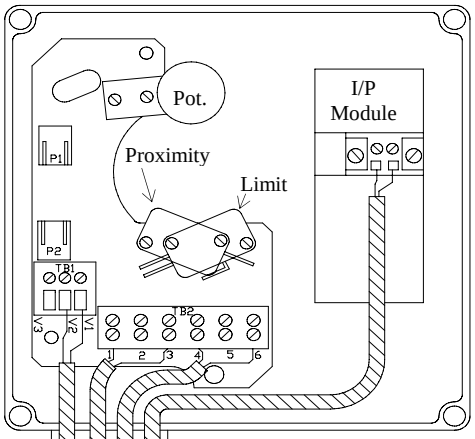
## Safe Area

1. Refer to the "model number" label located under the cover in order to identify the configuration of 760 Valve Controller in terms of options it is equipped with. Follow thereafter the installation instructions below for the particular 760 Valve Controller configuration.
2. After selecting the configurations of the intrinsically safe loops for the particular configuration of 760 Valve Controller, refer to Sheet 2 of this Control Drawing to determine the Temperature Code of Controller.

**Warning:**
Failure to follow the above instructions may impair suitability of 760 Valve Controller for use in Hazardous Locations

## Hazardous (Classified) Location

Class I, Division 1, Groups A, B, C, D
Class II, Division 1, Groups E, F, G
Class III, Division 1




## Installation Instructions:

1. If 760 Valve Controller is equipped with 4-20 mA feedback option, refer to the sheet 3 of 13 of this control drawing.
2. If 760 Valve Controller is equipped with Potentiometer (1K) option, refer to the sheets 4 to 7 of 13 of this control drawing.
3. If 760 Valve Controller is equipped with Limit Switch #1 option, refer to the sheets 8 to 11 of 13 of this control drawing.
4. If 760 Valve Controller is equipped with Proximity Switch #1 option, refer to the sheet 12 of 13 of this control drawing.
5. If 760 Valve Controller is equipped with Limit Switch #2 option, refer to the sheets 8 to 11 of 13 of this control drawing.
6. If 760 Valve Controller is equipped with Proximity Switch #2 option, refer to the sheet 12 of 13 of this control drawing.
7. If 760 Valve Controller is equipped with I/P option, refer to the sheet 13 of 13 of this control drawing.

**Certification Agency Controlled Document**
No Changes Allowed Without Reference to the Appropriate Certifying Agency

## General Intrinsically Safe Installation Notes

1) Shielded Cable is required and the shield shall be connected as shown. The unterminated end of the shield shall be insulated.
2) The series 760 Valve Controller shall not be connected to, under normal or abnormal conditions, a source of supply that exceeds 250 Vrms or 250 Vdc with respect to earth ground.
3) The user is responsible for compatibility and approval of the user provided associated apparatus.
4) Entity installation requirements (where applicable): $V_{max} \geq V_{oc}$; $I_{max} \geq I_{oc}$; $C_a \geq C_i + C_{cable}$; $L_a \geq L_i + L_{cable}$.
5) Installation must be in accordance with applicable electrical codes, refer to ISA RP12.6 for guidance.
6) Caution: use cables suitable for 5° C above surrounding ambient.
7) These instructions are provided for conformance with FM and CSA Certifications only.

## Notes for Installation in Division 2 Locations

1) Limit switches and potentiometers must be installed as intrinsically safe (with barriers). See sheets 8 to 11 for limit switches or sheets 4 to 7 for potentiometer installation notes.
2) Caution: use cables suitable for 5° C above surrounding ambient.

| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

Title
Control Drawing for Series 760 Valve Controller

Drawing No.
15032-7602

# Temperature Code and Ambient Temperature Range for Series 760 Valve Controller

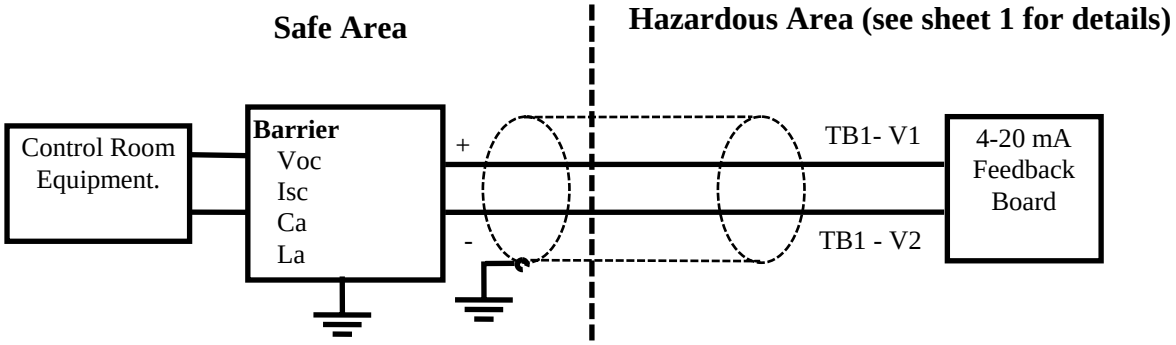
Determine the options that have been installed in your Series 760 Valve Controller by checking the label that is under the cover. Compare the option(s) installed to Table 1 to determine Model 760 Temperature Code and Ambient Temperature Range.

**Table 1: Determination of Temperature Code and Permissible Ambient Temperature Range**

| **Option or Combination of Options:** | **Temperature Code** | **Ambient Temperature Range** |
|---|---|---|
| 4-20 mA Feedback Option | T3C | -40°C to +85°C |
| 4-20 mA Feedback and Limit Switch #1 and #2 | T3C | -40°C to +85°C |
| 4-20 mA Feedback and Proximity Switch #1 and #2 | T3C | -25°C to +85°C |
| 4-20 mA Feedback and I/P Module | T3C | -40°C to +75°C |
| 4-20 mA Feedback and Limit Switch #1 and #2 and I/P Module | T3C | -40°C to +75°C |
| 4-20 mA Feedback and Proximity Switch #1 and #2 and I/P Module | T3C | -25°C to +75°C |
| Potentiometer Option | None | -40°C to +85°C |
| Potentiometer and Limit Switch #1 and #2 | None | -40°C to +85°C |
| Potentiometer and Proximity Switch #1 and #2 | None | -25°C to +85°C |
| Potentiometer and I/P Module | T3C | -40°C to +75°C |
| Potentiometer and Limit Switch #1 and #2 and I/P Module | T3C | -40°C to +75°C |
| Potentiometer and Proximity Switch #1 and #2 and I/P Module | T3C | -25°C to +75°C |
| Limit Switch #1 and #2 | None | -40°C to +85°C |
| Limit Switch #1 and #2 and I/P Module | T3C | -40°C to +75°C |
| Proximity Switch #1 and #2 | None | -25°C to +85°C |
| Proximity Switch #1 and #2 and I/P Module | T3C | -25°C to +75°C |
| I/P Module – ABB | T3C | -40°C to +75°C |
| I/P Module – ControlAir | T4 | -40°C to +75°C |

# 4-20 mA Feedback Board Installation

## 4-20 mA Feedback Board Intrinsically Safe Installation




Barrier must be CSA Certified and FM Approved single channel grounded shunt - diode Zener Barrier or single channel Isolating Barrier

**Entity Installation requirements:**

Vmax or Vt ≥ Voc, Imax or It ≥ Isc,
Ca ≥ Ci + C cable, La ≥ Li + Lcable

**4-20 mA Feedback Board Entity Parameters:**

| Vmax, or Vt | Imax, It | Ci | Li |
|---|---|---|---|
| 30 V | 225 mA | 49 nF | 44 uH |

## 4-20 mA Feedback Board Division 2 FM Approved and CSA Certified:

| | |
|---|---|
| Maximum Voltage: | 42 V |
| Current: | 4-20 mA |

**4-20 mA Feedback Board Ambient Temperature Range:** See Sheet 2 of 13

| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

Title

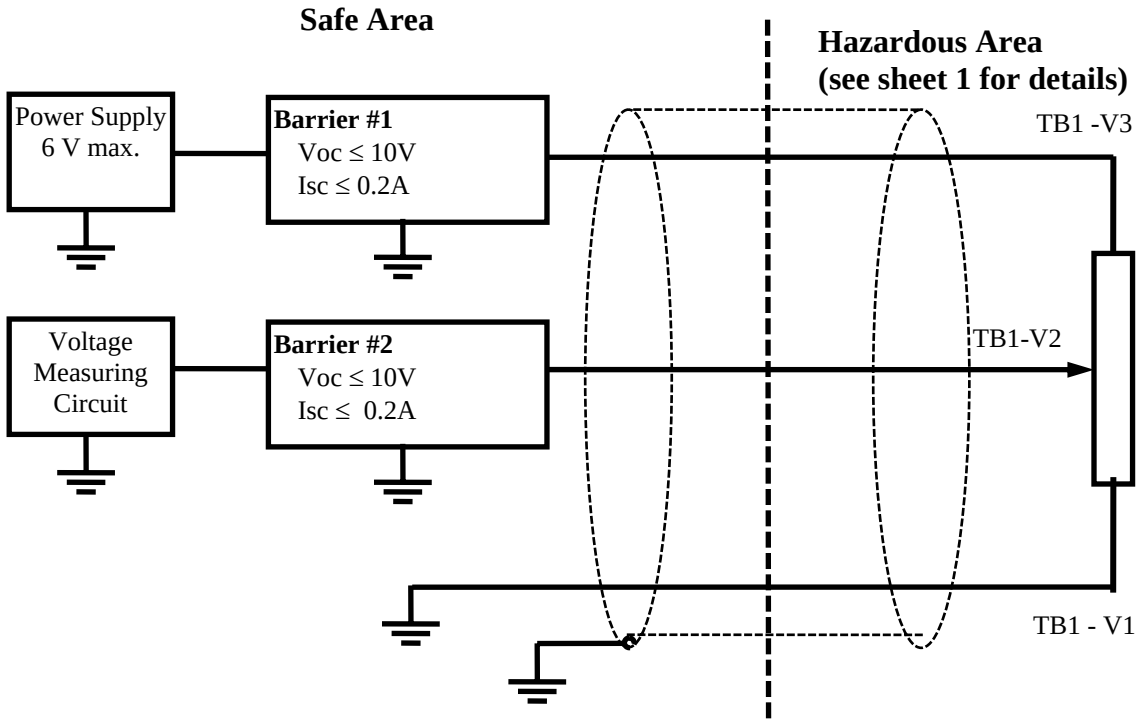
Control Drawing for
Series 760 Valve Controller

Drawing No.

15032-7602

# Potentiometer Installation

**Potentiometer Intrinsically Safe and Division 2 Installation - Grounded Circuit Two Barriers**




1. Barriers #1 and #2 must be CSA Certified and FM Approved single channel grounded Shunt-Diode Zener Barriers with Voc and Isc parameters as indicated. Alternatively, instead of two single Channel Barriers, one CSA Certified and FM Approved Dual Channel grounded Shunt Diode Barrier (with Voc and Isc parameters, for each channel as indicated for Barriers #1 and #2) may be used.

   CSA Certified and FM Approved MTL 710 Single Channel grounded Shunt Diode Zener Barrier is recommended for use as Barriers #1 and #2.

2. Connections to the terminals TB1-V1 and TB1-V3 may be swapped.

3. Potentiometer Cable Parameters for Intrinsic Safety - Grounded Circuit Two Barriers:

| **Gas Groups** | **Maximum Values** | | |
|---|---|---|---|
| | **Capacitance** | **Inductance** | **L/R Ratio** |
| A & B | 0.22 uF | 110 uH | 35 uH per Ohm |
| C & E | 0.90 uF | 440 uH | 140 uH per Ohm |
| D, F & G | 2.40 uF | 880 uH | 280 uH per Ohm |

4. Ambient Temperature Range**:** See Sheet 2 of 13.

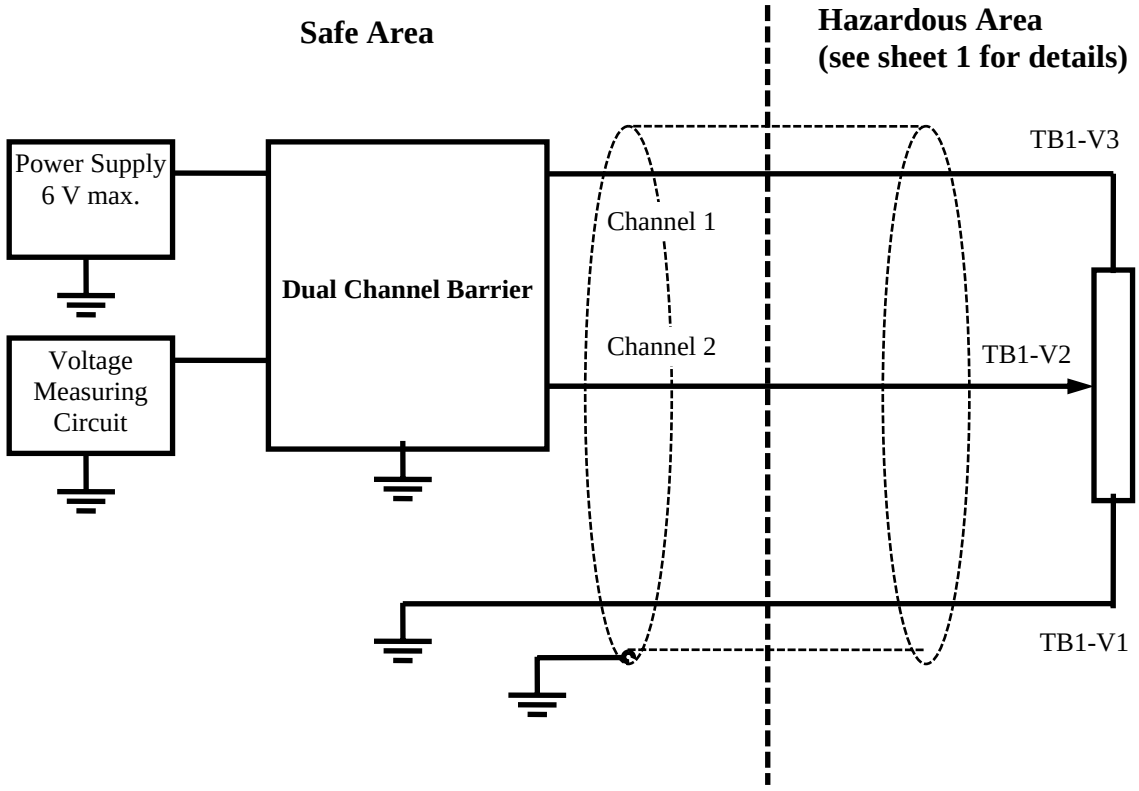
| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

Title
Control Drawing for
Series 760 Valve Controller

Drawing No.
15032-7602

**Potentiometer Intrinsically Safe and Division 2 Installation - Grounded Circuit Dual Channel Barrier**




1. Barrier must be CSA Certified and FM Approved dual channel grounded Shunt Diode Zener Barrier with output safety parameters, as follows:

   Voc Channel 1 - Channel 2 ≤ 10V; Voc Channel 1 - earth ≤ 10V;
   Voc Channel 2 - earth ≤ 10V; Isc Channel 1 or Channel 2 ≤ 0.2A.

   CSA Certified and FM Approved MTL760 Dual Channel, star connected Barrier, is recommended.

2. Connections to the terminals TB1-V1 and TB1-V3 may be swapped.

3. Potentiometer Cable Parameters for Intrinsic Safety - Grounded Circuit Dual Channel Barrier:

| **Gas Groups** | **Maximum Values** | | |
|---|---|---|---|
| | **Capacitance** | **Inductance** | **L/R Ratio** |
| A & B | 0.30 uF | 110 uH | 35 uH per Ohm |
| C & E | 0.90 uF | 440 uH | 140 uH per Ohm |
| D, F & G | 2.40 uF | 880 uH | 280 uH per Ohm |

4. Ambient Temperature Range**:** See Sheet 2 of 13.

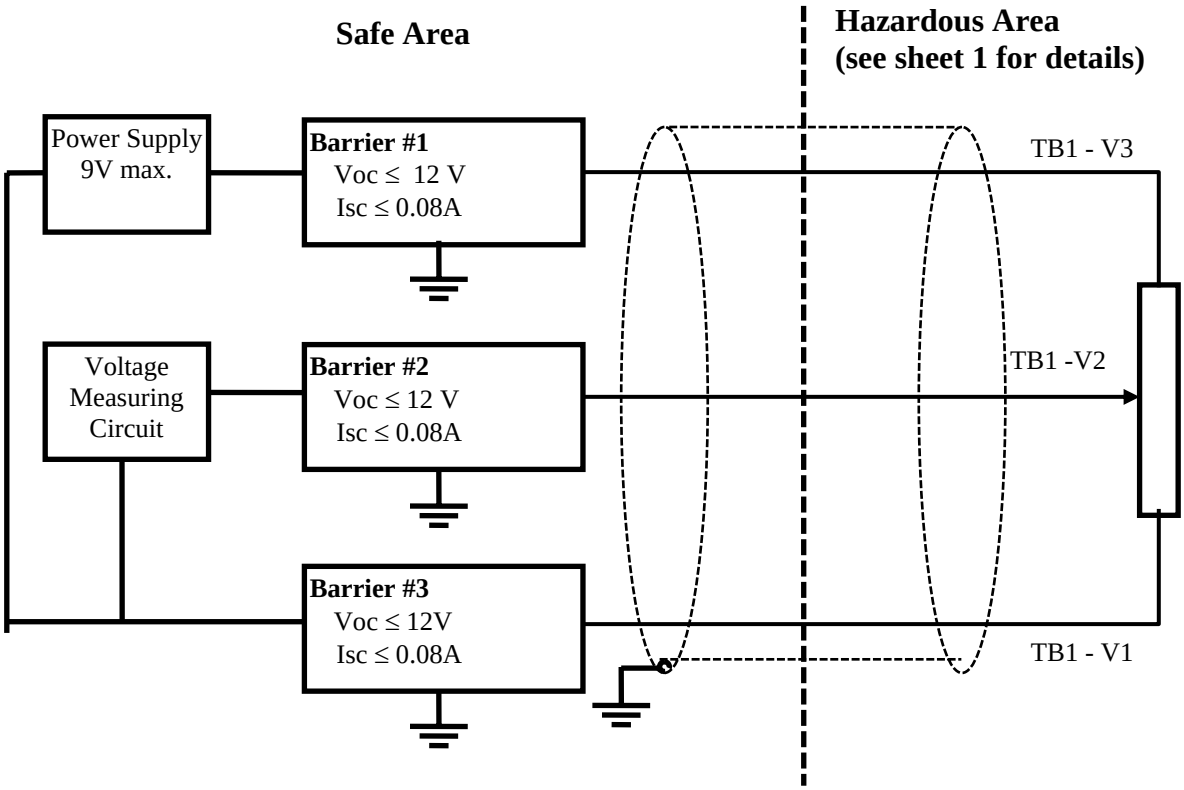
| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

Title
Control Drawing for
Series 760 Valve Controller

Drawing No.
15032-7602

**Potentiometer Intrinsically Safe and Division 2 Installation - Ungrounded Circuit Three Barriers**




1. Barriers #1, #2 and #3 must be CSA Certified CSA and FM Approved single channel grounded Shunt Diode Zener Barriers with Voc and Isc parameters as indicated.

   CSA Certified and FM Approved MTL 766 Single Channel Barrier is recommended for use as barrier #1, #2 and #3.

2. Connections to the terminals TB1-V1 and TB1-V3 may be swapped.

3. Potentiometer Cable Parameters for Intrinsic Safety - Ungrounded Circuit Three Barriers:

| **Gas Groups** | **Maximum Values** | | |
|---|---|---|---|
| | **Capacitance** | **Inductance** | **L/R Ratio** |
| A & B | 0.125 uF | 110 uH | 49 uH per Ohm |
| C & E | 0.57 uF | 440 uH | 190 uH per Ohm |
| D, F & G | 1.52 uF | 880 uH | 390 uH per Ohm |

4. Ambient Temperature Range**:** See Sheet 2 of 13.

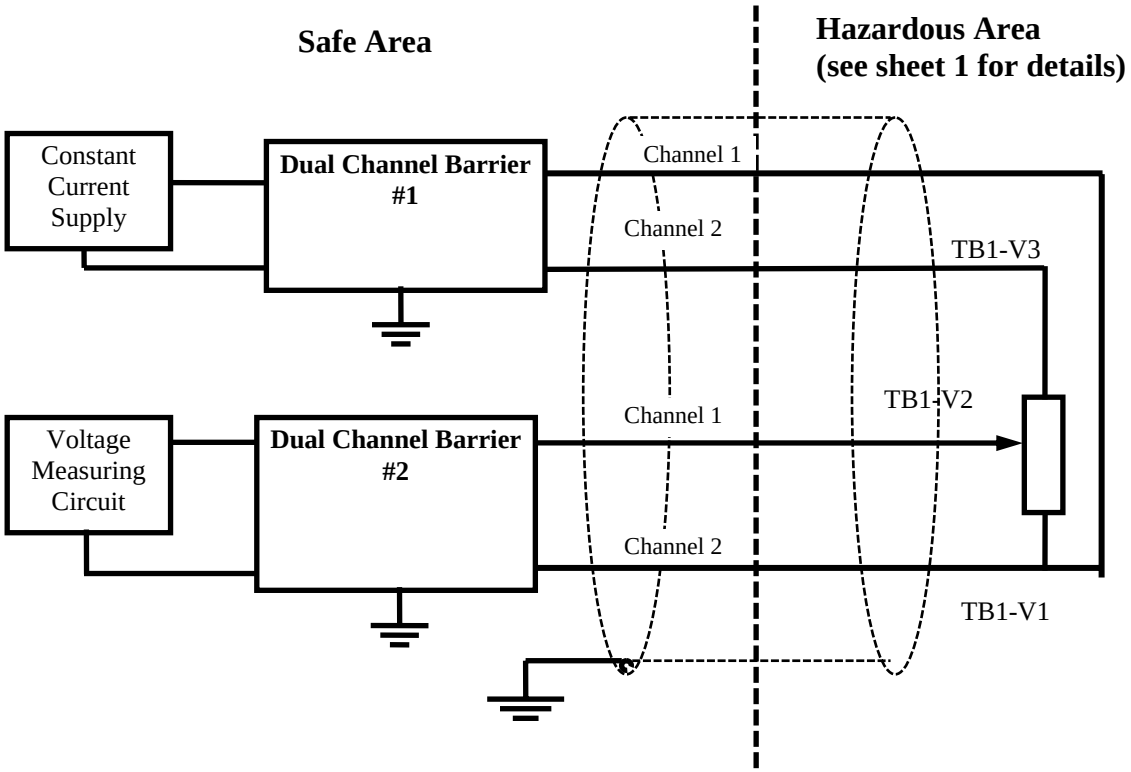
| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

Title
Control Drawing for
Series 760 Valve Controller

Drawing No.
15032-7602

**Potentiometer Intrinsically Safe and Division 2 Installation - Ungrounded Circuit**
**Two Dual Channel Barriers**




1. Barriers #1 and #2 must be CSA Certified and FM Approved dual channel grounded Shunt Diode Barriers with output safety parameters, as follows:

   Voc (Uo) Channel 1 - earth ≤ 9V; Voc (Uo) Channel 2 - earth ≤ 9V;
   Isc (Io) Channel 1 or Channel 2 ≤ 0.1A.

   CSA Certified and FM Approved MTL 761 Dual Channel Barrier is recommended as Barrier #1 and #2.

2. Connections to the terminals TB1-V1 and TB1-V3 may be swapped.

3. Potentiometer Cable Parameters for Intrinsic Safety - Ungrounded Circuit Two Dual Barriers:

| **Gas Groups** | **Maximum Values** | | |
|---|---|---|---|
| | **Capacitance** | **Inductance** | **L/R Ratio** |
| A & B | 0.31 uF | 110 uH | 35 uH per Ohm |
| C & E | 1.32 uF | 440 uH | 140 uH per Ohm |
| D, F & G | 3.52 uF | 880 uH | 280 uH per Ohm |

4. Ambient Temperature Range**:** See Sheet 2 of 13.

| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

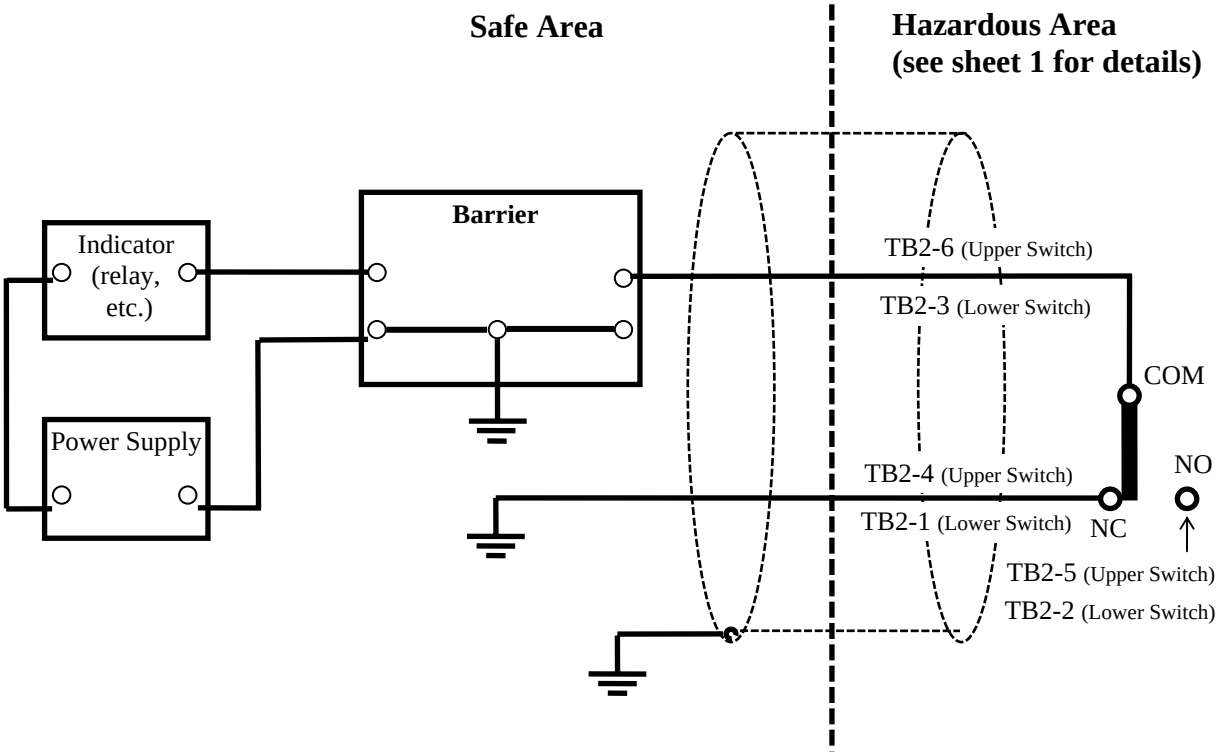
Siemens Industry, Inc.
Spring House PA, USA 19477

Title
Control Drawing for
Series 760 Valve Controller

Drawing No.
15032-7602

# Limit Switch Installation

**Limit Switch Intrinsically Safe and Division 2 Installation - Grounded Circuit Single Barrier**




1 Barrier must be CSA Certified and FM Approved single channel grounded Shunt-Diode Zener Barrier.

2. Limit Switch Cable Parameters for Intrinsic Safety - Grounded Circuit Single Barrier:

   A) Cable Capacitance may not exceed Ca of the barrier.
   B) Cable Inductance may not exceed La of the barrier or the cable L/R ratio may not exceed the L/R ratio of the barrier.

3. Ambient Temperature Range**:** See Sheet 2 of 13.

4. Normally, TB2-1 and TB2-4 are connected to ground as shown. Alternativly, TB2-2 may be grounded if no connection is made to TB2-1 and/or TB2-5 may be grounded if no connection is made to TB2-4.

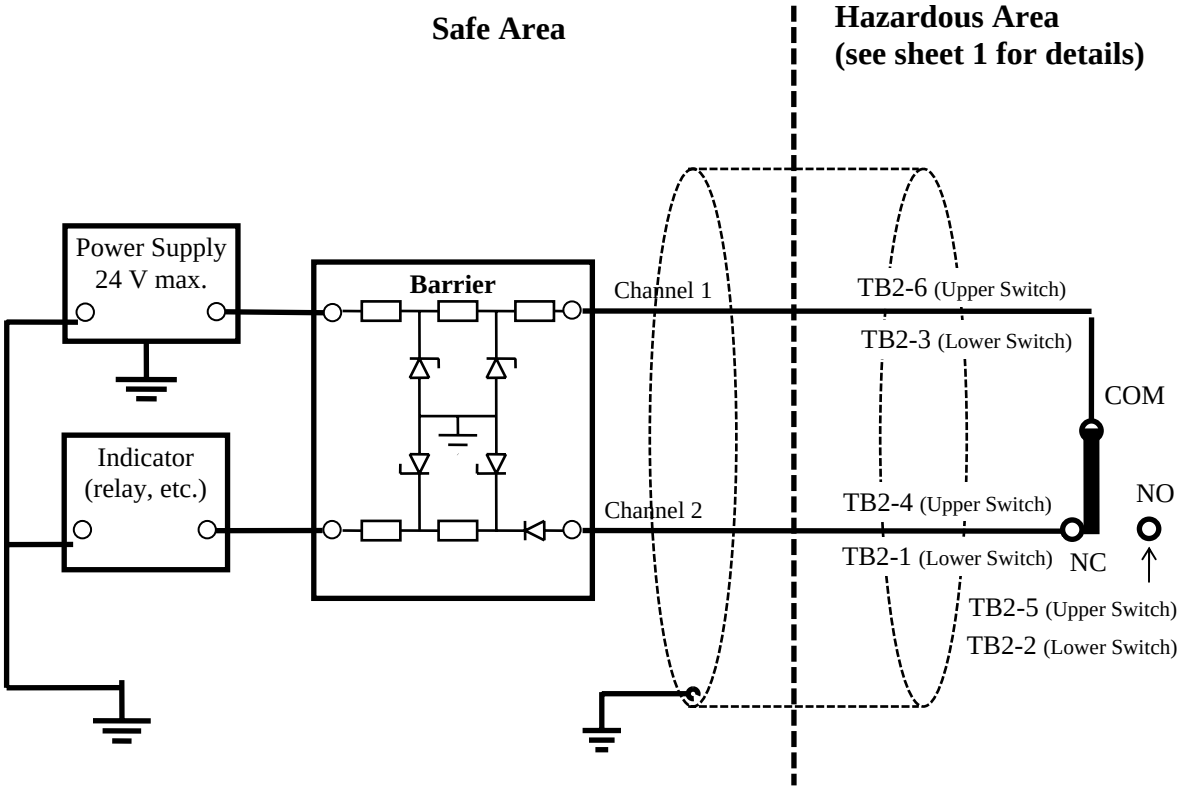
| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

Title
Control Drawing for
Series 760 Valve Controller

Drawing No.
15032-7602

**Limit Switch Intrinsically Safe and Division 2 Installation - Ungrounded Circuit Single Barrier**




1. Barrier must be CSA Certified and FM Approved dual channel shunt-diode Zener Barrier with output safety parameters, as follows:

   Voc Channel 1 - earth ≤ 28V; Isc Channel 1: ≤ 0.093A
   Voc Channel 2 - earth ≤ 28V; Isc Channel 2: Diode Return.

   CSA Certified and FM Approved MTL787 dual channel Barrier is recommended.

2. Limit Switch Cable Parameters for Intrinsic Safety - Ungrounded Circuit Single Barrier:

   A.) Cable Capacitance may not exceed Ca of the barrier.
   B.) Cable Inductance may not exceed La of the barrier or the cable L/R ratio may not exceed the L/R ratio of the barrier.

3. Ambient Temperature Range**:** See Sheet 2 of 13.

4. Normally, TB2-1 and TB2-4 are connected to Barrier channel 2 as shown. Alternativly, TB2-2 may be connected to Barrier channel 2 if no connection is made to TB2-1 and/or TB2-5 may be connected to Barrier channel 2 if no connection is made to TB2-4.

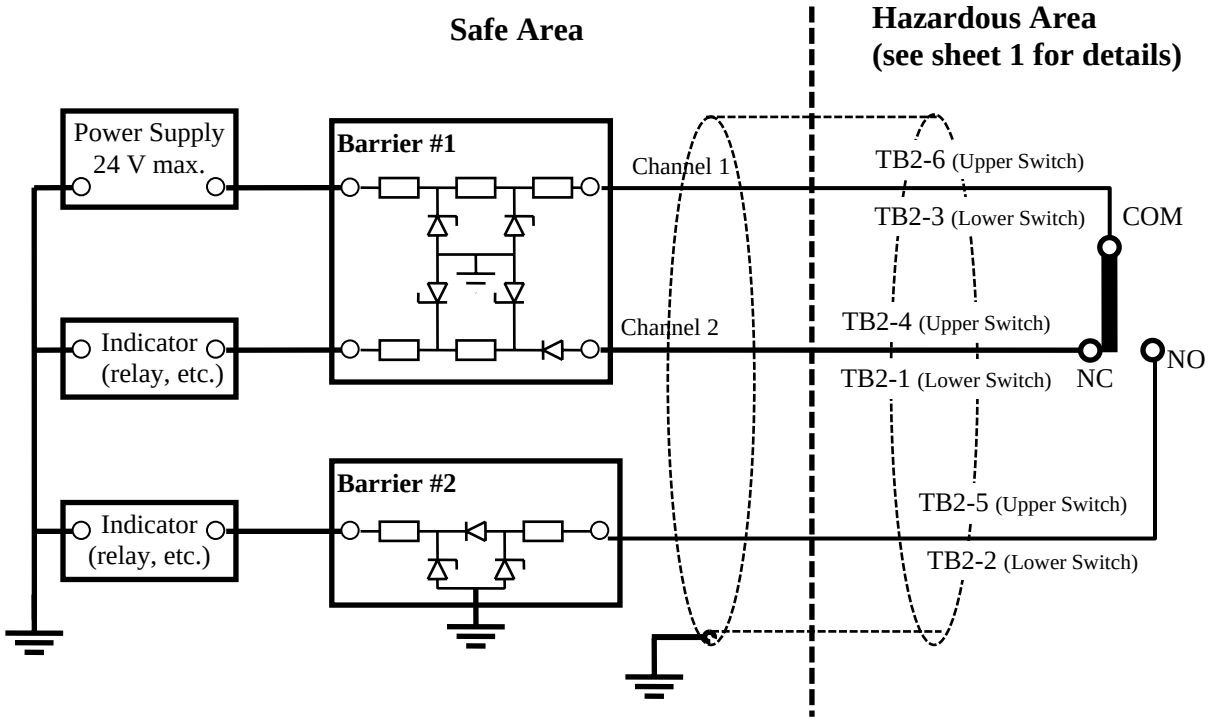
| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

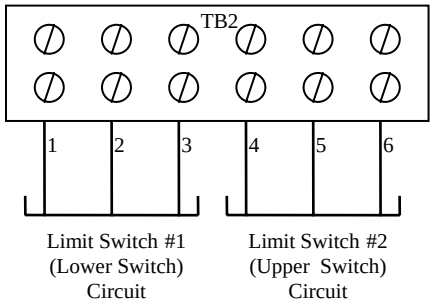
Title
Control Drawing for
Series 760 Valve Controller

Drawing No.
15032-7602

**Limit Switch Intrinsically Safe and Division 2 Installation - Ungrounded Circuit Two Barriers**




Note that connection is made to all three terminals for Limit Switch #1 (Lower Switch) and Limit Switch #2 (Upper Switch) in this configuration.




1. Barrier #1 must be CSA Certified and FM Approved dual channel Shunt-Diode Zener Barrier with output safety parameters, as follows:

   Voc Channel 1 - earth ≤ 28V; Isc Channel 1: ≤ 0.093A
   Voc Channel 2 - earth ≤ 28V; Isc Channel 2: Diode return.

   CSA Certified and FM Approved MTL 787 Dual Channel Barrier is recommended.

Notes continued on next sheet.

| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

Title
Control Drawing for
Series 760 Valve Controller

Drawing No.
15032-7602

2. Barrier #2 must be CSA Certified and FM Approved ground referenced Barrier with output safety parameters, as follows:

   Voc $\leq$ 28V (channel to earth)  Isc: Diode return.

   CSA Certified and FM Approved MTL 786 Diode Return Barrier is recommended.

3. Barrier #1 and Barrier #2 must be of the same polarity, either both positive or both negative.

4. Connections to the following terminals may be swapped:

   A) TB2-1 and TB2-2  B) TB2-4 and TB2-5

5. Limit Switch Cable Parameters for Intrinsic Safety - Ungrounded Circuit Two Barriers:

   A) Cable Capacitance may not exceed Ca of the corresponding Barrier.
   B) Cable Inductance may not exceed La of the corresponding Barrier or the cable L/R ratio may not exceed the L/R ratio of the corresponding Barrier.

6. Ambient Temperature Range**:** See Sheet 2 of 13.

| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

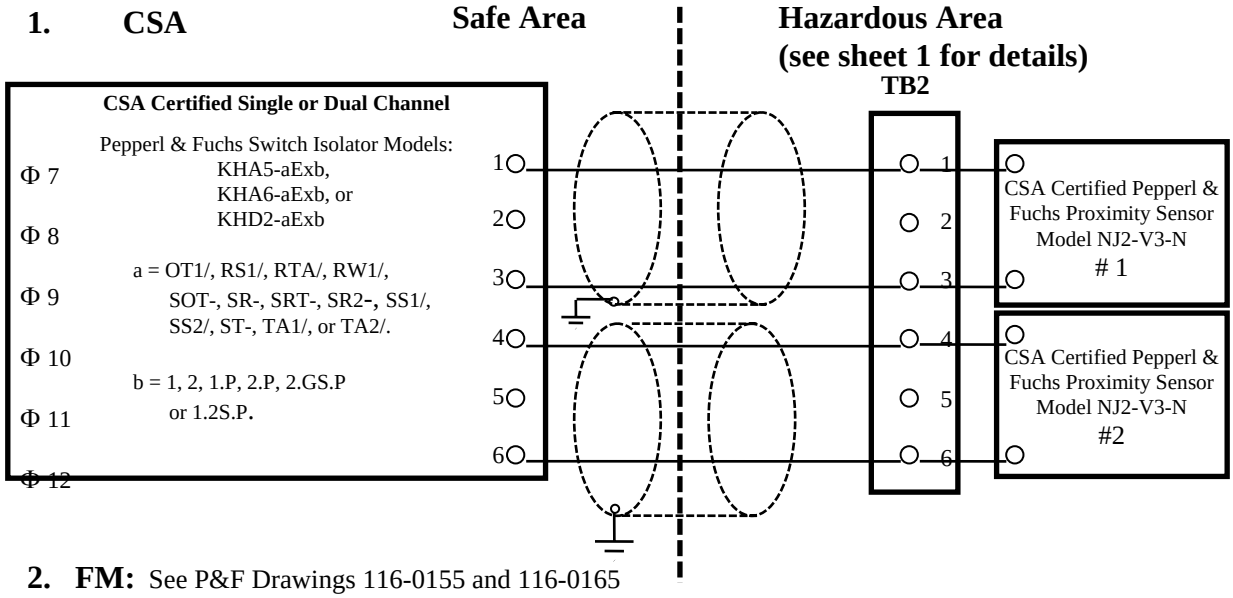
Title
Control Drawing for
Series 760 Valve Controller

Drawing No.
15032-7602

# Proximity Switch Pepperl & Fuchs GmbH Model NJ2-V3-N Installation Instructions

**Proximity Switch Intrinsically Safe Installation:**

**1. CSA**




**2. FM:** See P&F Drawings 116-0155 and 116-0165

**Proximity Switch Installation in Division 2:**

| Certification | Input Ratings |
|---|---|
| CSA Division 2 | 25 V, 0.05A Maximum |
| FM Division 2 | Maximum Voltage 25 V |

**Proximity Switch Ambient Temperature Range:** See Sheet 2 of 13

| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

Title
Control Drawing for
Series 760 Valve Controller

Drawing No.
15032-7602

# I/P Module Installation Instructions

**Determine the manufacturer of the supplied I/P Module and follow the appropriate instructions below:**

## ABB Model 22/06-65

### I/P Module Intrinsically Safe Installation:

### 1. CSA

I/P Module: CSA Certified ABB Type 22/06-65. It is intrinsically safe when connected as per attached ABB Control Document No. 900842, Page 4 of 4.

### 2. FM

See ABB Drawing No. 900842

### I/P Module Installation in Division 2:

| Certification | Input Ratings |
|---|---|
| CSA Division 2 | Current 4-20 mA, 8V maximum, 0.15A maximum |
| FM Division 2 | Current 4-20 mA |

**I/P Module Ambient Temperature Range:** See Sheet 2 of 13.

## ControlAir Model T590

### I/P Module Intrinsically Safe Installation:

### 1. CSA

I/P Module: CSA Certified ControlAir Model T590. It is intrinsically safe when connected as per attached ControlAir Control Document No. 431-990-047.

### 2. FM

See ControlAir Drawing No. 431-990-047

### I/P Module Installation in Division 2:

| Certification | Input Ratings |
|---|---|
| CSA Division 2 | Current 4-20 mA, 8V maximum, 0.15A maximum |
| FM Division 2 | Current 4-20 mA |

**I/P Module Ambient Temperature Range:** See Sheet 2 of 13.

| Rev | Date | Details | Approved |
|---|---|---|---|
| 3 | 19 Feb. 98 | As FM Approved | J. Sweeney |
| 4 | 20 April 98 | Minor corrections | J. Sweeney |
| 5 | 14 June 07 | ControlAir I/P Added | J. Sweeney |
| 6 | 19 May 08 | Minor correction pg 13 | J. Sweeney |
| 7 | 22 June 11 | Correct pg 12; add SII | J. Sweeney |

Siemens Industry, Inc.
Spring House PA, USA 19477

Title
Control Drawing for
Series 760 Valve Controller

Drawing No.
15032-7602