

Rayvoss™

Strikesorb™



Rayvoss™ Transient Voltage Surge Suppression Systems
Strikesorb™ Surge Suppression Modules

Application & Installation Guidelines

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Preface

This document provides technical information on Raycap's *Strikesorb* Surge Suppression Modules and *Rayvoss* Transient Voltage Surge Suppression (TVSS) Systems. An introduction to the principle of operation of Strikesorb's patented technology is briefly presented. The technical characteristics of all available types, the interconnection options and the selection of the appropriate Strikesorb type for any kind of power system configuration are described in detail. The method for integrating Strikesorb modules into the cabinets of large systems is given together with an example.

Strikesorb modules are the basic elements of Rayvoss TVSS systems. The internal configuration of Rayvoss system, which depends on the power system configuration, the required level of protection and the desired additional features, is provided for every Rayvoss type. The unique attribute of Rayvoss TVSS that does not include or require any type of thermal disconnect mechanism (fuses, breakers, etc) in series with Strikesorb surge protection modules allows Rayvoss to be connected directly on the power wires. This gives two possible installation options for Rayvoss TVSS systems:

- **Direct connection on the power lines.** Rayvoss is the only TVSS device that can be safely installed directly on the power lines.
- **T-connection.** This is the conventional method of connecting TVSS in a branch via an appropriate circuit breaker or fuse.

Ordering information of Rayvoss systems are given in the appendix.

Detailed installation instructions for the direct or T-connection of Rayvoss system are also provided.

Updated product information can be found on Rayvoss web site: www.rayvoss.com. The site provides detailed information in a downloadable format of the following:

- Interactive product selection tool
- Installation instructions
- Brochures and datasheets for all Rayvoss types
- Comprehensive presentation of Strikesorb's principle of operation
- Features and benefits of Strikesorb/Rayvoss unique technology
- Frequently asked questions on TVSS technologies



Strikesorb™ Surge Suppression Modules

Introduction

The Strikesorb surge suppression module is used either as a stand-alone protection element in integrated solutions or within a Rayvoss TVSS system. It incorporates a single, heavy duty, distribution grade Metal Oxide Varistor (MOV) disk, assembled under pressure in an environmentally sealed aluminum casing.

Strikesorb's unique design provides very low internal contact resistance and uniform distribution of the surge current over the total area of the protection element thus resulting in low current density which guarantees the lowest let-through voltages. Furthermore, the excellent thermal management of the MOV due to its aluminium housing provides extremely high energy handling capability. Strikesorb's patented design minimizes the effects of ageing and completely eliminates the risk of catastrophic failure, explosion or fire.

Strikesorb incorporates state of the art developments in metal oxide technology providing superior protection characteristics, which remain unchanged throughout its long service life. The module has been designed in order to withstand repeated surges providing a cost-effective and maintenance free operation in harsh environments. Strikesorb is the only UL (1449 – 2nd edition) recognized surge protection module in the industry rated for safe operation without the use of additional internal fuses. This unique feature combined with its capability to be connected directly on the power lines (feed-through connection) makes it the most reliable surge protection device known and insures that critical electronic equipment will remain protected at all times.

Strikesorb Options

▪ Available Strikesorb Types

Strikesorb modules are available in two sizes:

- **Strikesorb-40.** This module includes a single MOV disc of 40mm diameter and provides protection from surges up to 140kA (8/20µs). It can be used in all applications.
- **Strikesorb-80.** This module includes a single MOV disc of 80mm diameter and provides protection from surges up to 200kA (8/20µs). It is recommended to be used in locations where the risk of direct lightning strikes is high or at locations with a history of frequent surge-related equipment failures.

There are 8 Strikesorb surge protection modules available which are given in the following table:

Product ID	Nominal Operating Voltage (V)	Maximum Continuous Operating Voltage (MCOV) (V)	Maximum Surge Current Rating (8/20µs) (kA)
Strikesorb 40-120	120	150	140
Strikesorb 40-240	240	300	140
Strikesorb 40-277	277	350	140
Strikesorb 40-380	380	480	120
Strikesorb 80-120	120	150	200
Strikesorb 80-240	240	300	200
Strikesorb 80-277	277	350	200
Strikesorb 80-380	380	480	200

Notes:


Nominal Operating Voltage: This is the normal rms voltage that the Strikesorb module is designed to operate when applied between its terminals. This value is determined by the power system voltage. For example, if Strikesorb module is to be connected between line to neutral on a single-phase, 240V system, then Strikesorb 40-240 or Strikesorb 80-240 should be used.

Maximum Continuous Operating Voltage (MCOV): The maximum designated rms value of the voltage that may be continuously applied to the Strikesorb module.

Maximum Surge Current Rating (8/20µs): This is the maximum surge current (8/20µs waveform), as specified in IEEE C62.41-1 and NEMA LS-1, that the surge suppression module can withstand without damage or deterioration of its performance.

▪ Strikesorb Interconnection Options - Modes of Protection

The way that Strikesorb connectors A and B are connected to the power system determines the mode of protection that Strikesorb module will provide. There are four possible interconnection options described in the following table:

A	Connector		Mode of Protection	System
	A	B		
	L	G	Line-to-Ground (L-G)	Single-phase Split-phase Three-phase
	L	N	Line-to-Neutral (L-N)	Single-phase Split-phase Three-phase (with neutral wire)
	N	G	Neutral-to-Ground (N-G)	Single-phase Split-phase Three-phase (with neutral wire)
	L	L	Line-to-Line (L-L)	Single-phase Split-phase Three-phase

▪ Selecting Module Type

The Strikesorb module selection is based on the following two criteria:

- Nominal Operating Voltage. This is the rms voltage measured between the two points that Strikesorb module will be connected to.
- Surge current withstand capability. In critical applications where severe lightning strikes are expected, Strikesorb-80 should be preferred.

Example of product selection:

Requirements:

- Power system: Three-phase without neutral
- System voltage: 380Vrms (L-L)
- Required mode of protection: L-G
- Application: Protection of Variable Speed Drive (VSD) /Variable Frequency Drives (VFD) from lightning and power surges

In this application three Strikesorb modules are required to be installed between each line conductor and the ground. The protection modules should be able to withstand the thermal energy generated by periodic transients produced by the inverter circuit in addition to utility-generated surges, therefore Strikesorb 80-380 is recommended.

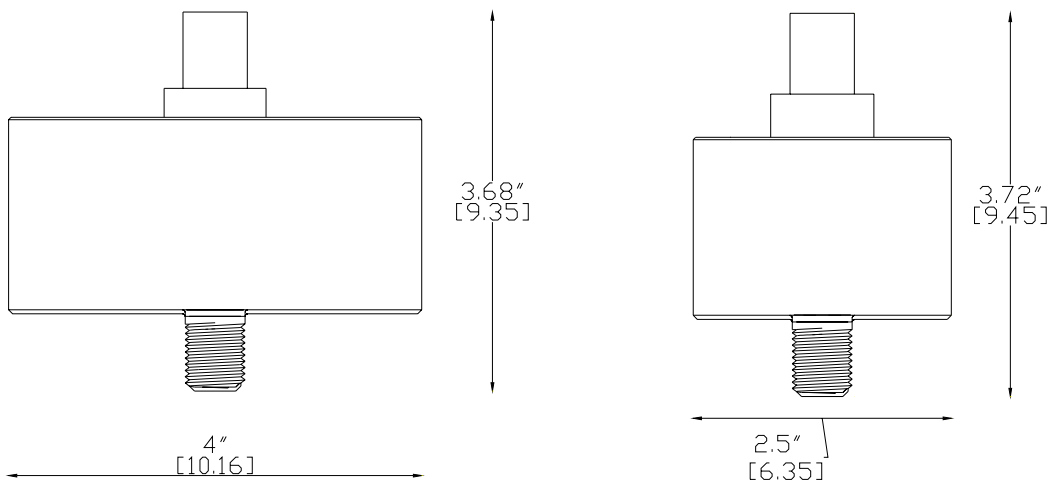
Strikesorb™ Surge Suppression Modules

▪ Mechanical Properties

The table below indicates the main mechanical properties of Strikesorb modules.

Mechanical Properties	Strikesorb 40	Strikesorb 80
Diameter inch [cm]	2.5 [6.35]	4 [10.16]
Height inch [cm]	3.72 [9.45]	3.68 [9.35]
Weight lb [gr]	0.82 [372]	2.07 [939]

The mechanical drawings of the Strikesorb 40 and Strikesorb 80 modules are given below:



Integrated Applications Of Strikesorb

Strikesorb surge suppression modules are the basic elements of the Rayvoss TVSS systems which are described in the following sections. They can also be used as stand-alone SPDs integrated into large systems. Integrating Strikesorb modules into the equipment provides the highest level of protection due to the elimination of the interconnecting cables. Strikesorb modules can be directly connected on the power line bars inside the cabinet of the equipment after the main circuit breaker. Due to the absence of lead wires and internal disconnect mechanisms, Strikesorb provides the lowest let-through voltage to the equipment.

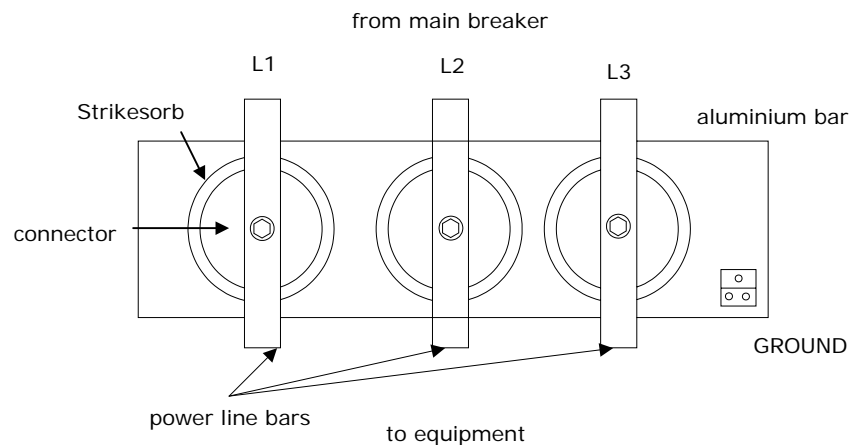
Typical applications of the integrated solutions include:

- Variable Speed Drives (VSDs), also known as Variable Frequency Drives (VFDs)
- Telecommunication equipment: base stations, exchange nodes, street cabinets, Optical Node Units (ONU), etc
- Uninterruptible power supplies (UPS)

Strikesorb modules can be integrated into any cabinet provided that there is sufficient space inside the cabinet to install the modules.

A general interconnection diagram explaining the direct connection of the Strikesorb modules on the power line bars is given below:

Note: The exact dimensions of the aluminium bar, the separation between the modules and mounting details will be determined by the available space inside the cabinet, the Strikesorb size (40mm or 80mm) and the separation between the AC line bars. In space-limited applications, the distance between the adjacent modules can be eliminated since Strikesorb's housings can touch each other. Furthermore, the use of insulated bus bars could alleviate constraints on clearance.



Rayvoss™

Transient Voltage Surge Suppression Systems

Introduction

▪ **General**

Rayvoss TVSS systems deploy Strikesorb suppression modules in a variety of configurations and operating voltages to provide the electrical protection required, whatever the type of the installation may be:

- Single-phase / Split-phase, 120V to 240V
- Three-phase Wye: 120/208V, 220/380V to 240/415V, 277/480V, 347/600V
- Three-phase Delta: 240V, 480V

Rayvoss™ Transient Voltage Surge Suppression Systems

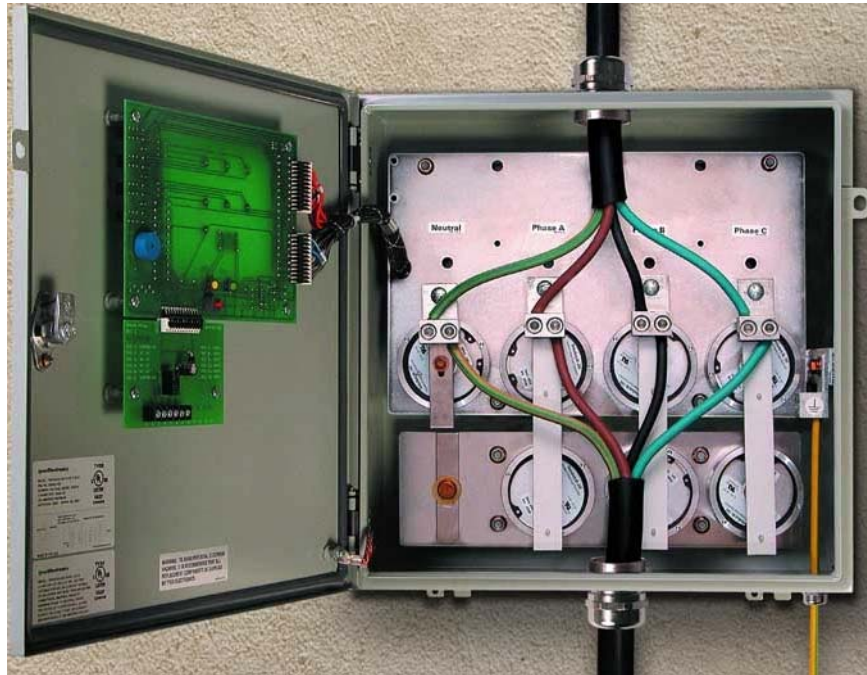
▪ Rayvoss Options

Rayvoss TVSS products provide continuous protection from lightning, temporary over-voltage and other transient voltage activity on a stand-alone basis at the building entrance and where critical equipment is connected.

▪ Selecting Module Type

Rayvoss products that incorporate the 80mm Strikesorb module are recommended for building entrance, large industrial loads, and extremely critical applications. The 80mm module has been tested successfully to 10/350 μ s lightning waveform as specified by IEC 61643-1. In addition Rayvoss systems (3 Wye – 4 wires) have been proven to successfully handle lightning currents up to 100kA (10/350 μ s).

System Ratings Rayvoss configurations based on the 80mm modules are rated for use on circuits capable of delivering up to 200kA rms symmetrical short circuit current. Rayvoss systems based on the 40mm modules are rated for use on circuits capable of delivering up to 100kA rms symmetrical short circuit current.

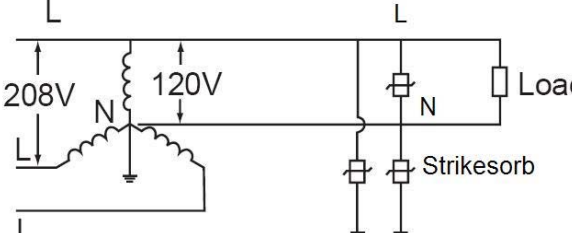
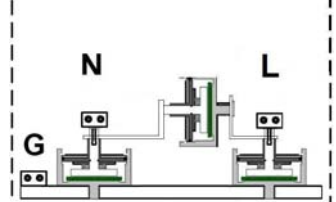


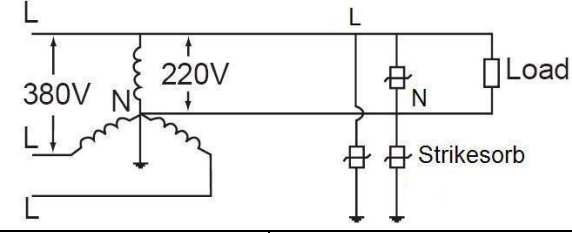
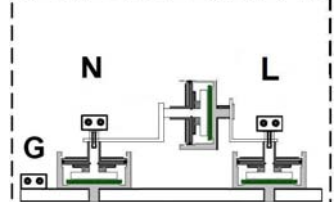
Example of Rayvoss system with 7 Strikesorb modules

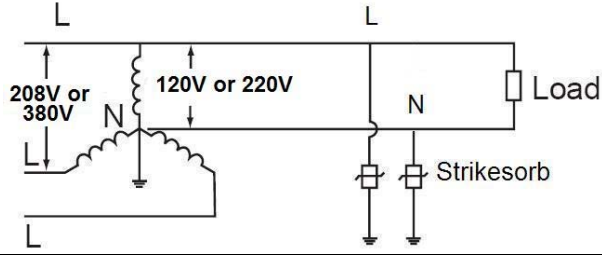
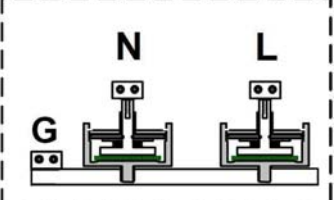
Rayvoss™ Transient Voltage Surge Suppression Systems

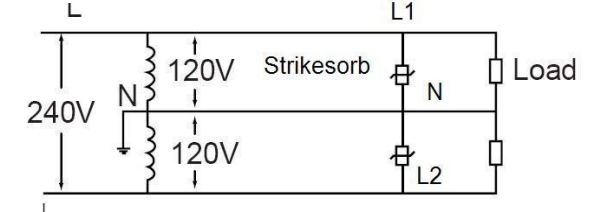
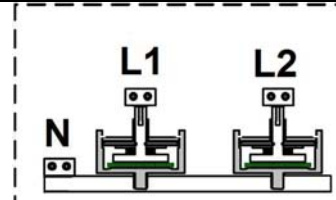
▪ Typical Product Configurations

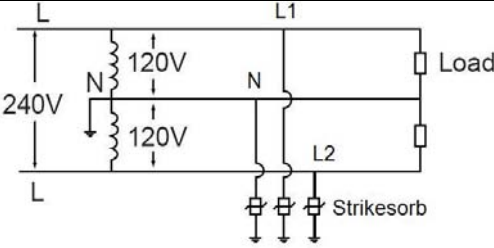
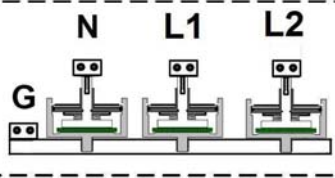
Rayvoss is available in a variety of configurations to match local electrical system requirements. The following table lists the most common configurations. Rayvoss configuration can also be customized to fit special applications.

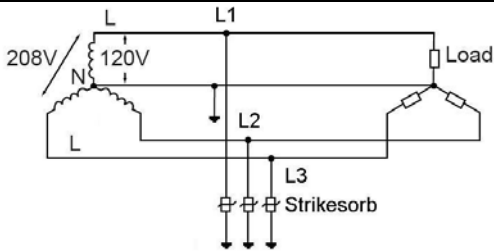
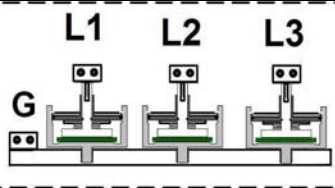
Electrical System Configuration	General Interconnection Diagram	
System Voltage: 120V Single Phase Circuit type: 2W+G Protection mode: L-N, L-G, N-G		
Rayvoss Configuration	Notes	Rayvoss Models
	3 module system for applications with sensitive electronic equipment.	Rayvoss 120-1P-N1-3-0x-A Rayvoss 120-1P-N1-3-0x-B Rayvoss 120-1P-M3-3-0x-A Rayvoss 120-1P-M3-3-0x-B

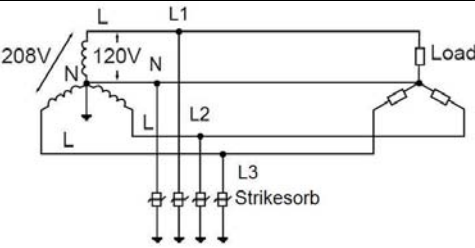
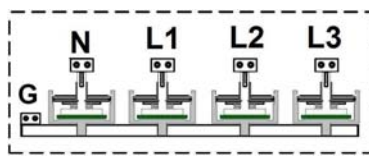
Electrical System Configuration	General Interconnection Diagram	
System Voltage: 220V Single Phase Circuit type: 2W+G Protection mode: L-N, L-G, N-G		
Rayvoss Configuration	Notes	Rayvoss Models
	3 module system for applications with sensitive electronic equipment.	Rayvoss 240-1P-N1-3-0x-B Rayvoss 240-1P-R1-3-0x-B Rayvoss 240-1P-M3-3-0x-B

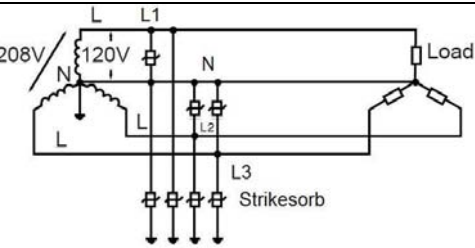
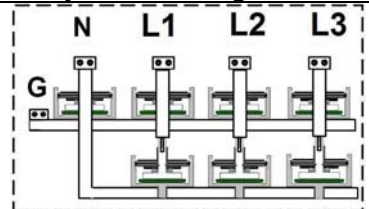
Electrical System Configuration	General Interconnection Diagram	
System Voltage: 120V or 220V Single Phase Circuit type: 2W+G Protection mode: L-G, N-G		
Rayvoss Configuration	Notes	Rayvoss Models
	2 module system suitable for most applications.	Rayvoss 120-1P-M1-2-0x-A Rayvoss 120-1P-M1-2-0x-B Rayvoss 120-1P-S3-2-0x-A Rayvoss 120-1P-S3-2-0x-B Rayvoss 240-1P-M1-2-0x-B Rayvoss 240-1P-S3-2-0x-B

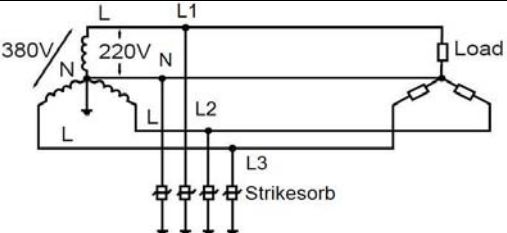
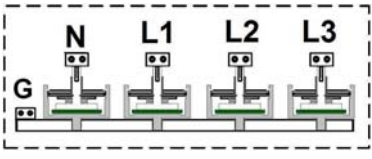
Electrical System Configuration	General Interconnection Diagram	
System Voltage: 120V/240V Split Phase Phase Circuit type: 2φ, 3W+G Protection mode: L1-N, L2-N		
Rayvoss Configuration	Notes	Rayvoss Models
	2 module system suitable for most applications.	Rayvoss 120-2S-N1-2-Nx-A Rayvoss 120-2S-N1-2-Nx-B Rayvoss 120-2S-M1-2-Nx-A Rayvoss 120-2S-M1-2-Nx-B Rayvoss 120-2S-S3-2- Nx-A Rayvoss 120-2S-S3-2- Nx-B

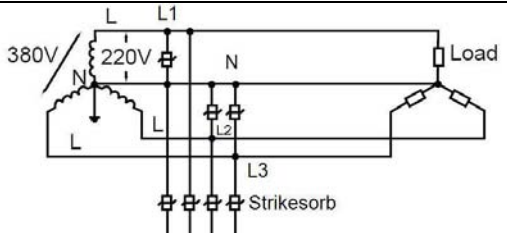
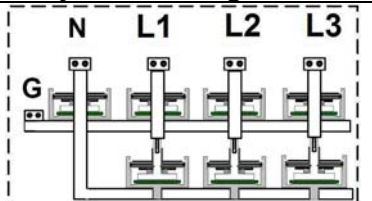
<p align="center">Electrical System Configuration</p>	<p align="center">General Interconnection Diagram</p>	
<p>System Voltage: 120V/240V Split Phase Circuit type: 2ϕ, 3W+G Protection mode: L-G, N-G</p>		
<p align="center">Rayvoss Configuration</p>	<p align="center">Notes</p>	<p align="center">Rayvoss Models</p>
	<p>3 module system for applications with equipment connected far from the transformer.</p>	<p>Rayvoss 120-2S-N1-3-0x-A Rayvoss 120-2S-N1-3-0x-B Rayvoss 120-2S-M1-3-0x-A Rayvoss 120-2S-M1-3-0x-B Rayvoss 120-2S-M3-3-0x-A Rayvoss 120-2S-M3-3-0x-B</p>

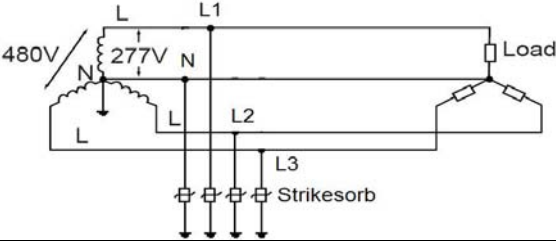
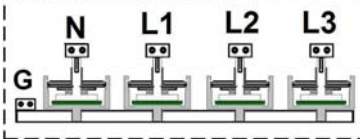
<p align="center">Electrical System Configuration</p>	<p align="center">General Interconnection Diagram</p>	
<p>System Voltage: 120/208V Three Phase Circuit type: 3ϕ, Star, 4W+G Protection mode: L-G</p>		
<p align="center">Rayvoss Configuration</p>	<p align="center">Notes</p>	<p align="center">Rayvoss Models</p>
	<p>3 module system suitable for service entrance panels with neutral to ground bonding.</p>	<p>Rayvoss 120-3Y-N1-3-0x-A Rayvoss 120-3Y-M1-3-0x-A Rayvoss 120-3Y-M3-3-0x-A</p>

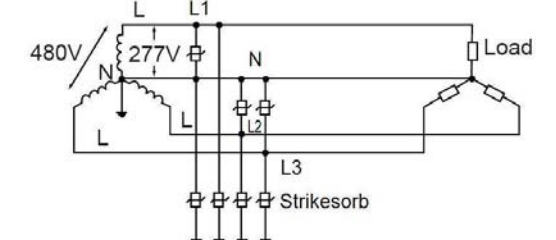
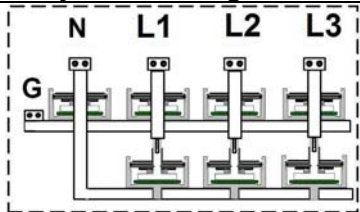
<p align="center">Electrical System Configuration</p>	<p align="center">General Interconnection Diagram</p>	
<p>System Voltage: 120/208V Three Phase Circuit type: 3φ, Star, 4W+G Protection mode: L-G, N-G</p>		
<p align="center">Rayvoss Configuration</p>	<p align="center">Notes</p>	<p align="center">Rayvoss Models</p>
	<p>4 module system suitable for most applications.</p>	<p>Rayvoss 120-3Y-A1-4-0x-A Rayvoss 120-3Y-A1-4-0x-B Rayvoss 120-3Y-N3-4-0x-A Rayvoss 120-3Y-N3-4-0x-B Rayvoss 120-3Y-M3-4-0x-A Rayvoss 120-3Y-M3-4-0x-B</p>

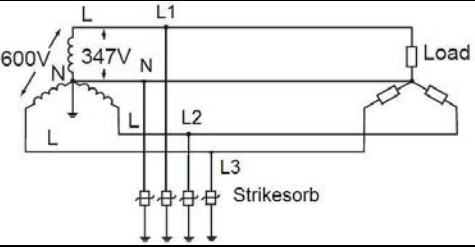
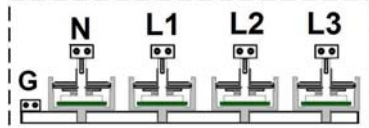
<p align="center">Electrical System Configuration</p>	<p align="center">General Interconnection Diagram</p>	
<p>System Voltage: 120/208V Three Phase Circuit type: 3φ, Star, 4W+G Protection mode: L-G, L-N, N-G</p>		
<p align="center">Rayvoss Configuration</p>	<p align="center">Notes</p>	<p align="center">Rayvoss Models</p>
	<p>7 module system for applications with sensitive electronic equipment connected far from the transformer.</p>	<p>Rayvoss 120-3Y-A1-7-0x-A Rayvoss 120-3Y-A1-7-0x-B Rayvoss 120-3Y-N3-7-0x-A Rayvoss 120-3Y-N3-7-0x-B</p>

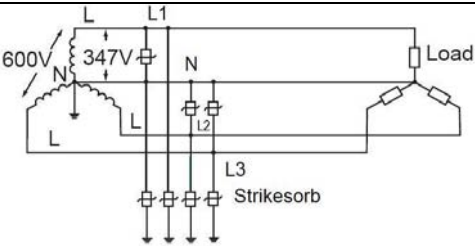
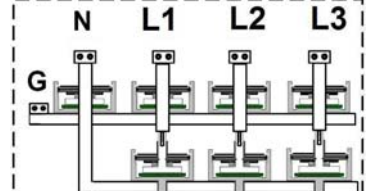
<p>Electrical System Configuration</p> <p>System Voltage: 220/380V Three Phase Circuit type: 3φ, Star, 4W+G Protection mode: L-G, N-G</p>	<p>General Interconnection Diagram</p> 	
<p>Rayvoss Configuration</p> 	<p>Notes</p> <p>4 module system suitable for most applications.</p>	<p>Rayvoss Models</p> <p>Rayvoss 240-3Y-A1-4-0x-B Rayvoss 240-3Y-R1-4-0x-B Rayvoss 240-3Y-M3-4-0x-B</p>

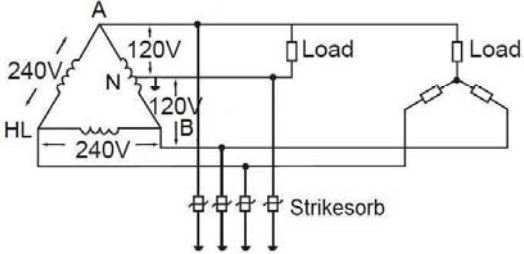
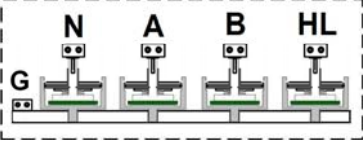
<p>Electrical System Configuration</p> <p>System Voltage: 220/380V Three Phase Circuit type: 3φ, Star, 4W+G Protection mode: L-G, L-N, N-G</p>	<p>General Interconnection Diagram</p> 	
<p>Rayvoss Configuration</p> 	<p>Notes</p> <p>7 module system for applications with sensitive electronic equipment connected far from the transformer.</p>	<p>Rayvoss Models</p> <p>Rayvoss 240-3Y-A1-7-0x-B Rayvoss 240-3Y-N3-7-0x-B</p>

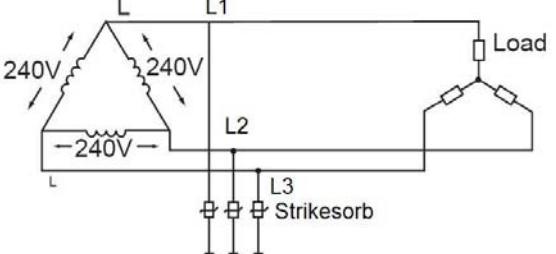
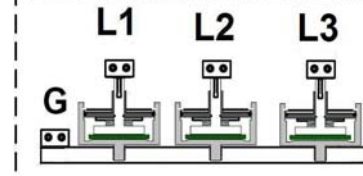
<p>Electrical System Configuration</p> <p>System Voltage: 277/480V Three Phase Circuit type: 3ϕ, Star, 4W+G Protection mode: L-G, N-G</p>	<p>General Interconnection Diagram</p> 	
<p>Rayvoss Configuration</p> 	<p>Notes</p> <p>4 module system suitable for most applications.</p>	<p>Rayvoss Models</p> <p>Rayvoss 277-3Y-A1-4-0x-C Rayvoss 277-3Y-A1-4-0x-D Rayvoss 277-3Y-M3-4-0x-C Rayvoss 277-3Y-M3-4-0x-D</p>

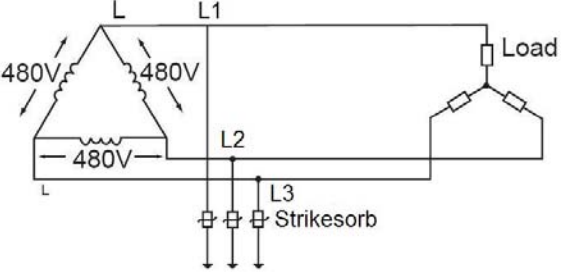
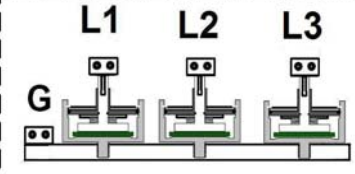
<p>Electrical System Configuration</p> <p>System Voltage: 277/480V Three Phase Circuit type: 3ϕ, Star, 4W+G Protection mode: L-G, L-N, N-G</p>	<p>General Interconnection Diagram</p> 	
<p>Rayvoss Configuration</p> 	<p>Notes</p> <p>7 module system for applications with sensitive electronic equipment connected far from the transformer.</p>	<p>Rayvoss Models</p> <p>Rayvoss 277-3Y-A1-7-0x-C Rayvoss 277-3Y-A1-7-0x-D Rayvoss 277-3Y-N3-7-0x-C Rayvoss 277-3Y-N3-7-0x-D</p>

<p>Electrical System Configuration</p> <p>System Voltage: 347/600V Three Phase Wye Circuit type: 3ϕ, Star, 4W+G Protection mode: L-G, N-G</p>	<p>General Interconnection Diagram</p> 	
<p>Rayvoss Configuration</p> 	<p>Notes</p> <p>4 module system suitable for most applications.</p>	<p>Rayvoss Models</p> <p>Rayvoss 347-3Y-A1-4-0x-D Rayvoss 347-3Y-N3-4-0x-D Rayvoss 347-3Y-M3-4-0x-D</p>

<p>Electrical System Configuration</p> <p>System Voltage: 347/600V Three Phase Wye Circuit type: 3ϕ, Star, 4W+G Protection mode: L-G, L-N, N-G</p>	<p>General Interconnection Diagram</p> 	
<p>Rayvoss Configuration</p> 	<p>Notes</p> <p>7 module system for applications with sensitive electronic equipment connected far from the transformer.</p>	<p>Rayvoss Models</p> <p>Rayvoss 347-3Y-A1-7-0x-D Rayvoss 347-3Y-N3-7-0x-D</p>

<p>Electrical System Configuration</p> <p>System Voltage: 240V High-Leg Delta Circuit type: 3φ, Delta, 3W+G Protection mode: L-G, CT-G</p>	<p>General Interconnection Diagram</p> 	
<p>Rayvoss Configuration</p> 	<p>Notes</p> <p>4 module system suitable for most applications.</p>	<p>Rayvoss Models</p> <p>Rayvoss 240-3H-A1-4-0x-B Rayvoss 240-3H-M3-4-0x-B</p>

<p>Electrical System Configuration</p> <p>System Voltage: 240V, Three Phase Delta Circuit type: 3φ, Delta, 3W+G Protection mode: L-G</p>	<p>General Interconnection Diagram</p> 	
<p>Rayvoss Configuration</p> 	<p>Notes</p> <p>3 module system suitable for most applications.</p>	<p>Rayvoss Models</p> <p>Rayvoss 240-3D-N1-3-0x-B Rayvoss 240-3D-N3-3-0x-B Rayvoss 240-3D-M3-3-0x-B</p>

<p align="center">Electrical System Configuration</p>	<p align="center">General Interconnection Diagram</p>	
<p>System Voltage: 480V, Three Phase Delta Circuit type: 3φ, Delta, 3W+G Protection mode: L-G</p>	 <p>The diagram shows a delta-connected transformer with 480V windings. The secondary terminals are labeled L, L1, and L2. A third phase, L3, is shown as a grounded conductor. A three-phase load is connected between L1, L2, and L3. A three-phase strike sorb system is also connected between L1, L2, and L3.</p>	
<p align="center">Rayvoss Configuration</p>	<p align="center">Notes</p>	<p align="center">Rayvoss Models</p>
 <p>The diagram shows three Rayvoss modules labeled L1, L2, and L3, each with two terminals. A ground terminal labeled G is also shown.</p>	<p>3 module system suitable for most applications.</p>	<p>Rayvoss 480-3D-N1-3-0x-D Rayvoss 480-3D-N3-3-0x-D Rayvoss 480-3D-M3-3-0x-D</p>

▪ Optional Features

OPTION 03: Surge counter, Phase indication LEDs and Remote relays

Normal operation is indicated by the illumination of three green phase lights and no alarm lights. In the event of a fault, (i.e. loss of a phase), a series of indicators will identify the type of fault. There is also an audible alarm, which may be disabled by depressing a switch located on the control board.

The surge counter system used in Rayvoss TVSS increments when a current, exceeding a certain threshold, has been diverted through the Strikesorb protector modules in the event of an overvoltage condition. The surge counter system includes pick up coils and will detect “positive” or “negative” surges, transients, or other conditions that cause the protector modules to operate.

OPTION 05: Pick up coils

Pick up coils are provided on the protection modules so that an external surge counter may be installed.

OPTION 06: Phase indication LEDs and Remote relays

Normal operation is indicated by the illumination of green lights. In the event of a fault or loss of power, the respective LEDs will go OFF. There are also dry contacts available which can be connected to a remote alarm system.

OPTION 08: Phase indication LEDs, Remote relays and Pick up coils

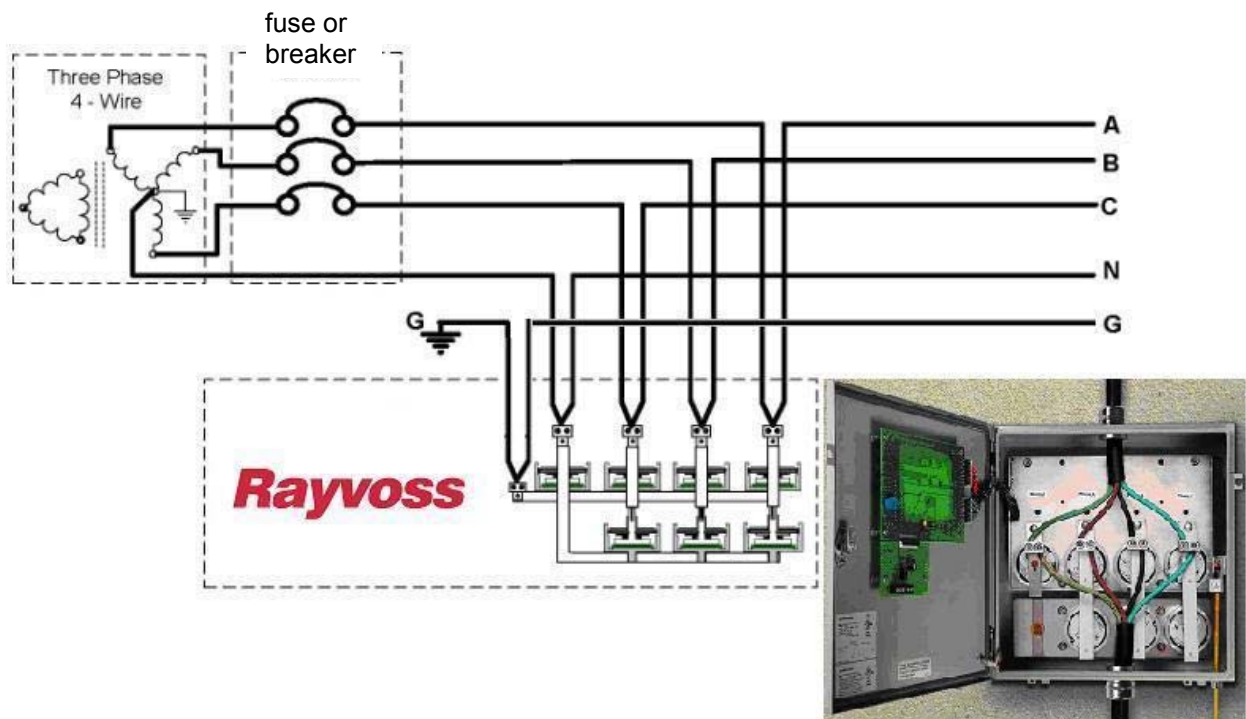
This is a combination of options 05 and 06.

Installation Guidelines

There are two options to install Rayvoss systems:

- **Direct Connection** – the ability to provide true continuous protection to downstream equipment. This is the preferred method for Rayvoss installation. It provides the lowest possible let-through voltage. In addition, it never leaves the equipment unprotected.
- **T- Connection** – traditional method of connection to the electrical system through a branch fuse or circuit breaker.

▪ Direct Connection



Key advantages of the direct connection

- **Zero lead length** – The modules are directly connected to the electrical system offering the lowest possible let-through voltage. The input wires (line and neutral wires) are inserted into the Rayvoss enclosure and are directly connected to one of the two Strikesorb connector ports. The second port of each connector is used to connect the corresponding wires that feed the equipment, as shown in the above diagram. Therefore, no additional lead wires that increase the voltage seen by the equipment are used.
- **Load is always protected** – Should a surge event exceeds the energy handling capability of Rayvoss, the module goes short and the upstream overcurrent protection device operates. In this way the equipment is taken off-line, protecting it from subsequent exposure to damaging conditions.

Installation Notes for the direct connection

Rayvoss installations are driven by the size of the enclosure, as indicated in the table below and must comply with the national codes:

Enclosure type	Enclosure Size	Upstream protection (Class J fuse or circuit breaker)	Maximum Conductor Size
S	8" x 6" x 6" [203x152x152mm]	50A	#6AWG [10mm ²]
M	12" x 10" x 6" [305x254x152mm]	100A	#2AWG [35mm ²]
R	15" x 15" x 7" [380x380x170mm]	100A	#2AWG [35mm ²]
N	20" x 16" x 8" [508x406x203mm]	225A	#4/0AWG [95mm ²]
A	20" x 20" x 8" [508x508x203mm]	225A	#4/0AWG [95mm ²]

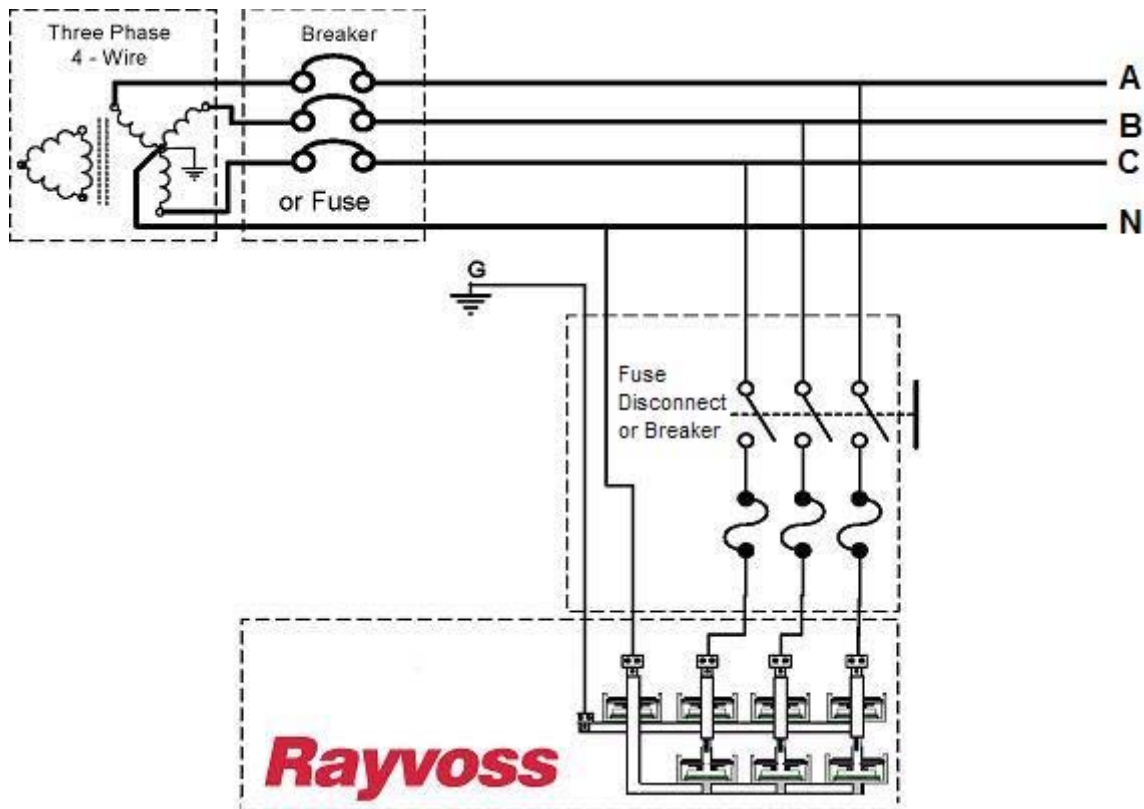
Rayvoss configurations based on the Strikesorb 80 modules are rated for use on circuits capable of delivering up to 200kA rms symmetrical fault current. Rayvoss systems based on the Strikesorb 40 modules are rated for use on circuits capable of delivering up to 100kA rms symmetrical fault current.

▪ T-Connection

T-connection is used in the following situations where direct connection is not possible:

- line wire size is greater than 4/0 AWG
- metallic bars are used instead of wires

Due to the ability of Rayvoss system to use large-size lead wires, Rayvoss can be connected using bigger fuses compared to the ones used in conventional TVSS systems even when connected in T-configuration. This allows continuous protection at higher surge currents, making maximum use of Strikesorb's superior capabilities.



▪ Installation notes for T-connection

Rayvoss installations are driven by the size of the enclosure, as indicated in the table below and must comply with the national electrical codes:

Enclosure type	Enclosure Size	Protection (Class J fuse or circuit breaker)	Conductor
S	8" x 6" x 6" [203x152x152mm]	50A	#6AWG [10mm ²]
M	12" x 10" x 6" [305x254x152mm]	100A	#2AWG [35mm ²]
R	15" x 15" x 7" [380x380x170mm]	100A	#2AWG [35mm ²]
N	20" x 16" x 8" [508x406x203 mm]	225A	#4/0AWG [95mm ²]
A	20" x 20" x 8" [508x508x203mm]	225A	#4/0AWG [95mm ²]

Rayvoss configurations based on Strikesorb 80 modules are rated for use on circuits capable of delivering up to 200kA rms symmetrical short circuit current. Rayvoss systems based on Strikesorb 40 modules are rated for use on circuits capable of delivering up to 100kA rms symmetrical short circuit current.

Installation Instructions

BEFORE INSTALLING, MAKE CERTAIN THE SYSTEM VOLTAGE AND CONFIGURATION ON THE NAMEPLATE IS APPROPRIATE FOR YOUR ELECTRICAL SERVICE.

Cautions & Warnings

1. Always select the appropriate Rayvoss type for your electrical system.
2. Rayvoss systems should be installed by qualified electricians.
3. Installation and wiring should conform to the National Electrical Code and applicable local codes.
4. The environmental rating and type of this product will be adversely affected if the incorrect type and rating of conduit fitting or cable glands is installed.
5. Disconnect from energized circuits before installing or servicing.

Mounting

The Rayvoss system needs to be mounted to a solid, flat surface capable of supporting appropriate weight as determined by the size of the enclosure per table below. It is convenient to install the lower mounting studs/bolts first as the Rayvoss has slotted lower mounting lugs. Once the lower studs/bolts are installed, the Rayvoss may be lowered onto them and the correct location for the upper mounting studs/bolts can be marked through the holes in the upper mounting lugs.

Enclosure type	Enclosure Size	Support Weight
S	8" x 6" x 6" [203x152x152mm]	5kg (11lb)
M	12" x 10" x 6" [305x254x152mm]	10kg (22lb)
R	15" x 15" x 7" [380x380x170mm]	17kg (38lb)
N	20" x 16" x 8" [508x406x203mm]	21kg (47lb)
A	20" x 20" x 8" [508x508x203mm]	27kg (62lb)

DO NOT USE THE MOUNTING LUGS TO MAKE THE SAFETY AND PROTECTION GROUND.

Grounding

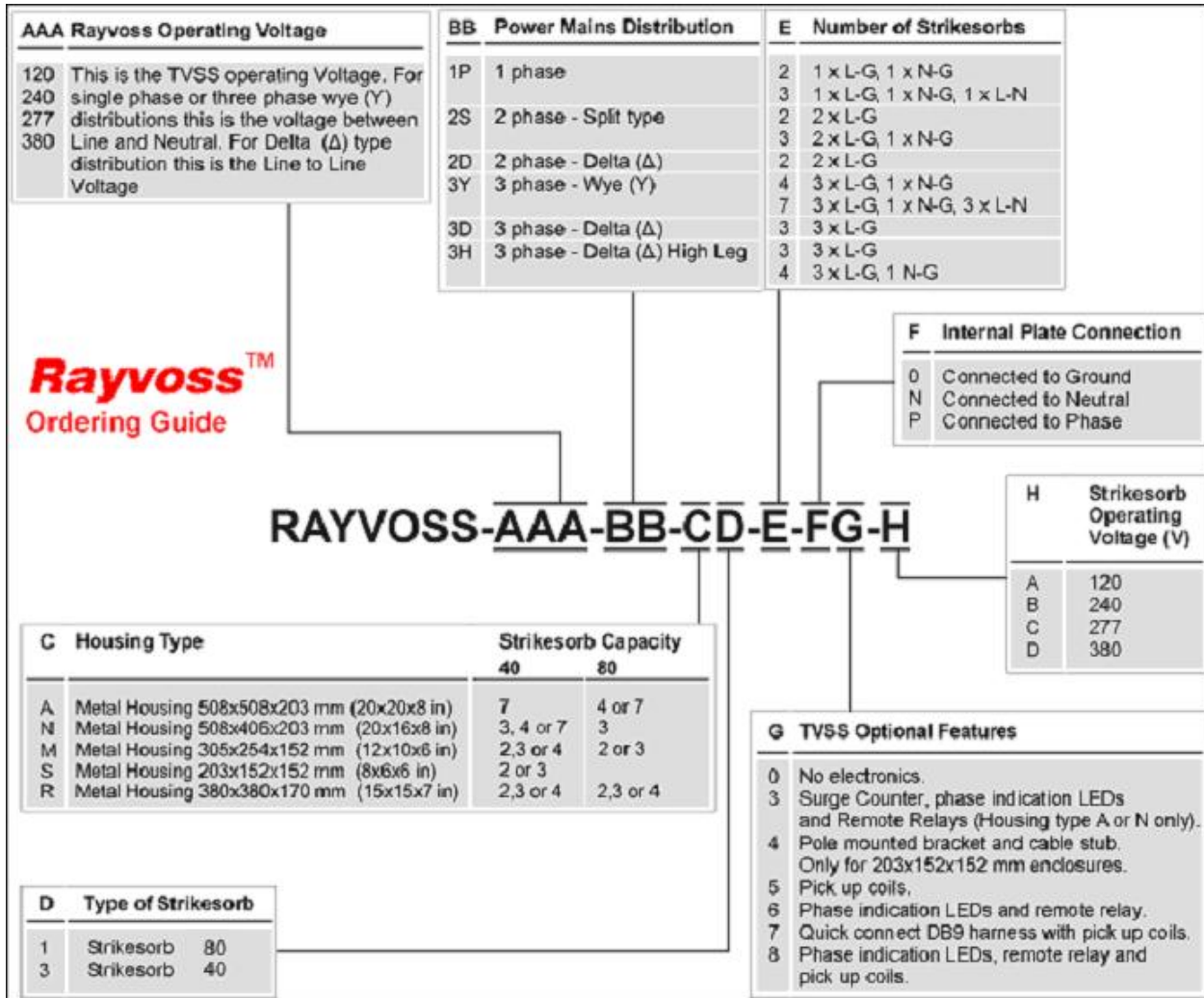
Ground connection is made to the ground terminal mounted on the inside of the Rayvoss enclosure. A short and straight cable should make the connection to the power ground or to the main ground bar at the installation location.

Installation of Remote Surge Counter

Plug the DB9 connecting cable to the respective plug at the lower side of the Rayvoss box and to the remote counter (connecting cable length is 10ft – 3m). Plug the power supply unit of the remote counter to a 120-240VAC outlet. Connect the 24VDC plug of the power supply unit to the remote counter.

APPENDIX

Product Selection Guide



A step-by-step product selection guide can be found on www.rayvoss.com