USER'S OPERATING MANUAL FOR PID DIGITAL TEMPERATURE CONTROLLER

(Models: Nx - 482 / 782 / 982)

Nx - 482
(48 X 48)

Nx - 782
(72 X 72)

Nx - 982
(96 X 96)

SPECIFICATIONS : -

1. DISPLAY TYPE : 8 - Digit 7 segment LED

Model no.	Nx-482	Nx-782	Nx-982	Display Colour
Display height (PV)	0.36"	0.56"	0.80"	White
Display height (SV)	0.36"	0.39"	0.56"	Green

2. STATUS LED'S : OP1 : Control Output Status
   OP2 : Output 2 Status
   ST : Soak Time Status
   AT : Tune Status

3. INPUT
   - Sensor Input : TC-J,K,R,S,N,T,B & RTD (PT-100)
   - Analog Input : 0 - 20mA, 4 - 20mA, 0 - 1VDC, 0 - 5VDC, 0 - 3.3VDC, 0 - 10VDC (Selectable)
   - Range : -1999 to 9999 (Analog Input Only)
   - Resolution : 0.001, 0.01, 0.1 & 1°C (Selectable for Analog Input only)
   - Range : Refer Table no. 5 on page 9
   - Sampling Time : 125 msec.
   - CJC for TC : Built in automatic
   - LWC for Pt-100 : Built in up to 18E max.
   - Digital Filter : 1 to 10 Sec.

4. RELAY OUTPUT
   - Contact type : N/O, COM
   - Contact Rating : 5A @ 250VAC or 30 VDC
   - Life expectancy : > 5,00,000 operations
   - Isolation : Inherent

5. SSR DRIVE OUTPUT
   - Drive Capacity : 12V @ 30mA.
   - Isolation : Non-Isolated.

6. FUNCTION
   - Output 1 : Main Control output (Selectable)
     1) Relay
     2) SSR
   - Output 2 : Programmable
     1) Auxiliary control
     2) Alarm
     3) None
   - Control Action : ON-OFF/PID (Select)
   - Control Mode : Heat/Cool (Select)

7. ENVIRONMENTAL
   - Operating Range : 0 ~50°C, 5~90% Rh
   - Storage Humidity : 95% Rh (Non-condensing)

8. POWER SUPPLY
   - Supply Voltage : 90~270VAC, 50/60Hz.
   - Consumption : 4W Maximum.

9. PHYSICAL
   - Housing : ABS Plastic

INSTALLATION GUIDELINES

1. Prepare the cut-out with proper dimension as shown in figure.
2. Remove clamp from Controller.
3. Push the Timer through panel cut-out and secure the Controller in its place by tightening the side clamp.

SAFETY INSTRUCTION

MECHANICAL

❖ Ambient temperature and relative humidity surrounding the Controller must not exceed the maximum specified limits.

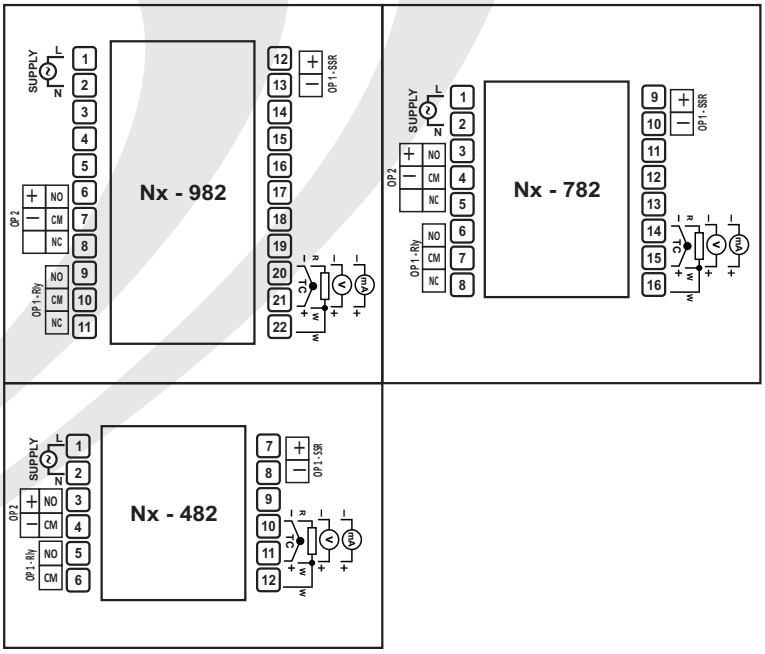
❖ The Controller in its installed state must be protected against excessive electrostatic or electromagnetic interferences.

ELECTRICAL

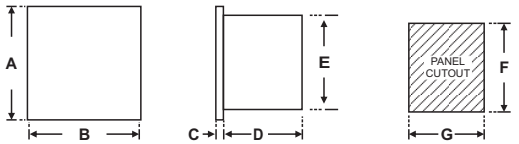
❖ The Controller must be wired as per wiring diagram & it must comply with local electrical regulation.

❖ The Electrical noise generated by switching inductive loads might create momentary Fluctuation in display, latch up, data loss or permanent damage to the instrument. To reduce this use snubber circuit across the load.

TERMINAL CONNECTIONS :

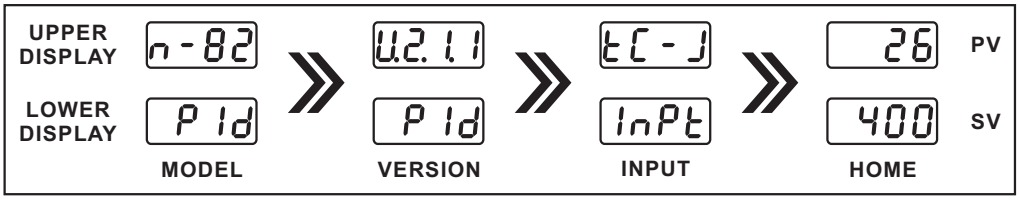


OVER ALL DIMENSIONS & PANEL CUT OUT (IN MM)



Dim / Model	A	B	C	D	E	F	G
Nx - 982	96	96	14	80	90	92	92
Nx - 782	72	72	14	80	68	70	70
Nx - 482	48	48	14	86	44	44	44

POWER UP: At power on, following sequence will be prompted on the display till it reaches to Home display mode.



PROGRAMMING

RUN MODE : To access the run mode Press SHIFT key to change SP1

Para Meter	Lower Display	Upper Display	Range	Description	Default
Control Set Point	SP1	0	LSPL ~ HSPL	User can change the SP1 value using UP/ DOWN and SHIFT keys. Holding the key will change the value at a faster rate. Press SET key to store the desired value.	0°C

USER LIST : To access the user list Press & Release SET key once.

Para Meter	Lower Display	Upper Display	Range	Description	Default
Control Set Point	SP1	0	LSPL ~ HSPL	User can change the SP1 value using UP/ DOWN and SHIFT keys. Holding the key will change the value at a faster rate. Press SET key to store the desired value.	0°C
Set Point 2	SP2	0	LSPL ~ HSPL -99 to 99 °C 2 to 99 °C	This parameter will be prompted if Output 2 is configured as AUCn and SP2 is Enabled (1) Either absolute auxiliary control mode. (2) Either deviation auxiliary control mode.	0°C
Ramp Rate	rAtE	5.0	0.0 °C to 25.0 °C	This parameter will be available only if Enabled in Configuration List. User can set ramp rate/min for SP1 (Set Point) to minimize overshoot.	Disable
Op2 Mode	OP2A	AUtO	----------	This parameter is prompted only if Control Logic for Output1 is configured for Heat-Cool. OP 2 will be automatically activated /de-activated w.r.t SP1 & HYS.	Auto
		On		OP 2 will be permanently Activated (ON).	
		OFF		OP 2 will be permanently De-Activated (OFF).	
Alarm Set Point	AL.SP	0	LSPL ~ HSPL -99 to +99°C 2 to 99°C	This parameter is prompted if AL.SP is Enable & output 2 is configured as (1) Alarm (High/Low) mode. (2) As a deviation alarm mode. (3) As a band alarm.	0°C
Soak Time	St.tA	00.30	1 Sec to 999.9 Hrs.	This parameter is prompted only if output 2 is configured as soak timer. Controller starts the execution of soak time as per the mode selected. Soak timer can be programmed using four different time base in Config. List.	1 min.
Minute Elapsed	tIME	30	---------	This parameter is prompted only if HOUR mode is selected in the Soak timer mode of OP2. (This is a View Only Parameter). During down counting of soak time it will display the remaining time & during up counting of soak time the elapsed time will be displayed.	-------

CONTROL LIST : To enter in this mode press SET & DOWN key simultaneously for 3 sec.

Para Meter	Lower Display	Upper Display	Range	Description	Default
Lock Code	LOCK	0	1 ~ 9999	Set this parameter to 15 (Default LOCK CODE) to access Control List. User has a choice to set different Lock Code via USER LOCK CODE in Config. List.	15
Proportional Band	Pb	5.0	0.5 to 99.9°C	This parameter will be prompted only if selected control action is PID. It sets bandwidth over which the output power is adjusted depending upon the error (SV-PV). The value of this parameter is automatically set by Auto tune function.	5.0°C
Integral Time	Int	240	0 to 999 Sec.	This parameter will be prompted only if selected control action is PID. It sets the time taken by PID algorithm to remove steady state error. Value of this parameter is automatically set by Auto Tune function. If set to '0', this function will be disabled.	240

Para Meter	Lower Display	Upper Display	Range	Description	Default
Derivative Time	dt	60	**0 to 300 Sec.**	This parameter will be prompted only if selected control action is PID. It defines how strongly the Controller will react to the rate of change of PV. Value of this parameter is automatically set by Auto Tune function. If set to '0', this function will be disabled.	**60**
Cycle Time	CYCt	16.0	**0.5 to 99.9 Sec.**	This parameter will be prompted only if selected control action is PID. User can set this value based on process being controlled & type of Output being selected. For Relay O/P, cycle time should be more 12sec & for SSR O/P, cycle time should be less than 10sec.	**16.0 Sec.**
Output Power Limit	OUtL	100	**0 % TO 100 %**	This parameter will be prompted only if selected control action is PID. This parameter will decide the maximum output power in % applied to the load	**100 %**
Output Off	OP.OF	dSbL	**1 to 10**	This parameter will be prompted only if selected control action is PID. With this parameter control O/P will be Completely OFF after the Set Point + Offset Value. If Disable, O/P will act Depending upon the PID Value after Set Point achieved.	**Disable**
Tune Offset	t.OFS	100	**50 % to 100 %**	This parameter will be prompted only if selected control action is PID. This parameter allows the User to carry out Auto Tuning function below the set point. (If Tune offset is 50 % tuning will be carried out at 50 % of the set point and if 100 % tuning will be carried out at 100% of the set point.)	**100 %**
Control Hys. 1	HY1	2	**1 to 25 °C**	This parameter will be prompted only if selected control action is ON-OFF. It sets the dead band between ON & OFF switching of the Output. Larger value of hysterisis minimize the number of ON-OFF operation of load.This increases life of actuators like contactors but also produces large errors (between PV & SV).	**2°C**
Delay 1	dLY1	0	**0 to 500 Sec.**	This parameter will be prompted only if selected control action is ON-OFF. It sets the main output restart time where O/P once turned OFF will turn ON only after restart time, regardless difference between PV & SP in Heat or Cool mode. If set to '0', O/P will be switched without delay. Also, Delay will be applicable in case of every power ON.	**0 Sec.**
Hys. 2	HY2	2	**1 to 25 °C**	This parameter will be prompted only it selected control mode for output2 is auxiliary control or an alarm. The value of this parameter sets the dead band between on and off switching of output load.	**2°C**
Gap 1	GAP1	0.0	**-9.9 to 9.9°C**	This parameter will be prompted only if Control Logic for Output1 is configured for Heat-Cool. SP (set point) will be consider as (SP1 - Gap1) for heating.	**0 °C**
Gap 2	GAP2	0.0	**-9.9 to 9.9°C**	This parameter will be prompted only if Control Logic for Output1 is configured for Heat-Cool. SP (set point) will be consider as (SP1 + Gap2) for cooling.	**0 °C**
Delay 2	dLY2	0	**0 to 500 Sec.**	This parameter will be prompted only if output 2 is configured as an Auxiliary control output. In this mode, O/P once turned OFF will restart only after set time regardless of the difference between PV and SP2. Time delay is settable up to 500 seconds. If time delay is set to 0, there is no delay between output switching.	**0 Sec.**
Soak Time Delay	St.dL	10	**0 to 99 Sec.**	This parameter will be prompted only if selected control mode for Output2 is Soak timer. Depending on end of soak strategy, the value of this parameter sets the activation time for OP2 when Soak timer is over. Setting this parameter to '0' will make OP2 continuously ON at the end of Soak time till User starts the next cycle.	**10 Sec.**
Soak Band	St.bd	0.0	**0.0 to 99°C.**	This parameter defines the permissible deviation of PV from SP during soak time cycle. If PV falls outside the Soak band during soak cycle, Timer halts. Timer will start only when PV falls within the soak band. This parameter is ignored if set to '0'.	**0.0**

CONFIGURATION LIST :

(1) To enter in this mode, Press and hold SET & UP key simultaneously for 3 sec.
(2) Press UP or DOWN key to scroll between parameter options.
(3) Press SET key to store the current parameter & move on to the next parameter.

Para Meter	Lower Display	Upper Display	Description	Default
Lock Code	LOCK	0	Set this parameter to 15 (Default LOCK CODE) to access Config. List. User has a choice to set different Lock Code between 1 to 9999 via USER LOCK CODE in Config. List.	**15**
Input Types	InPt	tC-J	'TC-J' :- If selected, instrument will accept temperature input from thermocouple J type sensor at rear terminal. Below range it will display 'LLLL' message & above range it will display 'HHHH'.	**TC-J**
		tC-K	'TC-K' :- If selected, instrument will accept temperature input from thermocouple K type sensor at rear terminal. Below range it will display 'LLLL' message & above range it will display 'HHHH'.	
		tC-r	'TC-R' :- If selected, instrument will accept temperature input from thermocouple R type sensor at rear terminal. Below range it will display 'LLLL' message & above range it will display 'HHHH'.	
		tC-S	'TC-S' :- If selected, instrument will accept temperature input from thermocouple S type sensor at rear terminal. Below range it will display 'LLLL' message & above range it will display 'HHHH'.	
		tC-n	'TC-N' :- If selected, instrument will accept temperature input from thermocouple N type sensor at rear terminal. Below range it will display 'LLLL' message & above range it will display 'HHHH'.	
		tC-t	'TC-T' :- If selected, instrument will accept temperature input from thermocouple N type sensor at rear terminal. Below range it will display 'LLLL' message & above range it will display 'HHHH'.	
		tC-b	'TC-B' :- If selected, instrument will accept temperature input from thermocouple B type sensor at rear terminal. Below range it will display 'LLLL' message & above range it will display 'HHHH'.	
		rtd	'RTD' :- If selected, instrument will accept temperature input from PT-100 sensor at rear terminal. Below range it will display 'LLLL' message & above range it will display 'HHHH'.	
		rtd.1	'RTD.1' :- If selected, instrument will accept temperature input from PT-100 sensor at rear terminal. Below range it will display 'LLLL' message & above range it will display 'HHHH'.	
		0-1	'0 - 1' :- If selected, instrument will accept 0 - 1VDC input at rear terminal. Below 0V it will display 'LLLL' message & above 1V it will display 'HHHH'.	
		0-3.3	'0 - 3.3' :- If selected, instrument will accept 0 - 3.3VDC input at rear terminal. Below 0V it will display 'LLLL' message & above 3.3V it will display 'HHHH'.	
		0-5	'0 - 5' :- If selected, instrument will accept 0 - 5 VDC input at rear terminal. Below 0V it will display 'LLLL' message & above 5V it will display 'HHHH'.	
		0-10	'0 - 10' :- If selected, instrument will accept 0 - 10VDC input at rear terminal. Below 0V it will display 'LLLL' message & Above 10V it will display 'HHHH'.	
		0-20	'0 - 20' :- If selected, instrument will accept 0 - 20 mA input at rear terminal. Below 0 mA it will display 'LLLL' message & Above 20 mA it will display 'HHHH'.	
		4-20	'4 - 20' :- If selected, instrument will accept 4 - 20mA input at rear terminal. Below 3.8mA it will display 'LLLL' message & Above 20mA it will display 'HHHH'. If input is less than 3.2mA it will display 'L.BRK'(Loop Break) message.	
Resolution	rES	0 0.0 0.00 0.000	This parameter will **NOT** be prompted when input type is selected as Thermocouple (TC-J,K,R & S). When input type selected is **RTD** then only "0 & 0.0" resolution format will be available. By this parameter user can select four format of resolution only for analog input, i.e. "0.000, 0.00, 0.0, 0". For range limit as per resolution selected Ref. Table No.6 (Page No. 9).	**0**
Lower SP Limit	LSPL	0	Sets the minimum limit for set point adjustment. It can be set from minimum specified range of selected sensor to HSPL value.	**0 °C**
Higher SP Limit	HSPL	400	Sets the maximum limit for set point adjustment. It can be set from LSPL value to maximum specified range of selected sensor.	**400 °C**

Para Meter	Lower Display	Upper Display	Description	Default
Analog Input Low Value	AiLo	0.	By this parameter user can define Low scale for input signal. Which can be in between '-1999 to Ai.Hi'. For range limit as per resolution selected Ref. Table No.1(Page No. 5).	0
Analog Input High Value	AiHi	9999.	By this parameter user can define HIGH scale for input signal. Which can be in between 'Ai.Lo to 9999'. For range limit as per resolution selected Ref. Table No.1(Page No. 5).	9999
Process Value Offset	OFSt	0	Function of this parameter is to add/subtract a constant value to the measured PV to obtain final PV for control applications. This parameter value can be altered : (i) To compensate for known thermal gradient. (ii)To match the display values with another recorder or indicator measuring the same PV.	0 °C
Input Filter	FLtr	1	The controller is equipped with an adaptive digital filter which is used to filter out any extraneous pulses on the PV. The filtered PV Value is used for all PV dependent functions. If the PV signal is fluctuating due to noise, increase the filter time constant value.	1
Control Mode	nodE	PId OnOF	User can select between PID or ON-OFF action algorithm to be adopted for output. If Factory set Control output is "mA" then Control mode as PID Selected & this parameter will be Skipped.	PID
Control Logic for OP 1	OP1L	HEAt COOL HtCL	User can select heating logic in which OP1 will remain ON till PV < SP. (PV increases when output is ON.) User can select cooling logic in which OP1 will remain ON till PV > SP. (PV decreases when output is ON.) This parameter will be prompted only if selected input is RTD or RTD.1 and is used for BOD application. Here OP1 acts as Heating control & OP2 as Cooling control.	Heat
Op1 Type Parameter	OP1t	rLY SSr	User should select RLY as output type when connecting a Relay or Contactor to the terminals of Relay as mentioned in terminal diagram. User should select SSR as output type when connecting a Solid State relay or Buzzer to the terminals of SSR mentioned in terminal diagram.	RLY
Overshoot Control Point	OCP	dSbL	This parameter will be prompted only if selected control action is PID. Setting this parameter on higher side will proportionally slows down the rate of rise of PV to minimize overshoot (this may cause delay to reach SP). Disabling or Setting this parameter on lower side will proportionally increase the rate of rise of PV (which may cause overshoot). Disable this option if delay is not required to reach SP. (This may cause overshoot w.r.t. SP)	Disable
Ramp Rate	rAtE	EnbL dSbL	User can set the desired RAMP rate in USER list. The RATE parameter will not be prompted in USER list.	Disable
Auto Tune	tUnE	EnbL dSbL	This parameter will be prompted only if selected control action is PID. If Enabled, this parameter will be prompted if user press Shift key for 3Sec. If Disabled, this parameter will not be prompted if user press Shift key for 3Sec.	Enable
Set Point 1	SP1	EnbL dSbL	If Enabled, User can View & edit the Set point (SP1) in USER list. If disabled, User can not View or edit Set Point (SP1) in USER list.	Enable
Output 2 Mode	OP2n	EnbL dSbL	This parameter will appear only if Control logic is Heat-Cool. If Enabled, User can set Diff. mode for OUTPUT 2 in USER list. If disabled, User can not set Diff. mode for OUTPUT 2 in USER list.	Disable
Output 2 Control	OP2	15.0	This parameter will appear only if Control logic is Heat-Cool. OP2 will be OFF at Ambient + OP2C value irrespective of output 2 mode.	15.0

Para Meter	Lower Display	Upper Display	Description	Default
Output 2 Function	OP2	AUCn	This parameter allows the user to select output 2 as an 'Auxiliary' control. For options refer Table 2.	Auxiliary
		ALrn	This parameter allows the user to select output 2 as an 'Alarm' control. For options refer Table 3.	
		SOAP	This parameter allows the user to select output 2 as a 'Soak' mode. For options refer Table 4.	
		AL.St	This parameter allows the user to select output 2 to function as both 'Alarm' & 'Soak'. For options refer Table 3 & 4.	
		nonE	This parameter the OP2 will be continuously OFF.	
Lower Display Message	LdSP	tOGL	By pressing DOWN key, Lower display will Toggle between SP1-value, SP2-value, Alarm SP-Value(AL.SP) & Timer-value(SOAK).	Toggle
		SP 1	By this parameter Lower display will only show the SP1-value.	
		tnEr	By this parameter Lower display will only show the Timer value(SOAK TIME).	
User Lock Code	ULOC	15	Default USER LOCK CODE is 15 to access Control & Configuration List. User has a choice to set its own USER LOCK CODE between 1 to 9999, this is to prevent unauthorized access of Control & Configuration List.	15

TABLE 2 : Below listed options will appear only if OP2 is selected as an Auxiliary control mode.

Parameter	Lower Display	Upper Display	Description	Default
OP 2 Mode	SP2	AbS	This parameter will be prompted only if Output 2 is selected as an Auxiliary control output. In this mode, User can set SP2 value independently. The instrument works as 2-Set point Controller.	Abs
		dEun	This parameter will be prompted only if Output 2 is selected as an Auxiliary control output. In this mode, User can set SP2 value which is always related to SP. User can set SP2 value with the deviation of ± 99°C w.r.t SP.	
OP 2 Logic	OP2.L	HEAt	User can select heating logic in which OP2 will remain ON till PV < SP2. (PV increases when output 2 is ON.)	Heat
		COOL	User can select cooling logic in which OP2 will remain OFF till PV < SP2. (PV decreases when output 2 is ON.)	
Set Point 2	SP2	EnbL	If Enabled, User can View & edit the Set point (SP2) in USER list.	Enable
		dSbL	If disabled, User can not View or edit Set Point (SP2) in USER list.	

TABLE 3 : Below listed parameters will appear only if OUTPUT 2 is selected as ALARM mode. In ALARM mode, Controller continuously compares PV with either SP (for Deviation or Band alarm) or an independent ALARM SP2 (for process high and process low Alarm).

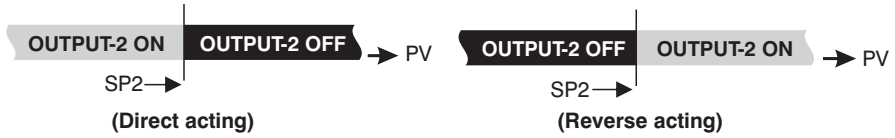
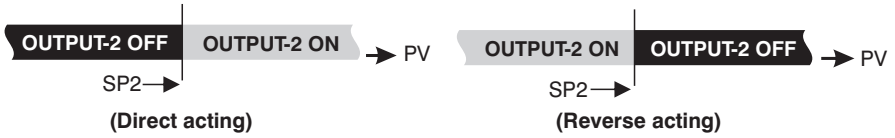
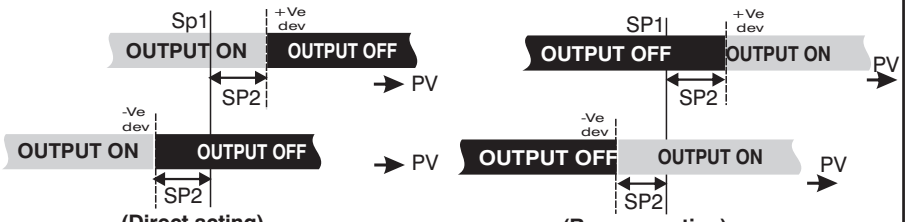
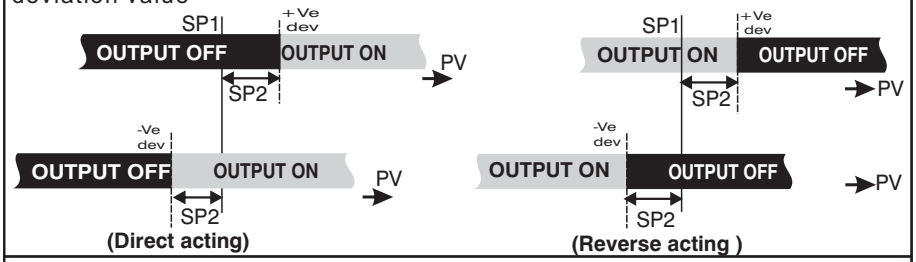
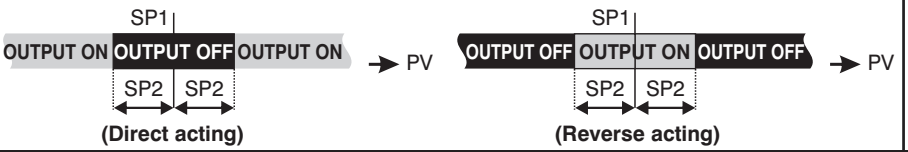
Parameter	Lower Display	Upper Display	Description	Default
Alarm Type	ALty	LOy	Low Alarm : OP2 activates when PV<SP2. 	**High Dev.**
		HIGH	High Alarm : OP2 activates when PV>SP2. 	
		Lodu	Low Deviation Alarm : OP2 activates when PV is less than SP1 ± set deviation value 	
		Hidu	High Deviation Alarm : OP2 activates when PV is greater than SP1 ± set deviation value 	
		bAnd	Band Alarm : OP2 activates when PV falls outside the band w.r.t. SP1 in either direction. 	
Alarm Logic	ALLG	dIr	If this parameter is set as 'Direct', Relay/SSR energizes under Alarm condition & remains De-energized otherwise. 'Direct' setting is generally used for Audio/Visual Alarm Output.	**Direct**
		rEu	If this parameter is set as 'Reverse', Relay/SSR De-energizes under Alarm condition & remains energized otherwise. 'Reverse' setting is generally used for tripping the process under Alarm condition.	
Alarm Inhibit	AL.IH	YES	This parameter can be used to inhibit (suppress) the Alarm activation upon power-up conditions by setting the parameter value to 'YES". From Power-up, the Alarm system remains disabled until PV is found with in the limits.	**No**
		nO	If Alarm activation is desired even under Power-up condition, Set this parameter value to 'NO'.	
Alarm Ack.	ALAP	AUtO	Once Alarm is activated, user has following three options to de-activate it. When PV falls within the programmed limits, Alarm will be de-activated automatically.	**Auto**
		MAUL	Once Alarm is activated, it remains activated until manually acknowledged by UP key.	
		bOtH	Once Alarm is activated, it can be de-activated either by pressing UP key or when PV falls within the alarm limits.	
Alarm Set Point	AL.SP	EnbL	If Enabled, User can View & edit the Alarm Set point in USER list.	**Enable**
		dSbL	If disabled, User can not View or edit Alarm Set Point in USER list.	

TABLE 4 : Below listed option will appear only if OP2 is selected as a soak timer.

PARA METER	LOWER DISPLAY	UPPER DISPLAY	DESCRIPTION	DEFAULT
END OF SOAK STRATEGY	SP.ES	none	It defines the behaviour of the controller at the end of soak timer cycle . Options are as below. If selected, the controller maintain PV at SP indefinitely irrespective of start or end of a soak timer.	BOTH
		H.OFF	The controller de-energizes OP1 as soon as the soak time is over. Here upper display will continue to show PV & lower display will show message "start".Next cycle will start only when user press START key for 3 sec.	
		AL.On	The controller energizes OP2 for a time period programmed via (StdL) parameter at the end of a soak time cycle. User can utilise OP2 for audio/visual indication.	
		both	The controller executes both, the Heater OFF and Alarm ON function as described above.	
TIME BASE SOAK TIMER	SP.tb	nn.SS	User can select the timer base of soak time among the four options as shown. Minutes & Seconds (Range 99 minutes, 59 seconds).	MMMM
		nnnn	Minutes (Range 9999 minutes).	
		HH.nn	Hours & Minutes (Range 99 Hours , 59 minutes).	
		HHHH	Hours (Range 9999 Hours).	
DIRECTION FOR SOAK TIME	St.dr	UP	If selected, soak timer will increment (from 0 to set value) (Note:- User can alter the new time value which should be > elapsed time even if soak timer is running. If user sets new time value < elapsed time, running timer will be terminated & End of soak Strategy will be executed.	DN
		dn	If selected ,soak timer will decrement (from set value to 0). (Note:- User can alter the new time value even when soak timer is running. In this case, balance time of previous set value will be ignored & new cycle will be executed.	
RESET OF RUNNING SOAK TIME	SP.rS	YES	If set as 'YES', soak time value will not be stored at the time of power failure.	NO
		nO	If set as 'NO' at power ON, soak time will continue from stored value. (Note: Seconds will not be stored.)	
TIMER START MODE	SP.md	mod1	User can define 4 different modes to start the soak timer as follows : - In this mode, Timer will start after pressing START key for 3 sec., irrespective of PV.	MOD 2
		mod2	In this Mode, after power ON Timer starts when PV >= SV. To continue with next cycle, user has to either switch Power on & off **OR** press START key for 3 sec when STRT message is displayed on the lower display.	
		mod3	In this Mode, Timer will start only after pressing START key for 3 sec & PV>=SV for any of the following conditions. (1) At every Power ON. (2) Completion of current soak time cycle. (3) Power failure during soak time is in progress.	
		mod4	In this Mode, Timer will start only after pressing START key for 3 sec & PV>=SV for any of the following conditions. (1) At every Power ON. (2) Completion of current soak time cycle. After executing start command, if cycle doesn't complete due to power failure, cycle will continue whenever PV >= SV after restore of power. **No need to press START key.**	

AUTO TUNING MODE : To enter in this mode, Press & hold SHIFT key for minimum 3 sec in the Run Mode.

Parameter	Lower Display	Upper Display	Description	Default
Auto Tuning Mode	AT	YES / nO	This function will be executed only if selected control action is PID. Auto-tuning function is enabled by setting this parameter to 'YES'. The AT led continuously flashes till Auto tuning function is in progress. During Auto-tuning, Controller learns the process characteristics by itself & calculates required P, I & D values. User can cancel or abort this feature by setting this parameter to 'NO'.	No

Table 5 :- Range of Different Sensor Types.

Sensor Type	Range	Resolution	Accuracy
Fe-k(J) T/C	0 ~ 760°C	1 °C	± 1 °C
Cr-AL(K) T/C	-99 ~ 1300°C	1 °C	
(R) T/C	0 ~ 1700°C	1 °C	
(S) T/C	0 ~ 1700°C	1 °C	
TC - N	-99 ~ 1300°C	1 °C	
TC - T	-99 ~ 400°C	1 °C	
TC - B	0 ~ 1800°C	1 °C	
Pt-100(RTD)	-100 ~ 450°C	1 °C	
Pt-100(RTD 0.1)	-100.0 ~ 450.0°C	0.1 °C	± 0.3 °C

Table 6 :- Range as per Resolution.

Resolution	Analog Input Low Value	Analog Input High Value	Process Value Offset	Alarm 1 Band	Alarm 2 Band	ALARM 1 Hysterisis	ALARM 2 Hysterisis
0000	-1999 to 9999	-1999 to 9999	-25 to 25	-50 to 50	-50 to 50	1 to 25	1 to 25
000.0	-199.9 to 999.9	-199.9 to 999.9	-25.0 to 25.0	-50.0 to 50.0	-50.0 to 50.0	0.1 to 25.0	0.1 to 25.0
00.00	-19.99 to 99.99	-19.99 to 99.99	-15.00 to 25.00	-19.00 to 50.00	-19.00 to 50.00	0.01 to 25.00	0.01 to 25.00
0.000	-1.999 to 9.999	-1.999 to 9.999	-1.500 to 2.500	-1.900 to 5.000	-1.900 to 5.000	0.001 to 2.500	0.001 to 2.500

Error Message:-

Display Message	Selected Input	Descriptions
"OPEN"	TC-J,K,R,S,N,B or RTD	Open Circuit of Control Sensor
"HHHH"	0 ~ 20 / 4 ~ 20 / 0 ~ 10	If input is above range it will display "HHHH" message.
"LLLL"	0 ~ 20 / 0 ~ 10	If input is below '0' it will display "LLLL" message.
"LLLL"	4 ~ 20	If input is below "3.8mA" and above "3.2mA" it will display "LLLL" message.
"L.BRK"	4 ~ 20	If input is less than "3.2mA" it will display "L.BRK" (Loop Break) message.
"C.E.R.R."	Any Input Selected	The device is out of calibration and need to be sent to factory for re-calibration.

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