

Series Included

Relay Output

TRDU.....	16
TRU	17

Solid-State Output

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Timers - Multifunction



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

Features:

- Microcontroller ±0.1% repeat accuracy
- Multifunction – 21 timing functions
- Multirange – 0.1s - 1,705h in 8 ranges
- Switch selectable modes, time delay, & ranges
- AC & DC input voltages are available
- Isolated, 10A, SPDT or DPDT output contacts



Auxiliary Products:

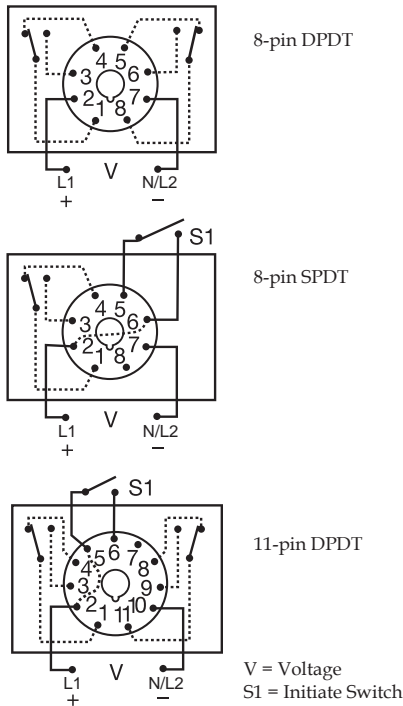
- **Panel mount kit:** P/N: BZ1
- **Hold-down clips (sold in pairs):**
P/N: PSC8 (NDS-8)
P/N: PSC11 (NDS-11)
- **11-pin socket:** P/N: NDS-11
- **Octal 8-pin socket:** P/N: NDS-8
- **DIN rail:**
P/N: C103PM (AI)

Available Models:

TRDU120A1	TRDU230A2
TRDU120A2	TRDU24A1
TRDU120A3	TRDU24A2
TRDU12D1	TRDU24A3
TRDU12D3	

If desired part number is not listed, please call us to see if it is technically possible to build.

Connection:



21 Functions:

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

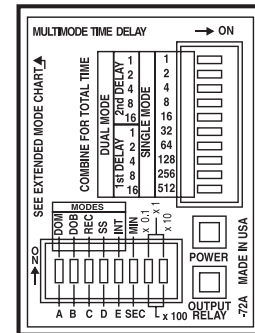
Single Functions-

- * Delay-on-Make
- Delay-on-Break
- * Recycle (ON time first, equal recycle delays)
- Single Shot
- * Interval
- Trailing Edge Single Shot
- Inverted Single Shot
- Inverted Delay-on-Break
- Accumulative Delay-on-Make
- Retriggerable Single Shot (motion detector)

Dual Functions -

- Delay-on-Make/Delay-on-Break
- * Delay-on-Make/Recycle (ON time first, equal recycle delays)
- * Delay-on-Make/Interval
- Delay-on-Make/Single Shot
- * Interval/Recycle (ON time first, equal recycle delays)
- Delay-on-Break/Recycle (ON time first, equal recycle delays)
- Single Shot/Recycle (ON time first, equal recycle delays)
- * Recycle - both times adjust. (ON time first)
- * Recycle - both times adjust. (OFF time first)
- * Interval/Delay-on-Make
- Accumulative Delay-on-Make/Interval

For more information see: Appendix A, page 163-164 for function diagrams. Appendix B, page 165, Figure 5 for dimensional drawing.



Order Table:

<u>TRDU</u>	<u>X</u>	<u>X</u>
	Input Voltage	Base Connection
	-12D - 12VDC	-1 - 8-pin DPDT*
	-24A - 24VAC/DC	-2 - 8-pin SPDT
	-120A - 120VAC	-3 - 11-pin DPDT
	-230A - 230VAC	

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

Specifications

Time Delay	Microcontroller
Type	Single Functions: 0.1s - 1,705h in 8 ranges
Range: Switch Selectable**	Dual Functions: 0.1s - 3,100m each in 8 ranges
Adjustments	Multiplier: 3 position DIP switches select 0.1, 1, 10, or 100 in s or m
Setting Accuracy	±1% or 50ms, whichever is greater
Repeat Accuracy	±0.1% or 20ms, whichever is greater
Timing Functions	Five switches are provided to set one of twenty-one single or dual functions
Reset Time	≤ 50ms
Initiate Time	120VAC: 75ms
Time Delay vs Temp. & Voltage	±1%
Indication	
Two LEDs indicate	1) Input voltage applied 2) Output relay status
Input Voltage	12VDC, 24VAC/DC, 120VAC, or 230VAC
Tolerance 12VDC & 24VAC/DC	-15% - 20%
120 & 230VAC	-20% - 10%
AC Line Frequency	50/60Hz
Power Consumption	24 to 230V ≤ 3W; 12VDC ≤ 2W

Output Type	Electromechanical relay
Form	SPDT or DPDT
Rating	10A resistive @ 120/240VAC & 28 VDC; 1/3 hp @ 120/240VAC
Life	Mechanical - 1 x 10 ⁷ ; Electrical - 1 x 10 ⁶
Protection	
Isolation Voltage	≥ 1500V RMS input to output
Insulation Resistance	≥ 100 MΩ
Polarity	DC units are reverse polarity protected
Mechanical	
Mounting	Plug-in socket
Dimensions	3.1 x 2.39 x 1.78 in. (78.7 x 60.7 x 45.2 mm)
Termination	Octal 8-pin plug-in or magnal 11-pin plug-in
Environmental	
Operating / Storage Temperature	-20° to 65°C / -40° to 85°C
Weight	≅ 5.8 oz (164 g)

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



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

Features:

- Microcontroller $\pm 0.1\%$ repeat accuracy
- Six timing functions are switch selectable
- 0.1s - 1000m in six ranges
- Knob adjustable time delay
- Universal input voltage 19 to 264VAC & 19 to 30VDC
- 10A, SPDT or DPDT output contacts

Approvals:

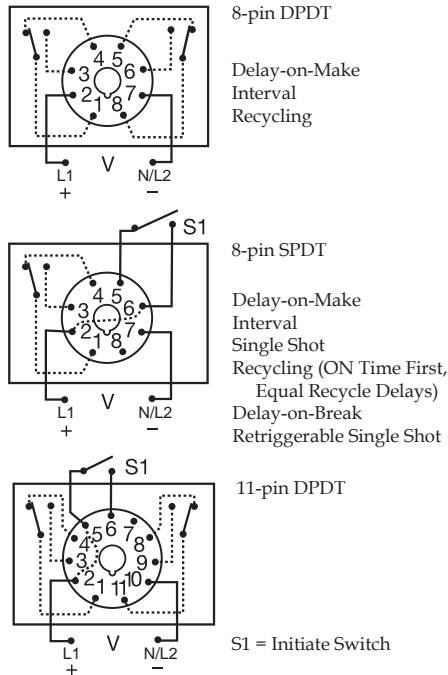
Auxiliary Products:

- **Panel mount kit:** P/N: BZ1
- **Hold-down clips (sold in pairs):** P/N: PSC8 (NDS-8) P/N: PSC11 (NDS-11)
- **11-pin socket:** P/N: NDS-11
- **Octal 8-pin socket:** P/N: NDS-8

Available Models:

- TRU1
- TRU2
- TRU3

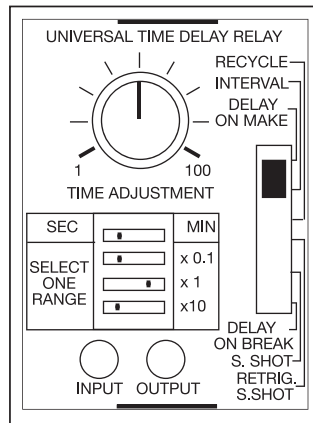
Connection:



Operation

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

For more information see:
Appendix A, pages 156-164 for function descriptions and diagrams.
Appendix B, page 165, Figure 6 for dimensional drawing.



Order Table:

Input Voltage	Base Wiring	Functions	Part Number
19 to 264VAC; 19 to 30VDC	8-pin DPDT	3	TRU1
19 to 264VAC; 19 to 30VDC	8-pin SPDT	6	TRU2
19 to 264VAC; 19 to 30VDC	11-pin DPDT	6	TRU3

Specifications

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

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



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

For more information see: Appendix A, pages 156-164 for function descriptions and diagrams. Appendix B, page 165, Figure 7 for dimensional drawing.

Features:

- 17.5 mm package for high rail density
- Microprocessor controlled with $\pm 1\%$ repeat accuracy
- Multimode: 5 selectable functions
- Multirange: knob adjustable from 0.1s - 100m
- Multivoltage: 24 to 240VAC or 9 to 110VDC
- 0.7A steady, 10A inrush rated solid-state output

Approvals:

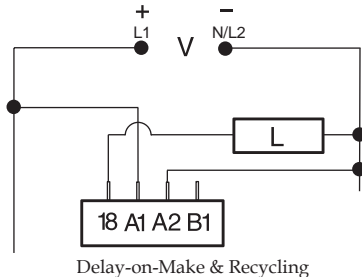
Auxiliary Products:

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

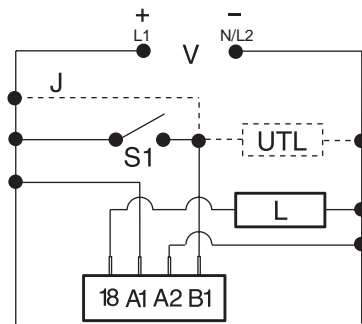
Available Models:

ASQUA3
ASQUD3
ASTUA3
ASTUD3

Connection:



Delay-on-Make & Recycling



Single Shot, Interval & Delay-on-Break

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

Adjustment:

DOM	A	<input type="checkbox"/>	R	M	S	C	<input type="checkbox"/>	E
	B	<input type="checkbox"/>				0.1-10s	X1s	D	☐	F
SS	A	<input type="checkbox"/>	R	M	S	C	<input type="checkbox"/>	E
	B	<input type="checkbox"/>				1-100s	X10s	D	☐	F
R	A	<input type="checkbox"/>	R	M	S	C	<input type="checkbox"/>	E
	B	<input type="checkbox"/>				10-1000s	X100s	D	☐	F
DOB	A	<input type="checkbox"/>	R	M	S	C	<input type="checkbox"/>	E
	B	<input type="checkbox"/>				1-100m	X10m	D	☐	F

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

R = Range
M = Multiplier
S = Setting

Order Table:

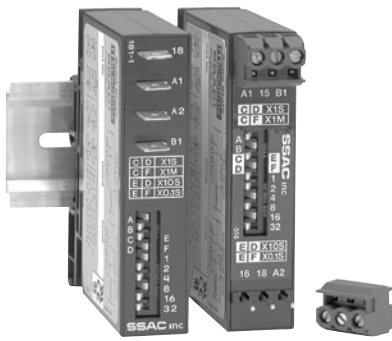
ASQU - Quick Connects
ASTU - Terminal Blocks

X	Input Voltage	X	Base Adaptors
A	Universal AC Voltage (24 to 240VAC)	3	Both - Surface & DIN rail adaptors with quick mount fasteners
D	Universal DC Voltage (9 to 110VDC)		

Specifications

Time Delay	Type.....Microcontroller based with ceramic resonator and watchdog circuitry	Protection	Surge.....IEEE C62.41-1991 Level A
Adjustment	.....Knob with dial; 2 switches select 1 of 4 multipliers	Circuitry	.....Encapsulated
Range*	.....0.1 - 10s, 1 - 100s, 10 - 1000s, 1 - 100m	Dielectric Breakdown	.....$\geq 2000V$ RMS terminals to mounting surface
Repeat Accuracy	.....$\pm 1\%$ or $\pm 50ms$, whichever is greater	Polarity	.....DC units are reverse polarity protected
Tolerance (Factory Calibration)	.....$\pm 2\%$ or $\pm 50ms$, whichever is greater	Mechanical	
Reset Time	.....$\leq 300ms$	Mounting	.....Two base adaptors are available
Initiate Time	.....Single Shot & Delay-on-Break: $\leq 32ms$	DIN Rail	.....Snap on to 32 mm DIN 1 & 35 mm DIN 3 rail
Time Delay vs Temp. & Voltage	.....$\pm 2\%$, or $\pm 50ms$, whichever is greater	Surface	.....Two #6 (M3.5 x 0.6) screws or quick mount fasteners
Input Voltage	.....AC: 24 to 240VAC; -20% - 10%	Termination	
	.....DC: 9 to 110VDC; -0% - 20% @ -25°C	ASQU	.....0.25 in. (6.35 mm) male quick connect terminals
	.....9.4 to 110VDC; -0% - 20% @ -40°C	ASTU	.....0.197 in. (5 mm) push-on terminal blocks for up to #14 AWG (2.5 mm ²) wire
AC Line Frequency / DC Ripple	.....50/60Hz / $\leq 10\%$	Environmental	
Output		Operating / Storage Temperature	.....-40° to 60°C / -40° to 85°C
Type	.....Solid state	Humidity	.....95% relative, non-condensing
Form	.....NO	Weight ≈ 4 oz (113 g)
Rating	.....0.7A steady state, 10A inrush		
Voltage Drop	.....AC $\approx 2.5V$ @ 0.7A; DC $\approx 1.5V$ @ 0.7A		

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



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

For more information see: Appendix A, pages 156-164 for function descriptions and diagrams. Appendix B, page 165, Figure 7 for dimensional drawing.

Features:

- 17.5 mm package for high rail density
- Microprocessor controlled with ±0.1% timing accuracy
- Multimode: 5 selectable functions
- Multirange: switch adjust from 0.1s - 63m
- Multivoltage: 24 to 240VAC or 9 to 110VDC
- 0.7A steady, 10A inrush rated solid-state output

Approvals:

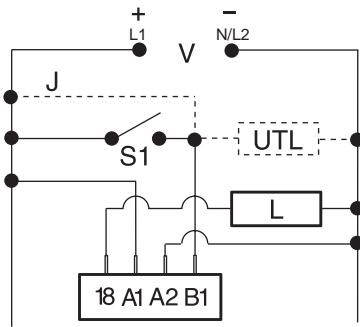
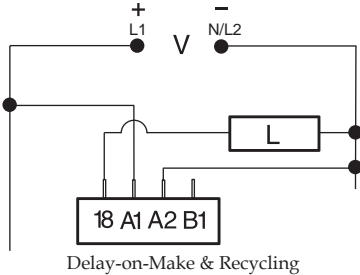
Auxiliary Products:

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

Available Models:

- DSQUA3
- DSQUD3
- DSTUA3
- DSTUD3

Connection:

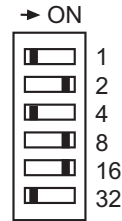


V = Voltage
L = Load
J = Wire Required for Interval Operation
S1 = Initiate Switch (for Single Shot or Delay-on-Break)
UTL = Optional Untimed Load

Adjustment:

DOM	A	<input type="checkbox"/>	R		M		S		I	
	B	<input type="checkbox"/>		0.1-6.3s		X0.1s		C		<input type="checkbox"/>
SS	A	<input type="checkbox"/>	R		M		S		I	
	B	<input type="checkbox"/>		1-63s		X1s		C		<input type="checkbox"/>
R	A	<input type="checkbox"/>	R		M		S		I	
	B	<input type="checkbox"/>		10-630s		X10s		C		<input type="checkbox"/>
DOB	A	<input type="checkbox"/>	R		M		S		I	
	B	<input type="checkbox"/>		1-63m		X1m		C		<input type="checkbox"/>

DOM = Delay-on-Make R = Range
SS = Single Shot/Interval M = Multiplier
R = Recycling S = Setting
DOB = Delay-on-Break I = Increments of time



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

Order Table:

- DSQU - Quick Connects
- DSTU - Terminal Blocks

X Input Voltage
 A - Universal AC Voltage (24 to 240VAC)
 D - Universal DC Voltage (9 to 110VDC)

X Base Adaptors
 3 - Both - Surface & DIN rail adaptors with quick mount fasteners

Specifications

Time Delay	Microcontroller based with ceramic resonator and watchdog circuitry
Type	6 switches adjust the time delay; 2 switches select 1 of 4 multipliers
Adjustment	x0.1s = 0.1 - 6.3s in 0.1s increments x1s = 1 - 63s in 1s increments x10s = 10 - 630s in 10s increments x1m = 1 - 63m in 1m increments
Range*	±0.1% or ±20ms, whichever is greater
Repeat Accuracy	±2% or ±50ms, whichever is greater
Setting Accuracy	≤ 300ms
Reset Time	Single Shot & Delay-on-Break: ≤ 32ms
Initiate Time	±2% or ±50ms, whichever is greater
Time Delay vs Temp. & Voltage	Input
Voltage	AC: 24 to 240VAC; -20% - 10% DC: 9 to 110VDC; -0% - 20% @ -25°C 9.4 to 110VDC; -0% - 20% @ -40°C
AC Line Frequency / DC Ripple	50/60Hz / ≤ 10%
Output	Type: Solid state Form: NO

Rating	0.7A steady state, 10A inrush
Voltage Drop	AC ≅ 2.5V @ 0.7A; DC ≅ 1.5V @ 0.7A
Protection	Surge: IEEE C62.41-1991 Level A
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000V RMS terminals to mounting surface
Polarity	DC units are reverse polarity protected
Mechanical	Mounting: Two base adaptors are available DIN Rail: Snap on to 32 mm DIN 1 & 35 mm DIN 3 rail Surface: Two #6 (M3.5 x 0.6) screws or quick mount fasteners
Termination	DSQU: 0.25 in. (6.35 mm) male quick connect terminals DSTU: 0.197 in. (5 mm) push-on terminal blocks for up to #14 AWG (2.5 mm ²) wire
Environmental	Operating / Storage Temperature: -40° to 60°C / -40° to 85°C Humidity: 95% relative, non-condensing Weight: ≅ 4.2 oz (119 g)

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