



Pathfinder Instruments Model MK200

Conductivity Controller

OPERATING MANUAL



General Description

The Model MK-200 is a microprocessor programmable Conductivity controller that accepts a conductivity electrode as an input. Outputs are : (1) on-off or proportional control relay (this control can be SSR drive or mechanical contacts);(2) a second optional control relay can be added for control above and below the set point or as an alarm (3) a 4-20 mA recorder signal proportional to the conductivity level. The power source is from 85 to 265 VAC, 50/ 60Hz free voltage there is no need to change connections for different voltages. The controller is programmable from the front panel via 8 switches, and calibration is done using two adjustment pots.(see programming instructions in the following pages). The front panel is NEMA 4X rated and mounting hardware is provided.

Specifications:

Input:CS-100, CS-1000, CS-5000(Range dependant)
 Input Range: 0 to 10uS, through 0 to20, 000uS
 Temperature compensation.....0 to 50 deg C
 Accuracy:.....+/- 2% of span
 Control output: (1) or optionally (2) 3A SPDT relays
 Recorder output:4 to 20mA isolated
 Front panel:NEMA-4X rated
 Panel cutout:92 X 92 mm (1/4 DIN)

outline drawing

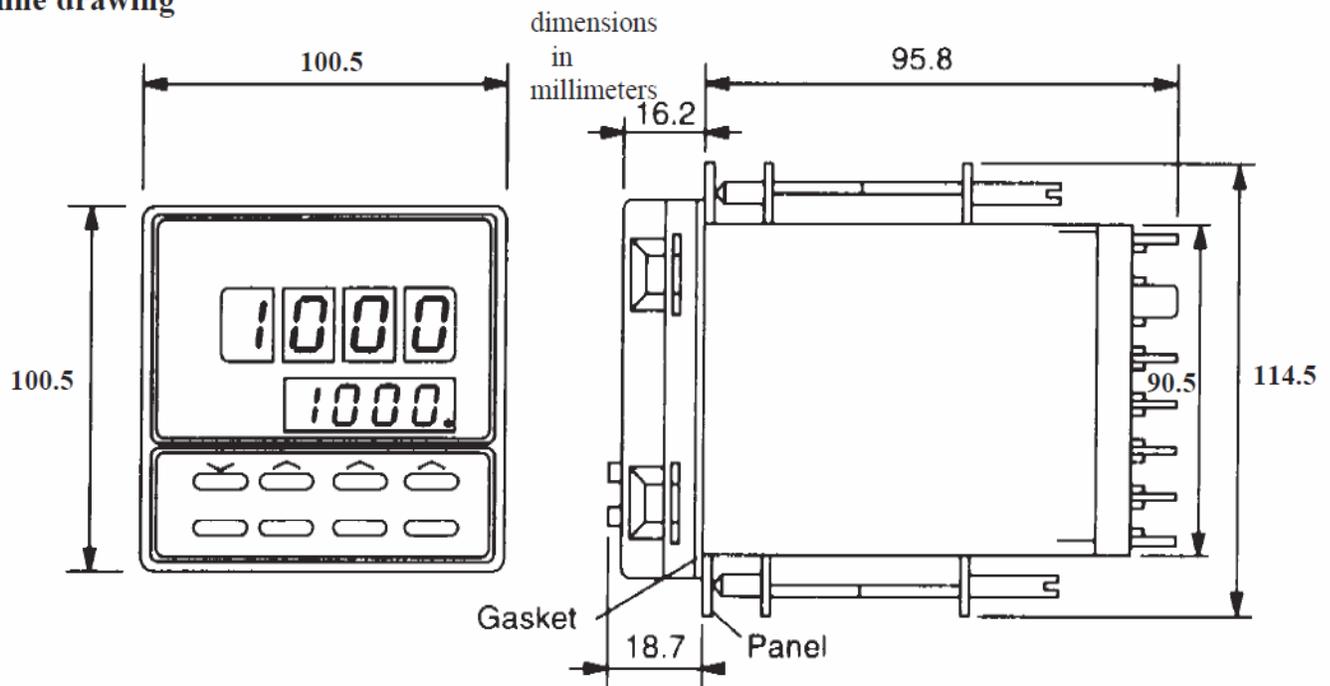


FIGURE 1

Installation

A. First Things

Upon receiving your order of MK-200 Controller Check to verify that all part numbers and quantities agree with the enclosed packing slip. If any discrepancies exist, be sure to contact your supplier immediately. Inspect all controllers for damage. Check for damaged storage boxes, scratches on the controller's enclosures and face plates, or any other irregularities that may exist due to improper handling. If such a case exists save the shipping boxes and shipping material, and contact your shipping agent immediately.

B. Mounting

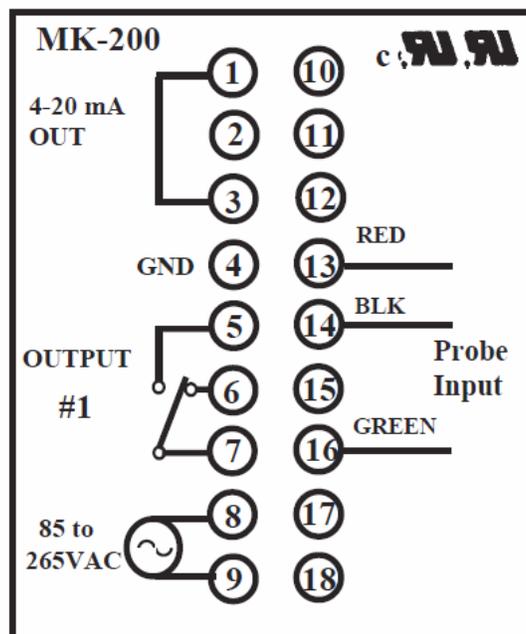
To flush panel mount your controller, first verify that the depth of your cabinet will accommodate the length of your instruments. Also, verify that where the controllers are to be mounted there is no corrosive gases (sulfuric gas, ammonia, etc.) present and no vibration, impact, water, or extreme temperature exposure. Once verified, follow the diagrams below and cut appropriately sized hole from the cabinet's panel; the panel should be between 1 and 8 millimeters thick. Insert each unit through the front of the panel. The controller's bezel should catch and not feed through the cut-out. If the fit seems too tight, insert the outer case alone, mount, then insert the rest of the controller inside the mounted case. Clip each of two metal, screw-type mounting brackets, two are shipped with every MK-200 unit, to the top and bottom of your controller. The mounting bracket's tabs fit into the two holes on both the top and bottom of the controller's outer case. With an instrument screwdriver, turn the screw in the mounting bracket until the end of it touches the back of the panel; do this to both brackets. Making sure the face of the controller is flush and straight, tighten both mounting bracket screws. Your controller should now be firmly set. If the controller still loose, however, tighten the mounting bracket screws a little more; do not use excessive force. Do this to each controller you want mounted. Your controllers are now ready to be wired.

C. Wiring Power to Controllers

AC power is to be connected to the power supply input terminals located on the back of your MK-200 consult the wiring diagram above for the correct terminals. Your power connections should be made with 20 gauge or larger insulated wire. A 3 AMP fuse should be connected in series with power and your controller to help eliminated any problems which could occur due to an over current situation. Spade connectors may be used to facilitate the connection of the power supply wires to the power supply input terminals. The MK-200's unique power supply circuit, incorporating a free voltage transformer, accepts line voltages between 85 and 264 VAC; no need to change your wiring to accommodate voltage differences within the rated voltage range. Screw down your terminals securely. Tape or otherwise insulate your connections making sure that there is no exposed wire which could cause a dangerous short across your controller. Do not apply power to your controller until all other wiring connections have been made. In order to minimize the risk of high frequency noise induced by coils and windings in relays, solenoids, and transformers, twist the power supply wires and keep them separated from the input and output wires also connected to your controller. A line filter or power conditioner connected to the input power will aid in protecting your controller from the effects of spikes and power transients.

MK-200

WIRING DIAGRAM



Operation

FRONT PANEL DESCRIPTION

Conductivity Display:.....4 digit 7 segment red LED display

Set point display:.....4 digit 7 segment green LED display Set point status LED indicates when the MK-200 is indicating the Main Set point.

C1 Indicator:Control Output #1 energized when output #1 is on.

∨ KEYDecrement key (data value decreased one digit every time key is pressed).

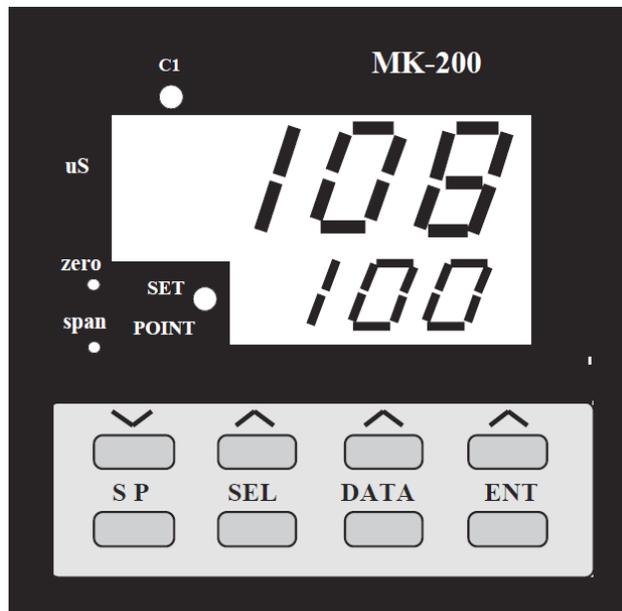
∧ KEYS (1,10,100)Up DIGIT keys (these keys enable a digit change the first time pressed the digit will flash) flashing digit will increase every time the keys are pressed.

"S/P" Set Point Key":.....Set point is displayed and menu is reset when pressed.

"SEL" select Key":..... Used to select parameters in the controllers menus, changes menus when held for 10 Seconds.

"DATA" Data Key":Displays the values programmed for each parameter selected.
"

ENT" Enter Key":Saves the parameter data in the controllers' memory.



Programming

How to Change the Set Point

1. Press "S/P"
2. Press ∧ under the digit you want to change, the digit will flash on and off meaning it's ready to be changed.
3. Press ∧ or ∨ to increment or decrement the digit, when it's at the number you want press "ENT", this puts it into memory.
4. Repeat step 2 and 3 for all the digits that you want to change.

How to Change From Primary to Secondary Menu

1. Press and release "SEL" key, "hys" will appear in set point display.
2. Press and hold "SEL" key for 5 to 10 seconds until "P-n1" appears.
3. Controller is now in the secondary menu.
4. To return the primary menu, press and hold "SEL" key for 5 to 10 seconds until the primary menu appears in the Set Point Display.
5. To return to the Main Set Point Display press the "S/P" key.

How to Program the hysteresis or dead band

1. Press "SEL" key, "hys" will appear in Set Point Display.
2. Press " DATA " key, the hysteresis is shown, (initially set to .1).
3. Press ^ to enable a DIGIT, change data with up ^ or down v key to change the amount of hysteresis
4. After changing the hysteresis setting Press " ENT " key to set it in memory.

How to change the control action

The output action is controlled by the **P-n1** parameter in the secondary menu, a value of "1" will have the output turn on below the set point, a value of "2" will have the output turn on above the set point, and the procedure is:

1. Enter the secondary menu as described above
2. Press the data key to see what is in the **P-n1** position
3. Use the UP or Down key to change the data
4. Press the ENT key to enter the new value and view **P-n1**
5. Press and hold the SEL key for 3 seconds and view the set point value

Calibration

ZERO and **SPAN** adjustments are located on the front panel of the instrument, Procedure is:

1. If you have a Flat surface graphite electrode, clean the electrode surface by rubbing it on a flat surface with 400 grit abrasive paper and rinse it in clean water, if you have a stainless steel electrode clean it in a detergent solution such as "Alconox" and rinse it clean in pure water.
2. Allow the instrument to warm up for 30 minutes before making any adjustments
- 3 with the electrode dry set the **ZERO** adjustment for a reading of 0000
4. Place the electrode in a beaker of calibration solution of a value near or at the full scale value for the instrument, adjust the **SPAN** adjustments for the correct reading (i.e. if the range is 7500uS use a 7500 uS solution or one that is close to full scale).

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