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]

5

Single Function

Sequencer

Dual Function

HVAC Timers

Vending Timers

Star Delta Motor Starting

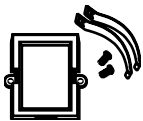# Recycling (Pulse Generator)
TDR Digi-Set
Time Delay Relay

5

- Switch Settable Time Delays - Both Times Adjustable
- 0.1 s ... 2.8 h in 3 Ranges
- +/-0.1% Repeat Accuracy
- +/-2% Setting Accuracy
- 10 A DPDT Isolated Relay Contacts
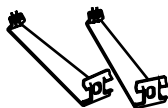- Octal Plug-in Base Connection
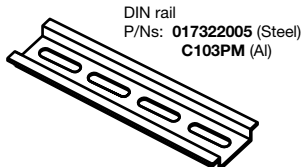
Approvals: **UL** **CSA**

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 TDR Series of time delay relays are comprised of digital circuitry and a 10 A isolated relay output. The ON and OFF delays are selected by means of two ten position binary switches, which allow the setting of the desired delay the first time and every time.

Operation (ON Time First)
Upon application of input voltage, the output relay is energized and the T1, ON time begins. At the end of the ON time, the output de-energizes and the T2, OFF time begins.   At the end of the OFF time, the output relay is energized and the cycle repeats as long as input voltage is applied. The OFF time may be the first delay in some recycling timers.
Reset: Removing input voltage resets the output and time delays, and returns the sequence to the first delay.

Operation (OFF Time First)
Upon application of input voltage, the T1, OFF time begins. At the end of the OFF time, the T2, ON time begins and the load energizes. At the end of the ON time the load de-energizes, and the cycle repeats until input voltage is removed.
Reset: Removing input voltage resets the output and the sequence to the OFF time.

Connection
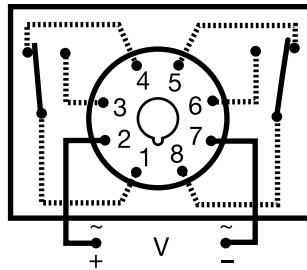
Relay contacts are isolated.   Dashed lines are internal connections.

Function

Recycling (ON First)
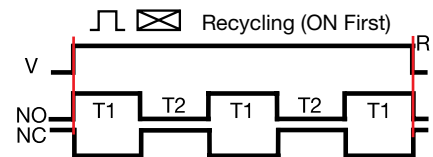
V = Voltage   R = Reset   T1 = ON Time
T2 = OFF Time   NO = Normally Open
NC = Normally Closed

Recycling (OFF First)
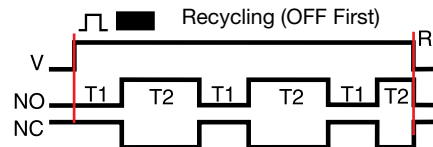
V = Voltage   R = Reset   T1 = OFF Time
T2 = ON Time   NO = Normally Open
NC = Normally Closed

Ordering Table

TDR Series	**X** Input	**X** Operating Sequence	**X** ON Time	**X** OFF Time
	1 - 12 V DC *	**A** - ON Time First	**1** - 0.1 ... 102.3 s in 0.1 s increments	**1** - 0.1 ... 102.3 s in 0.1 s increments
	2 - 24 V AC	**B** - OFF Time First	**2** - 1 ... 1023 s in 1 s increments	**2** - 1 ... 1023 s in 1 s increments
	3 - 24 V DC		**3** - 10 ... 10,230 s in 10 s increments	**3** - 10 ... 10,230 s in 10 s increments
	4 - 120 V AC			
	5 - 110 V DC			
	6 - 230 V AC			

Example P/N: **TDR4A12**

*Control status LED not available on 12 V DC units.

Recycling (Pulse Generator)
TDR 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		≤ 150 ms
Recycle Time		≤ 500 ms
Time Delay vs. Temperature & Voltage		+/-5%

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

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%
Line Frequency		50 ... 60 Hz

Output

Type	Electromechanical relay
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 x10^7; 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	Plug-in socket
Package	3.2 x 2.39 x 1.78 in. (81.3 x 60.7 x 45.2 mm)
Termination	Octal plug (8 Pin)

Environmental

Operating Temperature	-20°C ... +60°C
Storage Temperature	-30°C ... +85°C
Weight	≅ 6 oz (170 g)

Digi-Set Binary Switch Operation

Mechanical View

Inches (Millimeters)

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Recycling (Pulse Generator)
HRDR Power-Time
Time Delay Relay

CE

Description

The HRDR Series combines an electromechanical relay and microcontroller timing circuitry. It offers 12 to 230 V operation in five ranges and factory fixed, onboard or externally adjustable time delays with a repeat accuracy of +/-0.5%. The high switching capacity of the output contacts allow for direct control of heavy loads like compressors, pumps, motors, heaters, and lighting. Bypass/reset switch option allows operator to interrupt normal recycling sequence and energize output relay. An excellent choice for OEM applications.

5

TEN YEAR WARRANTY **10**

- 30 A SPDT N.O. Output Contacts
- 12 ... 230 V Operation in 5 Ranges
- Encapsulated Circuitry
- Delays from 100 ms ... 1000 m in 6 Ranges
- Independent Adjustment of ON and OFF Delays
- +/-0.5% Repeat Accuracy
- +/-5% Factory Calibration
- Fixed or Onboard or External Adjustment
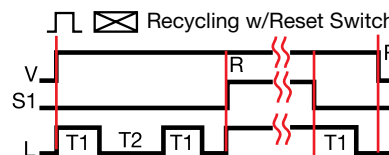
Approvals: UL CSA

Operation

Upon application of input voltage, the ON time T1 begins and output relay energizes. At the end of the ON time, the output relay de-energizes and the OFF time T2 begins. At the end of the OFF time, the output relay energizes and the cycle repeats as long as input voltage is applied. Some recycling timers have the OFF time as the first delay.

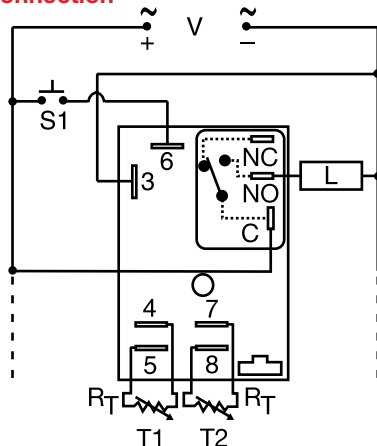**Reset:** Removing input voltage resets output and time delays, and returns sequence to the first delay.

Bypass/Reset Switch: Closing the normally open bypass/reset switch energizes the output relay and resets the time delays. Opening the switch restarts recycling operation with the first delay.

Connection

Note: Terminals 4 & 5 and/or 7 & 8 are only included on externally adjustable units.

NO = Normally Open   S1 = Reset Switch
C = Common, Transfer Contact   L = Load

Relay contacts are non-isolated. R_T is included when external adjustment is ordered. Dashed lines are internal connections. Terminal 6 is included when Bypass/Reset is selected.

Function

Recycling w/Reset Switch

V = Voltage   S1 = Reset Switch
L = Load   R = Reset   T1 = ON Time
T2 = OFF Time   ᛐ = Undefined time

Mechanical View
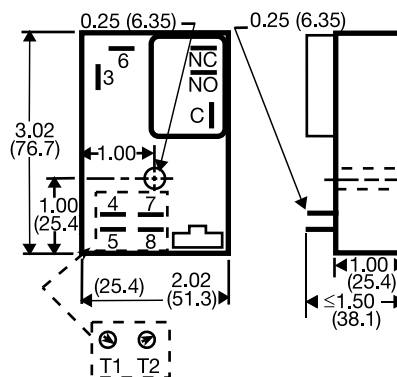
Inches (Millimeters)

Ordering Table

HRDR	X	X	X	X	X	X
Series	Input	External Adjust	T1 ON Time *	Operating Sequence	T2 OFF Time *	Operation
	1 - 12 V DC	**1** - Both Times Fixed	**0** - 0.1 ... 10 s	**A** - ON Time First	**0** - 0.1 ... 10 s	Blank - NoBypass/ Reset Option
	2 - 24 V AC	**2** - Both Times Onboard Adj.	**1** - 1 ... 100 s	**B** - OFF Time First	**1** - 1 ... 100 s	**R** - Bypass/Reset Option
	3 - 24 V DC	**3** - Both Times External Adj.	**2** - 10 ... 1000 s		**2** - 10 ... 1000 s	
	4 - 120 V AC	**4** - ON Time External Adj. OFF Time Fixed	**3** - 0.1 ... 10 m		**3** - 0.1 ... 10 m	
	6 - 230 V AC	**5** - ON Time Fixed OFF Time External Adj.	**4** - 1 ... 100 m		**4** - 1 ... 100 m	
		6 - ON Time Onboard Adj. OFF Time, Fixed	**5** - 10... 1000 m		**5** - 10 ...1000 m	
		7 - ON Time, Fixed OFF Time Onboard Adj.				
		8 - ON Time Onboard Adj. OFF Time, External Adj.				
		9 - ON Time, External Adj. OFF Time Onboard Adj.				

Example P/N:

HRDR431A4R

Fixed – **HRDR410.2SB100S**

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

Recycling (Pulse Generator)
HRDR Power-Time
Time Delay Relay

5

Technical Data

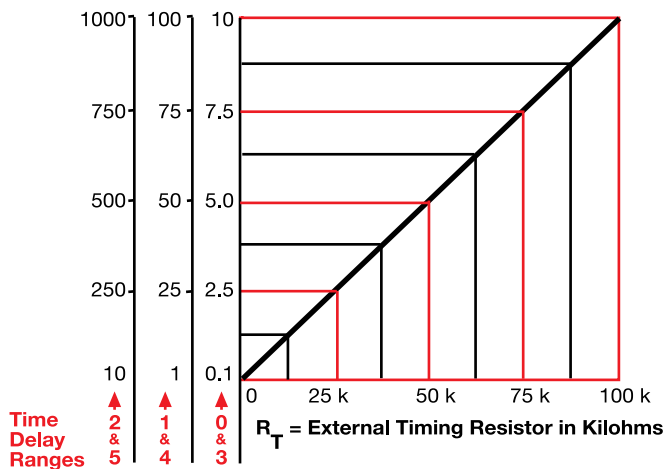| **Time Delay**	
Range	100 ms ... 1000 m in 6 adjustable ranges or fixed
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	+/-5%
Reset Time	≤ 150 ms
Time Delay vs. Temperature & Voltage	≤ +/-2%

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 -- 1×10^6; Electrical -- 1×10^5, *3×10^4, **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.

R_T = External Timing Resistor in Kilohms

Time Delay Ranges 2 & 5 | 1 & 4 | 0 & 3

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 time 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 ohm R_T. For 1 to 100 S use a 100 K ohm R_T.

Accessories

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

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

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

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

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

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

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

See accessory pages for specifications.

1TRC 001 009 C0202

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Recycling (Flasher)
HRD3 Power-Time
Time Delay Relay

5

- Equal ON and OFF Delays
- 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
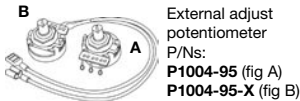- +/-0.5% Repeat Accuracy
- Fixed, External, or Onboard Adjustment

Approvals: UL CSA

Accessories

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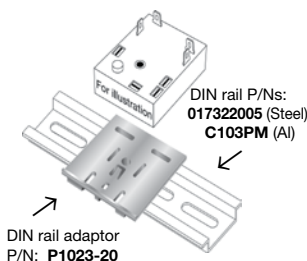**P1004-95-X** (fig B)

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**

For illustration

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

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

See accessory pages for specifications.

Description
The HRD3 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 (ON Time First)
Upon application of input voltage, the output relay energizes and the T1 ON time begins. At the end of the ON time, the output de-energizes and the T2 OFF time begins. At the end of the OFF time, the output relay energizes and the cycle repeats as long as input voltage is applied.
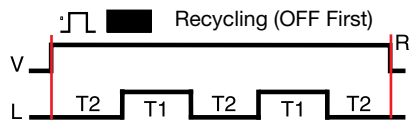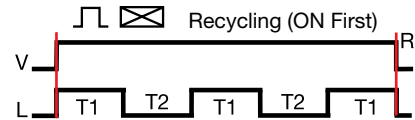**Reset:** Removing input voltage resets the output and time delays, and returns the sequence to the first delay.

Operation (OFF Time First)
Upon application of input voltage, the T2, OFF time begins. At the end of the OFF time, the T1, ON time begins and the load energizes. At the end of the ON time the load de-energizes, and the cycle repeats until input voltage is removed.
Reset: Removing input voltage resets the output and the sequence to the OFF time.

Function

Recycling (ON First)

Recycling (OFF First)

V = Voltage   R = Reset   L= Load
T1 = ON Time   T2 = OFF Time
T1 ≅ T2

Connection

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

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

HRD3 Series	X Input	X Adjustment	X Time Tolerance	X Time Delay *	X Operating Sequence
	1 - 12 V DC	**1** - Fixed	**A** - +/-1%	**0** - 0.1 ... 10 s	
	2 - 24 V AC	**2** - Onboard	Blank - +/-5%	**1** - 1 ... 100 s	**A** - ON Time First
	3 - 24 V DC	Knob		**2** - 10 ... 1000 s	
	4 - 120 V AC	**3** - External		**3** - 0.1 ... 10 m	**B** - OFF Time First
	6 - 230 V AC	Adjust		**4** - 1 ... 100 m	

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

Example P/N: **HRD3421A** Fixed – **HRD341A0.5SB**

Recycling (Flasher)
HRD3 Power-Time
Time Delay Relay

5

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%

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

		SPDT-N.O.	SPDT-N.C.
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 -- 1×10^6; Electrical -- 1×10^5, *3×10^4, **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 38.1 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	≅ 3.9 oz (111 g)

External Resistance vs Time Delay
In Secs. or Mins.

R_T = External Timing Resistor in Kilohms

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

Onboard Adjust Detail Replaces Terminals if Ordered

Inches (Millimeters)

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Recycling (Flasher)
ERD3 Econo-Timer
Time Delay Relay

5

CE

TEN YEAR WARRANTY **10**

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

Approvals: UL CSA

Description

Econo-Timers are a combination of digital electronics and a reliable electromechanical relay. DPDT relay output for relay logic circuits, and isolation of input to output voltages. Cost effective for OEM applications such as duty cycling, drying, washing, signaling, and flashing.

Operation

Upon application of input voltage, the output energizes and the ON time begins. At the end of the ON time, the output de-energizes and the OFF time begins. At the end of the OFF time, the output energizes and the cycle repeats as long as input voltage is applied. The OFF time may be the first delay in some recycling timers.
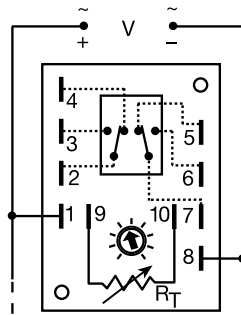**Reset:** Removing input voltage resets the output and time delays, and returns the sequence to the first delay.

Function

Recycling (ON First)

Recycling (OFF First)
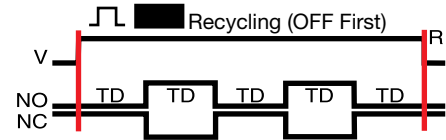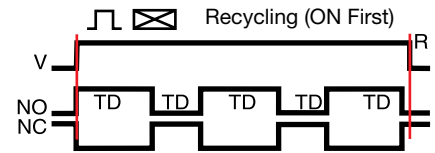
V = Voltage   R = Reset   TD = Time Delay
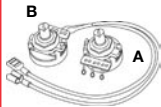NO = Normally Open   NC = Normally Closed

Connection

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

RT is used when external adjustment is ordered.

Accessories

B **A**
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

ERD3 Series	X Input	X Adjustment	X Time Delay *	X Operating Sequence
	1 - 12 V DC	**1** - Fixed	**1** - 0.1 ... 1 s	**A** - ON Time First
	2 - 24 V AC	**2** - Knob on Unit	**2** - 0.1 ... 5 s	**B** - OFF Time First
	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	

Example P/N: ERD3426A   Fixed – **ERD3410.1SA**

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

Recycling (Flasher)
ERD3 Econo-Timer
Time Delay Relay

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 AC/DC & 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--1×10^7; Electrical--1×10^6

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
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
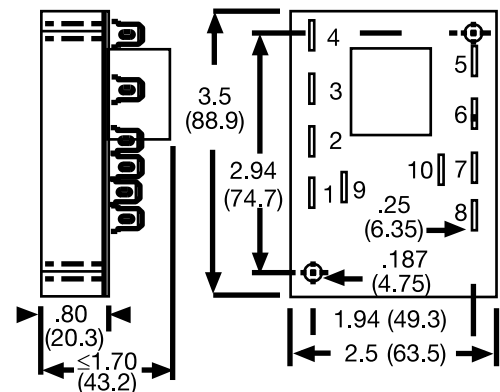
Inches (Millimeters)

ERD32B01 07.01.04

Recycling (Pulse Generator)
KRDR Digi-Timer
Time Delay Relay

5

Description
The KRDR 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 KRDR Series is a cost effective recycling timer for OEM applications that require small size, isolation, reliability, and long life.

Operation (ON Time First)
Upon application of input voltage, the output relay energizes and the T2 ON time begins. At the end of the ON time, the output de-energizes and the T1 OFF time begins. At the end of the OFF time, the output relay energizes and the cycle repeats as long as input voltage is applied.
**Reset:** Removing input voltage resets the output and the time delays, and returns the sequence to the ON time.

Operation (OFF Time First)
Upon application of input voltage, the T1 OFF time begins. At the end of the OFF time, the T2 ON time begins and the load energizes. At the end of the ON time the load de-energizes, and the cycle repeats until input voltage is removed.
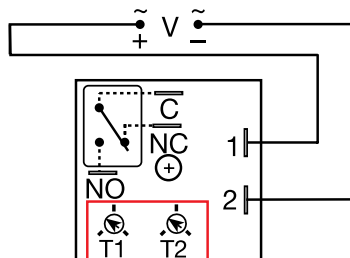**Reset:** Removing input voltage resets the output and the sequence to the OFF time.

Function

Recycling (ON First)

Recycling (OFF First)
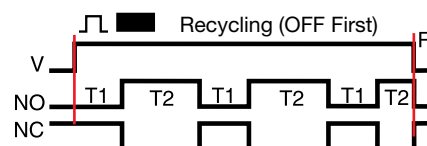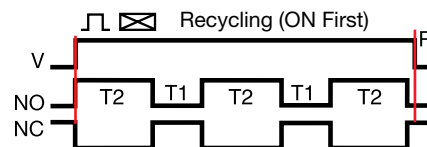
V = Voltage   R = Reset
T1 = OFF Time   T2 = ON Time
NO = Normally Open   NC = Normally Closed

Connection

T1 = OFF Time   T2 = ON Time

A knob is supplied for adjustable units. Dashed lines are internal connections.

- Compact Time Delay Relay
- Full 10 A SPDT Output Contacts
- Onboard Adjustment or Fixed Time Delay
- Delays from 100 ms...1000 m in 6 Ranges
- Input Voltages from 120...230V in 6 Ranges
- +/-0.5% Repeat Accuracy
- +/-5% Factory Calibration

Approvals:

Ordering Table

KRDR Series	X Input	X Adjustments	X T2, ON Time *	X Operating Sequence	X T1, OFF Time *
	1 - 12 V DC	1 - Both Times Fixed	0 - 0.1 ... 10 s	A - ON Time First	0 - 0.1 ... 10 s
	2 - 24 V AC	2 - Both Times Adj.	1 - 1 ... 100 s	B - OFF Time First	1 - 1 ... 100 s
	3 - 24 V DC	3 - ON Time Adj. OFF Time Fixed	2 - 10 ... 1000 s		2 - 10 ... 1000 s
	4 - 120 V AC	4 - ON Time Fixed, OFF Time Adj.	3 - 0.1 ... 10 m		3 - 0.1 ... 10 m
	5 - 110 V DC		4 - 1 ... 100 m		4 - 1 ... 100 m
	6 - 230 V AC		5 - 10 ...1000 m		5 - 10 ...1000 m

* If Fixed Delay is selected, insert delay [0.1 … 999] followed by (S) sec. or (M) min.
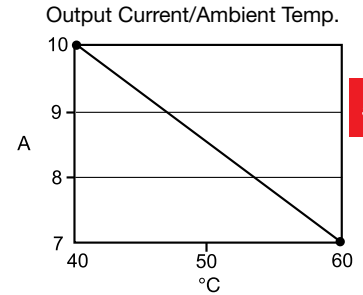
Example P/N: KRDR421A1 = 120 V AC, ON Time and OFF Time Onboard Adjustable, with ON Time from 1 to 100 seconds, ON Time First Operation, with OFF Time from 1 to 100 seconds

Fixed- **KRDR431B0.5S** = 230 V AC, ON Time Onboard Adjustable from 1 to 100 sseconds, OFF Time First Operation, with OFF Time

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Recycling (Pulse Generator)
KRDR Digi-Timer
Time Delay Relay

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
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 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 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	-20°C ... +60°C/-40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.6 oz (74 g)

Output Current/Ambient Temp.

A

5

Accessories

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.

Mechanical View

2.00
(50.8)

0.25
(6.35)

0.75
(19)

2.00
(50.8)

C
NC
NO
T1   T2

0.25
(6.35)

≤ 1.21
(30.7)
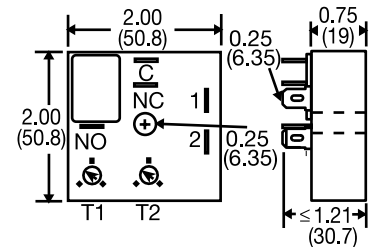
Inches (Millimeters)

T1 = OFF time   T2 = ON time

A knob is supplied for adjustable
time delays

KRDRGen   08.15.06

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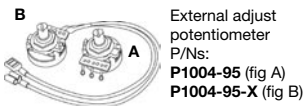# Recycling (Flasher)
KRD3 Digi-Timer
Time Delay Relay

5

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

Approvals: **RU** **SA**

Accessories

B **A** 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 KRD3 Series measures 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 KRD3 Series is a cost effective approach for OEM applications that require small size, isolation, reliability, and long life.

Operation (ON Time First)
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 relay is energized and the cycle repeats as long as input voltage is applied.
**Reset:** Removing input voltage resets the output and the time delays, and returns the sequence to the ON time.

Operation (OFF Time First)
Upon application of input voltage, the OFF time begins. At the end of the OFF time, the ON time begins and the output relay energizes. At the end of the ON time the output relay de-energizes, and the cycle repeats until input voltage is removed.
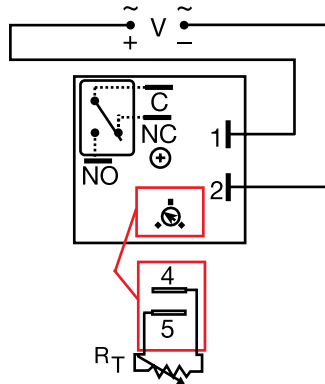**Reset:** Removing input voltage resets the output and the time delays, and returns the sequence to the OFF time.

Function

Recycling (ON First)

Recycling (OFF First)
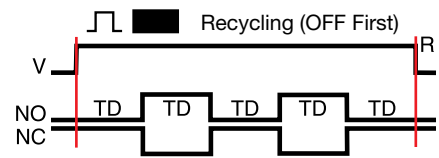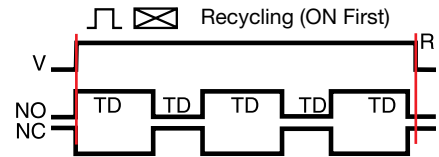
V = Voltage   R = Reset   TD = Time Delay
NO = Normally Open   NC = Normally Closed

Connection

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. Dashed lines are internal connections.

Ordering Table

KRD3 Series	X Input	X Adjustment	X Time Delay *	X Operating Sequence
	1 - 12 V DC	1 - Fixed	0 - 0.1 ... 10 s	A - ON Time First
	2 - 24 V AC/DC	2 - Onboard Adjustment	1 - 1 ... 100 s	B - OFF Time First
	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	

* If Fixed Delay is selected, insert delay [**0.1 … 1000**] followed by (**S**) sec. or [**0.1 ... 100**] (**M**) min.
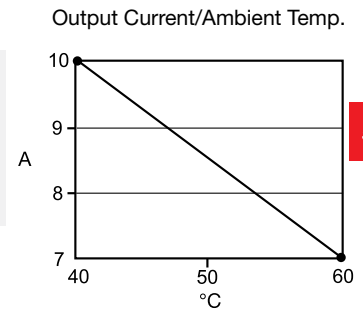
Example P/N: KRD3421A = 120 V AC; Onboard adjust from 1 to 100 seconds, ON Time First

KRD3610.5SB = 230 V AC, Fixed at 0.5 seconds, OFF Time First

5.136

1TRC 001 009 C0202

Low Voltage Products & Systems

KRD3Gen   08.15.06

Recycling (Flasher)
KRD3 Digi-Timer
Time Delay Relay

Technical Data

Time Delay	
Range	0.1 s ... 100 m in 5 adjustable ranges or fixed
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/- 5%
Reset Time	≤ 150 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 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 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	-20°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.

R$_T$ = External Timing Resistor in Kilohms
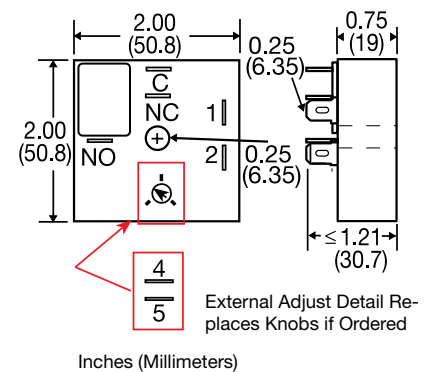
Time Delay Ranges

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 time 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 ohm R$_T$. For 1 to 100 S use a 100 K ohm R$_T$.

Mechanical View

External Adjust Detail Re-places Knobs if Ordered

Inches (Millimeters)

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Recycling (Pulse Generator)
RS Digi-Set
Timing Module

CE

5

■ Accurate, Reliable Recycling Timer
■ Switch Settable Time Delays - Both Times Adjustable
■ +/-0.1% Repeat Accuracy
■ +/-2% Setting Accuracy
■ 0.1 s ... 1023 h in 4 Ranges
■ 12 ... 230 V in 5 ranges
■ 1 A Solid State Output
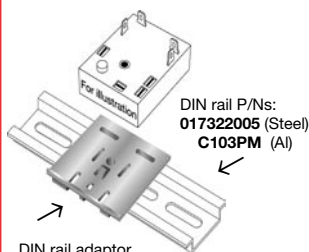■ Totally Solid State and Encapsulated

Approvals: UL CSA

Accessories

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**

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

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

See accessory pages for specifications.

Description
The RS Series is a solid state, encapsulated, recycling timer designed for tough industrial environments. It is used by many testing labs as a life cycle tester; by others as a cycle controller. The RS Series has separate DIP switch adjustments for the ON delay and the OFF delay. These make possible accurate adjustment the first time and every time. Time Delays of 0.1 seconds to 1023 hours are available in 4 ranges.

Operation (ON Time First)
Upon application of input voltage, the output energizes and the T1 ON time begins. At the end of the ON time, the output de-energizes and the T2 OFF time begins. At the end of the OFF time, the output energizes and the cycle repeats as long as input voltage is applied.
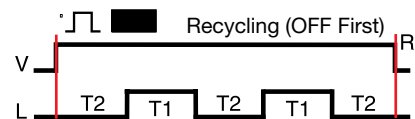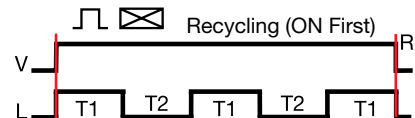**Reset:** Removing input voltage resets the output and time delays, and returns the sequence to the ON time.

Operation (OFF Time First)
Upon application of input voltage, the T2 OFF time begins. At the end of the OFF time, the output energizes and the T1 ON time begins. At the end of the ON time, the output de-energizes and the cycle repeats as long as input voltage is applied.
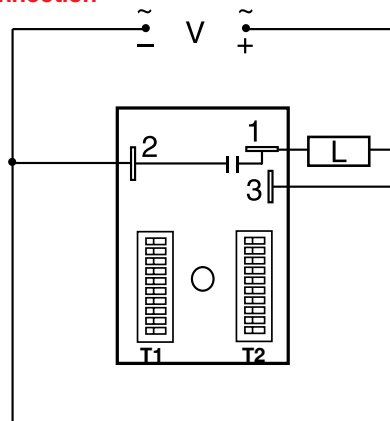**Reset:** Removing input voltage resets the output and time delays, and returns the sequence to the OFF time.

Function

Recycling (ON First)

Recycling (OFF First)

V = Voltage   L = Load   R = Reset
T1 = ON Time   T2 = OFF Time

Connection

Dashed lines are internal connections.

Ordering Table

RS Series	X Input	X Operating Sequence	X T1 ON Time	X T2 OFF Time
	1 - 12 V DC	**A** - ON Time First	**1** - 0.1 ... 102.3 s in 0.1 s increments	**1** - 0.1 ... 102.3 s in 0.1 s increments
	2 - 24 V AC	**B** - OFF Time First	**2** - 0.1 ... 102.3 m in 0.1 m increments	**2** - 0.1 ... 102.3 m in 0.1 m increments
	3 - 24 V DC		**3** - 1 ... 1023 m in 1 m increments	**3** - 1 ... 1023 m in 1 m increments
	4 - 120 V AC		**4** - 1 ... 1023 h in 1 h increments	**4** - 1 ... 1023 h in 1 h increments
	6 - 230 V AC			

Example P/N: **RS4A23, RS6B14**

5.138

1TRC 001 009 C0202

RSGen

11.11.04

Low Voltage Products & Systems

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Recycling (Pulse Generator)
RS Digi-Set
Timing Module

Technical Data
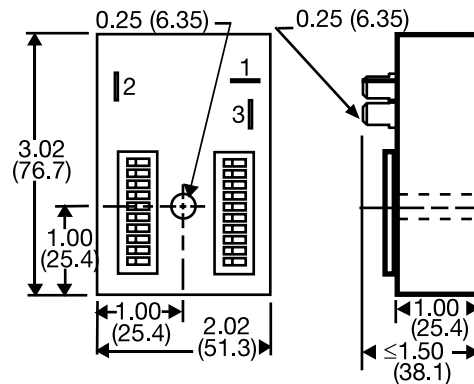
Time Delay

Range*	0.1 ... 102.3 s in 0.1 s increments
	0.1 ... 102.3 m in 0.1 m increments
	1 ... 1023 m in 1 m increments
	1 ... 1023 h in 1 h increments
Repeat Accuracy	+/-0.1% or 20 ms, whichever is greater
Setting Accuracy	$\leq$ +/-2% or 20 ms, whichever is greater
Reset Time	$\leq$ 150 ms
Time Delay vs Temperature & Voltage	$\leq$ +/- 2%

Input

Voltage	12, or 24 V DC; 24, 120, or 230 V AC
Tolerance	+/-20%
Line Frequency	50 ... 60 Hz
DC Ripple	$\leq$ +/-10%
Power Consumption	AC $\leq$ 2 VA; DC $\leq$ 1 W

Output

Type	Solid state
Maximum Load Current	1 A steady state, 10 A inrush at 60°C
OFF State Leakage Current	AC $\cong$ 5 mA at 230 VAC; DC $\cong$ 1 mA
Voltage Drop	AC $\cong$ 2.5 V at 1 A; DC $\cong$ 1 V at 1 A

Protection

Circuitry	Encapsulated
Dielectric Breakdown	$\geq$ 2000 V RMS terminals to mounting surface
Insulation Resistance	$\geq$ 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 38.1 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	$\cong$ 3.9 oz (111 g)

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

5

Mechanical View

Adjustment Switch Operation

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

Inches (Millimeters)

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Recycling (Pulse Generator)

ESDR Recycle Timer
Timing Module

5

- ON/OFF Recycling with Independent Adjustment of Both the ON and OFF Periods
- Onboard Adjust, External Adjust, or Fixed Time Delays
- 0.1 s to 1000 m in 6 Ranges
- +/-0.1% Repeat Accuracy
- +/- 5% Factory Calibration
- Available in AC or DC Voltages

Approvals:

Description

The ESDR Series offers independent time adjustment of both delay periods. Adjustment options include onboard adjust, external adjust or factory fixed. The ESDR is recommended for air drying, automatic oiling, life testing, chemical metering and automatic duty cycling. 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 $\leq$+/- 5%. The repeat accuracy, under stable conditions, is 0.1% of the selected time delay. This series is designed for input voltages of 12 V DC to 230 V AC in five ranges. Time delays of 0.1 seconds to 1000 minutes are available in six 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 (ON Time First)

Upon application of input voltage, the output energizes and the T1, ON time begins. At the end of the ON time, the output de-energizes and the T2, OFF time begins. At the end of the OFF time, the output energizes and the cycle repeats as long as input voltage is applied.
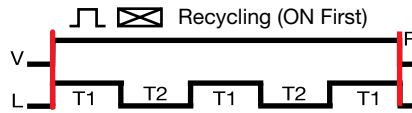**Reset:** Removing input voltage resets the output and time delays, and returns the sequence to the first delay.

Operation (OFF Time First)

Upon application of input voltage, the T2 OFF time begins. At the end of the OFF time, the output energizes and the T1 ON time begins. At the end of the ON time, the output de-energizes and the cycle repeats as long as input voltage is applied.
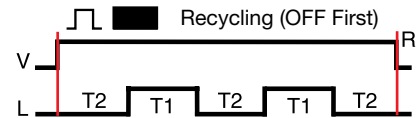**Reset:** Removing input voltage resets the output and time delays, and returns the sequence to the first delay.
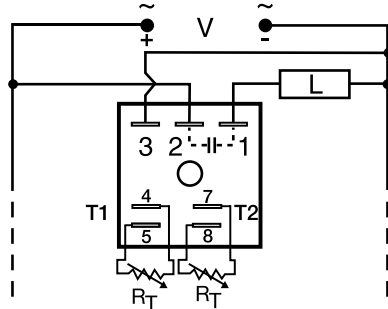
Function

Recycling (ON First)

V = Voltage   L = Load   R = Reset
T1 = ON Time   T2 = OFF Time

Function
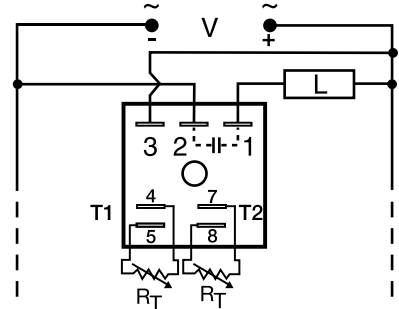

Recycling (OFF First)

V = Voltage   L = Load   R = Reset
T1 = ON Time   T2 = OFF Time

Connection

Positive Switching

V = Voltage
L = Load
T1 = ON Time
T2 = OFF Time

Negative Switching

R_T is used when external adjustment is ordered.
Dashed lines are internal connections.
A knob is supplied for adjustment on the unit; terminals for external adjustment.

Ordering Table

ESDR	X
Series	**Input**
	1 - 12 V DC
	2 - 24 V AC
	3 - 24 V DC
	4 - 120 V AC
	6 - 230 V AC

Example P/N:
ESDR623B1
Fixed – **ESDR310.1SB50MN**

X
Adjustment
1 - Both Times Fixed
2 - Both Times Onboard Adj.
3 - ON Time Onboard Adj. OFF Time Fixed
4 - ON Time Fixed OFF Time Onboard Adj.
5 - Both Times External Adj.
6 - ON Time External Adj. OFF Time Fixed
7 - ON Time Fixed, OFF Time External Adj.
8 - ON Time Onboard Adj., OFF Time External Adj.
9 - ON Time External Adj., OFF Time Onboard Adj.

X
T1 ON Time*
0 - 0.1 ... 10 s
1 - 1 ... 100 s
2 - 10 ... 1000 s
3 - 0.1 ... 10 m
4 - 1 ... 100 m
5 - 10 ... 1000 m

X
Operating Sequence
A - ON Time First
B - OFF Time First

X
T2 OFF Time*
0 - 0.1 ... 10 s
1 - 1 ... 100 s
2 - 10 ... 1000 s
3 - 0.1 ... 10 m
4 - 1 ... 100 m
5 - 10 ... 1000 m

X
Switching Mode
(V DC Only)
P - Positive
N - Negative

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

5.140

Recycling (Pulse Generator)
ESDR Series
Timing Module

Technical Data

Time Delay

Range	100 ms ... 1000 m in 6 adjustable ranges or fixed
Repeat Accuracy	+/-0.1% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/- 5%
Time Delay vs. Temperature & Voltage	≤ +/-2%
Reset Time	≤ 150 ms

Input

Voltage	12 or 24 V DC; 24, 120, or 230 V AC
Tolerance	+/-20%
Power Consumption	AC ≤ 2 VA; DC ≤ 1 W
Line Frequency	50 ... 60 Hz
DC Ripple	≤ 10%

Output

Type	Solid state
Maximum Load Current	1 A steady state , 10 A inrush at 60°C
OFF State Leakage Current	AC ≅ 5 mA at 230 V AC; DC ≅ 1 mA
Voltage Drop	AC ≅ 2.5 V at 1 A; DC ≅ 1 V at 1 A

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
Termination	0.25 in. (6.35 mm) male quick connect terminals
Operating/Storage Temperature	-40°C ... +75°C / -40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

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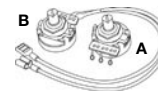
External adjust potentiometer P/Ns:
P1004-95 (fig A)
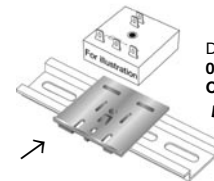**P1004-95-X** (fig B)

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

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

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

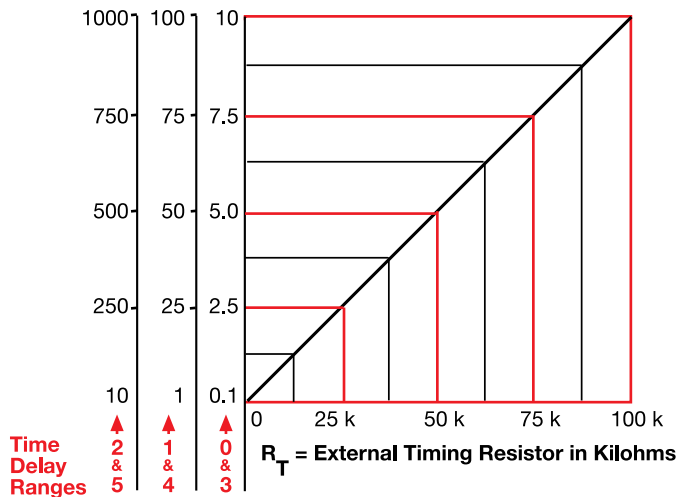Mounting bracket
P/N: **P1023-6**

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

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

See accessory pages for specifications.

5

External Resistance vs Time Delay

In Secs. or Mins.

| Time Delay Ranges | 2 & 5 | 1 & 4 | 0 & 3 |

R_T = External Timing Resistor in Kilohms

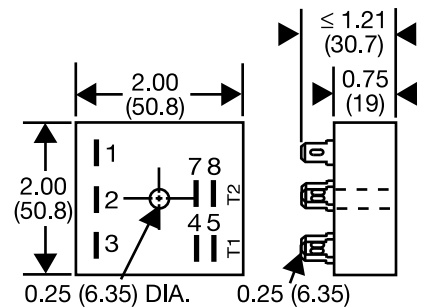This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the R_T terminals; as the resistance increases the time delay increases.
When selecting an external R_T, add the tolerances of the timer and the R_T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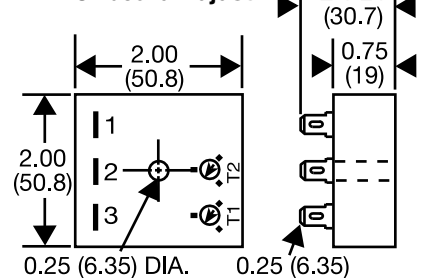**Examples:** 1 to 50 S adjustable time delay, select time delay range 1 and a 50 K ohm R_T. For 1 to 100 S use a 100 K ohm R_T.

Mechanical View

Fixed & External Adjust

Onboard Adjust

Inches (Millimeters)

Gross Automation (877) 268-3700 · www.ssacsales.com · sales@grossautomation.com

Recycling (Pulse Generator)
TSDR Digi-Timer
Timing Module

5

- ■ Fixed or Adjustable
  0.1 s ... 1000 m in 6 Ranges
- ■ +/- 0.5% Repeat Accuracy
- ■ +/- 5% Factory Calibration
- ■ 24, 120, or 230 V AC
- ■ 1 A Solid State Output
- ■ Encapsulated

Approvals: **UL** **CSA**

US PATENT 6708135

TEN YEAR WARRANTY **10**

Description
The TSDR Digi-Timer is an ON/OFF or OFF/ON recycling timing module designed to control metering pumps, chemical valves, flash lamps, or use in energy saving or duty cycling applications. It may be ordered with both time delays factory fixed, or one delay fixed and the other delay external or onboard adjustable. 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 $\leq$ +/- 5%. 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.

Operation (ON Time First)
Upon application of input voltage, the output energizes and the T1, ON time begins. At the end of the ON time, the output de-energizes and the T2, OFF time begins. At the end of the OFF time, the output energizes and the cycle repeats as long as input voltage is applied.
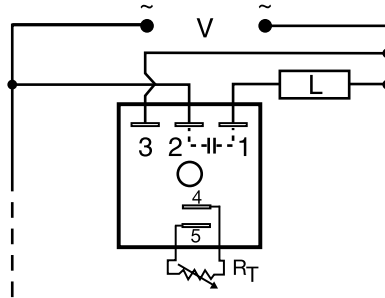**Reset:** Removing input voltage resets the output and time delays, and returns the sequence to the T1, ON time.

Operation (OFF Time First)
Upon application of input voltage, the T2, OFF time begins. At the end of the OFF time, the T1, ON time begins and the load energizes. At the end of the T1, T2 begins and the load de-energizes. This cycle repeats until input voltage is removed.
Reset: Removing input voltage resets the output and the sequence to T2, OFF time.

Function

Recycling (ON First)

Recycling (OFF First)

V = Voltage   R = Reset   L=Load
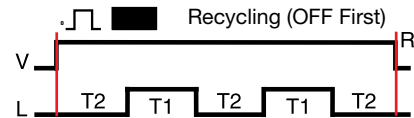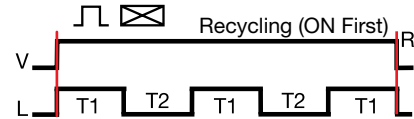T1 = ON Time   T2 = OFF Time

Connection

R_T is used when external adjustment is ordered.
Dashed lines are internal connections.
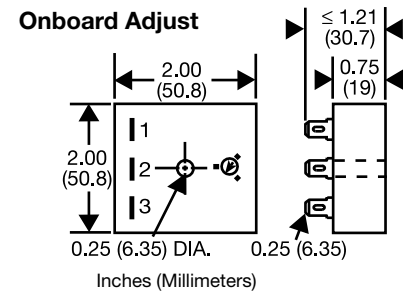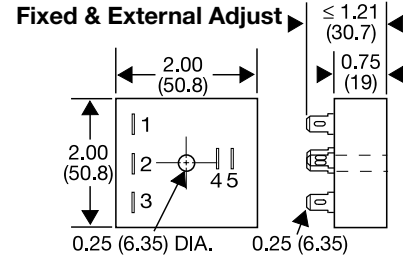
An onboard adjustment, or terminals 4 & 5 are only included on adjustable units.

Mechanical View

Fixed & External Adjust

≤ 1.21 (30.7)
0.75 (19)
2.00 (50.8)
2.00 (50.8)
0.25 (6.35) DIA.   0.25 (6.35)

Onboard Adjust

≤ 1.21 (30.7)
0.75 (19)
2.00 (50.8)
2.00 (50.8)
0.25 (6.35) DIA.   0.25 (6.35)

Inches (Millimeters)

Ordering Table

TSDR Series	X Input	X Adjustment	X T1, ON Time *	X First Delay	X T2, OFF Time *
	2 - 24 V AC	**1** - Fixed	**0** - 0.1 ... 10 s	**A** - ON Time	**0** - 0.1 ... 10 s
	4 - 120 V AC	**2** - ON Time Onboard adj./ OFF Time Fixed	**1** - 1 ... 100 s	**B** - OFF Time	**1** - 1 ... 100 s
	6 - 230 V AC	**3** - ON Time Ext. adj./ OFF Time Fixed	**2** - 10 ... 1000 s		**2** - 10 ... 1000 s
		4 - ON Time Fixed/OFF Time Ext. adj.	**3** - 0.1 ... 10 m		**3** - 0.1 ... 10 m
		5 - ON Time Fixed/OFF Time Onboard adj.	**4** - 1 ... 100 m		**4** - 1 ... 100 m
			5 - 10 ... 1000 m		**5** - 10 ... 1000 m

Example P/N: TSDR622A0.2S
Fixed – **TSDR411SA10M**

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

TSDRGen 07.01.04

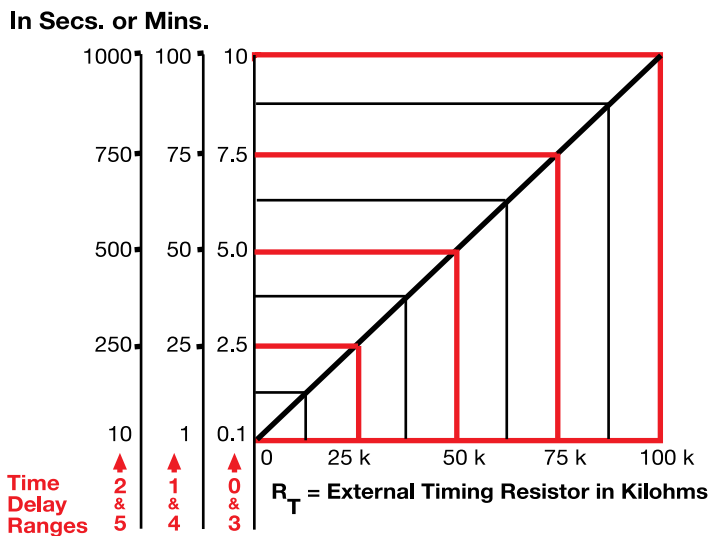# Recycling (Pulse Generator)
TSDR Digi-Timer
Timing Module
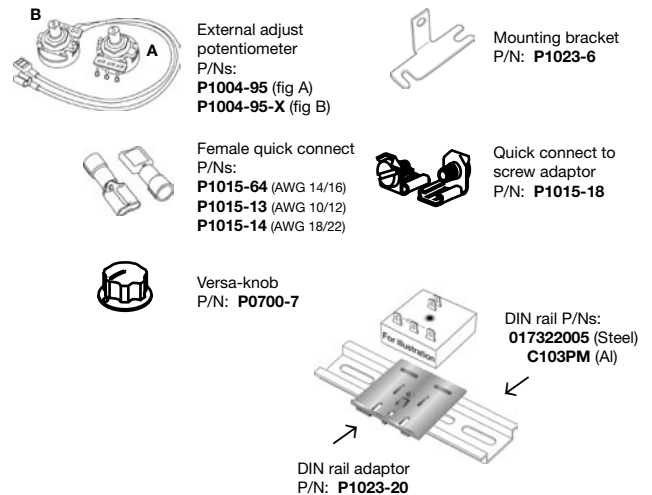
5

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
Time Delay vs. Temperature & Voltage	≤ +/-5%
Input	
Voltage	24, 120, or 230 V AC
Tolerance	+/-20%
Line Frequency	50 ... 60 Hz
Power Consumption	≤ 2 VA
Output	
Type	Solid state
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)

External Resistance vs Time Delay

In Secs. or Mins.

R_T = External Timing Resistor in Kilohms

Time Delay Ranges | 2 & 5 | 1 & 4 | 0 & 3

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 time 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 ohm R_T. For 1 to 100 S use a 100 K ohm R_T.

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)
P1015-14 (AWG 18/22)

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

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

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.

Recycling (Pulse Generator)
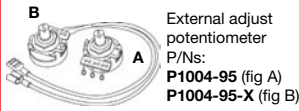## KSDR Digi-Timer
Timing Module

US PATENT 6708135

TEN YEAR WARRANTY

5

- ■ Adjustable 0.1 s...1000 m in 6 Ranges
- ■ +/-0.5% Repeat Accuracy
- ■ +/- 5% Factory Calibration
- ■ 24, 120, or 230 V AC
- ■ 1 A Solid State Output
- ■ Encapsulated

Approvals:

Accessories

B   **A**   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)
P1015-14 (AWG 18/22)

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

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

For illustration

DIN rail P/Ns:
C103PM (Al)
017322005 (Steel)
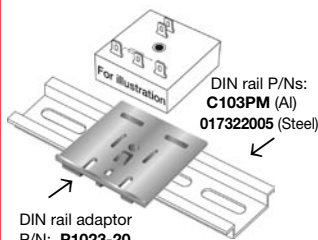
DIN rail adaptor P/N: **P1023-20**

See accessory pages for specifications.

Description
The KSDR Series offers independent time adjustment of both delay periods. The KSDR is recommended for air drying, automatic oiling, life testing, chemical metering, and automatic duty cycling. 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 delay. The repeat accuracy, under stable conditions, is 0.5% of the selected time delay. This series is designed for input voltages of 24, 120 or 230 volts AC. 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 (ON Time First)
Upon application of input voltage, the output energizes and the T1, ON time begins. At the end of the ON time, the output de-energizes and the T2, OFF time begins. At the end of the OFF time, the output energizes and the cycle repeats as long as input voltage is applied.
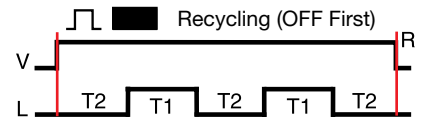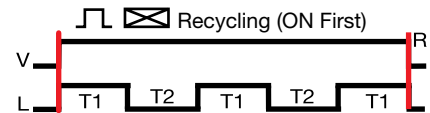**Reset:** Removing input voltage resets the output and time delays, and returns the sequence to T1, ON time.

Operation (OFF Time First)
Upon application of input voltage, the T2, OFF time begins. At the end of the OFF time, the T1, ON time begins and the load energizes. At the end of T1, T2 begins and the load de-energizes. This cycle repeats until input voltage is removed.
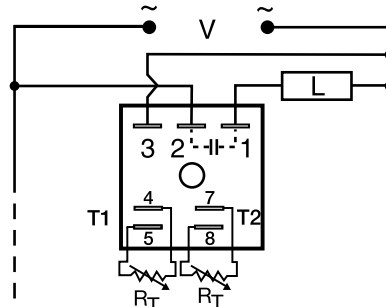**Reset:** Removing input voltage resets the output and the sequence to T2, OFF time.

Function

Recycling (ON First)

Recycling (OFF First)

V = Voltage   R = Reset   L = Load
T1 = ON Time   T2 = OFF Time

Connection

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

Ordering Table

KSDR Series	X Input	X T1, ON Time	X Operating Sequence	X T2, OFF Time
	2 - 24 V AC	**0** - 0.1 ... 10 s	**A** - ON Time First	**0** - 0.1 ... 10 s
	4 - 120 V AC	**1** - 1 ... 100 s	**B** - OFF Time First	**1** - 1 ... 100 s
	6 - 230 V AC	**2** - 10 ... 1000 s		**2** - 10 ... 1000 s
		3 - 0.1 ... 10 m		**3** - 0.1 ... 10 m
		4 - 1 ... 100 m		**4** - 1 ... 100 m
		5 - 10 ... 1000 m		**5** - 10 ... 1000 m

Example P/N: KSDR40A1

Recycling (Pulse Generator)
KSDR Digi-Timer
Timing Module

5

Technical Data

Time Delay

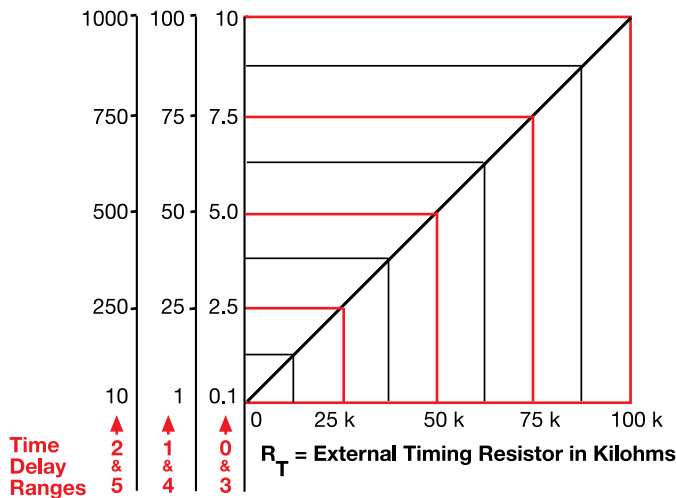|	
Range	0.1 s ... 1000 m in 6 ranges
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-5%
Reset Time	≤ 150 ms
Time Delay vs. Temperature & Voltage	≤ +/-10%

Input

Voltage	24, 120, or 230 V AC
Tolerance	+/-20%
Line Frequency	50 ... 60 Hz
Power Consumption	≤ 2 VA

Output

Type	Solid state
Rating	1 A steady state, 10 A inrush at 60°C
Voltage Drop	≅ 2.5 V at 1 A
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 1.21 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)

External Resistance vs Time Delay

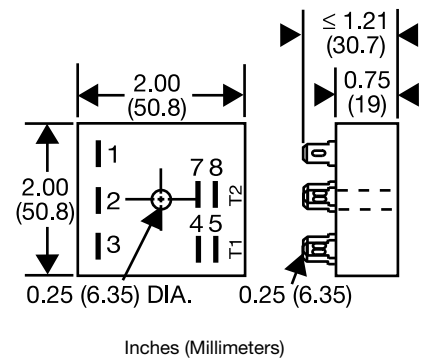## Mechanical View

Inches (Millimeters)

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 time delay increases.
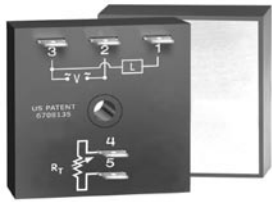When selecting an external R_T, add the tolerances of the timer and the R_T for the full time range adjustment.
Examples: 1 to 50 S adjustable time delay, select time delay range 1 and a 50 K ohm R_T. For 1 to 100 S use a 100 K ohm R_T.

KSDRGen 10.12.04
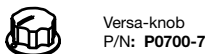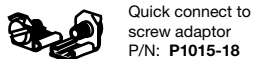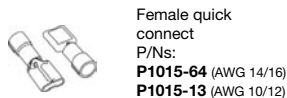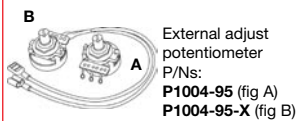
Recycling (Flasher)
THD3 Digi-Power
Power Timing Module

5

- 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 Mounting Surface for Efficient Heat Transfer
- Totally Solid State and Encapsulated

TEN YEAR WARRANTY 10

Approvals: UL CSA

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. The THD3 has equal ON and OFF time delays. A single RT sets both time delays. You can reduce labor, component cost, and increase reliability with these small, easy-to-use, Digi-Power timers.

Operation (ON Time First)

Upon application of input voltage, the output energizes and the T1 ON time begins. At the end of the ON time, the output de-energizes and the T2 OFF time begins. At the end of the OFF time, the output energizes and the cycle repeats as long as input voltage is applied.
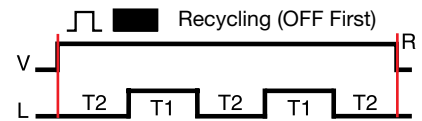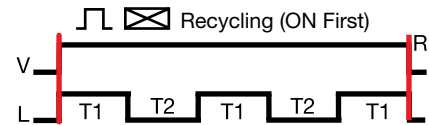**Reset:** Removing input voltage resets the output and time delays, and returns the sequence to T1, ON time.

Operation (OFF Time First)

Upon application of input voltage, the T2, OFF time begins. At the end of the OFF time, the T1, ON time begins and the load energizes. At the end of T1, T2 begins and the load de-energizes. This cycle repeats until input voltage is removed.
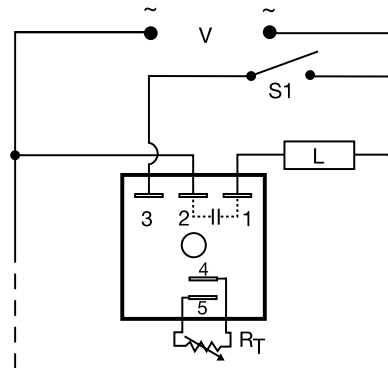**Reset:** Removing input voltage resets the output and the sequence to T2, OFF time.

Function

Recycling (ON First)

Recycling (OFF First)

V = Voltage   R = Reset   L = Load
T1 = ON Time   T2 = OFF Time
T1 ≅ T2

Connection

RT is used when external adjustment is ordered.
Dashed lines are internal connections.
S1 = Optional Low Current Initiate Switch

Accessories

B

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

THD3	X	X	X	X	X
Series	**Output Rating**	**Input**	**Adjustment**	**Operating Sequence**	**Time Delay** *
	A - 6 A	**2** - 24 V AC	**1** - Fixed	**A** - ON Time First	**0** - 0.1 ... 10 s
	B - 10 A	**4** - 120 V AC	**2** - External Adjust	**B** - OFF Time First	**1** - 1.0 ... 100 s
	C - 20 A	**6** - 230 V AC	**3** - Onboard Adjust		**2** - 10 ... 1000 s
					3 - 0.1 ... 10 m
					4 - 1 ... 100 m
					5 - 10 ... 1000 m

Example P/N: THD3B42A0
Fixed – **THD3A41A0.1S**

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

Recycling (Flasher)
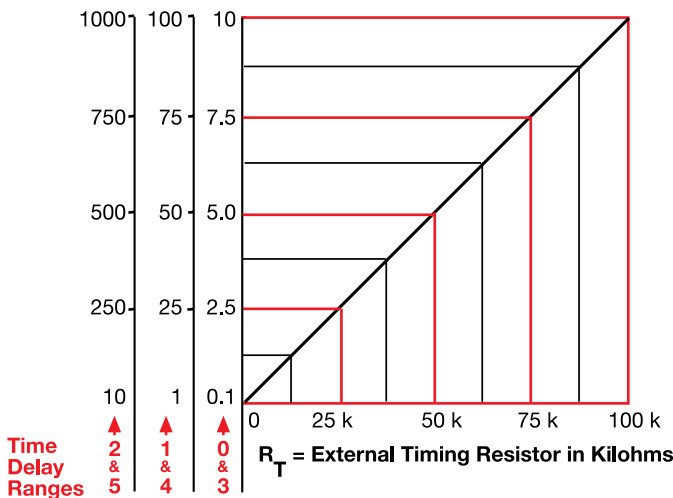## THD3 Digi-Power
Power Timing Module

Technical Data

Time Delay

Range	0.1 s ... 1000 m in 6 adjustable ranges or fixed
Adjustment	Single variable resistor changes both the ON & OFF times equally
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-1%
Reset Time	≤ 150 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
Maximum Load Current	

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
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)

5

External Resistance vs Time Delay

In Secs. or Mins.

R_T = **External Timing Resistor in Kilohms**

| Time Delay Ranges | 2 & 5 | 1 & 4 | 0 & 3 |

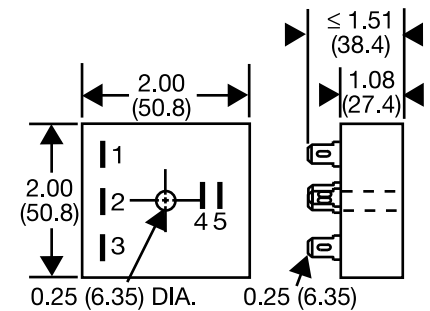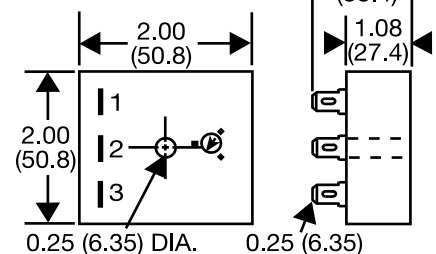**This chart applies to externally adjustable part numbers.**
The time delay is adjustable over the time delay range selected by varying the resistance across the R_T terminals; as the resistance increases the time delay increases.
When selecting an external R_T, add the tolerances of the timer and the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

Mechanical View

Fixed & External Adjust

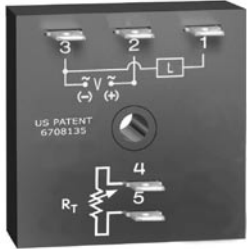### Onboard Adjust

Inches (Millimeters)

Gross Automation (877) 268-3700 · www.ssacsales.com · sales@grossautomation.com

Recycling (Flasher)
TSD3 Digi-Timer
Timing Module


US PATENT 6708135

TEN YEAR WARRANTY 10

5

- Fixed or Adjustable Delays From 0.1 s... 100 h
- Equal ON and OFF Delays
- +/-0.1% Repeat Accuracy
- +/-1% Factory Calibration
- 24, 120, or 230 V AC
- 1A Solid State Output
- Encapsulated

Approvals: UL CSA

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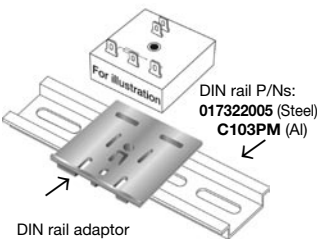
DIN rail adaptor P/N: **P1023-20**

See accessory pages for specifications.
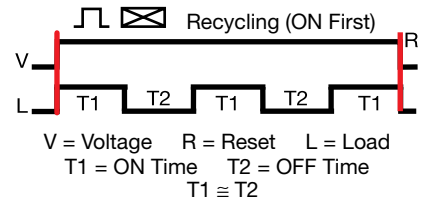
Description

The TSD3 is a solid state ON/OFF recycling timer with the ON time always equal to the OFF time. When time delay is changed by the R_T, both the ON and the OFF periods are changed. 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 0.1% of the time delay. The TSD Series is rated to operate over an extended temperature range. Time delays of 0.1 seconds to 100 hours 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.
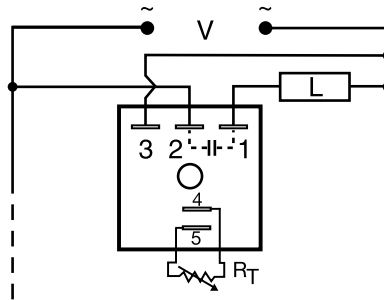
Operation

Upon application of input voltage, the output energizes and the T1, ON time begins. At the end of the ON time, the output de-energizes and the T2, 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 T1, ON time.

Function

Recycling (ON First)

V = Voltage   R = Reset   L = Load
T1 = ON Time   T2 = OFF Time
T1 ≅ T2

Connection

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

Ordering Table

TSD3 Series	X Input	X Adjustment	X Time Delay *
	2 - 24 V AC	**1** - Fixed	**0** - 0.1 ... 10 s
	4 - 120 V AC	**2** - External Adjust	**1** - 1 ... 100 s
	6 - 230 V AC	**3** - Onboard Adjust	**2** - 10 ... 1000 s
			3 - 0.1 ... 10 m
			4 - 1 ... 100 m
			5 - 10 ... 1000 m
			6 - 1 ... 100 h

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

Example P/N: TSD3421   Fixed – **TSD3410.5S**

07.01.04

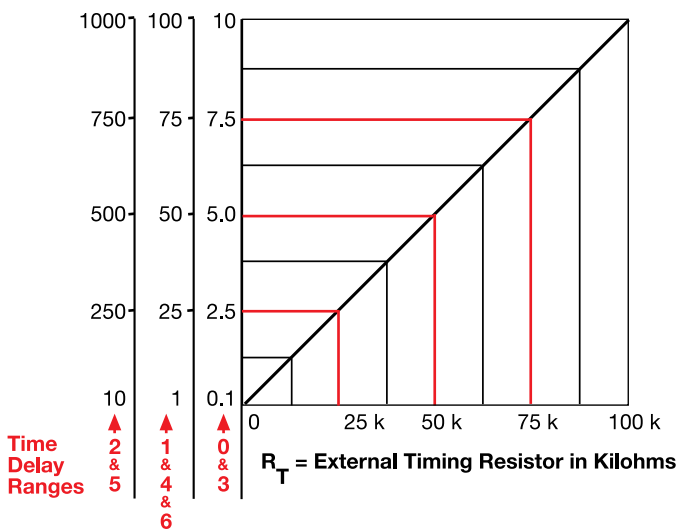TSD3Gen

Technical Data

Time Delay	
Range	0.1 s ... 100 h in 7 adjustable ranges or fixed
Repeat Accuracy	+/-0.1% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-1%
Reset Time	≤ 150 ms
Time Delay vs. Temperature & Voltage	≤ +/-1%
Input	
Voltage	24, 120, or 230 V AC
Tolerance	+/-20%
Line Frequency	50 ... 60 Hz
Power Consumption	≤ 2 VA
Output	
Type	Solid state
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)

External Resistance vs Time Delay

In Secs., Mins., or Hours

R_T = **External Timing Resistor in Kilohms**

Time Delay Ranges
2 & 5
1 & 4 & 6
0 & 3

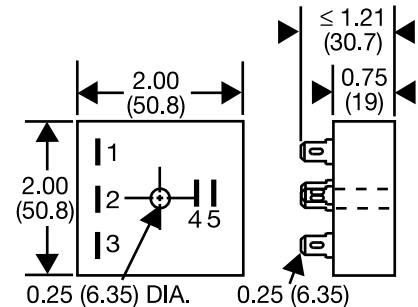**This chart applies to externally adjustable part numbers.**
The time delay is adjustable over the time delay range selected by varying the resistance across the R_T terminals; as the resistance increases the time delay increases.
When selecting an external R_T, add the tolerances of the timer and the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

Mechanical View

Fixed & External Adjust

Onboard Adjust

Inches (Millimeters)

TSD3Gen 07.01.04

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1TRC 001 009 C0202

Recycling (Flasher)
KSD3 Digi-Timer
Timing Module

CE

US PATENT 6708135

R_T

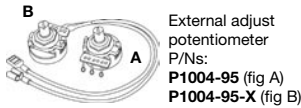TEN YEAR WARRANTY 10

- Fixed or Adjustable Delays from 0.1 s ... 1000 m
- Equal ON and OFF Delays
- +/-0.5% Repeat Accuracy
- +/- 5% Factory Calibration
- 12 ... 120 V in 4 Ranges
- 1 A Solid State Output
- Encapsulated

Approvals: UL CSA

Accessories

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

B   A

Mounting bracket P/N: **P1023-6**
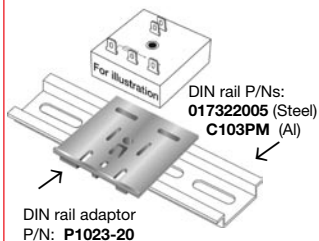
Female quick connect P/N:
P1015-64 (AWG 14/16)

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

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

For illustration

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

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

See accessory pages for specifications.

Description

The KSD3 Digi-Timer is a cost effective approach for ON/OFF recycling applications. The ON time is equal to the OFF time. An adjustment of the R⊤ will change the time delays of both ON and OFF times. 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 1 A steady and 10 A inrush. The modules are totally solid state and encapsulated to protect the electronic circuitry.

Operation (ON Time First)

Upon application of input voltage, the output energizes and the T1, ON time begins. At the end of the ON time, the output de-energizes and the T2, OFF time begins. At the end of the OFF time, the output energizes and the cycle repeats as long as input voltage is applied.
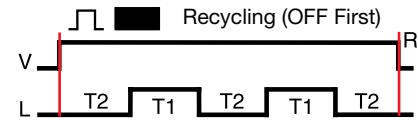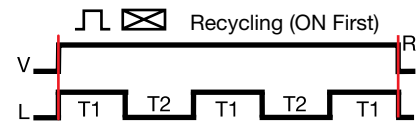**Reset:** Removing input voltage resets the output and time delays, and returns the sequence to the ON time.

Operation (OFF Time First)

Upon application of input voltage, the T2, OFF time begins. At the end of the OFF time, the T1, ON time begins and the load energizes. At the end of the ON time the load de-energizes, and the cycle repeats until input voltage is removed.
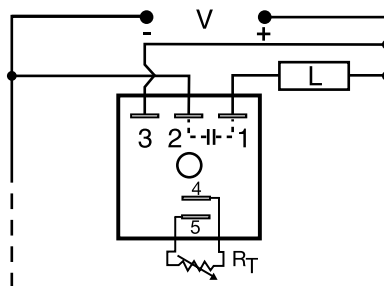**Reset:** Removing input voltage resets the output and time delays and the sequence to the OFF time.

Function

Recycling (ON First)

V
L   T1   T2   T1   T2   T1   R

Recycling (OFF First)

V
L   T2   T1   T2   T1   T2   R

V = Voltage   R = Reset   L = Load
T1 = ON Time   T2 = OFF Time
T1 ≅ T2

Connection

~ V ~
(-) (+)

L

3 2 1

4
5 R_T

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

Ordering Table

KSD3 Series	X Input	X Adjustment	X Time Delay*	X Operating Sequence
	1 - 12 V DC	**1** - Fixed	**0** - 0.1 ... 10 s	**A** - ON Time First
	2 - 24 V AC	**2** - External Adjust	**1** - 1 ... 100 s	**B** - OFF Time First
	3 - 24 V DC		**2** - 10 ... 1000 s	
	4 - 120 V AC	**3** - Onboard Adjust	**3** - 0.1 .... 10 m	
	Note: DC voltages available in negative switching <u>only</u>.		**4** - 1 ... 100 m	
			5 - 10 ... 1000 m	

Example P/N: KSD3421B   Fixed – **KSD3410.5SA**

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

5

Recycling (Flasher)
KSD3 Digi-Timer
Timing Module
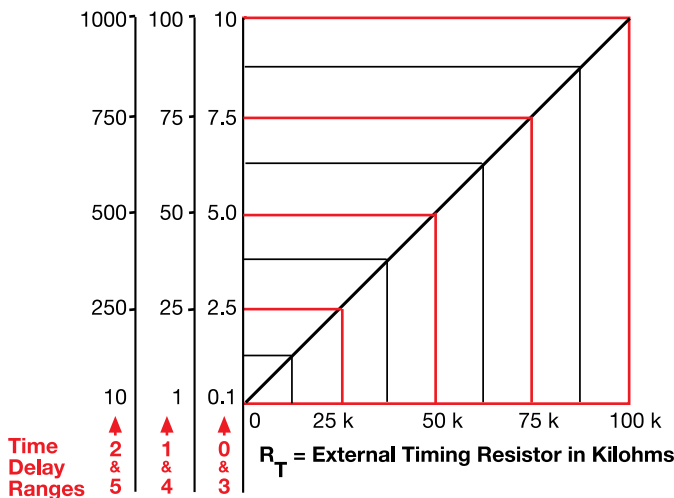
5

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
Time Delay vs. Temperature & Voltage	≤ +/-10%
Input	
Voltage	24 or 120 V AC; 12 or 24 V DC
Tolerance	+/-20%
Line Frequency	50 ... 60 Hz
Power Consumption	AC ≤ 2 VA; DC ≤ 1 W
Output	
Type	Solid state
Maximum Load Current	1 A steady state, 10 A inrush at 60°C
OFF State Leakage Current	AC ≅ 5 mA at 230 V AC; DC ≅ 1 mA
Voltage Drop	AC ≅ 2.5 V at 1 A; DC ≅ 1 V at 1 A
DC Operation	Negative switching only
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)

External Resistance vs Time Delay

In Secs. or Mins.

R_T = External Timing Resistor in Kilohms

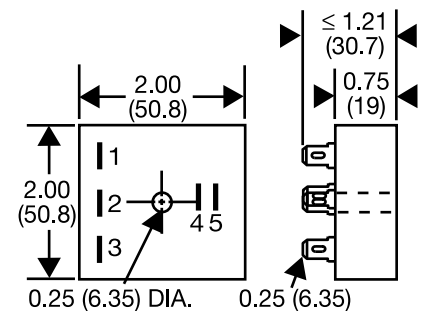**This chart applies to externally adjustable part numbers.**
The time delay is adjustable over the time delay range selected by varying the resistance across the R_T terminals; as the resistance increases the time delay increases.
When selecting an external R_T, add the tolerances of the timer and the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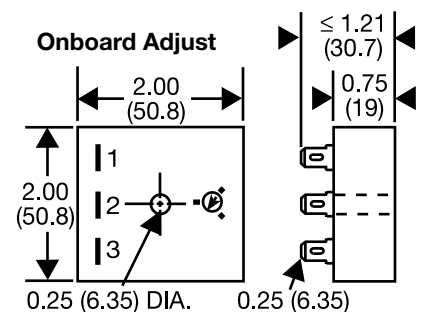**Examples:** 1 to 50 S adjustable time delay, select time delay range 1 and a 50 K ohm R_T. For 1 to 100 S use a 100 K ohm R_T.
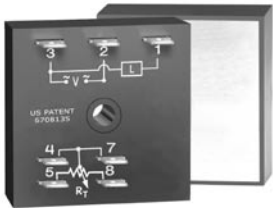
Mechanical View

Fixed & External Adjust

Onboard Adjust

Inches (Millimeters)

Low Voltage Products & Systems

5.151

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1TRC 001 009 C0202

Percentage Timing
PTHF Series
Power Timing Module

CE

5

Description

The PTHF Series can be used for a variety of applications from chemical metering, to temperature regulating, to energy management. The infinite adjustability from 1 to 99% provides accurate percentage ON control over a wide factory fixed cycle period. When mounted on a metal surface, it can be used to drive solenoids, contactors, relays, or lamps, up to 20 Amps steady, 200 Amps inrush. PTHF is the suggested replacement for the PT Series.

TEN YEAR WARRANTY 10

- ■ ON/OFF Recycling Percentage Control
- ■ Controls Loads up to 20 A, 200 A Inrush
- ■ Fixed Cycle Period 10 s... 1000 m
- ■ +/-0.5% Repeat Accuracy
- ■ +/-5% Factory Calibration
- ■ Totally Solid State & Encapsulated
- ■ Onboard or External Adjustment 1 to 99% ON

Approvals: cULus UL CSA

Operation

Upon application of input voltage, the output energizes and the T1 ON time begins. At the end of the ON time, the output de-energizes and the T2 OFF time begins. At the end of the OFF time, the output energizes and the cycle repeats as long as input voltage is applied. Increasing the ON time decreases the OFF time. The total cycle period is equal to the ON time plus the OFF time. The total cycle period is factory fixed. ON time range is 1 to 99 percent of cycle period.
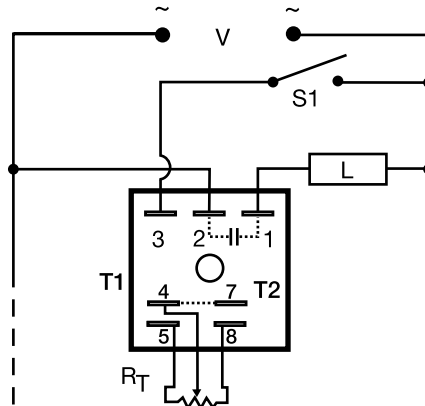
Reset: Removing input voltage resets the output and time delays, and returns the sequence to the T1 ON time.

Function

Percentage
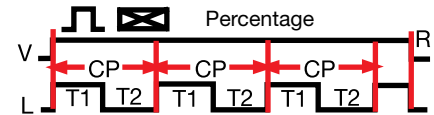
V = Voltage   L = Load   CP = Cycle Period
R = Reset   T1 = ON Time   T2 = OFF Time

Connection

Dashed lines are internal connections.

R_T = 100 KΩ   S1 = Optional Low Current Initiate Switch

R_T is used when external adjustment is ordered

T1 = ON Time   T2 = OFF Time

Accessories

External adjust potentiometer
P/N: **P1004-95**

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

PTHF	X	X	X	X
Series	**Input**	**Fixed Cycle Period**	**Output Rating**	**Adjustment**
	2 - 24 V AC	Specify **10 ... 1000** as the total fixed cycle period in seconds.	**A** - 6	**K** - Onboard Adjustment
	4 - 120 V AC		**B** - 10	**Blank** - External Adjustment
	6 - 230 V AC		**C** - 20	
			D - 1	

Note: Part number for fixed cycle period in minutes insert (**M**) suffix.

Example P/N:

PTHF210A = 24 V AC; Cycle Period 10 Seconds; 6 Amps; External Adjustment
PTHF410MA = 120 V AC; Cycle Period 10 Minutes; 6 Amps; External Adjustment
PTHF615MDK = 230 V AC; Cycle Period 15 Minutes; 1 Amp; Onboard Adjustment

PTHFGen   11.15.06

Percentage Timing
PTHF Series
Power Timing Module

5

Technical Data

Time Delay	
Type	External or Onboard Knob
Range / External Adjustment Resistance	Adjustable from 1 ... 99%; / R_T = 100 KΩ
Cycle Period	Fixed from 10 s ... 1000 m
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Cycle Period Tolerance (Factory Calibration)	≤ +/- 5%
Reset Time	≤ 150 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

Maximum Load Currents

Output	Steady State	Inrush*	Minimum
A	6 A	60 A	100 mA
B	10 A	100 A	100 mA
C	20 A	200 A	100 mA
D	1 A	10 A	- -

*Units rated ≥ 6 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.

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
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	1 A unit: ≅ 2.4 oz (68 g); 6, 10, 20 A units: ≅ 3.9 oz (111 g)

Mechanical View
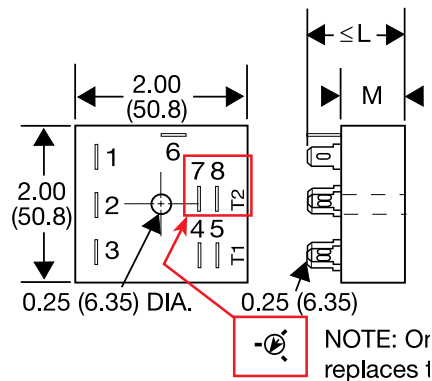
	1A	6A+
L	1.21 (30.7)	1.51 (38.4)
M	0.75 (19.1)	1.08 (27.4)

Inches (Millimeters)

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Sequencer (Recycling)
## SQ Series
Timing Module

CE

Description
The SQ Series is available with either 3 (SQ3) or 4 (SQ4) outputs and an adjustable or fixed time delay. The time delay period is the same for each output. This makes the SQ ideal for applications like dust collection, automatic lubrication, air drying, lighting displays, merchandising displays, duty cycling, and energy management.

TEN YEAR WARRANTY 10

■ Three or Four Outputs
■ Variable Delays From 0.1 s ... 100 m in 5 Ranges
■ Totally Solid State for Long, Reliable Life
■ Encapsulated to Protect Against the Environment
■ Digital Circuitry for Accuracy and Stability
■ 1 A Solid State Outputs

Approvals: cRUus

Operation
Upon application of input voltage, Load 1 energizes for the selected ON time delay. At the end of this ON time delay, Load 1 de-energizes and Load 2 immediately energizes starting another ON time delay. At the end of this ON time delay, Load 2 de-energizes and Load 3 immediately energizes. At the end of the ON time delay for Load 3 (Load 4 for 4 output devices), Load 1 re-energizes and the cycle repeats. The sequential operation continues as long as input voltage is applied.
Reset: Removing and re-applying input voltage resets the sequence to the Load 1 ON time delay.
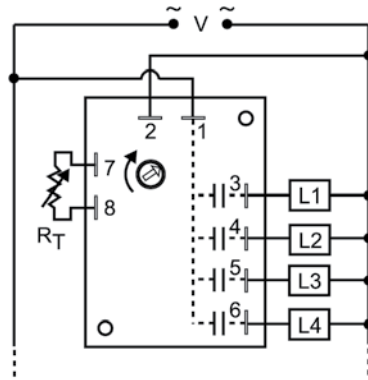
Function
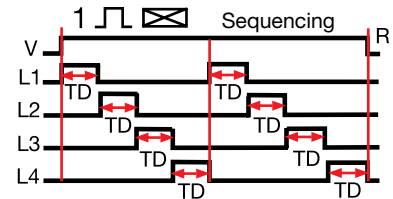
SQ4 shown; for SQ3, L4 is eliminated and L1 TD begins as soon as L3 TD is completed.

V = Voltage   R = Reset
TD = Time Delay   L = Load

Connection

R_T is 3 megohms, when external adjustment is ordered.
SQ4 shown; for SQ3, terminal 6 & load L4 are eliminated. Dashed lines are internal connections.

Time Delay	VTP P/N
0 – 0.1 ... 10 s	VTP4C
1 – 1 ... 100 s	VTP4G
2 – 10 ... 1000 s	VTP4K
3 – 0.1 ... 10 m	VTP4N
4 – 1 ... 100 m	VTP4P

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**

Plug-on adjustment module P/N: **VTP(X)(X)**
For illustration

See accessory pages for specifications.

Ordering Table

SQ	X	X	X	X
Series	# of Outputs	Input	Adjustment	Time Delay *
	3 - Three	2 - 24 V AC	1 - Fixed	0 - 0.1 ... 10 s
	4 - Four	4 - 120 V AC	2 - Onboard Adjust	1 - 1 ... 100 s
		6 - 230 V AC	3 - External Adjust	2 - 10 ... 1000 s
				3 - 0.1 ... 10 m
				4 - 1 ... 100 m

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

Example P/N: **SQ3421** Fixed – **SQ4410.5S**

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Sequencer (Recycling)
SQ Series
Timing Module

5

Technical Data

|	
Time Delay	
Type	Digital integrated circuitry
Range	0.1 s ... 100 m in 5 adjustable ranges or fixed
Repeat Accuracy	+/-1% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-10%
Time Delay vs. Temperature & Voltage	≤ +/-10%
Input	
Voltage	24, 120, or 230 V AC
Tolerance	+/-20%
Line Frequency	50 ... 60 Hz
Output	
Type	Solid state
Form	SPST N.O. (three or four)
Rating	1 A steady state, 10 A inrush per output
Voltage Drop (Each Output)	≅ 1.5 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 two #6 (M3.5 x 0.6) screws
Package	3.5 x 2.5 x 1.22 in. (88.9 x 63.5 x 31 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	≅ 5.4 oz (153 g)

Mechanical View

R_T Selection Chart					
Desired Time Delay*					
Seconds			Minutes		R_T
0	**1**	**2**	**3**	**4**	Megohm
0.1	1	10	0.1	1	0.0
1	10	100	1	10	0.3
2	20	200	2	20	0.6
3	30	300	3	30	0.9
4	40	400	4	40	1.2
5	50	500	5	50	1.5
6	60	600	6	60	1.8
7	70	700	7	70	2.1
8	80	800	8	80	2.4
9	90	900	9	90	2.7
10	100	1000	10	100	3.0

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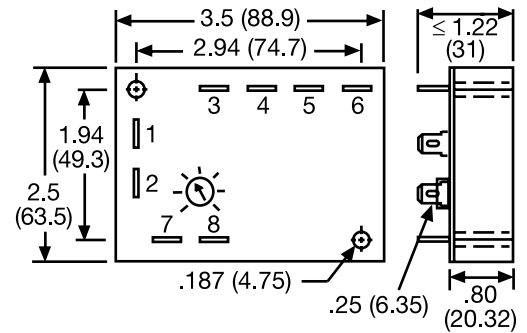
Inches (Millimeters)

Terminals 7 & 8 are only included on externally adjustable units. The knob is included when onboard adjust is ordered.
Terminal 6 is not included when SQ3 is ordered.

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