
Technical Information

Explosion Protection
(For ProSafe-RS)

TI 32S01J30-01E

Introduction

This book describes explosion protection compliance of ProSafe-RS. The engineering practice of explosion protection is regulated in each country, and in principle, construction technique including wiring should be done in accordance with the safety standards. When you build an explosion protection system for a real job, select products so as to comply with the standards of the country in which it is used, and check for construction technique beforehand.

Furthermore, this document contains the details of the NFM014-A13, NIE009-A101, and NFM037-A101 certificates that are included in the product documentation.

Please refer to CENTUM Explosion Protection (TI 33Q01J30-01E) for a general explanation of the explosion protections.

Safety Precautions

■ Safety, Protection, and Modification of the Product

- In order to protect the system controlled by the product and the product itself and to ensure safe operation, observe the safety precautions described in the Technical Information (this book and ProSafe-RS Installation Guidance) and the User's Manuals. We assume no liability for safety if users fail to observe these instructions when operating the product.
- If this product is used in a manner not specified in the Technical Information, the protection provided by this product may be impaired.
- If any protection or safety circuit is required for the system controlled by the product or for the product itself, prepare it separately.
- Be sure to use the spare parts approved by Yokogawa Electric Corporation (hereafter simply referred to as YOKOGAWA) when replacing parts or consumables.
- Do not use the accessories (Power supply cord set, etc.) that came with the product for any other products.
- Modification of the product is strictly prohibited.
- The following symbols are used in the product and this book to indicate there are safety precautions:



Indicates that caution is required. This symbol for the Product indicates the possibility of dangers such as electric shock on personnel and equipment, and also indicates that the user must refer to the User's Manuals for necessary actions. In the User's Manuals, this symbol is used together with a word "CAUTION" or "WARNING" at the locations where precautions for avoiding dangers are described.



Indicates that caution is required for hot surface. Note that the devices with this symbol become hot. The risk of burn injury or some damages exists if the devices are touched or contacted.



Identifies a protective conductor terminal. Before using the Product, you must ground the protective conductor terminal to avoid electric shock.



Identifies a functional grounding terminal. A terminal marked "FG" also has the same function. This terminal is used for grounding other than protective grounding. Before using the Product, you must ground this terminal.



Indicates an AC supply.



Indicates a DC supply.



Indicates that a component such as a power supply switch is turned ON.



Indicates that a component such as a power supply switch is turned OFF.

■ Symbols in this Book

This book has the following symbols.



WARNING

Indicates precautions to avoid a danger that may lead to death or severe injury.



CAUTION

Indicates precautions to avoid a danger that may lead to minor or moderate injury or property damage.

IMPORTANT

Identifies important information required to understand the operations or functions.

TIP

Identifies additional information.

SEE ALSO

Identifies a source to be referred to.

■ Considerations for Using This Product in Safety

● Power Supply Wiring



WARNING

The connection of power cables and the selection of power cables must be done in accordance with this book and the Installation Guidance, and implement so as to comply with the standards and laws about explosion protection in the country or the area where the cables are laid.

● Ground Wiring



WARNING

You should implement so as to comply with the standards and laws about explosion protection in the country or the area where the cables are laid.

● Input/Output Wiring



CAUTION

- The connection of input and output should be done in accordance with this book and the Installation Guidance, and implement so as to comply with the standards and laws about explosion protection in the country or the area where the cables are laid.
 - Wiring material and equipment which is electrically connected to this equipment should be products that complied with standards and laws about explosion protection in the country or the area where the cables are laid.
-

● Replacement of fuse



WARNING

- The specified fuse must be used as a replacement.
 - Before replacing fuse, confirm if there's no dangerous gas, and the power supply is OFF.
-

● Maintenance



WARNING

- The maintenance work should be done only by operators who received special training.
 - Use a vacuum cleaner and soft cloth to clean up the equipment.
 - At the time of the maintenance work, put on wrist straps and take the measures for Electrostatic Discharge.
 - If the label that indicates Danger is not legible, or if it has peeled off, order a new label using part number T9029BX.
 - Before starting the maintenance work, confirm if there's no dangerous gas.
 - The maintenance work should be done in accordance with the instructions provided in the related Installation Guidance and User's Manuals.
-

● Drawing Conventions

Some drawings depicted in the user's manual may be partially emphasized, simplified, or omitted for the convenience of description.

Trademark

■ Trademark Acknowledgments

The names of corporations, organizations, products and logos herein are either registered trademarks or trademarks of Yokogawa Electric Corporation and their respective holders.

Explosion Protection (For ProSafe-RS)

TI 32S01J30-01E 26th Edition

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1. ProSafe-RS and Explosion Protection Instrumentation

1.1 Explosion Protection Standards that ProSafe-RS Complies

There are various standards for explosion protection in each region. Therefore, when we try to use equipment in a certain region, it needs to be approved by the explosion protection standards adopted in the region. ProSafe-RS, a global product, has been certified according to the standards adopted in North America and Europe.

The table below lists the explosion protection standards that ProSafe-RS complies and their certification authorities. As shown in the table, ProSafe-RS devices comply with the FM Approval Standard for Non-Incendive equipment and satisfy the protection ATEX Type “n” therefore, they can be installed in Zone 2 or Division 2 hazardous areas. This chapter mainly describes the explosion protection compliance of ProSafe-RS devices.

Table Explosion Protection Standards that ProSafe-RS Complies (1/2)

Explosion protection construction	Complies standard	Certification authorities	Applicable equipment
US (FM) Nonincendive	Class 3600 : 2011 Class 3611 : 2004 Class 3810 : 2005	FM	Safety Control Unit, FIO, N-IO, and associated equipment (For detail, refer to Appendix 1.1.)
	FM 3600 : 2018 FM 3611 : 2018 FM 3810 : 2018 ANSI/UL 121201 Ed. 9 (2019) ANSI/UL 61010-1 Ed. 3 (2012) ANSI/UL 61010-2-030 Ed. 1 (2012) ANSI/UL 61010-2-201 Ed. 1 (2014)	FM	N-IO field enclosure (For detail, refer to Appendix 1.1.)
	Class 3600:2011 Class 3611:2004 Class 3810:2005 ANSI/ISA-60079-0 (12.00.01)-2013 ANSI/ISA-60079-15 (12.12.02)-2012	FM	S2BN5D Base plate for barrier (N-IO)
US (FM) intrinsic safe explosion protection	Class 3600:2011 Class 3610:2010 ANSI/ISA-60079-0 (12.00.01)-2013 ANSI/ISA-60079-11 (12.02.01)-2014	FM	S2BN5D Base plate for barrier (N-IO)
Canada (FM) Non-Incendive	C22.2 No.213-15 CAN/CSA-C22.2 No.61010-1-12 CAN/CSA-IEC 61010-2-201:14 CAN/CSA-C22.2 No.61010-2-030-12	FM	FIO, N-IO, and associated equipment (For detail, refer to Appendix 1.2.)
	C22.2 No. 213-17 CAN/CSA-C22.2 No. 61010-1-12 CAN/CSA-C22.2 No. 61010-2-030-12 CAN/CSA-IEC 61010-2-201:14	FM	N-IO field enclosure (For detail, refer to Appendix 1.2.)
	CAN/CSA-C22.2 No. 61010-1-12 CAN/CSA-C22.2 No. 60079-0:11 CAN/CSA-C22.2 No. 213-M1987 (R2013) CAN/CSA-C22.2 No. 60079-15:12	FM	S2BN5D Base plate for barrier (N-IO)
Canada (FM) intrinsic safe explosion protection	CAN/CSA-C22.2 No. 60079-0:11 CAN/CSA-C22.2 No. 60079-11:14	FM	S2BN5D Base plate for barrier (N-IO)

Note: Regarding the latest conformity standard, refer to the GS 32P01B60-01EN “ProSafe-RS Standards Compliant Models”.

Table Explosion Protection Standards that ProSafe-RS Complies (2/2)

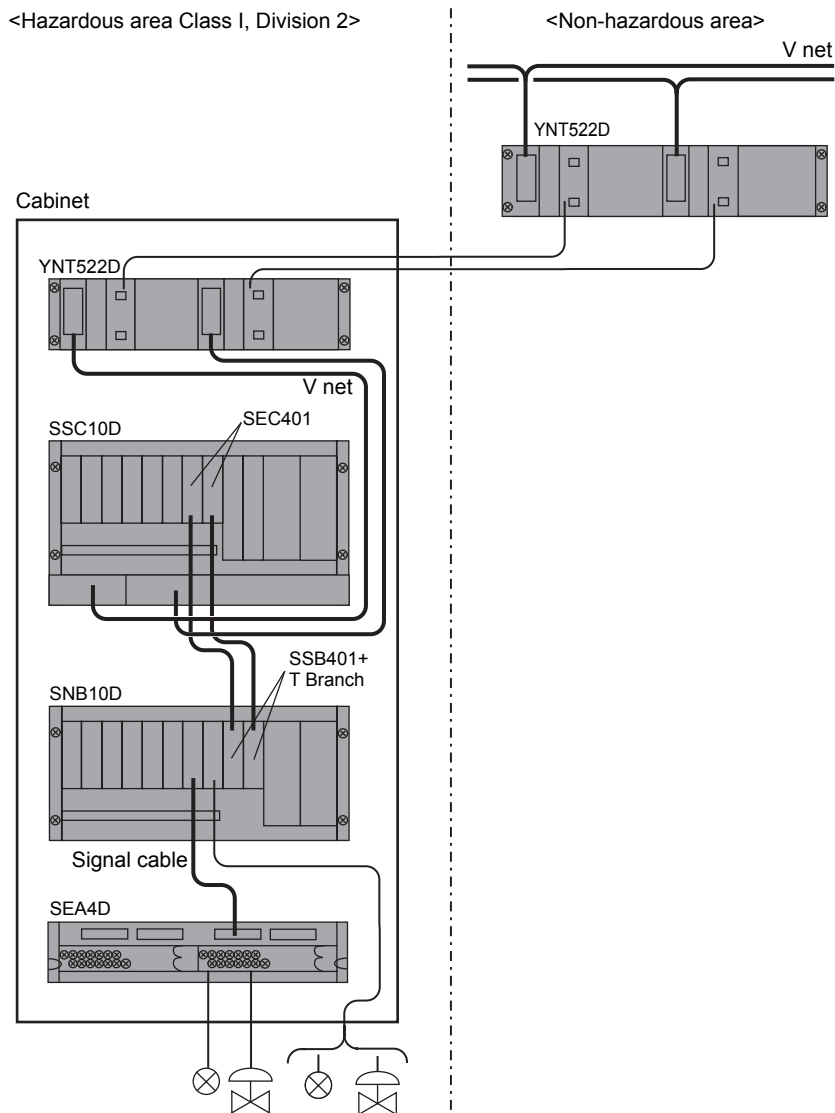
ATEX Type “n”	EN 60079-0: 2012+A11: 2013 EN 60079-15: 2010	Self-declaration	Safety Control Unit, FIO, N-IO, and associated equipment (For detail, refer to Appendix 2.1.)
	EN 60079-0:2012+A11:2013 EN 60079-15:2010	EXA	S2BN5D Base plate for barrier (N-IO)
	EN IEC 60079-0:2018 EN IEC 60079-15:2019	FM	N-IO field enclosure (For detail, refer to Appendix 2.1.)
IECEx Type “n”	IEC 60079-0:2011 IEC 60079-15:2010	FM	Safety Control Unit, N-IO, and associated equipment (For detail, refer to Appendix 2.2.)
	IEC 60079-0 Ed. 7.0 (2017) IEC 60079-15 Ed. 5.0 (2017)	FM	N-IO field enclosure (For detail, refer to Appendix 2.2.)
ATEX Type “e” (increased safety “e”)	EN IEC 60079-0:2018 EN IEC 60079-7:2015 + A1:2018	FM	N-IO field enclosure (For detail, refer to Appendix 2.1.)
IECEx Type “e” (increased safety “e”)	IEC 60079-0 Ed. 7.0 (2017) IEC 60079-7 Ed. 5.1 (2017)	FM	N-IO field enclosure (For detail, refer to Appendix 2.2.)
Emirates Conformity Assessment Scheme (ECAS-Ex) Type “n”	IEC 60079-0: 2011 IEC 60079-15: 2010	UL	Safety Control Unit, N-IO, and associated equipment except for A2BM4, S2BN4D and S2BN5D (For detail, refer to Appendix 2.3.)
ATEX Type “i” (intrinsic safety explosion protection)	EN 60079-0: 2012+A11: 2013 EN 60079-11 : 2012	EXA	S2BN5D Base Plate for barrier (N-IO)
IECEx Type “i” (intrinsic safety explosion protection)	IEC 60079-0: 2011 IEC 60079-11 : 2011	EXA	S2BN5D Base Plate for barrier (N-IO)

Note: Regarding the latest conformity standard, refer to the GS 32P01B60-01EN “ProSafe-RS Standards Compliant Models”.

1.2 Explosion Protection Construction Adopted for ProSafe-RS Devices

As described in 1.1, each country has its own standards and rules regarding technical methods for explosion protection. To install ProSafe-RS in hazardous areas, NI and Type “n” regulations are adopted as explosion protection construction. The adoption of NI and Type “n” makes it possible to install ProSafe-RS in Division 2 or Zone 2 that covers most hazardous areas. This widens a more variety of instrumentation. In addition, it makes it possible to connect to field devices installed in Division 2 or Zone 2 hazardous area. (There are some restrictions.) With N-IO field enclosure, NI, “ec” and Type “n” are adopted as explosion protection construction for the installation of N-IO field enclosure in hazardous areas. The adoption of NI allows N-IO field enclosure to be installed in Class II hazardous area (Division 2 or Zone 2). To install ProSafe-RS devices in a hazardous area, the nodes and terminal boards as well as I/O modules should comply with the standards. The figure below shows an example of NI compliant devices. The devices in shading and the cables shown in heavy line are NI compliant products.

For NI compliant products, see Appendix 1, “List of NI compliant products and NI parameters.”



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Figure Example of the Configuration in Hazardous Area for V net

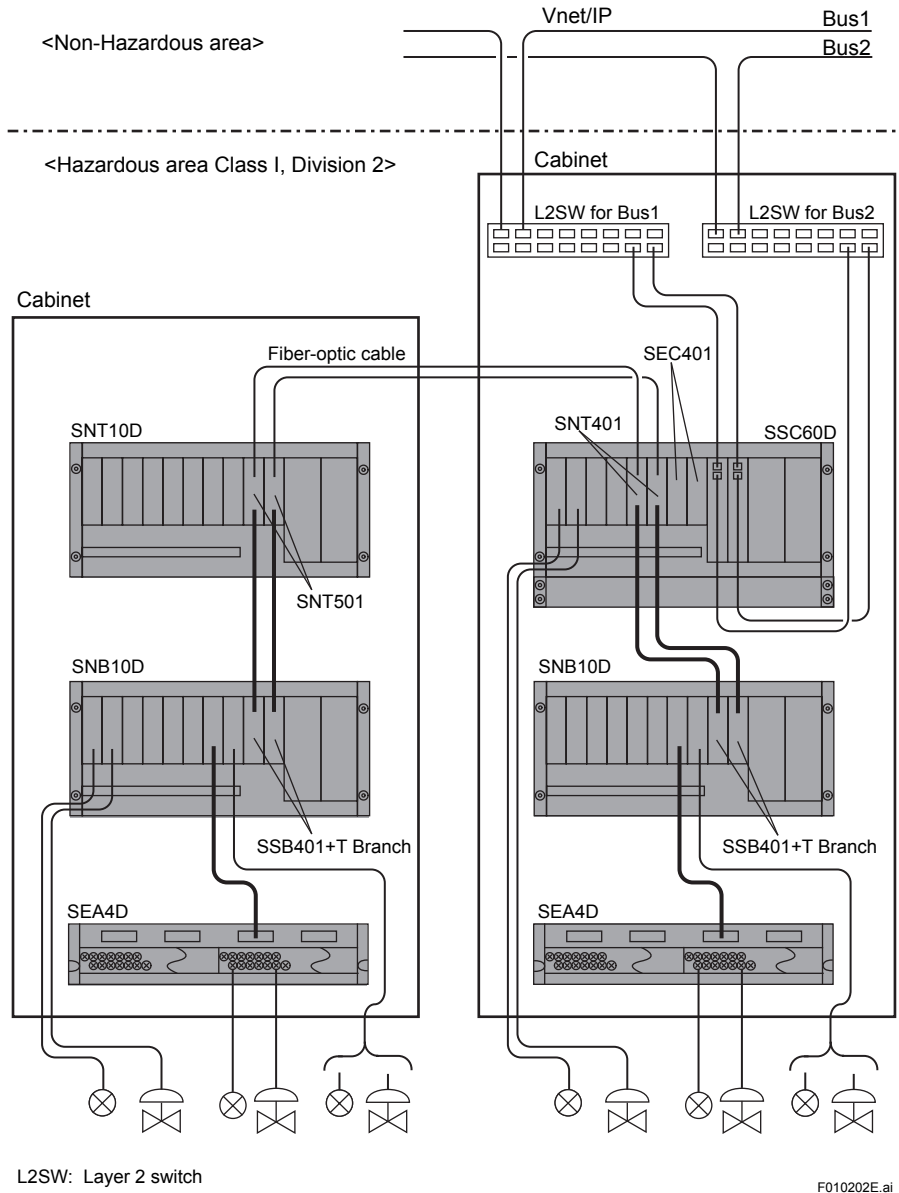


Figure Example of the Configuration in Hazardous Area for Vnet/IP

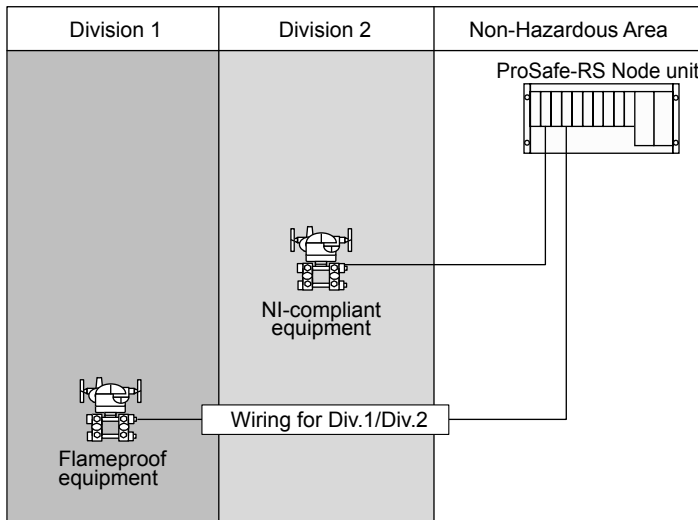
When the NI-compliant equipment is connected, energy exchange between them may affect the properties of NI-compliant equipment. Therefore, to ensure the properties, it is necessary to compare parameters among connected equipment in advance. With the results, it is necessary to determine whether general wiring can be used for connection in a hazardous area or dedicated wiring for Division 2 is needed. To compare parameters, it is required to display parameters on NI-compliant equipment.

1.3 Overview of ProSafe-RS Connection to the Devices Installed in a Hazardous Area

This section describes the overview of ProSafe-RS connection to the devices installed in a hazardous area, giving some examples

■ Connection of Non-Incendive Compliant Equipment

NI-compliant equipment can be connected to the devices installed in Division 2. For connection to NI-compliant device, it is necessary to compare parameters of the device installed in a hazardous area and those of the ProSafe-RS equipment to determine whether connection is available or not. NI-compliant equipment can be installed in Division 2 if it is in a keyed metal enclosure approved by certification authorities.

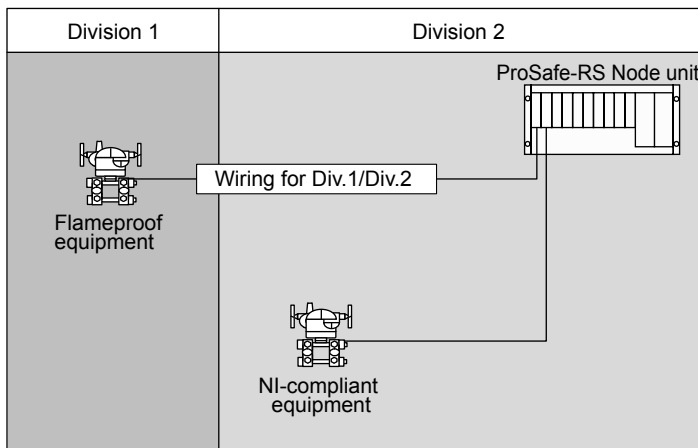


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Figure NI (Flameproof Wiring)

IMPORTANT

Flameproof wiring shows cabling (with flameproof packing) or metal tube wiring (sealing fitting). Lay wiring according to installation specifications of the flameproof equipment.

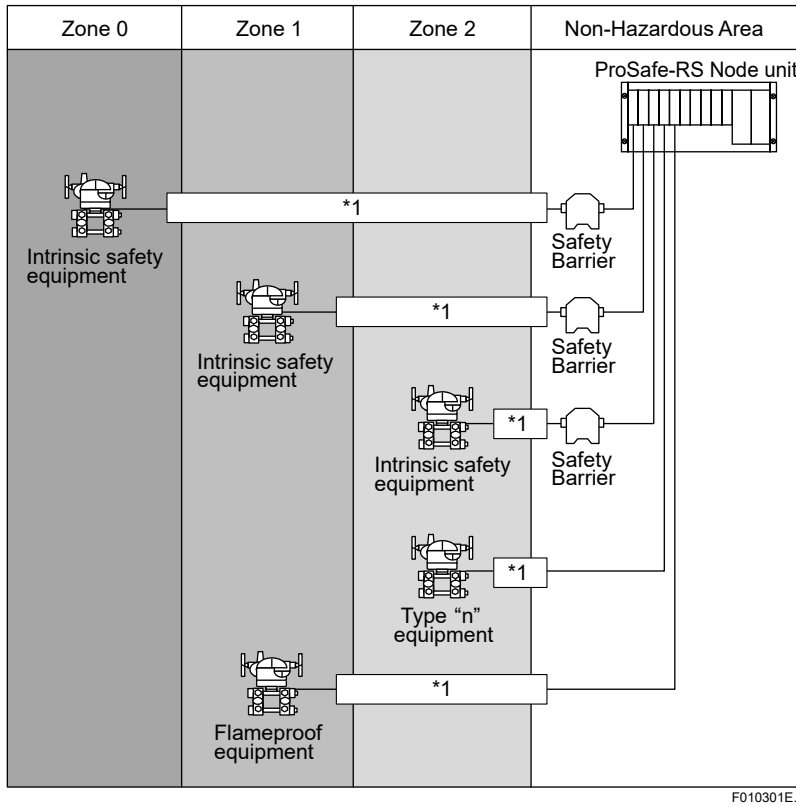


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Figure NI (Installation in Division 2)

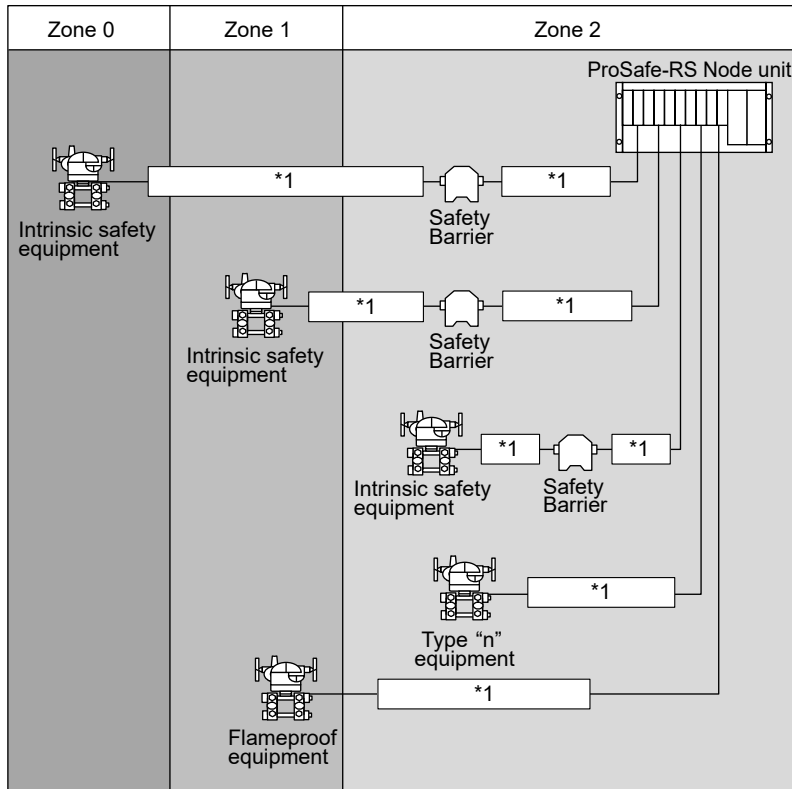
■ Connecting Type “n”-compliant Equipment

ProSafe-RS Type “n” equipment can be connected to the intrinsic safety equipment installed in Zone 0, Zone 1 and Zone 2 using a safety barrier and explosion-proof wiring as shown in the following figures. They can be connected to Type “n” equipment installed in Zone 2 using explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region. And they can be connected to flameproof equipment using explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region. Type “n”-compliant equipment (24 V DC supplied model) can be installed in Zone 2 if it is in a keyed metal enclosure with protection rating of IP54 or higher.



*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

Figure Type “n”



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*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

Figure Type "n" (Installation in Zone 2)

■ Overview of Connecting N-IO Components

● Overview of Connecting S2BN1D base plate for ATEX and IECEx

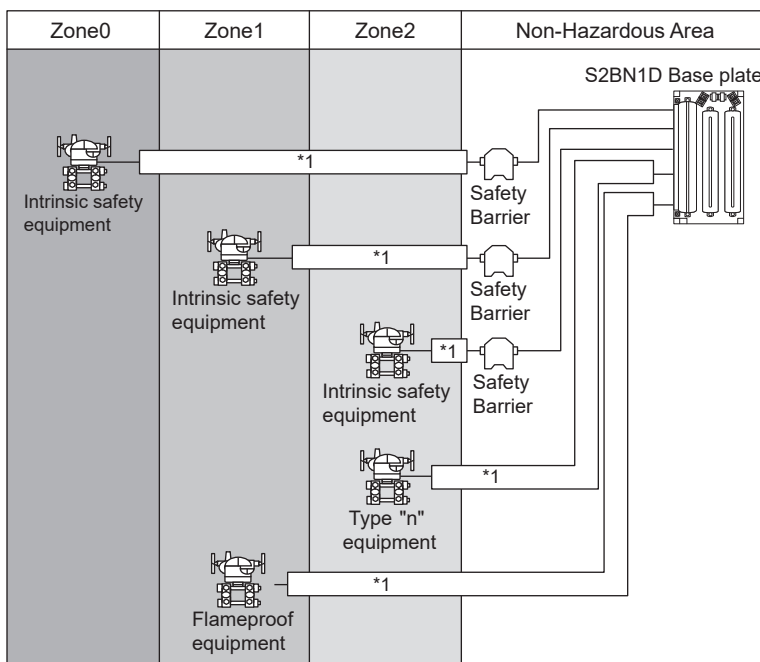
S2BN1D Base plate can be connected to the intrinsic safety equipment installed in Zone 0, Zone 1, and Zone 2 using a barrier and explosion-proof wiring as shown in the following figures. They can be connected to Intrinsic safety equipment installed in Zone 0, 1, and 2 using Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

They can be connected to Type “n” equipment installed in Zone 2 using explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

And they can be connected to flame-proof equipment using explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

N-IO node unit including S2BN1D and SCU or node unit (24 V DC feeding type) can be installed in Zone 2 by mounting in a keyed metal cabinet with protection rating of IP54 or higher.

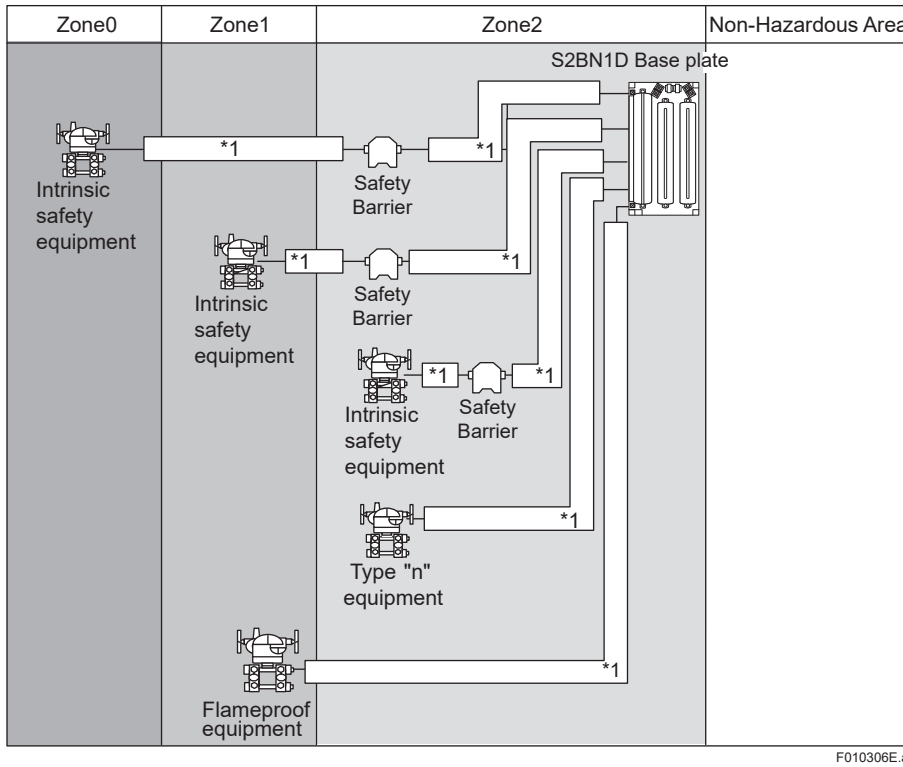
N-IO field enclosure S2NN70D is equipped with S2BN1D inside the enclosure, thus the following figure is also applicable to S2NN70D. In the case of S2NN70D, replace S2BN1D with S2NN70D.



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*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region

Figure Connection of S2BN1D for ATEX and IECEx (1)



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*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region

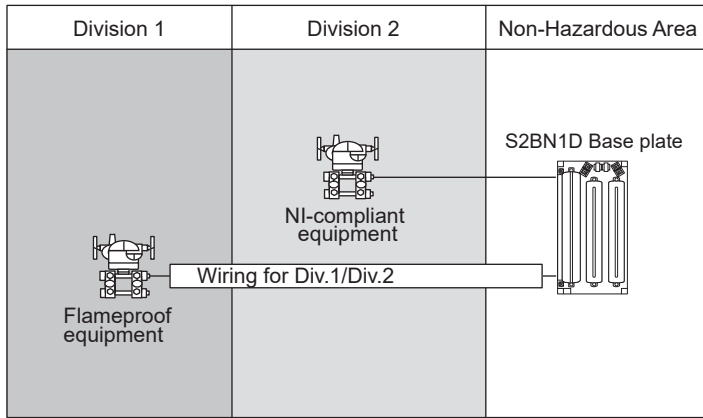
Figure Connection of S2BN1D for ATEX and IECEx (2)

● **Overview of Connecting S2BN1D base plate for US (FM) and Canada (FM)**

S2BN1D base plate can be connected to the devices installed in Division 2. For the connection to an NI-compliant module, it is necessary to compare parameters between the device installed in a hazardous area and the device of ProSafe-RS to evaluate whether connection is possible or not.

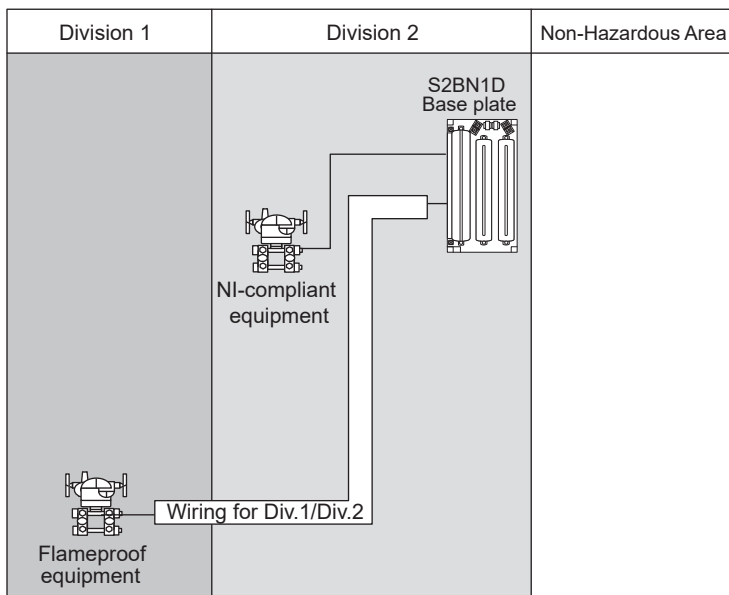
N-IO node unit including S2BN1D can be installed in Division 2 by mounting in a keyed metal cabinet approved by approval authorities.

N-IO field enclosure S2NN70D is equipped with S2BN1D inside the enclosure, so the figure below is also applicable for S2NN70D. In that case, replace S2BN1D with S2NN70D in the figure below.



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Figure Connection of S2BN1D for FM and CSA (1)



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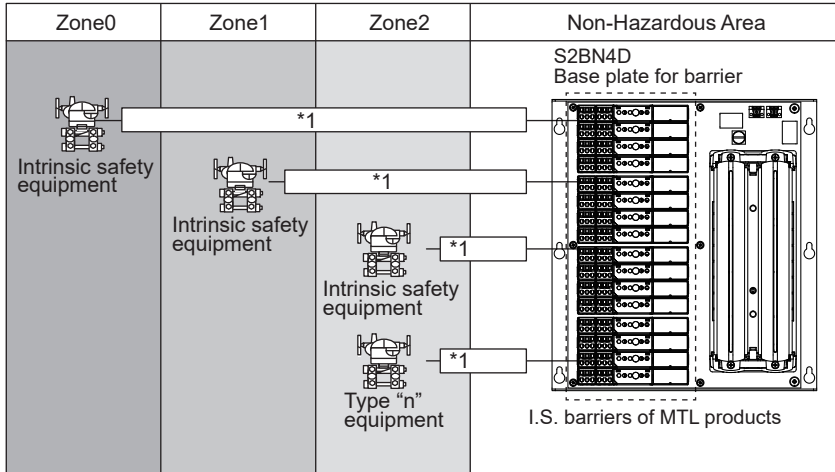
Figure Connection of S2BN1D for FM and CSA (2)

● Overview of Connecting S2BN4D base plate for ATEX and IECEx

Intrinsic safety (hereinafter I.S.) barriers (*1) of MTL products from Eaton Electric Limited which can be mounted to the base plate (S2BN4D), comply with I. S. explosion protection standard (*2). I. S. barriers can be connected to the I. S. equipment installed in the hazardous area with explosion-proof wiring as shown in the following figures.

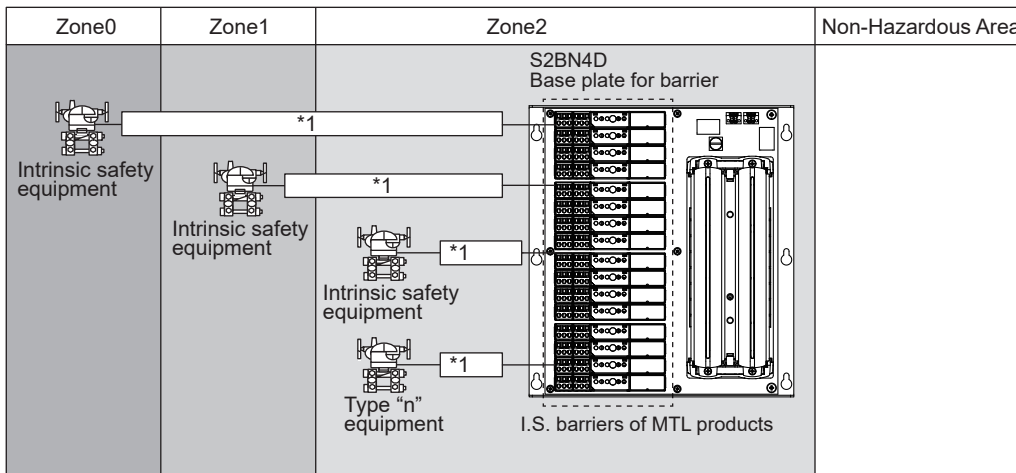
*1: Refer to "Base Plates for Barrier (for N-IO)" (GS 32P06P10-01EN).

*2: Refer to the instruction manual of MTL products for installation of the I.S. barriers.



1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

Figure Connection of S2BN4D for ATEX and IECEx (1)

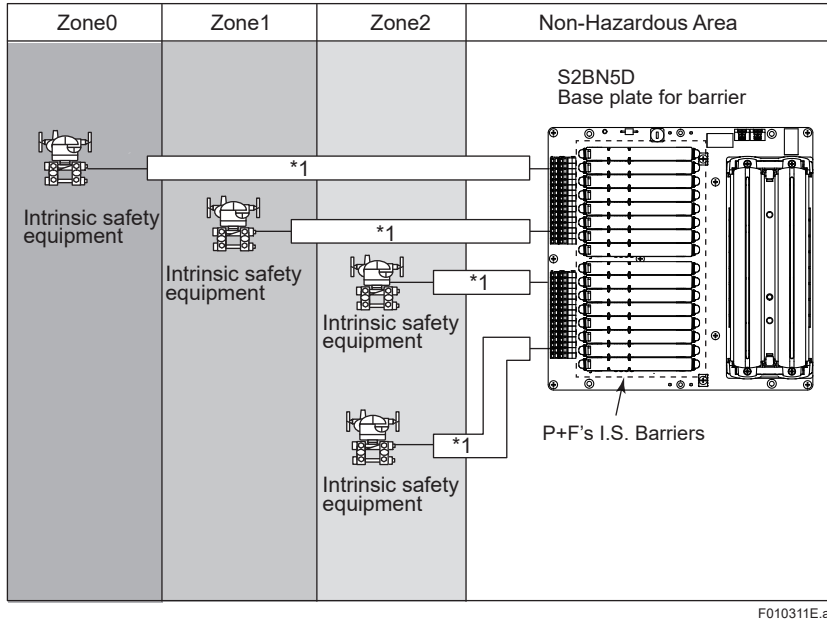


1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

Figure Connection of S2BN4D for ATEX and IECEx (2)

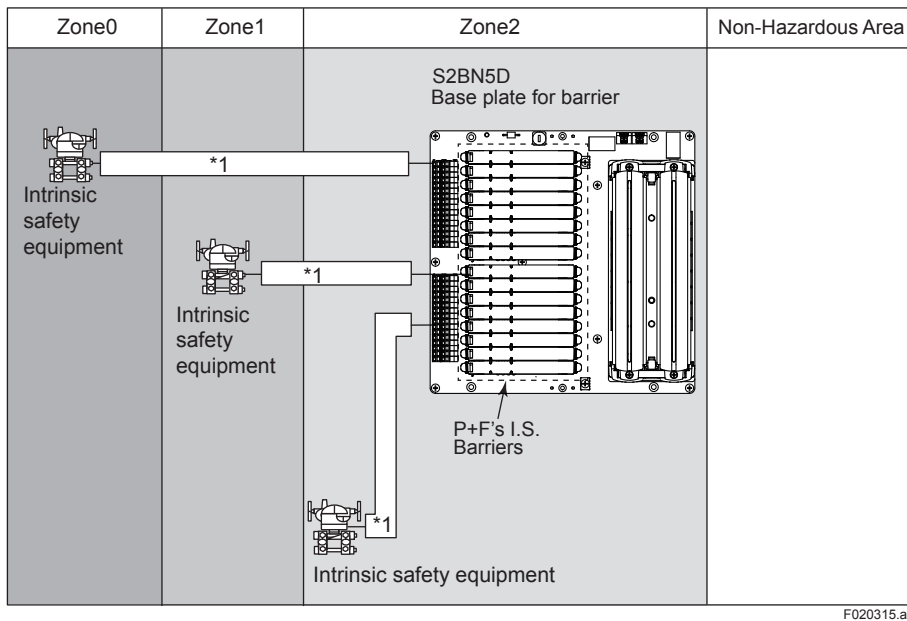
● Overview of Connecting S2BN5D base plate for ATEX and IECEx

S2BN5D base plate for barrier can be connected to the I.S./Type “n” equipment installed in the hazardous area with explosion-proof wiring and can be installed in Zone 2 by mounting in a keyed metal cabinet with protection rating of IP54 or higher as shown in the following figures. Please refer to the instruction manual of P+F I.S. barriers for installation of I.S. barriers.



*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

Figure Connection of S2BN5D for ATEX and IECEx (1)



*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

Figure Connection of S2BN5D for ATEX and IECEx (2)

● **Overview of Connecting S2BN5D barrier base plate for US (FM) and Canada (FM)**

S2BN5D base plate for barrier can be connected to the devices installed in Division 1 and Division 2. For connecting to the devices installed in Division 1 or Division 2, it is necessary to compare intrinsic safety parameters between the devices installed and S2BN5D to evaluate whether connection is possible or not.

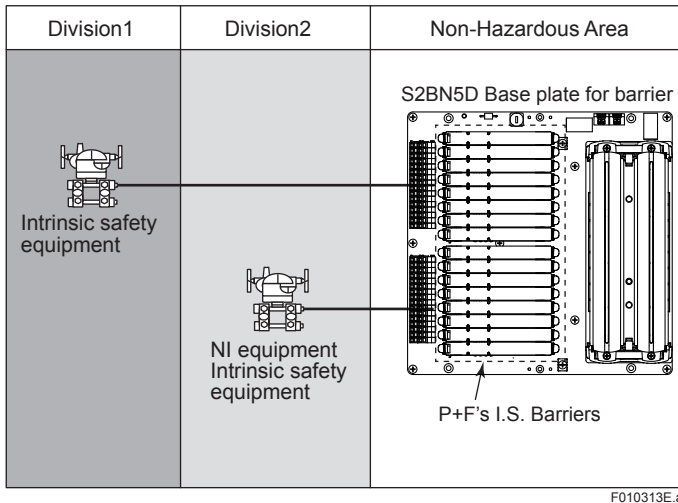


Figure Connection of S2BN5D for US (FM) and Canada (FM) (1)

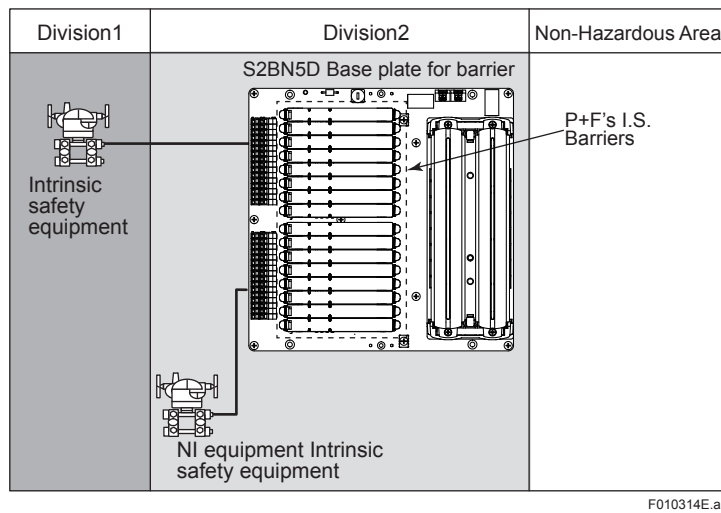


Figure Connection of S2BN5D for US (FM) and Canada (FM) (2)

2. Explosion Protection Instrumentation in Zone 2/Division 2

2.1 Non-Incendive

This document contains the details of FM Approvals Certification, NFM014-A13, NIE009-A101, and NFM037-A101. The precautions on handling the Non-Incendive products, the notices on wiring the Incendive products and so on are explained in this document.

Non-Incendive (hereinafter described as NI), especially in North America, represents one of the explosion protection constructions for explosion-proof apparatus used in hazardous areas. NI is a construction that enhances safety not to cause a spark, an arc or high surface temperatures in a normal operation. A safety control unit, a safety node unit, unit for Optical Bus Repeater Module, an I/O module, an optical repeater, an N-IO node, and N-IO field enclosure in the ProSafe-RS have acquired NI certificates of the following standards from FM. The certification ensures that the products above can be used in Class I, Division 2 (*1) hazardous (classified) areas and that the equipment can be directly connected to an NI approved field device installed in Class I, Division 2 hazardous areas. In addition, electrical equipment installed in non-hazardous areas can be directly connected to an NI approved local device installed in Class I, Division 2 hazardous areas.

*1: Class I, Division 2 is a place where gases or vapors do not form a potentially explosive atmosphere in a normal state, and even if they do, it stays for only a short period of time.

■ Approved Types and Standards

US (FM) NI

Class I, Division 2, Groups A, B, C and D, Temperature Code T4
 Class 3600 : 2011
 Class 3611 : 2004
 Class 3810 : 2005

For 100-120 V AC, 220-240 V AC and 24 V DC power supply

Canada (FM) NI

C22.2 No.213-15
 CAN/CSA-C22.2 No.61010-1-12
 CAN/CSA-IEC 61010-2-201:14
 CAN/CSA-C22.2 No.61010-2-030-12

US (FM) NI

Class I, Division2, Groups A, B, C, and D, Temperature code T4 (*1)
 FM 3600:2018 (*1)
 FM 3611:2018 (*1)
 FM 3810:2018 (*1)
 ANSI/UL 121201 Ed. 9 (2019) (*1)
 ANSI/UL 61010-1 Ed. 3 (2012) (*1)
 ANSI/UL 61010-2-030 Ed. 1 (2012) (*1)
 ANSI/UL 61010-2-201 Ed. 1 (2014) (*1)

Canada (FM) NI

Class I, Division2, Groups A, B, C, and D, Temperature code T4 (*1)
 C22.2 No.213-17 (*1)
 CAN/CSA-C22.2 No.61010-1-12 (*1)
 CAN/CSA-C22.2 No. 61010-2-030-12 (*1)
 CAN/CSA-IEC 61010-2-201:14 (*1)

*1: Applied for S2NN70D, S2NN60D, S2CB60, and A2CX100.

■ Precautions

- To install a device in accordance with the standards above, the device needs to be accommodated in a keyed metal cabinet and installed. As for US (FM), it is necessary to use a cabinet complying with FM Class 3810 and FM Class 3600 or approved by FM or local testing authorities for explosion-proof products.
As for Canada (FM), it is necessary to use a cabinet approved by CSA or local testing authorities for explosion-proof products. (*1)
- As a rule, NI explosion protection where FM approved device is connected to CSA approved device shall not be approved. It is necessary to connect devices approved by the same standard.
- Installation, wiring and maintenance of the devices should be carried out by the engineers or other professional personnel with related expertise.
- The Installation and the wiring should be in accordance with NEC (the National Electrical Code : ANSI/NFPA-70), CEC (Canadian Electrical Code) or wiring construction standards of the countries or regions where wiring is laid.
- During installation, the venting slots of the devices must not be blocked by cable parts, fixing accessories, etc. (*1)
- When the devices are used, abide by the following guidance so as to ensure the safety and performance.
 - Make sure that the door of the cabinet is closed when the devices are running.
 - Make sure that all the empty slots in the cabinet should be properly covered with attached caps.
 - Make sure that all the cables are rigidly fixed in the cabinet.
 - Make sure that the breakers are in the power supply circuits located in non-hazardous areas so that the power can be shutoff when abnormality occurs.
- Both the initial and periodical inspection should be based on the regulations of IEC 60079-17 and carried out by the personnel who have received the professional training.
- Instructions provided in GS (General specifications), TI (Technical Information of Installation Guidance) and/or IM (User's Manuals) shall be observed.
- As for the precautions of N-IO field enclosure, refer to Appendix4. US (FM) NI/ Canada (FM) NI Control Drawing.
- Please observe the following precautions while product is operating or under maintenance service.

*1: Excluding N-IO field enclosure.



WARNING

WARNING -EXPOSURE TO ANY CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE FOLLOWING DEVICES ; SBD2D, SBD3D, SBD4D and S1BB4D.

**WARNING**

WARNING -EXPLOSION HAZARD. DO NOT REMOVE OR REPLACE LAMPS OR FUSES UNLESS POWER HAS BEEN DISCONNECTED OR WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

**WARNING**

WARNING -EXPLOSION HAZARD. DO NOT DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

**WARNING**

WARNING -EXPLOSION HAZARD. DO NOT OPEN ENCLOSURE OR REPLACE BATTERY WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

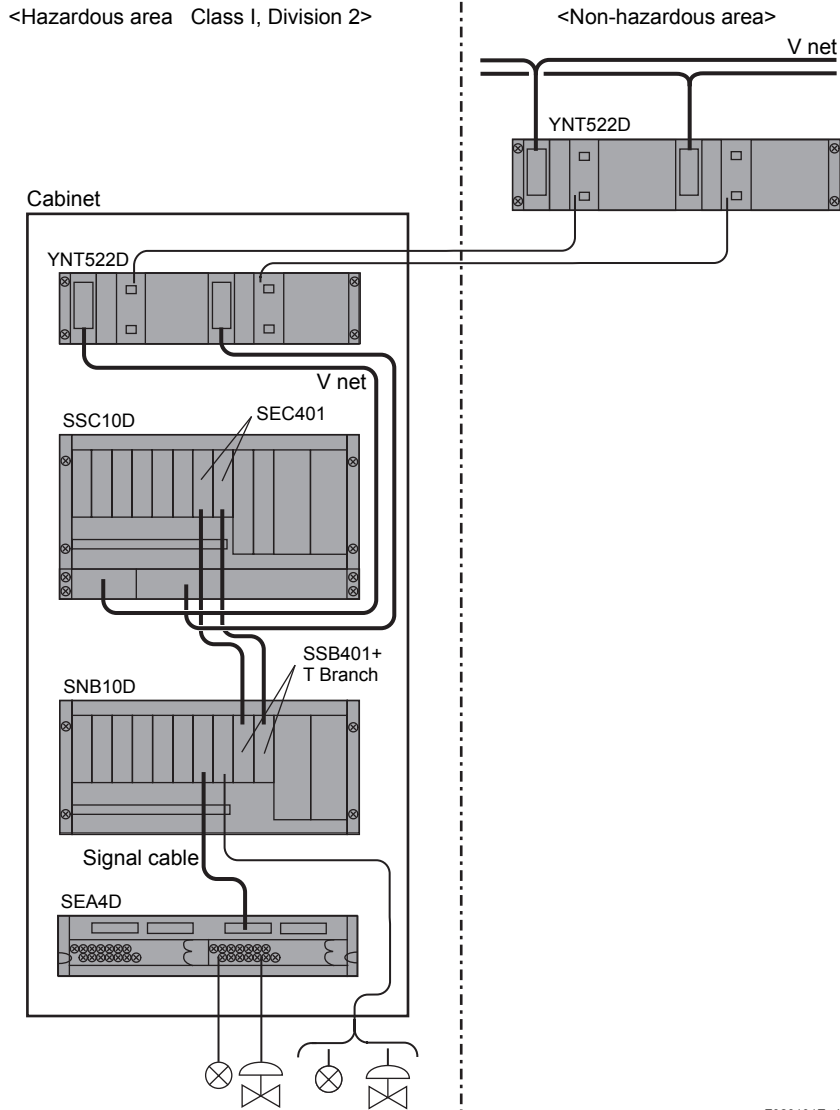
**WARNING**

For the warning of N-IO field enclosure, refer to Appendix 4. US (FM) NI / Canada (FM) NI Control Drawing.

NI approved Products and Their Configuration Example

The figure below is an example of the configuration of NI approved products which can be installed in hazardous areas.

For details, refer to Appendix for NI approved products.



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Figure Example of the Configuration of NI for V net

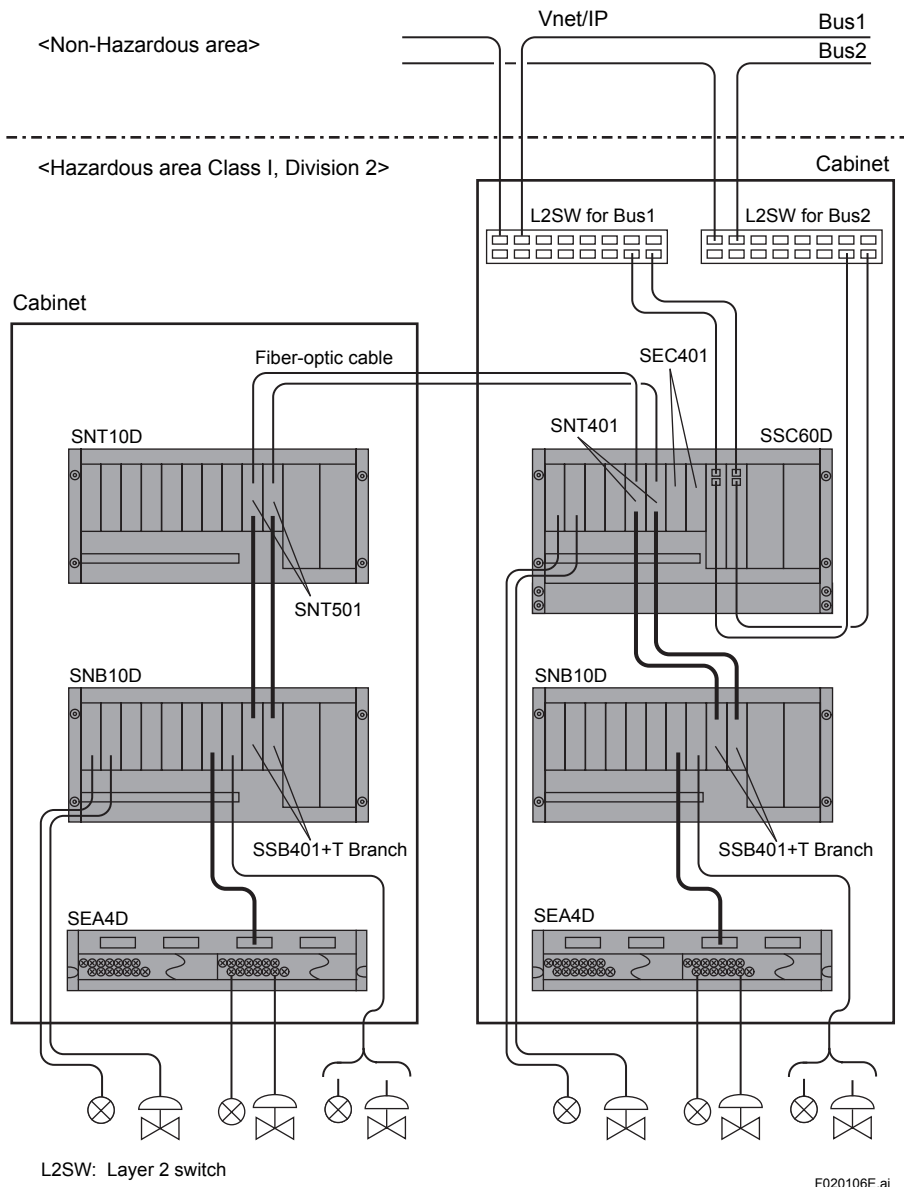


Figure Example of the Configuration of NI for Vnet/IP

■ Power Supply Wiring

The power cables for the safety control unit, safety node unit, unit for optical ESB bus repeater module, and N-IO node must be wired from a non-hazardous area by using specified Division 2, explosion-proof wiring such as conduit wiring.

In addition, do not apply stress on the both ends of the wiring cable.

The wiring should conform to the NEC (National Electrical Code: ANSI/NFPA-70), CEC (Canadian Electrical Code) or wiring construction standards of the countries or regions where wiring is laid.

The power cable of N-IO field enclosure must be wired in accordance with the instructions provided in the related GS (General Specifications), TI (Installation Guidance) and IM (User's Manuals).

■ Signal Wiring

Cables other than power cables should be wired to conform to NEC (National Electrical Code: ANSI/NFPA-70), CEC (Canadian Electrical Code) or the wiring construction standards of the countries or regions where wiring is laid. Please follow the procedure below.

- When V net cables (10BASE-2), Vnet/IP cables, ESB bus cables or GPS connection cables are connected outside the cabinet, use Division 2 wiring.
- When field wiring to I/O modules (including terminal blocks, terminal boards, etc.) is laid outside the cabinet, use Division 2 wiring.
- When an ALR111, ALR121, ALE111, S2LP131, S2EN402 or S2EN404 Communication Module is connected, use Division 2 wiring.
- The signal cable of N-IO field enclosure must be wired in accordance with the instructions provided in the related GS (General Specifications), TI (Installation Guidance) and IM (User's Manuals).

IMPORTANT

- (1) Attaching or removing a cable, a fuse or a card
In the system in operation, never attach or remove a cable, a fuse or a card in a explosive atmosphere.
- (2) Product maintenance
When product maintenance is carried out for the system in operation, never attach or remove the product in a explosive atmosphere.

<English>

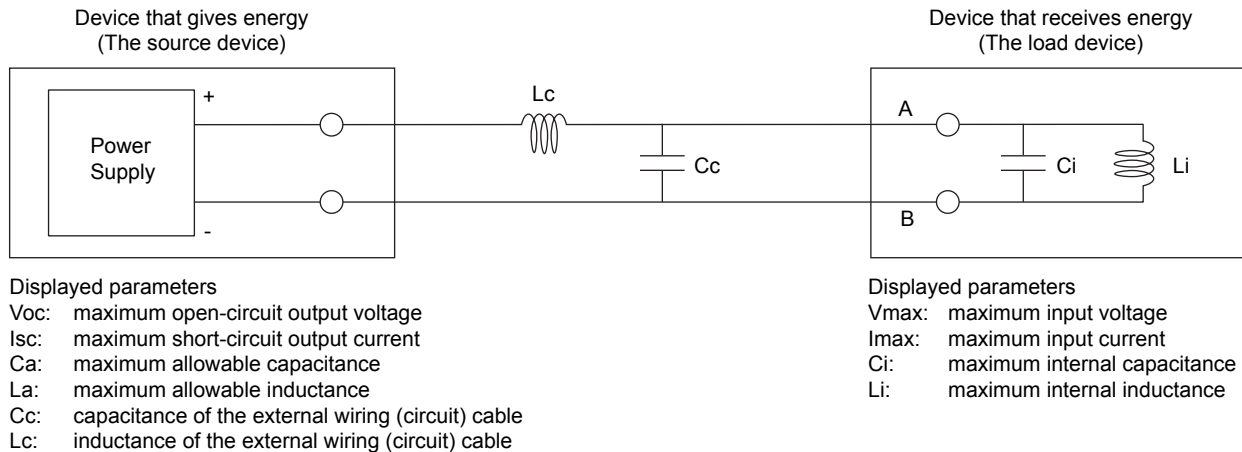
WARNING-EXPLOSION HAZARD-
DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE
NON-HAZARDOUS.

<French>

AVERTISSEMENT-RISQUE D'EXPLOSION. NE PAS DE BRANCHER TANT QUE LE
CIRCUIT EST SOUS TENSION, À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT
NON DANGEREUX.

Parameters in NI Device Connection

Since giving and receiving energy affects NI properties, parameters display is necessary for NI device connection to ensure the properties. To display parameters, NI devices are divided into one that gives energy and the other that receives energy.



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Figure Connection of Non-Incendive Devices and Associated Parameters

Parameters of the Device which Gives Energy

- Voc: maximum open-circuit output voltage
Maximum voltage developed at the open terminal (part) when the Non-Incendive (NI) circuit is open
- Isc: maximum short-circuit output current
Maximum current which flows when the NI is short circuited and earth fault occurs
- Ca: maximum allowable capacitance
Maximum capacitance that can be connected to the NI circuit
- La: maximum allowable inductance
Maximum inductance that can be connected to the NI circuit
- Cc: capacitance of the external wiring (circuit) cable
- Lc: inductance of the external wiring (circuit) cable

■ Parameters of the Device which Receives Energy

V_{max}: maximum input voltage

Maximum voltage to maintain the NI properties of the device

I_{max}: maximum input current

Maximum current to maintain the NI properties of the device

C_i: maximum internal capacitance

Maximum internal capacitance of the devices that are considered to be connected to the NI circuit (the external wiring) when the load device is connected to the NI circuit (the external wiring)

L_i: maximum internal inductance

Maximum internal inductance of the devices that are considered to be connected to the NI circuit (the external wiring) when the load device is connected to the NI circuit (the external wiring)

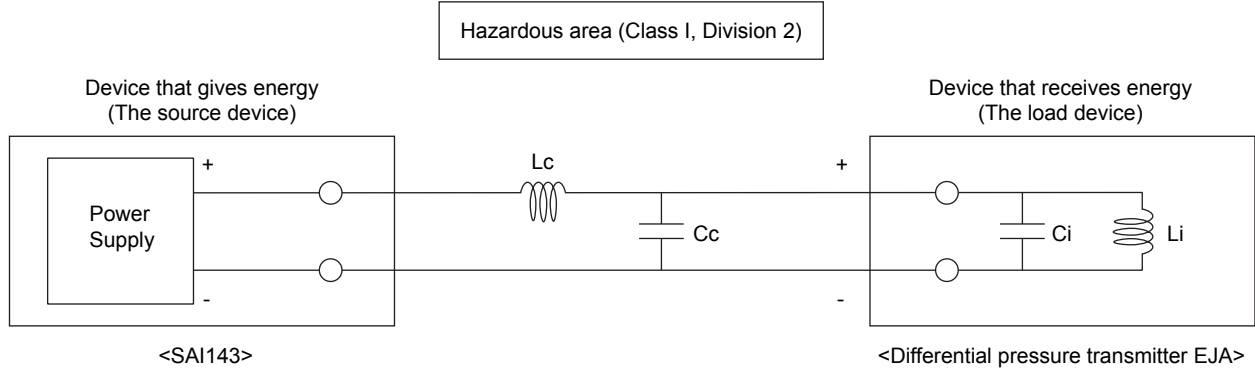
■ How to Compare Parameters

The following shows how to compare parameters when the device that gives energy and the device that receives energy are connected. If the parameters satisfy the following conditions, a FM NI explosion-proof device can be connected in a general wiring. If not, the wiring should be installed to conform to NEC (National Electrical Code: ANSI/NFPA-70) or an explosion-proof wiring defined in the relevant country.

Device that gives energy		Device that receives energy
V _{oc}	≤	V _{max}
I _{sc}	≤	I _{max}
C _a	≥	summation of C _i in the device which receives energy + summation of capacitance C _c in the external wiring
L _a	≥	summation of L _i in the device which receives energy + summation of inductance L _c in the external wiring

Example

As an example, we show the case where SAI143 I/O module, a power input module and EJA, a differential pressure transmitter of Yokogawa Electric Corporation are connected. EJA is connected to circuit of SAI143 via 100 m cable, and installed in Class I, Division 2 hazardous area.



The defined parameters have the following values.

(Voc) = 26.4 V
 (Isc) = 26 mA
 (Ca) = 0.13 μF
 (La) = 10 mH

and,

(Cc) = 200 pF/m × 100 m = 0.0002 μF × 100 = 0.02 μF
 (Lc) = 0.66 μH/m × 100 m = 0.00066 mH × 100 = 0.066 mH

(Vmax) = 30 V
 (Imax) = 165 mA
 (Ci) = 0.0225 μF
 (Li) = 0.73 mH

therefore,

Voc = 26.4 V	<	Vmax = 30 V
Isc = 26 mA	<	Imax = 165 mA
Ca = 0.13 μF	>	Ci + Cc = 0.0425 μF
La = 10 mH	>	Li + Lc = 0.796 mH

As the results above meet the combinational conditions, we can conclude that a field wiring can be installed in accordance with a general wiring construction.

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Figure Connection of SAI143 and EJA

Table Cable Parameter (*1)

Model	Lc (μH/m)	Cc (pF/m)	Remarks
YCB141	—	—	(*2)
YCB301	—	—	(*2)
KS1	1.50	110	
AKB331	1.50	110	
AKB651	—	—	(*2)
AKB131	—	—	(*2)
AKB132	—	—	(*2)
AKB135	—	—	(*2)
AKB136	—	—	(*2)
AKB161	—	—	(*2)
AKB611	2.00	200	
AKB162	—	—	(*2)

*1: These parameters are applied to all modes of each model if the mode is not specified in the Remarks.

*2: Wirings must comply with NEC (National Electrical Code : ANSI/NFPA-70) or the regulations of the relevant country.

■ Example of Connection

● Connecting a ProSafe-RS Device and a Device Installed in Division 2

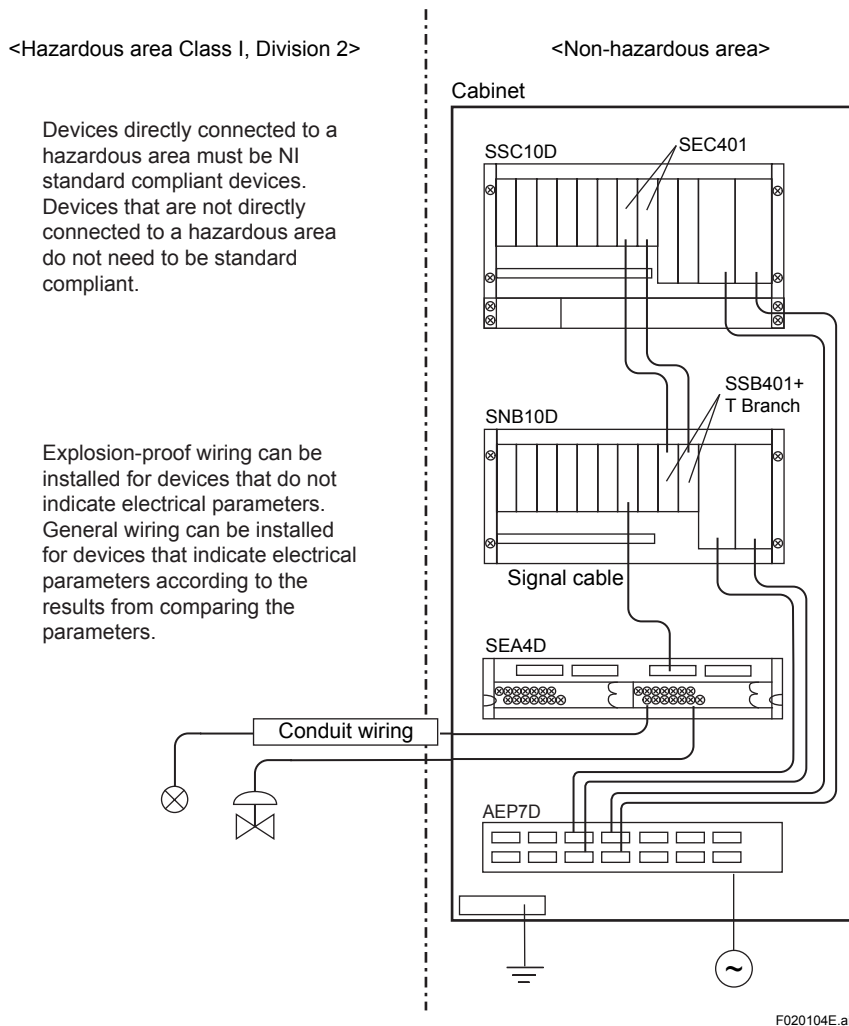


Figure Example of Connection (Flameproof Wiring)

- Connect to a field device in accordance with electrical parameter definitions of each device.
- To wire the devices for which electrical parameters are not defined, NEC (National Electrical Code: NFPA-70) or explosion-proof wiring (such as conduit wiring) defined in each country should be installed.

● Installing a ProSafe-RS device and a Device in Division 2

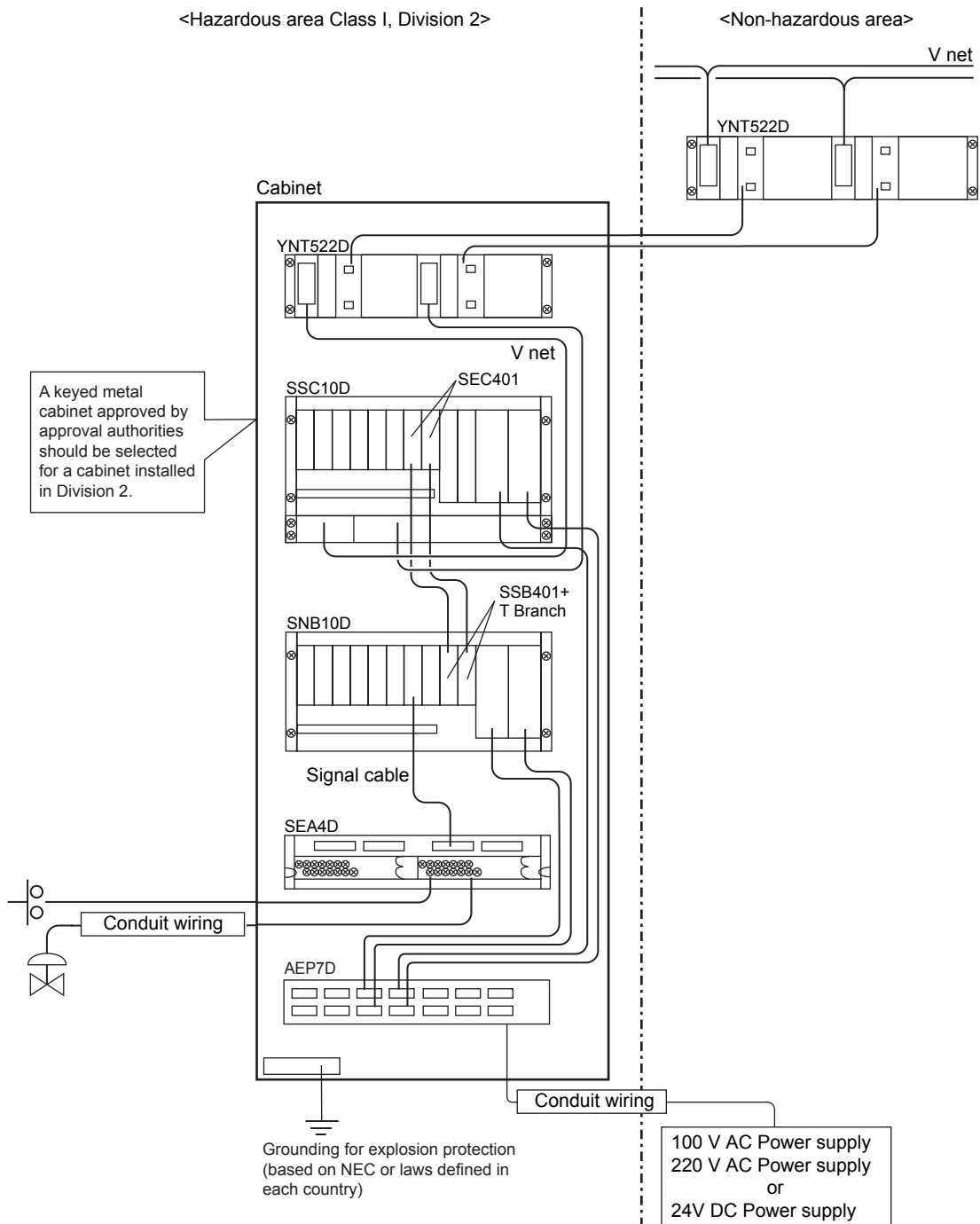


Figure Example of Connection (Installation in Division 2) for V net

- Connect to a field device in accordance with electrical parameter definitions of each device.
- To wire the devices for which electrical parameters are not defined, NEC (National Electrical Code: NFPA-70) or explosion-proof wiring (such as conduit wiring) defined in each country should be installed.

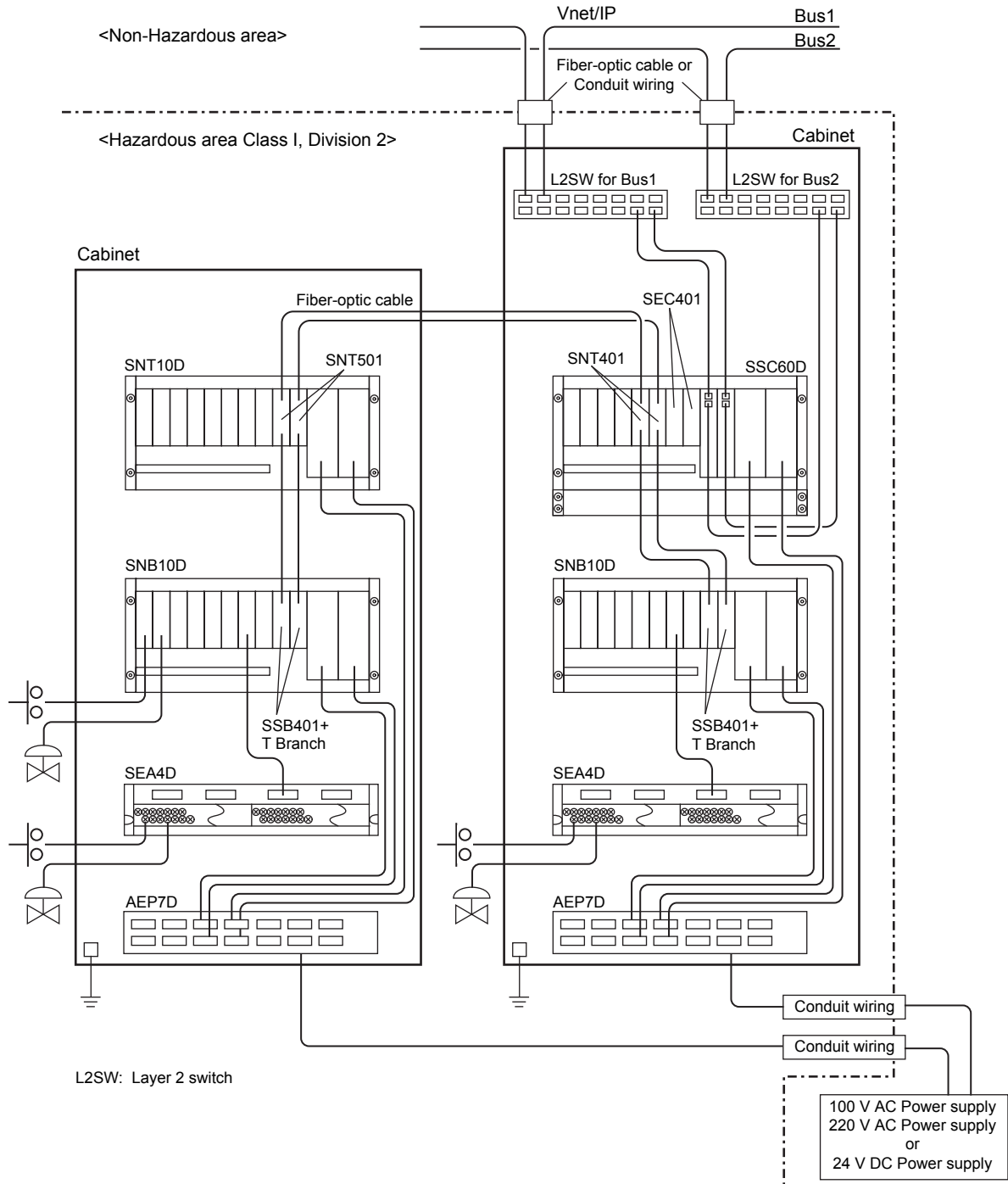


Figure Example of Connection (Installation in Division 2) for V net/IP

F020107E.ai

2.2 Type “n”, “ec”

Type “n” is a construction to enhance safety where spark, arc or high surface temperature is not caused in a normal operation and is avoided under defined conditions such as overload.

■ Complied Standards

The ProSafe-RS safety unit, safety node unit, I/O modules and optical repeater comply with the following standards.

● ATEX Type “n”, “ec”

[Explosion-proof specifications] (*1)

⊕ II 3 G Ex nA IIC T4 Gc X (*2) (*5)

⊕ II 3 G Ex nA nC IIC T4 Gc X (*3) (*5)

⊕ II 3 (1) G Ex nA [ja Ga] IIC T4 Gc (*4)

⊕ II 3G Ex ec nC IIC T4 Gc X (*7)

⊕ II 3G Ex ec IIC T4 Gc X (*8)

[Complied standard]

EN 60079-0:2012+A11:2013 (*9)

EN 60079-15:2010 (*9)

EN IEC 60079-0:2018 (*7) (*8)

EN IEC 60079-7:2015 + A1:2018 (*7) (*8)

EN IEC 60079-15:2019 (*7)

ProSafe-RS devices and an optical repeater can be installed in Zone 2 hazardous area if they are placed in a keyed cabinet (*6) with protection rating IP54 or higher. The I/O module can be connected to an intrinsic safety field device installed in Zone 0, Zone 1 and Zone 2 hazardous area using a safety barrier. In addition, it is possible to connect ProSafe-RS devices installed in a non-hazardous area and an intrinsic safety field device installed in Zone 0, Zone 1 and Zone 2 hazardous area using a safety barrier.

Note: Regarding the latest conformity standard, refer to the GS 32P01B60-01EN “ProSafe-RS Standards Compliant Models”.

Note: Only N-I/O field enclosure complies with ATEX Increased safety “ec”.

*1: The trailing “X” in symbols indicates specific conditions of use.

*2: Applied for products complied with Type “n”, except for SSC10□, SSC50□, SSC57□, SSC60□, S2SC70□, SNB10D, SBD2D, SBD3D, SBD4D, S2BN4D, S2BN5D, S2ZN70D, S2ZN60D, and S2CB60.

*3: Applied for the below products.

SSC10□, SSC50□, SSC57□, SSC60□ with SCP461, S2SC70□ with SCP461, SNB10D, SBD2D, SBD3D, and SBD4D

*4: Applied for S2BN4D and S2BN5D. S2BN5D style S1 cannot be installed in the hazardous area.

*5: “Type of protection” of the below products is indicated together with modules installed in.

SSC10□, SSC50□, SSC57□, SSC60□ with SCP461, S2SC70□ with SCP461, SNB10D, and SNT10D

*6: Cabinet

If a ProSafe-RS device installed in a non-hazardous area is connected to a field device installed in a hazardous area, it must be placed in a keyed metal cabinet.

*7: Applied for S2ZN70D and S2ZN60D.

*8: Applied for S2CB60.

*9: Applied for products complied with Type “n” with 24 V DC power supply, except for S2ZN70D, S2ZN60D, and S2CB60.

● IECEx Type “n”, “ec”

[Explosion-proof specifications]

Ex nA [ia Ga] IIC T4 Gc (*1)

Ex nA IIC T4 Gc (*2)

Ex ec nC IIC T4 Gc (*3)

Ex ec IIC T4 Gc (*4)

[Complied standard]

IEC 60079-0:2011(*1) (*2)

IEC 60079-15:2010(*1) (*2)

IEC 60079-0 Ed. 7.0 (2017) (*3) (*4)

IEC 60079-7 Ed. 5.1 (2017) (*3) (*4)

IEC 60079-15 Ed. 5.0 (2017) (*3)

Note: Regarding the latest conformity standard, refer to the GS 32P01B60-01EN “ProSafe-RS Standards Compliant Models”.

Note: Only N-IO field enclosure complies with IECEx Increased safety “ec”.

*1: Applied for S2BN5D. S2BN5D style S1 cannot be installed in the hazardous area.

*2: Applied for products complied with IECEx Type “n”, except for S2BN5D, S2NN70D, S2NN60D, and S2CB60.

*3: Applied for S2NN70D and S2NN60D.

*4: Applied for S2CB60.

If S2CB60 and S2NN60D are provided as individual products, the Ex marking on the outside of the enclosure shows the information about S2CB60 only. Information about S2NN60D is not included.

● ECAS-Ex Type “n”

[Explosion-proof specifications]

Ex nA IIC T4 Gc

[Complied standard]

IEC 60079-0: 2011

IEC 60079-15: 2010

Refer to descriptions for IECEx Type “n” on this document for installation and precautions for ECAS-Ex Type “n”.

■ Precautions

Refer to IM 32Q01J30-31E for the installation and the precaution for Type “n” compliant devices.

Refer to IM 32Q01J30-31E for the installation, the precaution, maintenance and repair for N-IO field enclosure.

● Specific conditions of use

- The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.
- The equipment shall be installed in an enclosure that provides a degree of protection not less than IP54 in accordance with IEC 60079-15.
- Transient protection that is set at a level not exceeding 119 V d.c. shall be provided at the supply terminals to the equipment.
- The equipment shall be used within -10 %/+20 % of specified input 24 V DC with adding ripple rate 1 %p-p maximum at the power supply terminals.

● Installation

- The equipment shall be installed and used within their ratings.
- All equipment and wiring in hazardous areas shall be installed in accordance with IEC/EN 60079-14 and related local electrical codes and the installation shall also comply with the appropriate requirements for non-hazardous areas.
- Instructions provided in GS (General specifications), TI (Technical Information of Installation Guidance) and/or IM (User's Manuals) shall be observed.
- The installation shall be carried out only by qualified personnel whose training has included instruction on the type of protection and installation practices, relevant rules and regulations and general principles of area classification.
- The degree of protection not less than IP54 shall be maintained at cable entries into the cabinet.
- It must be observed during the installation that the venting slots of the equipment are not blocked off by cable parts, fixing accessories etc.
- Screws of terminals for field wiring connections shall be tightened with specified torque values.
- On completion of the installation and prior to first use, initial inspection of the equipment and installation shall be carried out in accordance with IEC/EN 60079-17.
- Abide by the following guidance so as to ensure the safety and performance.
 - Make sure that all the empty slots in the cabinet should be properly covered with attached caps.
 - Make sure that all the cables are rigidly fixed in the cabinet.

● Maintenance and Repair

- Inspections and maintenance of the equipment and installations shall be carried out only by qualified personnel and in accordance with IEC/EN 60079-17.
- Repair, overhaul, reclamation of the equipment shall be carried out only by qualified personnel and in accordance with IEC/EN 60079-19.
- Repairs of the equipment shall be carried out only by trained, experienced, skilled, knowledgeable and/or supervised personnel, or by the service engineers recognized by Yokogawa. Otherwise, the type of protection may be invalidated.
- Modifications shall not be made to the equipment which are operated in hazardous areas.



WARNING

WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT, DO NOT OPEN THE CABINET WHILE THE EQUIPMENTS ARE ENERGIZED.



WARNING

WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT, DO NOT REMOVE OR REPLACE THE FUSE WHEN ENERGIZED.

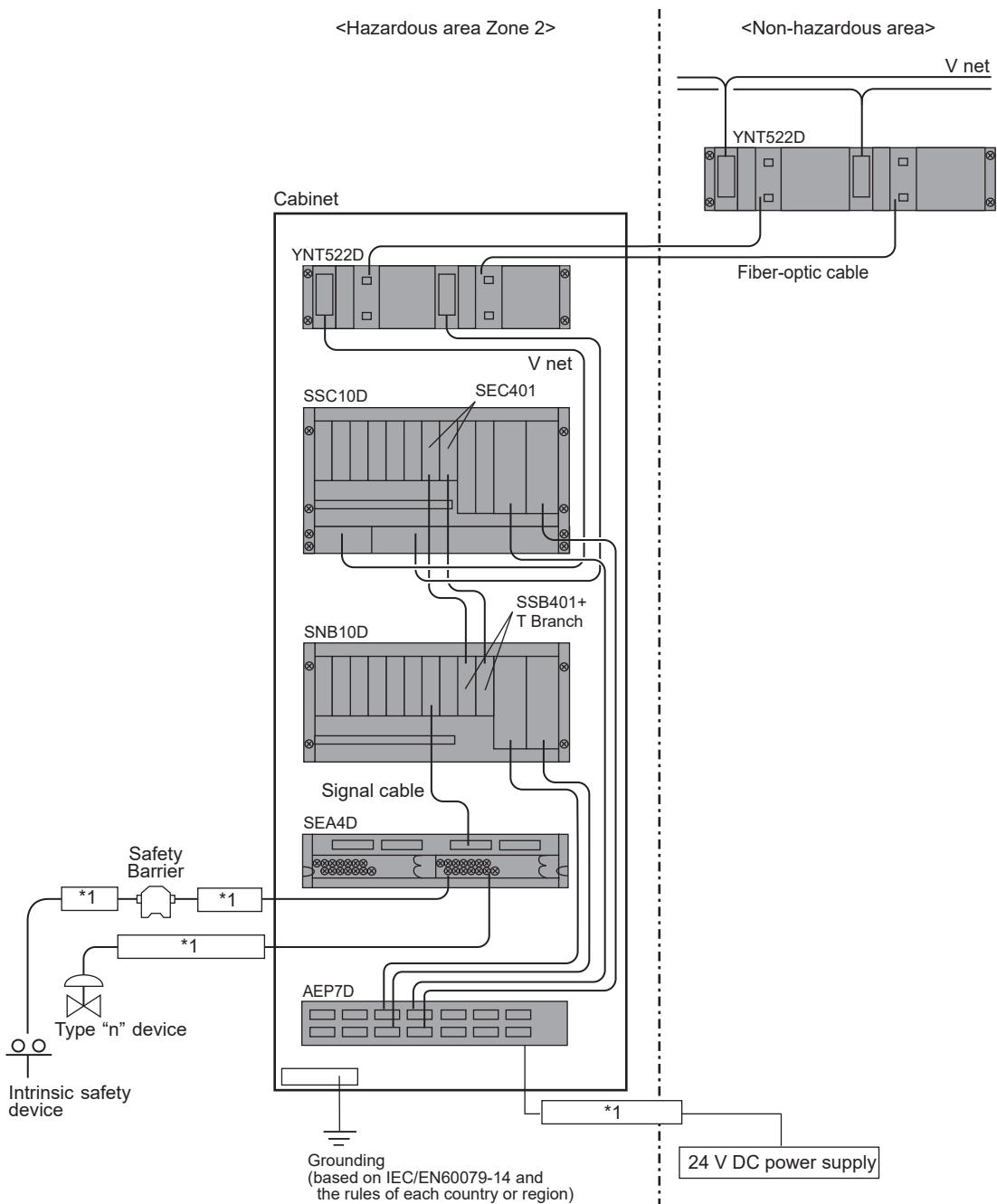


WARNING

WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT, DO NOT SEPARATE THE CONNECTIONS WHEN ENERGIZED.

Type “n” Compliant Products

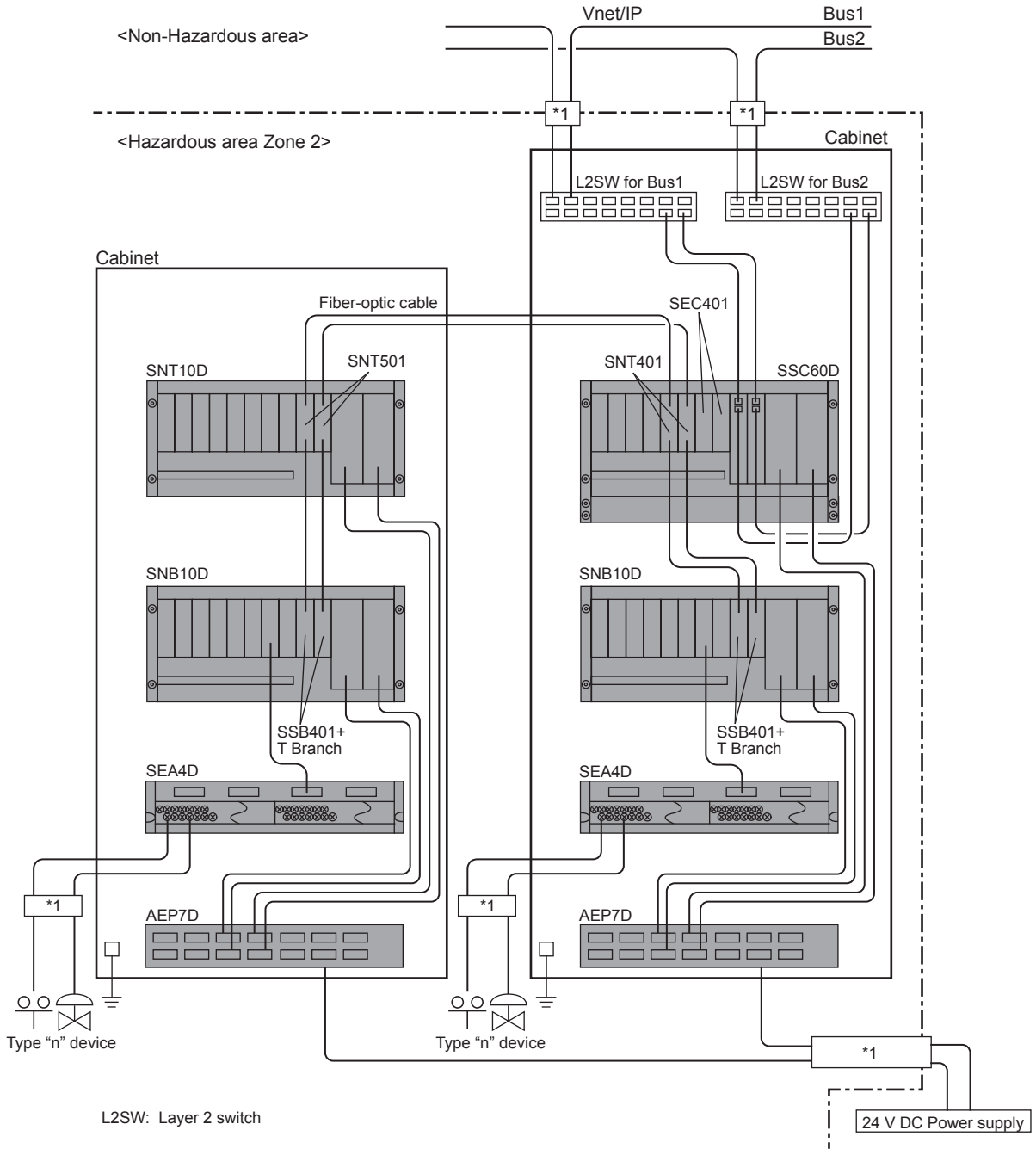
The figure below is an example of the configuration of Type “n” compliant products that can be installed in hazardous areas. See the table “the list of Type “n”, “ec” compliant products” described in Appendix for detail.



*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

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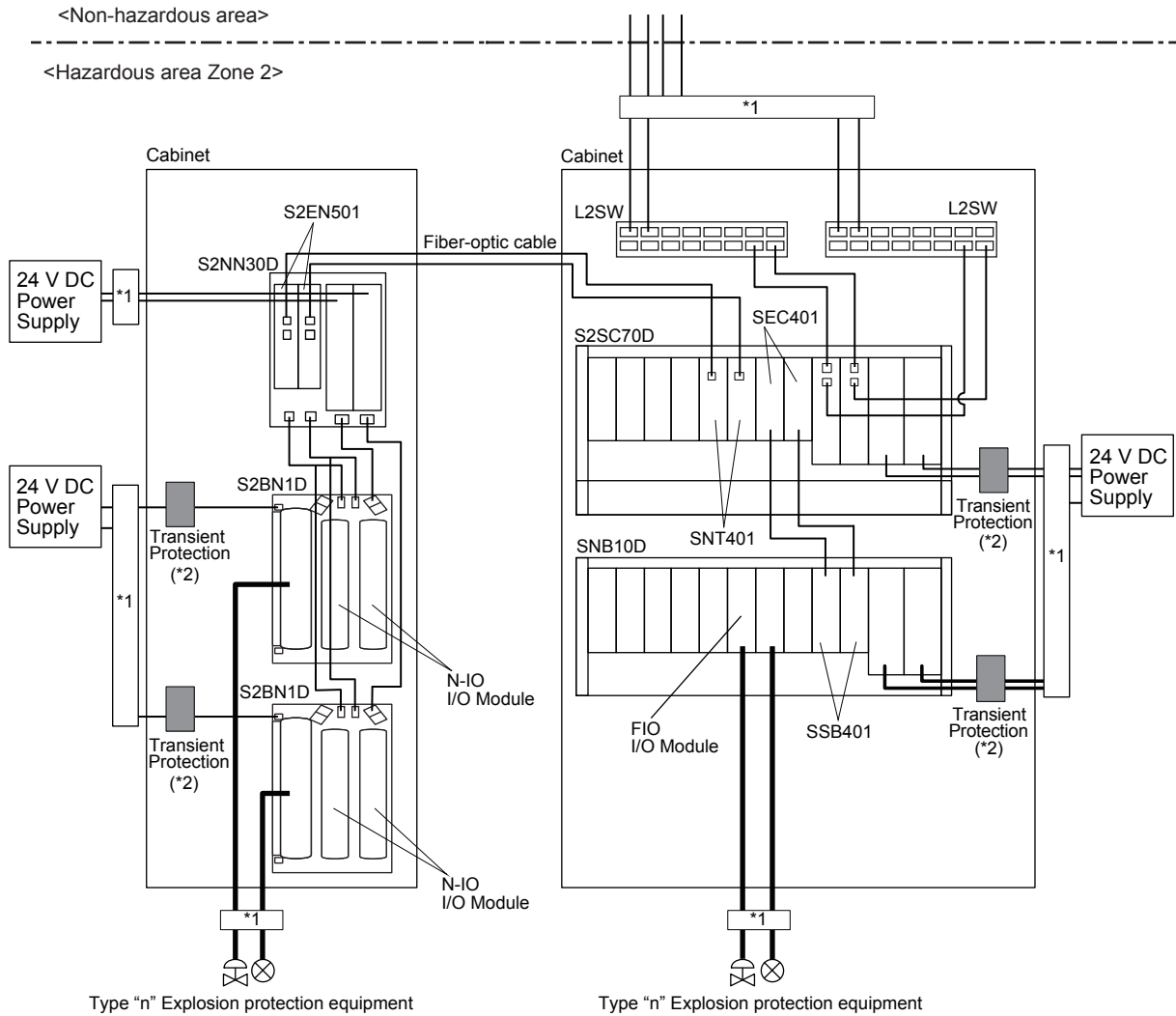
Figure Example of Type “n” Configuration for V net



F020205E.ai

*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

Figure Example of Type "n" Configuration for Vnet/IP



F030207.ai

- *1: Explosion-proof wiring that is defined in EN/IEC 60079-14 and the rules/standards of each country or region.
- *2: Transient protection shall be provided that is set at a level not exceeding 119 V DC at the supply terminal of S2BN1D, S2BN4D, and S2BN5D to the equipment.

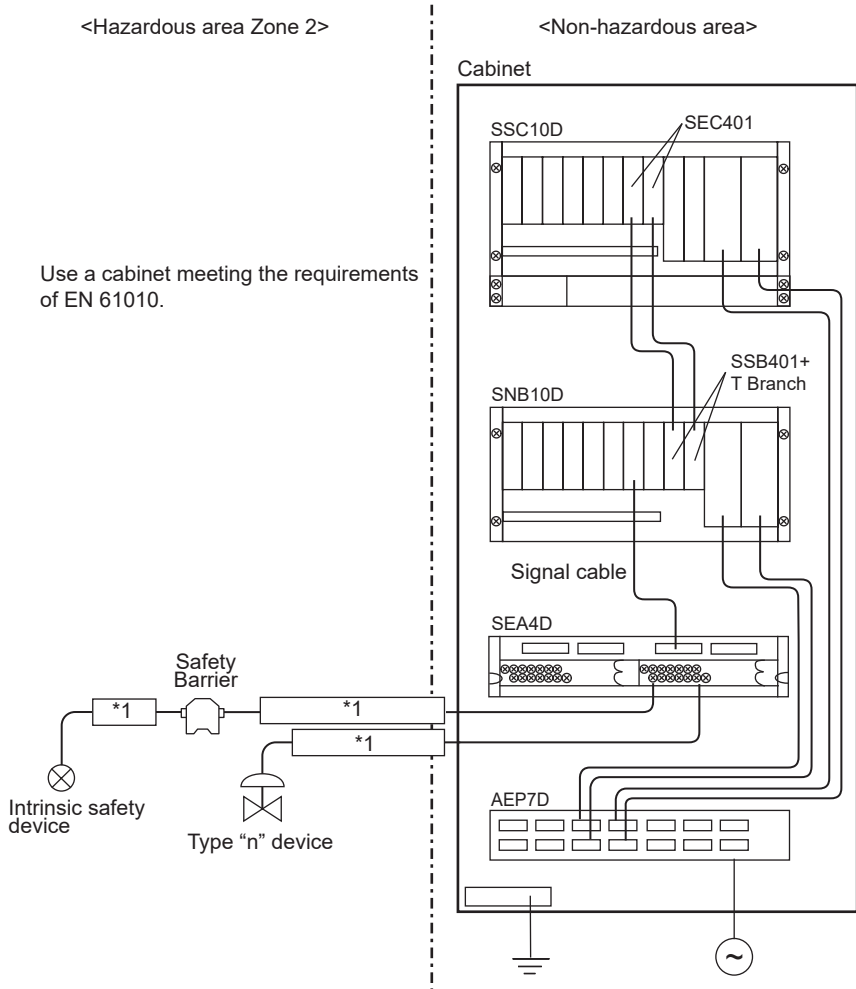
Figure Example of Typen "n" Configuration for Vnet/IP

■ Wiring of Type “n” Devices

Wiring should be installed to conform to IEC/EN 60079-14 and the rules/standards of each country or region. After wiring, check it out according to the checklist in IEC/EN60079-17.

■ Example of a Connection

● Connecting a ProSafe-RS Device and a Device Installed in Zone 2

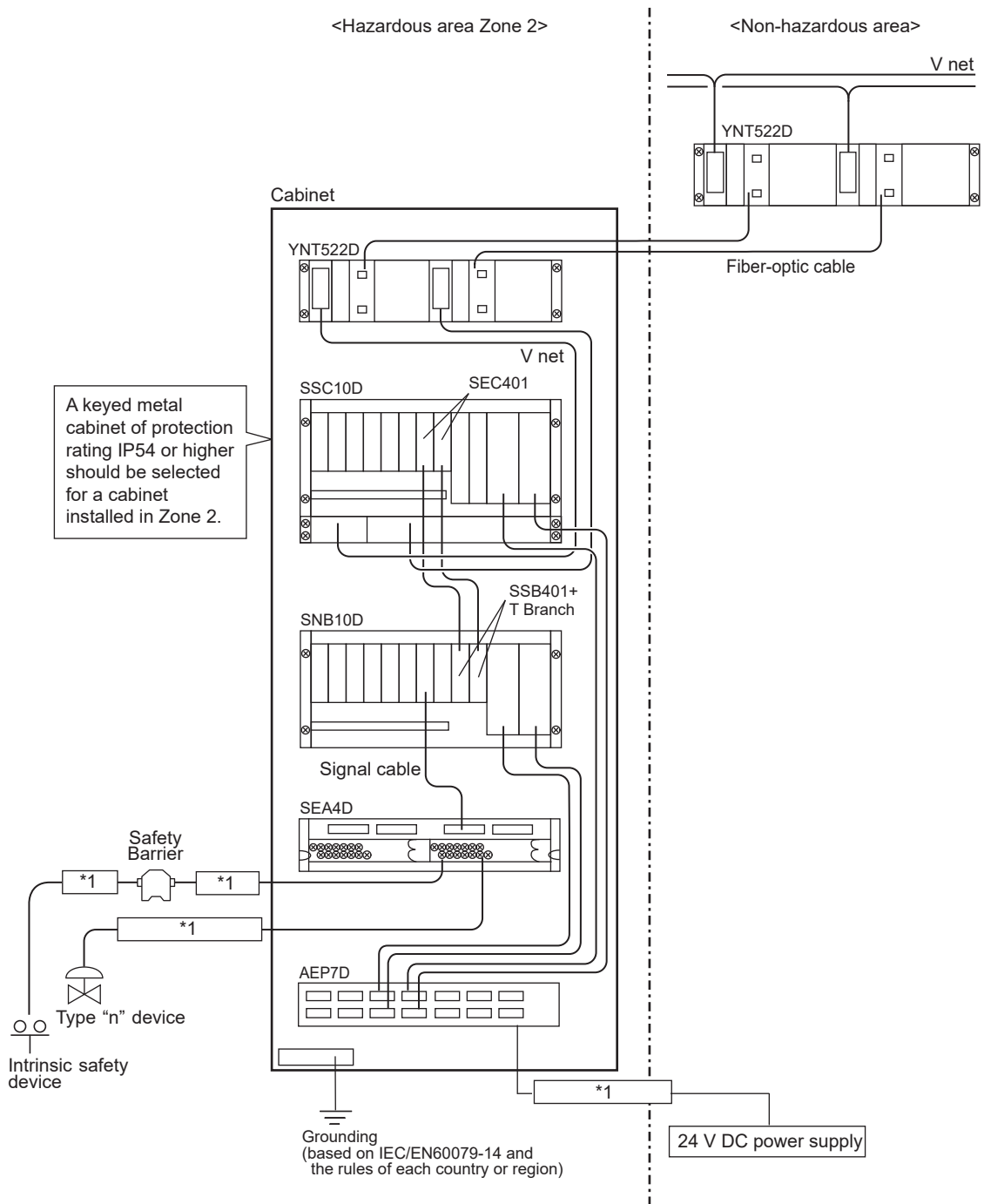


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*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

Figure Example of Connection

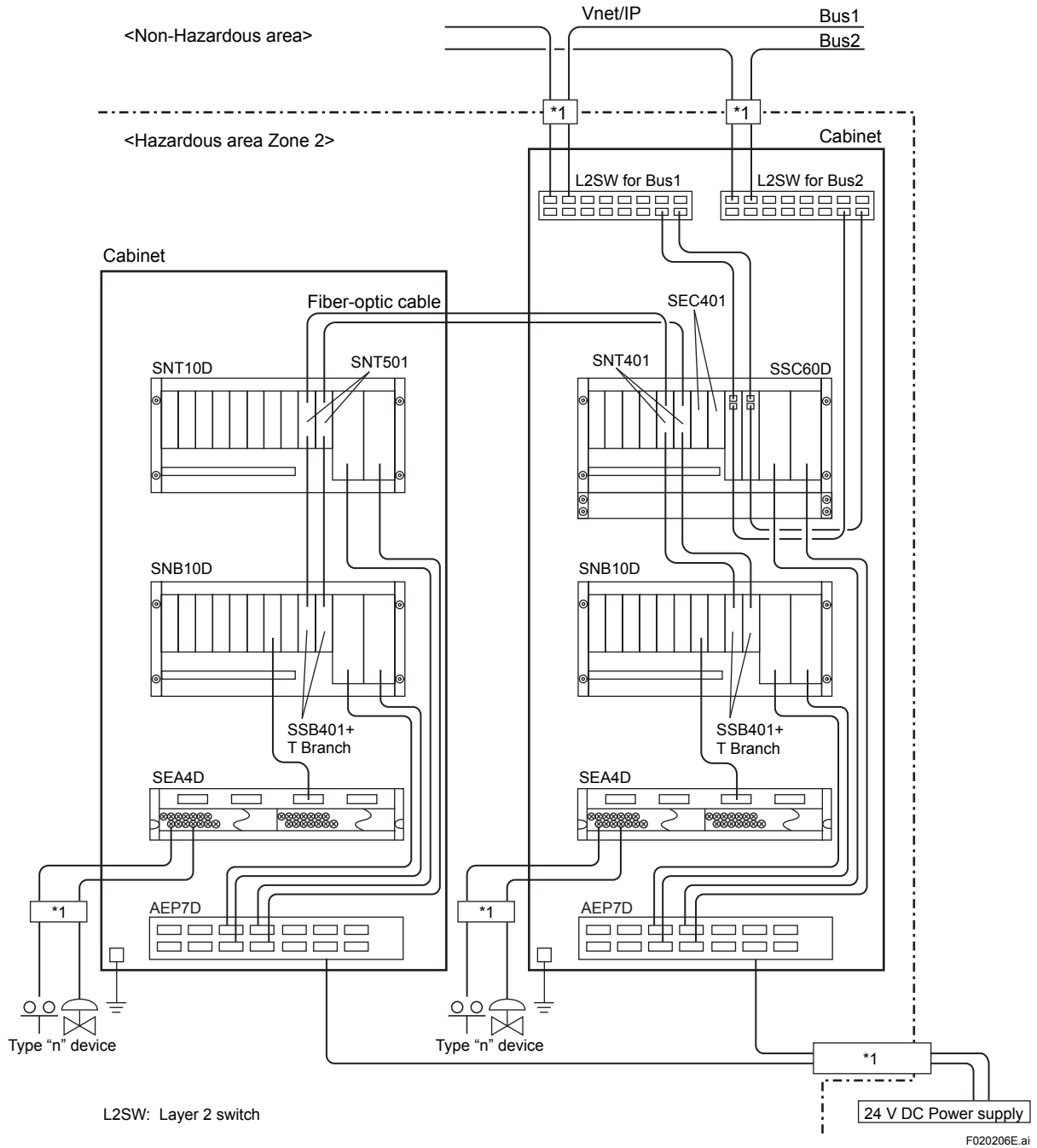
● Installing ProSafe-RS and Associated Devices in Zone 2



F020204E.ai

*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

Figure Example of Connection (Installation in Zone 2) for V net



*1: Explosion-proof wiring that is defined in IEC/EN 60079-14 and the rules/standards of each country or region.

Figure Example of Connection (Installation in Zone 2) for Vnet/IP

3. Intrinsic Safety Explosion Protection Instrumentation

Intrinsic safety explosion protection is an electric circuit and a construction, which made so as not to ignite to gas by controlling the energy of electric circuit, if sparks, arc, and heat occur at the time of normal operating and an accident (short-circuit, earth fault, burnout). Intrinsic safety explosion protection equipments include intrinsic safety equipments and equipments related with intrinsic safety. Intrinsic safety equipments are able to be used in hazardous area. Equipments related with intrinsic safety are set up in non-hazardous area, and is connected with intrinsic safety equipment.

3.1 Intrinsic Safety Explosion Protection Instrumentation Using Barrier base plates

3.1.1 Intrinsic Safety Explosion Protection of ATEX Standard

■ Base plate for barrier (S2BN5D)

Base plate for barrier (S2BN5D) is complied with I. S. explosion protection standard. P+F's I. S. barriers can be connected to the I. S. equipment installed in the hazardous area with explosion-proof wiring.

■ Explosion-proof Specifications and Complied Standard

[Explosion-proof specifications]

⊕ II 3(1) G Ex nA [ia Ga] IIC T4 Gc

⊕ II (1) D [Ex ia Da] III C

⊕ I (M1) [Ex ia Ma] I

[Complied standard]

EN 60079-0:2012+A11:2013

EN 60079-11:2012

■ Wiring of Intrinsic Safety Explosion Protection

An intrinsic safety circuit must be isolated from non-intrinsic safety circuit. Wiring should be prepared in accordance with EN 60079-14, or the standard of the country and the area in which it is set. In regards to the further wiring than the base plate for barrier (S2BN5D), take notice that it should be an intrinsic safety circuit. The wiring in cabinet should keep the distance to non-intrinsic safety circuit.

After setting, check the wiring according to the checklist described in EN 60079-17.

■ Parameter of Intrinsic Safety

Please refer to the P+F's instruction manual of I.S. barriers installed in the base plate for barrier (S2BN5D) for the parameter of Intrinsic Safety.

3.1.2 Intrinsic Safety Explosion Protection of IEC Standard

■ Base plate for barrier (S2BN5D)

Base plate for barrier (S2BN5D) is complied with I. S. explosion protection standard. P+F's I. S. barriers can be connected to the I. S. equipment installed in the hazardous area with explosion-proof wiring.

[Explosion-proof specifications]

Ex nA [ia Ga] IIC T4 Gc

[Ex ia Da] III C

[Ex ia Ma] I

[Complied standard]

IEC 60079-0:2011

IEC 60079-11:2011

■ Wiring of Intrinsic Safety Explosion Protection

An intrinsic safety circuit must be isolated from non-intrinsic safety circuit. Wiring should be prepared in accordance with IEC 60079-14, or the standard of the country and the area in which it is set. In regards to the further wiring than the base plate for barrier (S2BN5D), take notice that it should be an intrinsic safety circuit. The wiring in cabinet should keep the distance to non-intrinsic safety circuit.

After setting, check the wiring according to the checklist described in IEC 60079-17.

■ Parameter of Intrinsic Safety

Please refer to the P+F's instruction manual of I.S. barriers installed in the base plate for barrier (S2BN5D) for the parameter of Intrinsic Safety.

3.1.3 Intrinsic Safety Explosion Protection of US (FM) Standard

■ S2BN5D base plate for barrier

S2BN5D base plate for barrier can be connected to the I.S. equipment installed in the hazardous area with explosion-proof wiring and can be installed in Division 2 by mounting in a keyed metal cabinet approved by approval authorities.

Please refer to the instruction manual of P+F I.S. barriers for installation of I.S. barriers.

● Explosion-proof Specifications and Complied Standard

[Explosion-proof specifications]

Intrinsically Safe Associated Apparatus for Class I, II, III Division I Groups A, B, C, D, E, F and G

Intrinsically Safe Associated Apparatus Class I Zone 0, Group IIC, Temperature Class T4

Intrinsically Safe Associated Apparatus Zone 20, Group IIIC

[Complied standard]

Class 3600:2011

Class 3610:2010

ANSI/ISA-60079-0 (12.00.01)-2013

ANSI/ISA-60079-11 (12.02.01)-2014

● Wiring of Intrinsic Safety Explosion Protection

An intrinsic safety circuit must be isolated from non-intrinsic safety circuit. Installation and wiring of Intrinsic Safety Explosion Protection shall be carried out in according with "Appendix 6. US (FM) NI/Canada (FM) NI Control Drawing for S2BN5D".

● Parameter of Intrinsic Safety

Please refer to the P+F's instruction manual of I.S. barriers installed in S2BN5D for the parameter of Intrinsic Safety.

3.1.4 Intrinsic Safety Explosion Protection of Canada (FM) Standard

■ S2BN5D base plate for barrier

S2BN5D base plate for barrier can be connected to the I.S. equipment installed in the hazardous area with explosion-proof wiring and can be installed in Division 2 by mounting in a keyed metal cabinet approved by approval authorities.

Please refer to the instruction manual of P+F I.S. barriers for installation of I.S. barriers.

● Explosion-proof Specifications and Complied Standard

[Explosion-proof specifications]

Intrinsically Safe Associated Apparatus for Class I, II, III Division I Groups A, B, C, D, E, F and G

Intrinsically Safe Associated Apparatus Class I Zone 0, Group IIC

Intrinsically Safe Associated Apparatus Zone 20, Group IIIC

[Complied standard]

CAN/CSA-C22.2 No. 60079-0:11

CAN/CSA-C22.2 No. 60079-11:14

● Wiring of Intrinsic Safety Explosion Protection

An intrinsic safety circuit must be isolated from non-intrinsic safety circuit. Installation and wiring of Intrinsic Safety Explosion Protection shall be carried out in according with "Appendix 6. US (FM) NI/Canada (FM) NI Control Drawing for S2BN5D".

● Parameter of Intrinsic Safety

Please refer to the P+F's instruction manual of I.S. barriers installed in S2BN5D for the parameter of Intrinsic Safety.

3.2 Intrinsic Safety Explosion Protection Instrumentation Using Barriers

■ Category of Barriers

Classified roughly, barriers includes Zener barriers and insulating barriers (intrinsic safety barriers). Select the best one as your system, with the knowledge of their future.

(1) Feature of Zener barriers

Zener barrier has a simple construction which consists of just Zener Diode and resistance.

As the circuit of hazardous area and non-hazardous area are not insulated, they request the single point ground by the bus bar of Zener barriers, so as not to be created the functionally unfavorable ground loop by double point ground. Moreover, in most countries, it is impossible to ground circuits in hazardous area.

A power supply for barrier is not required, because Zener barriers carry out the function for security just with Zener Diode and resistance.

(2) Feature of insulating barriers

On the other hand, insulating barriers does not request intrinsic safety ground because the place between input and output of them is insulated. It is possible to ground circuits in hazardous area and use them (single point ground). However, a power supply for barrier is additionally required.

● Considerations for Selection of Barrier

Here is a general explanation about the selection of barrier. On the occasion of implementing intrinsic safety Explosion Protection instrumentation, select a barrier according to the manufacture's specifications and estimates with the equipment.

(1) Approved standard

Make sure the barrier has the approved standard which is required for the installation site.

(2) Cost

Compared Zener barriers to insulating barriers about the general cost of the main unit only per a channel, the approximate proportion are 1 to 2. Also, insulating barriers request a power supply.

(3) Volume (dimensions)

Dimensions may influence the number of cabinet in which the barrier is set. Compared Zener barriers to insulating barriers about the size per a general channel, the approximate proportion are 1 to 2.

(4) Difficulty of wiring, necessity of insulating hazardous area circuit

Zener barriers always need intrinsic safety ground, and most model of them have the construction grounded through the bus bar. All the circuit on the same bus bar in hazardous area and non-hazardous area are grounded to the same electric potential. Moreover, in most countries, circuits in hazardous area need withstand voltage of 500 Vrms. Therefore, it is impossible to ground circuits in hazardous area and use them. Insulating barriers impose no restrictions like this, so it is possible to ground circuits in hazardous area and use them (single point ground). However, a power supply for barrier is additionally required.

(5) Failure rate

The construction of Zener barriers is simple, because they carry out the function for security just with Zener Diode and resistance. On the other hand, insulating barriers consist of various parts, because they have the function of insulation and energy restriction. Therefore, the failure rate of insulating barriers is generally higher than that of Zener barriers. In Zener barriers, problems are usually solved by replacement and, in insulating barriers by modification.

(6) Accuracy, response

In general, Zener barriers have advantages about accuracy and response, because insulating barriers usually have more complex signal path than Zener barriers.

(7) Withstand voltage

Withstand voltage is a rating which only insulating barriers have. Most of the models have 250 V or more AC/DC, so there's almost no problem at the time of instrumentation.

(8) Security rating

Security rating indicates the scale of energy that can be occurred in hazardous area of barrier in the case of the accident. It is usually described by the signage, such as $U_o=n$ V, $I_o=n$ mA, $P_o=n$ W, $C_o=n$ μ F, $L_o=n$ mH ($U_m=n$ V_{rms} or DC: only insulating barriers).

(In FM standard, it is called entity parameter, including the parameter of (10), and is described such as $V_{oc}=n$ V, $I_{sc}=n$ mA, $C_a=n$ μ F, $L_a=n$ mH).

(9) Permissible cable parameter

Permissible cable parameter indicates the scale (capacity, inductance) of hazardous area circuit (including cables) which can be connected to barriers. It is regulated by a barrier and a kind of gases. It is usually described by group (ex. IIC etc.=a kind of gases), n μ F (capacity), n mH or n μ H/ Ω (inductance or L/R ratio).

(10) Voltage in non-hazardous area

In regards to Zener barriers, V_{wkg} (maximum working voltage) and V_{max} (maximum permissible voltage) are regulated. In regards to insulating barriers, regulation of voltage is for power supply rating only, but the use conditions of circuit in non-hazardous area are different by models.

(11) Influence by resistance value between input and output

This is a matter of only Zener barriers. As resistance and fuse exist between terminals of input and output in a barrier, in regards to an application that pass an electric current, it is necessary to take account of voltage drop inside the barrier. Moreover, in some application, it is necessary to take account of Diode current leakage (usually several μ A).

■ Wiring of Intrinsic Safety Explosion Protection

An intrinsic safety circuit must be isolated from non-intrinsic safety circuit.

Wiring should be prepared in accordance with IEC 60079-14, NEC (National Electrical Code : NFPA-70), or the standard of the country and the area in which it is set. The wiring in cabinet should keep the distance to non-intrinsic safety circuit.

After setting, check the wiring according to the checklist described in IEC 60079-17.

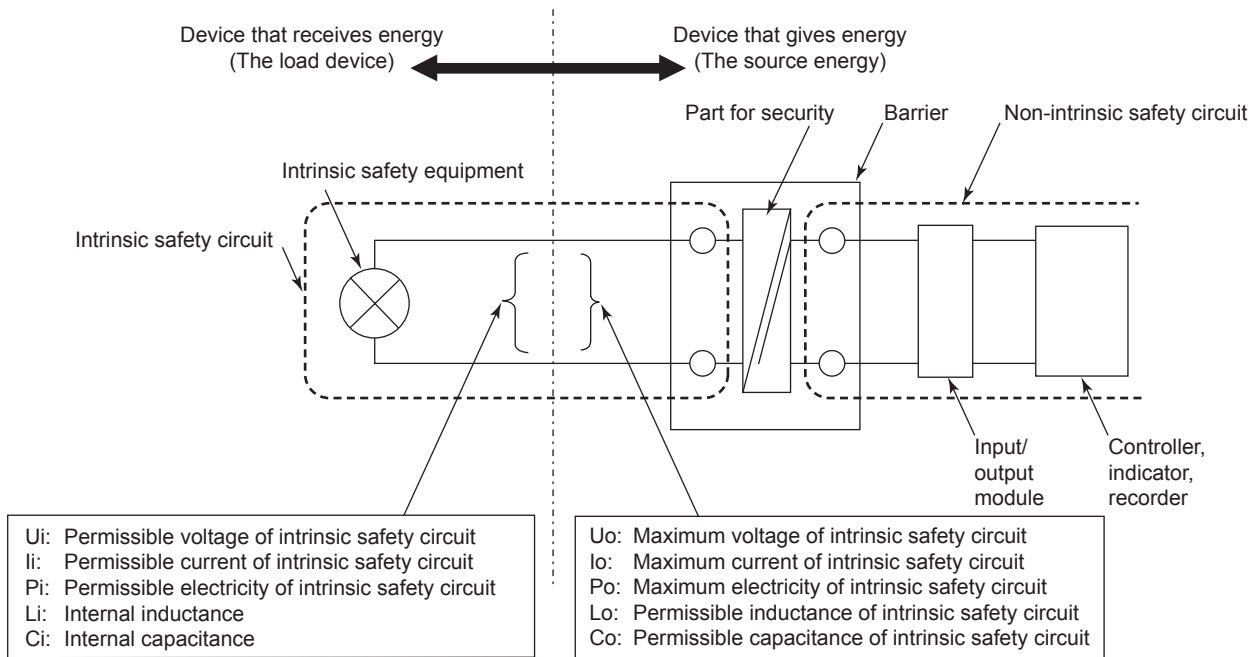
An intrinsic safety circuit of barrier is indicated by the following ratings.

Maximum voltage of intrinsic safety circuit	U _o
Maximum current of intrinsic safety circuit	I _o
Maximum electricity of intrinsic safety circuit	P _o
Permissible inductance of intrinsic safety circuit	L _o
Permissible capacitance of intrinsic safety circuit	C _o

As a combination of intrinsic safety circuits connected with barriers and wiring, it is necessary to meet the following conditions to keep the intrinsic safety performance.

U _o	≤	U _i
I _o	≤	I _i
P _o	≤	P _i
L _o	≥	L _i +L _w
C _o	≥	C _i +C _w

Intrinsic safety circuit should consist of barriers to meet these conditions of permissible voltage, current, and electricity, and should be wired so that inductance and capacitance of its wiring doesn't exceed its permissible value.



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Figure Composition Used in a Barrier

Appendix 1. List of NI Compliant Products

Note: Regarding the latest conformity standard, refer to the GS 32P01B60-01EN "ProSafe-RS Standards Compliant Models".

Appendix 1.1 US (FM) NI Compliant Products

■ ProSafe-RS US (FM) NI Compliant Products

Table US (FM) NI Approved Products (1/9)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
1	Safety Control Units	SSC10S-S2E11	Safety Control Units	-20 to 50°C	
		SSC10S-S2E11/GPS	100 to 120 V AC power supply		
		SSC10S-S2E21	Safety Control Units	-20 to 50°C	(*2)
		SSC10S-S2E21/GPS	220 to 240 V AC power supply		
		SSC10S-S2E41	Safety Control Units	-20 to 50°C	
		SSC10S-S2E41/GPS	24 V DC power supply		
		SSC10S-F2E11	Safety Control Units	-20 to 70°C	
		SSC10S-F2E11/GPS	(With fan, 100 to 120 V AC power supply)		
		SSC10S-F2E21	Safety Control Units	-20 to 70°C	(*2)
		SSC10S-F2E21/GPS	(With fan, 220 to 240 V AC power supply)		
		SSC10S-F2E41	Safety Control Units	-20 to 70°C	
		SSC10S-F2E41/GPS	(With fan, 24 V DC power supply)		
		SSC10D-S2E11	Duplexed Safety Control Units	-20 to 50°C	
SSC10D-S2E11/GPS	100 to 120 V AC power supply				
SSC10D-S2E21	Duplexed Safety Control Units	-20 to 50°C	(*2)		
SSC10D-S2E21/GPS	220 to 240 V AC power supply				
SSC10D-S2E41	Duplexed Safety Control Units	-20 to 50°C			
SSC10D-S2E41/GPS	24 V DC power supply				
SSC10D-F2E11	Duplexed Safety Control Units	-20 to 70°C			
SSC10D-F2E11/GPS	(With fan, 100 to 120 V AC power supply)				
SSC10D-F2E21	Duplexed Safety Control Units	-20 to 70°C	(*2)		
SSC10D-F2E21/GPS	(With fan, 220 to 240 V AC power supply)				
SSC10D-F2E41	Duplexed Safety Control Units	-20 to 70°C			
SSC10D-F2E41/GPS	(With fan, 24 V DC power supply)				
2	Safety Control Units for Vnet/IP	SSC50S-S2E1□	Safety Control Units	-20 to 40°C	
		SSC50S-S2E1□	100 to 120 V AC power supply		
		SSC50S-S2E2□	Safety Control Units	-20 to 40°C	(*2)
		SSC50S-S2E2□	220 to 240 V AC power supply		
		SSC50S-S2E4□	Safety Control Units	-20 to 40°C	
		SSC50S-S2E4□	24 V DC power supply		
		SSC50S-F2E1□	Safety Control Units	-20 to 70°C	
		SSC50S-F2E1□	(With fan, 100 to 120 V AC power supply)		
		SSC50S-F2E2□	Safety Control Units	-20 to 70°C	(*2)
SSC50S-F2E2□	(With fan, 220 to 240 V AC power supply)				
SSC50S-F2E4□	Safety Control Units	-20 to 70°C			
SSC50S-F2E4□	(With fan, 24 V DC power supply)				
SSC50D-S2E1□	Duplexed Safety Control Units	-20 to 40°C			
SSC50D-S2E1□	100 to 120 V AC power supply				
SSC50D-S2E2□	Duplexed Safety Control Units	-20 to 40°C	(*2)		
SSC50D-S2E2□	220 to 240 V AC power supply				
SSC50D-S2E4□	Duplexed Safety Control Units	-20 to 40°C			
SSC50D-S2E4□	24 V DC power supply				

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*2: The power supply input terminal-N of SPW482 shall be connected to the neutral line (N) of the main power supply.

Table NI Approved Products (2/9)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
2	Safety Control Units for Vnet/IP	SSC50D-F2E1□	Duplexed Safety Control Units (With fan, 100 to 120 V AC power supply)	-20 to 70°C	
		SSC50D-F2E2□	Duplexed Safety Control Units (With fan, 220 to 240 V AC power supply)	-20 to 70°C	(*2)
		SSC50D-F2E4□	Duplexed Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		SSC57S-S2E1□	Safety Control Units 100 to 120 V AC power supply	-20 to 40°C	
		SSC57S-S2E2□	Safety Control Units 220 to 240 V AC power supply	-20 to 40°C	(*2)
		SSC57S-S2E4□	Safety Control Units 24 V DC power supply	-20 to 40°C	
		SSC57S-F2E1□	Safety Control Units (With fan, 100 to 120 V AC power supply)	-20 to 70°C	
		SSC57S-F2E2□	Safety Control Units (With fan, 220 to 240 V AC power supply)	-20 to 70°C	(*2)
		SSC57S-F2E4□	Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		SSC57D-S2E1□	Duplexed Safety Control Units 100 to 120 V AC power supply	-20 to 40°C	
		SSC57D-S2E2□	Duplexed Safety Control Units 220 to 240 V AC power supply	-20 to 40°C	(*2)
		SSC57D-S2E4□	Duplexed Safety Control Units 24 V DC power supply	-20 to 40°C	
		SSC57D-F2E1□	Duplexed Safety Control Units (With fan, 100 to 120 V AC power supply)	-20 to 70°C	
		SSC57D-F2E2□	Duplexed Safety Control Units (With fan, 220 to 240 V AC power supply)	-20 to 70°C	(*2)
		SSC57D-F2E4□	Duplexed Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		SSC60S-S2E1□	Safety Control Units 100 to 120 V AC power supply	-20 to 40°C	
		SSC60S-S2E2□	Safety Control Units 220 to 240 V AC power supply	-20 to 40°C	(*2)
		SSC60S-S2E4□	Safety Control Units 24 V DC power supply	-20 to 40°C	
		SSC60S-F2E1□	Safety Control Units (With fan, 100 to 120 V AC power supply)	-20 to 70°C	
		SSC60S-F2E2□	Safety Control Units (With fan, 220 to 240 V AC power supply)	-20 to 70°C	(*2)
		SSC60S-F2E4□	Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		SSC60D-S2E1□	Duplexed Safety Control Units 100 to 120 V AC power supply	-20 to 40°C	
		SSC60D-S2E2□	Duplexed Safety Control Units 220 to 240 V AC power supply	-20 to 40°C	(*2)
		SSC60D-S2E4□	Duplexed Safety Control Units 24 V DC power supply	-20 to 40°C	
		SSC60D-F2E1□	Duplexed Safety Control Units (With fan, 100 to 120 V AC power supply)	-20 to 70°C	
		SSC60D-F2E2□	Duplexed Safety Control Units (With fan, 220 to 240 V AC power supply)	-20 to 70°C	(*2)
		SSC60D-F2E4□	Duplexed Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		S2SC70S-S□□11□□	Safety Control Unit 100 to 120 V AC power supply	-20 to 40°C	

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*2: The power supply input terminal-N of SPW482 shall be connected to the neutral line (N) of the main power supply.

Table NI Approved Products (3/9)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
2	Safety Control Units for Vnet/IP	S2SC70S-S□□21□□	Safety Control Unit 220 to 240 V AC power supply	-20 to 40°C	(*2)
		S2SC70S-S□□41□□	Safety Control Unit 24 V DC power supply	-20 to 40°C	
		S2SC70S-F□□11□□	Safety Control Unit (With fan, 100 to 120 V AC power supply)	-20 to 70°C	
		S2SC70S-F□□21□□	Safety Control Unit (With fan, 220 to 240 V AC power supply)	-20 to 70°C	(*2)
		S2SC70S-F□□41□□	Safety Control Unit (With fan, 24 V DC power supply)	-20 to 70°C	
		S2SC70D-S□□11□□	Duplexed Safety Control Unit 100 to 120 V AC power supply	-20 to 40°C	
		S2SC70D-S□□21□□	Duplexed Safety Control Unit 220 to 240 V AC power supply	-20 to 40°C	(*2)
		S2SC70D-S□□41□□	Duplexed Safety Control Unit 24 V DC power supply	-20 to 40°C	
		S2SC70D-F□□11□□	Duplexed Safety Control Unit (With fan, 100 to 120 V AC power supply)	-20 to 70°C	
		S2SC70D-F□□21□□	Duplexed Safety Control Unit (With fan, 220 to 240 V AC power supply)	-20 to 70°C	(*2)
		S2SC70D-F□□41□□	Duplexed Safety Control Unit (With fan, 24 V DC power supply)	-20 to 70°C	
3	Safety Node Units	SNB10D-□1E SNB10D-□1E/CU2N SNB10D-□1E/CU2T	Node Unit for Dual-Redundant ESB Bus 100 to 120 V AC power supply	-20 to 70°C	
		SNB10D-□2E SNB10D-□2E/CU2N SNB10D-□2E/CU2T	Node Unit for Dual-Redundant ESB Bus 220 to 240 V AC power supply	-20 to 70°C	(*2)
		SNB10D-□4E SNB10D-□4E/CU2N SNB10D-□4E/CU2T	Node Unit for Dual-Redundant ESB Bus 24 V DC power supply	-20 to 70°C	
4	Unit for Optical Bus Repeater Module	SNT10D-21E	Unit for Optical ESB Bus Repeater Module 100 to 120 V AC power supply	-20 to 70°C	
		SNT10D-22E	Unit for Optical ESB Bus Repeater Module 220 to 240 V AC power supply	-20 to 70°C	(*2)
		SNT10D-24E	Unit for Optical ESB Bus Repeater Module 24 V DC power supply	-20 to 70°C	
5	CPU Module	SCP401-E1	Processor Module for SSC10□	-20 to 70°C	
		SCP451-E□	Processor Module for SSC50□ and SSC57□	-20 to 70°C	
		SCP461-E1	Processor Module for SSC60□ and S2SC70□	-20 to 70°C	
		S2CP471-1□	Processor Module for SSC60□ and S2SC70□	-20 to 70°C	
	Power supply Module	SPW481-E3	100 to 120 V AC Input Power supply module	-20 to 70°C	
		SPW482-E3	220 to 240 V AC Input Power supply module	-20 to 70°C	(*2)
		SPW484-E3	24 V DC Input Power supply module	-20 to 70°C	
		S2PW503-S0130	24 V DC Output Power Supply Unit (100 to 240 V AC input power supply)	-40 to 70°C	

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*2: The power supply input terminal-N of SPW482 shall be connected to the neutral line (N) of the main power supply.

Table NI Approved Products (4/9)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
6	Power supply Module	S2PW504-S0130	24 V DC Output Power Supply Unit (24 V DC input power supply)	-40 to 70°C	
	Coupler Unit	AIP504-E3	V net Coupler Unit	-20 to 70°C	
	Bus Coupler Module	SEC401-E1	ESB Bus Coupler Module	-20 to 70°C	
		SEC402-E1	ESB Bus Coupler Module (for 2-Port)	-20 to 70°C	
	Bus Interface Module	SSB401-E3	ESB Bus Interface Slave Module	-20 to 70°C	
	Optical ESB Bus Repeater Module	SNT401-E□ SNT401-E□/CU1N SNT401-E□/CU1T	Optical ESB Bus Repeater Master Module	-20 to 70°C	
		SNT411-E□ SNT411-E□/CU1N SNT411-E□/CU1T	Optical ESB Bus Repeater Master Module 5 to 50 km	-20 to 70°C	
		SNT421-E3 SNT421-E3/CU1N SNT421-E3/CU1T	Optical ESB Bus Repeater Master Module (for Multimode Fiber)	-20 to 70°C	
		SNT501-E□	Optical ESB Bus Repeater Slave Module	-20 to 70°C	
		SNT511-E□	Optical ESB Bus Repeater Slave Module 5 to 50 km	-20 to 70°C	
		SNT521-E3	Optical ESB Bus Repeater Slave Module (for Multimode Fiber)	-20 to 70°C	
	N-ESB Bus Coupler Module	S2EN402-S0011	N-ESB Bus Coupler Module	-20 to 70°C	
		S2EN404-S0011	N-ESB Bus Coupler Module	-20 to 70°C	
	Node Interface Unit	S2NN30D-430□0□□13	Node Interface Unit (100 to 240 V AC input power supply)	-40 to 70°C	(*3)
S2NN30D-440□0□□13		Node Interface Unit (24 V DC input power supply)	-40 to 70°C	(*3)	
N-ESB Bus Module	S2EN501-S□□130	N-ESB Bus Module	-40 to 70°C	(*4)	
7	Input/Output Modules	SAI143-SE3 SAI143-SE3/K4A00 SAI143-SE3/A4S00 SAI143-SE3/A4S10 SAI143-SE3/A4D00 SAI143-SE3/A4D10 SAI143-SE3/CCC01	Analog Input Module (4 to 20 mA, 16 channels, module isolation)	-20 to 70°C	
		SAI143-SF3 SAI143-SF3/PRP			

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*3: When the S2NN30D Node Interface Unit is used with an optical ESB bus with the following specifications at an altitude of 2000 m or higher, the ambient temperature range is -40 to 60°C.
 S2NN30D-□□□□01□□ S2NN30D-□□□□02□□ S2NN30D-□□□□10□□
 S2NN30D-□□□□11□□ S2NN30D-□□□□12□□ S2NN30D-□□□□20□□
 S2NN30D-□□□□21□□ S2NN30D-□□□□22□□

*4: When the S2EN501 N-ESB Bus Module is used with an optical ESB bus with the following specifications at an altitude of 2000 m or higher, the ambient temperature range is -40 to 60°C.
 S2EN501-□01□□□ S2EN501-□02□□□ S2EN501-□10□□□ S2EN501-□11□□□
 S2EN501-□12□□□ S2EN501-□20□□□ S2EN501-□21□□□ S2EN501-□22□□□

Table NI Approved Products (5/9)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
7	Input/Output Modules	SAI143-HE3 SAI143-HE3/A4S00 SAI143-HE3/A4S10 SAI143-HE3/A4D00 SAI143-HE3/A4D10 SAI143-HE3/CCC01 SAI143-HEC SAI143-HEC/A4S00 SAI143-HEC/A4S10 SAI143-HEC/A4D00 SAI143-HEC/A4D10 SAI143-HEC/CCC01	Analog Input Module (4 to 20 mA, 16 channels, module isolation) with HART communication	-20 to 70°C	
		SAI143-HF3 SAI143-HF3/PRP SAI143-HFC SAI143-HFC/PRP			
		SAV144-SE3 SAV144-SE3/K4A00 SAV144-SE3/A4S00 SAV144-SE3/A4S10 SAV144-SE3/A4D00 SAV144-SE3/A4D10 SAV144-SE3/CCC01	Analog Input Module (1 to 5 V/1 to 10 V, 16 channels, module isolation)	-20 to 70°C	
		SAV144-SF3 SAV144-SF3/PRP			
		SAT145-SF3 SAT145-SF3/PRP	TC/mV Input Module (16 channels, Isolated Channels)	-20 to 70°C	
		SAR145-SF3 SAR145-SF3/PRP	RTD Input Module (16 channels, Isolated Channels)	-20 to 70°C	
		SAI533-HE3 SAI533-HE3/A4S00 SAI533-HE3/A4S10 SAI533-HE3/A4D00 SAI533-HE3/A4D10 SAI533-HE3/CCC01	Analog Output Module (4 to 20 mA, 8 channels, module isolation)	-20 to 70°C	
		SAI533-HF3 SAI533-HF3/PRP			
		SDV144-SE3 SDV144-SE3/B4S00 SDV144-SE3/B4S10 SDV144-SE3/B4D00 SDV144-SE3/B4D10 SDV144-SE3/CCC01 SDV144-SE3/CCC02 SDV144-SEC SDV144-SEC/B4S00 SDV144-SEC/B4S10 SDV144-SEC/B4D00 SDV144-SEC/B4D10 SDV144-SEC/CCC01 SDV144-SEC/CCC02	Digital Input Module (16 channels, module isolation)	-20 to 70°C	
		SDV144-SF3 SDV144-SF3/PRP SDV144-SFC SDV144-SFC/PRP	Digital Input Module (16 channels, module isolation)	-20 to 70°C	
		SDV521-SF3 SDV521-SF3/PRP SDV521-SFC SDV521-SFC/PRP	Digital Output Module (4 channels, module isolation)	-20 to 70°C	

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

Table NI Approved Products (6/9)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
7	Input/Output Modules	SDV531-SE3 SDV531-SE3/D4A00 SDV531-SE3/B4S00 SDV531-SE3/B4S10 SDV531-SE3/B4D00 SDV531-SE3/B4D10 SDV531-SE3/CCC01 SDV531-SE3/CCC02	Digital Output Module (8 channels, module isolation)	-20 to 70°C	
		SDV531-SF3 SDV531-SF3/PRP			
		SDV531-LE3 SDV531-LE3/B4S00 SDV531-LE3/B4S10 SDV531-LE3/B4D00 SDV531-LE3/B4D10 SDV531-LE3/CCC01 SDV531-LE3/CCC02 SDV531-LEC SDV531-LEC/B4S00 SDV531-LEC/B4S10 SDV531-LEC/B4D00 SDV531-LEC/B4D10 SDV531-LEC/CCC01 SDV531-LEC/CCC02	Digital Output Module (8 channels, module isolation, long distance type)	-20 to 70°C	
		SDV531-LF3 SDV531-LF3/PRP SDV531-LFC SDV531-LFC/PRP			
		SDV53A-SF3 SDV53A-SF3/PRP	Digital Output Module (8 channels, module isolation)	-20 to 70°C	
		SDV541-SE3 SDV541-SE3/B4S00 SDV541-SE3/B4S10 SDV541-SE3/B4D00 SDV541-SE3/B4D10 SDV541-SE3/CCC01 SDV541-SE3/CCC02 SDV541-SEC SDV541-SEC/B4S00 SDV541-SEC/B4S10 SDV541-SEC/B4D00 SDV541-SEC/B4D10 SDV541-SEC/CCC01 SDV541-SEC/CCC02	Digital Output Module (16 channels, module isolation)	-20 to 70°C	
	SDV541-SF3 SDV541-SF3/PRP SDV541-SFC SDV541-SFC/PRP				
	S2MMM843-SS1130	Analog Digital I/O Module	-40 to 70°C		
	S2MDV843-OS1130	Digital I/O Module	-40 to 70°C		
	Communication Modules	ALR111-SE1	Serial Communication Module (RS-232C, 2-port)	0 to 60°C	
		ALR121-SE1	Serial Communication Module (RS-422/RS-485, 2-port)	0 to 60°C	
		ALR121-SEB	Serial Communication Module (RS-422/RS-485, 2-port)	0 to 70°C	
		ALR121-SE3	Serial Communication Module (RS-422/RS-485, 2-port)	-20 to 70°C	

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

Table NI Approved Products (7/9)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
7	Communication Modules	ALE111-SE1	Ethernet communication Module	0 to 60°C	(*5)
		ALE111-SE3	Ethernet communication Module	-20 to 70°C	(*5)
		S2LP131-S11	Fire and gas communication module	-20 to 70°C	(*6)
8	Terminal Board	SEA4D-0F SEA4D-1F SEA4D-0F/NTRY SEA4D-1F/NTRY	Analog Terminal Board (Single and Dual-Redundant, 16 channels×2)	-20 to 70°C	
		SED2D-0F SED2D-1F SED2D-0F/NTRY SED2D-1F/NTRY	Digital Terminal Board (Single and Dual-Redundant, 4 channels×4)	-20 to 70°C	
		SED3D-AF SED3D-AF/NTRY	Digital Terminal Board (Single and Dual-Redundant, 8 channels×4)	-20 to 70°C	
		SED4D-0F SED4D-1F SED4D-0F/NTRY SED4D-1F/NTRY	Digital Terminal Board (Single and Dual-Redundant, 16 channels×2)	-20 to 70°C	
		SBT4D-0F	Terminal board for TC/mV: DIN rail mount type (Single and Dual-redundant, 16 channels×1)	-20 to 70°C	
		SBR4D-0F	Terminal board for RTD input: DIN rail mount type (Single and Dual-redundant, 16 channels×1)	-20 to 70°C	
		SBA4D-0F	Terminal board for Analog: DIN rail mount type (Single and Dual-redundant, 16 channels×1)	-20 to 70°C	
		S1BB4D-0F	Terminal Board for Analog, 3-wire: DIN rail mount type	-20 to 70°C	
		SBD2D-0F	Terminal board for Digital output: DIN rail mount type (Single and Dual-redundant, 4 channels×1, for SDV521)	-20 to 70°C	
		SBD3D-0F SBD3D-AF	Terminal board for Digital output: DIN rail mount type (Single and Dual-redundant, 8 channels×1, for SDV53□)	-20 to 70°C	
		SBD4D-0F	Terminal board for Digital: DIN rail mount type (Single and Dual-redundant, 16 channels×1, for SDV144/SDV541)	-20 to 70°C	
		A2BM4-130	Terminal board for analog digital I/O	-40 to 70°C	(*7)

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*5: ALE111 is available from ProSafe-RS R3.02.00 or later with S2SC70□, SSC60□, SSC50□ or SSC57□.

*6: S2LP131 is available from ProSafe-RS R4.05.00 or later with S2SC70□.

*7: The temperature range of the cable (AKB331 and AKB651) used with A2BM4 is -20 to 70°C.

Table NI Approved Products (8/9)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
9	Power Distribution Board	AEP7D-1F	Primary Power Supply Bus Unit (100 to 120 V AC input)	-20 to 70°C	
		AEP7D-2F	Primary Power Supply Bus Unit (220 to 240 V AC input)	-20 to 70°C	(*2)
		AEP7D-4F	Primary Power Supply Bus Unit (for 24 V DC input)	-20 to 70°C	
		AEPV7D-11F	Power Supply Bus Unit, Vertical Type (100 to 120 V AC input)	-20 to 70°C	(*8)
		AEPV7D-21F	Power Supply Bus Unit, Vertical Type (220 to 240 V AC input)	-20 to 70°C	(*2) (*8)
		AEPV7D-41F	Power Supply Bus Unit, Vertical Type (for 24 V DC input)	-20 to 70°C	(*8)
	Fan	AIP602	Fan Unit	-20 to 70°C	
10	Optical Bus Repeater	YNT511D-P41/NL	Optical Bus Repeater for Dual-Redundant Bus (10BASE-2 Cable) (Up to 4 km Transmission Distance, 100 to 120 V AC Power Supply)	0 to 50°C	
		YNT511D-P42/NL	Optical Bus Repeater for Dual-Redundant Bus (10BASE-2 Cable) (Up to 4 km Transmission Distance, 220 to 240 V AC Power Supply)	0 to 50°C	(*9)
		YNT511D-P44/NL	Optical Bus Repeater for Dual-Redundant Bus (10BASE-2 Cable) (Up to 4 km Transmission Distance, 24 V DC Power Supply)	0 to 50°C	
		YNT522D-P11/NL	Optical Bus Repeater for Dual-Redundant Bus (10BASE-2 Cable) (Up to 15 km Transmission Distance, 100 to 120 V AC Power Supply)	0 to 50°C	
		YNT522D-P12/NL	Optical Bus Repeater for Dual-Redundant Bus (10BASE-2 Cable) (Up to 15 km Transmission Distance, 220 to 240 V AC Power Supply)	0 to 50°C	(*9)
		YNT522D-P14/NL	Optical Bus Repeater for Dual-Redundant Bus (10BASE-2 Cable) (Up to 15 km Transmission Distance, 24 V DC Power Supply)	0 to 50°C	
		PW501	Power Supply Unit (for YNT5□□, 100 to 120 V AC)	0 to 50°C	
		PW502	Power Supply Unit (for YNT5□□, 220 to 240 V AC)	0 to 50°C	(*9)
		PW504	Power Supply Unit (for YNT5□□, 24 V DC)	0 to 50°C	
		AIP578	Optical Transceiver Unit for V net Repeater (For Max. 4 km Transmission Distance)	0 to 50°C	
		AIP591	Optical Transceiver Unit for V net Repeater (For Max. 15 km Transmission Distance)	0 to 50°C	
		AIP171	Transceiver Control Unit for V net Repeater	0 to 50°C	
		AIP571	Electrical Transceiver Unit for V net Repeater	0 to 50°C	

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*2: The power supply input terminal-N of SPW482 shall be connected to the neutral line (N) of the main power supply.

*8: For style code S1 and unit revision U:1 or later.

*9: Wirings must comply with NEC (National Electrical Code : ANSI/NFPA-70) or the regulations of the relevant country.

Table NI Approved Products (9/9)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
11	Base Plate	S2BN1D-□0130 S2BN1D-□1130 S2BN1D-□1130/L S2BN1D-□1130/T S2BN1D-□2130 S2BN1D-□2130/L S2BN1D-□2130/T	Base Plate with disconnecting terminal	-40 to 70°C	
		S2BN1D-□9130			
		S2BN5D-121□0	Base Plate for Barrier	-20 to 60°C	
12	N-IO field enclosure	S2NN70D- □□Q□□B□1□□□□□□□□ S2NN70D- □□Q□□D□1□□□□□□□□	N-IO field enclosure	-40 to 55 °C	
		S2NN60D- □□Q□□1□□□□	N-IO field enclosure base unit	-40 to 55 °C	(*11)
		S2CB60- B□1□□□□□□□□ S2CB60- D□1□□□□□□□□	Enclosure for S2NN60D	-40 to 55 °C	
		A2CX100	Sealing module set for N-IO field enclosure	-40 to 55 °C	(*12)

- *1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.
- *10: The temperature range of the cable (AKB331 and AKB651) used with S2BN1D is -20 to 70°C.
- *11: This temperature applies to the ambient temperature of S2CB60 with S2NN60D installed inside.
- *12: A2CX100 used in the N-IO field enclosure comply with FM NI.

Appendix 1.2 Canada (FM) NI Compliant Products

■ ProSafe-RS Canada (FM) NI Compliant Products

Table Canada (FM) NI Approved Products (1/5)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
1	Safety Node Units	SNB10D-□1E SNB10D-□1E/CU2N SNB10D-□1E/CU2T	Node Unit for Dual-Redundant ESB Bus 100 to 120 V AC power supply	-20 to 70°C	
		SNB10D-□4E SNB10D-□4E/CU2N SNB10D-□4E/CU2T	Node Unit for Dual-Redundant ESB Bus 24 V DC power supply	-20 to 70°C	
2	Unit for Optical Bus Repeater Module	SNT10D-21E	Unit for Optical ESB Bus Repeater Module 100 to 120 V AC power supply	-20 to 70°C	
		SNT10D-24E	Unit for Optical ESB Bus Repeater Module 24 V DC power supply	-20 to 70°C	
3	Power supply Module	SPW481-E3	100 to 120 V AC Input Power supply module	-20 to 70°C	
		SPW484-E3	24 V DC Input Power supply module	-20 to 70°C	
		S2PW503-S0130	24 V DC Output Power Supply Unit (100 to 240 V AC input power supply)	-40 to 70°C	
		S2PW504-S0130	24 V DC Output Power Supply Unit (24 V DC input power supply)	-40 to 70°C	
4	Bus Interface Module	SSB401-E3	ESB Bus Interface Slave Module	-20 to 70°C	
	Optical ESB Bus Repeater Module	SNT401-EF SNT401-EF/CU1N SNT401-EF/CU1T	Optical ESB Bus Repeater Master Module	-20 to 70°C	
		SNT411-EF SNT411-EF/CU1N SNT411-EF/CU1T	Optical ESB Bus Repeater Master Module 5 to 50 km	-20 to 70°C	
		SNT421-E3 SNT421-E3/CU1N SNT421-E3/CU1T	Optical ESB Bus Repeater Master Module (for Multimode Fiber)	-20 to 70°C	
		SNT501-EF	Optical ESB Bus Repeater Slave Module	-20 to 70°C	
		SNT511-EF	Optical ESB Bus Repeater Slave Module 5 to 50 km	-20 to 70°C	
		SNT521-E3	Optical ESB Bus Repeater Slave Module (for Multimode Fiber)	-20 to 70°C	
		Node Interface Unit	S2NN30D-430□□□□13	Node Interface Unit (100 to 240 V AC input power supply)	-40 to 70°C
	S2NN30D-440□□□□13		Node Interface Unit (24 V DC input power supply)	-40 to 70°C	(*2)

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*2: When the S2NN30D Node Interface Unit is used with an optical ESB bus with the following specifications at an altitude of 2000 m or higher, the ambient temperature range is -40 to 60°C.

S2NN30D-□□□□□01□□	S2NN30D-□□□□□02□□	S2NN30D-□□□□□10□□
S2NN30D-□□□□□11□□	S2NN30D-□□□□□12□□	S2NN30D-□□□□□20□□
S2NN30D-□□□□□21□□	S2NN30D-□□□□□22□□	

Table Canada (FM) NI Approved Products (2/5)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
4	N-ESB Bus Module	S2EN501-S□□130	N-ESB Bus Module	-40 to 70°C	(*3)
5	Input/Output Modules	SAI143-SE3 SAI143-SE3/K4A00 SAI143-SE3/A4S00 SAI143-SE3/A4S10 SAI143-SE3/A4D00 SAI143-SE3/A4D10 SAI143-SE3/CCC01	Analog Input Module (4 to 20 mA, 16 channels, module isolation)	-20 to 70°C	
		SAI143-SF3 SAI143-SF3/PRP			
		SAI143-HE3 SAI143-HE3/A4S00 SAI143-HE3/A4S10 SAI143-HE3/A4D00 SAI143-HE3/A4D10 SAI143-HE3/CCC01 SAI143-HEC SAI143-HEC/A4S00 SAI143-HEC/A4S10 SAI143-HEC/A4D00 SAI143-HEC/A4D10 SAI143-HEC/CCC01	Analog Input Module (4 to 20 mA, 16 channels, module isolation) with HART communication	-20 to 70°C	
		SAI143-HF3 SAI143-HF3/PRP SAI143-HFC SAI143-HFC/PRP			
		SAV144-SE3 SAV144-SE3/K4A00 SAV144-SE3/A4S00 SAV144-SE3/A4S10 SAV144-SE3/A4D00 SAV144-SE3/A4D10 SAV144-SE3/CCC01	Analog Input Module (1 to 5 V/1 to 10 V, 16 channels, module isolation)	-20 to 70°C	
		SAV144-SF3 SAV144-SF3/PRP			
		SAT145-SF3 SAT145-SF3/PRP	TC/mV Input Module (16 channels, Isolated Channels)	-20 to 70°C	
		SAR145-SF3 SAR145-SF3/PRP	RTD Input Module (16 channels, Isolated Channels)	-20 to 70°C	
		SAI533-HE3 SAI533-HE3/A4S00 SAI533-HE3/A4S10 SAI533-HE3/A4D00 SAI533-HE3/A4D10 SAI533-HE3/CCC01	Analog Output Module (4 to 20 mA, 8 channels, module isolation)	-20 to 70°C	
		SAI533-HF3 SAI533-HF3/PRP			
		SDV144-SE3 SDV144-SE3/B4S00 SDV144-SE3/B4S10 SDV144-SE3/B4D00 SDV144-SE3/B4D10 SDV144-SE3/CCC01 SDV144-SE3/CCC02	Digital Input Module (16 channels, module isolation)	-20 to 70°C	

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*3: When the S2EN501 N-ESB Bus Module is used with an optical ESB bus with the following specifications at an altitude of 2000 m or higher, the ambient temperature range is -40 to 60°C.

S2EN501-□01□□□ S2EN501-□02□□□ S2EN501-□10□□□ S2EN501-□11□□□
 S2EN501-□12□□□ S2EN501-□20□□□ S2EN501-□21□□□ S2EN501-□22□□□

Table Canada (FM) NI Approved Products (3/5)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
5	Input/Output Modules	SDV144-SEC SDV144-SEC/B4S00 SDV144-SEC/B4S10 SDV144-SEC/B4D00 SDV144-SEC/B4D10 SDV144-SEC/CCC01 SDV144-SEC/CCC02	Digital Input Module (16 channels, module isolation)	-20 to 70°C	
		SDV144-SF3 SDV144-SF3/PRP SDV144-SFC SDV144-SFC/PRP	Digital Input Module (16 channels, module isolation)	-20 to 70°C	
		SDV521-SF3 SDV521-SF3/PRP SDV521-SFC SDV521-SFC/PRP	Digital Output Module (4 channels, module isolation)	-20 to 70°C	
		SDV531-SE3 SDV531-SE3/D4A00 SDV531-SE3/B4S00 SDV531-SE3/B4S10 SDV531-SE3/B4D00 SDV531-SE3/B4D10 SDV531-SE3/CCC01 SDV531-SE3/CCC02	Digital Output Module (8 channels, module isolation)	-20 to 70°C	
		SDV531-SF3 SDV531-SF3/PRP			
		SDV531-LE3 SDV531-LE3/B4S00 SDV531-LE3/B4S10 SDV531-LE3/B4D00 SDV531-LE3/B4D10 SDV531-LE3/CCC01 SDV531-LE3/CCC02 SDV531-LEC SDV531-LEC/B4S00 SDV531-LEC/B4S10 SDV531-LEC/B4D00 SDV531-LEC/B4D10 SDV531-LEC/CCC01 SDV531-LEC/CCC02	Digital Output Module (8 channels, module isolation, long distance type)	-20 to 70°C	
		SDV531-LF3 SDV531-LF3/PRP SDV531-LFC SDV531-LFC/PRP			
		SDV53A-SF3 SDV53A-SF3/PRP	Digital Output Module (8 channels, module isolation)	-20 to 70°C	
		SDV541-SE3 SDV541-SE3/B4S00 SDV541-SE3/B4S10 SDV541-SE3/B4D00 SDV541-SE3/B4D10 SDV541-SE3/CCC01 SDV541-SE3/CCC02	Digital Output Module (16 channels, module isolation)	-20 to 70°C	
		SDV541-SEC SDV541-SEC/B4S00 SDV541-SEC/B4S10 SDV541-SEC/B4D00 SDV541-SEC/B4D10 SDV541-SEC/CCC01 SDV541-SEC/CCC02	Digital Output Module (16 channels, module isolation)	-20 to 70°C	

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

Table Canada (FM) NI Approved Products (4/5)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
5	Input/Output Modules	SDV541-SF3 SDV541-SF3/PRP SDV541-SFC SDV541-SFC/PRP	Digital Output Module (16 channels, module isolation)	-20 to 70°C	
		S2MMM843-SS1130	Analog Digital I/O Module	-40 to 70°C	
		S2MDV843-OS1130	Digital I/O Module	-40 to 70°C	
	Communication Modules	S2LP131-S11	Fire and gas communication module	-20 to 70°C	(*4)
6	Terminal Board	SEA4D-0F SEA4D-1F SEA4D-0F/NTRY SEA4D-1F/NTRY	Analog Terminal Board (Single and Dual-Redundant, 16 channels×2)	-20 to 70°C	
		SED2D-0F SED2D-1F SED2D-0F/NTRY SED2D-1F/NTRY	Digital Terminal Board (Single and Dual-Redundant, 4 channels×4)	-20 to 70°C	
		SED3D-AF SED3D-AF/NTRY	Digital Terminal Board (Single and Dual-Redundant, 8 channels×4)	-20 to 70°C	
		SED4D-0F SED4D-1F SED4D-0F/NTRY SED4D-1F/NTRY	Digital Terminal Board (Single and Dual-Redundant, 16 channels×2)	-20 to 70°C	
		SBT4D-0F	Terminal board for TC/mV: DIN rail mount type (Single and Dual-redundant, 16 channels×1)	-20 to 70°C	
		SBR4D-0F	Terminal board for RTD input: DIN rail mount type (Single and Dual- redundant, 16 channels×1)	-20 to 70°C	
		SBA4D-0F	Terminal board for Analog: DIN rail mount type (Single and Dual-redundant, 16 channels×1)	-20 to 70°C	
		S1BB4D-0F	Terminal Board for Analog, 3-wire: DIN rail mount type	-20 to 70°C	
		SBD2D-0F	Terminal board for Digital output: DIN rail mount type (Single and Dual-redundant, 4 channels×1, for SDV521)	-20 to 70°C	
		SBD3D-0F SBD3D-AF	Terminal board for Digital output: DIN rail mount type (Single and Dual-redundant, 8 channels×1, for SDV53□)	-20 to 70°C	
		SBD4D-0F	Terminal board for Digital: DIN rail mount type (Single and Dual- redundant, 16 channels×1, for SDV144/SDV541)	-20 to 70°C	
		A2BM4-130	Terminal board for analog digital I/O	-40 to 70°C	(*5)

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*4: S2LP131 is available from ProSafe-RS R4.05.00 or later with S2SC70□.

*5: The temperature range of the cable (AKB331 and AKB651) used with A2BM4 is -20 to 70°C.

Table Canada (FM) NI Approved Products (5/5)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
7	Power Distribution Board	AEP7D-1F	Primary Power Supply Bus Unit (100 to 120 V AC input)	-20 to 70°C	
		AEP7D-4F	Primary Power Supply Bus Unit (for 24 V DC input)	-20 to 70°C	
		AEPV7D-11F	Power Supply Bus Unit, Vertical Type (100 to 120 V AC input)	-20 to 70°C	
		AEPV7D-41F	Power Supply Bus Unit, Vertical Type (for 24 V DC input)	-20 to 70°C	
8	Base Plate	S2BN1D-□0130 S2BN1D-□1130 S2BN1D-□1130/L S2BN1D-□1130/T S2BN1D-□2130 S2BN1D-□2130/L S2BN1D-□2130/T	Base Plate with disconnecting terminal	-40 to 70°C	
		S2BN1D-□9130		-40 to 70°C	(*6)
		S2BN5D-121□0	Base Plate for Barrier	-20 to 60°C	
9	N-IO field enclosure	S2NN70D- □□Q□□B□1□□□□□□□□ S2NN70D- □□Q□□D□1□□□□□□□□	N-IO field enclosure	-40 to 55 °C	
		S2NN60D- □□Q□□1□□□□□	N-IO field enclosure base unit	-40 to 55 °C	(*7)
		S2CB60- B□1□□□□□□□□ S2CB60- D□1□□□□□□□□	Enclosure for S2NN60D	-40 to 55 °C	
		A2CX100	Sealing module set for N-IO field enclosure	-40 to 55 °C	(*8)

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.
 *6: The temperature range of the cable (AKB331 and AKB651) used with S2BN1D is -20 to 70°C.
 *7: This temperature applies to the ambient temperature of S2CB60 with S2NN60D installed inside.
 *8: A2CX100 used in the N-IO field enclosure comply with CSA NI.

Appendix 2. List of Type “n”, “ec” Compliant Products

Note: Regarding the latest conformity standard, refer to the GS 32P01B60-01EN “ProSafe-RS Standards Compliant Models”.

Appendix 2.1 ATEX Type “n”, “ec” Compliant Products

Table The List of ATEX Type “n”, “ec” Compliant Products (1/7)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
1	Safety Control Units (*2)	SSC10S-S2E41 SSC10S-S2E41/GPS/ATDOC	Safety Control Units 24 V DC power supply	-20 to 50°C	
		SSC10S-F2E41 SSC10S-F2E41/GPS/ATDOC	Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		SSC10D-S2E41 SSC10D-S2E41/GPS/ATDOC	Duplexed Safety Control Units 24 V DC power supply	-20 to 50°C	
		SSC10D-F2E41 SSC10D-F2E41/GPS/ATDOC	Duplexed Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
2	Safety Control Units for Vnet/IP	SSC50S-S2E4□ SSC50S-S2E4□/ATDOC	Safety Control Units 24 V DC power supply	-20 to 40°C	
		SSC50S-F2E4□ SSC50S-F2E4□/ATDOC	Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		SSC50D-S2E4□ SSC50D-S2E4□/ATDOC	Duplexed Safety Control Units 24 V DC power supply	-20 to 40°C	
		SSC50D-F2E4□ SSC50D-F2E4□/ATDOC	Duplexed Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		SSC57S-S2E4□ SSC57S-S2E4□/ATDOC	Safety Control Units 24 V DC power supply	-20 to 40°C	
		SSC57S-F2E4□ SSC57S-F2E4□/ATDOC	Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		SSC57D-S2E4□ SSC57D-S2E4□/ATDOC	Duplexed Safety Control Units 24 V DC power supply	-20 to 40°C	
		SSC57D-F2E4□ SSC57D-F2E4□/ATDOC	Duplexed Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		SSC60S-S2E4□ SSC60S-S2E4□/ATDOC	Safety Control Units 24 V DC power supply	-20 to 40°C	
		SSC60S-F2E4□ SSC60S-F2E4□/ATDOC	Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		SSC60D-S2E4□ SSC60D-S2E4□/ATDOC	Duplexed Safety Control Units 24 V DC power supply	-20 to 40°C	
		SSC60D-F2E4□ SSC60D-F2E4□/ATDOC	Duplexed Safety Control Units (With fan, 24 V DC power supply)	-20 to 70°C	
		S2SC70S-S□□41□□ S2SC70S-S□□41□□/ATDOC	Safety Control Unit 24 V DC power supply	-20 to 40°C	
		S2SC70S-F□□41□□ S2SC70S-F□□41□□/ATDOC	Safety Control Unit (With fan, 24 V DC power supply)	-20 to 70°C	
		S2SC70D-S□□41□□ S2SC70D-S□□41□□/ATDOC	Duplexed Safety Control Unit 24 V DC power supply	-20 to 40°C	
		S2SC70D-F□□41□□ S2SC70D-F□□41□□/ATDOC	Duplexed Safety Control Unit (With fan, 24 V DC power supply)	-20 to 70°C	

Note: Only N-IO field enclosure complies with ATEX Increased safety “ec”.

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*2: /GPS and/or /ATDOC can be selected.

Table The List of ATEX Type “n”, “ec” Compliant Products (2/7)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
3	Safety Node Units (*3)	SNB10D-□4E SNB10D-□4E/CU2N/ATDOC SNB10D-□4E/CU2T/ATDOC	Node Unit for Dual-Redundant ESB Bus 24 V DC power supply	-20 to 70°C	
4	Unit for Optical Bus Repeater Module	SNT10D-24E SNT10D-24E/ATDOC	Unit for Optical ESB Bus Repeater Module 24 V DC power supply	-20 to 70°C	
5	CPU Module	SCP401-E1	Processor Module for SSC10□	-20 to 70°C	
		SCP451-E□	Processor Module for SSC50□ and SSC57□	-20 to 70°C	
		SCP461-E1	Processor Module for SSC60□ and S2SC70□	-20 to 70°C	
		S2CP471-1□	Processor Module for SSC60□ and S2SC70□	-20 to 70°C	
	Power supply Module	SPW484-E3	24 V DC Power supply module	-20 to 70°C	
		S2PW504-S0130	24 V DC Output Power Supply Unit (24 V DC input power supply)	-40 to 70°C	
6	Coupler Unit	AIP504-E3	V net Coupler Unit	-20 to 70°C	
	Bus Coupler Module	SEC401-E1	ESB Bus Coupler Module	-20 to 70°C	
		SEC402-E1	ESB Bus Coupler Module (for 2-port)	-20 to 70°C	
	Bus Interface Module	SSB401-E3	ESB Bus Interface Slave Module	-20 to 70°C	
	Optical ESB Bus Repeater Module	SNT401-E□ SNT401-E□/CU1N SNT401-E□/CU1T	Optical ESB Bus Repeater Master Module	-20 to 70°C	
		SNT411-E□ SNT411-E□/CU1N SNT411-E□/CU1T	Optical ESB Bus Repeater Master Module 5 to 50 km	-20 to 70°C	
		SNT421-E3 SNT421-E3/CU1N SNT421-E3/CU1T	Optical ESB Bus Repeater Master Module (for Multimode Fiber)	-20 to 70°C	
		SNT501-E□	Optical ESB Bus Repeater Slave Module	-20 to 70°C	
		SNT511-E□	Optical ESB Bus Repeater Slave Module 5 to 50 km	-20 to 70°C	
		SNT521-E3	Optical ESB Bus Repeater Slave Module (for Multimode Fiber)	-20 to 70°C	
		N-ESB Bus Coupler Module	S2EN402-S0011	N-ESB Bus Coupler Module	-20 to 70°C
	S2EN404-S0011		N-ESB Bus Coupler Module	-20 to 70°C	
	Node Interface Unit	S2NN30D-440□0□□13 S2NN30D-440□0□□13/ATDOC	Node Interface Unit (24 V DC input power supply)	-40 to 70°C	(*4)

Note: Only N-IO field enclosure complies with ATEX Increased safety “ec”.

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*3: /CU2N and/or /ATDOC can be selected.
/CU2T and/or /ATDOC can be selected.

*4: When the S2NN30D Node Interface Unit is used with an optical ESB bus with the following specifications at an altitude of 2000 m or higher, the ambient temperature range is -40 to 60°C.

S2NN30D-□□□□01□□	S2NN30D-□□□□02□□	S2NN30D-□□□□10□□
S2NN30D-□□□□11□□	S2NN30D-□□□□12□□	S2NN30D-□□□□20□□
S2NN30D-□□□□21□□	S2NN30D-□□□□22□□	

Table The List of ATEX Type “n”, “ec” Compliant Products (3/7)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
6	N-ESB Bus Module	S2EN501-S□□130	N-ESB Bus Module	-40 to 70°C	(*5)
7	Input/Output Modules	SAI143-SE3 SAI143-SE3/A4S00 SAI143-SE3/A4S10 SAI143-SE3/A4D00 SAI143-SE3/A4D10 SAI143-SE3/CCC01	Analog Input Module (4 to 20 mA, 16 channels, module isolation)	-20 to 70°C	
		SAI143-SF3 SAI143-SF3/PRP			
		SAI143-HE3 SAI143-HE3/A4S00 SAI143-HE3/A4S10 SAI143-HE3/A4D00 SAI143-HE3/A4D10 SAI143-HE3/CCC01 SAI143-HEC SAI143-HEC/A4S00 SAI143-HEC/A4S10 SAI143-HEC/A4D00 SAI143-HEC/A4D10 SAI143-HEC/CCC01	Analog Input Module (4 to 20 mA, 16 channels, module isolation) With HART communication	-20 to 70°C	
		SAI143-HF3 SAI143-HF3/PRP SAI143-HFC SAI143-HFC/PRP			
		SAV144-SE3 SAV144-SE3/A4S00 SAV144-SE3/A4S10 SAV144-SE3/A4D00 SAV144-SE3/A4D10 SAV144-SE3/CCC01	Analog Input Module (1 to 5 V/1 to 10V, 16 channels, module isolation)	-20 to 70°C	
		SAV144-SF3 SAV144-SF3/PRP		-20 to 70°C	
		SAT145-SF3 SAT145-SF3/PRP	TC/mV Input Module (16 channels, Isolated Channels)	-20 to 70°C	
		SAR145-SF3 SAR145-SF3/PRP	RTD Input Module (16 channels, Isolated Channels)	-20 to 70°C	
		SAI533-HE3 SAI533-HE3/A4S00 SAI533-HE3/A4S10 SAI533-HE3/A4D00 SAI533-HE3/A4D10 SAI533-HE3/CCC01	Analog Output Module (4 to 20 mA, 8 channels, module isolation)	-20 to 70°C	
		SAI533-HF3 SAI533-HF3/PRP			
		SDV144-SE3 SDV144-SE3/B4S00 SDV144-SE3/B4S10 SDV144-SE3/B4D00 SDV144-SE3/B4D10 SDV144-SE3/CCC01 SDV144-SE3/CCC02	Digital Input Module (16 channels, module isolation)	-20 to 70°C	

Note: Only N-IO field enclosure complies with ATEX Increased safety “ec”.

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*5: When the S2EN501 N-ESB Bus Module is used with an optical ESB bus with the following specifications at an altitude of 2000 m or higher, the ambient temperature range is -40 to 60°C.

S2EN501-□01□□□
S2EN501-□12□□□

S2EN501-□02□□□
S2EN501-□20□□□

S2EN501-□10□□□
S2EN501-□21□□□

S2EN501-□11□□□
S2EN501-□22□□□

Table The List of ATEX Type “n”, “ec” Compliant Products (4/7)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
7	Input/Output Modules	SDV144-SEC SDV144-SEC/B4S00 SDV144-SEC/B4S10 SDV144-SEC/B4D00 SDV144-SEC/B4D10 SDV144-SEC/CCC01 SDV144-SEC/CCC02	Digital Input Module (16 channels, module isolation)	-20 to 70°C	
		SDV144-SF3 SDV144-SF3/PRP SDV144-SFC SDV144-SFC/PRP			
		SDV521-SF3 SDV521-SF3/PRP SDV521-SFC SDV521-SFC/PRP	Digital Output Module (4 channels, module isolation)	-20 to 70°C	
		SDV531-SE3 SDV531-SE3/B4S00 SDV531-SE3/B4S10 SDV531-SE3/B4D00 SDV531-SE3/B4D10 SDV531-SE3/CCC01 SDV531-SE3/CCC02	Digital Output Module (8 channels, module isolation)	-20 to 70°C	
		SDV531-SF3 SDV531-SF3/PRP			
		SDV531-LE3 SDV531-LE3/B4S00 SDV531-LE3/B4S10 SDV531-LE3/B4D00 SDV531-LE3/B4D10 SDV531-LE3/CCC01 SDV531-LE3/CCC02 SDV531-LEC SDV531-LEC/B4S00 SDV531-LEC/B4S10 SDV531-LEC/B4D00 SDV531-LEC/B4D10 SDV531-LEC/CCC01 SDV531-LEC/CCC02	Digital Output Module (8 channels, module isolation, long distance type)	-20 to 70°C	
		SDV531-LF3 SDV531-LF3/PRP SDV531-LFC SDV531-LFC/PRP			
		SDV53A-SF3 SDV53A-SF3/PRP	Digital Output Module (8 channels, module isolation)	-20 to 70°C	
		SDV541-SE3 SDV541-SE3/B4S00 SDV541-SE3/B4S10 SDV541-SE3/B4D00 SDV541-SE3/B4D10 SDV541-SE3/CCC01 SDV541-SE3/CCC02 SDV541-SEC SDV541-SEC/B4S00 SDV541-SEC/B4S10 SDV541-SEC/B4D00 SDV541-SEC/B4D10 SDV541-SEC/CCC01 SDV541-SEC/CCC02	Digital Output Module (16 channels, module isolation)	-20 to 70°C	
				-20 to 70°C	

Note: Only N-IO field enclosure complies with ATEX Increased safety “ec”.

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

Table The List of ATEX Type “n”, “ec” Compliant Products (5/7)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
7	Input/Output Modules	SDV541-SF3 SDV541-SF3/PRP SDV541-SFC SDV541-SFC/PRP	Digital Output Module (16 channels, module isolation)	-20 to 70°C	
		S2MMM843-SS1130	Analog Digital I/O Module	-40 to 70°C	
		S2MDV843-OS1130	Digital I/O Module	-40 to 70°C	
		ALR111-SE1	Serial Communication Module (RS-232C, 2-port)	0 to 60°C	
	Communication Modules	ALR121-SE1	Serial Communication Module (RS-422/RS-485, 2-port)	0 to 60°C	
		ALR121-SEB	Serial Communication Module (RS-422/RS-485, 2-port)	0 to 70°C	
		ALR121-SE3	Serial Communication Module (RS-422/RS-485, 2-port)	-20 to 70°C	
		ALE111-SE1	Ethernet Communication Module	0 to 60°C	(*6)
		ALE111-SE3	Ethernet Communication Module	-20 to 70°C	(*6)
		S2LP131-S11	Fire and gas communication module	-20 to 70°C	(*7)
		8	Terminal Board	SEA4D-0F SEA4D-1F SEA4D-0F/NTRY SEA4D-1F/NTRY	Analog Terminal Board (Single and Dual-Redundant, 16 channels×2)
SED2D-0F SED2D-1F SED2D-0F/NTRY SED2D-1F/NTRY	Digital Terminal Board (Single and Dual-Redundant, 4 channels×4)			-20 to 70°C	
SED3D-AF SED3D-AF/NTRY	Digital terminal board (Single and Dual-Redundant, 8 channels×4)			-20 to 70°C	
SED4D-0F SED4D-1F SED4D-0F/NTRY SED4D-1F/NTRY	Digital terminal board (Single and Dual-Redundant, 16 channels×2)			-20 to 70°C	
SBT4D-0F	Terminal board for TC/mV: DIN rail mount type (Single and Dual-redundant, 16 channels×1)			-20 to 70°C	
SBR4D-0F	Terminal board for RTD input: DIN rail mount type (Single and Dual-redundant, 16 channels×1)			-20 to 70°C	
SBA4D-0F	Terminal board for Analog: DIN rail mount type (Single and Dual-redundant, 16 channels×1)			-20 to 70°C	
S1BB4D-0F	Terminal Board for Analog, 3-wire: DIN rail mount type			-20 to 70°C	
SBD2D-0F	Terminal board for Digital output: DIN rail mount type (Single and Dual-redundant, 4 channels×1, for SDV521)			-20 to 70°C	
SBD3D-0F SBD3D-AF	Terminal board for Digital output: DIN rail mount type (Single and Dual-redundant, 8 channels×1, for SDV53□)			-20 to 70°C	

Note: Only N-IO field enclosure complies with ATEX Increased safety “ec”.

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*6: ALE111 supported in R3.02.00 or later can be mounted on S2SC70□, SSC60□, SSC50□ or SSC57□.

*7: S2LP131 is available from ProSafe-RS R4.05.00 or later with S2SC70□.

Table The List of ATEX Type “n”, “ec” Compliant Products (6/7)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
8	Terminal Board	SBD4D-0F	Terminal board for Digital: DIN rail mount type (Single and Dual-redundant, 16 channels×1, for SDV144/SDV541)	-20 to 70°C	
		A2BM4-130	Terminal board for analog digital I/O	-40 to 70°C	(*8)
	Power Distribution Board	AEP7D-4F	Primary power supply bus unit (for 24 V DC input)	-20 to 70°C	
		AEPV7D-41F	Power Supply Bus Unit, Vertical Type (for 24 V DC input)	-20 to 70°C	(*9)
	Fan	AIP602	Fan Unit	-20 to 70°C	
9	Optical Bus Repeater	YNT511D-P44/NL	Optical Bus Repeater for Dual-Redundant Bus (10BASE-2 Cable) (Up to 4 km Transmission Distance, 24 V DC Power Supply)	0 to 50°C	
		YNT522D-P14/NL	Optical Bus Repeater for Dual-Redundant Bus (10BASE-2 Cable) (Up to 15 km Transmission Distance, 24 V DC Power Supply)	0 to 50°C	
		PW504	Power Supply Unit (for YNT5□□, 24 V DC)	0 to 50°C	
		AIP578	Optical Transceiver Unit for V net Repeater (For Max. 4 km Transmission Distance)	0 to 50°C	
		AIP591	Optical Transceiver Unit for V net Repeater (For Max. 15 km Transmission Distance)	0 to 50°C	
		AIP171	Transceiver Control Unit for V net Repeater	0 to 50°C	
		AIP571	Electrical Transceiver Unit for V net Repeater	0 to 50°C	
10	Base Plate	S2BN1D-□0130 S2BN1D-□1130 S2BN1D-□1130/L S2BN1D-□1130/T S2BN1D-□2130 S2BN1D-□2130/L S2BN1D-□2130/T	Base Plate with disconnecting terminal	-40 to 70°C	
		S2BN1D-□9130		-40 to 70°C	(10)
		S2BN4D-101□0	Base Plate for Barrier	-20 to 60°C	
		S2BN5D-121□0	Base Plate for Barrier	-20 to 60°C	(*11)

Note: Only N-IO field enclosure complies with ATEX Increased safety “ec”.

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*8: The temperature range of the cable (AKB331 and AKB651) used with A2BM4 is -20 to 70°C.

*9: For style code S1 and unit revision U:1 or later.

*10: The temperature range of the cable (AKB331 and AKB651) used with S2BN1D is -20 to 70°C.

*11: S2BN5D style S1 cannot be installed in the hazardous area.

Table The List of ATEX Type “n”, “ec” Compliant Products (7/7)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
11	N-IO field enclosure	S2ZN70D	N-IO field enclosure	-40 to 55°C	(*12)
		S2NN70D-□□R□□B□2□□□□□□□□		-40 to 55°C	(*12) (*14)
		S2NN70D-□□R□□D□2□□□□□□□□		-40 to 55°C	(*12) (*14)
		S2ZN60D	N-IO field enclosure base unit	-40 to 55°C	(*12) (*13)
		S2NN60D-□□R□□2□□□□		-40 to 55°C	(*12) (*13) (*14)
		S2CB60-B□2□□□□□□□□	Enclosure for S2NN60D	-40 to 55°C	(*12) (*15)
		S2CB60-D□2□□□□□□□□		-40 to 55°C	(*12) (*15)

Note: Only N-IO field enclosure complies with ATEX Increased safety “ec”.

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*12: S2NN70D Style S1, S2NN60D Style S1, and S2CB60 Style S1 cannot be installed in Zone 2 hazardous area.

*13: This temperature indicates the ambient temperature of S2CB60 with S2NN60D installed inside.

*14: The N-IO field enclosure complies with ATEX Type “n”, “ec” as system models S2ZN60D and S2ZN70D.

*15: S2CB60 complies with ATEX Increased safety “ec” as system model S2ZN70D.

Appendix 2.2 IECEx Type “n”, “ec” Compliant Products

Table The List of IECEx Type “n”, “ec” Compliant Products (1/2)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
1	Safety Control Units for Vnet/IP	S2SC70S-S□□41□□ S2SC70S-S□□41□□/ATDOC	Safety Control Unit 24 V DC power supply	-20 to 40°C	
		S2SC70S-F□□41□□ S2SC70S-F□□41□□/ATDOC	Safety Control Unit (With fan, 24 V DC power supply)	-20 to 70°C	
		S2SC70D-S□□41□□ S2SC70D-S□□41□□/ATDOC	Duplexed Safety Control Unit 24 V DC power supply	-20 to 40°C	
		S2SC70D-F□□41□□ S2SC70D-F□□41□□/ATDOC	Duplexed Safety Control Unit (With fan, 24 V DC power supply)	-20 to 70°C	
2	Safety Node Units (*2)	SNB10D-□4E SNB10D-□4E/CU2N/ATDOC SNB10D-□4E/CU2T/ATDOC	Node Unit for Dual-Redundant ESB Bus 24 V DC power supply	-20 to 70°C	
3	Unit for Optical Bus Repeater Module	SNT10D-24E SNT10D-24E/ATDOC	Unit for Optical ESB Bus Repeater Module 24 V DC power supply	-20 to 70°C	
4	CPU Module	SCP461-E1	Processor Module for SSC60□ and S2SC70□	-20 to 70°C	
		S2CP471-1□	Processor Module for SSC60□ and S2SC70□	-20 to 70°C	
	Power supply Module	SPW484-E3	24 V DC Power supply module	-20 to 70°C	
		S2PW504-S0130	24 V DC Output Power Supply Unit (24 V DC input power supply)	-40 to 70°C	
5	Bus Coupler Module	SEC401-E1	ESB Bus Coupler Module	-20 to 70°C	
		SEC402-E1	ESB Bus Coupler Module (for 2-port)	-20 to 70°C	
	Bus Interface Module	SSB401-E3	ESB Bus Interface Slave Module	-20 to 70°C	
	Optical ESB Bus Repeater Module	SNT401-EF SNT401-EF/CU1N SNT401-EF/CU1T	Optical ESB Bus Repeater Master Module	-20 to 70°C	
		SNT411-EF SNT411-EF/CU1N SNT411-EF/CU1T	Optical ESB Bus Repeater Master Module 5 to 50 km	-20 to 70°C	
		SNT421-E3 SNT421-E3/CU1N SNT421-E3/CU1T	Optical ESB Bus Repeater Master Module (for Multimode Fiber)	-20 to 70°C	
		SNT501-EF	Optical ESB Bus Repeater Slave Module	-20 to 70°C	
		SNT511-EF	Optical ESB Bus Repeater Slave Module 5 to 50 km	-20 to 70°C	
		SNT521-E3	Optical ESB Bus Repeater Slave Module (for Multimode Fiber)	-20 to 70°C	
	N-ESB Bus Coupler Module	S2EN402-S0011	N-ESB Bus Coupler Module	-20 to 70°C	
S2EN404-S0011		N-ESB Bus Coupler Module	-20 to 70°C		

Note: Only N-IO field enclosure complies with IECEx Increased safety “ec”.

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*2: /CU2N and/or /ATDOC can be selected.
/CU2T and/or /ATDOC can be selected.

Table The List of IECEx Type “n”, “ec” Compliant Products (2/2)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks	
5	Node Interface Unit	S2NN30D-440□□□□13 S2NN30D-440□□□□13/ATDOC	Node Interface Unit (24 V DC input power supply)	-40 to 70°C	(*3)	
	N-ESB Bus Module	S2EN501-S□□□130	N-ESB Bus Module	-40 to 70°C	(*4)	
6	Input/Output Modules	S2MMM843-SS1130	Analog Digital I/O Module	-40 to 70°C		
		S2MDV843-OS1130	Digital I/O Module	-40 to 70°C		
	Communication Modules	ALR111-SE1	Serial Communication Module (RS-232C, 2-port)	0 to 60°C		
		ALR121-SE1	Serial Communication Module (RS-422/RS-485, 2-port)	0 to 60°C		
		ALR121-SE3	Serial Communication Module (RS-422/RS-485, 2-port)	-20 to 70°C		
		ALE111-SE1	Ethernet Communication Module	0 to 60°C	(*5)	
		ALE111-SE3	Ethernet Communication Module	-20 to 70°C	(*5)	
S2LP131-S11	Fire and gas communication module	-20 to 70°C	(*6)			
7	Power Distribution Board	AEPV7D-41F	Power Supply Bus Unit, Vertical Type (for 24 V DC input)	-20 to 70°C		
	Fan	AIP602	Fan Unit	-20 to 70°C		
8	Base Plate	S2BN1D-□□0130 S2BN1D-□□1130 S2BN1D-□□1130/L S2BN1D-□□1130/T S2BN1D-□□2130 S2BN1D-□□2130/L S2BN1D-□□2130/T	Base Plate with disconnecting terminal	-40 to 70°C		
		S2BN1D-□□9130		-40 to 70°C	(*7)	
		S2BN4D-101□□		Base Plate for Barrier	-20 to 60°C	
		S2BN5D-121□□		Base Plate for Barrier	-20 to 60°C	(*8)
		S2BM4-130		Terminal board for analog digital I/O	-40 to 70°C	(*9)
9	Terminal	A2BM4-130	Terminal board for analog digital I/O	-40 to 70°C	(*9)	
	N-IO field enclosure	S2NN70D-□□R□□B□2□□□□□□□□	N-IO field enclosure	-40 to 55°C	(*10)	
		S2NN70D-□□R□□D□2□□□□□□□□		-40 to 55°C	(*10)	
		S2NN60D-□□R□□□2□□□□□	N-IO field enclosure base unit	-40 to 55°C	(*10) (*11)	
		S2CB60-B□2□□□□□□□□	Enclosure for S2NN60D	-40 to 55°C	(*10)	
S2CB60-D□2□□□□□□□□		-40 to 55°C		(*10)		

Note: Only N-IO field enclosure complies with IECEx Increased safety “ec”.

- *1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.
- *3: When the S2NN30D Node Interface Unit is used with an optical ESB bus with the following specifications at an altitude of 2000 m or higher, the ambient temperature range is -40 to 60°C.
 S2NN30D-□□□□□□01□□ S2NN30D-□□□□□□02□□ S2NN30D-□□□□□□10□□
 S2NN30D-□□□□□□11□□ S2NN30D-□□□□□□12□□ S2NN30D-□□□□□□20□□
 S2NN30D-□□□□□□21□□ S2NN30D-□□□□□□22□□
- *4: When the S2EN501 N-ESB Bus Module is used with an optical ESB bus with the following specifications at an altitude of 2000 m or higher, the ambient temperature range is -40 to 60°C.
 S2EN501-□□1□□□ S2EN501-□□2□□□ S2EN501-□□10□□□ S2EN501-□□11□□□
 S2EN501-□□12□□□ S2EN501-□□20□□□ S2EN501-□□21□□□ S2EN501-□□22□□□
- *5: ALE111 is available from ProSafe-RS R3.02.00 or later with S2SC70□, SSC60□, SSC50□ or SSC57□.
- *6: S2LP131 is available from ProSafe-RS R4.03.10 or later with S2SC70□.
- *7: The temperature range of the cable (AKB331 and AKB651) used with S2BN1D is -20 to 70°C.
- *8: S2BN5D style S1 cannot be installed in the hazardous area.
- *9: The temperature range of the cable (AKB331 and AKB651) used with A2BM4 is -20 to 70°C.
- *10: S2NN70D Style S1, S2NN60D Style S1, and S2CB60 Style S1 cannot be installed in Zone 2 hazardous area.
- *11: This temperature indicates the ambient temperature of S2CB60 with S2NN60D installed inside.

Appendix 2.3 ECAS-Ex Type “n” Compliant Products

Table The List of ECAS-Ex Type “n” Compliant Products (1/2)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
1	Safety Control Units for Vnet/IP	S2SC70S-S□□41□□ S2SC70S-S□□41□□/ATDOC	Safety Control Unit 24 V DC power supply	-20 to 40°C	
		S2SC70S-F□□41□□ S2SC70S-F□□41□□/ATDOC	Safety Control Unit (With fan, 24 V DC power supply)	-20 to 70°C	
		S2SC70D-S□□41□□ S2SC70D-S□□41□□/ATDOC	Duplexed Safety Control Unit 24 V DC power supply	-20 to 40°C	
		S2SC70D-F□□41□□ S2SC70D-F□□41□□/ATDOC	Duplexed Safety Control Unit (With fan, 24 V DC power supply)	-20 to 70°C	
2	Safety Node Units (*2)	SNB10D-□4E SNB10D-□4E/CU2N/ATDOC SNB10D-□4E/CU2T/ATDOC	Node Unit for Dual-Redundant ESB Bus 24 V DC power supply	-20 to 70°C	
3	Unit for Optical Bus Repeater Module	SNT10D-24E SNT10D-24E/ATDOC	Unit for Optical ESB Bus Repeater Module 24 V DC power supply	-20 to 70°C	
4	CPU Module	SCP461-E1	Processor Module for SSC60□ and S2SC70□	-20 to 70°C	
		S2CP471-1□	Processor Module for SSC60□ and S2SC70□	-20 to 70°C	
	Power supply Module	SPW484-E3	24 V DC Power supply module	-20 to 70°C	
		S2PW504-S0130	24 V DC Output Power Supply Unit (24 V DC input power supply)	-40 to 70°C	
5	Bus Coupler Module	SEC401-E1	ESB Bus Coupler Module	-20 to 70°C	
		SEC402-E1	ESB Bus Coupler Module (for 2-port)	-20 to 70°C	
	Bus Interface Module	SSB401-E3	ESB Bus Interface Slave Module	-20 to 70°C	
	Optical ESB Bus Repeater Module	SNT401-EF SNT401-EF/CU1N SNT401-EF/CU1T	Optical ESB Bus Repeater Master Module	-20 to 70°C	
		SNT411-EF SNT411-EF/CU1N SNT411-EF/CU1T	Optical ESB Bus Repeater Master Module 5 to 50 km	-20 to 70°C	
		SNT421-E3 SNT421-E3/CU1N SNT421-E3/CU1T	Optical ESB Bus Repeater Master Module (for Multimode Fiber)	-20 to 70°C	
		SNT501-EF	Optical ESB Bus Repeater Slave Module	-20 to 70°C	
		SNT511-EF	Optical ESB Bus Repeater Slave Module 5 to 50 km	-20 to 70°C	
		SNT521-E3	Optical ESB Bus Repeater Slave Module (for Multimode Fiber)	-20 to 70°C	
	N-ESB Bus Coupler Module	S2EN402-S0011	N-ESB Bus Coupler Module	-20 to 70°C	
S2EN404-S0011		N-ESB Bus Coupler Module	-20 to 70°C		

*1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.

*2: /CU2N and/or /ATDOC can be selected.
/CU2T and/or /ATDOC can be selected.

Table The List of ECAS-Ex Type “n” Compliant Products (2/2)

Numbers	Classifications	Type Names	Products	Temperature Range (*1)	Remarks
5	Node Interface Unit	S2NN30D-440□□□□13 S2NN30D-440□□□□13/ATDOC	Node Interface Unit (24 V DC input power supply)	-40 to 70°C	(*3)
	N-ESB Bus Module	S2EN501-S□□□130	N-ESB Bus Module	-40 to 70°C	(*4)
6	Input/Output Modules	S2MMM843-SS1130	Analog Digital I/O Module	-40 to 70°C	
		S2MDV843-OS1130	Digital I/O Module	-40 to 70°C	
	Communication Modules	ALR111-SE1	Serial Communication Module (RS-232C, 2-port)	0 to 60°C	
		ALR121-SE1	Serial Communication Module (RS-422/RS-485, 2-port)	0 to 60°C	
		ALR121-SE3	Serial Communication Module (RS-422/RS-485, 2-port)	-20 to 70°C	
		ALE111-SE1	Ethernet Communication Module	0 to 60°C	(*5)
		ALE111-SE3	Ethernet Communication Module	-20 to 70°C	(*5)
S2LP131-S11	Fire and gas communication module	-20 to 70°C	(*6)		
7	Power Distribution Board	AEPV7D-41F	Power Supply Bus Unit, Vertical Type (for 24 V DC input)	-20 to 70°C	
	Fan	AIP602	Fan Unit	-20 to 70°C	
8	Base Plate	S2BN1D-□□0130 S2BN1D-□□1130 S2BN1D-□□1130/L S2BN1D-□□1130/T S2BN1D-□□2130 S2BN1D-□□2130/L S2BN1D-□□2130/T	Base Plate with disconnecting terminal	-40 to 70°C	
		S2BN1D-□□9130		-40 to 70°C	(*7)

- *1: The ambient temperature around not the cabinet but each unit such as Safety Control Unit, Safety Node Unit, Unit for Optical ESB Bus Repeater Module or Terminal Board is shown.
- *3: When the S2NN30D Node Interface Unit is used with an optical ESB bus with the following specifications at an altitude of 2000 m or higher, the ambient temperature range is -40 to 60°C.
 S2NN30D-□□□□□□01□□ S2NN30D-□□□□□□02□□ S2NN30D-□□□□□□10□□
 S2NN30D-□□□□□□11□□ S2NN30D-□□□□□□12□□ S2NN30D-□□□□□□20□□
 S2NN30D-□□□□□□21□□ S2NN30D-□□□□□□22□□
- *4: When the S2EN501 N-ESB Bus Module is used with an optical ESB bus with the following specifications at an altitude of 2000 m or higher, the ambient temperature range is -40 to 60°C.
 S2EN501-□□01□□□□ S2EN501-□□02□□□□ S2EN501-□□10□□□□ S2EN501-□□11□□□□
 S2EN501-□□12□□□□ S2EN501-□□20□□□□ S2EN501-□□21□□□□ S2EN501-□□22□□□□
- *5: ALE111 is available from ProSafe-RS R3.02.00 or later with S2SC70□, SSC60□, SSC50□ or SSC57□.
- *6: S2LP131 is available from ProSafe-RS R4.03.10 or later with S2SC70□.
- *7: The temperature range of the cable (AKB331 and AKB651) used with S2BN1D is -20 to 70°C.

Appendix 3. Lists of Parameters of Base Plate for Barrier (S2BN5D)

Table List of Parameters (ATEX) of Base Plate for Barrier (S2BN5D)

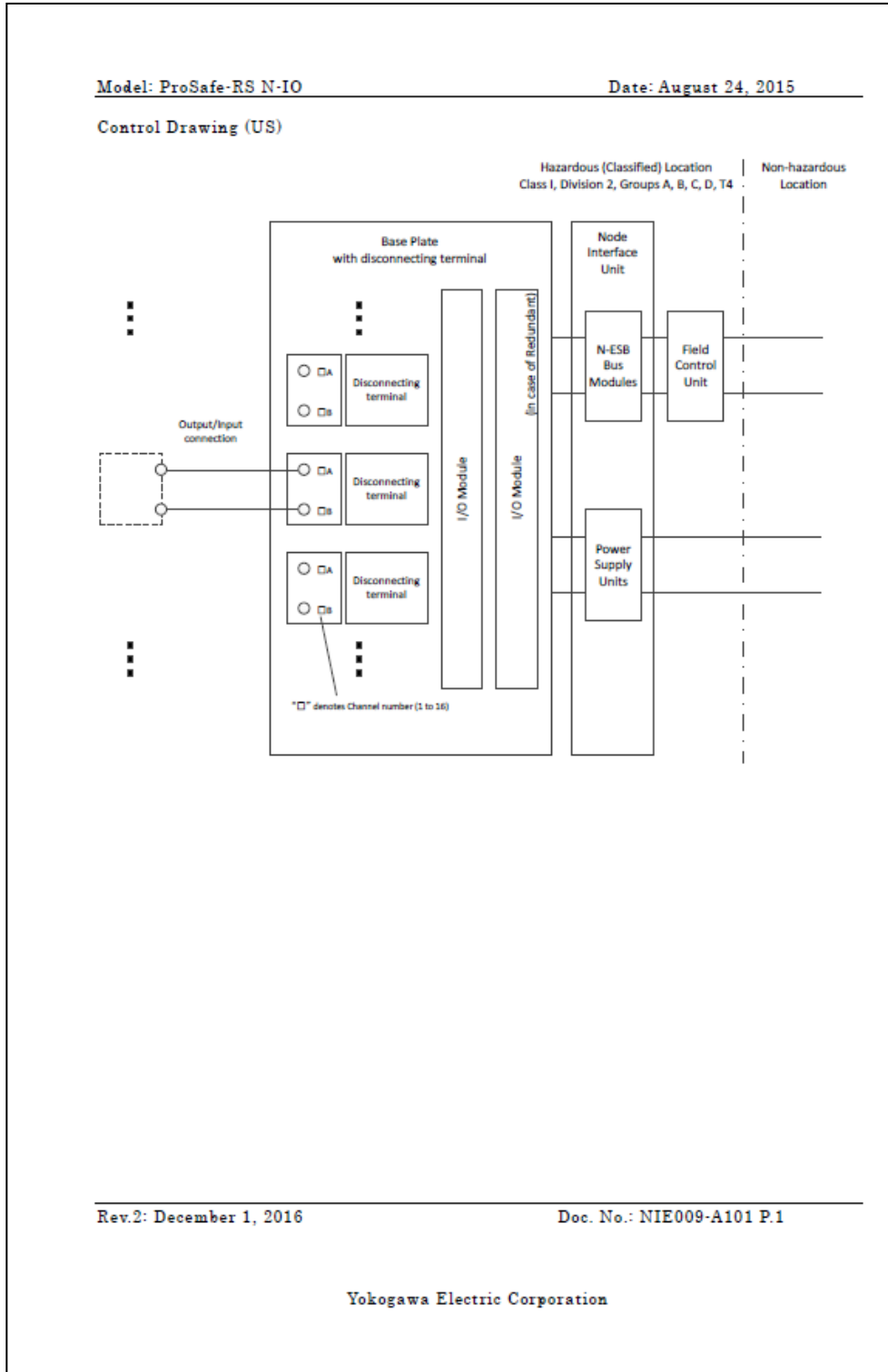
Modules	Uo (V)	Io (mA)	Po (mW)	Ui (V)	Co (nF)	Lo (mH)	Remarks
S2BN5D	30	—	—	30	—	—	(*1)

Table List of Parameters (IECEX) of Base Plate for Barrier (S2BN5D)

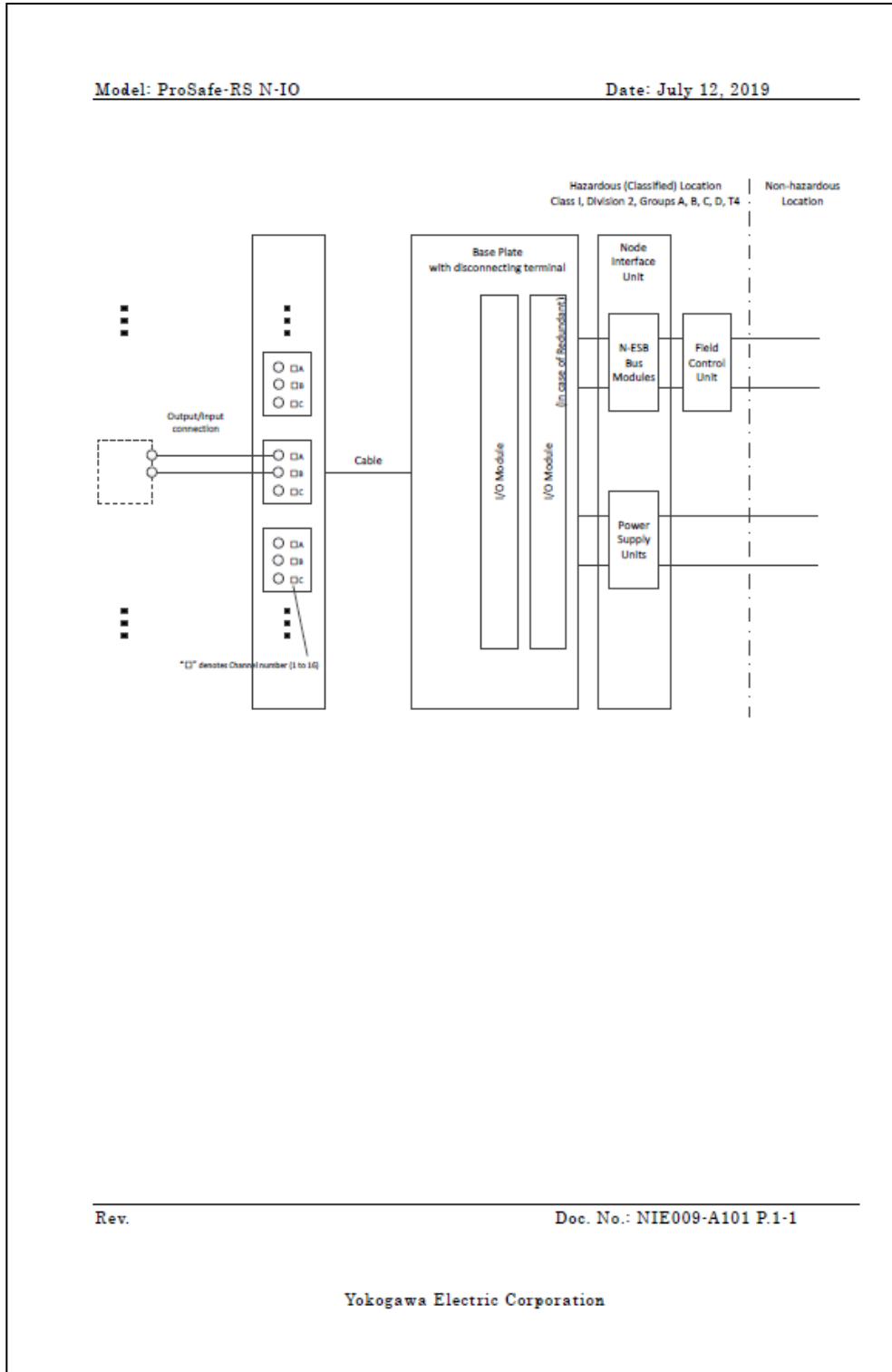
Modules	Uo (V)	Io (mA)	Po (mW)	Ui (V)	Co (nF)	Lo (mH)	Remarks
S2BN5D	30	—	—	30	—	—	(*1)

*1: The used P+F's I.S. barriers determine the ultimate output parameters of the channel. Please refer to P+F's instruction manual for the parameter of P+F's I.S. barriers.

Appendix 4. US (FM) NI/Canada (FM) NI Control Drawing for ProSafe-RS N-IO



F040001.ai



F040002.ai

Model: ProSafe-RS N-IO

Date: August 24, 2015

Non-incendive field wiring parameters (Output parameter)

Model	Function	Voc(V)	Isc(mA)	Ca(μ F)	La(mH)	Remark	
S2MMM843	Redundant	Analog Input (Current Input)	24.0	80.0	0.05	0.66	2-wire transmitter input
	Single						
	Redundant	Analog Output (Current Output)	28.0	23.0	0.05	0.66	-
	Single						
	Redundant	Digital Input	30.0	7.2	0.05	0.66	-
	Single						
Redundant	Digital Output	-	-	-	-	Nonincendive field wiring is not permitted.	
Single							
S2MDV843	Redundant	Digital Input	30.0	7.2	0.05	0.66	-
	Single						
	Redundant	Digital Output	-	-	-	-	Nonincendive field wiring is not permitted.
	Single						

Non-incendive field wiring parameters (Input parameters)

Model	Function	Vmax (V)	I _{max} (mA)	Ci(μ F)	Li(μ H)	Remark
S2MMM843	Redundant	30.0	-	0.02	10	4-wire transmitter input
	Single					

Rev.2: December 1, 2016

Doc. No.: NIE009-A101 P.2

Yokogawa Electric Corporation

F040003.ai

Model: ProSafe-RS N-IO

Date: August 24, 2015

Specific condition of use:

- The equipment shall be installed in a lockable metal cabinet. The suitability of the installation shall be determined by the authority having jurisdiction.
- The Ambient Temperatures are as follows.

Model code	Ambient Temperature
S2SC70S-S41b110c	-20 to 40 °C (*1)
S2SC70S-F41b110c	-20 to 70 °C (*2)
S2SC70D-S41b110c	-20 to 40 °C (*1)
S2SC70D-F41b110c	-20 to 70 °C (*2)
S2NN30D-4a0b0cd13e	When cd= 00, -40 to 70 °C When cd= 01, 11, 21, 02, 12, 22, 10, 20, -40 to 70 °C (altitude ≤ 2000 m) When cd= 01, 11, 21, 02, 12, 22, 10, 20, -40 to 60 °C (2000 m < altitude ≤ 3000 m)
S2PW503	-40 to 70 °C
S2PW504	-40 to 70 °C
S2EN402	-20 to 70 °C
S2EN404	-20 to 70 °C
S2EN501-Sab130c	When ab= 00, -40 to 70 °C When ab= 01, 11, 21, 02, 12, 22, 10, 20, -40 to 70 °C (altitude ≤ 2000 m) When ab= 01, 11, 21, 02, 12, 22, 10, 20, -40 to 60 °C (2000 m < altitude ≤ 3000 m)
S2MMM843 and S2MDV843	-40 to 70 °C (*3) When utilizing Digital output function, the total load current of all channels is limited as shown below according to the derating specifications due to the ambient temperature of modules. -40 to 40 °C: Max. 10.56 A 40 to 50 °C: Max. 9.71 A 50 to 60 °C: Max. 8.85 A 60 to 70 °C: Max. 8 A
S2BN1D-ab130c	When b = 0, 1, 2 -40 to 70 °C When b = 9 -40 to 70 °C (*4) When utilizing Digital output function of S2MMM843, the total load current of all channels is limited as shown below according to the derating specifications due to the ambient temperature of modules. -40 to 40 °C: Max. 10.56 A 40 to 50 °C: Max. 9.71 A 50 to 60 °C: Max. 8.85 A 60 to 70 °C: Max. 8 A
A2BM4	-40 to 70 °C (*4)

Rev.5: November 28, 2019

Doc. No.: NIE009-A101 P.3

Yokogawa Electric Corporation

F040004.ai

Model: ProSafe-RS N-IO

Date: August 24, 2015

(Continued)

Model code	Ambient Temperature
S2SC70S-SA1b110c	-20 to 40 °C (*1)
S2SC70S-FA1b110c	-20 to 70 °C (*2)
S2SC70D-SA1b110c	-20 to 40 °C (*1)
S2SC70D-FA1b110c	-20 to 70 °C (*2)

(*1) 0 to 40 °C when ALR111-S□1, ALR121-S□1, ALR121-S□B or ALE111-S□1 is installed.

(*2) 0 to 60 °C when ALR111-S□1, ALR121-S□1 or ALE111-S□1 is installed, and 0 to 70 °C when ALR121-S□B is installed.

(*3) If it is mounted on S2BN1D-□9130, the minimum temperature is limited to -20 °C for using AKB331 or AKB651 together.

(*4) The minimum temperature is limited to -20 °C for using AKB331 or AKB651 together.

Notes:

- No revision to this drawing without prior approval of FM.
- In this control drawing, the term "installation" includes reconfiguration of the function of each module, which is carried out in maintenance process.
- Installation must be in accordance with the National Electrical Code (NFPA 70) and relevant local codes.
- In the course of installation, the related documents of GS (General specifications), TI (Technical Information of Installation Guidance), and IM (User's Manuals) should be referred to and the instructions described in the documents should be observed.
- Modules can be mounted also on an FM-approved Base Plate S2BN5D. In such case, installation must be in accordance also with the control drawing of these Base Plates.
- PROSAFE-RS IS SUITABLE FOR USE IN CLASS 1, DIVISION 2, GROUPS A, B, C, and D OR NONHAZARDOUS LOCATIONS ONLY.
- It must be observed during the installation that the venting slots of the devices are not blocked by cable parts, fixing accessories etc.
- The doors of the cabinets must be closed when ProSafe-RS is energized.

Rev.2: November 28, 2019

Doc. No.: NIE009-A101 P.4

Yokogawa Electric Corporation

F040005.ai

Model: ProSafe-RS N-IO

Date: August 24, 2015

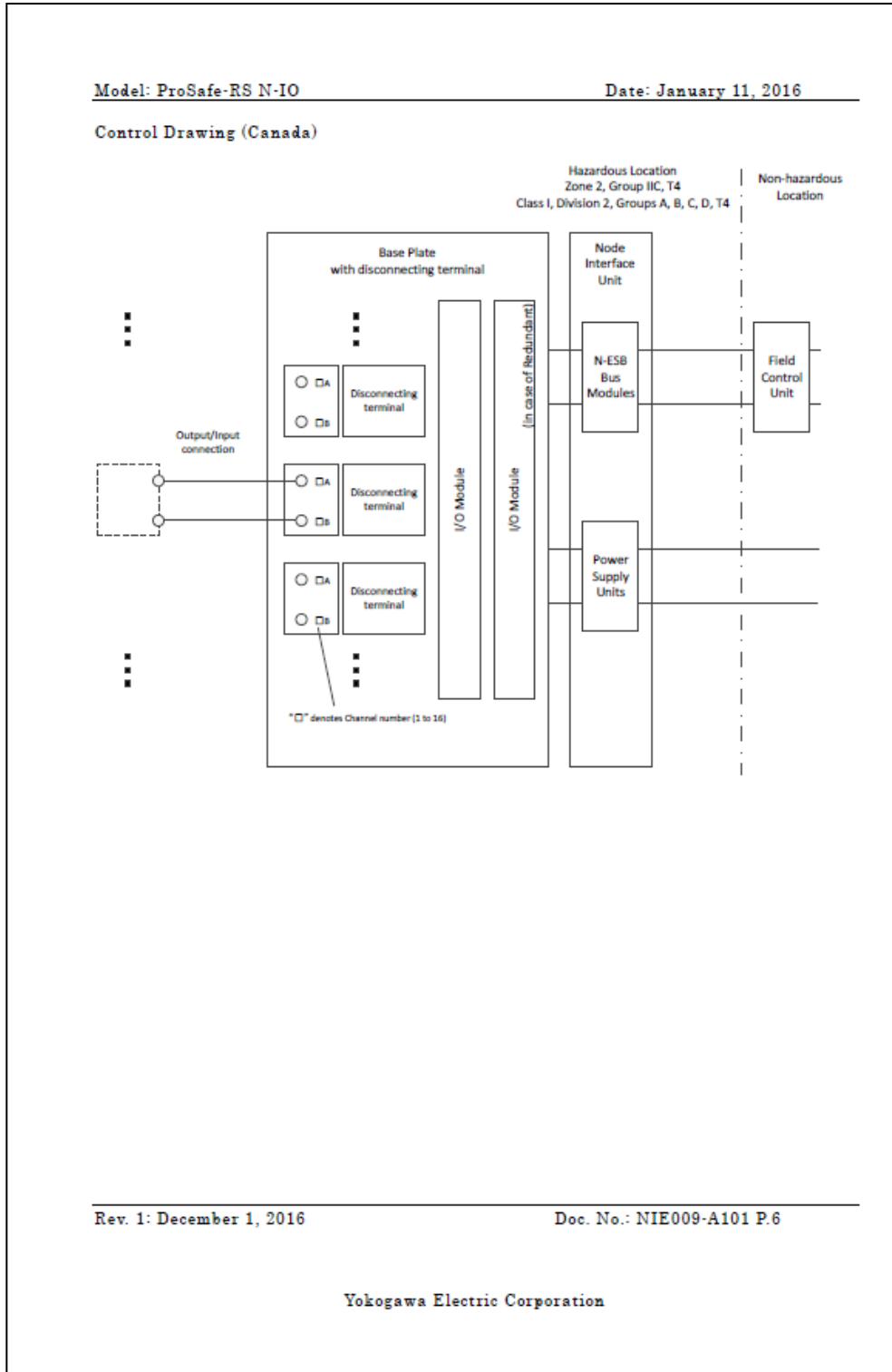
9. Nonincendive field wiring is permitted for the modules listed in tables of the Nonincendive field wiring parameters.
- 9.1 The Nonincendive field wiring circuit concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus, using any of the wiring methods permitted for unclassified locations.
- 9.2 Field equipment or other equipment connected to ProSafe-RS by Nonincendive field wiring must be FM approved.
- 9.3 The control drawing of field equipment or other equipment must be followed at the installation.
- 9.4 The following conditions must be met. See tables for the Nonincendive field wiring parameters of ProSafe-RS.
- $$V_{max} \geq V_{oc} \text{ or } V_t; I_{max} \geq I_{sc} \text{ or } I_t; C_a \geq C_i + C_{cable}; L_a \geq L_i + L_{cable}$$
- 9.5 For current controlled circuits, I_{max} of the nonincendive field wiring apparatus is not required and need not be aligned with parameter I_{sc} or I_t of ProSafe-RS or other associated nonincendive field wiring apparatus.
10. Use only the following batteries specified by Yokogawa Electric Corporation for the CPU modules:
SCP461: S9185FA, S2CP471: S9450FE.
11. WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR DIVISION 2.
12. WARNING – EXPLOSION HAZARD. DO NOT DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.
13. WARNING – EXPLOSION HAZARD. DO NOT REMOVE OR REPLACE FUSES UNLESS POWER HAS BEEN DISCONNECTED OR WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.
14. WARNING – EXPLOSION HAZARD. DO NOT OPEN ENCLOSURE OR REPLACE BATTERY WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

Rev.1: November 28, 2019

Doc. No.: NIE009-A101 P.5

Yokogawa Electric Corporation

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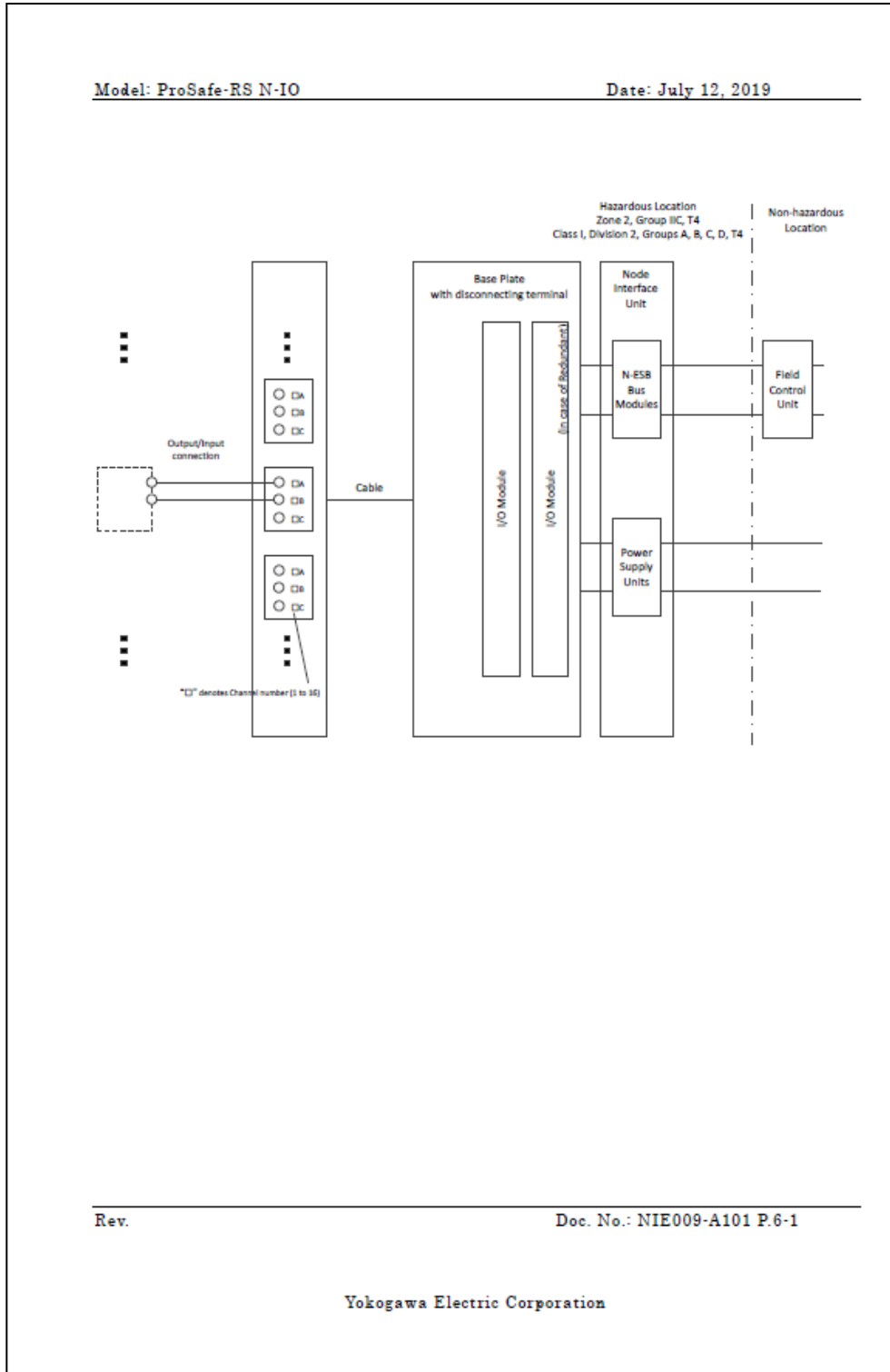


Rev. 1: December 1, 2016

Doc. No.: NIE009-A101 P.6

Yokogawa Electric Corporation

F040007.ai



Rev.

Doc. No.: NIE009-A101 P.6-1

Yokogawa Electric Corporation

F040008.ai

Model: ProSafe-RS N-IO

Date: January 11, 2016

Non-incendive field wiring parameters (Output parameter)

Model	Function	Voc(V)	Isc(mA)	Ca(μ F)	La(mH)	Remark	
S2MMM843	Redundant	Analog Input (Current Input)	24.0	80.0	0.05	0.66	2-wire transmitter input
	Single						
	Redundant	Analog Output (Current Output)	28.0	23.0	0.05	0.66	-
	Single						
	Redundant	Digital Input	30.0	7.2	0.05	0.66	-
	Single						
Redundant	Digital Output	-	-	-	-	Nonincendive field wiring is not permitted.	
Single							
S2MDV843	Redundant	Digital Input	30.0	7.2	0.05	0.66	-
	Single						
	Redundant	Digital Output	-	-	-	-	Nonincendive field wiring is not permitted.
	Single						

Non-incendive field wiring parameters (Input parameters)

Model	Function	Vmax (V)	Imax (mA)	Ci(μ F)	Li(μ H)	Remark
S2MMM843	Redundant	30.0	-	0.02	10	4-wire transmitter input
	Single					

Rev. 1: December 1, 2016

Doc. No.: NIE009-A101 P.7

Yokogawa Electric Corporation

F040009.ai

Model: ProSafe-RS N-IO

Date: January 11, 2016

Specific condition of use:

- The equipment shall be installed in a lockable metal cabinet. The suitability of the installation shall be determined by the authority having jurisdiction.
- The Ambient Temperatures are as follows.

Model code	Ambient Temperature
S2NN30D-4a0b0cd13e	When cd= 00, -40 to 70 °C
	When cd= 01, 11, 21, 02, 12, 22, 10, 20, -40 to 70 °C (altitude ≤2000 m)
	When cd= 01, 11, 21, 02, 12, 22, 10, 20, -40 to 60 °C (2000 m < altitude ≤3000 m)
S2PW503	-40 to 70 °C
S2PW504	-40 to 70 °C
S2EN501-Sab130c	When ab= 00, -40 to 70 °C
	When ab= 01, 11, 21, 02, 12, 22, 10, 20, -40 to 70 °C (altitude ≤2000 m)
	When ab= 01, 11, 21, 02, 12, 22, 10, 20, -40 to 60 °C (2000 m < altitude ≤3000 m)
S2MMM843 and S2MDV843	-40 to 70 °C (*1) When utilizing Digital output function, the total load current of all channels is limited as shown below according to the derating specifications due to the ambient temperature of modules. -40 to 40 °C: Max. 10.56 A 40 to 50 °C: Max.9.71 A 50 to 60 °C: Max.8.85 A 60 to 70 °C: Max.8 A
	When b = 0, 1, 2 -40 to 70 °C When b = 9 -40 to 70 °C (*2) When utilizing Digital output function of S2MMM843, the total load current of all channels is limited as shown below according to the derating specifications due to the ambient temperature of modules. -40 to 40 °C: Max. 10.56 A 40 to 50 °C: Max.9.71 A 50 to 60 °C: Max.8.85 A 60 to 70 °C: Max.8 A
A2EM4	-40 to 70 °C (*2)

(*1) If it is mounted on S2BN1D-□9130, the minimum temperature is limited to -20 °C for using AKB331 or AKB651 together.

(*2) The minimum temperature is limited to -20 °C for using AKB331 or AKB651 together.

Rev.3: November 28, 2019

Doc. No.: NIE009-A101 P.8

Yokogawa Electric Corporation

F040010.ai

Model: ProSafe-RS N-IO

Date: January 11, 2016

Notes:

1. No revision to this drawing without prior approval of FM.
2. In this control drawing, the term "installation" includes reconfiguration of the function of each module, which is carried out in maintenance process.
3. Installation must be in accordance with Canadian Electrical Code Part I (C22.1) and relevant local codes.
4. In the course of installation, the related documents of GS (General specifications), TI (Technical Information of Installation Guidance), and IM (User's Manuals) should be referred to and the instructions described in the documents should be observed.
5. Modules can be mounted also on an FM-approved Base Plate S2BN5D. In such case, installation must be in accordance also with the control drawing of these Base Plates.
6. PROSAFE-RS IS SUITABLE FOR USE IN ZONE 2, GROUP IIC; CLASS 1, DIVISION 2, GROUPS A, B, C, and D OR NON-HAZARDOUS LOCATIONS ONLY.
7. It must be observed during the installation that the venting slots of the devices are not blocked by cable parts, fixing accessories etc.
8. The doors of the cabinets must be closed when ProSafe-RS is energized.
9. The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void FM Non-incendive Certification.

Doc. No.: NIE009-A101 P.9

Yokogawa Electric Corporation

F040011.ai

Model: ProSafe-RS N-IO

Date: January 11, 2016

10. Nonincendive field wiring is permitted for the modules listed in tables of the Nonincendive field wiring parameters.
- 10.1 The Nonincendive field wiring circuit concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus, using any of the wiring methods permitted for unclassified locations.
- 10.2 Field equipment or other equipment connected to ProSafe-RS by Nonincendive field wiring must be FM approved.
- 10.3 The control drawing of field equipment or other equipment must be followed at the installation.
- 10.4 The following conditions must be met. See tables for the Nonincendive field wiring parameters of ProSafe-RS.
- $$V_{max} \geq V_{oc} \text{ or } V_t; I_{max} \geq I_{sc} \text{ or } I_t; C_a \geq C_i + C_{cable}; L_a \geq L_i + L_{cable}$$
- 10.5 For current controlled circuits, I_{max} of the nonincendive field wiring apparatus is not required and need not be aligned with parameter I_{sc} or I_t of ProSafe-RS or other associated nonincendive field wiring apparatus.
11. WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
AVERTISSEMENT – RISQUE D'EXPLOSION – LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATÉRIEL INACCEPTABLE POUR LES EMBLEMES DE CLASSE 1. DIVISION 2.
12. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT – RISQUE D'EXPLOSION. NE PAS DÉBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, À MOINS QU'IL NE S'AGISSE D'UN EMBLEMES NON DANGEREUX.
13. WARNING – EXPLOSION HAZARD – DO NOT REPLACE FUSES UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT – RISQUE D'EXPLOSION – COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX AVANT DE REPLACER LE COUPE-CIRCUIT À FUSIBLES.
14. WARNING – EXPLOSION HAZARD – BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT – RISQUE D'EXPLOSION – AFIN D'ÉVITER TOUT RISQUE D'EXPLOSION, S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX AVANT DE CHANGER LA BATTERIE.

Rev.1: November 28, 2019

Doc. No.: NIE009-A101 P.10

Yokogawa Electric Corporation

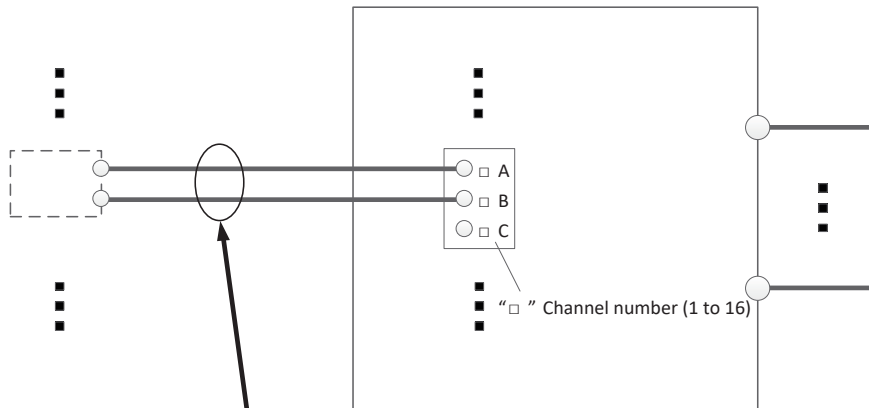
F040012.ai

Yokogawa Electric Corporation		Model		ProSafe-RS N-IO field enclosure			
Title	Control drawing (US)						
No.	NFM037-A101	Page	1	Revision	1	Date	2020-04-10
Revised pages	2, 4						

Control Drawing (US)

Hazardous (Classified) Location
Class I, Division 2, Groups A, B, C, D, T4

N-IO field enclosure



- Terminal block for field wiring connection and Nonincendive field wiring parameters.
- For details, refer to " NIE009 - A101 " .

F040013.ai

Yokogawa Electric Corporation		Model		ProSafe-RS N-IO field enclosure	
Title	Control drawing (US)				
No.	NFM037-A101	Page	2	Revision	1

Specific condition of use:

- S2NN60D shall be installed in S2CB60.
- Since Ta is not marked on the equipment, the control drawing NFM037-A101 shall be referred to for the ambient temperature range.
- Ambient temperature: -40 to +55 °C (outside the enclosure)

Notes:

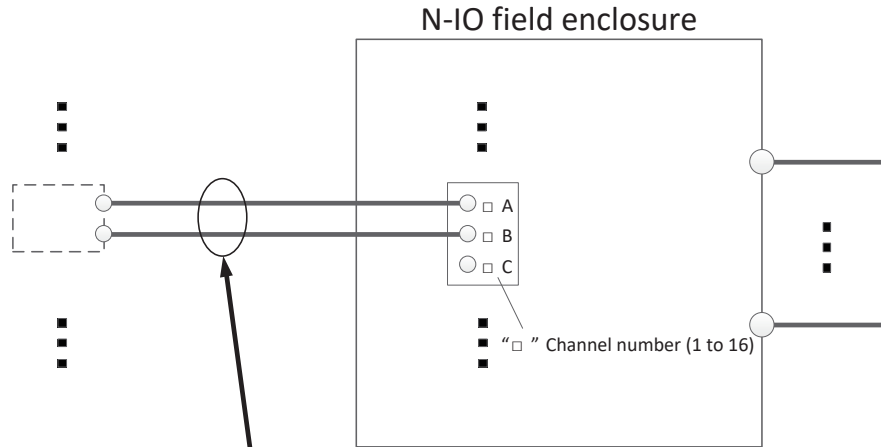
1. No revision to this drawing without prior approval of FM.
2. In this control drawing, the term "installation" includes reconfiguration of the function of each module, which is carried out in maintenance process.
3. Installation must be in accordance with the National Electrical Code (NFPA 70) and relevant local codes.
4. In the course of installation, the related documents of GS (General specifications), TI (Technical Information of Installation Guidance), and IM (User's Manuals) should be referred to and the instructions described in the documents should be observed.
5. THE EQUIPMENT IS SUITABLE FOR USE IN CLASS 1, DIVISION 2, GROUPS A, B, C, and D OR NONHAZARDOUS LOCATIONS ONLY.
6. When nonincendive field wiring is used as a wiring method, the installation must be in accordance with the control drawing NIE009-A101 (FM16US0077X).
7. The option code (/MDV1S, /MDV1D, /MMM1S and /MMM1D) indicates the default setting of I/O modules at the time of shipping from a factory. The pre-installed I/O modules are replaceable to separately prepared modules which are listed on FM16US0077X.
8. WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR DIVISION 2.
9. WARNING – DO NOT OPEN THE ENCLOSURE WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.
10. WARNING – EXPLOSION HAZARD. DO NOT DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.
11. WARNING – EXPLOSION HAZARD. DO NOT REMOVE OR REPLACE FUSES UNLESS POWER HAS BEEN DISCONNECTED OR WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.
12. WARNING – EXPLOSION HAZARD. DO NOT RESET CIRCUIT BREAKER UNLESS POWER HAS BEEN REMOVED FROM THE EQUIPMENT OR THE AREA IS FREE OF IGNITIBLE CONCENTRATIONS.

F040014.ai

Yokogawa Electric Corporation		Model	ProSafe-RS N-IO field enclosure		
Title	Control drawing (Canada)				
No.	NFM037-A101	Page	3	Revision	1

Control Drawing (Canada)

Hazardous Location
 Zone 2, Group IIC, T4
 Class I, Division 2, Groups A, B, C, D, T4



- Terminal block for field wiring connection and Nonincendive field wiring parameters.
 - For details, refer to " NIE009 - A101 ".

F040015.ai

Yokogawa Electric Corporation		Model	ProSafe-RS N-IO field enclosure		
Title	Control drawing (Canada)				
No.	NFM037-A101	Page	4	Revision	1

Specific condition of use:

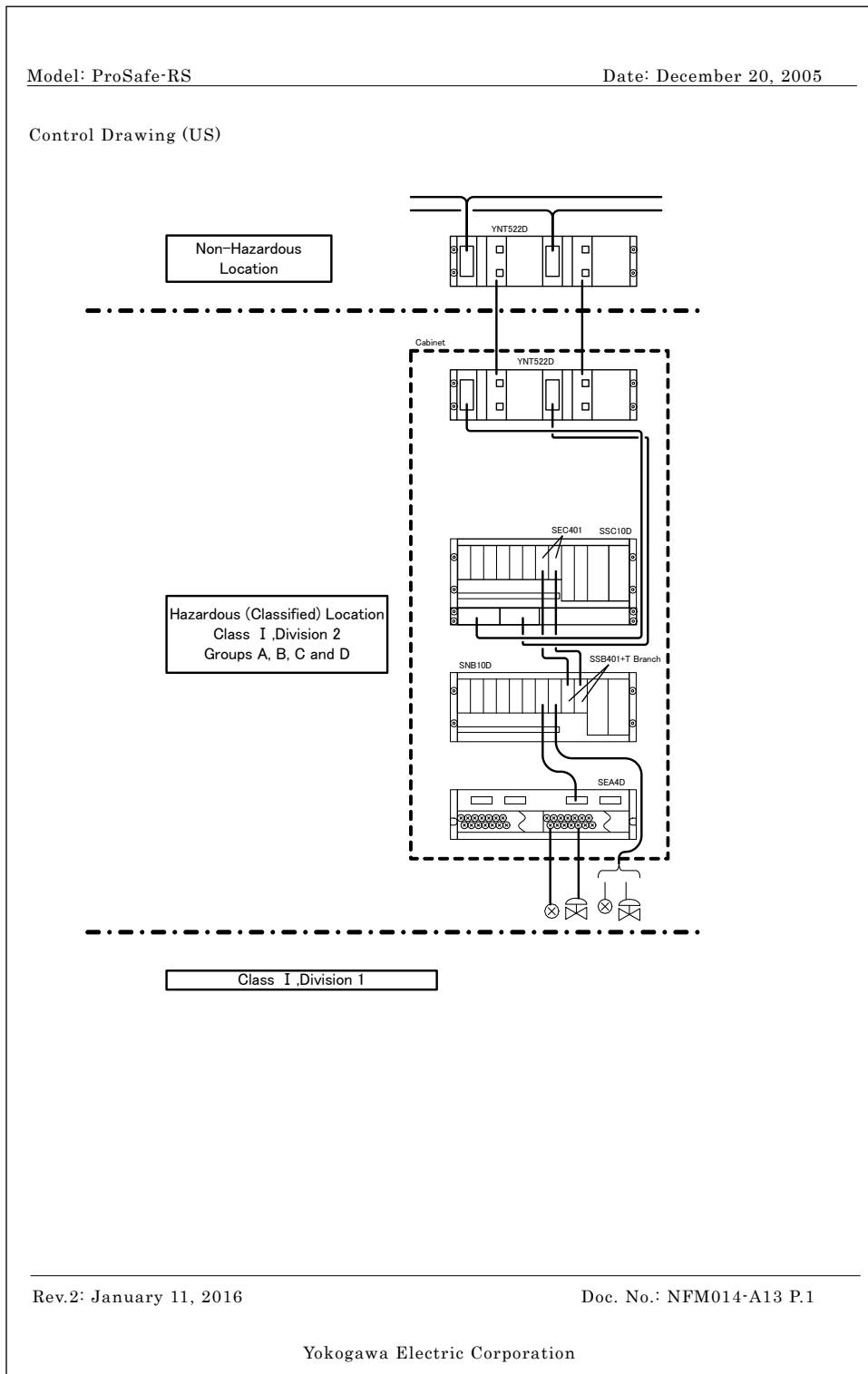
- S2NN60D shall be installed in S2CB60.
- Since Ta is not marked on the equipment, the control drawing NFM037-A101 shall be referred to for the ambient temperature range.
- Ambient temperature: -40 to +55 °C (outside the enclosure)

Notes:

1. No revision to this drawing without prior approval of FM.
2. In this control drawing, the term "installation" includes reconfiguration of the function of each module, which is carried out in maintenance process.
3. Installation must be in accordance with Canadian Electrical Code Part I (C22.1) and relevant local codes.
4. In the course of installation, the related documents of GS (General specifications), TI (Technical Information of Installation Guidance), and IM (User's Manuals) should be referred to and the instructions described in the documents should be observed.
5. THE EQUIPMENT IS SUITABLE FOR USE IN ZONE 2, GROUP IIC; CLASS 1, DIVISION 2, GROUPS A, B, C, and D; OR NON-HAZARDOUS LOCATIONS ONLY.
6. When nonincendive field wiring is used as a wiring method, the installation must be in accordance with the control drawing NIE009-A101 (FM16CA0044X).
7. The option code (/MDV1S, /MDV1D, /MMM1S and /MMM1D) indicates the default setting of I/O modules at the time of shipping from a factory. The pre-installed I/O modules are replaceable to separately prepared modules which are listed on FM16CA0044X.
8. WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
AVERTISSEMENT – RISQUE D'EXPLOSION – LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATÉRIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE 1. DIVISION 2.
9. WARNING – DO NOT OPEN THE ENCLOSURE WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.
AVERTISSEMENT – NE PAS OUVRIR L'ENVELOPPE EN PRÉSENCE D'UNE ATMOSPHERE EXPLOSIVE.
10. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT – RISQUE D'EXPLOSION. NE PAS DÉBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.
11. WARNING – EXPLOSION HAZARD – DO NOT REPLACE FUSES UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT – RISQUE D'EXPLOSION – COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX AVANT DE REPLACER LE COUPE-CIRCUIT À FUSIBLES.
12. WARNING – EXPLOSION HAZARD. DO NOT RESET CIRCUIT BREAKER UNLESS POWER HAS BEEN REMOVED FROM THE EQUIPMENT OR THE AREA IS FREE OF IGNITIBLE CONCENTRATIONS.
AVERTISSEMENT – RISQUE D'EXPLOSION. NE PAS RÉARMER LE DISJONCTEUR À MOINS QUE L'ALIMENTATION À L'APPAREILLAGE N'AIT ÉTÉ COUPÉE OU QUE L'EMPLACEMENT NE SOIT EXEMPT DE CONCENTRATIONS INFLAMMABLES.

F040016.ai

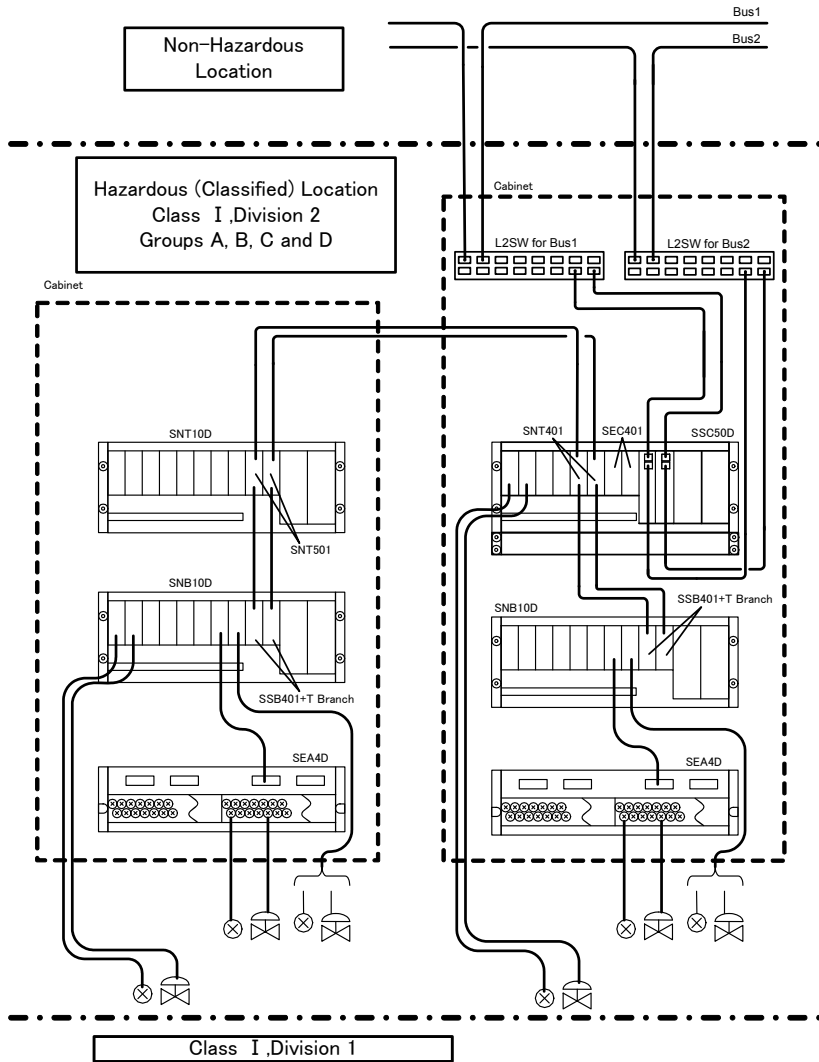
Appendix 5. US (FM) NI/Canada (FM) NI Control Drawing for ProSafe-RS FIO



Model: ProSafe-RS

Date: March 06, 2007

Control Drawing (US)



Rev.1: January 11, 2016

Doc. No.: NFM014-A13 P.1-1

Yokogawa Electric Corporation

F050002.ai

Model: ProSafe-RS

Date: December 20, 2005

Nonincendive Field Wiring Parameters (Output parameters) (*1)

(1/2)

Model	Voc (V)	Isc (mA)	Ca (μ F)	La (mH)	Remarks	
SCP451	Redundant	—	—	—	(*2)	
	Single	—	—	—		
SCP461	Redundant	—	—	—	(*2)	
	Single	—	—	—		
AIP504	—	—	—	—	(*2)	
SEC401	—	—	—	—	(*2)	
SEC402	—	—	—	—	(*2)	
SSB401	—	—	—	—	(*2)	
SNT401	—	—	—	—	(*2) for YCB301	
SNT501	—	—	—	—	(*2) for YCB301	
SNT411	—	—	—	—	(*2) for YCB301	
SNT511	—	—	—	—	(*2) for YCB301	
SNT421	—	—	—	—	(*2) for YCB301	
SNT521	—	—	—	—	(*2) for YCB301	
SAI143	Redundant	26.4	26	0.13	10	-2-wire transmitter input -Included terminal block and terminal board but excluded cable.
	Single	26.4	26	0.13	10	
	Redundant	12.2	0.14	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 40) -Included terminal block and terminal board but excluded cable.
	Single	12.2	0.07	0.01	1	
SAV144	Redundant	10	1.2	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 40) -Included terminal block and terminal board but excluded cable.
	Single	10	0.6	0.01	1	
SAI533	Redundant	18.9	23	0.16	10	-Output -Included terminal block and terminal board but excluded cable.
	Single	18.9	23	0.16	10	
	Redundant	10	220	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 40) -Included terminal block and terminal board but excluded cable.
	Single	10	110	0.01	1	
SDV144	Redundant	11.6	1.4	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 50) -Included terminal block and terminal board but excluded cable
	Single	11.6	0.7	0.01	1	
SDV531	Redundant	—	—	—	—	Output (*2)
	Single	—	—	—	—	
	Redundant	11.6	220	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 50) -Included terminal block and terminal board but excluded cable
	Single	11.6	110	0.01	1	
SDV541	Redundant	—	—	—	—	Output (*2)
	Single	—	—	—	—	
	Redundant	11.6	220	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 50) -Included terminal block and terminal board but excluded cable
	Single	11.6	110	0.01	1	

(*1) These parameters are applied to all modes of each model if the mode is not otherwise remarked.

(*2) Wiring for Division 2 (such as conduit systems) must comply with NEC or Local Electrical Code of each country.

Rev.3: January 11, 2016

Doc. No.: NFM014-A13 P.2

Yokogawa Electric Corporation

F050003.ai

Model: ProSafe-RS

Date: December 20, 2005

Nonincendive Field Wiring Parameters (Output parameters) (*1)
(Continued) (2/2)

Model		Voc (V)	Isc (mA)	Ca (μF)	La (mH)	Remarks
SDV521	Redundant	—	—	—	—	Output (*2)
	Single	—	—	—	—	
	Redundant	11.6	220	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 50) -Included terminal board but excluded cable
	Single	11.6	110	0.01	1	
SDV53A	Redundant	—	—	—	—	Output (*2)
	Single	—	—	—	—	
	Redundant	11.6	220	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 50) -Included terminal board but excluded cable
ALR111	Redundant	—	—	—	—	(*2)
	Single	—	—	—	—	
ALR121	Redundant	—	—	—	—	(*2)
	Single	—	—	—	—	
ALE111	Redundant	—	—	—	—	(*2)
	Single	—	—	—	—	
S2LP131	Single	—	—	—	—	(*2)
AEP7D		—	—	—	—	(*2)
AEPV7D		—	—	—	—	(*2)
AIP571		—	—	—	—	(*2)
S9161FA		—	—	—	—	Cable for GPS when SSC10 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> /GPS (*2)
SAT145	Redundant	1.5	1.0	0.01	0.14	-RJC input
	Single	1.5	1.0	0.01	0.14	-Included terminal board but excluded cable
	Redundant	6.0	3.0	0.45	3.74	-TC/mv input (Burn out)
	Single	6.0	3.0	0.45	3.74	-Included terminal board but excluded cable
	Redundant	6.0	20.0	0.01	0.14	-Cable coming out detection (Wires connected to Pin No. 1 and 50)
	Single	6.0	20.0	0.01	0.14	-Included terminal board but excluded cable.
SAR145	Redundant	6.0	50.0	0.20	1.32	-RTD input
	Single	6.0	50.0	0.20	1.32	-Included terminal board but excluded cable.
	Redundant	6.0	70.0	0.01	0.14	-Cable coming out detection (Wires connected to Pin No. 1 and 50)
	Single	6.0	70.0	0.01	0.14	-Included terminal board but excluded cable.
S2CP471	Redundant	—	—	—	—	(*2)
	Single	—	—	—	—	

(*1) These parameters are applied to all modes of each model if the model is marked with the wiring for Division 2 (such as conduit systems) must comply with NEC or Local Electrical Code of each country.

Rev. 6: November 28, 2019

Doc. No.: NFM014-A13 P.3

Yokogawa Electric Corporation

F050004.ai

Model: ProSafe-RS

Date: December 20, 2005

Nonincendive Field Wiring Parameters (Input parameters) (*1)

(1/2)

Model		Vmax (V)	Imax (mA)	Ci (μ F)	Li (μ H)	Remarks
SSC10S		—	—	—	—	(*2) for TM1 of Fan Unit in SSC10S-F
SSC10D		—	—	—	—	(*2) for TM1 of Fan Unit in SSC10D-F
SSC50S		—	—	—	—	(*2) for TM1 of Fan Unit in SSC50S-F
SSC50D		—	—	—	—	(*2) for TM1 of Fan Unit in SSC50D-F
SSC57S		—	—	—	—	(*2) for TM1 of Fan Unit in SSC57S-F
SSC57D		—	—	—	—	(*2) for TM1 of Fan Unit in SSC57D-F
SSC60S		—	—	—	—	(*2) for TM1 of Fan Unit in SSC60S-F
SSC60D		—	—	—	—	(*2) for TM1 of Fan Unit in SSC60D-F
SPW481		—	—	—	—	(*2)
SPW482		—	—	—	—	(*2)
SPW484		—	—	—	—	(*2)
SCP451	Redundant	—	—	—	—	(*2)
	Single	—	—	—	—	
SCP461	Redundant	—	—	—	—	(*2)
	Single	—	—	—	—	
AIP504		—	—	—	—	(*2)
SEC401		—	—	—	—	(*2)
SEC402		—	—	—	—	(*2)
SSB401		—	—	—	—	(*2)
SNT401		—	—	—	—	(*2) for YCB301
SNT501		—	—	—	—	(*2) for YCB301
SNT411		—	—	—	—	(*2) for YCB301
SNT511		—	—	—	—	(*2) for YCB301
SNT421		—	—	—	—	(*2) for YCB301
SNT521		—	—	—	—	(*2) for YCB301
SAI143	Redundant	26.4	26	0.008	20	-4-wire transmitter input
	Single	26.4	26	0.004	20	-Included terminal block and terminal board but excluded cable
SAV144	Redundant	30	0.6	0.001	10	-Input
	Single	30	0.3	0.001	10	-Included terminal block and terminal board but excluded cable
SDV144	Redundant	—	—	—	—	Input (*2)
	Single	—	—	—	—	
	Redundant	—	—	—	—	Power supply (*2)
	Single	—	—	—	—	
SDV531	Redundant	—	—	—	—	Power supply (*2)
	Single	—	—	—	—	
SDV541	Redundant	—	—	—	—	Power supply (*2)
	Single	—	—	—	—	
SDV521	Redundant	—	—	—	—	Power supply (*2)
	Single	—	—	—	—	
SDV53A	Redundant	—	—	—	—	Power supply (*2)
	Single	—	—	—	—	
ALR111	Redundant	—	—	—	—	(*2)
	Single	—	—	—	—	
ALR121	Redundant	—	—	—	—	(*2)
	Single	—	—	—	—	
ALE111	Redundant	—	—	—	—	(*2)
	Single	—	—	—	—	
S2LP131	Single	—	—	—	—	(*2)

(*1) These parameters are applied to all modes of each model if the mode is not otherwise remarked.
(*2) Wiring for Division 2 (such as conduit systems) must comply with NEC or Local Electrical Code of each country

Rev.7: May 10, 2017

Doc. No.: NFM014-A13 P.4

Yokogawa Electric Corporation

F050005.ai

Model: ProSafe-RS

Date: March 06, 2008

Nonincendive Field Wiring Parameters (Input parameters) (*1)
(Continued)

(2/2)

Model	Vmax (V)	Imax (mA)	Ci (μ F)	Li (μ H)	Remarks	
AEP7D	—	—	—	—	(*2)	
AEPV7D	—	—	—	—	(*2)	
PW501	—	—	—	—	(*2)	
PW502	—	—	—	—	(*2)	
PW504	—	—	—	—	(*2)	
AIP571	—	—	—	—	(*2)	
S9161FA	—	—	—	—	Cable for GPS when SSC10 □ □ □ □ □ □ /GPS (*2)	
SAT145	Redundant	5	1.53	0.6	10	-TC/mV input -Included terminal board but excluded cable
	Single	5	1.53	0.6	10	
SBD2D	—	—	—	—	—	Ready input(*2)
	60	20	0	0	0	Ready input DC
SBD3D	—	—	—	—	—	Ready input(*2)
	60	20	0	0	0	Ready input DC
SBD4D	—	—	—	—	—	Ready input(*2)
	60	20	0	0	0	Ready input DC
S1BB4D	—	—	—	—	—	Ready input(*2)
	60	20	0	0	0	Ready input DC
S2CP471	Redundant	—	—	—	—	(*2)
	Single	—	—	—	—	

(*1) These parameters are applied to all modes of each model if the mode is not otherwise remarked.

(*2) Wiring for Division 2 (such as conduit systems) must comply with NEC or Local Electrical Code of each country.

Rev.5: November 28, 2019

Doc. No.: NFM014-A13 P.4-1

Yokogawa Electric Corporation

F050006.ai

Model: ProSafe-RS

Date: January 11, 2016

Specific condition of use:

- The equipment shall be installed in a lockable metal cabinet. The suitability of the installation shall be determined by the authority having jurisdiction.
- The Ambient Temperatures are as follows.

Model code	Ambient Temperature
SSC10S-a2db1c	When a = S, -20 to 50 °C (*1)
	When a = F, -20 to 70 °C (*2)
SSC10D-a2db1c	When a = S, -20 to 50 °C (*1)
	When a = F, -20 to 70 °C (*2)
SSC50S-a2dbec	When a = S, -20 to 40 °C (*3)
	When a = F, -20 to 70 °C (*4)
SSC50D-a2dbec	When a = S, -20 to 40 °C (*3)
	When a = F, -20 to 70 °C (*4)
SSC57S-a2Ebdc	When a = S, -20 to 40 °C (*3)
	When a = F, -20 to 70 °C (*4)
SSC57D-a2Ebdc	When a = S, -20 to 40 °C (*3)
	When a = F, -20 to 70 °C (*4)
SSC60S-a2dbec	When a = S, -20 to 40 °C (*3)
	When a = F, -20 to 70 °C (*4)
SSC60D-a2dbec	When a = S, -20 to 40 °C (*3)
	When a = F, -20 to 70 °C (*4)
SNB10D	-20 to 70 °C (*4)
SNT10D	-20 to 70 °C
SCP401	-20 to 70 °C
SCP451	-20 to 70 °C
SCP461	-20 to 70 °C
S2CP471	-20 to 70 °C
AIP504	-20 to 70 °C
SEC401	-20 to 70 °C
SEC402	-20 to 70 °C
SSB401	-20 to 70 °C
SPW481	-20 to 70 °C
SPW482	-20 to 70 °C
SPW484	-20 to 70 °C
SNT401	-20 to 70 °C
SNT501	-20 to 70 °C
SNT411	-20 to 70 °C
SNT511	-20 to 70 °C
SNT421	-20 to 70 °C
SNT521	-20 to 70 °C
SAI143	-20 to 70 °C
SAV144	-20 to 70 °C
SAI533	-20 to 70 °C

Rev.2: November 28, 2019

Doc. No.: NFM014-A13 P.4-2

Yokogawa Electric Corporation

F050007.ai

Model: ProSafe-RS

Date: January 11, 2016

(continued)

Model code	Ambient Temperature
SAT145	-20 to 70 °C
SAR145	-20 to 70 °C
SDV144	-20 to 70 °C
SDV531	-20 to 70 °C
SDV541	-20 to 70 °C
SDV521	-20 to 70 °C
SDV53A	-20 to 70 °C
ALR111	0 to 60 °C
ALR121-Sba	When a = 1, 0 to 60 °C
	When a = B, 0 to 70 °C
	When a = 3, -20 to 70 °C
ALE111-Sba	When a = 1, 0 to 60 °C
	When a = 3, -20 to 70 °C
S2LP131	-20 to 70 °C
SEA4D	-20 to 70 °C
SED4D	-20 to 70 °C
SED2D	-20 to 70 °C
SED3D	-20 to 70 °C
AIP602	-20 to 70 °C
AEP7D	-20 to 70 °C
AEPV7D	-20 to 70 °C
SBA4D	-20 to 70 °C
SBT4D	-20 to 70 °C
SBR4D	-20 to 70 °C
SBD2D	-20 to 70 °C
SBD3D	-20 to 70 °C
SBD4D	-20 to 70 °C
S1BB4D	-20 to 70 °C
YNT511D	0 to 50 °C
YNT522D	0 to 50 °C
PW501	0 to 50 °C
PW502	0 to 50 °C
PW504	0 to 50 °C
AIP578	0 to 50 °C
AIP591	0 to 50 °C
AIP171	0 to 50 °C
AIP571	0 to 50 °C

(*1) 0 to 50 °C when ALR111-S□1, ALR121-S□1 or ALR121-S□B is installed.

(*2) 0 to 60 °C when ALR111-S□1 or ALR121-S□1 is installed, and
0 to 70 °C when ALR121-S□B is installed.

(*3) 0 to 40 °C when ALR111-S□1, ALR121-S□1, ALR121-S□B or ALE111-S□1 is installed.

(*4) 0 to 60 °C when ALR111-S□1, ALR121-S□1 or ALE111-S□1 is installed, and
0 to 70 °C when ALR121-S□B is installed.

Rev.2: November 28, 2019

Doc. No.: NFM014-A13 P.4-3

Yokogawa Electric Corporation

F050008.ai

Model: ProSafe-RS

Date: December 20, 2005

Notes:

1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with the National Electrical Code (NFPA 70) and relevant local codes.
3. In the course of installation, the related documents of GS (General specifications), TI (Technical Information of Installation Guidance), and IM (User's Manuals) should be referred to and the instructions described in the documents should be observed.
4. PROSAFE-RS IS SUITABLE FOR USE IN CLASS 1, DIVISION 2, GROUPS A, B, C, and D OR NONHAZARDOUS LOCATIONS ONLY.
5. It must be observed during the installation that the venting slots of the devices are not blocked by cable parts, fixing accessories etc.
6. The doors of the cabinets must be closed when ProSafe-RS is energized.

Rev.7: January 11, 2016

Doc. No.: NFM014-A13 P.5

Yokogawa Electric Corporation

F050009.ai

Model: ProSafe-RS

Date: May 14, 2010

7. Nonincendive field wiring is permitted for the modules listed in tables of the Nonincendive field wiring parameters.
- 7.1 The Nonincendive field wiring circuit concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus, using any of the wiring methods permitted for unclassified locations.
- 7.2 Field equipment or other equipment connected to ProSafe-RS by Nonincendive field wiring must be FM approved.
- 7.3 The control drawing of field equipment or other equipment must be followed at the installation.
- 7.4 The following conditions must be met. See tables for the Nonincendive field wiring parameters of ProSafe-RS.
- $V_{max} \geq V_{oc}$ or V_t ; $I_{max} \geq I_{sc}$ or I_t ; $C_a \geq C_i + C_{cable}$; $L_a \geq L_i + L_{cable}$
- 7.5 For current controlled circuits, I_{max} of the nonincendive field wiring apparatus is not required and need not be aligned with parameter I_{sc} or I_t of ProSafe-RS or other associated nonincendive field wiring apparatus.
8. Use only the following batteries specified by Yokogawa Electric Corporation for the CPU modules:
SCP461: S9185FA, S2CP471: S9450FE
9. WARNING – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR DIVISION 2.
10. WARNING – EXPLOSION HAZARD. DO NOT DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.
11. WARNING – EXPLOSION HAZARD. DO NOT REMOVE OR REPLACE FUSES UNLESS POWER HAS BEEN DISCONNECTED OR WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.
12. WARNING – EXPLOSION HAZARD. DO NOT OPEN ENCLOSURE OR REPLACE BATTERY WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.
13. WARNING – EXPOSURE TO ANY CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE RELAYS INCORPORATED IN THE FOLLOWING MODULES:
- SBD2D
SBD3D
SBD4D
S1BB4D

Rev.3: November 28, 2019

Doc. No.: NFM014-A13 P.5-1

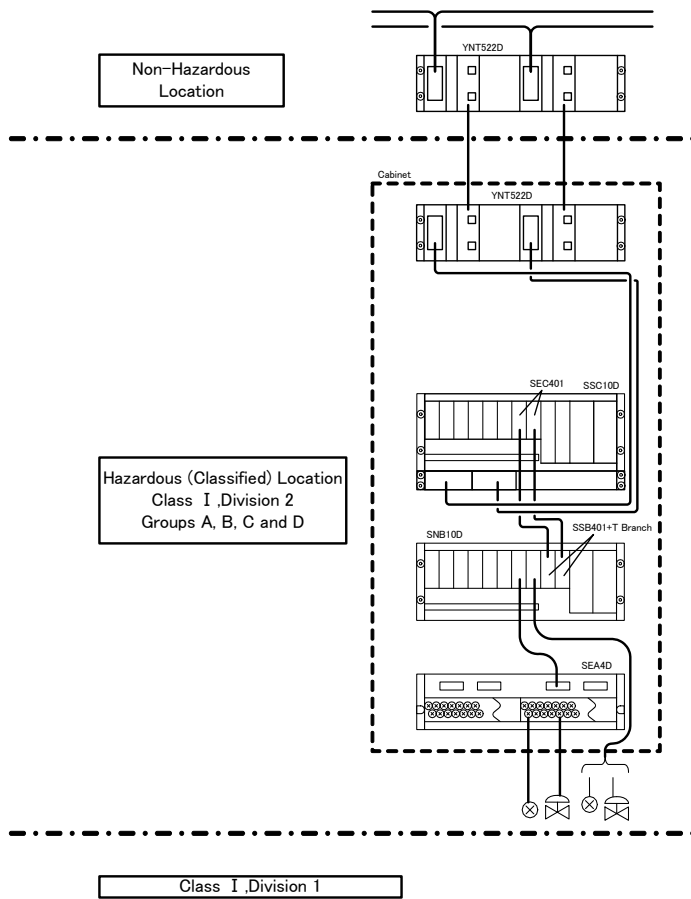
Yokogawa Electric Corporation

F050010.ai

Model: ProSafe-RS

Date: December 20, 2005

Control Drawing (Canada)



Rev.3: January 11, 2016

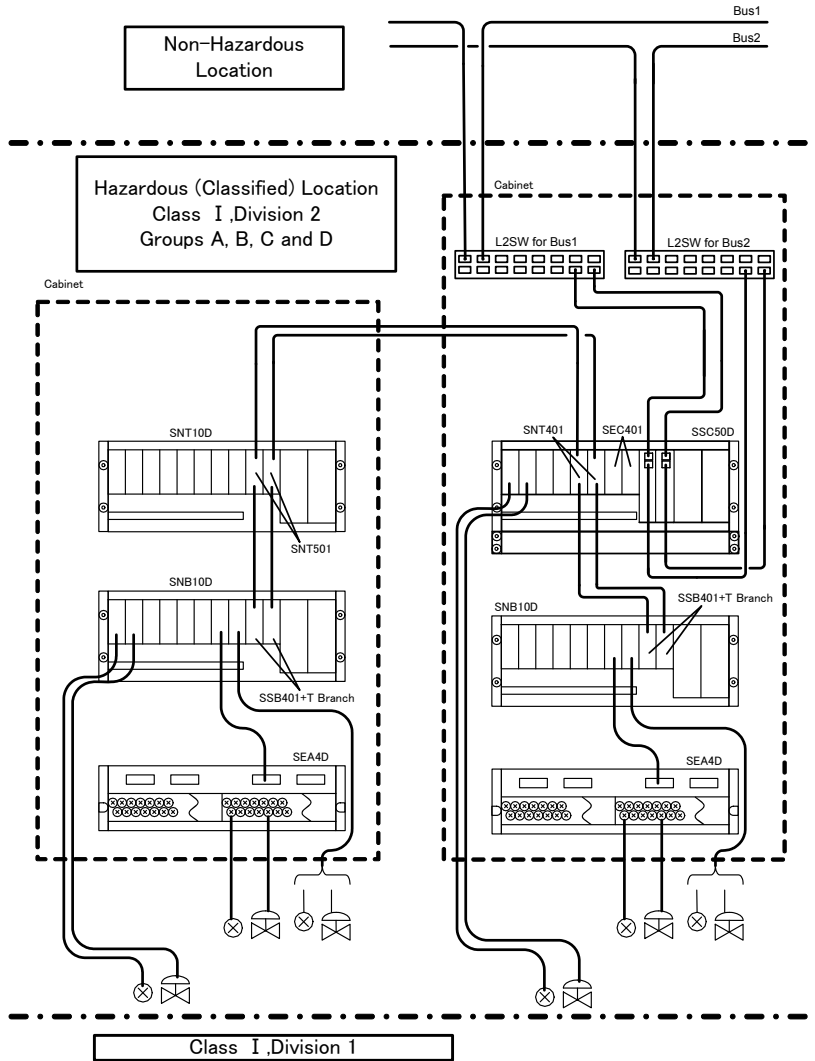
Doc. No.: NFM014-A13 P.6

Yokogawa Electric Corporation

F050011.ai

Model: ProSafe-RS

Date: December 20, 2005



Rev.3: January 11, 2016

Doc. No.: NFM014-A13 P.7

Yokogawa Electric Corporation

F050012.ai

Model: ProSafe-RS

Date: December 20, 2005

Nonincendive Field Wiring Parameters (Output parameters) (*1) (1/2)

Model	Voc (V)	Isc (mA)	Ca (μF)	La (mH)	Remarks	
SSB401	—	—	—	—	(*2)	
SNT401	—	—	—	—	(*2) for YCB301	
SNT501	—	—	—	—	(*2) for YCB301	
SNT411	—	—	—	—	(*2) for YCB301	
SNT511	—	—	—	—	(*2) for YCB301	
SNT421	—	—	—	—	(*2) for YCB301	
SNT521	—	—	—	—	(*2) for YCB301	
SAI143	Redundant	26.4	26	0.13	10	-2-wire transmitter input -Included terminal block and terminal board but excluded cable.
	Single	26.4	26	0.13	10	
	Redundant	12.2	0.14	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 40) -Included terminal block and terminal board but excluded cable.
	Single	12.2	0.07	0.01	1	
SAV144	Redundant	10	1.2	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 40) -Included terminal block and terminal board but excluded cable.
	Single	10	0.6	0.01	1	
SAI533	Redundant	18.9	23	0.16	10	-Output -Included terminal block and terminal board but excluded cable.
	Single	18.9	23	0.16	10	
	Redundant	10	220	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 40) -Included terminal block and terminal board but excluded cable.
	Single	10	110	0.01	1	
SDV144	Redundant	11.6	1.4	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 50) -Included terminal block and terminal board but excluded cable
	Single	11.6	0.7	0.01	1	
SDV531	Redundant	—	—	—	—	Output (*2)
	Single	—	—	—	—	
	Redundant	11.6	220	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 50) -Included terminal block and terminal board but excluded cable
	Single	11.6	110	0.01	1	
SDV541	Redundant	—	—	—	—	Output (*2)
	Single	—	—	—	—	
	Redundant	11.6	220	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 50) -Included terminal block and terminal board but excluded cable
	Single	11.6	110	0.01	1	

(*1) These parameters are applied to all modes of each model if the mode is not otherwise remarked.
 (*2) Wiring for Division 2 (such as conduit systems) must comply with NEC or Local Electrical Code of each country.

Rev.2: January 11, 2016

Doc. No.: NFM014-A13 P.8

Yokogawa Electric Corporation

F050013.ai

Model: ProSafe-RS

Date: January 11, 2016

Nonincendive Field Wiring Parameters (Output parameters) (*1)
(Continued) (2/2)

Model		Voc (V)	Isc (mA)	Ca (μ F)	La (mH)	Remarks
SDV521	Redundant	—	—	—	—	Output (*2)
	Single	—	—	—	—	
	Redundant	11.6	220	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 50) -Included terminal board but excluded cable
	Single	11.6	110	0.01	1	
SDV53A	Redundant	—	—	—	—	Output (*2)
	Single	—	—	—	—	
	Redundant	11.6	220	0.01	1	-Cable coming out detection (Wires connected to Pin No. 1 and 50) -Included terminal board but excluded cable
	Single	11.6	110	0.01	1	
S2LP131	Single	—	—	—	—	(*2)
AEP7D		—	—	—	—	(*2)
AEPV7D		—	—	—	—	(*2)
SAT145	Redundant	1.5	1.0	0.01	0.14	-RJC input
	Single	1.5	1.0	0.01	0.14	-Included terminal board but excluded cable
	Redundant	6.0	3.0	0.45	3.74	-TC/mv input (Burn out)
	Single	6.0	3.0	0.45	3.74	-Included terminal board but excluded cable
	Redundant	6.0	20.0	0.01	0.14	-Cable coming out detection (Wires connected to Pin No. 1 and 50)
	Single	6.0	20.0	0.01	0.14	-Included terminal board but excluded cable.
SAR145	Redundant	6.0	50.0	0.20	1.32	-RTD input
	Single	6.0	50.0	0.20	1.32	-Included terminal board but excluded cable.
	Redundant	6.0	70.0	0.01	0.14	-Cable coming out detection (Wires connected to Pin No. 1 and 50)
	Single	6.0	70.0	0.01	0.14	-Included terminal board but excluded cable.

(*1) These parameters are applied to all modes of each model if the mode is not otherwise remarked.
(*2) Wiring for Division 2 (such as conduit systems) must comply with NEC or Local Electrical Code of each country.

Rev.1: May 10, 2017

Doc. No.: NFM014-A13 P.9

Yokogawa Electric Corporation

F050014.ai

Model: ProSafe-RS

Date: January 11, 2016

Nonincendive Field Wiring Parameters (Input parameters) (*1)

(1/2)

Model		Vmax (V)	I _{max} (mA)	C _i (μF)	L _i (μH)	Remarks
SPW481		—	—	—	—	(*2)
SPW484		—	—	—	—	(*2)
SSB401		—	—	—	—	(*2)
SNT401		—	—	—	—	(*2) for YCB301
SNT501		—	—	—	—	(*2) for YCB301
SNT411		—	—	—	—	(*2) for YCB301
SNT511		—	—	—	—	(*2) for YCB301
SNT421		—	—	—	—	(*2) for YCB301
SNT521		—	—	—	—	(*2) for YCB301
SAI143	Redundant	26.4	26	0.008	20	-4-wire transmitter input -Included terminal block and terminal board but excluded cable
	Single	26.4	26	0.004	20	
SAV144	Redundant	30	0.6	0.001	10	-Input -Included terminal block and terminal board but excluded cable
	Single	30	0.3	0.001	10	
SDV144	Redundant	—	—	—	—	Input (*2)
	Single	—	—	—	—	
	Redundant	—	—	—	—	Power supply (*2)
	Single	—	—	—	—	
SDV531	Redundant	—	—	—	—	Power supply (*2)
	Single	—	—	—	—	
SDV541	Redundant	—	—	—	—	Power supply (*2)
	Single	—	—	—	—	
SDV521	Redundant	—	—	—	—	Power supply (*2)
	Single	—	—	—	—	
SDV53A	Redundant	—	—	—	—	Power supply (*2)
	Single	—	—	—	—	
S2LP131	Single	—	—	—	—	(*2)

(*1) These parameters are applied to all modes of each model if the mode is not otherwise remarked.
 (*2) Wiring for Division 2 (such as conduit systems) must comply with NEC or Local Electrical Code of each country.

Rev.1: May 10, 2017

Doc. No.: NFM014-A13 P.10

Yokogawa Electric Corporation

F050015.ai

Model: ProSafe-RS

Date: January 11, 2016

Nonincendive Field Wiring Parameters (Input parameters) (*1)
(Continued) (2/2)

Model	Vmax (V)	I _{max} (mA)	C _i (μF)	L _i (μH)	Remarks	
AEP7D	—	—	—	—	(*2)	
AEPV7D	—	—	—	—	(*2)	
SAT145	Redundant	5	1.53	0.6	10	-TC/mV input -Included terminal board but excluded cable
	Single	5	1.53	0.6	10	
SBD2D	—	—	—	—	—	Ready input(*2)
	60	20	0	0	0	Ready input DC
SBD3D	—	—	—	—	—	Ready input(*2)
	60	20	0	0	0	Ready input DC
SBD4D	—	—	—	—	—	Ready input(*2)
	60	20	0	0	0	Ready input DC
S1BB4D	—	—	—	—	—	Ready input(*2)
	60	20	0	0	0	Ready input DC

(*1) These parameters are applied to all modes of each model if the mode is not otherwise remarked.

(*2) Wiring for Division 2 (such as conduit systems) must comply with NEC or Local Electrical Code of each country.

Rev.

Doc. No.: NFM014-A13 P.11

Yokogawa Electric Corporation

F050016.ai

Model: ProSafe-RS

Date: January 11, 2016

Specific condition of use:

- The equipment shall be installed in a lockable metal cabinet. The suitability of the installation shall be determined by the authority having jurisdiction.
- The Ambient Temperatures are as follows.

Model code	Ambient Temperature
SNB10D	-20 to 70 °C
SNT10D	-20 to 70 °C
SSB401	-20 to 70 °C
SPW481	-20 to 70 °C
SPW484	-20 to 70 °C
SNT401	-20 to 70 °C
SNT501	-20 to 70 °C
SNT411	-20 to 70 °C
SNT511	-20 to 70 °C
SNT421	-20 to 70 °C
SNT521	-20 to 70 °C
SAI143	-20 to 70 °C
SAV144	-20 to 70 °C
SAI533	-20 to 70 °C
SAT145	-20 to 70 °C
SAR145	-20 to 70 °C
SDV144	-20 to 70 °C
SDV531	-20 to 70 °C
SDV541	-20 to 70 °C
SDV521	-20 to 70 °C
SDV53A	-20 to 70 °C
S2LP131	-20 to 70 °C
SEA4D	-20 to 70 °C
SED4D	-20 to 70 °C
SED2D	-20 to 70 °C
SED3D	-20 to 70 °C
SBA4D	-20 to 70 °C
SBT4D	-20 to 70 °C
SBR4D	-20 to 70 °C
SBD2D	-20 to 70 °C
SBD3D	-20 to 70 °C
SBD4D	-20 to 70 °C
S1BB4D	-20 to 70 °C
AEP7D	-20 to 70 °C
AEPV7D	-20 to 70 °C

Rev.2: November 28, 2019

Doc. No.: NFM014-A13 P.12

Yokogawa Electric Corporation

F050017.ai

Model: ProSafe-RS

Date: January 11, 2016

Notes:

1. No revision to this drawing without prior approval of FM.
2. Installation must be in accordance with Canadian Electrical Code Part I (C22.1) and relevant local codes.
3. In the course of installation, the related documents of GS (General specifications), TI (Technical Information of Installation Guidance), and IM (User's Manuals) should be referred to and the instructions described in the documents should be observed.
4. PROSAFE-RS IS SUITABLE FOR USE IN CLASS 1, DIVISION 2, GROUPS A, B, C, and D OR NON-HAZARDOUS LOCATIONS ONLY.
5. It must be observed during the installation that the venting slots of the devices are not blocked by cable parts, fixing accessories etc.
6. The doors of the cabinets must be closed when ProSafe-RS is energized.
7. The instrument modification or parts replacement by other than authorized representative of Yokogawa Electric Corporation is prohibited and will void FM Non-incendive Certification.
8. Nonincendive field wiring is permitted for the modules listed in tables of the Nonincendive field wiring parameters.
 - 8.1 The Nonincendive field wiring circuit concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus, using any of the wiring methods permitted for unclassified locations.
 - 8.2 Field equipment or other equipment connected to ProSafe-RS by Nonincendive field wiring must be FM approved.
 - 8.3 The control drawing of field equipment or other equipment must be followed at the installation.
 - 8.4 The following conditions must be met. See tables for the Nonincendive field wiring parameters of ProSafe-RS.

$$V_{max} \geq V_{oc} \text{ or } V_t; I_{max} \geq I_{sc} \text{ or } I_t; C_a \geq C_i + C_{cable}; L_a \geq L_i + L_{cable}$$
 - 8.5 For current controlled circuits, I_{max} of the nonincendive field wiring apparatus is not required and need not be aligned with parameter I_{sc} or I_t of ProSafe-RS or other associated nonincendive field wiring apparatus.

Rev.

Doc. No.: NFM014-A13 P.13

Yokogawa Electric Corporation

F050018.ai

Model: ProSafe-RS

Date: January 11, 2016

9. WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
AVERTISSEMENT – RISQUE D'EXPLOSION – LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATÉRIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE 1. DIVISION 2.
10. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT – RISQUE D'EXPLOSION. NE PAS DÉBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.
11. WARNING – EXPLOSION HAZARD – DO NOT REPLACE FUSES UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT – RISQUE D'EXPLOSION – COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX AVANT DE REPLACER LE COUPE-CIRCUIT À FUSIBLES.
12. WARNING – EXPLOSION HAZARD – BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT – RISQUE D'EXPLOSION – AFIN D'ÉVITER TOUT RISQUE LE D'EXPLOSION, S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX AVANT DE CHANGER LA BATTERIE.

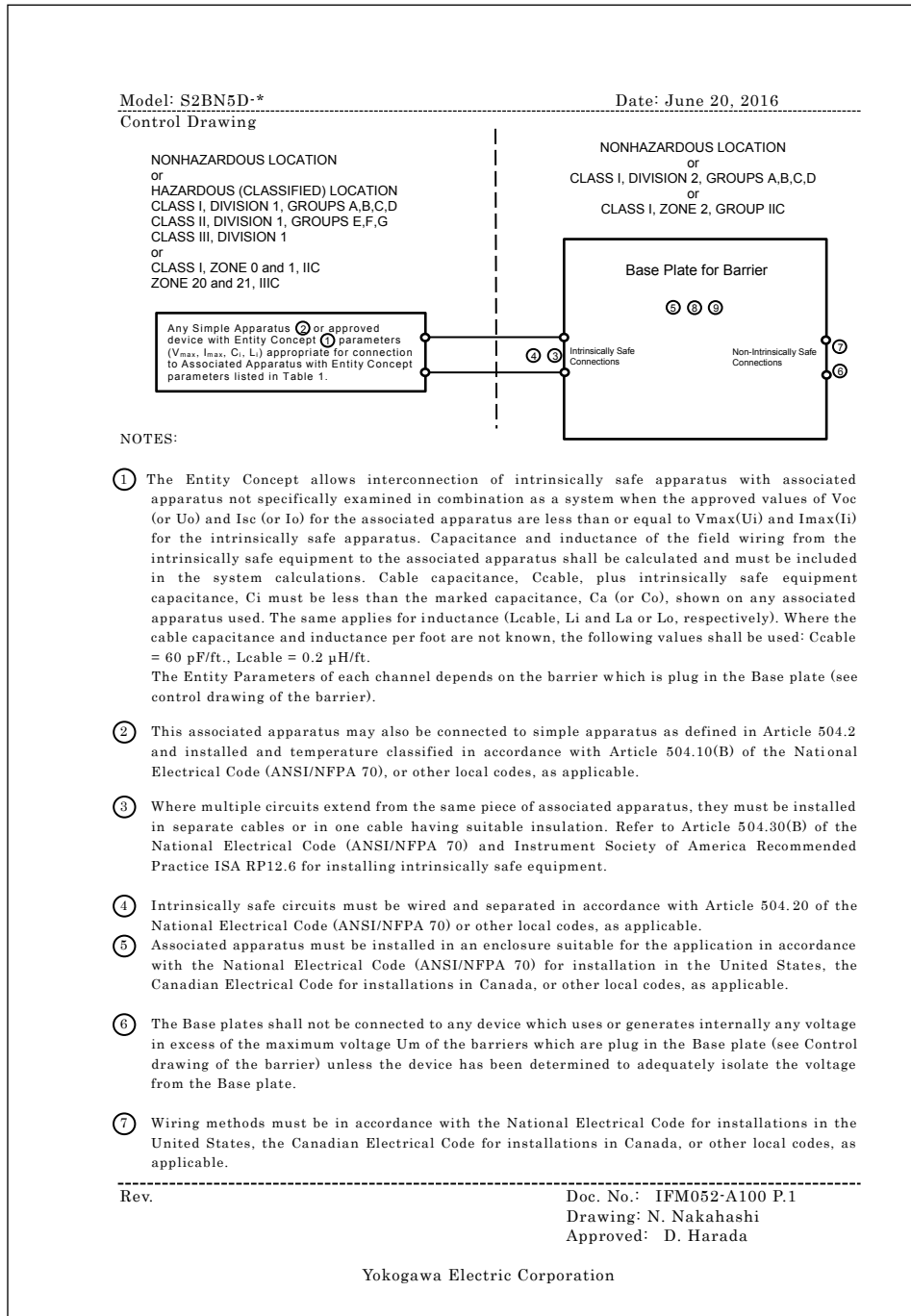
Rev.1: November 28, 2019

Doc. No.: NFM014-A13 P.14

Yokogawa Electric Corporation

F050019.ai

Appendix 6. US (FM) NI/Canada (FM) NI Control Drawing for S2BN5D



F060001.ai

Model: S2BN5D-*

Date: June 20, 2016

- ⑧ The Base plates are rated 'Nonincendive' for use in Class I, Division 2 or Zone 2 or non-hazardous locations. A temperature rating of T4 applies.
If the Base plates are intended to be mounted in a Division 2 location, they must be mounted in an enclosure with a minimum ingress protection of IP2X.
If the Base plates are intended to be mounted in a Zone 2 location, they must be mounted in an enclosure that is AEx certified (for US) or Ex certified (for Canada) with a minimum ingress protection of IP54 and installed in an area of not more than pollution degree 2.

- ⑨ Temperature range is -20 to +60°C.

WARNING - Substitution of components may impair intrinsic safety and suitability for use in Class I, Div. 2/Zone 2.

AVERTISSEMENT - La substitution de composants peut compromettre la sécurité intrinsèque et l'adéquation à une utilisation en Classe I, Div. 2/Zone 2.

WARNING - Do not disconnect the equipment when it is energized and an explosive atmosphere is present.

AVERTISSEMENT - Ne pas débrancher l'équipement lorsqu'il est sous tension et exposé à une atmosphère explosive.

WARNING - Do not remove or replace fuse when energized.

AVERTISSEMENT - Ne pas retirer ni remplacer de fusible sous tension

Rev.

Doc. No.: IFM052-A100 P.2

Drawing: N. Nakahashi

Approved: D. Harada

Yokogawa Electric Corporation

F060002.ai

Revision Information

- Title : Explosion Protection (For ProSafe-RS)
- Manual No. : TI 32S01J30-01E

June 2006/1st Edition

Newly published

June 2007/2nd Edition

Addition of new compliant products to FM NI and Type “n”.

June 2008/3rd Edition

- 1.1 Complied standard number in the table “Explosion Protection Standards that ProSafe-RS Complies” was revised.
- 2.1 Sample in the title “Example” was changed into SAI143 from AAI141.
- 2.2 Complied standard number of the “Complied Standards” was revised.

Nov. 2008/4th Edition

- Appendix 1. SDV531-L, SDV521, SED2D, SNT411, SNT511 and AKB651 were added.
 Appendix 2. SDV531-L, SDV521, SED2D, SNT411, SNT511 and AKB651 were added.

Nov. 2010/5th Edition

- Appendix 1. SSC60S, SSC60D, SCP461, SEC402, SDV53A, SED3D, AKB331-M□□□/SDV53A were added.
 Isc parameters for SDV521, SDV531 and SDV541 of “Table Parameters (The Source Devices)” were revised.
- Appendix 2. Io parameters for SDV521, SDV531 and SDV541 of “Table Parameters (The Source Devices)” were revised.

June 2012/6th Edition

- 1.1 Type “n” Complies standards were changed.
 - 2.1 precautions are added.
 - 2.2 Type “n” Complies standards were changed.
- Appendix 1. SAT145, SAR145, SBT4D, SBR4D, SBA4D, SBD2D, SBD3D, SBD4D, AEPV7D, AKB331-M□□□/SAT14, AKB651-M□□□/DV53L, AKB651-M□□□/DV53A, AKB651-M□□□/DV541, AKB611-M□□□ and AKB611-M□□□/SAR14 were added. Notes were added.
 (The Source Devices), SAT145 and SAR145 were added. Note was revised.
 (The Load Devices) SAT145, SBD2D, SBD3D and SBD4D were added. Note was revised and added.
- Appendix 2. SAT145, SAR145, SBT4D, SBR4D, SBA4D, SBD2D, SBD3D, SBD4D, AEPV7D, AKB331-M□□□/SAT14, AKB651-M□□□/DV53L, AKB651-M□□□/DV53A, AKB651-M□□□/DV541, AKB611-M□□□ and AKB611-M□□□/SAR14 were added.
 (The Source Devices), SAT145 and SAR145 were added. Note was revised.
 (The Load Devices) SAT145 was added. Note was revised and added.

Nov. 2012/7th Edition

- 2.1 ALE111 was added.
- Appendix 1. ALR121-S0B and ALE111-S01 were added.
 Modules of high-density installation were added.
 Temperature Range of AEPV7D was revised.
 (The Source Devices) ALE111 was added.
 (The Load Devices) ALE111 was added.
- Appendix 2. ALR121-S0B and ALE111-S01 were added.
 Modules of high-density installation were added.
 Temperature Range of AEPV7D was revised.
 (The Source Devices) ALE111 was added.
 (The Load Devices) ALE111 was added.

Apr. 2013/8th Edition

General Clerical error correction

- 1.1 Type “n” standard number was changed.
Descriptions of NI standard were revised.
- 1.2 Descriptions and figures were revised for change of Type “n” standards.
- 1.3 Descriptions and figures were revised for change of Type “n” standards.
- 2.1 Descriptions of NI standard were revised.
- 2.2 Type “n” standard number was change.
Descriptions and figures were revised for chagne of Type “n” standards.
- Appendix 1. AEP7D-□0, AEPV7D-□0□ and AEPV7D-□□0 were deleted.
- Appendix 2. Suffix codes for explosion protection were changed.
Parameters of Type “n” were deleted.
AEP7D-40, AEPV7D-40□ and AEPV7D-4□0 were deleted.
STK4A-00 and STD4A-00 were deleted.

Sep. 2013/9th Edition

General Clerical error correction

- Appendix 1. Suffix codes for explosion protection were changed.
SSC57□ was added.
- Appendix 2. SSC57□ was added.

Dec. 2013/10th Edition

- Appendix 1. Suffix codes for explosion protection were changed.

Oct. 2014/11th Edition

Safety Precautions

- [“Protective grounding terminal” was changed to “Protective conductor terminal”
(Based on IEC 61010-1)]
- 1.1 “Table Explosion Protection Standards that ProSafe-RS Complies”
[Revised descriptive texts]
- 2.1 Non-Incendive approved types and standards
[Revised descriptive texts]
- 2.2 Type “n” complied standards
[Revised descriptive texts]
- Appendix 1. “Table NI Approved Products”
[SNT421-E3, SNT421-E3/CU1N, SNT421-E3/CU1T, and SNT521-E3 are added]
“Table Parameters (The Source Devices)”
[SNT421 and SNT521 are added]
“Table Parameters (The Load Devices)”
[SNT421 and SNT521 are added]
- Appendix 2. “Table the List of Type “n” Compliant Products”
[SNT421-E3, SNT421-E3/CU1N, SNT421-E3/CU1T, and SNT521-E3 are added]

Feb. 2015/12th Edition

Safety Precautions

- Precautions were added.
- Appendix 1. ALR121-SE3 and ALE111-SE3 were added.
- Appendix 2. ALR121-SE3 and ALE111-SE3 were added.

Aug. 2015/13th Edition

General Clerical error correction

- 1.1 ATEX Type “n” standard number was revised.
- 2.2 ATEX Type “n” standard number was revised. Note was added.
- Appendix 2. ATEX was added in front of Type “n”.

Nov. 2015/14th Edition

- 1.1 Type “i” of “Table Explosion Protection Standards that ProSafe-RS Complies” was added.
- 1.3 “Overview of Connecting N-IO Components” was added.
- 2.2 S2BN5D of ATEX Type “n” was added.
IECEx Type “n” was added.
- 3 “3. Intrinsic Safety Explosion Protection Instrumentation” was added.

- Appendix 2. S2BN5D of “Table List of ATEX Type “n” Compliant Products” was added.
 “Appendix 2.2 IECEx Type “n” Compliant Products” was added.
- Appendix 3. “Appendix 3. Lists of Parameters of Base Plate for Barrier (S2BN5D)” was added.

June 2016/15th Edition

- Appendix 1. Suffix code of SCP451 is revised.
- Appendix 2. Suffix code of SCP451 is revised.
 Clerical error correction.

Oct. 2016/16th Edition

- General FM Non-Incendive is changed into US(FM) Non-Incendive.
- Safety Precautions Descriptions of symbols are revised.
- 1.1 “Table Explosion Protection Standards that ProSafe-RS Complies” is revised.
- 1.2 Overview of Connecting S2BN1D, S2BN4D, and S2BN5D is added.
- 2.1 Descriptions of Canada(FM) NI are added.
- 2.2 Descriptions of IECEx Type “n” are revised.
- 3.1.4 “Intrinsic Safety Explosion Protection of US (FM) Standard” is added.
- 3.1.5 “Intrinsic Safety Explosion Protection of Canada (FM) Standard” is added.
- Appendix 1 N-IO-Related Products are added.
 NI Parameters are deleted.
- Appendix 1.2 “Canada(FM) NI Compliant Products” is added.
- Appendix 2 N-IO-Related Products are added.
- Appendix 4 “US(FM) NI/Canada(FM) NI Control Drawing for ProSafe-RS N-IO” is added.
- Appendix 5 “US(FM) NI/Canada(FM) NI Control Drawing for ProSafe-RS FIO” is added.
- Appendix 6 “US(FM) NI/Canada(FM) NI Control Drawing for S2BN5D” is added.

Apr. 2017/17th Edition

- 1.1 Clerical error correction
- 2.1 Clerical error correction
- 2.2 Clerical error correction
 “Example of Type “n” Configuration for Vnet/IP” is added.
- 3.1 Clerical error correction
- Appendix 1 S2MDV843 is added.
 Option code /NTRY for Terminal Board is added.
- Appendix 2 S2MDV843 is added.
 Option code /NTRY for Terminal Board is added.
 Clerical error correction.
- Appendix 4 “US (FM) NI/Canada (FM) NI Control Drawing for ProSafe-RS N-IO” is revised.

June 2017/18th Edition

- 1.1 Canada (FM) standard number was revised.
- 2.1 Canada (FM) standard number was revised.
 Precautions were revised.

Feb. 2018/19th Edition

- 2.1 S2LP131 is added.
- Appendix 1 S2LP131 is added.
- Appendix 2 S2LP131 is added, notice for S2MDV843 is removed.
- Appendix 4 S2LP131 is added.
- Appendix 5 S2LP131 is added.

May 2018/20th Edition

- Introduction Certificate No. was added.
- Safety Precautions “Maintenance” is caution was added.
- 1.1 Applied standards of N-IO field enclosure were added.
- 1.2 Description of N-IO field enclosure was added.
- 1.3 Description of N-IO field enclosure was added.
 Correction due to company name change of MTL
- 2.1 Description of N-IO field enclosure was added.
 Applied standards of N-IO field enclosure were added.
 Warning of N-IO field enclosure was added.
- Appendix 1.1 S2NN70D, S2NN60D, and S2CB60 were added.

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- Appendix 1.2 S2NN70D, S2NN60D, and S2CB60 were added.
Appendix 4. Control Drawing of N-IO field enclosure was added.

Oct. 2018/21st Edition

- Safety Precautions Revision of logo mark description
1.1 Note for referring to GS was revised.
2.2 Note for referring to GS was revised.
Appendix 1. Note for referring to GS was added.
Appendix 2. Note for referring to GS was added.

Nov. 2019/22nd Edition

- Safety Precautions Descriptions of symbols are revised.
2.2 SCP461 related comments were added.
Appendix 1. S2CP471 related comments were added.
Appendix 2. S2CP471 related comments were added.

Mar.2020/23rd Edition

- Introduction Updated descriptions of trademark.
Appendix 1.1 A2BM4 was added, and S2BN1D was revised.
Option code "/ERFI" was deleted.
Clerical error correction(Correction of the temperature range of S2EN402 and S2EN404.)
Note for S2LP131 was revised.
Notes for S2NN30D and S2EN501 were added.
Appendix 1.2 A2BM4 was added, and S2BN1D was revised.
Option code "/ERFI" was deleted.
Note for S2LP131 was revised.
Notes for S2NN30D and S2EN501 were added.
Appendix 2.1 A2BM4 was added, and S2BN1D was revised.
Option code "/ERFI" was deleted.
Clerical error correction(Correction of the temperature range of S2EN402 and S2EN404.)
Note for S2LP131 was revised.
Notes for S2NN30D and S2EN501 were added.
Appendix 2.2 A2BM4 was added, and S2BN1D was revised.
Option code "/ERFI" was deleted.
Note for S2LP131 was revised.
Notes for S2NN30D and S2EN501 were added.
Appendix 4 Control Drawing(NIE009) was replace to new revision.

May 2020/24th Edition

- Appendix 1. S2CP471 was added.
Remarks for Safety Control Units were deleted.
Remarks for S2LP131, CPU module, Power supply module, and Coupler unit were deleted.
Appendix 2. S2CP471 was added.
Remarks for Safety Control Units were deleted.
Remarks for S2LP131, CPU module, Power supply module, and Coupler unit were deleted.
Appendix 4. "US (FM) NI/Canada (FM) NI Control Drawing for ProSafe-RS N-IO" was revised.
Appendix 5. "US (FM) NI/Canada (FM) NI Control Drawing for ProSafe-RS FIO" was revised.

July 2020/25th Edition

- Compliance with ECAS-Ex Type "n"
1.1 ECAS-Ex Type "n" was added to table of Explosion Protection Standards that ProSafe-RS Complies.
2.2 ECAS-Ex Type "n" was added.
Appendix 1.1 Note for SPW482 of table US (FM) NI Approved Products was revised.
Appendix 2.3 ECAS-Ex Type "n" Compliant Products was added.

Jan. 2021/26th Edition

- 1.1 "Table Explosion Protection Standards that ProSafe-RS Complies" [N-IO field enclosure was revised.]
1.3 Overview of Connecting N-IO Components [N-IO field enclosure was added.]
2.1 N-IO field enclosure was added.
2.2 N-IO field enclosure was added.
Appendix 1.1 N-IO field enclosure was revised.
Appendix 1.2 N-IO field enclosure was revised.

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- Appendix 2.1 N-IO field enclosure was added.
 - Appendix 2.2 N-IO field enclosure was added.
 - Appendix 4 "US (FM) NI/Canada (FM) NI Control Drawing for ProSafe-RS N-IO" is revised.

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Subject to change without notice.