



## Section 5 Dedicated Timers

Note: DIN Rail Mounting Product pages are not included in this catalog.  
Go to: [www.ssac.com/sg5.pdf](http://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



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



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

5

### Sequencer



SQ3 & 4 -- Solid State Output .....	5.154
-------------------------------------	-------

### Dual Function



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

### HVAC Timers



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

### Vending Timers



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

### Star Delta Motor Starting



<b>DIN Rail Mounting</b>	
CT-SDS .....	see Note above
CT-SDE .....	see Note above
CT-YDE .....	see Note above

# Coin Vending Timer

## HRV Accu-Vend

### Vending Control



US Patent 6708135



5

- Accumulates 1 ... 256 Coins
- Switch Selectable 1 ... 7 Coins to Start
- Vend Time from 1 s ... 31.75 m
- Coin Switch Can Be Connected to a Counter
- Up to 30 A, 1 Hp at 125 V AC N.O. Contacts
- Encapsulated Circuitry

Approvals:

#### Accessories



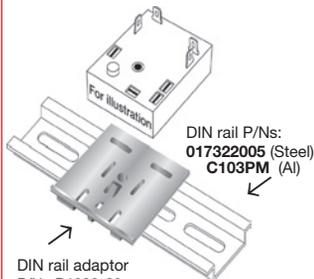
Mounting bracket  
P/N: **P1023-6**



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



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



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

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

See accessory pages for specifications.

#### Description

The HRV combines the accuracy of microcontroller based circuitry with an electromechanical relay output. The HRV's switching capacity allows direct control of loads like compressors, pumps, motors, heaters, and lighting. The HRV "S" version provides a vend time after the selected number of initiate switch closures to start is reached. The HRV "A" version includes all of the "S" features and allows the total vend time to be extended for each additional initiate switch closure. The HRV is ideal for cost sensitive single coin or token vending machines. The electronic circuitry is encapsulated to protect against humidity and vibration.

#### Operation

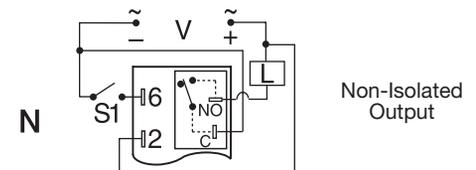
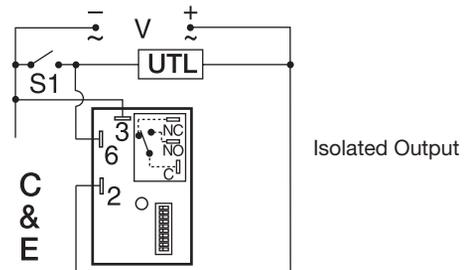
**Coin Totalizer & Vending Timer ("S" Version):** Input voltage must be applied prior to & during operation. When the total number of S1 initiate switch closures equals the number to start set on the lower 3 DIP switches, the load energizes and the vending time set on the upper 7 DIP switches begins. At the end of the vending time, the load de-energizes and the vending time is reset. Closing the initiate switch during vend timing will have no affect on vend time delay.

**Accumulating Vending Timer ("A" Version):** Input voltage must be applied prior to & during operation. When the total number of S1 initiate switch closures equals the number to start set on the lower 3 DIP switches, the load energizes and the vending time starts. For every initiate switch closure, the HRV unit adds one time per coin period, as set on the upper 7 DIP switches, to the total vending time.

**Operation Note:** If S1 is closed when input voltage is applied, the output remains de-energized and the S1 counter remains at zero closures. At least one "vend time" and one "closures to start" DIP switch must be in the "ON" position for proper operation.

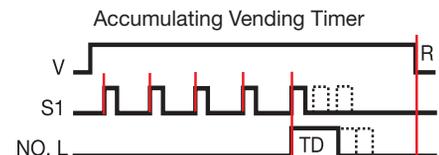
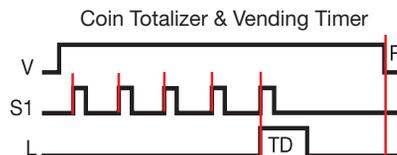
**Reset:** Removing input voltage resets the vend time delay, the S1 closure counter, and de-energizes the output relay.

#### Connection



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

#### Function



#### Ordering Table

HRV Series	X Input	X Vend Time	X Mode of Operation	X Output Form & Rating
	-1 - 12 V DC	-1 - 1 ... 127 s	-S - Coin Totalizer Vending Timer	-C - 30 A SPDT-N.O. (Isolated)
	-2 - 24 V AC	-2 - 5 ... 635 s	-S - Coin Totalizer Vending Timer	-E - 30 A SPDT-N.O. (Isolated)
	-3 - 24 V DC	-3 - 0.1 ... 12.7 m	-A - Accumulating Vending Timer	-N - 30 A SPDT-N.O. (Non-Isolated)
	-4 - 120 V AC	-4 - 0.25 ... 31.75 m		
	-6 - 230 V AC			

Example P/N: **HRV43SC, HRV62AN**

# Coin Vending Timer

## HRV Accu-Vend

### Vending Control

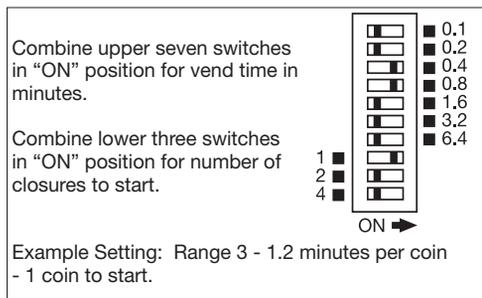


#### Technical Data

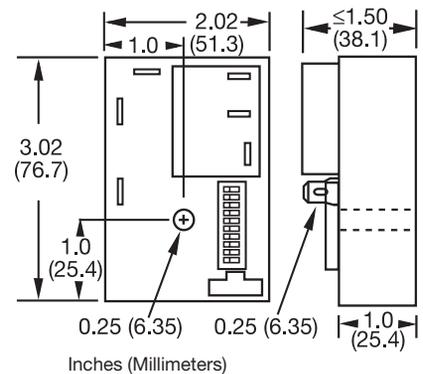
<b>Count Functions/Switch Type</b> Minimum Switch Closure Time Minimum Switch Open (between closures) Time Count Range to start Maximum Counts ("A" Version) <b>Time Delay/Range ***</b> Adjustment Setting Accuracy Repeat Accuracy Reset Time Time vs. Input Voltage & Temperature	Mechanical (counts on switch closure) $\geq 20$ ms $\geq 20$ ms 1 ... 7 counts 250 Adjustable 1 s ... 31.75 m in 4 ranges 7 of a 10 position DIP switch - 0 to +2% or 50 ms, whichever is greater +/-0.1% or 20 ms, whichever is greater $\leq 150$ ms $\leq +/-2\%$																		
<b>Input</b> Voltage/Frequency Tolerance DC Ripple Power Consumption	12 or 24 V DC; 24, 120, or 230 V AC/50 ... 60 Hz -15% ... +20% 12 V DC & 24 V DC/AC 120 & 230 V AC -20% ... +10% $\leq 10\%$ AC: $\leq 4$ VA; DC: $\leq 2$ W																		
<b>Output</b> Type Form	Electromechanical relay Isolated SPDT or Non-isolated SPDT																		
Ratings: General Purpose Resistive Motor Load	<table border="1"> <thead> <tr> <th></th> <th>SPDT-N.O.</th> <th>SPDT-N.C.</th> </tr> </thead> <tbody> <tr> <td>125/240 V AC</td> <td>30 A</td> <td>15 A</td> </tr> <tr> <td>125/240 V AC</td> <td>30 A</td> <td>15 A</td> </tr> <tr> <td>28 V DC</td> <td>20 A</td> <td>10 A</td> </tr> <tr> <td>125 V AC</td> <td>1 hp*</td> <td>1/4 hp**</td> </tr> <tr> <td>240 V AC</td> <td>2 hp**</td> <td>1 hp**</td> </tr> </tbody> </table>		SPDT-N.O.	SPDT-N.C.	125/240 V AC	30 A	15 A	125/240 V AC	30 A	15 A	28 V DC	20 A	10 A	125 V AC	1 hp*	1/4 hp**	240 V AC	2 hp**	1 hp**
	SPDT-N.O.	SPDT-N.C.																	
125/240 V AC	30 A	15 A																	
125/240 V AC	30 A	15 A																	
28 V DC	20 A	10 A																	
125 V AC	1 hp*	1/4 hp**																	
240 V AC	2 hp**	1 hp**																	
Life	Mechanical -- $1 \times 10^6$ Electrical -- $1 \times 10^5$ , * $3 \times 10^4$ , ** 6,000																		
<b>Protection</b> Surge Circuitry Dielectric Breakdown Insulation Resistance	IEEE C62.41-1991 Level A Encapsulated $\geq 1500$ V RMS input to output on isolated units $\geq 100$ M $\Omega$																		
<b>Mechanical</b> Mounting Package Termination	Surface mount with one #10 (M5 x 0.8) screw 3 x 2 x 1.5 in (76.7 x 51.3 x 38.1 mm) 0.25 in. (6.35 mm) male quick connect terminals																		
<b>Environmental</b> Humidity Operating/Storage Temperature Weight	95% relative, non-condensing -40°C ... +70°C / -40°C ... +85°C $\cong 3.9$ oz (111 g)																		

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

#### Switch Adjustment



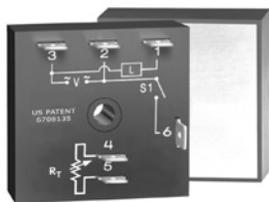
#### Mechanical View



# Single Shot (Pulse Former)

## THC & THS Series

### Power Timing Module



5

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

Approvals:

#### Description

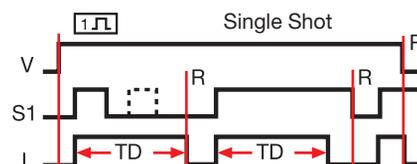
The TH series is a solid state relay and timer combined into one compact, easy-to-use control. When mounted to a metal surface, the TH Series may be used to directly control lamp or heater loads of up to 20 Amps steady 200 Amps inrush. Its single shot function can perform dispensing and pulse shaping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

#### Operation

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

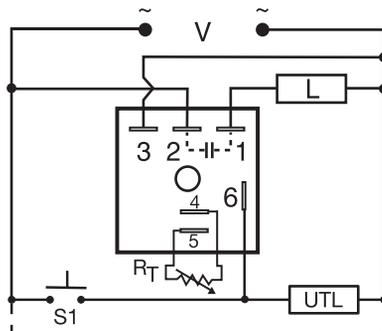
**Reset:** Reset occurs when the time delay is complete and the initiate switch opens. Loss of input voltage resets the time delay and output.

#### Function



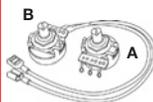
V = Voltage L = Load S1 = Initiate Switch  
TD = Time Delay R = Reset

#### Connection



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

#### Accessories



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



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



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



Versa-knob  
P/N: P0700-7

See accessory pages for specifications.

#### Ordering Table

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

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

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

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

Dedicated  
timers

## Technical Data

<b>Time Delay</b>													
Range	0.1 ... 600 s in 4 adjustable ranges or fixed												
Repeat Accuracy	+/-2% or 20 ms, whichever is greater												
Tolerance (Factory Calibration)	≤ +/- 5%												
Reset Time	≤ 150 ms												
Initiate Time	≤ 20 ms												
Time Delay vs. Temperature & Voltage	≤ +/-10%												
<b>Input</b>													
Voltage	24, 120, or 230 V AC												
Tolerance	+/-15%												
Line Frequency	50 ... 60 Hz												
Power Consumption	≤ 2 VA												
<b>Output</b>													
Type	Solid state												
Form	Normally Open, closed during timing												
Maximum Load Currents	<table border="1"> <thead> <tr> <th>Output</th> <th>Steady State</th> <th>Inrush**</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>6 A</td> <td>60 A</td> </tr> <tr> <td>B</td> <td>10 A</td> <td>100 A</td> </tr> <tr> <td>C</td> <td>20 A</td> <td>200 A</td> </tr> </tbody> </table>	Output	Steady State	Inrush**	A	6 A	60 A	B	10 A	100 A	C	20 A	200 A
Output	Steady State	Inrush**											
A	6 A	60 A											
B	10 A	100 A											
C	20 A	200 A											
Minimum Load Current	100 mA												
Voltage Drop	≅ 2.5 V at rated current												
OFF State Leakage Current	≅ 5 mA at 230 V AC												
<b>Protection</b>													
Circuitry	Encapsulated												
Dielectric Breakdown	≥ 2000 V RMS terminals to mounting surface												
Insulation Resistance	≥100 MΩ												
<b>Mechanical</b>													
Mounting **	Surface mount with one #10 (M5 x 0.8) screw												
Package	2 x 2 x 1.51 in. (50.8 x 50.8 x 38.4 mm)												
Termination	0.25 in. (6.35 mm) male quick connect terminals												
<b>Environmental</b>													
Operating Temperature	-20°C ... +60°C												
Storage Temperature	-40°C ... +85°C												
Humidity	95% relative, non-condensing												
Weight	≅ 3.9 oz (111 g)												

\*\*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.

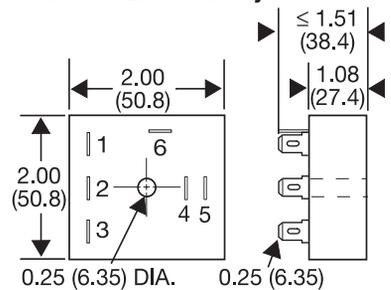
5

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

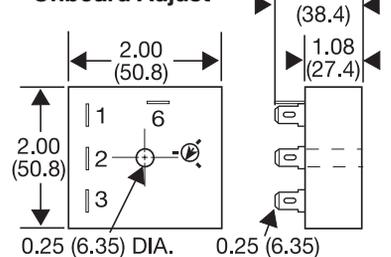
\* When selecting an external RT add at least 20% for tolerance of unit and the RT.

### Mechanical View

#### Fixed & External Adjust



#### Onboard Adjust



Inches (Millimeters)

# ProgramaCube® KSPU Series Timing Module



US Patent 6708135



5

- Choose 1 of 14 Standard Functions
- Special Time Ranges and Functions Available
- Factory Programmed
- Microcontroller Circuitry, +/-0.1% Repeat Accuracy
- Solid State Output 1 A Steady, 10 A Inrush
- Accurate Switch Adjustment
- 12 ... 240 V in 3 Ranges
- Delays from 100 ms...1023 h in 6 ranges
- Counts to 1023 in 3 Ranges

Approvals:

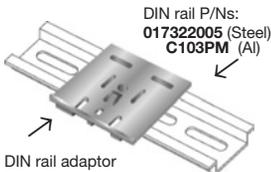
### Accessories



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



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



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

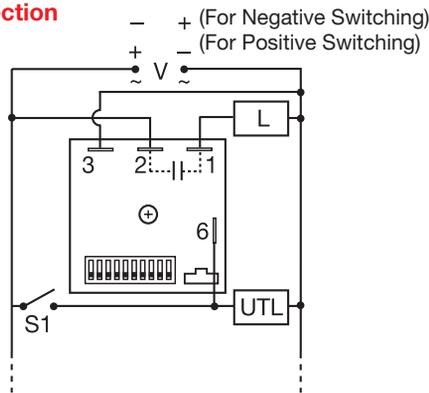
DIN rail adaptor  
P/N: **P1023-20**

See accessory pages for specifications.

### Description

The KSPU Series is a factory programmed module available in any 1 of 14 standard functions. The KSPU offers a single adjustable timer or counter function. Modules are manufactured without the function assigned. When an order is received, the function software is added. This approach provides fast delivery on all part numbers. Switch adjustment allows accurate selection of the time delay or number of counts the first time and every time. The 1 A steady, 10 A inrush rated solid state output provides 100 million operations, typical. Its microcontroller timing circuit provides excellent repeat accuracy and stability. Encapsulation protects against shock, vibration, and humidity. The KSPU Series is a cost effective approach for OEM applications that require small size, solid state reliability, and accurate switch adjustment. Special time ranges and functions are available; contact Technical Assistance (see below) for more information.

### Connection



V = Voltage S1 = Initiate Switch  
L = Load UTL = Untimed Load

The untimed load is optional. S1 is not used for some functions. Dashed lines are internal connections.

### Switch Adjustment

Adjustment Switch Operation			
TIME DELAY		COUNTER	
0.1...102.3	1...1023	1...165	1...63
OFF ON	OFF ON	OFF ON	OFF ON
6.3	544	57 counts	44 s Delay 2 counts to Start

One or more switches must be ON for proper operation.

### Ordering Table

**KSPU**  
Series

**X** Input  
**A** - 24 ... 240 V AC  
**P** - 12 ... 120 V DC Positive Switching  
**N** - 12 ... 120 V DC Negative Switching

**X** Time Delay/Counts

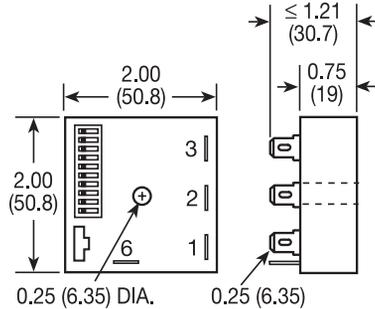
- 1** - 0.1 ... 102.3 s
- 2** - 1 ... 1023 s
- 3** - 0.1 ... 102.3 m
- 4** - 1 ... 1023 m
- 5** - 0.1 ... 102.3 h
- 6** - 1 ... 1023 h
- 7** - 1 ... 165 counts (straight) w/pulsed output
- 8** - 1 ... 1023 counts (binary) w/pulsed output
- 9** - 1 ... 7 counts to start 1 ... 63 s or m interval time

**X** Function\*\*

\*\*Specify Function (Refer to Function Chart for Code)

Example P/N: **KSPUA2RE**

### Mechanical View



Inches (Millimeters)

### \*\*Function Chart

- Delay on Make
- Delay on Break
- Recycle (ON Time First, Equal Times)
- Recycle (OFF Time First, Equal Times)
- Single Shot
- Interval
- Trailing Edge Single Shot
- Inverted Single Shot
- Inverted Delay on Break
- Accumulative Delay on Make
- Motion Detector/Retriggerable Single Shot
- Counter/Pulsed Output
- Counter/Interval Output

### Code

- M**
- B**
- RE**
- RD**
- S, SD**
- I**
- TS**
- US**
- UB**
- AM**
- PSD**
- C**
- CI**

For a Complete List of Functions with Descriptions, see Timer Function Section.

# ProgramaCube® KSPU Series Timing Module

Dedicated  
timers

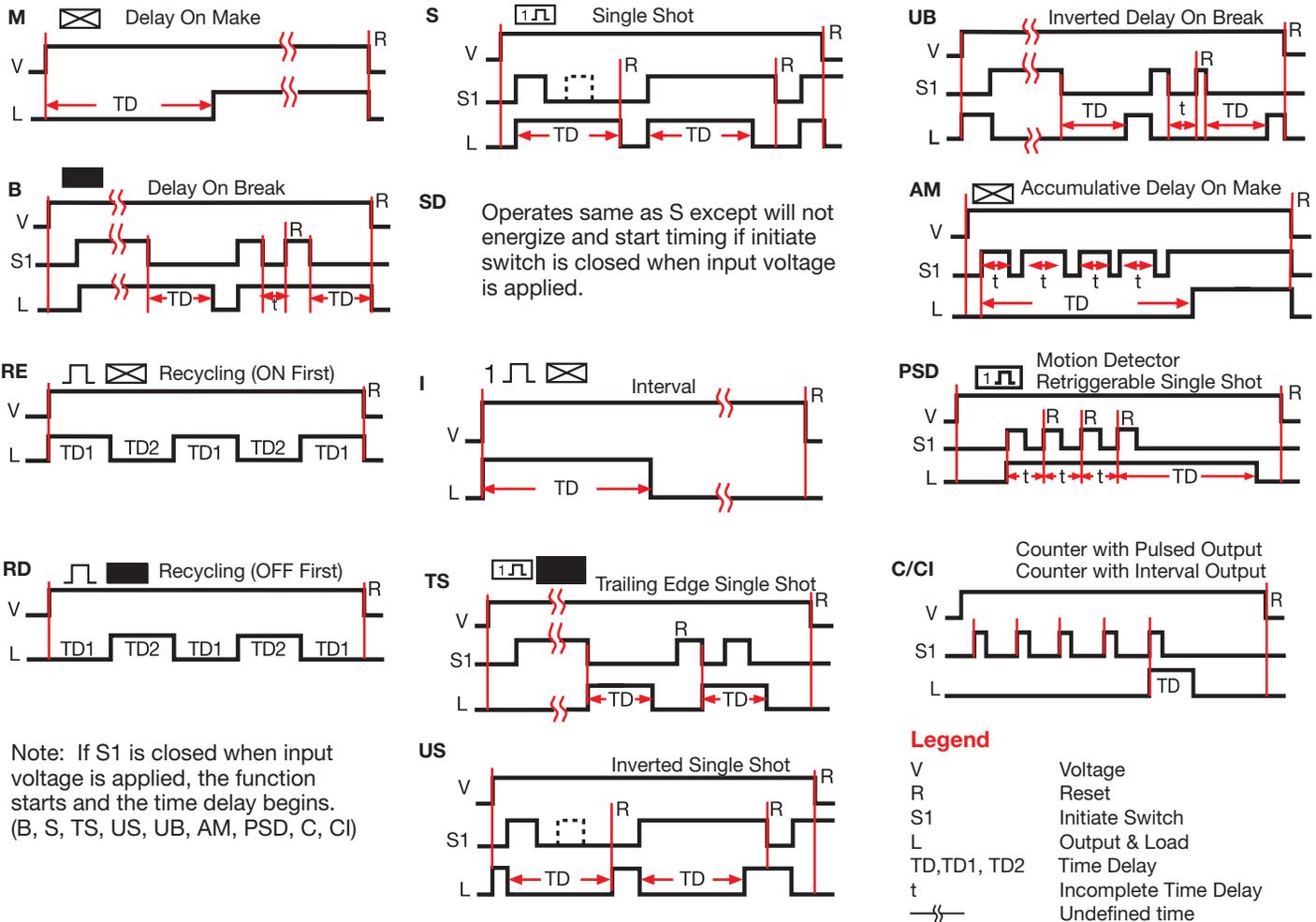
## Technical Data

<b>Time Delay</b> Type Range  Repeat Accuracy Setting Accuracy Reset Time Initiate Time Time Delay / Temp. & Voltage Count Range Count Rate	Microcontroller circuitry 0.1 ... 102.3 s, m or h in 0.1 s, m or h increments 1 ... 1023 s, m or h in 1 s, m or h increments 1 ... 63 s or m in 1 s or m increments +/-0.1% or 20 ms, whichever is greater ≤ +/-1% or 20 ms, whichever is greater ≤ 150 ms ≤ 20 ms ≤ +/-2% 1 ... 1023 in 3 ranges ≤ 25 counts per second	<b>Protection</b> Circuitry Dielectric Breakdown Insulation Resistance Polarity	Encapsulated ≥ 2000 V RMS terminals to mounting surface ≥ 100 MΩ DC units are reverse polarity protected
<b>Input</b> Voltage Tolerance Frequency/DC Ripple Power Consumption	12 ... 120 V DC; 24 ... 240 V AC ≤ +/-15% 50 ... 60 Hz / ≤ 10% AC ≤ 2 VA; DC ≤ 1 W	<b>Mechanical</b> Mounting Package Termination	Surface mt. with one #10 (M5 x 0.8) screw 2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm) 0.25 in. (6.35 mm) male quick connects
<b>Output</b> Type Rating Voltage Drop OFF State Leakage Current Counter Output (P/N Variable 7 & 8)	Solid state output 1 A steady, 10 A inrush for 16 ms AC ≅ 2.5 V at 1 A; DC ≅ 1 V at 1 A AC ≅ 5 mA at 240 V AC; DC ≅ 1 mA Output Pulse width: 300 ms +/-20%	<b>Environmental</b> Operating Temp. Storage Temp. Humidity Weight	-40°C ... +60°C -40°C ... +85°C 95% relative, non-condensing ≅ 2.4 oz (68 g)

5

## Function Diagrams

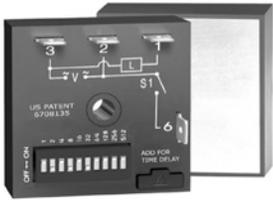
For a Complete List of Functions with Descriptions, see Timer Function Section.



Note: If S1 is closed when input voltage is applied, the function starts and the time delay begins. (B, S, TS, US, UB, AM, PSD, C, CI)

Dedicated  
timers

# ProgramaCube® NHPU Series Power Timing Module



US Patent 6708135



5

- High Load Currents up to 20 A, 200 A Inrush
- Factory Programmed
- Choose 1 of 14 Standard Functions
- Special Time Ranges and Functions Available
- Microcontroller Circuitry, +/-0.1% Repeat Accuracy
- Accurate Switch Adjustment
- 24 ... 240 V AC
- Delays from 100 ms...1023 h in 6 Ranges
- Counts to 1023 in 3 Ranges

Approvals:

## Accessories

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

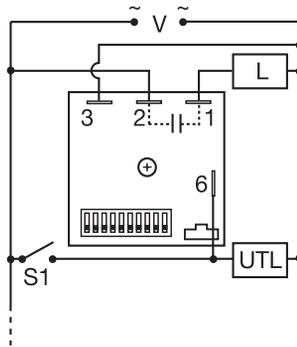
Quick connect to  
screw adaptor  
P/N: **P1015-18**

See accessory pages for specifications.

## Description

The NHPU Series is a factory programmed module available in any 1 of 14 standard functions. The NHPU offers a single adjustable timer or counter function. Modules are manufactured without the function assigned. When an order is received, the function software is added, making the modules complete. This approach provides fast delivery on all part numbers. Switch adjustment allows accurate selection of the time delay or number of counts, the first time and every time. The NHPU includes a high current solid state output. It can switch motors, lamps and heaters directly without the addition of a contactor. It can switch up to 20 A with up to 100 million operations, typical. Its microcontroller timing circuit provides excellent repeat accuracy and stability. Encapsulation protects against shock, vibration, and humidity. The NHPU Series is a cost effective approach for OEM applications that require small size, solid state reliability, and accurate switch adjustment. Special time ranges and functions are available; contact Technical Assistance (see below) for more information.

## Connection



V = Voltage L = Load  
UTL = Untimed Load S1 = Initiate Switch

The untimed load is optional. S1 is not used for some functions. Dashed lines are internal connections.

## Switch Adjustment

Adjustment Switch Operation			
TIME DELAY		COUNTER	
0.1...102.3	1...1023	1...165	1...63
OFF ▶ ON	OFF ▶ ON	OFF ▶ ON	OFF ▶ ON
0.1	1	1	1
0.2	2	2	2
0.4	4	3	4
0.8	8	4	8
1.6	16	5	16
3.2	32	10	32
6.4	64	20	M
12.8	128	30	1
25.6	256	40	2
51.2	512	50	4
6.3	544	57 counts	44 s Delay 2 counts to Start

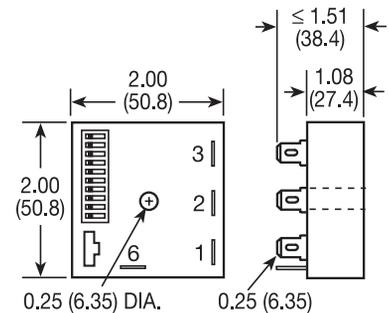
One or more switches must be ON for proper operation.

## Ordering Table

NHPU Series	X Output/Rating	X Input	X Time Delay/Counts	X Function**
	A - 6 A	A - 24 ... 240 V AC	-1 - 0.1 ... 102.3 s	- Specify Function (Refer to Function Chart for Code)
	B - 10 A		-2 - 1 ... 1023 s	
	C - 20 A		-3 - 0.1 ... 102.3 m	
			-4 - 1 ... 1023 m	
			-5 - 0.1 ... 102.3 h	
			-6 - 1 ... 1023 h	
			-7 - 1 ... 165 counts (straight) w/pulsed output	
			-8 - 1 ... 1023 counts (binary) w/pulsed output	
			-9 - 1 ... 7 counts to start 1 ... 63 s or m interval time	

Example P/N: **NHPUBA3TS, NHPUCA7C**

## Mechanical View



Inches (Millimeters)

## \*\*Function Chart

Function	Code
Delay on Make	M
Delay on Break	B
Recycle (ON Time First, Equal Times)	RE
Recycle (OFF Time First, Equal Times)	RD
Single Shot	S, SD
Interval	I
Trailing Edge Single Shot	TS
Inverted Single Shot	US
Inverted Delay on Break	UB
Accumulative Delay on Make	AM
Motion Detector/Retriggerable Single Shot	PSD
Counter/Pulsed Output	C
Counter/Interval Output	CI

For a Complete List of Functions with Descriptions, see Timer Function Section.

# ProgramaCube®

## NHPU Series

### Power Timing Module

Dedicated  
timers

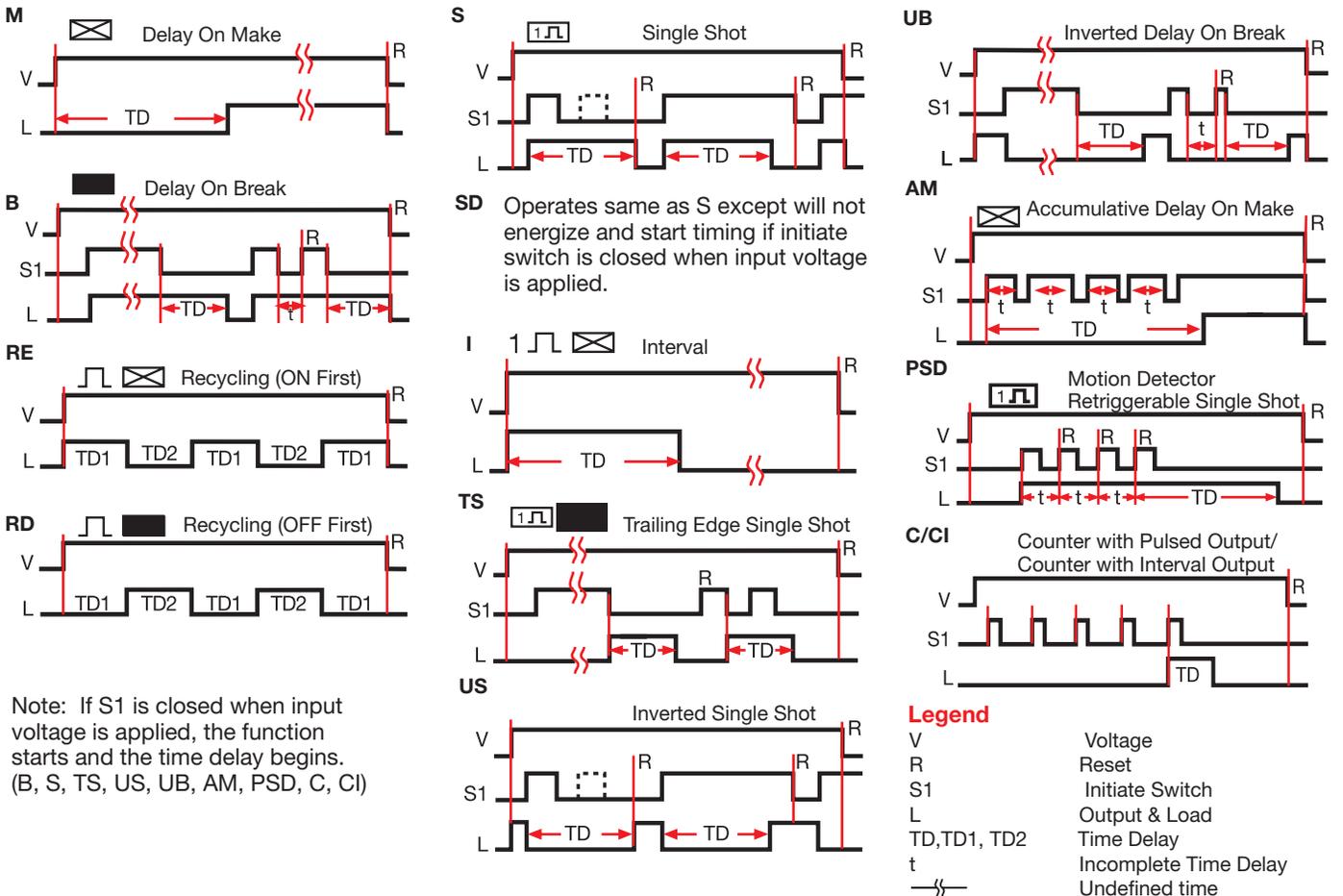
#### Technical Data

<b>Time Delay</b>		Microcontroller circuitry 0.1 ... 102.3 s, m or h in 0.1 s, m or h increments 1 ... 1023 s, m or h in 1 s, m or h increments 1 ... 63 s or m in 1 s or m increments +/-0.1% or 20 ms, whichever is greater ≤ +/-1% or 20 ms, whichever is greater	<b>Protection</b> Circuitry Dielectric Breakdown Insulation Resistance	Encapsulated ≥ 2000 V RMS terminals to mounting surface ≥ 100 MΩ
Type				
Range				
Repeat Accuracy				
Setting Accuracy				
Reset Time				
Initiate Time				
Time Delay vs. Temp. & Voltage				
Count Range				
Count Rate				
<b>Input</b>		24 ... 240 V AC ≤ +/-15% 50 ... 60 Hz	<b>Mechanical</b> Mounting *** Package Termination	Surface mt. with one #10 (M5 x 0.8) screw 2 x 2 x 1.51 in. (50.8 x 50.8 x 38.4 mm) 0.25 in. (6.35 mm) male quick connects
Voltage				
Tolerance				
Line Frequency				
<b>Output</b>		Solid state Output      Steady State      Inrush*** A            6 A                                  60 A B            10 A                                100 A C            20 A                                200 A	<b>Environmental</b> Operating Temp. Storage Temp. Humidity Weight	-40°C ... +60°C -40°C ... +85°C 95% relative, non-condensing ≅ 3.9 oz (111 g)
Type				
Rating				
Minimum Load Current		100 mA		
Voltage Drop		≅ 2.5 V at 1 A		
OFF State Leakage Current		≅ 5 mA at 230 V AC		
Counter Output (P/N Variable 7 & 8)		Pulse width: 300 ms +/-20%		
				***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.

5

#### Function Diagrams

For a Complete List of Functions with Descriptions, see Timer Function Section.



Note: If S1 is closed when input voltage is applied, the function starts and the time delay begins. (B, S, TS, US, UB, AM, PSD, C, CI)



---

**Sales Information:**

**ABB Inc.**  
1206 Hatton Road  
Wichita Falls, TX 76302  
Telephone 888-385-1221; 940-397-7000  
Fax 940-397-7085  
<http://www.abb-control.com>

**Technical Help and Product Support**

**ABB Inc.**  
Telephone 315-638-1300  
Technical Help 800-377-SSAC (7722)  
Fax 315-638-0333  
<http://www.ssac.com>

**Sales Information (Canada)**

**ABB Inc.**  
2105 32nd Avenue  
Lachine, Quebec H8T 3J1  
Canada

Telephone  
Atlantic & Quebec Region: 800-567-0203  
Ontario Region: 866-460-3300  
Mid-West & Pacific Region: 866-222-8368