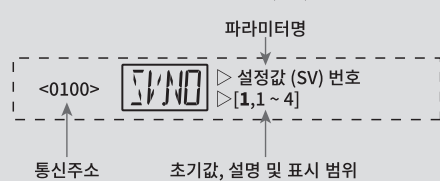
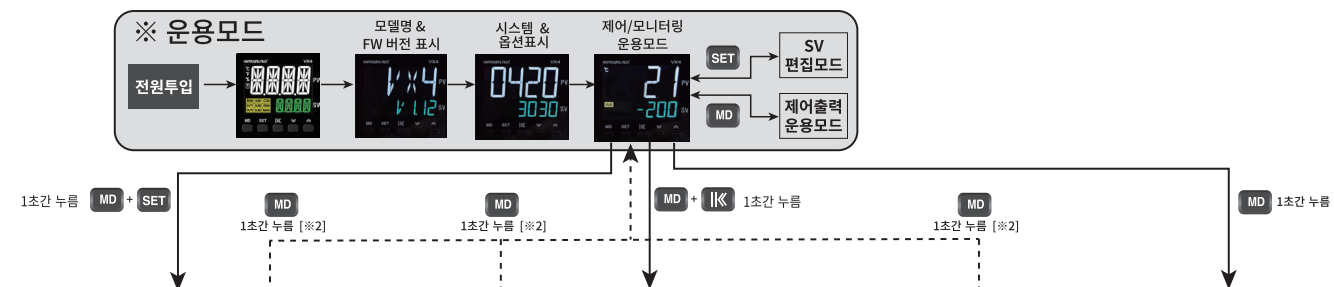
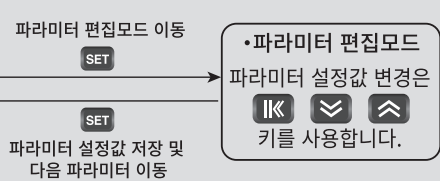


■ 파라미터 구성

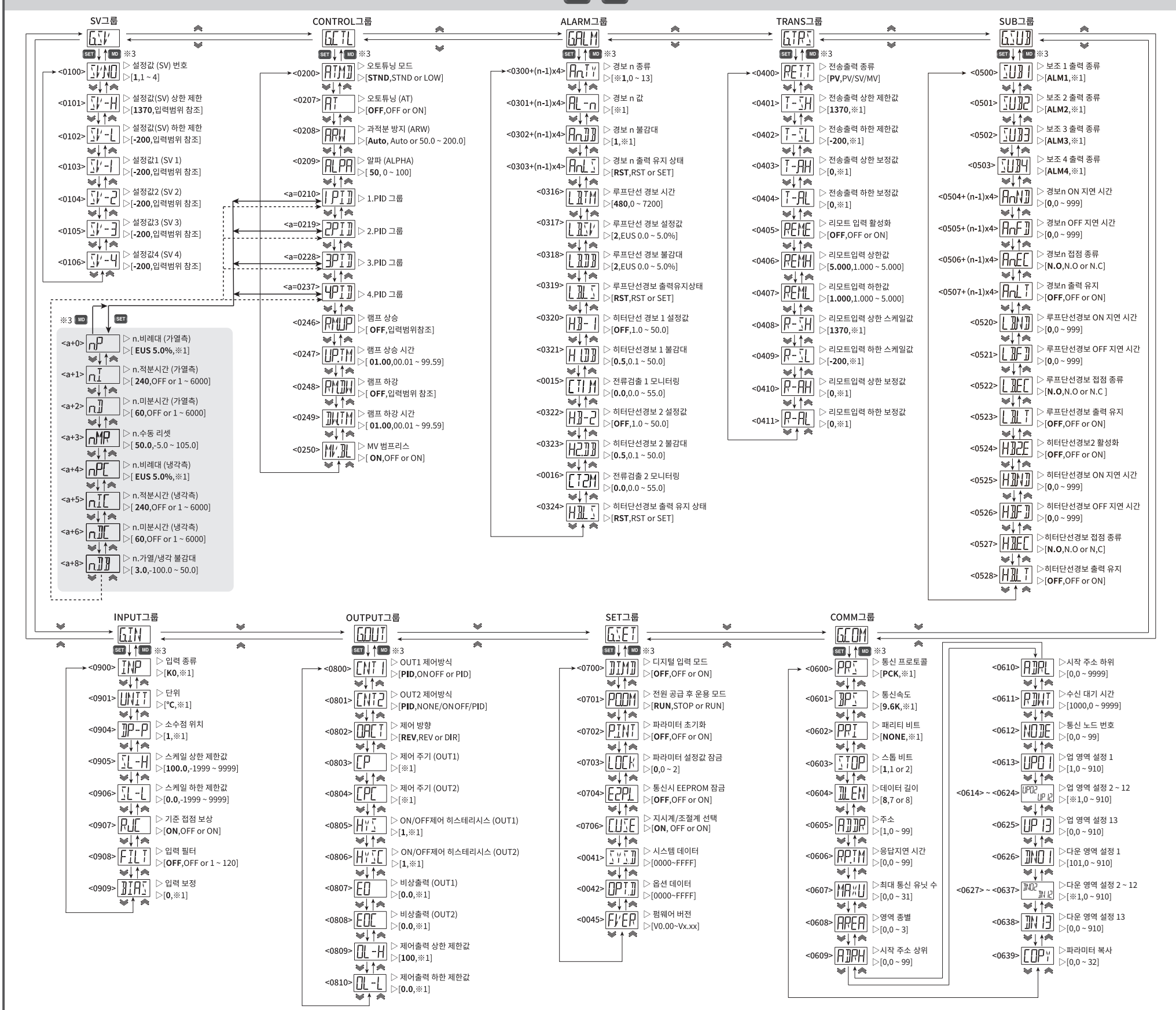
※ 파라미터 읽는 방법 (예)



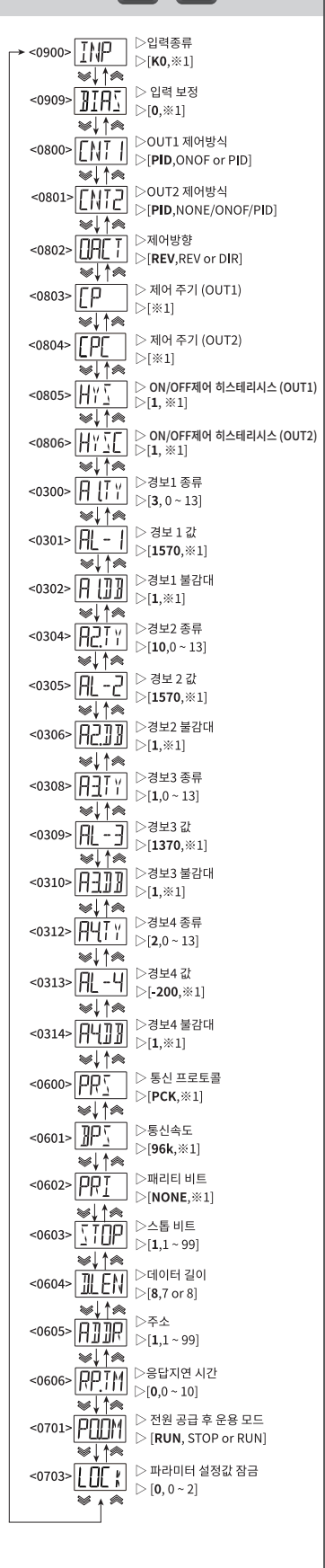
※ 파라미터 설정값 편집 방법



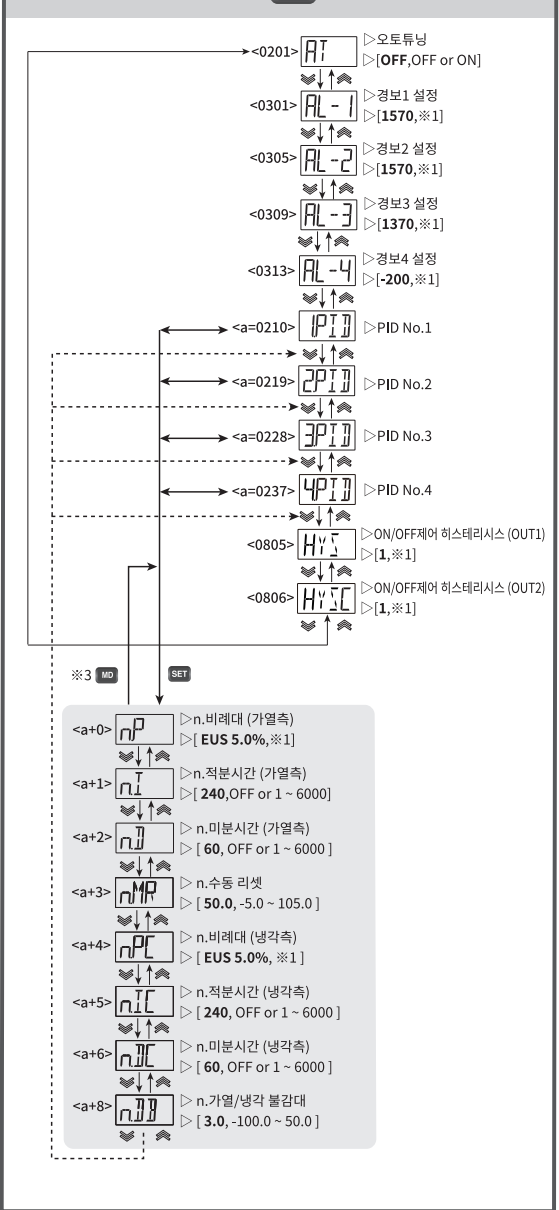
전체메뉴 MD + SET 1초간 누름



기본메뉴 **MD** + **IK** 1초간 누름



간편메뉴 **MD** 1초간 누름



※1: 사용설명서 참조
사용설명서 참조는 홈페이지 www.hanyoungnux.co.kr
자료실에 있는 사용설명서를 참고하여 주시기 바랍니다.

※2: 운전모드 화면 이동 키
파라미터 설정 화면에서 **MD** 키를 1초간 누르면
운용모드 화면으로 이동합니다.

※3: 그룹명 표시로 이동
파라미터 표시 중 **MD** 키를 누르면 그룹명으로 이동합니다.
(단, n.PID 내의 파라미터 표시중에는 n.PID로 이동합니다.)

※ 형명구성의 옵션 및 파라미터 설정에 따라 파라미터 표시가 다릅니다.

HALYOUNG nux

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MA0631KE241107

DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor injury or property damage

⚠ WARNING

If there is a possibility of a serious accident due to malfunction or abnormality of this product, install an appropriate protection circuit on the outside.

Since this product is not equipped with a power switch and fuse, install them separately on the outside (fuse rating: 250 V a.c., 0.5 A).

The power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.

Do not touch the power supply unit directly. The power supply unit may get very hot during operation.

The product does not have an explosion-proof structure, so avoid using it in places with flammable or explosive gases.

Never disassemble, modify, process, improve or repair this product, as it may cause abnormal operations, electric shocks or fires.

Please disassemble the product after turning OFF the power. Failure to do so may result in electric shocks, product abnormal operation or malfunctions.

Any use of the product other than those specified by the manufacturer may result in personal injury or property damage.

Please use this product after installing it to a panel, because there is a risk of electric shock.

When used in equipment with a high risk of personal injury or property damage (examples: medical devices, nuclear control, railway signal, railway, communication relay, criminal investigation equipment), install double safety devices and prevent accidents. Failure to do so may result in fire, personnel accident or property damage.

- The contents of this manual may be changed without prior notification.
- Please make sure that the product specifications are the same as you ordered.
- Please make sure that there are no damages or product abnormalities occurred during shipment.
- When replacing the sensor, be sure to turn off the power.
- Use an extra relay when the frequency of operation (such as proportional operation, etc.) is high, because connecting the load to the output relay rating without any room shortens the

- Use this product in the following environments:
 - indoors.
 - use it in the ambient temperature and humidity ranges indicated in the instruction manual.
 - use it in locations where corrosive gases (especially harmful gases, ammonia, etc.) and flammable gases are not generated.
 - use it in places where vibrations and impacts are not directly applied to product body.
 - use it in places without liquids, oils, chemicals, steam, dust, salt, iron, etc. (pollution degree 1 or 2).
 - avoid places where large industrial interference, static electricity, magnetic noise are generated.
 - avoid places with heat accumulation caused by direct sunlight, radiant heat, etc.
 - use it in places with elevation below 2000 m.
 - Power input and relay output wires are at least 75 °C of heat resistance and, use copper wires from 18 AWG to 24 AWG.
 - Tighten the screw on the terminal is torque from 0.5 to 0.7 N·m.
 - Do not wipe the product with neutral solvents such as alcohol, benzene, etc. (wipe it with organic detergents).
 - When water enters, short circuit or fire may occur, so please inspect the product carefully.
 - For thermocouple input, use the predetermined compensating cable (temperature errors occur when using ordinary cable).
 - For RTD input, use a cable with small lead wire resistance and without resistance difference among 3 wires (temperature errors occur if the resistance value among 3 wires is different).
 - Use the input signal line away from power line and load line to avoid the influence of inductive noise.
 - Input signal line and output signal line should be separated from each other. If separation is not possible, use shield wires for input signal line.
 - Use a ground-sprung sensor for thermocouple (using a grounded sensor may cause malfunctions to the device due to short circuits).
 - When there is a lot of noise from the power, we recommend to use insulation transformer and noise filter. Please install the noise filter to a grounded panel or structure, etc. and make the wiring of noise filter output and product power supply terminal as short as possible.
 - Tightly twisting the power cables is effective against noise.
 - If the alarm function is not set correctly, it will not be output in case of abnormal operation, so please check it before operation.
- Service life.** In this case, SSR drive output type is recommended.
- * When using electromechanical switch: set the proportional cycle to at least 20 sec.
 - * When using SSR: set the proportional cycle to at least 1 sec.
- Do not wear anything to unused terminals.
 - Please wire correctly, after checking the polarity of the terminals.
 - When you install this product to a panel, please use switches or circuit breakers compliant with IEC60947-1 or IEC60947-3.
 - Please install switches or circuit breakers at a close distance for user convenience.
 - Please specify on the panel that, since switches or circuit breakers are installed, if the switches or circuit breakers are activated, the power will be cut off.
 - We recommend regular maintenance for the continuous safe use of this product.
 - Some components of this product may have a lifespan or deteriorate over time.
 - The warranty period of this product is 1 year, including its accessories, under normal conditions of use.
 - The preparation period of the contact output is required during power supply. If used as a signal to external interlock circuit, etc. please use a delay relay together.
 - If the user changes the product in case of malfunctions, the operation may be different due to set parameters differently even if the model name is the same. So, please check the compatibility.
 - Before using the temperature controller, there may be a temperature deviation between the PV value of the temperature controller and the actual temperature, so please use the product after calibrating the temperature deviation.
 - The write life of non-volatile memory (EEPROM) is one million times. When configuring the system, please make sure that the number of times that data are written to non-volatile memory does not exceed one million times.
 - If you connect the USB loader to another device using a USB cable, additional input errors may occur depending on the target device to which the cable is connected. (it is recommended not to use it for control/monitoring)

Model		Code	Content
VX	[] [] [] [] [] [] [] [] [] []		LCD Digital Temperature Controller
Size	2		48(W) × 96(H) × 62.5(D) mm
	3		96(W) × 48(H) × 62.5(D) mm
	4		48(W) × 48(H) × 63(D) mm
	7		72(W) × 72(H) × 62.5(D) mm
	9		96(W) × 96(H) × 62.5(D) mm
Sensor	U		Universal input
OUT 1 (control output 1)	M		Relay output
	S		Voltage pulse output (voltage pulse output for SSR drive)
	C		Current output (4-20 mA current output for SCR drive)
OUT 2 (control output 2)	N		None
	M		Relay output
Power	A		100 - 240 V a.c. 50/60 Hz
	D		24 V d.c., Class2
Sub output	A1		1 relay output (VX4 basic option)
	A2		2 relay outputs (VX2, VX7, VX9 basic option)
	A4		4 relay outputs (※ *1)
Communication		C	RS-485 communication
Retransmission output (RET)		T	Retransmission output (4 ~ 20 mA)
Digital input (DI)		D2	2 digital inputs (DI 1 ~ 2)
Current detection input (CT)		H1	Current detection input (CT) 1 contact
Remote input (REM)		R	1 input, 4 ~ 20 mA (1 ~ 5 V)

	Control/Monitoring	SV change	Control output	Manual control output	Simple / Basic / Full	Change parameters
Mode	Move to control output SV change mode	-	Move to control/monitoring mode	Move to control/monitoring mode	*2	-
Set	Move to SV change mode	Save SV value	-	-	Change Parameter / Move within group	Move to next parameter after saving value
Shift	-	Shift digit position	-	Shift digit position	-	Shift digit position
Down	-	Decrease value	-	Decrease value	Move among parameters / Move group	Decrease/change value
Up	-	Increase value	-	Increase value	-	Increase/change value

Classification		VX2	VX3	VX4	VX5	VX7	VX9	
Input	Thermocouple	K, J, E, T, R, B, S, L, N, U, W, PLII						
	Reference junction compensation accuracy	± 1.5 °C (within -10~50 °C)						
	RTD	JPT100, PT100						
	Allowable line resistance	Each 3 wire within 10 Ω (but the resistance among 3 lines should be same)						
	DC voltage / current	1 ~ 5 V (4 ~ 20 mA), 0 ~ 5 V, 0 ~ 10 V, 0 ~ 50 mV, 0 ~ 100 mV						
	Sampling cycle	50 ms						
Control output	Relay output (OVV II, Resistive load)	• Rated switching capacity : 5 A 240 V a.c., 5 A 30 V d.c. • Max. switching power : 750 VA, 90 W • Max. switching voltage : 240 V a.c., 110 V d.c. • Max. switching current : 5 A • Mechanical life : 20 million times (at least 180 LPM) (VX3) Rated switch capacity: 3 A 240 V a.c., 3 A 30 V d.c., maximum switching current: 3 A						
	AC voltage type voltage pulse output	12 V d.c. ± 1 V d.c. pulse voltage (load resistance min. 600 Ω)						
	DC voltage type voltage pulse output	12 ~ 15 V d.c. pulse voltage (load resistance min. 600 Ω)						
	Current output	4 ~ 20 mA ± 0.2% of FS ± 1 digit, load resistance: max. 600 Ω						
Control	Control type	ON/OFF, PID control, 2DOF PID control						
	Output operation	Reverse action, direct action						
Memory	Non-volatile memory life	EEPROM unlocked: when setting EXP.L OFF in G.SET group (EEPROM life: 1 million times write guaranteed) / EEPROM locked: when setting EXP.L ON in G.SET group (store in RAM)						
Display part	Display method	Wide viewing angle LCD						
	PV character	20.5 x 6.9	19.7 x 7.2	15.2 x 6.8	19.8 x 9.3	29.0 x 13.6		
	SV character	12.8 x 5.9	10.7 x 7.4	7.4 x 3.9	10.2 x 4.9	15.0 x 7.2		
	MV character	9.3 x 4.4	7.3 x 3.5	7.4 x 3.9	7.5 x 3.3	11.0 x 4.8		
k-W/mm	Communication method	USB 2.0						
	Protocol	• Protocol : PC-LINK • Data bit : 8 bit		• Baudrate : 38400 bps • Parity bit : None		• Start bit : 1 bit • Stop bit : 1 bit		
USB reader	Communication distance	Within 5 m						
	Sub output	Relay 1 ~ 4 outputs, rated switching capacity: 5A 240 V a.c., 5 A 30 V d.c.						
Operation	Digital input	Contact input ON : 1 KΩ max., OFF: 100 KΩ min., Non-contact input ON : 1.5 V max., OFF: 0.1 mA max. Current Flow : approx. 2 mA per contact, Voltage at open : Approx. 5 V d.c.						
	Retransmission output	1 output, 4 ~ 20 mA ± 0.2% of FS ± 1 digit, load resistance: max. 600 Ω						
	Remote input	1 input, 4 ~ 20 mA (1 ~ 5 V)						
	Current detection input	1 input or 2 inputs, 0.0 ~ 50.0 A, CT-70 current transformer (sold separately)						
	RS-485	Communic. method	EIA RS485 standard, 2-wire half-duplex					
		Max. connections	31 (address setting 1~99 available)					
		Communic. sequence	No sequence					
		Communic. distance	Within 1.2 km					
		Communic. speed	4800, 9600, 14400, 19200, 38400, 57600 BPS					
		bit	Start bit : 1 bit, Data bit : 7 or 8 bit, Parity bit : NONE / EVEN / ODD, Stop bit : 1 or 2 bit					
	Protocol	PC-LINK STD, PC-LINK WITH SUM, MODBUS-ASCII, MODBUS-RTU, MC Protocol (format4), XGT Cnet Server Mode						
	Response time	Actual response time = processing time + response time ms						
Power	AC Power Supply Voltage	100 ~ 240 V a.c., 50/60 Hz						
	DC Power Supply Voltage	24 V d.c., Class2						
	Voltage fluctuation rate	± 10 % of power voltage						
	Insulation resistance	Min. 20 MΩ, 500 V d.c.						
	Dielectric strength	3,000 V a.c., 50/60 Hz for 1 minute (between 1st and 2nd terminal)						
	AC voltage type power consumption	Max. 8.5 VA	Max. 8.5 VA	Max. 8.2 VA	Max. 8.5 VA	Max. 9.0 VA		
	DC voltage type power consumption	Max. 2.7 W	Max. 2.7 W	Max. 2 W	Max. 2.8 W	Max. 3.2 W		
	Ambient temperature & humidity	-10 ~ 50 °C, 35 ~ 85 % RH (without condensation)						
	Storage temperature	-25 ~ 65 °C						
	Approval							
		• Electrostatic discharge (ESD) : KN61000-4-2 • EFT(RS) : KN61000-4-3 • Conductive RF (CS) : KN61000-4-6 • SURGE : KN61000-4-5						
		IP65 (front panel)	IP65 (front panel)	IP66 (front panel)	IP65 (front panel)	IP65 (front panel)		
Weight (g)		202	202	120	194	290		
Basic components		Main body, Bracket, 250 Ω resistor (1%), Rubber packing, Instruction manual						

Operation indicator

- 1:** RUN or STOP status
(Control output 1 blinks proportionally to 0 ~ 100%)
- 2:** Control output 2 status
(Control output 2 blinks proportionally to 0 ~ 100%)
- 3:** Sub output 1 status
(Sub output 1 blinks proportionally to 0 ~ 100%)
- 4:** Sub output 2 status
(Sub output 2 blinks proportionally to 0 ~ 100%)
- 5:** Sub output 3 status
(Sub output 3 blinks proportionally to 0 ~ 100%)
- 6:** Sub output 4 status
(Sub output 4 blinks proportionally to 0 ~ 100%)
- 7:** Communication status
(Control output 7 blinks proportionally to 0 ~ 100%)
- 8:** Remote input activation
(Remote input blinks proportionally to 0 ~ 100%)
- 9:** Manual output status
(Manual output blinks proportionally to 0 ~ 100%)
- 10:** Auto-tuning status
(Auto-tuning blinks proportionally to 0 ~ 100%)
- 11:** Lock setting status
(Lock setting blinks proportionally to 0 ~ 100%)

TUNING
(Blinks during Auto-Tuning (AT))

UNIT
(Displays "C", "F", "%, no unit depending on unit set value)

PRESENT VALUE
(Displays PV value in operating mode, displays parameter value in menu mode)

SET VALUE OR OUTPUT VALUE
(Displays SV or control output value in operating mode, displays parameter set value in menu mode)

OUTPUT VALUE
(Control output value in operating mode)

VX2

VX7, VX9

The diagram illustrates the VX3 system architecture. On the left, a rack-mounted unit is shown with a 'VX3' label. Below it, a detailed block diagram of the VX3 unit is provided. The unit is divided into several sections: 'P/V' (Power/Voltage) at the top, 'VX3' in the center, and 'M/V' (Motor/Voltage) at the bottom. The 'VX3' section contains a grid of components labeled 'VX3' and 'SV'. The 'M/V' section contains a grid of components labeled 'M/V' and 'SV'. Below the grid, there are control buttons labeled 'MO', 'SET', 'B/C', 'W', 'A', and a USB symbol. A 'USB loader' is connected to the USB port. The diagram also shows a 'VX3' unit connected to a 'VX3' unit, and a 'VX3' unit connected to a 'VX3' unit. The diagram is labeled 'VX3' and 'SV'.

Combination	Description	No.	Combination	Description
Press and hold + for 3 sec.	Lock / unlock	1	Press and hold for 1 sec.	Simple menu (set alarm value, PID value, HYS value, etc.) but go to operating mode from menu mode
Press and hold + for 3 sec.	Manual / automatic output mode			
Press and hold + for 3 sec.	Auto tuning (AT) on / off	2	Press and hold + for 1 sec.	Full menu (set all parameters divided into groups)
Press and hold for 1 sec.	Switch RUN / STOP			
Press or	Release during alarm latch	3	Press and hold + for 1 sec.	Basic menu (Set input type, control method, control cycle, alarm type, communication, lock, etc.)

No.	Combination	Description
1	Press and hold for 1 sec.	Simple menu (set alarm value, PID value, HYS value, etc.) but go to operating mode from menu mode
2	Press and hold + for 1 sec.	Full menu (set all parameters divided into groups)
3	Press and hold + for 1 sec.	Basic menu (Set input type, control method, control cycle, alarm type, communication, lock, etc.)

■ VX4

■ VX7

Classification	Type	Parameter set value		Temperature range		Tolerance
		Screen display	Communication	°C	°F	
Thermo couple	K	K0	1	-200 ~ 1370	-328 ~ 2498	±0.2 % of FS ± 1 digit
		K1	2	-100.0 ~ 500.0	-148 ~ 932	
	J	J0	3	-200 ~ 1200	-328 ~ 2192	
		J1	4	-199.9 ~ 900.0	-328 ~ 1652	
	E	5	-199.9 ~ 900.0	-328 ~ 1652		
	T	T1	6	-199.9 ~ 400.0	-328 ~ 752	
	R	R0	7	0 ~ 1700	32 ~ 3092	
	B	B0	8	100 ~ 1800	212 ~ 3272	±0.2 % of FS ± 1 digit 100~200 °C: ±0.0 % of FS ± 1 digit
	S	S0	9	0 ~ 1700	32 ~ 3092	
	L	L1	10	-199.9 ~ 900.0	-328 ~ 1652	
	N	N0	11	-200 ~ 1300	-328 ~ 2372	
	U	U1	12	-199.9 ~ 400.0	-328 ~ 752	
	W	W0	13	0 ~ 2300	32 ~ 4172	
	PLII	PL0	14	0 ~ 1300	32 ~ 2372	
RTD	JPt100	JPt0	20	-200 ~ 500	-328 ~ 932	±0.2 % of FS ± 1 digit
		JPt1	21	-199.9 ~ 500.0	-328 ~ 932	
	Pt100	Pt0	22	-200 ~ 640	-328 ~ 1184	
		Pt1	23	-199.9 ~ 640.0	-328 ~ 1184	

Classification	Type	Parameter set value		Range	Tolerance
		Screen display	Communication		
Direct current (Current Input)	4 ~ 20 mA (※)	1.5 V	30	-1999 ~ 9999	±0.2 % of FS ± 1 digit
	0 ~ 20 mA (※)	5 V	31		
Direct voltage (V d.c. / mV d.c.)	1 ~ 5 V	1.5 V	30		
	0 ~ 5 V	5 V	31		
	0 ~ 10 V	10 V	32		
	0 ~ 50 mV	0.05 V	33		
	0 ~ 100 mV	0.1 V	34		

Input	Type	Range	Tolerance
Direct current	4 ~ 20 mA (※)	Same as input setting range	±0.2 % of FS ± 1 digit
Direct voltage	1 ~ 5 V d.c.		

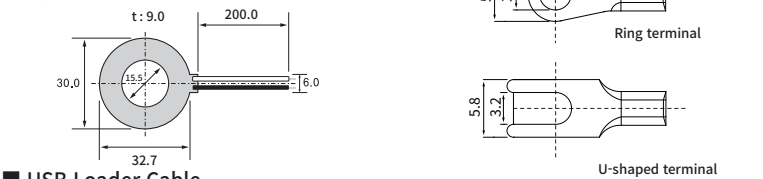
■ Dimensions

Product dimensions		W	48.0	96.0	48.0	72.0	96.0
Product dimensions	H	96.0	48.0	48.0	72.0	96.0	
	D	62.5	62.5	63.0	62.5	62.5	
	D1	5.5	5.5	5.0	5.5	5.5	
	L	78.4	78.4	78.4	78.4	78.4	
Panel cutout	W1 *1)	45.0	90.5	45.0	67.5	92.0	
	H1 *1)	90.5	45.0	45.0	67.5	92.0	
	A	70.0	122.0	60.0	83.0	117.0	
	B *2)	122.0	70.0	60.0	100.0	117.0	
Protective cover	W2	48.4	94.4	48.0	71.8	96.0	
	H2	94.4	48.4	48.1	71.8	96.0	
	D2	26.9	26.9	24.0	26.9	26.9	

The figure consists of two circuit diagrams for RS485 connections. The left diagram shows a standard RS485 connection where D11 A(+) is connected to pin 13 and COM B(-) is connected to pin 14. The right diagram shows a differential RS485 connection where D11 A(+) is connected to pin 37 and COM B(-) is connected to pin 38. Both diagrams include terminals for OUT1, OUT2, SUB1, SUB2, COM, SUB3, SUB4, RET, REM, and RTD.

※ Available with HBA option
(current ratio: 1000 : 1, current detection range: 0.0 - 50.0 A)

※ Make sure the CTs used are UL Listed or Recognized component (Reinforced insulation) in USA/Canada



※ USB2.0 Mini 5PIN Cable

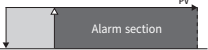
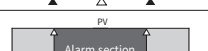


■ Protective cover (* sold separately)

VX2, VX3	VX4	VX7	VX9
TC2A-COV	TC4A-COV	TC7A-COV	TC9A-COV

※ Grey part: An.DB, △: SV set value, ▲: AL-n set value, the number indicated in parenthesis () has standby sequence
※ n indicates alarm numbers 1 ~ 4

Alarm type set value	Alarm type	Alarm operation	Absolute alarm	Deviation alarm
----------------------	------------	-----------------	----------------	-----------------

Alarm type set value	Alarm type	Alarm operation	Absolute alarm	Deviation alarm
0	Alarm off	-	-	-
1	High absolute		O	
(7)	High absolute with standby sequence			
2	Low absolute		O	
(8)	Low absolute with standby sequence			
3	High deviation			O
(9)	High deviation with standby sequence			
4	Low deviation			O
(10)	Low deviation with standby sequence			
5	High-Low deviation			O
(11)	High-Low deviation with standby sequence			
6	High-Low range			O
(12)	High-Low range with standby sequence			
13	Sensor error	Burn-out	O	

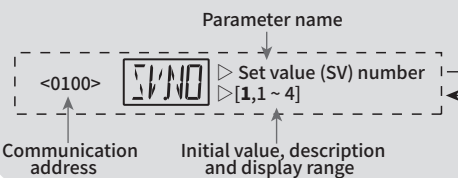
No	Screen display	Content	Cause and Action
1	SYS.E	System Data	System data setting error (please contact us)
2	OPT.E	Option Data	Option data setting error (please contact us)
3	E2P.E	EEPROM	EEPROM error (please contact us)
4	ADC.E	AD Converter	AD Converter error (please contact us)
5	CAL.E	Calibration	Calibration value setting error (please contact us)
6	RJC.E	RJC	Reference contact compensation error (please contact us)
7	AT.E	Auto tuning	Auto-tuning maximum elapsed time (24h) exceeded - Check if the connected sensor and the set sensor are different - If the output is not output from the output terminal when the control output is 100% (please contact us) - If the control output is generated from the instrument but PV does not change (check the wiring status) - If the control output is 0%, enter the P, I, D values manually without running AT for systems where temperature is not likely to drop
8	B.OUT	Burn out	Check sensor wiring status (check for disconnection) Check the sensor settings (check input type parameters (INP)) If the input is exceeded by more than $\pm$ OVER
9	OVR	+Over	Check the sensor settings (if the input is exceeded within +5% of sensor input range)
10	-OVR	-Over	Check the sensor settings (if the input is exceeded within -5% of sensor input range)

※ Error messages are displayed on PV display window.

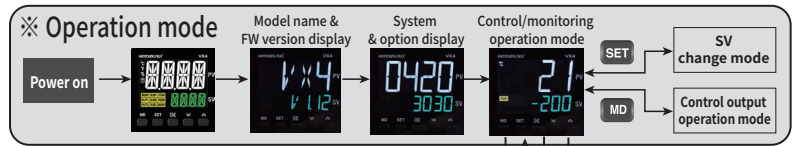
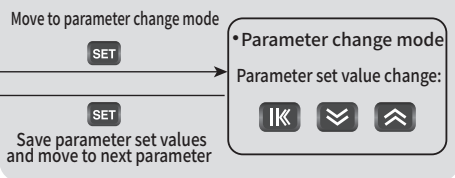
※ For further information, please visit our homepage(www.hanyoungnux.com) and refer to the user's manual in the archive.

Parameter configuration

※ How to read parameters (example)



※ How to change parameter set values



Press and hold for 1 sec. MD + SET

Press and hold for 1 sec. [※2] MD

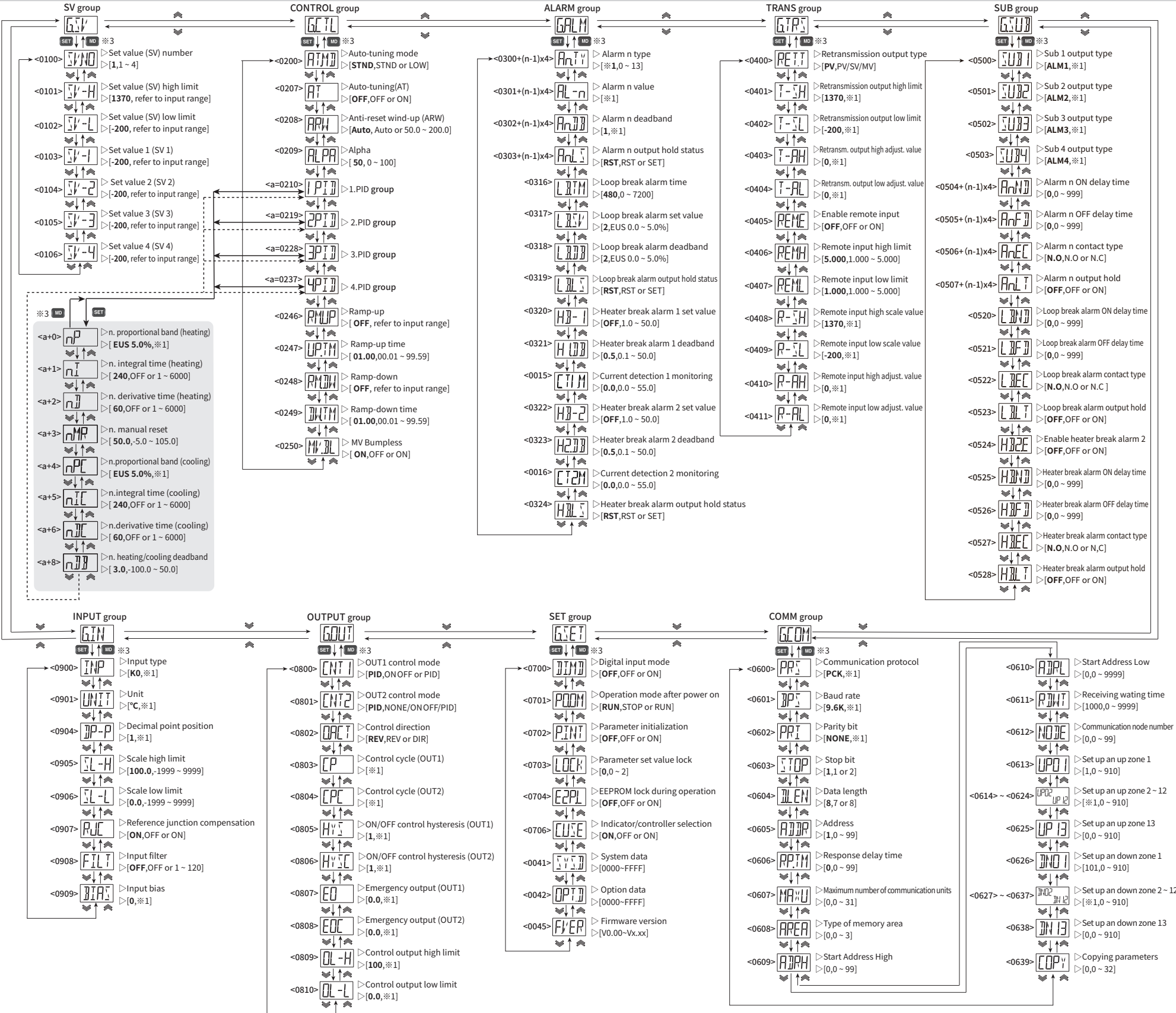
Press and hold for 1 sec. [※2] MD

Press and hold for 1 sec. [※2] MD

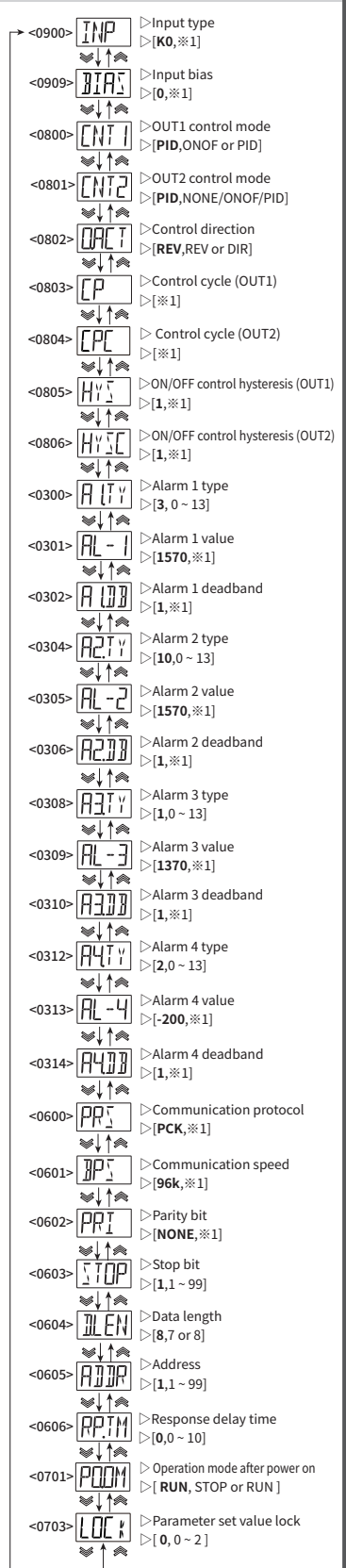
Press and hold for 1 sec. [※2] MD

Press and hold for 1 sec. MD

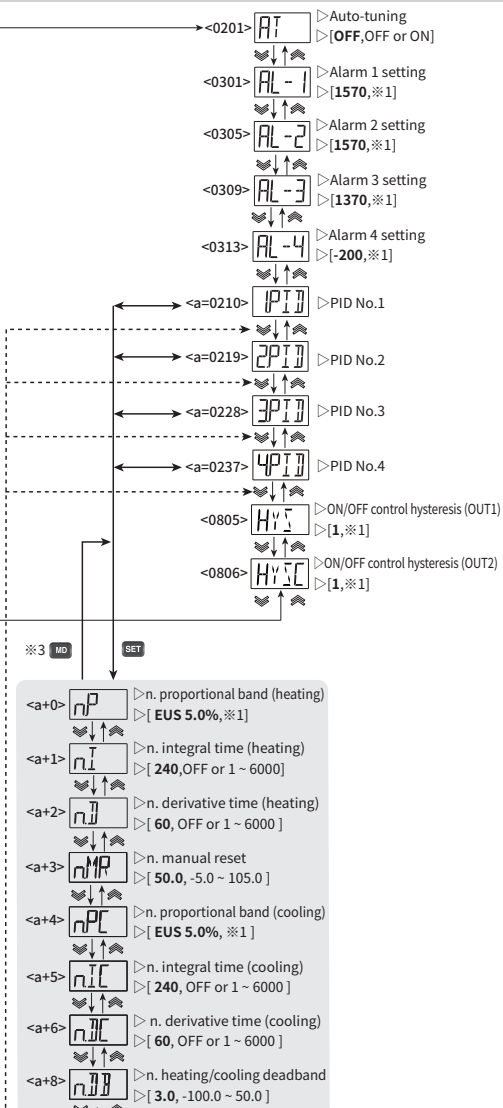
Full Menu: press and hold MD + SET for 1 sec.



Basic Menu: press and hold MD + I/K for 1 sec.



Simple menu: press and hold MD for 1 sec.



※ 1 : Refer to the User's Manual

※ Please visit our homepage (www.hanyoungnux.com) and refer to the user manual in the archive.

※ 2 : Key to move to operation mode screen

Press and hold MD in the parameter setting screen for 1 sec. to move to operation mode screen

※ 3 : Move to group name display

Press MD during parameter display to move to group name (but during parameter display in n.PID, it moves to n.PID.

※ The parameter display differs depending on suffix code options and parameter settings.