Instructions

Detonator Module
R1425

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INSTRUCTIONS

Detonator Module

R1425

APPLICATION

The R1425 Detonator Module expands the capabilities of Det-Tronics microprocessor-based ultraviolet (UV) and infrared (IR) detection systems by providing ultra-high speed response for suppression systems in hazardous applications, such as munitions manufacturing. When used in combination with a UV or an IR controller having a supression system, the R1425 can provide a detonator response in less than 11 milliseconds.

The R1425 Detonator Module provides two independent zones of protection. Each zone has one output circuit that can be used "as is" with internal capacitors providing one joule of energy. For continuous output applications, such as solenoid activated valves, an external power supply can be used. The input and output capabilities of the R1425 Detonator Module can be configured in a number of ways to provide a system of suppression applicable to many manufacturing operations and conditions.

The R1425 monitors its own internal circuits, and the status of external input devices. The R1425 also monitors detonators that are connected to it for opens, shorts to ground and low voltage conditions. System status is shown on the front panel indicators of the R1425 and troubleshooting procedures are provided should further investigation be required.

The R1425 Module fits into the Q4004 Mounting Cage along with other micromodule system components. The mounting cage, in turn, fits into a standard 19 inch instrument rack.

FEATURES

- Expands capabilities of UV and IR flame detection systems.
- Accepts fire alarm relay contact inputs directly from Det-Tronics ultra-high speed capable fllame detectors
- Independent response time of less than 1.5 milliseconds.
- Response time of less than 11 milliseconds when used with Det-Tronics UV controller with explosion suppression program or high speed IR controller.
- Allows as many as six matrix outputs per zone.
- Monitors two independent zones.
- Provides prioritized system status digital display for each of two zones.

- Allows selection of system status on four position keylock switch.
- Provides LED display of critical system functions.
- On-line LED Lamp Test.
- Allows complete isolation of detonator system for maintenance.
- Monitors detonator, controller, matrix, and auxiliary A and B circuits.
- Provides selection of up to four controllers.
- Provides selection of up to four matrix inputs.
- Accepts inputs from contact closure devices, such as manual call stations.

SYSTEM DESCRIPTION

An individual R1425 Detonator Module can accept multiple inputs from R7404 or R7094 Controllers, other R1425 Detonator Modules, manual alarm stations, heat sensors, smoke detectors, pressure sensors or any contact closure device. In the event of a fire, any of these devices will activate the output device, illuminate the function LED for the associated zone that detected the fire, and latch a status code "6" into the system status display. In addition, any controller, Aux A or Aux B inputs will automatically provide six identical latching matrix outputs. These outputs can be used to provide enable signals to other R1425 Detonator Modules and R6006 Relay Output Modules.

The detonator is energized by either a pair of capacitors inside the R1425 or, for continuous output applications, an external power supply can be used to operate a dc solenoid.

When using the internal detonator voltage output, the detonator circuitry is supplied with a minimum of one joule of energy, provided by two, 2200 microfarad capacitors.

To ensure reliable system operation, the R1425 module continuously monitors the input, output, and internal circuits.

FRONT PANEL INDICATORS (SEE FIGURE 1)

The front panel provides monitoring and control of system operations. The system mode of operation (NORMAL, RESET, TEST or ISOLATE) is selected by turning the keylock switch. The key can be removed in either the NORMAL or the ISOLATE position. Keylock switch position definitions are:

NORMAL - The output and input circuits are set to ready status with the keylock switch in the NORMAL position.

TEST - All outputs are inhibited. Pressing the TEST button sequentially selects and tests the Controller, Matrix, Aux A and Aux B inputs and illuminates the appropriate LED.

ISOLATE - Inhibits all R1425 outputs to isolate the detonators and allow maintenance. Illuminates the ISOLATE LED.

In any mode of operation with power applied, the green POWER LED is illuminated.

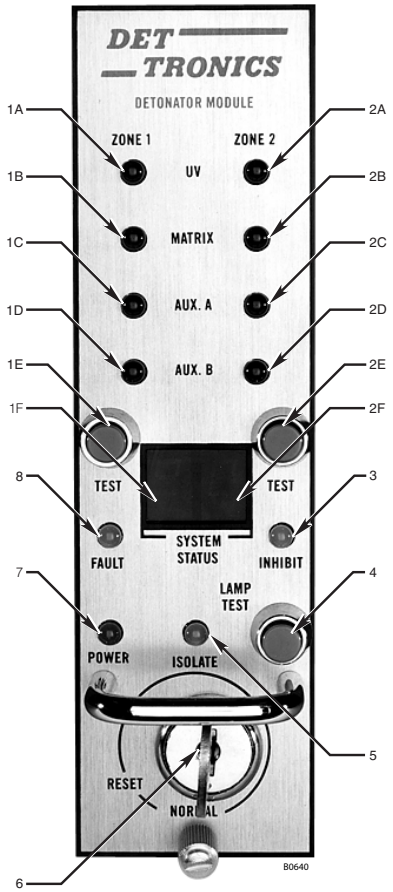
When the keylock switch is in TEST, RESET, or ISOLATE, or when the external reset inhibit input is enabled, the INHIBIT LED is illuminated.

The FAULT LED will be illuminated and a system status code will be displayed by selecting RESET, TEST, or ISOLATE on the keylock switch or by any fault in either of the two zones.

Pressing LAMP TEST will illuminate all faceplate LEDs with the detonator module on-line.

System Status Display

The faceplate contains a set of LEDs and a system status display for each of the two zones. Each circuit board provides the circuitry to accomplish all system functions for its zone. Faults or system status changes will be indicated by a priority-ranked system status code display. (See Table 1).



ITEM	DESCRIPTION
1A, 2A	CONTROLLER HAS ENABLED A "FIRE" CONDITION WHEN ILLUMINATED
1B, 2B	MATRIX INPUT HAS ENABLED A "FIRE" CONDITION WHEN ILLUMINATED
1C, 2C	AUX A INPUT HAS ENABLED A "FIRE" CONDITION WHEN ILLUMINATED
1D, 2D	AUX B INPUT HAS ENABLED A "FIRE" CONDITION WHEN ILLUMINATED
1E, 2E	TEST ZONE FUNCTION CIRCUITS (KEYLOCK SWITCH IN TEST ONLY)
1F, 2F	ZONE SYSTEM STATUS CODE READOUT
3	OUTPUT CIRCUITS INHIBITED, KEYLOCK SWITCH IN TEST, RESET OR ISOLATE POSITION
4	PERMITS ON-LINE ILLUMINATION TEST OF ALL LEDs
5	INDICATES DETONATOR CIRCUITS ARE ISOLATED FROM ALL LOADS
6	FOUR POSITION KEYLOCK SWITCH
7	MODULE POWER IS PRESENT WHEN ILLUMINATED
8	INDICATES MALFUNCTION EXISTS WHEN ILLUMINATED OR KEYSWITCH IN RESET, TEST OR ISOLATE

Figure 1—Front Panel Indicators for the R1425

Table 1—R1425 Detontator Module System Status Codes

Zone 1	Zone 2	Status
8	8	LAMP TEST button is depressed
7	7	ISOLATE position selected on keylock switch
6	6	Fire condition has been detected
5	5	Detonator circuit fault has been detected low voltage condition
4	4	Detonator circuit fault - open or short to ground condition
3	3	Aux A or Aux B fault
2	2	Controller or Matrix input fault. Ensure that switches are set correctly for the circuit boards in use. See "Switch Setting Procedure."
1	1	TEST position selected on keylock switch
0	0	RESET position set on keylock switch

For example, if a system status code "2" latches in the left side of the system status display, it indicates that the internal monitoring system has detected a Controller or Matrix input fault in Zone 1. The right half of the system status display will remain unaffected.

NOTE

To further identify the nature of this malfunction, refer to the "Troubleshooting" section of this manual.

Priority ranking occurs when a system condition with a high priority status overrides an existing system status condition. The new condition prevails, and its code is displayed and latched. The status code of the lower priority condition is no longer displayed, but remains latched as long as the condition exists.

Turning the keylock switch to RESET clears the current status code (if the condition is resolved) and allows a lower priority status condition to be displayed. This will repeat until all faults are resolved.

System status codes for Zone 1 or Zone 2 are displayed independently of one another, except status codes "8," "7," "1," and "0," which present status conditions for both zones simultaneously.

Status code "6" indicates that an enable signal is or has been present at the unit from Controller, Matrix, Aux A or Aux B devices connected to this zone. The source of the signal can be further identified by observing the annunciation LEDs for the associated zone.

A "5" system status code (detonator circuit fault) indicates that the detonator circuit is receiving insufficient voltage. Possible causes include internal detonator power supply malfunction, positive internal detonator supply voltage jumper missing (when capacitive discharge configuration is selected), external power supply incorrectly connected or missing (when external power supply configuration is selected).

A system status code "4" indicates a detonator or detonator lead open or shorted to ground. Possible causes include shorts and opens, as well as detonator fired or improperly connected, causing a loss of the 1 milliampere supervisory current.

A system status code "3" will result from the installation of the wrong supervisory resistor for the selected operating voltage or the supervisory resistors missing altogether on the "Aux" inputs.

NOTE

If Aux A or Aux B inputs are not used, a supervisory resistor must be installed between the positive and negative terminals of the applicable input. For 24 volt systems, use a 22 kilohm resistor. For 12 volt systems use a 10 kilohm resistor.

A system status code "2," UV/Matrix fault, is caused by improper selection of rocker switches for the Controller or Matrix inputs, a malfunction of any of these devices, or their interconnections to the R1425 unit.

OPERATION

TWO ZONE OPERATION

Each of the two circuit boards in the R1425 Detonator Module contains the circuitry for matrixing, circuit monitoring and input networking for its corresponding zone. Each circuit board can function with the other removed or inoperable. With rocker switches set correctly, the circuit boards are interchangeable. Functions of the individual zones are monitored and displayed on the faceplate of the module.

CONTROLLER INPUTS

The R1425 module will accept none or up to four controller inputs for each zone. The correct number of inputs must be set on the rocker switches of the corresponding zone to avoid incurring a Controller/Matrix fault.

In normal operation, any fire signal at the controller input will trigger the associated detonators and will enable and latch the six Matrix outputs. A "6" will appear in the system status display and the UV LED for the associated zone will be illuminated.

NOTE

The R1425B requires a fire signal at both the controller input and matrix input to trigger the associated detonators, latch the six matrix outputs, indicate a fire on the system status display and to illuminate the associated LEDs.

MATRIX INPUTS

The R1425 Module allows selection of none or up to four Matrix inputs per zone. The correct number of inputs must be selected on the associated rocker switches for the zone or a Controller/Matrix input fault (status code "2") will be displayed.

In normal operation, a fire enable signal from the Matrix input circuit causes the detonator circuit to trigger, a status code "6" appears in the system status display for the appropriate zone, and the MATRIX LED illuminates.

NOTE

The R1425B requires a fire signal at both the controller input and matrix input to trigger the associated detonators, latch the six matrix outputs, indicate a fire on the system status display and to illuminate the associated LEDs.

Matrix inputs are typically used with Matrix outputs from other zones. Activation of the Matrix input of a zone will not cause the Matrix output of that zone to activate.

The Matrix input circuits can be tested according to the "Checkout Procedure" section of this manual.

MATRIX OUTPUTS

Six identical latching Matrix output circuits are provided for each zone. These outputs can be used as inputs to other R1425 Modules or to R6006 Relay Output Modules. The presence of a fire signal at a Controller, Aux A or Aux B input will cause a signal to be present at each of the Matrix output terminals for the associated zones. These outputs will remain latched until the unit is reset.

AUXILLIARY INPUTS

The R1425 Module can accept two auxiliary inputs per zone. Aux A and Aux B inputs allow heat sensors, smoke detectors, pressure sensors, manual stations or any other contact closure device to trigger R1425 Module matrix outputs and detonator circuits (wired Class B).

DETONATOR CIRCUITS

Each zone supplies one detonator and monitors its circuitry for opens, shorts to ground, and low voltage conditions.

If any of these conditions are detected, the FAULT LED is illuminated and the appropriate system status code is displayed.

SPECIFICATIONS

INPUT VOLTAGE—
18 to 38 vdc.

POWER CONSUMPTION—
2.5 watts typical, 7 watts maximum (Alarm mode).

DETONATOR SUPPLY ENERGY—
1 joule minimum, supplied by two, 2200 microfarad capacitors located within the module.

DC SOLENOID RATING—
3 amperes continuous at 30 vdc maximum, 20 vdc minimum.

DETONATOR CONTACT RATING—
12 amperes peak (10 milliseconds),
4 amperes continuous (using external power supply).

DETONATOR MODULE INPUTS—
Controller, Matrix - Open collector transistor outputs rated at 100 milliamperes, less than 0.5 vdc on and maximum 60 vdc off.

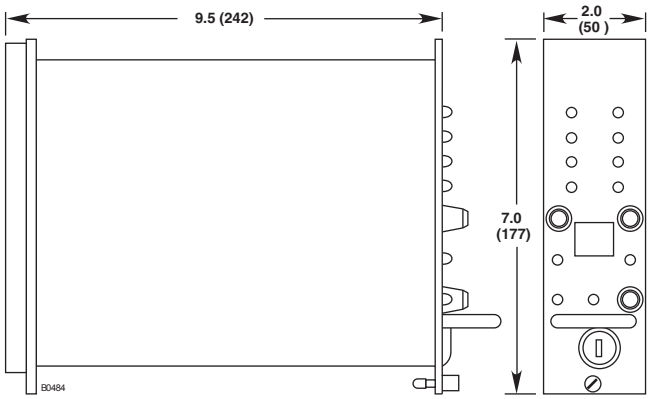


Figure 2—Dimensions of the R1425 Detonator Module in Inches (Millimeters)

Aux A, Aux B - Normally open contacts with end of line resistors across contacts. (10 kilohms at 24 vdc.) Class B supervised.

SOLID STATE OUTPUTS—
Open collector transistors rated at 100 milliamperes, less than 0.5 vdc on and maximum 60 vdc off (from external supply), with 100 kilohm resistor from output to ground (–).

RESPONSE TIME—
Less than 1.5 milliseconds.

TEMPERATURE RANGE—
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.

DIMENSIONS—
See Figure 2.

SHIPPING WEIGHT—
3.0 pounds (1.4 kilograms).

CERTIFICATIONS—
FM approved for Class B, Style A Initiating Device Circuits and for suppression system performance as defined by NFPA 72.

INSTALLATION

SWITCH SETTING PROCEDURE

This section includes instructions and switch setting diagrams for the two different switch configurations that are in use on the R1425, and instructions for determining which diagram to use.

The Controller and Matrix inputs are selectable for each zone through the use of eight, two-position rocker switches. Input selection is accomplished by opening or closing switches as shown in Figures 3 and 4.

Zone 1 switches are located on the top of the right side circuit board (Figure 5) and Zone 2 switches are located on the bottom of the left side circuit board (Figure 6). To set the switches, first determine the circuit board type, then proceed to the controller and matrix input switch setting procedures below.

Determine Circuit Board Type

Two different switch configurations are in use for the R1425 Detonator Module so it is necessary to determine which configuration is used before setting the switches for the desired number of controller and matrix inputs.

Follow the instructions below to determine which switch setting diagram to use.

NOTE

Failure to set switches correctly will result in a system status "2" - controller or matrix input fault.

1. The R1425 contains two circuit boards that function identically (each circuit board corresponds to a Zone), however, they may have different switch configurations. It is necessary to determine which switch configuration is used in order to choose the correct switch setting diagram to use for that Zone. From the front of the unit, Zone 1 switches are located on the top of the right side circuit board (Figure 5). Zone 2 switches are located on the bottom of the left side circuit board (Figure 6).

   Zone 1 - Examine the Zone 1 circuit board (top, right side of R1425) and locate the switch assembly. Compare the switch assembly and surrounding component layout to those pictured in Figures 3 and 4. Determine which pictured layout matches that of the Zone 1 circuit board and use the switch setting procedure within that figure to set the Controller and Matrix Input switches.

   Zone 2 - Examine the Zone 2 circuit board (bottom, left side of R1425) and locate the switch assembly. Compare the switch assembly and surrounding component layout to those pictured in Figures 3 and 4. Determine which pictured layout matches that of the Zone 2 circuit board and use the switch setting procedure within that figure to set the Controller and Matrix Input switches.

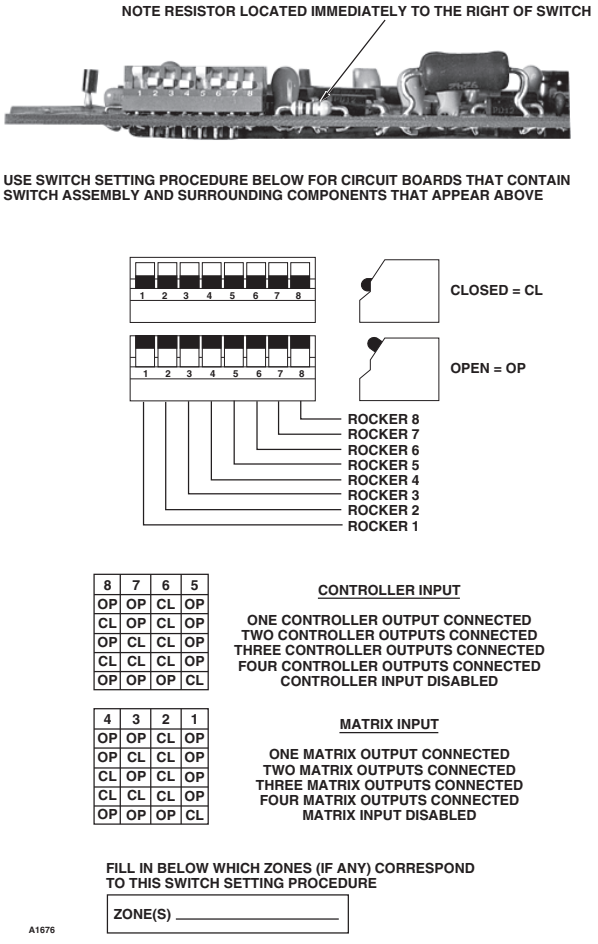


Figure 3—Switch Assembly Identification and Switch Setting Procedure

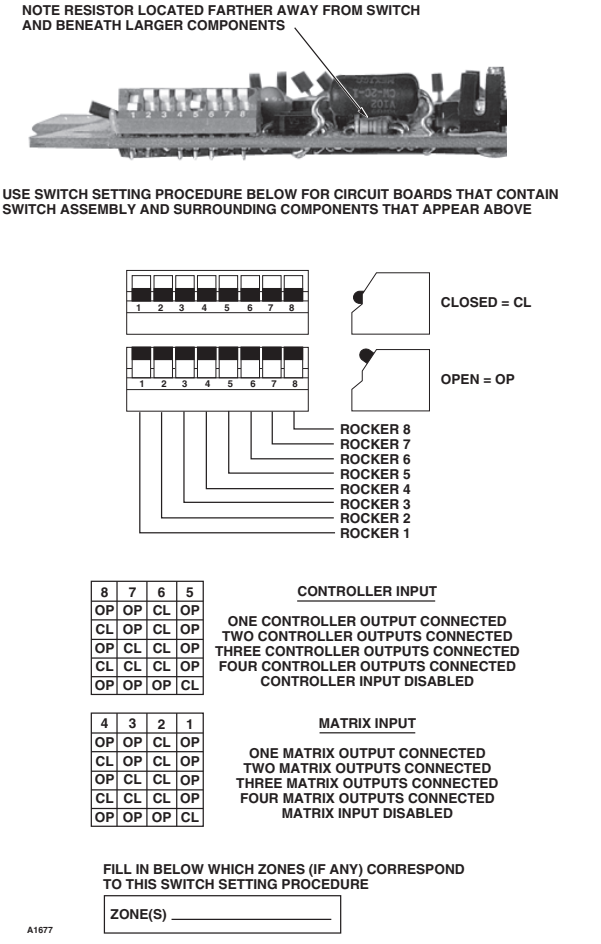


Figure 4—Switch Assembly Identification and Switch Setting Procedure

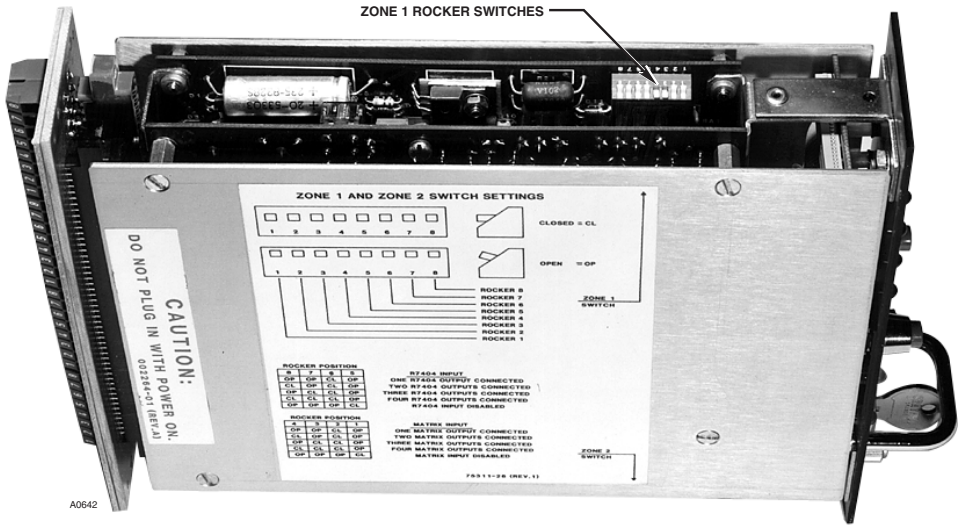


Figure 5—Location of Zone 1 Rocker Switches

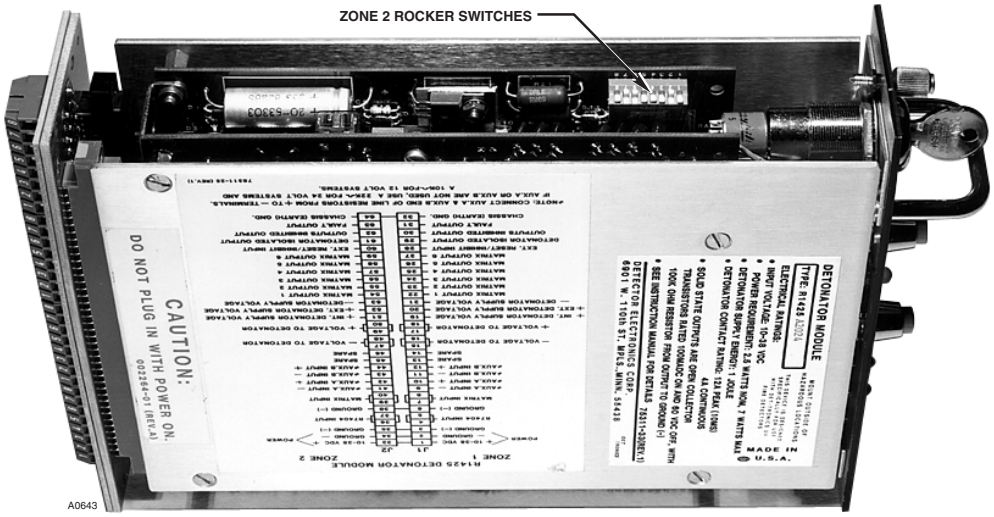


Figure 6—Location of Zone 2 Rocker Switches

IMPORTANT

It is possible that two different type switch configurations are contained in the same R1425, especially if the unit was repaired at any time, so it is important to check both circuit boards. If they differ, note which corresponds to each Zone so that switch setting can be effectively accomplished.

2. For easy reference, label the switch setting procedures by zone in the space provided in Figure 3 and/or Figure 4.

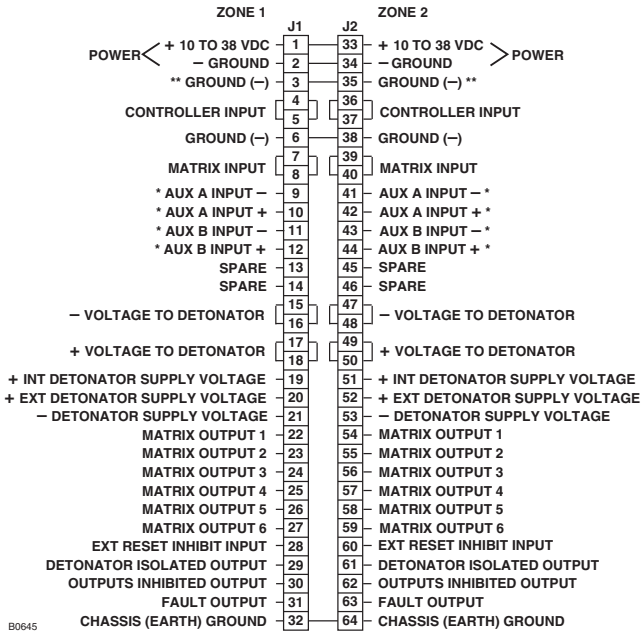
Controller Input Switches

Rocker switches 8, 7, 6 and 5 determine the number of controller inputs to the selected R1425 zone. For example, setting rocker switches 8, 7 and 5 open and 6 closed allows one controller input. The system can also be programmed for no controller inputs by setting rocker switches 8, 7 and 6 open and rocker switch 5 closed.

Matrix Input Switches

The selection of other R1425 Detonator Module outputs recognized as inputs is accomplished in the same manner as Controller input selection, this time using rocker switches 4 through 1. For example, an R1425 zone will recognize four other outputs as Matrix inputs by setting rocker switches 4, 3 and 2 closed and rocker switch 1 open.

Failure to select rocker switches correctly or use of the wrong switch setting diagram will result in a UV/Matrix fault, status code "2," in the corresponding zone.



* CONNECT AUX A AND AUX B END OF LINE RESISTORS FROM + TO + TERMINALS IF AUX A OR AUX B ARE NOT USED. USE A 22 KILOHM RESISTOR FOR 24 VOLT SYSTEMS AND A 10 KILOHM RESISTOR FOR 12 VOLT SYSTEMS.

** ENSURE GROUND (–) IS CONNECTED TO EACH CONTROLLER IN THE SYSTEM. IT IS IMPORTANT TO HAVE A COMMON GROUND (–) REFERENCE TO EACH CONTROLLER.

Figure 7—R1425 Terminal Configuration Showing J1 and J2

ELECTRICAL CONNECTIONS

Referring to Figure 7, J1 and J2 connections are identical, J1-1 to J1-32 coincides with J2-33 to J2-64. J1 connections are applicable to Zone 1 functions and J2 connections are applicable to Zone 2 connections. The following description applies to both J1 (Zone 1) and J2 (Zone 2), however, only J1 terminals are discussed specifically.

Controller inputs can be accepted at either terminal 4 or 5 or both, the terminals are electrically the same point. Similarly, terminals 7 and 8 are identical and will accept Matrix inputs in the same way.

The Aux A input is accepted at terminal 9 (–) and terminal 10 (+). The Aux B input is accepted at terminal 11 (–) and terminal 12 (+).

IMPORTANT

If Aux A or Aux B inputs are not used, a supervisory resistor must be installed from the positive (+) to negative (–) terminals of the applicable input. For 12 volt systems, use a 10 kilohm, 1/4 watt resistor. For 24 volt systems, use a 22 kilohm, 1/4 watt resistor.

When using the capacitive discharge circuit for detonation, connection should be made to either terminal 15 or 16, as they are electrically identical (negative voltage to detonator), and to terminal 17 or 18, which are also identical (positive voltage to detonator).

IMPORTANT

Deluge solenoids can cause inductive transients on the lines to and from the detonator module. These transients must be suppressed or they will cause output circuit failure. See Figures 10 and 11 for detailed information.

Electrical connection for external supply voltage to the detonator is rated for 3 amperes continuous @ 30 vdc maximum and 20 vdc minimum. To ensure that the minimum voltage specification is met at the solenoid, inherent wiring resistance and detonator module voltage drop must be considered.

If the distance from the detonator module to the solenoid is 75 feet, and the distance from the detonator module to the external supply is 10 feet, the total length of wire to consider for wiring resistance is 170 feet (2 X 75 + 2 X 10). To calculate the supply voltage needed to drive a solenoid, use the following equation:

Ve = Vs + Is X (Lw X Rw) + Vd where

Ve is the external supply voltage required

Vs is the rated operating voltage of the solenoid

Is is the current of the solenoid at the rated operating voltage

Lw is the total length of the wire from supply to solenoid (170 in the above paragraph)

Rw is the resistance per unit length of the wire

Vd is the drop across the detonator module and is equal to 1.4 volts

For example if a 24 volt solenoid requires 2.4 amperes, the total wire length is 170 feet and the resistance of the wire is 0.00258 ohms per foot at 25°C (14 AWG), then the external supply voltage would be:

Ve = 24 + 2.4 X (170 X 0.00258) + 1.4 = 26.45 volts

In order to use the capacitor discharge arrangement, there must be a jumper between the positive internal detonator supply voltage (terminal 19) and the positive external detonator supply voltage (terminal 20). Failure to install this jumper will cause a fault to occur. This jumper must not be installed when using an external detonator power supply. The capacitors are charged by the internal detonator power supply whenever power is applied to the module. (For discharge rate, see Figure 8.)

IMPORTANT

If a detonator or solenoid is not used, a 5 to 10 ohm, 1 watt resistor must be installed from terminal 15 or 16 to terminal 17 or 18.

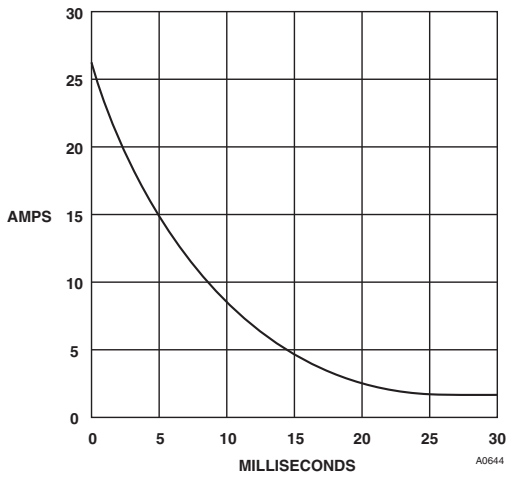


Figure 8—Capacitive Discharge Rate Through a One Ohm Load at 22°C

When an external power supply is used (required when a solenoid or more than one squib is used), it is connected to terminal 20 (positive external detonator supply voltage) and terminal 21 (negative detonator supply voltage). The jumper between terminal 19 and terminal 20 must not be installed for this application. An example of this is shown in Figure 10 on the J2 (Zone 2) side of the R1425. Note that external power is connected to J2-52 (+) and J2-53 (–) and that the jumper between J2- 51 and J2-52 has been removed.

Terminals 22 through 27 are Matrix outputs. These are latching open collector outputs so no voltage or signal will be present without a load connected.

External Reset/Inhibit input, terminal 28, which is normally high, allows the inhibit and reset functions to be accomplished from a remote location. This may be performed by a computer interface, external switches, or any interface that drives the input to less than 0.5 vdc. The Reset/Inhibit function can also be performed by the front panel keylock switch for each module.

Terminals 29, 30, and 31 Detonator Isolated output, Outputs Inhibited output and Fault output respectively, are provided for remote indication or annunciation when these conditions exist. They can also be inputs to other units of the system. Terminals 29 and 30 are normally off outputs and terminal 31 (Fault) is a normally on output.

STARTUP PROCEDURE

Ensure that detonator circuits are wired according to circuit wiring diagrams outlined in the "Electrical Connections" section of this manual.

1. Place keylock switch in ISOLATE position to ensure that detonator circuits do not receive power.
2. Slide module into mounting cage, plugging circuit board end connectors into field wiring connector plate (shipped with the R1425 for installation in the field on the back of the Q4004 Mounting Cage).
3. Apply power. The green POWER LED should illuminate. If the POWER LED is not illuminated, check the input power supply and associated wiring.
4. Place keylock switch in NORMAL position. If no faults are indicated, unit is now operable. Check faceplate indicators. Only the green POWER LED should be illuminated.

CHECKOUT PROCEDURE

(A Lamp Test should precede all other test and checkout procedures.)

1. Place keylock switch in TEST position. This position isolates detonator circuits so that the function of internal circuitry can be verified.
2. To test the circuitry of each zone, depress the associated TEST button. On first depression, the UV LED will illuminate, and a system status code "6" will be displayed. On the next depression, the MATRIX LED will illuminate and a status code "6" will be displayed. Aux A and Aux B can also be verified in this manner. The sequential stepping continues with each depression until all four functions have been tested. The final depression resets the sequence and clears the display. No function LEDs should be illuminated.

NOTE

This mode of operation generates a fire enable signal internally in order to test the circuitry.

3. When the checkout procedure is complete, place the keylock switch in the NORMAL position.

TROUBLESHOOTING

Fault and status information is available on the system status display and LEDs of the faceplate. (Refer to "Front Panel Indicators - System Status Display" section.) In the event that a UV, Matrix, Aux A or Aux B fault is indicated in the system status display, it is necessary to determine whether the malfunction is external to, or within the module. In order to determine this information, use the following procedure.

1. Select the TEST position with the keylock switch.
2. Depress the TEST button corresponding to the zone identifying the fault. Sequentially step through the zone functions, illuminating each corresponding LED. A "6" should be present in the system status display.

NOTE

As each function is verified, the corresponding LED will remain illuminated until the TEST button is pressed again, stepping to the next function. If an LED does not illuminate, the associated internal circuitry is malfunctioning.

3. If the sequential stepping indicates no malfunctions, the stepping sequence is complete when all function LEDs have been illuminated, turned off, and the system status display records the original fault. If no malfunctions are found, the self-test has verified that the internal circuitry of the module is functioning properly and the fault is external to the unit.

If an external problem in the UV, Matrix, Aux A or Aux B circuitry is indicated, check for the following:

1. Wiring from the R1425 Module to a controller (UV input) or Matrix input is shorted to ground, missing or disconnected. (Refer to Table 1, system status code "2.") Ensure that the circuit ground (negative) of the R1425 Module and associated controller are connected together.
2. Incorrect setting of the rocker switches. These switches must indicate the correct number of UV or Matrix inputs to the R1425 Module. (Refer to Table 1, system status code "2.")
3. Aux A and Aux B have open leads or incorrect supervisory resistors are installed. Check values. (Refer to Table 1, system status code "3.")
4. Missing jumper from terminals 19 to 20 and/or 51 to 52 (internal power supply is used).

TYPICAL SYSTEM APPLICATIONS

In a typical application, the R1425 Detonator Module is an integral part of a Det-Tronics system protecting a munitions manufacturing operation.

UV or IR detectors connected to controllers can be used to monitor a highly volatile material contained in several adjoining fire zones. In this situation, an explosion in one fire zone could easily cause a chain reaction involving adjoining fire zones.

The R1425 Detonator Module is designed for use in such applications. The diagram in Figure 9 illustrates the general operation of a system using the matrixing capability of the R1425 Module.

A fire is sensed by a fire detector in compartment 5. The flame controller (R7404 or R7094) sends a fire signal to Unit 2, Zone 1 of the R1425 Module. Upon receipt of this signal, the R1425 actuates the detonator in compartment 5 and produces matrix output signals.

The matrix feature allows simultaneous actuation of the detonator circuits in adjoining compartments as explained below.

The Matrix outputs of Unit 2, Zone 1 (compartment 5) are tied to Matrix inputs at Unit 2, Zone 2 (compartment 6), and Unit 1, Zone 2 (compartment 4).

At Zone 2 of Unit 2, the Matrix input causes actuation of the detonator in compartment 6 but does not enable the Matrix outputs.

At the same instant, at Zone 2 of Unit 1, the Matrix input causes actuation of the detonator in compartment 4 but does not enable the Matrix outputs. In effect, this system has extinguished the fire in compartment 5, and virtually eliminated the chances of it spreading by actuating the deluge systems in the two adjoining compartments (4 and 6). All other compartments remain unaffected.

Following are more detailed examples of systems illustrating the actual wiring. Figure 10 is an ultraviolet (UV) fire detection system with a detonator. Figure 11 is a high speed infrared (IR) fire detection system with a detonator.

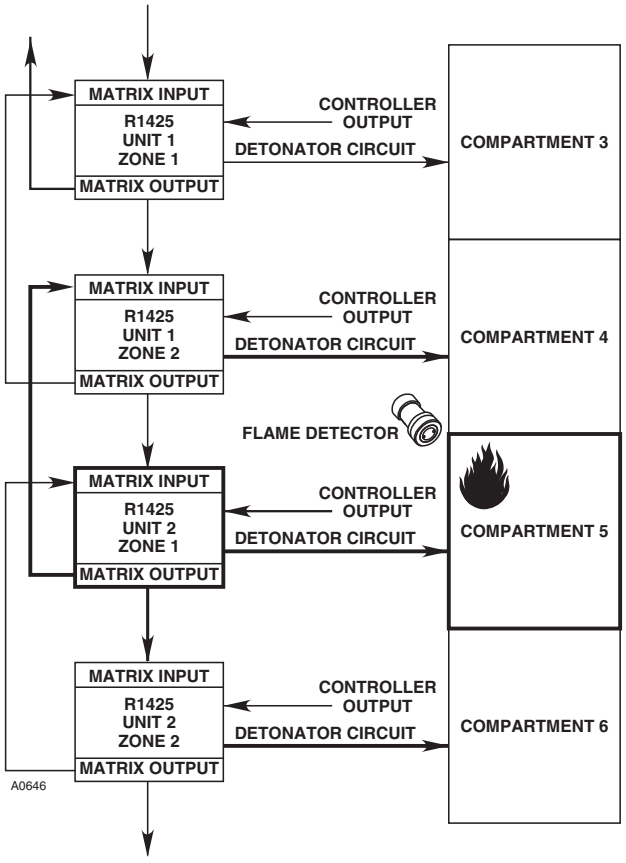


Figure 9—Block Diagram for Typical Application Using Two R1425s to Protect Four Individual Compartments

IMPORTANT

Deluge solenoids can cause inductive transients on the lines to and from the detonator module. These transients must be suppressed or they will cause output circuit failure. See Figures 10 and 11 for detailed information.

In the UV system, a fire sensed by the C7050 Detectors and processed by the R7404 UV Controller will cause the R6006 relay K1 to energize (ALARM OUT UV DETECTOR) and the deluge squib and deluge solenoid to activate.

Activating either manual trip will cause the R6006 relay K2 to energize (ALARM OUT MANUAL PULL) and the deluge squib and deluge solenoid to activate.

In the IR system a fire sensed by the detectors in zone 1 (either the C7093 IR detectors, the thermal detector or the pressure detector) will activate Zone 1 and Zone 2 detonator outputs and K1 (Alarm Output) and K2 (Process Interlock) relays on the R6006 Relay Module.

A fire in zone 2 will activate the Zone 2 detonator output and the K1 (ALARM OUTPUT) and K2 (PROCESS INTERLOCK) relays on the relay module.

REPLACEMENT PARTS

The R1425 Detonator Module is not designed to be repaired in the field. If a problem should develop, refer to the Troubleshooting section. If it is determined that the problem is caused by an electronic defect, the device must be returned to the factory for repair.

DEVICE REPAIR AND RETURN

Prior to returning devices, contact the nearest local Det-Tronics office so that a Return Material Identification (RMI) number can be assigned. **A written statement describing the malfunction must accompany the returned device or component to assist and expedite finding the root cause of the failure.**

Pack the unit properly. Always use sufficient packing material. Where applicable, use an antistatic bag as protection from electrostatic discharge.

NOTE

Det-Tronics reserves the right to apply a service charge for repairing returned product damaged as a result of improper packaging.

Return all equipment transportation prepaid to the factory in Minneapolis.

NOTE

It is highly recommended that a complete spare be kept on hand for field replacement to ensure continuous protection.

ORDERING INFORMATION

When ordering, specify model and options.

R1425A Detonator Module (Standard)
R1425B Detonator Module (Requires “Controller” **and** “Matrix” inputs)

NOTE

A diode kit, containing two diodes, is included with each order. The kit is affixed to the outside of the ESD bag containing the R1425 module.

OPTIONAL EQUIPMENT

Voltage converters are available from Det-Tronics for operating the system from line (mains) voltage.

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

Detector Electronics Corporation
6901 West 110th Street
Minneapolis, Minnesota 55438 USA
Phone: (952) 946-6491
Toll: (800) 765-3473
Fax: (952) 829-8750
Web site: www.det-tronics.com
E-mail: det-tronics@det-tronics.com

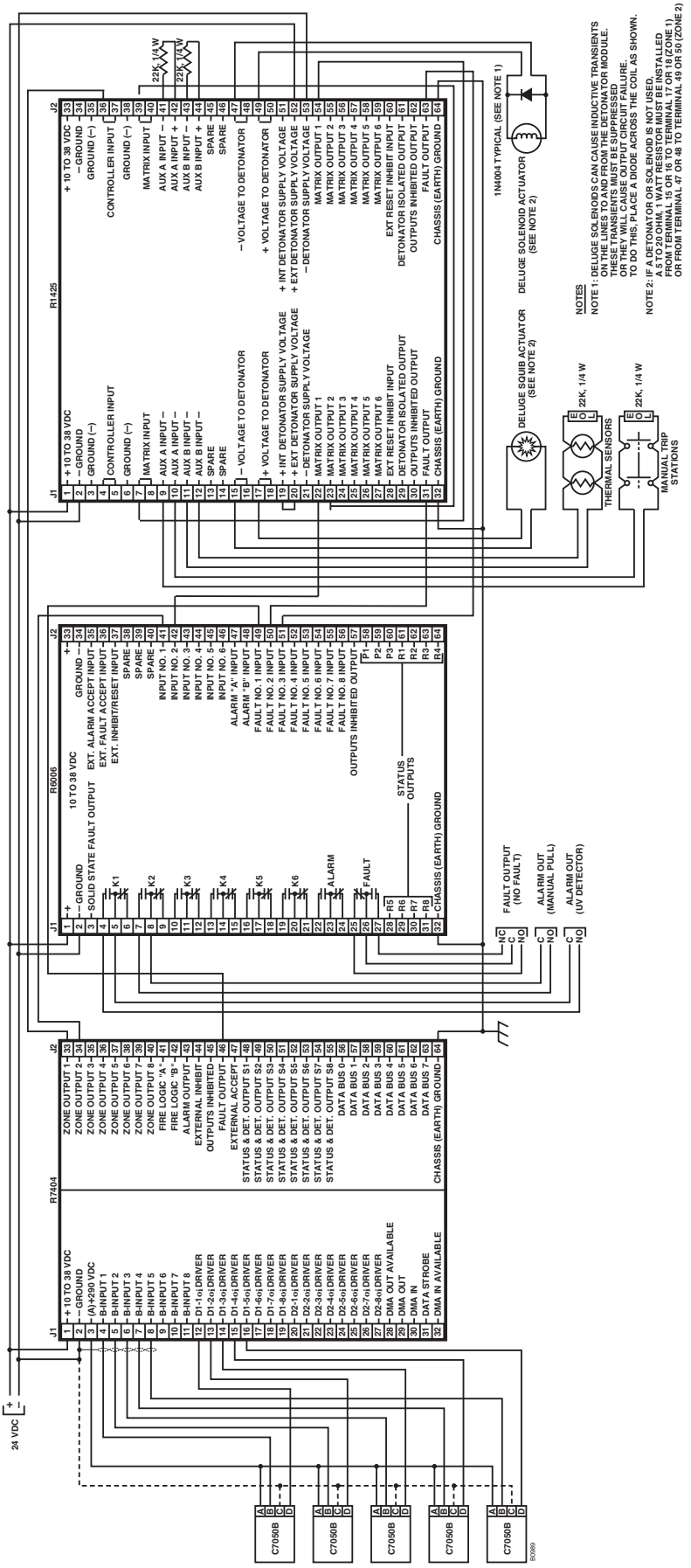


Figure 10—Ultraviolet Flame Detection System with R1425 Detonator Module

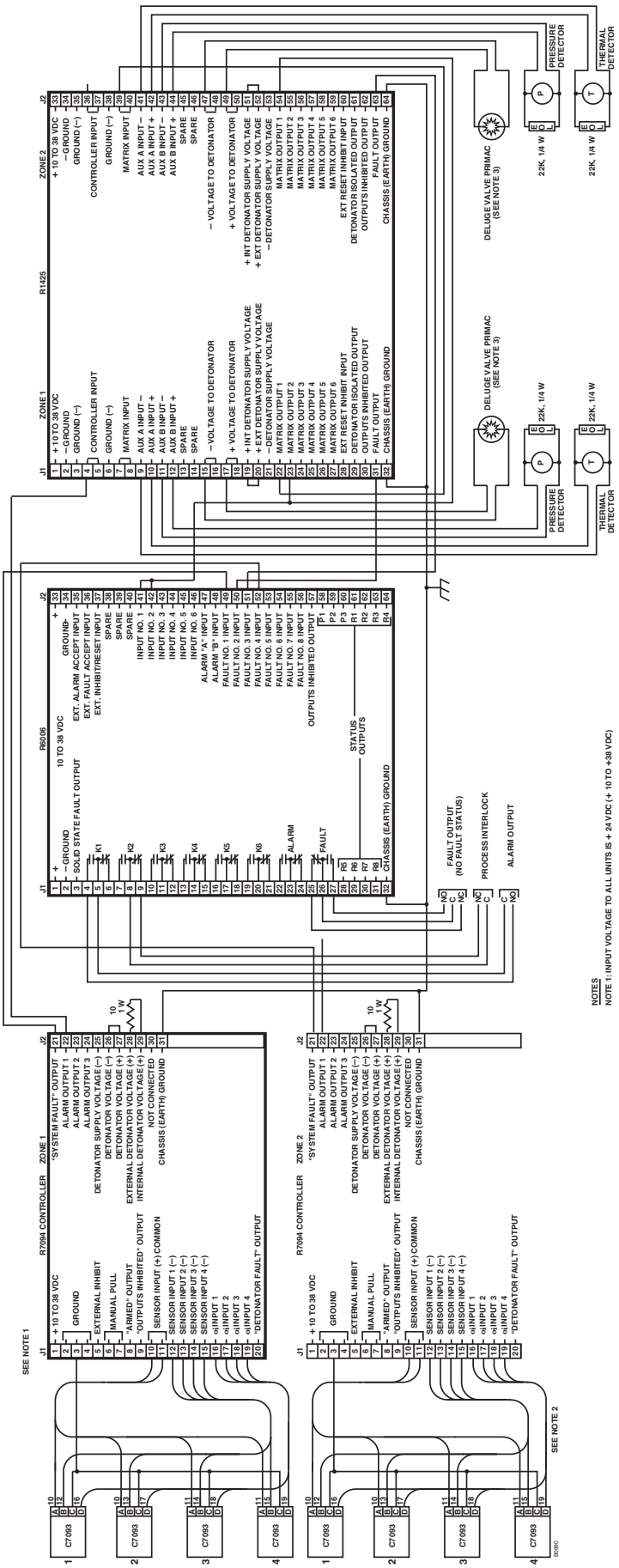


Figure 11—Infrared Flame Detection System with R1425 Detonator Module

95-8254

FlexSonic™ Acoustic
Leak Detector

X3301 Multispectrum
IR Flame Detector

PointWatch Eclipse® IR
Combustible Gas Detector

FlexVu® Universal Display
with GT3000 Toxic Gas Detector

Eagle Quantum Premier®
Safety System

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det-tronics@det-tronics.com

Det-Tronics manufacturing system is certified to ISO 9001—the world's most recognized quality management standard.

DET-TRONICS
United Technologies