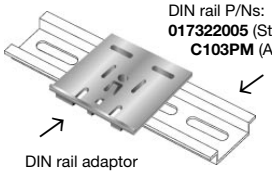
External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)

Versa-knob
P/N: **P0700-7**

Mounting bracket
P/N: **P1023-6**

Female quick connect
P/Ns:
P1015-64 (AWG 14/16)
P1015-13 (AWG 10/12)

Quick connect to screw adaptor
P/N: **P1015-18**



DIN rail P/Ns:
017322005 (Steel)
C103PM (Al)

DIN rail adaptor
P/N: **P1023-20**

See accessory pages for specifications.

Description

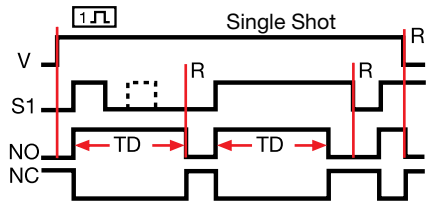
The KRDS Series is a compact time delay relay measuring only 2 in. (50.8 mm) square. Its microcontroller timing circuit provides excellent repeat accuracy and stability. Encapsulation protects against shock, vibration, and humidity. The KRDS Series is a cost effective approach for OEM applications that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

Operation

Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch, the output relay energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output will energize if the initiate switch is closed when input voltage is applied.

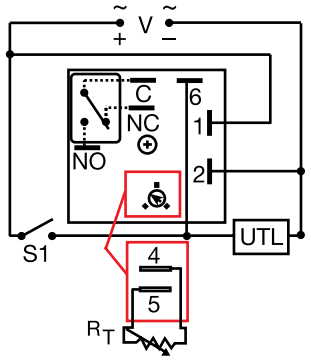
Reset: Reset occurs when the time delay is complete and the initiate switch is opened. Loss of input voltage resets the time delay and output.

Function



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

Connection



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

A knob is supplied for adjustable units. The untimed load is optional. Relay contacts are isolated. Dashed lines are internal connections.

Ordering Table

KRDS Series	X Input	X Adjustment	X Time Delay *
	1 - 12 V DC	1 - Fixed	0 - 0.1 ... 10 s
	2 - 24 V AC/DC	2 - Onboard Adjustment	1 - 1 ... 100 s
	4 - 120 V AC	3 - External Adjustment	2 - 10 ... 1000 s
	5 - 110 V DC		3 - 0.1 ... 10 m
	6 - 230 V AC		4 - 1 ... 100 m
			5 - 10 ... 1000 m

Example P/N: **KRDS421** = 120 V AC; Onboard adjust from 0.1 to 10 seconds
KRDS610.5S = 230 V AC; Fixed at 0.5 seconds

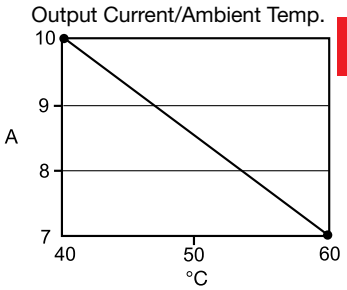
* If Fixed Delay is selected, insert delay [**0.1** … **1000**] followed by (**S**) sec. or (**M**) min.

KRDSGen 08.15.06

Single Shot (Pulse Former)
KRDS Digi-Timer
Time Delay Relay

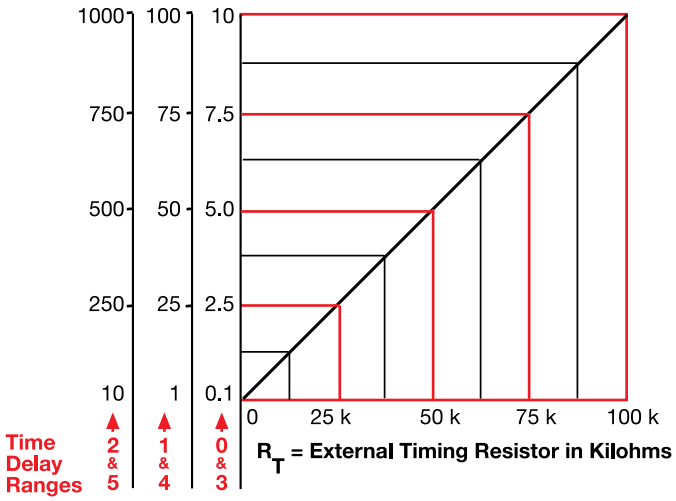
Technical Data

Time Delay	
Type	Microcontroller with watchdog circuitry
Range	0.1 s ... 1000 m in 6 adjustable ranges or fixed
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-5%
Reset Time	≤ 150 ms
Initiate Time	≤ 40 ms
Time Delay vs. Temperature & Voltage	≤ +/-5%
Input	
Voltage	12, 24 or 110 V DC; 24, 120 or 230 V AC
Tolerance 12 V DC & 24 V DC/AC	-15% ... +20%
110 V DC, 120 V AC or 230 V AC	-20% ... +10%
AC Line Frequency/DC Ripple	50 ... 60 Hz / ≤ 10%
Power Consumption	AC ≤ 2 VA; DC ≤ 2 W
Output	
Type	Isolated relay contacts
Form	Single pole double throw (SPDT)
Rating (at 40°C)	10 A resistive at 125 V AC 5 A resistive at 230 V AC & 28 V DC; 1/4 hp at 125 V AC
Life (Operations)	Mechanical -- 1 x 10^7; Electrical -- 1 x 10^5
Protection	
Circuitry	Encapsulated
Isolation Voltage	≥ 1500 V 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
Package	2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals
Environmental	
Operating/Storage Temperature	-40°C ... +60°C/-40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.6 oz (74 g)



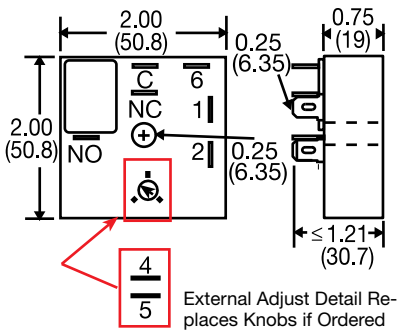
External Resistance vs Time Delay

In Secs. or Mins.



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.

Mechanical View



Inches (Millimeters)

Single Shot (Pulse Former)
TDUS Digi-Set
Timing Module

TEN YEAR 10 WARRANTY

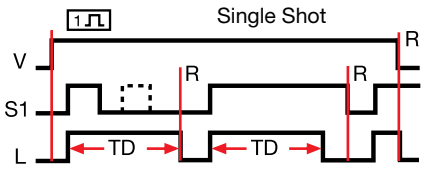
- Switch Selectable Time Setting
- 0.1 s ... 102.3 m in 3 Ranges
- +/- 0.5% Repeat Accuracy
- +/- 2% Setting Accuracy
- 1 A Solid State Output
- Encapsulated
- Wide Voltage Ranges

Approvals:

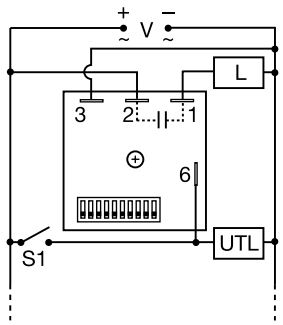
Description
The TDUS Series combines digital timing circuitry with universal voltage operation. Voltages of 24 to 240 V AC and 12 to 24 V DC are available in three ranges. The TDUS Series offers DIP switch selectable time delays ranging from 0.1 seconds to 102.3 minutes in three ranges. Its 1 A rated output, ability to operate on multiple voltages, and wide range of switch selectable time delays make the TDUS Series an excellent choice for process control systems and OEM equipment.

Operation
Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch (leading edge triggered), the output energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output will energize if the initiate switch is closed when input voltage is applied.

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

Function


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

Connection


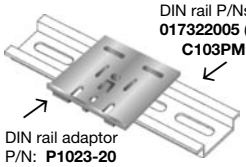
Dashed lines are internal connections.

UTL = Optional Untimed Load S1 = Initiate Switch
L = Timed Load

Accessories

Female quick connect P/Ns:
P1015-13 (AWG 10/12)
P1015-64 (AWG 14/16)
P1015-14 (AWG 18/22)

Quick connect to screw adaptor P/N: **P1015-18**



DIN rail P/Ns:
017322005 (Steel)
C103PM (Al)

DIN rail adaptor P/N: **P1023-20**

See accessory pages for specifications.

Ordering Table

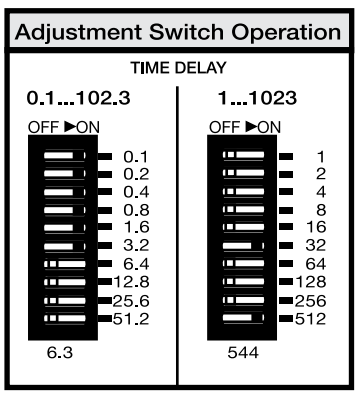
Input Voltage Range	Time Range	Part Number
24 ... 120 V AC	0.1 ... 102.3 s	TDUSL3000A
100 ... 240 V AC	0.1 ... 102.3 s	TDUSL3001A
12 ... 24 V DC	0.1 ... 102.3 s	TDUSL3002A
24 ... 120 V AC	1 ... 1023 s	TDUS3000A
100 ... 240 V AC	1 ... 1023 s	TDUS3001A
12 ... 24 V DC	1 ... 1023 s	TDUS3002A
24 ... 120 V AC	0.1... 102.3 m	TDUSH3000A
100 ... 240 V AC	0.1... 102.3 m	TDUSH3001A
12 ... 24 V DC	0.1... 102.3 m	TDUSH3002A

Single Shot (Pulse Former)
TDUS Digi-Set
Timing Module

Technical Data

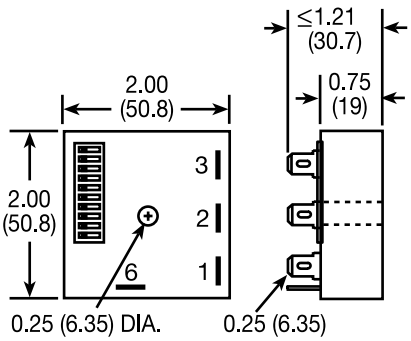
Time Delay	
Range*	0.1 ... 102.3 s in 0.1 s increments 1 ... 1023 s in 1 s increments 0.1 ... 102.3 m in 0.1 m increments
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Setting Accuracy	≤ +/-2% or 20 ms, whichever is greater
Reset Time	≤ 150 ms
Initiate Time	≤ 20 ms
Time Delay vs. Temperature & Voltage	≤ +/-5%
Input	
Voltage/Tolerance	24 ... 240 V AC, 12 ... 24 V DC /+/-20%
Line Frequency	50 ... 60 Hz
Power Consumption	AC ≤ 2 VA; DC ≤ 1 W
DC Ripple	≤ 10%
Output	
Type	Solid state
Form	Normally Open, closed during timing
Rating	1 A steady state, 10 A inrush at 60°C
Voltage Drop	AC ≅ 2.5 V at 1 A; DC ≅ 1 V at 1 A
Off State Leakage Current	AC ≅ 5 mA at 230 V AC; DC ≅ 1 mA
Protection	
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000 V 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
Package	2 x 2 x 1.21 in (50.8 x 50.8 x 30.7 mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals
Environmental	
Operating Temperature	-40°C ... +60°C
Storage Temperature	-40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

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



Add the value of switches in the ON position for the total time delay.

Mechanical View



Inches (Millimeters)

5

Single Shot (Pulse Former)
TSDS Digi-Timer
Timing Module

- Fixed or Adjustable Delays 0.1 s...1000 m in 6 Ranges
- +/-0.5% Repeat Accuracy
- +/-1% Factory Calibration
- 12 VDC...230 VAC in 5 Ranges
- 1 A Solid State Output
- Encapsulated

Approvals:

Accessories

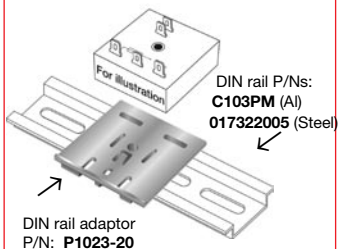
External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)

Mounting bracket
P/N: **P1023-6**

Female quick connect
P/N:
P1015-64 (AWG 14/16)

Quick connect to screw adaptor
P/N: **P1015-18**

Versa-knob
P/N: **P0700-7**



DIN rail P/Ns:
C103PM (Al)
017322005 (Steel)

DIN rail adaptor
P/N: **P1023-20**

See accessory pages for specifications.

Description

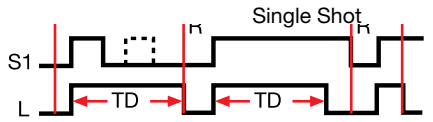
The TSD Series is designed for more demanding commercial and industrial applications where small size, and accurate performance is required. The factory calibration for fixed time delays is within 1% of the target time delay. The repeat accuracy, under stable conditions, is 0.5% of the time delay. The TSD Series is rated to operate over an extended temperature range. Time delays of 0.1 seconds to 1000 minutes are available. The output is rated 1 A steady and 10 A inrush. The modules are totally solid state and encapsulated to protect the electronic circuitry. This product is suitable for many applications, including dispensing, welding, and exposure timing.

Operation

Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch, the output energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output will not energize if the initiate switch is closed when input voltage is applied.

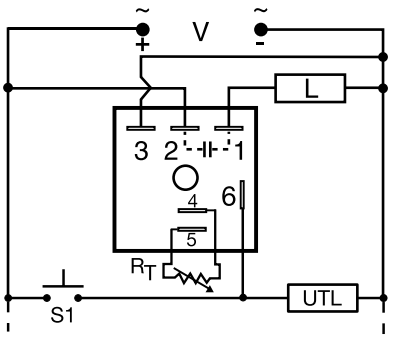
Reset: Reset occurs when the time delay is complete and the initiate switch is opened. Loss of input voltage resets the time delay and output.

Function

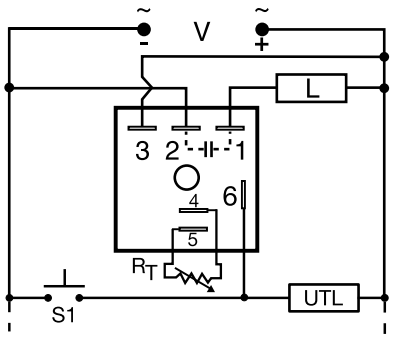


V = Voltage L = Load TD = Time Delay
S1 = Initiate Switch R = Reset

Connection



Positive Switching



Negative Switching

R_T is used when external adjustment is ordered.
Dashed lines are internal connections.
L = Timed Load UTL = Optional Untimed Load S1 = Initiate Switch

Ordering Table

TSDS Series	X Input	X Adjustment	X Time Delay*	X Switching Mode (V DC Only)
	1 - 12 V DC	1 - Fixed	0 - 0.1 ... 10 s	P - Positive
	2 - 24 V AC	2 - External Adjust	1 - 1 ... 100 s	N - Negative
	3 - 24 V DC	3 - Onboard Adjust	2 - 10 ... 1000 s	
	4 - 120 V AC		3 - 0.1 ... 10 m	
	6 - 230 V AC		4 - 1 ... 100 m	
			5 - 10 ... 1000 m	

Example P/N: TSDS421 Fixed – TSDS310.1SP

* If Fixed Delay is selected, insert delay [0.1 ... 1000] followed by (S) sec. or (M) min.

TSDSGen 07.01.04

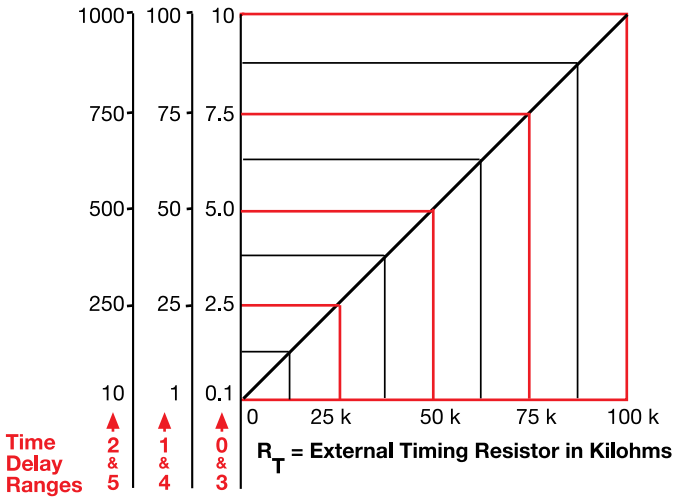
Single Shot (Pulse Former)
TSDS Digi-Timer
Timing Module

Technical Data

Time Delay	
Range	0.1 s ... 1000 m in 6 adjustable ranges or fixed
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-1%
Reset Time	≤ 150 ms
Initiate Time	≤ 20 ms
Time Delay vs. Temperature & Voltage	≤ +/-2%
Input	
Voltage	12 or 24 V DC; 24, 120, or 230 V AC
Tolerance	+/-15%
Power Consumption	AC ≤ 2 VA; DC ≤ 1 W
Line Frequency	50 ... 60 Hz
DC Ripple	≤ 10%
Output	
Type	Solid state
Form	Normally Open, closed during timing
Maximum Load Current	1 A steady state, 10 A inrush at 60° C
Voltage Drop	AC ≅ 2.5 V at 1 A; DC ≅ 1 V at 1 A
Off State Leakage Current	AC ≅ 5 mA at 230 V AC; DC ≅ 1 mA
DC Operation	Positive or negative switching
Protection	
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000 V 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
Package	2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals
Environmental	
Operating/Storage Temperature	-40°C ... +75°C / -40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

External Resistance vs Time Delay

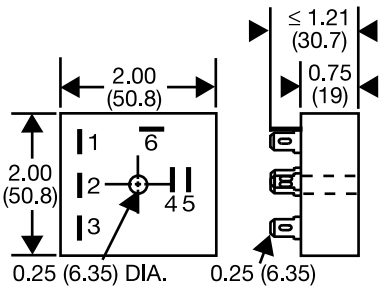
In Secs. or Mins.



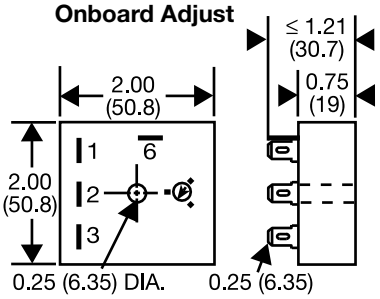
This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the RT terminals; as the resistance increases the time delay increases.
When selecting an external RT, add the tolerances of the timer and the RT 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.

Mechanical View

Fixed and External Adjust



Onboard Adjust

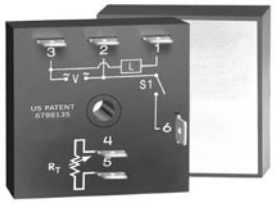


Inches (Millimeters)

5

TSDSGen 07.01.04

Single Shot (Pulse Former)
THDS Digi-Power
Power Timing Module

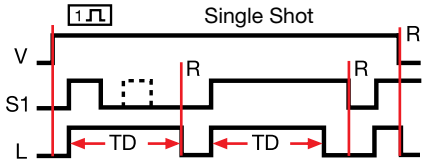


- High Load Currents up to 20 A, 200 A Inrush
- Fixed or Adjustable Delays From 0.1 s ... 1000 m
- +/-0.5% Repeat Accuracy
- +/-1% Factory Calibration
- 24, 120, or 230 V AC
- Metallized Mountiang Surface for Efficient Heat Transfer
- Totally Solid State and Encapsulated

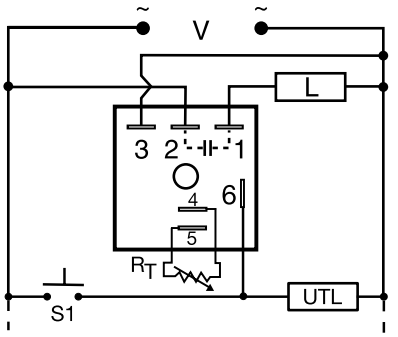
Approvals:

Description
The THD Series combines accurate timing circuitry with high power solid state switching. It can switch motors, lamps, and heaters directly without a contactor. You can reduce labor, component cost, and increase reliability with these small, easy-to-use, Digi-Power timers.

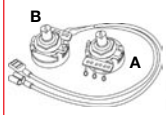
Operation
Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch, the output energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output energizes if the initiate switch is closed when input voltage is applied.
Reset: Reset occurs when the time delay is complete and the initiate switch is opened. Loss of input voltage resets the time delay and output.

Function


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

Connection


R_T is used when external adjustment is ordered.
Dashed lines are internal connections.
UTL = Optional Untimed Load L = Timed Load
S1 = Initiate Switch

Accessories


External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)


Female quick connect
P/Ns:
P1015-64 (AWG 14/16)
P1015-13 (AWG 10/12)


Quick connect to screw adaptor
P/N: **P1015-18**


Versa-knob
P/N: **P0700-7**

See accessory pages for specifications.

Ordering Table

THDS Series	X Input	X Adjustment	X Time Delay *	X Output Rating
	2 - 24 V AC	1 - Fixed	0 - 0.1 ... 10 s	A - 6 A
	4 - 120 V AC	2 - External Adjust	1 - 1.0 ... 100 s	B - 10 A
	6 - 230 V AC	3 - Onboard Adjust	2 - 10 ... 1000 s	C - 20 A
			3 - 0.1 ... 10 m	
			4 - 1 ... 100 m	
			5 - 10 ... 1000 m	

Example P/N: THDS420C Fixed – THDS410.1SA

*If Fixed Delay is selected, insert delay [0.1...1000] followed by(S) sec. or (M) min.

THDSGen 08.03.04

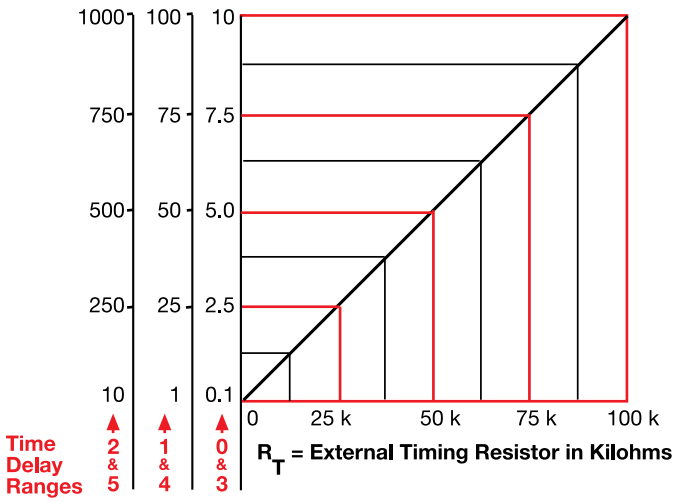
Single Shot (Pulse Former)
THDS Digi-Power
Power Timing Module

Technical Data

Time Delay				
Range	0.1 s ... 1000 m in 6 adjustable ranges or fixed			
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater			
Tolerance (Factory Calibration)	≤ +/-1%			
Reset Time	≤150 ms			
Initiate Time	≤ 20 ms			
Time Delay vs. Temperature & Voltage	≤ +/-2%			
Input				
Voltage	24, 120, or 230 V AC			
Tolerance	+/-20%			
Line Frequency	50 ... 60 Hz			
Power Consumption	≤ 2 VA			
Output				
Type	Solid state			
Form	Normally Open, closed during timing			
Maximum Load Current	**Output**	**Steady State**	**Inrush****	**Must be bolted to a metal surface using the included heat sink compound. The maximum mounting surface temperature is 90°C. Inrush: Non-repetitive for 16 ms.
	A	6 A	60 A	
	B	10 A	100 A	
	C	20 A	200 A	
Voltage Drop	≅ 2.5 V at rated current			
Off State Leakage Current	≅ 5 mA at 230 V AC			
Minimum Load Current	100 mA			
Protection				
Circuitry	Encapsulated			
Dielectric Breakdown	≥ 2000 V RMS terminals to mounting surface			
Insulation Resistance	≥ 100 MΩ			
Mechanical				
Mounting **	Surface mount with one #10 (M5 x 0.8) screw			
Termination	0.25 in. (6.35 mm) male quick connect terminals			
Environmental				
Operating/Storage Temperature	-40°C ... +60°C / -40°C ... +85°C			
Humidity	95% relative, non-condensing			
Weight	≅ 3.9 oz (111 g)			

External Resistance vs Time Delay

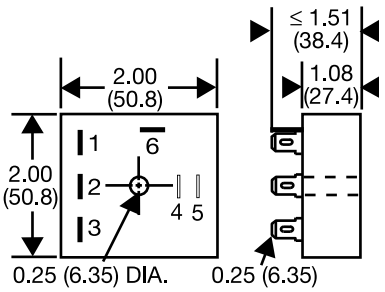
In Secs. or Mins.



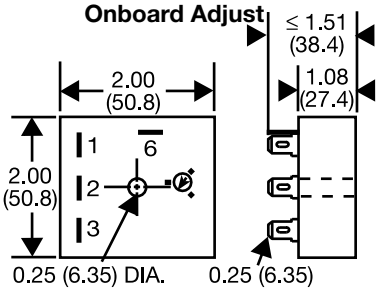
This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the RT terminals; as the resistance increases the time delay increases.
When selecting an external RT, add the tolerances of the timer and the RT 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.

Mechanical View

Fixed & External Adjust



Onboard Adjust



Inches (Millimeters)

THDSGen 08.03.04

Single Shot (Pulse Former)
KSDS Digi-Timer
Timing Module

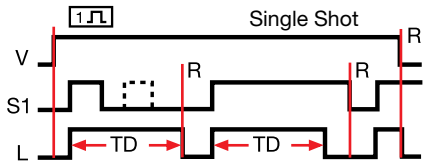
TEN YEAR 10 WARRANTY

- Fixed or Adjustable Delays 0.1 s ... 1000 min in 6 Ranges
- +/-0.5% Repeat Accuracy
- +/- 5% Factory Calibration
- 12 ... 230 V in 5 Ranges
- 1 A Solid State Output
- Encapsulated

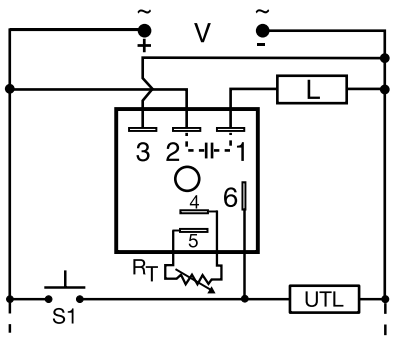
Approvals:

Description
The KSDS Series is ideal for applications that require momentary start interval timing including dispensing, exposure timing, or pulse shaping. This series is available for both AC and DC voltages. 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. Time delays of 0.1 seconds to 1000 minutes are available in 6 ranges. The output is rated 1 A steady and 10 A inrush. The modules are totally solid state and encapsulated to protect the electronic circuitry.

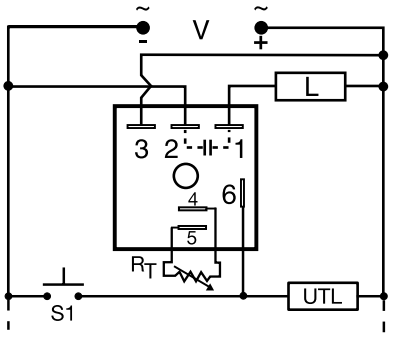
Operation
Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch (leading edge triggered), the output energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output will not energize if the initiate switch is closed when input voltage is applied.
Reset: Reset occurs when the time delay is complete and the initiate switch is opened. Loss of input voltage resets the time delay and output.

Function


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

Connection


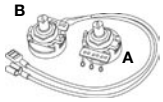
Positive Switching



Negative Switching

R_T is used when external adjustment is ordered.
Dashed lines are internal connections.
UTL = Optional Untimed Load L = Timed Load S1 = Initiate Switch

Accessories



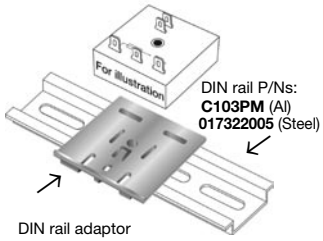
External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)

Mounting bracket
P/N: **P1023-6**

Female quick connect
P/N:
P1015-64 (AWG 14/16)

Quick connect to screw adaptor
P/N: **P1015-18**

Versa-knob
P/N: **P0700-7**



DIN rail P/Ns:
C103PM (Al)
017322005 (Steel)

DIN rail adaptor
P/N: **P1023-20**

See accessory pages for specifications.

Ordering Table

KSDS Series	X Input	X Adjustment	X Time Delay*	X Switching Mode V DC Only
	1 - 12 V DC	**1** - Fixed	**0** - 0.1 ... 10 s	**P** - Positive
	2 - 24 V AC	**2** - External Adjust	**1** - 1 ... 100 s	**N** - Negative
	3 - 24 V DC	**3** - Onboard Adjust	**2** - 10 ...1000 s	
	4 - 120 V AC		**3** - 0.1 ... 10 m	
	6 - 230 V AC		**4** - 1 ... 100 m	
			5 - 10 ...1000 m	

* If Fixed Delay is selected, insert delay [**0.1 ... 1000**] followed by (**S**) secs. or (**M**) mins.

Example P/N: **KSDS421** Fixed – **KSDS410.1S**

KSDSGen 02.08.05

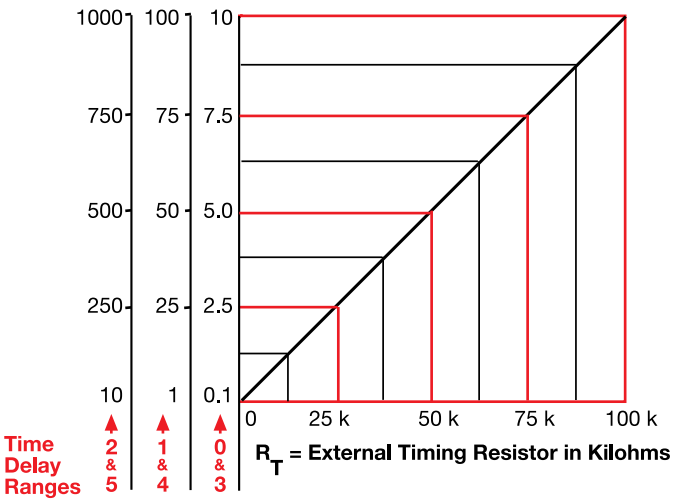
Single Shot (Pulse Former)
KSDS Digi-Timer
Timing Module

Technical Data

Time Delay	
Range	0.1 s ... 1000 m in 6 adjustable ranges or fixed
Repeat Accuracy	+/-0.5 % or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-5%
Reset Time	≤ 150 ms
Initiate Time	≤ 20 ms
Time Delay vs. Temperature & Voltage	≤ +/-10%
Input	
Voltage	12 or 24 V DC; 24, 120, or 230 V AC
Tolerance	+/-20%
Line Frequency	50 ... 60 Hz
DC Ripple	≤ 10 %
Power Consumption	AC ≤ 2 VA; DC ≤ 1 W
Output	
Type	Solid state
Form	Normally Open, closed during timing
Maximum Load Current	1 A steady state, 10 A inrush at 60°C
OFF State Leakage Current	AC ≅ 5 mA at 230 VAC; DC ≅ 1 mA
Voltage Drop	AC ≅ 2.5 V at 1 A; DC ≅ 1 V at 1 A
DC Operation	Positive or negative switching
Protection	
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000 V 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
Package	2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals
Environmental	
Operating/Storage Temperature	-40°C ... +60°C / -40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

External Resistance vs Time Delay

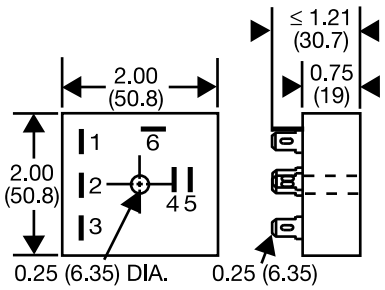
In Secs. or Mins.



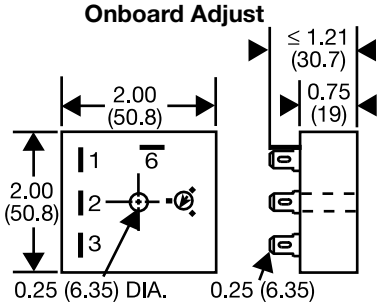
This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the RT terminals; as the resistance increases the time delay increases.
When selecting an external RT, add the tolerances of the timer and the RT 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.

Mechanical View

Fixed and External Adjust



Onboard Adjust



Inches (Millimeters)

5

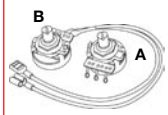
KSDSGen 02.08.05

Single Shot (Pulse Former)
TSS Series
Timing Module

- Expands or Decreases Switch Closures
- Momentary or Maintained Initiate Switch
- Totally Solid State
- Encapsulated to Protect Against Shock & Vibration
- Fixed or Adjustable Delays From 0.05 ... 600 s in 4 Ranges
- +/-2% Repeat Accuracy
- +/-5% Factory Calibration

Approvals:

Accessories



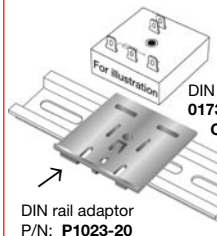
External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)

Mounting bracket
P/N: **P1023-6**

Female quick connect
P/N:
P1015-64 (AWG 14/16)

Quick connect to screw adaptor
P/N: **P1015-18**

Versa-knob
P/N: **P0700-7**



DIN rail P/Ns:
017322005 (Steel)
C103PM (Al)

DIN rail adaptor
P/N: **P1023-20**

See accessory pages for specifications.

Description

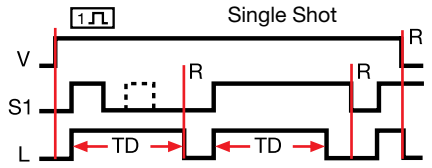
The TSS is a totally solid state timing module. Its 1 A rated solid state output provides an excellent method of time control for exposures, dispensing, or for increasing or decreasing a switch closure. Time delays from 0.05 to 600 seconds, in 4 ranges, cover 90% of all OEM applications. Factory calibration of fixed delays is +/-5% and the repeat accuracy is +/-2%. The TSS can be surface mounted with a single screw, or snapped on a 35mm DIN rail using the P1023-20 accessory adaptor.

Operation

Voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch, the output energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output will energize if the initiate switch is closed when input voltage is applied.

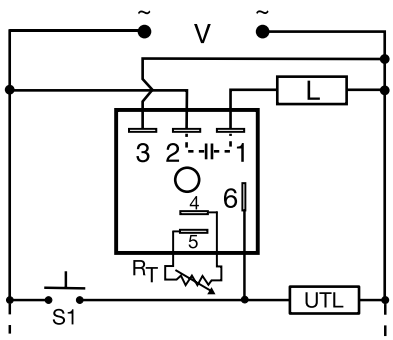
Reset: Reset occurs when the time delay is complete and the initiate switch opens. Loss of input voltage resets the time delay and output.

Function



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

Connection



R_T is used when external adjustment is ordered.
Dashed lines are internal connections.

S1 = Initiate Switch L = Timed Load
UTL = Optional Untimed Load

Ordering Table

TSS	X	X	X
Series	**Input**	**Adjustment**	**Time Delay***
	2 - 24 V AC	**1** - Fixed	**1** - 0.05 ... 3 s
	4 - 120 V AC	**2** - External Adjust	**2** - 0.5 ... 60 s
	6 - 230 V A	**3** - Onboard Adjust	**3** - 2 ... 180 s
			4 - 5 ... 600 s

Example P/N: **TSS422** Fixed – **TSS410.5**

* If Fixed Delay is selected, insert delay [**0.05** ... **600**] in seconds.

TSSGen 07.29.04

Single Shot (Pulse Former)
TSS Series
Timing Module

Technical Data

Time Delay	
Range	0.05 s ... 600 s in 4 adjustable ranges or fixed
Repeat Accuracy	+/-2% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-5%
Reset Time	≤ 150 ms
Initiate Time	≤ 20 ms
Time Delay vs. Temperature & Voltage	≤ +/-10%
Input	
Voltage	24, 120, or 230 V AC
Tolerance	+/-20%
Line Frequency	50 ... 60 Hz
Power Consumption	≤ 2 VA
Output	
Type	Solid state
Form	Normally Open, closed during timing
Maximum Load Current	1 A steady state, 10 A inrush at 60°C
Off State Leakage Current	≅ 5 mA at 230 V AC
Voltage Drop	≅ 2.5 V at 1 A
Protection	
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000 V RMS terminals to mounting surface
Insulation Resistance	≥ 100 MΩ
Mechanical	
Mounting	Surface mount with one #10 (M5 x 0.8) screw
Package	2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals
Environmental	
Operating Temperature	- 40°C ... +75°C
Storage Temperature	- 40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

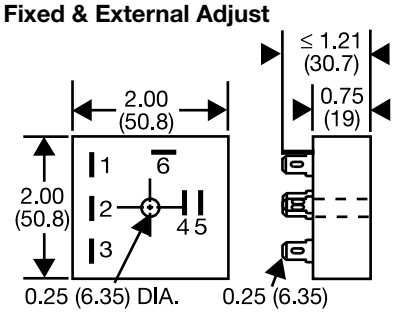
5

R_T Selection Chart				
Desired Time Delay* Seconds				R_T
1	2	3	4	Kohms
0.05	0.5	2	5	0
0.3	6	20	60	10
0.6	12	38	120	20
0.9	18	55	180	30
1.2	24	73	240	40
1.5	30	90	300	50
1.8	36	108	360	60
2.1	42	126	420	70
2.4	48	144	480	80
2.7	54	162	540	90
3.0	60	180	600	100

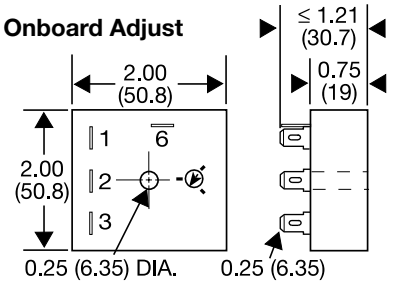
* When selecting an external R_T add at least 20% for tolerance of unit and the R_T.

Mechanical View

Fixed & External Adjust

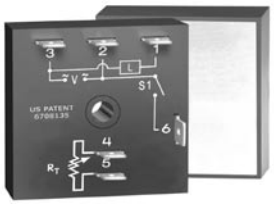


Onboard Adjust



Inches (Millimeters)

Single Shot (Pulse Former)
THC & THS Series
Power Timing Module



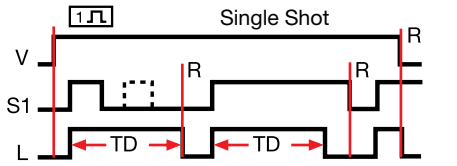
- High Load Current Capacity, up to 20 A, 200 A Inrush
- Momentary or Maintained Initiate Switch
- +/-2% Repeat Accuracy
- +/-5% Factory Calibration
- Fixed or Adjustable Delays From 0.1 ... 600 s in 4 Ranges
- Metallized Mounting Surface for Efficient Heat Transfer

Approvals:

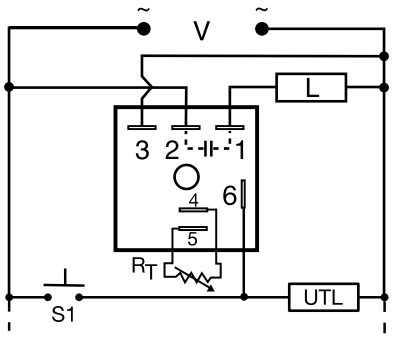
Description
The TH series is a solid state relay and timer combined into one compact, easy-to-use control. When mounted to a metal surface, the TH Series may be used to directly control lamp or heater loads of up to 20 Amps steady 200 Amps inrush. Its single shot function can perform dispensing and pulse shaping operations. The initiate switch can be a momentary or maintained type of switch. Time delays can be selected from 0.1 seconds to 600 seconds in 4 ranges. The THC Series is used for coin vending applications where fast initiate response is required.

Operation
Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch (leading edge triggered), the output energizes for a measured interval of time. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no affect on the time delay. The output will energize if the initiate switch is closed when input voltage is applied.

Reset: Reset occurs when the time delay is complete and the initiate switch opens. Loss of input voltage resets the time delay and output.

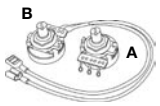
Function


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

Connection


R_T is used when external adjustment is ordered.
Dashed lines are internal connections.
S1 = Initiate Switch L = Timed Load
UTL = Optional Untimed Load

Accessories



External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)

Female quick connect
P/Ns:
P1015-64 (AWG 14/16)
P1015-13 (AWG 10/12)

Quick connect to screw adaptor
P/N: **P1015-18**

Versa-knob
P/N: **P0700-7**

See accessory pages for specifications.

Ordering Table

THC/THS Series	X Input	X Adjustment	X Time Delay *	X Output Rating
	2 - 24 V AC	1 - Fixed	1 - 0.1 ... 3 s	A - 6 A
	4 - 120 V AC	2 - External Adjust	2 - 0.5 ... 60 s	B - 10 A
	6 - 230 V AC	3 - Onboard Adjust	3 - 2 ... 180 s	C - 20 A
			4 - 5 ... 600 s	

Example P/N: THC432C Fixed – THC612A
THS421B Fixed – THS410.5C

*If Fixed Delay is selected, insert delay [0.1...600] in seconds.

THSGen 07.28.04

Single Shot (Pulse Former)
THC & THS Series
Power Timing Module

Technical Data

Time Delay		
Range	0.1 ... 600 s in 4 adjustable ranges or fixed	
Repeat Accuracy	+/-2% or 20 ms, whichever is greater	
Tolerance (Factory Calibration)	≤ +/- 5%	
Reset Time	≤ 150 ms	
Initiate Time	≤ 20 ms	
Time Delay vs. Temperature & Voltage	≤ +/-10%	
Input		
Voltage	24, 120, or 230 V AC	
Tolerance	+/-15%	
Line Frequency	50 ... 60 Hz	
Power Consumption	≤ 2 VA	
Output		
Type	Solid state	
Form	Normally Open, closed during timing	
Maximum Load Currents	**Output** / **Steady State** / **Inrush**** A / 6 A / 60 A B / 10 A / 100 A C / 20 A / 200 A	**Must be bolted to a metal surface using the included heat sink compound. The maximum mounting surface temperature is 90°C. Inrush: Non-repetitive for 16 ms.
Minimum Load Current	100 mA	
Voltage Drop	≅ 2.5 V at rated current	
OFF State Leakage Current	≅ 5 mA at 230 V AC	
Protection		
Circuitry	Encapsulated	
Dielectric Breakdown	≥ 2000 V RMS terminals to mounting surface	
Insulation Resistance	≥100 MΩ	
Mechanical		
Mounting **	Surface mount with one #10 (M5 x 0.8) screw	
Package	2 x 2 x 1.51 in. (50.8 x 50.8 x 38.4 mm)	
Termination	0.25 in. (6.35 mm) male quick connect terminals	
Environmental		
Operating Temperature	-20°C ... +60°C	
Storage Temperature	-40°C ... +85°C	
Humidity	95% relative, non-condensing	
Weight	≅ 3.9 oz (111 g)	

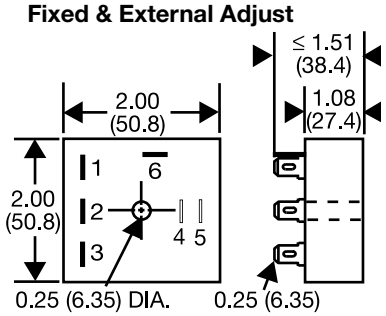
5

R_T Selection Chart				
Desired Time Delay* Seconds				R_T
1	2	3	4	Kohms
0.1	0.5	2	5	0
0.3	6	20	60	10
0.6	12	38	120	20
0.9	18	55	180	30
1.2	24	73	240	40
1.5	30	90	300	50
1.8	36	108	360	60
2.1	42	126	420	70
2.4	48	144	480	80
2.7	54	162	540	90
3.0	60	180	600	100

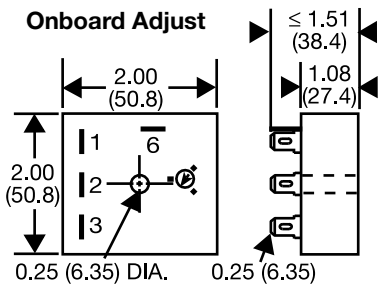
* When selecting an external R_T add at least 20% for tolerance of unit and the R_T.

Mechanical View

Fixed & External Adjust



Onboard Adjust



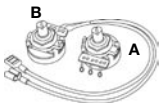
Inches (Millimeters)

Motion Detector - Retriggerable Single Shot
HRD9 Power-Time
Time Delay Relay

- 30 A SPDT N.O. Isolated Output Contacts
- 12 ... 230 V Operation in 5 Ranges
- Delays from 100 ms ...100 m in 5 ranges
- 0.5% Repeat Timing Accuracy
- Fixed, External or Onboard Adjustment
- Encapsulated Circuitry

Approvals:

Accessories



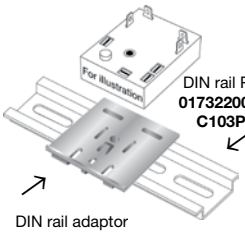
External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)

Mounting bracket
P/N: **P1023-6**

Female quick connect P/Ns:
P1015-64 (AWG 14/16)
P1015-13 (AWG 10/12)

Quick connect to screw adaptor
P/N: **P1015-18**

Versa-knob
P/N: **P0700-7**



DIN rail P/Ns:
017322005 (Steel)
C103PM (Al)

DIN rail adaptor
P/N: **P1023-20**

See accessory pages for specifications.

Description

The HRD9 Series combines an electromechanical relay output with microcontroller timing circuitry. It offers 12 to 230 V operation in five ranges and factory fixed, external, or onboard adjustable time delays with a repeat accuracy of +/-0.5%. The isolated output contact rating allows for direct operation of heavy loads such as compressors, pumps, blower motors, heaters, etc. The HRD9 is ideal for OEM applications where cost is a factor.

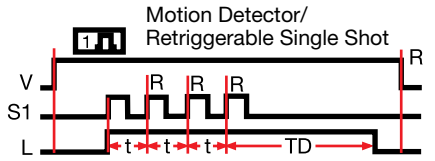
Operation

Input voltage must be applied prior to and during timing. The output is de-energized. Upon closure of the initiate switch (momentary or maintained) the output energizes and the time delay starts. On completion of the delay period, the output de-energizes.

Reset: Reclosing the initiate switch during or after timing will reset the time delay and restart timing. Reset is also accomplished by removing and reapplying input voltage.

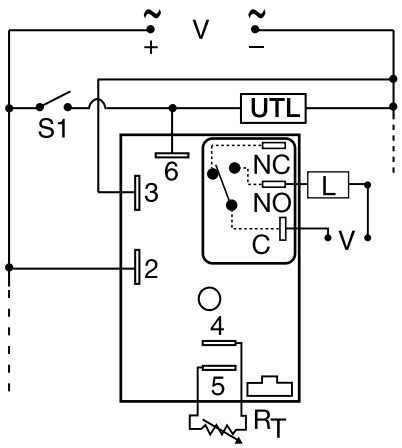
Note: Powering up the unit with the initiate switch closed will not energize the output relay or start timing.

Function



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

Connection



S1 = Initiate Switch L = Timed Load
UTL = Untimed Load NO = Normally Open
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 isolated. Dashed lines are internal connections. The untimed load is optional.

Ordering Table

HRD9 Series	X Input	X Adjustment	X Time Tolerance	X Time Delay *
	1 - 12 V DC	1 - Fixed	A - +/-1%	0 - 0.1 ... 10 s
	2 - 24 V AC	2 - Onboard Knob	Blank - +/-5%	1 - 1 ... 100 s
	3 - 24 V DC	3 - External Adjust		2 - 10 ... 1000 s
	4 - 120 V AC			3 - 0.1 ... 10 m
	6 - 230 V AC			4 - 1 ... 100 m

Example P/N: HRD9421 Fixed – HRD941A0.5S

* If Fixed Delay is selected, insert delay [0.1 ... 1000] followed by (S) sec. or [0.1 ... 100] (M) min.

HRD9Gen 10.03.05

Motion Detector - Retriggerable Single Shot
HRD9 Power-Time
Time Delay Relay

Technical Data

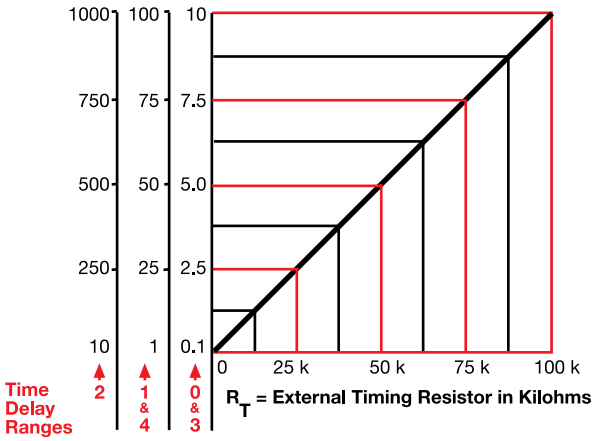
Time Delay		
Type		Microcontroller circuitry
Range		100 ms ... 100 m in 5 adjustable ranges or fixed
Repeat Accuracy		+/-0.5 % or 20 ms, whichever is greater
Tolerance (Factory Calibration)		+/-1%, +/-5%
Reset Time		≤ 150 ms
Time Delay vs. Temperature & Voltage		+/-2%
Initiate Time		≤ 20 ms (≤ 1500 operations per min.)
Input		
Voltage		12 or 24 V DC; 24, 120, or 230 V AC
Tolerance	12 V DC & 24 V DC	-15% ... +20%
	24 ... 230 V AC	-20% ... +10%
Line Frequency		50 ... 60 Hz
Power Consumption		AC ≤ 4 VA; DC ≤ 2 W
Output		
Type		Electromechanical relay
Form		SPDT, isolated

Ratings:		SPDT-N.O.	SPDT-N.C.
General Purpose	125/240 V AC	30 A	15 A
Resistive	125/240 V AC	30 A	15 A
	28 V DC	20 A	10 A
Motor Load	125 V AC	1 hp*	1/4 hp**
	240 V AC	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	≥ 2000 V 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
Package	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°C ... +60°C/-40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 3.9 oz (111 g)

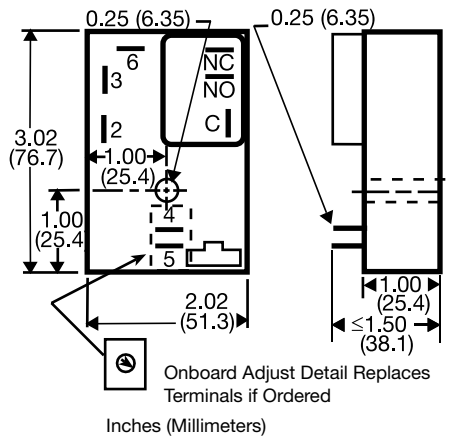
External Resistance vs Time Delay

In Secs. or Mins.



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.

Mechanical View



Inches (Millimeters)

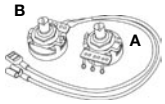
HRD9Gen 10.03.05

Motion Detector - Retriggerable Single Shot
KRD9 Digi-Timer
Time Delay Relay

- Compact Time Delay Relay
- Microcontroller Circuitry, +/- 0.5% Repeat Accuracy
- Isolated 10 A SPDT Output Contacts
- Onboard or External Adjustment or Fixed Time Delay
- Delays from 100 ms ... 1000 m in 6 Ranges
- Input Voltages from 12 ... 230 V in 5 Ranges

Approvals:

Accessories



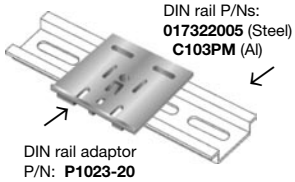
External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)

Versa-knob
P/N: **P0700-7**

Mounting bracket
P/N: **P1023-6**

Female quick connect
P/Ns:
P1015-64 (AWG 14/16)
P1015-13 (AWG 10/12)

Quick connect to screw adaptor
P/N: **P1015-18**



DIN rail P/Ns:
017322005 (Steel)
C103PM (Al)

DIN rail adaptor
P/N: **P1023-20**

See accessory pages for specifications.

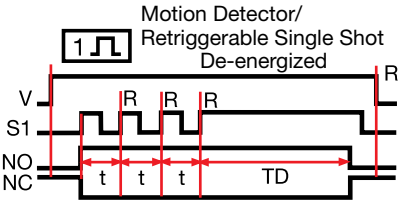
Description
The KRD9 Series microcontroller timing circuit provides excellent repeat accuracy and stability. Cost effective approach for OEM applications that require small size, isolation, reliability, and long life.

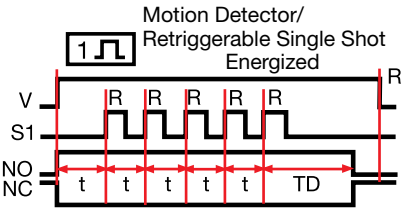
Operation- Retriggerable Single Shot
Function Type A (Output Initially De-energized): Input voltage must be applied prior to and during timing. When the initiate switch is closed, (momentary or maintained) the output energizes and the time delay starts. On completion of the delay, the output de-energizes. The unit will time out if S1 remains in the open or closed position for the full time delay. Reclosing the initiate switch resets the time delay and restarts timing; the output remains energized. The output will not energize if the initiate switch is closed when input voltage is applied.

Function Type B (Output Initially Energized): Upon application of input voltage, the output energizes and the time delay starts. At the end of the time delay, the load de-energizes. The unit will time out if S1 remains in the open or closed position for the full time delay. Closing (re-closing) the initiate switch resets the time delay and restarts timing; the output remains energized.

Reset: The time delay and the output are reset when input voltage is removed.

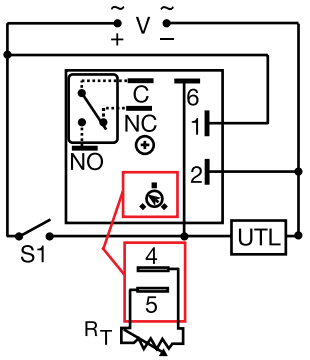
Function





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

Connection



C = Common, Transfer Contact 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. Dashed lines are internal connections. Relay contacts are isolated.

Ordering Table

KRD9 Series	X Input	X Adjustment	X Time Delay *	X Function Type
	1 - 12 V DC	1 - Fixed	0 - 0.1 ... 10 s	A - De-energized
	2 - 24 V AC/DC	2 - Onboard Adjustment	1 - 1 ... 100 s	B - Energized
	4 - 120 V AC	3 - External Adjustment	2 - 10 ... 1000 s	
	5 - 110 V DC		3 - 0.1 ... 10 m	
	6 - 230 V AC		4 - 1 ... 100 m	
			5 - 10 ... 1000 m	

* If Fixed Delay is selected, insert delay [0.1 ... 1000] followed by (S) sec. or (M) min.

Example P/N: KRD9421A = 120 V AC; Onboard adjust from 1 to 100 seconds, De-energized Function
KRD9610.5SB = 230 V AC, Fixed at 0.5 seconds, Energized Function

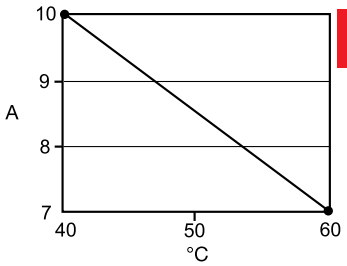
KRD9Gen 08.15.06

Motion Detector - Retriggerable Single Shot
KRD9 Digi-Timer
Time Delay Relay

Technical Data

Time Delay		
Type		Microcontroller based with watchdog circuitry
Range		0.1 s ... 1000 m in 6 adjustable ranges or fixed
Repeat Accuracy		+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)		≤ +/-5%
Reset Time		≤ 150 ms
Initiate Time		≤ 40 ms; ≤ 750 operations per minute
Time Delay vs. Temperature & Voltage		≤ +/-5%
Input		
Voltage		12, 24 or 110 V DC; 24, 120 or 230 V AC
Tolerance	12 V DC & 24 V DC/AC	-15% ... +20%
	110 VDC, 120 or 230 V AC	-20% ... +10%
AC Line Frequency / DC Ripple		50 ... 60 Hz / ≤ 10%
Power Consumption		AC ≤ 2 VA; DC ≤ 2 W
Output		
Type		Isolated relay contacts
Form		Single pole double throw (SPDT)
Rating (at 40°C)		10 A resistive at 125 V AC
		5 A resistive at 230 V AC & 28 V DC; 1/4 hp at 125 V AC;
Max. Switching Voltage		250 V AC
Life (Operations)		Mechanical -- 1 x 10^7 ; Electrical -- 1 x 10^5
Protection		
Circuitry		Encapsulated
Isolation Voltage		≥ 1500 V RMS input to output
Insulation Resistance		≥ 100 MΩ
Polarity		DC units are reversed polarity protected
Mechanical		
Mounting		Surface mount with one #10 (M5 x 0.8) screw
Package		2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)
Termination		0.25 in. (6.35 mm) male quick connect terminals
Environmental		
Operating/Storage Temperature		-40°C ... +60°C/-40°C ... +85°C
Humidity		95% relative, non-condensing
Weight		≅ 2.6 oz (74 g)

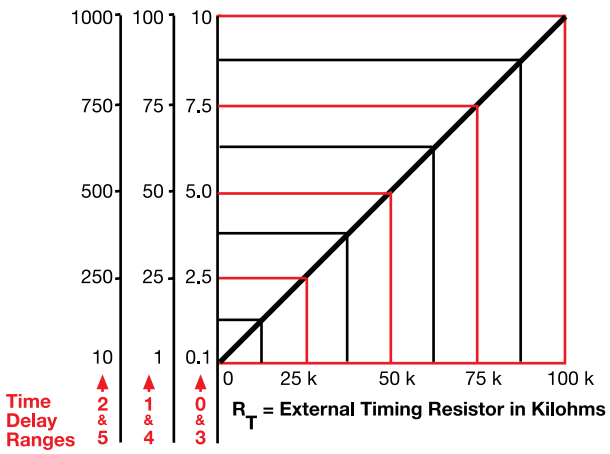
Output Current / Ambient Temp.



5

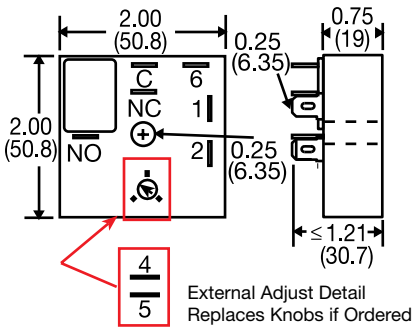
External Resistance vs Time Delay

In Secs. or Mins.



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.

Mechanical View



Inches (Millimeters)