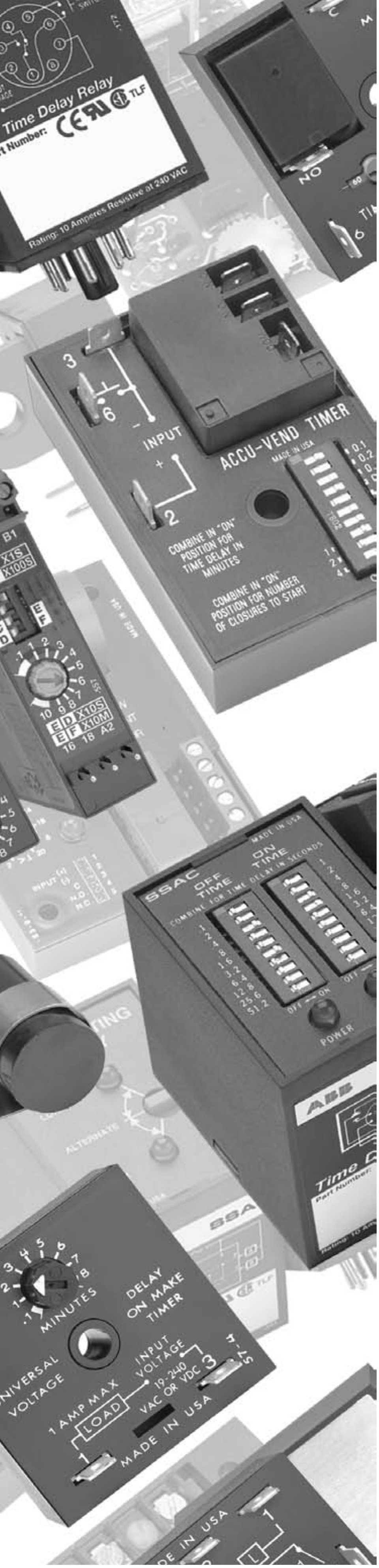


Section 5
Dedicated Timers

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

Single Function




Sequencer

Dual Function

HVAC Timers

Vending Timers

Star Delta Motor Starting

Dedicated timers

Delay On Break (Release)
TDBL, TDB, TDBH Digi-Set
Time Delay Relay

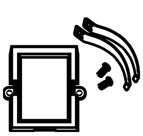
TEN YEAR 10 WARRANTY

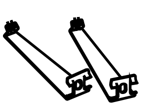
- Switch Settable Time Delay
- Three Time Ranges from 100 ms ... 10,230 s
- +/-0.1% Repeat Accuracy
- +/-2% Setting Accuracy
- SPDT or DPDT, 10 A Output Contacts
- LED Indication

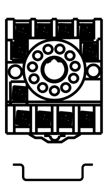
Approvals: ***

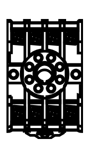
***8 pin models used in combination with P1011-6 socket only.

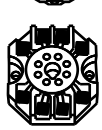
Accessories


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


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


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


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


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

See accessory pages for specifications.

Description

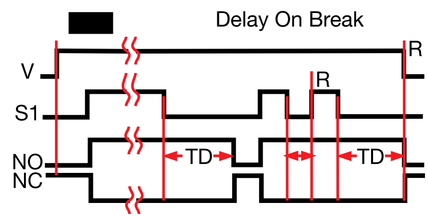
The TDB Series combines accurate digital circuitry with isolated 10 A rated DPDT or SPDT relay contacts in an 8 or 11 pin plug-in package. The TDB Series features DIP switch selectable time delays ranging from 100 milliseconds to 10,230 seconds in three ranges. The TDB Series is the product of choice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

Operation

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

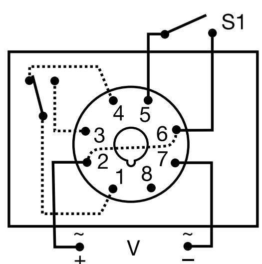
Reset: Reclosing the initiate switch during timing resets the time delay. Loss of input voltage resets the time delay and output.

Function

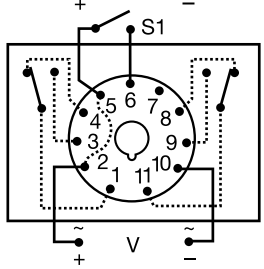


S1 = Initiate Switch V = Voltage R = Reset
NO = Normally Open NC = Normally Closed
TD = Time Delay = Undefined time

Connection



8 Pin Octal
SPDT



11 Pin
DPDT

S1 = Initiate Switch

Relay contacts are isolated. Dashed lines are internal connections.

Ordering Table

X	X	X	X
Series/Time Range	**Input**	**LED***	**Type Plug/Output Form**
TDBL - 0.1 ... 102.3 s in 0.1 s increments	**12D** - 12 V DC	**L**	**D** - 11 Pin Plug, DPDT
TDB - 1 ... 1023 s in 1 s increments	**24A** - 24 V AC		Blank - Octal (8 Pin) Plug, SPDT
TDBH - 10 ... 10,230 s in 10 s increments	**24D** - 24 V DC/28 V DC		
	110D - 110 V DC		
	120A - 120 V AC		
	230A - 230 V AC		

Example P/N: **TDB120AL**

* Note: LED not available on 12 V DC units

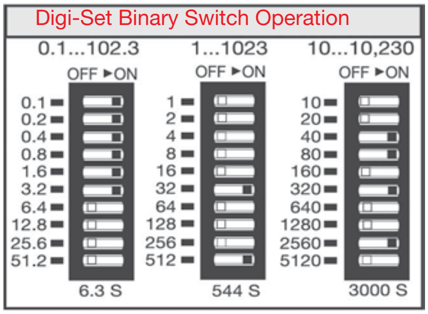
TDB02B01 07.07.04

Delay On Break (Release)

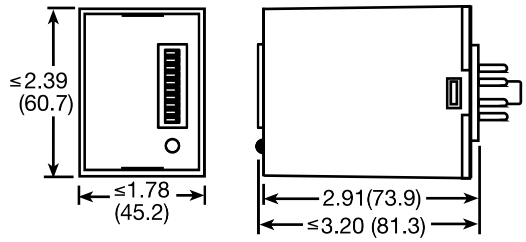
TDBL, TDB, TDBH Digi-Set Time Delay Relay

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



Mechanical View



Inches (Millimeters)

TDB02B01 07.07.04

Delay On Break (Release)
TRB Series
Time Delay Relay

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

Approvals: **

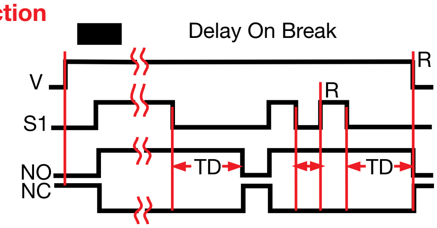
** 8 pin models used in combination with P1011-6 socket only.

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

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

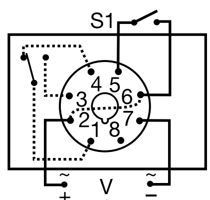
Reset: Reclosing the initiate switch during timing resets the time delay. Loss of input voltage resets the time delay and output.

Function

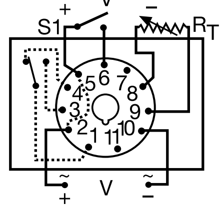


V = Voltage S1 = Initiate Switch TD = Time Delay
R = Reset NO = Normally Open
NC = Normally Closed = Undefined time

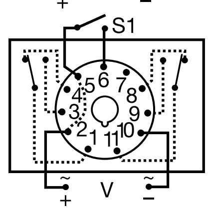
Connection



8 Pin Octal SPDT



11 Pin SPDT



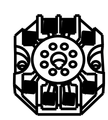
11 Pin DPDT

S1 = Initiate Switch

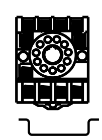
Relay contacts are isolated. Dashed lines are internal connections.

R_T is used when external adjustment is ordered.

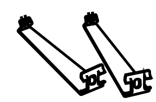
Accessories



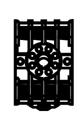
Octal socket for UL Listing
P/N: **P1011-6**



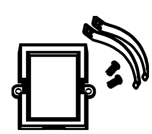
11 pin socket
P/N: **NDS-11**



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



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



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

See accessory pages for specifications.

Ordering Table

TRB	X	X	X	X
Series	**Input**	**Adjustment and Output Form**	**Time Tolerance**	**Time Delay* (Seconds)**
	24A - 24 V AC	1 - Fixed, Octal, SPDT	X - +/-20%	0.05 ... 1
	24D - 24 V DC/28 V DC	10 - Fixed, 11 Pin DPDT	Y - +/-10%	0.05 ... 2
	110D - 110 V DC	2 - Knob Adjust, Octal, SPDT	Z - +/- 5%	0.05 ... 3
	120A - 120 V AC	3 - Lock Shaft Adjust, Octal, SPDT		0.1 ... 5
	230A - 230 V AC	4 - Knob Adjust, 11 Pin, DPDT		0.1 ... 10
		7 - Ext. Adjust, 11 Pin, SPDT without Potentiometer		1 ... 30
				1 ... 60
				2 ... 120
				2 ... 180
				7 ... 240
				7 ... 300
				7 ... 360
				7 ... 420
				7 ... 480
				7 ... 600

Example P/N: **TRB120A2Y30** Fixed: **TRB230A10X600**

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

TRB02B01 07.07.04

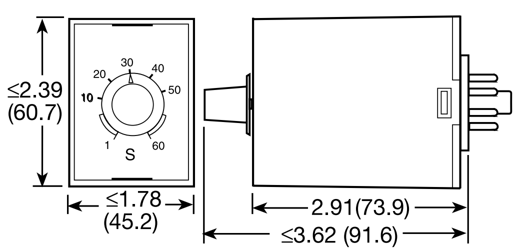
Delay On Break (Release)
TRB Series
Time Delay Relay

5

Technical Data

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

Mechanical View

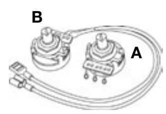


Inches (Millimeters)

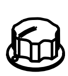
R_T Selection Chart	
Time Delay*	
Range	R_T
Seconds	Megohm
0.05...1	1.0
0.05...2	2.0
0.05...3	3.0
0.1...5	5.0
0.1...10	3.0
1...30	1.5
1...60	3.0
2...120	2.0
2...180	3.0
7...240	1.5
7...300	2.0
7...360	2.0
7...420	3.0
7...480	3.0
7...600	5.0

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

Accessories



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



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

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

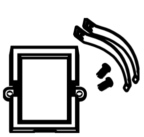
TRB02B01 07.07.04

Delay On Break (Release)
PRLB Series
Time Delay Relay

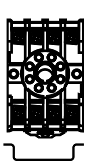
- Knob Adjustable Time Delay Relay
- Electronic Circuit with Electromechanical Relay
- Popular AC & DC Operating Voltages
- Industry Standard Octal Plug-in Connection
- Time Delays to 600 s in 6 Ranges
- +/-2% Repeat Accuracy
- +/-10% Factory Calibration
- LED Indication
- 10 A SPDT Relay Output

Approvals:

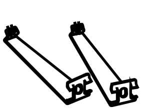
Accessories



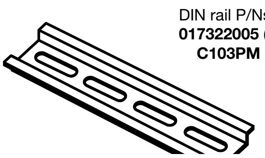
Panel mount kit
P/N: **BZ1**



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



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



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

See accessory pages for specifications.

5

Description

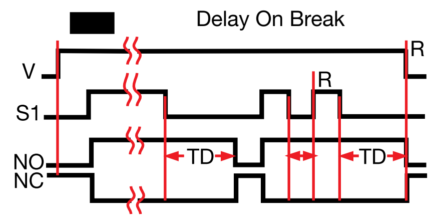
The PRLB Series is designed for use on non-critical timing applications. It offers low cost knob adjustable timing control, full 10 A relay output, and onboard LED indication. The knob adjustment provides a guaranteed time range of up to 10 minutes in 6 ranges. The onboard LED indicates whether or not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

Operation

Input voltage must be applied at all times prior to and during timing. Upon closure of the initiate switch, the output contacts transfer and remain transferred if no further action is taken. The LED is on steady. When the initiate switch is opened, the time delay is started. The LED flashes during timing. At the conclusion of the delay, the output contacts revert to their original unenergized position. Applying input voltage with the initiate switch closed will energize the load.

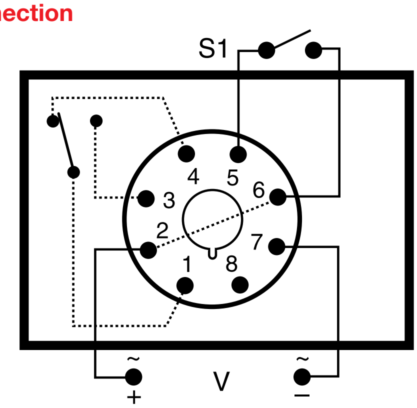
Reset: Reclosing the initiate switch during timing resets the time delay. Loss of input voltage resets the time delay and output.

Function



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

Connection



S1 = Initiate Switch

Relay contacts are isolated. Dashed lines are internal connnections.

Ordering Table

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

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

Example P/N: PRLB623 Fixed – PRLB4160

PRLB2B01 07.01.04

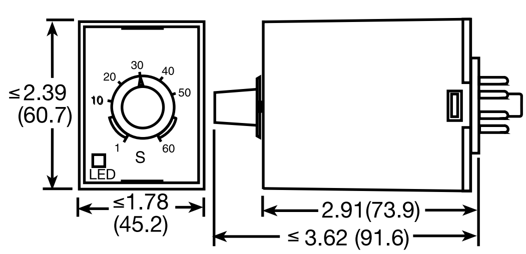
Delay On Break (Release)
PRLB Series
Time Delay Relay

Technical Data

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

5

Mechanical View



Inches (Millimeters)

PRLB2B01 07.01.04

Dedicated timers

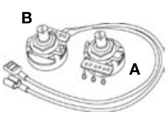
Delay On Break (Release)

HRDB Power-Time
Time Delay Relay

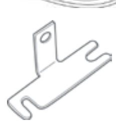
- 30 A SPDT N.O. Isolated Output Contacts
- 12 ... 230 V Operation in 5 Ranges
- Delays from 100 ms ...100 m in 5 Ranges
- +/-0.5% Repeat Accuracy
- Fixed, External, or Onboard Adjustment

Approvals:

Accessories

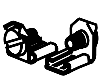


External adjust potentiometer P/Ns: **P1004-95** (fig A) **P1004-95-X** (fig B)

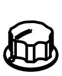


Mounting bracket P/N: **P1023-6**

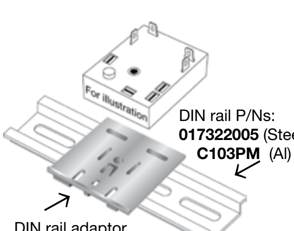
Female quick connect P/Ns: **P1015-64** (AWG 14/16) **P1015-13** (AWG 10/12)



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



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



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

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

See accessory pages for specifications.

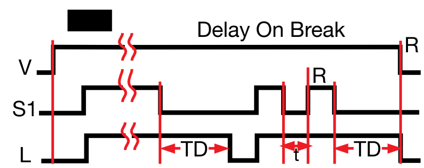
Description

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

Operation

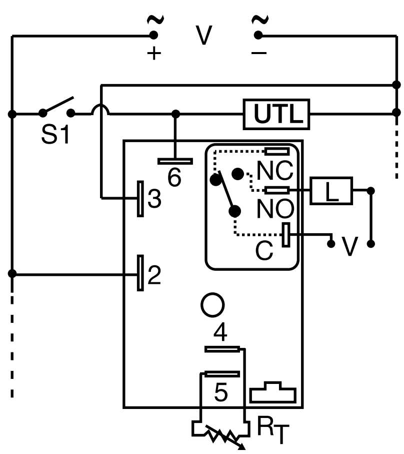
Input voltage must be applied before and during timing. Upon closure of the initiate switch, the output relay energizes. The time delay begins when the initiate switch is opened. The output remains energized during timing. At the end of the time delay, the output de-energizes. The output will energize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

Function



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

Connection



S1 = Initiate Switch L = Timed Load
UTL = Untimed Load NO = Normally Open
C = Common, Transfer Contact

NOTE: A knob, or terminals 4 & 5 are only included on adjustable units. R_T is used when external adjustment is ordered. Relay contacts are isolated. Dashed lines are internal connections. The untimed load is optional.

Ordering Table

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

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

Example P/N: **HRDB421** Fixed – **HRDB41A0.5S**

HRDBGem 10.03.05

1TRC 001 009 C0202

Delay On Break (Release)

HRDB Power-Time
Time Delay Relay

Technical Data

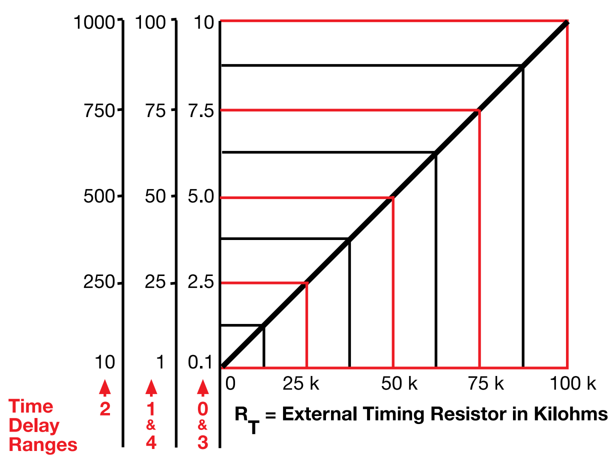
Time Delay	
Type	Microcontroller circuitry
Range	100 ms ... 100 m in 5 adjustable ranges or fixed
Repeat Accuracy	+/-0.5 % or 20 ms, whichever is greater
Tolerance (Factory Calibration)	+/-1%, +/-5%
Reset Time	≤ 150 ms
Initiate Time	≤ 20 ms
Time Delay vs. Temperature & Voltage	+/-2%
Input	
Voltage	12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

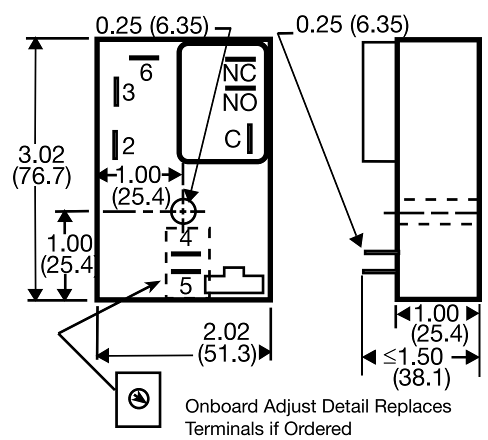
External Resistance vs Time Delay

In Secs. or Mins.



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

Mechanical View



Inches (Millimeters)

HRDBGen 10.03.05

1TRC 001 009 C0202

Dedicated timers

Delay On Break (Release)
ORB Series
Time Delay Relay

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

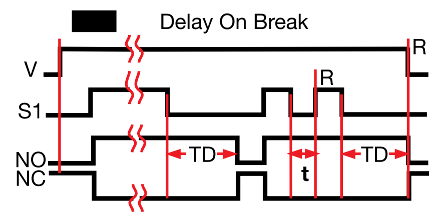
Approvals:

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

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

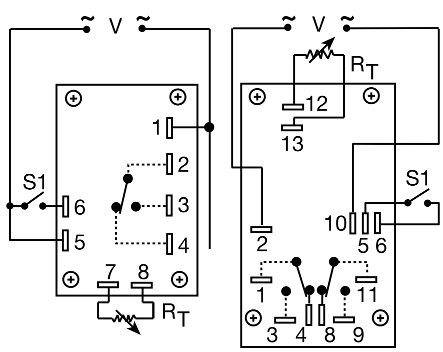
Reset: Reclosing the initiate switch during timing resets the time delay. Loss of input voltage resets the time delay and output.

Function



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

Connection

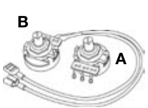


SPDT DPDT

Relay contacts are isolated. Dashed lines are internal connections.

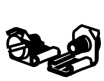
R_T is used when external adjustment is ordered.

Accessories

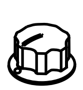


External adjust potentiometer
P/Ns:
P1004-12 (fig A)
P1004-12-X (fig B)

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



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



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

See accessory pages for specifications.

Ordering Table

ORB	X	X	X	X
Series	Input	Adjustment	Time Delay *	Output Form
	24A - 24 V AC	1 - Fixed	1 - 0.05 ... 3 s	Blank - SPDT
	120A - 120 V AC	2 - Adj. on Unit	2 - 0.5 ... 30 s	D - DPDT
	230A - 230 V AC	3 - External Adjust	3 - 0.6 ... 60 s	
			4 - 1.2 ... 120 s	
			5 - 3.0 ... 300 s	

Example P/N: **ORB120A31** Fixed – **ORB120A1200D**

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

ORB02B01 07.02.04

Delay On Break (Release)
ORB Series
Time Delay Relay

Technical Data

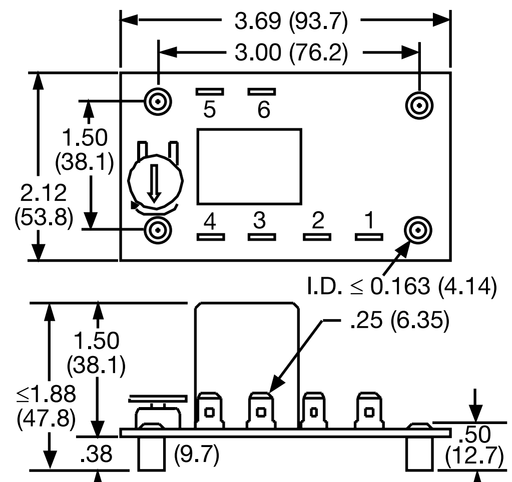
Time Delay	
Type	Analog circuitry
Range	0.05 ... 300 s in 5 adjustable ranges or fixed
Repeat Accuracy	+/-2% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	Adjustable: Guaranteed range Fixed: +/-10%
Reset Time	≤ 50 ms
Initiate Time	≤ 70 ms
Time Delay vs. Temperature & Voltage	≤ +/-10%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

R_T Selection Chart

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

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

Mechanical View



Inches (Millimeters)

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

ORB02B01 07.02.04

Dedicated timers

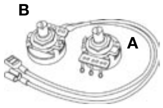
Delay On Break (Release)
KRDB Digi-Timer
Time Delay Relay

5

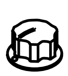
- Compact Time Delay Relay
- Microcontroller Circuitry, +/-0.5% Repeat Accuracy
- Isolated 10 A SPDT Output Contacts
- Onboard or External Adjustment or Fixed Time Delay
- Delays from 100 ms ... 1000 m in 6 Ranges
- Input Voltages from 12... 230 V in 5 Ranges
- +/-5% Factory Calibration

Approvals:

Accessories



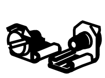
External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)



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

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

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



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

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

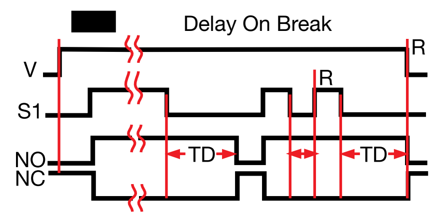
DIN rail adaptor
P/N: **P1023-20**

See accessory pages for specifications.

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

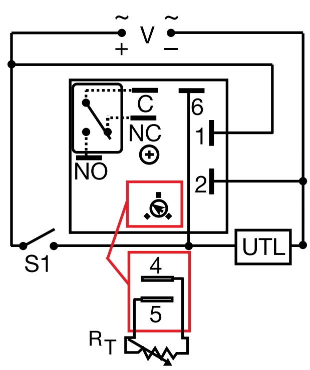
Operation
Input voltage must be applied before and during timing. Upon closure of the initiate switch, the output relay energizes. The time delay begins when the initiate switch is opened. The output remains energized during timing. At the end of the time delay, the output de-energizes. The output will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

Function



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

Connection



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

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

Ordering Table

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

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

Example P/N: KRDB421 = 120 V AC; Onboard adjust from 1 to 100 seconds
KRDB610.5S = 230 V AC; Fixed at 0.5 seconds

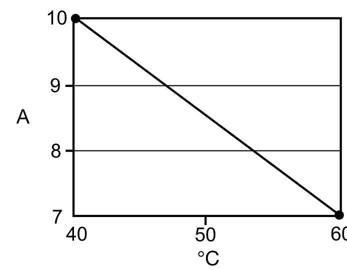
KRDBGen 08.14.06

Delay On Break (Release)
KRDB Digi-Timer
Time Delay Relay

Technical Data

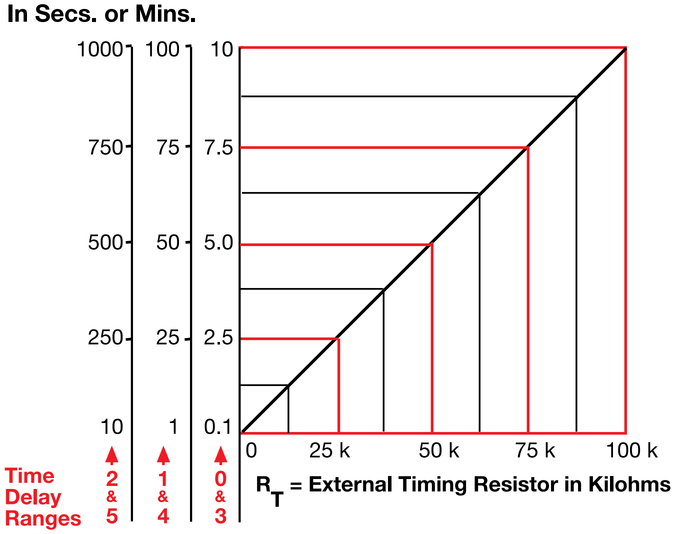
Time Delay	
Type	Microcontroller with watchdog circuitry
Range	0.1 s ... 1000 m in 6 adjustable ranges or fixed
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-5%
Recycle Time	≤ 150 ms
Initiate Time	≤ 40 ms
Time Delay vs. Temperature & Voltage	≤ +/-5%
Input	
Voltage	12, 24, 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	-40°C ... +60°C/-40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.6 oz (74 g)

Output Current/Ambient Temp.



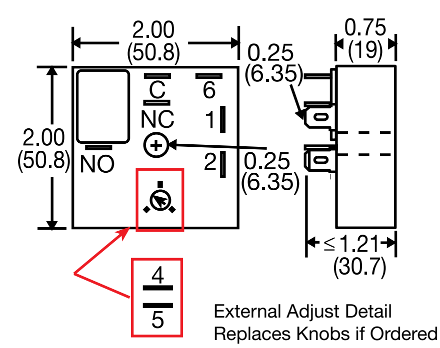
External Resistance vs Time Delay

In Secs. or Mins.



This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the 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



Inches (Millimeters)

KRDBGen 08.14.06

1TRC 001 009 C0202

Dedicated timers

Delay On Break (Release)

TDUB Digi-Set Timing Module

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

Approvals:

Description

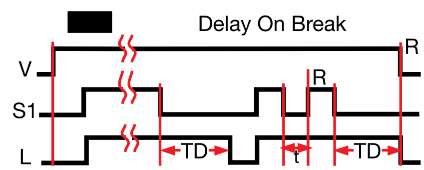
The TDUB Series combines digital timing circuitry with universal voltage operation. Voltages of 24 to 240 V AC and 12 to 24 V DC are available in three ranges. The TDUB Series offers DIP switch selectable time delays ranging from 0.1 seconds to 102.3 minutes in three ranges. Its 1 A rated output, ability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

Operation

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

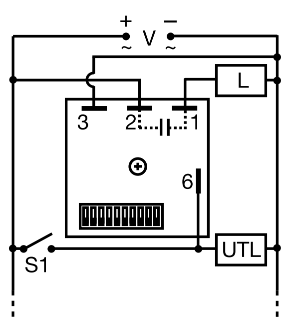
Reset: Reclosing the initiate switch during timing resets the time delay. Loss of input voltage resets the time delay and output.

Function



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

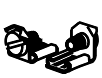
Connection



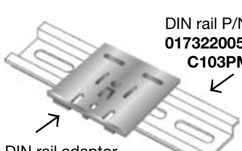
Dashed lines are internal connections.
UTL = Optional Untimed Load S1 = Initiate Switch
L = Timed Load

Accessories

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



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



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

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

See accessory pages for specifications.

Ordering Table

Input Voltage Range	Time Range	Part Number
24 ... 120 V AC	0.1 ... 102.3 s	TDUBL3000A
100 ... 240 V AC	0.1 ... 102.3 s	TDUBL3001A
12 ... 24 V DC	0.1 ... 102.3 s	TDUBL3002A
24 ... 120 V AC	1 ... 1023 s	TDUB3000A
100 ... 240 V AC	1 ... 1023 s	TDUB3001A
12 ... 24 V DC	1 ... 1023 s	TDUB3002A
24 ... 120 V AC	0.1 ... 102.3 m	TDUBH3000A
100 ... 240 V AC	0.1 ... 102.3 m	TDUBH3001A
12 ... 24 V DC	0.1 ... 102.3 m	TDUBH3002A

TDUBGen 07.01.04

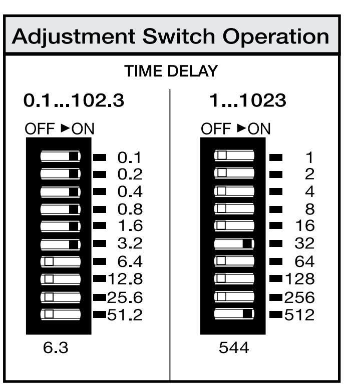
Delay On Break (Release)
TDUB Digi-Set
Timing Module

Technical Data

Time Delay	
Range*	0.1 ... 102.3 s in 0.1 s increments 1 ... 1023 s in 1 s increments 0.1 ... 102.3 m in 0.1 m increments
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Setting Accuracy	≤ +/-2% or 20 ms, whichever is greater
Reset Time	≤ 150 ms
Initiate Time	≤ 20 ms
Time Delay vs. Temperature & Voltage	≤ +/-5%
Input	
Voltage / Tolerance	24 ... 240 V AC, 12 ... 24 V DC /+/-20%
Line Frequency	50 ... 60 Hz
Power Consumption	AC ≤ 2 VA; DC ≤ 1 W
DC Ripple	≤ 10%
Output	
Type	Solid state
Form	Normally Open, closed before and during timing
Rating	1 A steady state, 10 A inrush at 60°C
Voltage Drop	AC ≅ 2.5 V at 1 A; DC ≅ 1 V at 1 A
Off State Leakage Current	AC ≅ 5 mA @ 230 V AC; DC ≅ 1 mA
Protection	
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000 V RMS terminals to mounting surface
Insulation Resistance	≥ 100 MΩ
Polarity	DC units are reverse polarity protected
Mechanical	
Mounting	Surface mount with one #10 (M5 x 0.8) screw
Package	2 x 2 x 1.21 in (50.8 x 50.8 x 30.7 mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals
Environmental	
Operating Temperature	-40°C ... +60°C
Storage Temperature	-40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

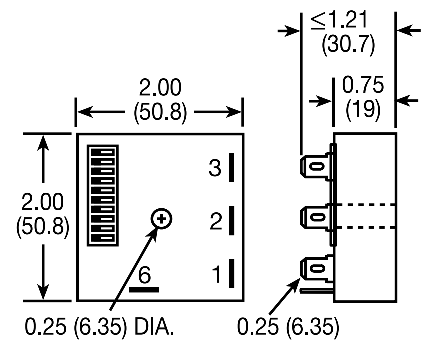
*For CE approved applications, power must be removed from the unit when a switch position is changed.

5



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

Mechanical View



Inches (Millimeters)

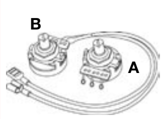
TDUBGen 07.01.04

Delay On Break (Release)
TSDB Series
Timing Module

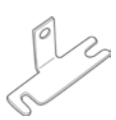
■ Fixed or Adjustable Delays 0.1 s ...1000 m in 6 Ranges
■ +/-0.5% Repeat Accuracy
■ +/- 1% Factory Calibration
■ 12 VDC...230 VAC in 5 Ranges
■ 1 A Solid State Output
■ Encapsulated

Approvals:

Accessories

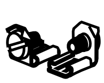


External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)



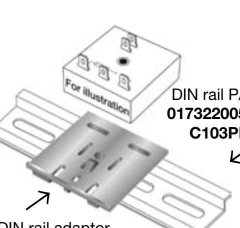
Mounting bracket
P/N: **P1023-6**

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



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

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



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

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

See accessory pages for specifications.

Description

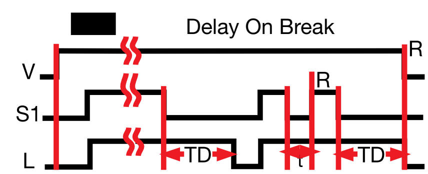
The TSD Series is designed for more demanding commercial and industrial applications where small size, and accurate performance is required. The factory calibration for fixed time delays is within 1% of the target time delay. The repeat accuracy, under stable conditions, is 0.5% of the time delay. The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

Operation

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

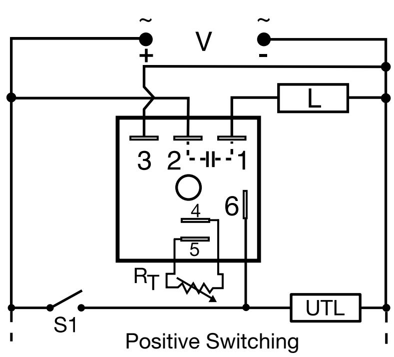
Reset: Reclosing the initiate switch during timing resets the time delay. Loss of input voltage resets the time delay and output.

Function

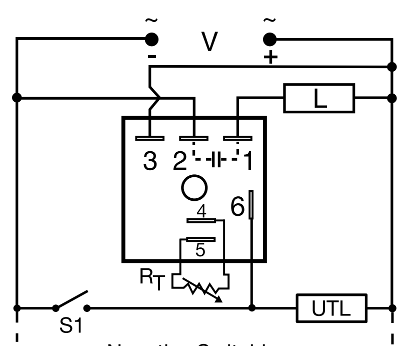


V = Voltage L = Load S1 = Initiate Switch
TD = Time Delay R = Reset
t = Incomplete Time Delay = Undefined time

Connection



Positive Switching



Negative Switching

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

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

Ordering Table

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

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

Example P/N: TSDB420 Fixed – **TSDB110.1SP**

TSDBGen 07.01.04

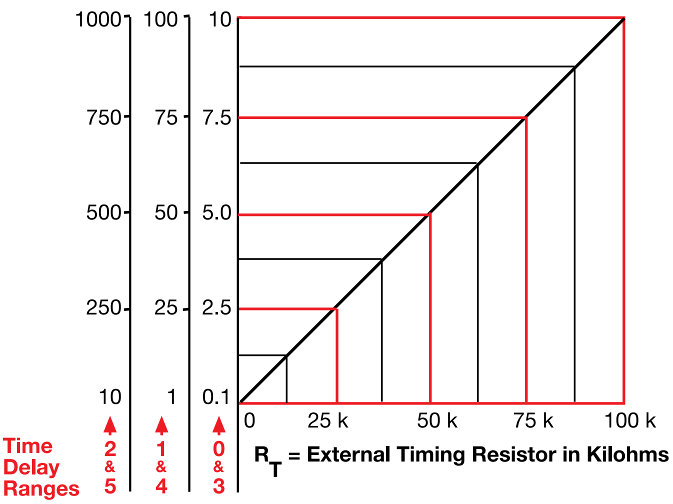
Delay On Break (Release)
TSDB Series
Timing Module

Technical Data

Time Delay	
Range	0.1 s ... 1000 m in 6 adjustable ranges or fixed
Repeat Accuracy	+/-0.5 % or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-1%
Reset Time	≤ 150 ms
Initiate Time	≤ 20 ms
Time Delay vs. Temperature & Voltage	≤ +/-2%
Input	
Voltage	12 or 24 V DC; 24, 120, or 230 V AC
Tolerance	+/-15%
Power Consumption	AC ≤ 2 VA; DC ≤ 1 W
Line Frequency	50 ... 60 Hz
DC Ripple	≤ 10 %
Output	
Type	Solid state
Form	Normally Open, closed before & during timing
Maximum Load Current	1 A steady state, 10 A inrush at 60°C
Off State Leakage Current	≅ 5 mA at 230 V AC; DC ≅ 1 mA
Voltage Drop	AC ≅ 2.5 V at 1 A; DC ≅ 1 V at 1 A
DC Operation	Positive or negative switching
Protection	
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000 V RMS terminals to mounting surface
Insulation Resistance	≥ 100 MΩ
Polarity	DC units are reverse polarity protected
Mechanical	
Mounting	Surface mount with one #10 (M5 x 0.8) screw
Termination	0.25 in. (6.35 mm) male quick connect terminals
Environmental	
Operating/Storage Temperature	-40°C ... +75°C / -40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

External Resistance vs Time Delay

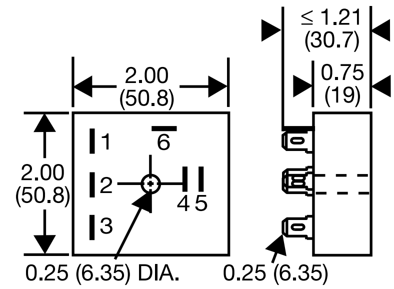
In Secs. or Mins.



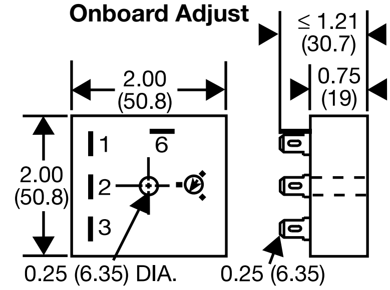
This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the R_T terminals; as the resistance increases the time delay increases.
When selecting an external R_T, add the tolerances of the timer and the R_T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



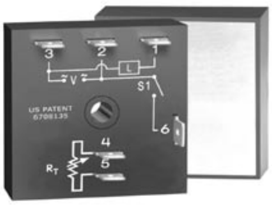
Onboard Adjust



Inches (Millimeters)

TSDBGen 07.01.04

Delay On Break (Release)
THDB Digi-Power
Power Timing Module



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

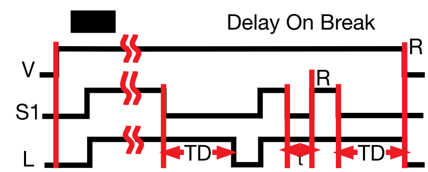
Approvals:

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

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

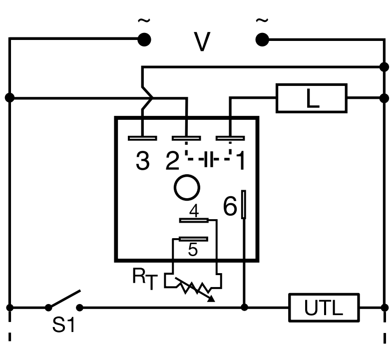
Reset: Reclosing the initiate switch during timing resets the time delay. Loss of input voltage resets the time delay and output.

Function



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

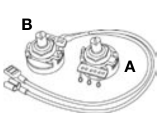
Connection



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

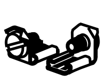
UTL = Optional Untimed Load L = Timed Load S1 = Initiate Switch

Accessories

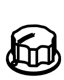


External adjust potentiometer P/Ns: **P1004-95** (fig A) **P1004-95-X** (fig B)

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



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



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

See accessory pages for specifications.

Ordering Table

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

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

Example P/N: **THDB420C** Fixed – **THDB410.1SA**

THDBGen 08.03.04

1TRC 001 009 C0202

Delay On Break (Release)
THDB Digi-Power
Power Timing Module

Technical Data

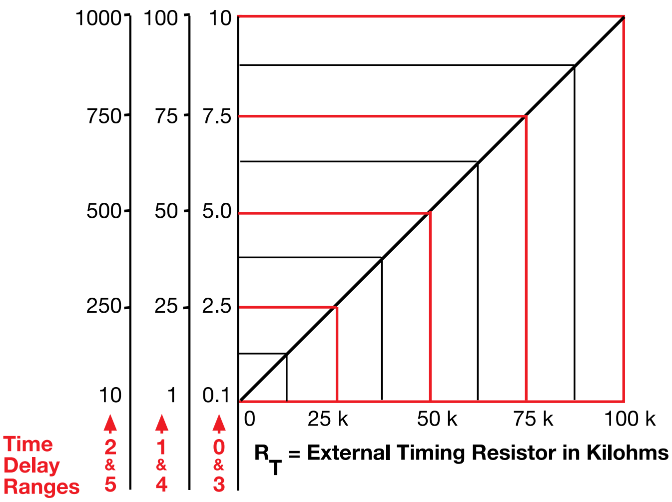
Time Delay	
Range	0.1 s ... 1000 m in 6 adjustable ranges or fixed
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-1%
Reset Time	≤ 150 ms
Initiate Time	≤ 20 ms
Time Delay vs. Temperature & Voltage	≤ +/-2%
Input	
Voltage	24, 120, or 230 V AC
Tolerance	+/-20%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

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 surface temperature is 90°C. Inrush: Non-repetitive for 16 ms.

External Resistance vs Time Delay

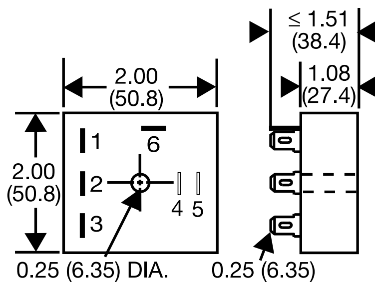
In Secs. or Mins.



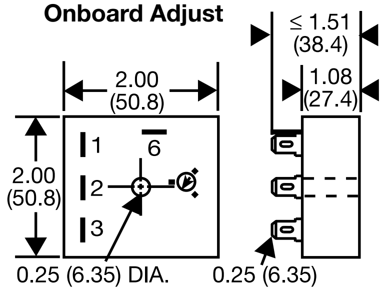
This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the R_T terminals; as the resistance increases the time delay increases.
When selecting an external R_T, add the tolerances of the timer and the R_T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

THDBGen 08.03.04

Delay On Break (Release)
KSDB Digi-Timer
Timing Module

Dedicated timers

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

5

Approvals:

Description

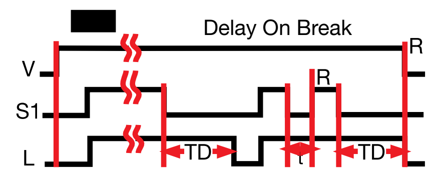
This series is designed for general purpose commercial and industrial applications where a small, cost effective, reliable solid state timer is required. The factory calibration for fixed time delays is within 5% of the target time delay. The repeat accuracy, under stable conditions, is 0.5% of the selected 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

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

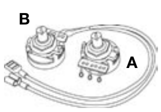
Reset: Reclosing the initiate switch during timing resets the time delay. Loss of input voltage resets the time delay and output.

Function



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

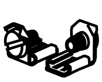
Accessories



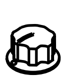
External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)

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

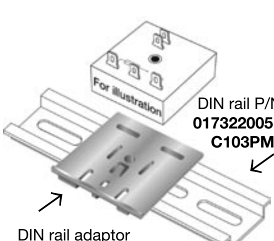
Female quick connect
P/Ns:
P1015-64 (AWG 14/16)
P1015-14 (AWG 18/12)



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



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

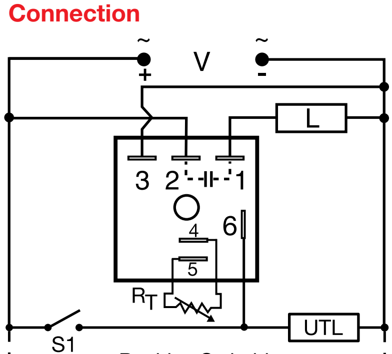


DIN rail P/Ns:
017322005 (Steel)
C103PM (Al)

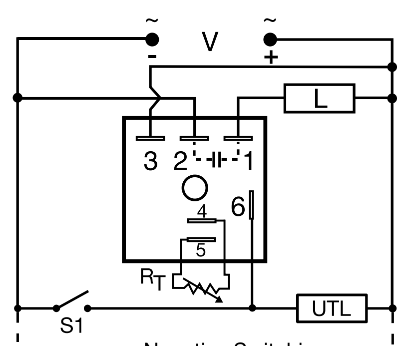
DIN rail adaptor
P/N: **P1023-20**

See accessory pages for specifications.

Connection



Positive Switching



Negative Switching

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

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

Ordering Table

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

Example P/N: KSDB420 Fixed – **KSDB110.1SP**

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

KSDBGen 07.02.04

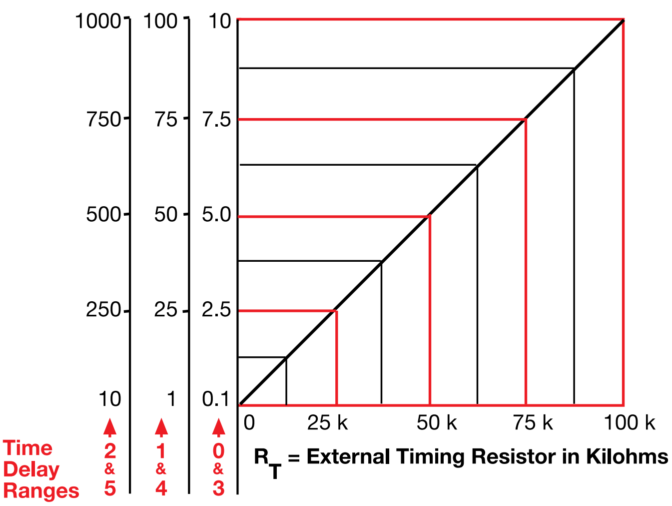
Delay On Break (Release)
KSDB Digi-Timer
Timing Module

Technical Data

Time Delay	
Range	0.1 s ... 1000 m in 6 adjustable ranges or fixed
Repeat Accuracy	+/-0.5 % or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-5%
Reset Time	≤ 150 ms
Initiate Time	≤ 20 ms
Time Delay vs. Temperature & Voltage	≤ +/-10%
Input	
Voltage	12, 24, or 120 V DC; 24, 120, or 230 V AC
Tolerance	+/-20%
Power Consumption	AC ≤ 2 VA; DC ≤ 2 W
Line Frequency	50 ... 60 Hz
DC Ripple	≤ 10 %
Output	
Type	Solid state
Form	Normally Open, closed before & during timing
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	Positive or negative switching
Protection	
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000 V RMS terminals to mounting surface
Insulation Resistance	≥ 100 MΩ
Polarity	DC units are reverse polarity protected
Mechanical	
Mounting	Surface mount with one #10 (M5 x 0.8) screw
Package	2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals
Environmental	
Operating / Storage Temperature	-40°C ... +60°C / -40°C ... +80°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

External Resistance vs Time Delay

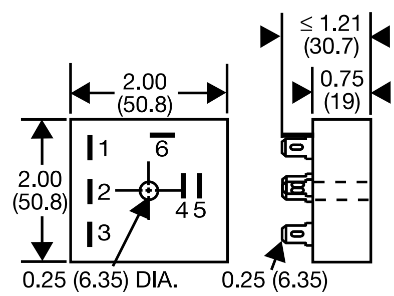
In Secs. or Mins.



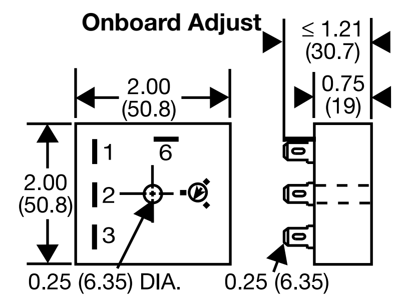
This chart applies to externally adjustable part numbers.
The time delay is adjustable over the time delay range selected by varying the resistance across the R_T terminals; as the resistance increases the time delay increases.
When selecting an external R_T, add the tolerances of the timer and the R_T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

5

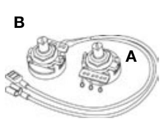
KSDBGen 07.02.04

Interval or Delay On Break
TSD7 Series
Timing Module

- Two Terminal Series Connection to Load
- Fixed or Adjustable Delays From 1 s ... 1000 m
- Digital Integrated Circuitry
- +/-0.5% Repeat Accuracy

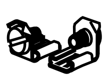
Approvals:

Accessories



External adjust potentiometer P/Ns: **P1004-13** (fig A) **P1004-13-X** (fig B)

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

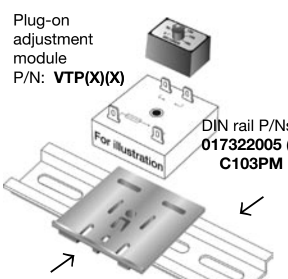


Quick connect to screw adaptor P/N: **P1015-18**

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

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

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



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

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

See accessory pages for specifications.

Description

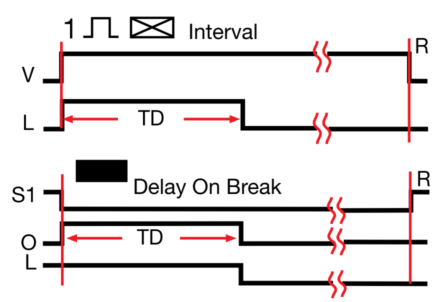
The TSD7 utilizes only two terminals connected in series with the load. Interval timing mode period is achieved by using a small portion of the AC sine wave allowing sufficient voltage for circuit operation. It can be used as an interval timer to control or pulse shape the operation of contactors, solenoids, relays, and lamp loads. The TSD7 can be wired to delay on the break of a switch for energy saving fan delays.

Operation

Interval -- Upon application of input voltage, the output energizes and the time delay begins. The output remains energized throughout the time delay. At the end of the time delay, the output de-energizes and remains de-energized until power is removed.
Reset: Removing input voltage resets the time delay and the output.

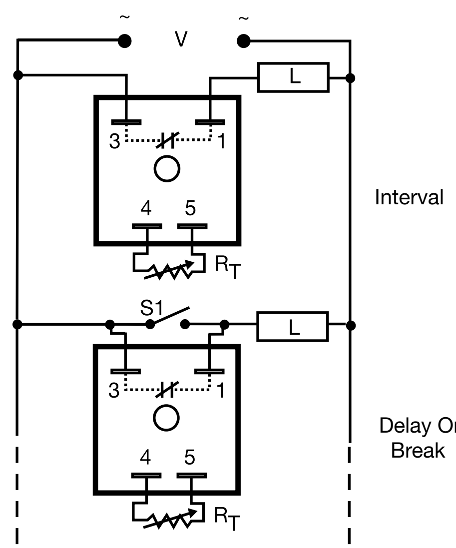
Delay On Break -- Upon closure of SW1, the load is energized and the timer is reset (zero volts across its input terminals). Opening SW1 re-applies input voltage to the timer, the load remains energized and the time delay begins. At the end of the time delay, the output de-energizes. If SW1 is open when power is applied, the load will energize for the time delay then de-energize.
Reset: Reclosing SW1 resets the timer.

Function



V = Voltage L = Load S1 = Initiate Switch
R = Reset TD = Time Delay O = Output
= Undefined time

Connection



V = Voltage L = Load S1 = Initiate Switch

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

Time Delay	VTP P/N
1 – 1 ... 100 s	VTP5G
2 – 10 ... 1000 s	VTP5K
3 – 0.1 ... 10 m	VTP5N
4 – 1 ... 100 m	VTP5P
5 – 10 ... 1000 m	VTP5R

Selection Table for VTP Plug-on Adjustment Accessory.

Ordering Table

TSD7	X	X	X
Series	**Input**	**Adjustment**	**Time Delay** *
	2 - 24 V AC	1 - Fixed	1 - 1 ... 100 s
	4 - 120 V AC	2 - External Adjust	2 - 10 ... 1000 s
	6 - 230 V AC		3 - 0.1 ... 10 m
			4 - 1 ... 100 m
			5 - 10 ... 1000 m

*If Fixed Delay is selected, insert delay [1...1000] followed by (S) sec. or [0.1 ...1000] (M) min.

Example P/N: TSD7221 Fixed – **TSD7410.5M**

TSD72B11 12.28.04

Interval or Delay On Break
TSD7 Series
Timing Module

Technical Data

Time Delay	
Type	Digital integrated circuitry
Range	1 s ... 1000 m in 5 adjustable ranges or fixed
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-10%
Recycle Time	≤ 400 ms
Time Delay vs. Temperature & Voltage	≤ +/-2%
Input	
Voltage	24, 120, or 230 V AC
Tolerance	+/-20%
Line Frequency	50 ... 60 Hz
Output	
Type	Solid state
Form	Normally Open, closed during timing
Maximum Load Current	1 A steady state, 10 A inrush at 45°C
Minimum Load Current	40 mA
Effective Voltage Drop (VLine-VLoad)	**Input** — **Effective Drop**
	24 V AC — 3 V
	120 V AC — 4 V
	230 V AC — 6 V
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/Storage Temperature	-40°C ... +75°C / -40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

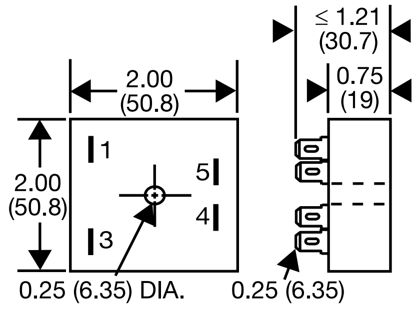
External Resistance vs Time Delay

R_T Selection Chart

Desired Time Delay*					R_T
Seconds		Minutes			
1	2	3	4	5	Megohm
1	10	0.1	1	10	0.0
10	100	1	10	100	0.5
20	200	2	20	200	1.0
30	300	3	30	300	1.5
40	400	4	40	400	2.0
50	500	5	50	500	2.5
60	600	6	60	600	3.0
70	700	7	70	700	3.5
80	800	8	80	800	4.0
90	900	9	90	900	4.5
100	1000	10	100	1000	5.0

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

Mechanical View



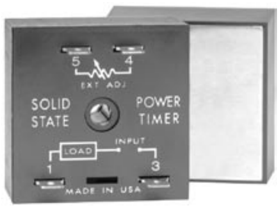
Inches (Millimeters)

TSD72B11 12.28.04

Dedicated timers

Interval or Delay On Break

THD7 Digi-Power Timing Module



TEN YEAR 10 WARRANTY

5

- Solid State Relay and Timer Combined
- Two Terminal Series Connection to Load
- Up to 20 A Steady State, 200 A Inrush
- Fixed or Adjustable Delays From 1 s ... 1000 m
- +/-0.5% Repeat Accuracy

Approvals:

Description

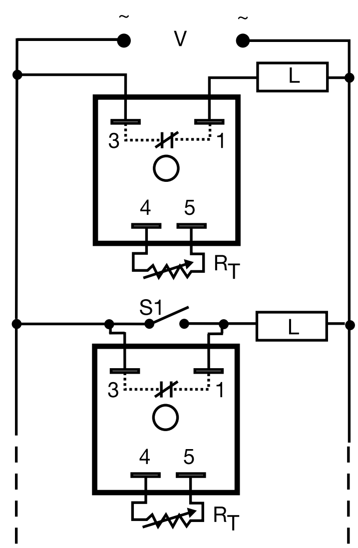
The THD7 utilizes only two terminals connected in series with the load. Interval timing mode is achieved by using a small portion of the AC sine wave allowing sufficient voltage for circuit operation. The THD7 can be used for interval or delay-on-break timing. It is designed to operate large loads directly, such as motors, heater elements, and motor starters.

Operation

Interval -- Upon application of input voltage, the output energizes and the time delay begins. The output remains energized throughout the time delay. At the end of the time delay the output de-energizes and remains de-energized until power is removed.
Reset: Removing input voltage resets the time delay and the output.

Delay On Break -- Upon closure of SW1, the load energizes and the timer is reset (zero voltage across its input terminals). Opening SW1 re-applies input voltage to the timer, the load remains energized and the time delay begins. At the end of the time delay the output de-energizes. If SW1 is open when power is applied, the load will energize for the time delay then de-energize.
Reset: Reclosing SW1 resets the timer.

Connection



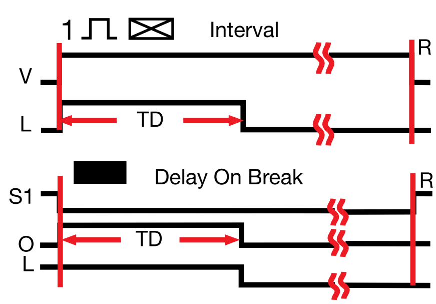
V = Voltage L = Load S1 = Initiate Switch

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

Time Delay	VTP P/N
1 – 1 ... 100 s	VTP5G
2 – 10 ... 1000 s	VTP5K
3 – 0.1 ... 10 m	VTP5N
4 – 1 ... 100 m	VTP5P
5 – 10 ... 1000 m	VTP5R

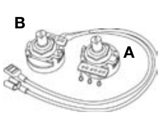
Selection Table for VTP Plug-on Adjustment Accessory.

Function



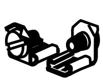
V = Voltage L = Load S1 = Initiate Switch
R = Reset TD = Time Delay O = Output
= Undefined time

Accessories



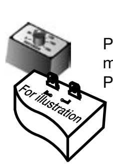
External adjust potentiometer
P/Ns:
P1004-13 (fig A)
P1004-13-X (fig B)

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**



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

See accessory pages for specifications.

Ordering Table

THD7 – **Series**

X – **Input**
- 2 - 24 V AC
- 4 - 120 V AC
- 6 - 230 V AC

X – **Adjustment**
- 1 - Fixed
- 2 - External Adjust

X – **Time Delay** *
- 1 - 1 ... 100 s
- 2 - 10 ... 1000 s
- 3 - 0.1 ... 10 m
- 4 - 1 ... 100 m
- 5 - 10 ... 1000 m

X – **Output Rating**
- A - 6 A
- B - 10 A
- C - 20 A

Example P/N: **THD7621B** Fixed – **THD7410.5MA**

*If Fixed Delay is selected, insert delay [1...1000] followed by (S) sec. or [0.1 ... 1000] (M) min.

THD72B01 12.28.04

Interval or Delay On Break
THD7 Digi-Power Timing Module

Technical Data

Time Delay	
Type	Digital integrated circuitry
Range	1 s ... 1000 m in 5 adjustable ranges or fixed
Repeat Accuracy	+/-0.5% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-10%
Recycle Time	During timing: ≤ 350 ms; After timing: ≤150 ms
Time Delay vs. Temperature & Voltage	≤ +/-2%
Input	
Voltage	24, 120, or 230 V AC
Tolerance	+/-20%
Line Frequency	50 ... 60 Hz
Output	
Type	Solid state
Form	Normally Open, closed during timing
Rating	Output / Steady State / Inrush**: A 6 A 60 A; B 10 A 100 A; C 20 A 200 A
Effective Voltage Drop (VLine-VLoad)	Input / Effective Drop: 24 V AC ≤ 3 V; 120 V AC ≤ 3 V; 230 V AC ≤ 5 V
Minimum Load Current	100 mA
Protection	
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000 V RMS terminals to mounting surface
Insulation Resistance	≥ 100 MΩ
Mechanical	
Mounting **	Surface mount with one #10 (M5 x 0.8) screw
Termination	0.25 in. (6.35 mm) male quick connect terminals
Environmental	
Operating/Storage Temperature	-40°C ... +60°C / -40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 3.9 oz (111 g)

Rating:

Output	Steady State	Inrush**
A	6 A	60 A
B	10 A	100 A
C	20 A	200 A

Effective Voltage Drop:

Input	Effective Drop
24 V AC	≤ 3 V
120 V AC	≤ 3 V
230 V AC	≤ 5 V

**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.

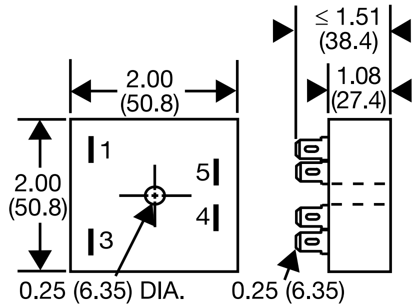
External Resistance vs Time Delay

R_T Selection Chart

Desired Time Delay*					R_T
Seconds		Minutes			
1	2	3	4	5	Megohm
1	10	0.1	1	10	0.0
10	100	1	10	100	0.5
20	200	2	20	200	1.0
30	300	3	30	300	1.5
40	400	4	40	400	2.0
50	500	5	50	500	2.5
60	600	6	60	600	3.0
70	700	7	70	700	3.5
80	800	8	80	800	4.0
90	900	9	90	900	4.5
100	1000	10	100	1000	5.0

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

Mechanical View



Inches (Millimeters)

THD72B01 12.28.04

1TRC 001 009 C0202

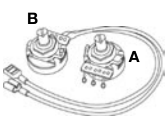
Dedicated timers

Delay On Break (Release)
TSB Series
Timing Module

- Totally Solid State Encapsulated
- Fixed or Adjustable Delays From 0.05 ... 600 s in 4 Ranges
- +/- 2% Repeat Accuracy
- +/-5% Factory Calibration

Approvals:

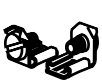
Accessories



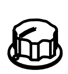
External adjust potentiometer
P/Ns:
P1004-95 (fig A)
P1004-95-X (fig B)

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

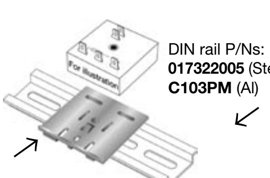
Female quick connect
P/N:
P1015-64 (AWG 14/16)



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



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



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

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

See accessory pages for specifications.

Description

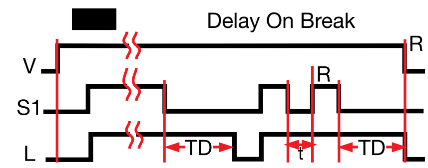
The TSB Series is a totally solid state delay on break timing module. The TSB is available with a fixed, external, or onboard adjustable time delay. Time Delays from .05 to 600 seconds, in 4 standard ranges, cover over 90% of all OEM and commercial appliance timing applications. The repeat accuracy is +/-2%. Operating voltages of 24,120, or 230 V AC are available. The TSB's 1A steady state, 10A rated solid state output is perfect for direct control of solenoids, contactors, relays, lamps, buzzers, and small heaters. The TSB can be surface mounted with a single screw, or snapped on 35 mm DIN rail using the P1023-20 adaptor.

Operation

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

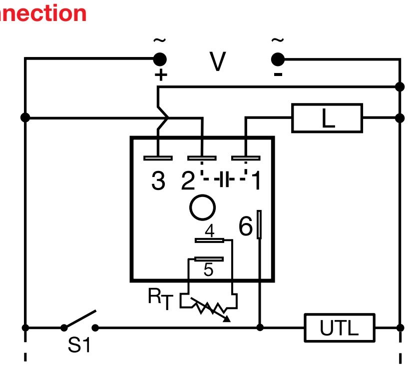
Reset: Reclosing the initiate switch during timing resets the time delay. Loss of input voltage resets the output and the time delay.

Function



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

Connection



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

Ordering Table

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

Example P/N: **TSB422** Fixed – **TSB410.5**

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

TSBGen 07.02.04

Delay On Break (Release)
TSB Series
Timing Module

Technical Data

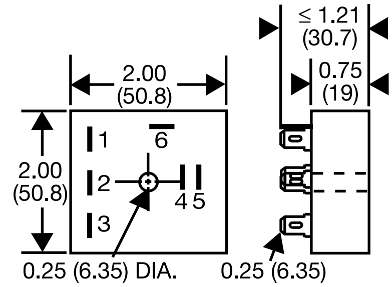
Time Delay	
Range	0.05 s ... 600 s in 4 adjustable ranges or fixed
Repeat Accuracy	+/-2% or 20 ms, whichever is greater
Tolerance (Factory Calibration)	≤ +/-5%
Time Delay vs. Temperature & Voltage	≤ +/-10%
Reset Time	≤ 150 ms
Input	
Voltage	24, 120, or 230 V AC
Tolerance	+/-20%
Line Frequency	50 ...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

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

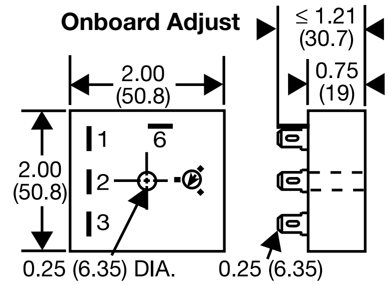
* When selecting an external R_T add at least 20% for tolerance of unit and the R_T.

Mechanical View

Fixed & External Adjust



Onboard Adjust



Inches (Millimeters)

TSBGen 07.02.04