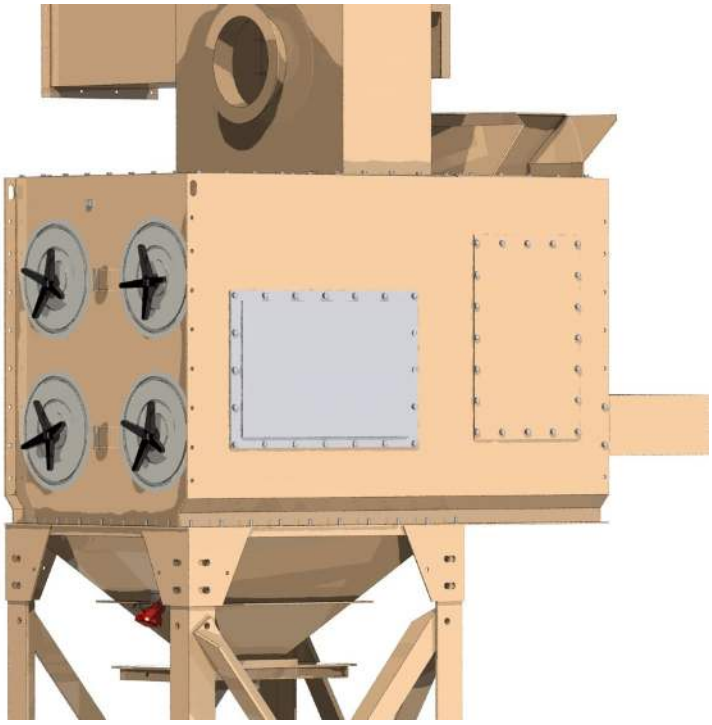
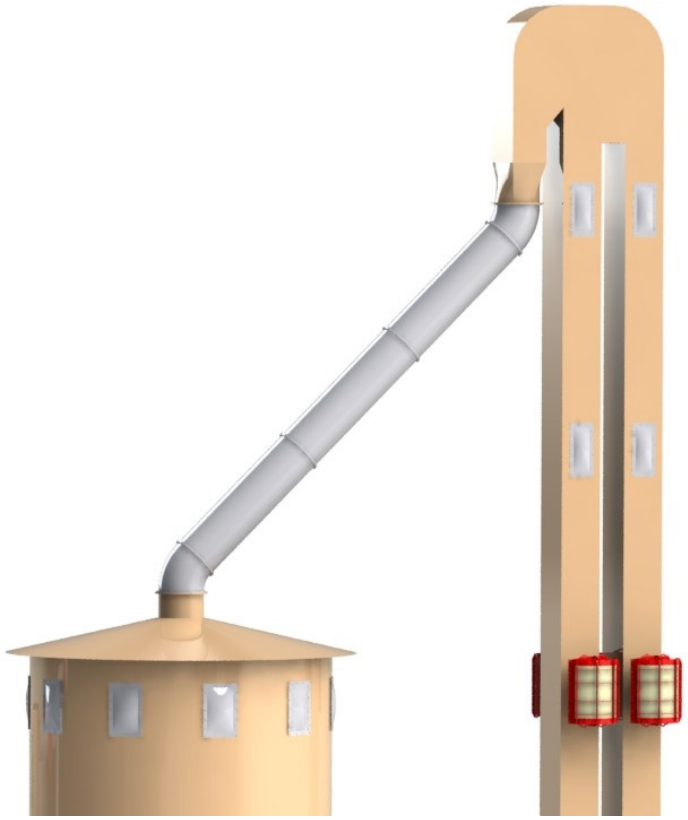
VIGILEX®

SAFETY PROTECTION By STIF





BOSS® PRODUCTS LLC

North America Supplemental Manual

for

Vigilex Flat, Domed, and High Vacuum Domed Explosion Vent Panels (VL, VD, and VDHV)

2023 - First Edition - Version 0002

V0002: Branding Consistency Update

Table of Contents

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Supplemental Manual Information

This manual is a supplement to the STIF installation, use and maintenance manual for flat and domed explosion vent panels. It has been compiled by Boss Products, LLC® for the North America market. The installer and end user must be familiar with both the STIF manual and the Boss Products supplement.

Safety

Electrical shock hazard

only qualified personnel should install, maintain or work on this equipment!

Always perform work with the power off.

Arc flash hazard.

Appropriate PPE required!

Follow all requirements in NFPA 70E

Always maintain proper conveying velocities as required by NFPA 652 & 654 for Combustible dusts.

Warning!

Do not substitute components.

Read all disclaimers in the corresponding Airex Manual.

It is the installers responsibility to verify that their installation complies with requirements set by the authority having jurisdiction:

All national, Local, NEC, and NFPA codes and/or Guidelines.

Warranty Returns

- Pre-qualified Warranty Returns must be shipped freight pre-paid and include an RMA approval document.
- The returned item will be inspected upon its arrival at Boss, Schertz Texas.
- If a replacement item is required before return and inspection, a new purchase order must be placed authorizing shipment of the replacement item.
- The new item will be invoiced and shipped FOB point of origin.
- If the returned item is determined to be under warranty and defective, it will be repaired or replaced at the seller's discretion and returned to the buyer FOB point of origin.

Warranty

- Boss Products, LLC® warrants that the materials sold to a buyer is free from manufacturing defects at the time of shipment.
- Boss Products further warrants to the buyer that the product will remain free of defect for a period of 12 months of shipment on the condition that product has been maintained, installed and operated according to its intended use.
- Furthermore, this warranty will remain in force only as long as the following conditions are documented as being accurately applied.
- Installation and application in compliance of all applicable codes and standards, including National Electric Codes, NFPA recommendations & generally accepted good practice.
- A buyer will be responsible for remedies for defects caused by services not provided by Boss Products.

THERE ARE NO WARRANTIES EITHER EXPRESSED OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH EXTEND BEYOND THE WARRANTIES SPECIFICALLY CONTAINED IN THIS DOCUMENT. BOSS PRODUCTS, LLC SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, DIRECT, INDIRECT OR OTHER DAMAGES ARISING UNDER ANY THEORY OF LAW WHATSOEVER.

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Introduction

Thank you for purchasing the Vigilex Flat, Domed, and High Vacuum Domed Explosion Vent Panel (VL/VD/VDHV). The VL/VD/VDHV is specifically designed to satisfy low to high pressure explosion venting requirements. The VL/VD/VDHV is ATEX certified and NFPA 68 compliant.

Required Items for NFPA 68 Compliance:

- Burst Sensor (Breakable, Inductive, or Magnetic)

Complementary Products:

- VQ line of Explosion Flameless Vents
- NRV line of No Return Valves
- VF line of Explosion Isolation Devices
- HSAG02 line of High Speed Abort Gates
- FBS line of FireBreak Shutters
- FCS Spark Detection and Extinguishing Systems
- IMS line of Dust Monitoring (Emissions) Systems
- ECOBOSS® line of Energy Management Control Systems

NFPA Compliance

NFPA 652 – Standard on the Fundamentals of Combustible Dust - 2019 Edition

- 9.7.3 – Equipment Protection
  - o 9.7.3.2 – Explosion protection systems shall incorporate one or more of the following methods of pro tection:
    2. Deflagration venting in accordance with NFPA 68
    3. Deflagration venting through listed flame arresting devices in accordance with NFPA 68

NFPA 68 – Standard on Explosion Protection by Deflagration Venting - 2018 Edition

- 8.1 - Introduction to Venting Deflagrations of Combustible Dusts and Hybrid Mixtures
- 8.2, 8.3, 8.4 - Explosion venting calculation with relevant equations to determine minimum venting area (8.2.1.1, 8.2.2.3, 8.2.4.6, 8.3.4, 8.4.1)
- 8.10 - Venting Internal to a Building with Flame-Arresting and Particulate Retention Device
- 8.10.1 - Expected overpressure shall be compared to the building design, and building venting shall be considered to limit overpressures
- 8.10.2 - The deflagration venting area provided for the protected enclosure shall be adjusted to compensate for the venting efficiency as determined by test for th device

Vigilex VL, VD, and VDHV (VL/VD/VDHV) Specifications

Standard Features (All Sizes)
304L Stainless Steel Construction * Integrated Gasketed Flange
Use in a Wide Range of Process Equipment * Easy Installation * No Maintenance Cost
Wide Variety of Standard and Custom Sizes * 08ATEXQ406 Quality Assurance * ATEX Certification

Type	VL (Flat Panel)	VD (Domed Panel)	VDHV (High Vacuum Domed Panel)
Certifications:	Certified ATEX EN14491, EN14994, EN14797, and EN1127.1	Certified ATEX EN14491, EN14994, EN14797, and EN1127.1	Certified ATEX EN14491, EN14994, EN14797, and EN1127.1
Kst Max:	500 bar m/s	500 bar m/s	500 bar m/s
Pmax:	12 bar (174 psi)	12 bar (174 psi)	12 bar (174 psi)
Pred Max:	1.8 bar (26 psi)	1.8 bar (26 psi)	1.8 bar (26 psi)
Pstat:	0.1 bar (1.45 psi) ± 15% at 71.6°F (22°C)	0.1 bar (1.45 psi) ± 15% at 71.6°F (22°C)	0.1 bar (1.45 psi) ± 15% at 71.6°F (22°C)
Max. Negative Pressure:	-20" H_2O (-50 mbar)	-80" H_2O (-200 mbar)	-200" H_2O (-500 mbar)

Table 1 - Specifications for all VL, VD, and VDHV explosion vent panels

Standard EPDM Gasket: -40°F (-40°C) to +176°F (+80°C)
Optional Silicone Gasket: -76°F (-60°C) to +392°F (200°C)

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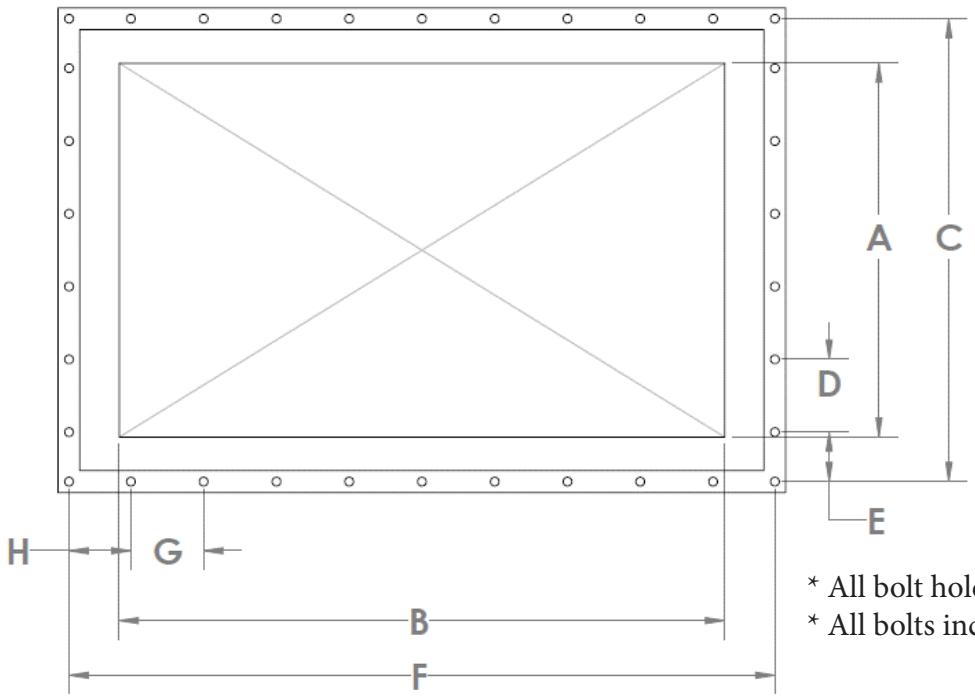
Vigilex VL, VD, and VDHV (VL/VD/VDHV) Dimensions



* All bolt holes are Ø0.47” (Ø12mm).
* All bolts included in shipping are M10X30.

Standard Sizes Available in Stock:

VL/VD Sizes	A	B	C	D	E	F	G	H	Bolt Qty.
VL/VD 7" x 19" (170 x 470mm)	6.6" (168mm)	18.4" (468mm)	8.7" (220mm)	1x 3.1" (1x 80mm)	2x 2.8" (2x 70mm)	20.5" (520mm)	3x 3.9" (3x 100mm)	2x 4.3" (2x 110mm)	16
VL/VD 11" x 18" (270 x 458mm)	10.5" (268mm)	17.9" (456mm)	12.6" (320mm)	1x 3.9" (1x 100mm)	2x 4.3" (2x 110mm)	20.0" (508mm)	4x 3.5" (4x 90mm)	2x 2.9" (2x 74mm)	18
VL/VD 12" x 20" (300 x 500mm)	11.7" (298mm)	19.6" (498mm)	13.8" (350mm)	2x 3.9" (2x 100mm)	2x 2.9" (2x 75mm)	21.6" (550mm)	4x 3.9" (4x 100mm)	2x 2.9" (2x 75mm)	20
VL/VD 12" x 24" (305 x 610mm)	11.9" (303mm)	23.9" (608mm)	14.0" (356mm)	2x 4.0" (2x 102mm)	2x 3.0" (2x 76mm)	26.0" (660mm)	5x 4.0" (5x 101.6mm)	2x 3.0" (2x 76mm)	22
VL/VD 14" x 26" (350 x 650mm)	13.7" (348mm)	25.5" (648mm)	15.7" (400mm)	2x 3.9" (2x 100mm)	2x 3.9" (2x 100mm)	27.6" (700mm)	5x 3.9" (5x 100mm)	2x 3.9" (2x 100mm)	22
VL/VD 19" x 23" (490 x 590mm)	19.2" (488mm)	23.2" (588mm)	21.3" (540mm)	4x 3.9" (4x 100mm)	2x 2.8" (2x 70mm)	25.2" (640mm)	5x 3.9" (5x 100mm)	2x 2.8" (2x 70mm)	26
VL/VD 24" x 24" (610 x 610mm)	23.9" (608mm)	23.9" (608mm)	26.0" (660mm)	4x 4.3" (4x 110mm)	2x 4.3" (2x 110mm)	26.0" (660mm)	4x 4.3" (4x 110mm)	2x 4.3" (2x 110mm)	24
VL/VD 18" x 35" (457 x 890mm)	17.9" (455mm)	35.0" (888mm)	20.0" (507mm)	3x 3.97" (3x 101mm)	2x 4.0" (2x 102mm)	37.0" (940mm)	3.97" + 5x 4.0" + 3.97" (101mm + 5x 102mm + 101mm)	2x 4.5" (2x 114mm)	28
VL/VD 23" x 36" (586 x 920mm)	23.0" (584mm)	36.1" (918mm)	25.0" (636mm)	5x 3.9" (5x 100mm)	2x 2.7" (2x 68mm)	38.2" (970mm)	8x 3.9" (8x 100mm)	2x 3.3" (2x 85mm)	34
VL/VD 24" x 36" (610 x 914mm)	23.9" (608mm)	36.0" (914mm)	26.0" (660mm)	5x 4.0" (5x 101.6mm)	2x 3.0" (2x 76mm)	38.0" (966mm)	3.97" + 6x 4.0" + 3.97" (101mm + 6x 102mm + 101mm)	2x 3.0" (2x 76mm)	34
VL/VD 36" x 36" (920 x 920mm)	36.1" (918mm)	36.1" (918mm)	38.2" (970mm)	8x 3.9" (8x 100mm)	2x 3.3" (2x 85mm)	38.2" (970mm)	8x 3.9" (8x 100mm)	2x 3.3" (2x 85mm)	40
VL/VD 36" x 44" (915 x 1118mm)	36.0" (914mm)	43.9" (1116mm)	38.0" (966mm)	2x 4.0" + 4x 3.97" + 2x 4.0" (2x 102mm + 4x 101mm + 2x 102mm)	2x 3.0" (2x 76mm)	46.0" (1168mm)	3x 4.0" + 4x 3.97" + 3x 4.0" (3x 102mm + 4x 101mm + 3x 102mm)	2x 3.0" (2x 76mm)	44
VL 44" x 44" (1130 x 1130mm)	44.4" (1128mm)	44.4" (1128mm)	46.5" (1180mm)	10x 3.9" (10x 100mm)	2x 3.5" (2x 90mm)	46.5" (1180mm)	10x 3.9" (10x 100mm)	2x 3.5" (2x 90mm)	44

Table 2 - Dimensions for all VL and VD standard sizes available in stock.

* High Vacuum Domed Panels (VDHV) custom sizes are available upon ordering.

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VL/VD/VDHV Installation Instructions

Step 1: Visually inspect the panel prior to installation.
NOTE: Do not use if damaged.

Figure 1 - Panel inspection prior to installation

Step 2: Carefully remove panel from crated wooden box. Use sides of the panel when transporting, not the center.

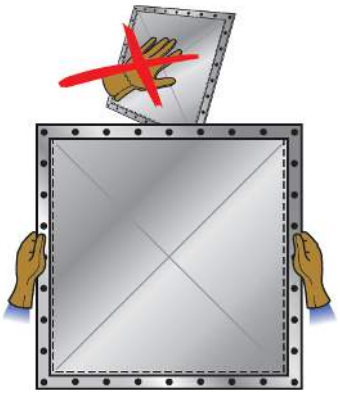

Figure 2 - Handle panel carefully using the sides

Step 3: Ensure all surfaces are clean before installation. Use a torque wrench to tighten all M10x30 provided with a force of 20Nm to secure panel to the dust collecting vessel.
NOTE: Panel must be installed outside of the protected vessel, not the inside.

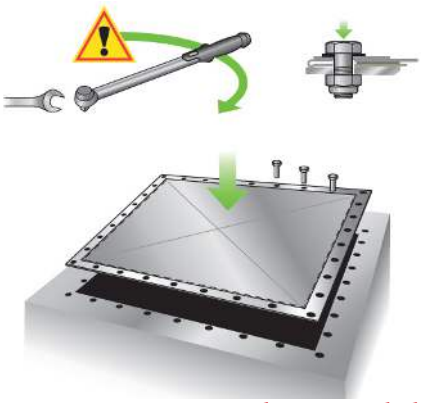

Figure 3 - Use torque wrench to secure bolts

Step 4: Properly ground the VL or VD panel to the vessel or the ground using conductivity strip provided.

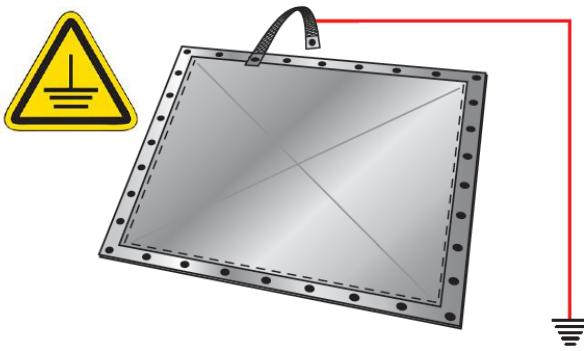

Figure 4 - Properly ground the panel

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Breakable Burst Sensor Technical Features

P/N: 40411-010000

P/N: 56001-010000

Technical Features of Breakable Burst Sensor	
DC Voltage:	24V DC Max.
Rated Current:	50 mA Max.
Material:	Nickel Plated Brass
Protection:	IP 67
Min. Static Load Required for Break:	19.5 lbf (2.2 Nm)
Min. Impact Energy:	0.12 J
Cable length:	6.56ft (2m)

Table 3 - Breakable burst sensor technical features

Breakable Burst Sensor Installation Instructions

Step 1: Remove protective plastic cap.

Breakable burst sensor is very fragile. Please handle it carefully to avoid any damage to the sensor.

Figure 5 - Plastic cap removal

Step 2: Lift external metal tab on the vent panel to 90°.

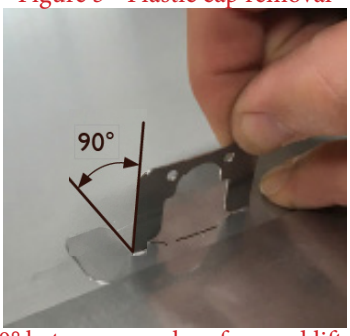

Figure 6 - 90° between panel surface and lifted metal tab

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Step 3: Use wrenches to secure breakable burst sensor to the metal mount ensuring the breakable tip is inserted through the metal tab from step 2.
NOTE: Breakable burst sensor requires a separate intrinsically safe control box to operate properly.
P/N: 56001-010000

Figure 7 - Breakable burst sensor proper installation

Breakable Burst Sensor Wiring to Intrinsically Safe Control Box

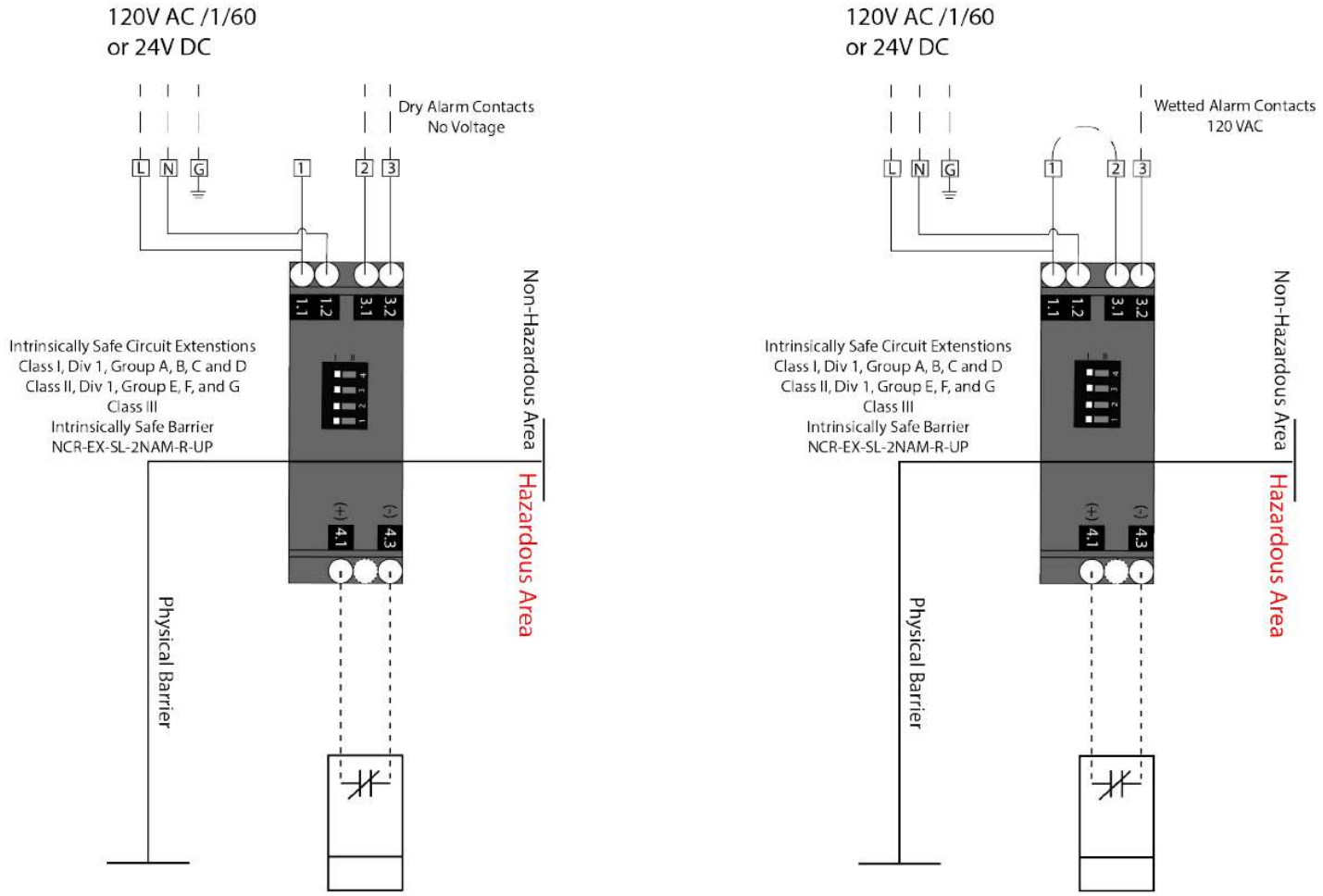

Figure 8 - Breakable burst sensor to intrinsically safe control box wiring diagram

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Inductive Burst Sensor Technical Features

P/N: 40411-020000

Technical Features of Inductive Burst Sensor	
DC Voltage:	12-48V DC
Rated Current:	200 mA Max.
Material:	Nickel Plated Brass
Protection:	IP 67
Dimensions:	2.4" long, Ø0.70" (61mm long, Ø18mm)
ISO Thread:	M18 x 1
Nominal Sensing Distance	0.32" (8mm)

Table 4 - Inductive burst sensor technical features

Inductive Burst Sensor Installation Instructions

Step 1: Lift internal metal tab on the vent panel to 90°.

Figure 9 - Internal metal tab lifted

Step 2: Use wrenches to secure inductive burst sensor to the metal mount ensuring inductive burst sensor tip is 0.16" (4mm) away from the metal tab in step 1.
NOTE: Inductive burst sensor does not require its own control box. It can be wired to Boss' control panels (CP03 or CP04) or any other control panel available on location.

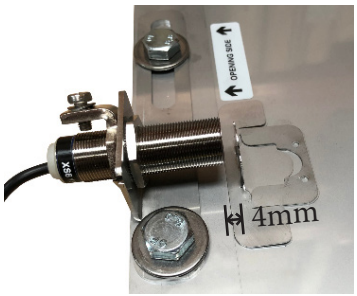

Figure 10 - Inductive burst sensor proper installation

Inductive Burst Sensor Wiring

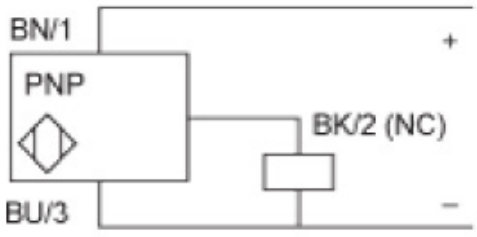

Figure 11 - Inductive burst sensor wiring diagram

Normally open contact held closed by metal tab

Brown: 24V+
Blue: 0V-
Black: Signal wire

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Magnetic Burst Sensor Technical Features

P/N: 40411-030000

Technical Features of Magnetic Burst Sensor	
DC Voltage:	12-60V DC
Rated Current:	0.1 A Max.
Power:	10W - 12VA
Protection:	IP 67
Operating Temperature:	-13°F to +185°F (-25°C to +85°C)
Cable length:	16.4ft (5m)

Table 5 - Magnetic burst sensor technical features

Magnetic Burst Sensor Installation Instructions

Step 1: Lift external metal tab on the vent panel to 90°.

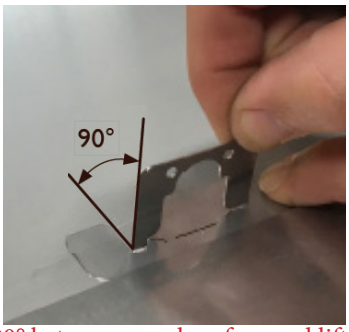

Figure 12 - 90° between panel surface and lifted metal tab

Step 2: Use M3 screws to mount magnet to the external metal tab from step 1. Tighten both screws with 0.5 Nm of torque.

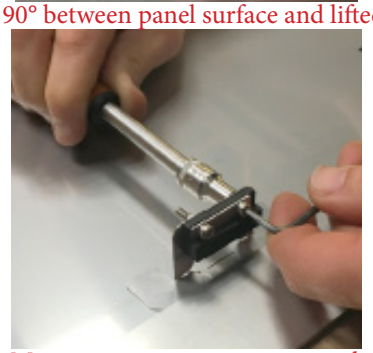

Figure 13 - M3 screws to secure magnet to the metal tab

Step 3: Use wrenches to secure magnetic burst sensor to the metal mount ensuring the burst sensor is 0.47" (12mm) away from the magnet in step 2.
NOTE: Magnetic burst sensor does not require its own control box. It can be wired to Boss' control panels (CP03 or CP04) or any other control panel available on location.

Figure 14 - Magnetic burst sensor proper installation

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Magnetic Burst Sensor Wiring

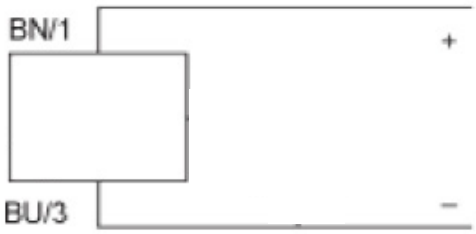


Figure 15 - Magnetic burst sensor wiring diagram

Normally open contact held closed by metal tab

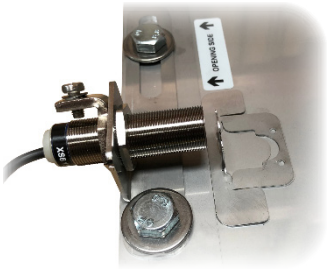
Brown: 24V+

Blue: 0V-

EV-VL/EV-VD/EV-VDHV Spare/Replacement Parts

Breakable Burst Sensor
P/N: 40411-010000

Intrinsically Safe Control Box
P/N: 56001-010000



Inductive Burst Sensor
P/N: 40411-020000

Magnetic Burst Sensor
P/N: 40411-030000

Flat Explosion Vent Panels
P/N: 51501

Domed Explosion Vent Panels
P/N: 51502

High Vacuum Domed
Explosion Vent Panels
P/N: 51503

Frequently Asked Questions

1. Do I need to have a burst sensor installed on the VL or VD explosion panels?
   ▹ Yes, in order to be NFPA compliant all devices shall be equipped with an indicating sensor that shall notify the user upon activation of the device. (NFPA68 6.9.6).

2. Do I need intrinsically safe wiring for the inductive or magnetic burst sensor?
   ▹ No, you only need the inductive burst sensor; however, if you choose to purchase the breakable burst sensor, you will also need the required intrinsically safe control box P/N 56001-010000.

3. How do I wire the inductive burst sensor to my control panel?
   ▹ The inductive burst sensor has 3 wires. The brown wire lands in any 24V+ terminal, the blue wire lands in any 0V- terminal, and the black wire is a signal wire. Refer to page 10.

4. How do I wire the magnetic burst sensor to my control panel?
   ▹ The magnetic burst sensor has 2 wires. The brown wire lands in any 24V+ terminal, and the blue wire lands in any 0V- terminal. Refer to page 12.

5. How do I know which type of panel to use for my application?
   ▹ It will depend on the vacuum pressure of your system. Refer to Table 1 for Max. Negative Pressure (vacuum pressure) for each type of explosion vent panel offered.

Troubleshooting Guide

1. I am not sure my breakable burst sensor is working properly.
   ▹ Check for continuity between the wires.

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Print date: 01/2023