TTM-i4N SERIES USER'S MANUAL

Thank you for purchasing model TTM-i4N SERIES Digital Temperature Controller. Please go through this Instruction Manual carefully and use the unit in proper manner. If the unit is used in a manner not specified by the manufacturer,the protection provided the unit may be impaired.

NOTICE/WARNING BEFORE OPERATION USE

- The meaning of the symbols indicated on the label found at the side of the unit is as follows.
- (\circ) : Alternating current : Cautions, Danger, Refer to a manual
- : Reinforced/dual insulation A : Cautions, Danger of Electric Shock
- When having the purchased controller at hand, please be sure that its correct model. See the following "Model Configuration"
- The following symbol marks / provide to prevent incident or damage. Kindly refer to the details of the WARNING/CAUTION when using for the first time.

Due to mishandling, the serious damages may occur to the operator, such as death, electrocution or skin burn.

Owing to mishandling, the operator may be inflicted with slight injury, or may cause some damage to the unit.

- For prevention of its malfanction, do not push the front key with sharp points.
- Spare terminal must not be used for other purposes.

- Make sure the correct wiring connection before turning on electricity. Mis-wiring may cause malfunction of the unit and fire.
- Never modify the unit to prevent damage or incident such as malfunction and fire etc.
- Please put this user's manual aside for your reference, when operating the unit.
- Copy or reprint of this manual, wholly or partially, is not allowed.
- The contents of this manual may change without notice in future.

INSTALLATION CONDITIONS

Indoor use
 Altitude up to 2000m
 Pollution Degree 2

ACCESSORY & CONFIGURATION

- 1) Please be sure that the unit enclosed in packing carton is a right model before using.
- 2) Kindly check the following accessory being contained in that carton box.
- Installation Attachment (For installation, please see "PANEL CUTOUT & INSTALLATION" on the right.)
- This user's manual : 1 copy



 This product is intended for use with industrial machineries, machine tools and measurement instruments.(It is not to be used with medical equipment which involves human lives).

SPECIFICATIONS

Input Power Requirments	AC100 to 240V/ 50/60Hz			
input i ower requiments				
Operating Voltage Range	85% to 110% of the rated voltage			
Power Consumption	6VA MAX			
Memory Element	EEPROM			
Input of Sensor	a) Thermocouple Input (type : K,J,R,T,N,S,B) b) 3-wire Resistance Temperature Detector Input (type : Pt100,JPt100) (Changeable by input type selection)			
Control Method	3 kinds of PID,ON/OFF			
OUT1 (Control Output)	a) Relay Contact Output AC250V 3A MAX b) SSR Driving Voltage Output DC12V 600 $\Omega($ or more) (Output type depends on the model.)			

OUTER DIMENSION





*Clean the unit by well squeezed cloth with water.

PANEL CUTOUT & INSTALLATION



• Install the unit in either horizontal or vertical (upward) direction. • When fitting the product give more than 12 mm space between the upper / lower / left & right & backface portion to the product and the peripheral device or plates.

∕!∖ CAUTION

· When you use compressed lead wire to install multiple units, please be careful sufficiently not to touch the other lead wires.

PARTS INDICATION



M KEY	For change of display
F KEY	For action of function s
▲ ▼ KEY	Up down key for chang Holding the U/D keys o
PV	Measured value indica
SV	Set value indication,Op
OUT	Output monitor(appear
AL1	Alarm1 monitor(appea
AL2	Alarm2 monitor(appea It also lights when OUT2
RDY	RDY lamp(It appears in
°C	It lights-up when the set
°F	It lights-up when the set

Event1	Relay Contact Output AC250V 1A MAX				
OUT2 / EV2 (Option)	Relay Contact Output AC250V 1A MAX				
Operation Environment	0 to 50°C, 20 to 90%RH (Avoid making of dew)				
Storage Environment	-25 to 75°C, 5 to 95%RH (Avoid making of dew)				
Weight	Less than 100 gms.				
Installation Environment	Overvoltage Category II				
Location of the Unit Setting	Keep away from the following:				
	 Gas of corrosion,dust and oily smoke. The electrical noise of the generator. The influence of electromagnetic field. Mechanical vibration and shock. The direct sunlight. 				

WIRING

*OUT2 / EV2 is not available when Option-B is not specified.



/!\ WARNING

- Use specified size (M3.5 width 7.3 mm or less) crimped terminals for wiring and machines & tools.
- A conformity wire : copper / AWG18-24 / Temp.rating 80°C
- Tightening torge : 0.5 Nm (5 kgfm, 4.43 lb.fin)
- Make sure the wiring is done correctly for any wires with polarity (+ and).
- For relay contact output, "C : common" and "NO : normal open"
- Temp.INPUT and OUT1 in case of SSR Output,only the secondary circuits with reinforced/dual insulation from the primary side can be connected.

Do not touch the terminal part while the power is on.

- This Controller is not equipped with overcurrent protection device (Fuse). Please prepare semi-time lag fuse (rated voltage : 250V, rated current : 1A) when making power source wiring. A Fuse is connected to the live side.
- The use of Noise Filter close to the Power Supply terminal is recommended. Recommended Noise Filter: RSEL-2002W/A (available from TDK Lambda) Noise filter's terminal 3 and 4 should be connected to the unit. Noise filter's body may or may not to be connected to frame ground. Both are acceptable.

CAUTION BEFORE CONTROL

- Setting program is stored after power OFF, as non-volatile memory is equipped with TTM-i4N SERIES controllers for setting storage.
- Either thermocouple or R.T.D (Pt100 / JPt100) is selectable input type.
- For suitable apprication, please select most appropriate input type and adjust input setup. • PID or ON/OFF control is selective for the optimal performance and each detail of features is specified in the table as bellow.

	PID Control				
Merit	Better control result is achieved as opposed to that of ON/OFF control.				
Demerit	Life span of relay is shorter, as output exists freduently with relay contact.				
	ON/OFF Control				

Demerit Control value is worse in comparison with that of PID control.

OPERATION FLOW AND SETTING MENU

POWER ON	•Setting mode						
"Input two acting coreen" appears for Accounts	SETO : Priority screen setting mo 1. Setting item selection screen	de> <set1 :="" input="" mode="" setting=""></set1>	<set2 :="" function="" key="" mode="" setting=""></set2>	<set3 :="" control="" mode="" setting=""></set3>	<set4 :="" ev1="" mode="" setting=""></set4>	<set5 :="" ev2="" mode="" setting=""> * 12*13</set5>	<set6 :="" mode="" setting="" timer=""> <set7 :="" lcd="" mode="" setting=""> 1. Setting item selection screen 1. Setting item selection screen</set7></set6>
then it will oriceed to "Run mode" .	Setting for priority screen	n \xrightarrow{KEY} $5EE1$ Setting related to input	AKEY <u>SEL2</u> Setting related to	(EY) Setting related to control	$\rightarrow \boxed{\frac{5EE}{8t}}$ EV1 output function setting	$\rightarrow \boxed{5EL5}$ EV2 output function setting	$\begin{array}{c} \langle EY \rangle \\ \hline SELS \\ \hline L DE \\ \hline L D$
\downarrow	$\int \mathbb{A} M \text{ key}$	↓ ↓ ↓ M key	$\bigvee KEY \longrightarrow Key $	LY ↓ M key	VKEY ↓ ⊕ M key	↓ h M key	$\begin{array}{c} \langle EY \\ \hline \\ & \downarrow \\ $
RUN mode Press for	2. Priority screen 1 setting	2. Input type setting	2. Function key function setting	2. SV limiter upper limit	2. EV1 setting mode	2. EV2 setting mode *	12 2. Timer output setting 2. Brightness setting $12 L PV $ Setting range: 5 ~ 100
A. Primary screen	<u><i>oFF</i></u> 5V Run mode B			<i>1200 SV</i> (%Keep the difference of more than 5 degrees(°C or °F) between Low and high limit of the SV limiter.			$ \begin{array}{c} \underline{\Box} \\ \underline{\Box} \\ \underline{J} \\ \underline$
Measured value FV Set the temperature Set value Set required	3. Priority screen 2 setting	SV UU K Thermocouple	0 : None	Setting unit : °C or °F	3 0 : None	3 0 : None	Image: Section of the section of t
↓ M key B. Priority screens (1 ~ 9)	Pri2PV Select 2nd screen on oFF 5V Run mode B	<u> </u>	1 : Digit shift 2 : RUN/READY	3. SV limiter lower limit	① 1 : Deviation upper and lower limits ② 2 : Deviation upper limit	1 : Deviation upper and lower limits Deviation upper limit 2 : Deviation upper limit	L EV1 output Image: Display="block">J EV2 output Image: Display="block">D Image: Display="block">J Image: Display="block">J <tr< td=""></tr<>
Priority displays by setting	↓ M key A Priority screen 3 setting	<u> </u>	3 : Al start/stop 4 : Timer start/stop	5LL PV Setting range : Low to high limit □ 5V %Keep the difference of more than 5 degrees(°C or °F)	3 : Deviation lower limit 4 : Deviation range 5 : Absolute value, upper and lower limits	2 Deviation lower limit 4 : Deviation range 5 : Absolute value upper and lower limits	"3" is not selectable when Option-B is not specified. [™] No dimming function when set to "0".
and shows max.9 screens by setting.	P_r Profity screen 3 setting	<u> </u>	6 : ENTER	between Low and high limit of the SV limiter. Setting unit : °C or °F	6 : Absolute value upper limit	6 : Absolute value upper limit	3. Function setting *18 4. Dimming Brightness setting
M key	$\int \frac{\Box_{aFF}}{\sqrt{2}} \frac{5V}{M} \text{ Run mode B}$		0 : None	↓ ⊕ M key	8 : Absolute value range	8 : Absolute value range	$ \underbrace{L \cap F}_{l} \underbrace{PV}_{l} $ $ \underbrace{L \cap F}_{l} \underbrace{PV}_{l} $ Setting range: 0 ~ 100 $ \underbrace{S \circ V}_{l} $ Setting unit : %
(Press for 4 seconds)	5. Priority screen 4 setting $P_{CL} \neq PV$ Select 4th screen on	J ↓ ⊸ M key 3. PV compensation gain setting	1 : Pressing time 1 second 2 : Pressing time 2 seconds	$\frac{1}{\prod_{i=1}^{n} PV}$ Setting for control mode	0 : None	0 : None	$5V$ Auto start (ON delay) $\sqrt{-100}$ M key, return to 1
Protect setting mode	<i>DEF 5V</i> Run mode B	$\begin{array}{ c c c }\hline P_{U} & \hline PV \\ \hline P_{U} & \hline PV \\ \hline PV \hline \hline PV \\ \hline PV \\ \hline PV \\ \hline PV \hline \hline PV \\ \hline PV \hline \hline PV \\ \hline PV \hline \hline PV $	3 : Pressing time 3 seconds 4 : Pressing time 4 seconds 5 : Decoding time 5 seconds	SV Control start	1 : Hold 2 : Standby	1 : Hold 2 : Standby 3 : Delay	\exists EV1 start (ON delay)
Setting screen	6. Priority screen 5 setting	↓ ↓ M key	↓ M key	<u>ー イソ</u> Control stop <i>ПR</i> Manual	4 : Hold+Standby	4 : Hold+Standby	S Manual start (OFF delay)
$\begin{array}{ c c }\hline PL & PV \\ \hline D & SV \end{array}$ Mode to set the protection level	Pri 5 PV Select 5th screen on oFF 5V Run mode B	4. PV compensation zero setting $P_{u} \subseteq PV$ [Setting range : -199 ~ 999	3. Key-lock setting	↓ M key	6 : Standby+delay 7 : Hold+standby+delay	6 : Standby+delay 7 : Hold+standby+delay	B EV1 start (OFF delay) 7 SV start (OFF delay)
5V 0 Non-Protect	↓ . M key			5. Control type setting PV PV	③Control mode interlocking function	③Control mode interlocking function	B EV2 start (ON delay) G EV2 start (OFF delay)
Setting Charge for SV/Priority Screen is Possible The Setting Mode Parameter blinds parameters excent for the following:	PrI = PV Select 6th screen on	- ↓ ⊕ M key 5. PV Filter setting		<u>□20</u> 5V 0 : TypeA 1 : TypeB	0 : All modes 1 : RUN/ MANUAL mode only	0 : All modes 1 : RUN/ MANUAL mode only 2 : RUN/ mode only	%"8" and "9" are not selectable when Option-B is not specified.
PV compasation zero setting	$\int \frac{\partial F}{\partial F} \mathbf{S} \mathbf{V} \mathrm{Run Mode B}$	$\frac{PdF}{FV}$ Setting range: 0.0 ~ 99.9	Lock run mode Lock except run mode	2 : Fuzzy	∠ NON mode only	↓ len houe om	↓ In M key
Alarm reset AT start/reset	8. Priority screen 7 setting $P_{\Gamma} P_{V}$ Select 7th screen on		WProtect Level Setting is not subjected to Key-Lock Setting.	1 : PID control 2 : ON/OFF control	3. EV1 alarm upper limit setting *8*9	3. EV2 alarm upper limit setting	$\begin{array}{c c} 12*14 \\ 15 \\ \hline Hr \Pi PV \\ \hline \end{array} \\ \end{array} \\ * 18 \\ \hline \end{array}$
Proportional band setting for OUT1/OUT2 Integral time setting	<i>□FF</i> 5 <i>V</i> Run mode B	$6. \text{ Decimal point setting}$ $\boxed{\partial P} PV = 0 \text{ : Not required}$	↓ ♪ M key	③Control type of OUT2	Setting range \sim 1999 \sim 3276 or \sim 1999 \sim 3276 \square SV Sin case of thermocouple R/S/B : -1999 \sim 3276 Setting unit \sim 0 or \degree	Setting unit 1° C \mathbb{S}	5V 1 Hour / Minute
Deviative time setting Control sensitivity setting for OUT1/OUT2	9. Priority screen 8 setting	(Except R/S/B Thermocoupl	$\begin{array}{c c} 4. \text{ Alarm reset} \\ \hline RLr 5 PV \end{array}$	0 : None 1 : PID control	↓ ⊕ M key	→ M key	Minute / second
Upper limit setting for EV1/EV2	PrIBPV Select 8th display on DFF 5V Run mode B	↓ ⓑ M key	Image: Constraint of the second se	2 : ON/OFF control 3 : EV2 output	4. EV1 alarm lower limit setting *8*1	0 4. EV2 alarm lower limit setting * R2LPV Setting range: -1999 ~ 3276 or -199.9 ~ 999.9 *	12±14 ↓ <" M key 16 5. Start SV permissible range setting * 18*19
Setting change is possible with SV only.	↓ . M key	7. Temperature unit setting $\left[\left[\mathcal{L} r^{\prime} \mathcal{F} \right] \mathcal{P} V \right]^{\circ} C$: Celsius	Press F key for 1 second to reset the alarm. (The indication momentarily disappears as	When Option B is not specified,Control type of OUT2 shall be fixed at "None" .	Setting unit ∶ ℃ or °F	Image: Strain case of thermocouple R/S/B : -1999 ~ 3276 Setting unit : °C or °F	$ \begin{array}{ c c } \hline \underline{L} & \underline{L} & \underline{L} \\ \hline \underline{L} & \underline{L} \\ \underline{L} $
Ine priority screen is with indication/ Setting Change not possible. All setting mode parameters will be blinded	$P_r I = PV$ Select 9th screen on	$- \underbrace{\Box \mathcal{I}}_{\mathcal{I}} \mathcal{I} \mathcal{I} $ F: Fahrenheit $\underbrace{\nabla \mathcal{I}}_{\mathcal{I}} \mathcal{I} \mathcal{I} \mathcal{I} \mathcal{I} \mathcal{I} $	the Alarm reset is executed). $5V \boxed{1} 1$ No alarm occurrence	↓ ⊸ M key 6. Forward/reverse operation setting	↓ ⊕ M key 5 EV1 alarm sensitivity setting ★ 8	5 EV2 alarm sensitivity setting	12*14 6 Time setting
SV is with indication / setting change not possible.	↓ ↓ M key , return to 1	•	Image: Image and the second	dl = PV 0: Reverse operation	$\boxed{R \text{ I } PV} \text{ Setting range: } 0 \sim 999 \text{ or } 0.0 \sim 999.9$	$\boxed{R2[} PV \text{ Setting range: } 0 \sim 999 \text{ or } 0.0 \sim 999.9$	$\frac{E \prod PV}{E \prod PV}$ Setting range: 00 : 00 ~ 99 : 59 (Hour/Minute)
Priority Screen is with indication / setting change not possible. All setting mode parameters will be blinded			Image: Complexity of the second mage Image: Complex	↓ M key	↓ I setung unit . C or F	$\int \frac{\partial \mathbf{v}}{\partial \mathbf{v}} = \mathbf{v} + \mathbf{v} + \mathbf{v}$	(<u>11:11</u>] 5V 00 ~ 99 : 99 (Minute/second)
- An setting mode parameters will be binded.		1	↓ 🖑 M key , return to 1	7. Operating amount for OUT1 $\boxed{\Pi_{u}} PV$ Displays operating amount for OUT1	6. EV1 alarm delay timer setting $*11$	6. EV2 alarm delay timer setting * $\boxed{R2EPV}$ Setting range: 0 ~ 9999	12*17 7. Remaining time monitor *18
●EX1. Priority screens & its setting					5 Setting unit : seconds	5V Setting unit : seconds	String start and stop are alternately switched by F key.
This function enables the selection of the most ne from all the screen indication found in the setting r	cessary screen indication mode, and assign it to			Setting amount : ILL I ~ ILH I(%)	7. EV1 alarm function 2 setting	7. EV2 alarm function 2 setting *	12 $\sqrt{10}$ M key , return to 1
the RUN mode on priority basis. Please select priority screen indication through the p	priority screen setting mode.	<when control="" pid="" select=""></when>	<when control="" off="" on="" select=""></when>	31 Sensitivity setting for OUT2	$\begin{array}{c c} P & IF \\ \hline P $	R2F2 PV EV2 alarm function 2 setting 0000 5V for PV error	* 1 No indication when the type of control OUT1 is ON/OFF Control.
eg : Basic screen \rightarrow OUT1 manipulated value \rightarrow Sett	ing high limit for EV1	8. Tuning type setting *1	19. Sensitivity setting for OUT1 *2	$\boxed{\boxed{2}}$	3 0 : None	3 0 : None	 * 2 No indication when the type of control OUT1 is PID Control. * 3 No indication when the OUT1 loop error determination time is "0"
*Screen is shifted when pressing M key each time.				↓ Setting unit C or F	2 1 : PV error	2 1 : PV error	 * 4 No indication when the type of control OUT2 is either "None" or "EV2".
●EX2. Function key works		5V [] Auto-tuning : OUT1	$\sqrt{-10}$ M key 20. OFE point position setting for OUT1 12	32. OFF point position setting for OUT2 *4 *6	0 : None	0 : None	 * 5 No indication when the type of control OUT2 is ON/OFF Control. * 6 No indication when the type of control OUT2 is PID Control.
This function is to enable F key to use as a specif selected in F key setting belonging to setting mod	fic key,for the following actions	Image: Self tuning : OUT2	<i>[P] PV</i> Setting range : -199 ~ 999 or -199.9 ~ 999.9	<i>□ sv</i> Setting unit : °C or °F	2 : Delay	2 : Delay	 * 7 No indication when the OUT2 loop error determination time is "0". * 8 No indication when the EV1 Eurotion is set at "No Eurotion"
Function		Self-tuning : 0012		33.Loop anormaly time setting for OUT2 *4	③Control mode interlocking function	③Control mode interlocking function	* 9 No indication when the EV1 Function is not used in the Upper Limit Alarm.
1. Digit shift Setting digit shift is enabled when setting value is change	aed. Effective	9. AT coefficient setting *1	21. Loop anormaly time setting for OUT1 $L_{O}P$ PV Setting range: 0 ~ 9999	L P2 PV Setting range : 0 ~ 9999 5V Setting unit : seconds	0 : All modes 1 : RUN/ MANUAL mode only	0 : All modes 1 : RUN/ MANUAL mode only	* 10 No indication when the EV1 Function is not used in the Lower Limit Alarm. * 11 No indication when the EV1 & 2 Functions to "No Function".
Digit under selection will blink.	in all modes	REDPV Setting range: 0.1 ~ 10.0	Sv Setting unit : seconds XAt "0" setting,there is no loop error determination.	%At "0" setting,there is no loop error determination. ↓ ↓ ↓ M key	2 : RUN mode only	2 : RUN mode only	 * 12 No indication when Option-B is not specified. * 13 No indication when the type of Control OUT2 is set to anything other than "EV2".
2. RUIV/READY Control stop(READY) and control performance(RUN) a	re	M key	↓ → M key	34. Loop anormaly PV change threshold for OUT2 *4 *7 $P52PV$ [Setting range: $0 \sim 999$ or $0 \sim 999$ 9	8. EV1 alarm function 3 setting	8. EV2 alarm function 3 setting *	12 * 14 No indication when EV2 Function is set at "No Function".
3. AT Start / Reset		$\frac{10. \text{ AT sensitivity setting}}{\text{REL}PV}$ Setting range: 0 ~ 999 or 0.0 ~ 999.9	$P5$ i PV Setting range : $0 \sim 999$ or $0.0 \sim 999.9$	<i>SV</i> Setting unit : °C or °F	$1 \frac{1}{1} \frac{1}{2} $	$\begin{array}{c} H_{CF} = J_{FV} EVZ \text{ alarm function 3 setting} \\ \hline UU \\ = U \\ =$	* 16 No indication when the EV2 Function is not used in the Opper Linit Alarm.
AT(Auto -Tuning) starts instantly after pressing F key. Start and Reset are alternately switched by F key.	Effective only in Operating mode	L _2 <i>5V</i> [Setting unit : ℃ or °F	XAt "0" setting there is no loop error	PV change determination. ↓ ⊕ M key	①Function 0 : None	①Function 0 : None	 * 17 No indication when the EV 1 & 2 Functions to "No Function". * 18 No indication when the Timer Output is set to "Timer Not Used".
4. Timer Start / Reset Start and Reset are alternately switched by E key.		11. AT start/stop *1	→ M key	35. Loop anormaly PV threshold for OUT2 $*4*7$	1 : Loop error	1 : Loop error	* 19 No indication when the Timer Function is set to other than "SV Start" .
5. Alarm Reset			$E \leq I PV \text{ Setting range : } 0 \sim 999 \text{ or } 0.0 \sim 999.9$	<i>I I S S S S S S S S S S</i>	0 : None 1 : Hold	0 : None 1 : Hold	Other Display Indication
Press once for function.	Effective	AT start	×At "0" setting there is no loop error	PV threshold determination.	↓ the second se	↓ In key	Displays whenever input value exceeds the high limit of display range.
Press once for function.	in all modes	by F key.	↓	36. Protection OFF timer time setting for OUT2 *6 *4	9. EV1 alarm polarity setting	9. EV2 alarm polarity setting *	12 Displays whenever input value exceeds the low limit of display range
●EX3 To select PID		12. Proportional band setting for OUT1 *1	$\frac{FdE}{PV}$ Setting range : 0 ~ 99	5V Setting unit : Minuites		5v 0 Normal open	
Features of type A,B,FUZZY		$\begin{array}{ c c } P & PV & \text{Setting range} : 0.1 \sim 200.0 \\ \hline \exists D & SV & \text{Setting unit} & :\% & \text{per } SLL \sim SLH \\ \hline \end{array}$	↓ SV Setting unit : Minuites	37. Protection ON timer time setting for OUT2 *6 *4	1 Normal close	I Normal close	Displays at memory error.
TypeA Basic PID		↓	25. Protection ON timer time setting for OUT1 *2 adt PV Setting range: 0 ~ 99	PV Setting range: 0 ~ 99 String unit : Minuites	V 🖑 NI Key , return to T	ψ \forall IVI key , return to 1	Displays at input circuit error.
FUZZY Effectively control the over shoot in the l	beginning of PID control.	PV Setting range : 0 ~ 3600 PV Setting unit : seconds	5V Setting unit : Minuites	J M key	Shift to Blind setting mode		Displays when auto-tuning does not end after 3 hrs., or when error occurs during the auto-tuning.
If control is unstable under self-tuning, please change to type A. B or FUZZY and also ON/OFF con	ntrol.	₩ M key	26. Operating amount for OUT2 *4		• POWER ON		Displays when the parameter change is attempted during key lock mode.
		$\frac{d}{d} PV$ Setting range: 0 ~ 3600	$\begin{array}{c} 11_{U} \ 2 \\ \hline 11_{U} \ 2 \\ \hline 1 \hline 1$	5V No Balance less / Bump less function	"Input type setting screen" appears for 4 s	seconds,	
EX4. ARW (Anti-Reset-Windup) ARW take effect for overshooting by over-integral	l of PID action	↓ ⊕ M key	Display amount : 0.0 ~ 100.0(%) Setting amount : תננ2 ~ תנH2(%)	/ With Balance less / Bump less function			RE Displays during auto-turing. Displays when the control mode change is attempted
ARW controls integral action (PV accords with \$	SV).	15. Proportional cycle setting for OUT1 *1	M key <when control="" off="" on="" select=""></when>	39. Manual reset setting *1	↓ ⓑ M key (Press for 10 seconds)		<i>FUnC</i> during which function keys are allocated to RUN/READY.
If integral value goes down, it takes effects.	n	20 5V Setting unit : seconds	When select PID control> 27. Proportional band setting for OUT2 *4 *5	□ □ 5 Setting range : 0.0 × 100.0 % (Heat / Cool)	Undication disappears momentarily		Displays when the control mode change is attempted during which the timer is in use
		16. ARW setting (see Ex.4) *1	$\begin{array}{ c }\hline P2 & PV \\ \hline P2 & Setting range: 0.10 \sim 10.00 \\ \hline DD & SV \\ \hline SV \\ \hline SV \\ \hline P2 & Setting unit \\ \hline SV \\ $	40. Dead band setting ★4	↓ M key (Press for once) Blind setting mode		
Table1. To select input sensors and se	etting range. unit : °C	用r 出 PV Setting range : 0.0 ~ 110.0 1 100 5∨ Setting unit : %	M key	□ □ PV Setting range : -100 ~ 100 −100.0 ~ 100.0 □	Please select parameters to be blinded	PV **** : Selected parameter is indicated. 5V	
Symbol Low limit ~ High limit 0.0	Setting	17. Operating amout limiter upper limit for OLIT1	28. Proportional cycle setting for OUT2 $*4*5$ $\boxed{\underline{L2}PV}$ Setting range: 1 ~ 120	∫Setting unit :℃ or °F	ORUN mode	In Value is indicated.	
K Thermocouple -200 ~ 1372 -199.9 J " -200 ~ 850 -199.9	~ 999.9 ~ 850.0	$\boxed{\square L H I PV}$ Setting range: $\Pi L L I \sim 100.0$	<u>∠</u> <u>J</u> St Setting unit : seconds	41. Ramp time setting	↑ M key (Press for 2 seconds)	IN/OFF is changed by F key.	
R " 0 ~ 1700 T " -200 ~ 400 -1000	- 400.0	$\int \frac{\partial u d}{\partial t} = t $	29. Operating amout limiter upper limit for OUT2 *4 *5	<i>Lince</i> Setting unit :°C/min. or °F/min.			TOHO ELECTRONICS INC.
N " -200 ~ 1300 -199.9	~ 999.9	18. Operating amout limiter lower limit for OUT1 *1	<u> 1000</u> SV Setting unit : %		→ → → → → → → → → → → → → → → → → → →	y ⊕M key ⊕M key	Head office: 2-4-3 NISHIHASHIMOTO MIDORI-KU SAGAMIHARA KANAGAWA
S " 0 ~ 1700 B " 0 ~ 1800	-	$\boxed{\boxed{\square} } \mathbf{5V} $ Setting unit : %	↓ - ♥ M key 30. Operating amout limiter lower limit for OUT2 +4 +5	42. Control back up function setting $P_{U}P_{V}$ Setting range: 0.0 ~ 10.0	Pril InP FU 5LH ÅIFI	I R2F I ENo LLu on on on	252-0131 JAPAN Phone: +81-50-3535-9960 Fax: +81-42-700-2118
Pt100 -200 ~ 500 -199.9	~ 500.0		$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Setting unit : °C or °F %Control back up function OFF at 0.0	Reset the power for Blind setting mode OF	F.	E-Mail: overseas@toho-inc.co.jp
	·~ 500.0	1	↓	√ Im Key , return to 1			URL: http://www.toho-inc.com