LCD display type PID control temperature controller

DX SERIES

Instruction manual

DX4H
DX4C
DX4M

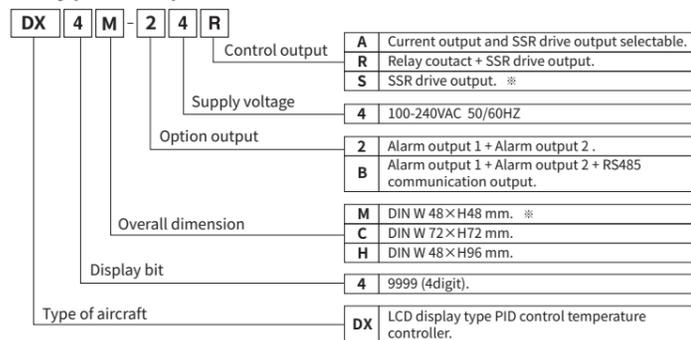## For your safety, please read the following before use

■ Pay attention to safety

※ "Pay attention to safety" is to use the product safely and correctly to prevent the occurrence of dangerous accidents, please comply with the following content
※ ⚠ Accidents or dangers may occur under special conditions

⚠ warn — A violation of this may result in serious injury or death.
⚠ Look out — Any violation of this may result in minor injury or damage to the product.

⚠ warn

1. For machines that have a great impact on people and property (e.g. nuclear power control, medical devices, ships, vehicles, railways, aviation, flammable devices, etc.).
Safety devices, disaster prevention/anti-theft devices, etc.), please be sure to install double safety protection devices.
2. Install or use it on the panel.
Otherwise there is a risk of electric shock or fire.
3. Do not connect cables or perform maintenance when the power is on.
Otherwise there is a risk of electric shock or fire.
4. Confirm the wiring diagram before connecting cables.
There is a fire hazard.
5. Do not arbitrarily modify the product.
Otherwise there is a risk of electric shock or fire.

⚠ Look out

1. When connecting the power input terminal and the relay output terminal, use AWG 20(0.5mm²) or higher cables, and maintain the torque of the screw
0.74~0.9N·m. Sensor input and communication connection, if there is no special wire, use AWG28~16 specification cable, screw
Torque is maintained at 0.74~0.9N·m. Otherwise, fire or product misoperation may occur due to poor contact
2. Please use within the rated specification range.
Otherwise there is a risk of fire and product failure.
3. Do not use water or organic solvents when cleaning. Wipe with a dry towel.
Otherwise there is a risk of electric shock or fire.
4. It is prohibited to use in flammable and explosive corrosive gas, humidity, direct sunlight, thermal radiation, vibration, impact, salt environment.
Otherwise there is a risk of fire or explosion.
5. Do not let foreign objects such as metal debris, dust, and cable residue enter the product.

■ Type composition

DX	4	M	-	2	4	R		

Control output		A	Current output and SSR drive output selectable.
		R	Relay coutact + SSR drive output.
		S	SSR drive output. ※

| Supply voltage | | 4 | 100-240VAC 50/60HZ |

| Option output | | 2 | Alarm output 1 + Alarm output 2 . |
| | | B | Alarm output 1 + Alarm output 2 + RS485 communication output. |

Overall dimension		M	DIN W 48×H48 mm. ※
		C	DIN W 72×H72 mm.
		H	DIN W 48×H96 mm.

| Display bit | | 4 | 9999 (4digit). |

| Type of aircraft | | DX | LCD display type PID control temperature controller. |

※ DX4M model . The selected size is : 48×48.
Only choice : Selettctable RS485 com. Output and SSR drive output.

■ Enter specifications and scope of use

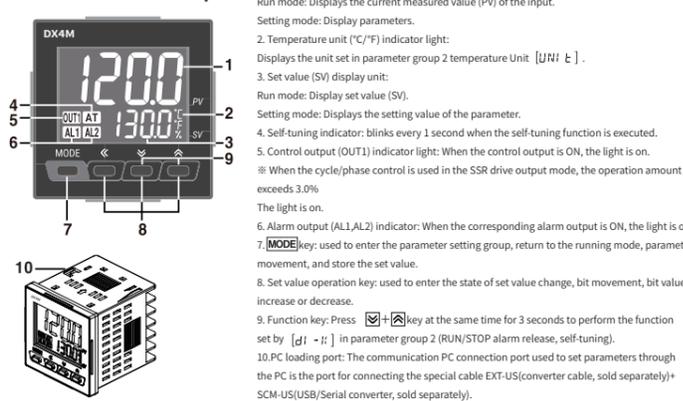| Input specification		Decimal point	reveal	Scope of use (°C)	Scope of use (°F)
Thermoelectric couple (Thermocouple)	K (CA)	1	KCRH	−50 ~ 1200	−58 ~ 2192
		0.1	KCRL	−50.0 ~ 999.9	−58.0 ~ 999.9
	J (IC)	1	J1CH	−30 ~ 800	−22 ~ 1472
		0.1	J1CL	−30.0 ~ 800.0	−22.0 ~ 999.9
	2 (IC)	1	ICH	−40 ~ 600	−40 ~ 1112
		0.1	ICL	−40.0 ~ 600.0	−40.0 ~ 999.9
	T (CC)	1	ŁCCH	−50 ~ 400	−58 ~ 752
		0.1	ŁCCL	−50.0 ~ 400.0	−58.0 ~ 752.0
	R (PR)	1	RPR	0 ~ 1700	32 ~ 3092
	S (PR)	1	SPR	0 ~ 1700	32 ~ 3092
Thermal resistance (RTD)	DPt 100Ω	1	dPŁH	−100 ~ 400	−148 ~ 752
		0.1	dPŁL	−100.0 ~ 200.0	−148.0 ~ 752.0
	Cu50Ω	1	CUSH	−50 ~ 200	−58 ~ 392
		0.1	CUSL	−50.0 ~ 200.0	−58.0 ~ 392.0

※ Specifications, dimensions, etc. specified in this manual are subject to change or discontinuance due to product improvement without prior notice.
※ Please be sure to follow the instructions and technical instructions (selection samples, web pages).

■ specification

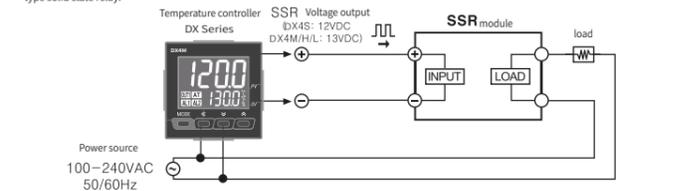| Series name	DX4M	DX4C	DX4H
Supply voltage	100~240VAC~ 50/60Hz		
Allowable voltage variation range	Mains voltage	90~110%	
Power consumption	8VA 以下		
Display mode	11 segments (PV: white, SV: green), other displays (yellow) LCD mode ※1		
Text size	PV(W×H) 7.2×14mm	10.7×17.3mm	7.2×15.8mm
	SV(W×H) 3.9×7.6mm	6.8×11mm	6.2×13.7mm
Input specification	Thermal resistance	DPt100Ω、Cu50Ω (Each wire allows maximum impedance below 5Ω)	
	Thermocouple	K (CA), J (IC), L (IC), T (CC), R (PR), S (PR)	
reveal precision ※2	Thermal resistance	• Normal temperature: (23℃±5℃) (The larger of PV. ; ±0.3% ; ±1℃) ±1digit	
	Thermocouple	• Ambient temperature: (The larger of PV.:±0.5% ; ±2℃) ±1digit	
Control output	Relay	250VAC~ 3A, 30VDC= 3A, 1a	
	SSR	12VDC= ±2V 20mA below 13VDC= ±3V 20mA below	
	Electric current	DC4~20mA ; DC0~20mA (Load impedance below 500Ω)	
Option output	Alarm output	AL1, AL2: 250VAC~ 3A 1a	
	Transfer output	DC4~20mA (Load impedance below 500Ω, output accuracy: ±0.3%F.S.)	
	Communication output	RS485 Communication output (Modbus RTU way)	
Control mode	ON/OFF Controls, P, PI, PD, PID Controls		
Regulating sensitivity	1~100℃/°F (0.1~50.0℃/°F) changeable		
Proportional band (P)	0.1~999.9℃/°F		
Integration time (I)	0~9999 S		
Differential time (D)	0~9999 S		
Control cycle (T)	0.5~120.0 S		
Manual reset value	0.0~100.0%		
Sampling period	50ms		
Withstand voltage	3,000VAC 50/60Hz 1 minute (between 1st side and 2nd side)		
Vibration resistance	5~55Hz (period 1 minute) amplitude 0.75mm X Y Z All directions, two hours		
Relay Life span	machine	OUT, AL1/2: 500 More than ten thousand times	
	electric	OUT, AL1/2: 20 More than two thousand times (250VAC 3A Resistive load)	
Insulation impedance	100MΩ above (500VDC teraohm)		
anti-interference	Square wave interference generated by interference simulator 1 μs） ±2kV R phase, S phase		
Outage compensation	About 10 years (non-volatile semiconductor storage)		
Surrounding environment	Service ambient temperature	−10~50℃, Storage time : −20~60℃	
	Ambient humidity	35~85%RH, Storage time : 35~85%RH	
Class of protection	IP50 (Front part, IEC specification)		
Insulation type	Double insulation or reinforced insulation (symbol: back, between the 1st and 2nd sides and withstand voltage: 3KV)		
authentication	C€ ⚡		
weight ※3	about146.1g (about 85.7g)	about 233g (about 143g)	about 214g (about 133g)

※1: According to the LCD characteristics, the display cycle will be slow when used at low temperatures. But the control output works fine.
※2: ○ Room temperature (23℃±5℃)
Thermocouple, R (PR), S (PR) under 200 ℃ (PV of 0.5% plus or minus or plus or minus 3% ℃ with strong) plus or minus 1 digit
Above 200℃ : (the larger of ±0.5% or ±2% of PV)±1digit
· Electric couple L(IC), thermal resistance Cu50Ω : (PV ±0.5% or ±2%℃ of the larger)±1digit
○ Ambient temperature
· Thermocouple R(PR), S(PR) : (the larger of ±1.0% of PV or ±5%℃)±1digit
· Electric couple L(IC), thermal resistance Cu50Ω : (PV ±0.5% or ±3%℃ of the larger)±1digit
※3: The weight of the packaging box is included, and the net weight of the product is in parentheses.
※ Ambient conditions are non-freezing and non-condensation.

■ Name of each part

1. Measurement value (PV) display:
Run mode: Displays the current measured value (PV) of the input.
Setting mode: Display parameters.
2. Temperature unit (℃/°F) indicator light:
Displays the unit set in parameter group 2 temperature Unit [UNIŁ] .
3. Set value (SV) display unit:
Run mode: Display set value (SV).
Setting mode: Displays the setting value of the parameter.
4. Self-tuning indicator: blinks every 1 second when the self-tuning function is executed.
5. Control output (OUT1) indicator light: When the control output is ON, the light is on.
※ When the cycle/phase control is used in the SSR drive output mode, the operation amount exceeds 3.0%
The light is on.
6. Alarm output (AL1,AL2) indicator: When the corresponding alarm output is ON, the light is on.
7. MODE key: used to enter the parameter setting group, return to the running mode, parameter movement, and store the set value.
8. Set value operation key: used to enter the state of set value change, bit movement, bit value increase or decrease.
9. Function key: Press ⬜+⌃ key at the same time for 3 seconds to perform the function set by [dI-Ł] in parameter group 2 (RUN/STOP alarm release, self-tuning).
10.PC loading port: The communication PC connection port used to set parameters through the PC is the port for connecting the special cable EXT-US(converter cable, sold separately)+ SCM-US(USB/Serial converter, sold separately).

■ Feature

● Input correction [IN-b]
This function is used to correct temperature errors caused by external sensors, etc., but the controller itself is basically error-free.
When the actual temperature is 80 ° C and the temperature displayed on the controller is 78 ° C, set the input correction [IN-b] value to 2, so that the temperature of the controller will be displayed at 80 ° C.
※ After input correction, HHHH or LLLL will be displayed if the current temperature (PV) value is out of the range of use of the sensor.

● Enter digital filter [MAVF]
The input model changes too quickly, causing the current temperature (PV) display to be unstable, which will affect the operating capacity instability and cause the output instability.
This function is to filter the input signal, which can achieve stable control. If the digital filter is set to 0.4 seconds, the input value within 0.4 seconds is digitally filtered before being displayed. Therefore, the current temperature may not be the same as the actual input value.

● SSR driver output mode function (SSRP function) [SSRM]
·SSRP function refers to the use of general SSR driver output to achieve ON/OFF control, cycle control, phase control functions.
· Only the control output is displayed in the SSR driver output type (DX□-□4S).
· Can achieve linear control (cycle control, phase control), can be described as a low price to achieve precision control.
· Select one of the general ON/OFF control [SSRM] , period control [SŁNd] , and phase control [CYCL] parameters in the SSR driver output mode [PHRS] parameter of parameter group 2.
For period control, please use zero trigger type solid state relay or random trigger type relay, and for phase control, please use random trigger type solid state relay.

Temperature controller DX Series
SSR Voltage output DX4S: 12VDC DX4M/H/L: 13VDC
INPUT LOAD
SSR module
load
Power source 100~240VAC 50/60Hz

※ When using cycle control or phase control for control, the load and temperature controller must use the same power supply.
● Control mode [C-Md] , set to PId , SSR drive output mode [SSRM] , set to SŁNd , you can set the control cycle [Ł].

■ Connection diagram
※ Shadow processing terminals are basic models constructed
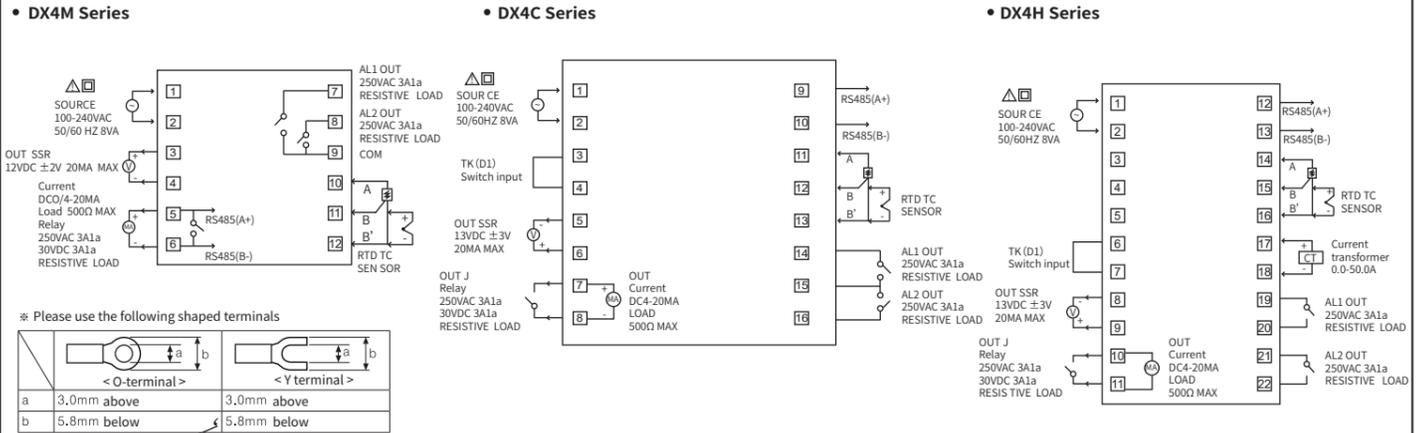
• DX4M Series

• DX4C Series

• DX4H Series

※ Please use the following shaped terminals

< O-terminal > < Y terminal >
	a	b
a	3.0mm above	3.0mm above
b	5.8mm below	5.8mm below

※ The control output is current output or SSR drive output selectivity (DX□-□4S) will not be displayed, and only general ON/OFF control can be performed through SSR.
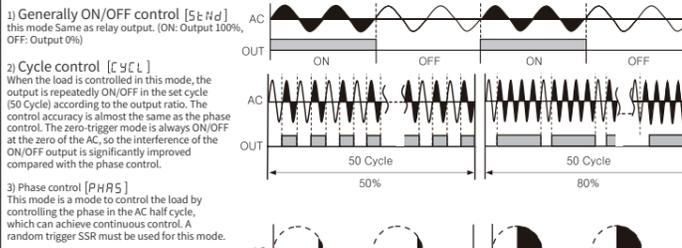
1) Generally ON/OFF control [SŁNd]
this mode Same as relay output. (ON: Output 100%, OFF: Output 0%)

2) Cycle control [CYCL]
When the load is controlled in this mode, the output is repeatedly ON/OFF in the set cycle (50 Cycle) according to the output ratio. The control accuracy is almost the same as the phase control. The zero-trigger mode is always ON/OFF at the zero of the AC, so the interference of the ON/OFF output is significantly improved compared with the phase control.

3) Phase control [PHRS]
This mode is a mode to control the load by controlling the phase in the AC half cycle, which can achieve continuous control. A random trigger SSR must be used for this mode.

● Current output range [oMA]
When the control output is current output or SSR drive output selectivity (DX4□-□4S), When the control output, [oUŁ] in parameter group 2 is set to [CURR] , the upper and lower limits of the current output must be set to 4-20mA [oMA] or 0-20mA from [4-20] in parameter group 2 [0-20] .

● Lag [HYS]
The ON/OFF control sets the interval between ON and OFF for the output.
· If the lag amplitude is too small, the control output may be unstable due to external interference and other reasons. In ON/OFF control, even if a stable state is reached, there may be certain oscillations. The causes of oscillation are [HYS] set value and the thermal response characteristics of the control object, the installation position of the sensor, etc. In order to minimize the oscillation amplitude, the following factors should be considered in the design of the temperature control system: appropriate control sensitivity [HYS], the capacity and thermal characteristics of the heater, the responsiveness of the sensor, and the location.

When Heating is reversed
Control output
ON OFF
hysteresis [HYS]
SV temperature

● Timing function description TM-F
· TM-F=ON has timing function M/H time unit light on, =OFF has no timing function;
· TM-F can be quickly set to ON or OFF by long pressing MODE and adding the key for 1 second;
· The RUN indicator blinks during timing and is steady on at the end of timing.
· When the shift key is being clicked, the current remaining time can be viewed (valid when two rows are displayed);
· When the timing ends, the bottom line displays END;
· When the start mode is button start, long press the shift key for more than 2 seconds to start the timing or return to wait after the timing.

SV
SP (Start Point)
Control interval
Waiting interval | Timing action interval (Set time: ST-T) | Time out

● Manual reset [RESŁ]
In proportional control (P/PD mode), when the PV value reaches a stable state, because the heater rise and fall time may be inconsistent due to the thermal characteristics of the control target, such as heating capacity, heater capacity, etc., the system may have a temperature error, which is called the static error (OFFSET). The manual reset [RESŁ] function is used to set/correct static errors.

Setting method
If PV=SV, the manual reset value is 50.0%
If PV>SV, the manual reset value >50.0%
If PV<SV, manual reset value <50.0%

Manual reset [RESŁ] Adjustment method
The manual reset value is set to less than 50.0
Set temperature
SV
Normal deviation
Normal deviation
The manual reset value is set to exceed 50.0

● Function key (⬜ + ⌃ 3 S) [dI-Ł]

argument		movement
OFF	oFF	Do not use function keys
RUN/STOP	SŁoP	This key is used when the control output is paused, but the auxiliary output other than the control output (except the sensor disconnection alarm, heater disconnection alarm) operates normally. To resume operation, press the function key for 3 seconds. Function key t: More than three seconds
ST01		The function is the same as STOP, different from the STOP state when power-on
Alarm release	ALRE	Through this function key, the alarm output can be forcibly removed. (Alarm option is only alarm hold, standby hold alarm 1/2 can be used) Although the current value exceeds the alarm action range, the single alarm output is ON, use. After the alarm is removed, random normal action.
self-tuning	AŁ	The self-tuning execute/end function is the same as setting the self-tuning parameter [RŁ] for group 1. After self-tuning is performed in Set 1, the function key can be used to terminate. ※ [C-Md] will be displayed only when the control mode PI d in parameter group 2 is set to RŁ . If oNoF is located, the function key [dI-Ł] will change to oFF .

RUN STOP RUN STOP RUN

● Control the output operation [ERMV]
when the input sensor is disconnected
When the input sensor is disconnected, the control output operation can be set.
When the control mode [C-Md] of parameter group 2 is oNoF , the control output is set to 00 (OFF) or 1000 (ON).
When set to PId , the setting range is 00~1000 , and the user can set the amount of operation at will.

■ Dimension
(mm)

• DX4M
□48 51 6 45 44.8 91.5

• DX4H
48 51 45 96 91.5
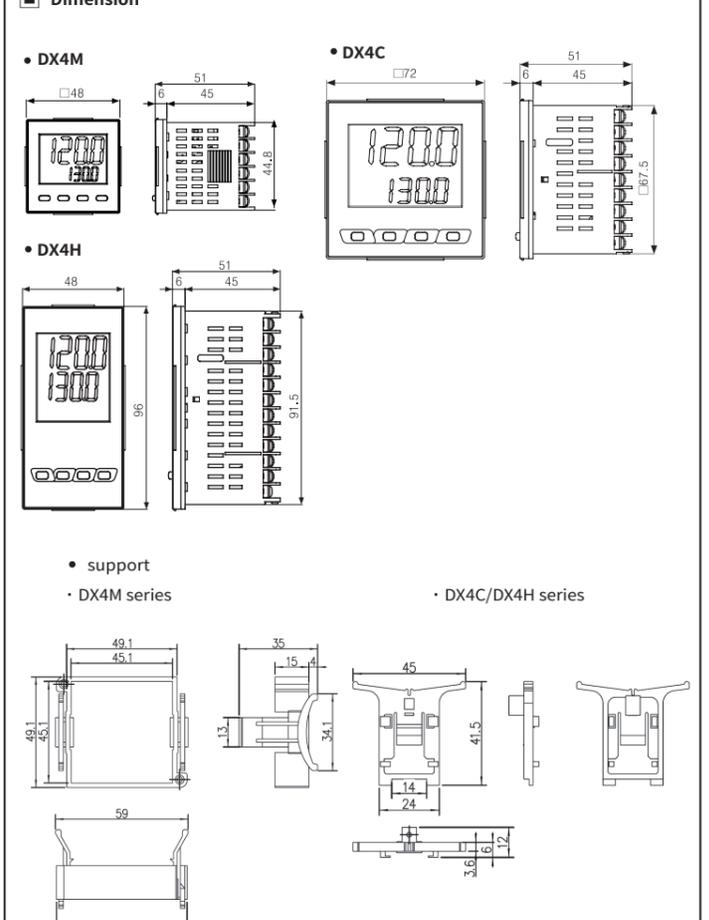
• DX4C
□72 51 6 45 67.5

• support
· DX4M series
· DX4C/DX4H series

49.1 45.1 35 15.4 45 41.5 13 34.1 14 24 59 3.6 1.2 58.1

• Panel processing dimensions

A B C D

Model	Size	A	B	C	D
DX4M		65 above	65 above	45 $^{+0.6}_{0}$	45 $^{+0.6}_{0}$
DX4C		90 above	90 above	68 $^{+0.7}_{0}$	68 $^{+0.7}_{0}$
DX4H		115 above	65 above	45 $^{+0.6}_{0}$	92 $^{+0.8}_{0}$
(mm)

● Parameter group 2

| Operation mode |
| MODE 3S |

PAr-2

Input sensor — IN-t — KCAH

※1: S K V A Press any key.
※2: In each parameter group, after confirming/changing the set value, press the MODE key and the set value will be saved and automatically moved to the next parameter.
 In any parameter state, as long as you press the MODE key for 3 seconds, it will return to the running mode.
 Parameters marked with [....] may not be displayed, depending on the Settings of the corresponding associated parameters.
 Setting range: Please refer to "■ Input specification and use range".
※2: Input sensor change when SV, parameter group 2 (IN-b, H-SV, L-SV, AL1, AL2, LbAt, AHYS) Will initialize.

Temperature unit — UNIt — ℃ / ℉
 ※ When the set value changes, SV, parameter group 2 (IN-b, H-SV, L-SV, AL1, AL2, LbAt, AHYS) Will initialize.

Input correction — IN-b — 0   Set range: −999~999℃/℉ (−199.9~999.9℃/℉)

Input digit filtering — AR.F — 0.1   Set range: 0.1~120.0 S

Set temperature Lower limit value — L-SV — −50
 Setting range: within the use range of each sensor [L-SV ≤ (H-SV −1digit)]
 ※ When the setpoint changes, SV will be initialized to L-SV when SV < L-SV

Set temperature Upper limit value — H-SV — 1200
 Setting range: within the use range of each sensor [H-SV ≥ (L-SV +1digit)]
 ※ When the setpoint changes, SV will be initialized to H-SV when SV > H-SV

Control output movement — o-Ft — HEAt — CooL

Control mode — C-Md — PId — oNoF
 ※ When the set value changes, [ERMV] is initialized to 0.0, [dI-K] Initialize to oFF.

Control output — oUt — CURR — SSR — RLY
 ※ The control output can only be displayed in current output or SSR drive output type (DX4M-□4C)

SSR drive Output mode — SSRM — StNd — CYCL — PHAS
 ※ It is displayed only when the control output is (DX4M-□4C) driven by SSR

Current output Radius — OARL — 0.00 — 9.00
 ※ This parameter is displayed only when the control output [oUt] is set to CURR.
OARH — 9.50 — 2.00

Control cycle — t — 20.0
 Set range: 0.5~120.0 S
 ※ This parameter is displayed only when the control mode [C-Md] is PId.
 ※ When the current output or SSR output mode is set to CYCL, PHAS, the parameter is not displayed.

AL1 Alarm action — AL-1 — AM1A — LbAt — AM1A — AM1b
 ※ Alarm action mode / ※ Alarm option
 ※ When the set value changes, Parameter group 1 [AL1, AL2] The parameter will be initialized.
 ※ Press K key to switch between 'alarm action mode' ⇔ 'alarm options'

AL2 Alarm action — AL-2 — AM2A
 ※ Same setting as AL1 alarm action [AL-1].
 ※ Displays only in models that support alarm output 2.

A1Ot — 0
8 Alarm 1 Delay time, the unit is second, positive number is delay alarm output, negative number is delay disconnect output, such as = 3 alarm conditions meet the delay 3 seconds after the alarm action, = -3 alarm conditions meet the immediate alarm action delay 3 seconds after the alarm disconnect.

A2Ot — 0   The function is the same as A1OT

Alarm output hysteresis — AHYS — 1
 Setting range: 1~100℃/℉ (0.1~100.0℃/℉)
 ※ AL1/AL2 Alarm action [AL-1, AL-2]
 When the value is set to AM□/5bAt/LbAt, it is not displayed.

LBA Monitoring time — LbAt — 0
 Setting range: 0~9999 seconds (automatic setting time is automatically set)
 ※ When the alarm action mode [AL-1, AL-2] is set to LbAt, it will be displayed.

LBA Detection amplitude — LbAb — 2
 Setting range: 0~999℃/℉ (0~999.9℃/℉) (Auto-timer is set automatically)
 ※ When the alarm action mode [AL-1, AL-2] is set to LbAt and [LbAb] is not set to 0, the LbAb parameter will be displayed.

Transfer output Lower limit value — FS-L — −50
 Setting range: Please refer to "■ input specification and scope of use".
 ※ Displays only in transfer output type (DX4M-A4□).
Transfer output Upper limit value — FS-H — 1200

Correspondence address — AdRS — 1   Setting range: 1~127

Communication speed — bPS — 96
 Setting range: 24, 48, 96, 144, 192, 288, 384 bps
 When reading, set the value × 100
 仅在RS485通信输出型 (DX4M-B4□)中显示。

communication Response time — RSHt — 20   Setting range: 5~99ms

communication write Permit/forbid — CoMW — ENA — dISA

Numeric setting Function key — dI-K — StoP — SEt1 — RLRE — At — oFF
 ※ When control mode [C-Md] is set to oNoF, At key will be displayed.

When the input is disconnected, Control output Operating quantity — ERMV — 0.0
 Setting range: 0.0~100.0%
 ※ Control mode [C-Md] When set to oNoF only displays 0.0 (OFF) / 100.0 (ON).
 ※ The control output [C-Md] is greater than PI or PI~do~nooF, and when the setting value is lower than 1000, it will startConvert to 0.0.

Lock key — LoC — oFF — LoC1 — LoC2 — LoC3

Setting range:	
oFF	unlock
LoC1	Lock parameter group 2
LoC2	Lock parameter group 1,2
LoC3	Lock parameter groups 1,2 and SV parameter groups

■ Parameter set

Operation mode

MODE K V A	MODE 2 s	MODE 4 s
Press any key		
SV Settings	Parameter group 1 [PAr1]	Parameter group 2 [PAr2]
MODE	MODE 3 s	MODE 3 s

Parameter group 2 → Parameter group 1 → SV setting

※ Parameter setting sequence
- As each parameter group is related to each other, please be sure to set it in the above order.
※ In parameter setting mode, if no key is pressed within 30 seconds, it will automatically return to the running mode, and the changed parameters will not be saved, but will remain unchanged before the change Parameter value.
※ Press the MODE key for 3 seconds to return to the running mode. If you press the MODE key again within 1 second, you will enter the first parameter group before returning to the running mode Parameters.
※ In running mode, hold down the K + V + A key for 5 seconds at the same time, the parameter initialization interface will be entered. When YES! is selected, the full argument is initialized to out Factory Settings.

● Parup 1

MODE 3 s — Operation mode — PAr-1

※1: S K V A Press any key.
※2: In each parameter group, after setting/changing the set value, press the MODE key to save the set value and automatically move to the next parameter.
 In any parameter state, as long as you press the MODE key for 3 seconds, it will return to the running mode.
 Parameters marked with [....] may not be displayed, depending on the Settings of the corresponding associated parameters.

AL1 Alarm temperature — AL1 — 1250
 ※1
AL2 Alarm temperature — AL2 — 1250
 ※2
 Setting range: deviation alarm (-|F.S|~|F.S|), absolute alarm (use range)
 ※ When setting 2 groups of AL1/AL2 alarm action mode [AL-1, AL-2] set to AM□/5bAt/LbAt□ parameter is not displayed.
 ※ [AL2] Display only in models that support alarm output 2

Self-tuning execution/stop — At — oFF — oN
 ※ When set to oN, it will perform the self-tuning function, and automatically change to oFF after the end.
 ※ Activating self-tuning timing, flashing self-tuning execution light (1 second cycle).

Proportional band — P — 10.0   Setting range: 0.1~999.9℃/℉

Integration time — I — 0
 The value ranges from 0 to 9999S
 ※ When the setting value is set to '0', the score is collected The action is OFF.

Differential time — d — 0
 Setting range: 0~9999S
 ※ When the setpoint is set to '0', differentiate The action is OFF.

Manual reset — RESt — 50.0
 The value ranges from 0.0 to 100.0%
 ※ Only displayed in P/PID control.

hysteresis — HYS — 2
 Set range: 1~100℃/℉(0.1~50.0℃/℉)
 ※ Displays only when control mode [C-Md] in parameter group 2 is set to oNoF.

Timing execution/stop — tN-F — oN — oFF
 ※When set to ON, the timing function is executed; If OFF is set, the command is not executed. After the end of the time control output s tops, PV monitoring, alarm output, abnormal action monitoring as usual.

Timing mode — StCn — 0 102

Time setting — St-t — 00.01
 Setting range: 00.00~99.59(h.m)
 ※Timing execution/stop [tN-F] is displayed only when the value is set to ON.

Note: Added menu STCN =0000~9999 timing mode, divided into hundreds of independent definitions
Units: Temperature start (PV=>SV= units) start time
Tens: =1 Turn off the heating output at the end of the timing, turn on the heating after waiting for the key to start; = other do not turn off the heating
Hundred bit: Start timing mode, =2 temperature start, ((PV=>SV= one bit) start)
=3 button and temperature combination start
=4 Power on the device
= Other keys to start
Thousands: Timing unit and mode 0 ~4 indicates positive definite, 5~9 indicates reverse timing, and 0/5~ 4/9 corresponds to the same
=0/5 Timing unit minute, displaying minute: second, 00:01~99:59
=1/6 Timing unit hour, displaying minutes, 00:01~99:59
=2/7 Timing unit minute, indicating minutes. Seconds, 000.1~999.9
=3/8 Timing unit hour, when displayed. Score: 000.1~999.9
=4/9 Timing unit minute, display minute, 0001~9999

■ SV setting

※ Suppose the set temperature is changed from 210℃ to 250℃

① Operation mode

② SV Set mode
Make use of K V A Key to change the Settings

③ SV Setup complete

④ SV verify

※When the SV setting mode enters the state, if there is no key input within 3 seconds, it will automatically return to the running mode, and the value in the setting will be stored.

■ Give an alarm [AL-1/AL-2]

AM1A
Alarm action / Alarm option

The alarm output is set by a combination of alarm actions and alarm options.
When there are 2 alarm outputs, each can act independently.
When the current temperature exceeds the alarm action range, the alarm will be automatically lifted.
When the alarm option is alarm hold or standby alarm hold 1/2, the alarm can be lifted by pressing the function key (V + A 3 seconds, set [dI-K] in parameter group 2 RLRE) or restarting after the power is turned off.

• Alarm action

mode	name	Alarm action		Instructions
AM0..	—			No-alarm output
AM L□	deviation Upper limit alarm	OFF →H← ON / SV PV 100℃ / Upper limit deviation: Set 10℃	OFF ←H↑ ON / PV SV 110℃ / Upper limit deviation: Set −10℃	The upper limit of PV and SV deviation is greater than the deviation temperature When the value is set, the alarm output is ON.
AM2.□	deviation Lower limit alarm	ON H↓ OFF / PV SV 90℃ 100℃ / Lower limit deviation: Set 10℃	ON H↓ OFF / SV PV 100℃ 110℃ / Lower limit deviation: Set −10℃	The lower limit of PV and SV deviation is greater than the deviation temperature When the value is set, the alarm output is ON.
AM3.□	deviation Limit and limit Give an alarm	ON H↓ OFF ←H↑ / PV SV 90℃ 100℃ / Upper and lower limit deviation: Set 10℃		The deviation of upper or lower limits of PV and SV is greater than the deviation When the difference temperature is set, the alarm output is ON.
AM4.□	deviation Limit and limit Reverse alarm	OFF H↓ ON ←H↑ OFF / PV SV 90℃ 100℃ 110℃ / Upper and lower limit deviation: Set 10℃		The deviation of upper or lower limits of PV and SV is greater than the deviation When the difference temperature is set, the alarm output is ON.
AM5.□	Absolute value Upper limit alarm	OFF →H← ON / PV SV / Alarm absolute value: Set 90℃	ON H↓ OFF / SV PV / Alarm absolute value: Set 110℃	When PV is greater than the absolute value of the alarm, the alarm output It is ON.
AM6.□	Absolute value Lower limit alarm	ON H↓ OFF / PV SV 90℃ / Alarm absolute value: Set 90℃	ON H↓ OFF / SV PV / Alarm absolute value: Set 110℃	When PV is less than the absolute value of the alarm, the alarm output is ON.
5bA□	sensor Disconnected alarm	—		The alarm output is ON when the sensor is disconnected.
LbA□	heater Disconnected alarm	—		The alarm output is ON when the heater is disconnected.

※ H: Alarm output lag [AHYS]

• Alarm option

mode	name	Instructions
AM□.A	General alarm	The alarm output is ON when the alarm condition is met, and OFF when it is not met.
AM□.b	Alarm hold	When the alarm condition is met, the alarm output is ON and its state is maintained. (Alarm output HOLD)
AM□.C	Standby alarm 1	The first time to reach the alarm value does not act, the second time to reach the alarm value according to the general alarm action After the power supply ON the first time does not act, meet the second alarm conditions according to the general alarm action.
AM□.d	Standby hold alarm 1	Do not act when the alarm value is reached for the first time, the alarm hold and the alarm wait act simultaneously. After the power supply ON the first time does not act, meet the second alarm conditions, press the alarm to keep the action.
AM□.E	Standby alarm 2	Do not act when the alarm value is reached for the first time, and press the general alarm action when the alarm value is reached for the second time. Do not act when meeting the alarm holding conditions, and press the general alarm action after lifting the alarm conditions.
AM□.F	Standby hold alarm 2	The basic action is the same as the alarm wait 1, but not only the action when the power is ON/OFF, the alarm value, and the alarm option It also acts when it changes. Do not move when the standby alarm condition is met, and press the alarm to keep moving after lifting the alarm condition

※ Standby alarm 1, standby hold alarm 1 Standby alarm reapplication conditions: when the power supply is ON; Standby alarm 2, standby hold alarm 2 Standby alarm applicable conditions: when the power supply is ON, change the set temperature, alarm temperature [AL-1, AL-2] and action alarm [AL1, AL2], switch from stop mode to running mode.

• Sensor disconnected alarm

Alarm output when the sensor is not connected or when a sensor disconnection occurs in temperature control. By connecting the contact of the alarm output to the buzzer or other means, you can confirm whether the sensor is broken.
Alarm output options can be selected from General alarm [5bAt], Alarm Ho [5bAb].

• Heater Break Alarm (LBA)

By controlling the temperature change of the object to determine the heater status and then issue an alarm function.
When heating control (refrigeration control), the control output operation increases in PV value during LBA monitoring time [LbAt] under 100%(0%) state
If the LBA detection amplitude [LbAb] is not increased or the control output operation quantity is 0%(100%), the PV value is less than the LBA detection amplitude [LbAb] during the LBA monitoring time [LbAt], and the alarm output will be ON.

Control initiation ~(1)	When the control output operation is 100%, increase the LBA detection amplitude [LbAt] or more within the LBA monitoring time [LbAt]
①~②	Control output operation change status (LBA monitoring time reset)
②~③	When the control output is 0%, the detection amplitude is reduced within the LBA detection amplitude [LbAt] within the LBA monitoring time [LbAt], so the heater break alarm (LBA) is ON after the LBA monitoring time.
③~④	The control output operation is 0%, so the heater break alarm (LBA) remains ON.
④~⑥	Control control output operation change status (LBA monitoring time reset)
⑥~⑦	When the control output is 100%, the increase rate within the LBA monitoring time [LbAt] is within the LBA detection amplitude [LbAb], Therefore, the heater disconnection alarm (LBA) is ON after the LBA monitoring time.
⑦~⑧	When the control output is 100%, the LBA detection amplitude [LbAt] is increased within the LBA monitoring time [LbAt], so the heater break alarm (LBA) is OFF after the LBA monitoring time.
⑧~⑨	Control output operation change status (LBA monitoring time reset)

※Performing the self-tuning will automatically set the LBA detection amplitude [LbAb] and LBA monitoring time [LbAt] according to the self-tuning value.
Alarm action mode [AL-1, AL-2] When the heater break alarm [LbA□] is selected, LBA detection amplitude [LbAb] and LBA monitoring time [LbAt] parameters will be displayed.

■ Installation method

• DX4M (48x48mm) series / • Other series

(−) screwdriver / (−) screwdriver

※ After the product is installed on the panel, use (1) a screwdriver to push in the direction of the arrow to fix it.

■ Communication setting

This function is the function of parameter setting and monitoring through external link devices (PC,PLC, etc.). The RS485 communication output is optional and applicable only to the model (DX4□-B4□) that supports this output.Please refer to "■ Model composition"

• Communication specification

Communication protocol	Modbus RTU	Communication speed	2400,48,9600 (factory specifications), 19200,38400bps
Connection mode	RS485	Communication response time	5~99ms(Factory specification: 20ms)
Applicable specification	EIA RS485 standard	Start bit	1bit(immobilization)
Maximum connection number	31 units (Address: 01~127)	Data bit	8bit(immobilization)
Communication synchronous mode	Asynchronous mode	Parity bit	Parity bit None(Factory specification), Odd, Even
Communication method	2-wire Half Duplex	Stop bit	1bit, 2bit(Factory specification)
Communication effective distance	Max. 800m		

• System component example

RS232C/ USB/Wi-Fi RS485
Terminal resistance (100~120Ω)
B(−) RS485 DEVICE #31
A(+)
Communication converter
Computer
A(+) B(−) / A(+) B(−) / A(+) B(−)
RS485 DEVICE #1 / RS485 DEVICE #2 / RS485 DEVICE #30
ON ● OFF

※ Communication converter recommended to use our company SCM-WF48(Wi-Fi/RS485 / USB wireless communication converter, sold separately), SCM-US48I(USB/RS485 converter, sold separately),SCM-38I(RS232C/RS485 converter, RS232C/RS485 converter, Sold separately), SCM-US(USB/Serial converter, sold separately). SCM-WF48.
It is recommended that Twisted pair cables suitable for RS485 communication be used for the communication cables of SCM-US48I and SCM-38I.

■ Error display

reveal	content	measure
oPEN	Blinks when the input sensor is disconnected or disconnected.	Determine the status of the input sensor
HHHH	Blinks when input value exceeds the operating temperature range.	The error was cleared when the input changed to the normal range.
LLLL	Blink when the input value is below the operating temperature range.	

■ Factory setting

• SV Settings

argument	Factory setting
–	0

• Parameter group 1

argument	Factory setting
AL1	1250
AL2	
At	oFF
P	10.0
I	0
d	
RESt	50.0
HYS	2
St-t	000 1
tN-F	oN

• Parameter group 2

argument	Factory setting	argument	Factory setting
IN-t	KCRH	AHYS	1
UNIt	℃	LbAt	0
IN-b	0	LbAb	2
MAV.F	0.1	FS-L	−50
L-SV	−50	FS-H	1200
H-SV	1200	AdRS	1
o-Ft	HEAt	bPS	96
C-Md	PId	PREY	NoNE
oUt	CURR	StP	2
SSRM	StNd	RSHt	20
OMAL	OMRH	dI-K	StoP
t	20.0 (relay) / 2.0(SSR Drive)	ERMV	0.0
AL-1	AM1A	LoC	oFF
AL-2	AM2A		
A1Ot	0		
A2Ot	0		

■ Matters needing attention

1. Please follow the precautions in use. Otherwise, unexpected accidents may occur.
2. Check the polarity of the terminal before connecting the temperature sensor.
The thermal resistance (RTD) temperature sensor should be connected in 3-wire mode and use wires of the same thickness and length.
When extending the wire of a thermocouple (TC) temperature sensor, use the specified compensation wire.
3. In order to eliminate the induction interference, please separate the product from the high-voltage line and the power line.
When installing power cables and input cables in close proximity, install filters on the power end and screen the signal cables.
Do not use near machines with strong magnetic fields and high frequency interference.
4. Do not use excessive force when inserting or removing the connector.
5. The switch or circuit breaker used to power on or off the product is installed nearby for the operator to operate.
6. Do not use for purposes other than temperature controller (voltmeter, ammeter, etc.)
7. When changing the input sensor, power off the product before changing it.
After changing the input sensor, change the associated parameters.
8. Do not route the communication cable and power cable together.
Be sure to use Twisted pair cables for communication, and link round Ferrite beads at both ends of the line to reduce external interference
9. Please reserve some space around the product to facilitate heat dissipation.
For accurate temperature measurement, preheat for 20 minutes after power-on before use.
10. Make the voltage reach the rated voltage within 2 seconds after putting into the power supply.
11. Do not connect cables to unused segments.
12. This product can be used in the following environments.
① Indoor (meet the ambient conditions in the specifications)
② Below 2,000m above sea level
③ Pollution Degree 2(Pollution Degree 2)
Installation Category II(Installation Category II)