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**(GB) Instructions specific to hazardous area installations**

Model numbers covered: 7812\*\*\*\*J\*\*\*\* (\*\* indicates options in construction, function and materials.)  
The following instructions apply to equipment covered by certificate number **Nemko 12ATEX1007X** and **IECEX NEM 12.0001X**:

1. The equipment may be used with flammable gases and vapours with apparatus groups IIA, IIB & IIC, and with temperature classes T1, T2, T3, T4 & T5. The equipment is suitable for use in non-weather protected industrial environments.
2. Installation of this equipment shall be carried out by suitably trained personnel, in accordance with the applicable code of practice.
3. Inspection and maintenance of this equipment shall be carried out by suitably trained personnel, in accordance with the applicable code of practice. Only approved spares supplied by the manufacturer or approved agent should be used.
4. It is the responsibility of the user to ensure that voltage and current limits for the equipment are not exceeded.
5. The apparatus electronics is only certified for use in ambient temperatures in the range of -40°C to +70°C. It should not be used outside this range.
6. If the equipment is likely to come into contact with aggressive substances, it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

Aggressive Substances - e.g. acidic liquids or gases that may attack metals or solvents that may affect polymeric materials.

Suitable Precautions - e.g. regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals.

7. The intrinsic safe outputs must not be connected together.
8. The 7812 meets the requirements of clause 6.3.12 (Isolation of circuits from earth or frame) in IEC 60079-11:2006 (EN 60079-11:2007).
9. Technical Data:

a. Materials of construction:


Body: Aluminium Alloy B85 A360.0

Wetted parts: Stainless Steel 316 type, Ni-span, Permendur Iron, Stycast 2850/Catalyst 11

b. Coding:

ATEX;                    II 1 G,

ATEX/IECEX;        Ex ia IIC T5 Ga (-40°C ≤ Ta ≤ +70°C)

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c. Electrical:

Input parameters:

| Terminal numbers | Ui | Ii  | Pi   | Ci | Li |
|------------------|----|-----|------|----|----|
|                  | V  | mA  | W    | µF | mH |
| 1,2,3,4 *        | 28 | 93  | 0.65 | 0  | 0  |
| 5,6,7,8 *        | 15 | 150 | 0.5  | 0  | 0  |

\* The voltage, current and power values are the total available to all four connections.


d. Pressure: Must not exceed the rating of the coupling/flange fitted.

10. Special conditions for safe use:

- a. The metallic alloy used for the enclosure material may be at the accessible surface of this equipment; in the event of rare accidents, ignition sources due to impact and friction sparks could occur. This shall be considered when the 7812 is being installed in locations that specifically require Ga (group II, category 1G) equipment.

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Please note that the safety instructions and certificates in this publication have been translated from English (United Kingdom)

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**System Wiring Notes:**

- Fig 1;- System wiring for 3 wire Shunt-Diode Barriers
- Fig 2;- System wiring for 2 wire Shunt-Diode Barriers
- Fig 3;- System wiring for 3 wire Isolating Interface Units
- Fig 4;- System wiring for 2 wire Isolating Interface Units
- SA = Safe Area
- HA = Hazardous Area
- SAA = Safe Area Apparatus
- CS1 = Signal Connection Supply
- CS2 = Signal Connection
- PS1 = PRT Connection Supply
- PS2 = PRT Connection

1. Safe Area Apparatus is unspecified except that it must not be supplied from nor contain in normal or abnormal conditions a source of potential with respect to earth in excess of 250Volts RMS or 250Volts DC.
2. A multi-core cable may be used for Gas groups IIC & IIB provided the cable is screened in accordance with the following method.
  - 2.a. All wires are individually screened.
  - 2.b. Wires are screened as pairs/threes as shown.
  - 2.c. Wires are screened as a pair and quad as shown
  - 2.d. Wires are screened as a three and quad as shown
  - 2.e. The outputs from Interface unit 'X' or from barriers 'A' & 'B', may be individually screened or screened together with an overall screen as shown.
3. The insulation material between screens must be of sufficient quality to withstand a breakdown when a voltage of 500VDC is applied across them.
4. The supplies to the PRT and to signal amplifier shall be installed as separate circuits.

**Shunt-Diode Safety Barriers**


5. In all cases the cable screens must be earthed only at the Barrier.
6. Barriers in position 'A' and 'B' may be either single or dual channel  
Barriers in position 'C' and 'D' and 'E' may either single or multi channel, but if only dual channel barriers are used, 'C' and 'D' should use the same dual channel barrier.

These Shunt Zener Diode safety barriers are to be ATEX/IECEX certified to [Ex ia] IIC, whose output parameters are equal to or less than:-

| Barrier | Uo  | Io    | Po                  |
|---------|-----|-------|---------------------|
| A       | 28V | 93mA  | Total A+B<br>0.65W  |
| B       | 28V | Diode |                     |
| C       | 15V | 50mA  | Total C+D+E<br>0.5W |
| D       | 15V | 50mA  |                     |
| E       | 15V | 50mA  |                     |

In any barrier the output current must be limited by a resistor 'R' such that  $I_o = U_o/R$ .  
Typical barriers: 'A', 'B' = MTL 787; 'C', 'D', 'E' = MTL 764

7. The electrical circuits in the hazardous area must be capable of withstanding an AC test voltage of 500Volts RMS to earth or frame of the equipment, for a period of 1 minute without breakdown.

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### Isolating Interface Units (Galvanic isolators)

8. Interface Unit in position 'X' is a pulse signal isolator, typically MTL 5032 or MTL 5532. Interface Unit in position 'Y' is a PRT temperature converter, typically MTL 5074 or MTL 5575. The interfaces are to be ATEX/IECE<sub>x</sub> certified to [Ex ia] IIC.
9. Because the power supplies have isolation the electrical circuit in the hazardous area need not be capable of withstanding an AC test voltage of 500Volts RMS to earth or frame of the equipment, for a period of 1 minute without breakdown.
10. Typical resistor values: R1= 2K, R2= 10K
11. Typical Zener Diode value for a 24V isolator output:

|                       |      |
|-----------------------|------|
| Barrier trigger value | ZD1  |
| 12V                   | 6.2V |
| 6V                    | 13V  |
| 3V                    | 16V  |



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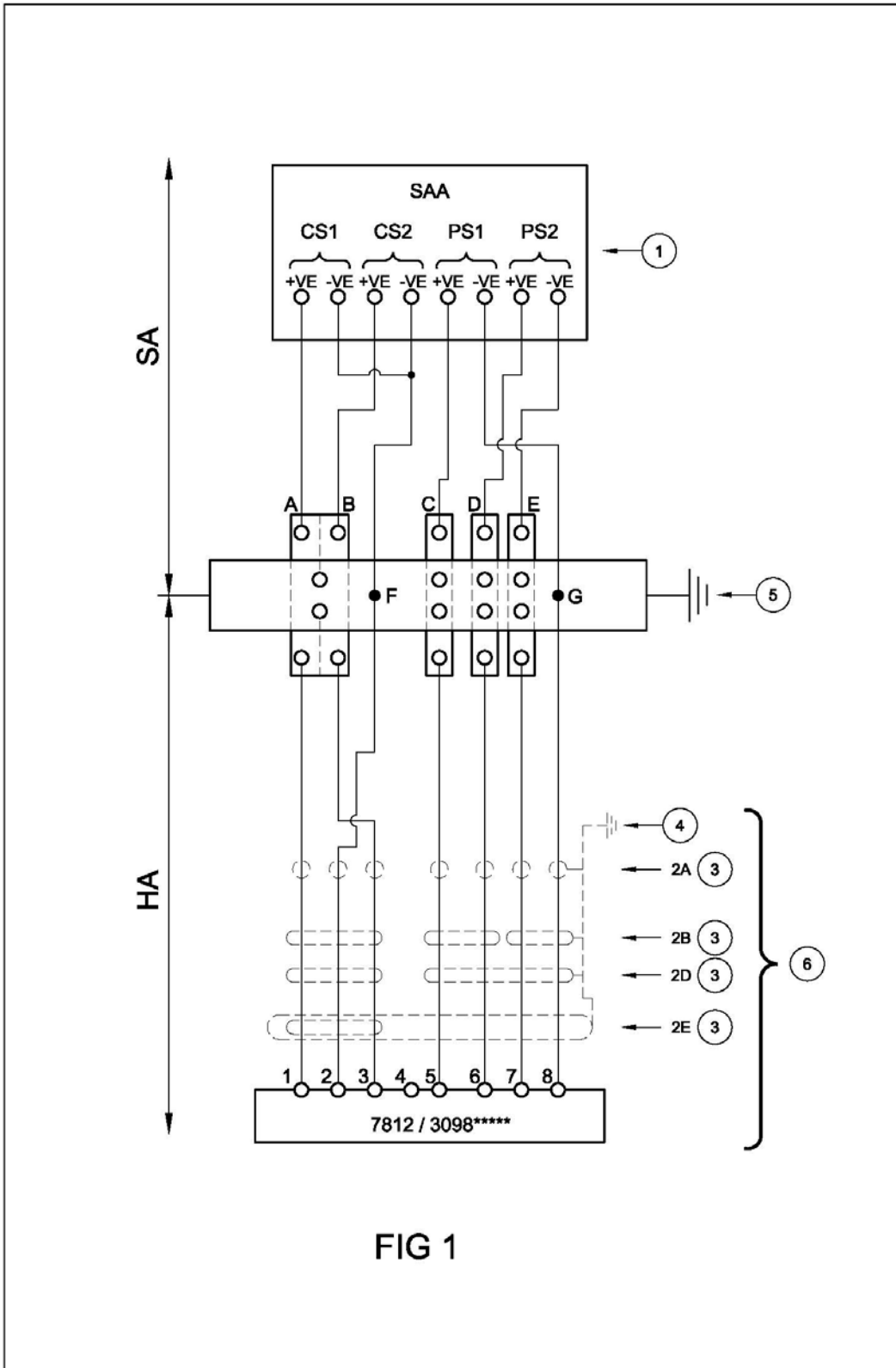
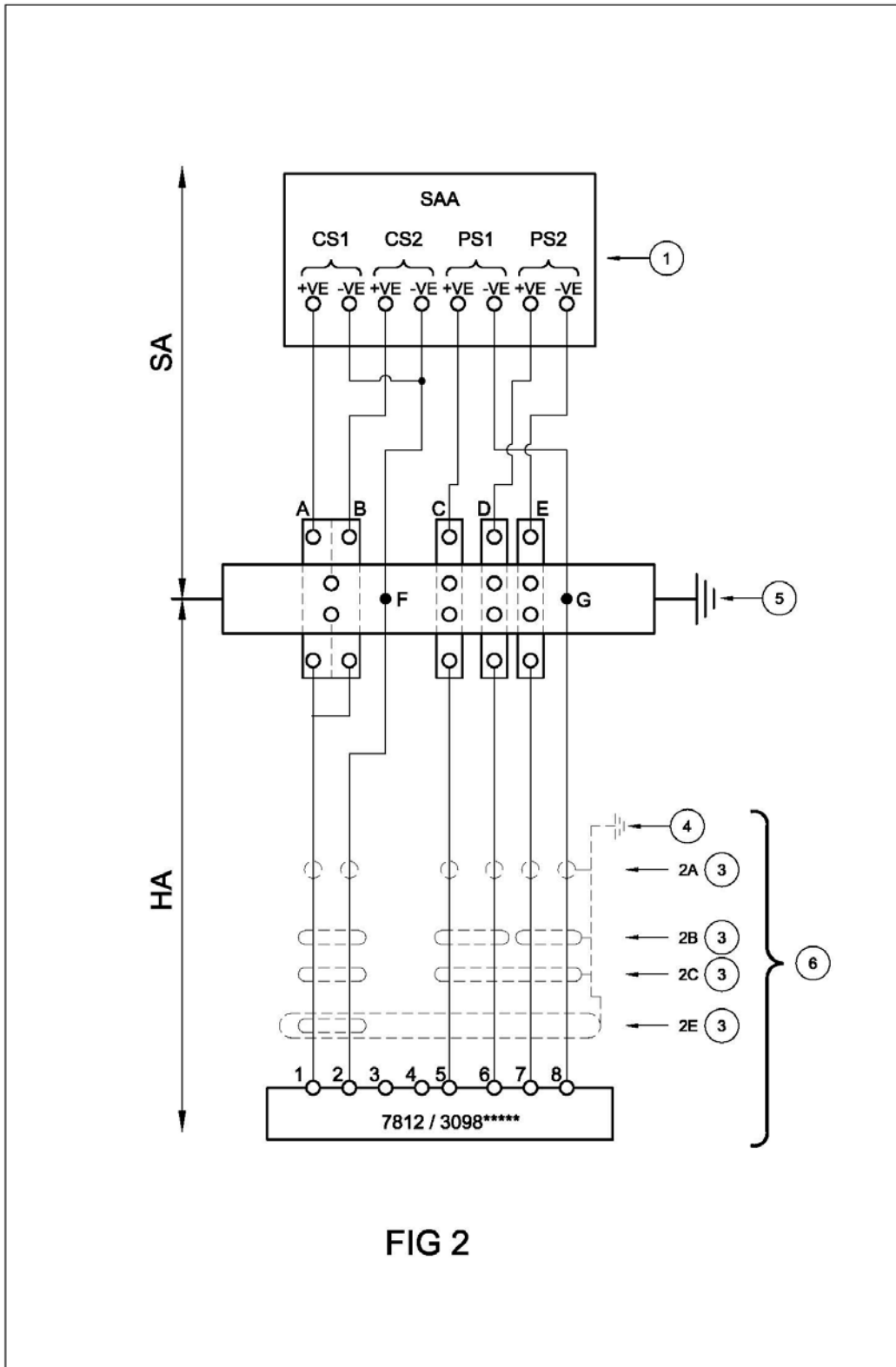


FIG 1



# ENGINEERING SPECIFICATION

|          |                                     |           |         |                    |         |          |
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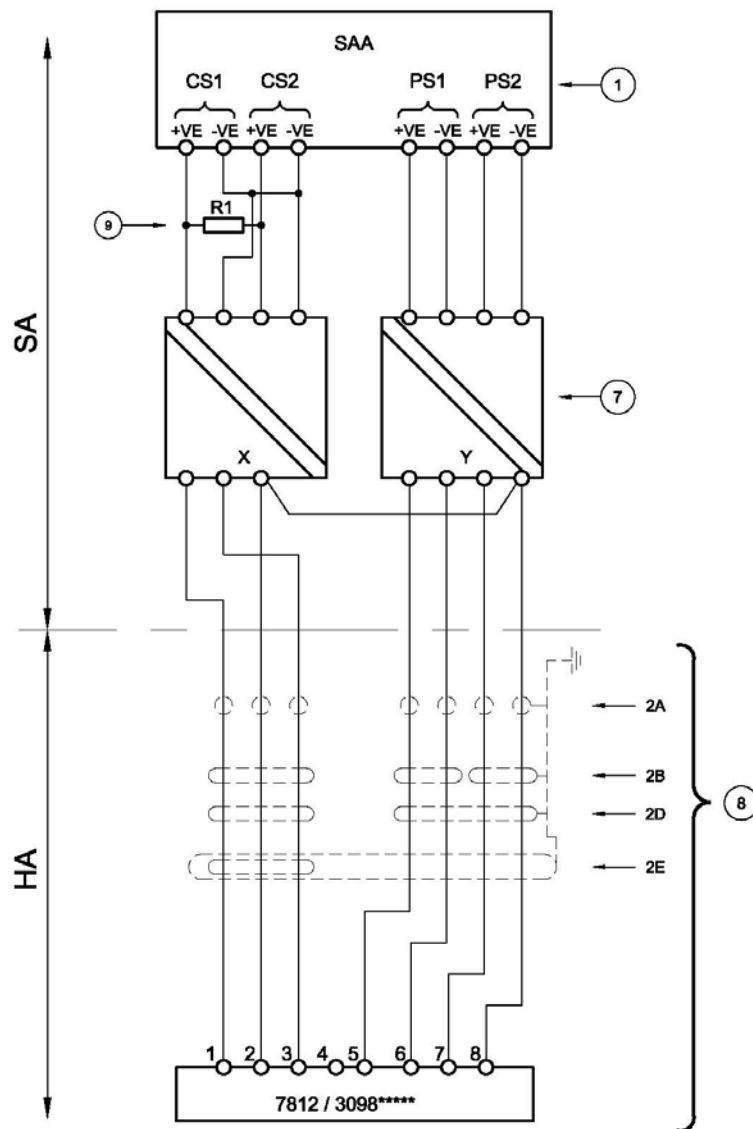


FIG 3



# ENGINEERING SPECIFICATION

|          |                                     |           |         |                    |         |          |  |
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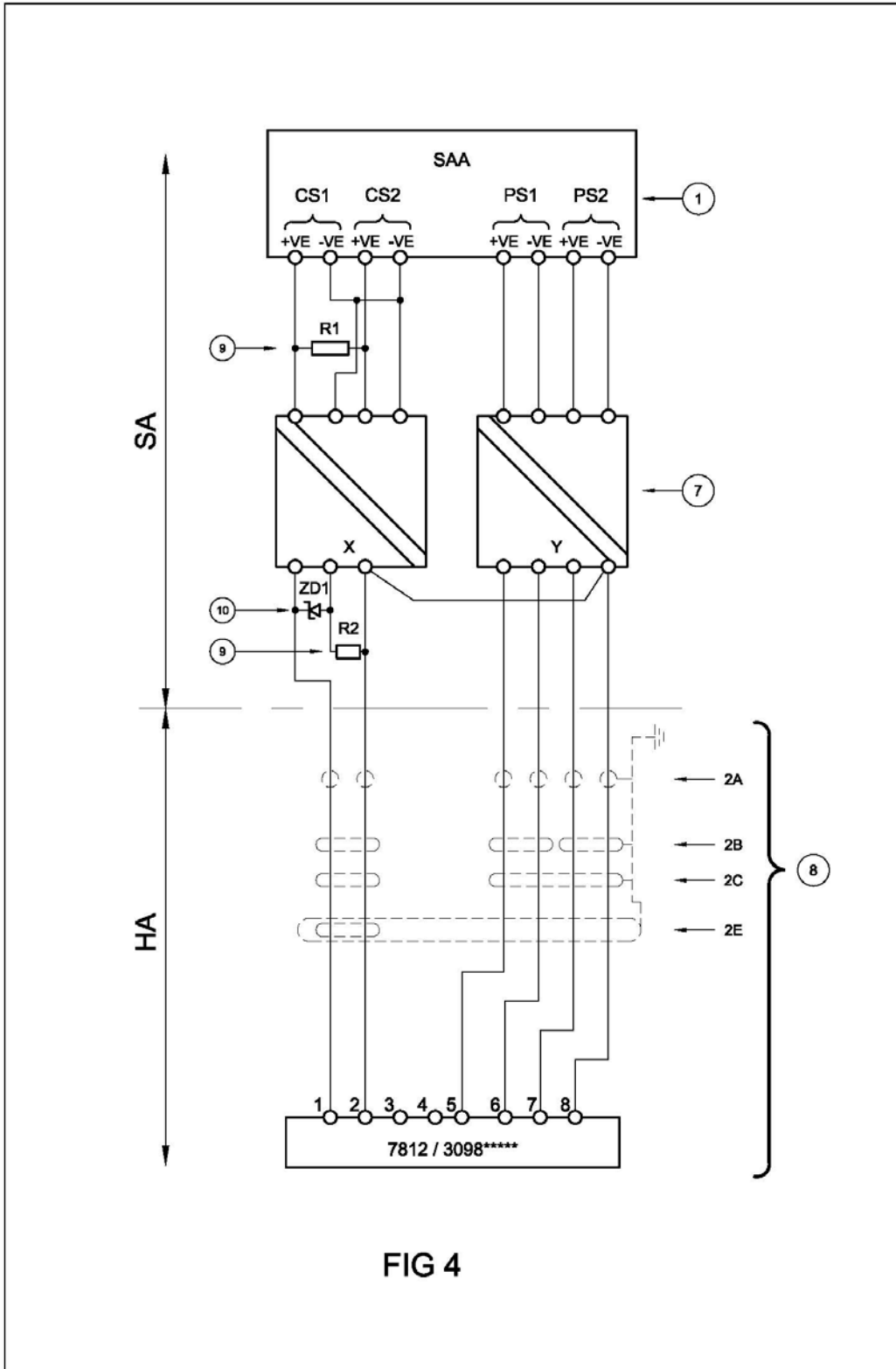


FIG 4