MACROMATIC

Better. By Design.

Control, Monitoring and Protection

Product Selection Guide

General Purpose Relays

Alternating Relays

Intrinsically Safe Barrier Relays

Three-Phase Monitor Relays

Time Delay Relays

Industrial control products deliver high quality and exceptional value

When we say Macromatic is "Better by Design" we are referring to both the performance of our products and our exceptional customer service - before, during and after the sale.

Our attention to your requirements includes engineering assistance for your unique applications, quick turnaround on prototypes, and the best technical support in the industry.

Macromatic products are used in systems for a range of industries including water/wastewater, pump and motor control, irrigation, oil and gas, HVACR, material handling, lifts and elevators and other systems requiring process control and protection.

NEED TECHNICAL HELP? HAVE A SPECIAL APPLICATION?

Can't decide which product is most suitable for your application? Need a custom-engineered solution? Having trouble setting up one of our products?

View our online Technical Resource Center at *macromatic.com/technical-support* or contact our team of technical advisors at *macromatic.com/contact*.

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GS Series:
- Slim relays (6 mm wide on rail) for high-density applications
- Relay and socket assembled as one unit for use together.
- One Form C contact
- High capacity 6 Amp rating

GB Series:
- "Ice Cube" style with blade terminals
- Economical, compact design
- Sockets for DIN-rail or screw mounting
- Two Form C contacts rated 12 Amp
- Three Form C contacts rated 10 Amp
- Four Form C contacts rated 6 Amp

GR Series:
- "Ice Cube" style with octal (round) terminals
- Economical, compact design
- Sockets for DIN-rail or screw mounting
- Two Form C or Three Form C contacts rated 10 Amp

Approvals for all General Purpose Relays:

Compact, side-by-side mounting simplifies installation and wiring for reduced costs.

GS Series

GB Series

GR Series
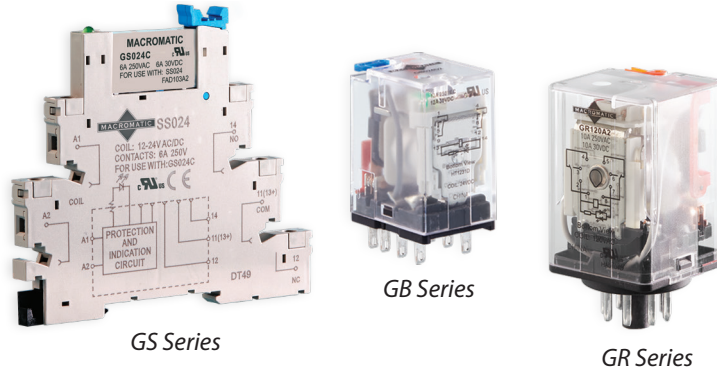
COMPACT DESIGN PROVIDES ECONOMICAL AND RELIABLE OPERATION

Small profile General Purpose Relays make the best use of panel space in applications with space restrictions. The relays are economical for reduced system cost, while providing durable and reliable operation.

Three configurations offer mounting versatility. Slim GS Series relays, installed in sockets for DIN-rail mounting, are only 0.25 in (6 mm) wide. GB Series (blade terminals) and GR series (octal terminals) installed on sockets can be DIN-Rail or screw mounted.

EASY INSTALLATION, TESTING AND TROUBLESHOOTING

Side-by-side DIN-rail mounting simplifies installation and wiring. GB Series and GR Series are color coded for easy testing and troubleshooting of control logic circuits. AC voltage units have orange "Push-to-Test" buttons. DC voltage units have blue "Push to Test" buttons.

The buttons can be pushed for a momentary test. Or, they can be locked in place with a simple 90-degree rotation. All relays have an LED light for visual confirmation that the relay is energized. AC is red and DC is green.

TYPICAL MODEL CODE

GSC, GB and GR Series

Family	Style	Control Voltage	Output Contacts	Options

Family		Style		Control Voltage		Output Contacts		Options	
G	General Purpose	SC	Slim DIN Rail	024	24V AC/DC (GS Series) ■	2	2 Form C (GB and GR Series Only)	T	Omit Push-to-Test (GR Series Only)
		B	Blade Terminal	120	120V AC/DC (GS Series) ■	3	3 Form C (GB and GR Series Only)		
		R	Octal Terminal	024D	24V DC (GB and GR Series)	4	4 Form C (GB Series Only)		
				120A	120V AC (GB and GR Series)	C	1 Form C (GSC Series Only) ■		

■ *GSC024C is comprised of GS024C (relay) and SS024 (socket).*
GSC120C is comprised of GS060C (relay) and SS120 (socket).

	CONTACTS	SOCKETS
GB	2 Form C	SB2ZC5 8-blade - Order Separately
	3 Form C	SB3ZC5 11-blade - Order Separately
	4 Form C	SB4ZC5 14-blade - Order Separately
GR	2 Form C	SR2ZC3 8-pin - Order Separately
	3 Form C	SR3ZC3 11-pin - Order Separately

Alternating Relays

ARP Series:
- Plug-in enclosure uses standard 8- or 11-pin octal socket
- Duplex control of two loads
- 10 A SPDT, DPDT or DPDT Cross-Wired output

with appropriate socket

ARF Series:
- Flange enclosure for door mounting (back-mounted socket included)
- Duplex control of two loads
- 10 A SPDT or DPDT Cross-Wired output

ATP Series:
- Plug-in enclosure uses standard 8-pin octal or 12-pin square socket
- Triplex control of three loads
- Works with three switch inputs: LEAD, LAG and LAG2
- Optional top-mounted switch allows use as Duplexor until system expansion requires added third load
- 3 A SPNO output contacts

with appropriate socket

Equalizing run times increases equipment life and provides additional capacity.

ARP Series

ARF Series

ATP Series
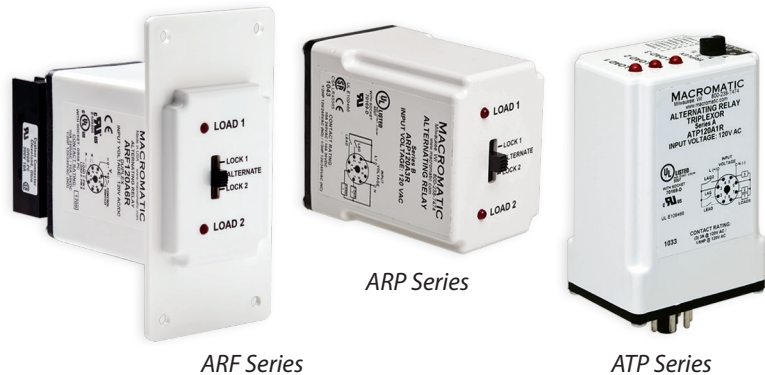
EQUALIZING THE RUN TIME OF MULTIPLE LOADS

Alternating Relays are used in applications where the optimization of load usage is required by equalizing the run time of multiple loads.

When identical loads are used for the same jobs, a standby unit is typically available in case the first load fails. However, an idle standby unit might deteriorate due to lack of use and is not a reliable backup. Alternating relays prevent this by assuring that multiple loads get equal run time.

CONTROLLING MULTIPLE LOADS FOR ADDITIONAL CAPACITY

Alternating Relays can also be used where multiple loads are on at the same time for additional capacity, if one load cannot keep up with demand.

This alternating action is normally initiated by a control switch such as a float switch or pressure switch. Each time the initiating switch is opened, turning off a load, the alternating relay will change state, thus alternating between multiple loads.

Typical applications include pump/motor units with float switches as the initiating contact, or compressors with pressure switches, or thermostats as the initiating contact.

DUPLEX AND TRIPLEX CONTROL OF LOADS

Macromatic offers two types of Alternating Relays:

Duplexor: For controlling two loads with both plug-in (ARP Series) and Flange enclosure (ARF Series) for inner-door mounting, in SPDT, DPDT and DPDT Cross- Wired output configurations. ARP Series Duplex Controllers provides Sequence On - Simultaneous OFF (S.O.S.O.) operation with three switch inputs.

Triplexor: For controlling up to three loads with plug-in enclosures (ATP Series). An optional top-mounted switch allows it to be used as a Duplexor until system expansion requires an added third load.

ARP Series Duplex Controllers:

◆ Combines the functions of alternating relay, control relay and auxiliary contacts in one unit.

◆ Protects against failures of both OFF and LEAD switches

◆ Space saving, compact plug-in design uses standard 8-pin octal socket

◆ Low-profile selector switch for normal alteration or to lock either load to be on first

◆ Two LEDs indicate load to be energized first

◆ 5A output contacts

with appropriate socket
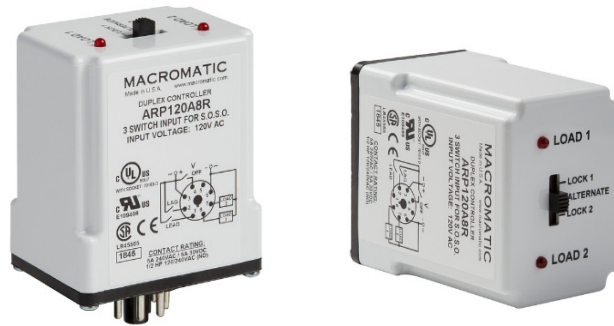
ARP Series Duplex Controller

DUPLEX CONTROLLERS FOR S.O.S.O. OPERATION REDUCE PANEL COSTS

Many duplex pump applications require Sequence On – Simultaneous OFF (S.O.S.O.) operation with three switch inputs and alternation of which pump is turned on first. The two loads are energized sequentially when the LEAD & LAG switches close, but remain on together until the OFF switch is opened.

Macromatic ARP Series Duplex Controllers combine the function of alternating relay, control relay and auxiliary contacts in one plug-in unit. This reduces control panel cost by saving space, reducing the number of components and minimizing assembly labor.

TYPICAL MODEL CODE

ARP, ARF and ATP Series

Family	Function	Enclosure Style	Control Voltage	Output Configurations	Standard Modifications

A	Alternating

R	Duplexor
T	Triplexor

P	Plug-in
F	Flange Mounted - Available for Output Configurations A3, A6 and A8

012	12V AC/DC (ARP and ARF Series only)
024	24V AC/DC
120	120V AC
240	240V AC (ARP and ARF Series only)

A1	8-pin Octal Base (ATP Series only)
A2	DPDT (ARP Series only)
A3	DPDT Cross-Wired, Pins 3-6 Input Voltage (ARP & ARF Series only)
A4	DPDT Cross-Wired 12-pin Square Base (ARP Series only)
A5	DPDT Cross-Wired, Pins 5-6 Input Voltage (ARP Series only)
A6	SPDT (ARP & ARF Series only)
A7	12-pin Square Base (ATP Series only)
A8R	Duplex Controller for S.O.S.O. Operation (3-6 Input Voltage) with standard switch to select normal alternation or lock loads 1or 2 (Model ARP***A8R)

R	Optional switch to select normal alternation or lock Loads 1 or 2 (ARP Series only) - Standard on ARF Series;
	Optional switch to operate as normal Triplexor or Duplexer or lock Loads in sequence (ATP Series only);
Z	Bulk Packaging

SERIES	OUTPUT CONFIGURATION	SOCKETS
ARP	A2	70170-D 11-pin - Order Separately
ARP	A3, A5, A6, A8	70169-D 8-pin - Order Separately
ARP	A4	SD12-PC 12-pin - Order Separately
ATP	A1	70169-D 8-pin - Order Separately
ATP	A7	SD12-PC 12-pin - Order Separately
ARF	A3, A6	SR6P-M08G (included)

CAH, COH, CUH Series:
- ◆ Encapsulated enclosure
- ◆ Monitors AC over-current or under-current
- ◆ Three separate adjustable fault trip current ranges (0.5 - 50 A)

COKP Series:
- ◆ Plug-in enclosure uses standard 8-pin octal socket
- ◆ Monitors AC over-current
- ◆ Three separate adjustable current monitoring ranges (0.1 - 10 A)

with appropriate socket

CAP Series:
- ◆ Plug-in enclosure uses 11-pin octal socket for DIN-rail or panel mounting
- ◆ Monitors 3 built-in current ranges for both AC and DC over-current
- ◆ Non-latching and latching modes

with appropriate socket

Protect sensitive and expensive equipment by detecting current faults and no-load conditions.

CAH Series

COKP Series

CAP Series

SELECT FROM A WIDE VARIETY OF CURRENT SENSING RELAYS

Current Sensing Relays protect equipment by detecting current fault conditions. An LED indicates fault status. All models have 10 Amp SPDT output contact ratings.

Models with encapsulated construction offer protection in harsh environments. Three models (CAH, COH and CUH) offer a choice of sensing functions and include user-adjustable settings for fault trip current and time delay.

COKP models with plug-in enclosures include user-adjustable pick-up current settings within one of three ranges.

CAP Series relays also have plug-in enclosure. These models are the most versatile with three potentiometers for selecting the pick-up setting, selecting the drop-out setting, and setting the start-up sensing delay.

These relays are ideal for detecting locked rotor or load loss condition, conveyor jam-up conditions, machine tool wear, no load conditions, or monitoring heater or lamp loads.

TYPICAL MODEL CODE

CAH, COH, CUH, COKP, AND CAP Series

| Family | Function and Enclosure Style | Current Range | Output | Control Voltage | Trip Delay | Sensing Delay on Power-up |

C	Current Sensing	

	ENCAPSULATED ENCLOSURE:	
AH	Over-current & Undercurrent - Adjustable Pick-up Setting and Fixed Drop-out Setting	
OH	Over-current - Adjustable Pick-up Setting and Fixed Drop-out Setting	
UH	Under-current - Fixed Pick-up Setting & Adjustable Drop-out Setting	
	PLUG-IN ENCLOSURE:	
AP	Over-current with Latching - Adjustable Pick-up Setting and Adjustable Drop-out Setting. Adjustment for Time Delay on Start-up (Ts)	
OKP	Over-current - Adjustable Pick-up Setting & Adjustable Drop-out Setting. Adjustable delay on energization of output relay (T)	

	SOCKETS
COKP	70169-D 8-pin - Order Separately
CAP	70170-D 11-pin - Order Separately

ENCAPSULATED:	
05A	0.5 - 5 Amp
20A	2 - 20 Amp
50A	5 - 50 Amp
COKP PLUG-IN:	
01A	0.1 - 1 Amp
05A	0.5 - 5 Amp
10A	1 - 10 Amp
CAP PLUG-IN:	
10AD	DC: 5 - 100 mA, 0.05 - 1A, 0.5 - 10A AC: 3.5 - 70.7 mA, 0.035 - 0.707 A, 0.35 - 7.707 A

COKP ONLY:	
6	10A SPDT

ENCAPSULATED:	
1	240V AC
2	120V AC
6	12V DC
8	24V AC/DC
PLUG-IN:	
2	120V AC
8	24V AC

ENCAPSULATED ONLY:	
A	0.150 - 7 Seconds
B	0.5 - 50 Seconds
F	Fixed time delay in seconds, in whole of 0.5 increments

ENCAPSULATED ONLY:	
C	No Delay
D	1 Second
E	2 Seconds
F	3 Seconds
G	4 Seconds
H	5 Seconds
J	6 Seconds

Protect HazLoc circuits and control loads without additional relays or contactors.

ISD Series

ISE Series

ISP Series on Socket

ISD and ISE Series:

◆ Both series are approved for use in these Hazardous Locations:

Class 1, Div 1 (Zones 0 and 1 Canada), Group A, B, C, D;

Class II, Div 1 (Zones 20 and 21 Canada), Group E, F, G;

Class III, Div 1

◆ Isolated 5A relay outputs

ISD Features

◆ Four-channel with independent selection of configuration for each.

◆ 60 mm wide enclosure for DIN-rail or panel mounting.
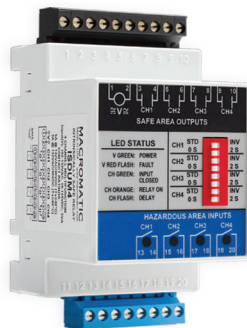
◆ Choice of operating modes and time delay

ISE Features

◆ One-channel

◆ 17.5 mm wide enclosure for DIN-rail or panel mounting.

◆ Standard or inverse logic

ISP Series:

◆ One-channel

◆ Plug-in enclosure with socket for DIN-rail or panel mounting

◆ Approved for use in these Hazardous Locations:

Class 1, Div 1, Group A, B, C, D

Class II, Div 1, Group E, F, G

Class III, Div 1

◆ Isolated 10A relay output

CIRCUIT PROTECTION AND CONTROL IN ONE COMPACT DEVICE

Intrinsically Safe Barrier Relays provide low-cost protection when controlling loads with input devices located in hazardous areas. IS circuits operate at low-energy levels that cannot ignite potentially explosive atmospheres. In the event of a fault condition, the IS barrier prevents excess voltage and current from reaching the hazardous area.

ISD SERIES: FOUR CHANNEL DIN-RAIL MOUNTED BARRIER RELAYS

ISD Series barrier relays, with a 60 mm wide enclosure, mount on 35mm DIN-rail or can be panel-mounted with screws.

These barrier relays provide a safe and reliable method to control up to four loads (motor starters, relays, etc.) with up to four input devices (switches, sensors, etc.) located in a hazardous area. Models are available for time delay or logic selection to be independently applied to each channel.

Terminals are pluggable and removable for easy connection.

ISE SERIES: ONE-CHANNEL DIN-RAIL MOUNTED BARRIER RELAYS

ISE Series barrier relays, with 17.5 mm wide enclosure, mount on 35mm DIN-rail or can be panel-mounted with screws. These barrier relays provide a safe method to control a single load with a single input device located in a hazardous area.

ISP SERIES: ONE-CHANNEL PLUG-IN BARRIER RELAYS

ISP Series barrier relays, with an 8-pin plug-in design with socket, can be mounted on 35mm DIN-rail or panel-mounted with two screws. These barrier relays provide a safe method to control a single load with a single input device located in a hazardous area.

TYPICAL MODEL CODE

ISD, ISE and ISP Series

Family	Enclosure Style	Control Voltage	Function	Number of Channels	Standard Modification
IS Intrinsically Safe		U 102-132V AC and 10-125V DC (ISD and ISE Series only)	R Time delay or logic selection applied to all channels (ISD and ISE Series only)		V Inverted Operation (ISE Series only)
	D 60 mm	120A 120V AC (ISP Series Only)	M Time delay or logic selection independently applied to each channel (ISD Series only)	1 1 Channel (ISE Series only)	
	E 17.5 mm			4 4 channels (ISD Series only)	
	P Plug-in				

LCP Series:

◆ Plug-in enclosure uses standard 8-pin octal socket

◆ Controls level of conductive liquids in Pump Up (Fill) or Pump Down (Drain) applications

◆ Single probe or dual probe models

◆ Probe is pulsed to prevent electroplating

◆ Two adjustable sensitivity ranges

◆ LED status indication

◆ Factory-fixed time delay of 1-60 seconds prevents rapid cycling (single probe only)

◆ 10A SPDT contacts

with appropriate socket

Precisely detect and raise, lower or maintain levels of conductive liquids.

LCP Series

SINGLE OR DUAL PROBE MODELS AVAILABLE TO MEET REQUIREMENTS

Liquid Level Control Relays detect and control levels of conductive liquids in pump up (fill) or pump down (drain) applications.

The conductive properties of the liquid complete a circuit between a probe and common when the liquid comes in contact with both. The relay compares the value of the measured resistance between probes with the set-point of the adjustable potentiometer on the device.

The output of the relay is used to control pumps, solenoids or valves to lower, raise or maintain the level of the liquid in the tank.

Single probe or dual probe configurations are available. On single probe models a fixed time delay prevents rapid cycling of the output relay and its load. Ten factory-set time delays are available.

Dual probe models are available with specific pin configurations to match competitive devices.

These relays are used in processes involving liquids such as tap water, seawater, sewage, water treatment, irrigation, chemical and pharmaceutical solutions, beer, coffee, ice cream, and many conductive liquids.

TYPICAL MODEL CODE

LCP Series

Family	Control Voltage		Function / Configuration	Sensitivity Range		Fixed Time Delay (Single Channel)	Standard Modifications
				100	4.7K - 100K Ω		Z	Bulk Packaging
LCP	Liquid Level Control			250	1K - 250K Ω		
	8	24V AC	A	Single Probe Pump Up			Fx	Factory fixed time delay in Secs: 1, 2, 3, 4, 5, 10, 15, 20, 30, or 60 Secs Applies to Single Channel Function A & B only
	2	120V AC	B	Single Probe Pump Down			
	1	240V AC	C	Dual Probe Pump Up (w/ Pin Configuration = SSAC & NCC unit)			
			D	Dual Probe Pump Down (w/ Pin Configuration = SSAC & NCC unit)			
			E	Dual Probe Pump Up (w/ Pin Configuration = Crouzet & SymCom Unit)			
			G	Dual Probe Pump Down (w/ Pin Configuration = Crouzet & SymCom Unit)			
			H	Dual Probe Pump Up (w/ Pin Configuration = GEMS unit)			
			J	Dual Probe Pump Down (w/ Pin Configuration = GEMS unit)			

SOCKET	
LCP	70169-D 8-pin - Order Separately

SFP Series:

◆ Works with pumps using Resistance Sensing Leakage Detection

[c UL us] [CE] [c UL us]
with appropriate socket

SFF Series:

◆ Works with pumps using Resistance Sensing Leakage Detection

[c UL us] [CE] [c UL us]
with appropriate socket

TC Series:

◆ TCP and TCF works with pumps using Resistance Sensing Leakage Detection; TCF-E works with pumps using Float Type Sensors; TCF-F works with pumps using CLS or FLS Sensors; TCF-A installed in place of existing Flygt MiniCas

[c UL us] [CE] [c UL us]
with appropriate socket

Protect submersible pumps by monitoring for over temperature and shaft seal leakage.

SFP Series

SFF Series

TCF Series
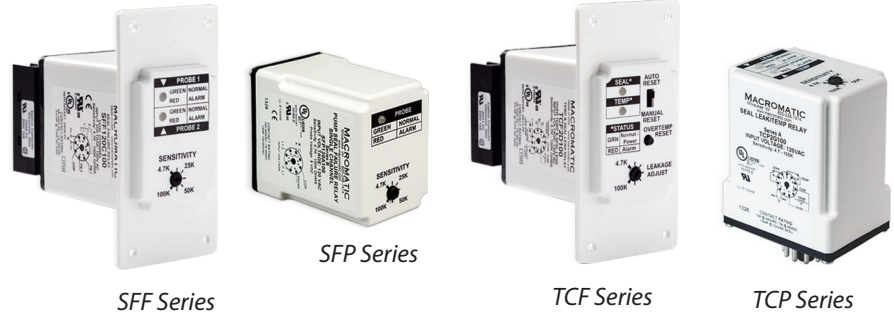
TCP Series

SELECT FROM SINGLE OR DUAL CHANNEL MODELS.

Seal Leakage Relays monitor the shaft seals of submersible pumps for leakage. Select from models with Plug-in enclosures (SFP Series) or Flange Mounting (SFF Series) for mounting on inner door. Select from two sensitivity ranges to meet requirements.

Over Temperature & Seal Leakage Relays protect submersible pump motors against damage from both conditions. Select from Plug-in enclosures (TCP Series) or Flange Mounting (TCF Series) for mounting on inner door.

TYPICAL MODEL CODE

SFP and SFF Series

Family	Enclosure Style	Control Voltage	Function	Sensitivity Range	Standard Modification

SF Seal Leakage	P Plug-in F Flange Mount	024 24V AC AD7 24 V AC/DC 120 120V AC 240 240V AC	A Single Channel 8-pin SPDT B Single Channel 11-pin DPDT (Plug-in only) C Dual Channel 8-pin (2) SPNO	100 4.7K - 100K Ω 250 1K - 250K Ω	Z Bulk Packaging

TYPICAL MODEL CODE

TCP and TCF Series

Family	Enclosure Style	Control Voltage	Function	Sensitivity Range	Standard Modification
TC Over Temperature	P Plug-in F Flange Mount	8 24V AC 7 24V AC/DC 2 120V AC 1 240V AC	A Combination Single Channel Seal Leak / Over Temperature 11-pin (2) SPDT - Both Automatic & Manual Reset w/ switch - Installed in place of existing Flygt MiniCAS ("F" enclosure only) D Combination Single Channel Seal Leak / Over Temperature 11-pin (2) SPDT - Both automatic & manual reset w/ switch ("F" enclosure only) E Combination Single Channel Seal Leak / Over Temperature 11-pin (2) SPDT - Both Automatic and Manual Reset w/ switch - For Ebara submersible pumps onyx using float-type leakage detection ("F" enclosure style only) F Combination Single Channel Seal Leak / Over Temperature 11-pin (2) SPDT - Both Automatic & Manual Reset w/ switch - For Xylem / Flygt submersible pumps only using a CLS or FLS sensor (MINI-CAS equivalent). ("F" enclosure only) G Combination Single Channel Seal Leak / Over Temperature 11-pin (2) SPDT- Automatic Reset only. ("P" enclosure only)	**Applied to Functions D and G only:** 100 4.7K - 100K Ω 250 1K - 250K Ω	Z Bulk Packaging

SOCKETS	
SFF / TCF	Included
SFP	Order Separately:
A and C Function:	70169-D 8-pin
B Function:	70170-D 11-pin
All TCP	Order Separately: 70170-D

VMP Series:
- ◆ Wide range of user-adjustable pick-up voltages

with appropriate socket

VAKP Series:
- ◆ Wide range of user-adjustable pick-up voltages
- ◆ Adjustable time delay

with appropriate socket

VWKP Series:
- ◆ Provides voltage band protection
- ◆ Wide range of user-adjustable over- and under-voltage settings
- ◆ Adjustable time delay

with appropriate socket

VWKE Series:
- ◆ 17.5mm DIN-Rail mounting
- ◆ Provides voltage band protection
- ◆ Wide range of user-adjustable over- and under-voltage settings
- ◆ Adjustable time delay

Protect equipment from premature failure caused by voltage faults on single-phase systems.

VMP Series

VAKP Series

VWKE Series

RELAYS REQUIRE NO SEPARATE POWER SUPPLY

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 since each unit is powered by monitored voltage.

VWKE Series have 15 Amp output contact ratings. All other models have 10 Amp contact ratings.

Versions are available in either a plug-in enclosure using an 8-pin octal socket or a narrow 17.5mm DIN-Rail mounted case (VWKE Series only).

SELECT FROM OVER/UNDER OR VOLTAGE BAND RELAYS

Over/Under Voltage Relays protect equipment where either an over- or under-voltage condition is potentially damaging. Select from either fixed or adjustable time delay on drop-out. These relays (VMP Series and VAKP Series) are available with plug-in enclosures.

Voltage Band Relays protect equipment that is required to operate within an upper and lower voltage limit. The relay stays energized as long as the monitored voltage remains within the adjustable OVER and UNDER voltage limits. These relays are available with either plug-in enclosures (VWKP Series) or with enclosures for DIN-rail mounting (VWKE Series).

TYPICAL MODEL CODE

VMP, VAKP, VWKP and VWKE Series

Family	Function	Drop-out Voltage Setting	Enclosure Style	Monitored Voltage	Standard Modifications

V	Voltage Monitor	

M	Over/Under-voltage Relay w/ fixed time delay on drop-out (Plug-in enclosure only)
A	Over/Under-voltage Relay w/ adjustable time delay on drop-out (Plug-in enclosure only)
W	Voltage Band Relay (Plug-in & DIN-Rail enclosure)

Blank	Fixed % of Pick-up Voltage Setting (Functions M & W only; Plug-in enclosure only)
K	Adjustable % of Pick-up Voltage Setting (Functions A & W only; Plug-in & DIN-Rail enclosure)

	SOCKET
Plug-in	70169-D 8-pin - Order Separately

P	Plug-in
E	DIN-Rail

X	5A DPDT 240V instead of 10A SPDT (240A and 480A only)
Z	Bulk Packaging

012D	12V DC (Plug-in enclosure only)
024D	24V DC (Plug-in and DIN-Rail enclosure)
048D	48V DC (Plug-in enclosure only)
110D	110V DC (Plug-in enclosure only)
120A	120V AC (Plug-in and DIN-Rail enclosure)
240A	240V AC (Plug-in and DIN-Rail enclosure)
480A	480V AC (Plug-in enclosure only)

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PCP, PLP and PMP Series:
- ◆ Plug-in enclosure uses standard 8-pin octal socket
- ◆ Universal voltage range
- ◆ 10A SPDT contacts

PAP Series:
- ◆ Plug-in enclosure uses standard 8-pin octal socket
- ◆ 10A SPDT contacts

PMPU-FA Series:
- ◆ Simple single-knob operation
- ◆ Universal voltage range

PMD Series:
- ◆ Compact 52.5 mm wide enclosure for DIN-rail or panel-mounting
- ◆ Universal voltage range
- ◆ 10A SPDT contacts

PBDU Series:
- ◆ 17.5 mm wide enclosure for DIN-rail mounting
- ◆ Universal voltage range
- ◆ 10A SPDT contacts

Approvals for all Three-Phase Voltage Monitor Relays:

with appropriate socket

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Protect against premature equipment failure caused by voltage faults on 3-phase systems.

PMP Series
PMD Series
PBDU Series
PAP Series
PCP Series
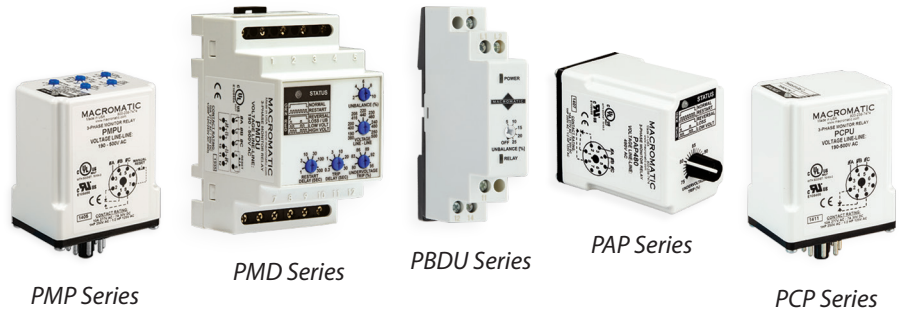
RETAINS INDICATION AND CONTINUES MONITORING EVEN WITH A LOST PHASE

Three-Phase Monitor Relays continuously monitor voltage faults on three-phase systems. They are compatible with most Wye or Delta systems with no connection to Neutral required. True RMS voltage measurement ensures more accurate sensing across more applications.

Select from models that offer protection against a combination of voltage faults. Refer to "Typical Model Code".

Phase Loss is a total loss of one or more of the three phases. This "single phasing" can be caused by a blown fuse, broken wire or worn contact and can result in motor burn-out.

Phase Reversal will cause a motor to rotate in the opposite direction. Phase Monitors can detect and protect against machinery damage or potential injury to personnel.

Phase Unbalance results from loads connected such that one or two lines carry more or less of the load. Phase Monitors can protect motors from resulting over heating.

Under-voltage is caused when voltage in all three lines drop simultaneously with an increase in current and over heating resulting in a reduction in motor performance.

Over-voltage is caused by voltage in all three lines increasing simultaneously causing a decrease in load current and poor power.

TYPICAL MODEL CODE

PCP, PLP, PMP, PAP, PMPU-FA, PMD and PBDU Series

Family	Function	Enclosure Style	Monitored Voltage	Standard Modifications

P	Three-Phase Monitor

P	Plug-in (A, C, J, L and M Functions)
D	DIN-Rail (B and M Function only)

A	Phase Loss, Phase Reversal and Under-voltage
B	Phase Loss, Phase Reversal and Voltage Unbalance
C	Phase Reversal only
J	Phase Loss, Phase Reversal and Under-voltage (All Trip) w/ Unbalance Indication only (No Trip)
L	Phase Loss and Phase Reversal
M	Phase Loss, Phase Reversal, Voltage Unbalance, Under-voltage and Over-voltage

120	120V AC (M Series only)
208	208V AC (A Series only)
240	240V AC (A Series only)
400	400V AC (A Series only)
480	480V AC (A Series only)
575	400 - 600V AC (C, L and M Series only)
600	600V AC (A Series only)
U	190 - 500V AC (C, J, L and M Series only) 208 – 480V AC (B Series only)

-FA8	Fixed Under-voltage, Unbalance and Time Delay settings on PMPU only w/ 8-pin SPDT output
-FA8X	Fixed settings of -FA8 on PMPU and PJPU w/ 8-pin SPDT and SPNO output
-FA12X	Fixed settings of -FA8 on PMPU series w/ 12-pin DPDT output
-Z	Bulk Packaging

	SOCKET
Plug-in	70169-D 8-pin - Order Separately

PC Series:

◆ Provides real-time status and measurement data via Modbus TCP

◆ Webserver provides access to status, measurements, and configuration from your web browser

◆ Protects against phase loss, phase reversal, phase unbalance, undervoltage and overvoltage

◆ Compact 60 mm wide enclosure for both DIN-rail or screw mounting with extendable clips

◆ Wide voltage ranges to cover more global applications

◆ True RMS voltage measurement with full wave monitoring increases accuracy

◆ Full fault indication on front face for easy troubleshooting

◆ Pluggable terminal blocks simplify initial wiring and replacement

◆ 5A SPDT output contacts

Relays with Modbus TCP communication to reduce downtime and service costs
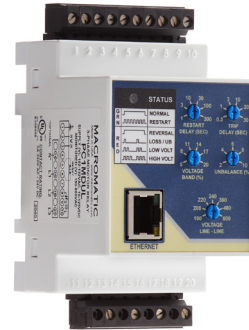
Model PC1MDUL

REAL TIME AND HISTORICAL FAULT DATA FOR CONTINUOUS MONITORING

PC Series Three-Phase Monitor Relays protect equipment from voltage faults *and* communicate voltage parameters via Modbus TCP. This industry-first technology provides real-time alerts and intelligent evaluation and troubleshooting of voltage systems.

Communication improves decision making within smart network control systems. This affordable IoT solution is an advantage in automation applications requiring smart, connected systems including motors and voltage sensitive equipment.

PC Series relays monitor three-phase system voltages to protect from damage due to phase loss, phase reversal, phase unbalance, undervoltage and overvoltage. These products detect single phasing and unbalanced voltages regardless of any regenerative voltages.

A universal monitored voltage range of 190 to 600V AC covers more global applications.
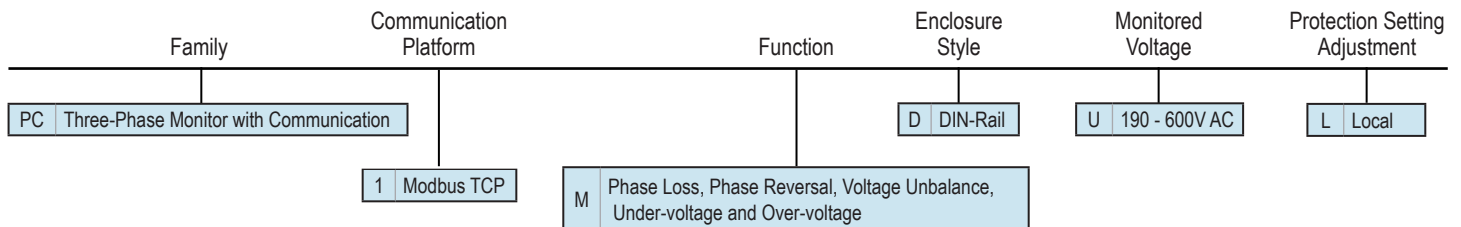
Dials allow adjustment of the undervoltage trip point, trip delay, restart delay and unbalance trip point.

A 60 mm wide enclosure mounts on 35 mm DIN-rail or on a panel with two screws inserted through extended clips on the back of the enclosure.

Pluggable terminal blocks on both the input and output side allow for easy initial wiring and replacement without having to remove any wires.

TYPICAL MODEL CODE

PC Series

Family	Communication Platform	Function	Enclosure Style	Monitored Voltage	Protection Setting Adjustment
PC Three-Phase Monitor with Communication			**D** DIN-Rail	**U** 190 - 600V AC	**L** Local
	1 Modbus TCP	**M** Phase Loss, Phase Reversal, Voltage Unbalance, Under-voltage and Over-voltage			

PTA Series Percentage Timers:

◆ Industry-standard panel cutout and mounting pattern

◆ Easy setting of time delay using a rotary potentiometer

◆ 10A SPNO output

◆ Available with or without memory of timing sequence

RT Series Reset Timers:

◆ Encapsulated enclosure for reliable operation in harsh environments

◆ Easy setting of time delay using a rotary potentiometer

◆ Available with or without memory of timing sequence

Ensure reliable and accurate timing for critical applications such as agricultural irrigation.

PTA Series

RT Series

PERCENTAGE TIMERS DELIVER RELIABLE AND ACCURATE TIMING

PTA Series microprocessor-based Percentage Timers provide reliable and accurate timing for critical applications such as agricultural irrigation. A potentiometer setting determines the ON time as a percentage of the total ON/OFF cycle time. Seven fixed total cycle times are available in seconds, minutes and hours.

SURFACE-MOUNT RESET TIMERS SAVE SPACE AND INSTALLATION TIME

RT Series microprocessor-based Reset Timers deliver reliable and accurate timing for critical applications. The compact 2" x 2" enclosure installs with a single bolt or screw through the center mounting hole, saving panel space and installation time.
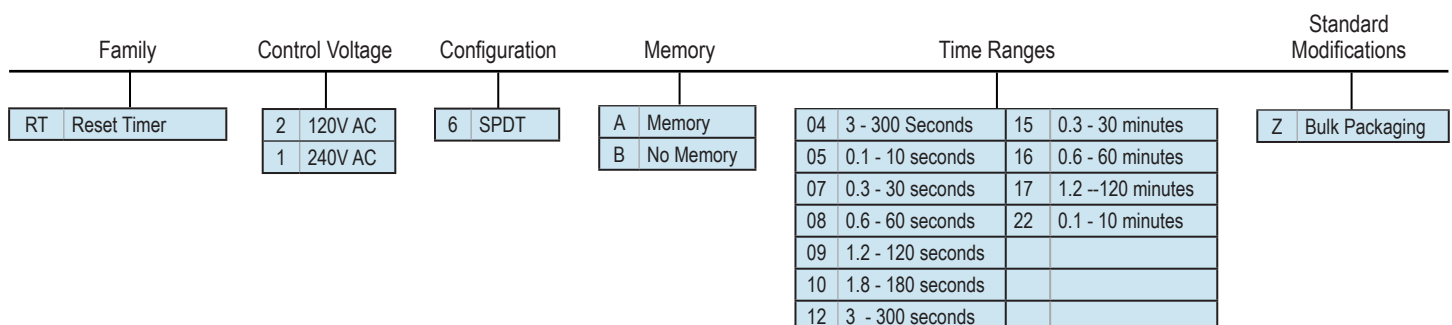
TYPICAL MODEL CODE - Percentage Timers

PTA Series

Family	Control Voltage	Total Time	Time Base	Memory	Standard Modifications
PTA Percentage Timer					Z Bulk Packaging
	2 120V AC	XXX — 3-digit time required. Time in seconds, minutes or hours. Represent with simplest value: use 001 (one minute), rather than 060 (sixty seconds). Available total times are 015 (seconds), 030 (seconds), 001 (minute), 002 (minutes) 015 (minutes), 030 (minutes) and 001 (hours). ■	S Seconds M Minutes H Hour		
	1 240V AC			Blank Memory enabled B Memory disabled	

■ Example: PTA2030S = PTA with 120V, 30 second total time with memory enabled

TYPICAL MODEL CODE - Reset (Over-watering) Timers

RT Series

Family	Control Voltage	Configuration	Memory	Time Ranges		Standard Modifications
RT Reset Timer	2 120V AC	6 SPDT	A Memory	04 3 - 300 Seconds	15 0.3 - 30 minutes	Z Bulk Packaging
	1 240V AC		B No Memory	05 0.1 - 10 seconds	16 0.6 - 60 minutes	
				07 0.3 - 30 seconds	17 1.2 --120 minutes	
				08 0.6 - 60 seconds	22 0.1 - 10 minutes	
				09 1.2 - 120 seconds		
				10 1.8 - 180 seconds		
				12 3 - 300 seconds		

THR-1 Series:

◆ Encapsulated 2" x 2" enclosure, panel mounted with one bolt or screw

◆ Single Function - Select from 15 Single Time or Dual Time (ON-OFF)

◆ Microprocessor-based design for good performance and maximum flexibility

◆ 10A SPDT relay output contacts can handle most pilot duty and fractional HP loads

◆ On-board and remote adjustable or fixed time delays from 0.05 seconds to 100 hours.

Single-function, encapsulated relays operate reliably in harsh environments.

THR-1 Series

COST-EFFECTIVE DESIGN IDEAL FOR VOLUME OEM APPLICATIONS

THR-1 Series are basic, cost-effective Time Delay Relays in a compact 2" x 2" enclosure. Encapsulation makes them resistant to the effects of harsh environments.

Setting the time delay is easy using the adjustable potentiometers. The microprocessor-based design provides good performance and maximum versatility.

These relays have three time delay options: on-board adjustable, on-board fixed, or remote adjustable settings.

TYPICAL MODEL CODE

THR-1 Series

| Family | Function | Output Configuration | Control Voltage | Time Ranges | Standard Modifications |

Family / Function

THR-1	Time Delay

	SINGLE TIME
02	On Delay
05	Interval On
08	Flasher (Off 1st)
09	Flasher (On 1st)
12	On Delay (Switch Trigger)
13	Watchdog (Switch Trigger)
15	Single Shot (Switch Trigger)
16	Off Delay (Switch Trigger)
22	Single Shot Falling Edge (Switch Trigger)
	DUAL TIME (ON-OFF)
31	Repeat Cycle (OFF 1st)
41	On Delay / Off Delay (Switch Trigger)
51	Repeat Cycle (On 1st)
61	Delayed Interval
65	Delayed Interval (Switch Trigger)

Dual Time functions come with same ON & OFF time ranges as standard. Can be ordered in combinations of Standard or Fixed time ranges. See www.macromatic.com/onoff for details.

Output Configuration

5	SPNC
6	SPDT
7	SPNO

Control Voltage

1	240V AC
2	120V AC/DC
4	48V AC/DC
6	12V DC
8	24V AC/DC

Time Ranges

-04	0.05 - 5 seconds
-30	0.1 - 10 seconds
-07	0.3 - 30 seconds
-08	0.6 - 60 seconds
-31	1 - 100 seconds
-09	1.2 - 120 seconds
-10	1.8 - 180 seconds
-12	3 - 300 seconds
-36	10 - 1,000 seconds
-32	0.1 - 10 minutes
-15	0.3 - 30 minutes
-16	0.6 - 60 minutes
-33	1 - 100 minutes
-37	10 - 1,0000 minutes
-17	0.02 - 2 hours
-34	0.1 - 10 hours
-35	1 - 100 hours
-F	Fixed Time Range (i.e., F5S for Fixed 5 seconds)

Standard Modifications

J	Relay Common internally connected to Pin 2
	REMOTE POTENTIOMETER (Only applies to Functions 02, 05, 08, 09, 12, 13, 15, 16, and 22):
R1	100K (Std.)
R7	1M
R9	2M
T	Control Switch connected to Pin 2 (applies to functions 12, 13, 15, 16, 22, 41, & 65 only)
Z	Bulk Packaging

All combinations of -R and T are allowed where appropriate with the function as described above except as noted by each modification.

THR-3 Series:

◆ Encapsulated 2" x 2" enclosure, panel mounted with one bolt or screw

◆ Multi-Function: Three models each offer 4 common time delay functions.

◆ Universal Voltage: 24-240V AC and 12-125VDC

◆ 10A SPDT relay output contacts can handle most pilot duty and fractional HP loads

◆ On-board & remote adjust of time delay (remote adjust not offered on THR-3856U)

◆ THR-3856U allows different ON and OFF times

Replace thousands of other devices with these programmable, multi-function relays.

THR-3 Series

ENCAPSULATION ENSURES RELIABLE OPERATION IN HARSH ENVIRONMENTS

The THR-3 Series was developed to replace thousands of products from Macromatic and many other manufacturers with just three Catalog Numbers. Each model includes four functions and four timing ranges covering 0.1 second to 100 minutes (1,000 minutes on THR-3856U dual time unit).

These relays have three time delay options: on-board adjustable, on-board fixed, or remote adjustable time delay setting (remote time delay not available on THR-3856U).

Set up is done with DIP switches for ease of use. A universal input voltage of 24-240V AC and 12-125V DC adds to the versatility of these products.

Encapsulation makes them impervious to the effects of harsh environments. A 10A SPDT relay output rating can handle most pilot duty and fractional HP loads.

TYPICAL MODEL CODE

THR-3 Series

Family	Function	Output Configuration	Control Voltage	Standard Modifications
THR-3 | Time Delay	**SINGLE TIME**	6 | SPDT	U | 24-240V AC and 12-125V DC	Z | Bulk Packaging
	81 — **Four Functions:** ● On Delay ● Interval ● Off Delay ● Single Shot			
	83 — **Four Functions:** ● Watchdog ● Single Shot Falling Edge ● Flasher OFF 1st ● Flasher ON 1st			
	85 — **Four Functions:** ● Delayed Interval ● Triggered Delayed Interval ● Repeat Cycle OFF 1st ● Repeat Cycle ON 1st			

15
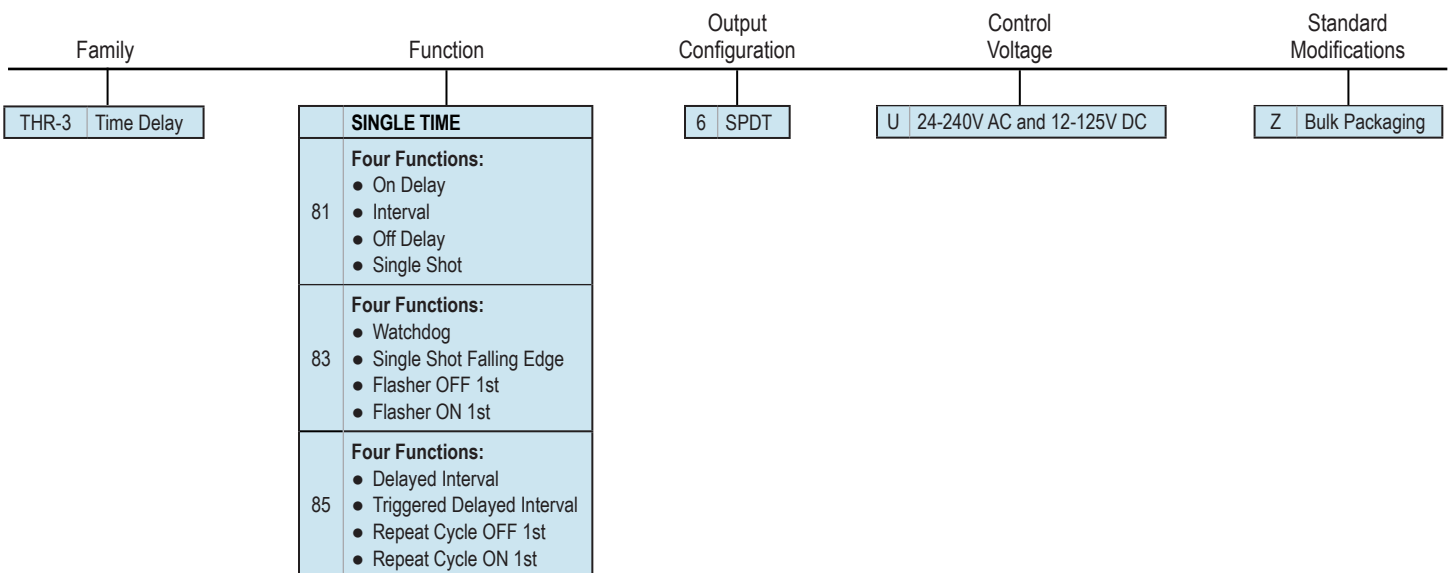
THS-1 Series:
- ◆ Solid State Output
- ◆ Encapsulated 2" x 2" enclosure, panel mounted with one bolt or screw
- ◆ Single Function - Select from 15 Single Time or Dual Time (ON-OFF)
- ◆ Microprocessor-based design for greater performance and maximum flexibility
- ◆ Solid-state output rated 1A continuous/10A inrush is ideal for high cycle rate and long life applications
- ◆ Built-in load suppression eliminates need for separate protection
- ◆ Pilot duty rating

Single-function, solid state relays operate reliably with good accuracy in harsh environments.

THS-1 Series

SOLID STATE OUTPUT FOR HIGH CYCLE RATE AND LONG LIFE

THS-1 Series are solid state Time Delay Relays in a compact 2" x 2" enclosure. Encapsulation makes them resistant to the effects of harsh environments.

Setting the time delay is easy using the adjustable potentiometers. The microprocessor-based design provides good performance and maximum versatility.

These relays have three time delay options: on-board adjustable, on-board fixed, or remote adjustable settings.

TYPICAL MODEL CODE

THS-1 Series

Family	Function	Output Configuration	Control Voltage	Time Ranges	Standard Modifications

THS-1	Time Delay

4	SPNO

A	24 - 240V AC
D	12 -125V DC

	SINGLE TIME
02	On Delay
05	Interval On
08	Flasher (Off 1st)
09	Flasher (On 1st)
12	On Delay (Switch Trigger)
13	Watchdog (Switch Trigger)
15	Single Shot (Switch Trigger)
16	Off Delay (Switch Trigger)
22	Single Shot Falling Edge (Switch Trigger)
	DUAL TIME (ON-OFF)
31	Repeat Cycle (OFF 1st)
41	On Delay / Off Delay (Switch Trigger)
51	Repeat Cycle (On 1st)
61	Delayed Interval
65	Delayed Interval (Switch Trigger)

-02	0.01 - 1 second	-36	10 - 1,000 seconds
-04	0.05 - 5 seconds	-32	0.1 - 10 minutes
-30	0.1 - 10 seconds	-15	0.3 -30 minutes
-07	0.3 - 30 seconds	-16	0.6 - 60 minutes
-08	0.6 - 60 seconds	-33	1 - 100 minutes
-31	1 - 100 seconds	-37	10 - 1,0000 minutes
-09	1.2 - 120 seconds	-17	0.02 - 2 hours
-10	1.8 - 180 seconds	-34	0.1 - 10 hours
-12	3 - 300 seconds	-35	1 - 100 hours
-F	Fixed Time Range (i.e., F5S for Fixed 5 seconds)		

	REMOTE POTENTIOMETER
R1	100K (Std.)
R7	1M
R9	2M
T	Control Switch connected to Pin 2 (applies to functions 12, 13, 15, 16, 22, 41, & 65 only)
Z	Bulk Packaging

All combinations of -R and -T are allowed where appropriate with the function as described above except as noted by each modification.

Dual Time functions come with same ON & OFF time ranges as standard. Can be ordered in combinations of Standard or Fixed time ranges. See www.macromatic.com/onoff for details.
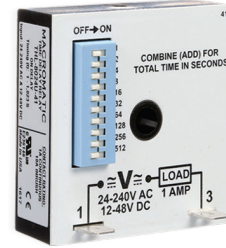
THL-1 and THL-8 Series:

◆ On Delay Function

◆ Solid State In-line (Series Connection)

◆ Encapsulated 2" x 2" enclosure, panel mounted with one bolt or screw

◆ Microprocessor-based design for greater performance and maximum versatility

◆ Universal Voltage: 24-240V AC and 12-48V DC

◆ Solid-state output rate 1A continuous/10A inrush is ideal for high cycle rate and long life applications

Inline (series connection) On Delay function with universal input voltage.

THL-1 Series

THL-8 Series

THL-1 SERIES PROVIDES SOLID STATE, ANALOG-SET TIME DELAY

Micro-processor-based THL-1 Series Time Delay Relays provide greater performance and maximum versatility. Setting the time delay is easy using the adjustable potentiometers. The relays have three time delay options: on-board adjustable, on-board fixed, or remote adjustable time delay setting.

Encapsulation makes them resistant to the effects of harsh environments.

THL-8 SERIES PROVIDES SOLID STATE, DIGITAL-SET TIME DELAY

Inline (series connection) THL-8 Series On Delay Relays offer an easy and accurate method to select any time delay. Programming using a 10-position DIP-switch provides greater accuracy compared to units with analog potentiometers.

The relays feature a universal input voltage of 24-240V AC and 12-48V DC. The in-line two-terminal output is rated 1A continuous/10A inrush pilot duty, and is deal for high cycle rate and long life applications.

Encapsulation makes them resistant to the effects of harsh environments.

TYPICAL MODEL CODE

THL-1 and THL-8 Series

Family	Function	Output Configuration	Input Voltage	Time Ranges	Standard Modifications

| THL-1 | Time Delay - Analog Set |
| THL-8 | Time Delay - Dip-Switch Digital Set |

| 02 | On Delay |

| 4 | SPNO |

| U | 24-240V AC and 12-48V DC |

THL-1 SERIES			
-02	0.01 - 1 seconds	-36	10 - 1,000 seconds
-04	0.05 - 5 seconds	-32	0.1 - 10 minutes
-30	0.1 - 10 seconds	-15	0.3 - 30 minutes
-07	0.3 - 30 seconds	-16	0.6 - 60 minutes
-08	0.6 - 60 seconds	-33	1 - 100 minutes
-31	1 - 100 seconds	-37	10 - 1,000 minutes
-09	1.2 - 120 seconds	-17	0.02 - 2 hours
-10	1.8 - 180 seconds	-34	0.1 - 10 hours
-12	3 - 300 seconds	-35	1 - 100 hours
-F	Fixed Time Range (i.e., F5S for Fixed 5 seconds)		

THL-8 SERIES	
-40	0.1 - 102.3 seconds
-41	1 - 1,023 seconds
-42	1- 10,230 seconds

THL-1 SERIES	
REMOTE POTENTIOMETER USES VALUES BELOW	
R1	100K (Std.)
R7	1M
R9	2M
Z	Bulk Packaging
THL-8 SERIES	
Z	Bulk Packaging

Basic plug-in relays offer a range of single function units with analog-set time delays.

TR-5 Series

TR-5 SERIES - SINGLE FUNCTION, ANALOG-SET TIME DELAYS

TR-5 Series Relays offer reliable performance with a wide range of units with single functions. Select from 21 functions with Single Time or Dual Time (ON-OFF).

Setting the time delay is easy using the adjustable potentiometers. The microprocessor-based design provides good performance and maximum versatility.

These relays have three time delay options: on-board adjustable, on-board fixed, or remote adjustable settings from 50 ms to 2 hours.

TYPICAL MODEL CODE

TR-5 Series

Family	Function	Output Configuration	Control Voltage	Time Ranges	Standard Modifications

TR-5	Time Delay

SINGLE TIME

02	On Delay
05	Interval On
06	True Off Delay
08	Flasher (Off 1st)
09	Flasher (On 1st)
12	On Delay (Switch Trigger)
13	Watchdog (Switch Trigger)
15	Single Shot (Switch Trigger)
16	Off Delay (Switch Trigger)
17	Single Shot (Power Trigger)
18	Watchdog (Power Trigger)
19	Off Delay (Power Trigger)
22	Single Shot Falling Edge, Retriggerable (Switch Trigger)

DUAL TIME (ON-OFF)

31	Repeat Cycle (OFF 1st)
41	On Delay / Off Delay (Switch Trigger)
46	On Delay / True Off Delay
51	Repeat Cycle (On 1st)
61	Delayed Interval
65	Delayed Interval (Switch Trigger)

2	DPDT - Available all Functions
6	SPDT - Applies only to Functions 13, 15, 16, 17, 18 and 19

1	240V AC
2	120V AC/DC
4	48V AC/DC (not available on Function 06 or 46)
6	12V DC
-8	24V AC/DC

-04	0.05 - 5 seconds	-10	1.8 - 180 seconds
-05	0.1 - 10 seconds	-12	3 - 300 seconds
-07	0.3 - 30 seconds	-22	0.1 -10 minutes
-08	0.6 - 60 seconds	-15	0.3 - 30 minutes
-09	1.2 - 120 seconds		
-16	0.6 - 60 minutes (not available on Functions 06 or 46)		
-17	0.02 - 2 hours (not available on Functions 06 or 46)		
-F	Fixed Time Delay in seconds (S), minutes (M), or hours (H) (i.e., F5S = Fixed 5 seconds)		

Dual Time Delay models are available with the same ON-OFF time ranges as standard. May be ordered special with different time ranges for ON and OFF (i.e.,F5S-F10M = 5 seconds ON delay and 10 minutes OFF delay).

REMOTE POTENTIOMETER
(Applies to all Functions except 06, 17, 18, 19 and 46. Does not apply to Functions 12, 13, 15 and 16 with SPDT.):

R5	500K
R6	750K
R7	1M

SPECIAL TRIGGER SWITCH PIN CONFIGURATION
Contact your Regional Sales Manager or email sales@macromatic.com.

Z	Bulk Packaging

OUTPUT	SOCKETS (Order Separately)
SPDT & DPDT	70169-D 8-pin
DPDT with Trigger	70170-D 11-pin

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TR-6 Series:

◆ Plug-in enclosure uses standard 8-pin or 11-pin octal sockets

◆ Programmable Multi-Range

◆ 16 built-in timing ranges from 50 ms - 100 hours, easily selected using a rotary switch.

◆ Universal Voltage: 24-240V AC and 12-125V DC

◆ 10A DPDT output contacts can handle most pilot duty and fractional HP loads

TR-681 and TR-682 Features

◆ Programmable Multi-Function

◆ Four or eight timing functions in one unit are selected using two rotary switches

◆ 16 built-in time ranges from 50 ms - 100 hours

TR-606 Features

◆ Programmable True Off Delay

◆ Eight built-in timing ranges from 50 ms - 30 minutes

c**UL**us   C€   c**UL**us
with appropriate socket

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</table>

Versatile relays are easily programmed for multiple functions and built-in time delays.

TR-6 Series

VERSATILE TR-6 SERIES RELAYS

TR-6 Series Relays were developed to replace hundreds of different catalog numbers, greatly reducing inventory requirements. These relays provide flexible functions, multi-range time delays, and universal input voltage.

Selecting one of 16 time ranges between 50 ms and 100 hours is easy using a rotary switch. Actual time delay is then set by adjusting a potentiometer within the selected range.

MODEL TR-681 AND TR-682

Multi-function relays are easily programmed, choosing from one of eight (TR-681) or one of four (TR-682) time delays. Two rotary switches select function and time range. The actual time delay is then set using a potentiometer.

MODEL TR-606

The TR-606 True Off Delay relay can replace the function of pneumatic time delays which are very large, expensive and inaccurate. This relay is perfect to use when a trigger switch is not available in the circuit.

TYPICAL MODEL CODE

TR-6 Series

Family	Function	Output Configuration	Control Voltage	Standard Modifications

TR-6	Time Delay

2	DPDT
6	SPDT (Applies to Function 81 only)

Z	Bulk Packaging

U	24-240V AC and 12-125V DC (not available on Function 06)
1	240V AC (06 Function only)
2	120V AC/DC (06 Function only)
4	48V AC/DC (06 Function only)
6	12V DC (06 Function only)
8	24V AC/DC (06 Function only)

SINGLE TIME		DUAL TIME (ON-OFF)	
02	On Delay	31	Repeat Cycle (OFF 1st)
05	Interval On	41	On Delay / Off Delay (Switch Trigger)
06	True Off Delay	46	On Delay / True Off Delay
08	Flasher (Off 1st)	51	Repeat Cycle (On 1st)
09	Flasher (On 1st)	61	Delayed Interval
12	On Delay (Switch Trigger)	65	Delayed Interval (Switch Trigger)
13	Watchdog (Switch Trigger)	81	**Eight Functions:** ● On Delay ● Interval On ● Off Delay ● Single Shot ● Flasher (ON 1st) ● Single Shot Falling Edge ● Watchdog ● On Delay (Switch Trigger)
15	Single Shot (Switch Trigger)		
16	Off Delay (Switch Trigger)		
17	Single Shot (Power Trigger)		
18	Watchdog (Power Trigger)		
19	Off Delay (Power Trigger)	82	**Four Functions:** ● On Delay ● Interval On ● Flasher OFF 1st ● Flasher ON 1st
22	Single Shot Falling Edge, Retriggerable (Switch Trigger)		

FUNCTION	SOCKETS
02, 05, 06, 08, 09, 31, 51, 61	70169-D 8-pin - Order Separately
12,13,15, 16, 17, 18, 19, 22, 65, 812	70170-D 11-pin - Order Separately

Digital setting of function and time delay is easy with pushbutton thumbwheels.

TD-7 Series

DIGITAL INPUT FOR GREATER ACCURACY THAN ANALOG INPUT

TD-7 Series Relays offer an easy and accurate way to select any time delay between 50 ms and 999 hours. A pushbutton thumbwheel is used to select one of seven built-in time ranges. Three pushbutton thumbwheels digitally set the time delay required.

This method provides a greater setting accuracy compared to units with an analog potentiometer.

An LED indicates timing mode and time out condition.

MODEL TD-781 PROVIDES TEN SELECTABLE FUNCTIONS IN ONE UNIT

These multi-function units have a fifth pushbutton thumbwheel to select one of ten built-in functions. Like other models in the TD-7 Series, an LED indicates timing mode and time out condition. It also has a pilot duty rating.

TYPICAL MODEL CODE

TD-7 Series

	Family	Function		Output Configuration	Control Voltage	Standard Modifications

TD-7	Time Delay

02	On Delay
05	Interval On
08	Flasher (Off 1st)
09	Flasher (On 1st)
12	On Delay (Switch Trigger)
13	Watchdog (Switch Trigger)
15	Single Shot (Switch Trigger)
16	Off Delay (Switch Trigger)
22	Single Shot Falling Edge, Retriggerable (Switch Trigger)
41	On Delay / Off Delay (Switch Trigger)

81	Multi-Function (10 Functions) ● On Delay ● Interval On ● Off Delay ● Single Shot ● Flasher (OFF 1st) ● Flasher (ON 1st) ● On/Off Delay ● Single Shot Falling Edge ● Watchdog ● Triggered On Delay

2	DPDT
6	SPDT 8-pin versions of 11-pin DPDT (Applies to 12, 13, 15, 16, 22 and 81 Functions only)

1	240V AC
2	120V AC/DC
4	48V AC/DC
6	12V DC
8	24V AC/DC

Z	Bulk Packaging

FUNCTION	SOCKETS
02, 05, 08, 09	70169-D 8-pin - Order Separately
12, 13, 15, 16, 41, 81, 812	70170-D 11-pin - Order Separately

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TD-8 Series:

◆ Plug-in enclosure uses standard 8-pin or 11-pin octal sockets

◆ DIP-switches for accurate digital setting of time delay

◆ Programmable from 50ms - 10,230 hours

◆ 10A DPDT output contacts

◆ LED indicates relay status

◆ Pilot duty rating

TD-881 Features

◆ Sixteen built-in functions are user-selectable using two 10-position DIP-switches

with appropriate socket

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</table>

Dip-switches provide ultimate flexibility and digital accuracy.

TD-8 Series

SINGLE-FUNCTION RELAYS ARE EASY TO PROGRAM

TD-8 Series Time Delay Relays are easy to accurately select any time delay between 100 ms and 1,023 hours.

Programming is accomplished using a 10-position DIP-switch. Each position is marked with a binary time increment. The required delay is selected by moving the switch of each increment to the ON position and adding their corresponding values.

MULTI-FUNCTION MODEL TD-881 CAN REDUCE INVENTORY

Two 10-position DIP-switches provide an easy and accurate method to select any of 16 time delay functions and any time delay between 50 ms and 10,230 hours (310 hours for Dual Mode functions).

The TD-881 relays can replace hundreds of different catalog numbers, greatly reducing inventory requirements. Refer to the online programming tool at:

macromatic.com/blog/relays/dip-switch-programming

TYPICAL MODEL CODE

TD-8 Series

	Family	Function	Output Configuration	Control Voltages	Time Ranges	Standard Modifications

| TD-8 | Time Delay |

02	On Delay
05	Interval On
08	Flasher (Off 1st)
09	Flasher (On 1st)
12	On Delay (Switch Trigger)
13	Watchdog (Switch Trigger)
15	Single Shot (Switch Trigger)
16	Off Delay (Switch Trigger)
22	Single Shot Falling Edge, Retriggerable (Switch Trigger)
31	Repeat Cycle (OFF 1st)
41	On Delay / Off Delay (Switch Trigger)
51	Repeat Cycle (On 1st)
61	Delayed Interval
65	Delayed Interval (Switch Trigger)

Multi-Function (16 Functions)

| 81 |

SINGLE TIME:
- On Delay
- Interval On
- Flasher (OFF 1st)
- Flasher (ON 1st)
- Off Delay
- Single Shot
- Watchdog
- Single Shot (Trailing Edge)

DUAL TIME (ON-OFF):
- Repeat Cycle (OFF 1st)
- Repeat Cycle (ON 1st)
- Delayed Interval
- Triggered Delayed Interval
- On/Off Delay
- Single Shot - Flasher
- On Delay / Flasher

Output Configuration

| 2 | DPDT |
| 6 | SPDT 8-pin versions of 11-pin DPDT (Applies to 12, 13, 15, 16, 22 and 81 Functions only) |

1	240V AC
2	120V AC/DC
4	48V AC/DC
6	12V DC
8	24V AC/DC

Time Ranges

	Not required for Multi-function 81
-40	0.1 - 102.3 seconds
-41	1 - 1,023 seconds
-42	1- 10,230 seconds
-43	1 - 1,023 minutes
-44	10 - 10,230 minutes
-45	1 - 1,023 hours

Standard Modifications

Special internal jumper connection with 5-6 trigger to match equivalent products from SSAC and Infitec (Applies to Functions 15, 16, 41 and 81 only):

SPDT 8 PIN:	
T14	Internal Jumper Pins 2-6
DPDT 11 PIN:	
T15	Internal Jumper Pins 2-5
Z	Bulk Packaging

OUTPUT	SOCKETS
SPDT & DPDT	70169-D 8-pin - Order Separately
DPDT with Trigger	70170-D 11-pin - Order Separately

21

Relays provide easy 1/16 DIN mounting and accurate set-up with large displays.

TAD Series

TAA Series

TAD Series Relays include 10 selectable functions in one unit. Setting the time delay is easy with push-button thumbwheels.

The LED display shows time remaining in both digit and bar graph form. It also indicates relay status and time base. A switch on the bottom of the unit allows a choice of timing up or timing down display.
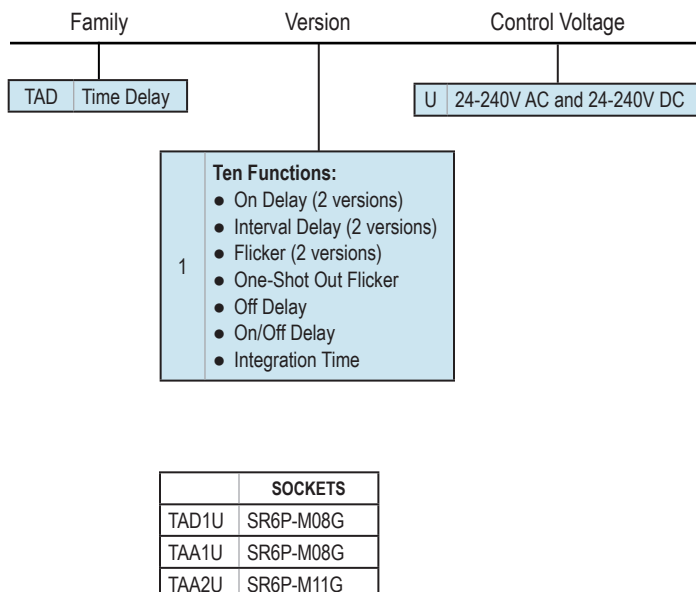
TAA Series Time Delay Relays include six built-in functions. A large dial is used to set the time delay.

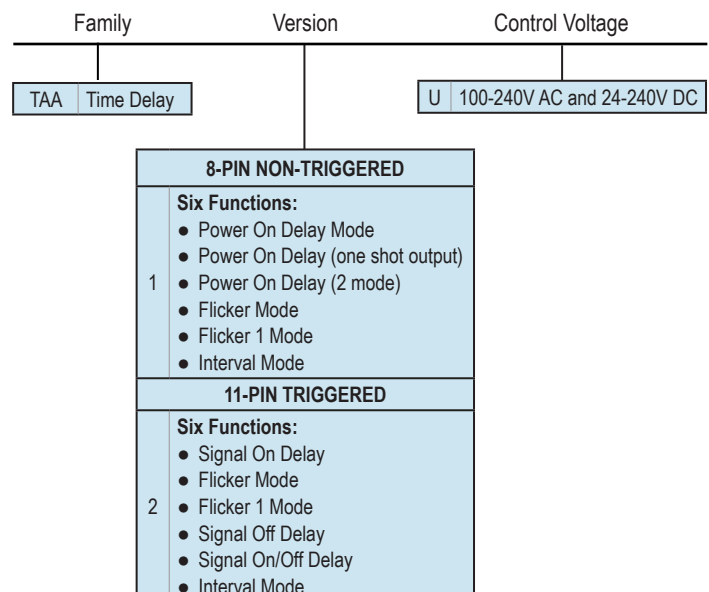One red LED indicates Voltage/Timing (flashing) and a second red LED indicates relay status.

TYPICAL MODEL CODE

TAD Series

Family	Version	Control Voltage

TAD	Time Delay

U	24-240V AC and 24-240V DC

1	**Ten Functions:** ● On Delay (2 versions) ● Interval Delay (2 versions) ● Flicker (2 versions) ● One-Shot Out Flicker ● Off Delay ● On/Off Delay ● Integration Time

	SOCKETS
TAD1U	SR6P-M08G
TAA1U	SR6P-M08G
TAA2U	SR6P-M11G

TAA Series

Family	Version	Control Voltage

TAA	Time Delay

U	100-240V AC and 24-240V DC

	8-PIN NON-TRIGGERED
1	**Six Functions:** ● Power On Delay Mode ● Power On Delay (one shot output) ● Power On Delay (2 mode) ● Flicker Mode ● Flicker 1 Mode ● Interval Mode
	11-PIN TRIGGERED
2	**Six Functions:** ● Signal On Delay ● Flicker Mode ● Flicker 1 Mode ● Signal Off Delay ● Signal On/Off Delay ● Interval Mode

TE-881 Series:

◆ Narrow 17.5 mm enclosure mounts on 35mm DIN-rail

◆ Ten field-selectable functions in one unit

◆ Universal Input Voltage: 12 - 240V AC/DC

◆ Programmable time delay from 0.1 second - 10 days

◆ 15A SPDT or DPDT output contacts

◆ LED indication

Versatile relays with DIN-rail mounting conserve space and reduce installation time.

TE-881 Series

TEN PROGRAMMABLE FUNCTIONS

TE-881 Series Time Delay Relays provide ten timing functions and a universal voltage input (12-240V AC/DC) with a programmable time range from 0.1 second to 10 days, all in one compact unit.
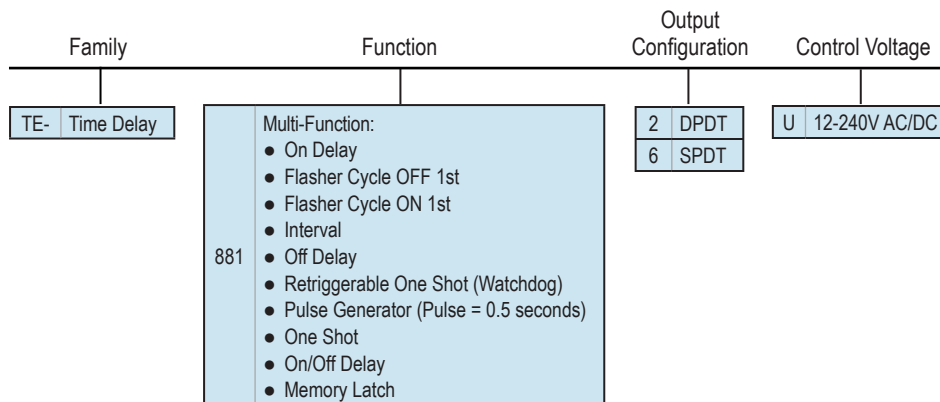
Choose between versions with 15A SPDT or DPDT output contacts.

A green LED indicates input voltage applied; a red LED blinks during timing and is steady when the output relay is energized.

The versatile TE-881 Series can replace hundreds of separate time delay relays. The compact size conserves space and reduces installation time, which saves money.

TYPICAL MODEL CODE

TE-881 Series

Family	Function	Output Configuration	Control Voltage
TE- Time Delay	881 Multi-Function: ● On Delay ● Flasher Cycle OFF 1st ● Flasher Cycle ON 1st ● Interval ● Off Delay ● Retriggerable One Shot (Watchdog) ● Pulse Generator (Pulse = 0.5 seconds) ● One Shot ● On/Off Delay ● Memory Latch	2 DPDT 6 SPDT	U 12-240V AC/DC

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