

# SIEMENS

## Fire Safety

# Operation, Installation, and Maintenance Manual

## Model CP-48

### Fire and Smoke Detection and Alarm System

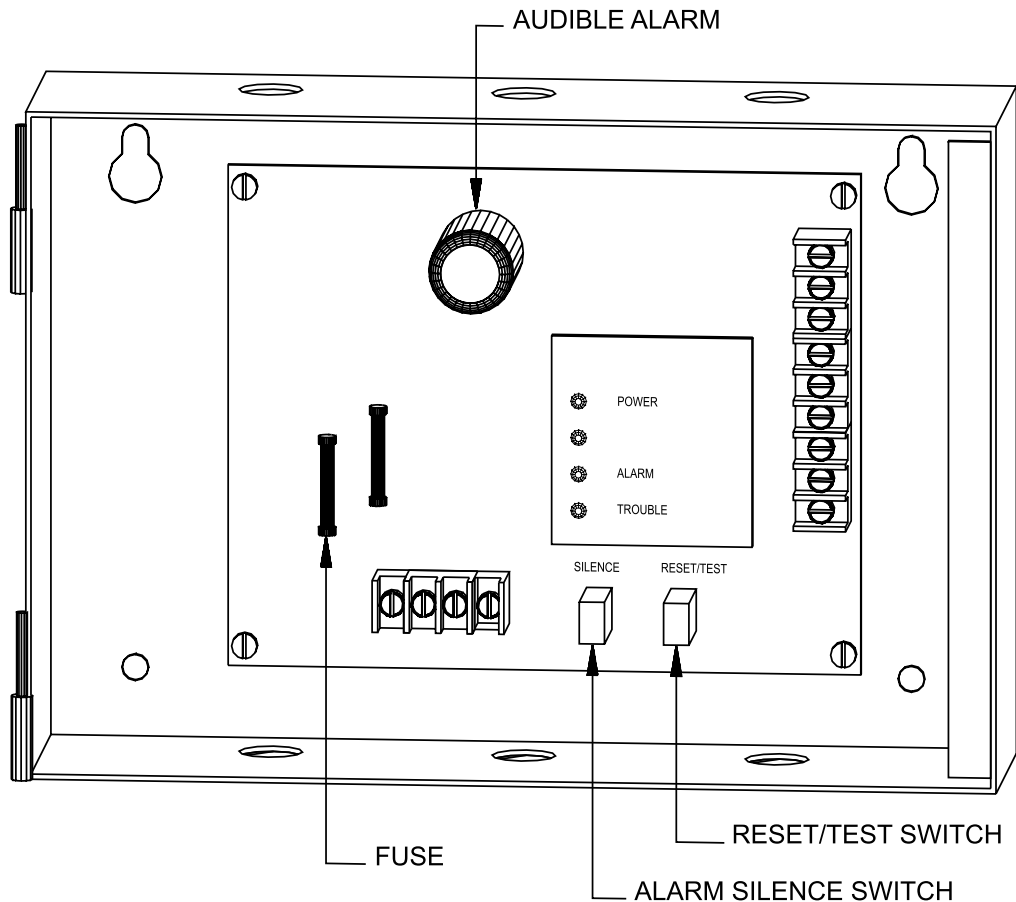
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**Figure 1**  
**Model CP-48**

## 1.0 INTRODUCTION

The **SIEMENS** Model CP-48 Control Panel is a single zone fire alarm control unit, which may employ the specified ionization, thermal or photoelectric type detector. This unit has been especially designed to operate from a 48 volt DC power input source such as is available in telephone community dial offices. The front cover contains a manual fire alarm station and entry key lock. Displayed through the front cover are the: "Power On," "Alarm," and "Trouble" Visual Indicators. Within the control panel are a fire alarm "Reset/Lamp Test" switch, a switch to silence the panel contained audible alarm, two sets of isolated alarm relay contacts, and one set of trouble relay contacts.

## 2.0 USER OPERATING INSTRUCTIONS FOR CP-48

(Refer to schematic on inside back cover.)

### 2.1 Normal Stand-By Operation:

With panel connected to the 48 VDC Power Supply using the correct polarity connection, and the initiating circuit terminated with the 1.8K end of line resistor, the panel should display a normal condition with only the visual "Power" indicator illuminated in the normal state.

An off normal position of the internal audible alarm selector switch when the panel is not in alarm condition will result in a trouble condition.

An alarm condition may be cleared or reset by operating the momentary "Reset" switch. The associated manual fire alarm station must be returned to manual position before the system will reset.

### 2.2 If Fire Alarm Sounds:

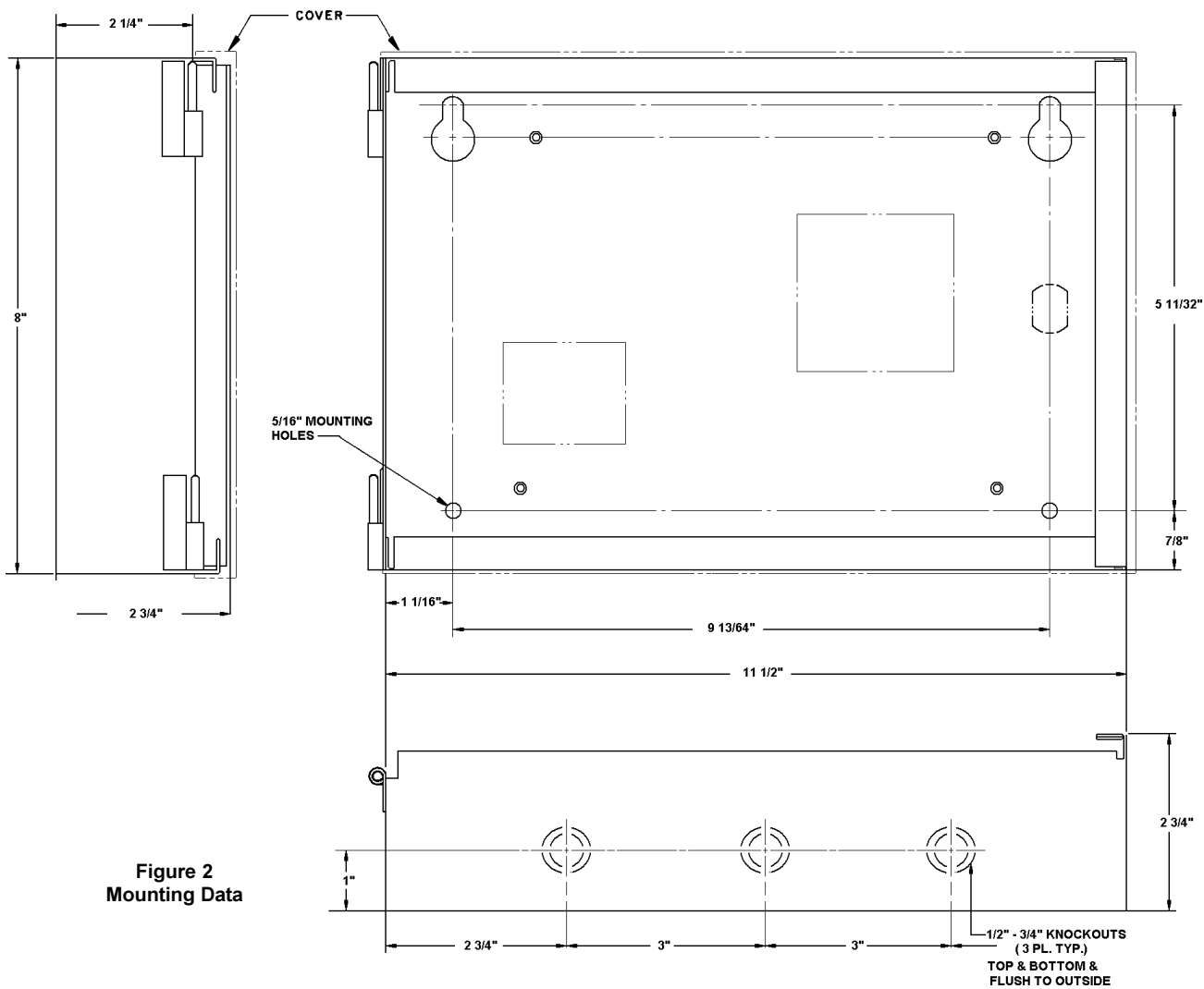
- Notify the Fire Department. If the system is connected to the Fire Department or a central station, this is done automatically by the control equipment. Keep in mind that the Fire Department or central station should be notified when resetting the system.
- If fire is not apparent, **DO NOT RESET SYSTEM**. Locate the detector initiating the alarm. The initiating detector will have the base indicating lamp energized.
- After the fire is completely extinguished and all smoke and gases are cleared from the area, reset the system by moving the Reset Switch momentarily to the "Reset" position.

### 2.3 When Trouble Condition Develops:

- The trouble contacts will be in "trouble" state. Call your authorized Siemens Building Technologies, Inc. Representative. The trouble should be diagnosed and corrected immediately.

### 2.4 Periodically Testing the System: (Be sure to notify the proper authorities prior to performing tests)

- The system should be tested at regular intervals to insure operational reliability and optimum performance. To test the system, activate at least one detector. An ionization detector may be activated by blowing smoke into the screened chamber or holding a lighted match a few inches below it. Check that system responds properly.
- Reset the system.
- This inspection should include checking the sensitivity of every ionization detector using a sensitivity checker.



**Figure 2**  
Mounting Data

### 3.0 INSTALLATION AND WIRING

The reliability of any system depends to a great extent on the proper installation of the control units, detectors, associated equipment, and wiring. These instructions outline the requirements for a satisfactory installation. Careful completion of each detail will provide an automatic fire and smoke detection system that will be dependable and give reliable operation.

Connection instructions are mounted inside the chassis cover of the CP-48. Additional wiring information is provided in this manual. Any questions regarding the equipment or installation should be directed to Siemens Building Technologies, Inc., or an authorized representative. Do not make any alteration without first consulting the above.

#### 3.1 Mounting Control Units (Refer to Figure 2):

The Control Unit should be securely fastened to a shock and vibration free surface in a clean, dry area. It must be mounted greater than 3 ft., but less than 6 ft. from the floor. The location should be easily visible and readily accessible for maintenance and allow sufficient clearance to open the hinged front door.

Local regulations or codes generally require all wiring to, from, and between units to be carried in 1/2"-3/4" knockouts provided in the top and bottom of the control unit. #18 AWG 300V insulation, color coded wire is recommended for the detector circuits. A larger size may be used if desired. For the DC power input use #14 AWG 300V wire.

#### 3.2 Power Requirements:

The Model CP-48 Control Unit is designed to be operated from a 48 VDC power source having the positive line grounded, such as

is available in telephone community dial offices. The 48 VDC input powers all internal circuitry. The DC voltage may vary between the limits of 42 and 55 volts and the limits should not be exceeded. The CP-48 Control Unit, ungrounded leg, must be connected through a separate circuit breaker or fuse directly to the DC power supply. No other equipment may be supplied from this separate circuit breaker or fuse. Wire must be run continuously from power source to terminals in Control Unit. Refer to Wiring Diagram (Figure 3) for terminal connections.

#### 3.3 Installation of Conduit and Outlet Boxes:

Install outlet boxes and run conduit between boxes and control unit. Use 4"x2 1/8" deep octagon boxes for ionization, photoelectric, flame, and plug-in thermal detectors. Do not mount boxes in direct air flow from air-conditioning or ventilating system supply registers.

The control unit, and all detectors and alarm circuit conduit, must be properly grounded. Insure that all conduit has clean threads and makes good electrical contact between control unit and outlet boxes.

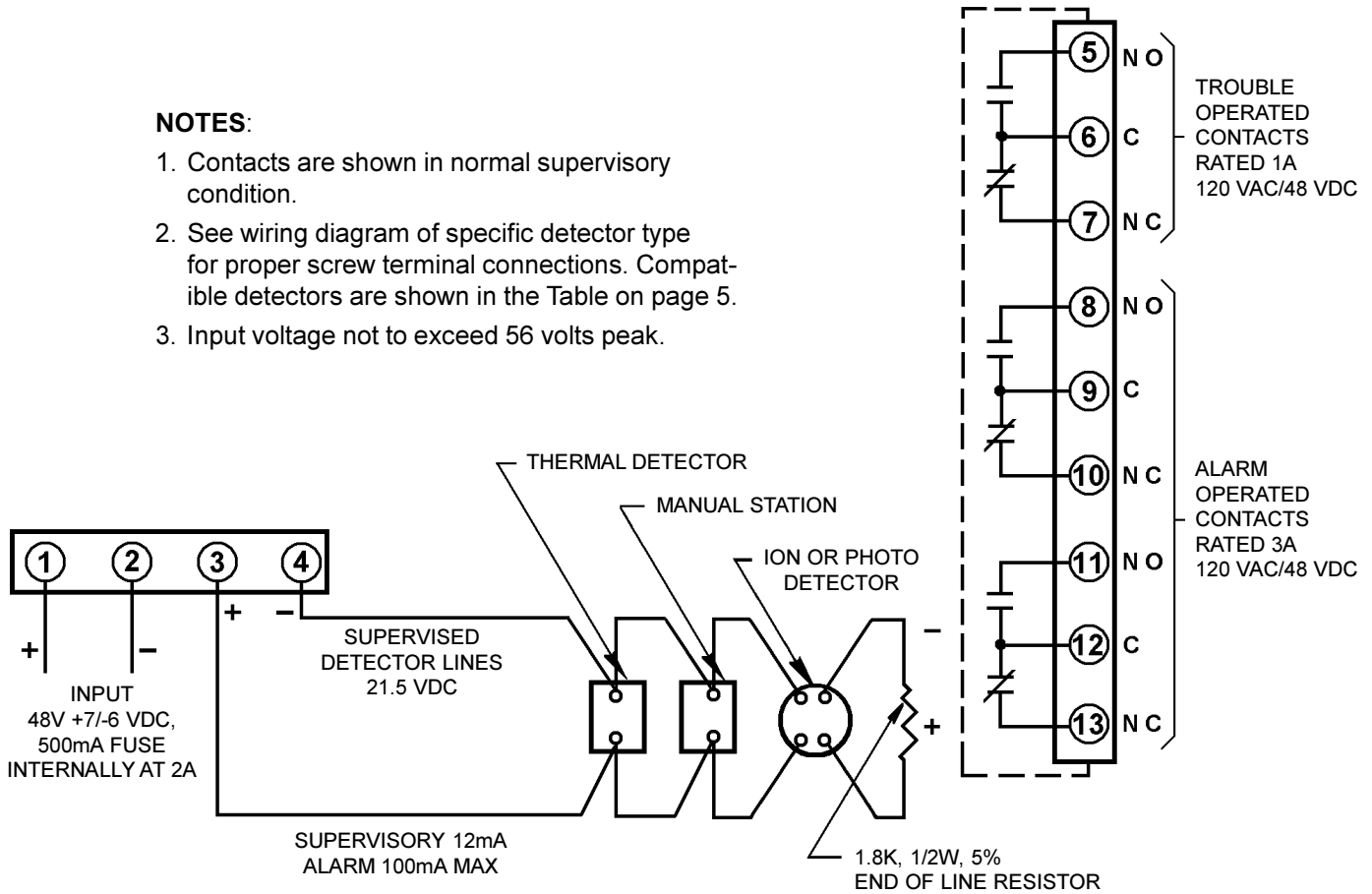
#### 3.4 Installation of Detector Bases:

##### a. Wiring (Refer to Figure 3):

Run wire in accordance with wiring diagram. Use at least #18 AWG 300 volt insulation, color coded wire for the detector circuits. Wiring between control unit and first detector base, and all subsequent detector bases must be continuous; no splices, wire nuts, solder or any other type connection is permissible. On rare occasions an exception may be necessary due to an extremely long run. In this case, the splice must be soldered.

**NOTES:**

1. Contacts are shown in normal supervisory condition.
2. See wiring diagram of specific detector type for proper screw terminal connections. Compatible detectors are shown in the Table on page 5.
3. Input voltage not to exceed 56 volts peak.



**Figure 3  
Wiring Diagram**

The wire interconnecting the detector bases is continuously supervised by a small electrical current flow through the circuit to the end-of-line resistor (1.8K ohms) mounted in the base of the last detector. In order to keep this supervision complete, no parallel branching of wires is permissible. Every base, except the last one, will have one set of incoming, and one set of outgoing wires.

**b. Installing Bases:**

Mount end-of-line resistor between appropriate terminals of last base on circuit, as indicated on wiring diagram. Mount all bases to outlet boxes. Manual Stations, Thermal Detectors, Air Duct Detectors, etc., are to be connected to the circuit at this time. Please refer to wiring diagrams for specific equipment for connection details.

**3.5 Test of Wiring:**

**Note:** It is suggested that electrical tests be conducted jointly by the installer and the manufacturer's technician or representative. Fifteen (15) days prior written notice is requested so that the services of the technician may be scheduled.

**The installation of the wiring should be checked as follows:**

- a. Detectors should not be in their bases. Temporary jumpers should be inserted appropriately in all bases. Install end-of-line resistor to appropriate terminals of last detector on circuit. Wiring from bases should NOT be connected to Control Panel at this time.

- b. Check the wiring of the detector circuit with ohmmeter. Resistance reading between wires normally connected to terminals 3 and 4 of the Control Panel should be approximately 1.8K ohms. Short the detector lines together and megger the combined lines to chassis and conduit. There should be at least 10 meg resistance reading between wires and conduit or ground.
- c. Connect wires to appropriate terminals of the Model CP-48. For base wiring, follow instructions included with base.
- d. The manufacturer's service representative will then install detectors and check sensitivity.

**3.6 Test for System Operation:**

- a. See that the CP-48 Control Unit is in normal standby operation.
- b. To test for supervision of initiating circuit, remove the detector connected to the last device and check that proper trouble indicators respond in the system. Re-connect detector.
- c. To test operation of initiating circuit, actuate a detector. Check that system fire indicators and alarm relay contacts respond to the alarm.
- d. Test operation of detector circuit, activate each detector and manual station, one at a time, resetting each, and check that detector base lamp and the control unit alarm controls operate. Each ionization detector may be activated by blowing smoke into the chamber or holding a lighted match a few inches below it. The manual station on front panel should be checked independently.

#### 4.0 MAINTENANCE

Fire and Insurance authorities recommend annual inspection and if necessary, service of fire protection equipment. To insure proper and reliable operation, we recommend the following inspection and testing annually by a qualified technician:

1. The detector head screen should be inspected for dust accumulations and if excessive, contact your distributor or factory for service.
2. Activate a detector. Check that base lamp operates and that proper fire indications are given by the system. An ionization detector may be activated by blowing smoke into the screened chamber or by holding a lighted match a few inches below it.
3. Check the supervisory circuit by operating the Reset Switch to the "reset" position. In this position, the system should give the required trouble indications.
4. Check operation of each detector on circuit. Measure sensitivity of each detector with appropriate sensitivity checker.

#### 5.0 TROUBLE SHOOTING THE SYSTEM

Perform checks in order following symptom noted. Refer to chart for proper readings across specific terminals.

A trouble condition may result from any of the following conditions:

- Open circuit detector lines
- Input fuse open\*
- Loss of input supply\*
- Reset switch not in closed or normal position.
- Alarm silence switch in off normal or silenced position during non-alarm condition.

\*Note items 2 and 3 above.

These conditions cause a change of state of the trouble relay contacts only and not a visual trouble indication.

Trouble Condition (Trouble contacts in trouble state):

1. Check main power; terminals 1 (+) to 2 (-).
2. Check fuse F1.
3. Check detector circuit voltage: terminals 3 (+) to 4 (-).

Alarm Condition (alarm contacts in alarm state) without symptoms of fire:

- a. Place Reset Switch in 'reset' position and release.
- b. If voltage terminals 3 (+) 4 (-) is less than 20 VDC, check current terminal 3. If an excess of "Normal" range then check detector circuit for alarmed detector, correct end of line resistor, or shorted lines.

VOLTAGE/CURRENT MEASUREMENT CHART			
For DC voltage measurement on terminals noted in left hand column, the positive terminal is listed first.			
Terminals	Voltage	Current	Mode
3+ 4-	20-23 VDC	—	Normal
1+ 2-	42-55 VDC	—	Normal
3	—	14-20 mA DC	Normal
3	—	> 50 mA DC	Alarm

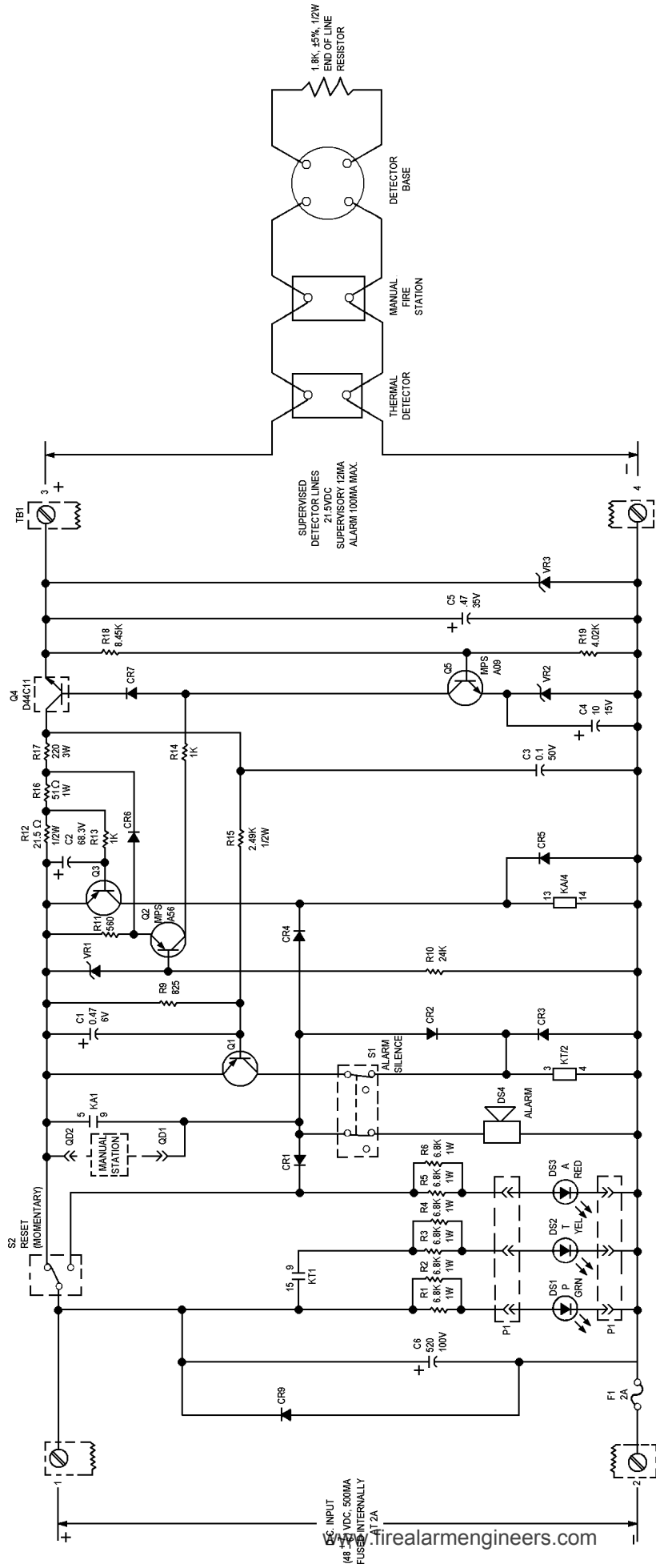
#### DETECTORS

May use up to 30 detectors (selected from any of the compatible detectors listed at the right) or may use shorting devices, detector relays, or remote lamps (Refer to the related detector instructions).

#### COMPATIBLE DETECTORS\*

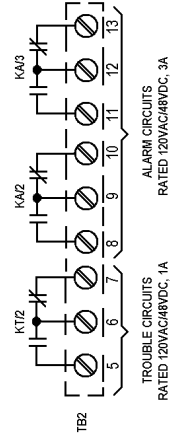
DETECTOR COMPATIBILITY IDENTIFIER	BASE COMPATIBILITY IDENTIFIER	INSTALLATION/ WIRING INSTRUCTIONS
DI-3 DI-4A PE-3	DB-3S DB-4 DB-3S	P/N 315-081943-15 P/N 315-085257-11 P/N 315-090875-6

\*CP-48 is the compatibility identifier.



**CP-48 Schematic**  
530-083621

- NOTES:
1. UNLESS OTHERWISE SPECIFIED, ALL RESISTOR VALUES ARE IN Ω's (OHMS) 1/4W
  2. UNLESS OTHERWISE SPECIFIED, ALL CAPACITOR VALUES ARE IN μFD (MICROFARADS)
  3. DIODES CR5-CR9 ARE IN4003.
  4. KT1/2 SHOWN ENERGIZED  
KA1/4 SHOWN DE-ENERGIZED.



**CP-48 Schematic**

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