8000 Series I/O Systems Div.2 System : Installation and Use

NOTES :

1. This document provides details of the precautions which must be observed when installing and using 8000 Series I/O Management System in Class I, Division 2 Hazardous Locations.

2. The system comprises a carrier (Backplane) populated with I/O Modules, Field Terminals (Terminal Blocks) and in certain cases a Bus Interface Module (also referred to as a BIM). An alternative to the BIM is the 8521or 8851 Processor Module , one or two of which are mounted on a suitable carrier (e.g. 8750-CA-NS or 8751-CA-NS) together with an optional 8410-NS-PS Node Services Power Supply Monitor. This carrier is then connected to the I/O module carriers by either plugging one carrier directly into the right-hand end of the previous carrier, or using a combination of right hand carrier extender/carrier extender cables/left hand carrier extender between the two adjacent carriers. Similarly, if more than one I/O module carrier is used, they can either be plugged directly together, or connected via carrier extender and extender cables. Refer to note 15 for details of suitable extender cables. The maximum length of Railbus (including carrier extenders and extension cables) must not exceed 6.8m (22.3ft).

3. A Carrier (8-Way, or 4-Way) has provision for the input of power to the I/O modules, which in turn supply the same power to field circuits. This power is derived from an external power supply which may be located in the Class I, Division 2 Hazardous Location. Such an arrangement is referred to as a "Bussed Power System". The connectors for incoming bussed power are located on the rear edge of the carrier. Each connector has eight terminals grouped into two sets of four such that each set of four provides bussed power to two I/O modules - see Diagram 1.

4. Each I/O module interfaces the field through a Field Terminal Assembly (Terminal Block).

5. For use in hazardous locations, field outputs (and also field circuits) are classified according to the type of output, i.e. for Division 2 hazardous locations field circuits are either Non-Incendive or Non-Arcing. Non-Incendive circuits have special low voltage and current levels so that they are incapable of causing ignition, Non-Arcing circuits are designed to prevent sparks from occuring during normal operation. Non-Incendive and Non-Arcing circuits must NOT be interconnected.

6. The BIM, 8521 or 8851 communicates with the I/O modules by means of the Railbus which runs through all the carriers connected to it. The Railbus and the I/O modules are designed to allow removal and insertion of the modules on the carriers without the need to remove power from the Railbus. The I/O modules are energised by a 12V Railbus power supply. This may also remain powered up during module removal and insertion. Removal and insertion of I/O modules as described is referred to as "Hot Plugging" or "Hot Swapping". See also Table on sheets 6 and 7.

7. Field Terminal Assemblies (Terminal Blocks) may be left in place and remain connected to field circuits whilst an I/O module is Hot Plugged but the field circuit itself may need to be de-energised - see Sheet 6 and 7. The possibility of inserting a Non-Arcing output I/O module in place of a Non-Incendive output version (or vice versa) is prevented by means of a keying system. Refer to sheets 4 and 5.

8. Keying between the 8000 Series I/O modules and the Field Terminals is achieved by means of rotary keys. Either of two styles of rotary keys may be used (see Sheets 4 and 5 of this drawing), but both styles employ keys which can be indexed into one of six positions. The keys fitted to I/O Modules are factory-set (ultrasonic welding) whilst the keys fitted to the Field Terminal Assemblies are adjustable and are set to match those of the chosen I/O Module at the time of installation. Note that the later style keying system prevents I/O Modules using the original style keys mating with the Field Terminals using the later style keys except in Safe Location applications.

9. The table on sheets 6 and 7 of this drawing gives details of the key positions allocated to each type of I/O module. Note that there are no keying arrangements given to other components such as Bus Interface and Processor Modules and Power Supplies.

10. The power supply energising the BIM and I/O modules and the Railbus Drivers in the 8521 or 8851, (12V dc nominal Railbus supply) must be CSA-Certified for use in Class I, Division 2 Hazardous Locations and must have the following output terminal parameters :-

Vout < 12.6V

11. Power supplies providing bussed field power must also be CSA-Certified for use in Class I, Division 2 Hazardous Locations, and must have a V:max.out which does not exceed the V:max.in of the I/O modules to which they will supply field power.

12. Only I/O modules receiving bussed field power at 30V or less and 100mA or less may be considered suitable for hot plugging whilst field circuits are energised.

13. CAUTION
When fused Field Terminal Assemblies are to be used the installer and user must be aware that the fuses must not be removed or inserted whilst the circuits are alive or unless the area is known to be non-hazardous.

14. PERMITTED OPERATIONS
Refer to SCI-830 (for 8502-BI-DP), SCI-831 (for 8505-BI-MB) and SCI-957 (for 8521 & 8851) for details under which these products may be connected or disconnected in the presence of a flammable atmosphere.

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NOTES

15. The carrier extender cables connect Railbus signals between carriers that are not directly plugged together (see note 2 on sht 1). There are three types of carrier extender cable assemblies. The 800x series have straight connectors, the 809x series have 45 degree connectors, and the 804x series have right-angle connectors. The part numbers of suitable cables are listed in the table below. Note that none of these cables need to carry CSA approval markings.

Cable length	800x series	804x series	809x series
0.35m	8001-CC-35	8041-CC-35	
0.66m			8090-CC-66
0.85m	8002-CC-85	8042-CC-85	
1.2m	8003-CC-12	8043-CC-12	
2.0m	8004-CC-20	8044-CC-20	8091-CC-20
3.0m			8092-CC-30
See below	8005-CC-xxx	8045-CC-xxx	8095-CC-xxx

16. The 8005-CC-xxx, 8045-CC-xxx and 8095-CC-xxx cables may be of any length, where xxx defines the length in centimetres. The Railbus power is transferred between a right-hand carrier extender and a left-hand carrier extender via a cable cut to length on site and connected to the screw terminals on the carrier extenders.
The following field terminals meet the requirements of Hazardous Location coding, Class I Division 2 Groups A, B, C, D Temperature Code T6 at Ta = +70°C.

8601-FT-NI, 8602-FT-ST, 8603-FT-FU, 8604-FT-FU, 8605-FT-TC, 8606-FT-RT, 8607-FT-TC, 8608-FT-NI, 8610-FT-NA, 8611-FT-FU, 8612-FT-NA, 8615-FT-4W, 8617-FT-NI, 8618-FT-MT, 8618-FT-NI, 8619-FT-MT, 8619-FT-NI, 8620-FT-MT, 8632-FT-NI.

The following field terminal meets the requirements of Hazardous Location coding, 8616-FT-FU Class I Division 2 Groups A, B, C, D Temperature Code T6 at Ta = +50
8616-FT-FU

17. WARNING - EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2; and
AVERTISSEMENT - RISQUE D'EXPLOSION – LA SUBSTITUTIOND E COMPOSANTSP EUTR ENDRE CE MATERIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2;.

18. WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. and
AVERTISSEMENT - RISQUE D'EXPLOSION. NE PAS DEBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, A MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.

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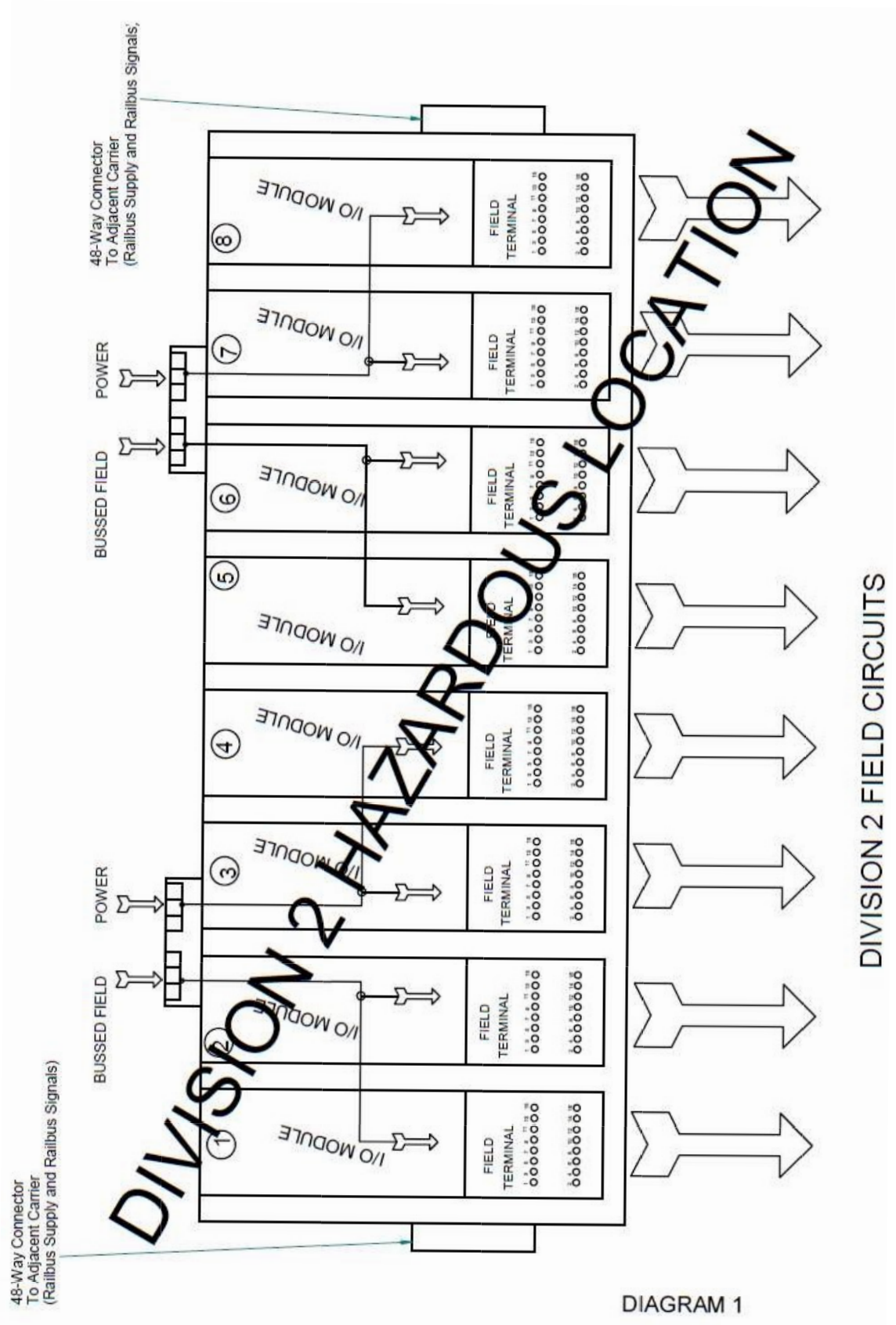
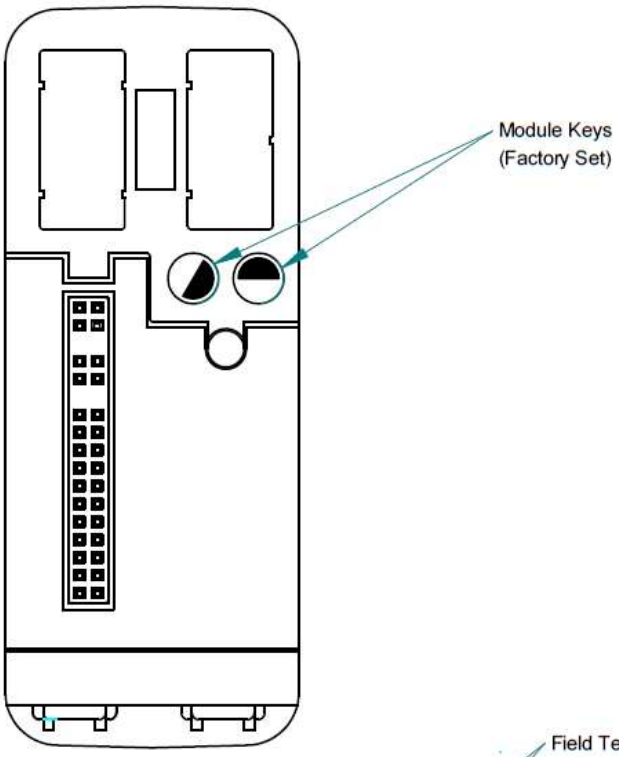
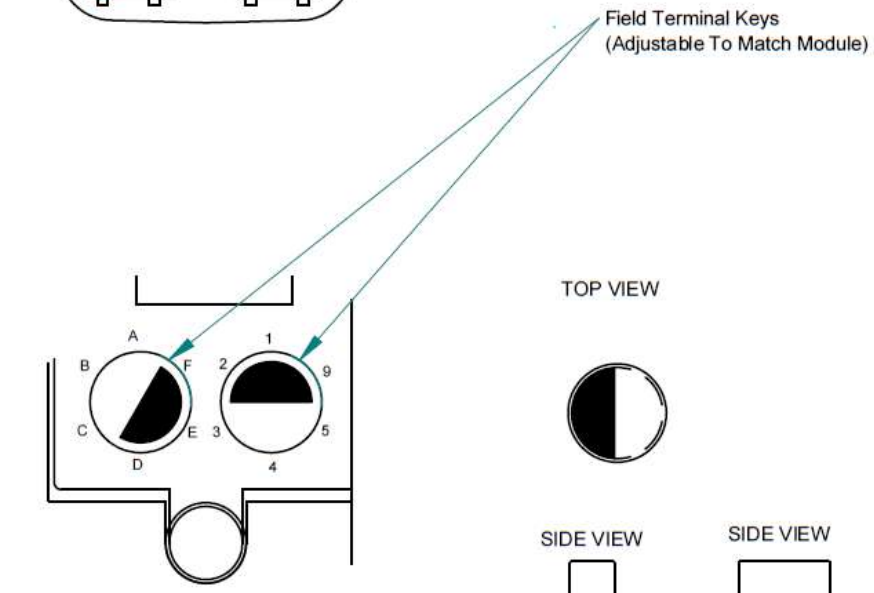

48-Way Connector
To Adjacent Carrier
(Railbus Supply and Railbus Signals)
BUSSED FIELD
POWER
I/O MODULE
FIELD TERMINAL
DIVISION 2 HAZARDOUS LOCATION
DIVISION 2 FIELD CIRCUITS

DIAGRAM 1

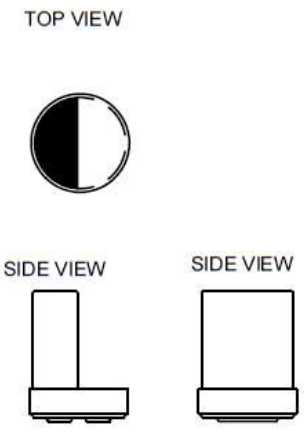




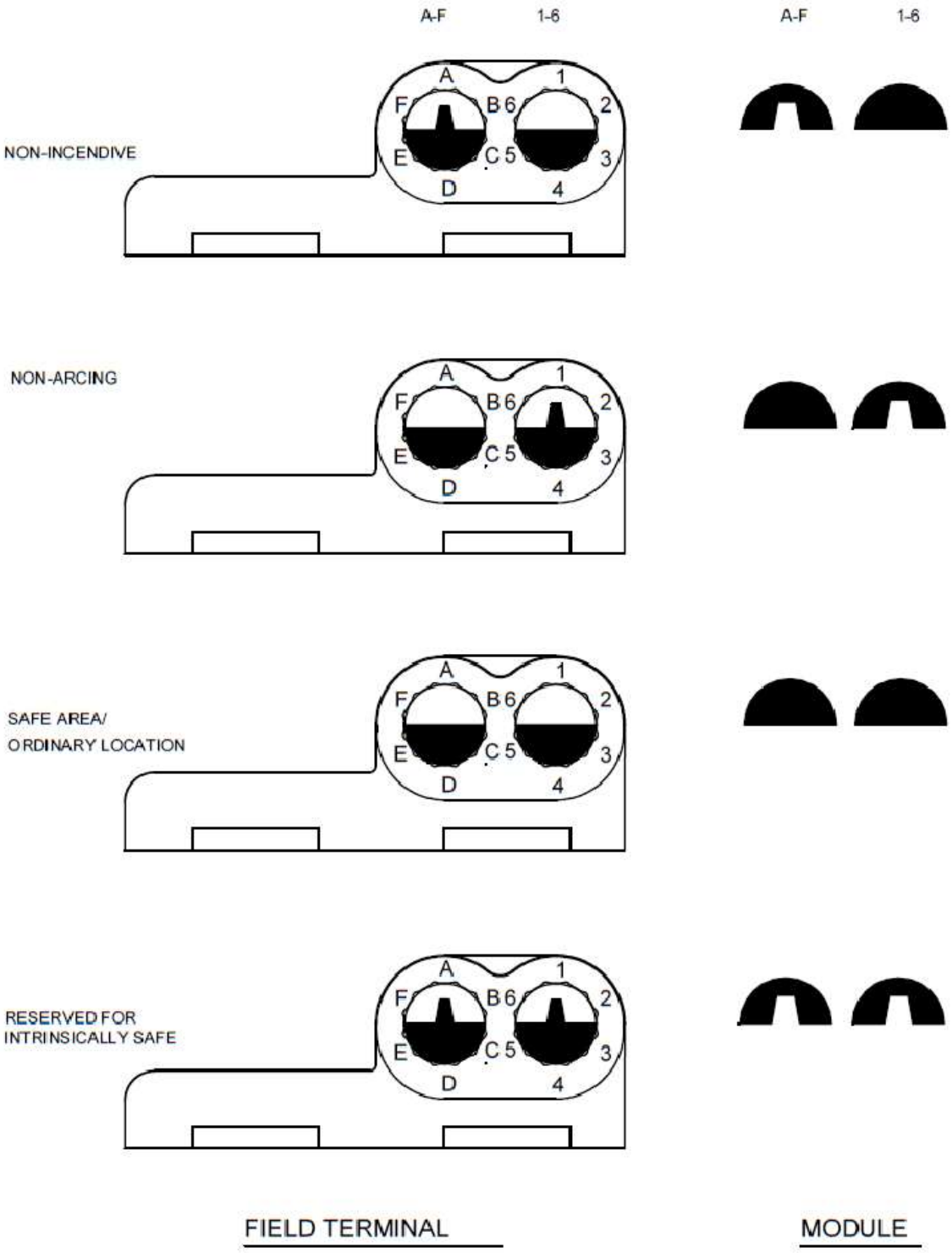
DETAIL 'A'

KEY POSITIONS / SCALE 2:1

High level shown shaded
Letters & numbers shown
for reference only
Example shown:- E1



KEY DETAILS



FOR ASSIGNMENT OF KEY POSITIONS TO SPECIFIC APPLICATIONS
REFER TO SHEETS 6 AND 7 OF THIS DRAWING

MODEL NO.	FIELD CIRCUIT DESCRIPTION / POWER SOURCE	FIELD CIRCUIT CLASS	LETTER KEY POS'N	NUMBER KEY POS'N	HOT PLUG FIELD / TRMLS ENERGISED	HOT PLUG RAILBUS ENERGISED
8101-HI-TX	AI - 4-20mA (with HART) / BUS-POWERED	NON-INCENDIVE	A	1	NO	YES
8102-HO-IP	AO - 4-20mA (with HART) / BUS POWERED	NON-INCENDIVE	A	4	NO	YES
8103-AI-TX	AI - 4-20mA / BUS POWERED	NON-INCENDIVE	A	1	NO	YES
8104-AO-IP	AO - 4-20mA / BUS POWERED	NON-INCENDIVE	A	4	NO	YES
8105-TI-TC	THC OR mV INPUT / RAILBUS	NON-INCENDIVE	C	1	YES	YES
8106-TI-RT	RTD / Ohm INPUT / RAILBUS	NON-INCENDIVE	C	3	YES	YES
8109-DI-DC	24V dc FLOATING / FIELD	NON-INCENDIVE (See note below)	B	2	YES (See note below)	YES
8110-DI-DC	24V dc / BUS-POWERED	NON-INCENDIVE	B	1	YES	YES
8111-DI-AC	120V ac FLOATING / FIELD	NON-ARCING	E	4	NO	YES
8112-DI-AC	120V ac / BUS POWERED	NON-ARCING	E	1	NO	YES
8113-DI-AC	230V ac FLOATING / FIELD	NON-ARCING	E	5	NO	YES
8114-DI-AC	230V ac / BUS-POWERED	NON-ARCING	E	2	NO	YES
8115-DO-DC	24V dc / BUS-POWERED	NON-ARCING	B	6	NO	YES
8116-DO-AC	120/230V dc / BUS-POWERED	NON-ARCING	F	1	NO	YES
8117-DO-DC	24V dc FLOATING / FIELD POWERED	NON-ARCING	B	5	NO	YES
8118-DO-AC	120/230V ac FLOATING / FIELD POWERED	NON-ARCING	F	4	NO	YES

Note : The Field Circuits of the 8109-DI-DC are volt-free (not connected to any other circuits within the module) and so may be considered as non-incendive. However, the installer must verify that the field circuits to which the 8109-DI-DC is to be connected are also non-incendive. If this cannot be verified then the 8109-DI-DC may not be hot plugged whilst the field terminals remain energised.

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MODEL NO.	FIELD CIRCUIT DESCRIPTION / POWER SOURCE	FIELD CIRCUIT CLASS	LETTER KEY POS'N	NUMBER KEY POS'N	HOT PLUG FIELD / TRMLS ENERGISED	HOT PLUG RAILBUS ENERGISED
8119-VI-05	24V dc / BUS-POWERED	NON-INCENDIVE (See note 3 below)	A	1	YES (See note 3 below)	YES
8121-DI-DC	24V dc / BUS-POWERED	NON-INCENDIVE	E	1	YES	YES
8122-DI-DC	24V dc FLOATING / FIELD POWERED	NON-INCENDIVE (See note 1 below)	E	2	YES (See note 1 below)	YES
8123-PI-QU	24V dc / BUS-POWERED	NON-INCENDIVE (See note 2 below)	F	2	YES (See note 2 below)	YES
8124-CO-08	24V dc / BUS-POWERED	NON-INCENDIVE	A	6	NO	YES
8125-DI-DC	24V dc / BUS-POWERED	NON-INCENDIVE	B	3	See Note 4	YES
8127-DI-SE	24V dc / BUS-POWERED	NON-INCENDIVE	B	3	See Note 4	YES
8129-IO-DC	24V dc / BUS-POWERED	NON-ARCING	B	6	NO	YES
8132-AI-UN	AI - 4-20mA/THC/RTD/mV/V BUS-POWERED	NON-INCENDIVE	A	1	NO	YES
8133-HI-TX	AI - 4-20mA BUS-POWERED (with HART)	NON-INCENDIVE	A	1	NO	YES
8139-SH-DC	24V dc BUS-POWERED	NON-ARCING	C	2	NO	YES
8140-DI-AC	115 V ac Floating / Field	NON-ARCING	E	3	NO	YES
8142-DO-DC	12-42V dc BUS-POWERED	NON-ARCING	B	4	NO	YES
8810-HI-TX	AI - 4-20mA BUS-POWERED (with HART)	NON-INCENDIVE	A	1	NO	YES
8811-IO-DC	24V dc BUS-POWERED	NON-ARCING	B	6	NO	YES

NOTES-

1. The Field Circuits of the 8122-DI-DC are volt-free (not connected to any other circuits within the module)
   and so may be considered as non-incendive. However, the installer must verify that the field circuits to which the
   8122-DI-DC is to be connected are also non-incendive. If this cannot be verified then the 8122-DI-DC may
   not be hot-plugged whilst the field terminals remain energised..
2. The Discrete Output field terminals of the 8123-PI-QUare volt-free (refer to SCI-953 for terminal numbers)
   and the requirements in Note 1 are equally applicable. The remaining field terminals of the 823-PI-QU are
   non-incendive and may be hot-plugged without further consideration.
3. Refer to SCI-850 for details.
4. Refer to SCI-994 for details.

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