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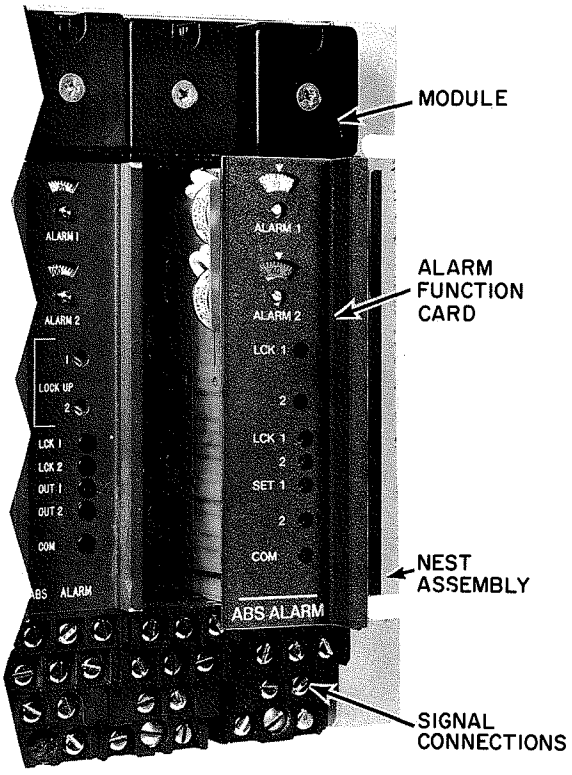
Instruction

MI
2AP-102
December 1974

— DUAL ABSOLUTE ALARM —

Relay Model 2AP+ALM-AR, Style B

(Model Number Includes Module)

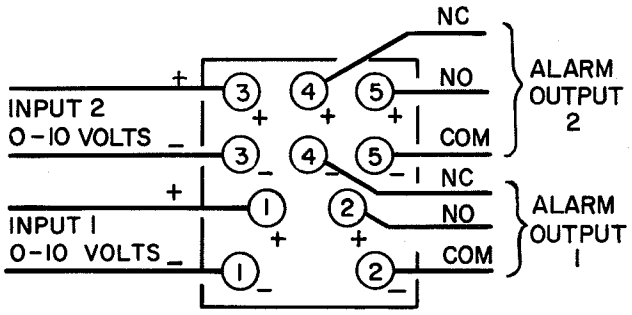


General

The Dual Absolute Alarm is a solid state function card that slides into a module located in the nest assembly. The dual absolute alarm is essentially two single alarms with a common power supply mounted on one function card. Each alarm has one input, one set point, and one output. The alarm set points are calibrated from 0 to 100 percent of scale.

Alarm output action, either high or low, is determined by jumpers on the function card. The front plate has adjustments and test points for calibration or troubleshooting either on the bench or in the nest assembly.

Wiring



NOTE: See bottom of Page 2 for internal diagram of relay contacts.

The signal connections are located on lower front on the module (see illustration above). The input signals are 0 to 10 volts dc. The alarm outputs provide relay contact connections from internal mounted contacts. The NC (normally closed) contact is closed when the relay is de-energized; the NO (normally open) contact is closed when the relay is energized. The relay is energized in a no alarm condition and becomes de-energized in an alarm condition. This operation provides failsafe action in case of power failure in the alarm card. The following specification is for the relay contact output:

28 V dc maximum - 100 mA, resistive load.

FOXBORO

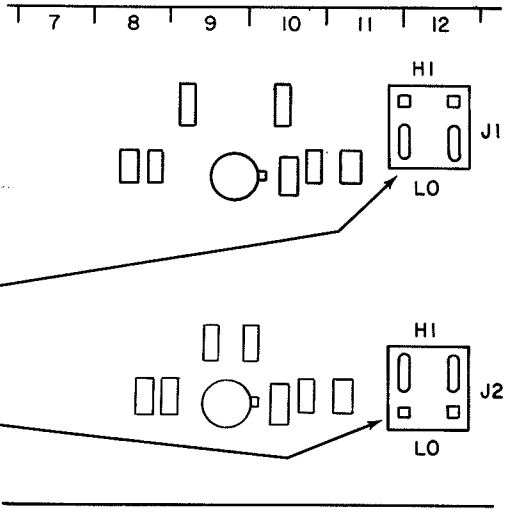
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Alarm Action

Alarm action, either high or low is determined by Jumpers J1 and J2 on the function card. For a high alarm action, the output relay is de-energized when the input signal rises above the set point; for a low alarm action, the output relay is de-energized when the input signal falls below the set point.

Jumper J1 is for Alarm Output 1 and is shown in the low alarm action.

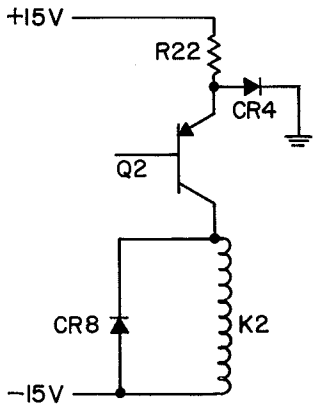
Jumper J2 is for Alarm Output 2 and is shown in the high alarm action.

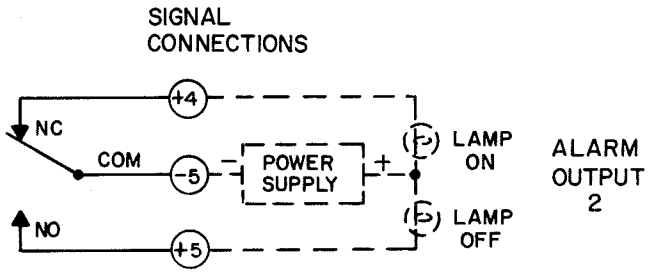


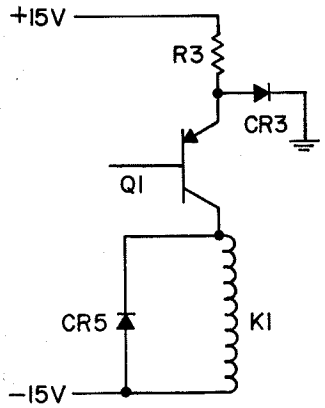
Alarm Relay Output

The alarm output is a set of internal contacts that open and close with respect to the input signal and set point. The NC (normally closed) contacts are closed when the relay coils are de-energized; the NO (normally open) contacts are closed when the relay coils are energized. The operation of the relay with respect to the input signal and set point is that the relay is energized in the no alarm condition. During an alarm condition the relay is de-energized causing the relay contacts to assume the positions shown in the illustration below. This operation is for failsafe condition, should loss of power occur.

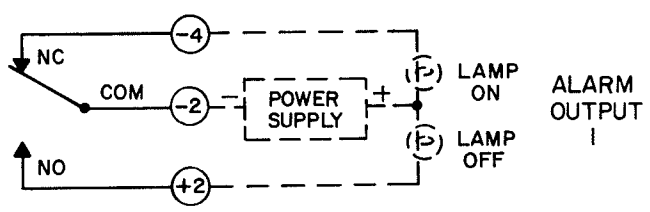
The external circuits are connected to resistive loads not exceeding 100 mA at 28 V dc. The illustration below shows a typical load and the internal wiring.







NOTE: The relay contacts NC (normally closed) are shown in the alarm condition



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Equipment Needed

(For Calibration and/or Troubleshooting)

System Calibrator, Model 2AT-CAL

Card Test Module, Model 2AT-CTM

Card Test Extender, Model 2AT-CXMA

DC Voltmeter, Triplett 630
or equivalent

Alternate equipment if System Calibrator is NOT available

DC Voltmeter, Range 0 to 10 volts
Accuracy: ±0.5%

DC Voltage Source, Range 0 to 10 volts

DC Power Supply, +15 V and -15 %, 100 mA
For bench calibration or troubleshooting

Lockup Adjustment

"Lockup" is a term applied to the input voltage difference between the points at which the output energizes and de-energizes.

1. For lockup adjustment, place Jumpers J1 and J2 in the LO alarm action as shown on top of Page 2.

2. Connect Calibrator at test points LCK 1 (+) and COM (-) on front plate.

3. Adjust Set Points 1 and 2 to approximately 50% of scale.

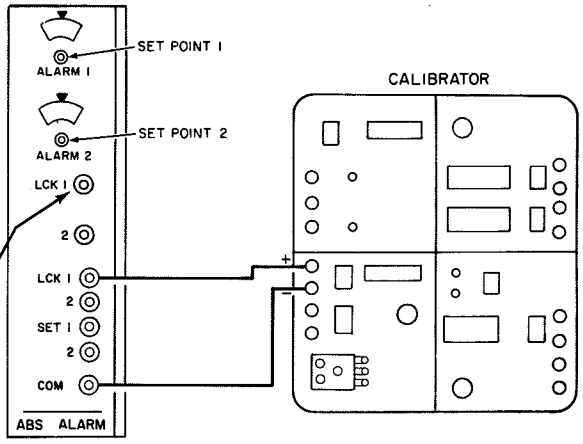
4. Determine the amount of lockup desired for Outputs 1 and 2. It is usually given as a percentage factor from 0.5% to 10% of span.

5. Read the Calibrator. It should read 0.1 times the percent lockup.

   Example:

   Lockup desired = 5% of span
   DC voltage = 5 x 0.1
   = 0.5 volts

   If voltage is incorrect, adjust Lockup 1 (CW to increase) on front plate.



6. Move test point lead on front plate from LCK 1 to LCK 2.

7. Repeat Step 5 and adjust Lockup 2 if necessary.

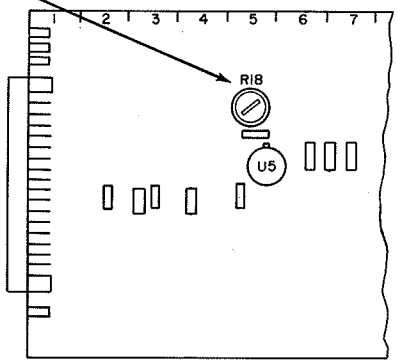
8. Replace Jumpers J1 and J2 to their original position.

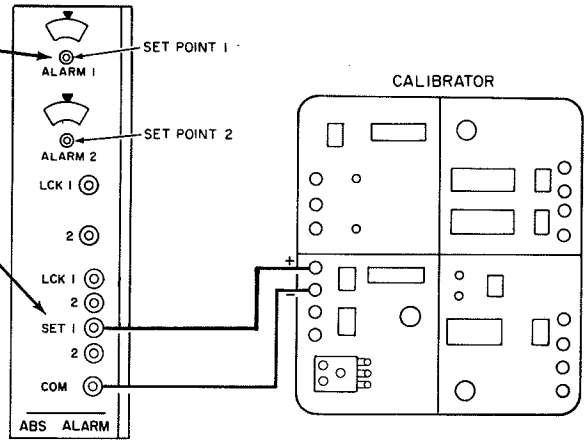
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Set Point Dial Calibration

Use a card extender if calibration is done at the nest assembly.
For wiring with function card removed from module, see Page 6.

1. Turn set screw on Set Point 1 fully clockwise.
2. Connect Calibrator at test points SET 1 (+) and COM (-) on front plate.
3. Adjust Potentiometer R18 on function card until Calibrator reads 10 V ±5 mV. Set Points 1 and 2 are now both calibrated electrically.





4. Turn Set Point Dials 1 and 2 counterclockwise until they stop. If zero point on either dial does not line up with arrow on front plate, loosen set screw on back of dial face and line zero correctly.

Set Point Adjustment

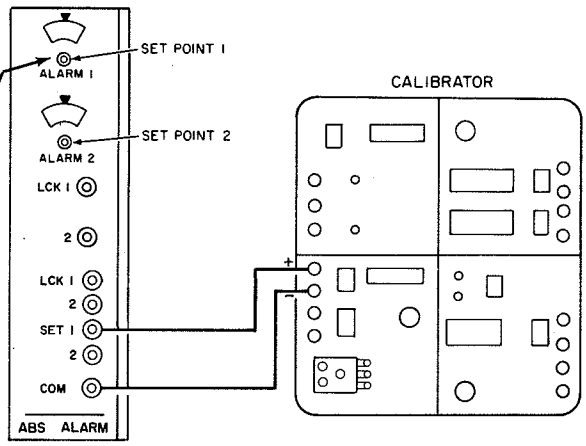
The set point adjustment can be made directly at the front plate. The accuracy is ±2% of scale. Turn the set screw on front plate until hairline index is in line with the desired set point. For a more accurate setting of the set point, the following procedure will adjust the set point to an accuracy of ±1%.

1. Connect Calibrator at test points SET 1 (+) and COM (-) on front plate.
2. The alarm set point dial is calibrated from 0 to 100% of scale. This corresponds to 0 to 10 volts on the Calibrator. If a desired set point is needed, turn the set point set screw until the Calibrator reads the numerical value.

   Example:

   Desired Set Point = 47%
   Calibrator Voltage = 4.7 volts

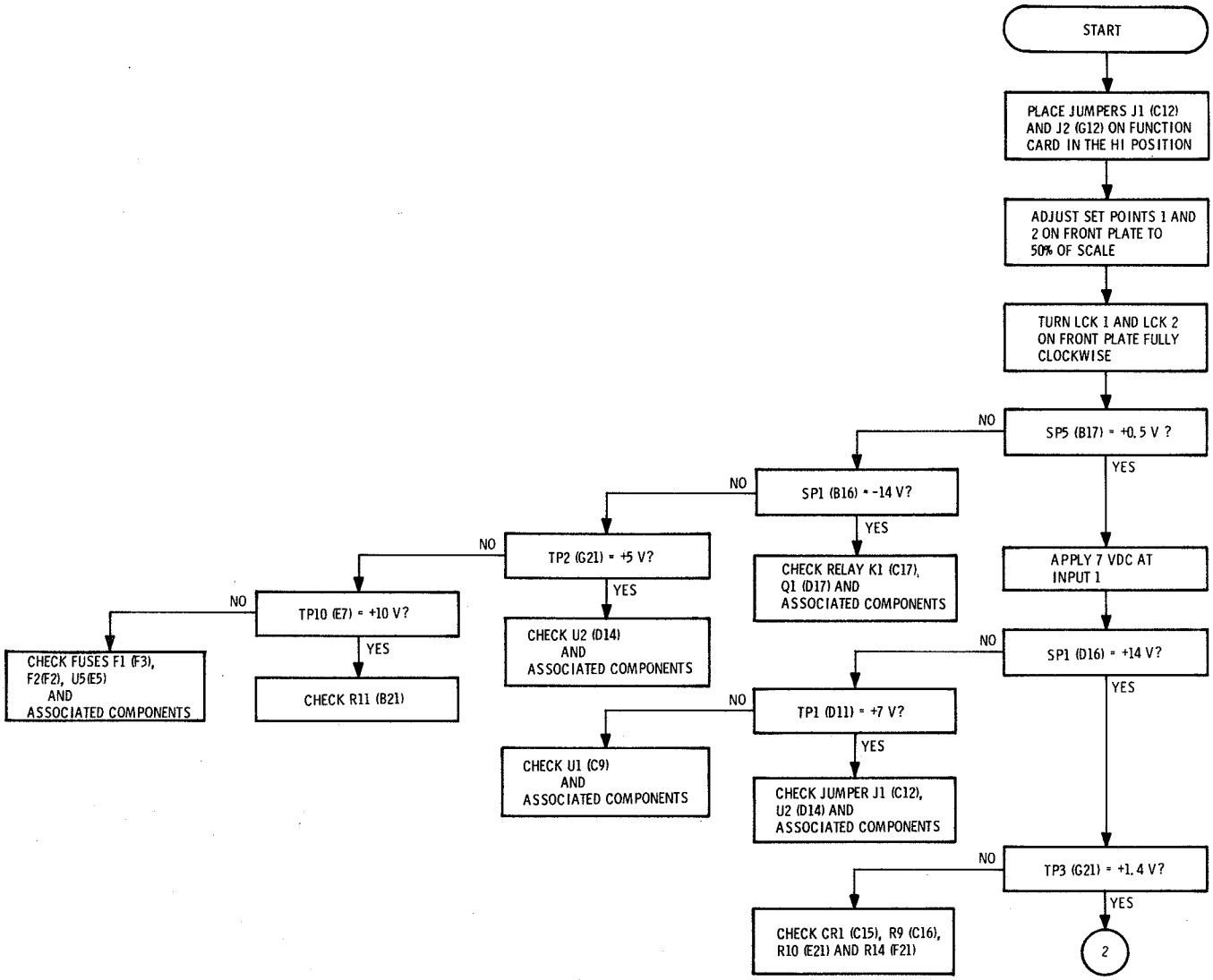
   Turn Set Point 1 set screw until the Calibrator reads 4.70 volts.
3. For adjustment of Set Point 2, connect Calibrator at test points SET 2 (+) and COM (-) on front plate.



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Troubleshooting

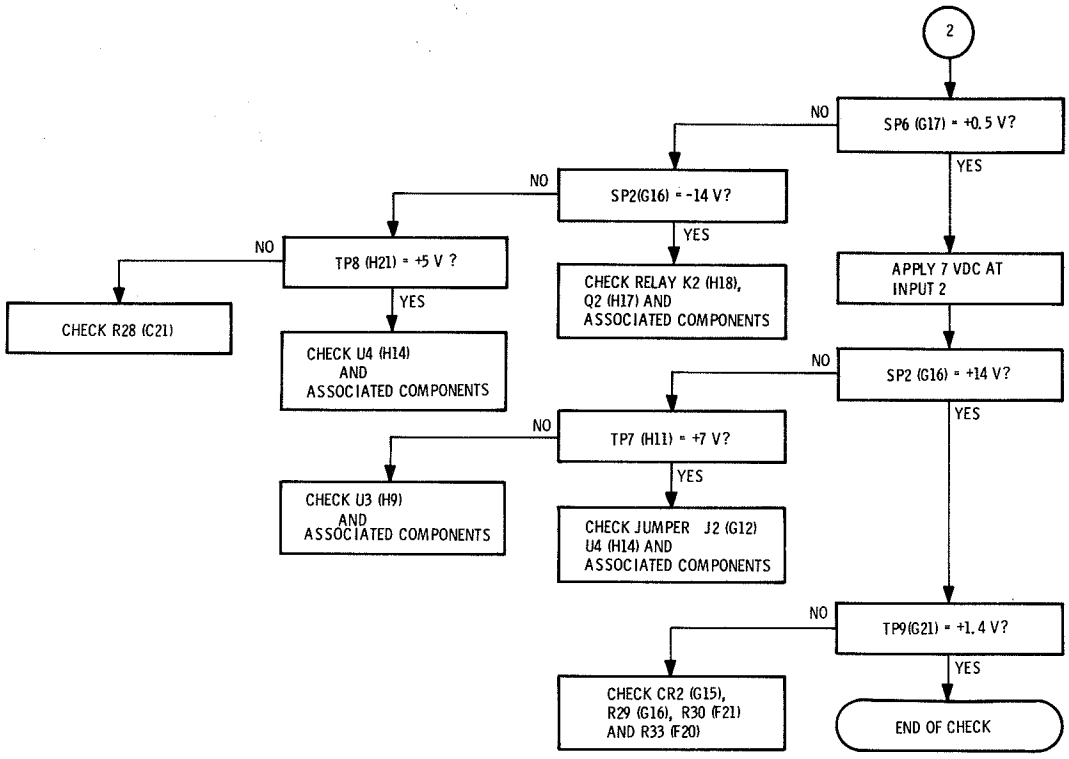
The troubleshooting flow diagram below will aid in isolating a malfunction. If any parts are replaced, recalibrate function card using procedures on Pages 3 and 4. All service points (SP), test points (TP) and components in the diagram are followed by a letter and number in parentheses (B12). This is a grid coordinate location code found on the component diagram (see illustration on Page 7). All voltages are referenced to test point TP5 (I21) unless specified. Make the necessary power connections if troubleshooting is performed on bench (see Page 6).



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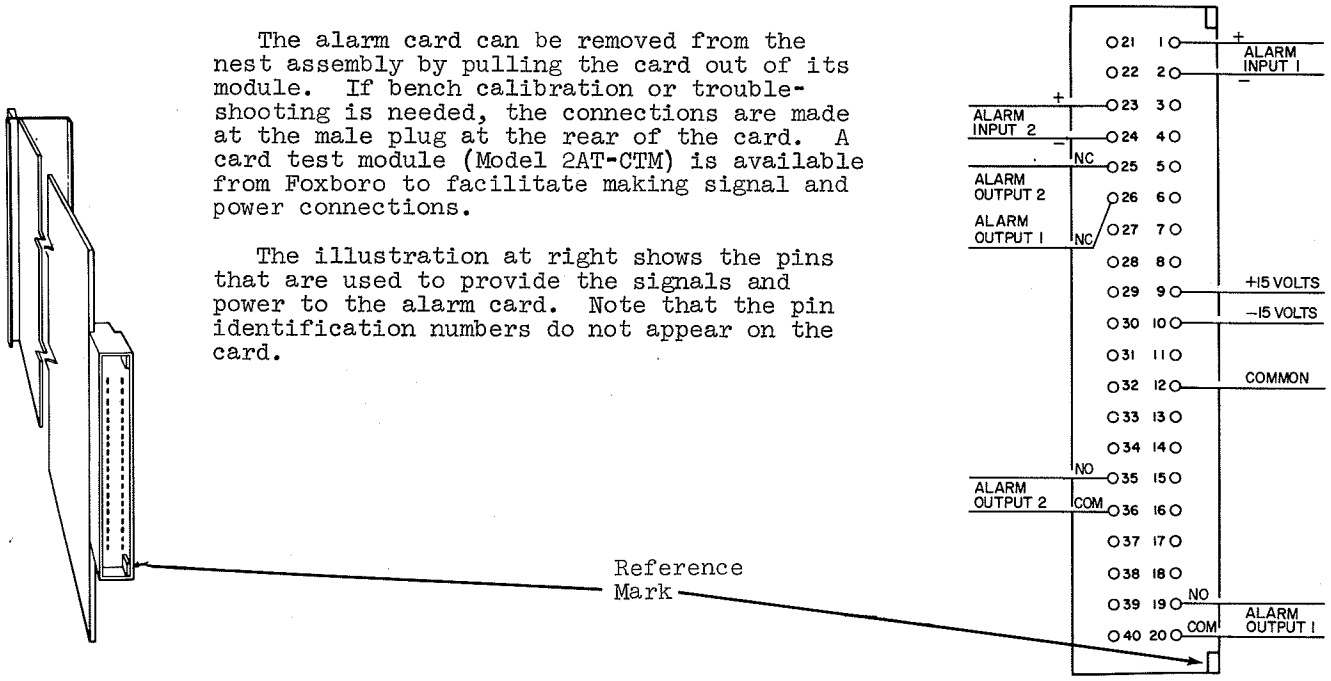
Troubleshooting (continued)



Rear Connector of Alarm Card

The alarm card can be removed from the nest assembly by pulling the card out of its module. If bench calibration or trouble-shooting is needed, the connections are made at the male plug at the rear of the card. A card test module (Model 2AT-CTM) is available from Foxboro to facilitate making signal and power connections.

The illustration at right shows the pins that are used to provide the signals and power to the alarm card. Note that the pin identification numbers do not appear on the card.



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