

FX3D-Sync

USER MANUAL

DOTECH
SENSING & CONTROL

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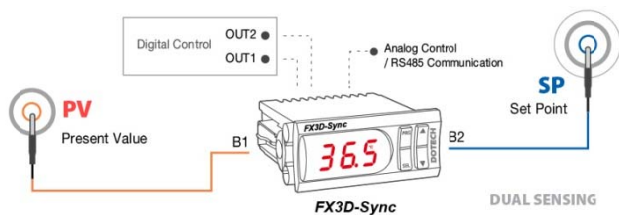
www.dotech21.com

- This product may cause an electric shock in handling. Please do not attempt to open it with power turned on.
 - This product should be installed in a place fixed secured by a rack or panel.
 - This product can be used under the following environmental condition.
 - ① Indoor ② Pollution Degree 2 ③ At an altitude of 2000m or below
 - Power input must be within the designated ranges.
 - 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.
 - Please be understood that if this product is dismantled or modified discretionary, after sales service will not be able to be provided.
 - 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).
 - In order to prevent it from an inductive noise, please maintain the high-voltage wire and power wire separated.
 - Please avoid installing the product in a place where a strong magnetism, noise, severe vibration and impact exist.
 - When extending the sensor wire, use a shield wire and do not extend it unnecessary long.
 - The sensor wire and signal wire should be away from the power and load wires using conduits separately installed.
 - 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)
 - Product's damages other than those described in the guarantee conditions provided by the manufacturer shall not be responsible by us.
 - 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



FX3D-Sync measures a set point and a present value precisely and synchronizes. Basically it has FX3D functions and can be used in the various applications.

: STANDARD SPECIFICATIONS

Model	Description
Power	100-240Vac, 50/60Hz
Power Consumption	MAX 6VA
Connection	Screw Terminal, Wire Range : 24~12AWG
Input/Output	2P Relay Output (250Vac / 5A) 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-Sync-00	Standard
FX3D-Sync-A1	4~20 mA Transmission (※ Communication Cable Included)
FX3D-Sync-R4	RS485 Communication : MODBUS RTU MODE (※ Communication Cable Included)
FX3D-Sync-A1R4	4~20mA Transmission & RS485 Communication (※ Communication Cable Included)

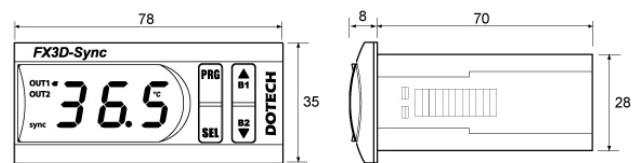
※ Temperature sensor is optional.

: SENSORS

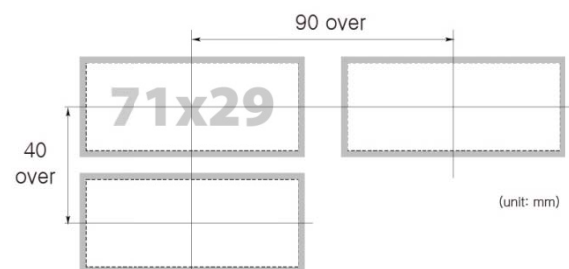
Model	Description
	<p>Standard</p>
DPR-TH01-ET*2M	NTC 5kΩ at 25 °C / -50~105°C / ±0.3°C at 25°C
	<p>For High Temperature</p>
DPR-TH02-P6D100L*2M	NTC 10kΩ at 25°C / -50~150°C / ±1.5°C at 25°C

2. INSTALLATION

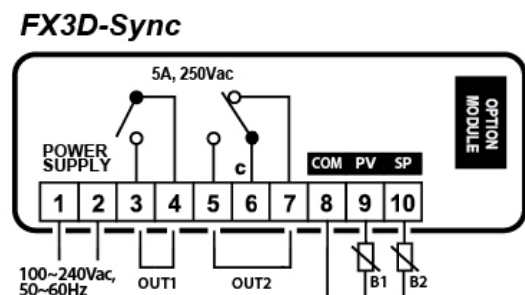
: DIMENSIONS AND PANEL CUT(mm)



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



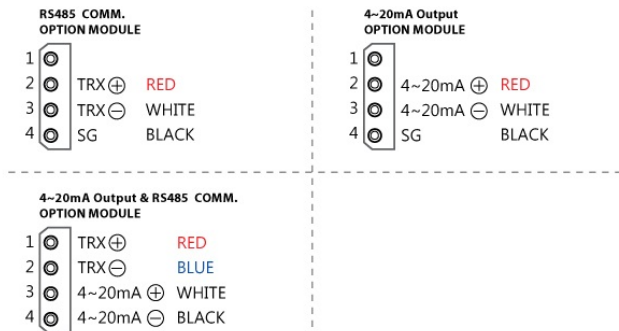
: WIRING DIAGRAM



: WIRING

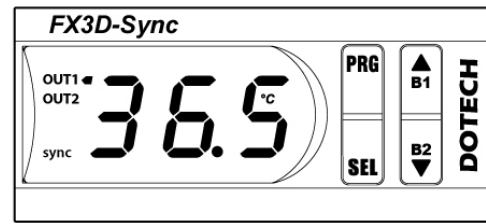
No.	Code	Description
1	L1	100~240 Vac, 50/60Hz Power Input
2	L2	
3	OUT1	Relay which is closed when OUT1 outputs
4		Common Signal
5	OUT2	Relay which is closed when OUT2 outputs
6		Common Signal
7		Relay which is opened when OUT2 outputs
8	NTC	Common Signal
9		B1 Temperature Sensor Input
10		B2 Temperature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

: OPTION MODULES



3. User Interfaces

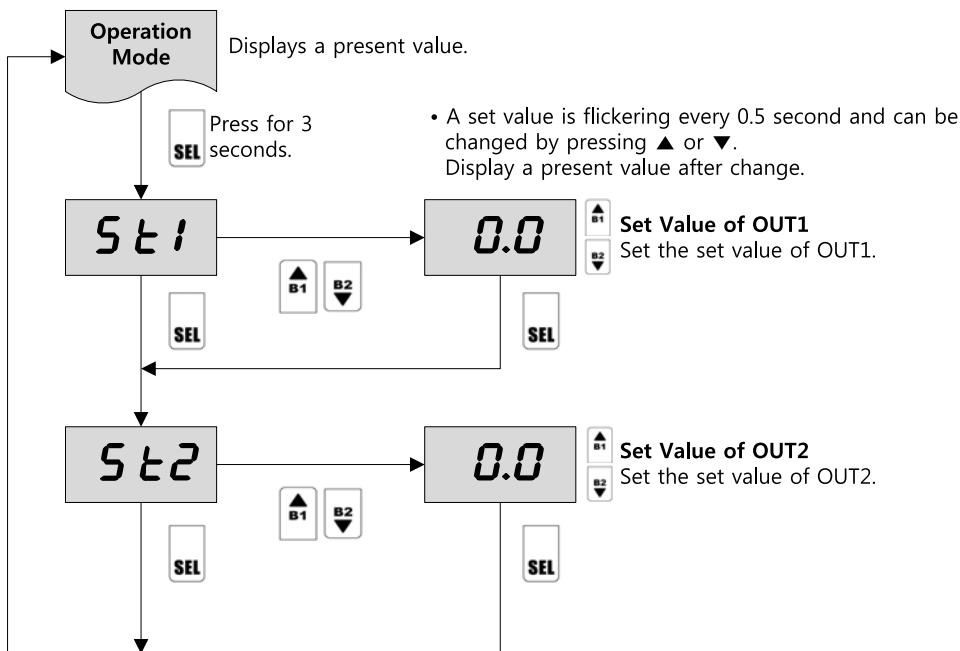
: DISPLAY AND CONTROLS



LED	
OUT1	Lighting when relay output 1 is on(flickering when waiting)
OUT2	Lighting when relay output 2 is on(flickering when waiting)
sync	Lighting when B2 sensor is normal(flickering when error)
CONTROLS	
PRG	Set a Program
▲ B1	Increase or Move Up
▼ 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

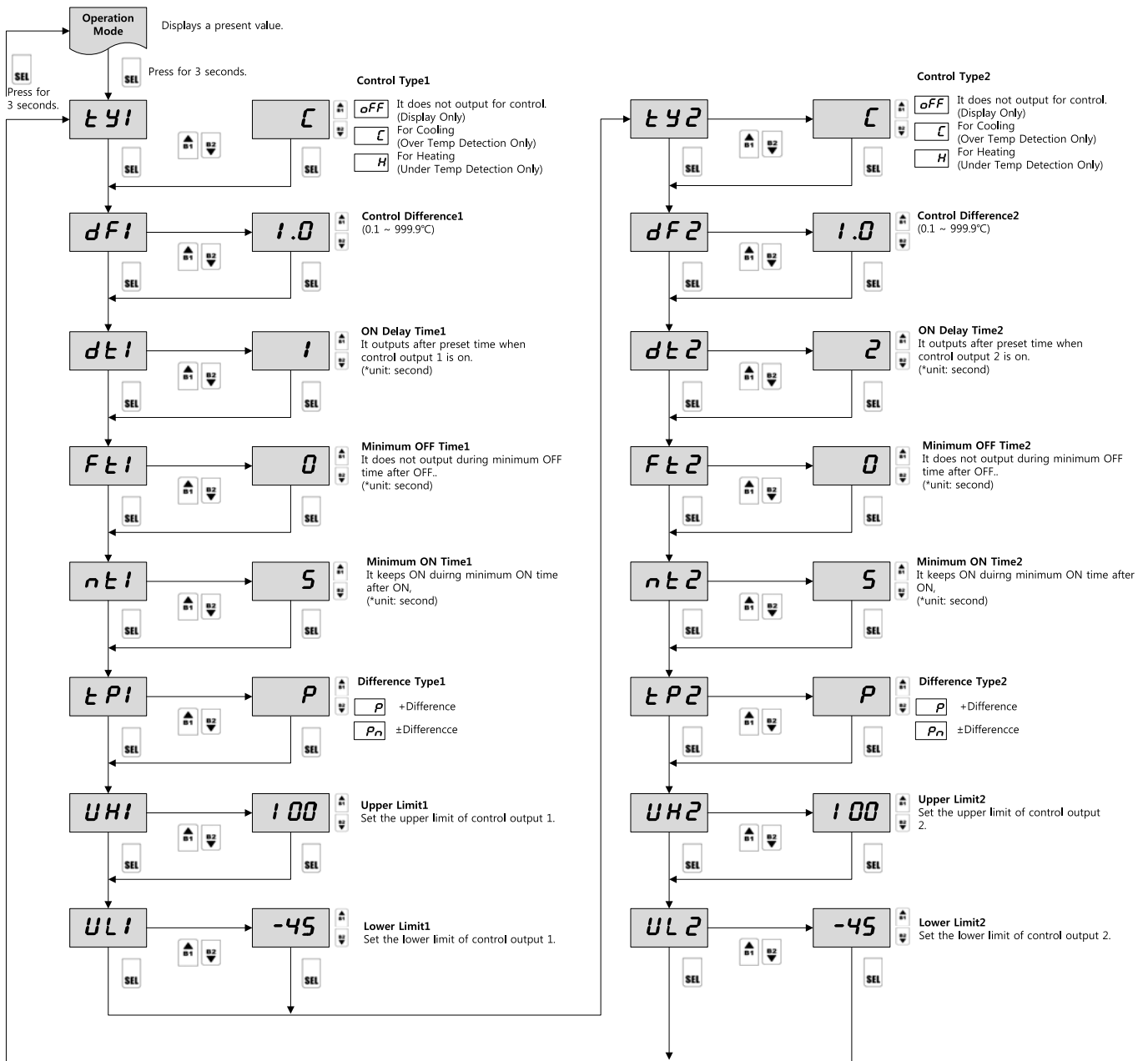


• If not pressed for 60 seconds, it returns to operation mode automatically.

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

※ If there is an error in B2 temperature(disconnection or short), it is controlled based on a fixed temperature.

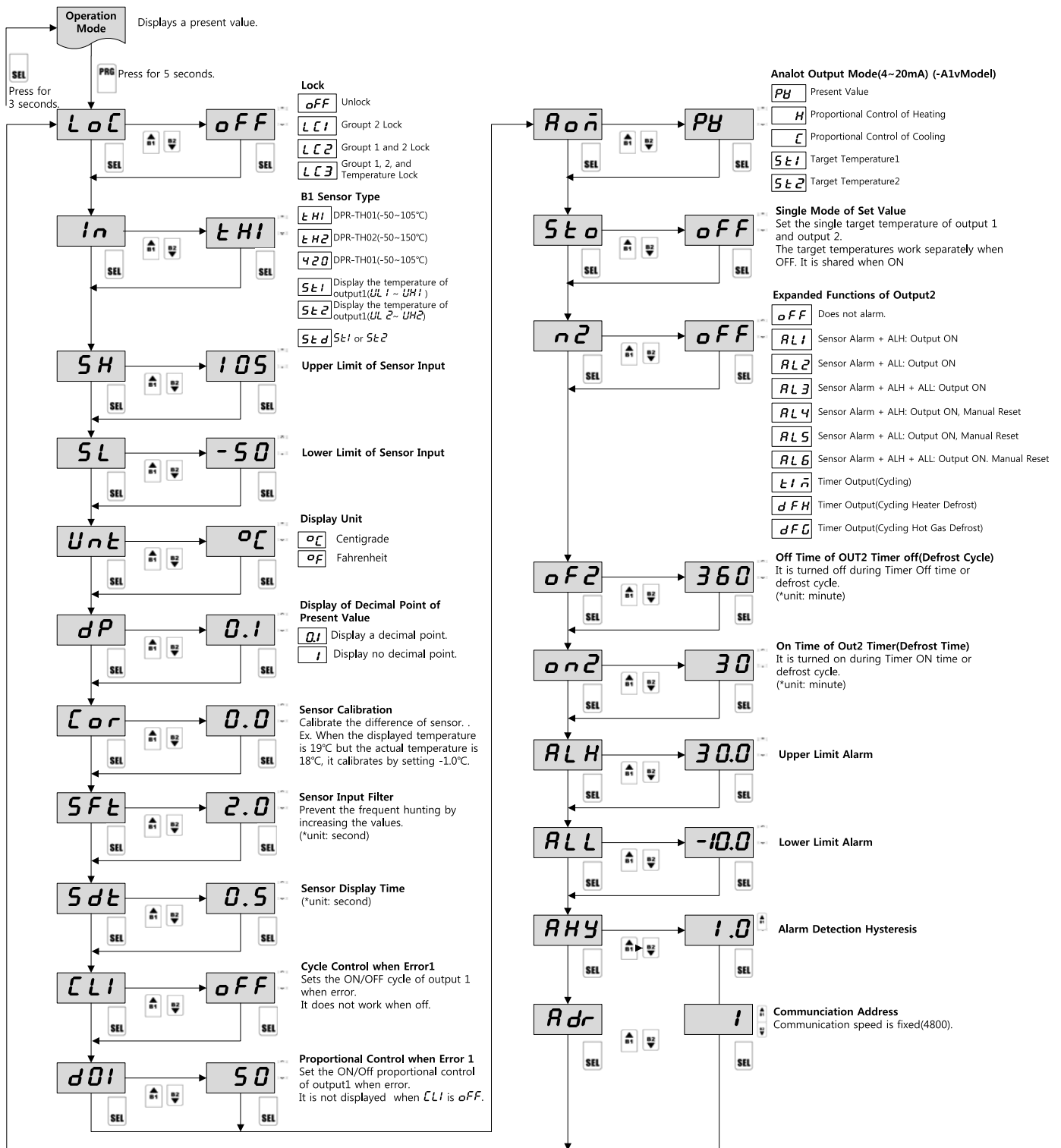
: PARAMETER SETTINGS IN GROUP 1



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

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

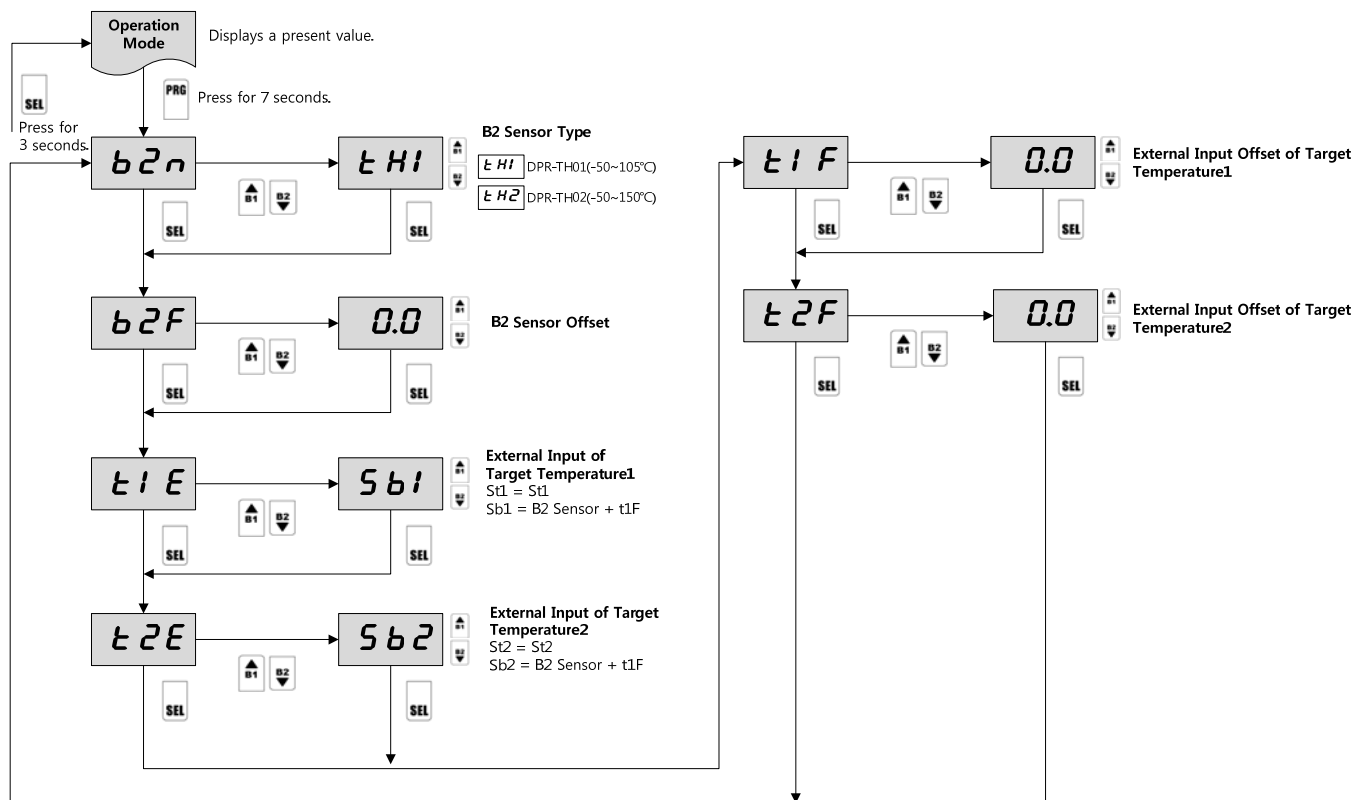
: PARAMETER SETTINGS OF GROUP 2



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

※ To set the expanded functions of output2, *t42* in group 1 must be *oFF*.

: PARAMETER SETTINGS OF GROUP 3



: PARAMETER TABLE IN GROUP 1

Number	Menu	Code	Unit	Step	Min.	Max.	Default	Custom
002	OUT1	Control Type		αFF : No Use	\mathcal{C} : Cooling	H : Heating	\mathcal{C}	
003		Control Difference	K	0.1	0.1	99.9	1.0	
004		ON Delay Time	Sec	1	0	999	1	
005		Minimum OFF Time(※1)	Sec	1	0	999	0	
006		Minimum ON Time(※2)	Sec	1	0	999	5	
007		Difference Type(※3)			P : + Difference	Pn : ±Difference	P	
008		Upper Limit	°C	1	$UL1$	SH	100	
009		Lower Limit	°C	1	SL	$UH1$	-4.5	
010		OUT2	Control Type		αFF : No Use	\mathcal{C} : Cooling	H : Heating	\mathcal{C}
011	Control Difference		K	0.1	0.1	20.0	1.0	
012	ON Delay Time		Sec	1	0	999	2	
013	Minimum OFF Time(※1)		Sec	1	0	999	0	
014	Minimum ON Time(※2)		Sec	1	0	999	5	
015	Difference Type(※3)				P : + Difference	Pn : ±Difference	P	
016	Upper Limit		°C	1	$UL2$	SH	100	
017	Lower Limit		°C	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	<i>LoC</i>	<i>oFF</i> : Unlock <i>LC1</i> : Group 2 Lock <i>LC2</i> : Group 1, 2 Lock <i>LC3</i> : Group 1, 2 and Temperature Lock				<i>oFF</i>	
301	B1 Sensor Type	<i>ln</i>	<i>tH1</i> : DPR-TH01 (-50~105°C) <i>tH2</i> : DPR-TH02 (-50~150°C) <i>420</i> : If selected, it is switched to <i>tH1</i> (DPR-TH01). <i>St1</i> : Outputs ST1 <i>St2</i> : Outputs ST2 <i>Std</i> : ST1 or ST2(※1)				<i>tH1</i>	
302	Upper Limit of Sensor Input(※1)	<i>SH</i>	-	1	<i>SL</i>	+999	105	
303	Lower Limit of Sensor Input(※1)	<i>SL</i>	-	1	-199	<i>SH</i>	-50	
304	Display Unit	<i>Unit</i>	<i>oC</i> : Centigrade <i>oF</i> : Fahrenheit				<i>oC</i>	
305	Display of Decimal Point of Present Value(※6)	<i>dP</i>	<i>01</i> : Display a Decimal Point <i>1</i> : Display No Decimal Point				0.1	
306	Sensor Calibration	<i>Cor</i>	K	0.1	-19.9	+19.9	0.0	
307	Sensor Input Filter	<i>SFt</i>	Sec	0.1	0.1	5.0	2.0	
308	Sensor Display Time	<i>Std</i>	Sec	0.1	0.0	5.0	0.5	
309	Cycle Control when Error(※2) (Displays <i>tYI</i> when <i>C</i> or <i>H</i> is set)	<i>CL1</i>	Min	1	0	999	<i>oFF</i>	
310	Proportional Control when Error(※2) (Displays <i>tYI</i> when <i>C</i> or <i>H</i> is set)	<i>dU1</i>	%	1	0	100	50	
311	Analog Output Mode (-A1 Model)	<i>Roñ</i>	<i>PB</i> : Present Value <i>C</i> : Proportional Control of Cooling <i>H</i> : Proportional Control of Heating <i>St1</i> , <i>St2</i> : Individual Set Value				<i>PB</i>	
312	Single Mode of Set Value(※3)	<i>Sto</i>	<i>oFF</i> : Out1/Out2 Separation Mode <i>On</i> : Single Mode				<i>oFF</i>	
313	Expanded Functions of OUT2 (※ Displays <i>tH2</i> when <i>oFF</i> is set)	<i>n2</i>	<i>oFF</i> : Operates as set in TY2 control output Automatic Recovery Alarm <i>RL1</i> : Alarm Output(Sensor Alarm + ALH) <i>RL2</i> : Alarm Output(Sensor Alarm + ALL) <i>RL3</i> : Alarm Output(Sensor Alarm+ALL+ALH) <i>tIn</i> : Timer Output(Cycling) <i>dFH</i> : Timer Output(Cycling Heater Defrost) <i>dFG</i> : Timer Output(Cycling Hot Gas Defrost) Manual Recovery Alarm(※4) <i>RL4</i> : Alarm Output(Sensor Alarm + ALH) <i>RL5</i> : Alarm Output(Sensor Alarm + ALL) <i>RL6</i> : Alarm Output(Sensor Alarm+ALL+ALH)				<i>oFF</i>	
314	Off Time of OUT2 Timer Off(Defrost Cycle)	<i>oF2</i>	Min	1	0	999	360	
315	On Time of OUT2 Timer(Defrost Time)	<i>on2</i>	Min	1	0	999	30	
316	Upper Limit Alarm (※5)	<i>RLH</i>	-	0.1	<i>RL1</i>	<i>SH</i>	30.0	
317	Lower Limit Alarm (※5)	<i>RL1</i>	-	0.1	<i>SL</i>	<i>RLH</i>	-10.0	
318	Alarm Detection Hysteresis	<i>RHY</i>	K	0.1	0.0	99.9	1.0	
319	Communication Address(-R4 Model) (※7)	<i>Rdr</i>	-	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.

(※6) **Display of Decimal Point of Present Value**: Set 0.1 or 1 as the present value display. If 1 is set, it cuts off the decimal when displayed.

(※7) **Communication Address**: The address for master mode is between -64 and -1.

: PARAMETER TABLE IN GROUP 3

Number	Menu	Code	Unit	Step	Min.	Max.	Default	Custom
400	B2 Sensor Type	<i>b2n</i>	<i>tH1</i> : DPR-TH01-P6D100L*2M <i>tH2</i> : DPR-TH02-P6D100L*2M				<i>tH1</i>	
401	B2 Sensor Offset	<i>b2F</i>	°C	0.1	-19.9	19.9	<i>0.0</i>	
402	External Input of Target Temperature 1(※1)	<i>t1E</i>		<i>St1</i> = St1	<i>Sb1</i> = B2 + t1F		<i>Sb1</i>	
403	External Input of Target Temperature 2(※1)	<i>t2E</i>		<i>St2</i> = St2	<i>Sb2</i> = B2 + t2F		<i>Sb2</i>	
404	External Input Offset of Target Temperature 1	<i>t1F</i>	°C	0.1	-99.9	99.9	<i>0.0</i>	
405	External Input Offset of Target Temperature 2	<i>t2F</i>	°C	0.1	-99.9	99.9	<i>0.0</i>	

(※1) **External Input of Target Temperature**: It is controlled by set point when it is Sb1 and set value when St1.

Ex. When Sb1 is set, OUT1 is controlled by B2 + t1F.

: TRIP / ALARM MESSAGES

No.	Trip / Alarm	Code	Description / Instruction	Response at Detection	Reset Type
1	Internal Parameter Error	<i>SY5</i>	Please change any parameters and turn off. Then restart.	Immediate Stop	Automatic Reset
2	High Pressure Sensor Open	<i>HoP</i>	Please check a high pressure sensor because it is open.	Immediate Stop	Automatic Reset
3	High Pressure Sensor Short	<i>HSH</i>	Please check a high pressure sensor because it is short.	Immediate Stop	Automatic Reset
4	Low Pressure Sensor Open	<i>LoP</i>	Sensor input is lower than <i>SL</i> .	Immediate Stop	Automatic Reset
5	Low Pressure Sensor Short	<i>L5H</i>	Sensor input is higher than <i>SH</i> .	Immediate Stop	Automatic Reset
6	Lower Limit Alarm	<i>RL1</i>	Sensor input is lower than <i>RL1</i> (lower limit).	Immediate Stop	Automatic Reset
7	Upper Limit Alarm	<i>RLH</i>	Sensor input is higher than <i>RLH</i> (upper limit).	Immediate Stop	Automatic Reset

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