

# VOLTAGE MONITOR RELAYS

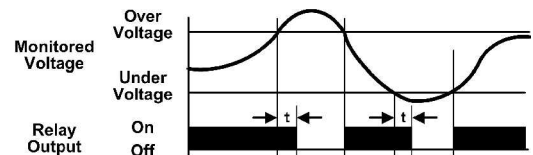
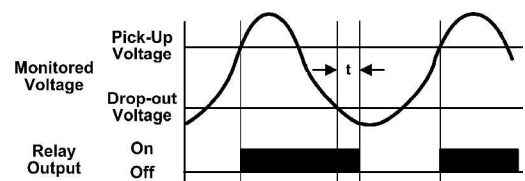
## PRODUCT SUMMARY



Voltage Monitor Relays monitor either AC single phase (50-60Hz) or DC voltages to protect equipment against voltage fault conditions. No separate supply (input) voltage is required on any Macromatic Voltage Monitor Relays. All versions are available in a compact plug-in case utilizing an 8 pin octal socket.

Macromatic offers two styles of Voltage Monitor Relays:

- ◆ Over/Under Voltage Relays--provides protection to equipment where either an over or under voltage condition is potentially damaging. When used as an under voltage relay, they provide protection to equipment that is required to operate above a minimum voltage. When used as over voltage relays, they protect equipment against excessive voltage conditions. Over/Under Voltage Relays are designed to operate when the operating voltage reaches a preset value and drop-out when the operating voltage drops to a level below the preset value.
- ◆ Voltage Band Relays--provides protection to equipment that is required to operate within an upper & lower voltage limit. As long as the operating voltage remains within an OVER & UNDER voltage range, the internal relay stays energized. If the operating voltage falls outside this range, the relay will drop-out.



These products are summarized below:

OVERVOLTAGE/UNDERVOLTAGE RELAYS					
Monitored Voltage	Pick-up Setting	Drop-out Setting	Time Delay on Drop-out	Series	Page
12V DC, 24V AC, 24V DC, 48V DC, 110V DC & 120V AC	Adjustable	Fixed	Fixed 500ms	VMP	23
	Adjustable	Adjustable	Fixed 500ms	VMKP	23
	Adjustable	Fixed	Adjustable 0.5-10 Seconds	VAP	24
	Adjustable	Adjustable	Adjustable 0.5-10 Seconds	VAKP	24
208-240V AC	Adjustable	Adjustable	Adjustable 0.1-10 Seconds	VAKPU	26
VOLTAGE BAND RELAYS					
Monitored Voltage	Overvoltage Setting	Undervoltage Setting	Time Delay on Drop-out	Series	Page
12V DC, 24V AC, 24V DC, 48V DC, 110V DC & 120V AC	Adjustable	Adjustable	Fixed 500ms	VWP	28
	Adjustable	Adjustable	Adjustable 0.5-10 Seconds	VWKP	28
208-240V AC	Adjustable	Adjustable	Adjustable 0.1-10 Seconds	VWKPU	30

# VOLTAGE MONITOR RELAYS

## VWKPU SERIES VOLTAGE BAND (WINDOW)

208-240V PLUG-IN



- ◆ Monitors 208-240V AC single phase voltage
- ◆ Provides voltage band (window) protection
- ◆ Wide range of user-adjustable Over Voltage and Under Voltage settings
- ◆ Independantly adjustable time delay on Pick-Up and Drop-Out
- ◆ LED indicates output relay status
- ◆ Compact plug-in case utilizing industry standard 8 pin octal socket
- ◆ 10A SPDT output contacts

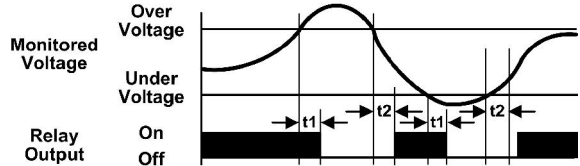


with appropriate socket

Voltage Band Relays provide protection to equipment that is required to operate within an upper & lower voltage limit. As long as the operating voltage remains within an OVER & UNDER voltage range, the internal relay stays energized. If the operating voltage falls outside this range, the relay will drop-out.

The VWKPU can be used to monitor any 208, 220 or 240V AC single phase voltage. The relay will energize (pick-up) when the voltage falls within the preset OVER trip point

(adjustable 100-125% of nominal) or UNDER trip point (adjustable 75-100% of nominal) for a period longer than the pick-up time delay ( $t_1$ ). If the operating voltage falls outside the preset OVER or UNDER trip points for a period longer than the drop-out time delay ( $t_2$ ), the relay will de-energize (drop-out). When the voltage returns to normal (within the preset OVER & UNDER trip points) for a period longer than the pick-up time delay ( $t_1$ ), the unit automatically resets and the relay energizes. The pick-up time ( $t_1$ ) and drop-out time ( $t_2$ ) are independantly adjustable.



### Adjustable Nominal Voltage Setting 208-240V AC Adjustable Time Delay on Pick-up & Drop-Out from 0.1 - 10 Seconds

NOMINAL VOLTAGE	UNDER VOLTAGE RANGE	OVER VOLTAGE RANGE	PRODUCT NUMBER	WIRING/ SOCKET
208, 220 & 240V AC	75-100% of Nominal Voltage Setting	100-125% of Pick-Up Setting	VWKPU	8 PIN OCTAL <b>70169-D</b>  MONITORED VOLTAGE <b>DIAGRAM 150</b>

Application Data & Dimensions—Page 31  
Sockets & Accessories—Pages 80 & 81



**800-238-7474**

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[sales@macromatic.com](mailto:sales@macromatic.com)

# VOLTAGE MONITOR RELAYS

## VWKPU SERIES VOLTAGE BAND (WINDOW)

### 208-240V PLUG-IN APPLICATION DATA & DIMENSIONS

#### APPLICATION DATA

##### Voltage Tolerance:

+50%/-40% of nominal voltage; AC voltages are 50-60Hz;  
No supply (input) voltage is required.

Load (Burden): Less than 3VA

##### Voltage Settings:

Over Voltage: 100-125% of Normal Voltage

Under Voltage: 75-100% of Normal Voltage

##### Temperature:

-28° to 65° C (-18° to 149° F)

##### Output Contacts:

SPDT: 10A @ 240V AC/30V DC, 1/2HP @ 240V AC

##### Life:

Mechanical: 10,000,000 operations

Full Load: 100,000 operations

##### Response Times:

Power Up: 2 seconds fixed delay

Operate: 0.1 - 10 seconds adjustable

Release: 0.1 - 10 seconds adjustable

Indicator LED: Red steady when relay is energized; Green when relay is off; Green rapid flashing when in power-up mode.

Reset: Automatic

##### Approvals:



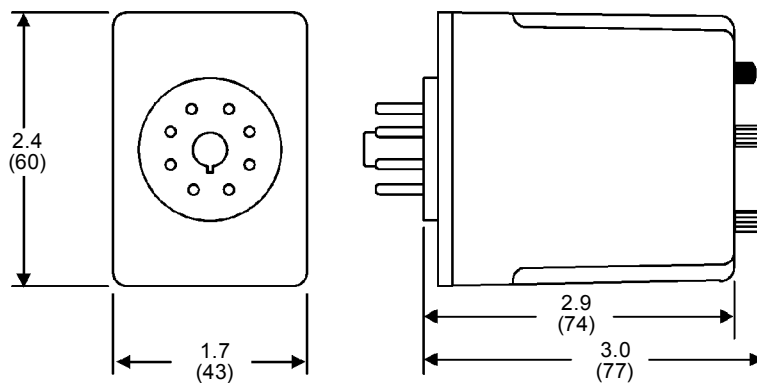
Low Voltage & EMC Directives  
EN60947-1, EN60947-5-1



with  
appropriate  
socket

File #E109466

#### DIMENSIONS



All Dimensions in  
Inches (Millimeters)

# SOCKETS & ACCESSORIES

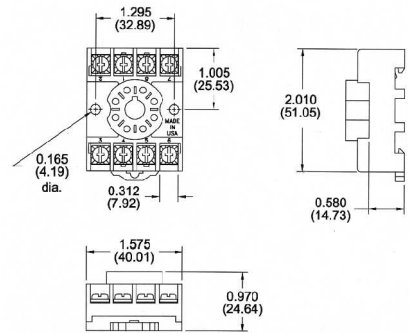
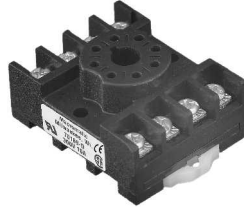
## 8 Pin Octal Socket-- Surface or DIN Rail-Mounted

10A @ 600V \*  
1 or 2 #12-22 AWG Wire  
Recommended Tightening Torque  
of 6-7 in.-lbs. (12 in.-lbs maximum)  
Pressure Wire Clamp Terminations



File #E169693 File #LR701114

### Product Number 70169-D



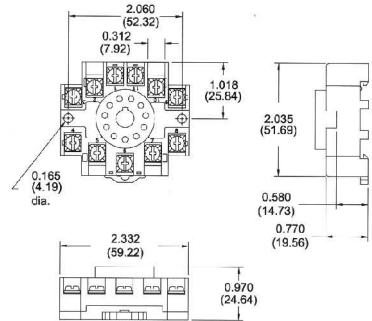
## 11 Pin Octal Socket-- Surface or DIN Rail-Mounted

10A @ 300V  
1 or 2 #12-22 AWG Wire  
Recommended Tightening Torque  
of 6-7 in.-lbs. (12 in.-lbs maximum)  
Pressure Wire Clamp Terminations



File #E169693 File #LR701114

### Product Number 70170-D



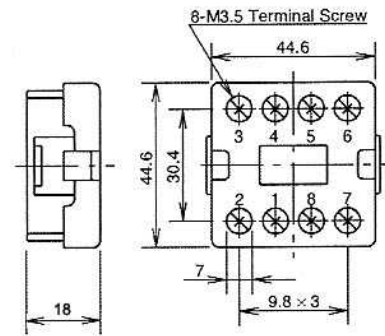
## 8 Pin Octal Socket-- Back-Mounted

10A @ 300V  
Pressure Wire Clamp Terminations



File #E62437

### Product Number SR6P-M08G



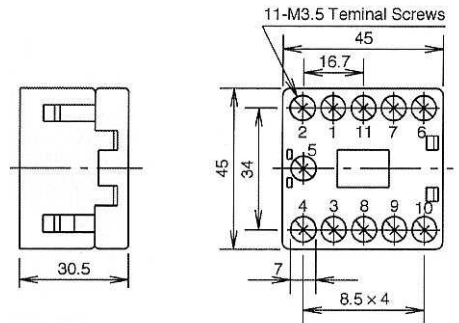
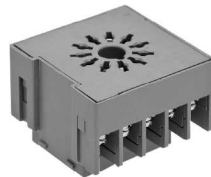
## 11 Pin Octal Socket-- Back-Mounted

10A @ 300V  
Pressure Wire Clamp Terminations



File #E62437

### Product Number SR6P-M11G



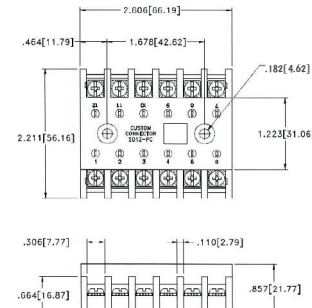
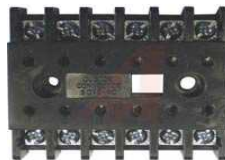
## 12 Pin Socket-- Surface-Mounted

10A @ 600V  
#12-20 AWG Wire  
Pressure Wire Clamp Terminations



File #E60008 File #LR29513

### Product Number SD12-PC



**NOTE:** if a 12 Pin Socket is required for DIN-rail mounting, please contact Macromatic.

\* Plug-in Three-Phase Monitor Relays require a 600V-rated socket when used on system voltages greater than 300V.

# SOCKETS & ACCESSORIES

## Hold Down Spring Product Number 70166

Can be used for:

- ◆ Panel-Mounted Sockets
- ◆ Sockets Mounted to 35mm DIN Track \*

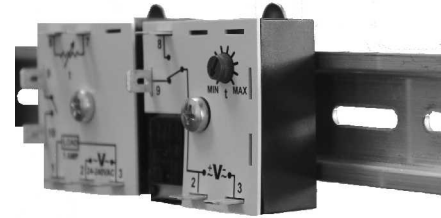
\* Requires two machine screws with washers & nuts-- contact Macromatic or [www.macromatic.com/70166](http://www.macromatic.com/70166) for more information.



## DIN Rail Adaptor Kit Product Number 70500

Quick & Economical Way to Install Any THx Series 2" x 2" Encapsulated Time Delay Relays on 35mm DIN Track

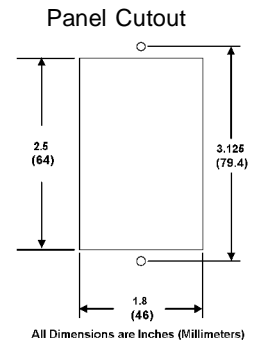
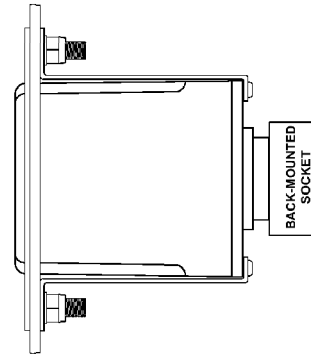
- ◆ Clip Comes with a Threaded Hole to Eliminate Need for a Washer & Nut
- ◆ All Mounting Hardware Included



## Panel Mount Assembly For Panel Mounting Standard Plug-in Products Product Number 70400

This assembly provides a simple & economical method to mount plug-in products to the deadfront of an enclosure/panel:

- ◆ Sturdy Aluminum Construction
- ◆ Stainless Steel Studs
- ◆ All Mounting Hardware Included
- ◆ White Textured Painted Finish
- ◆ 2 3/16" W x 3 7/16" H



(Relay Not Included with Assembly--  
Shown for Reference Only)

## INDEX BY PRODUCT NUMBER

Product *	Page	Product *	Page	Product *	Page	Product *	Page	Product *	Page	Product *	Page
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70169-D	80	ARP024A6R	32	ATP024A7R	36	CMP01A22	18	COKP05A22	19	COP10A68	19
70170-D	80	ARP120A2	32	ATP120A1	36	CMP01A28	18	COKP05A28	19	CUH05Ayyy ***	16
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ARP012A2	32	ARP120A3R	34	CAH05Ayyy	16	CMP05A22	18	COKP10A22	19	CUP01A22	20
ARP012A2R	32	ARP120A5	34	CAH20Ayyy	16	CMP05A28	18	COKP10A28	19	CUP01A28	20
ARP012A3	34	ARP120A5R	34	CAH50Ayyy	16	CMP05A62	18	COKP10A62	19	CUP01A62	20
ARP012A3R	34	ARP120A6	32	CMKP01A22	18	CMP05A68	18	COKP10A68	19	CUP01A68	20
ARP012A5	34	ARP120A6R	32	CMKP01A28	18	CMP10A22	18	COP01A22	19	CUP05A22	20
ARP012A5R	34	ARP240A2	32	CMKP01A62	18	CMP10A28	18	COP01A28	19	CUP05A28	20
ARP012A6	32	ARP240A2R	32	CMKP01A68	18	CMP10A62	18	COP01A62	19	CUP05A62	20
ARP012A6R	32	ARP240A3	34	CMKP05A22	18	CMP10A68	18	COP01A68	19	CUP05A68	20
ARP024A2	32	ARP240A3R	34	CMKP05A28	18	COH05Ayyy	16	COP05A22	19	CUP10A22	20
ARP024A2R	32	ARP240A5	34	CMKP05A62	18	COH20Ayyy	16	COP05A28	19	CUP10A28	20
ARP024A3	34	ARP240A5R	34	CMKP05A68	18	COH50Ayyy	16	COP05A62	19	CUP10A62	20
ARP024A3R	34	ARP240A6	32	CMKP10A22	18	COKP01A22	19	COP05A68	19	CUP10A68	20
ARP024A5	34	ARP240A6R	32	CMKP10A28	18	COKP01A28	19	COP10A22	19		
ARP024A5R	34	ATP024A1	36	CMKP10A62	18	COKP01A62	19	COP10A28	19		

\* The "-xx" suffix denotes the time range for time delay relays with adjustable time delay. Contact Macromatic for any product not listed.

\*\*\* The "-yyy" suffix denotes the input voltage, trip delay & sensing delay for CxH Series encapsulated current sensing relays.

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ISP120A	40	TD-78126	69	THR-11561-xxJ	46	THR-16161-xxJ	44	TR-51522-xx	57	TR-61326	63
PAP120	8	TD-78128	69	THR-11561-xxJT	48	THR-16162-xx	43	TR-51526-xx	57	TR-61328	63
PAP208	8	TD-80221-xx	67	THR-11561-xxT	47	THR-16162-xxJ	44	TR-51528-xx	57	TR-61521	63
PAP240	8	TD-80222-xx	67	THR-11562-xx	45	THR-16166-xx	43	TR-51561-xx	60	TR-61522	63
PAP400	8	TD-80226-xx	67	THR-11562-xxJ	46	THR-16166-xxJ	44	TR-51562-xx	60	TR-61526	63
PAP480	8	TD-80228-xx	67	THR-11562-xxJT	48	THR-16168-xx	43	TR-51566-xx	60	TR-61528	63
PCP1	6	TD-80521-xx	67	THR-11562-xxT	47	THR-16168-xxJ	44	TR-51568-xx	60	TR-61621	63
PCP2	6	TD-80522-xx	67	THR-11566-xx	45	THR-16561-xx	45	TR-51621-xx	57	TR-61622	63
PLP120	6	TD-80526-xx	67	THR-11566-xxJ	46	THR-16561-xxJ	46	TR-51622-xx	57	TR-61626	63
PLP208	6	TD-80528-xx	67	THR-11566-xxJT	48	THR-16561-xxJT	48	TR-51626-xx	57	TR-61628	63
PLP240	6	TD-81521-xx	67	THR-11566-xxT	47	THR-16561-xxT	47	TR-51628-xx	57	TR-61721	63
PLP400	6	TD-81522-xx	67	THR-11568-xx	45	THR-16562-xx	45	TR-51661-xx	60	TR-61722	63
PLP480	6	TD-81526-xx	67	THR-11568-xxJ	46	THR-16562-xxJ	46	TR-51662-xx	60	TR-61726	63
PMD120	14	TD-81528-xx	67	THR-11568-xxJT	48	THR-16562-xxJT	48	TR-51666-xx	60	TR-61728	63
PMD600	14	TD-81621-xx	67	THR-11568-xxT	47	THR-16562-xxT	47	TR-51668-xx	60	TR-61821	63
PMDU	14	TD-81622-xx	67	THR-11661-xx	45	THR-16566-xx	45	TR-51721-xx	57	TR-61822	63
PMP120	10	TD-81626-xx	67	THR-11661-xxJ	46	THR-16566-xxJ	46	TR-51722-xx	57	TR-61826	63
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PMPU-FA8	12	TD-83128-xx	67	THR-11662-xxJT	48	THR-16568-xxJT	48	TR-51766-xx	60	TR-61928	63
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SFP120A025	38	TD-85126-xx	67	THR-11666-xxJ	46	THS-1024D-xx	50	TR-51822-xx	57	TR-63126	64
SFP120A100	38	TD-85128-xx	67	THR-11666-xxJT	48	THS-1054A-xx	50	TR-51826-xx	57	TR-63128	64
SFP120A250	38	TD-88121	66	THR-11666-xxT	47	THS-1054D-xx	50	TR-51828-xx	57	TR-65121	64
SFP120B025	38	TD-88122	66	THR-11668-xx	45	THS-1094A-xx	50	TR-51861-xx	60	TR-65122	64
SFP120B100	38	TD-88126	66	THR-11668-xxJ	46	THS-1094D-xx	50	TR-51862-xx	60	TR-65126	64
SFP120B250	38	TD-88128	66	THR-11668-xxJT	48	THS-1134A-xx	51	TR-51866-xx	60	TR-65128	64
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SFP240B025	38	THR-10266-xxJ	44	THR-12262-xxJ	46	THS-1154D-xxT	52	TR-51962-xx	60	TR-66526	64
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SFP240B250	38	THR-10268-xxJ	44	THR-12262-xxT	47	THS-1164A-xxT	52	TR-51968-xx	60	VAKP012D	24
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SS-6266-xx	76	THR-10568-xx	43	THR-12268-xxJT	48	THS-1314A-xx	50	TR-54126-xx	58	VAP012D	24
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SS-8762-xx	76	THR-10868-xx	43	THR-13168-xx	43	THS-1614A-xx	50	TR-56126-xx	58	VMKP024D	23
SS-8766-xx	76	THR-10868-xxJ	44	THR-13168-xxJ	44	THS-1614D-xx	50	TR-56128-xx	58	VMKP048D	23
SS-8768-xx	76	THR-10961-xx	43	THR-14161-xx	45	THS-1654A-xx	51	TR-56521-xx	58	VMKP110D	23
TAA1U	74	THR-10961-xxJ	44	THR-14161-xxJ	46	THS-1654A-xxT	52	TR-56522-xx	58	VMKP120A	23
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TD-70222	70	THR-10966-xx	43	THR-14162-xx	45	TR-50221-xx	56	TR-60221	62	VMP024D	23
TD-70226	70	THR-10966-xxJ	44	THR-14162-xxJ	46	TR-50222-xx	56	TR-60222	62	VMP048D	23
TD-70228	70	THR-10968-xx	43	THR-14162-xxJT	48	TR-50226-xx	56	TR-60226	62	VMP110D	23
TD-70521	70	THR-10968-xxJ	44	THR-14162-xxT	47	TR-50228-xx	56	TR-60228	62	VMP120A	23
TD-70522	70	THR-11361-xx	45	THR-14166-xx	45	TR-50521-xx	56	TR-60521	62	VVKP012D	28
TD-70526	70	THR-11361-xxJ	46	THR-14166-xxJ	46	TR-50522-xx	56	TR-60522	62	VVKP024A	28
TD-70528	70	THR-11361-xxJT	48	THR-14166-xxJT	48	TR-50526-xx	56	TR-60526	62	VVKP024D	28
TD-70821	70	THR-11361-xxT	47	THR-14166-xxT	47	TR-50528-xx	56	TR-60528	62	VVKP048D	28
TD-70822	70	THR-11362-xx	45	THR-14168-xx	45	TR-50821-xx	56	TR-60621	62	VVKP110D	28
TD-70826	70	THR-11362-xxJ	46	THR-14168-xxJ	46	TR-50822-xx	56	TR-60622	62	VVKP120A	28
TD-70828	70	THR-11362-xxJT	48	THR-14168-xxJT	48	TR-50826-xx	56	TR-60628	62	VVKPU	30
TD-71521	70	THR-11362-xxT	47	THR-14168-xxT	47	TR-50828-xx	56	TR-60821	62	VW P012D	28
TD-71522	70	THR-11366-xx	45	THR-15161-xx	43	TR-51321-xx	57	TR-60822	62	VW P024A	28
TD-71526	70	THR-11366-xxJ	46	THR-15161-xxJ	44	TR-51322-xx	57	TR-60826	62	VW P024D	28
TD-71528	70	THR-11366-xxJT	48	THR-15162-xx	43	TR-51326-xx	57	TR-60828	62	VW P048D	28
TD-71621	70	THR-11366-xxT	47	THR-15162-xxJ	44	TR-51328-xx	57	TR-60921	62	VWP110D	28
TD-71622	70	THR-11368-xx	45	THR-15166-xx	43	TR-51361-xx	60	TR-60922	62	VWP120A	28
TD-71626	70	THR-11368-xxJ	46	THR-15166-xxJ	44	TR-51362-xx	60	TR-60926	62		
TD-71628	70	THR-11368-xxJT	48	THR-15168-xx	43	TR-51366-xx	60	TR-60928	62		
TD-78121	69	THR-11368-xxT	47	THR-15168-xxJ	44	TR-51368-xx	60	TR-61321	63		

\* The "-xx" suffix denotes the time range for time delay relays with adjustable time delay. Contact Macromatic for any product not listed.