D9412GV3/D7412GV3

Approved Applications
Compliance Guide

EN Control Panels

BOSCH

Listings and Approvals

Fire

UL

The D9412GV3 and D7412GV3 Control Panels are UL Listed for Central Station, Local, Auxiliary, Proprietary, and Household Fire Alarm, and Central Station, Local, Police Station Connect, Household Burglar Alarm and Encrypted line Security when communicating via a network.

Department of Defense (DOD)

The D9412GV3/D7412GV3 was granted approval for Department of Defense (DoD) installations in Sensitive Compartmented Information Facilities (SCIF).

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1.0 Introduction

The UL System Chart (*Table 3* on page 14) references the components that are evaluated and listed by UL for compatibility with the control panel. These components meet the basic system requirements for the applicable standard.

The System Wiring Diagrams, Issue A (refer to *Figure 4* to *Figure 9* on pages 15 to 20) show the relationship between the control panel and the accessory components referred to in *Figure 4*.

2.0 Optional Compatible Equipment

UL Listed components not requiring evaluation for electrical compatibility can be used in many applications when installed according to the manufacturer's instructions.

2.1 Burglary Applications

UL Listed burglary alarm sensors not requiring evaluation for electrical compatibility can be used in burglary applications. In some cases, a UL Listed interface module must be used with the sensors. Consult the individual component specification and installation documents to determine suitability.

Test Weekly: UL Standard 1023 requires a weekly test for residential burglary applications.

2.2 Bank Safe and Vault Applications

The UL Listed Model 5110 Bell and Model 4001-42 External Line Balancer (both made by Rothenbuhler) must be used for the bell and balanced line module in bank safe and vault applications. Modify the D8108A Attack-Resistant Enclosure to meet UL Standard 681.

Bell Test at Arming: UL Standard 365 requires a Bell Test at arming for bank safe and vault applications.

2.2.1 Control Panel Enclosure Requirements

UL Standard 681 for Installation and Classification of Mercantile and Bank Burglary Alarm Systems requires foil lining or equivalent protection of the control unit enclosure. The D8108A Attack-Resistant Enclosure does not have a foil lining, but acceptable protection is provided by mounting electronic vibration sensors inside the enclosure. Refer to *Figure 1* on page 6.

Do not use proximity alarms (capacitance) to protect the control panel enclosure.

Install the same electronic vibration sensors in the D8108A that are used to protect the safe or vault. Mount the Sentrol 5402, Potter EVD-S, or Arrowhead S-3810 electronic vibration detection (EVD) system inside the D8108A to meet the UL 681 requirements.

Mount the EVD sensor directly inside the metal cabinet of the D8108A as shown in *Figure 1*.

Do not install the EVD sensor within 6.4 mm (0.25 in.) of the components or traces of the printed circuit assembly.

Install and test the EVD sensor according to the manufacturer's instructions.

2.2.2 Battery Connections

Using a D122 Dual Battery Harness, connect two 12 V batteries in the control panel enclosure. Refer to *Figure 1* for battery placement information.

Use a separate D8108A for the 12 V batteries. When using a D122L Dual Battery Harness, wire the batteries in parallel and connect the harness to Terminals 4 and 5 of the control panel.

Auxiliary power, limited to 300 mA for 72 h, is required for standby.

2.2.3 Bell Requirements

Use the following Rothenbuhler bell and balanced line modules with the control panel:

- UL Listed Model 5110 Bell
- UL Listed Model 4001-42 External Line Balancer

Bell Test at Arming: UL Standard 365 requires a Bell Test at arming for bank safe and vault applications.

2.2.4 System Configuration Requirements

The following configuration and programming options are required for UL Bank Safe and Vault Systems. Refer to the *D9412GV3/D7412GV3 Control Panel Program Entry Guide* (P/N: F01U170807) for programming information.

Safe and Vault Protective Circuits

To test the devices that protect the safe(s) or vault(s) without sounding the bell, specify the devices' points as controlled zones and supervised for trouble conditions. Refer to *Point Index* in the *D9412GV3/D7412GV3 Control Panel Program Entry Guide* (P/N: F01U170807) for more information.

Bell Configuration

UL 365 requires the bell time to be 15 to 30 min. The Rothenbuhler 5110 Bell provides selectable bell time through manipulation of its jumpers. Refer to the manufacturer's installation instructions for more information.

In addition to the jumper settings inside the bell, you can activate the control panel for a bell time of 15 min.

UL 365 requires a Bell Test at arming and must be enabled in control panel programming.

Refer to *Bell Parameters* in the *D9412GV3/D7412GV3 Control Panel Program Entry Guide* (P/N: F01U170807) for more bell time and test programming information.

Bell Test

To enable the bell test feature, you enable an unused area of the control panel. Enable the bell test feature for the unused area **only**. Program Relay B as the area bell relay for the unused area.

All pass codes with authority to arm the safe or vault and also send a Closing Report must be valid in this area. Program the area for a five-second exit delay. Refer to *Figure 1* on page 6 for test connections. To complete the installation for this feature, connect the output to a D133 Relay Module.

2.2.5 Exit Delay

The control panel's programmed maximum exit delay must not exceed 30 sec.

2.2.6 Equipment Requirements

- D9412GV3 or D7412GV3 Control Panel
- Two (2) D126 12 V, 7 Ah batteries
- Two (2) D1218 12 V 18 Ah batteries
- D8132 Battery Charger Module
- Two (2) D8108A Enclosures
- D122 Dual Battery Harness
- D122L Dual Battery Harness
- D133 Relay Module
- EVD System (Listed Safe/Vault)

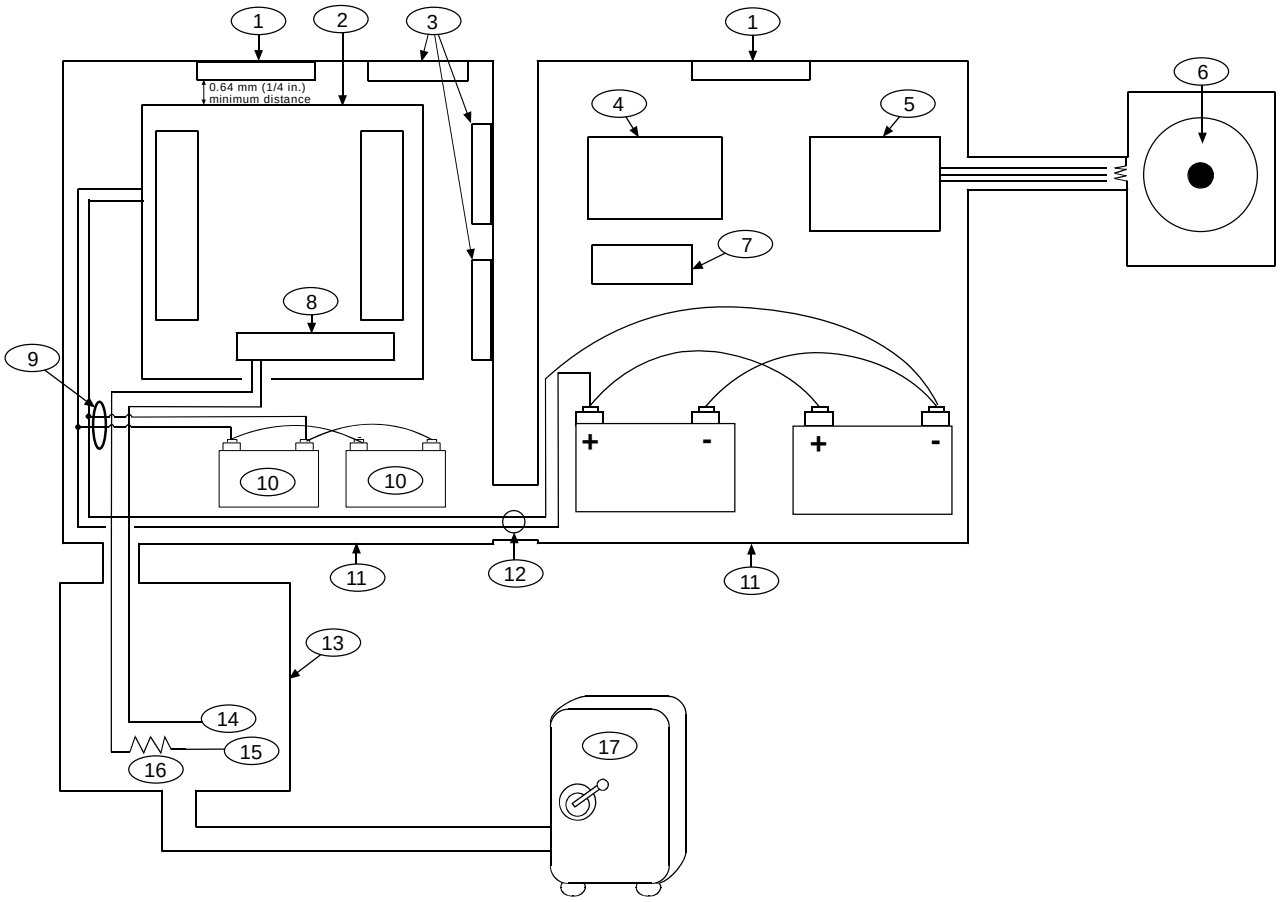
2.2.7 Wiring the Rothenbuhler 5110/4001-42 High Security Bell to the D9412GV3 or D7412GV3 Control Panel

Warning: Wear ear protection when installing and testing the Rothenbuhler High Security Bell.

Sound levels greater than 95 dBA at 3 m (10 ft) can occur.

1. Remove all power from the control panel.
2. Use six-conductor 1.2 mm (18 AWG) shielded stranded wire between the control panel and the 5110 Logic Board (located in the bell enclosure).
3. If you do not have a Silence switch, temporarily install a 1 Ω resistor across TB1-1 and TB1-6 on the 5110 Logic Board. The resistor keeps the 5110's bell silent during the installation and alignment procedures. Also place a temporary wire jumper across the TB1-6 Bell Relay and TB1-7. Refer to *Figure 2* on page 7 for wiring a Silence switch.
4. Mount the D8108A's 4001-42 External Balanced Line Module and wire it to the 5110 Logic Board using two-conductor 0.8 mm (22 AWG) cable.
5. Wire the 4001-42 to the control panel. Refer to *Figure 2* and the Rothenbuhler installation manual.
6. Before supplying AC and DC power to the control panel and bell, ensure you are wearing ear protection. The bell sounds for 2 sec and then silences during power up.

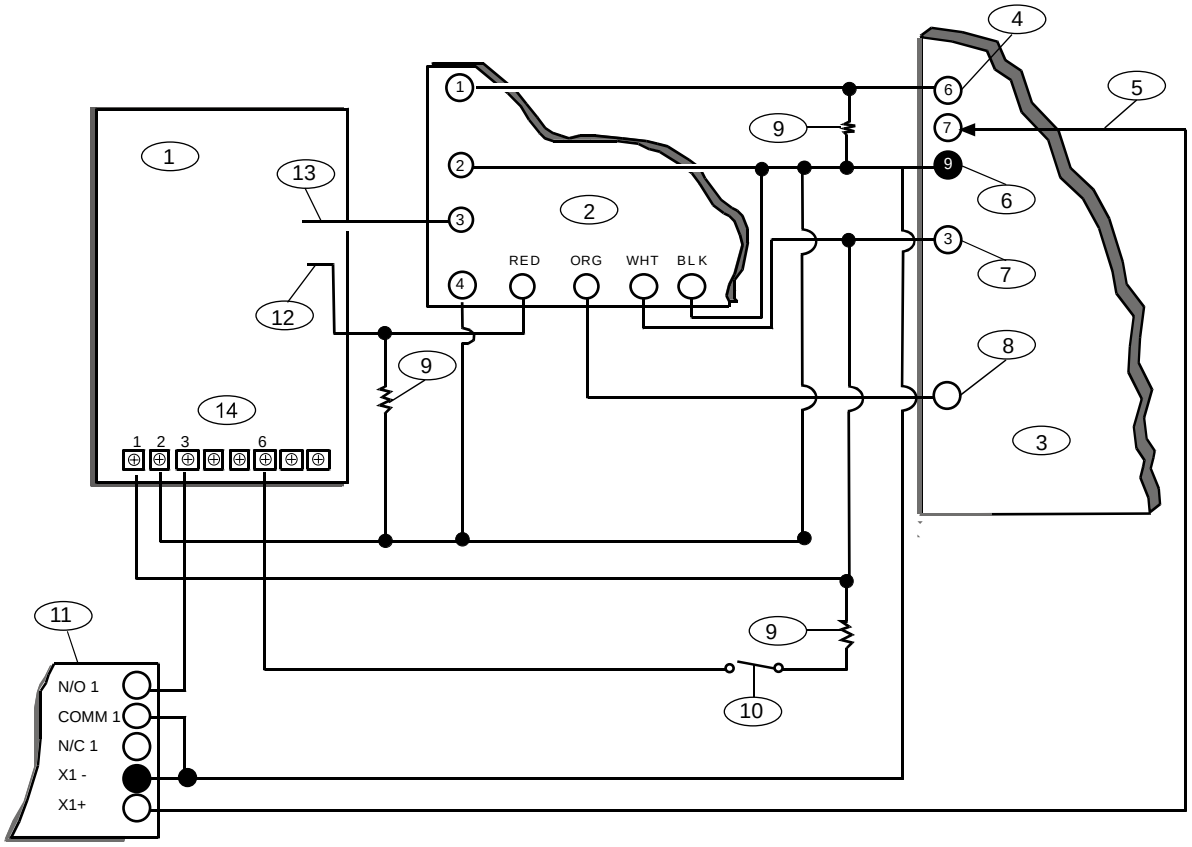
Figure 1: Rothenbuhler 5110/4001-42 High Security Bell Wiring Configuration



1 - Self-contained vibration sensor
2 - Control panel
3 - Accessory modules
4 - High line security module
5 - 4001-42 Balanced Line Module
6 - 5110 Bell
7 - D133 Relay
8 - Zone input
*9 - D122 Battery Harness**
10 - D126 Battery
11 - D8108A Enclosure
*12 - D122L Battery Harness**
13 - Proximity/control unit
14 - Normally open (NO)
15 - Normally closed (NC)
16 - End-of-line (EOL) resistor
17 - Safe

* Use a D113 Battery Lead Supervision Module to supervise the battery connections.

Figure 2: Wiring the Rothenbuhler 5110/4001-42 High Security Bell to the D9412GV3 or D7412GV3 Control Panel



1 - 5110 Logic Board
2 - 4001-42 External Line Balancing Module
3 - D9412GV3 or D7412GV3 Control Panel
4 - Alarm output
5 - Alternate alarm
6 - Common
7 - +12 VDC
*8 - Alarm zone input**
9 - 10 kΩ resistor
10 - Optional Silence switch
11 - D133 Relay Module
12 - BBL In 4
13 - BBL Out 5
14 - Terminal TB1

* *Use Terminal 11, 13, 14, 17, 19, 20, or 22. (Select only one.)*

2.3 Fire Applications

UL Listed fire initiating devices not requiring electrical compatibility evaluation can be used in any application. For example, the four-wire smoke detectors, heat detectors, waterflow switches, and manual pull stations are suitable fire initiating devices. Consult the individual component specification and installation documents to determine suitability.

UL requires any device powered from a power output to be supervised.

UL requires that power outputs are not shared between fire and non-fire devices unless all devices are in conduit within 20 ft and are in the same room.

The expansion bus can be shared between fire and non-fire devices where the POPIT module is providing data isolation between the input and the bus connections.

2.3.1 Four-Wire Smoke Detectors

When using four-wire smoke detectors, install a power supervision device according to the manufacturer's instructions. You can connect any number of four-wire smoke detectors to the GV3 Series Control Panels (subject to available auxiliary power).

The Reset Sensor command is available from the keypads when the Reset Sensor is enabled. Connect the smoke detectors to a suitable interface such as the D125B or D129, or to the D9127 Modules when used with a D9412GV3 or D7412GV3 Control Panel. Smoke detectors can also be connected to the on-board points to meet UL and NFPA requirements.

When using four-wire smoke detectors, install a power supervision unit according to the manufacturer's instructions. Refer to *Section 2.3.5 Other Devices*.

2.3.2 Two-Wire Smoke Detectors

Two-wire smoke detectors connect to the control panel only through the D125B Powered Loop Interface. Two-wire detectors must be evaluated for electrical compatibility, and be UL Listed for use with the control panel. Refer to *Table 1* on page 9 for the two-wire smoke detectors that are UL Listed for compatibility and the maximum number of detectors that can be connected to each loop of the D125B Powered Loop Interface Module.

You can also consult the smoke detector manufacturer to determine if a particular smoke detector is UL Listed for use with the D9412GV3 and D7412GV3 Control Panels. The Reset Sensor command is available from the keypads when Reset Sensor is enabled.

2.3.3 Two-Wire Smoke Detector Specifications

- Voltage Range: 8.0 VDC to 14 VDC
- UL Compatibility Identifier: Type A (for control panel, detector, and base)

The control panel does not support multiple detectors in alarm. The control panel is intended to handle detectors with optional features. Detectors from different manufacturers cannot be mixed on the same circuit.

2.3.4 NFPA Style A (Class "B") Circuit

Loops A and B on the D125B Module are NFPA Style A (Class "B") initiating circuits suitable for connecting any fire alarm initiating device, including two-wire and four-wire smoke detectors. To connect initiating devices to on-board points (1 through 8) on the D9412GV3 or D7412GV3 Control Panel:

- Use a D125B Powered Loop Interface Module with two-wire initiating devices.
- Use a D129 Dual Class "A" (NFPA Style D) Initiating Circuit Module with any type of initiating device, **except** a two-wire smoke detector.

Use the following guidelines when connecting fire alarm initiating devices to off-board points:

- Do not connect two-wire smoke detectors to POPITs or MUX bus inputs.
- Use the D9127U or D9127T POPIT Modules to connect four-wire smoke detectors when using a D9412GV3 or D7412GV3.

2.3.5 Other Devices

Use a D130 Relay Module, D8129 OctoRelay, or Switched Aux (Terminal 8) to provide reset capability to other initiating devices such as:

- D125B Powered Loop Interface Module (2-wire smoke detector module)
- D129 Dual "Class A" Initiation Circuit Module (4-wire smoke detector)
- D9127T/U POPITs
- On-board points

Install devices according to the manufacturer's instructions. Refer to *Off-Board Relays* in the *D9412GV3/D7412GV3 Operation and Installation Guide* (P/N: F01U143070).

For battery calculations, refer to *Table 5* on page 23 and *Section 8.0 NFPA 72 Fire Alarm Applications* on page 24.

Test Weekly: Perform a Fire Test weekly. Both the AC power and battery are tested according to UL 864.

2.3.6 UL Listed Two-Wire Smoke Detectors Compatible with the D125B

A D125B Powered Loop Interface Module is required to connect smoke detectors to the on-board points (1-8).

Table 1: UL Listed Two-Wire Smoke Detectors Compatible with the D125B

Manufacturer	Detector Model	Base Model	Maximum Number of Detectors per Loop	
			D125B	
			12 VDC	24 VDC[1]
Bosch Security Systems, Inc.	D262	D260	25	N/A
	D263	N/A	10	10
	D263TH	N/A	10	10
	D263S	N/A	10	10
	D263THS	N/A	10	10
	D281	D280	N/A	80
	D282	D280	N/A	80
	D283	D280	N/A	80
	D285	D287, D288	10	10
	D285DH	D340	10[2]	10
	D285TH	D287, D288	10	10
	D340	N/A	10	10
	D286	D287, D288	10	10
	D603	D287, D288	10	10
	D604	D287, D288	10	10
	D605	D287, D288	10	10
	DS230	MB2W, MB2WL	10	10
	DS230F	MB2W, MB2WL	10	10
	DS233F	MB2W, MB2WL	10	10
	DS250	MB2W, MB2WL	10	10
	DS250TH	MB2W, MB2WL	10	10
	DS260	MB2W, MB2WL	10	10
	DS282	N/A	10	10
	DS282TH	N/A	10	10
	DS282S	N/A	10	10
	DS282THS	N/A	10	10
	DS290	N/A	10	10
	F220P	F220-B6	10	10
	F220PTH	F220-B6	10	10
	F220PC	F220-B6	10	10
	F220PTHC	F220-B6	10	10
	F220-135	F220-B6	10	10
	F220-135F	F220-B6	10	10
	F220-190F	F220-B6	10	10

[1] Requires a UL1481 regulated power-limited Power Supply.

[2] Remote Test Station works only when used at 24 VDC.

Table 1: UL Listed Two-Wire Smoke Detectors Compatible with the D125B (Continued)

Manufacturer	Detector Model	Base Model	Maximum Number of Detectors per Loop	
			D125B	
			12 VDC	24 VDC[1]
Detection Systems	DS200	MB200-2W	20	60
	DS200HD	MB200-2W	20	60
	DS230	MB2W, MB2WL	10	10
	DS230F	MB2W, MB2WL	10	10
	DS233F	MB2W, MB2WL	10	10
	DS250	MB2W, MB2WL	10	10
	DS250DH	DS290	10[2]	10
	DS250TH	MB2W, MB2WL	10	10
	DS260	MB2W, MB2WL	10	10
	DS282	N/A	10	10
	DS282TH	N/A	10	10
	DS282S	N/A	10	10
	DS282THS	N/A	10	10
	DS290	N/A	10	10
Radionics	D262	D260	10	N/A
	D263	N/A	25	10
	D263TH	N/A	10	10
	D263S	N/A	10	10
	D263THS	N/A	10	10
	D281	D280	10	80
	D282	D280	N/A	80
	D283	D280	N/A	80
	D285	D287, D288	N/A	10
	D285DH	D340	10[2]	10
	D285TH	D287, D288	10	10
	D340	N/A	10	10
	D286	D287, D288	10	10
	D603	D287, D288	10	10
	D604	D287, D288	10	10
	D605	D287, D288	10	10
Honeywell	TC805C-1000	14506587 and 14506587-004	10	40
	TC804C-1001	14506587 and 14506587-004	10	40
	TC804C-1019	14506587 and 14506587-004	10	40
System Sensor	1499	N/A	10	40
	2400	N/A	10	40
	2400TH	N/A	10	40
	1451DH	DH400	10	40

[1] Requires a UL1481 regulated power-limited Power Supply.

[2] Remote Test Station works only when used at 24 VDC.

2.3.7 UL Listed Synchronization (Sync) Modules and Strobes Compatible with the D9412GV3/D7412GV3

To be UL 864 compliant, you must use only these models of synchronization modules and strobes with the D9412GV3 and D7412GV3 Control Panels.

Table 2: Synchronization Module and Strobe Compatibility

Manufacturer	Synchronization Module Model	Strobe Model	Input Power Source	Candelas (cd)	Number of Strobes
System Sensor	MDL	S1224MC	Control panel (12 VDC)	15 cd	8
			External power supply (12 VDC)*	15 cd	23
			External power supply (24 VDC)*	15 cd	50
				110 cd	28
Wheelock	DSM-12/24	RSS-121575-FW	Control panel (12 VDC)*	15 cd	4
			External power supply (12 VDC)*	12 cd	11
		RSS-241575-FW	External power supply (24 VDC)*	75 cd	33

* Requires a UL1481 regulated power-limited Power Supply.

2.4 Enclosures

Bosch Security Systems offers three optional enclosures for the control panel. *Sections 2.4.1 D8103 Enclosure, 2.4.2 D8108A Enclosure*, and *2.4.3 D8109 Red Fire Enclosure* describe the three options.

2.4.1 D8103 Enclosure

The D8103 is suitable for residential fire and burglary installations and commercial burglary applications that do not require attack resistance or the approval by Factory Mutual (FM) or New York City – Materials and Equipment Acceptance (NYC-MEA). Refer to *Table 3* on page 14 for acceptable applications.

2.4.2 D8108A Enclosure

The D8108A is attack resistant and intended primarily for UL commercial burglar alarm and mercantile safe and vault applications requiring a local bell. This enclosure can be used in any burglar or fire alarm application where the D8109 Enclosure is suitable. The D8108A, with some modification, can be used for bank safe and vault applications as described in *Section 2.2 Bank Safe and Vault Applications* on page 4. UL lists the D8108A for all commercial fire alarm applications. It is approved by FM, CSFM, and the NYC-MEA.

2.4.3 D8109 Red Fire Enclosure

Generally, the D8109 is used for fire alarm applications. UL lists the D8109 for all commercial fire alarm applications. It is approved by FM, CSFM, and the NYC-MEA.

All references to NFPA and related requirements are based on compliance with the NFPA 72, National Fire Alarm Code. Because installation specifications are generally based on a specific edition of a standard that was legally adopted by the authority having jurisdiction (AHJ), consult with the appropriate AHJ for confirmation.

3.0 UL/NFPA Compliant Installations

3.1 Required Components

To install a D9412GV3 or D7412GV3 that is UL and NFPA compliant, the following items must be included:

- D8109 Red Fire Enclosure
- D192G Bell Supervision Module
- D928 Dual Phone Line Module
- D8004 Transformer Enclosure
- Ground Fault Detect enabled on the control panel

Refer to *Table 3* on page 14 for specific application installation requirements.

3.2 Installing Combination Fire and Intrusion Alarm Systems

When installing a combination fire and intrusion alarm system, you must adhere to the following requirements in order to comply with Sections 56.1, 56.2, and 56.4 of the 9th Edition of UL864.

3.2.1 SDI Bus Devices

Keypads (Command Centers)

Keypads used exclusively for intrusion system operation are **not allowed**. Keypads connected to the D9412GV3 and D7412GV3 Control Panels must include the scope of all fire-related points and must be assigned to include Area 1 in the scope.

Interface Modules

- Connect the DX4020 Network Interface Module and the D9210B Access Control Interface Module to the SDI bus only if the interface module is located within the control panel enclosure or in a separate enclosure in the same room within 6.1 m (20 ft) of the main control panel.
- Route all SDI bus wiring in EMT (electrical metallic tubing) conduit.

3.2.2 Zonex Bus Devices

D8125 POPEX Modules

The expansion bus can be shared between fire and non-fire devices where the POPIT module provides data isolation between the input and the bus connections.

D8125MUX Multiplex Interface Modules

- When connecting a D8125MUX module to Zonex Bus 1 or 2, all multiplex modules should supervise only all fire or all non-fire devices.
- **Do not connect** fire and non-fire devices to the same D8125MUX module.
- Using Zonex Bus 1 exclusively for fire devices and Zonex Bus 2 exclusively for non-fire devices is acceptable.

D8128D OctoPOPIT Modules

- If any fire devices are connected to Zonex Bus 1 or Zonex Bus 2 through the D8125 POPEX Module or D8125MUX Module, all devices connected to all D8128D OctoPOPIT Modules must also be fire points.
- **Do not connect** fire and non-fire devices to the same D8128D OctoPOPIT Module.
- Using Zonex Bus 1 exclusively for fire devices and Zonex Bus 2 exclusively for non-fire devices is acceptable.
- Install all D8128D OctoPOPIT Modules used for fire devices within the control panel enclosure or in a separate enclosure in the same room within 6.1 m (20 ft) of the main control panel.
- Route all Zonex bus wiring in EMT (electrical metallic tubing) conduit.

D8129 OctoRelay Modules

- If any fire devices are connected to Zonex Bus 1 (or Zonex Bus 2), you must use all D8129 OctoRelay Modules connected to Zonex Bus 1 (or Zonex Bus 2) only for fire applications.
- Install all D8129 OctoRelay Modules used for fire devices within the control panel enclosure or in a separate enclosure in the same room within 6.1 m (20 ft) of the main control panel.
- Route all Zonex bus wiring in EMT (electrical metallic tubing) conduit.

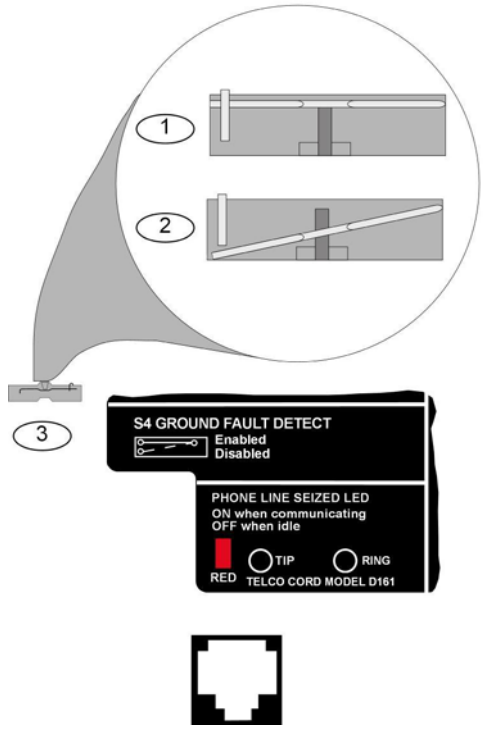
Auxiliary (AUX) Power Terminals

If any fire device is connected to an auxiliary (AUX) power terminal on the control panel, **do not connect** any non-fire device to the same AUX power terminal. For example, if a four-wire smoke detector is connected to Terminal 8 (SWITCHED AUX), no other non-fire devices can be connected to the same terminal.

4.0 Ground Fault Detect Enable

To enable ground fault detection, lock (close) the S4 GROUND FAULT DETECT pin on the control panel as shown in *Figure 3*.

Figure 3: Ground Fault Detection



1 - With S4 closed, control panel detects ground faults.

2 - With S4 open, control panel does not detect ground faults.

3 - S4, Ground fault detect enable.

5.0 Compatible UL Listed Components

In *Table 3*, the text in the columns and rows has the following meanings:

No = Not acceptable for this application

Req. = Required for this application

Opt. = Optional for this application.

[Empty box] = Not used for this application

Table 3: UL Listed Components Compatible with the D9412GV3 and D7412GV3 Control Panels

	Household Burglary	Household Fire	Household Fire/ Burglary Combined	Central Station Burglary	Police Connected Burglary	Local Burglary	Local Fire/Burglary Combined	Local Fire	Local and Central Station Fire Combined	Local and Central Station Fire/ Burglary	Central Station Fire/ Burglary Combined	Central Station Fire	Electrically Actuated Transmitter
Minimum Hours of Standby Battery	4	24 + 4 min alarm		4	4	4	24 + 5 min alarm						
D8103/D8109 Enclosure	Opt.	Opt.	Opt.	Opt.	No	Opt.	No	Opt.	Opt.	No	No	Opt.	No
D8108A Enclosure	Opt.	Opt.	Opt.	Opt.	Req.	Opt..	Req.	Opt.	Opt.	Req.	Req.	Opt.	Opt.
D125B Class B, Style A Powered Loop Interface*	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D129 Class A, Style D Initiating Module*	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D928 Dual Phone Line Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Required if using two telephone lines for communication.						
D192G Class "B", Style Y Bell Circuit Supervision	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Req.	Req.	Req.	Req.	Req.	Req.	
D268/D269H Independent Zone Control	Optional. **Only** connect to Zones 1 to 8.						No	No	No	No	No	No	No
DS7432 Eight Input Remote Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
DS7457iF Single Zone Input Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
DS7560i Dual Zone Input Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
DS7461i Single Zone Input Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
DS7465i Input/Output Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
D130 Relay Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
D1255 and D1260 Keypads	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	No	No	No	No	No	No	No
D1256 Command Center and D1257 Annunciator	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	No	No	No	No	No	No	No
D1255B and D1260B Keypads	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	No	No	No	No	No	No	No
D1255RB, D1256RB, D1257RB	No	Opt.	Opt.	No	No	No	Req.	Req.	Req.	Req.	Req.	Req.	
D1640 Transformer	Required for **all** applications.												
D8004 Transformer Enclosure	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Req.	Req.	Req.	Req.	Req.	Req.	
D8125 Class B, Style 4.0 POPEX Module	Required for the D9127T/U POPITs.												
D8125MUX Class B, Style 4.0	Required for MUX devices. Refer to *Section 7.1 D8125MUX* on page 21.												
D9127T/U Class B, Style A POPIT Modules	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
D8128D OctoPOPIT	Opt.	No	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D8129 OctoRelay	Optional. For remote annunciation of system functions.												
D8130 Release Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D8132 Battery Charger	Refer to *Table 5* on page 23.						No	No	No	No	No	No	No
D9131A Parallel Printer Interface	Opt.	No	No	Opt.	Opt.	Opt.	No	No	No	No	No	No	Opt.
D9210B Access Control Interface	No	No	No	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	No

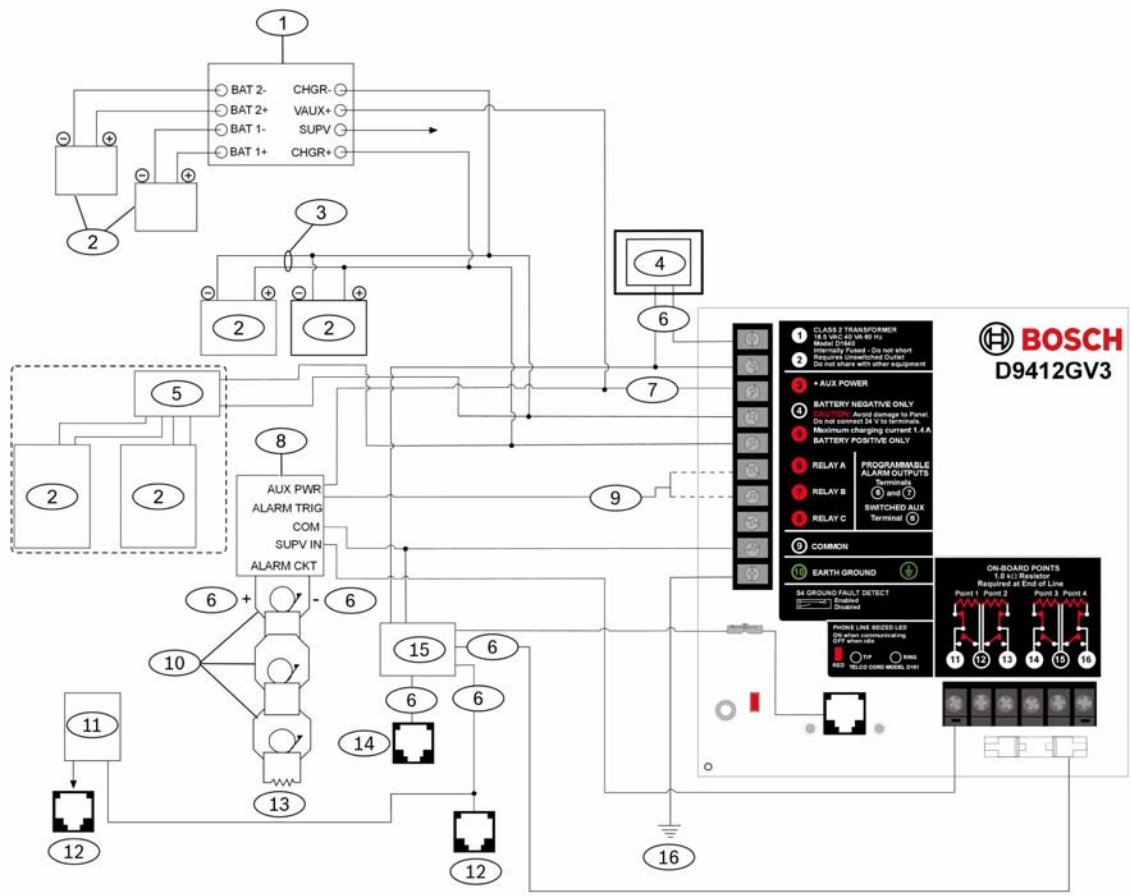
* The D125B is required to connect two-wire fire alarm initiating devices. The D125B provides two powered loops for connecting listed two-wire smoke detectors. The D129 provides two non-powered Class "A" initiating circuits.

6.0 System Wiring Diagrams, Issue A

The System Wiring Diagrams, Issue A (refer to *Figure 4* to *Figure 9* on pages 15 to 20) show the relationship between the control panel and the accessory components referred to in *Table 3* on page 14).

6.1 D9412GV3 Wiring Diagrams

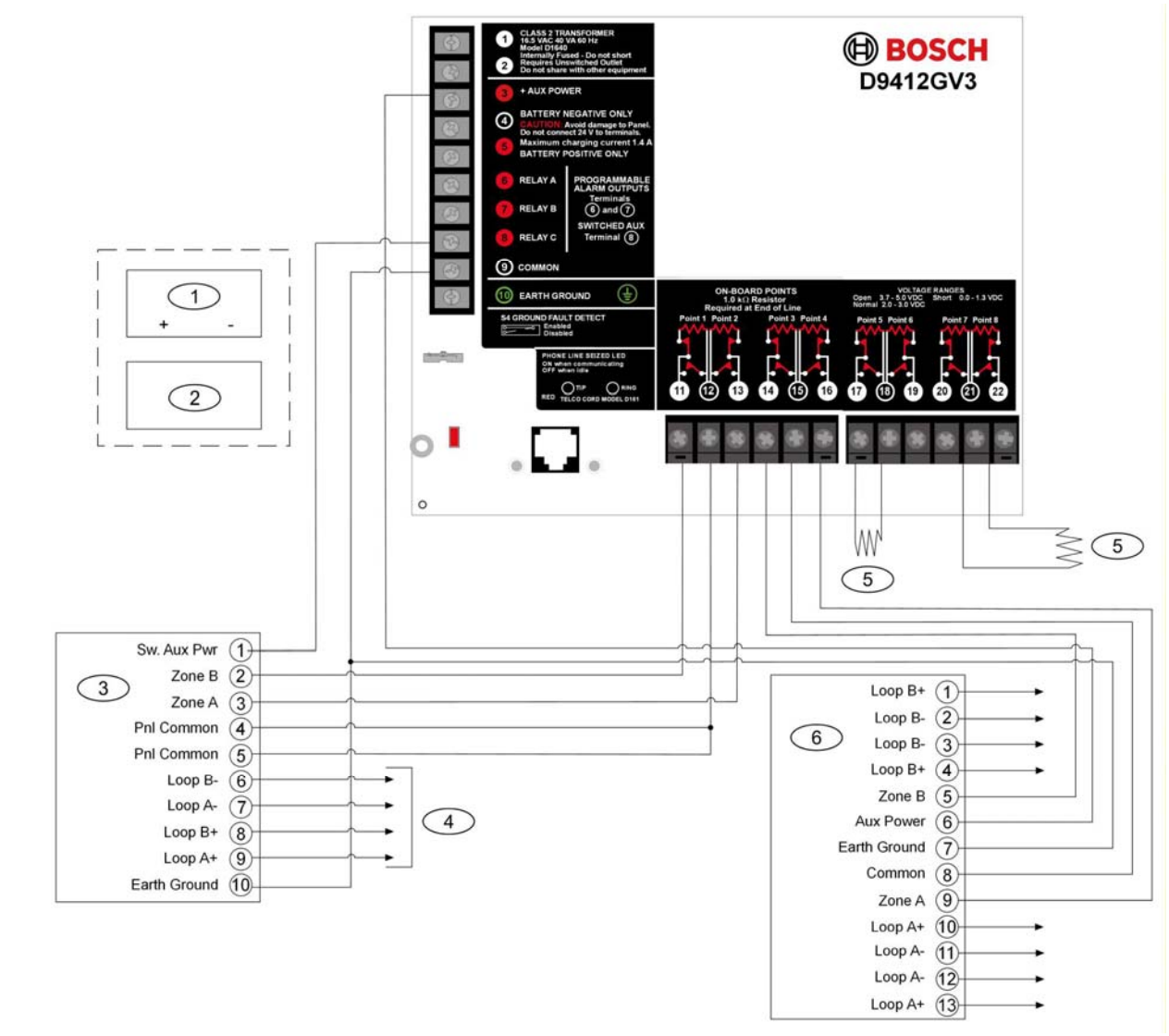
Figure 4: D9412GV3, Power Supply Side System Wiring



1 - *If required by local AHJ, connect D113 Battery Lead Supervision Module.*
2 *Batteries*
3 - *D122 Dual Battery Harness, as required*
4- *D1640 Transformer and D8004 Transformer Enclosure required for NFPA Applications*
5 - *D8132 Dual Battery Charger with two batteries (Batteries are not supervised.)*
6 - *Power limited, supervised*
7 - *Power limited*
8 - *D192G Bell Supervision Module*
9 - *To Relay A or Relay B*
10 - *Listed Audible Signaling Devices rated at 12.0 VDC nominal (do not use vibrating type horns)*
11 - *C900V2(optional)*
12 - *RJ31X, secondary phone line*
13 - *560 Ω, 2 W EOL Resistor (P/N: 15-03130-005)*
14 - *RJ31X, primary phone line*
15 - *D928*
16 - *To earth ground*

All external connections except Terminal 5 (battery positive) are power limited.

Figure 5: D9412GV3, Input Points and Peripheral Devices System Wiring



1 - *(Optional): For 24 V applications use a UL 1481 Listed Regulated Power Limited 24 VDC with a D130 Relay Module. Refer to the* D130 Installation Instructions *(P/N: F01U072455) for correct wiring requirements.*

2 - *D130 Relay Module*

3 - *D125B Powered Loop Interface Module*

4 - *To UL Listed two-wire smoke detectors. Refer to Section* 2.3.2 Two-Wire Smoke Detectors on page *8 for a listing of compatible two-wire smoke detectors.*

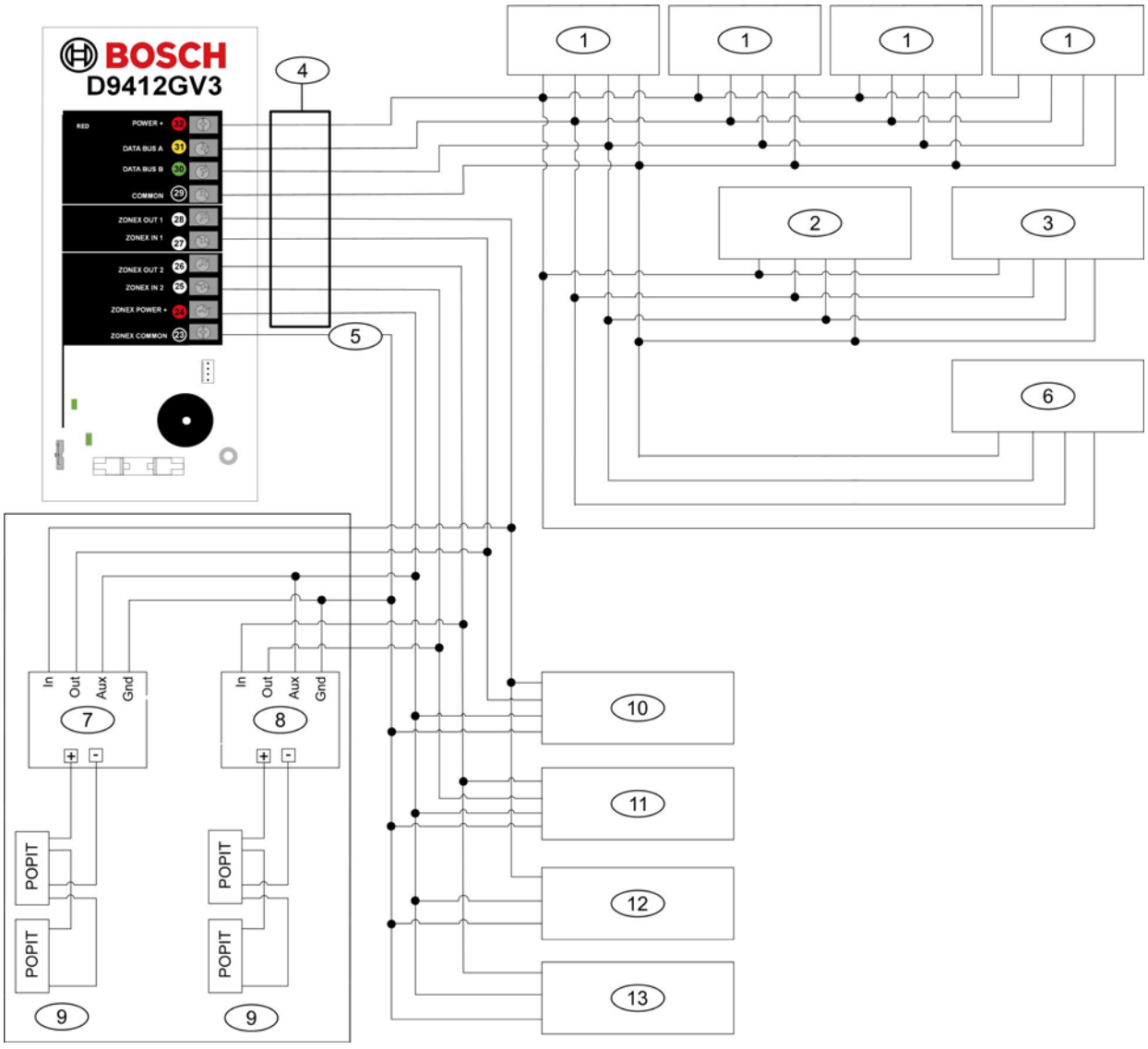
5 - *P105BL1 1 kΩ EOL resistor (P/N: F01U033966): For typical burglar alarm applications.*

6 - *D129 Dual Class A Initiation Circuit Module: Provides optional Waterflow Alarm Retard feature. Not suitable for two-wire smoke detectors.*

Use zero retard except for waterflow devices.

All external connections except Terminal 5 (battery positive) are power limited.

Figure 6: D9412GV3, SDI Devices System Wiring



1 - Up to 16 supervised D1255 (all models), D1255RB, D1256, D1256RB, D1257RB, D1257 Fire Annunciators, or up to 8 supervised D1260 (all models) keypads

2 - Up to 8 D9210B Access Control Interface Modules

3 - Up to 3 supervised 9131A Parallel Printer Interface Modules, or other SDI devices

4 - Power limited, supervised

5 - Power limited

6 - DX4020 Network Interface Module or other SDI device

7 - D8125 POPEX No.1

8 - D8125 POPEX No. 2

9- Up to 119 D9127U/T POPITs

*10 - Zonex 1: 15 D8128Ds maximum**

*11 - Zonex 2: 15 D8128Ds maximum**

*12 - Zonex 1: Up to 8 D8129s maximum**

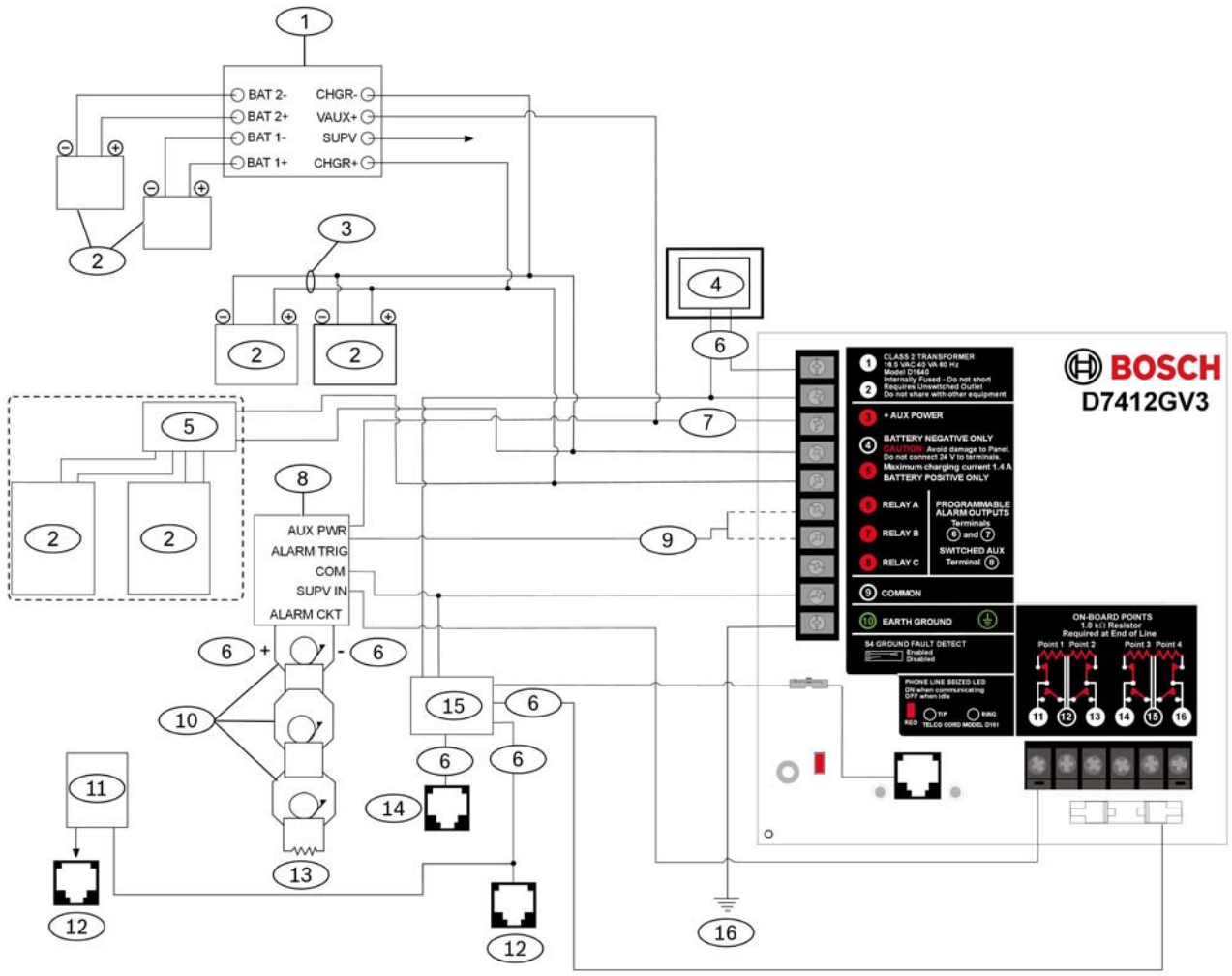
*13 - Zonex 2: Up to 8 D8129s maximum**

* The number of D8129 OctoRelays that can be connected to each zonex terminal on the control panel is limited by the number of D8128D OctoPOPITs connected to the same terminal. Refer to the *D8128D Installation Guide* (P/N: F01U070537) or the *D8129 Operation and Installation Guide* (P/N: F01U036302) for specific information.

All external connections except Terminal 5 (battery position) are power limited.

6.2 D7412GV3 Wiring Diagrams

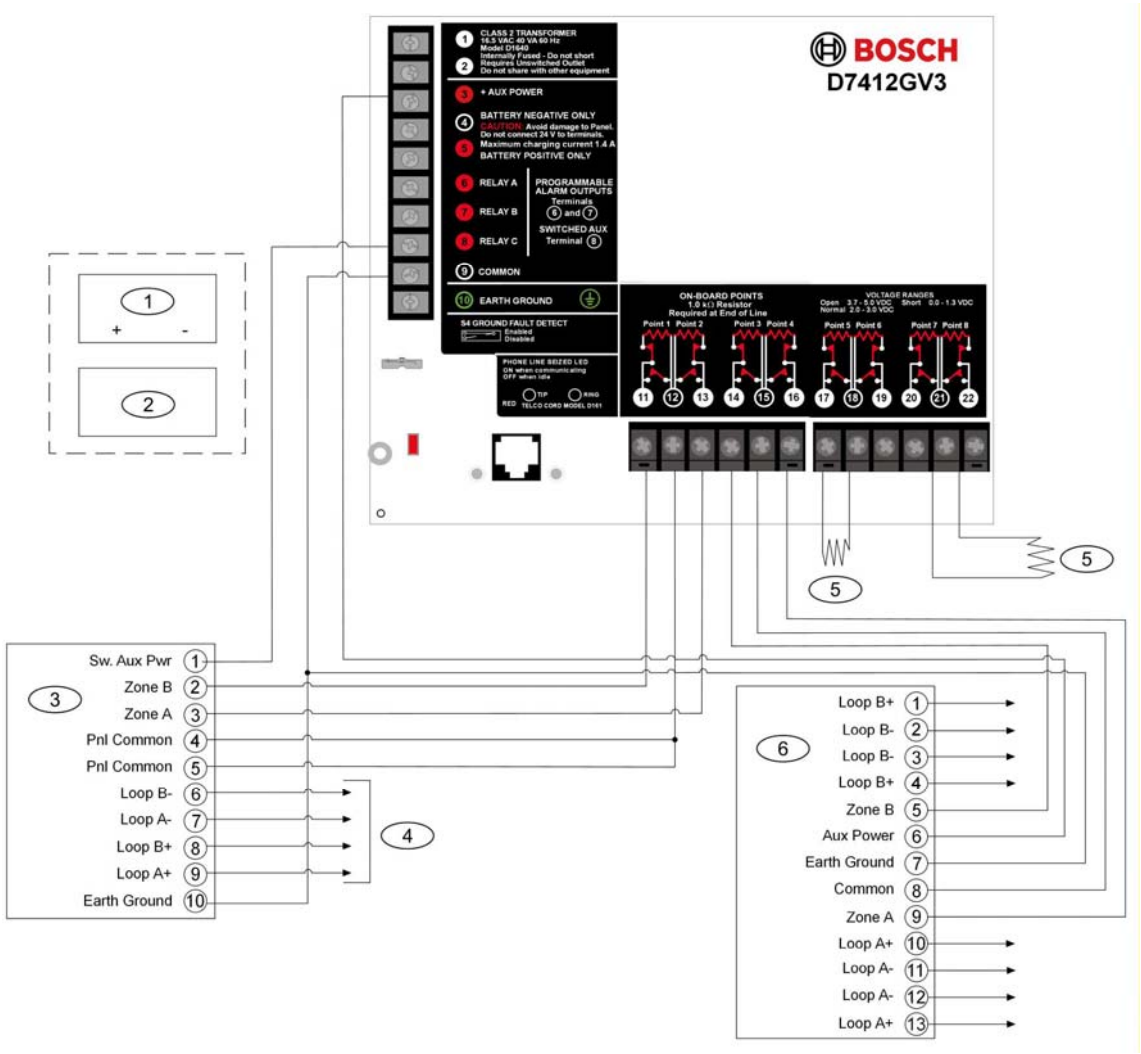
Figure 7: D7412GV3, Power Supply Side System Wiring



1 If required by local AHJ, connect D113 Battery Lead Supervision Module.	*9 - To Relay A or Relay B*
2 Batteries	*10 - Listed Audible Signaling Devices rated at 12.0 VDC nominal (do not use vibrating type horns)*
3 - D122 Dual Battery Harness, as required	*11 - C900V2(optional)*
4- D1640 Transformer and D8004 Transformer Enclosure required for NFPA Applications	*12 - RJ31X, secondary phone line*
5 - D8132 Dual Battery Charger with two batteries (Batteries are not supervised.)	*13 - 560 Ω, 2 W EOL Resistor (P/N: 15-03130-005)*
6 - Power limited, supervised	*14 - RJ31X, primary phone line*
7 - Power limited	*15 - D928*
8 - D192G Bell Supervision Module	*16 - To earth ground*

All external connections except Terminal 5 (battery positive) are power limited.

Figure 8: D7412GV3, Input Points and Peripheral Devices System Wiring



1 - (Optional): For 24 V applications use a UL 1481 Listed Regulated Power Limited 24 VDC power supply with a D130 Relay Module. Refer to the D130 Installation Instructions *(P/N: F01U072455) for correct wiring requirements.*

2 - D130 Relay Module

3 - D125B Powered Loop Interface Module

4 - To UL Listed 2-wire smoke detectors. Refer to Two-Wire Smoke Detectors *in the* D9412GV3/ D7412GV3 Approved Applications Compliance Guide *(P/N: F01U143069) for a listing of compatible two-wire smoke detectors.*

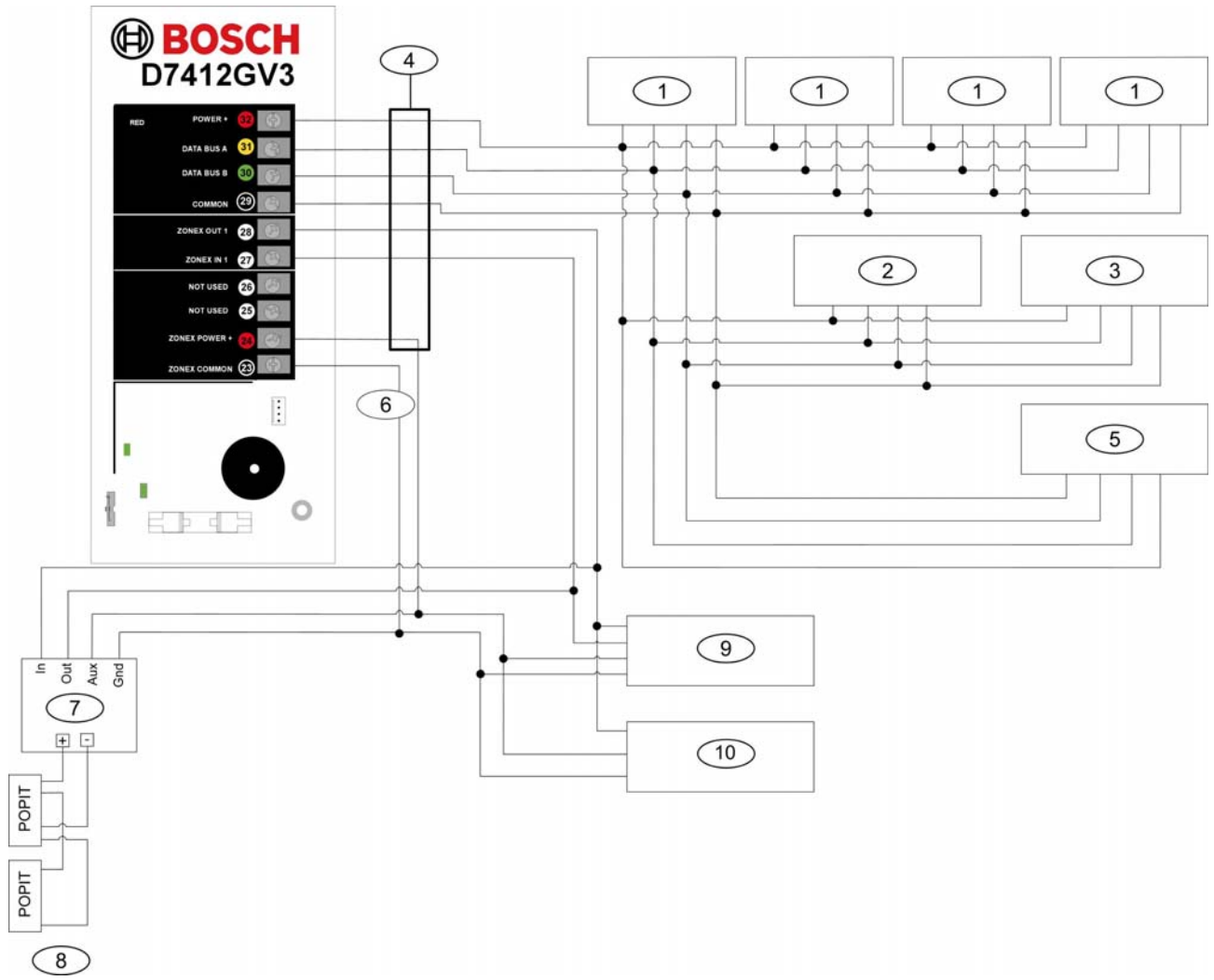
5 - P105BL1 1kΩ EOL resistor (P/N: F01U033966): For typical burglar alarm applications.

6 - D129 Dual Class A Initiation Circuit Module: Provides optional Waterflow Alarm Retard feature. Not suitable for two-wire smoke detectors.

Use zero retard except for waterflow devices.

All external connections except Terminal 5 (battery positive) are power limited.

Figure 9: D7412GV3, SDI Devices System Wiring



1 - Up to 16 supervised D1255 (all models), D1255RB, D1256, D1256RB, D1257RB, D1257 Fire Annunciators, or up to 8 supervised D1260 (all models) keypads

2 - Up to 2 D9210B Access Control Interface Modules

3 - Up to 1 supervised 9131A Parallel Printer Interface Module, or other SDI device

4 - Power limited, supervised

5 DX4020 Network Interface Module or other SDI device

6 - Power limited

7 - D8125 POPEX No. 1

8 - Up to 67 D9127U/T POPITs

*9 - Zonex 1: Up to 9 D8128Ds maximum**

*10 - Zonex 1: Up to 8 D8129s maximum**

* The number of D8129 OctoRelays that can be connected to each zonex terminal on the control panel is limited by the number of D8128D OctoPOPITs connected to the same terminal. Refer to the *D8128D Installation Guide* (P/N: F01U070537) or the *D8129 Operation and Installation Guide* (P/N: F01U036302) for specific information.

All external connections except Terminal 5 (battery positive) are power limited.

7.0 Current Ratings Charts

7.1 D8125MUX

Complete the chart in *Table 4* to determine the maximum currents for the D8125MUX and its accessories. Transfer the total figures to *Table 5* on page 23.

The maximum current draw for each MUX Bus is 75 mA.

Table 4: Current Rating Chart for D8125MUX

		AC Power Off Maximum Current (mA)			In Alarm Maximum Current (mA)		
Accessory Module	**Qty Used**	**Each Unit**	**Qty**	**Total System**	**Each Unit**	**Qty**	**Total System**
DS7432	_______	10	x Qty =	________	10	x Qty =	________
DS7457i	_______	0.35	x Qty =	________	0.35	x Qty =	________
DS7460i	_______	1	x Qty =	________	1	x Qty =	________
DS7465i	_______	1	x Qty =	________	1	x Qty =	________
Ratings of other devices on the MUX Buses that are not shown above*:							
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
______________	________	_______	x Qty =	________	________	x Qty =	________
		Column A Total =		________	**Column B Total =**		________
* Refer to the device's installation guide for current draw values.							

7.2 Standby Battery Calculations

Table 5: Current Rating Chart for Standby Battery Calculations

		A AC Power On Normal Current (mA)			B AC Power Off Minimum Current (mA)			C In Alarm Maximum Current (mA)		
Model Number	**Qty Used**	**Each Unit**[1]	**Qty**	**Total**	**Each Unit**[1]	**Qty**	**Total**	**Each Unit**[1]	**Qty**	**Total**
D9412GV3/ D7412GV3	_____	225	x 1	= 225	225	x 1	= 225	300	x 1	= 300
D125B	_____	25	x Qty	= _____	25	x Qty	= _____	168	x Qty	= _____
D127	_____	5	x Qty	= _____	5	x Qty	= _____	55	x Qty	= _____
D129	_____	23	x Qty	= _____	23	x Qty	= _____	25	x Qty	= _____
D185	_____	245	x Qty	= _____	245	x Qty	= _____	300	x Qty	= _____
D192G	_____	35	x Qty	= _____	35	x Qty	= _____	100	x Qty	= _____
D1255/D1255B	_____	104	x Qty	= _____	106	x Qty	= _____	206	x Qty	= _____
D1256/D1257	_____	104	x Qty	= _____	106	x Qty	= _____	206	x Qty	= _____
D1255RB	_____	104	x Qty	= _____	106	x Qty	= _____	225	x Qty	= _____
D1256RB	_____	104	x Qty	= _____	106	x Qty	= _____	225	x Qty	= _____
D1257RB	_____	104	x Qty	= _____	106	x Qty	= _____	225	x Qty	= _____
D1260/D1260B	_____	140	x Qty	= _____	140	x Qty	= _____	250	x Qty	= _____
D720	_____	20	x Qty	= _____	20	x Qty	= _____	100	x Qty	= _____
D8125	_____	60	x Qty	= _____	60	x Qty	= _____	60	x Qty	= _____
D8125MUX[1]	_____			= _____			= _____			= _____
D8128D	_____	25	x Qty	= _____	25	x Qty	= _____	50	x Qty	= _____
D8129	_____	20	x Qty	= _____	20	x Qty	= _____	Refer to footnote[2]		= _____
D8130	_____	7	x Qty	= _____	7	x Qty	= _____	60	x Qty	= _____
D9127T/U	_____	0.8	x Qty	= _____	0.8	x Qty	= _____	0.8	x Qty	= _____
D9131A	_____	21	x Qty	= _____	21	x Qty	= _____	23	x Qty	= _____
D9210B	_____	110	x Qty	= _____	110	x Qty	= _____	110[3]	x Qty	= _____
D928	_____	20	x Qty	= _____	20	x Qty	= _____	100	x Qty	= _____
DX4010i[4]	_____	50	x Qty	= _____	50	x Qty	= _____	55	x Qty	= _____
DX4020i	_____	80	x Qty	= _____	80	x Qty	= _____	84	x Qty	= _____
ITS-DX4020-G	_____	50	x Qty	= _____	50	x Qty	= _____	200	x Qty	= _____
Ratings of other devices in the system that are not shown above:										
____	_____	_____	x Qty	= _____	_____	x Qty	= _____	____	x Qty	= _____
____	_____	_____	x Qty	= _____	_____	x Qty	= _____	____	x Qty	= _____
____	_____	_____	x Qty	= _____	_____	x Qty	= _____	____	x Qty	= _____
____	_____	_____	x Qty	= _____	_____	x Qty	= _____	____	x Qty	= _____
____	_____	_____	x Qty	= _____	_____	x Qty	= _____	____	x Qty	= _____
			Total A	= _____		**Total B**	= _____		**Total C**	= _____

[1] Refer to *Table 4* on page 22 to determine maximum currents for the D8125MUX and its accessories.

[2] The **In Alarm** calculation for the D8129 is: 20 x Qty + (16.25 x number of relays)

[3] Use 110 mA + reader current. **Do not exceed 260 mA**.

[4] UL requires that the DX4010i be used for programming only.

8.0 NFPA 72 Fire Alarm Applications

8.1 Household Burglary and Commercial Burglary

Four hours of standby battery capacity are required.

8.2 Bank Safe and Vault

Because of changing regulations, verify the necessary time with your local authority having jurisdiction (AHJ).

UL 365 requires 72 h of standby battery capacity. Limit the auxiliary power current for all devices, including keypads, to 300 mA or less to meet this requirement.

Table 6: Standby Battery Requirements

Type	Required Capacity	Calculations
Household Burglary and Commercial Burglary	4 h	
Bank Safe and Vault	72 h (UL 365). Auxiliary power current for all devices, including keypads, must be limited to 300 mA or less to meet this requirement.	
Central Station or Local Fire Alarm	24 h + 5 min of alarm operation. Refer to *Table 8* on page 25.	
Remote Station or Auxiliary Fire Alarm	60 h + 5 min of alarm operation. Refer to *Table 9* on page 25.	
Household Fire Warning Equipment	24 h + 4 min of alarm operation. Refer to *Table 10* on page 26.	

8.3 Standby Battery Calculation

Because of changing regulations, verify the necessary time with your local authority having jurisdiction (AHJ).

Refer to *Table 5* on page 23 for totals B and C used in the formulas below. When connecting two batteries, use either the D122 Dual Battery Wiring Harness or the D8132 Battery Charger Module.

Table 7: General Ampere-Hour (Ah) Calculation Formula

Total B[1]		Hours		Total C[1]		Alarm Operation[2]		Contingency		Total Ah[3]
(	x	24)	+	(_____	x	0.083)	+	10%	=	_____ _____

1 Refer to *Table 5* on page 23.

2 Value = $\frac{\text{Minutes of alarm operation}}{60}$

3 Total Ah requirements must not exceed the Ah capacity of batteries:
One D126 Battery = 7 Ah
Two D126 Batteries = 14 Ah
One D1218 Battery = 17.2 or 18 Ah
Two D1218 Batteries = 34.4 or 36 Ah

8.4 Central Station or Local Systems

Central Station or Local Systems require 24 h of standby plus 5 min of alarm operation at the end of the 24-hour period. A single battery is sometimes adequate for central station systems, but two batteries must be installed to meet the basic standby requirements for a local system installation. Use the battery ampere-hour (Ah) calculations to confirm compliance. The formula in *Table 8* includes the calculation for 5 min of alarm operation at the end of the 24-hour period, as well as a 10% contingency factor that allows for depletion of battery capacity with age.

Because of changing regulations, verify the necessary time with your local AHJ (authority having jurisdiction).

Table 8: Central Stations or Local Systems Ah Calculation Formula

Total B[1]		Hours		Total C[1]		Alarm Operation[2]		Contingency		Total Ah[3]
(_____	x	24)	+	(_____	x	0.083)	+	10%	=	_____

1 Refer to *Table 5* on page 23.

2 Value = $\frac{\text{Minutes of alarm operation}}{60}$

3 Total Ah requirements must not exceed the Ah capacity of batteries:
- One D126 Battery = 7 Ah
- Two D126 Batteries = 14 Ah
- One D1218 Battery = 17.2 or 18 Ah
- Two D1218 Batteries = 34.4 or 36 Ah

8.5 Remote Station or Auxiliary Systems

Remote Station or Auxiliary Systems require 60 h of standby plus 5 min of alarm operation at the end of the 60-hour period. A D8132 Battery Charger Module with additional batteries installed in a separate D8109 or D8108A Enclosure might be required in the system to meet the basic standby requirements for a remote station or auxiliary system installation. Use battery Ah calculations to confirm compliance. The formula in *Table 9* includes the calculation for 5 min of alarm operation at the end of the 60-hour period, as well as a 10% contingency factor that allows for depletion of battery capacity with age.

Because of changing regulations, verify the necessary time with your local AHJ (authority having jurisdiction).

Table 9: Remote Station or Auxiliary Systems Ah Calculation Formula

Total B[1]		Hours		Total C[1]		Alarm Operation[2]		Contingency		Total Ah[3]
(_____	x	60)	+	(_____	x	0.083)	+	10%	=	_____

1 Refer to *Table 5* on page 23.

2 Value = $\frac{\text{Minutes of alarm operation}}{60}$

3 Total Ah requirements must not exceed the Ah capacity of batteries:
- One D126 Battery = 7 Ah
- Two D126 Batteries = 14 Ah
- One D1218 Battery = 17.2 or 18 Ah
- Two D1218 Batteries = 34.4 or 36 Ah

8.6 Household Fire Warning Equipment

The Household Fire Warning Equipment Standard requires 24 h of standby current plus 4 min of alarm operation at the end of the 24-hour period. Use battery Ah calculations to confirm compliance. The formula in *Table 10* includes the calculation for 4 min of alarm operation at the end of the 24-hour period, and a 10% contingency factor that allows for depletion of battery capacity with age.

Because of changing regulations, verify the necessary time with your local AHJ (authority having jurisdiction).

Table 10: Household Fire Ah Calculation Formula

Total B[1]		Hours		Total C[1]		Alarm Operation[2]		Contingency		Total Ah[3]
(	x	24)	+	(_____	x	0.067)	+	10%	=	_____

1 Refer to *Table 5* on page 23.

2 Value = $\frac{\text{Minutes of alarm operation}}{60}$

3 Total Ah requirements must not exceed the Ah capacity of batteries:
- One D126 Battery = 7 Ah
- Two D126 Batteries = 14 Ah
- One D1218 Battery = 17.2 or 18 Ah
- Two D1218 Batteries = 34.4 or 36 Ah

8.7 UL 609

The leads providing operating power to the alarm sounding device shall be electrically and mechanically protected as required in the Standard for Installation and Classification of Mercantile and Bank Burglar-Alarm Systems, UL 681, or the circuit shall be constructed so that the system is not defeated by cutting or short-circuiting connections between the control unit and the alarm housing.

The alarm housing for a bank alarm system without a remote alarm transmission connection shall be mounted on the outside of the building, visible from a public street or highway. It shall be accessible for examination and repair. It shall also be located not more than four stories above the street level unless:

- A second alarm sounding device and housing, intended for outside service [see 3.3(a)], is mounted adjacent to the premises or area of the building in which the alarm system is installed or
- A second alarm sounding device, intended for inside service [see 3.3(b)], is mounted within the premises.

In either case, the outside alarm sounding device and housing may be mounted as high as the seventh floor.

8.8 UL 365

In a mercantile burglar alarm system, a mercantile alarm sounding device located within a building but outside the protected area, is acceptable, provided it is rated for outside service and alarm conditions are transmitted to:

a. The dispatch location of the law enforcement agency having jurisdiction over the protected property or

b. A central station or residential monitoring station complying with the Standard for Central-Station Alarm Services, UL 827.

In a mercantile burglar alarm system, an alarm sounding device located within the area of greatest protection, or outside the area of greatest protection but within an area protected by an alarm system and that shares a common control unit with the system installed in the area of greatest protection, is acceptable provided it is rated for inside service and alarm conditions are transmitted to:

a. The dispatch location of the law enforcement agency having jurisdiction over the protected property or

b. A central station or residential monitoring station complying with the Standard for Central-Station Alarm Services, UL 827.

An inside sounding device shall be mounted at least 10 feet (3.05 m) above the floor or at the surface of the ceiling. When there is a fixed construction within the area that could provide access for an intruder, the alarm sounding device shall also be mounted at least 4 ft (1.2. m) as measured horizontally, away from the edges of the fixed construction or at least 10 ft (3.05 m) above it so as to minimize access by an intruder.

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F01U143069-03

BOSCH