

# MODEL 18

## 3-Phase Monitor with Trip & Restart Delays

- Detects phase loss, low voltage, phase reversal
- 50Hz, 60Hz and 400Hz models
- Automatic reset
- UL Recognized in the U.S. and Canada
- Five year unconditional warranty



### DESCRIPTION

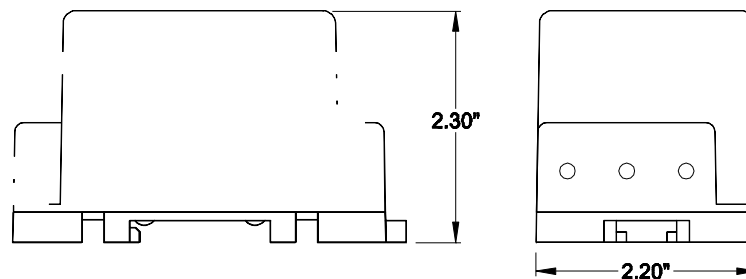
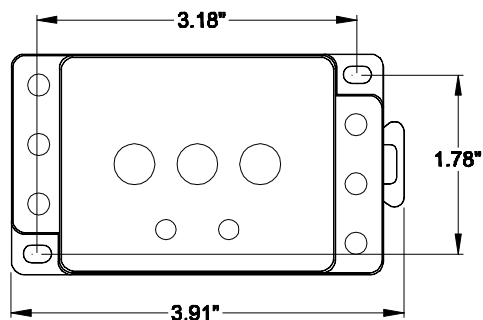
The **Model 18** continuously monitors 3-phase power lines for abnormal conditions. When properly adjusted, the Model 18 monitor will detect phase loss on a loaded motor even when regenerated voltage is present.

This device consists of a microcontroller with a voltage and phase-angle sensing circuit, driving an electromechanical relay. When correct voltage and phase rotation are applied, the internal relay will energize. A fault condition will de-energize the relay. When the fault is corrected, the monitor will automatically reset. An adjustable restart delay prevents short cycling in compressor applications and an adjustable trip delay prevents nuisance tripping during power fluctuations.

The Model 18 does not require a neutral connection and can be used with Wye or Delta systems. Voltage ranges are sufficiently wide to allow for proper adjustment to existing conditions. Both "FAULT" and "NORM" condition indicators are provided to aid in adjustment and system trouble-shooting.

All versions of the Model 18 are available with optional gold flashed silver contacts for low current applications.

### DIMENSIONS



(dimensions have a tolerance of  $\pm 0.06"$ )

### SPECIFICATIONS


Model	18-120	18-208/240	18-480	18-380-50	18-120-400	18-208/240-400	18-415-50
Nominal AC (phase to phase)	120VAC	208/240VAC	480VAC	380VAC	120VAC	208/240VAC	415VAC
Adjustment range	85-120VAC	160-240VAC	380-480VAC	300-400VAC	85-120VAC	160-240VAC	340-440VAC
Frequency	60Hz	60Hz	60Hz	50Hz	400Hz	400Hz	50Hz
Power consumption	1.4W	2.4W	3.7W	3.0W	1.4W	2.4W	3.3W
Transient protection	2500VAC for 10ms						
Repeat accuracy	$\pm 0.1\%$ of set point (fixed conditions)						
Trip delay	1-30 sec.						
Restart Delay	1-300 sec.						
Dead band	Approximately 2%						
Output contacts	SPDT 10 amps at 240VAC resistive (Low current options available for all models—See below)*						
Expected relay life	Mechanical: 10 million operations Electrical: 100,000 operations at rated load						
Operating temp	$-20^{\circ}$ to $+131^{\circ}$ F						
Humidity tolerance	0 - 97% w/o condensation						
Terminal Torque	3.5 in. lbs. maximum						
Wire Type	Stranded or solid 14-28 AWG, 1/terminal						
Enclosure material	NORYL plastic						
Mounting	DIN Rail or Surface Mount						
Weight	5.1 oz.						
* Low Current Options	For low current applications: Models ordered with suffix "/SG" will have silver with gold flash contacts (SPDT 5 amps at 120VAC resistive)						
Agency Approval	UL Recognized (U.S. and Canada) (For use in a Pollution Degree 2 Environment)						



**TIME MARK**  
CORPORATION

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# MODEL 18

# 3-Phase Monitor

READ ALL INSTRUCTIONS BEFORE INSTALLING, OPERATING OR SERVICING THIS DEVICE.  
KEEP THIS DATA SHEET FOR FUTURE REFERENCE.

## GENERAL SAFETY

POTENTIALLY HAZARDOUS VOLTAGES ARE PRESENT AT THE TERMINALS OF THE MODEL 18.  
ALL ELECTRICAL POWER SHOULD BE REMOVED WHEN CONNECTING OR DISCONNECTING WIRING.  
THIS DEVICE SHOULD BE INSTALLED AND SERVICED BY QUALIFIED PERSONNEL.

## Installation Instructions

### INSTALLATION

Mount the Model 18 in a suitable enclosure either to the back panel of the enclosure using two #6 x 9/16 screws or to a din rail (*Mounting hardware is not included*).

Connect terminals 1, 2, and 3 to the line side of the motor starter. Phase rotation should be verified using a Time Mark Model 108A or 108B Phase Sequence Detector.

Connect output relay to the control circuit.

**For motor control applications:** use terminals 4 and 6.  
**For phase loss alarm applications:** use terminals 5 and 6.  
*Refer to wiring diagram for example of typical application.*

Apply power. If the contact does not transfer (green light ON), check that all phases are present, and of the correct voltage. If power is correct, rotate the trip adjust control counterclockwise.

If the contact still does not transfer, remove power and reverse two of the three phase wires at terminals 1, 2, and 3 (phase rotation is reversed). Re-apply power. The contact should transfer to provide a signal path between terminals 4 and 6.

### ADJUSTMENT SETTINGS

The following procedure will allow the Model 18 to be adjusted to achieve a trip point just below the nominal phase-to-phase voltage, where the unit is applied:

Initially, set all adjustments fully counterclockwise.

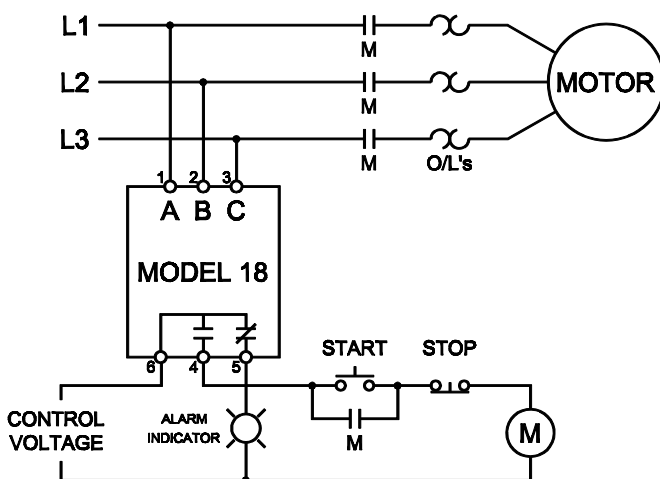
Rotate the trip adjust control clockwise until the red (FAULT) indicator illuminates.

Next, slowly rotate the trip adjust control in a counterclockwise direction, until the green (NORM) indicator illuminates.

At this point, the Model 18 is the most sensitive to irregular power line conditions. Adjust the trip delay as required to prevent nuisance tripping due to power fluctuations or motor start-ups. Adjust the restart delay as required for the application.

A more accurate setting will require the use of a 3-phase variac to lower the voltage to an exact measurable setting. Time Mark also offers a factory set version of all models and voltage ranges, for only a small additional charge.

### TYPICAL APPLICATION



### TROUBLESHOOTING

Should the Model 18 Monitor fail to operate properly, check that all three voltages are present, and are of the correct voltage level and phase rotation (a Model 108A or 108B Phase Sequence Detector should be used to verify phase rotation). Check all fuses and verify that all wiring connections are correct. If problems persist, contact your local Time Mark Distributor, or the factory for assistance (*Monday-Friday, 8 a.m. to 5 p.m. CST*).

### WARRANTY

This product is warranted to be free from defects in materials and workmanship, and is covered by our exclusive **5-year Unconditional Warranty**. Should this device fail to operate for any reason, we will repair it for five years from the date of manufacture. For complete warranty details, see the *Terms and Conditions of Sales* page in the front section of the Time Mark catalog or contact Time Mark at 1-800-862-2875.



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