



## What is Intrinsic Safety?

An intrinsically safe system is one in which all electrical devices and their associated circuits are designed such that they can neither arc nor spark with sufficient energy to ignite the hazardous substances around which they are being used. Put another way, the energy stored from the inductance of the circuit components must be unable to generate a spark or arc at the circuits open point during current circulation that is capable of igniting the hazardous materials present when they are in a fuel/air mixture that is most favorable for ignition.

## What is Entity approval?

According to INTRINSIC SAFETY standards, there is no requirement for authorized laboratory certification of system-wide intrinsic safety if the designer can determine, with certainty, that the physical and electrical parameters of every system component has been met sufficient to ensure that system-wide intrinsic safety has been maintained.

An "Entity Approval" is documentation stating that a device is intrinsically safe in specified hazardous atmospheres if the stated physical and electrical conditions contained in the approval are met. By meeting the requirements of "Entity Approvals" on all components of a system, the designer can more easily document that system-wide intrinsic safety has been maintained.

The Clippard EI-EIO series valves hold the Entity Approvals listed and supporting documentation is available to our customers.

## **Increase Flow**

**High Flow Valves** Models 2020 and 2021 high flow valves are piloted 3-way valves that work with EI/EIO intrinsically safe valves as well as EV/ET 3-way valves. They are designed to be mounted on EI/EIO manifold valves. Outputs from the EI/EIO will actuate the valve and produce outputs up to 22 scfm at 100 psig. Piloted 3-way valves are also available as R-481 and R-482.

**EVB Booster Valve** Clippard EVB-3 booster valve mates with manifold mounted EI/EIO valves and manifolds to provide increased flow. Direct piloting from Clippard EI/EIO valves provides a flow of up to 6.1 scfm at 100 psig.

## Definitions

Ca: Maximum Allowed Capacitance Isc: Maximum Output Current Voc: Maximum Output Voltage V<sub>max</sub>: Maximum Input Voltage C<sub>i</sub>: Maximum Internal Capacitance L<sub>a</sub>: Maximum Allowed Inductance Imax: Maximum Input Current Li: Maximum Internal Inductance V<sub>t</sub>: Voltage Total **FM APPROVAL Typical Intrinsically Safe Circuit** Safe Area Hazardous Area Valve terminals mate with AMP connector #5-103959-1 or equivalent (Clippard Part # C2-RB18) Switch **Dual or Single** 24 VDC Equipment cannot use channel or generate in excess of nom. Power barrier circuit. 250 volts Supply (see note 1) Maximum parameters **Coil Specifications:** for I.S. Valve:  $V_{nom} = 15.5 V$  $V_{max} = 35 V$  $I_{nom} = 43 \text{ mA}$  $I_{max} = 300 \text{ mA}$  $R_{nom} = 360 \Omega$  $C_i = 0$ 1. For barrier interconnection refer to maximum barrier output parameters as  $L_i = 0$ referenced on the specific barrier installation drawing. Connect as follows: a.  $V_{max > oc}$  of single channel barrier or  $V_t$  of dual channel barrier b.  $I_{max} > I_{sc}$  of single channel barrier or  $I_t$  of dual channel barrier c.  $C_i$  + field wiring <  $C_a$  of single or dual channel barrier d.  $L_i$  = field wiring <  $L_a$  of single or dual channel barrier 2. Installation of intrinsically safe system is to be done in accordance with ANSI / ISA-RP12.6