Introduction and System Definition

The system described below represents a typical DeltaV Series-1 or Series-2 System. This comprises of Unspecified Safe Area Apparatus and I/O Modules and all other necessary apparatus such as power supplies, carriers, carrier extenders, etc. A system may be configured in a horizontal or vertical position depending on the type of carriers used. Each system has a maximum length of 6.5 meters (including interconnections) and may include up to 64 I/O modules.

General installation instructions of these components, the hardware specifications and the environmental specifications are covered in the **Hardware Manual, Installing Your DeltaV™ Digital Automation System**. Special installation requirements, applicable to the use in Zone 2 hazardous location are covered here and are defined below. This system may also be placed in a Safe Area and have its field wiring enter a Zone 2 hazardous area as long as all criteria listed in this document are met.

Applicable Standards

- EN 60079-0:2012
- IEC 60079-0 (Ed. 6, 2011)
- EN 60079-11:2012
- IEC 60079-11 (Ed. 6, 2011)
- EN 60079-15:2010; EN 60079-15:2005
- IEC 60079-15 (Ed. 4, 2010); IEC 60079-15 (2005)

Reference to further documentation

Laws, standards, or directives applicable to the intended use must be observed. In relation to hazardous areas, Directive 1999/92/EC must be observed. The corresponding EC type examination certificates and IECEx certificates are an integral part of this document.

Due to constant revisions, documentation is subject to permanent change. Please refer only to the most up-to-date version available from Fisher Rosemount Systems / Emerson Process Management.

Marking

For marking details refer to the individual ATEX Instruction Sheet for each module.

Notes, Warnings and Limitations

1. Provision shall be made external to the system to prevent the rated voltage being exceeded by transient disturbances of more than 40%. The system must be mounted in an enclosure in accordance to EN 60079-15, or one of the protections listed in Clause 1 in EN 60079-0 with at least a degree of protection IP54 according to EN 60529:1991 and pollution degree 2, as defined in IEC 60664-1. When the system is installed in an enclosure, the enclosure must have a label that reads, “Before opening please confer the Zone 2 Installation Document”. Metal enclosures, which are rated IP-54, pass the required impact specification by default. Consult the hardware manual for temperature de-rating calculations for system components when located in an enclosure.
2. The System consists of the items noted in Figure 1 and in Table 1.

   Ambient Temperature: -40°C < Ta < +70°C (unless noted in Table 1). See the **Hardware Manual, Installing Your DeltaV™ Digital Automation System** for complete specifications.

WARNING: A Terminal Block fuse may NOT be removed with field power energized for non-sparking circuits. To determine field circuit status see Table 1.

13. A rotary keying system ensures compatibility between I/O Modules and Terminal blocks after installation is complete (see figure 2 below). The exception: the SLS Terminal blocks do not have keys. They physically can only connect to the SLS 1508 controller.

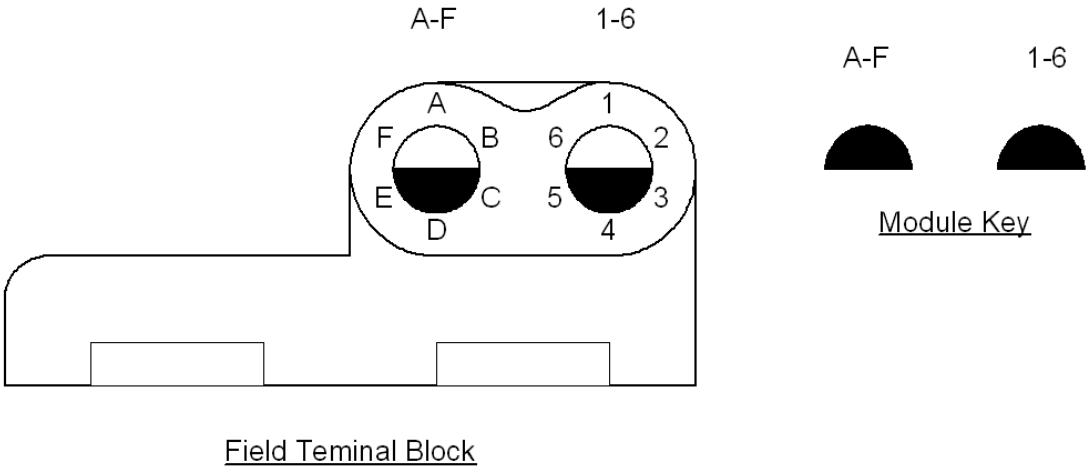


Figure 2

14. A Module Cover KJ4001-FA1 must be fitted to any permanently unoccupied location on an I/O Module Carrier. (Permanently unoccupied implies no I/O Module AND no Terminal Block are intended for that particular location.)
15. Additional I/O Carriers or a Local Bus Extender may be used to further distribute the system power provided:
    a) The combination of up to eight I/O Carriers and Local Bus Extenders shall not exceed maximum length of 6.5 m (21.3 ft).
    b) The interconnecting cable between enclosures must be in conduit.

CAUTION: Carriers, Extenders, Extension Cables must NOT be unplugged unless either

A. The System has been de-energized, or

B. The area is known to be non-hazardous.

16. When using a KJ3004X1-BA1 in a safe area and connecting to energy limited field circuits, use the KJ4020X1-BA1, Fieldbus Power Supply Conditioner KJ4020X1-BD1. Please refer to Figure 3.
17. Field Power supplied to the KJ2231X1-BA1 or BB1 Auxiliary Relay Modules must be removed (power de-energized) before removing or inserting Relay Module Power connectors.
18. Field Power must be removed (power de-energized) before removing or connecting the customer load to the KJ2231X1-BC1 Diode Module.
19. Field Power to the KJ2201X1-BA1 SLS Module (Module L) must be de-energized before removing or connecting the I/O connections to the KJ2231X1-BA1 or BB1 Relay Module.
20. Field Power supplied to the KJ2222X1-BA1 SISNet Distance Extender (Module P) must be removed (power de-energized) before removing or inserting the SISNet Distance Extender power connector.

21. Field Power supplied to the KJ2231X1-EA1 SIS Relay Module or EB1 Voltage Monitor Module must be removed (power de-energized) before removing or inserting Module Power connectors.
22. Field Power to the KJ2201X1-BA1 SLS Module (Module L) must be de-energized before removing or connecting the I/O connections to the KJ2231X1-EA1 or EB1 Modules.
23. Field Power must be removed (power de-energized) before removing or connecting the customer load to the KJ2231X1-EA1 SIS Relay Module.
24. Output of Module R is an Energy Limited Circuit (Nonincendive output) acceptable for use in Zone-2 installations.
25. **WARNING:** Substitution of components may impair intrinsic safety

Intended Use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

The device must only be operated in the ambient temperature range and at the relative humidity (non-condensing) specified.

The input and output modules listed in Table 1 act as an interface between signals from the hazardous area (Ex area) and the safe area (NON-Ex area).

The modules listed in this document are used in C&I (control and instrumentation) technology for the galvanic isolation of C&I signals such as 20 mA and 10 V standard signals or alternatively for adapting or standardizing signals. Devices that incorporate intrinsically safe circuit are used for operating intrinsically safe field devices in hazardous areas.

Avoid improper use

Protection of the operating personnel and the overall system is not ensured if the product is not being used according to its intended purpose.

Mounting and Installation Instructions

Prior to mounting, installation, and commissioning of the device the installer should be familiar with the device and carefully read the instruction manual.

The installation instructions specified by IEC/EN 60079-14 must be observed.

The EC type examination certificate, certificates and/or declarations of conformities have to be observed - if applicable – especially the special conditions of use.

If the device has already been operated in general electrical systems, it is not allowed to install it in electrical systems used in combination with hazardous areas.

The device fulfils a degree of protection IP 20 according to IEC/EN 60529.

To ensure the IP degree of protection all seals of the device housing (ultrasonic welding) and the housings themselves must be undamaged and correctly fitted.

The device may only be installed and operated in Zone 2 if it has been mounted in an enclosure with degree of protection IP 54 according to IEC/EN 60529. The enclosure must have a declaration of conformity according to 94/9/EC for at least category 3G.

The System must be supplied with a SELV / PELV or class 2 power supply with a maximum DC voltage of Um = 40VDC at the edge connectors.

Carrier terminals can be used to connect a cable screen of the field wiring. The screen bar itself must be connected to the equipotential bonding system of the hazardous area.

The communication network must have a prospective fault current of < 100A.

Operation, Maintenance and Repair

The device must not be repaired, changed or manipulated. If there is a defect, the product must always be replaced with an original device.

Connection or disconnection of energized non-intrinsically-safe and non-energy-limited circuits are only permitted in the absence of a hazardous atmosphere.

Torque Requirements for I/O Terminal Screws:

I/O terminals 0.45 Nm (4 in-lb)

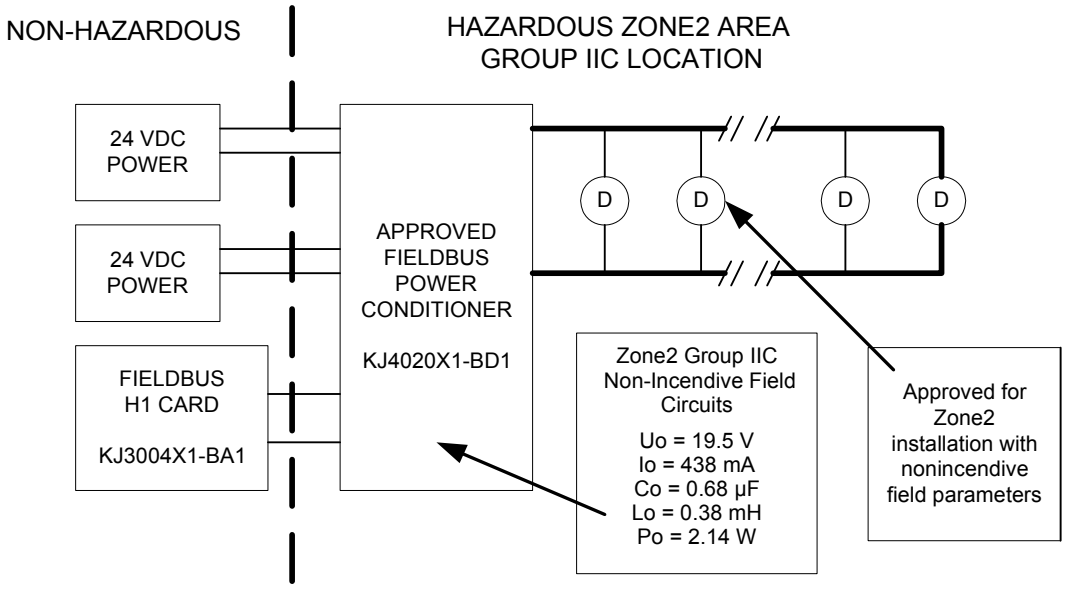


Figure 3 – Fieldbus Nonincendive circuit wiring for KJ4020X1-BD1 Power Conditioner

Model	Ref. Fig. 1	Description	Removal or Insertion with System Power Energized	Key Pos.	Field Circuit Class For Definitions please refer to Item 10.
KJ4001X1 - CG1	C	Thermocouple Terminal Block	N/A	C 1	N/A
KJ4001X1 - CH1	C	RTD Terminal Block	N/A	C 3	N/A
KJ4001X1 - CJ1	C	32-channel Terminal Block	N/A	B 3	N/A
KJ4001X1 - CK1	C	Mass Termination 40 Pin Assembly	N/A	B 3	N/A
KJ4001X1 - HA1	E	Local Bus Extender	NO	N/A	N/A
KJ4001X1 - JA1		I/O Switch Over Panel	NO	N/A	NON-SPARKING
KJ4001X1 - LA1	B	4-Wide Remote I/O Carrier	NO	N/A	N/A
KJ4001X1 - NA1	E	Dual Right Extender	NO	N/A	N/A
KJ4001X1 - NB1	E	Dual Left Extender	NO	N/A	N/A
KJ4002X1 - BA1	B	Left Side 8-Wide Carrier	NO	N/A	N/A
KJ4002X1 - BB1	B	Right Side 8-Wide Carrier	NO	N/A	N/A
KJ4002X1 - BC2	A	Top 4-Wide Carrier	NO	N/A	N/A
KJ4002X1 - BD2	A	Bottom 4-Wide Carrier	NO	N/A	N/A
KJ4002X1 - BE1	E	Cable, Top Extender	NO	N/A	N/A
KJ4002X1 - BF1	E	Cable, Bottom Extender	NO	N/A	N/A
KJ4002X1 - BF2	E	Cable, Bottom Extender	NO	N/A	N/A
KJ4002X1 - BF3	E	Cable, Bottom Extender	NO	N/A	N/A
KJ4002X1 - BF4	E	Cable, Bottom Extender	NO	N/A	N/A
KJ4003X1 - BA1	B	Sis Vertical, Left Side 8-Wide Carrier	NO	N/A	N/A
KJ4003X1 - BB1	B	Sis Vertical, Right Side 8-Wide Carrier	NO	N/A	N/A
KJ4003X1 - BC1	A	Sis Vertical Controller Carrier	NO	N/A	N/A
KJ4003X1 - BD1	A	Sis Net Repeater Carrier	NO	N/A	N/A
KJ4003X1 - BE1	E	Sis Vertical Right Extender Carrier	NO	N/A	N/A
KJ4003X1 - BF1	E	Sis Vertical Left Extender Carrier	NO	N/A	N/A
KJ4003X1 - BG1	A	Sis Vertical Power Carrier	NO	N/A	N/A
KJ4003X1 - BH1	E	Sis Vertical Extender Cable	NO	N/A	N/A
KJ4003X1 - BH2	E	Sis Vertical Extender Cable	NO	N/A	N/A
KJ4020X1 - BD1		Fieldbus Power Conditioner		N/A	Energy limited field circuits Uo = 19.5, Io = 438mA, Po = 2.14W Co=0.68µF, Lo=0.38mH
KJ6001X1 - BA1		Fieldbus H1 Carrier with Enclosure	NO	N/A	N/A
KJ6001X1 - BA2		Fieldbus H1 Carrier with Enclosure	NO	N/A	N/A
KJ6001X1 - CA1		Fieldbus H1 Carrier	NO	N/A	N/A
KJ6001X1 - CA2		Fieldbus H1 Carrier	NO	N/A	N/A

Table 1 – Certified Products

[1]Note:
Removal or insertion of an I/O module with system power energized, may only be done when used with the KJ1501X1-BCxx, System Dual DC/DC power supply operating on 24V DC input power or the KJ1501X1-BB1, DC/DC Power Supply or the KJ1501X1-BCxx, System Dual DC/DC power supply operating on 12V DC input power with primary circuit wiring inductance of less than 23 uH, or a certified bulk power supply with an open circuit voltage, Uo of 12.6 VDC and an Lo of less than 23 uH (including wire inductance).

[2]Note:
Non-Sparking filed circuits are designed so that ignition does not occur during normal operation. Non-sparking field circuits MUST be de-energized before removing and inserting an I/O module. Please refer to definitions in Item 10.

[3]Note:
The Series-2 Fieldbus Card Field Circuit classification is Nonincendive only when this device is used with Fieldbus devices and Fieldbus power supplies that also have Nonincendive ratings. All devices on the segment must be rated as Nonincendive. See Figure 4.