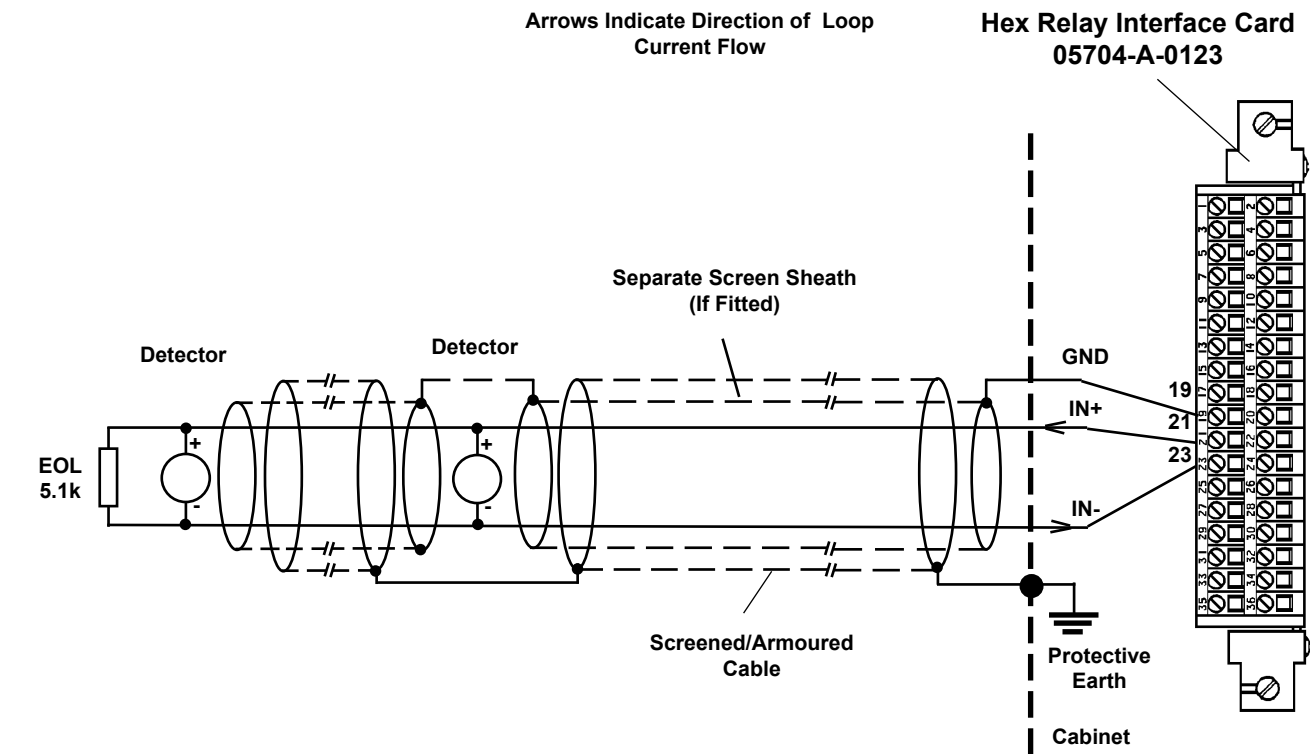


CHAPTER 4 INSTALLATION INSTRUCTIONS



- Notes:
- 1. Where a detector is earthed locally, either to an Earth Stud or through the detector casing or mounting, to avoid earth loops the screen sheath of the cable should only be connected at one end.
 - 2. The above diagram shows the detector connections for Channel 1. Channels 2, 3 and 4 connections are similar and their pin connection numbers are shown below:

	Channel	Detector Connection		
		IN+	IN-	Ground
Hex Relay Interface Connections	1	21	23	19
	2	22	24	20
	3	27	29	19
	4	28	30	20

Typical Loop Powered Detector and Terminal Block Connections

CHAPTER 4 INSTALLATION INSTRUCTIONS

12.3 Typical Loop Powered Detector with IS Barrier Connections

Loop powered intrinsically safe detectors (eg. most smoke, heat and manual call points) have two wire connection. The detector documentation will indicate the positive and negative loop connections. Multiple detectors may be connected in parallel on a single loop input provided the IS criteria and loop operational limit for quiescent current are not exceeded.

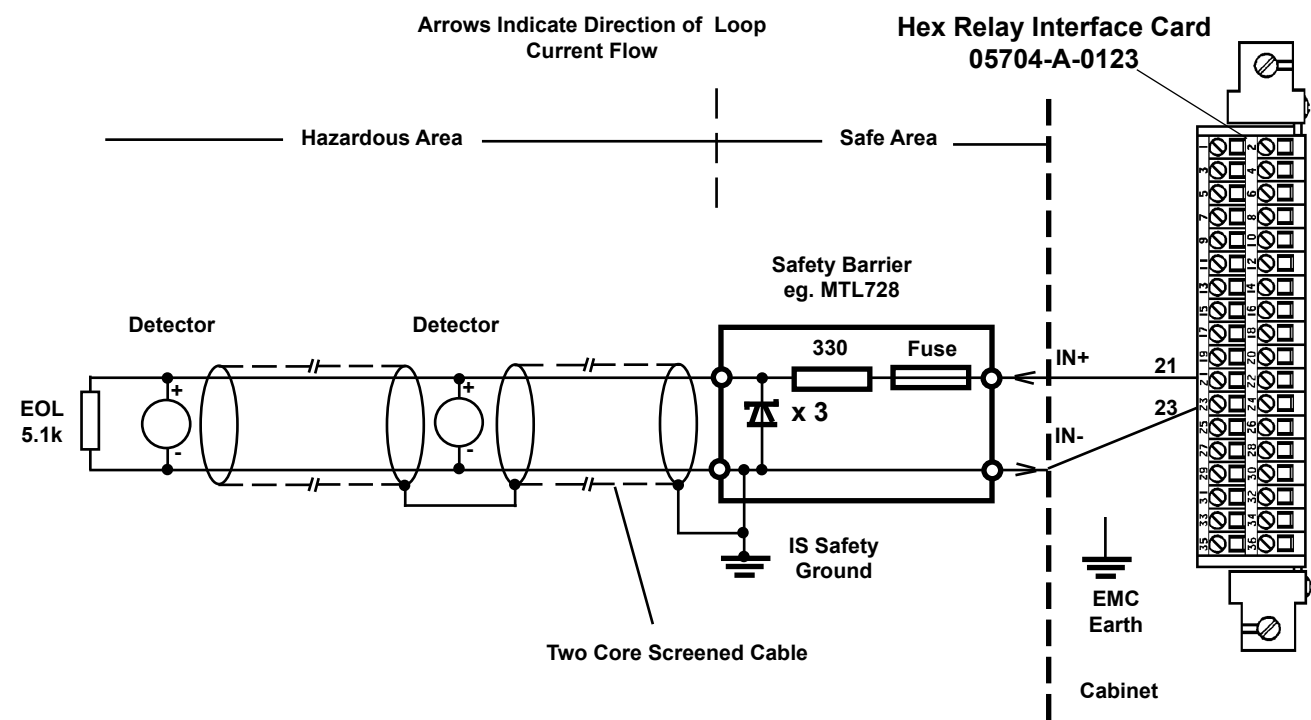
In the safe area, the two wires from the detector should be connected to the field (hazardous area) side of the barrier. The input (safe area) side wires from the barrier should be connected to the appropriate channels IN+ and IN- terminals of the Hex Relay Interface Card that is attached to the required 5704F Control Card. The loop current always flows from the IN+ terminal and returns via the IN- terminal. The barrier must be earthed appropriately.

For fault monitoring purposes an end of line (EOL) resistor must be fitted in or after the last detector on the loop. The typical value for end of line resistance is 5.1k ohms.

When using an external barrier the IS compatibility link for the input must be set appropriately, see section Chapter 2 Section 4.3.

Intrinsically safe systems must be earthed at one point only. All detector cable screens should be connected separately to the IS safety ground.

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- Notes:
- 1. Earth Leakage must not be used with single or dual barriers since the 0V is connected to IS ground. If earth leakage is required an isolating barrier must be used.
 - 2. A suitable barrier specification is a 28V 300 ohm Shunt Barrier with 50mA minimum current capability for short circuit survival.
 - 3. The above diagram shows the detector connections for Channel 1. Channels 2, 3 and 4 connections are similar and their terminal block connection numbers are shown below:

	Channel	Detector Connection		
		IN+	IN-	Ground
Hex Relay Interface Connections	1	21	23	19
	2	22	24	20
	3	27	29	19
	4	28	30	20

Typical Loop Powered Detector, IS Barrier and Terminal Block Connections

CHAPTER 4 INSTALLATION INSTRUCTIONS

12.4 Separately Powered Detectors

Separately powered detectors (eg. most IR, UV/IR Flame detectors) require three or four wire connections. The detector documentation will indicate the 0V and +24V power connections and the positive and negative loop connections. When using flame detectors it is common practice to use only one detector per loop input.

At the System 57 end of the field cables the two detector signal wires should be connected to the appropriate channels IN+ and IN- terminals of the Hex Relay Interface Card that is attached to the required 5704F Control Card. The loop current always flows from the IN+ terminal and returns via the IN- terminal.

The power for the detector may be sourced from the System 57 power supply or a separate field supply, whichever is most appropriate. In small systems, power can be obtained from terminals 35 and 36 of the Hex Relay Interface Card, but care must be taken not to exceed the maximum backplane current loading of 8A. A separate dc power distribution block is recommended.

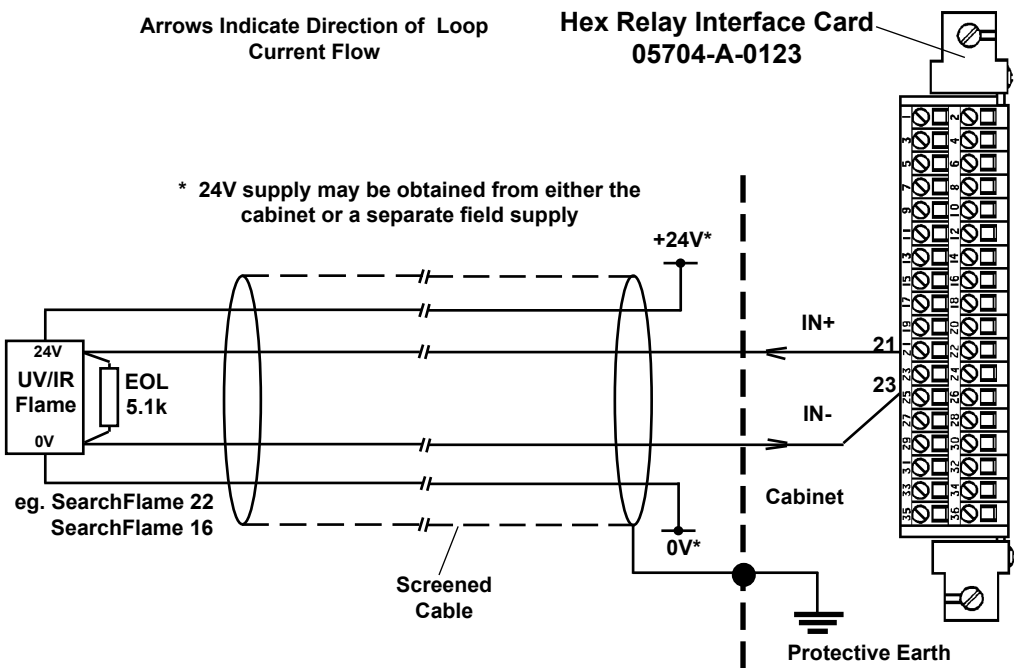
For fault monitoring purposes, an end of line (EOL) resistor must be fitted in or after the last detector on the loop. The typical value for end of line resistance is 5.1k ohms.

The detector cable screen, or steel wire armour or braid as appropriate, should be connected to the system protective earth. This can be achieved where the cable enters the cabinet by using a metal cable gland, or by other suitable means, and avoiding any screen tails within the cabinet.

Where the cable consists of a separate screen sheath and wire armour or braid, the armour should be connected at the cabinet entry to the protective earth and the screen sheath should be connected to the GROUND terminal of the Hex Relay Interface Card or to a suitable instrument earth point.

Notes: 1. Separate provision may be required for power supply isolation

CHAPTER 4 INSTALLATION INSTRUCTIONS



in order to reset the detector after an alarm condition. Consult the detector operating instructions for more details.

- 2. For a 3 wire connection, the IN- signal can return via the 0V supply but care should be taken with the system layout to minimise electrical noise and other forms of interference.
- 3. Where a detector is earthed locally, either to an Earth Stud or through the sensor casing or mounting, to avoid earth loops the screen sheath of the cable should be connected at one end only.
- 4. The above diagram shows the detector connections for Channel 1. Channels 2, 3 and 4 connections are similar and their terminal block connection numbers are shown below:

	Channel	Detector Connection		
		IN+	IN-	Ground
Hex Relay Interface Connections	1	21	23	19
	2	22	24	20
	3	27	29	19
	4	28	30	20

Typical Separately Powered Detector and Terminal Block Connections

CHAPTER 4 INSTALLATION INSTRUCTIONS

12.5 Call Points and Simple Switched Output Detectors

Manually Activated Call Points (MAC) and some fire detectors have a simple switched alarm output via two wire connection. The detector documentation will indicate the switch contact connections. Many call points may be connected in parallel on a single loop input, but it is good practice to keep call points on a separate input to other types of detector.

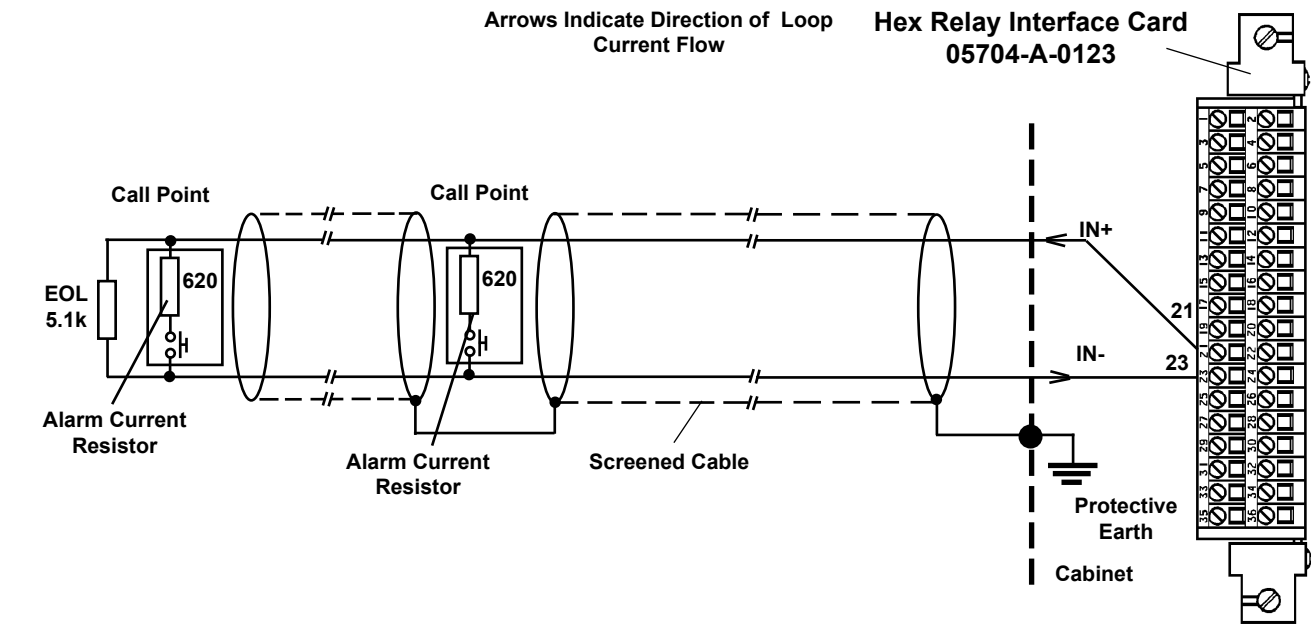
At the System 57 end of the field cables the two call point signal wires should be connected to the appropriate channels IN+ and IN- terminals of the Hex Relay Interface Card that is attached to the required 5704F Control Card. The loop current always flows from the IN+ terminal and returns via the IN- terminal.

For fault monitoring purposes an end of line (EOL) resistor must be fitted in or after the last call point on the loop. The typical value for end of line resistance is 5.1k ohms.

The detector cable screen, steel wire armour or braid as appropriate, should be connected to the system protective earth. This can be achieved where the cable enters the cabinet by using a metal cable gland, or by other suitable means, and avoiding any screen tails within the cabinet.

Where the cable consists of a separate screen sheath and wire armour or braid, the armour should be connected at the cabinet entry to the protective earth and the screen sheath should be connected to the GROUND terminal of the Hex Relay Interface Card or to a suitable instrument earth point.

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- Notes:
- 1. Most modern call points already incorporate the alarm current resistor, shown with a typical value of 620 ohms , if not this can be easily fitted externally within the call point junction box.
 - 2. The Fire Card inputs are also compatible with devices that use a zener diode, typical value 8.2V, 0.5W, to set the alarm current.
 - 3. The operation of more than two call points simultaneously may cause the loop current to exceed the short circuit warning threshold. This will not suppress the alarm output but a fault indication will be given on the fire card display.
 - 4. Where the call point is earthed locally, either to an Earth Stud or through the sensor casing or mounting, the screen sheath of the cable should be connected at one end only to avoid earth loops.
 - 5. The above diagram shows the detector connections for Channel 1. Channels 2, 3 and 4 connections are similar and their terminal block connection numbers are shown below:

	Channel	Detector Connection		
		IN+	IN-	Ground
Hex Relay Interface Connections	1	21	23	19
	2	22	24	20
	3	27	29	19
	4	28	30	20

Typical Call Point and Terminal Block Connections

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CHAPTER 4 INSTALLATION INSTRUCTIONS

12.6 Detectors with Voltage Free Contact Outputs

Some fire detectors (especially flame) are equipped with a voltage free contact for the alarm output and often with a second voltage free contact for fault output. These types of detector are easily connected to the fire card using a two wire connection. The detector documentation will indicate the voltage free contact connections. Although a number of detectors may be connected in parallel on a single loop input, it is good practice to connect only one flame detector on any input.

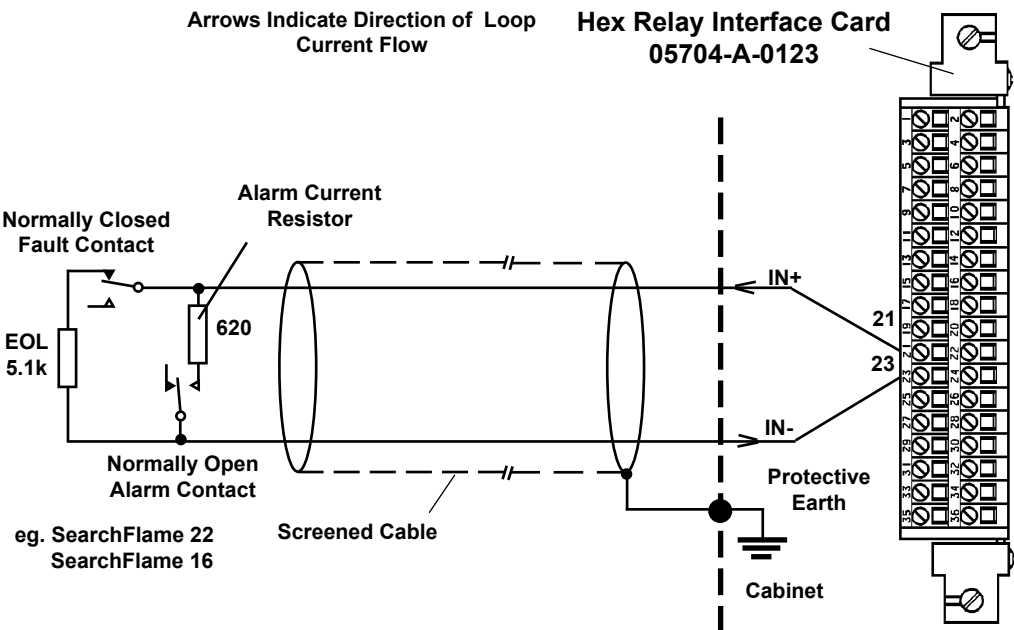
At the System 57 end of the field cables the signal wires should be connected to the appropriate channels IN+ and IN- terminals of the Hex Relay Interface Card that is attached to the required 5704F Control Card. The loop current always flows from the IN+ terminal and returns via the IN- terminal.

For fault monitoring purposes, an end of line (EOL) resistor must be fitted in or after the last detector on the loop. The typical value for end of line resistance is 5.1k ohms.

The detector cable screen or steel wire armour or braid as appropriate, should be connected to the system protective earth. This can be achieved where the cable enters the cabinet by using a metal cable gland, or by other suitable means, and avoiding any screen tails within the cabinet.

Where the cable consists of a separate screen sheath and wire armour or braid, the armour should be connected at the cabinet entry to the protective earth and the screen sheath should be connected to the GROUND terminal of the Hex Relay Interface Card or to a suitable instrument earth point.

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- Notes:
- 1. Some detectors may incorporate the alarm current resistor shown with a typical value of 620 ohms, if not, this can be easily fitted externally within the detector junction box.
 - 2. Where the detector is earthed locally, either to an earth stud or through the detector casing or mounting, to avoid earth loops the screen sheath of the cable should be connected at one end only.
 - 3. The above diagram shows the detector connections for Channel 1. Channels 2, 3 and 4 connections are similar and their terminal block connection numbers are shown below:

	Channel	Detector Connection		
		IN+	IN-	Ground
Hex Relay Interface Connections	1	21	23	19
	2	22	24	20
	3	27	29	19
	4	28	30	20

Typical Volt Free Output Detector and Terminal Block Connections

CHAPTER 4 INSTALLATION INSTRUCTIONS

13. OUTPUTS

13.1 Output Types

The System 57 Fire Control System is equipped with two different output capabilities. Each 5704F Control card offers two fault monitored switched dc outputs and between six and 16 voltage free relay outputs depending upon the type of relay card fitted. The switched dc outputs are powered from the system dc power supply (21 to 32V) and fused at 1A maximum. For relay ratings see Chapter 7 Section 5.

Outputs facilities are therefore available to suit most types of audible sounder, visual indicators and actuators from many different manufacturers.

13.2 Switched Outputs

Each output circuit, when switched on, provides power direct from the system dc power supply (21 to 32V). The outputs are fused at 1A maximum, For fuse type see Chapter 7 Section 5.3. The outputs are suitable for switching lamps, sounders, relays etc.

CAUTION

The maximum backplane current capacity of 8A must not be exceeded. Provision is made for the individual powering of each fire controller card when required.

Inductive apparatus should always be fitted with a suppression diode.

While switched off each output is monitored for short circuit and open circuit faults to ensure that the output is capable of operating when required. When switched on the output is monitored for fuse failure.

IMPORTANT

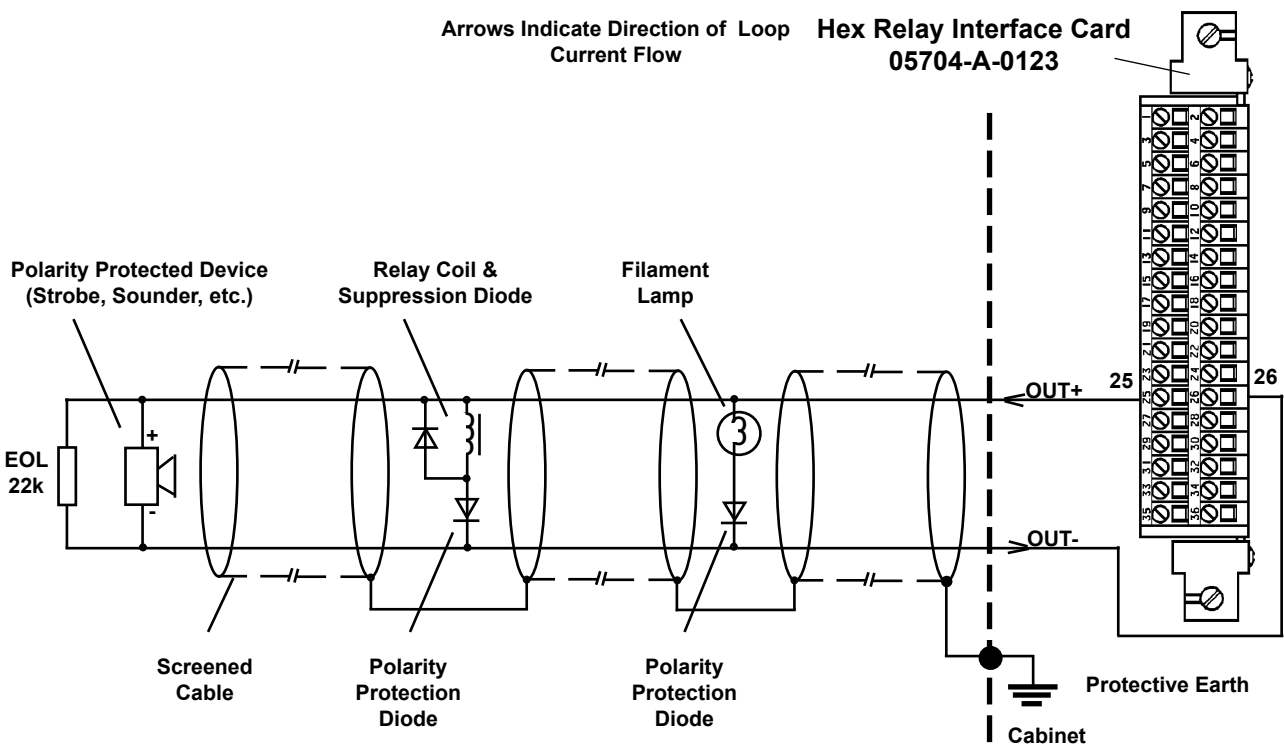
The output is reversed biased during the inactive state to facilitate monitoring for fault conditions. Equipment connected to the output must therefore have built-in polarity protection or be provided with a separate series diode.

Each output must be electrically terminated by connecting an appropriate resistance at the end of the line. The nominal end of line resistance is 22k ohms.

The output cable screen or steel wire armour or braid as appropriate, should be connected to the system protective earth. This can be achieved where the cable enters the cabinet by using a metal cable gland, or by other suitable means, and avoiding any screen tails within the cabinet.

Where the cable consists of a separate screen sheath and wire armour (or braid), the armour should be connected at the cabinet entry to the protective earth and the screen sheath should be connected to the GROUND terminal of the Hex Relay Interface Card or to a suitable instrument earth point.

CHAPTER 4 INSTALLATION INSTRUCTIONS



- Notes:
- 1. Some devices have built in polarity protection, if not this can be easily achieved using a series diode fitted within the junction box.
 - 2. Where the detector is earthed locally, either to an earth stud or through the detector casing or mounting, to avoid earth loops the screen sheath of the cable should be connected at one end only.
 - 3. Although the outputs are not isolated from the system power supply, an external connection between OUT- and 0V is not permitted.
 - 4. The above diagram shows the connections for Output A. Output B connections are similar and their terminal block numbers are shown below

	Output	Device Connections		
		OUT+	OUT-	Ground
Hex Relay Card Interface Connections	A	25	26	19
	B	31	32	20

Typical Output Circuit Wiring and Terminal Block Connections

4-34

CHAPTER 4 INSTALLATION INSTRUCTIONS

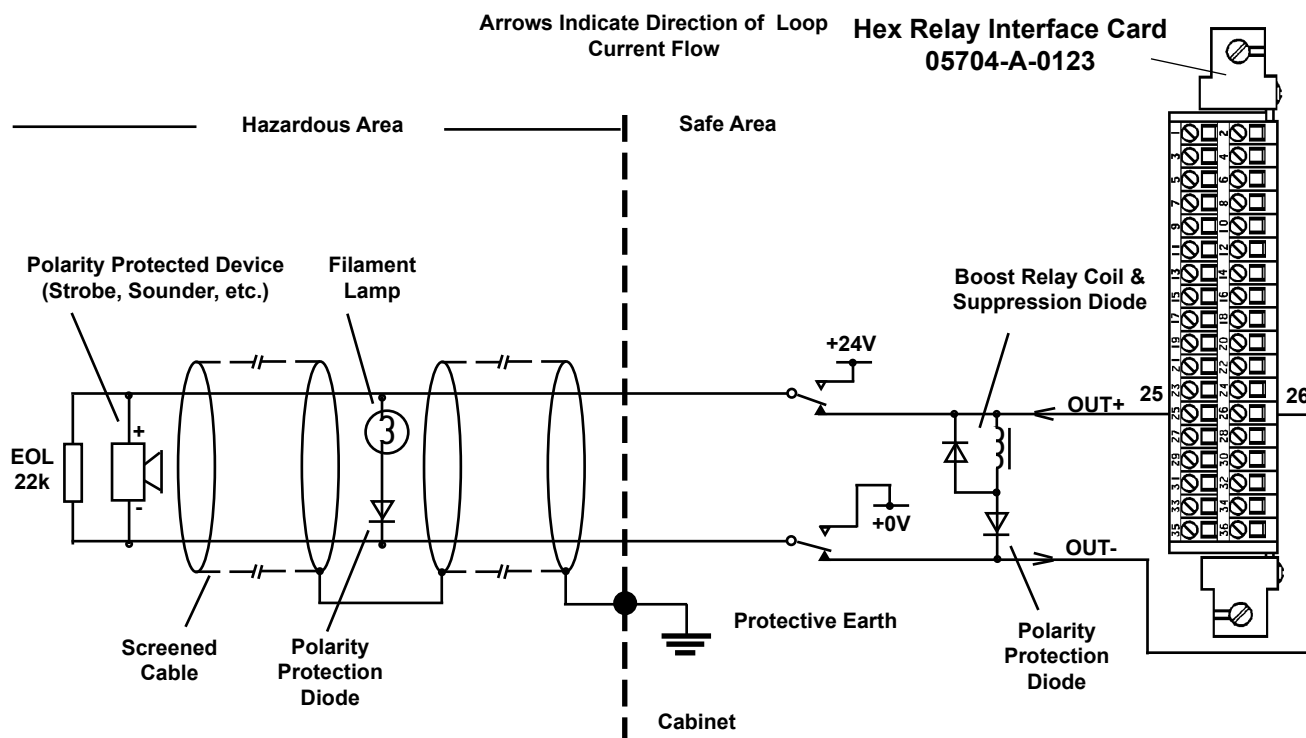
13.3 Switched Outputs with Boost Circuit

Where the 1A maximum current limit of the switched outputs is not sufficient for system requirements an external boost relay circuit can be used. The following boost topology retains the fault monitoring capability for short circuit and open circuit faults of the output.

IMPORTANT

The output is reversed biased during the inactive state to facilitate monitoring for fault conditions. Equipment connected to the output must therefore have built-in polarity protection or be provided with a separate series diode.

All other guidelines stated in Section 13.2 apply including the need for an electrical termination by connecting the appropriate resistance at the end of the line.



Note: The boost relay specification requires a coil voltage of 24V nominal, contact rating as per anticipated maximum field device current and voltage requirements. Fault monitoring current is only 150µA.

CHAPTER 4 INSTALLATION INSTRUCTIONS

13.4 Relay Outputs

*Note: The **FAULT** relay is permanently configured for normally **ENERGISED** operation in the non-fault condition.*



CAUTION

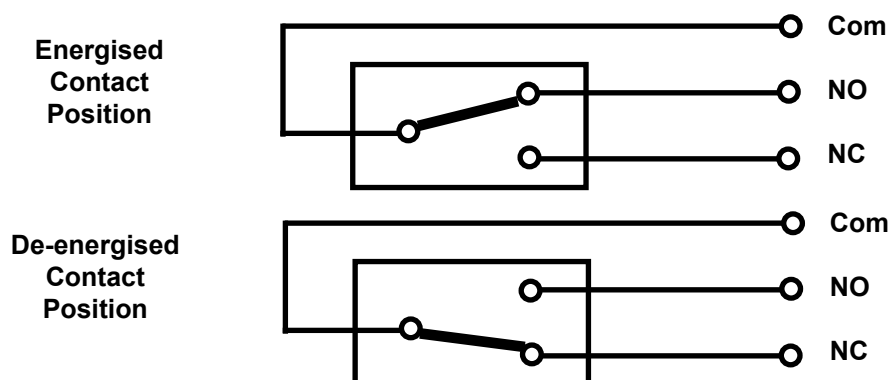
When mains ac is connected to the relay contacts:

- The ac supply should be fused at 5A maximum.
- A safety earth connection should be made to the ground terminal of the relay card.

There are two options for voltage free relay outputs. The standard Hex Relay Card provides six relay outputs, while the 5704F Relay Interface Assembly provides sixteen relay outputs. For relay ratings see Chapter 7 Section 5. Before installation it is important to check the function and operating state of each relay by referring to the configuration printout supplied with all new systems.

For terminal block and relay contact numbering refer to Chapter 2 Section 5.

The cabling to the relays should where possible be kept away from the detector cabling, especially those cables carrying mains supplies. The following figure shows the relay contact connections as shown on the terminal block.



De-energised and Energised Relays Showing Contact Positions

The alarm relays may be configured for either normally de-energised or normally energised operation. Check the configuration sheet supplied with the system to determine the operating mode of the relays on each card. The energising mode of the relays can be reconfigured easily using a computer attached to the Engineering Port. Contact Zellweger Analytics or your local agent for more information.

CHAPTER 4 INSTALLATION INSTRUCTIONS

14. REMOTE INPUT CONNECTIONS



CAUTION

Connecting any external voltage to the remote inputs may cause permanent damage to the Fire Control Card.

The Fire Control Card has a single remote input connection that supports three functions.

The required function is selected by applying a specific value of resistance to the line by means of a momentary action switch as follows:

- a. Remote Accept 10k ohms.
- b. Remote Reset 4.7k ohms.
- c. Remote Silence 2.2k ohms.

The remote input functions are not subject to access level restrictions in the same way as the Fire Status Panel push-buttons. Where this is required, external means should be used such as key switches. It is not permitted to operate more than one remote input at a time.

The remote inputs of the control card, that is driving the Fire Status Panel, provide master remote functions for all of the Fire Cards fitted to the rack. In most applications this is the only remote input that will need to be connected.

Hex Relay Interface Card 05704-A-0123

The remote input is fault monitored for open and short circuits and therefore must be electrically terminated by connecting an appropriate resistance at the end of the line. The nominal end of line resistance is 22k ohms.

