Instructions 95-8244-05

Relay Output Module
R6006A, B, C, D

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DET-TRONICS®

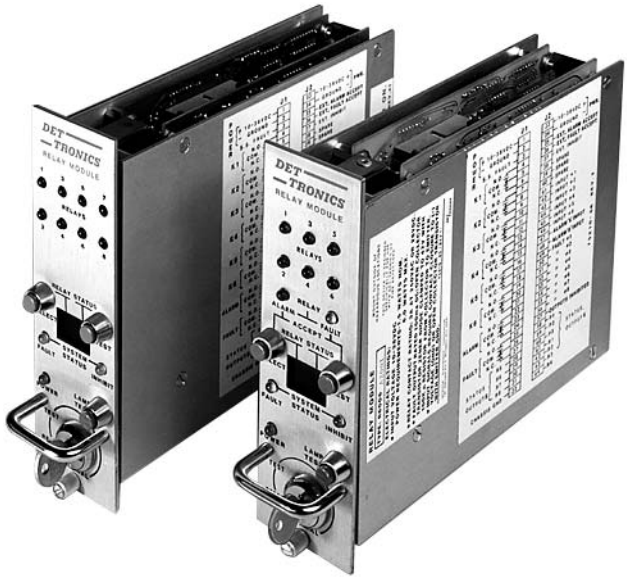
INSTRUCTIONS

Relay Output Module

R6006A, B, C, D

DESCRIPTION

The microprocessor based R6006 Relay Output Module is designed to receive inputs from solid state switching devices, and to provide load relay switching in response to the input signals. It can be used with devices such as the Det-Tronics' R7404, R7409, R7484 and R7494 control units. Throughout this manual, the term "controller" will be used, referring to any of the units listed above. The R6006 Relay Output Module has eight relay output circuits that can be programmed for instantaneous or time delayed operation. The relays have Form C contacts (N.O./N.C.), which can operate alarms, solenoids or other equipment that draws 3 amperes or less at up to 30 vdc or up to 250 vac. Each relay is represented on the R6006 front panel by an LED, which indicates whether or not it is activated. Four models are available:



R6006A

- Six Fire Relays—selectable latching or non-latching; relays energize and red faceplate LEDs go on when fire is present.
- One Alarm Relay—selectable latching or non-latching; relay energizes and red faceplate LED goes on when alarm condition exists.
- One Fault Relay—relay is energized and amber faceplate LED is off during normal operation (power on and no faults present); when fault occurs, relay de-energizes and faceplate LED latches on.
- Six Fire input terminals—up to four R7404 solid state outputs can be connected to each terminal
- Two Alarm input terminals—up to four R7404 solid state outputs can be connected to each terminal
- Eight Fault input terminals—only one R7404 solid state output can be connected to each terminal

R6006B

- Eight Fire Relays—selectable latching or non-latching; relays energize and red faceplate LEDs go on when fire is present.
- Eight Fire input terminals—up to four R7404 solid state outputs can be connected to each terminal.

R6006C

- Same as R6006A, but includes selectable dc load monitoring on fire and alarm relays.

R6006D

- Same as R6006B, but includes selectable dc load monitoring on **all** relays.

Activation of any single solid state output of the controller used is sufficient to drive an R6006 input. Figure 1 illustrates a system incorporating an R6006A Relay Module and two controllers.

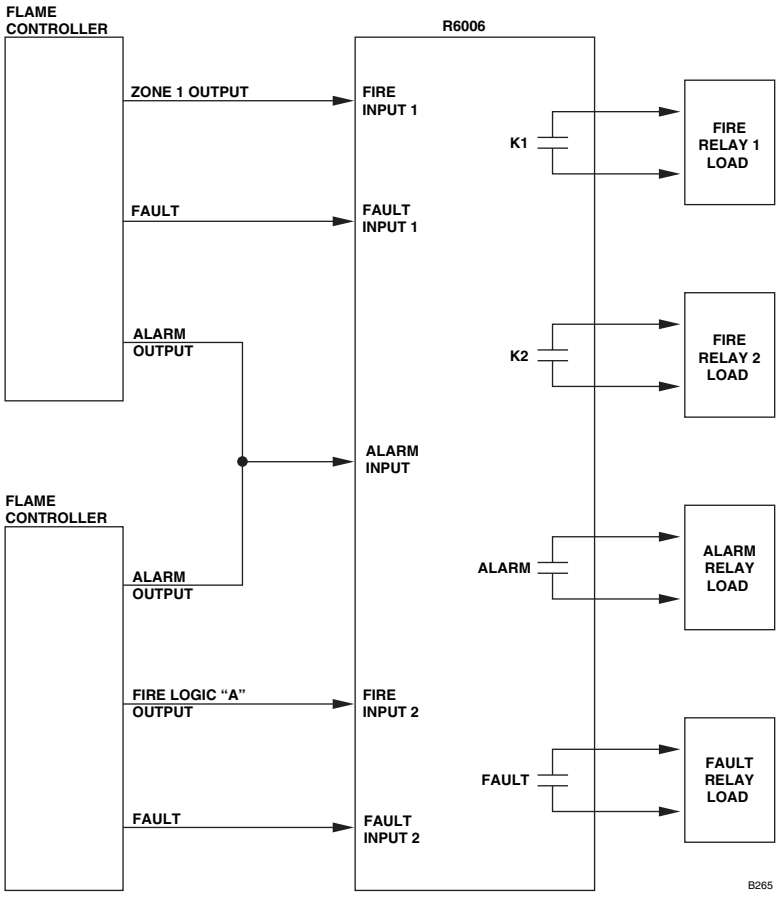


Figure 1—Two Controller System

A microprocessor in the R6006 stores and executes instructions for interpreting input signals from the controller. The microprocessor also controls input supervision and relay circuit self-testing. Input supervision is a continuity check of all wires that connect the controller to the R6006. The relay self-test checks relay drive circuitry and the continuity of each relay coil.

On models with the dc load monitoring feature (R6006C and R6006D), the electrical continuity of external loads such as alarm and extinguishing equipment is continuously supervised. Should an open occur in these circuits, the Fault relay is de-energized and a fault condition is reported.

FEATURES

- Eight relays with redundant, Form C, 3 ampere contacts.
- Accepts four solid state signals per fire or alarm terminal.
- All relays can be individually programmed for latching or non-latching operation (except the R6006A and R6006C Fault relay, which is a latching relay).
- A time delay in the range of 0 to 15 seconds can be individually programmed for all relays in 1 second increments (except the R6006A and R6006C Fault relay, which has no time delay). The fastest possible response time is 20 milliseconds.
- Microprocessor control of relay circuit self-testing and input supervision.
- Fault Accept and Alarm Accept (R6006A and R6006C).
- Terminals for connecting remote Fault Accept and Alarm Accept switches (R6006A and R6006C).
- Relay and status identification digital display.
- LEDs to indicate status of Fire relays.
- LEDs to indicate System Fault and System Inhibit status.
- LEDs to indicate status of Fault and Alarm relays (R6006A and R6006C only).
- Solid state outputs for event recording.

- Manual test capabilities.
- Keylock switch for selecting NORMAL, RESET, or TEST mode.
- Terminal provided for connecting remote Inhibit/Reset switch.
- External dc load monitoring capability (R6006C, R6006D only).
- R6006A and R6006B FM approved, CSA certified and CSFM listed.

OPERATION

The R6006 provides an appropriate relay response to fire and (for the R6006A and R6006C) fault signals from one or more Det-tronics controllers.

The R6006 reacts when:

a. The unit receives a signal from the controller,

b. A FAULT condition occurs within the R6006,

c. The keylock switch is placed in the TEST or RESET position,

d. The Inhibit/Reset input is activated, or

e. The external load circuit opens (R6006C, R6006D).

FRONT PANEL

A dual digital display on the front panel (see Figure 2) reports status code and relay identification. A status change such as a fire, fault, alarm, test or reset condition will be reported on the right hand display. The number of the affected relay will appear on the left display. Table 1 lists the system status and relay identification code.

The status of each individual relay is indicated by red LEDs numbered 1 through 6 on the R6006A and R6006C, and 1 through 8 on the R6006B and R6006D (LED on = relay energized, LED off = relay de-energized).

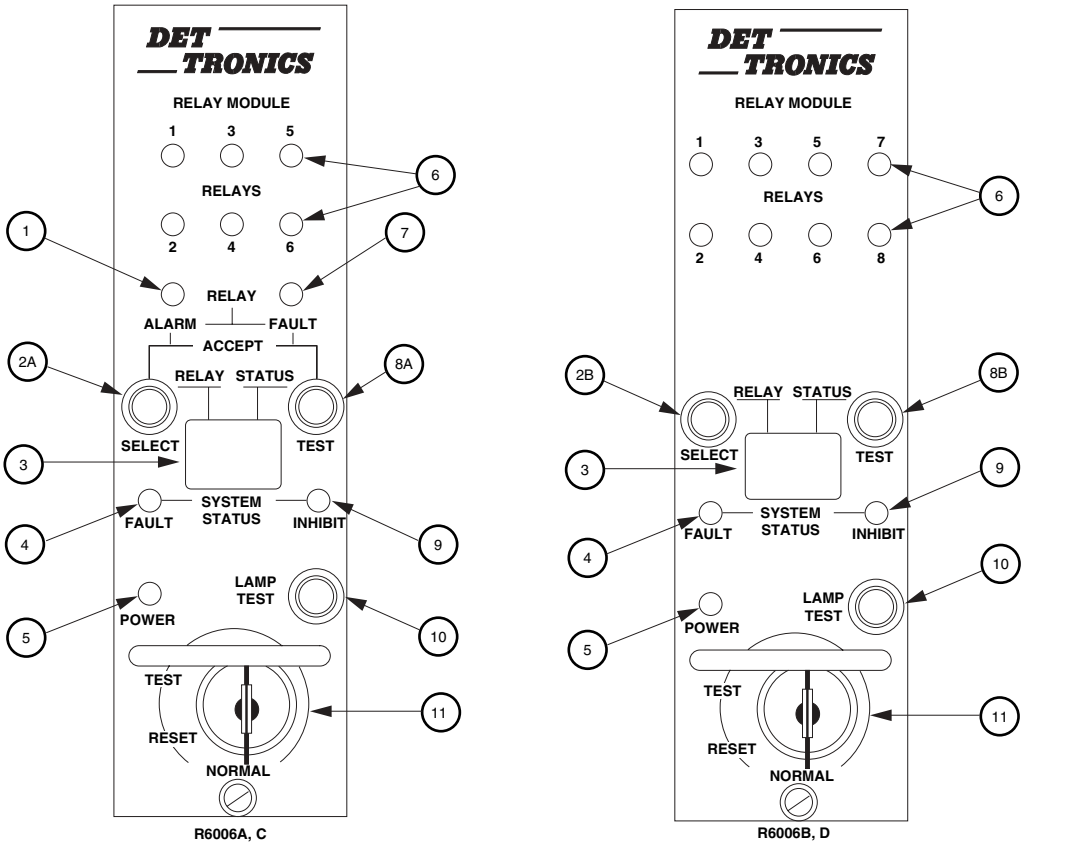
SELECT and TEST buttons are used to perform a manual check of the relay control circuitry. The SELECT button cycles the test program to the next relay circuit to be tested and the TEST button energizes the selected relay drive circuit, **but not the relay itself.** On the R6006A and R6006C, the select button also serves as an ALARM ACCEPT button (to remove power from the Alarm relay), and the TEST button is also used as a FAULT ACCEPT button (to restore power to the Fault relay). The Alarm Accept and Fault Accept features provide means to silence alarms without interrupting the fire or fault signal.

Table 1—R6006 Status and Relay Identification Code

Relay (Left Display)	Status (Right Display)	Status
0	7	R6006A and C only—Fault in controller or Fault relay rocker switch is set for too many fault signal inputs
The number of the first relay activated	6	Fire relay closure—also indicated by blinking FIRE RELAY LED
	5	Relay circuit fault
	4	Relay coil open or external load open (R6006C and D)
	3	R6006 rocker switch set for too many controller outputs or wire to controller is open (refer to “Installation” section)
	2	R6006 rocker switch set for too few controller outputs (refer to “Installation” section)
Number of the relay circuit under test	1	Test mode—keylock switch in TEST position
0	0	R6006 in RESET (via keylock switch or remote Inhibit/Reset)
0	8	No relays selected on side-plate rockers

The keylock switch has three positions: NORMAL, RESET, and TEST. In the NORMAL mode, the Fault relay is energized, and all relay circuits are enabled. In the RESET and TEST modes, the Fault relay is de-energized and all relay circuits are disabled. The Test and Select functions are functional when the keylock switch is placed in the TEST position. The Alarm Accept and Fault Accept functions are functional only when the keylock switch is in the NORMAL position. The key is removable in the NORMAL position only.

The amber SYSTEM FAULT LED is illuminated whenever there is a change in R6006 system status (other than Fire relay closure). The amber SYSTEM INHIBIT



1	RED ALARM RELAY LED, NORMALLY OFF—BLINKS WHEN RELAY ENERGIZED, ON (STEADY) WHEN RELAY DE-ENERGIZED, (ALARM ACCEPT)
2A	SELECT/ALARM ACCEPT BUTTON—IN NORMAL MODE, DE-ENERGIZES ALARM RELAY – IN TEST MODE, SELECTS NEXT RELAY CIRCUIT FOR TEST
2B	SELECT BUTTON—SELECTS RELAY CIRCUIT IN TEST MODE
3	DIGITAL DISPLAY—NORMALLY OFF—TURNS ON TO INDICATE STATUS CHANGE AND RELAY AFFECTED
4	AMBER SYSTEM FAULT LED, NORMALLY OFF—ON TO INDICATE SYSTEM FAULT
5	GREEN POWER LED, NORMALLY ON WHEN UNIT IS POWERED
6	RED FIRE RELAY LEDS, NORMALLY OFF (RELAY UN-ENERGIZED)—BLINK WHEN RELAY ENERGIZED—ON (STEADY) WHEN RELAY DE-ENERGIZED
7	AMBER FAULT RELAY LED, NORMALLY OFF (RELAY ENERGIZED) BLINKS WHEN RELAY DE-ENERGIZED—ON (STEADY) WHEN RE-ENERGIZED (FAULT ACCEPT)
8A	TEST/FAULT ACCEPT BUTTON—IN NORMAL MODE, RE-ENERGIZES FAULT RELAY—IN TEST MODE, ACTIVATES RELAY DRIVE CIRCUITRY IN TEST MODE
8B	TEST BUTTON—ACTIVATES RELAY DRIVE CIRCUITRY IN TEST MODE
9	AMBER INHIBIT LED, NORMALLY OFF—ON TO INDICATE RELAYS ARE INHIBITED
10	LAMP TEST BUTTON—TESTS ALL LEDS AND DIGITAL DISPLAY
11	KEYLOCK SWITCH—SELECTS NORMAL, RESET, TEST MODES

B266

Figure 2—R6006 Front Panel

LED is illuminated when the relays are disabled. Both LEDs are illuminated, and the relays disabled, when the R6006 is placed in the RESET or TEST mode.

The R6006A and R6006C have an ALARM RELAY LED and a FAULT RELAY LED, which indicate the status of the Fault and Alarm relays. Both LEDs are normally off. The ALARM RELAY LED blinks when the **Alarm relay** is **energized,** and the FAULT RELAY LED blinks when the **Fault relay** is **de-energized.** Each LED will lock on (steady state) when the corresponding Alarm Accept or Fault Accept feature is activated.

Under normal operating conditions, only the green POWER LED is illuminated. The operation of all other LEDs and digital display segments can be tested by pressing the LAMP TEST button provided on the front panel. It is not necessary to switch the controller out of the NORMAL mode to perform this test.

NOTE

If the SYSTEM FAULT LED is illuminated but the digital display remains blank, a microprocessor failure has occurred.

RELAYS

All relay circuits of the R6006 (except the Fault relay of the A and C versions) can be individually programmed for a time delay of 0 to 15 seconds, adjustable in increments of one second. They can also be programmed for latching or non-latching operation. The Fault relays of the A and C versions are latching relays and have no time delay. On the R6006C and R6006D, the normally open relay contacts can be individually programmed to monitor the continuity of external dc loads attached to the Fire and Alarm relays.

Relays and Corresponding Front Panel LEDs

The relays will respond in the following manner:

- Fire relays (R6006A, B, C, and D)

  – If its corresponding input is activated, the Fire relay will energize and its front panel LED will blink.

  – If the non-latching option has been selected, the relay will be de-energized when the input signal is removed. Its front panel LED will go to steady state.

  – When latched, the relay will remain energized and its LED will continue to blink until the R6006 is reset.

- Alarm relay (R6006A and R6006C)

  – If one of the two alarm inputs is activated, the Alarm relay will be energized and its LED will blink.

  – The Alarm relay can be de-energized (to silence an audible alarm) either by pressing the SELECT/ALARM ACCEPT button, or by actuating an external Alarm Accept input (see "Note" below). The ALARM LED will then go to steady state. Once accepted, the Alarm relay is locked out (de-energized) until the R6006A is reset.

- Fault relay (R6006A and R6006C)

  – In the event of a fault condition, the normally energized Fault relay will be de-energized and the FAULT RELAY LED will blink.

  – Power can be restored to the Fault relay either by pressing the TEST/FAULT ACCEPT button, or by actuating the external Fault Accept input (see "Note" below). The FAULT RELAY LED will then go to steady state. Once accepted, the Fault relay is latched on (energized) until the R6006A or R6006C is reset.

  – The Fault relay is de-energized and cannot be "fault accepted" when the keylock switch is in the TEST or RESET positions or when the external Inhibit/Reset input is activated (see "Note" below).

NOTE

All relays and LEDs are reset either by turning the keylock switch to the RESET position and then back to the NORMAL position, or by temporarily activating the external Inhibit/Reset input.

The external Alarm Accept, Fault Accept and Inhibit/Reset input terminals (back panel terminals 35, 36, and 37 respectively) provide a means to connect switching devices to reset the Alarm and Fault relays and to inhibit/reset the R6006 Relay Module from a remote location (see "Electrical Connections"). Although functionally identical, the external Inhibit/Reset input is labeled "EXT INHIBIT" on some models.

SPECIFICATIONS

OPERATING VOLTAGE—
The R6006 Relay Module is designed for operation over the range of 18 to 38 vdc (24 vdc nominal). If it is desired to operate the relay module from line (mains) supply (120 vac or 220/240 vac), an optional model W4220 Voltage Converter module is available, which provides 24 vdc for up to eight controllers and R6006 modules (see instruction manual 95-8243 for W4220 specifications).

DC LOAD MONITOR CIRCUIT (R6006C and R6006D)—
10 kilohm resistor across normally open relay contacts. (Peak monitor current is 2.5 milliamperes for 24 vdc loads).

RELAY CONTACT RATING—
3 amperes at up to 30 vdc or up to 250 vac. Dry nitrogen gas sealed inside relays to eliminate arcing and corrosion, increase reliability.

INPUT, OUTPUT DETAILS—
R6006 inputs must be driven low (less than 0.5 vdc). R6006 outputs are rated 100 milliamperes at 0.5 volt when "on" (low). The outputs are high impedance (open collector, 100 kilohms) when "off" (high). See Tables 2 and 3 detailing R6006 terminal configurations.

POWER CONSUMPTION—
Standby condition: 2.5 watts.
Fire condition: 7 watts (all relays energized).

TEMPERATURE RATING—
Operating: –40°F to +158°F (–40°C to +70°C).
Storage: –67°F to +167°F (–55°C to +75°C).

HUMIDITY—
0 to 95% RH, non-condensing.

SHIPPING WEIGHT—
3.25 pounds (1.45 kilograms).

DIMENSIONS—
The R6006 is designed for mounting in an optional model Q4004 Mounting rack (Figures 3 and 4). The cage holds up to eight modules and is designed to fit into a standard 19 inch instrument rack. Refer to instruction sheet 95-8241 for Q4004 specifications. Cages designed to hold two, three and four modules are also available. See Figure 5 for dimensions of the R6006 module.

WIRING—
Relay connections should be made with 18 gauge wire (0.75 mm^2) minimum. Other connections should be made with 22 gauge shieldedwire (0.34 mm^2) minimum.

CERTIFICATIONS—
FMRC Approved per Fm 3260 and ANSI/NFPA 72.
CSA Certified per C22.22 #142.

INSTALLATION

ELECTRICAL CONNECTIONS

To install the R6006, connect the power supply, outputs from the controller, relay outputs to the loads and remote Inhibit/Reset or Fault and Alarm Accept switches, if used. The R6006 is furnished with a terminal connector that incorporates screw terminals for attaching wires and circuit board edge connectors for plugging in the R6006. The terminal connection diagrams and descriptions that correspond to each R6006 model are listed below and the "Typical Applications" section in this manual shows some examples of system interconnection.

NOTE

For proper operation, the negative lead of the power supply (–) of the model R6006 and the system controller must be connected together directly on the controller backplate. This ensures proper voltage reference.

RACK TYPE	PART NUMBER 005269-XXX	CONTROLLER POSITIONS FOR:		HT:	DIM. (A)		DIM. (B)		DIM. (C)		DIM. (D)		DIM. (E)		WEIGHT	
		FIRE	GAS		INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	LB	KG
4U	–001	8	16	4U	19.00	482.6	18.30	464.8	17.36	440.9	4.00	101.6	6.97	177.1	9.3	4.2
4U	–002	6	12	4U	15.06	382.6	14.36	364.7	13.42	340.9	↓	↓	↓	↓	7.6	3.5
4U	–003	4	8	4U	11.13	282.6	10.43	264.9	9.49	241.1	↓	↓	↓	↓	5.9	2.7
4U	–004	3	6	4U	9.16	232.7	8.46	214.9	7.52	191.0	↓	↓	↓	↓	5.1	2.3
4U	–005	2	4	4U	7.19	182.7	6.49	164.9	5.55	141.0	↓	↓	↓	↓	4.2	1.9
4U	–006	1	2	4U	5.22	132.6	4.52	114.8	3.58	90.9	↓	↓	↓	↓	3.1	1.4

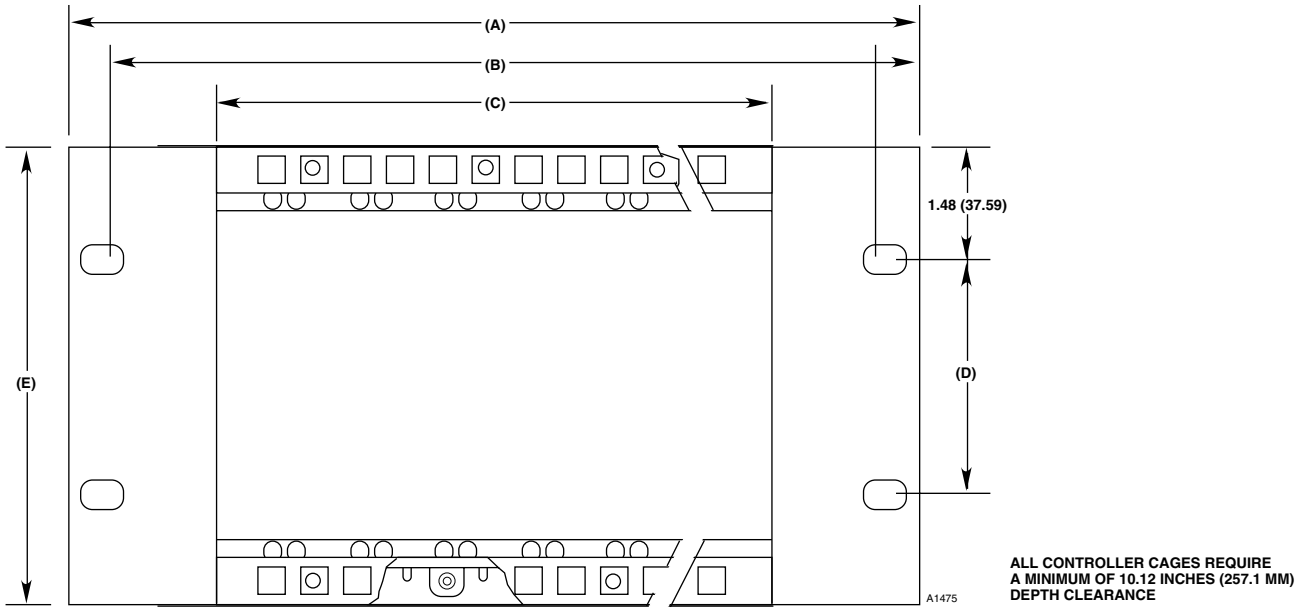


Figure 3—Dimensions of Q4004 Mounting Rack

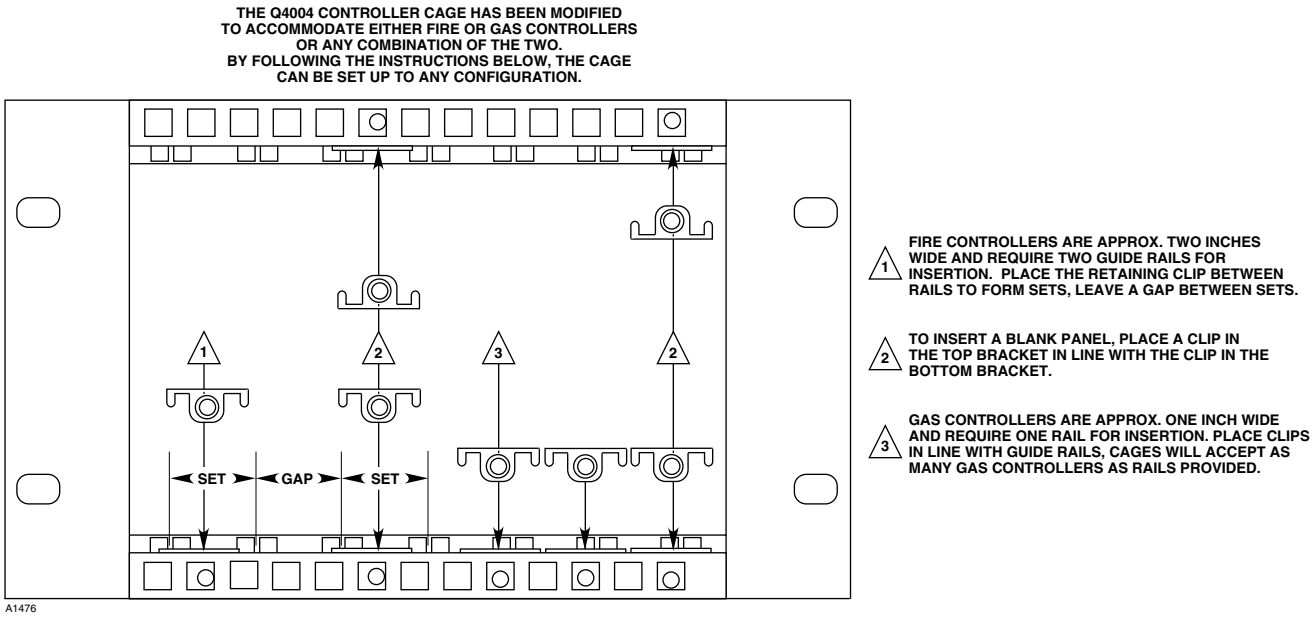


Figure 4—Clip Positioning for Q4004 Mounting Racks

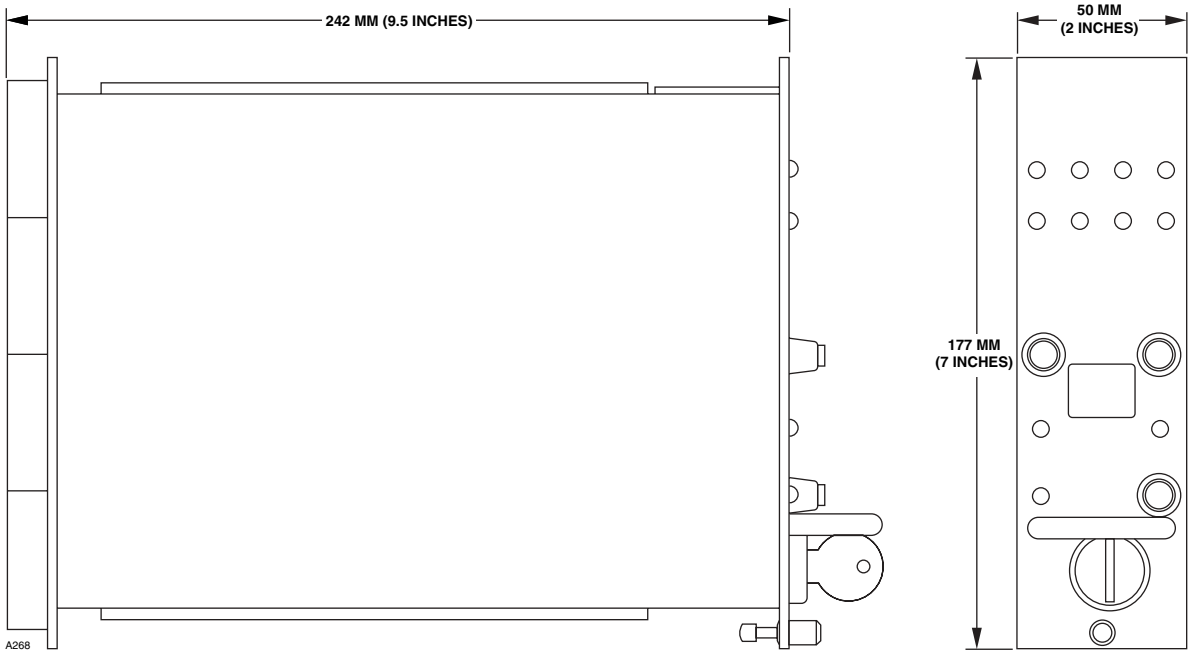


Figure 5—Dimensions of the R6006

R6006A

Refer to Figure 6 for the terminal configuration and Table 2 for an explanation of each terminal connection.

R6006B

Refer to Figure 7 for the terminal configuration and Table 3 for an explanation of each terminal connection.

R6006C

Refer to Figure 8 for the terminal configuration and Table 2 for an explanation of each terminal connection.

R6006D

Refer to Figure 9 for the terminal configuration and Table 3 for an explanation of each terminal connection.

SWITCH SETTINGS

On the side of each R6006 there are a series of rocker switch assemblies that are used to select:

- Number of controller outputs connected to each Fire input.
- Number of controller Alarm outputs connected to each Alarm input (R6006A and R6006C).
- Number of Fault inputs that will be used (R6006A and R6006C).

NOTE
Fault relay is latching and has no time delay.

- Time delay for **each** Fire/Alarm relay
- Latching/Non-latching option for **each** Fire/Alarm relay
- Number of R6006 outputs to have dc loads monitored (R6006C and R6006D only).

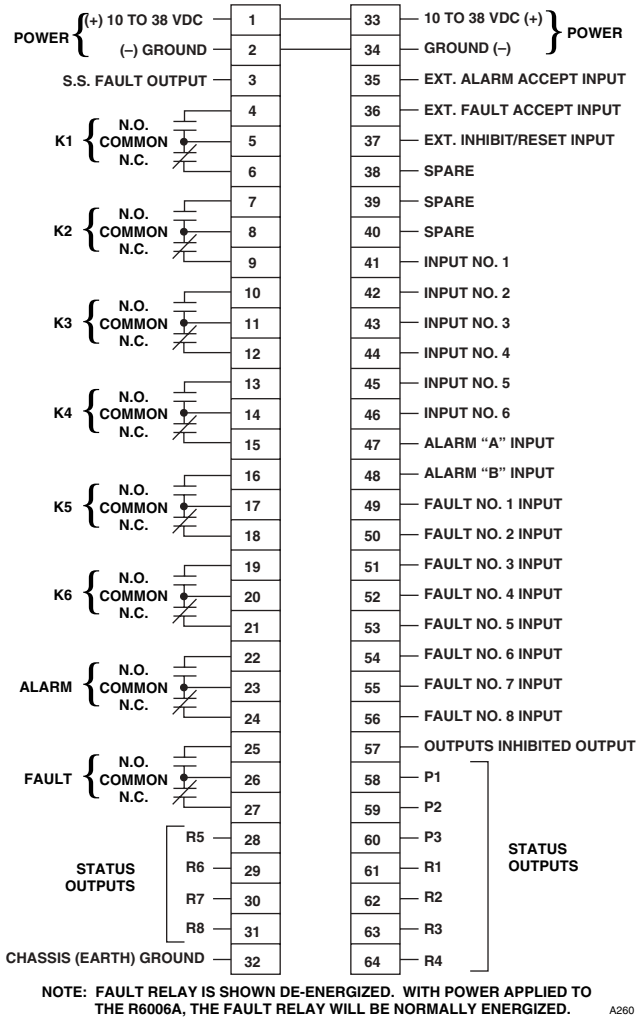


Figure 6—R6006A Electrical Terminal Configuration

Each rocker switch assembly contains eight switches. These are numbered as shown in Figure 10. Pressing the switch down on the numbered side positions it to closed. Pressing the switch down toward the opposite side, labeled "OPEN," positions it to open.

R6006A and R6006C

Figure 11 is the rocker switch assembly diagram for the R6006A and R6006C, which is designed to serve as a guide for switch setting. A brief description of the function of each switch assembly according to its label in the diagram is provided below.

FIRE RELAY K-1 through FIRE RELAY K-6

These six switch assemblies are identical in function. Each switch assembly corresponds to a fire relay and is used to set it to function as desired. These functions include:

- Number of controller outputs connected to corresponding R6006 input: Rockers 1-2 select the number of Controller or Fire Logic outputs that are to be

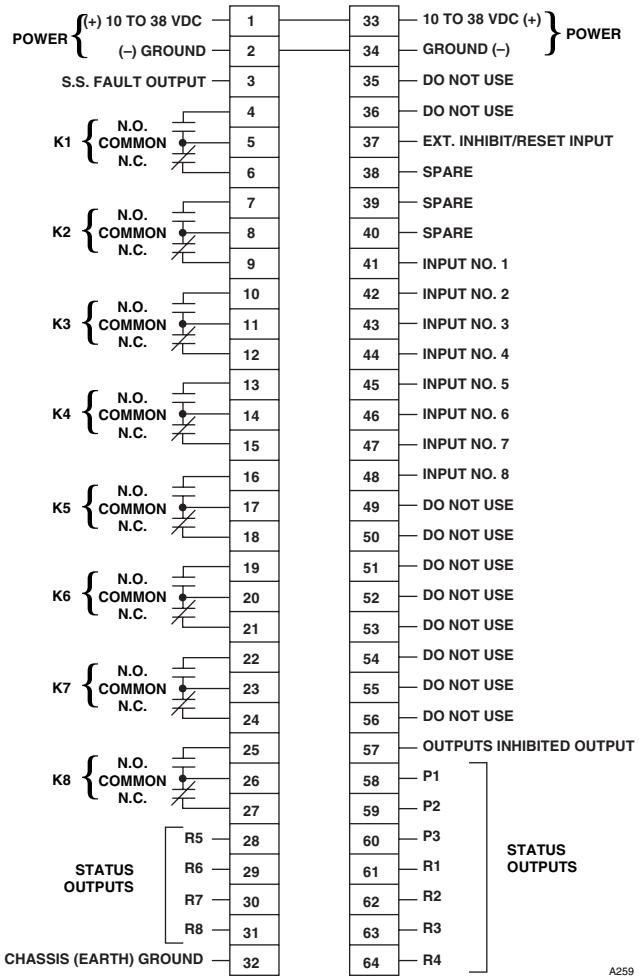


Figure 7—R6006B Electrical Terminal Configuration

Table 2—R6006A and R6006C Terminal Connections

Electrical Terminals	Description
1 and 33 (+), 2 and 34 (–)	Input power: 10 to 38 vdc.
3	Solid state System Fault output, normally a low state (less than 0.5 vdc). Output switches to high impedance when the SYSTEM FAULT LED is illuminated. *NOTE: All R6006 solid state outputs are rated 100 ma at 0.5 volt when "on" (low). The outputs are high impedance (open collector, 100 kohm) when "off" (high).*
4 through 21	Connections for Fire relay contacts (relays K1 through K6).
22 through 24	Connections for Alarm relay contacts.
25 through 27	Connections for Fault relay contacts.
28 through 31 and 61 through 64	Solid state outputs R1 through R8, outputs R1 through R6 correspond to relay circuits K1 through K6. R7 refers to the Alarm relay and the Alarm "A" input circuit. R8 refers only to the Alarm "B" input circuit. Under normal conditions all outputs are high. When a particular relay is energized and its front panel LED is blinking, the corresponding solid state output exhibits a pulsing signal. After the relay has been de-energized and its front panel LED is illuminated (steady state) the corresponding solid state output will be low. If a fault occurs in a particular relay circuit, the corresponding solid state output will be low.
32	Chassis (earth) ground.
35	External Alarm Accept input provides remote means to de-energize Alarm relay.
36	External Fault Accept input provides remote means to re-energize Fault relay.
37	External Inhibit/Reset input provides remote means to disable relays and reset the R6006. (Labeled "EXT. INHIBIT" on some models).
41 through 46	Solid state inputs 1 through 6 correspond to Fire relays K1 through K6. Up to four Zone or Fire Logic outputs from controllers can be connected to each input. If one controller output is to be connected to more than one Fire or Alarm input, a 100 kohm resistor must be connected from the controller output to circuit ground (terminal 2 or 34) for each input driven (to satisfy the requirements of input supervision).
47 and 48	Solid state Alarm "A" and "B" inputs. Alarm relay is energized when either input is driven low. Each terminal can accept up to four controller Alarm outputs. Therefore, Alarm "B" input is used only if a total of five or more controller Alarm outputs are to be connected.
49 through 56	Solid state Fault inputs 1 through 8 correspond to the Fault relay. Each of the Fault inputs can be connected to only one controller Fault output. Selected inputs (see "Switch Setting" subsection) are normally driven low by the controller Fault outputs. A high signal will de-energize the Fault relay.
57	Outputs Inhibited solid state (normally high) output, is driven low when the R6006 is in RESET or TEST mode.
58 to 60	Solid state status outputs, provide a 3-bit binary representation of the status identification code (Table 4). Low state represents a binary 1, high state represents 0.

(Inputs must be driven low—less than 0.5 vdc)

connected to the individual R6006A and R6006C inputs (up to four outputs can be connected to one input). See diagram for switch setting table.

- Relay in service/Relay not in service: Rocker 3 selects relay in service (open), or relay not in service (closed).
- Latching/Non-latching Operation: Rocker 4 selects relay latching (open), or relay non-latching (closed).
- Time Delay: Rockers 5 through 8 select the time delay for each relay (time delay = value of closed

Table 3—R6006B and R6006D Terminal Connections

Electrical Terminals	Description
1 and 33 (+), 2 and 34 (–)	Input power: 10 to 38 vdc.
3	Solid state SYSTEM FAULT output, normally a low state (less than 0.5 vdc). Output switches to high impedance when the SYSTEM FAULT LED is illuminated. *NOTE: All R6006 solid state outputs are rated 100 ma at 0.5 volt when "on" (low). The outputs are high impedance (open collector, 100 kohm) when "off" (high).*
4 through 27	Connections for Fire relay contacts (relays K1 through K8).
28 through 31 and 61 through 64	Solid state outputs R1 through R8 correspond to relay circuits K1 through K8. Under normal conditions all outputs are high. When a particular relay is energized and its front panel LED is blinking, the corresponding solid state output exhibits a pulsing signal. After the relay has been de-energized and its front panel LED is illuminated (steady state) the corresponding solid state output will be low. If a fault occurs in a particular relay circuit, the corresponding solid state output will be low.
32	Chassis (earth) ground.
35 and 36	Do not use.
37	External Inhibit/Reset input — provides remote means to disable relays and reset the R6006. (Labeled "EXT. INHIBIT" on some models).
41 through 48	Solid state inputs 1 through 8 correspond to Fire relays K1 through K8. Up to four Zone or Fire Logic outputs from controllers can be connected to each input. If one controller output is to be connected to more than one Fire input, a 100 kohm resistor must be connected from the controller output to circuit ground (terminal 2 or 34) for each input driven (to satisfy the requirements of input supervision).
49 through 56	Do not use.
57	Outputs Inhibited solid state (normally high) output, is driven low when the R6006 is in RESET or TEST mode.
58 through 60	Solid state status outputs, provide a 3-bit binary representation of the status identification code (Table 4). Low state represents a binary 1, high state represents 0.

(Inputs must be driven low— less than 0.5 vdc)

rockers added together). See diagram for switch setting table.

ALARM RELAY K7

The two switch assemblies labeled "ALARM RELAY K7" (A and B) are used to select the options for the alarm relay and its corresponding input terminals. These two assemblies are not identical and are configured as follows:

- Switch Assembly A: Rockers 1 and 2 select the number of controller Alarm outputs that are connected to the Alarm "A" input (maximum of four).

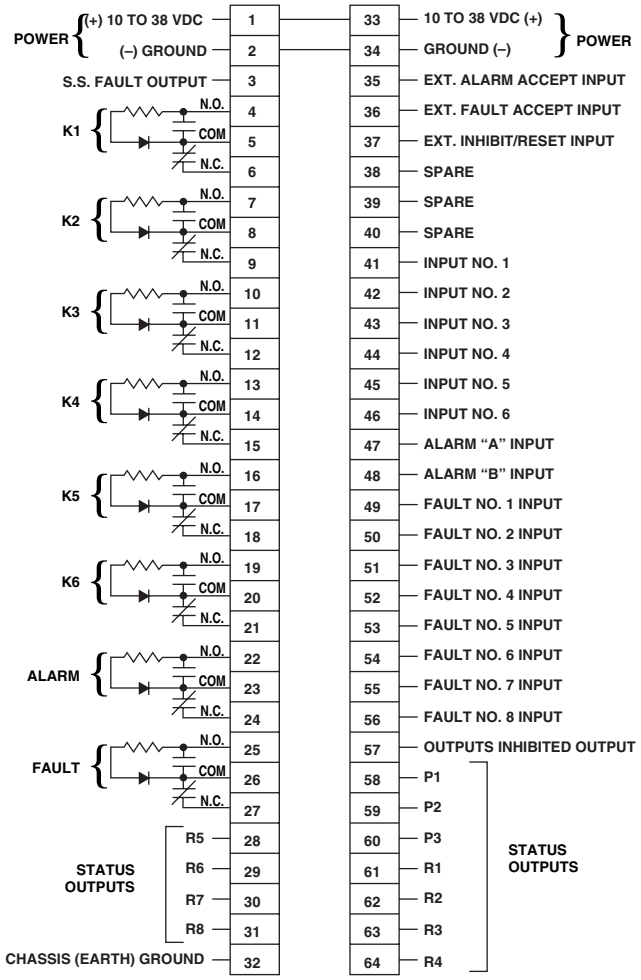
  Rocker 3 selects relay in service (Open), or relay not in service (closed).

  Rocker 4 selects relay latching (open), or relay non-latching (closed).

  Rockers 5 through 8 select the time delay for the Alarm relay (time delay = value of closed rockers added together).

- Switch Assembly B: Rockers 1 and 2 select the number of controller Alarm outputs that are connected to the Alarm "B" input (maximum of four). In order for the Alarm "B" terminal to be used, four outputs must be connected to the Alarm "A" input.

  Rocker 3 should be in the open position when Alarm "B" input is used, and in the closed position when not used.



NOTE: FAULT RELAY IS SHOWN DE-ENERGIZED. WITH POWER APPLIED TO THE R6006C, THE FAULT RELAY WILL BE NORMALLY ENERGIZED.

Figure 8—R6006C Electrical Terminal Configuration

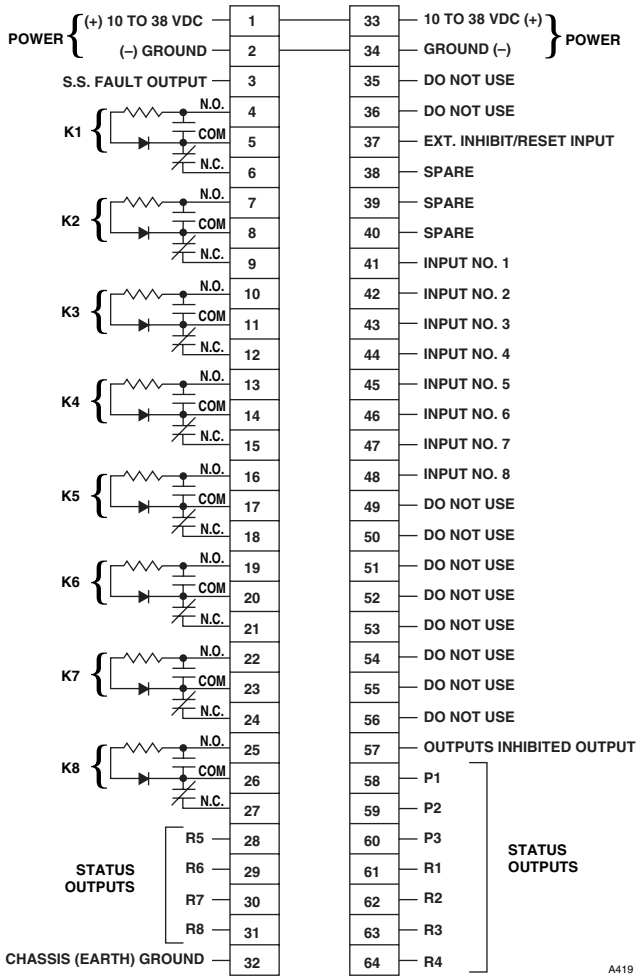


Figure 9—R6006D Electrical Terminal Configuration

Table 4—Relationship of SYSTEM STATUS Display to Status Output

Front Panel Display	Status Outputs			
System Status	P1	P2	P3	Outputs Inhibited
0	0	0	0	0
1	1	0	0	0
2	0	1	0	1
3	1	1	0	1
4	0	0	1	1
5	1	0	1	1
6	0	1	1	1
7	1	1	1	1
8	0	0	0	1
Blank or No Fault	0	0	0	1
High Low	Logic 0 = 100 kilohms to 0 volts Logic 1 = Less than 25 ohms to 0 volts			

Note: Terminals R1 through R8 in terminal configuration figures refer to the status of Fire relays and Alarm relay (if any).

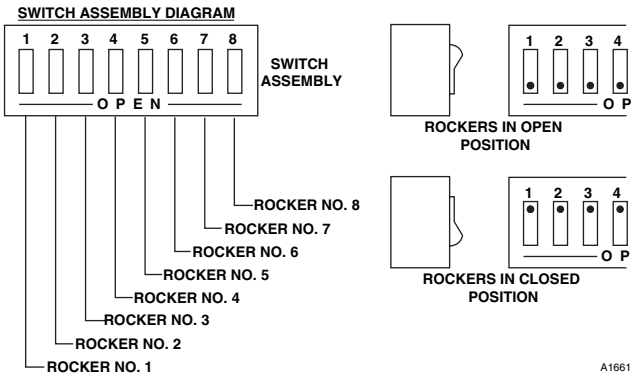


Figure 10—Rocker Switch Numbering and OPEN/CLOSED positions

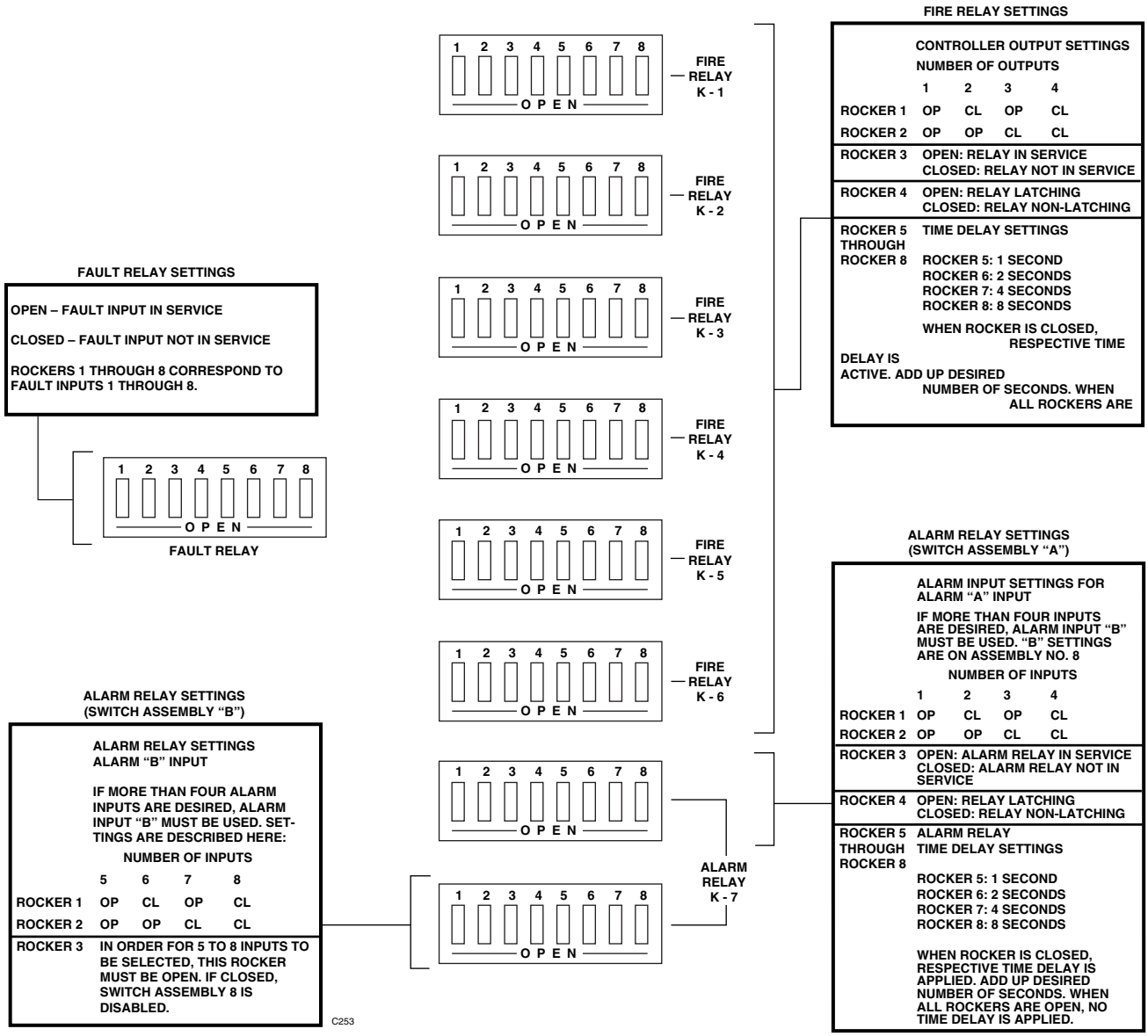


Figure 11—R6006A and R6006C Rocker Switch Assembly

Rockers 4 through 8 on assembly B are not used.

NOTE

The R6006A and R6006C have one Alarm relay that is driven by signals at both the Alarm"A" and Alarm "B" inputs. The Alarm "A" input is used when 1 to 4 controller outputs are connected and the Alarm "B" input is used only when more than 4 (5 to 8) controller outputs are connected.

FAULT RELAY SWITCH ASSEMBLY

The R6006A and R6006C models both have one fault relay. Up to eight separate fault inputs can drive the fault relay, however, each input that is connected must be activated using the Fault relay switch.

The Fault relay switch is mounted on the rear part of the R6006A and R6006C. Rockers 1 through 8, when open, activate the corresponding Fault inputs. When a Fault input is not being used, the corresponding rocker should be closed.

Rocker Number	Corresponding Fault Input Terminal
1	49
2	50
3	51
4	52
5	53
6	54
7	55
8	56

R6006B and R6006D

Figure 12 is the rocker switch assembly diagram for the R6006B and R6006D which is designed to serve as a guide for switch setting. A brief description of the

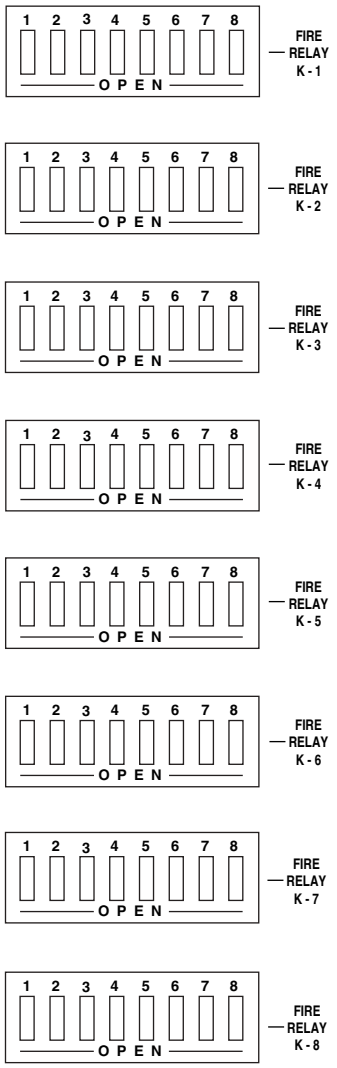


TABLE OF FIRE RELAY SWITCH ASSEMBLY SETTINGS

	CONTROLLER OUTPUT SETTINGS NUMBER OF OUTPUTS			
	1	2	3	4
ROCKER 1	OP	CL	OP	CL
ROCKER 2	OP	OP	CL	CL
ROCKER 3	OPEN: RELAY IN SERVICE CLOSED: RELAY NOT IN SERVICE			
ROCKER 4	OPEN: RELAY LATCHING CLOSED: RELAY NON-LATCHING			
ROCKERS 5 THROUGH ROCKER 8	TIME DELAY SETTINGS ROCKER 5: 1 SECOND ROCKER 6: 2 SECONDS ROCKER 7: 4 SECONDS ROCKER 8: 8 SECONDS WHEN ROCKER IS CLOSED, RESPECTIVE TIME DELAY IS ACTIVE. ADD UP DESIRED NUMBER OF SECONDS. WHEN ALL ROCKERS ARE OPEN, NO TIME DELAY IS APPLIED.			

NOTE: ALL FIRE RELAY SWITCH ASSEMBLIES FUNCTION THE SAME. REFER TO MANUAL TEXT FOR A MORE DETAILED DESCRIPTION OF EACH ROCKER FUNCTION.

B254

Figure 12—R6006B and R6006D Rocker Switch Assembly

function of each switch assembly according to its label in the diagram is provided below.

FIRE RELAY K-1 through FIRE RELAY K-8

These eight switch assemblies are identical in function. Each switch assembly corresponds to a Fire relay and is used to set it to function as desired. These functions include:

- Number of controller outputs connected to corresponding R6006 input: Rockers 1 and 2 select the number of controller or Fire Logic outputs that are to be connected to the individual R6006B and R6006D inputs (up to four outputs can be connected to one input). See diagram for switch setting table.

- Relay in service/Relay not in service: Rocker 3 selects relay in service (open), or relay not in service (closed).

- Latching/Non-latching Operation: Rocker 4 selects relay latching (open), or relay non-latching (closed).

- Time Delay: Rockers 5 through 8 select the time delay for each relay (time delay = value of closed rockers added together). See diagram for switch setting table.

WARNING

Do not install the relay module with power turned on. An initial power surge could damage the components.

Load Monitoring Circuit (R6006C and R6006D)

The R6006C and R6006D have one additional switch assembly, with a somewhat different appearance, located on its bottom edge. The eight rocker switches are used to enable the load monitor circuits connected to the eight relay outputs of the R6006. Rocker No.

1 corresponds to Fire relay 1, No. 2 to Fire relay 2, and so on. Figure 13 illustrates the load monitor switch assembly found on the bottom edge of the R6006C and R6006D modules.

Figure 14 illustrates the load monitoring output circuit for 12 and 24 vdc loads. The load is connected to the normally open contacts in the usual method. For the load monitor to be functional, its corresponding rocker should be closed. An open in the load's continuity produces a 4-fault condition.

NOTE

Load monitor rocker switch 8 on the R6006C, corresponding to the Fault relay, must be open for correct operation of the unit.

NOTE

Load monitoring for ac loads is not available.

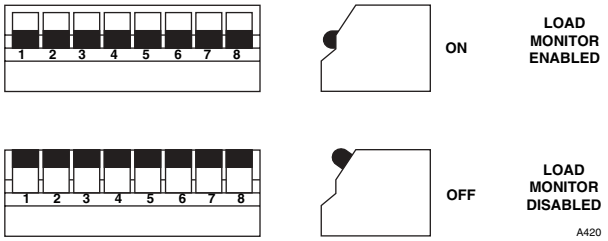


Figure 13—Load Monitoring Switches

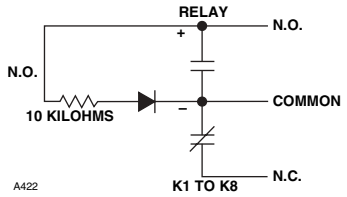


Figure 14—Load Monitor Output Circuit – 12/24 vdc Loads

SYSTEM APPLICATION EXAMPLES

The following system applications are presented only as examples of wiring connections and switch settings, and are not intended to be specific recommendations for all applications.

EXAMPLE OF AN R6006A OR R6006C SYSTEM

Figure 15 shows the switch settings for this example UV system. Figure 16 shows the wiring diagram for the R6006A or R6006C described below.

- Seven C7050 detectors
- Two R7404 controllers
- All six Fire relays selected to be in service
- Four single inputs (K1, K2, K3, K4)

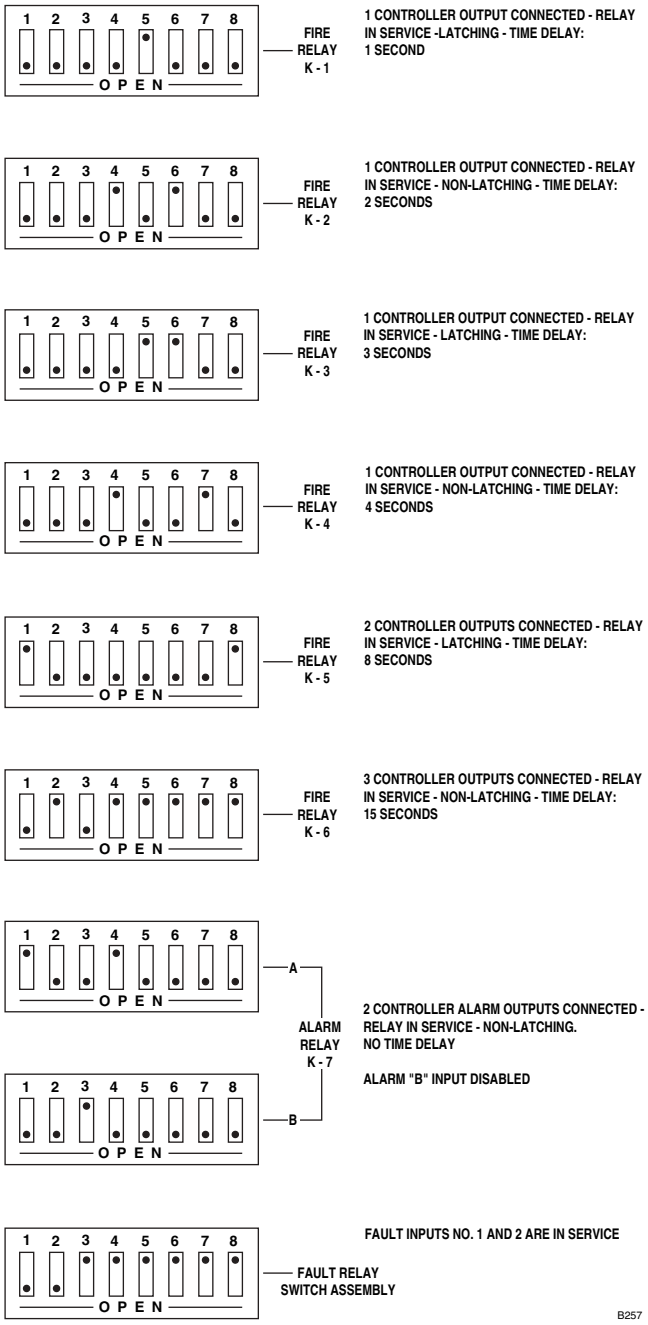


Figure 15—Rocker Switch Settings for an R6006A or R6006C System

- One double input (K5)
- One triple input (K6)
- Six individual time delays
- Three latching relays (K1, K3, K5)
- Three non-latching relays (K2, K4, K6)
- Two alarm inputs to Alarm "A" only (Alarm "B" not in service - closed)
- Non-latching Alarm relay
- Two Fault inputs in service.

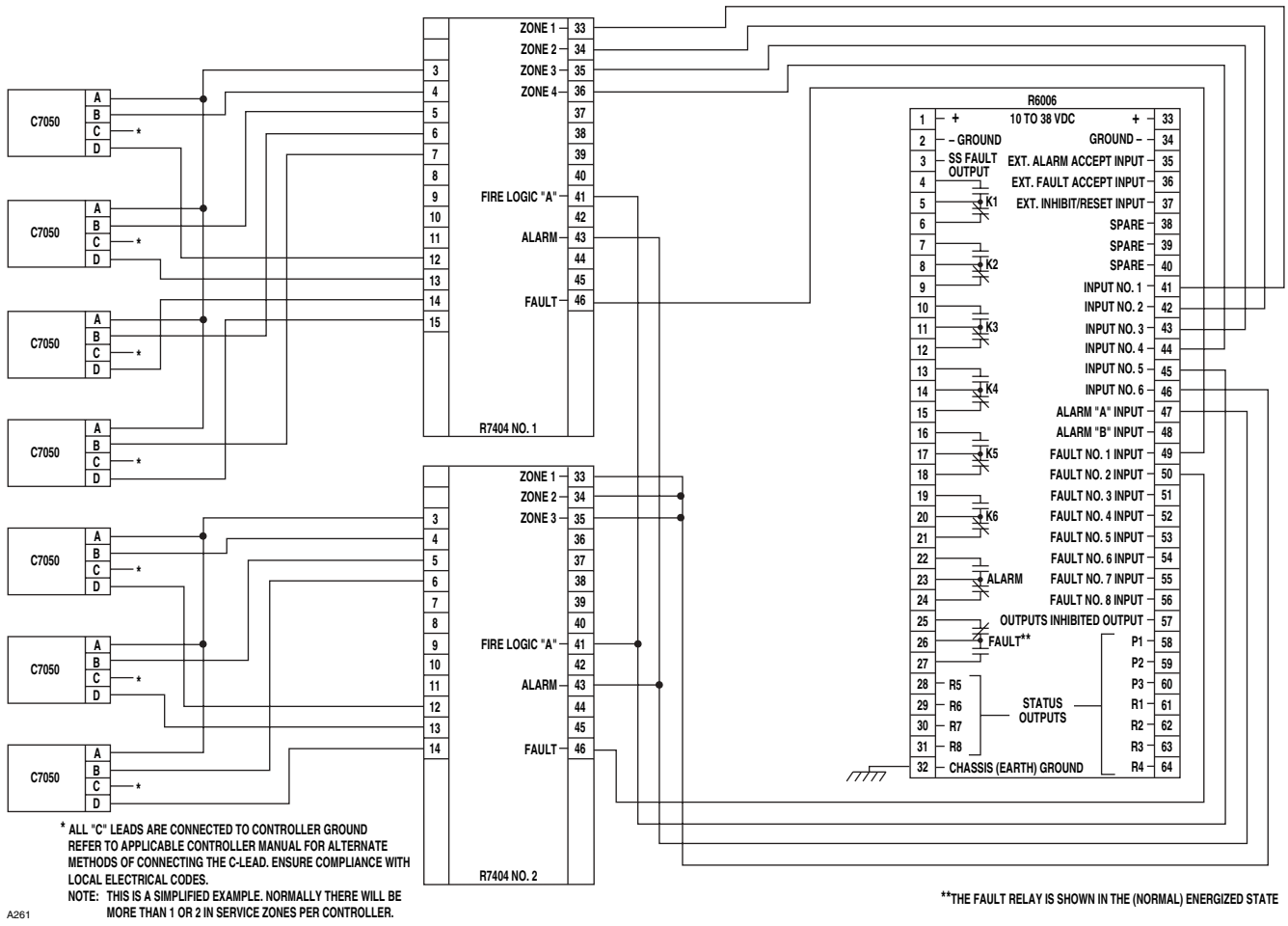


Figure 16—Wiring Diagram of an R6006A or R6006C UV System

R6006C LOAD MONITORING RELAY OUTPUTS

Figure 17 illustrates the output circuits of an R6006C system with 24 vdc loads monitored on K1, K2, K3, K5 and K6.

EXAMPLE OF AN R6006B OR R6006D SYSTEM

Figure 18 shows the switch settings for this example UV/IR system. Figure 19 shows the wiring diagram for the R6006B or R6006D system described below.

- Nine C7052J detectors
- Four R7494 controllers
- All 8 fire relays selected to be in service
- Six single inputs (K1, K2, K4, K6, K7, K8)
- One double input (K3)
- One triple input (K5)
- Four latching relays (K1, K3, K5, K7)
- Four non-latching relays (K2, K4, K6, K8)
- Eight individual time delays.

R6006D LOAD MONITORING RELAY OUTPUTS

Figure 20 illustrates the output circuits of an R6006D system with 24 vdc loads monitored on K1, K3, K5, and K8.

SYSTEM STARTUP PROCEDURE

The following procedure checks the operation of the entire flame detection system with the exception of the R6006 output relays. To test the output relays, secure all output loads, leave the R6006 in NORMAL mode, and begin at step three.

1. Disable all external equipment that is directly connected to the controller's solid state outputs.

2 Place R6006 keylock switch in the TEST position.

   a. R6006 relays will be inhibited.

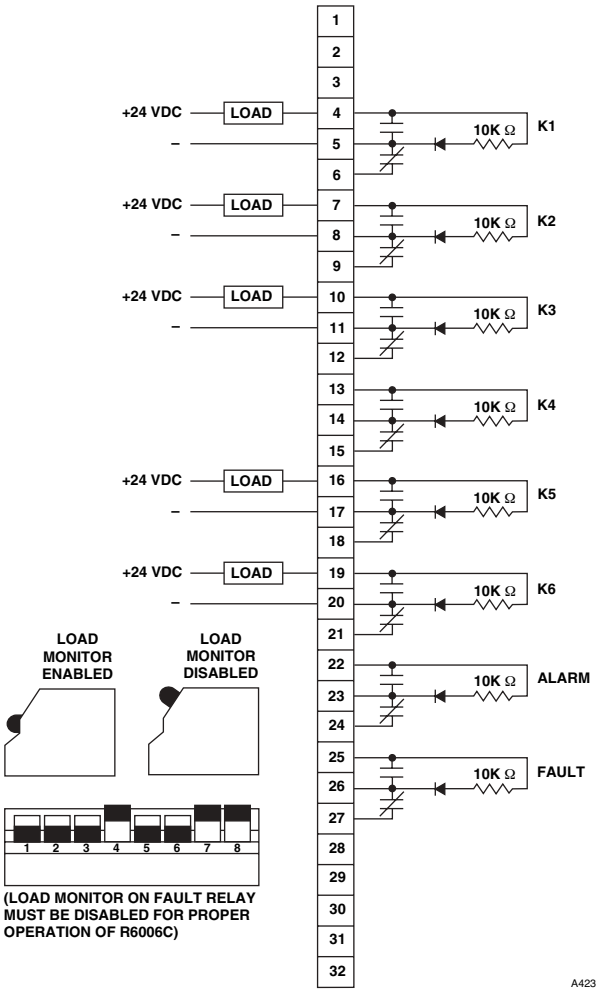


Figure 17—R6006C Output Circuits, 24 vdc Loads
Load Monitors Enabled on K1, K2, K3, K5, K6

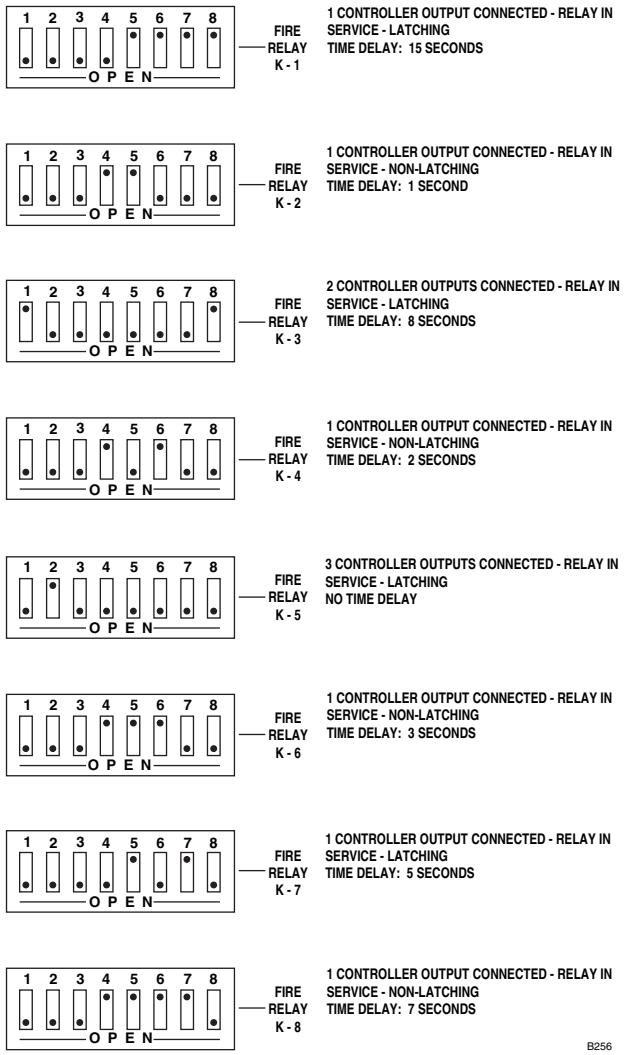


Figure 18—Rocker Switch Settings for an
R6006B or R6006D system

b. The SYSTEM FAULT and INHIBIT LEDs will turn on.

c. Fault relay (R6006A and R6006C) will de-energize and FAULT RELAY LED will blink.

d. The right digital display will indicate test mode (numeral 1). The left digital display will indicate which relay has been selected for manual test.

3. Expose a system detector to light from a Test Lamp or an equivalent radiation source.

   a. After the preselected time delay the system controller will respond.

      • The appropriate controller (solid state) Zone output will turn on and its corresponding ZONE LED will blink.

      • The controller's upper digital display will indicate the number of the responding zone.

      • The controller's lower digital display will show a "6" (Fire status code).

      • The controller's (solid state) Alarm output will turn on.

      • The controller's Fire Logic output(s) and LED(s) will turn on if voting requirements are satisfied.

   b. The R6006 will respond to signals from the controller. After its own preselected time delay, the appropriate R6006 Fire relay circuit will energize. The affected Fire relay is inhibited (disabled) in the TEST mode but its corresponding LED will blink.

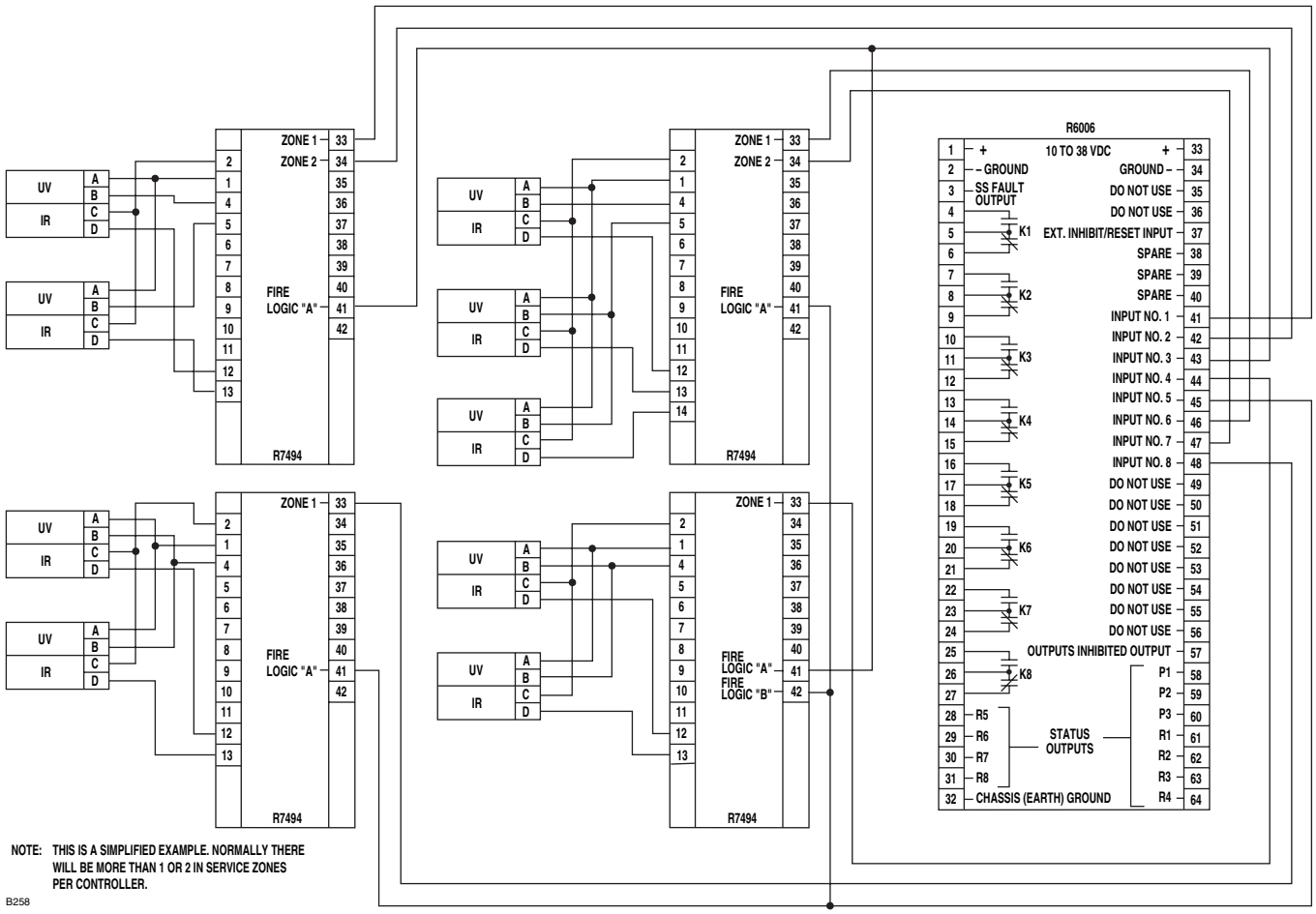


Figure 19—Wiring Diagram of an R6006B or R6006D UV/IR System

After its preselected time delay, the (R6006A and R6006C) Alarm relay circuit will energize. The Alarm relay is inhibited (disabled) in the TEST mode but the ALARM LED will blink.

- The R6006 left digital display will indicate the number of the first affected Fire relay.
- The R6006 right digital display will show a “6” (Fire status code).

4. Remove the radiation source.

   a. If the controller is set for latching outputs, the R6006 FIRE RELAY LED will continue to blink. If not, it will switch to steady state.

   b. The ALARM RELAY LED (R6006A and R6006C) will continue to blink until the controller is manually reset or “alarm accepted.”

5. Turn the controller keylock switch to RESET and back to NORMAL.

6. Turn the R6006 keylock switch to RESET and back to TEST.

7. Repeat steps 3 through 6 at each detector in the system.

8. Reset both units (the controller first) and return each to NORMAL mode. All LEDs and the digital display will return to normal state. If not, consult the Troubleshooting section.

9. Enable all controller solid state outputs that are directly connected to external equipment.

SYSTEM CHECKOUT PROCEDURE

The R6006 should be checked regularly, either by repeating the startup procedure, or by performing the following test:

MANUAL TEST

The R6006 manual test program cycles through a test of each “in service” relay circuit with the exception of

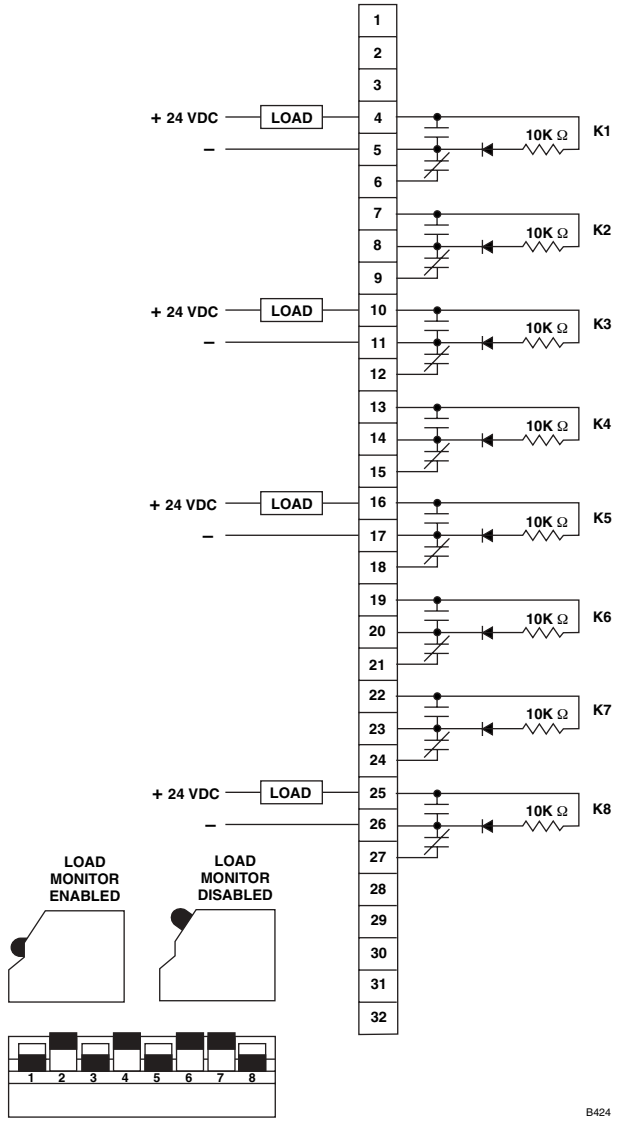


Figure 20—R6006D Output Circuits - 24 vdc Loads
Load Monitors Enabled on K1, K3, K5, K8

the Fault relay circuit (R6006A and R6006C). (The Fault relay circuit is actuated when the unit is placed in the TEST mode.)

1. Place the R6006 in the TEST mode.

   a. The SYSTEM FAULT and INHIBIT LEDs will turn on.

   b. The R6006A or R6006C Fault relay will de-energize and the FAULT RELAY LED will blink.

   c. The STATUS digital display will show a “1” (TEST status code).

   d. The RELAY digital display will indicate the number of the relay circuit to be tested.

      The test program automatically starts at the highest numbered “in service” relay circuit. For the R6006A and R6006C, the Alarm relay and Alarm “A” input circuit is designated number 7. The Alarm “B” input circuit is designated number 8.

2. Depress and hold the R6006 TEST button.

   a. After the preselected time delay, the STATUS digital display will change to a “6” (Fire status code).

   b. The appropriate relay LED will blink to indicate that the relay circuit under test has been activated (relay will not energize).

3. Release the TEST button.

   a. The STATUS digital display will change back to a “1.”

   b. The RELAY LED will change from blinking to steady state.

4. Depress the SELECT button.

   a. The R6006 test program will cycle to the next (lower numbered) relay circuit.

   b. The RELAY digital display will indicate the next relay circuit to be tested.

5. Repeat steps 2 through 4 until all “in service” relay circuits have been checked.

6. Place the R6006 in the NORMAL mode.

   a. The digital display will go blank.

   b. The SYSTEM FAULT and INHIBIT LEDs will turn off.

   c. The RELAY LED(s) will turn off.

   d. The Fault relay is re-energized and the FAULT RELAY LED turns off (R6006A and R6006C).

NOTE

This method quickly tests the operation of the R6006 but does not check input signals or relay closure.

TROUBLESHOOTING

If a fault occurs in the R6006, the SYSTEM FAULT LED will turn on and the digital display will indicate the status code number on the right and the number of the affected relay circuit on the left. The status code is provided in Table 1. A microprocessor malfunction will be indicated by an illuminated SYSTEM FAULT LED and a blank digital display.

The LEDs and all of the segments on the digital display will be illuminated when the LAMP TEST button is pressed. (This test may be performed in the NORMAL mode).

If an internal malfunction such as a microprocessor, LED or relay circuit failure occurs, the R6006 should be returned to Detector Electronics for repair.

DEVICE REPAIR

Before returning devices or components, contact the nearest Detector Electronics office so that an RMI (Return Material Identification) number can be issued.

A written statement describing the malfunction must be included with the shipment in order to expedite finding the cause of failure, so that the time and cost of repair may be reduced.

When packing the component or unit, use sufficient packing material, as well as an antistatic bag to protect from electronic discharge.

Return all equipment, transportation prepaid, to the Minneapolis Location.

ORDERING INFORMATION

When ordering, specify:

R6006A Relay Module—6 Fire relays, 1 Fault relay and 1 Alarm relay

or

R6006B Relay Module—8 Fire relays

or

R6006C Relay Module—6 Fire relays, 1 Fault relay and 1 Alarm relay, individually programmable for dc load monitoring

or

R6006D Relay Module—8 Fire relays, individually programmable for dc load monitoring.

OPTIONAL EQUIPMENT

W4220 Voltage Converter
Q4004 Mounting Cage

For assistance in ordering a system to fit your application, please contact:

Detector Electronics Corporation
6901 West 110th Street
Minneapolis, Minnesota 55438 USA
Operator: (952) 941-5665 or (800) 765-FIRE
Customer Service: (952) 946-6491
Fax: (952) 829-8750
Web site: www.detronics.com
E-mail: detronics@detronics.com