FISCO-Concept

The FISCO Concept allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criteria for interconnection is that the voltage (Ui or Vmax), the current (Ii or Imax) and the power (Pi or Pmax) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (Uo or Voc or Vt), the current (Io or Isc or It) and the power (Po or Pmax) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance (Ci) and inductance (Li) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 10 µH respectively.

In each segment only one active device, normally the associated apparatus is allowed to provide the necessary energy for the fieldbus system. The voltage Uo (or Voc or Vt) of the associated apparatus has to be limited to the range of 14V to 24V d.c. All other equipment connected to the bus cable has to be passive, meaning that they are not allowed to provide energy to the system, except to a leakage current of 50 µA for each connected device.

Separately powered equipment needs a galvanic isolation to assure that the intrinsically safe fieldbus circuit remains passive. The cable used in to interconnect the devices has to meet the following values:

- Loop resistance R: 15 ... 150 Ω/km, inductance L: 0.4 ... 1 mH/km
- Capacitance C: 80 ... 200 nF/km
- Leakage current ≤ 50 µA
- C = C line/line + 0.5 C line/screen, if both lines are floating or
- C = C line/line + C line/screen, if the screen is connected to one line

Length of spur cable: 30 m, length of trunk cable: 1 km, length of splice: 1 m

At each end of the trunk cable an approved infallible line termination with the following parameters is suitable:

- R = 90 ... 100 Ω
- C = 0 ... 2.2 µF
- L = 90 ... 100 mH

The number of passive devices connected to the bus segment is not limited due to I.S. reasons. If the above rules are respected, up to a total length of 1000 m (sum of the length of trunk cable and all spur cables), the inductance and capacitance of the cable will not impair the intrinsic safety of the installation.

NONINCENDIVE

- Intrinsic safety barrier not required. Vmax ≤ 35 V DC.
- Warning: Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- Nonincendive field wiring installation

The Nonincendive Field Wiring Circuit Concept allows interconnection of Nonincendive Field Wiring Apparatus with Associated Nonincendive Field Wiring Apparatus or Associated Intrinsically Safe Apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when Voc

\[ V_{oc} \leq V_{max} \]

Field indicator Nonincendive Field Wiring parameters are as follows:

- Ui or Vmax ≤ 35 V DC
- Ci = 5 nF
- Li ≤ 10 µF

For these current controlled circuits, the parameter Imax is not required and need not to be aligned with parameter Isc and it of the Associated Nonincendive Field Wiring Apparatus or Associated Intrinsically Safe Apparatus

- Warning: Explosion Hazard- Do not disconnect equipment unless power has been switched off or the area is known to be non hazardous
- The field indicator is suitable to be installed according the FNICO concept.