

# SIEMENS

## Statement of Compliance

Document: CSA10024

Original CSA Report:

Project: 760P

Date Issued: February 1, 2002

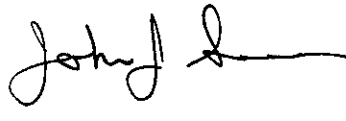
Issued to: Siemens Energy & Automation, Inc.  
1201 Sunneytown Pike  
Spring House, PA 19477  
U.S.A

*The Products listed below are eligible to bear the CSA Mark shown*



Issued by: John J. Sweeney,  
Approvals Coordinator

Signature:



### CLASS

**2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations**

### PRODUCTS

**Class I, Div. 2, Groups A, B, C and D; Class II, Div. 2, Groups E, F and G; Class III; Encl. Type 4X**

Valve Controller Model 760P (with suffixes), electrical ratings, ambient temperature range(s), installation requirements and connection are per Control Drawing 15032-7609.

### CLASS

**2258 03 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations.**

### PRODUCTS

**Class I, Groups A, B, C and D; Class II, Groups E,F and G; Class III; Encl. Type 4X**

Valve Controller Model 760P (with suffixes), intrinsically safe when installed / connected per Control Drawing 15032-7609.

Note: Temperature code(s), ambient temperature range(s) and electrical ratings are per Control Drawing 15032-7609.

### **APPLICABLE STANDARDS**

|                   |            |   |
|-------------------|------------|---|
| CSA Std C22.2 No. | 142-M 1987 | - Process Control Equipment   |
|                   | 157-92     | - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations         |
|                   | 213-M 1987 | - Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations |

### **MARKINGS**

Each unit is marked in a permanent and visible manner with the following items:

- Company name;
- Series 760P Valve Controller;
- Serial number or Date Code;
- Hazardous locations designation;
- Reference to Control Drawing 15032-7609;
- Wording: Intrinsically Safe / Securite Intrinseque and symbol Ex ia;
- Special Enclosure rating Type 4X;
- CSA monogram.

### **AUTHORITY**

1. By the authority of CSA, this equipment is immediately eligible to bear the CSA Mark
2. In accordance with the Category Certification procedure, the evaluation and testing of this equipment is subject to final validation by CSA
3. The manufacturers quality system is register with QMI to ISO9001
4. The manufacturers production facilities are audited periodically by CSA

# Descriptive and Test Report

**REPORT: CSA 10024**

**PROJECT: 760P**

**Edition 1:** February 1, 2002, Original release. This report covers 760P with 2001 enclosure design. Electrical options are the same as Certified 760E under CSA10017 .

## **PRODUCTS**

**Class I, Div. 2, Groups A, B, C and D; Class II, Div. 2, Groups E, F and G; Class III; Encl. Type 4X**

Valve Controller Model 760P (with suffixes), electrical ratings, ambient temperature range(s), installation requirements and connection are per Control Drawing 15032-7609.

## **CLASS**

**2258 03 – PROCESS CONTROL EQUIPMENT** – Intrinsically Safe and Non-Incendive Systems – For Hazardous Locations.

## **PRODUCTS**

**Class I, Groups A, B, C and D; Class II, Groups E,F and G; Class III; Encl. Type 4X**

Valve Controller Model 760P (with suffixes), intrinsically safe when installed / connected per Control Drawing 15032-7609.

Note: Temperature code(s), ambient temperature range(s) and electrical ratings are per Control Drawing 15032-7609.

## **APPLICABLE REQUIREMENTS**

As appear above on the Statement of Compliance

## **MARKINGS**

- 
- Company name;
- Series 760P Valve Controller;
- Serial number or Date Code;
- Hazardous locations designation;
- Reference to Control Drawing 15032-7609;

- Wording: Intrinsically Safe / Securite Intrinseque and symbol Ex ia;
- Special Enclosure rating Type 4X;
- CSA monogram.

Nameplate is 0.020 in min. thick stainless steel attached with drive screws as shown on the certification drawings. Alternatively, a CSA certified adhesive label may be used.

### **Internal:**

The internal markings shall appear on a CSA Certified Adhesive Type Label, Compatible with the surface to which it is mounted, with printing in 0.060 in (1.5mm) min high characters with at least the following information.

Identification of the electrical options installed in the particular 760 Valve Controller (may appear on either the outside or inside label.

Note: Control Drawing No. 15032-7609 Sheet 1 makes reference to this label for the above-mentioned purpose.

Service Instructions incorporate, on the dedicated page, the following caution statements:

For Division 1 Hazardous locations:

**WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.**

For Division 2 hazardous locations:

**WARNING: EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.**

### **ALTERATIONS**

Markings as per the Certificate of Compliance

### **FACTORY TEST**

The equipment at the conclusion of manufacture and before shipment, shall withstand for one min, without breakdown, the application of 500V between extra low potential live parts and exposed non-current-carrying metal parts or ground terminal, if such circuits leave or enter the enclosure.

Notes:

- 1 As an alternative, potentials 20 percent higher may be applied for one second.
- 2 Where it is more convenient to do so, the dielectric strength test may be made by applying a direct current voltage instead of an ac voltage, provided that the voltage used is 1.414 times that values specified above.
- 3 Capacitors in the secondary circuit may be disconnected during the dielectric strength tests specified in Items 1 (a) to (c).
- 4 The test specified in Item1 (c) shall be waived on grounded or Class 2 circuits.

**Warning:** The factory test(s) specified may present a hazard of injury to personnel and/or property and should only be performed by persons knowledgeable of such hazards and under conditions designed to minimise the possibility of injury.

## **DESCRIPTION**

The Model 760P Valve Controller is a valve controller that drives an actuator to position a valve in proportion to an input signal. The input signal is pneumatic (3 to 15 psi or 3 to 27 psi). When the input calls for the valve to open or close, the positioner acts as a pneumatic relay, supplying air from an independent source and / or exhausting air from the actuator, to bring the valve to the required position. The optional internal 4 to 20mA Feedback Board provides an analog 4 to 20mA feedback signal in proportion to the valve position. The internal 1k ohm Feedback Potentiometer option provides an analog voltage feedback signal in proportion to the valve position. Optional internal Mechanical Limit Switches or NAMUR Proximity Sensors provide on/off feedback for external customer equipment or control systems.

## **MODEL 760, MODEL NUMBER BREAKDOWNS**

### **Basic Model Number**

76x Valve positioner (x can be 0-9 or A-Z and designates OEM option configurations).

#### **Input**

|    |                               |
|----|-------------------------------|
| P1 | 3 to 15 psig                  |
| P2 | 3 to 27 psig                  |
| P3 | 6 to 30 psig                  |
| P4 | 20 to 100 kPa                 |
| P5 | 0.2 to 1.0 Bar                |
| P6 | 0.2 to 1.0 kg/cm <sup>2</sup> |

#### **Action**

A-Z or 0-9 Designates input shaft configuration options

#### **Enclosure (with ¾ inch NPT Conduit Connection)**

|   |  |
|---|--|
| A | Standard   |
| B | Standard with Beacon Indicator and 90° Pneumatic Connections |
| J | Standard with Flat Indicator and 60° Pneumatic Connections   |
| K | Standard with Flat Indicator and 90° Pneumatic Connections   |

#### **Enclosure (with M25 Conduit Adapter)**

|   |  |
|---|--|
| E | Standard   |
| F | Standard with Beacon Indicator and 90° Pneumatic Connections |
| N | Standard with Flat Indicator and 60° Pneumatic Connections   |
| P | Standard with Flat Indicator and 90° Pneumatic Connections   |

#### **Flow Capacity**

A-Z or 0-9 Designates flow capacity options

#### **Environmental Construction Options**

A-Z or 0-9 Designates Materials of Elastomers and option boards

#### **Gauges and Manifolds**

A-Z or 0-9 Designates pressure gauge options

**Limit Switches**

- N None
- 1 Mechanical
- 2 Proximity Switches (NAMUR Std)

**Feedback**

- N None
- 1 Potentiometer – 1K
- 2 4-20 mA Feedback
- 3 Potentiometer – 1K, SS feedback gear
- 4 4-20 mA Feedback, SS feedback gear
- 5 Potentiometer – 1K ( high temp 300° C)

**Design Level**

A-Z or 0-9 Designates current design

Electrical Certification

- N Not required
- 7 FM Div 1 & 2  
CSA Div 1 & 2  
EEx ia  
ExN  
CE

**Construction:**

1.0 Enclosure (Certification Drawing 15032-7608 Sheets 1, 2 and 6):

The enclosure is accepted, in this project, as a protection for 760 Series Valve Controller as special enclosure Type 4X and makes all the non-intrinsically safe configurations, outlined in the Control Drawing 15032-7609, suitable for use in Class II, Div. 2, Groups E,F and G Hazardous Locations and all the Intrinsically Safe configurations of 760 Series Valve Controller suitable for use in Class II, Groups E, F and Hazardous Locations.

Note: Coating used in 760 Series Valve Controller enclosure is the same as Accepted under LO4000-5322 file.

2.0 Electrical Options (Certification Drawing 15032-7608, sheet 3, 4 and 5): Refer to the Control Drawing 15032-7609 for installation instructions.

2.2 The optional PC boards provide the following options: 4-20mA, 1K Potentiometer, Proximity Switches, Limit Switches, or combinations of thereof. Only on PC board can be installed in the Series 760P Valve Controller. Depending upon the options, one or two NRTL Approved Terminal Blocks (TB1 and/or TB2) are mounted on the PC Board. The minimum spacing between different intrinsically safe circuits at the field wiring terminals are 6 mm through air and also over the

surface. The Accepted terminal blocks are – TB1: Certified Weidmuller Type Top 1.5GS, 3 terminals, rated 300V, 10A; -TB2: Certified Weidmuller Type MK3, 6 terminals, rated 300V, 25A.

Notes:

- i. 4-20mA option is not available if 1K Potentiometer option is installed and vice versa:
- ii. Limit switches cannot be used if Proximity Switches are installed and vice versa.

### 2.2.1 4-20ma Feedback Option

- R1-5k ohm potentiometer is used in the non-incendive circuits (maximum Voltage 1.2V dc, maximum current 0.25mA).
- Installation instructions: Control Drawing 15032-7609, sheets 1, 2 and 3.
- 4-20 mA field connections are on the Terminal Block TB1, terminals V1 and V2.

### 2.2.2 1K Feedback Potentiometer Option

- Installation instructions: Control Drawing 15032-7609, sheets 1, 2, 4, 5, 6 and 7.
- R1 – 1K potentiometer field connections are on the terminal block TB1, terminals, V1, V2 & V3.
- This option must be intrinsically safe to be used in Div. 2 Hazardous Location.

### 2.2.3...Limit Switches No. 1 and No. 2:

- Installation instructions: Control Drawing 15032-7609, sheets 1, 2, 8, 9, 10 and 11.
- Limit switches are NRTL Approved switches, SW2-upper and SW2-lower.
- Limit switches are screw secured to the PCB and hard wire connected to the terminal block TB2.
- Limit switches field connections are:
  - Limit switch No. 1 (SW2-lower) on the terminal block TB2, terminals (1 or 2) and 3 (per sheets 8 and 9 of Control Drawing 15032-7609);
  - Limit switch No. 2 (SW2-upper) on the terminal block TB2, terminals (4 or 5) and 6 (per sheets 8 and 9 of Control Drawing 15032-7609);
  - Limit switch No. 1 (SW2-lower) on the terminal block TB2, terminals 1, 2 and 3 (per sheet 10 of Control Drawing 15032-7609);
  - Limit switch No. 2 (SW2-upper) on the terminal block TB2, terminals 4, 5 and 6 (per sheet 10 of Control Drawing 15032-7609);
- The Accepted limit switches are:
  - McGill Part No. 4602-3100, rated 15A at 125-250V ac, 0.5A at 125V dc and 0.25A at 250V dc;
  - MicroSwitch Part No. V3L-3053, rated 15A at 125-250V ac, 0.5A at 125-250V ac, 0.5A at 125V dc and 0.25A at 250V dc;
  - C & K P/N TMCJG6ST1010C or P/N TMCJG6ST1010CU , rated 15A at 125-250V ac, 0.5A at 125-250V ac, 0.5A at 125V dc and 0.25A at 250V dc;
- This option must be intrinsically safe to be used in Div. 2 Hazardous Locations.

### 2.2.4 Proximity Switches No 1 and No 2:

- Installation instructions: Control Drawing 15032-7609, sheets 1, 2 and 12.
- Proximity switches are Certified Pepperl + Fuchs Type NJ2-V3-N or NJ2-V3-N-Y17905.

- The proximity switches are screw secured to the PCB and hard wire connected to the terminal block TB2.
- Proximity switch field connections are:
  - Proximity switch No. 1 – on the terminal block TB2, terminals 1 and 3:
  - Proximity switch No. 2 – on the terminal block TB2, terminals 4 and 6.

Note: Certified Pepperl + Fuchs Model NJ2-V3-N proximity switches are inductive sensors with no normally arcing parts. Pepperl + Fuchs Model NJ2-V3-N proximity switches are Certified under LR36087-2 report. Pepperl + Fuchs provided the authorization to access their files on the subject for the evaluation conducted for this Application.

**Descriptive Documents:**

| <b><u>Item</u></b> | <b><u>Subject</u></b>  | <b><u>Drawing No.</u></b> | <b><u>Rev.</u></b> | <b><u>Date</u></b> |
|--------------------|--|---------------------------|--------------------|--------------------|
| 1                  | Nameplate  | 15177-7601                | 1                  | 01-10-02           |
| 2                  | LBL, Options, 760  | 5-979A                    | 1                  | 02-11-02           |
| 3                  | FM & CSA Hazardous Location Precautions                      | -                         | -                  | -                  |
| 4                  | Certification Dwg 760P (6 sheets)                            | 15032-7608                | 2                  | 01-31-02           |
| 5                  | Control Drawing for Series 760P Valve Controller (12 sheets) | 15032-7609                | 1                  | 01-03-02           |
| 6                  | FMRC Test Reports – Covering Enclosure testing (?? pages)    |                           |                    |                    |
| 7                  | LO 4000-5322 Findings Letter Re: Power coating               | -                         | -                  | 12-19-94           |

**Tests**

**The following tests are from CSA report LR38024-125. The change to the enclosure will have no effect on these tests. 15032-7608 760P control drawing replaced 15032-7602 760 control drawing. They are the same except that 760P does not have an I/P option (sheet 13).**

Reference: Standard C22.2 No. 157

1.0 Spark Ignition Capability:

1.1 4-20 mA Feedback Board (Control Dwg No. 15032-7602, Sheets 1, 2 and 3):



It is investigated using entity evaluation.

$V_{max} = 30V$ , as specified by the submitter.

$I_{max} = 0.225A$ , as specified by the submitter.

$C_i = 49nF$  – Total value of all the capacitors (they are selected with 10 % tolerance) on the board.

$L_i = 20\mu H$  – Total (maximum) value of the inductance on the board

Both parameters ( $C_i$  at 1.5V max and  $L_i$  at 1.5 I max) are acceptable per the published curves for capacitance/inductance circuits.

- 1.2 R1 (1k ohm) Potentiometer, Voltage Mode (Control Dwg No. 15032-7602, sheets 1, 2, 4 through 7):

Spark ignition tests were waived. All the loops presented at the subject control dwg are acceptable per published curves for resistive circuits for all the combinations of fault(s) and 1.5 safety factor.

- 1.3 Limit Switch (Control Dwg No. 15032-7602, sheets 1, 2, 8 through 11):

Spark ignition tests were waived. All the loops presented at the subject control dwg are acceptable per published curves for resistive circuits [limit switch is a dry contact(s) for all the combination of the fault(s) and 1.5 safety factor.

- 1.4 Proximity Switch (Control Dwg No. 15032-7602, sheets 1, 2 and 12)

Spark ignition tests were waived. All the loops presented are the accepted combinations, under Pepperl & Fuchs LR 36087 file, of Certified single/dual channel barriers and Pepperl & Fuchs Certified proximity sensor Model NJ2 – V3-N.

- 1.5 I/P Module (Control Dwg. No. 15032-7602, sheets 1, 2 and 13):

Spark ignition test were waived , I/P module is Certified Sensycon Type 22/06-55 which is intrinsically safe when connected as per Sensycon Document No. 900842, Page 4 of 4.

## 2.0 Temperature Code:

- 2.1 Potentiometer (R1, 1K ohm):

Barrier parameters: 20V/100 ohm:

Potentiometer R1 adjusted to 100 ohm value;

$T_{max} = 88 \text{ deg C}$  at  $T_{ambient} = 80 \text{ deg C}$ ;

$T_{max} = 93 \text{ deg C}$  corrected to  $T_{ambient} = 85 \text{ deg C}$

- 2.2 Resistor R23 (4-20 Feedback Board):

Barrier parameters: 30V/133 ohm:

$T_{max} = 320 \text{ deg C}$  at  $T_{ambient} = 80 \text{ deg C}$ ;

Thermal Ignition test for the components was conducted with R23 placed in a suitable test chamber, containing 0.65cc of Diethyl Ether/3L of air, for a period of 5 minutes and under the same conditions as during temperature code test.

Results: No ignition.

- 3.0 Rating: (22.2 No. 142, C1 6.3)
- 4.0 Temperature: (C22.2 No. 142, C1 6.4)
- 5.0 Temperature Code: (C22.2 No. 213, C1 6.2)
- 6.0 Dielectric Strength: (C22.2 No. 142, C1 6.8.1)
- 7.0 Evaluation of Non-Incendive Circuits for Potentiometer R1, 5k ohm on 4 to 20mA Feedback Board: (22.2 No. 213, C1 6.4)

V max (measured) = 1.2V dc;  
I max (measured) = 0.25mA

- 8.0 Corrosion Resistance: (22.2 No 94, C1 6.12.2)

Test conducted under LO 4000-5322 Special Investigation is considered acceptable.

- 9.0 The following test conducted by FMRC under project J.I. 1D4A1.AX are considered acceptable:

- 9.1 Water Hosedown (Doc No ES200-018)  
Window, Flat Window and Non-Window versions.
- 9.2 Dust Exclusion (Doc No ES200-06)  
Window, Flat Window and Non-Window versions.
- 9.3 Impact (Doc No ES200-007)  
4.0 and 7.0 Joules impact on the covers (Beacon and Flat Plastic Indicator versions) of the 760 Valve Controller.

Application LR 38024-142: This Application covers revision of the Control Drawing No. 15032-7602  
The subject revisions do not compromise the integrity of the Certified Products.

No other tests were deemed necessary.

The complete tests results are in the Engineering file of LR 38024-125 report.

**760P - 2001 Enclosure testing: Covered by FM Global report J.I. 1D4A1.AX with revisions**