

740C Series

Digital, Circular Chart, Recording Controllers

The 740C Microprocessor-Based Recording Controller provides continuous trending for up to four inputs on a nominal 12-inch round chart. The instrument receives inputs from a thermocouple, RTD, mV, V, or mA sources, and provides one or two loops of PID control with, or without EXACT® Control. An integral 40-character digital display sequentially indicates the instantaneous value of each input. At the user's discretion, the unit may be configured to display selected functions and inputs, or continuously display one function or input. A multi-function, internally mounted keypad is provided for configuration and operational control. Numerous options are also offered to enhance the recording controller's capability.

FEATURES

- Display and retransmission output accuracy of 0.1% of input span, and recording accuracy of 0.25% of input span.
- EXACT control for one or both controllers (U.S. Patent RE 33267).
- Input Isolation; digital calibration of input signal conditioning and pen positioning.
- Auto/manual operation with adjustable manual output and bumpless, balanceless transfer between modes.
- Remote/local set point, with remote signal selectable from any recorder pen channel, remote set point bias.
- INC-INC or INC-DEC control action.
- Keyboard and contact input control over auto/manual, and remote/local modes.
- Single or duplex 4 to 20 mA or relay outputs per controller loop.
- Up to four pens for trending. any trend pen may also be used for event oriented applications.
- Logic equation actuated events to control various recording controller functions.
- Brilliant, 2-Line (20 Character/Line), dot matrix electronic display with a neutral density filter.
- Assignable Absolute, Rate of Change, or Deadband Alarms; four alarms/channel - up to six channels.
- Configuration and calibration information stored in nonvolatile, nonbattery-backed memory.
- Selectable power mains operation for worldwide voltages and frequency.
- Four independent timers for logic or event-driven activities.
- Certified by CSA for use in general purpose (ordinary) locations.
- Menu-driven prompts; configuration parameters are password protected; external programming device not required.
- Security time-coded chart provides evidence that chart position has (or has not) been changed from the installed position.
- NEMA 4 enclosure is standard with panel and surface mounted controllers; and NEMA 4X is standard with pipe-mounted controllers.
- Optional tamper-evident design conforms to dairy industry FDA regulations. Optional door lock prevents unauthorized access to instrument.
- Other options, including calculated variables; ramp generator; isolated field power for up to four remote-mounted 2-wire transmitters; polycarbonate user interface and chart windows; up to four totalizers with remote totalizer outputs; 2, 4, 6, or 8 relay outputs; 1, 2, 3, or 4 to 20 mA retransmission outputs; 8 or 16 contact inputs; NEMA 4X enclosure and NEMA 4X pipe mounting kit.



GENERAL DESCRIPTION

This 4-pen digital, circular chart, recording controller (Figure 1) consists of a swing-out platen that supports the writing mechanism, display, and keypad. The platen is hinged to the enclosure, and provides easy access to the controller electronics by simply swinging out the platen. A molded polyester door with glass, or optional plastic windows, provides NEMA 4 protection. A NEMA 4X enclosure is optionally available for use where corrosive atmospheres might be expected.

The instrument uses a nominal 12-inch diameter chart paper, fiber-tip pens, a digital display consisting of two lines of dot-matrix characters, and a keypad for data entry and operation. All keypad access can be switch enabled or disabled. Essential configuration parameters are pass-code protected.

OPERATOR CONTROLS

With the front door open, the recording controller can be configured from the front panel using keys located on both sides of, and below, the digital display. The keypad is a tactile membrane type with a plastic switch panel. See Figure 1 and Table 1.

DIGITAL DISPLAY SYSTEM

An alphanumeric display provides a sequential or channel-selected digital indication of the channel readings, and provides the operator interface for configuration. See Figure 1.

Alarm Indication

Each Alarm has its own character position within a channel display. The universal bell symbol is provided to indicate an alarm condition on any display.

Display Type

Blue-Green, Vacuum-Fluorescent Display.

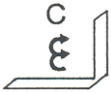




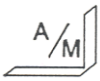


Display Format

Two lines of 20 characters, each character defined using a 5 x 7 dot matrix.

EXACT CONTROL

The Foxboro patented EXACT algorithm 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.

Table 1. Keypad Description

Nomenclature on Key	Usage of Multi-Functional Keys
	<ul style="list-style-type: none"> • Clears Operator Entry, Moves Up and Out of Alternate Modes. • Restarts Display cycle in Run Mode.
	<ul style="list-style-type: none"> • Stops Display Cycle in Run Mode. • Enters Value or Selection.
	<ul style="list-style-type: none"> • Enters Operator Mode. • Moves Cursor to the Next Digit Position.
	<ul style="list-style-type: none"> • Enters Configuration Mode. • Advances to Next Menu Display.
	<ul style="list-style-type: none"> • Change Set Point Status between Remote and Local. Arrows to Right of R/L Key Ramp Set Point only in Local.
	<ul style="list-style-type: none"> • Change Output Status between Auto and Manual. Arrow to right of A/M Key Ramp Output only in Manual.
	<ul style="list-style-type: none"> • Increments Digit and Changes the Choices in Menu.
	<ul style="list-style-type: none"> • Decrements Digit and Changes the Choices in Menu.

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.

This field-proven tool is on the job 24 hours a day, and it can be turned on or off at the keypad.

Process upsets do occur, but with EXACT control, the product quality need not suffer.

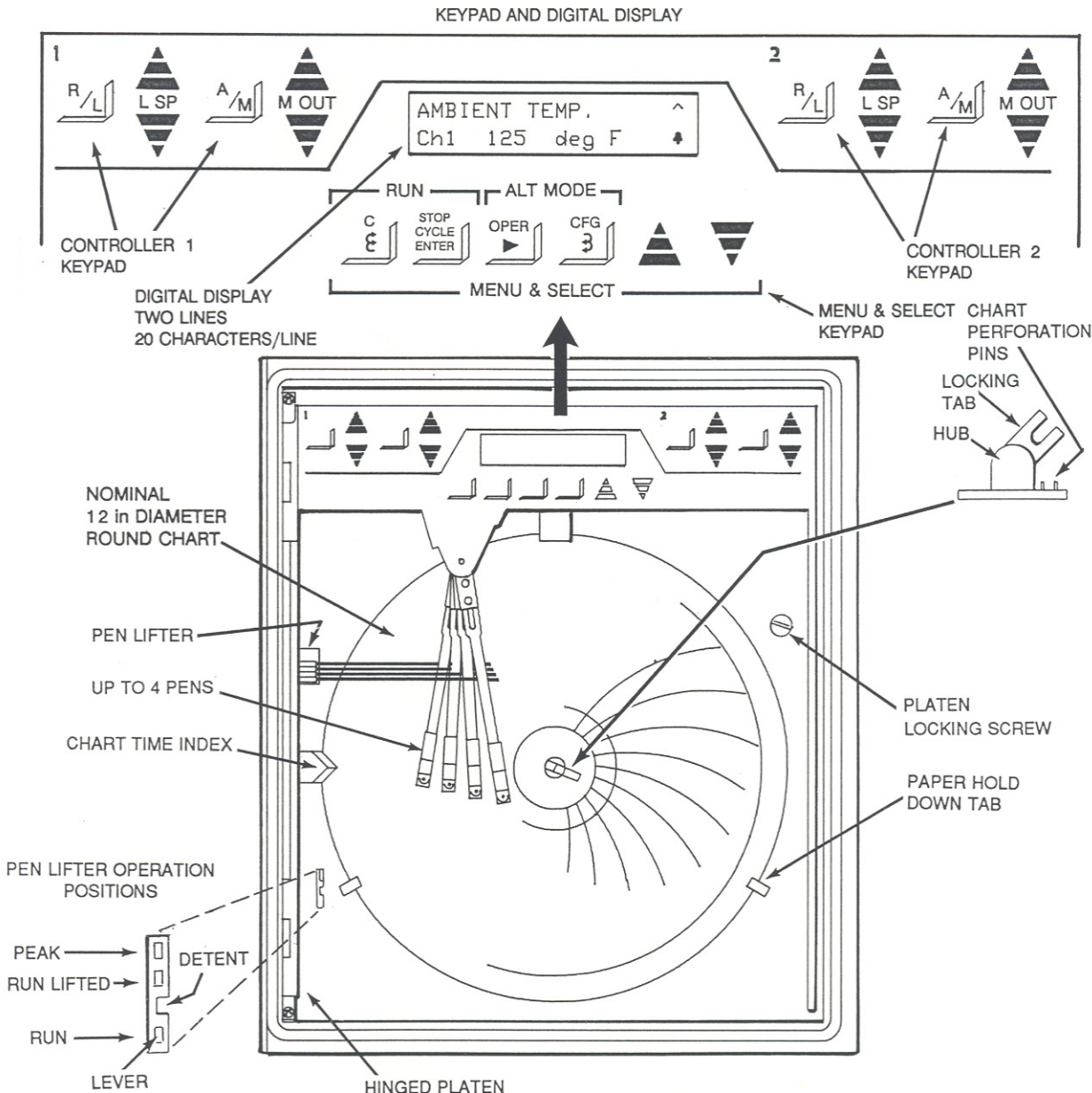


Figure 1. Controller with Front Door Removed

CONTROLLER SYSTEM

A Proportional-Integral-Derivative (PID) controller is provided with or without EXACT Control, as specified. The specifications for this system are as follows;

Proportional Band

1.0 to 2000%

Integral

0.01 to 999.9 min/repeat (0.0 = Off)

Derivative

0.0 to 99.99 min (0.0 = Off)

Ratio Gain

0.00 to 10.00

CHART DRIVE SYSTEM

Electronic Speed Selection

Configurable; incremental speeds from 1 to 4096 hours per revolution.

Chart Drive

Synchronous ac stepper motor with fixed reduction gear box.

Chart Size

Nominal 12-inch Round Chart.

Chart Installation

Two holes automatically punched in chart when installed. Guarantees reinstallation of same chart in identical position.

Chart Scale

Per Foxboro Chart Catalog 600.

WRITING SYSTEM

Number of Pens

1, 2, 3, or 4 Pens.

Type of Recording

Continuous Line.

Pen Type

Disposable Fiber-Tip Pen.

Pen Description

Red pen represents time line and is innermost pen; Violet pen is second, after the red pen; Green pen is third, after the violet pen; and Blue pen is the fourth and outermost pen.

Pen Drive

Stepper motor via anti-backlash linkage and reduction gear box with integral, resistive type feedback.

Minimum Response Time

(For a 10 to 90% Step) 5 seconds, typical.

ALARMS

The recording controller provides programmable alarms and event processing. Input channels (1 to 4) plus the calculated channels (5 and 6) each have four programmable alarm set points available. Alarms are self-clearing (nonlatchable). Alarm specifications are as follows:

Alarm Types

High, low, deadband, rate of change (rising or falling).

Number of Alarm Set Points

Twenty-four alarm set points (four per input channel, four per calculated variables channel).

Set Point Range

ABSOLUTE AND DEVIATION

Engineering units per configured range.

RATE OF CHANGE

Engineering units of configured range per unit time configured.

Alarm Relays

2, 4, 6, or 8 dry contact outputs are optionally available; rated at 30 W dc or 60 VA ac maximum, or 260 V ac maximum.

Hysteresis

Adjustable.

TIMERS

Four independent elapsed-time timers are provided for controlling logic or event-driven activities. Each timer starts (is reset) on command from an internal trigger. Action equation trigger codes can also be set to actuate the timer. The timer output can be set to "Off" or "Periodic". When in "Periodic", it functions as a repeating interval timer. The time duration can be set between 1 and 999 999 999 minutes.

OPERATING AND STORAGE CONDITIONS

Influence	Reference Operating Conditions	Normal Operating Condition Limits	Operative Limits	Storage and Transportation Limits
Ambient Temperature	25 ±1° C (77 ±2° F)	0 and 50° C (32 and 122° F)	0 and +50° C (32 and +122° F)	-20 and +75° C (-4 and +167° F)
Relative Humidity	50 +10%	5 and 95% (noncondensing)	5 and 95%	0 and 95%
Supply Voltage	120 V ac 220/240 ±2 V ac	90 and 132 V ac 180 and 264 V ac	90 and 132 V ac 180 and 264 V ac	Not Applicable
Supply Frequency	50 ±3.0 Hz 60 ±3.0 Hz	45 and 65 Hz	45 and 65 Hz	Not Applicable
Vibration and Shock	Negligible	Vibration from 20 to 200 Hz at an acceleration of 5 m/s ² (0.5 "g") can cause a ±4% pen shift; no effect on display readings.		With the instrument in its packing container, the instrument will <u>not</u> sustain damage when subjected to: <ul style="list-style-type: none"> • Vibration of 4 Hz at 10 m/s² (1 "g") for one hour • Ten 76 mm (30 in) drops

PERFORMANCE SPECIFICATIONS

(At Reference Operating Conditions unless otherwise specified)

Accuracy - Display

±0.1% of Input Span.

Accuracy - Recording

±0.25% of Input Span.

Accuracy - Retransmission Output

±0.1% of Span.

Repeatability - Display

0.02% of Span.

Resolution - Display

0.01% of Full Scale.

Input Resolution

0.01% of Operating Span
2 µV on 20 mV Span
6 µV on 60 mV Span
8 µV on 80 mV Span
20 µV on 200 mV Span
40 µV on 400 mV Span
170 µV on 1.7 V Span
500 µV on 5.0 V Span

Supply Voltage Effect

Less than 0.025% of span within ±10% of Reference Operating Supply Voltage.

Supply Frequency Effect

Less than 0.025% of span between 45 and 65 Hz.

Ambient Temperature Effect - Resistance Converter

SPAN ERROR

Less than 0.5% of span per 50° C (90° F) change in temperature.

ZERO ERROR

Less than 0.1% of span per 50° C (90° F) change in temperature.

Ambient Temperature Effect - Thermocouple/mV Converter

SPAN ERROR

Less than 0.5% of span per 50° C (90° F) change in temperature.

ZERO ERROR

Less than 0.1% of span per 50° C (90° F) change in temperature.

REFERENCE JUNCTION ERROR

±1° C (±1.8° F).

REFERENCE JUNCTION TRACKING ERROR

±1° C between 0 and 50° C

(±1.8° F between 32 and 122° F)

ac Power Interruptions Effect

No effect up to 150 ms

FUNCTIONAL SPECIFICATIONS

Number of Inputs

1, 2, 3, or 4.

Input Signal Types

TC, RTD, mA dc, mV dc, or V dc.

Thermocouple (TC) Types

ISA or ANSI Base Metal Types T, J, E, C, L, K, N, Ni-NiMo; and Platinum Metal Types R, S, and B.

Resistance Temperature Detector (RTD) Types

ANSI or IEC Calibration, 100 Ω Platinum RTD, 10 Ω Copper RTD, 100 Ω and 120 Ω Nickel RTD.

Input Signal Ranges

(See Table Below)

Input Signal Range	Comments
-4 to +20 mV -12 to +60 mV -16 to +80 mV -40 to +200 mV -80 to +400 mV -0.34 to +1.7 V -0.50 to +2.5 V -1.0 to +5.0 V	Field Configurable; includes TC and RTD Input Signals.
Greater than 0 to 5.0 V dc through 0 to 100 V dc	Field Configurable; Requires External Resistor, Divides 100:1, 1 MΩ
4 to 20 mA dc, or other mA dc	Field Configurable; Uses a 250 Ω Precision Shunt Resistor.

Thermocouple Burnout Detection

TC BURNOUT DETECTION RESPONSE TIME

35 s, maximum

LEAD WIRE ZERO ERROR DUE TO TC

BURNOUT DETECTION CIRCUIT

500 mA, downscale or upscale indication.

RTD Excitation Current

0.5 mA ±20%

Channel Isolation

All channels electrically isolated to 250 V from each other, line, and earth (ground).

Retransmission Outputs

4 to 20 mA into 0 to 600 ohms

Standard Linearizations Provided

Square root, Power 3/2 and 5/2, and Log 10.

Resistance Converter Lead Wire

10Ω maximum per lead.

Temperature Ranges - TC's and RTD's

Sensor Type	Temperature Range	
	Minimum	Maximum
Thermocouples		
ANSI Type T	-190° C (-310° F)	400° C (752° F)
ANSI Type L	-200° C (-328° F)	900° C (1652° F)
ANSI Type E	-260° C (-436° F)	1000° C (1832° F)
ANSI Type J	-190° C (-310° F)	1200° C (2192° F)
ANSI Type N	-200° C (-328° F)	1300° C (2372° F)
Ni-NiMo	-18° C (-3.6° F)	1305° C (2381° F)
ANSI Type K	-210° C (-346° F)	1370° C (2498° F)
ANSI Type R	-50° C (-58° F)	1760° C (3200° F)
ANSI Type S	-50° C (-58° F)	1760° C (3200° F)
ANSI Type B	200° C (392° F)	1820° C (3308° F)
ANSI Type C	0° C (32° F)	2300° C (4172° F)
RTD's		
Cu 10Ω	-74° C (-101° F)	138° C (262° F)
Ni 100Ω	-40° C (-40° F)	200° C (392° F)
Ni 120Ω	-70° C (-94° F)	320° C (608° F)
Pt 100Ω, ANSI	-180° C (-292° F)	800° C (1472° F)
Pt 100Ω, DIN	-220° C (-36° F)	850° C (1562° F)

Power Supply

LINE VOLTAGES

90 to 132 V ac or 180 to 264 V ac, as specified.

LINE FREQUENCY

45 to 65 Hz

POWER RATING

30 W maximum

MEMORY BACKUP

0.1 Farad storage capacity provides three day backup of active values, such as Totalizer readings.

Input Impedance (for Voltage Inputs Only)

FOR 5 V dc OR LESS

20 MΩ minimum

FOR GREATER THAN 5 V dc

> 25 kΩ/V, minimum

mV or TC Converter Input Resistance

WITHOUT BURNOUT

Greater than 20 MΩ

WITH BURNOUT ACTIVE

20 MΩ

FUNCTIONAL SPECIFICATIONS (Cont.)**Cold Junction Compensation**

±1° C from 0 to 50° C
±1.8° F from 32 to 122° F

Common Mode Rejection

140 dB minimum at 50 or 60 Hz.

Normal Mode Rejection

50 dB minimum at 50 or 60 Hz.

Sample Rate

Two samples per second on each channel.

Radio Frequency Interference (RFI) Susceptibility

10 V/m, from 20 to 1000 MHz. Maximum shift of -3% provided signal and power leads are brought in by separate metal conduit.

Electrostatic Discharge Withstand (per IEC 801-2)

8 kV minimum at operator accessible surfaces.

Surge Withstand Capability (per ANSI/IEEE 37.90A-1978)

2.5 kV to mains, no effect.

High Frequency Transients (per IEC 801-4)

4 kV to mains for survival;
2 kV to mains for no effect (Level II)
500 V to signal, no effect (Level I).

Lightning Transients (per ANSI/IEEE C.62.41-1980)

2 kV to mains, no effect.

PHYSICAL SPECIFICATIONS**Enclosure (Case and Door)**

Polyester sheet molding compound, ultraviolet stabilized.

PLATEN

Polyphenylene oxide resin (Noryl FN-215).

DOOR WINDOW

Standard window is shatterproof glass. See Optional Features section for ultraviolet, stabilized, polycarbonate window.

Flammability Rating

The enclosure meets Type V-0 of UL 94. (Underwriter Laboratory Incorporated Standard for Test Flammability of Plastic Materials, UL 94.)

Environmental Protection

The overall enclosure construction is weatherproof and dusttight as defined for NEMA Type 4. See Optional Features section for NEMA Type 4X enclosure.

Dimensions

See Dimensions-Nominal section.

Approximate Mass

8.2 kg (18 lb)

Mounting

A parts kit is provided for mounting the recorder on a surface, or flush in a panel up to 16 mm (0.6 in) thick. Optionally, a separate parts kit (rated NEMA 4X) is offered for those users mounting the recorder to a 50 mm (2 in) diameter pipe.

Electrical Connections

Two nominal 22 mm (0.875 in) diameter holes are provided in the bottom surface of the enclosure for a nominal 20 mm (CEE 23), P616, or 1/2 in conduit fitting, one each for power and measurement. Six additional 22 mm (0.875 in) diameter holes are available as "knockouts".

Physical Orientation

Recorder designed for operation while in the vertical position, but it may also be operated in the horizontal, face up position (or any intermediate angle between the vertical and face up position).

ELECTRICAL SAFETY SPECIFICATIONS

Testing Laboratory, Type of Protection, and Area Classification	Electrical Certification Specification
CUL certified for use in General Purpose, Ordinary Locations	CS-E/CUL1
CUL certified nonincendive, Ex n, Zone 2, Division 2 locations	CS-E/CUL2

OPTIONS AND ACCESSORIES
28 V dc Transmitter Power Supply

This 28 V dc, 22 mA supply provides isolated field power outputs for up to four remote, 2-wire transmitters. Select Model Code Optional Suffix -A.

Calculated Variables and Custom—Curve

This software option provides two additional recording channels (5 and 6), and allows the user to select a computational function from a fixed set of equations. The user can configure up to nine calculated variable functions. The functions are split into two basic categories: simple mathematics functions and specialized processing functions (see below). Select Model Code Optional Selection -B.

Simple Mathematic Functions Provided

- Addition, Subtraction, Multiplication, Division
- Linear Scaling, Polynomial Scaling, Log 10, and Power of 10
- High Select, Low Select
- High Peak, Low Peak
- Single Point Average

Specialized Processing Functions Provided

- Pressure and Temperature Compensated Flow Equations
- Relative Humidity, from Wet and Dry Temperature Readings
- Sterilization Constant (F_0)
- Zirconia Oxide Oxygen Probe

Tamper Evident Feature

This option provides a platen screw which permits the installation of a tamper evident seal. This design conforms to U.S. Food and Drug Administration (FDA) and 3A Committee practice. Select Model Code Optional Suffix -K.

NEMA 4X Enclosure

This option (standard with pipe mounted units) provides the environmental and corrosion resistant protection required when the recorder is subjected to corrosive atmospheres. Select Model Code Optional Suffix -L.

Polycarbonate Door Windows

The standard glass chart and user interface windows on the front door are replaced with ultraviolet stabilized, polycarbonate (Lexan) windows. Select Model Code Optional Suffix -M.

Pipe Mounting Kit

A kit of parts (ANSI Type 304 stainless steel) providing the environmental protection of NEMA Type 4X is offered to allow mounting of the Recorder to a nominal 50 mm (2 in) diameter pipe. Select Model Code Optional Suffix -N.

Integral Totalizer

This option provides up to four totalizers (one per channel). Each can be configured to totalize a measurement channel or a calculated variable channel. The Totalizers are not alarmable. The Totalizer may be the inventory type (nonresettable), or the resettable type.

Each totalized value may be read on the alphanumeric display, one at a time. The totalized value is displayed as a 9-digit integer value. A scaled internal trigger is available to activate a counter (relay) output.

The Totalizer can be configured to operate in one of the following modes: Continuous, Preset Up, or Preset Down.

Each Totalizer requires entry of the following parameters:

- Source Channel and Type (or Mode)
- High Cutoff in Engineering Units
- Low Cutoff in Engineering Units
- Totalization Factor
- Preset Value
- Reset Logic Equation
- Hold Logic Equation
- Counter Output Enable

This option must be selected if Remote Totalizer Output option is selected. Select Model Code Optional Suffix -C, -D, -E, or -F, for one, two, three or four totalizers, respectively.

Contact Inputs

This option provides a selection of either 8 or 16 contact inputs. These contact inputs are used to remotely switch auto/manual and remote/local set point, to reset and hold programmed set points, and to reset totalizers. Select Model Code Optional Suffix -U or -V for 8 or 16 contact inputs, respectively.

Relay Output

Two, four, six, or eight dry contact relay outputs can be provided, rated at 30 W dc or 60 VA ac maximum, 260 V ac maximum. Must be selected when Remote Totalizer Output option is selected. Select Model Code Optional Suffix -Q, -R, -S, or -T for two, four, six, or eight relay outputs, respectively.

Remote Totalizer Output

A totalizer and at least one relay output must be selected for each Remote Totalizer Output selected. Select Model Code Optional Suffix -1, -2, -3, or -4 for one, two, three, or four outputs, respectively.

OPTIONS AND ACCESSORIES (Cont.)

Ramp Generator

The option generates a pre-programmed profile. The pre-programmed profile is called a Recipe. The user selects all the variables using time versus values to create the recipe. The 740 may have up to 4 recipes per instrument. Each recipe may have upto 20 segments. Up to 8 event outputs may be programmed per recipe. Contact inputs may be used to initiate a ramp profile. Select Model Code Optional Suffix -G.

Retransmission Outputs

The retransmission output option allows the user to scale and retransmit any one of the following values as an analog 4 to 20 mA output:

- Channel Engineering Unit Values
- Calculated Variable Engineering Unit Values
- Controller Output

The retransmitted outputs are fully isolated from inputs and from the serial communications link. Specify Model Code Optional Suffix -5, -6, -7, or -8 for one, two, three, or four 4 to 20 mA outputs, respectively.

Door Lock

This option provides a key operated lock in the door handle. Specify AS Reference Code DRS-A.

Blind Door

This option eliminates the chart window for nonrecording and indicate only applications. Specify AS Reference Code DRS-B.

Replacement Fiber Tip Pens

These replacement pens are provided in a package of two in a sealed, foil pack. Specify the part number listed in the table below.

Description	Part No.
Red, Number One Pen, Inner Position	L0122AR
Violet, Number Two Pen, Second Position	L0122BP
Green, Number Three Pen, Third Position	L0122CG
Blue, Number Four Pen, Outer Position	L0122DB

MODEL CODE

Description	Model
Digital, Circular Chart Recording Controller	740CA
Nominal Supply Voltage and Frequency	
120 V ac, 50/60 Hz	-A
240 V ac, 50/60 Hz	-C
Input Channel 1	
0 to 20 mV dc through 0 to 5 V dc, with Pens, RTD and TC (a)	1
Greater than 0 to 5 V dc through 0 to 100 V dc, with Pens (a)	2
4 to 20 mA dc, with Pens (a)	3
0 to 20 mV dc through 0 to 5 V dc, without Pens, RTD, and TC (a)	6
Greater than 0 to 5 V dc through 0 to 100 V dc, without Pens (a)	7
4 to 20 mA dc, without Pens (a)	8
Input Channel 2	
None	0
0 to 20 mV dc through 0 to 5 V dc, with Pens, RTD and TC (a)	1
Greater than 0 to 5 V dc through 0 to 100 V dc, with Pens (a)	2
4 to 20 mA dc, with Pens(a)	3
0 to 20 mV dc through 0 to 5 V dc, without Pens, RTD, and TC (a)	6
Greater than 0 to 5 V dc through 0 to 100 V dc, without Pens (a)	7
4 to 20 mA dc, without Pens (a)	8
Input Channel 3 (b)	
None	0
0 to 20 mV dc through 0 to 5 V dc, with Pens, RTD and TC (a)	1
Greater than 0 to 5 V dc through 0 to 100 V dc, with Pens (a)	2
4 to 20 mA dc, with Pens(a)	3
0 to 20 mV dc through 0 to 5 V dc, without Pens, RTD, and TC (a)	6
Greater than 0 to 5 V dc through 0 to 100 V dc, without Pens (a)	7
4 to 20 mA dc, without Pens (a)	8

Model Code continued on next page

MODEL CODE (Continued)

Description (Continued)	Model
Input Channel 4 (b)	
None	0
0 to 20 mV dc through 0 to 5 V dc, with Pens, RTD and TC (a)	1
Greater than 0 to 5 V dc through 0 to 100 V dc, with Pens (a)	2
4 to 20 mA dc, with Pens (a)	3
0 to 20 mV dc through 0 to 5 V dc, without Pens, RTD, and TC (a)	6
Greater than 0 to 5 V dc through 0 to 100 V dc, without Pens (a)	7
4 to 20 mA dc, without Pens (a)	8
Control Type	
One PID without EXACT Tuning	A
One PID with EXACT Tuning	B
Two PIDs without EXACT Tuning	C
Two PIDs, one with EXACT Tuning	D
Two PIDs, both with EXACT Tuning	E
Output Type (See Table 2)	
Single 4 to 20 mA Output for one Controller (not with Control Types C, D, and E)	A
Duplex 4 to 20 mA Outputs for one Controller (not with Control Types C, D, and E)	B
Two Single 4 to 20 mA Outputs for two Controllers (not with Control Types A and B)	C
Two Duplex 4 to 20 mA Outputs for two Controllers (not with Control Types A and B)	D
Single 4 to 20 mA Output for one Controller, and Duplex 4 to 20 mA Output for second Controller (not with Control Types A and B)	E
Single Time Duration, Relay Output for one Controller	F
Duplex Time Duration, Relay Outputs for One Controller	G
Two Single Time Duration, Relay Outputs for two Controllers	H
Two Duplex Time Duration Relay Outputs for two Controllers	I
Single Time Duration, Relay Output for one Controller, and Duplex Time Duration, Relay Output for second Controller	J
Optional Selections	
28 V dc Transmitter Power Supply	-A
Calculated Variables and Custom Curve	-B
Select one option below only:	
One Integral Totalizer (One input Channel)	-C
Two Integral Totalizer (Two Input Channels)	-D
Three Integral Totalizers (Three Input Channels)	-E
Four Integral Totalizers (Four Input Channels)	-F
Dual Ramp Generators	-G
Tamper Evident Feature	-K
Select one option below only:	
NEMA 4X Enclosure(c)	-L
Polycarbonate Door Windows	-M
Pipe Mounting (NEMA 4X)(c)	-N
Select one option below only: (d)	
Two Relay Outputs	-Q
Four Relay Output	-R
Six Relay Outputs	-S
Eight Relay Outputs	-T
Select one option below only: (d)	
Eight Contact Inputs	-U
Sixteen Contact Inputs	-V
Select one option below only:	
One Remote Totalizer Output (e)	-1
Two Remote Totalizer Outputs (e)	-2
Three Remote Totalizer Outputs (e)	-3
Four Remote Totalizer Outputs (e)	-4

Model Code continued on next page

MODEL CODE (Continued)

Description (Continued)	Model
Optional Selections (Cont.)	
Select one option below only: (d)(f)	
One 4 to 20 mA Retransmission Output	-5
Two 4 to 20 mA Retransmission Outputs	-6
Three 4 to 20 mA Retransmission Outputs	-7
Four 4 to 20 mA Retransmission Outputs	-8
Examples: 740RA-A1110; 740RA-C1113-BK; 740RA-A1100-LDR2	

(a) Operating ranges are field configurable.

(b) Input channels must be specified sequentially. Specify Input Code 0 if previous channel selection is Code 0.

(c) NEMA 4X is standard with pipe mounting Code -N.

(d) The availability of Relay Output, Contact Input, and Retransmission Output Options is space dependent and therefore contingent upon previously selected functions. The instrument accommodates a maximum of three function PWA's with each PWA loaded as shown in Table 2 below.

(e) Input channels must be specified sequentially. Specify Input Code 0 if previous channel selection is Code 0.

(f) A totalizer must be selected for each totalizer output selected.

Table 2. PWA Functions and Capacity

Number of PWAs Required	Selected Function
1	One or Two Single 4 to 20 mA Control Outputs
1	One or Two 4 to 20 mA Retransmission Outputs
1	Each Duplex 4 to 20 mA Control Output
1	Two or Four Relay Outputs
1	Eight Contact Inputs plus One or Two Single 4 to 20 mA Control or Retransmission Outputs
1	Eight Contact Inputs plus One Duplex 4 to 20 mA Control Output

Table 3. 4 to 20 mA Outputs

Output Type Code	Maximum Number of Retransmission Outputs	Output Type Code	Maximum Number of Retransmission Outputs
A	3	D	0
B	2	E	1
C	2	F through J	4

ORDERING INSTRUCTIONS

1. Model Number
2. Charts and Chart Range (see Note)
3. Electrical Certification Specifications
4. AS Code and Part Numbers from Options/Accessories section.
5. Customer Tag Data

NOTE

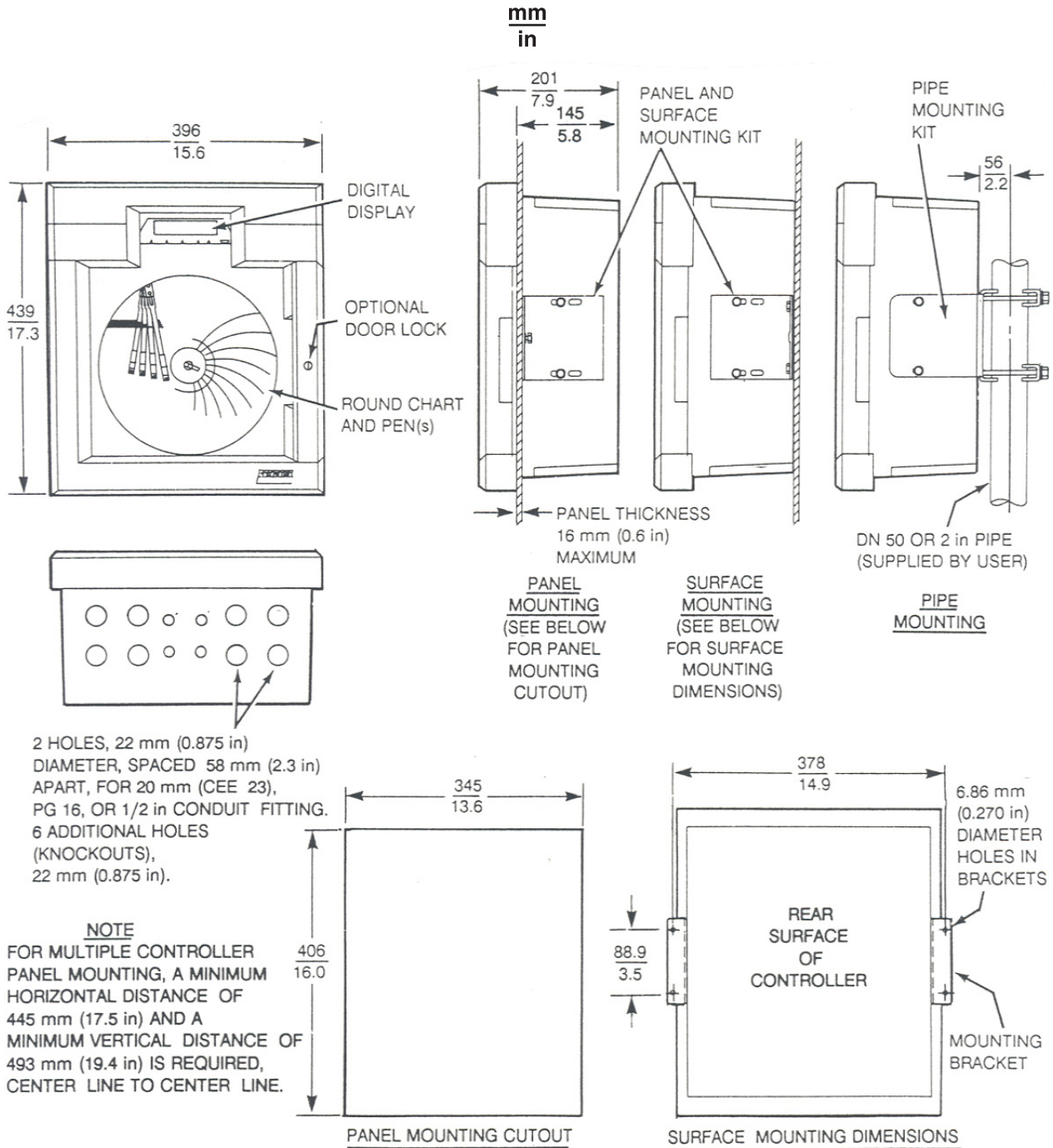
Approximately 10 complimentary 24-hour charts with 0-100% graduations are supplied with the recorder. For additional charts, specify the charts and range required from Foxboro Chart and Dial Catalog 600.

OTHER M&I PRODUCTS

Invensys Foxboro provides a broad range of measurement and instrument products, including solutions for pressure, flow, analytical, positioners, temperature, controlling and recording. For a listing of these offerings, visit the Invensys Foxboro web site at:

www.foxboro.com/instrumentation

DIMENSIONS – NOMINAL



33 Commercial Street
Foxboro, MA 02035-2099
United States of America
www.foxboro.com
Inside U.S.: 1-866-746-6477
Outside U.S.: 1-508-549-2424
or contact your local Foxboro representative.
Facsimile: 1-508-549-4999

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