# MULTISPAN

Guide to operate Temperature controller.
Model No: - UTC-211 P, Universal Input Temperature controller.

1. Specifications:

1. Micro Controller Based. Single Display.
2. Dimension: Size: 72 x 72 x 120 mm.
    Panel Cutout: 68 x 68 mm.
3. Supply: 110 to 250 V AC(SMPS).
4. Sensor: 'J, K , RTD' Type Thermocouple.
5. Range: -99.9 TO 400.0 °C   For RTD Type ,DP Selectable
    0.0 TO 600.0 °C   For J Type , DP Selectable
    0-1200°C For K Type , DP not selectable.
6. Output: 1 Relay with 1 C/O, 230V AC, 5A.
7. Control Action: PID.
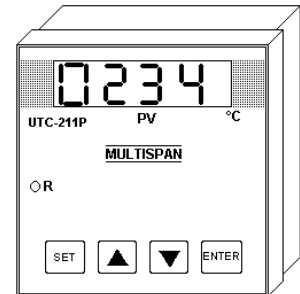
2. Displays:
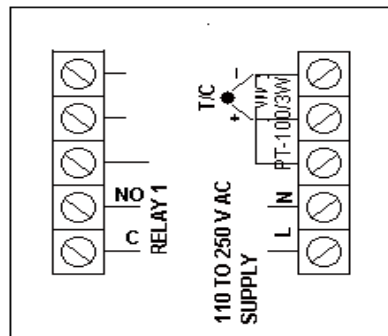
(A) **Display 1:** Upper 4-Digit Display in RED colour .
(B) **LED's:**   A small Red LED on left hand side near SV.

3. Front keys: SET   ▲   ▼   ENT

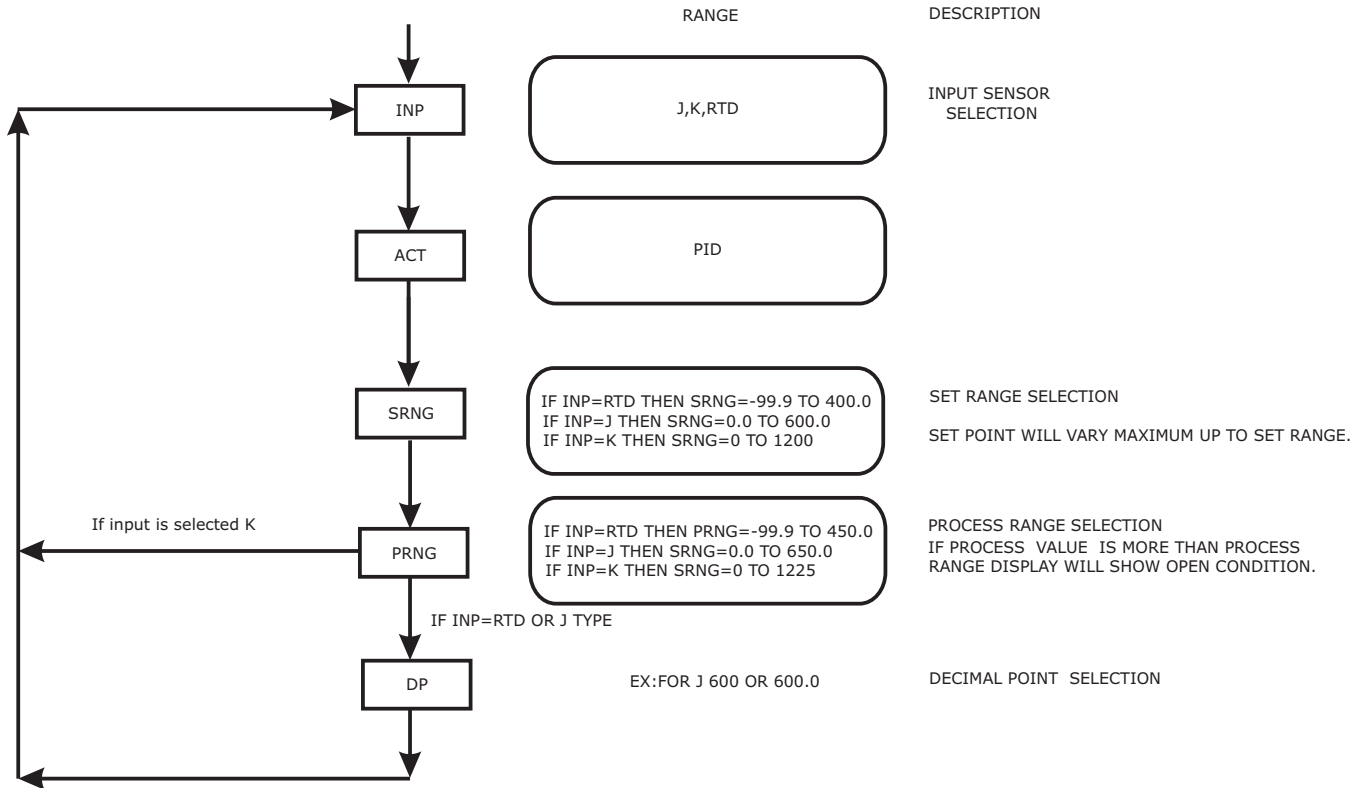These front keys can be used to see and change current values of parameters given in the flow chart.

4. CONNECTION DIAGRAM:

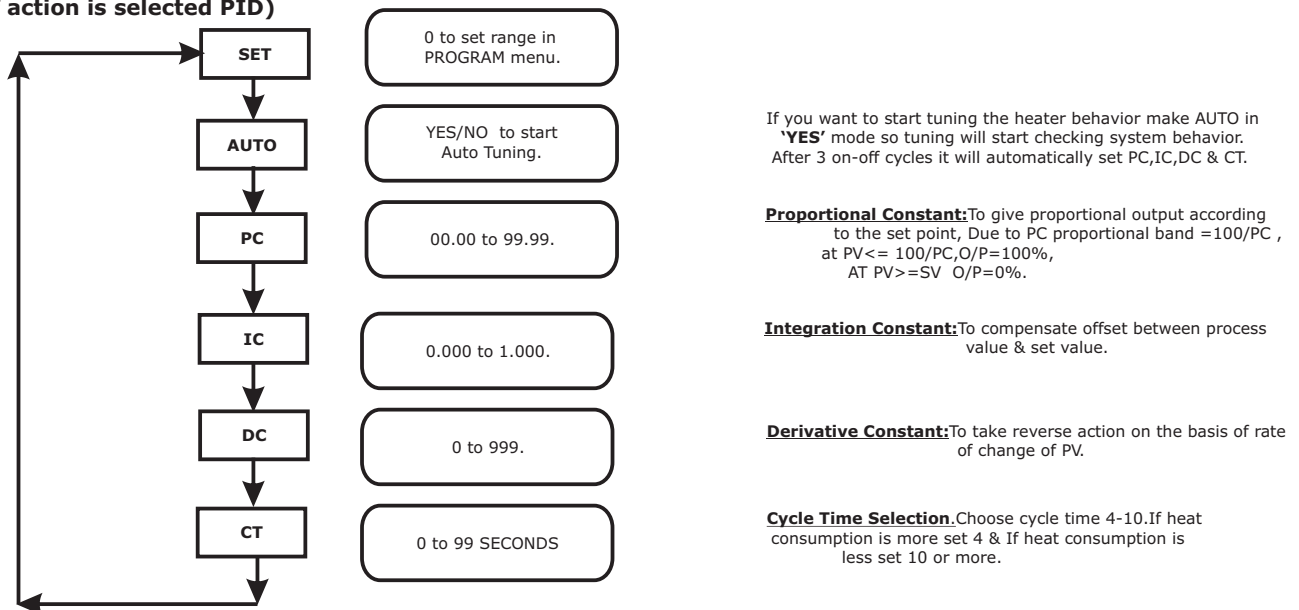## (1) PROGRAM MENU

To go into program menu first press and hold set & up key until upper display show **INP**.

RANGE   DESCRIPTION
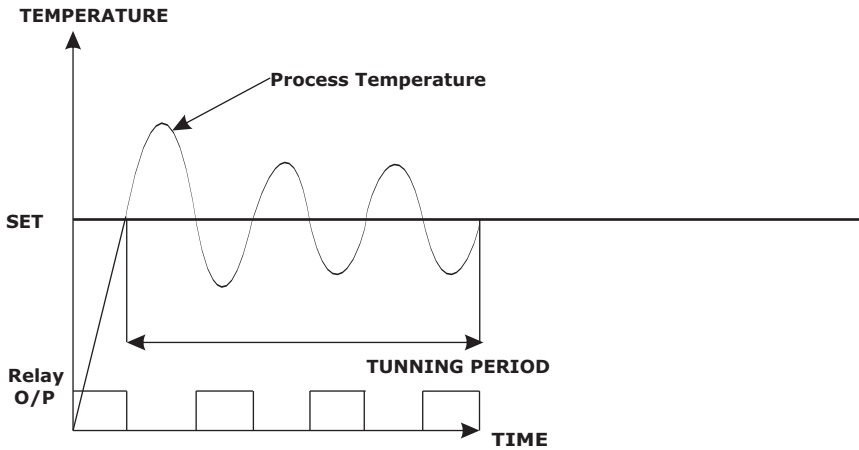
| INP | J,K,RTD | INPUT SENSOR SELECTION |

| ACT | PID | |

| SRNG | IF INP=RTD THEN SRNG=-99.9 TO 400.0
IF INP=J THEN SRNG=0.0 TO 600.0
IF INP=K THEN SRNG=0 TO 1200 | SET RANGE SELECTION

SET POINT WILL VARY MAXIMUM UP TO SET RANGE. |

If input is selected K

| PRNG | IF INP=RTD THEN PRNG=-99.9 TO 450.0
IF INP=J THEN SRNG=0.0 TO 650.0
IF INP=K THEN SRNG=0 TO 1225 | PROCESS RANGE SELECTION
IF PROCESS VALUE IS MORE THAN PROCESS
RANGE DISPLAY WILL SHOW OPEN CONDITION. |

IF INP=RTD OR J TYPE

| DP | EX:FOR J 600 OR 600.0 | DECIMAL POINT SELECTION |

(2) SET MENU (If action is selected PID)

| **SET** | 0 to set range in PROGRAM menu. |

| **AUTO** | YES/NO to start Auto Tuning. |

If you want to start tuning the heater behavior make AUTO in **'YES'** mode so tuning will start checking system behavior. After 3 on-off cycles it will automatically set PC,IC,DC & CT.

| **PC** | 00.00 to 99.99. |

Proportional Constant: To give proportional output according to the set point, Due to PC proportional band =100/PC , at $PV <= 100/PC, O/P=100\%$, AT $PV >= SV$ $O/P=0\%$.

| **IC** | 0.000 to 1.000. |

Integration Constant: To compensate offset between process value & set value.

| **DC** | 0 to 999. |

Derivative Constant: To take reverse action on the basis of rate of change of PV.

| **CT** | 0 to 99 SECONDS |

Cycle Time Selection.Choose cycle time 4-10.If heat consumption is more set 4 & If heat consumption is less set 10 or more.

PID Control Action

TEMPERATURE

Process Temperature

SET

TUNNING PERIOD

Relay O/P

TIME

Effects of Increasing Parameters				
Parameter	**Rise Time**	**Overshoot**	**Settling Time**	**Steady State Error**
PC (Proportional Constant)	Decrease	Increase	Small Change	Decrease
IC (Integral Constant)	Decrease	Increase	Increase	Eliminate
DC (Derivative Constant)	Small Change	Decrease	Decrease	None

IC (INTEGRAL CONSTANT):

When PB is set and PV is stable in desired range, but offset is present between set value & process value then increase IC & set it according to system response. If system response is slower for heating & cooling action then set IC to higher value ,about 100 & more and if system response is faster then set IC to lower value near about 10 & more.

DC (DERIVATIVE CONSTANT):

If system behavior is not constant for PV to be increase or decreased .Means system behave random due to random heat consumption /heat loss or due to externally generated heat in system.
Derivative constant is to be set according to the variation noticed in PV. If variations due to heat loss / generated are more set DC at higher value and if variations is less set DC to lower value.