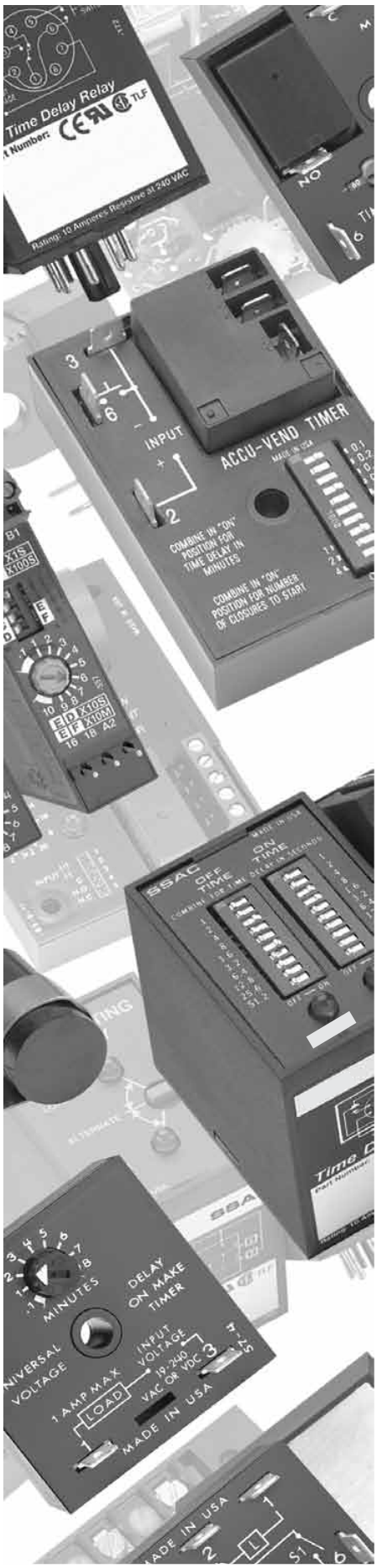


Section 4
Multifunction Timers

Multifunction Timers

4

Relay Output

Solid State Output

TRDU Series Universal Time Delay Relay

- 21 Functions are Switch Selectable
- Switch Selectable Modes & Time Ranges
- 0.1 s to 1705 h in 8 Ranges
- 10 Amps, SPDT or DPDT Isolated Relay Contacts
- 8 or 11 Pin Plug-in Base
- 1.78 x 2.39 x 3.1 Inches (45 x 61 x 79 mm)
- Popular Part Numbers are In Stock
- UL Recognized, CSA Certified, CE

TRU Series Universal Time Delay Relay

- 6 Functions are Switch Selectable
- Knob Adjustable Time Delay
- 0.1 s to 1000 m in 6 Ranges
- Universal Voltage 19 to 264VAC and 19 to 30VDC
- 10 Amps, SPDT or DPDT Isolated Relay Contacts
- 1.78 x 2.39 x 3.44 Inches (45 x 61 x 87 mm)
- In Stock
- UL Recognized, CSA Certified, CE

• denotes a preferred product

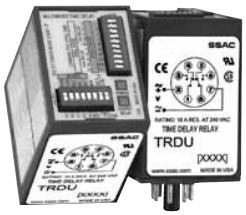
Selection Guide
Multifunction Timers

For detailed product specifications, refer to catalog pages.

	Switch Adjust Plug-in	Knob Adjust Plug-in	Knob or Switch Adjust
			
Series	**TRDU**	**TRU**	**ASQU/ASTU DSQU/DSTU**
Output Form	SPDTor DPDT	SPDTor DPDT	Solid State
Function and Features Page	4.4	4.6	4.8 & 4.10
Delay on Make (ON-delay)	•	•	•
Delay on Break (OFF-delay)	•	•	•
Delay on Break (Inverted)	•		
Single Shot (Pulse Former)	•	•	•
Single Shot Trailing Edge	•		
Single Shot Retriggerable (Motion Detector)	•	•	
Single Shot (Inverted)	•		
Interval (Impulse ON)	•	•	•
Interval, Trailing Edge (Impulse OFF)			
Interval/Recycling (Equal)	•		
Recycling (Pulse Generator) (Both Times Adjustable)	•		
Recycling (Equal Times ON First)	•	•	•
Recycling (Equal Times OFF First)			
Fast Function			
Dual Functions			
Star Delta Motor Starting			
Delay on Make & Delay on Break	•		
Delay on Make & Single Shot	•		
Delay on Make & Interval	•		
Delay on Make (Accumulative) & Interval	•		
Delay on Make & Recycling (Equal)	•		
Delay on Break & Recycle (Equal)	•		
Single Shot & Recycle (Equal Times)	•		
Interval & Delay on Make	•		
General Features			
Instantaneous Contacts			
Accumulative Timing	•		
Solid State Output			•
Relay Output	•	•	
Knob or Onboard Adjustment		•	•
Switch Adjustment	•		•
External Adjustment			
Dimensions (w x h x d) in	1.78 x 2.39 x ≤3.44	0.69 x 3.0 x ≤2.41	
mm	45.2 x 60.7 x 87.4	17.5 x 76.2 x 61.2	

• denotes a preferred product

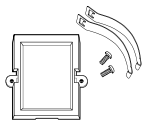
Multifunction
TRDU Series
Time Delay Relay



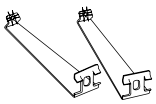
- Microcontroller +/-0.1% Repeat Accuracy
- Multifunction – 21 Timing Functions
- Multirange – 0.1 s ... 1,705 h in 8 Ranges
- Switch Selectable Modes, Time Delay, & Ranges
- AC and DC Input Voltages are Available
- 10 A, Isolated SPDT or DPDT Output Contacts

Approvals:

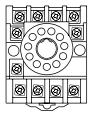
Accessories



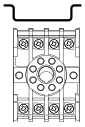
Panel mount kit
P/N: **BZ1**



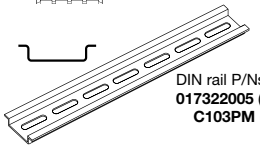
Hold down clips
P/Ns:
PSC8 (NDS-8)
PSC11 (NDS-11)



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



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



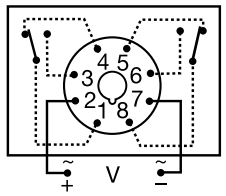
DIN rail P/Ns:
017322005 (Steel)
C103PM (Al)

See accessory pages for specifications.

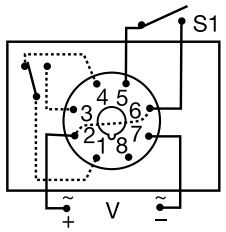
Description

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

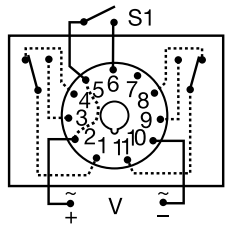
Connection



8 Pin DPDT



8 Pin SPDT



11 Pin DPDT

V = Voltage S1 = Initiate Switch

Relay contacts are isolated. Dashed lines are internal connections.

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

*9 Functions in 8 PIN DPDT UNITS

Available Models-

•TRDU120A1
TRDU12D1
TRDU230A2
•TRDU24A3

•TRDU120A2
TRDU12D2
•TRDU24A1

•TRDU120A3
•TRDU12D3
•TRDU24A2

Don't see what you need? Call us for a minimum quantity and price quote!

Ordering Table

TRDU	X	X
Series	**Input**	**Base Connection**
	12D - 12 V DC	**1 -** 8 pin DPDT *
	24A - 24 V AC/DC	**2 -** 8 pin SPDT
	120A - 120 V AC	**3 -** 11 pin DPDT
	230A - 230 V AC	

*Limited to Nine Operating Functions

Example P/N: **TRDU120A2**

TRDU2B01 09.10

• denotes a preferred product

Multifunction
TRDU Series
Time Delay Relay

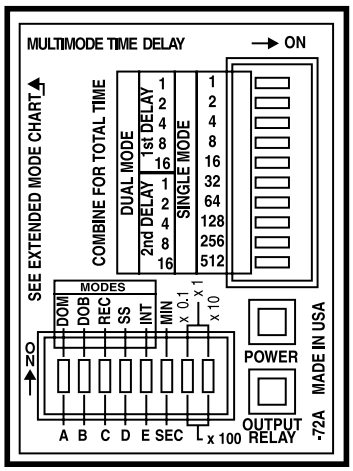
Multifunction timers

4

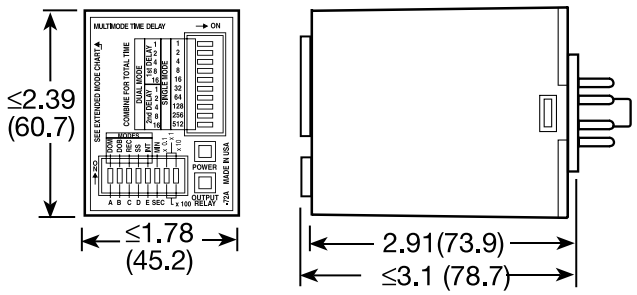
Technical Data

Time Delay	
Type	Microcontroller
Range: Switch Selectable**	Single Functions: 0.1 s ... 1,705 h in 8 ranges Dual Functions: 0.1 s ... 3,100 m each in 8 ranges
Adjustments	Three switches are provided to set secs/mins & multipliers of x0.1, x1, x10, or x100
Setting Accuracy	+/-1% or 50 ms, whichever is greater
Repeat Accuracy	+/-0.1% or 20 ms, whichever is greater
Timing Functions	Five switches are provided to set one of twenty-one single or dual functions
Reset Time	≤ 50 ms
Initiate Time	120 V AC: 75 ms
Time Delay vs. Temp. & Voltage	+/-1%
Indication	
Two LED's indicate	1) Input voltage applied; 2) Output relay status
Input	
Voltage	12 V DC, 24 V AC/DC, 120 V AC, or 230 V AC
Tolerance 12 V DC & 24 V DC/AC	-15% ... +20%
120 & 230 V AC	-20% ... +10%
Frequency	50 ... 60 Hz
Power Consumption	24 ... 230 V ≤ 3 W; 12 V DC ≤ 2 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
Insulation Resistance	≥ 100 MΩ
Polarity	DC units are reverse polarity protected
Mechanical	
Mounting	Plug-in socket
Package	3.1 x 2.39 x 1.78 in. (78.7 x 60.7 x 45.2 mm)
Termination	Octal plug (8 Pin) or Magnal plug (11 Pin)
Environmental	
Operating Temperature	-20°C ... +65°C
Storage Temperature	-40°C ... +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.



Mechanical View



Inches (Millimeters)

TRDU2B01 09.10

SSAC, LLC. • 800-377-7722 • customerservice@ssac.com • technicalsupport@ssac.com • www.ssac.com

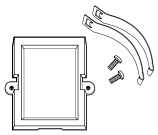
• denotes a preferred product

Multifunction, Multirange
TRU Series
Universal Time Delay Relay

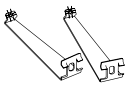
- Microcontroller +/-0.1% Repeat Accuracy
- Six Timing Functions are Switch Selectable
- 0.1 s ... 1000 m in Six Ranges
- Knob Adjustable Time Delay
- Universal Input Voltage 19...264 V AC & 19...30 V DC
- 10 A, SPDT or DPDT Relay Contacts

Approvals:

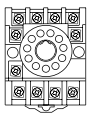
Accessories



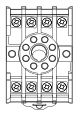
Panel mount kit
P/N: **BZ1**



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**

See accessory pages for specifications.

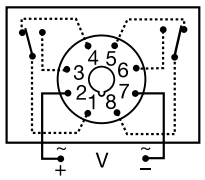
Description

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

Operation

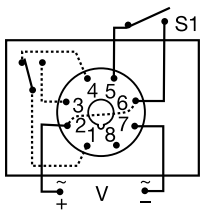
A six position slide switch selects Delay on Make, Interval, Single Shot, Recycling (ON time first), Delay on Break, and Retriggerable Single Shot. 8 Pin DPDT base wiring is limited to Delay on Make, Interval, and Recycling functions. All six functions are available in the 8 pin SPDT and 11 pin DPDT versions.

Connection



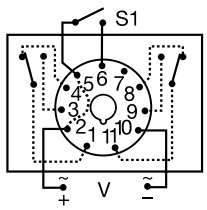
8 Pin DPDT

Delay On Make
Interval
Recycling



8 Pin SPDT

Delay On Make
Interval
Single Shot
Recycling (ON Time First)
Delay on Break
Retriggerable Single Shot

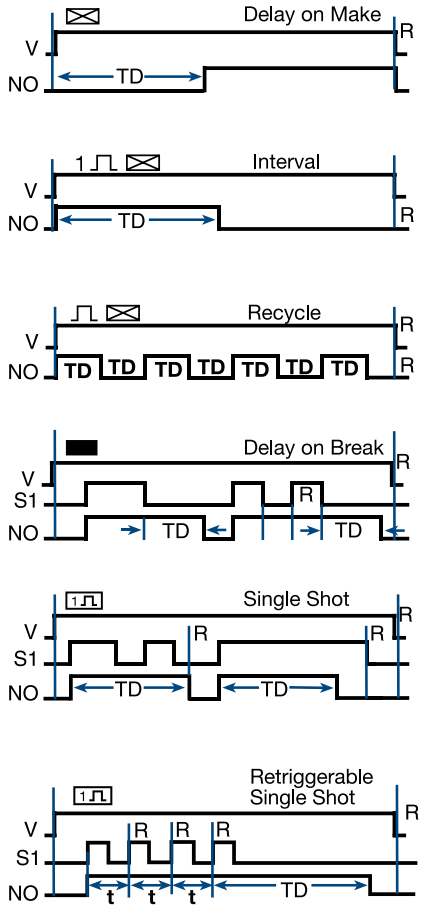


11 Pin DPDT

S1 = Initiate Switch

Dashed lines are internal connections.
Relay contacts are isolated.

Function



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

Available Models-

•TRU1 •TRU2 •TRU3

Don't see what you need? Call us for a minimum quantity and price quote!

Ordering Table

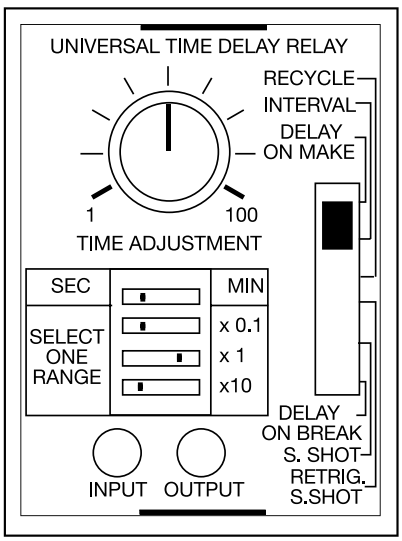
Voltage	Base Wiring	Functions	Part Number
19 ... 264 V AC; 19 ... 30 V DC	8 pin DPDT	3	TRU1
19 ... 264 V AC; 19 ... 30 V DC	8 pin SPDT	6	TRU2
19 ... 264 V AC; 19 ... 30 V DC	11 pin DPDT	6	TRU3

Multifunction, Multirange
TRU Series
Universal Time Delay Relay

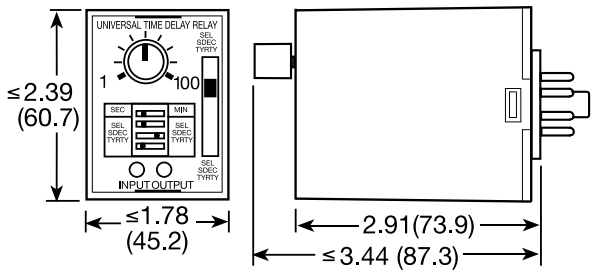
Technical Data

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

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



Mechanical View



Inches (Millimeters)

Knob Adjustable Universal Timer

ASQU/ASTU MicroTime Timing Module

- 17.5 mm Package for High Rail Density
- Microprocessor Controlled with +/-1% Repeat Accuracy
- Multimode: 5 Selectable Functions
- Multirange: Knob Adjustable from 0.1 s ... 100 m
- Multivoltage: 24 ... 240 V AC or 9 ... 110 V DC
- 0.7 A Steady, 10 A Inrush Rated Solid State Output

Approvals:

Description

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 top of the unit. Adjustment through the time range is accomplished by an onboard knob.

Adjustment

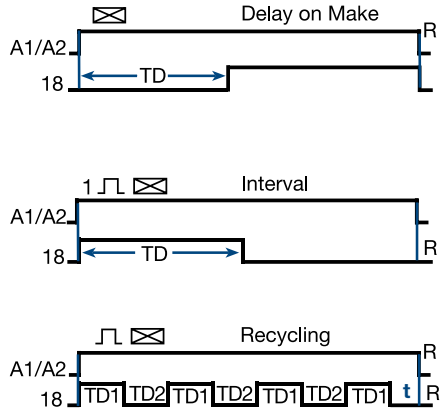
DOM	A B
SS	A B
R	A B
DOB	A B

R	M	S
0.1...10s	X1s	C E D F
1...100s	X10s	C E D F
10.1 000s	X100s	C E D F
1...100m	X10m	C E D F

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

R = Range
M = Multiplier
S = Setting

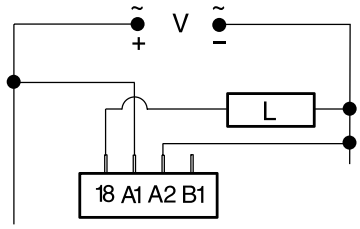
Function



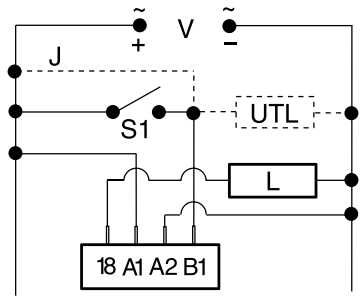
R = Reset TD = Time Delay
t = Incomplete Time Delay
TD1 = TD2

Connection

Delay on Make & Recycling



Single Shot, Interval & Delay on Break



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

Available Models-

- •ASQUA3
- • ASQUD3
- • ASTUA3
- •ASTUD3

Don't see what you need? Call us for a minimum quantity and price quote!

Ordering Table

X Series
- **ASQU** - Quick Connects
- **ASTU** - Terminal Blocks

X Input
- **A** - Universal AC Voltage (24 ... 240 V AC)
- **D** - Universal DC Voltage (9 ... 110 V DC)

X Base Adaptors
- **3** - Both - Surface & DIN Rail Adaptors, with Quick Mount Fasteners

Example P/N: **ASQUA3, ASTUD3**

Accessories

Female quick connect P/Ns:

P1015-13 (AWG 10/12)
P1015-64 (AWG 14/16)
P1015-14 (AWG 18/22)

See accessory pages for specifications.

ASQU2B01 09.10

• denotes a preferred product

Knob Adjustable Universal Timer
ASQU/ASTU MicroTime
Timing Module

Multifunction timers

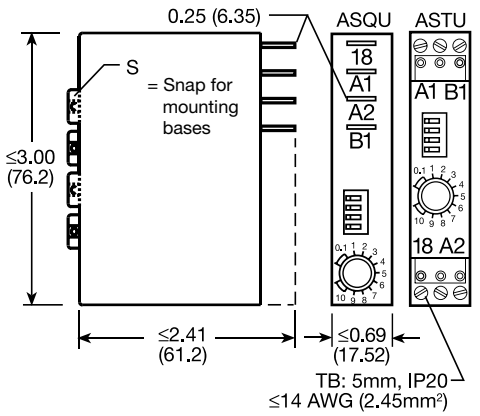
Technical Data

Time Delay	
Type	Microcontroller based with ceramic resonator and watchdog circuitry
Adjustment and Range*	Knob with dial; 2 switches select 1 of 4 multipliers x1s = 0.1 ... 10 s; x10s = 1 ... 100 s; x100s = 10 ... 1000 s; x10m = 1 ... 100 m
Repeat Accuracy	+/-1%, or +/-50 ms, whichever is greater
Tolerance (Factory Calibration)	+/-2%, or +/-50 ms, whichever is greater
Reset Time	≤ 300 ms
Initiate Time	Single Shot & Delay on Break: ≤ 32 ms
Time Delay vs. Temp. & Voltage	+/-2%, or +/-50 ms, whichever is greater
Input	
Voltage	AC: 24 ... 240 V AC; -20% ... +10% DC: 9 ... 110 V DC; -0% ... +20% at -25°C 9.4 ...110 V DC; -0% ... +20% at -40°C
AC Line Frequency	50 ... 60 Hz
DC Ripple	≤ 10%
Output	
Type	Solid state
Form	Normally Open
Rating	0.7 A steady state, 10 A inrush
Voltage Drop	AC: ≅ 2.5 V at 0.7 A; DC: ≅ 1.5 V at 0.7 A
Protection	
Surge	IEEE C62.41-1991 Level A
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000 V 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	
ASQU	0.25 in. (6.35 mm) male quick connect terminals
ASTU	0.197 in. (5 mm) push-on terminal blocks for up to #14 AWG (2.5 mm²) wire
Environmental	
Operating Temperature	-40°C ... +60°C
Storage Temperature	-40°C ... +85°C
Humidity	95% relative, non-condensing
Weight	≅ 4 oz (113 g)

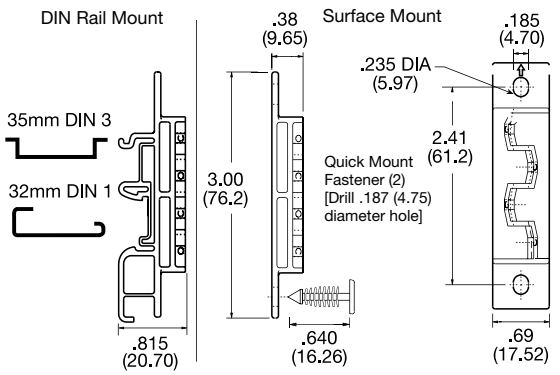
*For CE approved applications, power must be removed from the unit when a switch position is changed.

4

Mechanical View



TB = Push-on Terminal Blocks



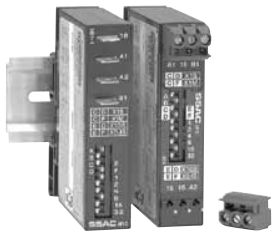
Inches (Millimeters)

ASQU2B01 09.10

• denotes a preferred product

Switch Adjustable Universal Timer

DSQU/DSTU MicroTime
Timing Module



- 17.5 mm Package for High Rail Density
- Microprocessor Controlled with +/-0.1% Timing Accuracy
- Multimode: 5 Selectable Functions
- Multirange: Switch Adjust from 0.1 s ... 63 m
- Multivoltage: 24 ... 240 V AC or 9 ... 110 V DC
- 0.7 A Steady, 10 A Inrush Rated Solid State Output

Approvals:

Accessories

Female quick connect P/Ns:

P1015-13 (AWG 10/12)
P1015-64 (AWG 14/16)
P1015-14 (AWG 18/22)

See accessory pages for specifications.

Description

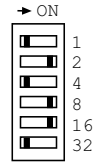
The DSQU/DSTU Series of 17.5 mm, switch adjustable, universal solid state timers offer multiple functions, voltages, and time delay ranges. Choose one of 5 functions and 4 time delay ranges via 4 selection switches located on top of the unit. Six switches adjust the time delay through the selected range.

Adjustment

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

R		M	
0.1 ... 6.3s	X0.1s	C D E F	0.1s
1 ... 63s	X1s	C D E F	1s
10 ... 630s	X10s	C D E F	10s
1 ... 63m	X1m	C D E F	1m

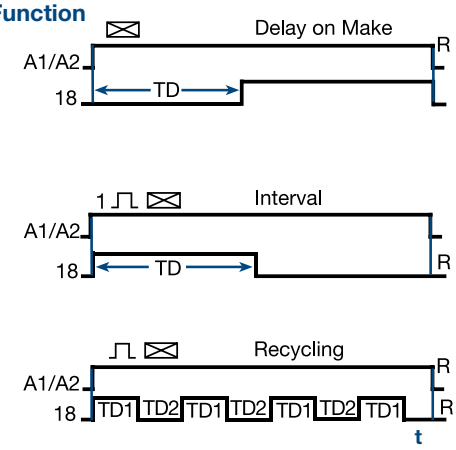
Time Delay Adjustment



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

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

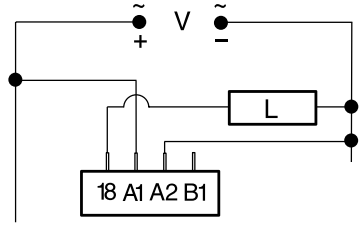
Function



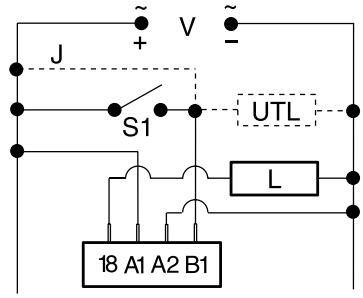
R = Reset TD = Time Delay
t = Incomplete Time Delay
TD1 = TD2

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

For Function Descriptions, See Timer Function Section

Available Models-

- DSQUA3
- DSQUD3
- DSTUA3
- DSTUD3

Don't see what you need? Call us for a minimum quantity and price quote!

Ordering Table

X
Series
- **DSQU** - Quick Connects
- **DSTU** - Terminal Blocks

X
Input
- **A** - Universal AC Voltage (24 ... 240 V AC)
- **D** - Universal DC Voltage (9 ... 110 V DC)

X
Base Adaptors
- **3** -Both - Surface & DIN Rail Adaptors, with Quick Mount Fasteners

Example P/N: **DSQUA3, DSTUD3**

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• denotes a preferred product

Switch Adjustable Universal Timer
DSQU/DSTU MicroTime
Timing Module

Multifunction timers

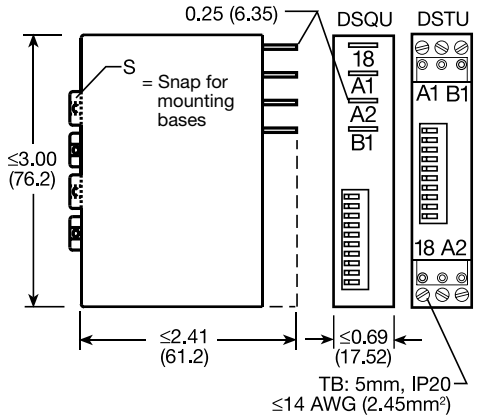
4

Technical Data

Time Delay	
Type	Microcontroller based with ceramic resonator and watchdog circuitry
Adjustment and Range*	6 switches adjust the time delay; 2 switches select 1 of 4 multipliers; x0.1s = 0.1 ... 6.3 s in 0.1 s increments x1s = 1 ... 63 s in 1 s increments x10s = 10 ... 630 s in 10 s increments x1m = 1 ... 63 m in 1 m increments
Repeat Accuracy	+/-0.1% or +/-20 ms, whichever is greater
Setting Accuracy	+/-2% or +/-50 ms, whichever is greater
Reset Time	≤ 300 ms
Initiate Time	Single Shot & Delay on Break: ≤ 32 ms
Time Delay vs. Temp. & Voltage	+/-2% or +/-50 ms, whichever is greater
Input	
Voltage	AC: 24 ... 240 V AC; -20% ... +10% DC: 9 ... 110 V DC; -0% ... +20% @ -25°C 9.4 ...110 V DC; -0% ... +20% @ -40°C
AC Line Frequency	50 ... 60 Hz
DC Ripple	≤ 10%
Output	
Type	Solid state
Form	Normally Open
Rating	0.7 A steady state, 10 A inrush
Voltage Drop	AC: ≅ 2.5 V at 0.7 A; DC: ≅ 1.5 V at 0.7 A
Protection	
Surge	IEEE C62.41-1991 Level A
Circuitry	Encapsulated
Dielectric Breakdown	≥ 2000 V 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 mm²) wire
Environmental	
Operating Temperature	-40°C ... +60°C
Storage Temperature	-40°C ... +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.

Mechanical View



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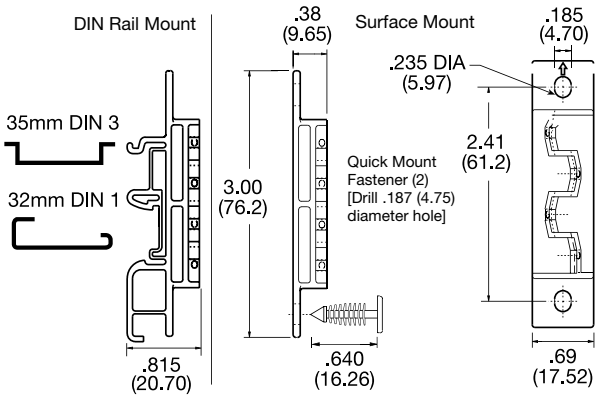

Inches (Millimeters)

DSQU2B01 09.10

• denotes a preferred product