K1 Series 250 mm Strip Chart Recorders

K1 Series Recorder and Data Logger
10 inch (250 mm) Continuous, Multipoint and Videographics

- *Tracing and/or Data Logging*
- *Extensive Event Capabilities*
- *Longer Descriptor Tags*
- *Easy Function Block Software*
- *Chart Illumination*

optional   optional

This feature rich recorder/data logger provides unmatched event capabilities at competitive price levels.

Optional Features

- RS-485 Communications
- Two Levels of Math Capability
- CE, CSA and Certified Calibration

- Memory Card Data Storage
- *"Secret 'til Lit"* Keyboard

Introduction

Barber-Colman K1 Series Strip Chart Recorders are available with a wide range of features to meet virtually every need. From the two point model K1C continuous trace recorder to the model K1G videographic recorder with 96 inputs, these units represent an unrivaled means of data acquisition and process recording. The models offered in the K1 Series include:

K1C   10" continuous trace with digital display
K1M   10" multipoint trace with digital display
K1G   10" multipoint trace with graphic display
K1P   Paperless – electronic record in 10" frame with graphic display

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Ordering Information

MODEL K 1 ☐ ☐ - ☐ ☐ ☐ ☐ ☐ - 0 ☐ ☐ - ☐ - ☐ ☐
Field No. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Fields 1, through 3. BASE MODEL

K1C - 10" continuous trace with digital display
K1M - 10" multipoint trace with digital display
K1G - 10" multipoint trace with graphic display
K1P - 10" paperless – graphic display only

Field 4. NUMBER OF PENS

0 - Multipoint (K1M or K1G) or paperless (K1P)
Model K1C
1 - One trace pen with annotating pen
2 - Two trace pens with annotating pen
3 - Three trace pens with annotating pen
4 - Four trace pens with annotating pen

Field 5. UNIVERSAL INPUTS*

(Eight inputs per card. Model K1C must use 1, 2, or 3)
0 - None   4 - Four cards
1 - One card   5 - Five cards
2 - Two cards   6 - Six cards
3 - Three cards   7 - Seven cards

Field 6. TWO WIRE DC INPUTS*

(16 inputs per card. Not available on Model K1C)
0 - None   4 - Four cards
1 - One card   5 - Five cards
2 - Two cards   6 - Six cards

Fields 7. LINE VOLTAGE AND MOUNTING

0 - 90 to 130 Vac, 50/60 Hz, panelmount
1 - 90 to 130 Vac, 50/60 Hz, bench stand/handle
2 - 190 to 260 Vac, 50/60 Hz, panelmount
3 - 190 to 260 Vac, 50/60 Hz, bench stand/handle

Field 8. RELAY OUTPUTS*

(Eight outputs per card)
0 - None
1 - One card
2 - Two cards
3 - Three cards
4 - Four cards
5 - Five cards
6 - Six cards
7 - Seven cards

Field 9. 250 Ω SHUNTS

0 - None   5 - Five
1 - One   6 - Six
2 - Two   7 - Seven
3 - Three   8 - Eight
4 - Four   9 - Nine
Order additional shunts separately: part no. CA042K25.

Field 10. RESERVED

Field 11. MATH

0 - None
1 - Level 1
2 - Level 2
3 - Totalizers, timers, counters
4 - Level 1, plus totalizers, timers, counters
5 - Level 2, plus totalizers, timers, counters
6 - Continuous emissions monitor (CEM)

Field 12. MEMORY CARD

0 - None
1 - Reader only
2 - Reader and 128K card
3 - Reader and 512K card
4 - Reader and 2M card

Field 13. COMMUNICATIONS, CONFIGURATION AND ARCHIVING

0 - None
1 - RS-232/422/485 Communications
2 - PC configuration software
3 - ASCII data logging (product data)
4 - RS-232/422/485 and PC configuration software
5 - RS-232/422/485 and ASCII data logging
6 - PC configuration software and ASCII data logging
7 - RS-232/422/485 and PC configuration software, and ASCII data logging

Field 14. "SECRET 'TIL LIT" KEYBOARD

0 - No
1 - Yes

Field 15. SPECIALS

0 - None
1 - Certified calibration
3 - Pen offset compensation
5 - Certified calibration and pen offset compensation
Model K1M only
6 - CSA
7 - Certified calibration and CSA
8 - Pen offset compensation and CSA
9 - Certified calibration, pen offset compensation, and CSA

* Cannot exceed combined total of seven relay and input cards; or six DC input cards only.

Recorders

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Specifications

Recorder

General:	**Input board types:**	8 channel universal input; 16 channel DC input
	Output board type:	8 channel relay output
	Maximum number of I/O boards per type:	7 off 8 channel input, 7 off relay output
		6 off 16 channel input
	Maximum number of inputs:	96 DC (V, mV, mA, T/C, contact closure, but not resistance);
		56 resistance; 78 contact closure
	Maximum number of relay outputs:	8 times number of free slots
	Maximum number of traced channels:	45 total input/derived
Single Board Computer Memory Size:	**AH243487U200, Type 2:**	128 K RAM + 32 kb EEPROM
	AH243748U300, Type 3:	256 K RAM + 64 kb EEPROM
Environmental:	**Performance:**	To BS2011: 1981
	Temperature limits, operating:	0 to 50 °C
	Temperature limits, storage:	-20 to 70 °C
	Humidity, operating/storage:	5 to 85% rh, non-condensing
	Protection:	IP54 (door and bezel); IP31 (housing)
	Shock:	IEC348: 1978 (safety); IEC 873: 1986
	Vibration:	IEC348: 1978 (safety); IEC 873: 1986
		also recovers from 2g peak at 10 to 150 Hz
Electromagnetic Compatibility (EMC):	**Static:**	IEC801.2: 15 KV (door open)
	RF emissions:	To EN 55022 level B
	Fast transients:	IEC 801.4; level 2: less than 40 μV deviation; level 3: self recovery
	RF immunity:	IEC 801.3 less than 40μV deviation
	Electrical safety:	To IEC 348: 1978 Class 1
Physical:	**Bezel size (mm; inches in parenthesis):**	288 H x 360 W x 53 D (11.34 x 14.18 x 2.08)
	Panel cutout size (mm; inches in parenthesis):	273.5 x 348, +1.4, -0 (10.76 x 13.70)
	Depth behind bezel rear face:	450 mm with rear cover (17.72");
		410 mm no rear cover (16.15")
	Weight (8 channel instrument):	20 kg. maximum (44.2 pounds)
	Panel mounting angle:	Up to ±30° from vertical
Performance:	**Maximum scan and update rate:**	All parameters in one second
	Maximum print rate (trending):	45 channels per second
	Maximum chart speed:	1500 mm/hr
	Clock accuracy:	Better than 50 ppm/day
Printing System	**Type:**	14 pin dot matrix printhead with six color disposable ribbon cartridge (red, orange, green, blue violet black)
	Ribbon life:	Greater than 5 million dots per color. 1 million black text characters
	Pin diameter:	0.35 mm
	Dot spacing (vertical):	chart speed less than 300 mm/hr: 0.083 mm
		chart speed 600 mm/hr: 0.17 mm
		chart speed 1200 mm/hr: 0.33 mm
		chart speed 1500 mm/hr: 0.42 mm

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Specifications (continued)

	Dot spacing (horizontal):	0.40 mm
	Characters per line:	104
	Noise level:	55 dbA maximum (door closed)
	Maximum print rate:	45 channels per second (trending)
Paper Transport:	**Type:**	Tractor feed, selectable chart speed from 1 to 1500 mm/hr (0.4 to 60"/hr)
	Chart length:	22 meters (z-fold depth 75 mm); 32 meters (roll)
	Chart width:	274.5 mm overall; 250 mm calibrated
	Chart visible length:	155 mm
	Resolution (horizontal):	±0.2 mm
	Pen to paper accuracy:	0.25% of calibrated chart width
	Transport accuracy:	Better than 10 mm in 32 meters
Power Requirements:	**Line voltage (45 to 65 Hz.):**	90 to 132 V or 180 to 264 V (user selectable)
	Maximum power:	120 W
	Fuse type:	Ceramic 20 mm 3.15 Amps; fast blow
	Interrupt protection:	100 ms at 60% load
	Memory Protection:	EEPR0M for configuration; battery backed RAM for operating features
	Battery type:	Nickel-Cadmium (rechargeable)
	Charge Time (no power to recorder):	Three months minimum at 25°C; one month minimum at 50°C

Universal 8 Channel Input Board

General:	**Number of inputs:**	Eight
	Termination:	Edge connector/terminal block
	Input types:	Vdc, mVdc, mAdc (with shunt), T/C, RTD (2 or 3 wire), Ω, contact closure
	Input type mix:	Software selected on configuration for each channel
	Measurement frequency:	All channels in one second
	Step response to within resolution:	Two seconds
	Noise rejection, common mode:	150 db above 45 Hz channel to channel and channel to grd
	Noise rejection, series mode:	67 db above 45 Hz
	Maximum common mode voltage:	250 Vac
	Maximum series mode voltage:	20 mVdc at lowest range; 500 mVdc peak at highest range
	Isolation (DC to 65 Hz; IEC 348):	250 volts channel to channel and channel to ground
	Dielectric strength:	1500 Vac for one minute channel to channel and channel to ground
	Insulation resistance:	50 MΩ at 500 Vdc
	Input impedance:	Greater than 10 MΩ
	Over voltage protection:	60 volts peak, 500 volts through 50 KΩ resistor
	Open circuit detection (to 200 mV range):	100 nA current maximum; eight seconds recognition time (maximum); 40 MΩ minimum break resistance

Recorders

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Specifications (continued)

DC Input

Ranges:	-10 to 40 mVdc; -50 to 200 mVdc; -500 mVdc to 1 Vdc; -5 to 10 Vdc
Temperature performance (typical):	0.0001% of range + 70 ppm of reading per °C
Shunt:	Externally mounted resistor modules
Additional error due to shunt:	0.1%
Typical performance in instrument at 20°C:	

Range	Resolution	Performance
-10 to 40 mV	1.2 μV	0.09% reading + 0.01% range
-50 to 200 mV	6.0 μV	0.08% reading +0.009% range
-0.5 to 1V	36 μV	0.08% reading + 0.008% range
-5 to 10 V	360 μV	0.08% reading + 0.007% range

Thermocouple Data

Linearization errors:	0.15°C or better
Bias current:	12 nA (40 nA at 70°C)
Cold Junction (CJ) types (selectable):	Off, internal, external, remote
CJ error:	0.5°C or better
CJ rejection ratio:	25:1 minimum
Remote CJ:	Via user selected input channel
Upscale/downscale drive:	Configurable for each channel

T/C Type	Range (°C)	Standard
B	200 to 1800	IEC584.1: 1977 Hoskins
C	0 to 2300	IEC584.1: 1977 Hoskins
E	-200 to 1000	IEC584.1: 1977
J	-200 to 1200	IEC584.1: 1977
K	-200 to 1370	IEC584.1: 1977
L	-200 to 900	DIN 43710
N	-200 to 1300	IEC584.1: 1977
R	-50 to 1760	IEC584.1: 1977
S	-50 to 1760	IEC584.1: 1977
T	-250 to 400	IEC584.1: 1977
U	-100 to 600	DIN 43710-85
NiNiMo	0 to 1300	Chessell
Platinel II	-100 to 1300	Engelhard R83

Recorders

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Specifications (continued)

Three Wire RTD

Linearizations:	Pt100, Pt1000, Cu10, Ni100, Ni120
Linearization errors:	0.012°C or better
Influence of lead resistance:	<u>error:</u> 0.15% of lead resistance
	<u>mismatch:</u> 1 Ω per ohm

RTD Type	Range (°C)	Standard
Pt100	-200 to 850	IEC751: 1981
PT1000	-200 to 850	Based on IEC751: 1981
Cu10	-20 to 250	General Electric
Ni100	-50 to 170	DIN 43760
Ni120	-50 to 170	Based on DIN 43760

Typical Pt100 figures:

Range (°C)	Resolution (°C)	Performance
-200 to 200	0.032	0.1% reading +0.15°C
-200 to >1000	0.19	0.1% reading + 0.74°C

Ohms ranges: 0 to 180 Ω; 0 to 1.8 kΩ; 0 to 10.0 kΩ
Temperature performance: (8 ppm range + 75 ppm reading) per °C (typ)

Range	Lead Resistance	Resolution (mΩ)	Performance (at 20°C)
0 to 180 Ω	10 Ω	12.5	0.1% reading + 0.04% range
0 to 1.8 kΩ	10 Ω	75	0.1% reading + 0.02 % range
0 to 10.0 kΩ	10 Ω	750	0.1% reading + 0.06% range

Other linearizations: $\sqrt{value}$; $(value)^{3/2}$; $(value)^{5/2}$
User defined tables (up to 3 off)

Contact Closure (switch) Inputs:

Type:	Volt-free contact
Wetting voltage:	5 volts
Minimum latched pulse width:	10 ms.
De-bounce:	inherent 1 second

16 Channel DC Input Board

General

Number of inputs:	16
Termination:	Edge connector/terminal block
Input types:	Vdc, mVdc, mAdc (with shunt), T/C, contact closure (not channels 1, 8, 16)
Input type mix:	Software selected on configuration for each channel; maximum of eight different linearizations (seven + linear) allowed per board
Measurement frequency:	All channels in one second
Step response:	1.5 seconds

Recorders

Specifications (continued)

	Noise rejection, common mode:	150 db above 45 Hz (channel to channel and channel to grd)
	Noise rejection, series mode:	Greater than 60 db between 10 to 100 Hz
	Maximum series mode voltage:	Hardware range + 15 mVdc
	Safety isolation (IEC348):	250 volts channel to channel and channel to ground
	Dielectric strength:	1500 Vac continuous (channel to channel and channel to ground)
	Input impedance:	Greater than 10 MΩ
	Over voltage protection:	60 volts peak, 500 Vdc through 50 KΩ resistor
	Open circuit detection (85 mV range only):	250 nAdc current maximum; eight seconds recognition time (maximum); 40 MΩ minimum break resistance
	Damping:	2, 4, 8, 16, 32, 64, 128 or 256 seconds time constant as configured. Damping improves o/p noise and performance figures listed in table below.

DC Input

	Ranges:	-15 to 85 mVdc; -1.0 to 5 Vdc
	Temperature performance (typical):	0.01% of reading ±0.1 µV per °C
	Shunt:	Externally mounted resistor modules
	Additional error due to shunt:	0.1%
	Typical performance in instrument at 20°C:	

Thermocouple Data

Range	O/P Noise	Performance
-15 to 85 mVdc	±6 µVdc	0.1% reading ±6 µVdc
-1 to 5 Vdc	±200 µVdc	0.1% reading ±200 µVdc

(in addition to above):

	Linearization errors:	0.15 °C or better
	Bias current:	Less than 2 nAdc (less than 40 nAdc at 70 °C)
	Cold Junction (CJ) types (selectable):	Off, internal, external, remote
	CJ error:	1 °C or better
	CJ rejection ratio:	25:1 minimum
	Remote CJ:	Via user selected input channel
	Upscale drive:	Configurable for each channel

Recorders

Specifications (continued)

T/C Type	Range (˚C)	Standard
B	200 to 1800	IEC584.1: 1977 Hoskins
C	0 to 2300	IEC584.1: 1977 Hoskins
E	-200 to 1000	IEC584.1: 1977
J	-200 to 1200	IEC584.1: 1977
K	-200 to 1370	IEC584.1: 1977
L	-200 to 900	DIN 43710
N	-200 to 1300	IEC584.1: 1977
R	-50 to 1760	IEC584.1: 1977
S	-50 to 1760	IEC584.1: 1977
T	-250 to 400	IEC584.1: 1977
U	-100 to 600	DIN 43710-85
NiNiMo	0 to 1300	Chessell
Platinel II	-100 to 1300	Engelhard R83

Other linearizations: $\sqrt{value}$; $(value)^{3/2}$; $(value)^{5/2}$
User defined tables (up to 3 off)

Contact Closure (switch) Inputs (not available for channels 1, 8, 16):

Type:	Volt-free contact
Wetting voltage:	5 volts
Minimum latched pulse width:	18 ms.
De-bounce:	inherent 1 second

Relay Output Board:

Number of relays per board:	Eight
Contact format:	Single pole changeover (single set of common, normally open, and normally closed contacts)
Estimated life at 60 VA load:	1,000,000 operations
Maximum contact voltage*:	250 Vac
Maximum contact current*:	Make: 8 Amps; continuous: 3 Amps; break: 2 Amps
Maximum switchable power*:	60 Watts or 500 VA
Isolation:	250 Vac channel to channel and channel to ground
Dielectric strength:	1000 Vac for one minute contact to contact
	1500 Vac for 1 minute channel to channel/channel to ground

* With resistive load; derate with reactive or inductive load

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Features

Continuous or Multipoint Trace: Model K1C can be equipped with up to four independent pens, each of which will provide a continuous trace of a single input, and each in a different color.

Model K1M is equipped with a traversing printhead and can be configured to dot trace as many as 45 inputs from a maximum field of 96 inputs. The printhead contains six different colored pens – each associated with user programmable inputs – so that traces can be easily separated and distinguished.

In addition to time, date and chart speed notations, the K1C and K1M recorder can be configured to tag each trace, print the channel scale and print the state of alarm. In addition, the recorder will print the name, descriptor and value for all channels, as well as custom messages.

K1C, K1M Display: The two line, 80 character vacuum fluorescent display shows up to four channel values simultaneously, or two channels with full descriptor and engineering units.

Video Graphics: The color video graphics offering is available in 10" frames – Models K1G and K1P. Model K1G features paper back-up for documentation support upon alarm conditions.

The videographic models feature a sophisticated, touch sensitive graphics screen using the common hierarchical-oriented software structure found on the continuous and multipoint units. All of this means simple, one time learning for all Barber-Colman recorders.

The recorder displays process values and alarm conditions through group structures. Values can be displayed by groups, bargraphs, trend display or multi-group display. Each method provides unique features, allowing you to enhance the look of your equipment.

Printing Systems: Model K1G contains a high speed color printer that allows you to print on alarm, or on demand. In addition, stored process data can be recalled and printed. Model K1P provides complete paperless operation.

K1G, K1P Display: The high resolution, color, liquid crystal display (LCD) with its touch sensitive capability allows the user to switch from screen to screen without the reliability problems typically associated with mechanical switches.

Inputs: Each model will accept any combination of thermocouple, RTD, Vdc, mAdc, or contact closure signals. Furthermore, any channel can be assigned as a digital input. Linearization of all common thermocouples is built-in. A shunt resistor is required for each mAdc input. Accuracy is rated 0.1% or better at 20 °C. All channels are updated every second.

Configuration: Configuration is password protected and follows clear English prompts. PC software is available to configure the recorder via a built-in connector, memory card or the optional communications port.

Alarms: Up to four alarms per channel can be configured as absolute high, absolute low, deviation in, deviation out, rising or falling rate of change, or digital change of state. All alarm setpoints are scanned every second.

For absolute and deviation types, a hysteresis value can be configured to prevent continuous triggering of the alarm if the process variable hovers near the setpoint (or threshold). A "dwell" period can be configured in all types of alarms to delay the alarm becoming active after it has been triggered. If the value goes out of alarm during the dwell time, the alarm is ignored.

Alarms can be used to initiate a wide range of jobs, including operating output relays.

Recorders

Features (continued)

Alarm Action:

The four types of alarm are as follows:

Off: The alarm is disabled.

Trigger: Once active, the alarm stays active until the alarm source returns to a non-alarm state. Any continuous job – e.g., change print mode – will remain active for the duration of the alarm state. Trigger alarms are not annunciated in any way (no bell symbol displayed; no message printed) and do not appear in history lists.

Latching: Once active, the alarm stays active until it is acknowledged *and* the alarm source has returned to a non-alarm state. Any continuous job will remain active for the duration of the alarm state.

Non-latching: Once active, the alarm stays active until the alarm source returns to a non-alarm state. Any continuous job will remain active for the duration of the alarm state
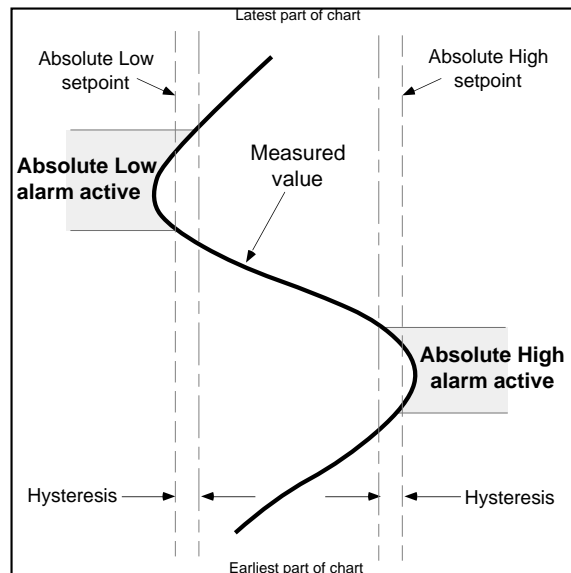
An absolute high alarm becomes active when its setpoint value is exceeded. The alarm remains active until the measured value falls below setpoint minus hysteresis.

An absolute low alarm becomes active when its setpoint is exceeded in the negative sense. It remains active until the value rises above setpoint plus hysteresis.
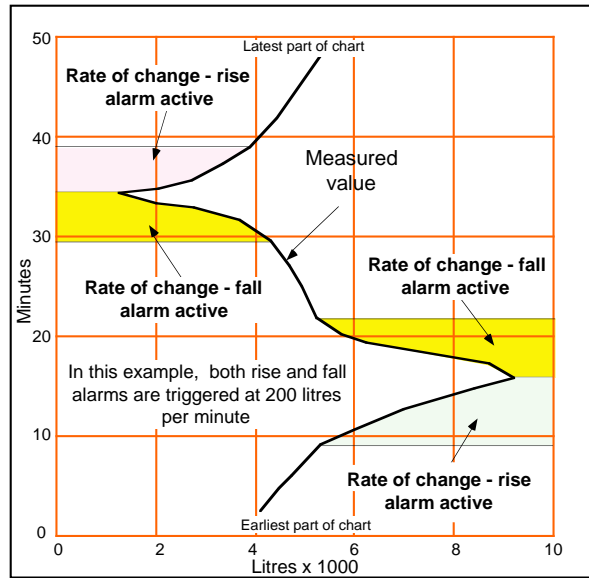
Absolute Alarm Definitions
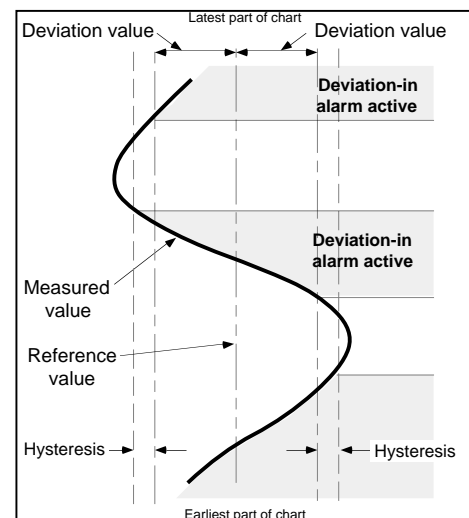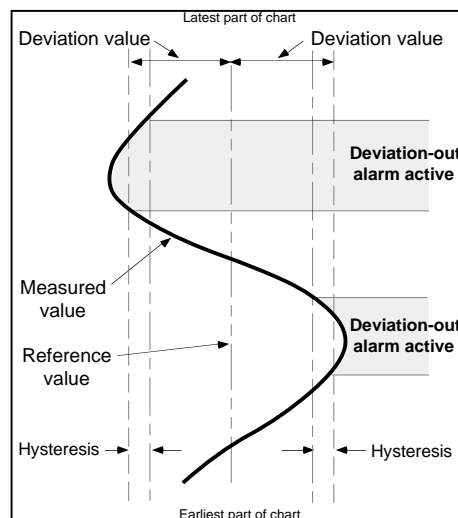
Deviation Alarm Definitions

Recorders

Features (continued)

Rate of Change Alarm Definitions

With rate of change alarms, a value, a time period, and an averaging period must be configured. The alarm is triggered if the measured value changes by more than the configured value in less than the configured time period. The averaging period is used to change the sensitivity of the alarm, such that noise spikes, or normal oscillations in the input signal do not trigger false alarms.

Status Indicators: System error indicators flash if any of the items listed below are true. Current system errors can be viewed via the operator menu or instrument configuration menu.

- Chart is used up or missing
- Fault with remote CJ temperature
- Battery is exhausted or missing
- Failure in RTC, or time/date have not been set
- Fault in the writing system
- Fault in an input or derived channel
- Battery-backed RAM failure or EEPROM failure
- Instrument cycle time has been exceeded
- Memory card battery low or exhausted

Jobs: A job is defined as an action that can be initiated by an alarm. You can configure jobs to be active continuously while the initiating source is active (or inactive), e.g., select chart speed B; or to carry out a particular task, e.g., increment totalizer number 3, as the result of a single trigger going active or inactive. Up to two jobs can be initiated by each trigger. Job triggers and possible job actions are listed below:

Job triggers: channel alarm; contact closure i/p; counter setpoint; totalizer setpoint; timer trigger; operator softkeys; instrument alarm.

Job types	Possible job actions:
Chart jobs:	Switch chart drive on; switch to chart speed B; switch to print mode B; chart advance.
Trace jobs:	Trace specified channel/group; select zone B for channel/group; select color B for channel/group; rapid scale print.
Alarm jobs:	Acknowledge alarms of specified group; disable alarms of specified group; sound buzzer.
Message jobs:	Output specified message to the chart, display, rolling memory, or memory card.
Logging jobs:	Output specified log; switch to log interval B; switch to archive interval B.

Features (continued)

Derived channel jobs:	Reset/trigger/disable/switch/trace a channel or group of channels.
Timer jobs:	Start/reset specified timer; reset all timers (global reset).
Counter jobs:	Increment/decrement/pre-set/disable specified counter; pre-set/disable group of counters.
Totalizer jobs:	Pre-set specified totalizer/group of totalizers; disable specified totalizer/group of totalizers.
Memory jobs:	Start/stop replay; enable/disable input; trigger samples; select sample interval B.
Relay jobs:	Operate specified relay on specified (by address) relay board.
Clock jobs:	Add/subtract one hour; load pre-set time.
Memory card jobs:	Switch chart copy on/off; replay specified report; stop replay of current report.

Editing: The "secret 'til lit" keyboard provides access to a wide range of alpha and numeric characters using the alpha/numeric keys, or the field scroll and +/- keys, or a combination of both. The two alternative selection keys in the lower left corner let you select different characters for other keys of the keyboard. The character shown in the lower right corner of a key is selected as long as the upper alternative selection key is operated. The capital letter, and character printed in the top right corner of a non-alpha/numeric key, is selected as long as the lower alternative selection key is operated.

A second character set can be accessed with the field scroll keys of the lower keyboard, or by using the softkeys and the +/- key.

Memory Card: These recorders offer the personal computer memory card reader option. The memory card is a convenient, cost effective means of capturing, storing, and transferring both process data and instrument configurations. This allows a user the convenience and time to prepare a configuration at a personal computer, and then download it to the instrument.

Model K1 recorders are designed for Type I, Release 2, SRAM (static random access memory) cards. Several different types of PCMCIA (Personal Computer Memory Card International Association) cards are commercially available. Each type is manufactured to specific sets of operating and electrical standards. Although commercially available cards are acceptable, all Barber-Colman PCMCIA cards have been modified to provide additional grounding to protect against static electricity. Since it is not practical to always power down a recorder before inserting or removing a memory card, the additional grounding minimizes the danger of static discharge damage.

Field 12 allows you to include the PCMCIA card reader and configuration storage to your recorder. Field 13 ASCII data logging allows the PCMCIA to store process data.

Communications: This optional feature permits two way communication up to 19,200 baud with built-in MODBUS® protocol assuring compatibility with any standard SCADA system and many other instruments. A host computer can read up to 16 recorders on the RS-232/422-485 multi-drop communications loop.

Math: Math function blocks allow a wide range of calculations from channel averages to complex formulas. More advance strategies can be implemented by the use of timers and counters, while totalizers are available for tasks such as integration of liquid flow or power signals.

Math Options	K1C	K1M; K1G; K1P
Level 1	32 DVs, basic	32 DVs, basic
Level 2	32 DVs, basic, advanced	32 DVs, basic, advanced
Totalizers	6	12
Timers	6	12
Counters	6	12
CEM	n/a	96 DVs, basic, advanced, TTC

DV = Derived variable.
Basic math = addition, subtraction, multiplication, division, constant, copy.
Advanced math = square root, averaging, exponent, rate of change, minimum, maximum, rh, time stamp.
CEM = continuous emissions monitoring.
TTC = Totalizers, timers, counters.

Recorders

K1 Series 250 mm Strip Chart Recorders

Features (continued)

|	
Certified Calibration:	Upon request, factory calibration will be documented on certification form showing results of performance tests, and adherence to pre-defined standards.
CSA:	Upon request, factory testing and labeling of CSA approved product can be provided.
CE:	Upon request, factory testing and labeling of CE approved product can be provided.

Display Information
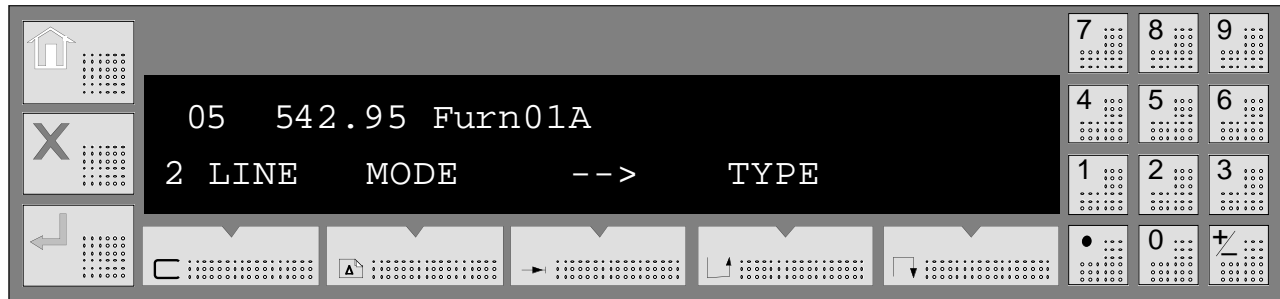
The three keys at the left end of the operator interface are the display control hardkeys. They allow you to access and edit items with minimum effort.
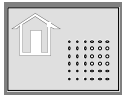
The "home" key (top, left) returns the display to top level menus. When in an operating menu, the home key re-displays the top level operating menu. During configuration, the first press on the home key recalls the top level configuration menu; the second press displays the top level operator menu.
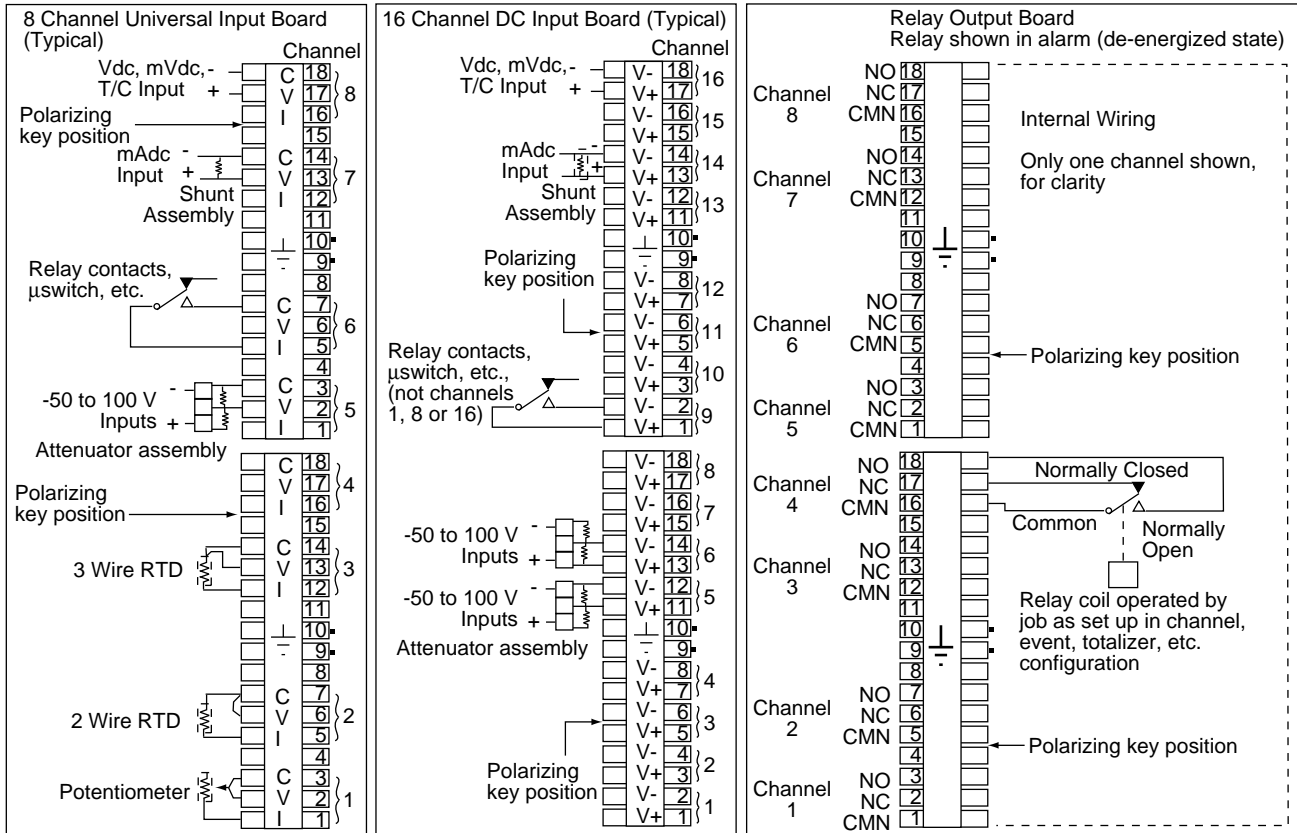
The "cancel" key (center, left) cancels all changes made since the "enter" key was last pressed. Each subsequent press of the key moves the user back one menu level.
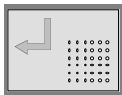
The "enter" key (bottom, left) confirms all the changes made and saves them in the recorder's data base. Each subsequent press of the key moves the user back one menu level.
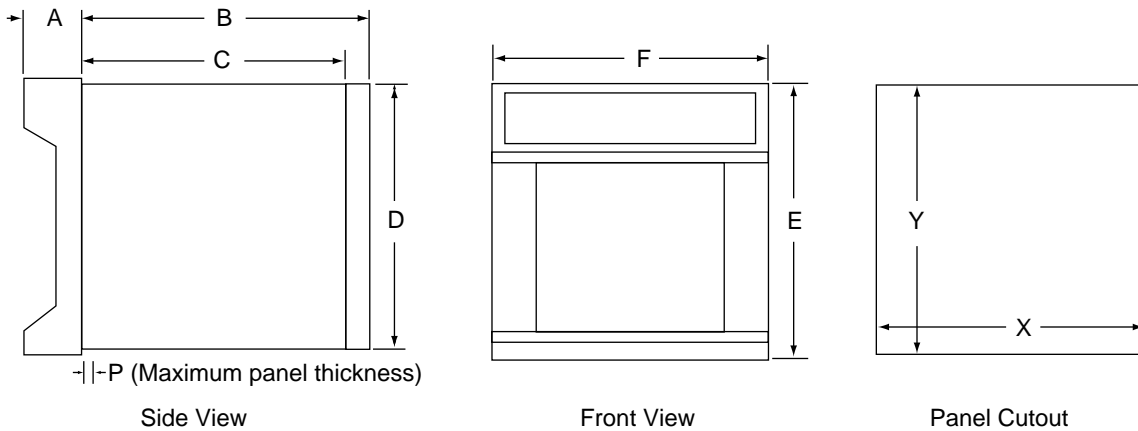
K1 Series 250 mm Strip Chart Recorders

Wiring

8 Channel Universal Input Board (Typical)

Vdc, mVdc,- T/C Input +
Polarizing key position
mAdc Input +
Shunt Assembly
Relay contacts, μswitch, etc.
-50 to 100 V Inputs +
Attenuator assembly
Polarizing key position
3 Wire RTD
2 Wire RTD
Potentiometer

16 Channel DC Input Board (Typical)

Vdc, mVdc,- T/C Input +
mAdc Input +
Shunt Assembly
Polarizing key position
Relay contacts, μswitch, etc., (not channels 1, 8 or 16)
-50 to 100 V Inputs +
-50 to 100 V Inputs +
Attenuator assembly
Polarizing key position

Relay Output Board
Relay shown in alarm (de-energized state)

Channel 8 — NO NC CMN
Channel 7 — NO NC CMN
Channel 6 — NO NC CMN
Channel 5 — NO NC CMN
Channel 4 — NO NC CMN
Channel 3 — NO NC CMN
Channel 2 — NO NC CMN
Channel 1 — NO NC CMN

Internal Wiring

Only one channel shown, for clarity

Polarizing key position

Normally Closed
Common
Normally Open

Relay coil operated by job as set up in channel, event, totalizer, etc. configuration

Polarizing key position

Mounting Information

Side View — P (Maximum panel thickness)

Front View

Panel Cutout

Model	Dimensions							Cutout	
	A	B	C	D	E	F	P	X	Y
K1C	53 (2.09)	450 (17.72)	410 (16.14)	271 (10.67)	288 (11.34)	360 (14.17)	42 (1.65)	348 (13.70) +0 -1.4 (+0 -.06)	274 (10.79) +0 -1.4 (+0 -.06)
K1M									
K1G	66 (2.60)								
K1P									

Dimensions shown in millimeters, inches in parenthesis ( ).

Recorders