SEVERAL DIFFERENT SOURCES OF POWER CAN BE CONNECTED TO THE FIRE ALARM CONTROL UNIT. DISCONNECT ALL SOURCES OF POWER BEFORE SERVICING. CONTROL UNIT AND ASSOCIATED EQUIPMENT MAY BE DAMAGED BY REMOVING AND/OR INSERTING CARDS, MODULES, OR INTERCONNECTING CABLES WHILE UNIT IS ENERGIZED. DO NOT ATTEMPT TO INSTALL, SERVICE OR OPERATE THIS EQUIPMENT UNTIL MANUAL(S) ARE READ AND UNDERSTOOD.
FIGURE 1 - BASIC SYSTEM WIRING DIAGRAM

CONNECTING CABLE
FOR POWER TRANSFORMER

ALARM RELAY
ACT IN ALARM

NC
NO
POLE

3
2
1

DRIY SUPPLEMENTARY
ALARM CONTACTS
RATED:
3A, 120VAC RESISTIVE
3A, 30VDC RESISTIVE

4
5
6

BELL CIRCUIT "B"
3A, 120V, 8GA

7
8
9

BELL CIRCUIT "B"
3A, 120V, 8GA

10
11
12

BELL CIRCUIT "B"
3A, 120V, 8GA

13
14

SUPERVISED CLASS "B" BELL CIRCUIT
(MAX. CURRENT: 3A COMBINED, 2A PER CIRCUIT

15
16
17
18
19
20

BELL CIRCUIT "B"

21
22

ALARM

23
24

REVERSE POLARITY
REMOTE STATION OUTPUT

25
26

AC POWER MONITOR
RELAY

27
28

NORM. ACT.

29
30

UNFILTERED/UNREGULATED

31

REGULATED (350MA, MAX.
ON M912, 200MA, MAX.
ON M924)

32
33
34
35
36
37

ALARM INITIATING CIRCUITS
SUPERVISED, CLASS "B"

38
39
40
41
42
43

OPTIONAL ZONE
BOARD

PLUG-IN 3 ZONE CARD

MOUNTING TRACK

PLUG-IN MASTER CARD

MASTEB BOARD

NORMAL SUPVrary DEVICE (3),
TYPICAL CURRENT:
M912 IS 120MA, M924 IS 210MA.
OPEN CIRCUIT VOLTAGE:
M912 IS 12VDC, M924 IS 24VDC.

NOTES:
1. Combined current drain for all device power from panel should not exceed 3 Amperes.
2. Do not exceed current limit specified for any individual circuit.
3. Refer to instruction manual section 4 for system specifications.
4. Refer to instruction manual section 5 for system Installation Instructions.
5. Detector loop(s) reverse polarity remote station output, and supervisory device(s) input are power limited circuit which may be connected to limited energy cable.
6. Unregulated power outputs comply with paragraphs 27.3 and 27.4 of UL standard UL481.
### Figure 2 - Initiating Device Connections (Typical)

**Refer to Manual Sections 4.2, 4.3 and 5.3**

#### Alarm Initiating Circuits

<table>
<thead>
<tr>
<th>MCB Board</th>
<th>AC Power Monitor Relay</th>
<th>Alarm Detector</th>
<th>E.L.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>27</td>
<td>Manual Station</td>
<td>MS112</td>
</tr>
<tr>
<td>27+</td>
<td>28</td>
<td>Heat Detector</td>
<td>MS124</td>
</tr>
<tr>
<td>28-</td>
<td></td>
<td></td>
<td>2.2 K</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.7 K</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ZONE 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ZONE 2</td>
<td></td>
</tr>
<tr>
<td>32+</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34+</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36+</td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ZONE 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ZONE 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Explore, After Last Device</td>
<td>2.2 K</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.7 K</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**

1. Detection loop specifications
   - Operation: Class B
   - Maximum standby head current: 3mA peak per zone
   - Supervision current: 5mA
   - Standby Voltage: MS112-11VDC, MS124-23VDC
   - End of line resistor: MS112-2.2K, MS124-4.7K
   - Current required to ensure alarm: 15mA minimum
   - Maximum resistance per side: 100 Ohms
   - Short circuit currents: 15mA ± 10mA
   - Maximum total zone resistance: 200 Ohms

2. Initiating devices include: Manual station, heat detectors, smoke detectors, ionization detectors, waterfall alarm devices, coded manual stations.

3. If coded manual stations are connected to any zone, see Figure 8.

4. Use mechanical water motor gong if waterfall alarm devices are connected to an MS112/MS124.

5. Smoke and ionization detectors requiring separate power can be powered from master control board Terminal 10 (−) and Terminal 12 (+). See section 4.9.1 for current limitations. Use end of line relay (SOLR-A on MS112, SOLR-B on MS124). See device data sheets for complete connection information.

6. Caution is advised when using 2 wire detector containing supplementary relays or indicators since their operation cannot be assured. Example: activation of a manual station, heat detector, or other shorting type detector will shunt operating current from the 2 wire detector(s) on the same zone thereby preventing their operation.

7. Detector loop current is sufficient to ensure operation of one detector per zone.

8. Detector loop is a power limited circuit, which may be connected to limited energy cable.

9. Compatible, U.L. listed, 2 wire detector available from Fire-Lite, include the following series:

<table>
<thead>
<tr>
<th>Detector Series</th>
<th>IONIZATION TYPE</th>
<th>PHOTOELECTRIC TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF71</td>
<td>CF1800</td>
<td>SD71</td>
</tr>
<tr>
<td>CF801</td>
<td>CF500</td>
<td>SD600</td>
</tr>
<tr>
<td>CF503</td>
<td>CF600</td>
<td>SD851</td>
</tr>
<tr>
<td>COMPATIBLE PANELS</td>
<td>MS124</td>
<td>MS124</td>
</tr>
<tr>
<td>MS112</td>
<td>MS124</td>
<td>MS124</td>
</tr>
<tr>
<td>MS124</td>
<td>MS112</td>
<td>MS124</td>
</tr>
<tr>
<td>MS124</td>
<td>MS112</td>
<td>MS124</td>
</tr>
<tr>
<td>MAX. STANDBY CURRENT</td>
<td>.065mA</td>
<td>.085mA</td>
</tr>
<tr>
<td>MAX. DETECTORS PER ZONE</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Notes:</td>
<td>CF71/SD71 - Use with CF001, CF002, CF003, CF004 base or DH-23 Duct Housing. CF651/SD651 - Use BI01 base with MS112 and BI01 or BI07 base with MS124. Duct detector versions CH18D/DM28D are compatible with MS124 only. AR 10 Relay is not compatible with 2 wire operation. SD600 - Model SD600T has a integral fixed temperature thermal. 224 - Compatible options: Integral thermal (T), Isolated thermal (H), Aux. Relay (R), Integral Horn (P), and Controlled Horn (CP).</td>
<td></td>
</tr>
</tbody>
</table>
FIGURE 3 - SIGNALING CIRCUITS
Refer to Manual Sections 4.4 and 5.4
SUPERVISED CLASS "B" BELL CIRCUIT
(MAX. CURRENT: 3A COMBINED, 2A PER CIRCUIT)

NOTES:
1. Connect signalling circuits as shown.
2. Size wire for a maximum voltage drop of 1.0VDC on M8112 and 2.0VDC on M8124.
3. Use polarized U.L. listed, signalling devices with a minimum rated operating voltage range of 9 to 15VDC on M8112 and 18 to 30VDC on M8124.
4. Total current to all external devices cannot exceed 3 amperes, with a maximum of 2 amperes from either signalling circuit.

Figure 4 - Remote Station and Local Energy Municipal Box Connection Information

NOTES:
1. Remote station Connection (Non-Supervised)
   A. Remove jumper J1 unless local regulations specifically prohibits the transmission of a trouble signal.
   B. A U.L. Listed polarity sensitive remote station receiving unit having compatible ratings may be connected to terminals 21 and 24.
   C. Nominal remote station output levels:
      1. Alarm: 12VDC on M8112, 24VDC on M8124 with terminal 23 positive.
      2. Normal: 12VDC on M8112, 24VDC on M8124 with terminal 24 positive.
      3. Trouble: 0VDC if jumper J1 has been removed. Trouble is not transmitted if jumper J1 is installed.
      4. If a remote station is not employed leave terminals 23 and 24 open.
2. Local Energy Municipal Box (Supervised Circuit)
   A. When a local energy municipal box is to be employed, remove the 10K, 1W resistor from terminals 25 and 26.
   B. Connect the auxiliary trip coil to terminals 25 and 26.
   C. Nominal trip coil characteristics should be:
      1. Trip current=0.25 Amperes
      2. Coil voltage=5.0VDC
      3. Coil resistance=16.0 Ohms
   D. Limit the total interconnecting wire resistance between panel and trip coil to 3 OHMS.
   E. Connect the reset supervisory switch as follows:
      1. Switch common to Terminal 12
      2. Normally closed contact to Terminal 9
   F. Wiring must comply with N.F.P.A. 72A-Auxiliary
Figure 5: Connection of McCulloch Type Transmitter

Refer to Manual Sections 4.7 and 5.7

NOTES:

1. McCulloch Transmitter is mounted in separate cabinet.

2. Mount STAB Board on left side of riser cabinet and connect harness (red to 12, brown to 10, orange to 7)


4. Connect transmitter (TM term. 1 to MS term. 19, TM term. 2 to MS term. 26, TM term. 3 to STAB term. 1, STAB term. 3 to MS term. 11, TM term. 4 to MS term. 10) as shown.

5. Connect TM output as shown in detail A.

6. Derate signalling (BELL) circuit A by TM coil alarm current.

7. TM alarm coil is fused by signalling (BELL) circuit A.

8. Miniscan will not supervise municipal box and McCulloch transmitters simultaneously.

9. Denote resistor used in 24 volt transmitters only.

McCulloch Transmitter Operation

Alarm: An alarm signal initiated by a detector on the main control will actuate the TM coder and cause four rounds of coded signal.

To restore system to normal after cause of alarm has been corrected, press the SYSTEM RESET button on the control panel. One additional round of coded signal will follow and the sounder will return to its normal position. Re-wind mechanism to the right.

Trouble: Loss of primary power or break in detector or other supervised circuits will cause control panel to go into trouble condition. This will actuate the TM and cause one round of coded signal.

To restore system to normal after cause of trouble has been corrected, first press the SYSTEM TEST button and then press SYSTEM RESET on Miniscan control panel. Four rounds of coded signal will follow and the sounder will return to its normal position. Rewind mechanism to the right.

If an alarm condition occurs at the same time or during a trouble condition, a three round coded signal for alarm will follow the one round for trouble.

Note: Normal position is when sounder is next to the green dot on sounder. After one round of coded signal the sounder will move next to the blue dot. After the code alarm signal the sounder will stop next to the red dot.
FIGURE 6—REMOTE ZONE ANNUNCIATOR (OPTIONAL)

Refer to manual sections 4.12 and 5.10

NOTES
1. Remove jumper connecting terminals 12 to 13, 13 to 14, 14 to 29, 29 to 30, and 30 to 31 before connecting ANNUNCIATOR.
2. Minimum power and supervise one annunciator only.
3. All wiring except audible trouble supervised for open and ground fault condition.
4. Remote indicator circuitry is limited and may be connected to limited energy cable.
FIGURE 7 - SYSTEM TROUBLE RELAY BOARD (STRB) CONNECTION INFORMATION (OPTIONAL)
Refer to Manual Section 4.13 and 5.12

NOTES:
1. Mount the system trouble Relay Board on the left side of the Miniacan cabinet using the two number 4 screw and lockwasher provided.
2. Connect harness to Master Board (red to terminal 12, brown to terminal 10, and orange to terminal 7)
3. Connect output contacts as required.
4. Contacts rated 1A, 28VDC, resistive.
5. Relay coil will be energized in normal non-trouble state.
### Fire Alarm Control Unit

- **AC Power**
- **System Alarm**
- **System Trouble**
- **Bell Trouble**
- **Transmitter**
- **Supervisory**
- **Battery Tab**
- **Ground Fault**
- **System Reset**
- **Trouble Silence**
- **Transmitter Disconnect**
- **System Test**

### Annunciator

#### Zone 1
- **Alarm**
- **Trouble**
- **Disable**

#### Zone 2
- **Alarm**
- **Trouble**
- **Disable**

#### Zone 3
- **Alarm**
- **Trouble**
- **Disable**

#### Zone 4
- **Alarm**
- **Trouble**
- **Disable**

---

**CAUTION**

MISUSE OF THIS SYSTEM CAN CAUSE ACCIDENTAL RELEASE OF EXTINGUISHING AGENT. SEE MANUAL.
### TABLE 1 - Maximum Current Available for Various Battery-System Combinations

<table>
<thead>
<tr>
<th>System Size</th>
<th>Standby Requirements</th>
<th>Maximum Current Available for External Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.5 Amp-hr Battery</td>
<td>1 Amp-hr Battery</td>
</tr>
<tr>
<td>SINGLE ZONE</td>
<td>24 hour Standby, 5 Minute Alarm, NFP A72A &amp; 72B</td>
<td>0.120 Amp</td>
</tr>
<tr>
<td></td>
<td>60 hour Standby, 5 Minute Alarm, NFP A72B &amp; 72C</td>
<td>0.033 Amp</td>
</tr>
<tr>
<td>FOUR ZONE</td>
<td>24 hour Standby, 5 Minute Alarm, NFP A72A &amp; 72D</td>
<td>0.108 Amp</td>
</tr>
<tr>
<td></td>
<td>60 hour Standby, 5 Minute Alarm, NFP A72B &amp; 72C</td>
<td>0.013 Amp</td>
</tr>
</tbody>
</table>

**NOTES:**

1. The Table below shows the maximum current available for operation of external devices powered from Terminals 10, 11, and 12 for different standby batteries.
2. Do not exceed maximum currents given in section 4.9.

### TABLE 2 - Battery Voltages Required for MS112/124

<table>
<thead>
<tr>
<th>Miniscan Model</th>
<th>Battery Voltage Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS112</td>
<td>12VDC</td>
</tr>
<tr>
<td>MS124</td>
<td>24VDC</td>
</tr>
</tbody>
</table>

### TABLE 3 - Battery Selection Guide

<table>
<thead>
<tr>
<th>Ampere-Hour Capacity</th>
<th>Quantity Req.</th>
<th>Recommend Batteries</th>
<th>Fire-Lite Number</th>
<th>Manufacture and Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MS112</td>
<td>MS124</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.5</td>
<td>1</td>
<td>2</td>
<td>Power Sonic PS1245</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>N.A.</td>
<td>Ademco 620</td>
<td>Gates 12V-5.0 AH</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>4</td>
<td>GC-660</td>
<td>Globe GC660</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>2</td>
<td>PS1260</td>
<td>Power Sonic PS1260</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>2</td>
<td>Yuasa NP6-12</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>N.A.</td>
<td>PS680</td>
<td>Power Sonic PS680</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>N.A.</td>
<td>Eagle-Ficher CF6V8</td>
<td></td>
</tr>
</tbody>
</table>

**N.A.** - Not Applicable

**NOTE:**

Batteries are float charged during normal standby operation. A discharged battery will charge at 3/4 amperes (typically) and obtain its float voltage within 48 hours.
Miniscan 124R is a single zone, 24VDC fire alarm control panel with the releasing module. When an alarm signal is received from initiating device, the control panel will sound audible devices, trip municipal box, notify remote station, annunciate a fire zone and energize releasing circuit for immediate discharge of an extinguishing agent.

The releasing card called Chemical Deluge Board (CDB) simply plugs into standard master-boards MCB-24 and MTAB.

*This is the same master board used with triple annunciator board except terminals are redesignated.

**Releasing Module Specifications:**

- **Releasing Circuit** - Supervised output for class B operation of UL listed releasing coil or valve etc., rated 10 to 30 VDC at maximum of one amper. Ansul #22097 or equivalent. Connect releasing device across terminals 36 and 37. When non-latching type device is used, remove jumper marked N.C. on Chemical Deluge Board and connect terminal 30 to terminal 33 and terminal 34 to terminal 34.
- **Manual Release Circuit** - Supervised output for normally open pull station with latching action.
  - Maximum line resistance: 200 Ohms.
  - Manual release switch will override the delay circuit and abort circuit.
- **Delay Circuit** - This circuit will energize releasing relay at the set time.
  - Delay circuit is activated by removing jumper J1.
  - Typical adjustment range is 10 to 50 seconds.

**NOTE:** The local authority having jurisdiction must approve any discharge delay.

- **Abort Circuit** - Supervised external momentary or self restoring Normally Open switch circuit.
  - Abort mode produces trouble signal.
  - Connect UL listed abort switch across terminals 32 and 33 as shown.
- **Dry Contact** - Normally Open or Normally Closed contact (rated 5A at 28VDC or 115VAC resistive) upon release.
  - Maintain jumper marked N.C. for Normally Open contact and N.C. for Normally Closed contact on CDB. But remove the opposite jumper.
  - Release indicating contact is available at terminal 30 and 31.
- **Trouble Signal** - Loss of power for the releasing device and open in field wiring will activate audible/visual trouble devices.

**Power Requirements for Releasing Module:**

A. Regulated 24VDC: Standby Current is 13 MA. Alarm Current is 30 MA.
B. Unregulated 24VDC: The signaling and releasing devices are powered from the same supply. See Section 4.9.

**Mounting** - Snap Master Triple Annunciator board into mounting track as shown in Figure 1.
- Jumper terminal 29 to 11. (Unfiltered 24VDC).
- Then plug in Chemical Deluge Board.

**Recommendation** - Operate system without extinguishing agent for several days to eliminate possible source (of false alarms).
- Run detection loop and the bell loop in separate conduct.
- Test the control panel monthly for proper operation.

For information on the basic panel, refer to Miniscan 112/124 Instruction Manual.
FIRE-LITE INSTALLATION RECOMMENDATIONS

Adherence to the following will aid in problem free installation with long term reliability:

1. Locate system in an area where the temperature is within 32° to 120° Farenheit and free of condensation, moisture, dust, etc.

2. Verify that wire sizes are adequate for all signaling and detector loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

3. This system, like all solid state electronic devices, may operate erratically or can be damaged when subjected to lightning induced transients. Although no systems are completely immune from lightning transients and interferences, proper grounding will reduce susceptibility. Consult with Fire-Lite Applications Engineering Department if any problems are anticipated or encountered.

4. Fire-Lite systems contain static sensitive components. Always ground yourself before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from unit.

5. Remove all electronic assemblies prior to any drilling, filing, reaming or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer and printed circuit board location(s).

6. Do not tighten screw terminals more than 9 in. - 1 lbs. Over tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

7. Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.