MULTIFUNCTION DIGITAL CONTROLLER

FX3D-Dual

USER MANUAL

DOTECH
SENSING & CONTROL

DOTECH INC.
6F, JOONGANG-ILBO B/D, 30, Dongsan-ro, Danwon-gu,
Ansan-si, Gyeonggi-do, KOREA
Phone: +82-31-495-3767, Fax : +82-31-495-3917
INNOBIZ
www.dotech21.com

⚠ CAUTIONS

1. This product may cause an electric shock in handling. Please do not attempt to open it with power turned on.
2. This product should be installed in a place fixed secured by a rack or panel.
3. This product can be used under the following environmental condition.
   ① Indoor ②Pollution Degree 2 ③At an altitude of 2000m or below
4. Power input must be within the designated ranges.
5. To turn on or turn off power supply for this product, please the circuit breaker or switch of a standard product of IEC 60947-1 or IEC 60947-3 product and install it within a close distance allowing convenient operation by user.
6. Please be understood that if this product is dismantled or modified discretionary, after sales service will not be able to be provided.
7. An output wire to be used for this product should be inflammable grade FV1 (V-1 grade or above), the thickness of the wire should be AWG No. 20 or above(0.50mm²).
8. In order to prevent it from an inductive noise, please maintain the high-voltage wire and power wire separated.
9. Please avoid installing the product in a place where a strong magnetism, noise, severe vibration and impact exist.
10. When extending the sensor wire, use a shield wire and do not extend it unnecessary long.
11. The sensor wire and signal wire should be away from the power and load wires using conduits separately installed.
12. Please avoid using the product near a device generating strong high frequency noise (high-frequency welding machine, high-frequency sewing machine, high-frequency radiotelegraph, high capacity SCR controller)
13. Product's damages other than those decribed in the guarantee conditions provided by the manufacturer shall not be respoinsible by us.
14. If this unit is used to control machineries (Medical equipment, vehicle, train, airplane, combustion apparatus, entertainment, processing and transportation equipment, elevator and various safety device etc.) enabling to effect on human or property, it is required to install fail-safe device.

※ The Aforementioned precautions must be observed, and if you fail to do so, it may cause a product's breakdown.
※ The specifications, dimensions, and etc. are subject to change for enhancement without a prior notice.

1. OVERVIEW

※ FEATURES

Digital Temperature Controller
Digital Multi Measurements and Controls

FX3D-Dual controls each output with two temperature sensors. It is economical and space saving as it functions like 2 controllers.

: STANDARD SPECIFICATIONS

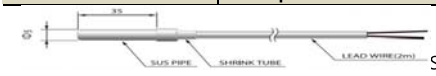
Model	Description
Dimensions	78(W)mm X 35(H)mm X 78(D)mm
Power	100-240Vac, 50/60Hz
Power Consumption	MAX 6VA
Connection	Screw Terminal, Wire Range : 24~12AWG
Output	2P Relay Output (250Vac / 5A)
Input	2P Temperature Sensor Input
Operation	Temperature –10~50 °C, Humidity 90%RH or less
Storage	Temperature –20~60 °C, Humidity 90%RH or less

: SELECTION GUIDE

Model	Description
FX3D-Dual-00	Standard
FX3D-Dual-A1	4 ~ 20 mA Transmission (※ Communication Cable Included)
FX3D-Dual-R4	RS485 Communication : MODBUS RTU MODE (※ Communication Cable Included)

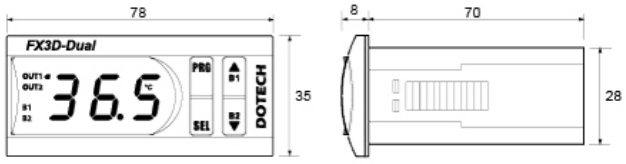
※ Temperature sensor is optional.

: SENSORS

Model	Description
	Standard
DPR-TH01-ET*2M	NTC 5kΩ at 25℃ / -50~105℃ / ±0.3℃ at 25℃
	For High Temperature
DPR-TH02-P6D100L*2M	NTC 10kΩ at 25℃ / -50~150℃ / ±1.5℃ at 25℃

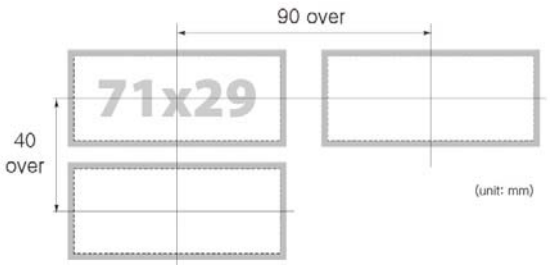
2. INSTALLATION

: DIMENSIONS AND PANEL CUT(mm)



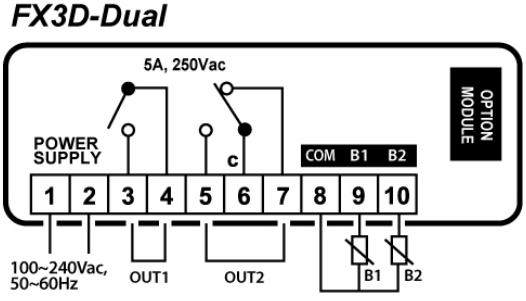
(unit: mm)

DOTECH Standardized Dimensions (Panel Cut Size : 71 X 29mm)



(unit: mm)

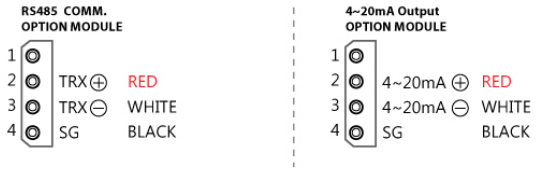
: WIRING DIAGRAM



: WIRING

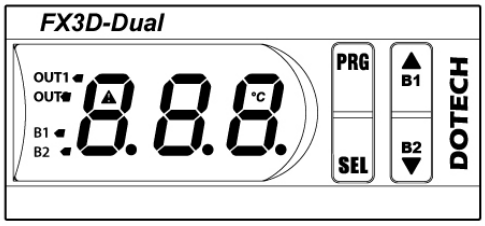
No.	Code	Description
1	L1	100~240 Vac, 50/60Hz Power Input
2i	L2	
3	OUT1	Relay which is closed when OUT1 outputs
4		Common Signal
5	OUT2	Relay which is closed when OUT2 outputs
6		Common Signal
7		Relay which is opened when OUT2 outputs
8	NTC	Common Signal
9		B1 Temperature Sensor Input
10		B2 Temperature Sensor Input

: OPTION MODULES



3. User Interfaces

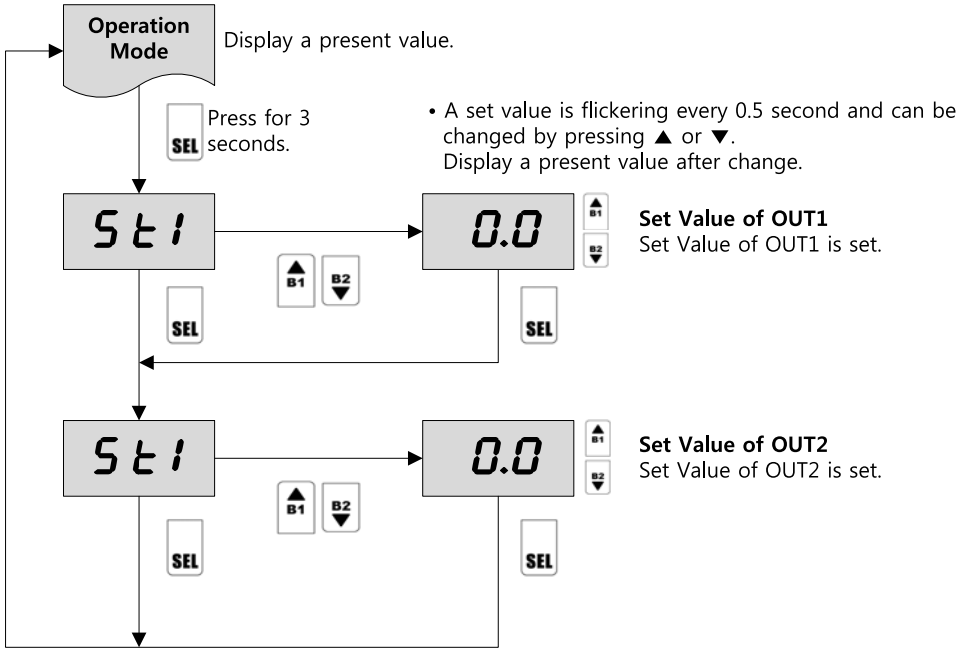
: DISPLAY AND CONTROLS



LED	
OUT1	Lighting when relay output 1 is on(flickering when waiting)
OUT2	Lighting when relay output 2 is on(flickering when waiting)
B1	Lighting when B1 Temperature is displayed.
B2	Lighting when B2 Temperature is displayed.
CONTROLS	
PRG	Set a Program
B1	Increase or Move Up or Display B1 Temperature
B2	Decrease or Move Down or Display B2 Temperature
SEL	Select and Save, Set a Parameter
PRG + B2	Reset when Pressed Simultaneously for 10 Seconds.

4. Parameters

: SET VALUE SETTINGS

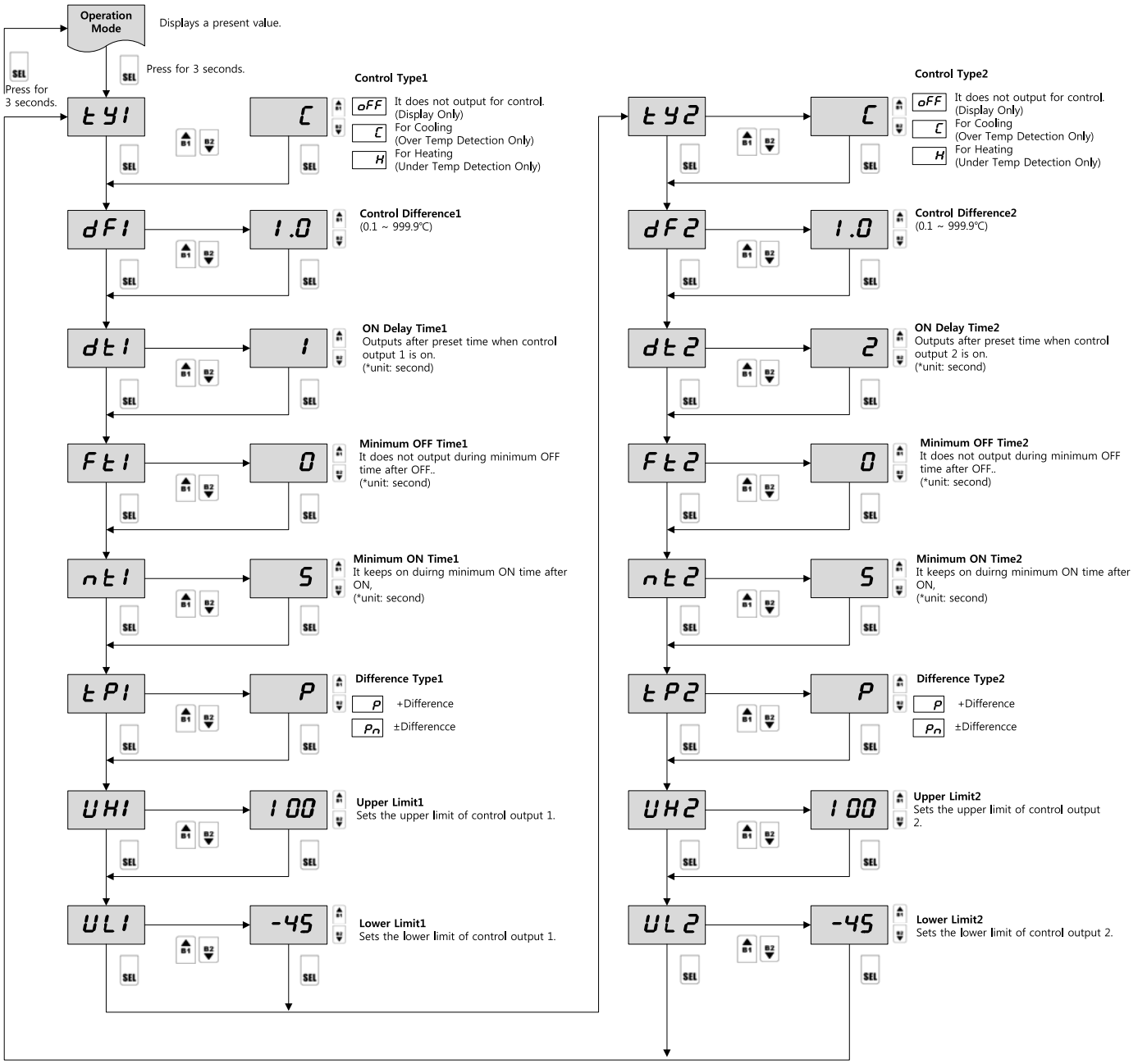


• If not pressed for 60 seconds, it returns to operation mode automatically.

※ If syncing with a sensored temperature is not set, it is controlled based on a fixed temperature.

※ Output 1 or 2 is set depending on the parameter of **oI b, oCb** in group 3.

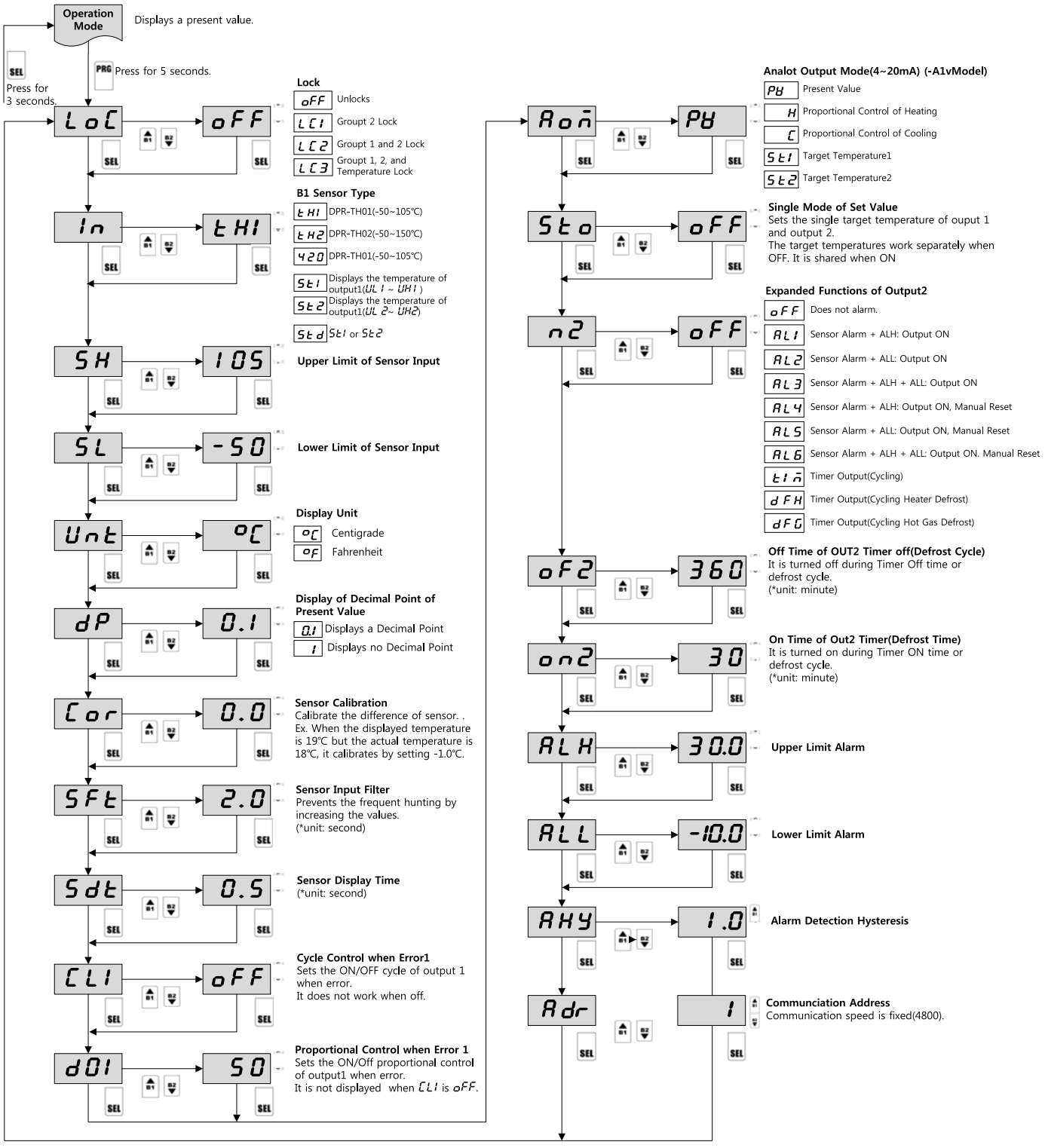
: PARAMETER SETTINGS IN GROUP 1



※ If tY1 or tY2 is oFF, its submenus are not displayed.

※ If not pressed for 3 seconds, it returns to operation mode automatically.

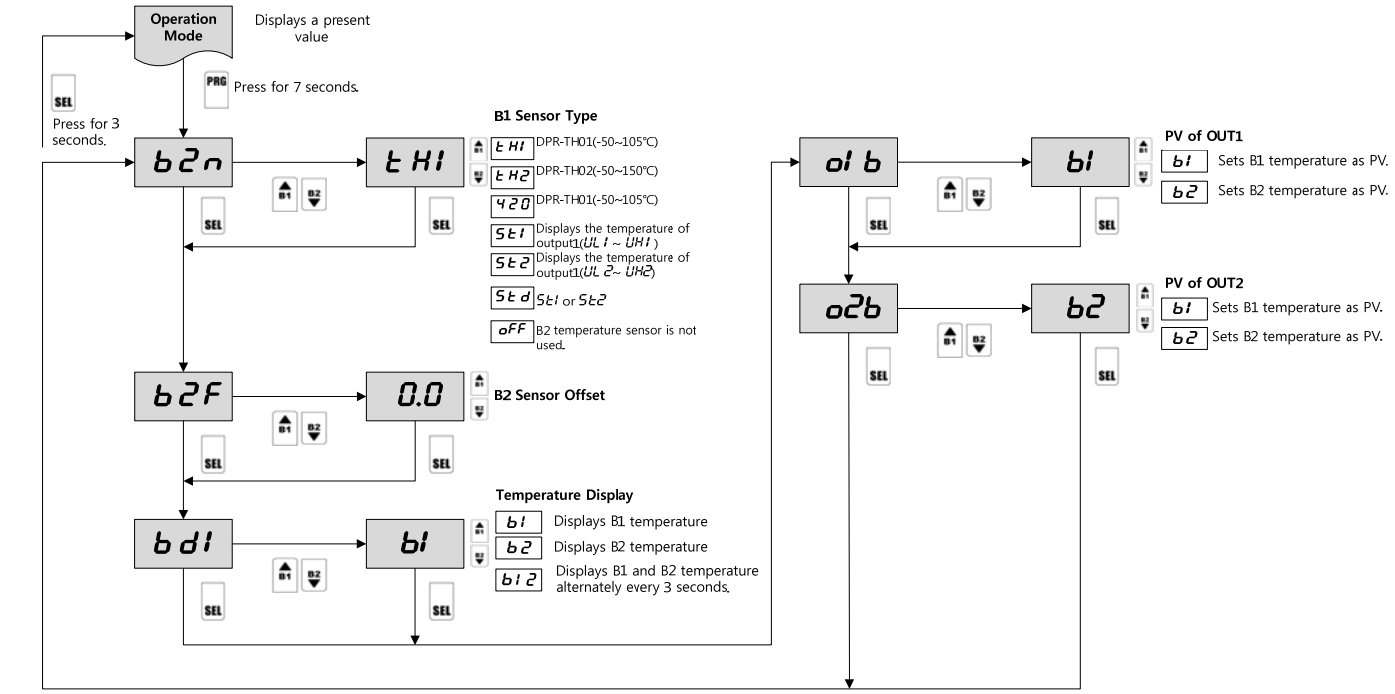
: PARAMETER SETTINGS OF GROUP 2



※ Only temperature sensor are available in **In** because FX3D-Dual uses them only.

※ To set the expanded functions of ouput2, **tY2** in group 1 must be **oFF**.

: PARAMETER SETTINGS OF GROUP 3



※ IF **b2n** is **oFF**, out1 and ou2 are controlled by B1 temperature sensor.

: PARAMETER TABLE IN GROUP 1

Number	Menu		Code	Unit	Step	Min.	Max.	Default	Custom
002	OUT1	Control Type	tY1	oFF: No Use C:Cooling H:Heating				C	
003		Control Difference	dF1	K	0.1	0.1	99.9	1.0	
004		ON Delay Time	dt1	Sec	1	0	999	1	
005		Minimum OFF Time(※1)	Ft1	Sec	1	0	999	0	
006		Minimum ON Time(※2)	nt1	Sec	1	0	999	5	
007		Difference Type(※3)	tP1	P: + Difference Pn: ±Difference				P	
008		Upper Limit	UH1	℃	1	UL1	SH	100	
009		Lower Limit	UL1	℃	1	SL	UH1	-4.5	
010	OUT2	Control Type	tY2	oFF: No Use C:Cooling H:Heating				C	
011		Control Difference	dF2	K	0.1	0.1	20.0	1.0	
012		ON Delay Time	dt2	Sec	1	0	999	2	
013		Minimum OFF Time(※1)	Ft2	Sec	1	0	999	0	
014		Minimum ON Time(※2)	nt2	Sec	1	0	999	5	
015		Difference Type(※3)	tP2	P: + Difference Pn: ±Difference				P	
016		Upper Limit	UH2	℃	1	UL2	SH	100	
017		Lower Limit	UL2	℃	1	SL	UH2	-4.5	

※1) Minimum OFF Time: It does not output during minimum OFF time after OFF. During minimum OFF time, it flickers every second and light when it outputs.

※2) Minimum ON Time: To prevent frequent ON/OFF of control outputs, it maintains ON status during minimum ON time after switching to ON even under the OFF condition(immediately switching to OFF when error)

※3) Difference Type: Select a difference type. Ex. If set 10.0 of cooling and 1.0 of difference, it is ON(11.0) / OFF(10.0) under +difference or ON(10.5) / OFF(9.5) under ±difference.

: PARAMETER TABLE IN GROUP 2

Number	Menu	Code	Unit	Step	Min.	Max.	Default	Custom
300	Lock	LoC	oFF: Unlock LC1: Group 2 Lock LC2: Group 1, 2 Lock LC3: Goupr 1, 2 and Temperature Lock				oFF	
301	B1 Sensor Type	In	tH1: DPR-TH01 (-50~105°C) tH2: DPR-TH02 (-50~150°C) 420: If selected, it is switched to tH1 (DPR-TH01). St1: Outputs ST 1 St2: Outputs ST2 Std: S T 1 or S T 2(※1)				tH1	
302	Upper Limit of Sensor Input(※1)	SH	-	1	SL	+999	105	
303	Lower Limit of Sensor Input(※1)	SL	-	1	-199	SH	-50	
304	Display Unit	Unt	°C: Centigrade °F: Fahrenheit				°C	
305	Display of Decimal Point of Present Value	dP	0.1: Display a Decimal Point 1: Display No Decimal Point				0.1	
306	Sensor Calibration	Cor	K	0.1	-19.9	+19.9	0.0	
307	Sensor Input Filter	SFt	Sec	0.1	0.1	5.0	2.0	
308	Sensor Display Time	Sdt	Sec	0.1	0.0	5.0	0.5	
309	Cycle Control when Error(※2) (Displays tY1 when C or H is set)	CL1	Min	1	0	999	oFF	
310	Proportional Control when Error(※2) (Displays tY1 when C or H is set)	dU1	%	1	0	100	50	
311	Analog Output Mode (-A1 Model)	Aon	PV: Present Value H: Proportional Control of Heating C: Proportional Control of Cooling St1, St2: Individual Set Value				PV	
312	Single Mode of Set Value(※3)	Sto	oFF: Out1/Out2 Separation Mode On: Single Mode				oFF	
313	Expanded Functions of OUT2 (※ Displyas tH2 when oFF is set)	n2	oFF: Operates as set in TY2 control output Automatic Recovery Alarm / Manual Recovery Alarm(※4) AL1: Alarm Output(Sensor Alarm + ALH) / AL4: Alarm Output(Sensor Alarm + ALH) AL2: Alarm Output(Sensor Alarm + ALL) / AL5: Alarm Output(Sensor Alarm + ALL) AL3: Alarm Output(Sensor Alarm+ALL+ALH) / AL6: Alarm Output(Sensor Alarm+ALL+ALH) tIn: Timer Output(Cycling) dFH: Timer Output(Cycling Heater Defrost) dFC: Timer Output(Cycling Hot Gas Defrost)				oFF	
314	Off Time of OUT2 Timer Off(Defrost Cycle)	oF2	Min	1	0	999	360	
315	On Time of OUT2 Timer(Defrost Time)	on2	Min	1	0	999	30	
316	Upper Limit Alarm (※5)	ALH	-	0.1	ALL	SH	30.0	
317	Lower Limit Alarm (※5)	ALL	-	0.1	SL	ALH	-10.0	
318	Alarm Detection Hysteresis	AHY	K	0.1	0.0	99.9	1.0	
319	Communication Address(-R4 Model)	Adr	-	1	-64	64	1	

(※1) Std: Display St1 when connected to B2 or St2 to B1.

(※2) **Control Output when Error:** The control output when error repeats OFF/ON operation until it is cleared.
Ex. If set at cycle of 60 minutes and ON proportion of 20%, it repeats 48 minutes of OFF and 12 minutes of ON.

(※3) **Single Mode of Set Value**: If it is on, the set value(set point) is controlled in single.

(※4) **Manual Reset Alarm**: When the manual recovery alarm reset is set, it will be cleared after it is powered again or PRG button is pressed twice quickly.

(※5) Although ALH or ALL alarms, it does not affect output 1.

: PARAMETER TABLE IN GROUP 3

No.	Menu	Code	Unit	Step	Min.	Max.	Default	Custom
202	B2 Sensor Type	b2n	tH1: DPR-TH01-P6D100L*2M tH2: DPR-TH02-P6D100L*2M 420: DPR-TH01-P6D100L*2M St1: ST 1 St2: ST2 Std: ST 1 or ST 1 oFF: B2 temperature sensor is not used.				tH1	
203	B2 Sensor Offset	b2F	℃	0.1	-19.9	19.9	0.0	
207	Temperature Display	bdI	b1 = B1 Temperature b2 = B2 Temperature b12 = Displays B1 and B2 alternately every 3 seconds.				b1	
208	PV of Output1	o1b	b1 = B1 temperature as PV b2 = B2 temperature as PV				b1	
209	PV of Output2	o2b	b1 = B1 temperature as PV b2 = B2 temperature as PV				b2	

: TRIP / ALARM MESSAGES

No.	Trip / Alarm	Code	Description / Instruction	Response at Detection	Reset Type
1	Internal Parameter Error	SYS	Change any parameters and turn off. Then restart.	Immediate Stop	Automatic Reset
2	B1 High Pressure Sensor Open	oPn	Please check a high pressure sensor because B1 sensor is open.	Immediate Stop	Automatic Reset
3	B1 High Pressure Sensor Short	SHt	Please check a high pressure sensor because B1 sensor is short.	Immediate Stop	Automatic Reset
4	B1 Low Pressure Sensor Open	LLL	Sensor input is lower than sensor range	Immediate Stop	Automatic Reset
5	B1 Low Pressure Sensor Short	HHH	Sensor input is higher than sensor range.	Immediate Stop	Automatic Reset
6	B2 High Pressure Sensor Open	oP2	Please check a high pressure sensor because B2 sensor is open.	Immediate Stop	Automatic Reset
7	B2 High Pressure Sensor Short	SH2	Please check a high pressure sensor because B2 sensor is short.	Immediate Stop	Automatic Reset
8	B2 Low Pressure Sensor Open	LL2	Sensor input is lower than sensor range.	Immediate Stop	Automatic Reset
9	B2 Low Pressure Sensor Short	HH2	Sensor input is higher than sensor range.	Immediate Stop	Automatic Reset
10	Lower Limit Alarm	ALL	Sensor input is lower than ALL (lower limit).	Immediate Stop	Automatic Reset
11	Upper Limit Alarm	ALH	Sensor input is higher than ALH(upper limit).	Immediate Stop	Automatic Reset

※ One of the error messages above flickers every 0.5 second when error.