

Fig. 3: Installation Diagram

Note: Positive signal channel shown. Sensor switch may be any non-voltage producing, essentially resistive device; containing no energy storing components. Flow and level switches, temperature switches, pressure switches or resistive transducers or transmitters are typical.

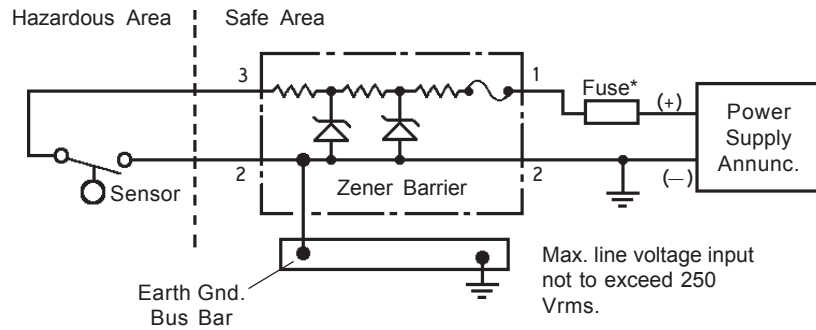
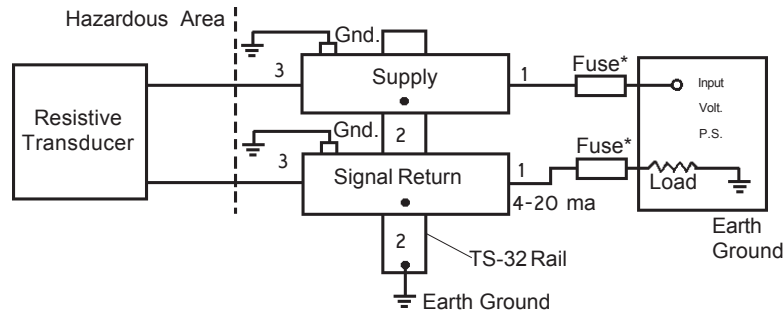


Fig. 4:

Supply and Signal Return Barrier Installation(4-20 ma Transducer with Both Leads Floating & Neg. Signal Common)

Note: Redundant grounding required by CSA.



*Little fuse type 3AG or equal (optional). External fuses are recommended to protect barrier from incorrect wiring or equipment faults at start-up.



**65800 Series
Single Channel Zener Barrier**

Instruction Bulletin No. 111970

GEMS 65800 Series, shunt diode, safety barriers are one channel devices which pass a unidirectional signal (D.C.) and limit the energy to a level that cannot ignite an explosive atmosphere. **Approvals include FM, UL, CSA.**
*****WARNING: To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.**

Installation Requirements

Location: Barriers must be installed and grouped in a **non-hazardous location**. If necessary to locate in a hazardous area, barriers must be mounted in a suitable enclosure which, along with its installation, must be suitable for the location.

Environment: The operating temperature range of these barriers is -40°F to +140°F. They should be mounted in a **clean, dry environment and well ventilated**, so that the maximum temperature is not exceeded. If an enclosure is used, it must be suitable for the location.

Earth Connection: The bracket on which the barrier is mounted must be connected to an earth ground. Grounding should be adequate for conduction of line-generated fault currents and should have an impedance of less than one ohm. **See Figs. 1 and 2.**

Safe Area Apparatus: Safe area apparatus must not generate, or be connected to, sources having **voltages greater than 250 Vrms or VDC.**

Installation

It is expected that the installation will be in accordance with ISA RP-12.6, NEC Chapters 5 and 7 and FM Standards Approval. The following specific points should be kept in mind:

1. Check that the barrier is of **specified type and polarity.**
2. **For multiple barrier installation**, the barrier's safe area sides should face one side of the enclosure and the I.S. sides should face the opposite side (**Fig 1**). Wiring must be channeled and segregated as shown, so that no mis-wiring can occur during servicing, testing or replacement.
3. **Connect the hazardous area equipment** to terminals marked "3" and "2" (Fig. 3). Hazardous area field wiring will store energy due to distributed capacitance and inductance in proportion to its length. Common, commercially available signal wire may be used; provided the capacitance and inductance are below the following maximum values:



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Installation (Cont.)

Example: Typical values of capacitance for a twisted pair of copper wires is between 20 and 60 pf per foot. Inductance of a typical twisted pair is between 0.10 and 0.20 uH/ft. The maximum values of capacitance/or inductance should be used to determine field wiring length.

GEMS P/N	Rated Volt.	GEMS P/N	Rated Volt.	Group	Parallel Capac. - uf	Series Induct. - mH
111950	+15	111951	-15	A, B, C, D, E, G	0.32	2.0
111952	+20	111953	-20		0.18	4.1
111954	+24	111955	-24		0.12	3.0
111956	+30	111957	-30		0.07	1.8
113000	+30	114071	-30		C, D, E, G	0.20
114072	+24	114073	-24	0.33		3.1
114074	+18	114075	-18	0.72		3.6
114175	+27	114176	-27	0.24		3.3

Signal Return Barriers

GEMS P/N	Rated Volt.	GEMS P/N	Rated Volt.	Group	Parallel Capac. - uf	Series Induct. - mH
114162	+18	114163	-18	A, B, C, D, E, G	0.23	.35
114164	+24	114165	-24		0.11	.35
114166	+30	114167	-30		0.07	.35

Safety depends on earth continuity. The resistance to earth ground *must* be less than 1 ohm.

Inspection and Test of Barrier

A routine inspection should be made at intervals of not more than two years. Harsh locations should be inspected more frequently to:

1. Check integrity of earth grounding (Less than one ohm).
2. Check unit labeling for legibility.
3. Check all interconnections for good electrical connection.

CAUTION

Never conduct tests while circuit is active. Use of instruments between input and output will bypass barrier.

Testing:

1. All testing is to be done with circuit inactive and all but earth grounding disconnected.
2. With a suitable ohmmeter (resolution to 1 ohm), measure the resistance from input (1) to output (3). The total resistance readings shown in the chart on the next page indicate a good unit. Signal return barriers will not read low resistance (33.9 w), as these have diodes internal to the barrier.

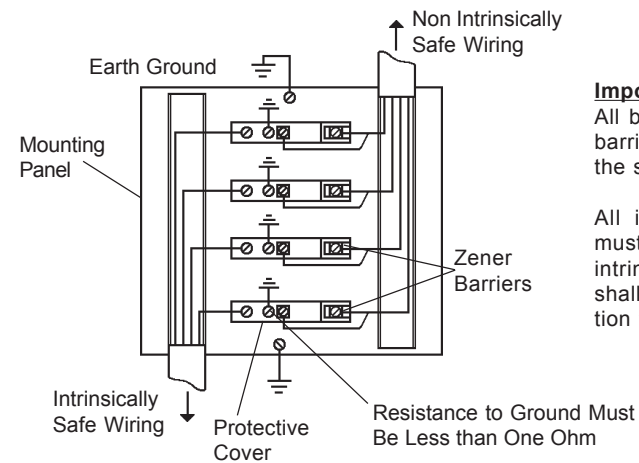
GEMS P/N	Rated Volt.	GEMS P/N	Rated Volt.	Total Resist. Ohms**	Limit Resist. Ohms**	Fuse Rating ma	Max. Voc	ISC ma
111950	+15	111951	-15	183	153	250	19.3	133
111952	+20	111953	-20	303	273	125	24.4	94
111954	+24	111955	-24	390	360	62	29.5	86
111956	+30	111957	-30	750	720	62	37.1	54
113000	+30	114071	-30	303	273	250	37.1	140
114072	+24	114073	-24	234	204	62	29.5	152
114074	+18	114075	-18	183	153	125	22.0	151
114175	+27	114176	-27	276	246	62	33.5	144

Signal Return Barriers

GEMS P/N	Rated Volt.	GEMS P/N	Rated Volt.	Total Resist. Ohms**	Limit Resist. Ohms**	Fuse Rating ma	Max. Voc	ISC ma
114162	+18	114163	-18	33.9	30	125	22.0	0
114164	+24	114165	-24	33.9	30	62	29.5	0
114166	+30	114167	-30	33.9	30	250	37.1	0

**All resistance values are $\pm 5\%$

Fig. 1: Multiple Barrier Mounting



Important Notes:

All barriers used for multiple barrier mounting must be of the same polarity.

All intrinsically safe wiring must be segregated from non-intrinsically safe wiring and shall have a minimum insulation thickness of .010".

Fig. 2: Optional Mounting Clip (P/N 113530)

