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ACA-514/515 SINGLE / DUAL AC CURRENT/VOLTAGE ALARM INSTRUCTION MANUAL

1.0 INTRODUCTION

These instructions refer to the above models. Supplementary sheets are attached if the unit has special options or features. For detailed specifications, see page 4 or refer to the Data Bulletin. All ADTECH instruments are factory calibrated and supplied with a label detailing the calibration. Adjustments are normally not necessary. A simple calibration check should be performed to verify calibration before installing the instrument per 3.0 below.

2.0 GENERAL DESCRIPTION

The ADTECH Model ACA 514/515 Single/Dual Alarm accepts standard process AV Current and AC Voltage input signals and provides one or two user configurable SPDT relay contact outputs. The output contacts are rated at 10 amps, 30 VDC, or 250 VAC resistive.

An isolated 24 VDC at 30 mA DC output is provided as standard for a loop two-wire transmitter. An integral red LED provides indication on alarm independent of relay coil power.

The alarm is furnished as standard with the relay(s) power fail-safe F.S. (i.e., relay coil energized) regardless of high or low alarm configurations. You may specify the relay to be non-fail-safe N.F.S. (i.e., relay coil de-energized).

The ACA 514/515 is supplied with adjustable deadband of 1 to 50% of input span, and an adjustable time delay of 100MS to 30 seconds is also provided as standard.

3.0 INSTALLATION

The instrument is supplied in a DIN mount general purpose enclosure as standard. NEMA 4 or 7 are optionally available. Installation area/location must agree with supplied instruments, including operating temperature and ambient conditions.

Mounting
Refer to the appropriate outline drawing for mounting and clearance dimensions on page 4.

Electrical Connections
The wire used to connect the instrument to the control system Input/Output should be a twisted pair(s) and sized according to normal practice. Shielded cable is not normally necessary. (If used, the shield must be grounded at the input negative of the ADTECH instrument and left floating at the sensor.)

An 18-position compression terminal block is provided for I/O and power connection.

Input Controls
Instrument controls consist of the following:

- A 2-position and a 4-position jumper for input range
- One 16-position rotary switch for COARSE span
- One 2-position jumper for measurement response (TRMS or average)
- Two external multi-turn potentiometers for FINE ZERO and SPAN controls

The FINE ZERO and SPAN controls are accessible through the front of the instrument.

Alarm Controls
Multiturn set point (SP) control is provided to set the trip point(s) level on all units. Adjustable deadband (DB) control and adjustable time delay (TD) controls are also provided as standard.

The multiturn control(s) are accessible through the instrument front panel and are clearly marked for ease of use.

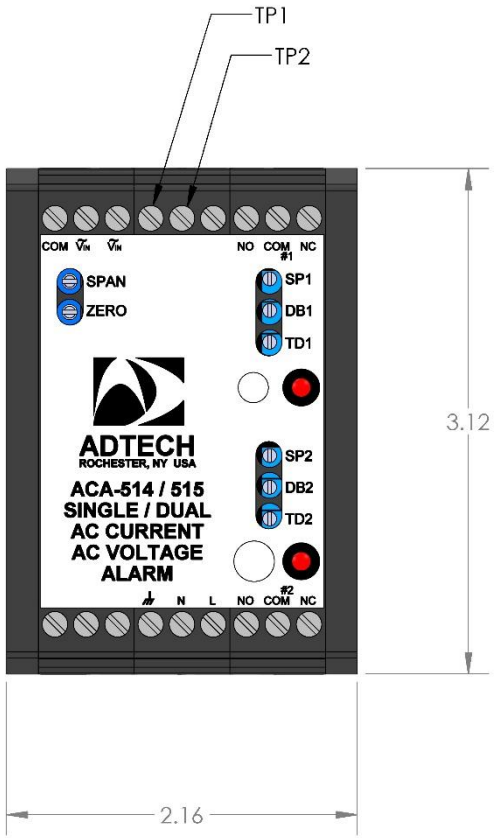
Dip switches are provided to select the trip mode and relay action per the Alarm Configuration Table.

4.0 MAINTENANCE

These instruments are electronic except for the relay(s) output(s) and require no maintenance except for periodic cleaning and calibration verification. The standard relay is rated by the manufacturer for 100,000 10 amp operations at 30 vdc or 250 vac and 5 x 10^6 mechanical operations. Relay output(s) should be verified at user-established time intervals. If the unit appears to be mis-operating it should be checked in place, per section 6.0, or removed for a bench check, per sections 6.0 and 7.0. MOST problems are traced to field wiring and/or associated circuits. If the problem appears to be within the instrument, proceed to section 7.0.

5.0 CONNECTIONS

Standard connections are shown below and on the instrument faceplate, Data Bulletin, or on attached supplementary sheet.



6.0 CONFIGURATION

All ADTECH units are factory calibrated per P.O. instructions. Usually, a complete recalibration is not required unless you want to change input type, output type, or the range of the unit. A calibration sticker located on the unit identifies the model, calibration, and options present. If recalibration to the same range is required, follow section 6.1.

SAFETY CAUTION

If the AC alarm is in service, DO NOT open the input connection. FIRST SHUT OFF the primary current that is being monitored, then disconnect the leads from the input terminals. It is also IMPORTANT NOT to make jumper changes while an input is applied on the input terminals.

For new range:

A. Open the case to gain access to the unit's pc boards. The left pc board is the input pcb.
B. Follow Table 1 to set the MAJOR RANGE. The range picked should be the smallest value in the table that is still greater than the input Full Scale.
C. Follow Table 2 to select Response Type.
D. Follow Table 3 for Zero Offset, if required.

6.1 Calibration

To perform a calibration check or re-calibration of the instrument, follow this procedure:

A. Make sure the unit I / O wiring is properly connected and that the correct power source, per the label, is also connected. The instrument must be at normal power for a minimum of 2 minutes before proceeding to B.
B. The input signal source must be adjustable from 0 to 100% in steps of 10% or at least 25%. The source should be either pre-calibrated or an accurate meter must be used to monitor the input. The input signal needs to conform to an acceptable method of simulating a thermocouple signal.
C. The output may be monitored as a voltage across a TP1 and TP2.
D. With the input set at the zero input, adjust the fine ZERO control for 100mV to the desired accuracy.
E. Apply an input corresponding to the full scale input. Turn the FINE SPAN control fully counterclockwise. Turn the COURSE SPAN switch (SW2) to a position where the output just exceeds 500 mV output. Turn the switch back one number less (but not less than 0).
F. With the input set to the full scale input, adjust the fine span control for 500mV to the desired accuracy.
G. Repeat steps F and H until the readings remain within to desired calibration accuracy.
H. Check the instrument at the 25-50-75% input settings minimum.
I. The output contacts may be monitored with an ohmmeter or a suitable source with indicator lights to prove contact transfer and LED action.
J. Set the input source to the value desired for a trip.
K. Adjust the potentiometer marked Time Delay (TD) fully counterclockwise for 0 second time delay.
L. Adjust the potentiometer marked Deadband (DB) fully counterclockwise to the minimal Deadband (approximately 1% of input span).
M. Adjust the set point (SP) multiturn potentiometer until the relay operates. The LED will come on when the relay actuates.
N. Vary the adjustment CW and CCW to get as close as possible to the actual trip point as set in Step D.
O. Vary the input source to verify that the relay operates at the desired trip point. The DIFFERENCE between the trip setpoint that activates the relay and when it drops out is the amount of deadband.
P. Adjust the deadband "DB" multiturn potentiometer and vary the input source between pull in/drop out until the desired deadband is obtained.
Q. The deadband adjustment has a minimal effect on the trip point. For improved accuracy resolution, check and adjust (if needed) the SP control as described in Steps D, E, F and G.
R. Adjust the potentiometer marked Time Delay (TD) to set the desired time delay 0-30 sec. The time delay pot does not affect the Set Point or deadband. Also, the delay is only present from input changing from no alarm to alarm condition. Once in the alarm state, the time delay has no effect on the return to the normal or no alarm state.
S. Repeat this procedure for the second setpoint.
T. This completes the calibration.

Note: If recalibration to a different relay action is required, proceed to the tables listed under Section 8.0.

7.0 FIELD TROUBLESHOOTING GUIDE

This section offers a simple, first-level troubleshooting aid for an apparent instrument malfunction.

SYMPTOM	CORRECTIVE ACTION
No output	1. Check the input and output connections carefully. 2. Check that the input signal polarity is correct and that it is present on the instrument terminals. 3. Check that the input source(s) is correct and that it changes magnitude between zero and full scale values when so adjusted.
	All external checks are complete. Problem seems internal.

If the problem seems to be internal, replace the instrument with a spare and return the defective instrument to ADTECH for prompt checkout and repair. To avoid unnecessary delays, always send a cover note with the name and telephone number of the contact and return address along with a brief description of what the unit is doing when it fails.

8.0 CONFIGURATION TABLES

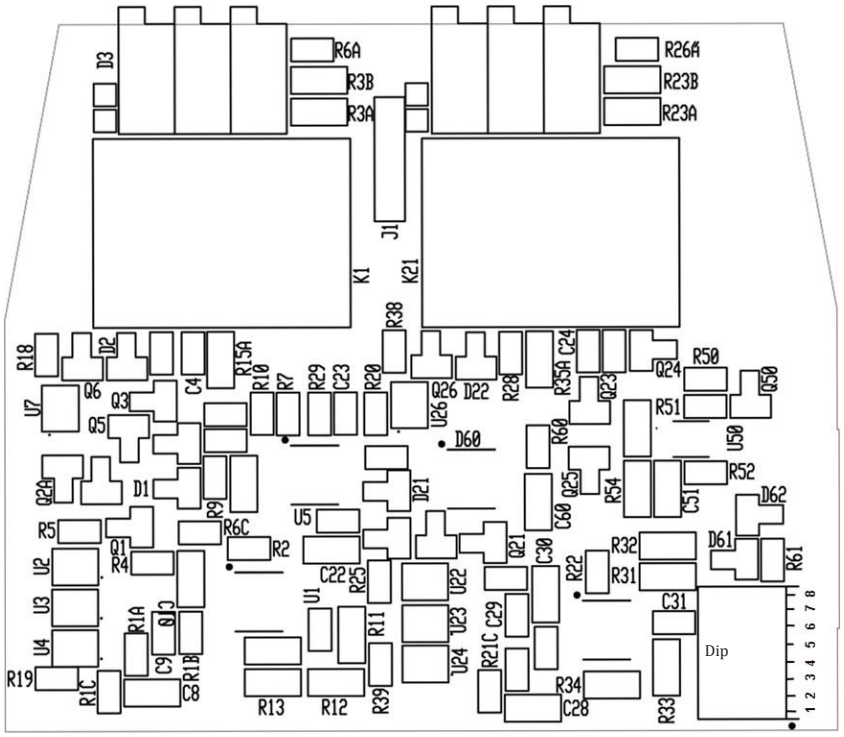
Table 1 Input Major Range				**Table 2 Response Type**	
5 Amp	J3-A	J2-A		TRMS	J4-A
250 mV	J3-A	J2-B		Average	J4-B
2.5 V	J3-B	J2-B		**Table 3 Output Zero Type**	
25 V	J3-C	J2-B		Elevated 20%	JA-1
250 V	J3-D	J2-B		Zero Based	N/A

Note: All jumpers J1, J2, J3, J4 are located on the input PCB.

Alarm PCB Configuration

Table 1: Alarm Configuration		
Setpoint # 1		
	DIP Switch Settings	
	ON	OFF
Position 3	Latching	Non-latching
Position 4	High Alarm	Low Alarm
Position 5	Failsafe	Non-failsafe
Setpoint # 2		
	Dip Switch Settings	
	ON	OFF
Position 1	Latching	Non-latching
Position 2	High Alarm	Low Alarm
Position 6	Failsafe	Non-failsafe
Note: DIP Switch is located in the lower right hand part of the output board, see below For ON the DIP switch is depressed or down, OFF is in the up position		

OUTPUT BOARD



9.0 SPECIFICATIONS

INPUT/OUTPUT

A. Input Signal

1. AC Current-any 0-1 to 0-5 amps ac, burden less than 0.5 va
2. AC Voltage-any 0-0.25V to 0-250 vac rms signal, burden less than 0.5 va (4 major ranges)
3. Zero Suppression: Up to 5% of span
4. Coarse Span Adjustment: 100% of major range (voltage only)
5. Fine Span Adjust: ±5% of major range (±1 amp for current inputs)

B. Output Signal

Standard

1. SPDT contact rated 10 amps at 30 VDC or 250 VAC resistive
2. Isolated 24 VDC at 30 mA DC two-wire transmitter excitation

Note: Dip Switch configurable Alarm type-high or low Relay Action F.S. or N.F.S.

C. Performance

1. Repeatability: ±0.1% of span
2. Trip Point Stability: ±0.004%/ oF typical ±0.01%/ oF maximum for a 50˚F change from ambient
3. Trip Adjustment: 0-100% of span continuously adjustable Blind Set: infinite resolution
4. Adjustable Dead Band: 1-50% of span continuously adjustable Blind Set: infinite resolution
5. Latching Action: on/off jumper selectable, latching reset via front panel push button
6. Adjustable Time Delay: 100ms-30 seconds
7. Power Supply Effect: ±0.05% for a ±10% power variation
8. Isolation: Input/output/power 1,500 VAC, 50/60 Hz, for AC & powered units
9. Response Time: Less than 200 milliseconds
10. Temperature Range: 32˚ to 131˚F (0˚ to 55˚C) operating -40˚ to 185˚F (-40˚ to 85˚C) storage
11. Zero TempCo:

$$\pm\left(\frac{.025 \rightarrow}{\text{Input span (MV)}} + 0.007\right) \text{ \% of span max ˚C}$$

12. Span TempCo: ±0.008% of span max/°C

Note: All accuracies are given as a percentage of span.

D. Power

1. 100-230 VAC standard
2. 24 VDC optional

Note: All units 3 watts maximum, and a ±10% power variation unless noted. For DC power, consult factory.

E. Mechanical

1. Electrical Classification: General Purpose
2. Connection: Screw compression type accepts up to 14 AWG
3. Controls: Multiturn trip set, deadband and time delay controls.
4. Mounting: DIN: Optional Nema 4
5. Weight: Net unit: 9.0 oz. (257 grams) Shipping: 16.0 oz. (455 grams)

10.0 OUTLINE AND MOUNTING