

## (A1) ECO SERIES DIGITAL TEMPERATURE INDICATOR / CONTROLLER IN ABS ENCLOSURE



### MODEL WISE DESCRIPTIONS :

<b>SERIES 720 (72 x 72 x 110)mm.</b>		
1.1	DTI-720	Temperature Indicator
1.2	DTC-720	Single Set Point on/off Controller potentiometer setting
1.3	DSP-720	Two Set Point on/off Controller potentiometer setting
1.4	TPC-721	Single Set Point Time Proportional potentiometer setting
1.5	DPC-721	Proportional Controller with Analog O/P / Triggering pulses for external max. 40A Triac
1.6	DSP-722	Two Set Point Time Proportional, on/off Controller Pot. Settings

<b>SERIES 480 (48 x 96 x 110)mm.</b>		
1.7	DTI-480	Temperature Indicator
1.8	DTC-481	Single set point on/off controller potentiometer setting
1.9	DSP-482	Two set point on/off controller potentiometer setting
1.10	TPC-481	Single set point Time proportional potentiometer setting
1.11	TPC-482	Two Set Point Time Proportional, on/off Controller Pot. Settings (Relay + SSR)

<b>SERIES 960 (96 x 96 x 110)mm.</b>		
1.12	DTI-12/P	Temperature Indicator
1.13	DTC-300/N	Single set point on/off controller potentiometer setting
1.14	DSP-12/P	Two set point on/off controller potentiometer setting
1.15	DTC-301/P	Two set point on/off controller 3/4 digit T/W setting
1.16	TPC-10/P	Single set point Time proportional controller
1.17	DTI-20/P	Dual Input / Dual Display Indicator
1.18	DTC-22/P	Dual Input / 2 Set Point on/off Controller (1 SP per input)
1.19	DTC-24/P	Dual Input / 4 Set Point on/off Controller (2 SP per input)

**DESCRIPTION :**

Librathern new ECO - MODEL series 480, 720 & 960 of Digital Temperature Indicator / Controllers available in ABS enclosure in three different sizes. These are low cost, accurate, rugged and reliable Digital Temperature Indicator / controllers offered as On/Off or Time proportional control, for general-purpose temperature control applications.

On/Off control is the simplest controlling method. When used for heating control the temperature sensed by the connected sensor is compared with the set point and when the temperature exceeds this set point, the heater is put OFF. When the temperature again drops below the set point, the heater is turned ON. So, depending upon the heating system design, inertia due to heat, the heat absorption by process or the natural losses, the temperature will oscillate above and below the set points by few degree. When the application is for

cooling control, the cooling device such as compressor or water circulating valves are turned OFF, when temperature drops below the set point and turned ON when the temperature rises above the set point.

Where steady state control is desired, the time proportional control is more suitable. In this controlling method, the heater is continuously turned on and off at the fixed rate called cycle time within in the proportional band defined above and below the set point. This is done to feed the correct amount of power to the heating system to maintain the temperature exactly at the set point. The fine tuning is achieved by front panel BAND and RESET control.

**Some of the above models are also available in suitable size Weather proof and flameproof enclosures for use in the hazardous environment.**

**FEATURES :**

- Elegant appearance and compact in size.
- Accurate and sturdy in operation.
- Accuracy better than  $\pm 0.5\%$  of the full scale.
- Very easy to operate.
- Accepts standard type of thermocouple or RTD - Pt-100.
- Control output Relay or TRIAC or DC pulse for external SSR.
- Uses high quality potentiometer and membrane switch for adjusting the set points.

**APPLICATION :**

- Heat treatment
- Food processing
- Environmental chambers
- Cold Storage and Chilling plants
- Furnace / Oven control
- Constant temp. Baths,
- Plastic / Packaging / Pharma industry
- Laboratory equipment etc.

**TECHNICAL SPECIFICATIONS:**

<b>Input</b>	Thermocouple type J, K, RTD (Pt-100)/2 or 3 wire (any one to be specified)
<b>Range</b>	0 to 400°C for J type or K type or RTD (Pt-100) 0 to 1000 °C for K type 0.0 to 199.9 °C for RTD (Pt-100) -50.0 to 199.9 °C for RTD (Pt-100) User may specify the required range
<b>Accuracy</b>	Indicating accuracy better than $\pm 0.5\%$ of the specified range
<b>Display</b>	3 or 3.5 digit 0.3" or 0.5" Red/Green 7-segment LED display
<b>Set Points</b>	Adjustable using front panel multi-turn potentiometers with push to read membrane switches / push button coded wheel {only for DTC 300}
<b>Type of Control Outputs</b>	<p>a) Relay changeover contacts (rated for 6A @ 230VAC) preferred for ON/OFF control</p> <p>b) Solid state relay driver (0 to 10) VDC pulse preferred for Time Proportional control</p> <p>c) Built in Solid-state relay or Triac (rated for 10A @ 230VAC) preferred for Time Proportional control</p> <p>d) Analog or triggering pulses for Triac for phase angle control {single phase} preferred for proportional control</p>
<b>Hysteresis</b>	2°C for ON/OFF action (for 1°C resolution controller) 0.3°C for ON/OFF action (for 0.1°C resolution controller)
<b>Proportional Band</b>	$\pm 3\text{ }^\circ\text{C}$ to $\pm 15\text{ }^\circ\text{C}$ for time proportional & proportional action adjustable using front
<b>Adjustment</b>	panel ten turn potentiometer

**TECHNICAL SPECIFICATIONS:**

<b>Reset Control</b>	0 to 100% (adjustable using front panel ten turn potentiometer)
<b>Cycle Time</b>	a) 2 to 5 seconds for SSR DC pulse output (to drive external solid-state relays, Single SSR for single-phase load and 3 SSR for 3-phase load).
	b) 20 second for Relay or Triac Output (to drive external load contactor)
	c) 2 to 5 second for TRIAC Output (to drive direct heater load of max.1.5KW@ 230VAC)
<b>Supply</b>	230VAC / 110 VAC $\pm$ 10% (5VA), 50/60Hz or 24VDC @ 250mA
<b>Size</b>	96 x 48, 72 x 72 or 96 x 96 mm
<b>Panel Cutout</b>	68 x 68, 92 x 44, 92 x 92 mm $\pm$ 0.5 mm
<b>Enclosure</b>	ABS Plastic with polycarbonate front

**ORDERING INFORMATION :****SERIES 720 (1.1 to 1.6)**

<b>MODEL</b>	<b>SENSOR INPUT A</b>	<b>MEASURING RANGE IN °C B</b>	<b>OUTPUT 1 MODE C</b>	<b>OUTPUT 1 TYPE D</b>
DTI-720	'J' - (A1)0.0 199.9	(B1) HEAT or LO ALM	-(C1)	RELAY - (D1)
DTC-720	'K' - (A2)	-50.0 199.9-(B2)	COOL or HI ALM	DC PULSE- (D2)
DSP-720	Pt-100 - (A3)	0-400 - (B3)	NONE - (C3)	TRIAC/SSR-(D3)
TPC-721	OTHER - (A4)	0-600 - (B4)		TRIAC - (D4)
DSP-722		0-800 - (B5)		0-5VDC - (D5)
DPC-721		0-1000 - (B6)		{4-20}mA - (D6)
		OTHER - (B7)		NONE - (D7)

<b>OUTPUT 2 MODE E</b>	<b>OUTPUT2 TYPE F</b>	<b>SUPPLY VOLTAGE G</b>
HEAT or LO ALM - (E1)	RELAY - (F1)	230 VAC - (G1)
COOL or HI ALM - (E2)	DC PULSE - (F2)	110 VAC - (G2)
NONE - (E3)	TRIAC/SSR - (F3)	24 VDC - (G3)
	NONE - (F4)	

**ORDERING INFORMATION :****SERIES 480 (1.7 to 1.11)**

<b>MODEL</b>	<b>SENSOR TYPE i.e. INPUT A</b>	<b>MEASURING RANGE IN °C B</b>	<b>OUTPUT 1 MODE C</b>	<b>OUTPUT 1 TYPE D</b>
DTI - 480	'J' - (A1)	0.0-199.9 - (B1)	HEAT or LO ALM - (C1)	RELAY - (D1)
DTC - 481	'K' - (A2)	-50.0-199.9- (B2)	COOL or HI ALM - (C2)	DC PULSE - (D2)
DSP - 482	Pt-100 - (A3)	0-400 - (B3)	NONE - (C3)	TRIAC/SSR - (D3)
TPC - 481	OTHER - (A4)	0-600 - (B4)		NONE - (D4)
TPC - 482		0-800 - (B5)		
		0-1000 - (B6)		
		OTHER - (B7)		

<b>OUTPUT 2 MODE E</b>	<b>OUTPUT2 TYPE F</b>	<b>SUPPLY VOLTAGE G</b>
HEAT or LO ALM - (E1)	RELAY - (F1)	230 VAC - (G1)
COOL or HI ALM - (E2)	DC PULSE - (F2)	110 VAC - (G2)
NONE - (E3)	TRIAC/SSR - (F3)	24 VDC - (G3)
	NONE - (F4)	

**SERIES 960 (1.12 to 1.19)**

<b>MODEL</b>	<b>SENSOR TYPE i.e. INPUT A</b>	<b>MEASURING RANGE IN °C B</b>	<b>OUTPUT 1 MODE C</b>	<b>OUTPUT 1 TYPE D</b>
DTI-12/P	'J' - (A1)	0.0-199.9 - (B1)	HEAT or LO ALM - (C1)	RELAY - (D1)
DTC-300/N	'K' - (A2)	-50.0-199.9 - (B2)	COOL or HI ALM - (C2)	DC PULSE - (D2)
DSP-12/P	Pt-100 - (A3)	0-400 - (B3)	TRIAC/SSR - (C3)	TRIAC/SSR - (D3)
DTC-301/P	OTHER - (A4)	0-600 - (B4)	NONE - (C4)	NONE - (D4)
TPC-10/P		0-800 - (B5)		
DTI-20/P		0-1000 - (B6)		
DTC-22/P		OTHER - (B7)		
DTC-24/P				

<b>OUTPUT 2 MODE E</b>	<b>OUTPUT2 TYPE F</b>	<b>SUPPLY VOLTAGE G</b>
HEAT or LO ALM - (E1)	RELAY - (F1)	230 VAC - (G1)
COOL or HI ALM - (E2)	DC PULSE - (F2)	110 VAC - (G2)
NONE - (E3)	TRIAC/SSR - (F3)	24 VDC - (G3)
	NONE - (F4)	

**EXAMPLE :**

MODEL	A	B	C	D	E	F	G
DSP-722	A2	B6	C1	D3	E2	F1	G1

This is Two Set Point controller in 72 x 72 enclosure with K type thermocouple input having range 0-1000°C - Set point-1 as Time Proportional Triac output - 2<sup>nd</sup> set point as High Alarm or Cooling Relay Output and operating on 230VAC supply.

**Note: Please mention FLP next to the model for flameproof enclosures. e.g. DTI-720(FLP)**