

## 761 Series SINGLE STATION MICRO Plus Controller



The 761 Series controller extends the features of the basic Foxboro 760 Series with built-in capability to facilitate highly advanced control strategies for the most difficult closed loops.

### FEATURES EXCLUSIVE TO THE 761 SERIES

- Dynamic Compensation with Lead/Lag, Impulse, and Dead Time Functions
- Assignable Alarms
- Algebraic Computation
- More Flexible Configuration Blocks with Internal Signal Routing
- Expanded Serial Communications
- Pulse Driven Input
- Boolean Logic Capability
- pH Display
- Display of an Independent Variable can be Configured
- Simple Batch Control
- Single Station Cascade Control
- Configuration Option to Display Second Variable

**FEATURES IN COMMON WITH THE 760 SERIES**

- EXACT Control
- Fully Interactive Display
- 10 to 50 mA Input Signal Option, External Power
- 10 to 50 mA Input/Output Signal Option, Internal Power
- Standard Computer Interface for Operation and Configuration
- Nonvolatile Memory
- Transferable Configuration
- Power Failure Recovery Logic
- Front Panel Keypad for Both Configuration and Operator Interface
- Housing or Shelf-Mounting
- Easy Physical Retrofit into Existing Foxboro Shelves
- Internal Signal Sources for Calibration
- Passcode Security

**EXACT CONTROL**

EXACT control uses microprocessor technology to make ongoing controller adjustments based on the actual, real time process dynamics. This is in direct contrast to other "self-tuning" controllers that establish the values of tuning parameters based on an arbitrary process model.

While continuously scanning the process variables, EXACT control initiates corrective action immediately upon sensing a process upset. The user selects the degree of response by specifying the desired damping and overshoot-to-load change, such as quarter amplitude damping.

Values of EXACT can be read by the user.

EXACT control functions as if your best operator is on the job 24 hours a day. It can be turned on or off at the keypad or by configuring logic functions, allowing these controllers to function as advanced PID controllers.

With EXACT control, product quality need not suffer from inevitable process upsets.

**PULSE DRIVEN INPUT**

There is provision for two pulse inputs, forming a pulse up/pulse down pair that can be assigned to any scaled signal such as remote set point. This feature facilitates replacement of an older controller having a pulse-driven set point, such as a Foxboro Model 62HM, with a modern, state-of-the-art controller.

**ASSIGNABLE ALARMS**

Four dual-level alarms, each with a deadband and one Boolean output, are assignable to a wide variety of signals, including non-control signals. High/High, High/Low, and Low/Low types; Latching, Nonlatching, and Permissive action; and Absolute, Deviation, and Rate-of-Change form are supported. Thus, virtually any alarm application is accommodated.

**EXTENDED COMPUTATIONAL CAPABILITY**

This controller performs up to three independent calculations. The variables may include the results of other calculation blocks, scaled and conditioned inputs, and other internal control signals. The operators are +, -, ÷, x, √, >, <, and ten Boolean gates. Open and close brackets are also provided for grouping variables.

An equation is entered from the keypad one character at a time following the usual rules of algebra and a few easy-to-learn rules. The result of this flexibility is exceptional computational capability in a single station controller.

**BOOLEAN LOGIC CAPABILITY**

There are five single input gates and five dual input gates. Each gate is configured by selecting the logic and then selecting the source of each input. Gates 0 through 4 are the single input gates and are configured DIRECT or NOT by the user. Gates 5 through 9 are the dual input gates and the user selects one of the following logic types for each one: OR, NOR, AND, NAND, XOR, or NXOR.

**DYNAMIC COMPENSATION**

The result of a dedicated calculation block can be passed through a dynamic compensator, prior to distribution. The dynamic compensator provides lead/lag, impulse, and dead time functions, each with its individual follow switch. Functionally, dead time precedes lead/lag and is the input to the lead/lag function.

Utilizing the dynamic compensator and the follow switches, feedforward and other complex control applications are easily and efficiently handled.

**EXPANDED SERIAL COMMUNICATIONS**

Serial communications capability is expanded to include downloading of configuration, polling of all inputs and the auxiliary output and writing as well as reading of all configurable parameters. Both loops of the single station cascade controller are accommodated. The user can also select parity, stop bits, and panel or workstation (host) priority.

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### **10 TO 50 MA INPUT/OUTPUT SIGNAL OPTION**

This option permits retrofitting an older 10 to 50 mA loop with a modern, state-of-the-art controller, while leaving all other components of the loop in place. Power is provided for one transmitter and one control output.

### **CHOICE OF HOUSING OR SHELF MOUNTING**

The 761CNA has an integral housing that can be mounted directly to a panel. The 761CSA can be installed in most Foxboro shelves with little additional hardware.

This controller is a physical substitute for H-Line, E27 Series, and even pneumatic 100-Line controllers. In the case of H-Line it is also a functional substitute for most 62H Controllers.

### **SIMPLIFIED CONFIGURATION AND OPERATION**

Because of its flexibility, this controller is easily configured to meet the most exacting process requirements. All operating functions are examined and/or changed by keystrokes. Interactive prompting simplifies setting the adjustable parameters.

From the operator's standpoint there is very little new to learn. The same familiar control concepts and terminology are used. What is new is the ease with which the various controller operations are implemented or changed, and the ease with which complete information about the process and the controller is made available, literally at the push of a button.

### **READY FOR COMPUTER COMMUNICATION**

This controller is equipped with an RS-485 serial port for communication with most host computers, either directly or via an RS-232/RS-485 converter or equivalent accessory. Utilizing the Foxboro Model F6501A converter, up to 90 controllers can be accommodated with a single host communication port.

### **COMPLETE SECURITY**

The operator has keypad access to read the values of inputs, alarm and limit settings, and the operating configuration. However, the operator can adjust only those settings which were specified as operator-adjustable when the controller was configured. A passcode must be entered from the keypad to enable adjustment of the remaining parameters.

This passcode is determined by an authorized person at the time the controller is configured. Thus, only those who have been given this passcode can change any of the protected parameters.

### **FULL-FUNCTION DISPLAY**

The front of this controller has a clear, bright, easy-to-read, anti-glare display consisting of graphics and alphanumeric characters. This enables the operator to monitor all data that is received or generated by the controller. Measurement, set-point, and output displays have their engineering units electronically displayed. See Figure 1.

If single station cascade is configured, the SEL key can be utilized to toggle (switch) between the displays of the Primary and Secondary controller.

### **COPY FEATURE**

The copy feature permits the configuration of one controller to be duplicated for use in another controller. This is accomplished utilizing two NOVRAMS (nonvolatile, random access memory modules) and a configuration copy accessory. Briefly, after turning off the power, the procedure is as follows: remove the configured NOVRAM from the controller; install the copy accessory; plug the configured NOVRAM and a second NOVRAM (to be configured) into the copy accessory; then turn on the power and the second NOVRAM is copied for use in another controller. With minimum effort, any number of controllers can thus be configured with the same parameter values as the original controller. Then individual parameters in each controller are easily changed to fit the particular loop.

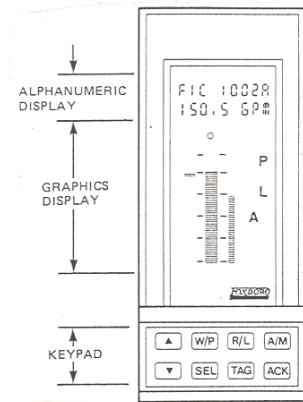


Figure 1. Front-of-Panel Functions

**FUNCTIONAL SPECIFICATIONS**

**Proportional Input Signals**

Any combination of the following proportional inputs. All signals can be characterized or combined in a variety of calculations. See table below.

Proportional Type Input Signal	Maximum Number	Details		
4 to 20 mA dc Current Input	4	4 to 20 mA dc input is standard for all shelf-mounted controllers, and for housing-mounted controllers that have 32-position terminal blocks on the rear of the housing. Inputs are across 250Ω resistors. Housing-mounted controllers that have a 30-pin socket on the rear of the housing will accept 4 to 20 mA inputs by the addition of 250Ω resistors across the input terminations. Includes 25 V dc source for powering one or two field transmitters.		
10 to 50 mA dc Current Input	4	10 to 50 mA dc input is optionally available; refer to Optional Features section. 10 to 50 mA input with 10 to 50 mA output and internal power for one field transmitter is also optionally available for the shelf-mounted versions. Refer to Model Codes section.		
1 to 5 V dc Voltage Input	4	1 to 5 V dc input is standard on all housing-mounted controllers that have a 30-pin plug socket on the rear of the housing. All other controllers will accept 1 to 5 V dc by removing the input resistors.		
Thermocouple Input (requires E93 Temperature Transmitter, or equivalent)	1	Linearization of displayed value is provided as follows:		
		Thermocouple Type J Type K Type E	Temperature Range -20 to +760°C (-4 to +1400°F) -20 to +1380°C (-4 to +2500°F) -130 to +540°C (-200 to +1000°F)	
1 to 9999 Hz Frequency Input	2	Input pulse rates, voltage levels, and field power are compatible with Foxboro E83 Series Vortex Flowmeter, and with Foxboro 81 or 82 Series Turbine Flowmeter having a preamplifier input. Input impedance is 500Ω.		
1 to 9999 Hz Pulse Up/Pulse Down Inputs	1 Pair	1 to 9999 Hz up/pulse down pair of inputs driven by external contact closure or voltage pulse. Contact closure/open times and pulse voltage pulse. Contact closure/open times and pulse voltage level are compatible with Foxboro 62HM controller.		
Resistance Temperature Detector (RTD) Input	1	Platinum, per IEC 100 or SAMA* 100 (RC 21-4) temperature curves. Linearization of displayed value is provided, as follows:		
			IEC 100	SAMA 100
		Range	-200 to +850°C (-330 to +1560 F)	-200 to + 600°C (-330 to +1100°F)
Span	110 to 1000°C (200 to 1800 F)	110 to 800°C (200 to 1440°F)		

\*Scientific Apparatus Makers Association

## FUNCTIONAL SPECIFICATION (Cont.)

### Output Signals

#### TWO NONISOLATED ANALOG OUTPUTS

Control output and auxiliary output.

- Control: 4 to 20 mA into 500 $\Omega$  maximum. (Isolated 4 to 20 mA output and nonisolated or isolated 10 to 50 mA output into 660 $\Omega$  maximum available as options.)
- Auxiliary: 1 to 5 V dc into 2 k $\Omega$  minimum. Can be used for measurement, set point, control, or conditioned input signals.

#### TWO DISCRETE OUTPUTS

Two nonisolated open collector transistor (NPN) switch outputs. For status indication of A/M, R/L, W/P, and alarms, or can be configured as the destination for any two of the Boolean Gate Inputs. Contact ratings are 50 V dc maximum, 250 mA maximum. Leakage current is 100  $\mu$ A maximum.

### Discrete Input Signals

Two nonisolated contact or transistor switch inputs, 5 V dc nominal open circuit voltage, 1 mA maximum current. For remote status changes such as A/M, R/L, W/P, EXT ACK, and tracking functions.

### Control Functions

Within this controller are two interconnected controllers with individual built-in options that can be configured. Thus, the 761 Series is an advanced single station cascade controller. The Secondary controller can be disabled to provide a single controller having the functions of the Primary.

#### PRIMARY CONTROLLER

Standard algorithms are P, I, PD, PI, PID, and EXACT control. The following options may be configured: nonlinear extender, ratio, measurement and set point tracking, output tracking, remote/local set point, output multiplication or summing, external reset, external limits for output, and simple batch control.

#### SECONDARY CONTROLLER

This controller is enabled by configuring CASCADE in the user interface menu. The standard algorithms are P and PI. Ratio and external limits for output are configurable options.

### Other Control Functions

- Nonlinear Extender to PID
- Input bias, gain, and output bias available for every input.
- Characterizers (two available, 10 and 15 segments, assignable).
- Boolean Gate Logic {DIRECT and NOT (single input); OR, NOR, AND, NAND, XOR, and NXOR (dual input); 18 function switches. Inputs selectable from contact inputs, alarm output states, status indicator outputs, EXACT state, gate outputs, and three fixed states.}
- Signal Conditioning (square, square root, characterizer).

### Alarms

Four dual-level alarms, each with a dead band and one Boolean output are available. Each alarm is configurable for Absolute, Deviation, Rate-of-Change, High/Low, High/High, Low/Low, Latching, Nonlatching, or Permissive. Each alarm can be configured to act on any one of a number of user-selected points.

- The alarm status is indicated by a combination of alphanumeric display, the bar graphs, an alarm symbol, and the contact outputs.
- The alarm dead band is adjustable between 0 and 100% of span.

### Calculations

There are three calculation functions, designated CALC 1, CALC 2, and CALC 3. The variables in each calculation can be any combination of direct inputs to the controller, configured constants, and results of other calculation blocks. The available operators are +, -,  $\div$ , x,  $\sqrt{\quad}$ , >, <, and ten Boolean gates. Open and close brackets are also available for grouping variables.

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**FUNCTIONAL SPECIFICATION (Cont.)**
**Dynamic Compensation**

The result of CALC 3 may be passed through the dynamic compensator function prior to distribution. This block provides lead/lag, impulse, and dead time functions, each with its individual follow switch. Functionally, dead time precedes lead/lag and is the input to the lead/lag function. Dead time allows the input to be delayed by a configured time before making it available at the output. The lead/lag function allows the output to dynamically lead or lag the input by a configured time. Both functions can be enabled or by-passed selectively utilizing the follow switches.

The impulse can be positive, negative, or bi-polar and is part of the lead/lag function.

**ADJUSTMENT LIMITS***Dead Time*

0 and 200 minutes

*Lead/Lag Time*

0 and 200 minutes

**Execution Rate**

Ten times per second. May be five times per second for some complex configurations.

**Memory**

All configuration and operating parameters are stored in a nonvolatile memory. Should a power failure occur, essential control settings and last operating conditions are saved indefinitely. No batteries are used.

**Control Mode Limits****PROPORTIONAL BAND**

1 and 8000%

**INTEGRAL**

0.01 and 200 minutes per repeat

**DERIVATIVE**

0 and 100 minutes

**RATIO**

0 and 5

**Input Filter**

Second order Butterworth filter. Adjustment time: 0 to 10 minutes.

**Signal Distribution**

Twenty-five signals are available for internal routing. These are the conditioned and scaled inputs, unconditioned inputs, control inputs and outputs, and calculation results.

**Front Panel**

This controller can be configured and operated entirely from the front panel without any external equipment. Using the keypad and the display, complete process information can be read and all controller settings can be changed. See Figure 1. The front panel consists of the following:

- An alphanumeric display having two lines of nine characters each, a graphics display of three 50-segment bar graphs, an alarm symbol, and status indicators.
- The displays are highly-visible fluorescent. The numerical quantities have a resolution of  $\pm 0.1\%$  of upper range value. The bar graphs have a resolution of  $\pm 2\%$  of span.
- A keypad having eight keys. Keys must be pressed for a minimum of 0.2 seconds. Switches are normally-open contacts, closing to a common lead.

**Environmental Operating Limits****TEMPERATURE**

5 and 50°C and (40 and 120°F)

**RELATIVE HUMIDITY**

5 and 95%

**Supply Voltage**

As specified; fused.

**ac SUPPLY VOLTAGE**

24, 100, 120, 220 or 240 V; all +10, -15%, 47 to 63 hz, at 30 VA maximum

**dc SUPPLY VOLTAGE**

24 V +20, -10%, at 1 A maximum

**Transmitter Power Supply**

Nominal 25 V dc power supply with a 250 $\Omega$  limiting resistor at each transmitter connection. Provides field power for two 4 to 20 mA transmitters. (Nominal 65 V dc power supply for one transmitter available with 10 to 50 mA input/output signal option).

**Toggle Mode**

Configuring the TOGGLE mode allows a user to toggle (switch) between a menu level and the normal front panel display and back to the same menu level utilizing the TAG key.

## PERFORMANCE SPECIFICATIONS

### Accuracy at Numeric Display

In percent of span, unless otherwise noted. Refer to table below.

Parameter	Accuracy
Set Point	
Local	±0.1%
Remote	±0.1%
Ratio	±0.1%
Input	
Analog	±0.1%
Frequency	±0.1%
RTD	±0.5°C
Output	
Valve	±0.5%
Retransmitted (linear)	±0.25%
Linearization	
RTD	±0.5°C
Thermocouple	±0.5°C
Control Modes	
Prop. Band	±5% of indication
Integral	±5% of indication (setting $\geq$ 0.1 min)
Derivative	±5 s(setting < 0.1 min)
Alarm Settings	
Absolute	±0.1%
Deviation	±0.1%
Rate-of-Change	±0.1%
Calculations	±0.1%

### Resolution

#### DISPLAY

±0.1% of upper range value

#### BARGRAPH

±2% of upper range value

### Ambient Temperature Effect

Maximum error in percent of span, except as noted, for a 30°C (55°F) change in temperature within normal operating limits. See table below.

Parameter	Maximum Error
Set Point	
Local	±0.1%
Remote	±0.5%
Input	
Analog	±0.5%
Frequency	±0.2%
RTD	±0.5°C
Output	
Valve	±0.5%
Retransmitted	±0.5%

### Humidity Effect

Maximum error in any conversion, calculation, or setting is ±0.1% of span for a change from reference conditions to 95% R.H. at 30°C (85°F) wet bulb.

### Frequency Response

Analog input to output conversion is flat to 3 Hz.

### Output Noise

0.25% maximum, peak-to-peak.

### Supply Voltage Effect

±0.1% of span (maximum) for a +10% or -15% change in ac voltage within normal operating conditions; or a +20% or -10% change in dc voltage within normal operating conditions.

## PHYSICAL SPECIFICATIONS

### Signal Connections (on rear panel)

#### 761CNA (HOUSING MOUNTING)

- 32-position terminal block, with compression terminals, for wire sizes up to 2.5 mm (14 AWG), or
- 30-pin socket for use with a 2AK or 2AKQ SPEC 200 cable.

#### 761CSA (SHELF MOUNTING)

- 30-pin socket for use in 202S Shelf with 32-position terminal block and cord set. Terminal block has compression terminals for wire sizes up to 2.5 mm<sup>2</sup> (14 AWG).
- 20-pin socket for retrofit use in all Foxboro shelves using 20-position terminal block and cord set.

### Power Connections (on rear panel)

#### 761CNA (HOUSING MOUNTING)

3-position terminal strip with 8-32 screw connections.

#### 761CSA (SHELF MOUNTING)

3-position power cord connector.

### Mounting

#### 761CNA

Controller with integral housing is mounted to a panel. Refer to Dimensions-Nominal section.

#### 761CSA

Mounts in a 202S Series Shelf; or with retrofit installations, in EH, 101, or 102 Series Shelves.

### Approximate Mass

4.5 kg (10 lb)

**PRODUCT SAFETY SPECIFICATIONS**

**Electrical Classification**

<b>Testing Laboratory, Types of Protection, and Area Classification</b>	<b>Conditions of Certification</b>	<b>Electrical Safety Design Code</b>
<b>CSA</b> certified for use in Ordinary Locations.	Panel-mounted controllers without a housing are not approved.	CS-E/CG-A
<b>CSA</b> certified for Class I, Groups A, B, C, and D, Division 2.	10 to 50 mA options and panel-mounted controllers without a housing are not approved. Temperature Class T6.	CS-E/CN-A
<b>FM</b> certified for use in Ordinary Locations.	10 to 50 mA options are Foxboro certified only. See below.	CS-E/FG-A
<b>FM</b> certified for Class I, Groups A, B, C, and D, Division 2.	10 to 50 mA options are not approved. Temperature Class T6.	CS-E/FN-A
<b>Foxboro</b> certified for use in Ordinary Locations.	Controllers with 10 to 50 mA input and output options.	CS-E/XG-F

**MODEL CODE - 761CNA**

<b>Description</b>	<b>Model</b>
SINGLE STATION MICRO Controller, Housing Mounting	761CNA
<b>Nominal Supply Voltage and Frequency</b>	
120 V ac, 50/60 Hz	-A
20 V ac, 50/60 Hz	-B
240 V ac, 50/60 Hz	-C
24 V dc	-D
24 V ac, 50/60 Hz	-E
100 V ac, 50/60 Hz	-J
<b>Housing and Signal Connections</b>	
32-Position Terminal Block on Rear of Housing. Standard 4 to 20 mA dc Input(a,b)	T
30-Pin Plug Socket on Rear of Housing. Standard 1 to 5 V dc Input(c)	C
Controller Chassis without Housing	W
<b>Optional Features</b>	
Isolated Output Signal (Output Number 1 only)	1
RTD Input (Input Number 1 only)	2

(a) 10 to 50 mA dc input. Specify AS Code SIG.

(b) Will accept 1 to 5 V dc input by removing input resistor.

(c) Will accept 4 to 20 mA dc or 10 to 50 mA dc, respectively, by addition of 250Ω or 100Ω voltage dropping resistors at input terminations.



## MODEL CODE - 761CSA

<u>Description</u>	<u>Model</u>
SINGLE STATION MICRO Controller, Shelf Mounting, Standard 4 to 20 mA dc Input(a)	761CSA
<b><u>Signal Connector</u></b>	
20-Pin Signal Connector, Quick Disconnect	-2
30-Pin Signal Connector, Quick Disconnect	-3
<b><u>Nominal Supply Voltage and Frequency</u></b>	
120 V ac, 50/60 Hz	-A
220 V ac, 50/60 Hz	-B
220 V ac, 50/60 Hz	-C
240 V ac, 50/60 Hz	-D
24 V dc. Not available with 10 to 50 mA dc Input/Output Signal Option, Code 3.	-E
24 V ac, 50/60 Hz. Not available with 10 to 50 mA Input/Output Signal Option, Code 3.	-J
100 V ac, 50/60 Hz	
<b><u>Optional Features</u></b>	
Isolated Output Signal (Output Number 1 only)	1
RTD Input (Input Number 1 only). Not available with 20-pin Signal Connector, Code -2.	2
10 to 50 mA dc Input/Output Signal	3

(a) Will accept 1 to 5 V dc input by removing input resistor.

## ACCESSORIES

**Configuration Copy Accessory**

All of the operating configuration is stored in a NOVRAM. The copy accessory permits the entire contents of the memory module to be quickly copied to another NOVRAM, either a spare or one from another controller. Specify Part Number K0143DV for the copy accessory, and Part Number K0141LA for a spare NOVRAM.

**Replacement Shelf Signal Connector Assembly**

For installing shelf-mounted controllers with 30-pin signal connector (Code -3) into existing 102, 202, and EH Series Shelves. Connector set assembly includes plug, cable, and terminal block. Specify Part Number K0143CG for 4 to 20 mA inputs and outputs; or Part Number K0143EF for 10 to 50 mA self-powered inputs and 4 to 20 mA outputs. When ordering this accessory, a replacement power cord is also required (see Replacement Power Cord section).

**Replacement Power Cord**

Required when ordering a Replacement Shelf Signal Connector Assembly. Available with power plug at each end (plug type) with power plug on one end with a long extension, or with power plug on one end with a short extension type. See table below.

<b>Power Cord Type</b>	<b>Approximate Length</b>	<b>Part Number</b>
Plug Type (Plug at each end)	1.2 m (4 ft)	N0139CA
Long Extension Type (Plug on one end)	5.6 m (18.5 ft)	N0139CB
Short Extension Type (Plug on one end)	1.2 m (4 ft)	N0139TZ

**Guide for EH Series Shelves**

A snap-in, plastic guide must be added to EH Series Shelves, between instruments, when installing 761CSA Controllers. Specify Part Number K0143CF.

**ACCESSORIES (Cont.)**

**Panel Cutout Adapter Bezels**

For 761CNA Controllers only. Used when replacing E Series Housing-Mounted Electronic CONSOTROL Control Stations and 54 Series Pneumatic CONSOTROL Control Stations with 761CNA Controllers. Two bezels are required for each panel cutout. See table below.

To Replace	Bezel Part Number	Quantity Required
E-3 Single Unit Electronic Housing with one 761CNA	K0143DG	2
E-6 Double Unit Electronic Housing or 54 Series Pneumatic CONSOTROL Control Station with two 761CNA's	K0143DH	2
E-9 Triple Unit Electronic Housing with two 761CNA's	K0143DJ	2
E-9 Triple Unit Electronic Housing with three 761CNA's. Width of existing cutout must be increased by 13 mm (0.5 in)	K0143DK	2

**Computer Based Training Package**

Consists of a software program that operates on any IBM-compatible personal computer that has a 256K RAM (minimum) and MS-DOS 2.0 release. The package includes a keyboard overlay so that designated keys on the computer clone the function of the controller front panel keyboard. Specify Part Number L0121AA.

**OPTIONAL FEATURES**

**10 to 50 mA dc Input**

10 to 50 mA dc input is optionally available for controllers with a 32-position terminal block on the rear of the housing (761CNA-□T). The output signals are 4 to 20 mA dc for control and 1 to 5 V dc for the auxiliary output with this Optional Feature. Specify Auxiliary Specification (AS) Code SIG.

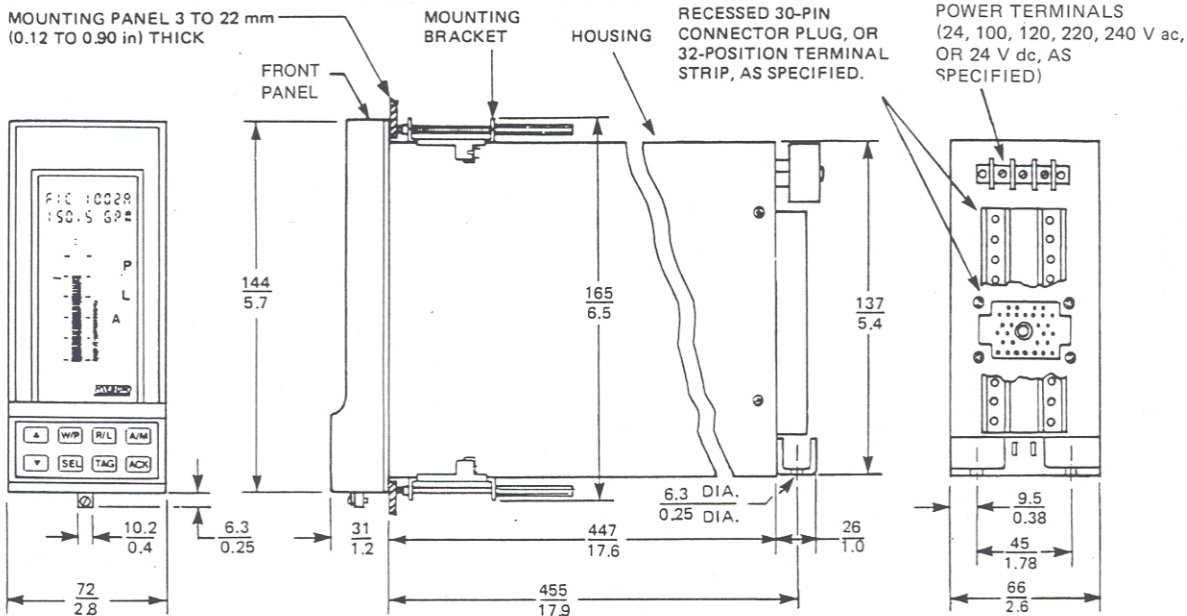
**Surge Suppressor**

A surge suppressor is optionally available for use with serial communication input when external wiring is located near transient producing sources such as meters, solenoids, high voltages, etc. Specify AS Code SURSUP.

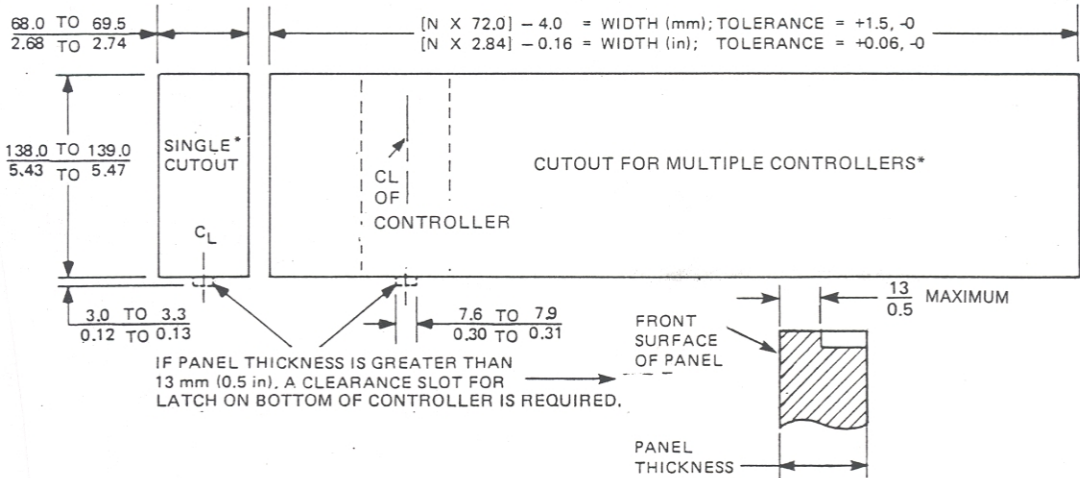
DIMENSIONS--NOMINAL

mm  
in

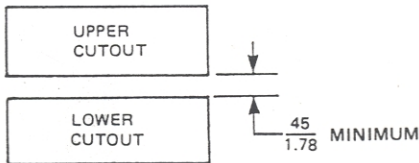
760CNA CONTROLLER – HOUSING MOUNTING



PANEL CUTOUT DIMENSIONS



\*IF PANEL HAS MORE THAN ONE CUTOUT, ALLOW 45 mm (1.78 in) VERTICAL DISTANCE BETWEEN CUTOUTS AS SHOWN BELOW. THIS PROVIDES 36 mm (1.4 in) SPACING BETWEEN CONTROLLERS.



**DIMENSIONS – NOMINAL (Cont.)**  
**761CSA CONTROLLER--SHELF MOUNTING**  
**FOR 761CSA SHELF DIMENSIONS,**  
**REFER TO APPLICABLE DIMENSIONAL PRINT IN TABLE BELOW.**

<b>For Shelf Model</b>	<b>Use Dimensional Print</b>
EH	DP 018-510
101	DP 017-441
102	DP 017-410
202S	DP 202-100

**ORDERING INSTRUCTIONS**

1. Model Number
2. Optional Features
3. Accessories
4. Customer Tag Data

**NOTE**

For 761CSA (Shelf-Mounted Controller), refer to GS 2A-12A1 A, GS 2B-12B1 B, GS 2B-12B1 A, and PSS 2E-2A1 C for shelves and cord sets for the EH, 101, 102, and 202S Shelves, respectively.

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