

UL CONTROL DRAWING 5104QU01

Hazardous (Classified) Location

Class I, Division 1, Group A,B,C,D
Class I, Zone 0 and 1, Group IIC
Class II, Division 1 Group E, F, G

Nonhazardous

Associated apparatus
Galvanically Isolated

Intrinsically safe apparatus
entity parameters:

$$V_{max}(U_i) \geq V_t(U_o)$$

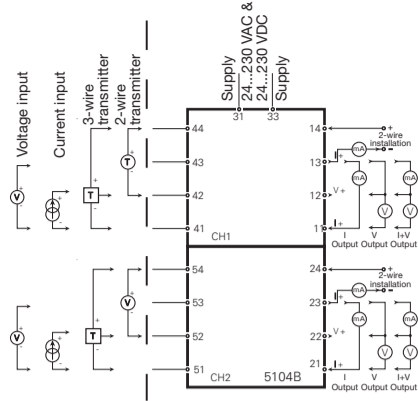
$$I_{max}(I_i) \geq I_t(I_o)$$

$$P_i \geq P_o$$

$$C_a \geq C_{cable} + C_i$$

$$L_a \geq L_{cable} + L_i$$

The sum of capacitance and inductance of cable and intrinsic safe equipment must be less or equal to C_a and L_a



| 5104B Associated apparatus parameters | | | |
|---------------------------------------|--------------------|--------------|-------------|
| CH1 | Terminals 41 to 44 | | |
| CH2 | Terminals 51 to 54 | | |
| Vt (Uo) | 28 V | | |
| It (Io) | 93 mA | | |
| Po | 0.65 W | | |
| | IIC / grp. A,B | IIB / grp. C | IIA / grp.D |
| Ca (Co) | 0.052 μF | 0.44 μF | 1.45 μF |
| La (Lo) | 2.4 mH | 12 mH | 20 mH |

Installation notes:

- The maximum nonhazardous location voltage is 250VAC/DC.
- The installation shall be in accordance with the National Electrical Code NFPA 70, Articles 504 and 505.
- The terminals of the two individual channels shall not be interconnected in any way.
- Install in Pollution degree 2 or better
- Use 60 / 75 °C copper conductors with wire size AWG: (26 - 14).
- Warning: Substitution of components may impair intrinsic safety.

Rev. AA 2003-02-12

UL CONTROL DRAWING 5105QU01

Hazardous (Classified) Location

Class I, Division 1, Group A,B,C,D
Class I, Zone 0 and 1, Group IIC
Class II, Division 1 Group E, F, G

Nonhazardous

Associated apparatus
Galvanically isolated

Intrinsically safe apparatus
entity parameters:

$$V_{max}(U_i) \geq V_{oc}(U_o)$$

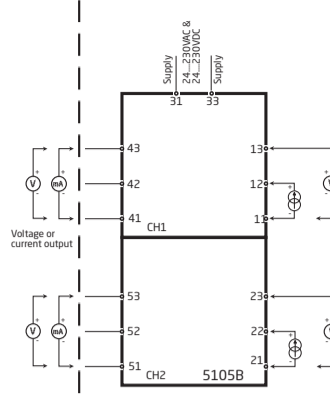
$$I_{max}(I_i) \geq I_{sc}(I_o)$$

$$P_i \geq P_o$$

$$C_a \geq C_{cable} + C_i$$

$$L_a \geq L_{cable} + L_i$$

The sum of capacitance and inductance of cable and intrinsic safe equipment must be less or equal to C_a and L_a



| 5105B Associated apparatus parameters | | | |
|---------------------------------------|--------------------|--------------|-------------|
| CH1 | Terminals 41 to 43 | | |
| CH2 | Terminals 51 to 53 | | |
| Voc (Uo) | 28 V | | |
| Isc (Io) | 93 mA | | |
| Po | 0.65 W | | |
| | IIC / grp. A,B | IIB / grp. C | IIA / grp.D |
| Ca (Co) | 0.052 μF | 0.44 μF | 1.45 μF |
| La (Lo) | 2.4 mH | 12 mH | 20 mH |

Installation notes:

- The maximum nonhazardous location voltage is 250 VAC/DC.
- The installation shall be in accordance with the National Electrical Code NFPA 70, Articles 504 and 505.
- The terminals of the two individual channels shall not be interconnected in any way.
- Install in Pollution degree 2 or better
- Use 60 / 75 °C copper conductors with wire size AWG: (26 - 14).
- Warning: Substitution of components may impair intrinsic safety.

Rev. AA 2003-02-12

UL CONTROL DRAWING 5106QU01

Hazardous (Classified) Location

Class I, Division 1, Group A,B,C,D
Class I, Zone 0 and 1, Group IIC
Class II, Division 1 Group E, F, G

Nonhazardous

Associated apparatus
Galvanically Isolated

Intrinsically safe apparatus
entity parameters:

$$V_{max}(U_i) \geq V_t(U_o)$$

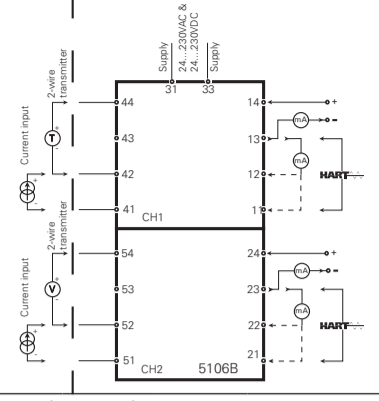
$$I_{max}(I_i) \geq I_t(I_o)$$

$$P_i \geq P_o$$

$$C_a \geq C_{cable} + C_i$$

$$L_a \geq L_{cable} + L_i$$

The sum of capacitance and inductance of cable and intrinsic safe equipment must be less or equal to C_a and L_a



| 5106B Associated apparatus parameters | | | |
|---------------------------------------|-----------------------|--------------|-------------|
| CH1 | Terminals 44 to 41,42 | | |
| CH2 | Terminals 54 to 51,52 | | |
| Vt (Uo) | 28 V | | |
| It (Io) | 93 mA | | |
| Po | 0.65 W | | |
| | IIC / grp. A, B | IIB / grp. C | IIA / grp.D |
| Ca (Co) | 0.06 μF | 0.52 μF | 1.72 μF |
| La (Lo) | 2.4 mH | 12 mH | 20 mH |
| | IIC / grp. A, B | IIB / grp. C | IIA / grp.D |
| | 3.0 μF | 3.0 μF | 1.0 H |

Installation notes:

- The maximum nonhazardous location voltage is 250VAC/DC.
- The installation shall be in accordance with the National Electrical Code NFPA 70, Articles 504 and 505.
- The terminals of the two individual channels shall not be interconnected in any way.
- Install in Pollution degree 2 or better
- Use 60 / 75 °C copper conductors with wire size AWG: (26 - 14).
- Warning: Substitution of components may impair intrinsic safety.

UL CONTROL DRAWING 5107QU01

Hazardous (Classified) Location

Class I, Division 1, Group A,B,C,D
Class I, Zone 0 and 1, Group IIC
Class II, Division 1 Group E, F, G

Nonhazardous

Associated apparatus
Galvanically isolated

Intrinsically safe apparatus
entity parameters:

$$V_{max}(U_i) \geq V_{oc}(U_o)$$

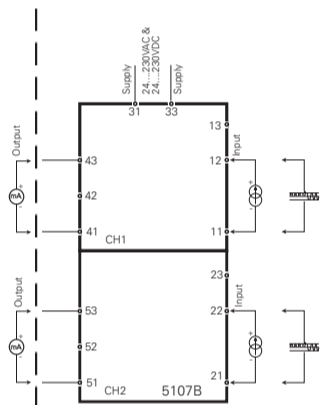
$$I_{max}(I_i) \geq I_{sc}(I_o)$$

$$P_i \geq P_o$$

$$C_a \geq C_{cable} + C_i$$

$$L_a \geq L_{cable} + L_i$$

The sum of capacitance and inductance of cable and intrinsic safe equipment must be less or equal to C_a and L_a



| 5107B Associated apparatus parameters | | | |
|---------------------------------------|--------------------|--------------|-------------|
| CH1 | Terminals 41 to 43 | | |
| CH2 | Terminals 51 to 53 | | |
| Voc (Uo) | 28 V | | |
| Isc (Io) | 93 mA | | |
| Po | 0.65 W | | |
| | IIC / grp. A,B | IIB / grp. C | IIA / grp.D |
| Ca (Co) | 0.06 μF | 0.52 μF | 1.72 μF |
| La (Lo) | 2.4 mH | 12 mH | 20 mH |

Installation notes:

- The maximum nonhazardous location voltage is 250 VAC/DC.
- The installation shall be in accordance with the National Electrical Code NFPA 70, Articles 504 and 505.
- The terminals of the two individual channels shall not be interconnected in any way.
- Install in Pollution degree 2 or better
- Use 60 / 75 °C copper conductors with wire size AWG: (26 - 14).
- Warning: Substitution of components may impair intrinsic safety.

Rev. AA 2003-01-22

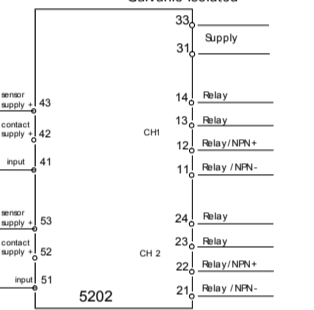
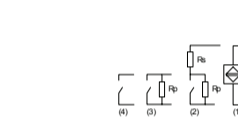
UL CONTROL DRAWING 5202QU01

Hazardous (Classified) Location

Class I, Division 1, Group A,B,C,D
Class I, Zone 0 and 1, Group IIC
Class II, Division 1 Group E, F, G

Nonhazardous

Associated apparatus
Galvanic Isolated



| 5202B Associated apparatus parameters | | | |
|---------------------------------------|-----------------------|--------------|-------------|
| CH1 | Terminals 41 to 43 | | |
| CH2 | Terminals 51 to 53 | | |
| Vt (Uo) | 10.6 V | | |
| It (Io) | 13.8 mA | | |
| Po | 0.038 W | | |
| | IIC / grp. A,B | IIB / grp. C | IIA / grp.D |
| Ca (Co) | 1.9 μF | 4.0 μF | 50 μF |
| La (Lo) | 160 mH | 600 mH | 1 H |
| Relay output 11 - 14, 21 - 24 | | | |
| Voltage | 250V AC, 100 VA | | |
| Current | 2 A AC, 100 VA | | |
| 24VDC | 1 A DC | | |
| Pilot Duty | 120/240 V AC, 100V AC | | |
| NPN output 11 - 12, 21 - 22 | | | |
| General purpose | 30V DC, 80 mA | | |
| Pilot duty | 30V DC, 80 mA | | |

Intrinsically safe apparatus
entity parameters:

$$V_{max}(U_i) \geq V_t(U_o)$$

$$I_{max}(I_i) \geq I_t(I_o)$$

$$P_i \geq P_o$$

$$C_a \geq C_{cable} + C_i$$

$$L_a \geq L_{cable} + L_i$$

The sum of capacitance and inductance of cable and intrinsic safe equipment must be less or equal to C_a and L_a

Installation notes:

- The maximum nonhazardous location voltage is 250VAC/dc.
- The installation shall be in accordance with the National Electrical Code NFPA 70, Articles 504 and 505.
- The terminals of the two individual channels shall not be interconnected in any way.
- Install in Pollution degree 2 or better
- Use 60 / 75 °C Copper Conductors with Wire Size AWG: (26 - 14).
- Warning: Substitution of components may impair intrinsic safety.
- If cable parameters are unknown C_{cable} may be set to 60pF/ft and L_{cable} may be set to 0.20 μH/ft

Rev. AA 2003-09-19

UL CONTROL DRAWING 5203QU01

Hazardous (Classified) Location

Class I, Division 1, Group A,B,C,D
Class I, Zone 0 and 1, Group IIC
Class II, Division 1 Group E, F, G

Nonhazardous

Associated apparatus
Galvanic Isolated

Intrinsically safe apparatus
entity parameters:

$$V_{max}(U_i) \geq V_t(U_o)$$

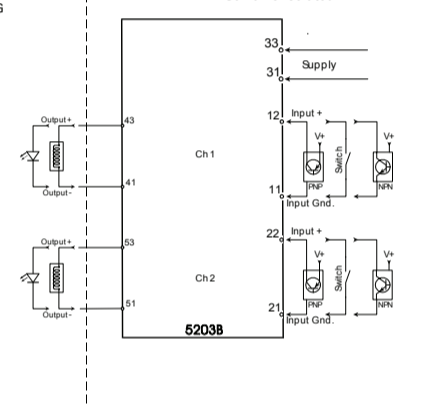
$$I_{max}(I_i) \geq I_t(I_o)$$

$$P_i \geq P_o$$

$$C_a \geq C_{cable} + C_i$$

$$L_a \geq L_{cable} + L_i$$

The sum of capacitance and inductance of cable and intrinsic safe equipment must be less or equal to C_a and L_a



| 5203B Associated apparatus parameters | | | | | | | | | |
|---------------------------------------|-------------|-----------|-----------|-------------|-----------|-----------|-------------|-----------|-----------|
| Type | F | | H | | I | | | | |
| Vt (Uo) | 28 V | | 28 V | | 28 V | | | | |
| It (Io) | 115 mA | | 110 mA | | 93 mA | | | | |
| Po | 0.81 W | | 0.77 W | | 0.65 W | | | | |
| Group | A,B and IIC | C and IIB | D and IIA | A,B and IIC | C and IIB | D and IIA | A,B and IIC | C and IIB | D and IIA |
| La (Lo) | 1.6 mH | 5.0 mH | 16mH | 2.0 mH | 8 mH | 20 mH | 2.4 mH | 9 mH | 25 mH |
| Ca (Co) | 0.06 μF | 0.52 μF | 1.7 μF | 0.06 μF | 0.52 μF | 1.7 μF | 0.06 μF | 0.52 μF | 1.7 μF |

Installation notes:

- The maximum nonhazardous location voltage is 250VAC/dc.
- The installation shall be in accordance with the National Electrical Code NFPA 70, Articles 504 and 505.
- The terminals of the two individual channels shall not be interconnected in any way.
- Install in Pollution degree 2 or better
- Use 60 / 75 °C Copper Conductors with Wire Size AWG: (26 - 14).
- Warning: Substitution of components may impair intrinsic safety.
- If cable parameters are unknown C_{cable} may be set to 60pF/ft and L_{cable} may be set to 0.20 μH/ft

Rev. AA 2003-09-19

FM CONTROL DRAWING NO. 5116QF01

Hazardous (Classified) Location

Class I, Division 1, Group A,B,C,D
Class II, Division 1 Group E, F, G
Class III, Division 1
Class I, Zone 0 and 1, Group IIC, IIB, IIA
Class II, Zone 20 and 21

Unclassified Location

or

Hazardous (Classified) Location

Class I, Division 2, Group A,B,C,D
Class I, Zone 2, Group IIC, IIB, IIA

Simple Apparatus or
Intrinsically safe apparatus
with entity parameters:

$$V_{max}(U_i) \geq V_t(U_o)$$

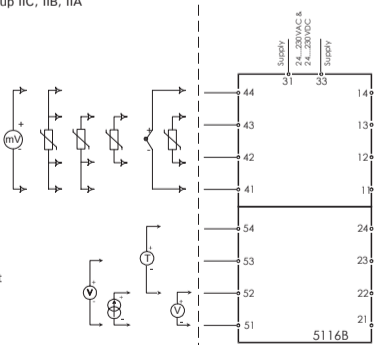
$$I_{max}(I_i) \geq I_t(I_o)$$

$$P_i \geq P_o$$

$$C_a \geq C_{cable} + C_i$$

$$L_a \geq L_{cable} + L_i$$

The sum of capacitance and inductance of cable and intrinsic safe equipment must be less or equal to C_a and L_a



| Terminal | Voc (V) | Isc (mA) | Po (mW) | La (mH) | | | Ca (μF) | | |
|-------------|---------|----------|---------|---------|------|-------|---------|-------|-------|
| | | | | A,B | C,E | D,F,G | A,B | C,E | D,F,G |
| 41,42,43,44 | 7.5 | 2.2 | 4.2 | 1000 | 1000 | 1000 | 6 | 36 | 445 |
| 51,52,53 | 7.5 | 2.2 | 4.2 | 1000 | 1000 | 1000 | 6 | 36 | 445 |
| 51,52,53,54 | 28 | 93.0 | 650 | 3 | 16 | 31 | 0.075 | 0.645 | 2 |

Installation notes:

- The maximum non hazardous location voltage is 250VAC/dc.
- The installation shall be in accordance with the National Electrical Code NFPA 70, Articles 504 and 505.
- 5116B is galvanic isolated and does not require grounding
- For Installation in Div 2 or Zone 2 the 5116B must be installed in an enclosure according to ANSI/ISA S82.
- Install in Pollution degree 2 or better
- Use 60 / 75 °C Copper Conductors with Wire Size AWG: (26 - 14).
- Warning: Substitution of components may impair intrinsic safety.

Rev. AA 2005-07-20