

## USER'S MANUAL FOR DIGITAL TEMPERATURE CONTROLLER

MODEL NO. AI-01C



*For any technical assistance, please feel free to contact factory at the below address...*

***Manufactured By :***

## **ACE INSTRUMENTS**

(An ISO 9001-2008 Certified Company )

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## **1. INTRODUCTION:-**

The DIGITAL TEMPERATURE CONTROLLER, Model AI-01C, is a microcontroller based indicating instrument for indicating process temperature value. This instrument has been designed mainly to monitor very important process parameter of temperature using input from RTD Pt-100, 3 Wire temperature sensors.

The Digital Temperature Controller (Model AI-01C), measures temperature in the range from -50.0 to +200.0 Deg. C.

The front panel operation has been specially designed for user friendly operations. There are commands for directing mode settings, alarm settings and output settings.

The documentation presented here describes the front panel operation in detail. The user is requested to go through this manual and simultaneously give commands on the panel of the indicator. After initial difficulties the user will find that the front panel operations are quite simple and easy.



## 2. APPLICATION:-

1. Pharmaceuticals/Bulk Drug Reactor Temperature Monitoring
2. Distillation Column Temperature
3. Tray Drier Temperature
4. Steam Line/Jacket Temperature
5. Pharma Machinery Temperature
6. Clean Room/ Pharma Room Temperature
7. Laboratory Equipment Temperature, etc.

## 3. CLASSICFEATURES:-

**Input** : RTD-PT 100, 3 Wire  
 Thermocouple K Type (Chromel - Alumel)  
 Thermocouple J Type (Iron - Constantan)  
 Thermocouple R Type (Pt - PtRh 13%)  
 Thermocouple S Type (Pt - PtRh 10%)  
 4 to 20mA DC (-999 to 9999 Programmable )

**Relay Output:** 2 nos. of Relay Output

**Resolution :** RTD-PT 100 - 1°C or 0.1°C  
 Thermocouple K Type - 1°C  
 Thermocouple J Type - 1°C  
 Thermocouple R Type - 1°C  
 Thermocouple S Type - 1°C  
 4 to 20mA DC - Selectable



## 4. Technical Specifications:

Measuring Range : RTD-PT 100 (0.1°C) - -99.9 to 400.0°C  
 RTD-PT 100 (1°C) - -99 to 400°C  
 Thermocouple K Type - 0000 to 1200°C  
 Thermocouple J Type - 0000 to 750°C  
 Thermocouple R Type - 0000 to 1750°C  
 Thermocouple S Type - 0000 to 1750°C  
 4 to 20mA DC - Programmable -999 to 9999

Resolution : RTD-PT 100 - 1°C or 0.1°C  
 Thermocouple K Type - 1°C  
 Thermocouple J Type - 1°C  
 Thermocouple R Type - 1°C  
 Thermocouple S Type - 1°C  
 4 to 20mA DC - Selectable

Accuracy : Better than  $\pm 0.2\%$  of Full Scale  
 Display : 4 Digit ½" High Red L.E.D.

Compensation : Automatic Cold Junction Compensation

Key Features : 

- Less Complex System due to Single Chip Solution
- Sensor Calibration

One point calibration for RTD-PT100

One point calibration for all Thermocouples

Two point calibration for 4 to 20mA DC

● Input sensor selection through front keyboard

Control Type : On-Off  
 Time Proportional

Control Logic : Heating or Cooling

Quality is not an act, it is a habit."



Proportional	:	Proportional Band
Parameter		Offset
		Cycle Time
Relay Output	:	2 nos. of Relay Output
		Time Proportional action for first Relay only
Features through	:	Three Keys on the front panel
Keyboard		,Relay - Set Point, Control Logic, Hysteresis in Temperature, Delay in Time, Time Proportional Parameter - Proportional Band, Offset, Cycle Time, Input Sensor Selection, Range selection for mA Input
Retransmission	:	Optional 4-20mA Retransmission corresponding to input range
Power Supply	:	230VAC, 50Hz
Size	:	96 X 96 X 65mm or 96 x 48 x 110 mm.

### 3. FLOW CHART:

#### 1) FLOW CHART FOR INPUT TYPE ADJUSTMENT: -

(Factory Set, Hence Please Avoid Setting)

#### INPUT TYPES;

1. ANLG : 4-20Ma.
2. rtd.1 : rtd sensor.(with decimal)
3. Rtd1 : rtd sensor.(without decimal)
4. j : j-type.
5. t :t-type.
6. r :r-type.
7. s :s-type.

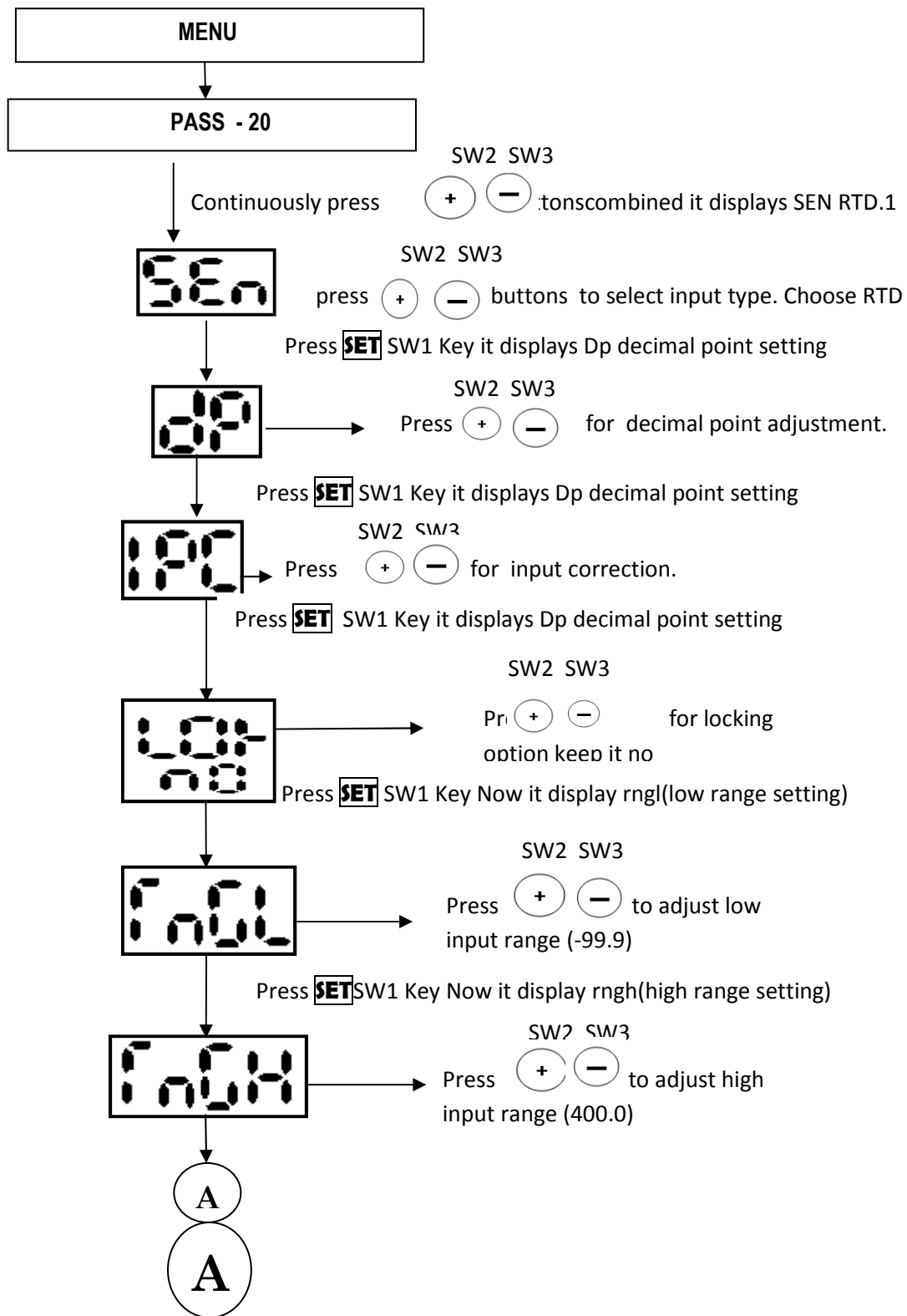
### 5.FLOW CHART:

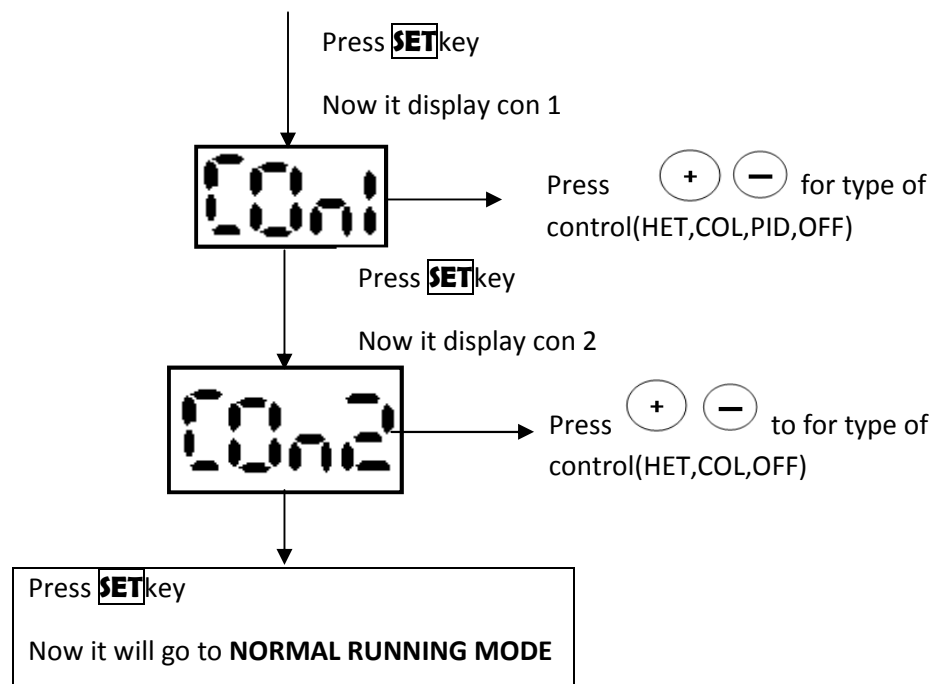
#### 1) FLOW CHART FOR INPUT TYPE ADJUSTMENT: - (Factory Set, Hence Please Avoid

Quality is not an act, it is a habit.”



Setting)





**Note:** these are for PID control settings.

#### HET: BELOW SET POINT

**IN CON1** select HET mode

1. Press set key it will display HY 1 (hysteresis) adjust it by using (+,-) keys.
2. Press set key it will display dL 1 (delay) adjust it by using (+,-) keys.

#### COL: AFTER SET POINT

**IN CON1** select HET mode

1. Press set key it will display HY 1 (hysteresis) adjust it by using (+,-) keys.





**INPUT TYPES;**

1. CUR : 4-20Ma.
2. rtd.1 : rtd sensor ( Factory Set )
3. Rtd1 : rtd sensor.
4. j : j-type.
5. t :t-type.
6. r :r-type.
7. s :s-type.

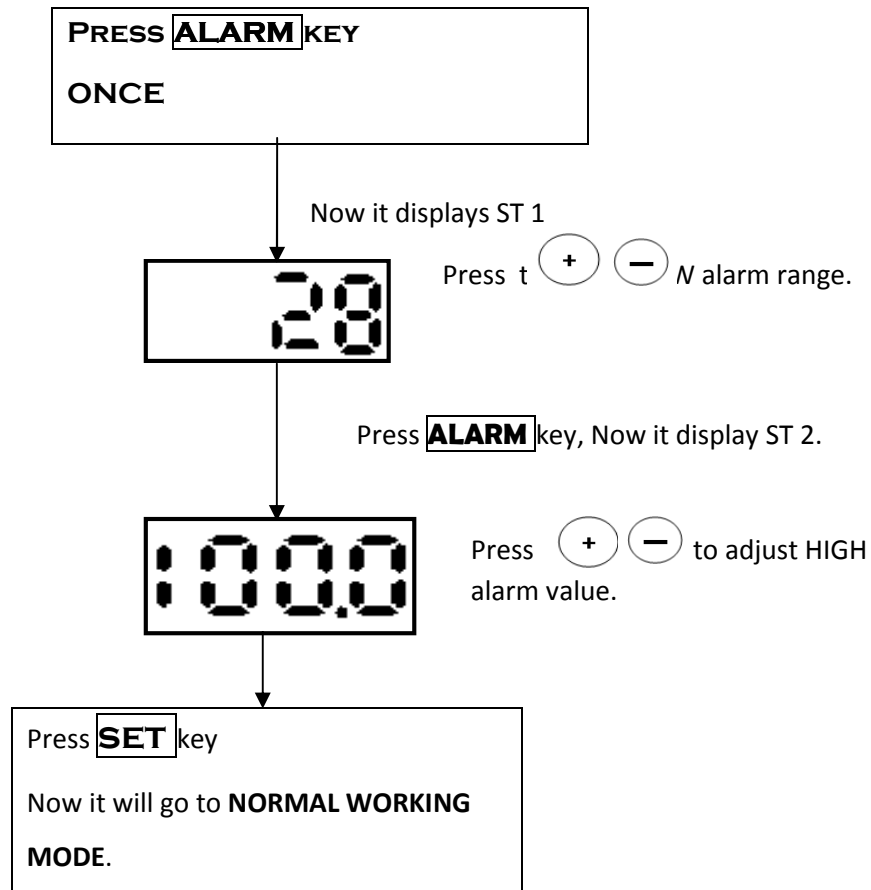
**WIRING DIAGRAM**

Model 96 x 96 x 65 mm.

RTD(PT100)									
( - )	( - )	( + )							
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	
10	11	12	13	14	15	16	17	18	
<b>L</b>	<b>N</b>		<b>NO</b>	<b>CO</b>	<b>NC</b>	<b>NO</b>	<b>CO</b>	<b>NC</b>	
<b>230 V.A.C.</b>			<b>RELAY-2</b>			<b>RELAY-1</b>			



### 3) FLOW CHART FOR ALARM SETTINGS:-



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