

244.0

SPECIFICATIONS

Display

DP294-V05

4+4 digit, 7 segment digital display 4 digit for DTC204A-2/DTC324A-2 LED Indications

- 1: Output 1 ON
- 2: Output 2 ON
- T: Auto tune

S: Dwell timer* (Applicable for TCX44A/AX) Keys

3 keys for digital setting

INPUT SPECIFICATIONS

Input Signal

Thermocouple (J,K,T,R,S) / RTD (Pt100)

Sampling time

250 ms Input Filter (FTC)

0.2 to 10.0 sec

Resolution

0.1/1° for TC/RTD input (Fixed 1° for R & Stype TC input)

Temperature Unit

°C / °F selectable

Indication Accuracy

For TC inputs : 0.25% of F.S ±1° For R & S inputs: 0.5% of F.S ± 2° (20 min of warm up time for TC input) For RTD inputs : 0.1% of F.S ±1° (F.S = Full Scale)

FUNCTIONAL SPECIFICATIONS

Control Method

1) PID control with auto tuning 2) ON-OFF control

3) Heat-Cool (with auto-tuning)

Proportional Band (P)

1.0 to 400.0°

Integral Time (I)

0 to 9999 sec Derivative Time (D)

0 to 9999 sec

Cvcle Time

0.1 to 99.9 sec

Hysteresis Width

0.1 to 99.9° **Dwell Timer**

0 to 9999 min (only for TCX44A/AX)

Manual Reset Value -19.9 to 19.9°

HEAT COOL PID **Control Method** PID

Proportional Band-Cool

TC344

0.0 to 400.0°

Cvcle Time-Cool 0.1 to 99.9 sec.

Dead Band

- SPLL to SPHL (Programmable)
- OUTPUT
- Control Output (Relay or SSR user selectable) :
 - Relay Contact (SPDT) 05 A resistive @ 250V AC / 30V DC (TC544A : SPST RLY) 10 A resistive*@250V AC / 30V DC (*For DTC204A-2 / DTC324A-2)
 - SSR Drive Output (Voltage Pulse) 12V DC. 50 mA

Auxiliary Output :

Relay Contact (SPDT) 05 A resistive@250V AC / 30V DC(TC544A : SPST RLY) SSR Drive Output (Voltage Pulse) 12V DC, 50 mA

POWER SUPPLY

Supply Voltage 85 to 270V AC/DC (AC : 50 or 60 Hz)

Optional - 24V AC/DC

Power Consumption 6 VA max@230V AC

Temperature

Operating: 0 to 50°C

Storage : -20 to 75°C

Humidity (non-condensing) 95% RH

Weight

TC544A : 142 gms TC244AX / DTC204A-2 : 200 gms

TC344AX / DTC324A-2 : 252 gms

A SAFETY PRECAUTIONS

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If the equipment is not handled in a manner specified by the manufacturer it might impair the protection provided by the equipment.

Read complete instructions prior to installation and operation of the unit.

WARNING : Risk of electric shock.

WIRING GUIDELINES

WARNING :

- 1. To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement. Do not touch the terminals while power is being supplied.
- 2. To eliminate electromagnetic interference use short wire with adequate ratings; twists of the same in equal size shall be made. For the input and output signal lines, be sure to use shielded wires and keep them away from each other.
- 3. Cable used for connection to power source, must have a cross section of 1mm² or greater. These wires shall have insulation capacity made of at least 1.5kV.
- 4. When extending the thermocouple lead wires, always use thermocouple compensation wires for wiring. For the RTD type, use a wiring material with a small lead resistance (5 Ω max per line) and no resistance differentials among three wires.
- 5. A better anti-noise effect can be expected by using standard power supply cable for the instrument.

MAINTENANCE

- 1. The equipment should be cleaned regularly to avoid blockage of ventilating parts.
- 2. Clean the equipment with a clean soft cloth. Do not use Isopropyl alcohol or any other cleaning agent.

INSTALLATION GUIDELINES

- 1. This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and Internal wiring.
- 2. Do not allow pieces of metal, wire clippings, or fine metallic fillings from installation to enter the product or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
- 3. Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to the operator.
- 4. Use and store the temperature controller within the specified ambient temperature and humidity ranges as mentioned in this manual.

CAUTION

- 1. When powering up for the first time, disconnect the output connections.
- 2. Fuse Protection : The unit is normally supplied without a power switch and fuses. Make wiring so that the fuse is placed between the mains power supply switch and the controller. (2 pole breaker fuse - rating : 275V AC,1A for electrical circuitry is highly recommended)
- 3. Since this is a built-in-type equipment (finds place in main control panel), its output terminals get connected to host equipment. Such equipment shall also comply with basic EMI/EMC and other safety requirements like BSEN61326-1 and BSEN 61010 respectively.
- 4. Thermal dissipation of equipment is met through ventilation holes provided on chassis of equipment. Such ventilation holes shall not be obstructed else it can lead to a safety hazard.
- 5. The output terminals shall be strictly loaded to the manufacturer specified values / range

MECHANICAL INSTALLATION



- 1. Prepare the panel cutout with proper dimensions as shown above.
- 2. Fit the unit into the panel with the help of clamp given.
- 3. The equipment in its installed state must not come in close proximity to any heating sources, caustic vapors, oils, steam, or other unwanted process by-products.

- 4. Use the specified size of crimp terminals (M3.5 screws) to wire the terminal block. Tighten the screws on the terminal block using the tightening torque within the range of 1.2 N.m.
- 5. Do not connect anything to unused terminals.

EMC GUIDELINES

- 1. Use proper input power cables with shortest connections and twisted type.
- 2. Layout of connecting cables shall be away from any internal EMI source.

LOAD CONNECTIONS

the power output circuit.

L

the instrument.

FC544A

To reduce noise:

above, is recommended.

b) Use separate shielded wires for inputs

L(+) 1

N(-)|2

3

4

5

NO2

COM2

NO1

Doc. Name : OP INST

DTC204A-2 / DTC324A-2

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TERMINAL CONNECTIONS

1. The service life of the output relays depends on the switching capacity and switching conditions. Consider the actual application conditions and use the product within the rated load and electrical service life. 2. Although the relay output is rated at 5/10 amps it is

always necessary to use an interposing relay or

contactor that will switch the load. This avoids damage to

the controller in the event of a fault short developing on

3. Always use a separate fused supply for the "power load

terminals supplying power to the controller.

For load current less than 0.5A

тс

MOV

тс

MOV

С

ELECTRICAL PRECAUTIONS DURING USE

NO

ŇO

circuit"and do not take this from the live and neutral

тс

For bigger loads, use interposing relay / contactor

TC

Electrical noise generated by switching of inductive

loads can create momentary disruption, erratic

display, latch up, data loss or permanent damage to

a) Use of snubber circuits across loads as shown

11

SSR1+

SSR1-

12

SSR2

6

8 RTD3

9

10

LOAD

Snubber

Contactor

Snubber

LOAD

Ν

Ν

TC+/BTD1

TC-/RTD2

COM1

TC544A / TC244AX / TC344AX /

OP294-V05 (Page 1 of 3)



INCTIONS	S DESCRII	KEY PRESS					
NLINE							
view Level	1	Press 🛡 key for 3	3 sec.				
iew Level	2	Press A key for 3 sec.					
ew Protec	tion Level	Press A + V keys for 3 sec.					
ew online		Lower display selectable between SET1/SET2/TIME using A key.					
selecti	on of ONL	emaining time dep parameter in level DTC204A-2 / DTC3	1.				
204A-2 / D view online ameters	TC324A-2 Ə	Display selectable between SET 1/ SET 2 using A key. Note : Display shows parameter SET 1 / SET 2 for 1 sec.					
change on ameter va		Press □ + △ / ▽ t parameter value.					
		•					
view parar same leve ncrease or value of a p ameter.	el. decrease	 ▲ or ♥ key once to view the next or previous function in operational menu. ■ + ▲ to increase and ■ +♥ to decrease the function value. Note : Parameter value will not alter when respective level is locked. 					
inactiv	ity.	exit programming m	ode after 30 sec. of				
OR B	y pressing t	he 🛆 or 🛡 or 🛆 + 🕻	keys for 3 sec.				
	INPUT F	RANGES (Tabl	e 1)				
OR RTD							
INPUT		RANGES					
Resolutio	on	1	0.1				
Pt100	°C °F	-150 to 850 -238 to 1562	-150 to 850 -199 to 999				
OR THER	MOCOUP		133 10 333				
NPUT		RANGES					
Resolutio	on	1	0.1				
	°C	-199 to 750	-199 to 750				
J	°F	-328 to 1382	-199 to 999				
	°C	-199 to 1350	-199 to 999				
	°F	-328 to 2462	-199 to 999				
к		-328 to 2482					
K	00	1 - 199 10 400	-199 to 400				
к т	°C	200 to 750	100 +- 750				
к T	°F	-328 to 750	-199 to 750				
K T R & S		-328 to 750 0 to 1750 32 to 3182	-199 to 750 N/A N/A				
T R & S	°F °C °F	0 to 1750	N/A N/A				
T R & S	°F °C °F ERROR	0 to 1750 32 to 3182	N/A N/A le 2)				
T R&S	°F °C °F ERROR ror has occuven below.	0 to 1750 32 to 3182 DISPLAY (Tab red, the upper displa	N/A N/A le 2)				
T R & S When an er codes as giv	°F °C °F ERROR For has occuven below. Ma Sensor b	0 to 1750 32 to 3182 DISPLAY (Tab red, the upper displa	N/A N/A le 2) ay indicates error Control Output				

TCX44A/AX

Programming online parameters Setpoint 1 Default : 50 Range : SPLL to SPHL If upper display is selected as SEE! then, Pressing key will show on Upper display : SEE Lower display : <50> Press D+A/ Vkeys to increment / decrement 58 L1 value

Setpoint 2 / Dead band Default:0 Range : SPLL to SPHL If upper display is selected as SEE2/db then, Pressing key will show on Upper display: 5822/db Lower display: <0> Press **D** + **A** / **V** keys to increment / decrement SEt2/db value.

Dwell Timer Range : OFF, 1 to 9999 min If upper display is selected as E.PER/E.ELP then, Pressing key will show on Upper display : Lin E Lower display : <OFF>

Press D + A / V keys to increment / decrement dYEL time value.

DTC204A-2 / DTC324A-2

Programming online parameters

Setpoint 1 Default : 50

Range : SPLL to SPHL If online parameter is selected as 58 bit then, Pressing key will show on display : 58 bl & then <50> Press D+A/V keys to increment / decrement SEEL value.



CALIBRATION CERTIFICATE

Date :

Model No:

Claimed Accuracy :

For TC inputs : 0.25% of FS ±1° For R & S inputs : 0.5% of F.S \pm 2° (20 min of warm up time for TC input) For RTD inputs : 0.1% of FS ±1°

Sources calibrated against :

Multimeter calibration report no :

The calibration of this unit has been verified at the following values :

SENSOR	CALIBRATION TEMP (°C)	DISPLAY VALUE (°C)
	35.0	35.0
J	300.0	300.0
	600.0	600.0
	35.0	35.0
К	700.0	700.0
	1350	1350
	0.0	0.0
PT100	400.0	400.0
	800.0	800.0

The thermocouple / RTD curves are linearised in this microprocessor based product; and hence the values interpolated between the readings shown above are also equally accurate; at every point in the curve.

Unit is accepted as accuracy is within the specified limit of claimed accuracy and certificate is valid upto one year from the date of issue.

CHECKED BY:

Doc. Name : OP INST DTC204A-2 / DTC324A-2 TC544A / TC244AX / TC344AX / OP294-V05 (Page 2 of 3)

Default : OFF

CON	FIGURATION INSTRUC	TIONS														
Image: Strain of the strain					Pres	Press for 3 sec to enter Level 2 Press once t					o view next parameter in configuration menu					
					Pres	Press once to view previous parameter in configuration menu						Press for 3 sec to enter protection Level				
КЕҮ	• + • or	•		llows the user to in	crease or d	ecrease associated p	arameter	value 🛕 or 🕽	or A + V	\Box	To exit configur	ation menu	u press any of the	se keys for 3 sec		
OPE	RATIONAL MENU															
_							POWE	ER ON								
							T LEC	7								
								29:	Note :	At power C	N lower display sho	ows (mome	ntary) input type se	elected in Level 1		
						10	• ा 0	8.8.\$			play not applicable f		.,			
			Press tkey for 3s	ec.		20	os <u>U</u> .				Pre	Press ▲ + ♥ keys for 3sec.				
					Press A	key for 3sec.		40								
			\								↓					
Display	Description	Leve Default		Display	Display	Display Description Default Range Display					Description	Protection Level otion Default Range Display				
лэріау		Value	linange	Condition	Display	Description	Value	liange	Condition	Display	Description	Value	Tiange	Condition		
IUbf	Input type (Refer Table 1)	J	J/K/T/R/S/RTD	_	FUUE	Tune	0 6 6	OFF/ON	For CNTL=PID	SPI	Lock setpoint 1	0006	UNLK/LOCK			
resu	Display Resolution	I	1/0.1	Not prompted for R & S type	ρ	Proportional band	10	1.0 to 400.0°	For CNTL=PID	585	Lock setpoint 2	0006	UNLK/LOCK	—		
NUIF	Temperature unit	٥٢	°C/°F	_	1	Integral time	150	0 to 9999 sec	For CNTL=PID	נטנו	Lock level 1	חטרה	UNLK/LOCK	-		
5Ριι	Set point low limit	- 199	Min range of sensor selected to SPHL	_	Ь	Derivative time	30	0 to 9999 sec	For CNTL=PID	1015	Lock level 2	UULA	UNLK/LOCK	_		
5PHL	Set point high limit	٦50	SPLL to Max range of sensor selected	—	C 9 C.A	Cycle time mode	8UF0	AUTO/USR.F	For CNTL=PID	4757 4757	Lock dwell time	UULS	UNLK/LOCK	Prompted whe		
۶۴C	Filter time constant	1.0	0.2 to10.0 sec	-	C 9 C.E	Cycle time	15.0	0.1 to 99.9 sec	For CNTL=PID	Note	DWEL=YES					
ACFI	Control action for relay 1	ſΕ	RE/FD	Not prompted for HC=YES	8951	Hysteresis 1	1.0	0.1 to 99.9°	For CNTL=ONF	1. Loci	1. Locking parameters (LVL1 or LVL2 or SP or DWEL) will not permit					
C N E L	Control logic		PID/ONF	_		-			For CNTL=PID	 change in the value of respective level parameters. Time value (online) can be altered only when DWEL is not locked in protection level. 2. Continuous operation of □ + Δ / ♥ keys for SP or other parameters makes update speed faster in 3 stages after 3 sec. 						
005	Control Output selection		RELAY/SSR	—	2010	Manual reset	0.0	-19.9 to +19.9°	& I=0							
1326	Dwell mode enable	no	NO/YES	_	Р Ь.С	Proportional band-cool	10	1.0 to 400.0°	For CNTL=PID & HC=YES	mak	es update speed ta	ster in 3 sta	ages aπer 3 sec.			
нC	Heat-cool mode selection	00	NO/YES	-	۲ ۲ ۲ ۲	Cycle time-cool	15.0	0.1 to 99.9 sec	For CNTL=PID & HC=YES							
8CF5	Control action for relay 2	٩٩	RE/FD/TIME*	When HC=NO. TIME prompted when DWEL =YES	8925	Hysteresis 2	1.0	0.1 to 99.9°	For HC=NO or HC=YES & CNTL=ONF							
200 S	Relay 2 type	4 E U	DEV/ABS	When ACT2=RE/FD	* 15 5	Dwell time	0 F F	OFF, 1 to 9999 min	When DWEL =YES		(Spec	cifications ar	e subject to change	. since developmer		
	Online menu for timer	nean	REMN/ELPS	When DWEL =YES	d S P.b	Display bias	0.0	-19.9 to 19.9°	_		cont	inuous proc	ess)	· •		
JIIL		25.0	1.0 to 100.0%	When CNTL =PID	L	1	1	I	I]		1		trols Pvt. Lt			
0NL 8ry	Anti-reset windup %	CD.0			* Parameter marked not applicable for DTC204A-2 & DTC324A-2 Tel. No. : +91-22-40394200 / 40394202 * Parameter marked not applicable for DTC204A-2 & DTC324A-2 Fax No. : +91-22-28471733 Toll free : 1800 227 3 * Default value of []] L L = []] [] [] [] [] [] [] [] [] [] [] [] []											