



BEACON Series
Voltage & Current Meters
Installation and Operating Instructions

kep.com
<http://www.kep.com>

KEP
KESSLER-ELLIS PRODUCTS
10 Industrial Way East
Eatontown, NJ 07724
800-631-2165 • 732-935-1320
Fax 732-935-9344

CONTENTS

Receipt of Equipment	1
Wiring	1
Installation	1
Specifications	2
Switch and Solder Jumper Matrix for Standard Ranges	3
Setup for Standard Ranges	4
Setup for Scaling From "0" (Span) for Voltage Inputs	5
Setup for Scaling From "0" (Span) for Current Inputs	6
Setup for "0" Offset Scaling For Voltage Inputs	7
Setup for "0" Offset Scaling For Current Inputs	8
Troubleshooting Guide	9
Warranty & Decoding Part Number	

Receipt of Equipment

When the equipment is received, the outside packing case should be checked for damage incurred during shipment. If the packing case is damaged, the local carrier should be notified at once regarding his liability. A report should be submitted to the distributor.

Remove the Installation and Operation Instructions. Carefully remove the equipment from the packing case and inspect for damaged or missing parts.

Return Shipment

Do not return assembly or part without a Return Material Authorization. The RMA is obtained by calling your local authorized distributor.

Electrical Connections

All connections are completed at terminal blocks located at the rear of the case. Make sure all power is disconnected before making any electrical connections. In cases where cables are situated in areas with heavy electrical fields, shielding is required for maximum noise immunity. One end of the shielding should be connected to earth ground. Relays or inductive coils connected to or located in the immediate area should be arc suppressed with appropriate diodes, MOV's or resistor capacitor networks.

Terminal Designations:

- P1 DISPLAY HIGH Adj. (ref)
 - P2 NON "0" INPUT adj. ("0" offset)
 - P3 NON STANDARD INPUT COARSE Adj. (span)
 - P4 NON STANDARD INPUT FINE Adj. (span)
-
- 1• V/I INPUT
 - 2• V/I INPUT COMMON
 - 3• +18 VDC OUT (+DC POWER IN)
 - 4• -DC OUT (-DC POWER IN)
 - 5• EARTH GROUND
 - 6• AC POWER
 - 7• AC POWER

WARNING

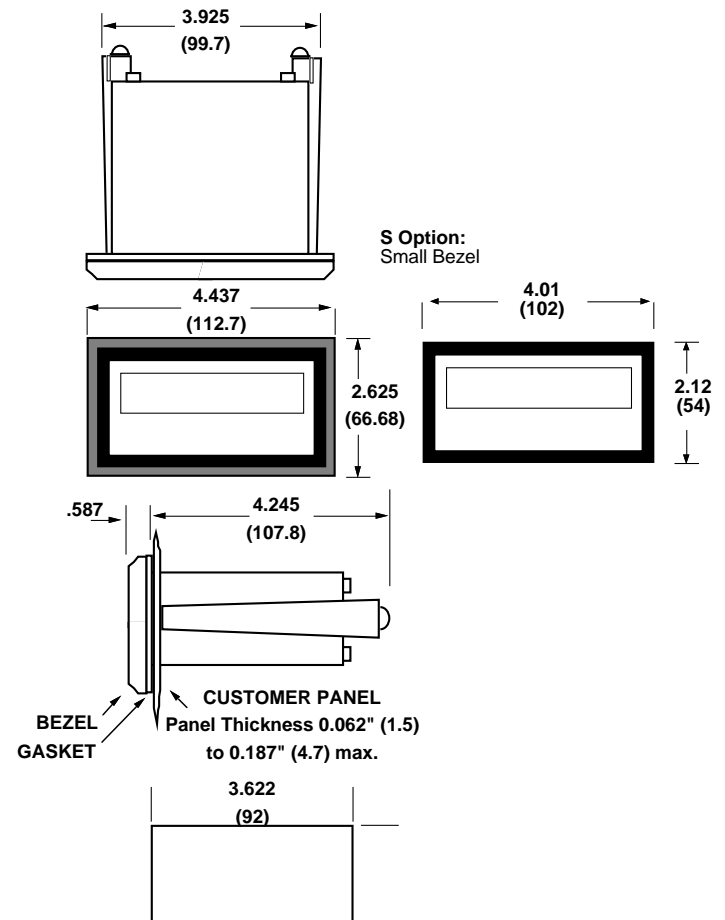
Set input range switches / jumpers before applying input. Damage may occur if a higher voltage/current than selected is applied to the input, especially if current shunts are selected.

Panel Mounting

The controller should be located in an area with a clean, dry atmosphere which is relatively free of shock and vibration. The unit should be installed in a 3.62" (92 mm) wide by 1.77" (45 mm) high panel cutout. To mount the controller proceed as follows:

- a. Prepare the panel opening.
- b. Slip the gasket (provided) over the rear of the case and slide it forward until it engages the inner surface of the front bezel.
- c. Install the screws (provided) in the mounting brackets and slide the brackets in the grooves located on both sides of the case.
- d. Tighten the screws firmly to attach the bezel to the panel.

Dimensions:



Description:

The BEACON series is a bright new addition to KEP's product line. Featuring 3^{1/2} digits of bright RED or GREEN (optional) LED's, these meters outshine the competition by offering DIP switch selection of the most frequently used functions. The new BEACON series focuses on applications needing 3^{1/2} digits of display, showing -1999 to +1999 with switch selectable decimals. With their great flexibility and multiple input ranges, let the BEACON series digital panel meters be your guide.

Specifications:

Display: 3^{1/2} digit, .55" high, 7 segment bright LED. Minus sign displayed when current or voltage is negative. Decimal points inserted before 1st, 2nd, or 3rd least significant digits by DIP switch selection.

Power: Available in 5VDC, 8-24VDC, 115VAC or 230VAC ($\pm 10\%$). 260 mA (DC); 6 VA (AC).

Operating Temperature: +32°F to 130°F (0°C to 60°C)

Storage Temperature: -40°F to 200°F (-40°C to 80°C)

Output Power: (AC powered units only)

18 VDC regulated $\pm 4\%$ @ 50 mA

Input Ranges (Pos. / Neg.): (switch/jumper selectable)

<u>AC & DC Volt Meters</u>	<u>AC & DC Current Meters</u>
0-1.999 Volts	0-199.9 μ A
0-19.99 Volts	0-1.999 mA
0-199.9 Volts	0-19.99 mA
0-199.9 mV	0-199.9 mA
	0-1.999 amps (2A Option)

Over-Range Indication: Three least significant digits blank when input is over range.

Max. Voltage on Basic Range: Input Range +75 V AC/DC

Max. Voltage on Terminal Block: 300 V AC or DC

Max Shunt Currents:

199.9 μ A through 19.99mA- 10 x (max. range current)

199.9mA- 1 amp

1.999 amp- 3 amps

Caution: A fast blow fuse should be installed in series with the current meter in applications where fault currents may exceed maximum allowable current.

Scaling:

Reference Adjust (supplied on all units)

Used to calibrate display to $\pm 30\%$ of STD input.

Span Adjust

Coarse and fine adjust pots offer $\div 1$ to $\div 13$ and when used with the switch selected ranges, offers direct readout of linear transducers.

"0" Offset Adjust

Sets "low" input display at $\pm 50\%$ of span.

Accuracy: (23°C, 85% R.H.)

(Add ± 2 digits to below for negative readings)

DC Volts- $\pm .1\%$ of Reading ± 1 digit

AC Volts- $\pm .1\%$ of Reading ± 3 digits

DC Current

199.9 μ A, 1.999mA, 19.99mA: $\pm .1\%$ of reading ± 1 digit

199.9mA: $\pm .18\%$ of reading ± 1 digit

1.999A: $\pm .1\%$ of reading ± 1 digit

AC Current

199.9 μ A, 1.999mA, 19.99mA: $\pm .1\%$ of reading ± 3 digit

199.9mA: $\pm .15\%$ of reading ± 3 digits

1.999A: $\pm .5\%$ of reading ± 3 digits

Temperature Coefficients:

Current Inputs

DC: ± 100 PPM/ $^{\circ}$ C

(1.999A: ± 200 PPM/ $^{\circ}$ C)

AC: ± 200 PPM/ $^{\circ}$ C

Voltage Inputs

DC: ± 75 PPM/ $^{\circ}$ C

AC: ± 150 PPM/ $^{\circ}$ C

Input Response Time: 1 second

Sample Rate: 3 samples/second

Normal Mode Rejection: 70dB 50/60Hz (DC units only)

Common Mode Rejection: 110dB DC or 50/60Hz (DC units only)

Case: Plastic case, NEMA 4X/IP65 front panel

Weight: 2 lbs.

Switch S1 Functions:

S1-1 Decimal Point XXX.X

S1-2 Decimal Point XX.XX

S1-3 Decimal Point X.XXX

S1-4 Input Range 0-199.9 mV (Current Inputs)

S1-5 Input Range 0-1.999 V

S1-6 Input Range 0-19.99 V

S1-7 Input Range 0-199.9 V

S1-8 Current Shunt 0-199.9 μ A

S1-9 Current Shunt 0-1.999 mA

(Current Shunt 0-19.99 mA: Jumper A)

(Current Shunt 0-199.9 mA: Jumper B)

(Current Shunt 0-1.999 A: Jumper C) (2A Option)

S1-10 ON: DC input

OFF: AC input

Switch S2 Functions:

S2-1 ON: "0" Low Input

OFF: Non "0" Input (Adj. P2)

S2-2 ON: Non STD Input Range (Adj. P3 & P4)

OFF: STD Input Range

S2-3 ON: AC Input

OFF: DC Input

S2-4 ON: AC Input

OFF: DC Input

Potentiometer Function:

P1: Display High Adj. (Ref)

P2: Non "0" Input Adj. ("0" Offset) (S2-1 Must be OFF)

P3: Non STD Input Adj. (Span) (Coarse)
(S2-2 Must be ON)

P4: Non STD Input Adj. (Span) (Fine)
(S2-2 Must be ON)

Switch and Solder Jumper Matrix for Standard Ranges

"X" = Switch ON or Solder Jumper Closed, "-" = Switch OFF or Solder Jumper Open

"†" = Switch S2-2 ON when using scaling (P3 & P4); OFF when using Standard ranges.

Table A

Voltage Input	Switch S1										Switch S2				Solder Jumper			Display
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	C	B	A	
*0 to 199.9 mVDC	X	-	-	X	-	-	-	-	-	X	X	†	-	-	-	-	-	mV
0 to 1.999 VDC	-	-	X	-	X	-	-	-	-	X	X	†	-	-	-	-	-	V
0 to 19.99 VDC	-	X	-	-	-	X	-	-	-	X	X	†	-	-	-	-	-	V
0 to 199.9 VDC	X	-	-	-	-	-	X	-	-	X	X	†	-	-	-	-	-	V
*0 to 199.9 mVAC	X	-	-	X	-	-	-	-	-	-	X	†	X	X	-	-	-	mV
0 to 1.999 VAC	-	-	X	-	X	-	-	-	-	-	X	†	X	X	-	-	-	V
0 to 19.99 VAC	-	X	-	-	-	X	-	-	-	-	X	†	X	X	-	-	-	V
0 to 199.9 VAC	X	-	-	-	-	-	X	-	-	-	X	†	X	X	-	-	-	V

Current Input	Switch S1										Switch S2				Solder Jumper			Display
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	C	B	A	
DC Current																		
0 to 199.9 μA	X	-	-	X	-	-	-	X	-	X	X	†	-	-	-	-	-	μA
0 to 1.999 mA	-	-	X	X	-	-	-	-	X	X	X	†	-	-	-	-	-	mA
0 to 19.99 mA	-	X	-	X	-	-	-	-	-	X	X	†	-	-	-	-	X	mA
0 to 199.9 mA	X	-	-	X	-	-	-	-	-	X	X	†	-	-	-	X	-	mA
**0 to 1.999 A	-	-	X	X	-	-	-	-	-	X	X	†	-	-	X	-	-	A
AC Current																		
0 to 199.9 μA	X	-	-	X	-	-	-	X	-	-	X	†	X	X	-	-	-	μA
0 to 1.999 mA	-	-	X	X	-	-	-	-	X	-	X	†	X	X	-	-	-	mA
0 to 19.99 mA	-	X	-	X	-	-	-	-	-	-	X	†	X	X	-	-	X	mA
0 to 199.9 mA	X	-	-	X	-	-	-	-	-	-	X	†	X	X	-	X	-	mA
**0 to 1.999 A	-	-	X	X	-	-	-	-	-	-	X	†	X	X	X	-	-	A

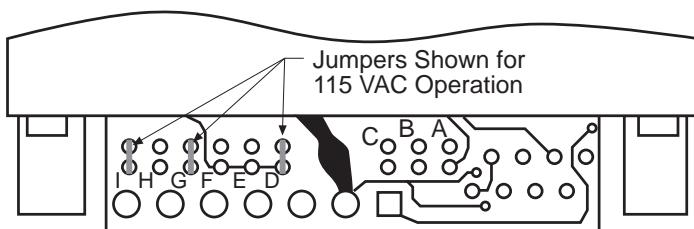
* Use these settings for external 200 mV shunt (Positions 1, 2 and 3 of SW1 sets decimal).

** Use for 2A and 5A input options

Table B

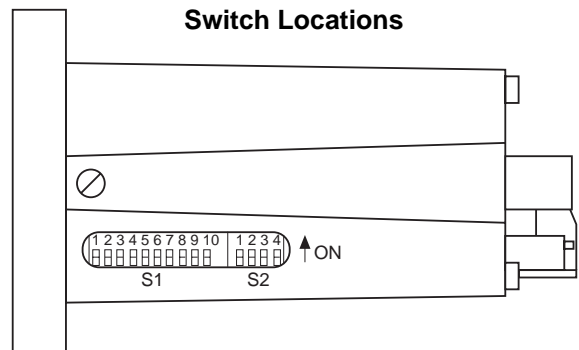
Input Power	Solder Jumpers						
	D	E	F	G	H	I	
230 VAC	X	-	-	-	X	-	
115 VAC	X	-	-	X	-	X	
+8 to 24 VDC	-	-	X	-	-	-	
+5 VDC	-	X	-	-	-	-	

Solder Jumper Locations



Remove the plastic case extension to expose the PCB.
Make solder jumpers as described above.

Switch Locations



Setup for Standard Ranges (no scaling)

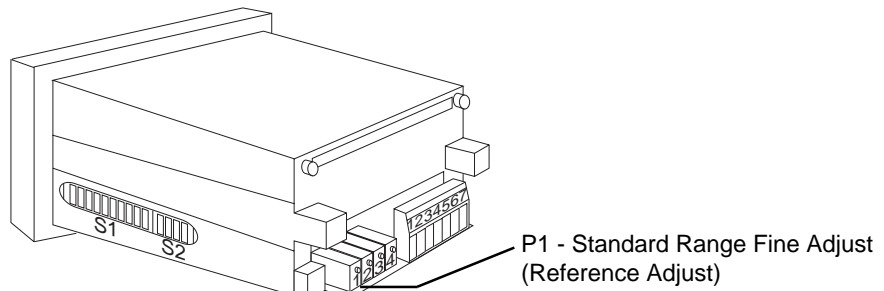
Supply Voltage:

The supply voltage input is set at the factory according to the part number ordered. If a different supply voltage is desired, make the appropriate solder jumpers as explained in Table B (PG. 3).

NOTE: If solder jumper changes are made, modify the part number to reflect the changes.

Standard Ranges Setup From "0": (Input DS)

The unit is calibrated at the factory, therefore the display will read the voltage or current applied to the input. See Table A to select the appropriate input range. Set the switches to select the range at or within 20% of your maximum input. Connect Input to pins 1 & 2. Apply maximum voltage or current and adjust P1 to fine adjust DPM to read input. If max input and reading are not within 20% of a standard range shown on Table B, a DPM with "scaling" must be used. (If special reading [scaling] or "0" offset is desired, a DPM with these features must be used, see "Scaling Setup" or "0 Offset Setup" .



NOTE: P2, P3 & P4 are not supplied with Standard Input units

Setup for Scaling From "0" (Span) for Voltage Inputs

Scaling from "0" Only Setup for Voltage Inputs: (Input D0 or A0)

When the unit is ordered with scaling from "0" only, it can be setup to display any value from "0" (fixed low) to "0-1999" (adjustable high) with decimal as desired. (If your min. input or min. display is a value other than "0", a DPM with "0" Offset scaling must be used, See Setup for "0" Offset Scaling.) Use the formula below to assist in the proper configuration of the switch settings.

Voltage Inputs:

If the voltage input from **0** to **Vm (max V input)** is to be displayed as **0** to **Dm (display at max input)**, then the following calculation can be used to find the appropriate switch configuration using Table C below.

NOTE: This equation assumes the use of best resolution, i.e. a display of 0-10 should be displayed as 0.00-10.00.

$$\text{Jumper Ratio} = 10,000 \times \frac{V_m}{D_m \times \text{D.P.}}$$

The value for D.P. depends on the display decimal point format and should be determined as follows:
(Set decimal using S1 - 1, S1 - 2, S1 - 3, see below)

Display Format	Value of D.P.
XXXX (S1-1, S1-2, S1-3 OFF)	1
XXX.X (S1-1 ON; S1-2, S1-3 OFF)	10
XX.XX (S1-2 ON; S1-1, S1-3 OFF)	100
X.XXX (S1-3 ON; S1-1, S1-2 OFF)	1000

Using the Jumper Ratio value calculated above, the proper switch settings for S1 positions 4, 5, 6 & 7 can be determined as follows:

Insure that S1-4, S1-5, S1-6, S1-7, S1-8, S1-9 & S2-2 are OFF when beginning setup.

Table C

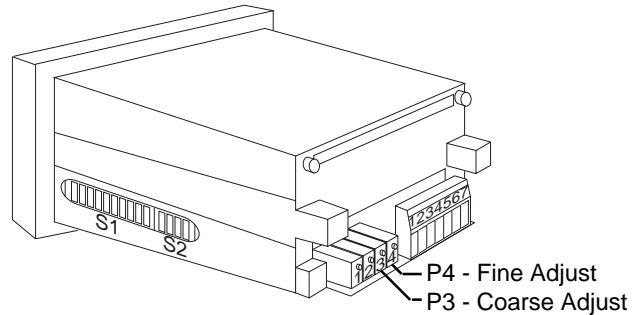
Switch Settings

Jumper Ratio	Switch Setting	DC Input	AC Input
1 to 13	SW1 - 4 ON	S1 - 10 ON	S1 - 10 OFF
14 to 105	SW1 - 5 ON	S2 - 3, S2 - 4 OFF	S2 - 3, S2 - 4 ON
106 to 1005	SW1 - 6 ON		
1006 and above	SW1 - 7 ON		

Procedure for Scaling from "0" (Span) Adjust:

Select the proper input range switch settings as described in Table C. When the voltage input (Va to Vb) is to be displayed as C to D, the following procedure must be performed.

- 1) Select the proper input range and AC or DC operation switch settings as described in Table C
- 2) Turn S2 - 1 ON, S2 - 2 ON
- 3) Set decimal using S1 - 1, S1 - 2, S1 - 3
- 4) Apply max voltage (Vm) to input
- 5) Adjust P3 so that display shows Dm), Use P4 for fine adjust



NOTE: If unit blanks due to over-range, it may be helpful to set input at half range and adjust P3 so that the display reads half scale. Then follow Steps 1 - 5 above.

NOTE: P2 is not supplied with Scaling from "0" Only units

EXAMPLE:

Input: 0 to 5 VDC (Vm = 5) Jumper Ratio = 10,000 x $\frac{5}{150.0 \times 10} = 33.333$
 Display: 0 to 150.0 (Dm = 150.0)

Using Table C above, note that S1 - 5 should be ON for this example.

- 1) Turn S1-5 & S1-10 ON; S2-3 & S2-4 OFF
- 2) Turn S2 - 1 ON, S2 - 2 ON
- 3) Set S1-1 ON; S1-2, S1-3 OFF (1 decimal)
- 4) Apply 5 Volts to input
- 5) Adjust P3 so that display shows 150.0), Use P4 for fine adjustment

Setup for Scaling From "0" (Span) for Current Inputs

Scaling from "0" Only Setup for Current Inputs: (Input D0 or A0)

When the unit is ordered with scaling from "0" only, it can be setup to display any value from "0" (fixed low) to "0-1999" (adjustable high) with decimal as desired. (If your min. input or min. display is a value other than "0", a DPM with "0" Offset scaling must be used, See Setup for "0" Offset Scaling.) Use the formula below to assist in the proper configuration of the switch settings.

Current Inputs:

If the current input from **0** to **Im (max I input)** is to be displayed as **0** to **Dm (display at max input)**, then the following calculation can be used to find the appropriate switch configuration using Table D below.

NOTE: This equation assumes the use of best resolution, i.e. a display of 0-10 should be displayed as 0.00-10.00.

$$\text{Jumper Ratio} = 10,000,000 \times \frac{I_m}{D_m \times \text{D.P.}}$$

The value for D.P. depends on the display decimal point format and should be determined as follows:

Display Format	Value of D.P.
XXXX (S1-1, S1-2, S1-3 OFF)	1
XXX.X (S1-1 ON; S1-2, S1-3 OFF)	10
XX.XX (S1-2 ON; S1-1, S1-3 OFF)	100
X.XXX (S1-3 ON; S1-1, S1-2 OFF)	1000

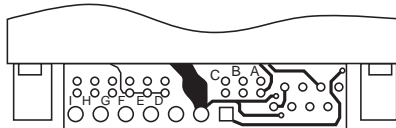
Using the Jumper Ratio value calculated above, the proper switch/solder blob settings for S1 positions 8 & 9 and solder blobs A, B & C can be determined as follows:

Insure that S1-5, S1-6, S1-7, S1-8, S1-9 & S2-2 are OFF, and Solder Blobs A, B & C are OPEN when beginning setup.

Table D

Switch/ Solder Blob Settings			
Jumper Ratio	Switch/ Solder Blob Setting	DC Input	AC Input
1 to 10	SW1 - 8 ON	S1 - 10 ON	S1 - 10 OFF
11 to 100	SW1 - 9 ON	S2 - 3, S2 - 4 OFF	S2 - 3, S2 - 4 ON
101 to 1000	Solder Blob A Closed		
1001 to 10000	Solder Blob B Closed		
10001 and above	Solder Blob C Closed		

Solder Jumper Locations



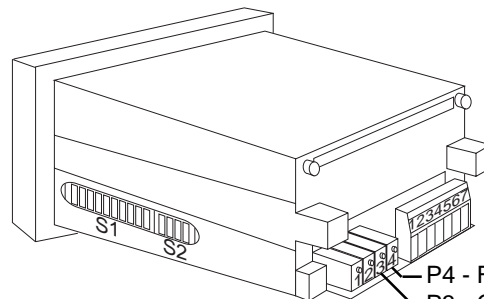
Remove the plastic case extension to expose the PCB.

Procedure for Scaling from "0" (Span) Adjust:

Select the proper input range switch/solder blob settings as described in Table D.

When the current input (0 to Im) is to be displayed as 0 to Dm, the following procedure must be performed.

- 1) Select the proper input range and AC or DC operation switch settings as described in Table D
- 2) Turn S1 - 4, S2 - 1 & S2 - 2 ON
- 3) Set decimal using S1-1, S1-2, S1-3
- 4) Apply current (Im) to input
- 5) Adjust P3 so that display shows Dm, Use P4 for fine adjust



NOTE: P2 is not supplied with Scaling from "0" Only units

NOTE: If unit blanks due to over-range, it may be helpful to set input at half range and adjust P3 so that the display reads half scale. Then follow Steps 1 - 5 above.

EXAMPLE:

Input: 0 to 20 mA (Im = .020) Jumper Ratio = 10,000,000 x $\frac{.020}{(100.0) \times 10} = 200$
 Display: 0 to 100.0 (Dm = 100.0)

Using Table D above, note that Solder Blob A should be CLOSED for this example.

- 1) Turn S1-10 ON, Solder Blob A Closed
- 2) Turn S1 - 4, S2 - 1 & S2 - 2 ON
- 3) Set S1-1 ON; S1-2, S1-3 OFF (1 decimal)
- 4) Apply 20 mA to input
- 5) Adjust P3 so that display shows 100.0, Use P4 for fine adjustment

Setup for "0" Offset Scaling For Voltage Inputs

Scaling with "0" Offset Setup for Voltage Inputs: (Input DX or AX)

When the unit is ordered with "0" offset scaling, it can be setup to display any value from 0 to 1999 (with decimal as desired). Use the formula below to assist in the proper configuration of the switch settings.

Voltage Inputs:

If the voltage input from **V_a** (min V input) to **V_b** (max V input) is to be displayed as **C** (display at min input) to **D** (display at max input), then the following calculation can be used to find the appropriate switch configuration using Table E below.

NOTE: This equation assumes the use of best resolution, i.e. a display of 0-10 should be displayed as 0.00-10.00.

$$\text{Jumper Ratio} = 10,000 \times \frac{V_b - V_a}{(D - C) \times \text{D.P.}}$$

The value for D.P. depends on the display decimal point format and should be determined as follows:
(Set decimal using S1 - 1, S1 - 2, S1 - 3, see below)

Display Format	Value of D.P.
XXXX (S1-1, S1-2, S1-3 OFF)	1
XXX.X (S1-1 ON; S1-2, S1-3 OFF)	10
XX.XX (S1-2 ON; S1-1, S1-3 OFF)	100
X.XXX (S1-3 ON; S1-1, S1-2 OFF)	1000

Using the Jumper Ratio value calculated above, the proper switch settings for S1 positions 4, 5, 6 & 7 can be determined as follows:

Insure that S1-4, S1-5, S1-6, S1-7, S1-8, S1-9 & S2-2 are OFF when beginning setup.

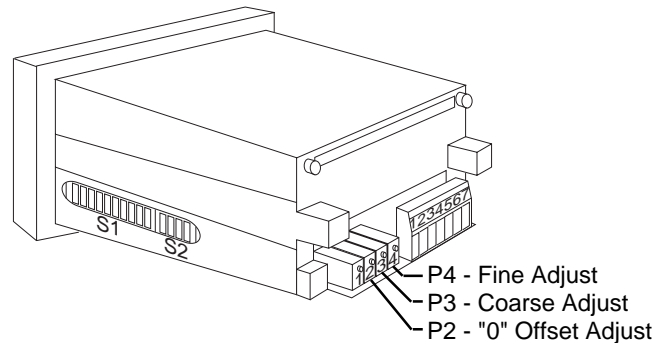
Table E

Switch Settings			
Jumper Ratio	Switch Setting	DC Input	AC Input
1 to 13	SW1 - 4 ON	S1 - 10 ON	S1 - 10 OFF
14 to 105	SW1 - 5 ON	S2 - 3, S2 - 4 OFF	S2 - 3, S2 - 4 ON
106 to 1005	SW1 - 6 ON		
1006 and above	SW1 - 7 ON		

Procedure for "0" Offset Adjust:

Select the proper input range switch settings as described in Table E. When the voltage input (V_a to V_b) is to be displayed as C to D, the following procedure must be performed.

- 1) Select the proper input range and AC or DC operation switch settings as described in Table E
- 2) Turn S2 - 1, S2-2 ON
- 3) Apply voltage (V_b - V_a) to input
- 4) Adjust P3 so that display shows (D - C), Use P4 for fine adjust
- 5) Turn S2 - 1 OFF
- 6) Apply voltage V_a and adjust P2 so that display shows C
- 7) Apply voltage V_b to insure that display shows D
- 8) Set decimal using S1 - 1, S1 - 2, S1 - 3



EXAMPLE:

Input: 1 to 5 VDC (V_a = 1, V_b = 5) Jumper Ratio = 10,000 x $\frac{5 - 1}{(1500 - 10) \times 1}$ = 26 .845
 Display: 0 to 1500 (C = 0, D = 1500)

Using Table E above, note that S1 - 5 should be ON for this example.

- 1) Turn S1-5 & S1-10 ON; S2-3 & S2-4 OFF
- 2) Turn S2 - 1, S2-2 ON
- 3) Apply 4 Volts to input
- 4) Adjust P3 so that display shows 1490 (1500 - 10), Use P4 for fine adjustment
- 5) Turn S2 - 1 OFF
- 6) Apply 1 Volt and adjust P2 so that display shows 10
- 7) Apply 5 Volts to insure that display shows 1500
- 8) Set S1-1, S1-2, S1-3 OFF (no decimal)

Setup for "0" Offset Scaling For Current Inputs

Scaling with "0" Offset Setup for Current Inputs: (Input DX or AX)

When the unit is ordered with "0" offset scaling, it can be setup to display any value from 0 to 1999 (with decimal as desired). Use the formula below to assist in the proper configuration of the switch/solder jumper settings.

Current Inputs:

If the current input from **Ia (min current input)** to **Ib (max current input)** is to be displayed as **C (display at min input)** to **D (display at max input)**, then the following calculation can be used to find the appropriate switch/solder blob configuration using Table F below.

NOTE: This equation assumes the use of best resolution, i.e. a display of 0-10 should be displayed as 0.00-10.00.

$$\text{Jumper Ratio} = 10,000,000 \times \frac{Ib - Ia}{(D - C) \times \text{D.P.}}$$

The value for D.P. depends on the display decimal point format and should be determined as follows:

Display Format	Value of D.P.
XXXX (S1-1, S1-2, S1-3 OFF)	1
XXX.X (S1-1 ON; S1-2, S1-3 OFF)	10
XX.XX (S1-2 ON; S1-1, S1-3 OFF)	100
X.XXX (S1-3 ON; S1-1, S1-2 OFF)	1000

Using the Jumper Ratio value calculated above, the proper switch/solder blob settings for S1 positions 8 & 9 and solder blobs A, B & C can be determined as follows:

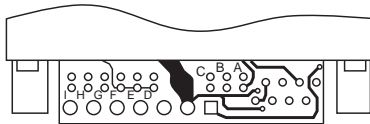
Insure that S1-5, S1-6, S1-7, S1-8, S1-9 & S2-2 are OFF, and Solder Blobs A, B & C are OPEN when beginning setup.

Table F

Switch/ Solder Blob Settings

Jumper Ratio	Switch/ Solder Blob Setting	DC Input	AC Input
1 to 10	SW1 - 8 ON	S1 - 10 ON	S1 - 10 OFF
11 to 100	SW1 - 9 ON	S2 - 3, S2 - 4 OFF	S2 - 3, S2 - 4 ON
101 to 1000	Solder Blob A Closed		
1001 to 10000	Solder Blob B Closed		
10001 and above	Solder Blob C Closed		

Solder Jumper Locations

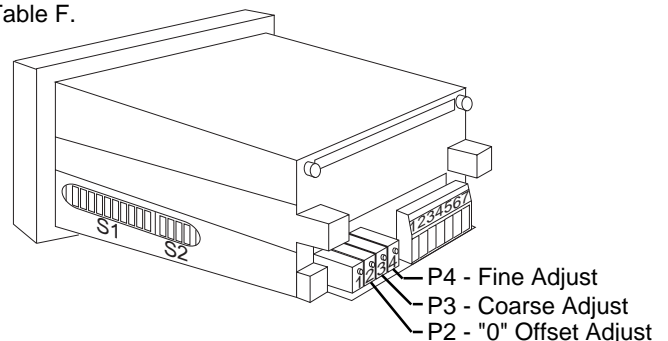


Remove the plastic case extension to expose the PCB.

Procedure for "0" Offset Setup:

Select the proper input range switch/solder blob settings as described in Table F. When the current input (Ia to Ib) is to be displayed as C to D, the following procedure must be performed.

- 1) Select the proper input range and AC or DC operation switch settings as described in Table F
- 2) Turn S1 - 4, S2 - 1, S2-2 ON
- 3) Apply current (Ib - Ia) to input
- 4) Adjust P3 so that display shows (D - C), Use P4 for fine adjust
- 5) Turn S2 - 1 OFF
- 6) Apply current Ia and adjust P2 so that display shows C
- 7) Apply current Ib to insure that display shows D
- 8) Set decimal using S1-1, S1-2, S1-3



EXAMPLE:

Input: 4 to 20 mA (Ia = .004, Ib = .020)
 Display: 50 to 1000 (C = 50, D = 1000)

$$\text{Jumper Ratio} = 10,000,000 \times \frac{.020 - .004}{(1000 - 50) \times 1} = 168$$

Using Table F above, note that Solder Blob A should be CLOSED for this example.

- 1) Turn S1-10 ON, Solder Blob A Closed
- 2) Turn S1 - 4, S2 - 1, S2-2 ON
- 3) Apply 16 mA to input
- 4) Adjust P3 so that display shows 950 (1000 - 50), Use P4 for fine adjustment
- 5) Turn S2 - 1 OFF
- 6) Apply 4 mA and adjust P2 so that display shows 50
- 7) Apply 20 mA to insure that display shows 1000
- 8) Set S1-1, S1-2, S1-3 OFF (no decimal)

TROUBLESHOOTING GUIDE

<u>PROBLEM</u>	<u>POSSIBLE CAUSES</u>	<u>SOLUTIONS</u>
Display shows 1 in left hand digit.	<ol style="list-style-type: none"> 1. Input is over range. 	<ol style="list-style-type: none"> 1. Check switch selection for proper input range. If switch selection is correct, and you are scaling the unit then set input at half range and adjust pots P3 & P4 so that display shows one half of desired reading. Then set input at full range and adjust pots P3 & P4 to display full range.
Input signal is connected but display shows "0".	<ol style="list-style-type: none"> 1. Input wiring is incorrect. 2. Improper switch selection for input range 3. Transmitting device is defective. 	<ol style="list-style-type: none"> 1. Recheck input wiring. 2. Check switch selection for proper input range. (Insure that only one current shunt jumper and/or switch is ON / Closed.) 3. Replace transmitting device.
0V input & display is not "0".	<ol style="list-style-type: none"> 1. "Coarse" and "Fine" adjustments out of calibration. 2. Stray AC Voltages are being coupled to input 	<ol style="list-style-type: none"> 1. Turn P3 & P4 clockwise, even if S2-2 is OFF. 2. Connect Earth Ground to PIN 5.
Display will not calibrate to max input range.	<ol style="list-style-type: none"> 1. P1 Reference adjustment is out of calibration. 	<ol style="list-style-type: none"> 1. Select proper standard range and apply maximum input for that range. Adjust P1 until display reads max input. Switch S2-2 should be OFF when calibrating reference
Unstable Display	<ol style="list-style-type: none"> 1. AC Input polarity reversed 2. Earth ground not stabl 	<ol style="list-style-type: none"> 1. Check that AC Neutral is connected to Pin 2. 2. Provide stable earth ground or disconnect earth ground and check if stability improves.

WARRANTY

This product is warranted against defects in materials and workmanship for a period of two (2) years from the date of shipment to Buyer.

The Warranty is limited to repair or replacement of the defective unit at the option of the manufacturer. This warranty is void if the product has been altered, misused, dismantled, or otherwise abused.

ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, ARE EXCLUDED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Decoding Part Number

Example	BC	1	DX	G
---------	----	---	----	---

BEACON

Power:

- 1= 5VDC
- 2= 8-24VDC (DC ranges jumper selectable)
- 4= 115VAC } All ranges
- 5= 230VAC } jumper selectable

Input:

- DS=DC Volt/Current display STD Input (no scaling)
- D0=DC Volt/Current scale from "0" only
- DX=DC Volt/Current scale with "0" offset
- A0=AC or DC Volt/Current scale from "0" only
- AX=AC or DC Volt/Current scale with "0" offset

Options:

- G= Green LED's
- S= Small Bezel (2.12" H x 4.01" W)
- 2A= 0 - 1.999 A input option
- 5A= 0 - 5 Amp input option

Accessories:

- BCAL1 = Descriptor Labels: %, °F, °C, Hz, kHz, RPS, V DC, mA DC, mV DC, V AC, mA AC, mV AC, uA DC, A AC, A DC
- BCAL2 = Descriptor Labels: ft/sec, ft/min, ft/hr, ft³/sec, ft³/min, ft³/hr, GPM, GPH, RPM, in/sec, in/min, in/hr, lb/sec, lb/min, lb/hr
- BCAL3 = Descriptor Labels: L/sec, L/min, L/hr, m³/sec, m³/min, m³/hr, m/sec, m/min, m/hr, kpa, bar, kg, lb, PSI, kW
- BCR2A =External .1Ω 1% 5W shunt (0 - 1.999 A)

BCSCALING = Custom Scaling
(Specify with each unit, see below)

Example:	Input	IDC	0.004	0.020
	Display	10.0	150.0	

Where:

- IDC = DC Current, IAC = AC Current
- VDC = DC Voltage, VAC = AC Voltage
- Low Range 0.004 = 4 mA
- High Range 0.020 = 20 mA
- Low Display = 10.0
- High Display = 150.0