Redefine Innovative Metering

Table 1 :Standard current input ranges

Standard current input ranges		
Input(mA)	JUMPER SETTING	RESISTOR CHANGES
0….20	B101,B105,B106,B111	NO CHANGE
1...5	B101,B104,B106,B109,B112	NO CHANGE
4….20	B101,B105,B106,B107,B108,B111,B112	NO CHANGE

Table 2 :Non-standard current input ranges

Non standard current input ranges		
Input(mA)	JUMPER SETTING	RESISTOR CHANGES
0….0.1	B101,B105,B106,B111	R7=SMD RES 3 KOHM / 1% / 0.25 W / 50PPM / 1206
0….0.2	B101,B105,B106,B111	R7=SMD MFR 1.5 KOHM / 1% / 0.25 W / 50PPM / 0204 MINIMELF
0….0.5	B101,B104,B109,B110,B111	NO CHANGE
0…...1	B101,B104,B107,B110,B111	NO CHANGE
0….…2	B101,B104,B108,B111	NO CHANGE
0…...5	B101,B105,B106,B107,B108,B110,B111	NO CHANGE
0….10	B101,B105,B110,B111	NO CHANGE
0….40	B101,B105,B106,B111	R7=SMD MFR 7.5 / 1% / 0.25W / 50 PPM / 0204 MINIMELF
0….80	B104,B105,B106,B111	R7=SMD MFR 2.2 OHM / 1 /%0.25W /50 PPM /0204 MINIMELF , R6=SMD MFR 1.5 OHM / 1/\ %0.25W / 50PPM / 0204 MINIMELF
0….100	B101,B105,B106,B111	R7 =SMD MFR 1.5 OHM `1% V 0.25W V50PPM / 0204 MINIMELF
0.2….1	B101,B104,B108,B110,B111,B112	NO CHANGE
1….…5	B101,B104,B106,B109,B112	NO CHANGE
2….10	B101,B105,B106,B107,B110,B111,B112	NO CHANGE

Table.3 Standard voltage input ranges

Standard voltage input ranges		
Input(V)	JUMPER SETTING	RESISTOR CHANGES
0….10	B101,B110,B111	NO CHANGE
1...5	B102,B106,B108,B109,B110,B112	NO CHANGE
2….10	B101,B106,B107,B110,B111,B112	NO CHANGE

Table.4 Non standard voltage input ranges

Non standard voltage input ranges		
Input(V)	JUMPER SETTING	RESISTOR CHANGES
0….0.06	B106,B109,B110,B111	NO CHANGE
0...…0.1	B107,B108,B110,B111	NO CHANGE
0….0.2	B106,B108,B109,B111	NO CHANGE
0...…0.5	B106,B107,B108,B109	NO CHANGE
0…...…1	B102,B106,B107,B108,B110,B111	NO CHANGE
0…….…2	B102,B107,B108,B109,B111	NO CHANGE
0…….…5	B102,B108,B110	NO CHANGE
0…...…20	B101,B106,B111	NO CHANGE
0…...…40	B101,B108	NO CHANGE
0.2...…1	B102,B109,B110,B111,B112	NO CHANGE
1…...…5	B102,B106,B108,B109,B110,B112	NO CHANGE
4…...…20	B101,B106,B107,B108,B111,B112	NO CHANGE

Version: 1

## Procedure to change the input configuration

I)Before making changes ensure that transducer should be electrically dead and all connection wires should be disconnected .

II)Remove the Back cover of transducer by using screw driver .

Insert screw driver in a snap fitting slot and press in direction of arrow, remove all snap fitting pillars of back cover.
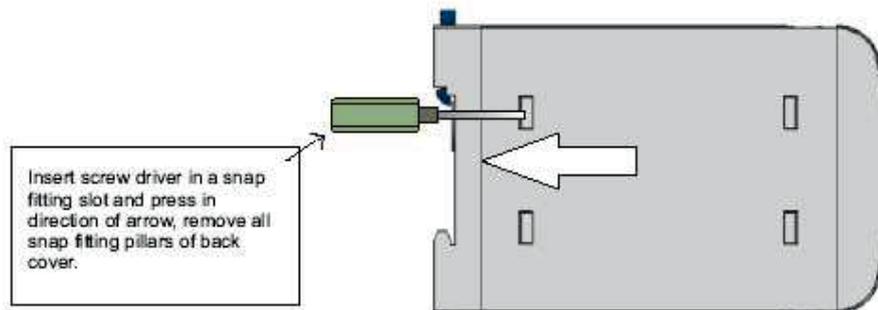
III)Remove the front cover and take the Main card out .

Insert screw driver in a snap fitting slot and press in direction of arrow, remove all snap fitting pillars of front cover.
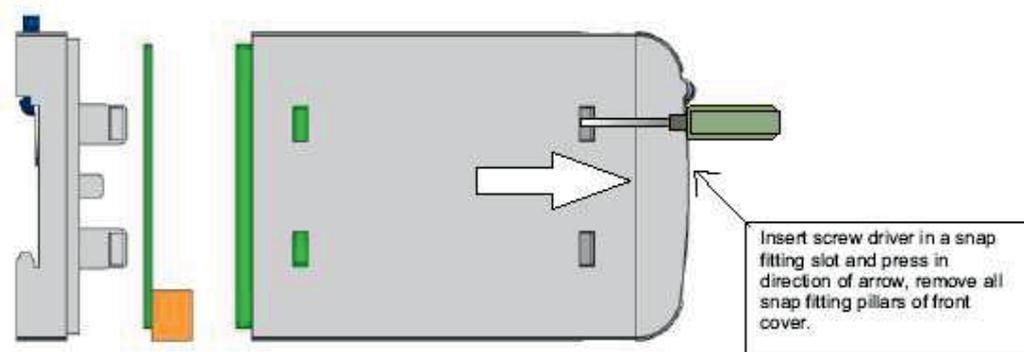
IV)Remove Main PCB out of middle cover .
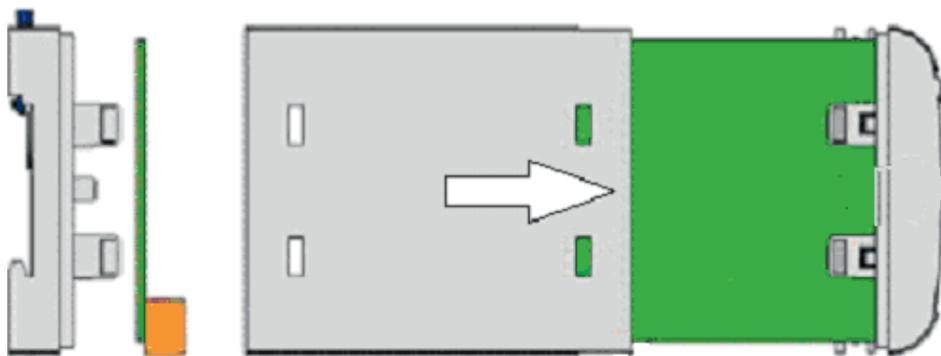
V) To convert Standard input ranges to Non standard input ranges or vice versa change the jumper settings and / or resistor values as per Table **1** ,Table **2** ,**T**able **3 &** Table **4 .**

VI) For location of the Jumpers and resistors on PCB refer Fig .A AND Fig .B

COMPONENT SIDE

ZERO

SPAN

B121 B120

B110

B104 B105 B102

B101

R6

R7

B109

B111

B106 B107 B108

B112
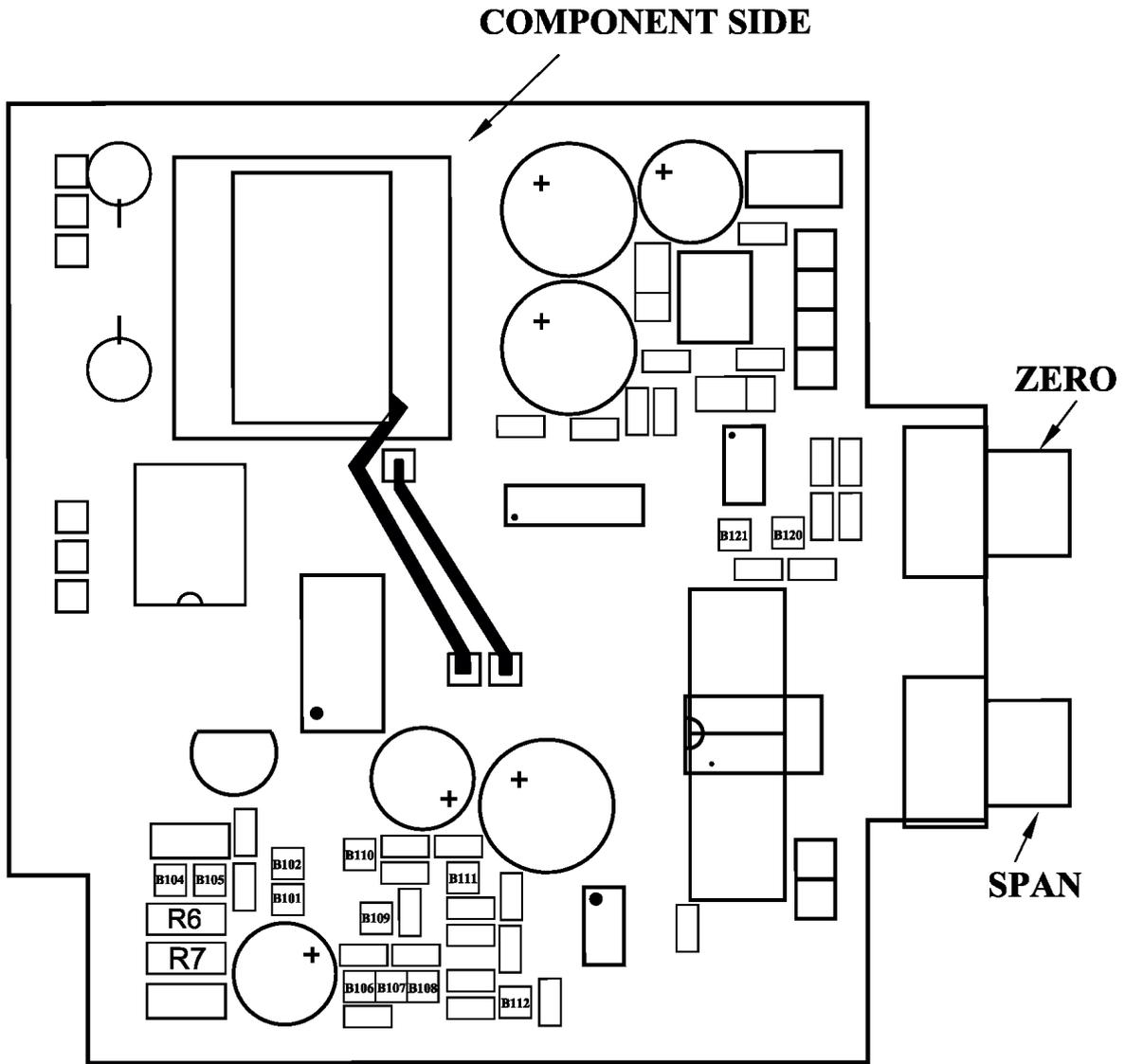
Fig. A -Component side of PCB
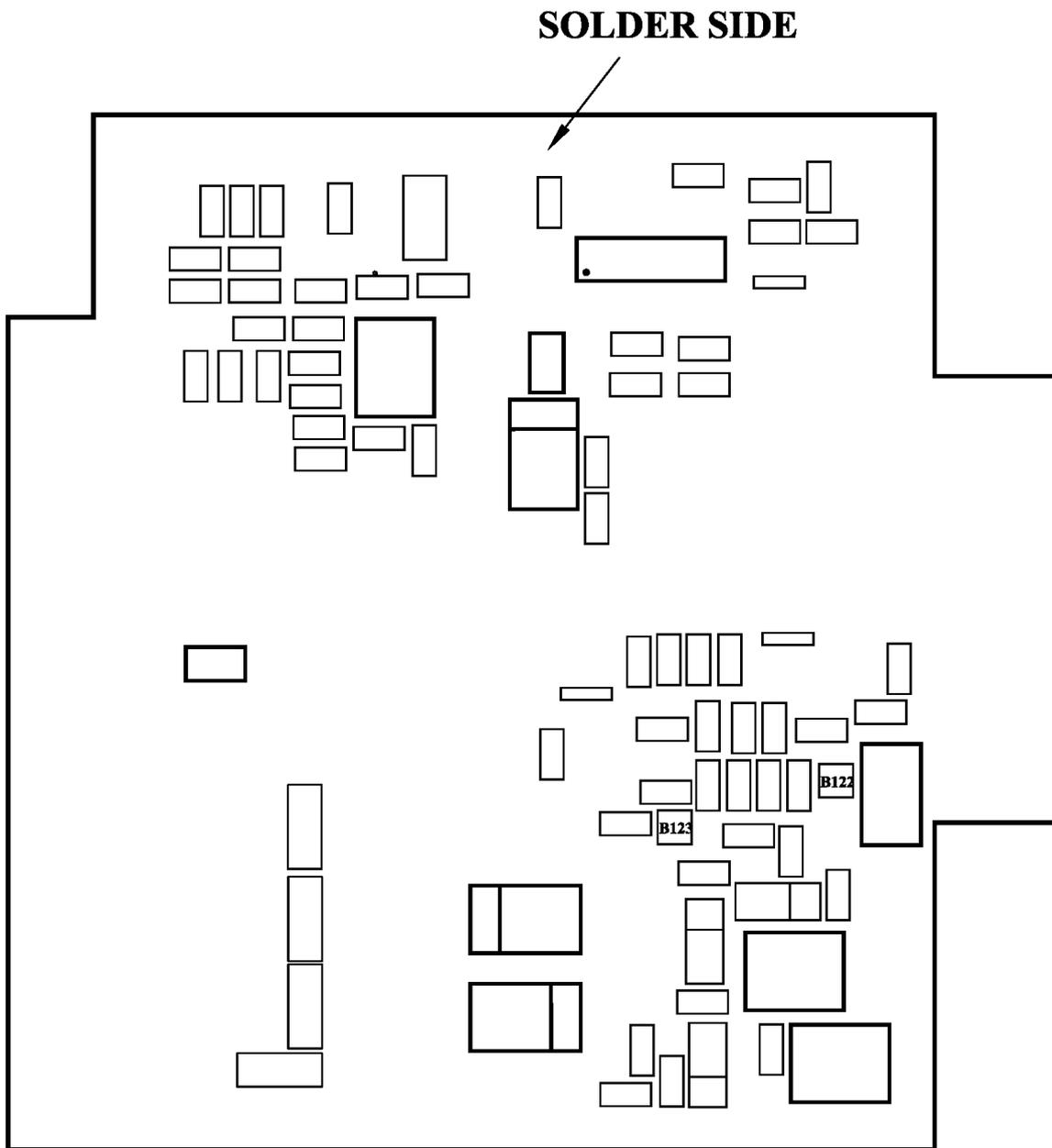
SOLDER SIDE

Fig. B -Solder side of PCB

VII(After configuring the input and output ranges follow the below procedures for calibration of ZIEGLER SI-101 .

a (Select Load resistance Rn) Nominal value of load resistance (as per Table A and Table B .If the out put is different than the table values use Formula1 OR Formula2 for calculating Rn ,Rmin and Rmax

Table A :LOAD RESISTANCE (Rb)for Current Output

Sr.no	Output current (mA)	Minimum value of load Resistance (Rmin)	Nominal value of load Resistance (Rn)	Maximum value of load Resistance (Rmax)
1 .	0…20	0	300	600
2 .	4…20	0	300	600

Rmax $= (12V / I_{AN})$;$I_{AN} =$ Full scale value of the output current …… Formula1
Rmin = .0
(Rn = . Rmax / 2)

Table B: LOAD RESISTANCE)Rb (for Voltage Output

Sr.no	Output Voltage (Volts)	Minimum value of load Resistance (Rmin)	Nominal value of load Resistance (Rn)	Maximum value of load Resistance (Rmax)
1 .	0….10	2000	4000	∞
2 .	2….10	2000	4000	∞

Rmin $= U_{AN} / 5mA$;$U_{AN} =$Full-scale value of the output voltage ……Formula2
Rn = 2 * Rmin ;
Rmax =∞ ;

b) Make the connections as shown in table below .

	E +	1
Input terminals	E -	2
Output Terminals	A +	3
	A -	4
Auxiliary Supply	H +	5
	H -	6

Fig .C: Connection Diagram for current output

```
                    +E              +H
┌──────────────┐   ┌─────────────┐   ┌──────────────┐
│ INPUT SOURCE │   │             │   │   AUX .      │
│ )DC (        │───│  ZIEGLER    │───│   SUPPLY .   │
│ CALIBRATOR   │   │  SI-101     │   │   AC/DC      │
└──────────────┘   └─────────────┘   └──────────────┘
                    - E            -H
                   +A              - A
                    +
   DMM (mA DC)     (↗)
                    -
                   ┌─────────────┐
                   │   LOAD      │
                   │ RESISTANCE  │
                   └─────────────┘
```
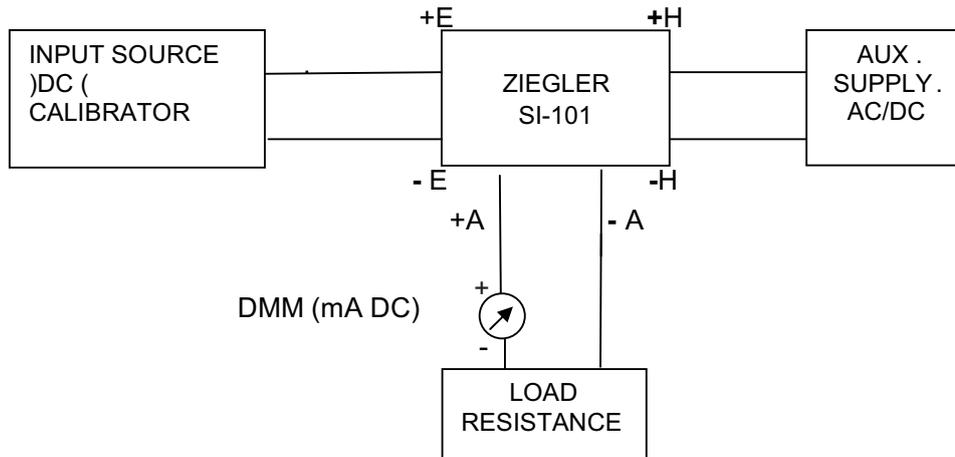
Fig. D: Connection Diagram for Voltage Output .

```
                   +E              +H
┌──────────────┐   ┌─────────────┐   ┌──────────────┐
│ INPUT      ( │   │             │   │   AUX .      │
│ SOURCE       │───│  ZIEGLER    │───│   SUPPLY .   │
│ )DC (        │   │  SI-101     │   │   AC/DC      │
│ CALIBRATOR   │   │             │   │              │
└──────────────┘   └─────────────┘   └──────────────┘
                   -E              -H
                   +A        -A
                   ┌─────────────┐
                   │   LOAD      │
                   │ RESISTANCE  │
                   └─────────────┘
                   + (↗) -DMM) V DC (
```
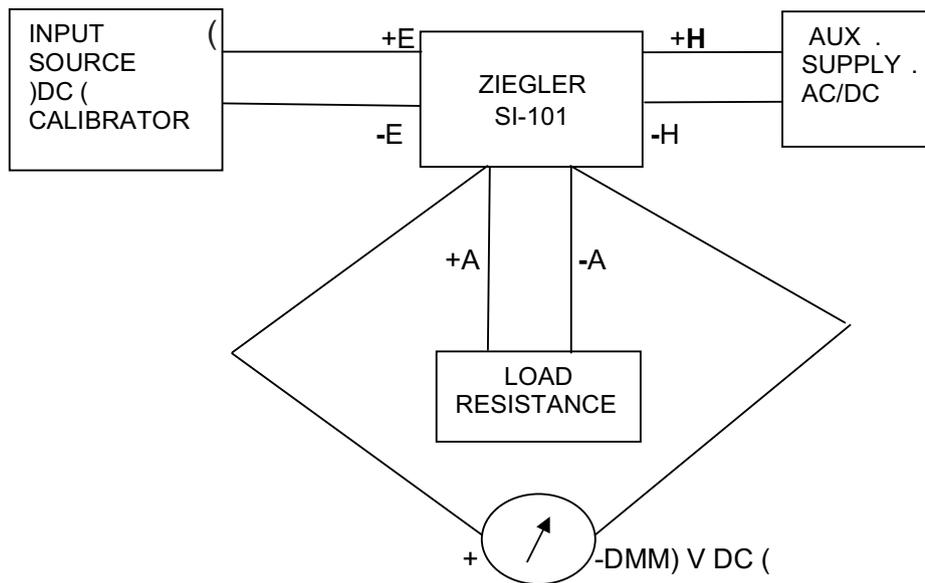
Reference conditions:

1) Ambient temperature : 23^0 C ± ,2K
2) Auxiliary Power Supply   : 230V AC ±10 %
3) Load Resistance   :   Current :0.5*Rmax.
                                 Voltage :2*Rmin .

ZERO adjustment :

Refer Fig. B for position of Potentiometers & Table 4 for limits of ZERO adjustment

1 . Keep Potentiometers RV1 and RV2 in middle position .

2 . Set the initial value of input equal to Xo such that output should be zero .

This means for the output Range : 20…100 %, x0 - = 25 % of the measuring range
0…100%, x0 = 0% of the measuring range

Refer Table 5 for selecting input value for setting output value to zero .

3 . Vary the potentiometer RV1 ,and check the Output can be adjusted in ±2% of the output end value .

4 . If it can be adjusted in ± 2 % of output end value ,then go to step 5 .

5 . Adjust output(Y) = output zero value ± [0.0005 * Output End value [with Potentiometer P1

Refer Table 5 for limits for ZERO adjustment .

Table 5 : Limits for ZERO adjustment

Sr . No	Xo Value of input for output=0(NULL)mA /Volt		Standard Input range	Standard Output Range	Limits for Calibration of output zero value ± = (0.0005 * Y2)
1	X0 =0 %of InputRange	0	0…10 Volt	0…10 Volt	- 0.005 to 0.005 Volt
		0	0…20 mA	0…20 mA	-0.01 to 0.01 mA
2	X0 - =25 %of Input Range	0	1…5 mA / Volt	2…10 Volt	- 0.005 to 0.005 Volt
3		0	2…10 Volt		
4		0	4…20 mA	4…20 mA	-0.01 to 0.01 mA

SPAN adjustment :

6. Set the input to the final value of measured Range.

7. Apply input (X = (End value of input)X2),zand adjust the
   Output (Y = (Output End value) Y2) ± [0.05 % of output End Value]with Potentiometer RV2 .

8. .Vary the potentiometer RV2 till the output is adjusted within ±0.05 %of output end value .
   Refer Table 6 for limits for the span adjustment .

Table 6 :Limits for SPAN adjustment

Sr . No .	Output End Value (Y2)	Limits for Calibration of Output End Value (Y2) ± 0.05 %of measuring range
3 .	10 Volt	9.995 to 10.005 mA \ Volt
4 .	20 mA	19.99 to 20.01 mA

Ensuring Zero and Span adjustment :

9 .In this method it is ensured that the zero and span adjustment remains unchanged .

10 .Give input to transducer such that output should be zero i.e .give same input ,which
   Was given for Zero adjustment .

11 .Measure the output ,if it is not within± 0.05 %of the output end value ,repeat step 3 .

12 .Again give input as end value of input range i.e .give input ,which was given for
   span adjustment .

13 .Measure the output .If it is output end value with ±0.05 %of tolerance, then Calibration procedure
   is completed .If it is not within tolerance of ±0.05 %of output end value ,then repeat step 6   .

14 .Repeat the above step 11 ,step 12 and step 13 until the output is adjusted within allowable
   tolerance of ±0.05 %of the output end value .

VIII)   After making the input output configuration inserts the front card   .
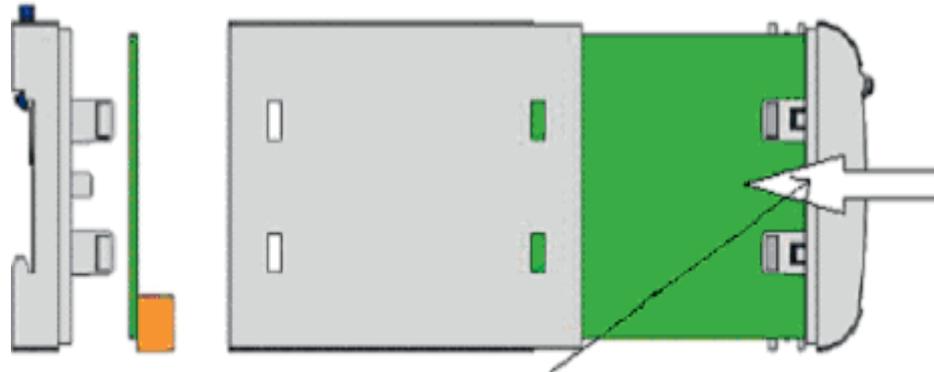
Insert the front cover ,press in the direction of arrow

IX)   Insert the Aux card and back cove
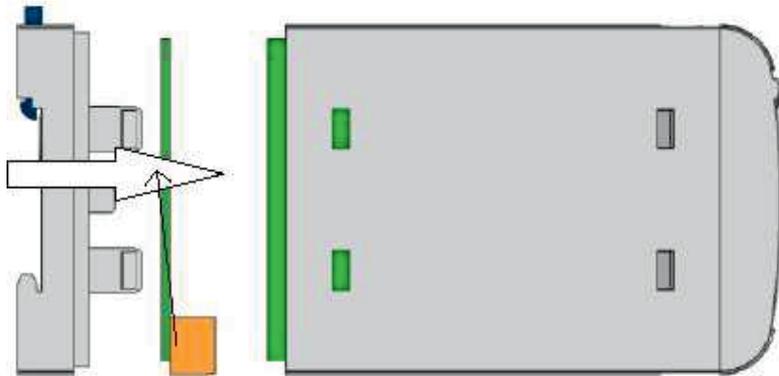
Insert the aux card PCB and Back cover as direction of arrow.

X) After inserting the Back cover ,transducer can be used for required application .