



# NOVA Series

SL590/540

Instruction Manual

LIMIT CONTROLLER

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## 1. Safety Guide

The following safety symbols are used in this manual

- (A) If this symbol is marked on the product, the operator must investigate the explanation given in this manual to protect injury or death to personnel or damage to instrument.



(1) For Production : it should be marked when operator must refer the explanation in the manual to avoid loss of life or damage to instrument.

(2) For Instruction Manual : it marks to avoid operator's loss of life and injury that may result comes from Electric Shock.

- (B) Functional earth terminal



It marks the terminal must be connected to Ground prior to operating the equipment.

- Equipment protected by double or reinforced insulation



- (C) It marks additional Information on the operation and features of the product.



- (D) It marks for further information on the current topic and pages



### Precautions on this instruction Manual

- (1) This Manual should be passed on the end User and keep a suitable place for operator to study and check the function of the product.
- (2) Operator should carefully study, understand how to operate this product before
- (3) This manual is describing the functions of the product. We, Samwontech, does not warrant that the functions will suit a particular purpose.
- (4) Under absolutely no circumstance may the contents of this manual in part or in whole be transcribed or copied without permission.
- (5) All contents of this manual has been made to ensure accuracy in the preparation, However, should any errors or omissions come to the attention of the user, feel free to contact our sales representatives or our sales office



### Regarding Safety and Unauthorized Modification

- (1) In order to protect this product and the system controlled by it against damage and ensure its safe use, make certain that all of the safety instructions and precautions in this manual are strictly adhered to.
- (2) We, Samwontech, are not guarantee safety if the products are not handled according to this instruction manuals
- (3) If separate protection or safety circuits are to be installed for this product or the system which is controlled by this product, ensure that such circuits are installed external to the product.
- (4) Don't try to make modifications or additions internal to the product. It may becomes electric shock, burn or out of order.
- (5) In case of replacement parts or consumables of the product, must call to our sales office.
- (6) Protect this product from moisture. It may becomes out of order.
- (7) Protect any kind of shock and vibration to the product. It may becomes product defects and out of order



### Regarding an exemption from responsibility

- (1) Samwontech co. Ltd does not make any warranties regarding the product except Warranty conditions those mentioned in this manual.
- (2) We assumes no liability to any party for any loss or damage, direct or indirect, caused by the use or any unpredictable defect of the product.



### Regarding the production Quality Assurance.

- (1) The guaranteed period of the production quality assurance is (1) one year after end user buy it and it will be free to fix defected product under regular usage described by this manual.
- (2) It will be charged to fix defected product after warranty period. This charge will announced by our actual cost to be calculated during the fixing time.
- (3) It will be charging even if within warranty period as following events.
  - (3.1) Defect by operator and user's default.(forget password, production initialize)
  - (3.2) Natural disaster.(fire, water flow etc)
  - (3.3) Additional shift after 1st installed.
  - (3.4) Improperly repaired, or altered, modified in anyway.
  - (3.5) Power failure in unstable power condition.
- (4) Feel free to contact our sales office whenever it need to make A/S.



### Environmental precautions for installation.

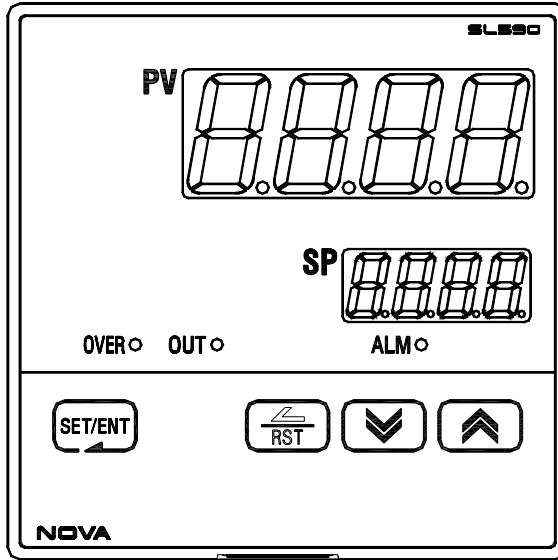
- (1) Be sure to operate the controller installed on a panel to prevent electric shock.
- (2) To install the controller, do select a location where:
  - No one may accidentally touch terminal.
  - Mechanical vibrations are minimal.
  - No corrosive gas is prevent.
  - Temperature fluctuation is minimal.
  - Temperature can be maintained. (50 °C below / 10 °C over)
  - No direct heat radiation is present.
  - No magnetic disturbances are caused
  - No water is splashed.
  - No flammable materials are around.
  - No wind blows. (prevent Dust with salt)
  - No ultraviolet rays are present.
  - Pollution Degree 2
  - Installation Category II
  - Do not block openings
  - If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
  - A switch or circuit-breaker acting as the disconnect device shall be included in the application or the building installation



### Precautions of Controller Mounting.

- Keep the input circuit wiring as far as possible away from power and ground circuit.
- Keep the controllers in 10°C ~ 50°C/ 20 % ~ 90 % RH,  
Warming up needed to use controller when temperature is below 10°C in advance.
- Do not mount front panel facing downward.
- To prevent electric shock, be sure to turn off and the source circuit breaker before wiring.
- The power consumptions are 100-240VAC, 50/60Hz, 10VAmx and operate without power switching in advance.
- No work in wet hands ( it caused electric shock)
- Follow operation by precaution in the manual to avoid fire, electric shock, loss of life etc.
- Requested to follow mounting and operation methods just indicated in this manual.
- Refer the way of grounding connection, however, keep away for grounding to Gas pipe, water pipe, lightening rod etc.
- Be sure not to power connection before finishing of wiring between each contact point.
- Not close and wrapping the heat hole in back case of controller.

2. Control Keys and Display



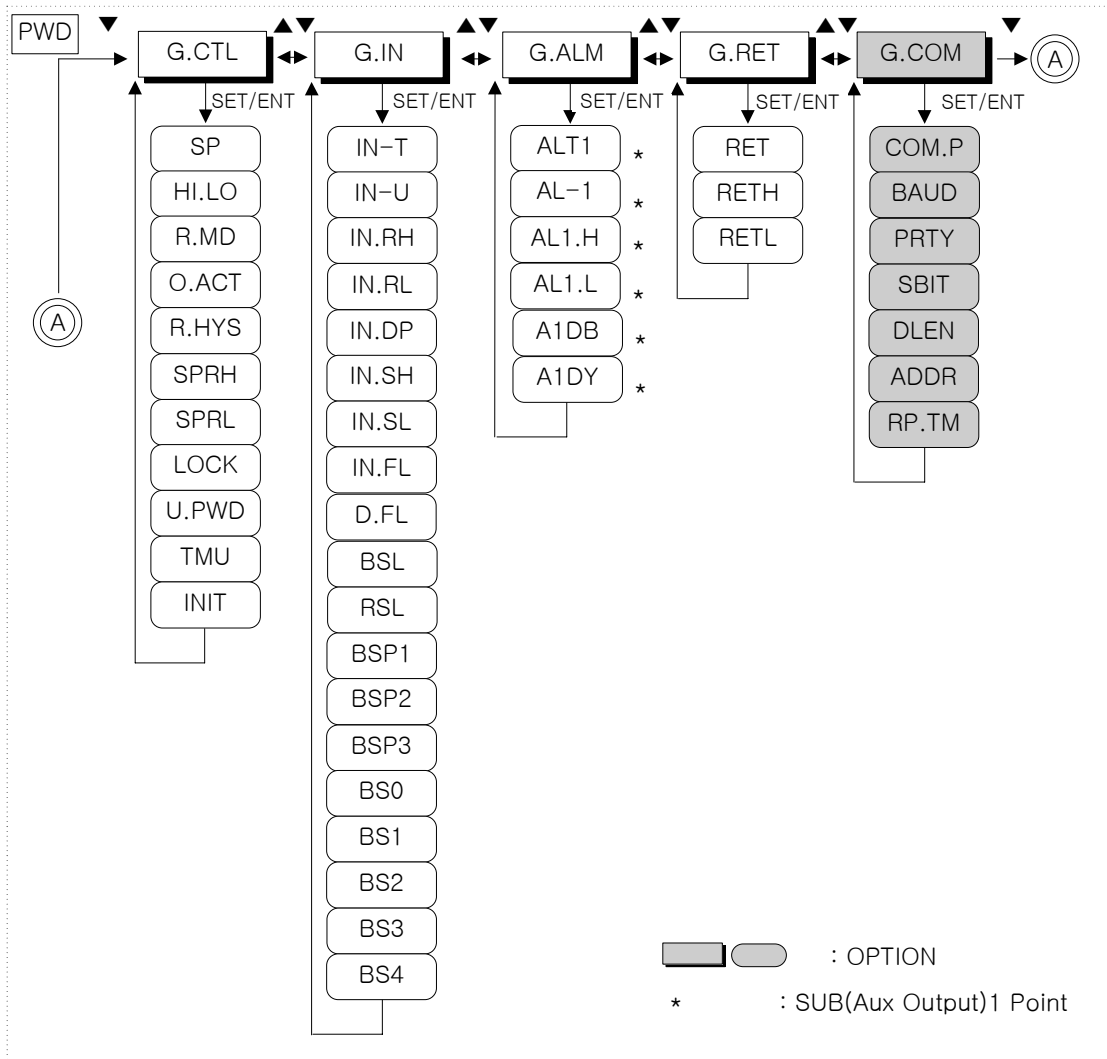
Control Keys

KEY	Contents
SET/ENT (ENTER)	<ul style="list-style-type: none"> <li>- Used in switching between parameters or registering parameter settings.</li> <li>- Pressing SET/ENT Key at least 3 sec. switches between an operating display and an operating parameter setting display</li> </ul>
▲ / ▼ (UP/DOWN)	<ul style="list-style-type: none"> <li>- Used to change the value of parameters.</li> <li>- Used to move between GROUP and change SP value.</li> </ul>
◀ (SHIFT)	<ul style="list-style-type: none"> <li>- Used when shifting position to modify value.</li> </ul>

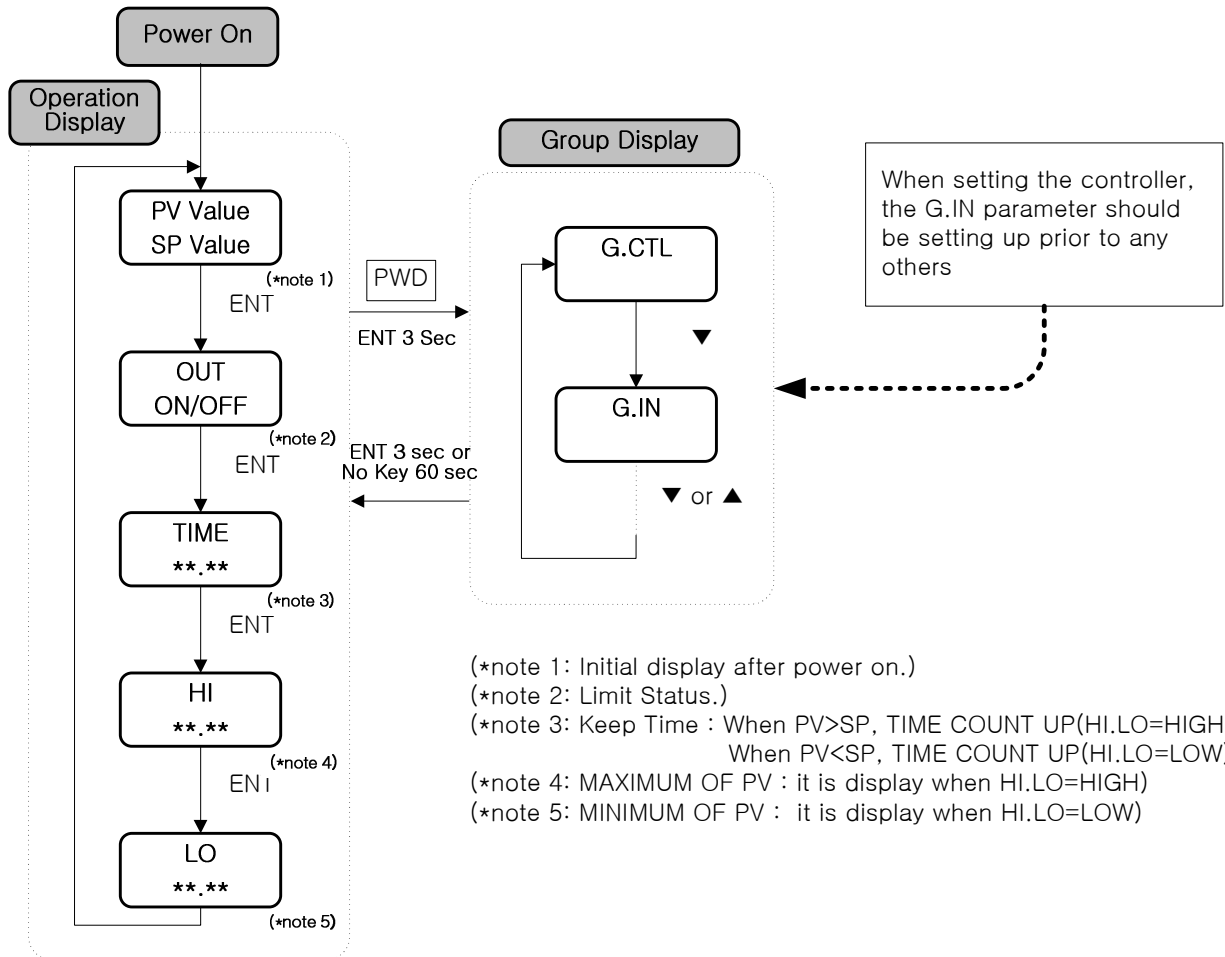
LED Display

LED	Contents
OVER	<ul style="list-style-type: none"> <li>- Lights on When PV input is higher then setting Value.(HI.LO=High).</li> </ul>
OUT	<ul style="list-style-type: none"> <li>- Lights on when PV input is lower then setting Value (HI.LO=LOW).</li> </ul>
AL	<ul style="list-style-type: none"> <li>- Lights on when Output operates.</li> <li>- Lights on during Alarm operation operates.</li> </ul>

### 3. Parameter Map



## 4. Flow of Operating Display





## 5. Setting Up Parameter in each Group.

### 5.1 Input Group(G.IN)

PV G.In

Press SET/ENT Key to select input group after press ▲ or ▼ Key in Menu display. (Refer to parameter Map in chapter 3.)

```

                ▲▼
            G.COM ↔ PWD ↔ G.CTL
            ▲▼
            ▼   ▲   ▲
            G.RET ↔ G.ALM ↔ G.IN
            ▲▼   ▲▼
            
```



Change setting up parameters should be done for the first stage because it is suspended initializing parameters in other group around.

PV In-t

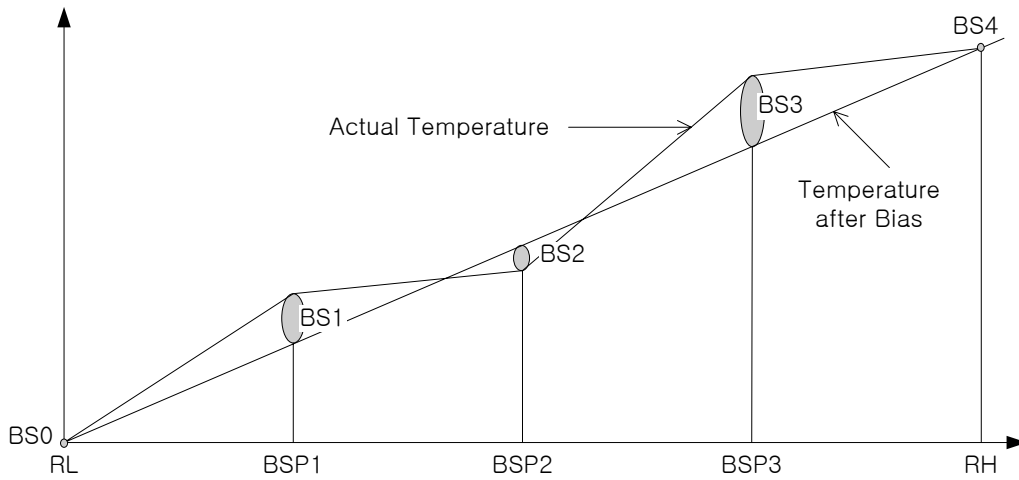
The parameter to select type of temperature sensor and its initial setting is type TC,K1. Refer to following 'Table of Input Sensor' and select No shown in Table 1.

Table 1 : Type of Input Sensor

*\*display range : -5% ~ +105%*

No.	TYPE	Temp.Range(°C)	Temp.Range(°F)	Group	DISP
1	K1	-200~1370	-300~2500	T/C	TC.K1
2	K2	-199.9~999.9	0~2300		TC.K2
3	J	-199.9~999.9	-300~2300		TC.J
4	E	-199.9~999.9	-300~1800		TC.E
5	T	-199.9~400.0	-300~750		TC.T
6	R	0~1700	32~3100		TC.R
7	B	0~1800	32~3300		TC.B
8	S	0~1700	32~3100		TC.S
9	L	-199.9~900.0	-300~1600		TC.L
10	N	-200~1300	-300~2400		TC.N
11	U	-199.9~400.0	-300~750		TC.U
12	W	0~2300	32~4200		TC.W
13	Platine II	0~1390	32~2500		TC.PL
14	C	0~2320	32~4200		TC.C
15	PtA	-199.9~850.0	-300~1560	RTD	PTA
16	PtB	-199.9~500.0	-199.9~999.9		PTB
17	PtC	-19.99~99.99	-4.0~212.0		PTC
18	JPtA	-199.9~500.0	-199.9~999.9		JPTA
19	JPtB	-150.0~150.0	-199.9~300.0		JPTB
20	0.4~2.0V	0.400~2.000V		DCV	2V
21	1~5V	1~5V			5V
22	0~10V	0~10V			10V
23	-10~20mV	-10~20mV			mV
24	0~100mV	0~100mV		100M	

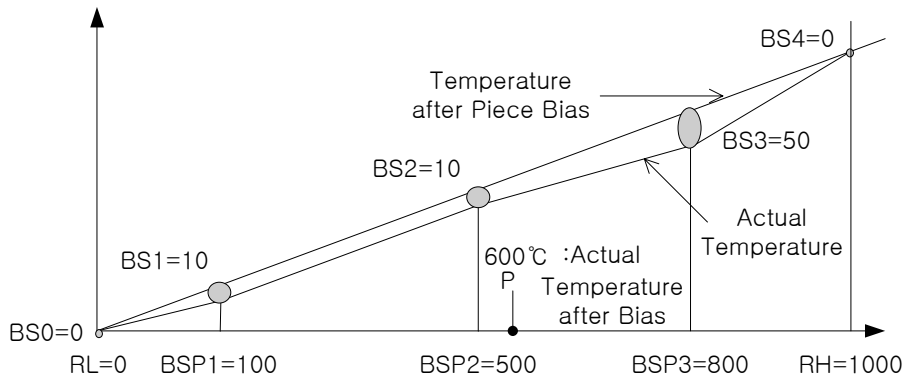
<p>PV <b>ln-U</b></p>	<p>The parameter to select type of temperature unit for °C or °F. Its initial selection is °C type. Refer to Table 1 when change temperature unit.</p>
<p>PV <b>lnrH</b></p>	<p>The parameter to set High-Limit for input temperature measuring range.</p>
<p>PV <b>lnrL</b></p>	<p>The parameter to set Low-Limit for input temperature measuring range.</p>
<p>PV <b>lnnP</b></p>	<p>The parameter to set the position of decimal value in case that sensor type is mV or V. The position if decimal value can change 0 ~ 3. its initial set value is '1'.</p>
<p>PV <b>lnSH</b></p>	<p>The parameter to set High-Limit of input measuring scale in case that sensor type is mV or V. its initial value of 'ln.SH' is '100.0'</p>
<p>PV <b>lnSL</b></p>	<p>The parameter to set Low-Limit of input measuring scale in case that sensor type is mV or V. its initial value of 'ln.SL' is '0.0'</p>
<p>PV <b>lnFL</b></p>	<p>The parameter to set PV filter for stabilizing from electromagnetic noise etc. it may effect violation of PV value. Its initial value of 'ln. FL' is OFF and can change 1 sec to 120 sec.</p>
<p>PV <b>dFL</b></p>	<p>The parameter to set for decreasing when PV is unstable due to sensitive sensor response under normal control.</p>
<p>PV <b>bSL</b></p>	<p>The parameter to set a direction of PV operation when sensor open. When set value of BSL is 'UP', PV operation is for High-Limit of Input Sensor. When set value of BSL is 'DOWN', PV operation is for Low-Limit of Input Sensor. Its initial setting is 'UP' (* in case of mV, V input, initialize 'OFF' and No checking Sensor-Open in 10V, 20mV, 100mV</p>
<p>PV <b>rSL</b></p>	<p>The parameter to set whether using RJC or not in case that input sensor is thermocouple. Its initial setting of 'rSL' is 'ON'</p>
<p>PV <b>bSP1</b> ⋮ PV <b>bSP3</b></p>	<p>The parameter to set range of Bias in PV value enabling Bias process. Bias range can set Max 4. for further information, refer to Fig 1. and Fig 2.</p>
<p>PV <b>bS0</b> ⋮ PV <b>bS4</b></p>	<p>The parameter to set Bias value of PV in Bias range. For further information, refer to Fig 1. and Fig 2.</p>



(Fig 1 : Example of Piece Bias)

Ex) There are +2°C in 25°C, -1°C in 50°C, +3°C in 75°C as temperature deviation in measuring actual temperature in range from 0°C to 100°C, and try to take a Piece Bias, each Bias set value are shown as belows(RL=0°C, BSP1=25°C, BSP2=50°C, BSP3=75°C, RH=100°C)

BS0=0°C, BS1=-2°C, BS2=+1°C, BS3=-3°C, BS4=0°C



(Fig 2 : Example of Piece Bias Formula)

Temperature Bias Value = Temperature after Bias - Actual Temperature  
 Temperature in 600°C(P) after Bias

$$P = 600 + (600 - BSP2) \times \frac{BS3 - BS2}{BSP3 - BSP2} + BS2$$

Sym	Parameter	Setting Range	Unit	Initial	Remark
IN-T	Input Type	Refer to Table 1 Type of Input Sensor	ABS	TC.K1	All time indicate
IN-U	Display Unit	°C / °F	ABS	°C	T/C, RTD
IN.RH	Max. Value of Measurement Range	Within DEF. Range refer to Table 1 however, INRH > INRL	EU	1370	All time indicate
IN.RL	Min. Value of Measurement Range		EU	-200	All time indicate
IN.DP	Decimal Point Position	0~3	ABS	1	mV, V
IN.SH	Max Value of Input Scale	Within -1999~9999 however, INSH > INSL The Decimal Point Position is relay on the value of IN.DP	ABS	100.0	mV, V
IN.SL	Min Value of Input Scale			0.0	mV, V
IN.FL	PV Filter	OFF, 1~120	sec	OFF	All time indicate
D.FL	Display Filter	OFF, 1~120	sec	OFF	All time indicate
BSL	BOUT SEL (note1)	OFF, UP, DOWN	ABS	UP (DCV=OFF)	All time indicate
RSL	RJC SEL	ON, OFF	ABS	ON	T/C
BSP1	Reference Bias Point1	EU(0.0~100.0%), RL≤BSP1≤BSP2≤BSP3≤RH	EU	EU(100.0%)	All time indicate
BSP2	Reference Bias Point2	EU(0.0~100.0%), RL≤BSP1≤BSP2≤BSP3≤RH	EU	EU(100.0%)	All time indicate
BSP3	Reference Bias Point3	EU(0.0~100.0%), RL≤BSP1≤BSP2≤BSP3≤RH	EU	EU(100.0%)	All time indicate
BS0	Bias Value for RL Point	EUS(-100.0~100.0%)	EUS	0	All time indicate
BS1	Bias Value for BSP1 Point	EUS(-100.0~100.0%)	EUS	0	All time indicate
BS2	Bias Value for BSP2 Point	EUS(-100.0~100.0%)	EUS	0	All time indicate
BS3	Bias Value for BSP3 Point	EUS(-100.0~100.0%)	EUS	0	All time indicate
BS4	Bias Value for RH Point	EUS(-100.0~100.0%)	EUS	0	All time indicate

(note 1) : S.OPN(Sensor-Open)=BOUT(Burn-Out)

### 5.2 Control Group(G.CTL)

<p>PV <b>GCTL</b></p>	<p>Press 'SET/ENT Key to select Control Group after press ▼ or ▲ Key in Menu display.</p> <pre style="text-align: center;">                 ▲▼             G.COM ↔ PWD ↔ <u>G.CTL</u>             ▲▼             ▼   ↑   ▲▼             G.RET ↔ G.ALM ↔ G.IN             ▲▼   ▲▼             </pre>
<p>PV <b>SP</b></p>	<p>The parameter to set SP value for controller operation.</p>
<p>PV <b>HI.Lo</b></p>	<p>Set the status of HIGH LIMIT or LOW LIMIT. In case of High, it operates LIMIT when PV &gt; SP, In case of LOW, it operates LIMIT when PV &lt; SP.</p>
<p>PV <b>r.nd</b></p>	<p>Set the operation of Relay Out when Power on. In case of R.MD = OFF, Relay Out is 'OFF' ('ON' when it is reset) In case of 'ON', Relay Out is Off only when it is Over temperature.</p>
<p>PV <b>oACT</b></p>	<p>The parameter to set Reverse or Forward operation of Control Output. If 'O.Act' sets Reverse operation and PV value is lower the SP value, The control output is ON(Relay) or increase control output(SSR,SCR) If Forward operations, it works reverse. Its initial setting is 'REV'.</p>
<p>PV <b>r.HYS</b></p>	<p>The parameter to set Hysteresis in case of Off in OVER.</p>
<p>PV <b>SPrH</b></p>	<p>The parameter to set High-Limited value when input setting value. the 'SPrH' can initialize when sensor input set or 'In.rH' (In.SH When mV, V Sensor input) when changing of 'In.rH'</p>
<p>PV <b>SPrL</b></p>	<p>The parameter to set Low-Limited value when input setting value. the 'SPrL' can initialize when sensor input set or 'In.rL' (In.SL When mV, V Sensor input) when changing of 'In.rL'</p>
<p>PV <b>LoCK</b></p>	<p>The parameter to set parameter display for common using or checking. If LOCK sets 'ON',prohibit to set all parameter and SP value in operation display as well. Its initial setting is 'OFF'.</p>
<p>PV <b>UPyD</b></p>	<p>The parameter to set PASSWORD in Controller. Set U/PWD in PASSWORD screen before entering control group (G.CTL) of parameter group. Not allow for entering parameter group if input value is not the same as registered password. Its initial setting U.PWD is '0'.</p>



- Be sure not to forget PASSWORD after registration.
- If Forget the PASSWORD, Not available for operator's maintenance.
- Need to return the controller for our service center and sales office.

	The parameter to set time unit as HH.MM (hour.minute) or MM.SS(minute.second) for time relating parameters. Its initial setting is HH.MM.
	The parameter to initialize the controller. It is initialing when 'INIT' sets 'ON' (However, not allow communication for initializing)

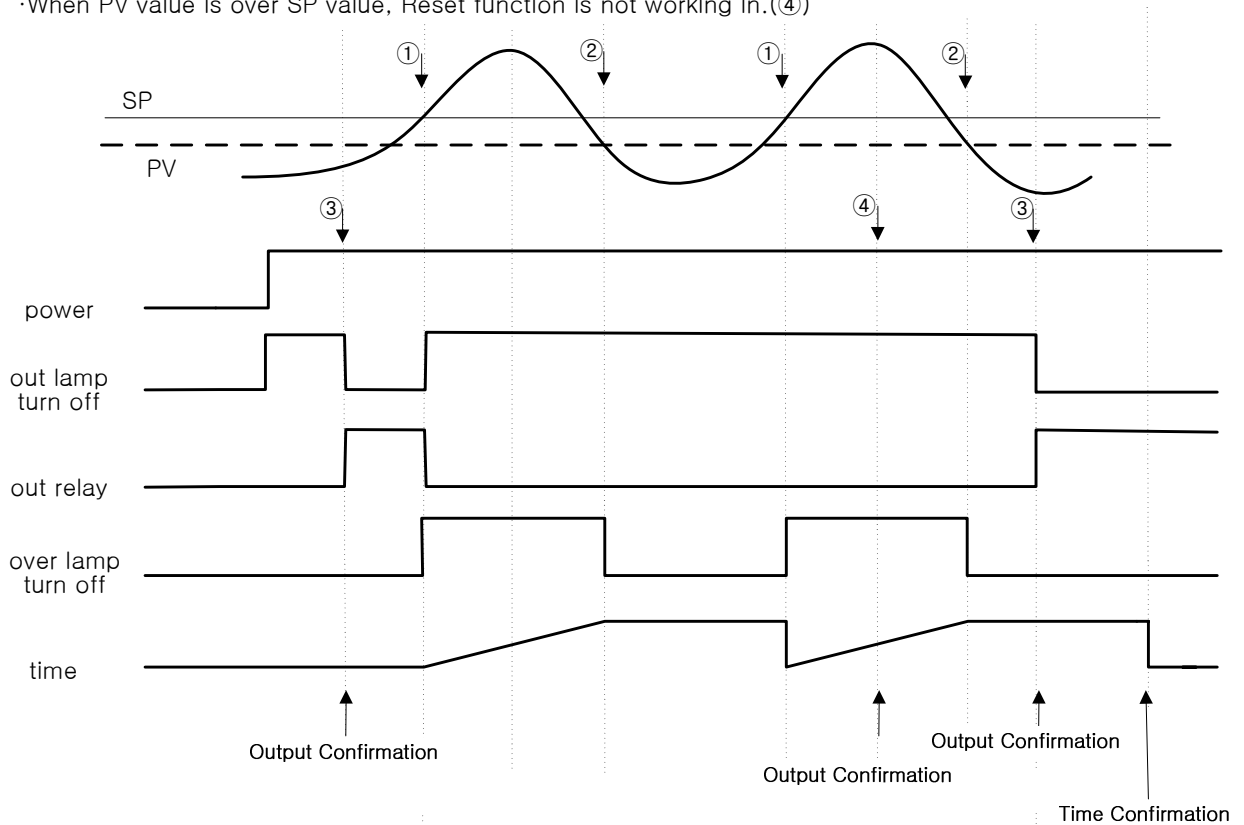


It will be initialized all parameters of the controller when 'INIT' parameter sets. Be sure to avoid any kind of inconvenience.

5-2-1 Operation of LOCK

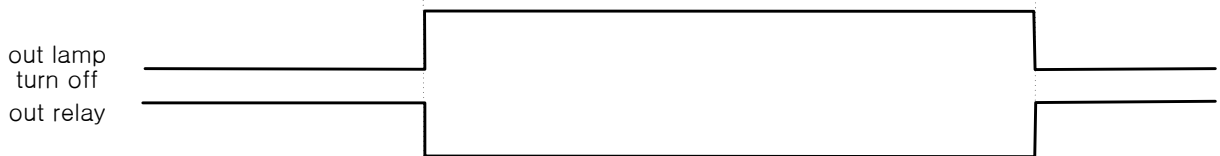
5-2-1-1 O.ACT=REV when HI.LO=HIGH, R.MD=OFF

- If PV value is over then SP value, "OVER" LAMP and "OUT" LAMP is ON .(①)
- PV value returns normal status, "OVER" LAMP is OFF. However, "OUT" LAMP is remaining.(②)
- Operator press "RESET" Key(③) for Confirmation, "OUT" LAMP is OFF, "OUT" RLY is ON.
- When PV value is over SP value, Reset function is not working in.(④)



(Fig 3 : Over, Out operation when R.MD = OFF, O.ACT=REV)

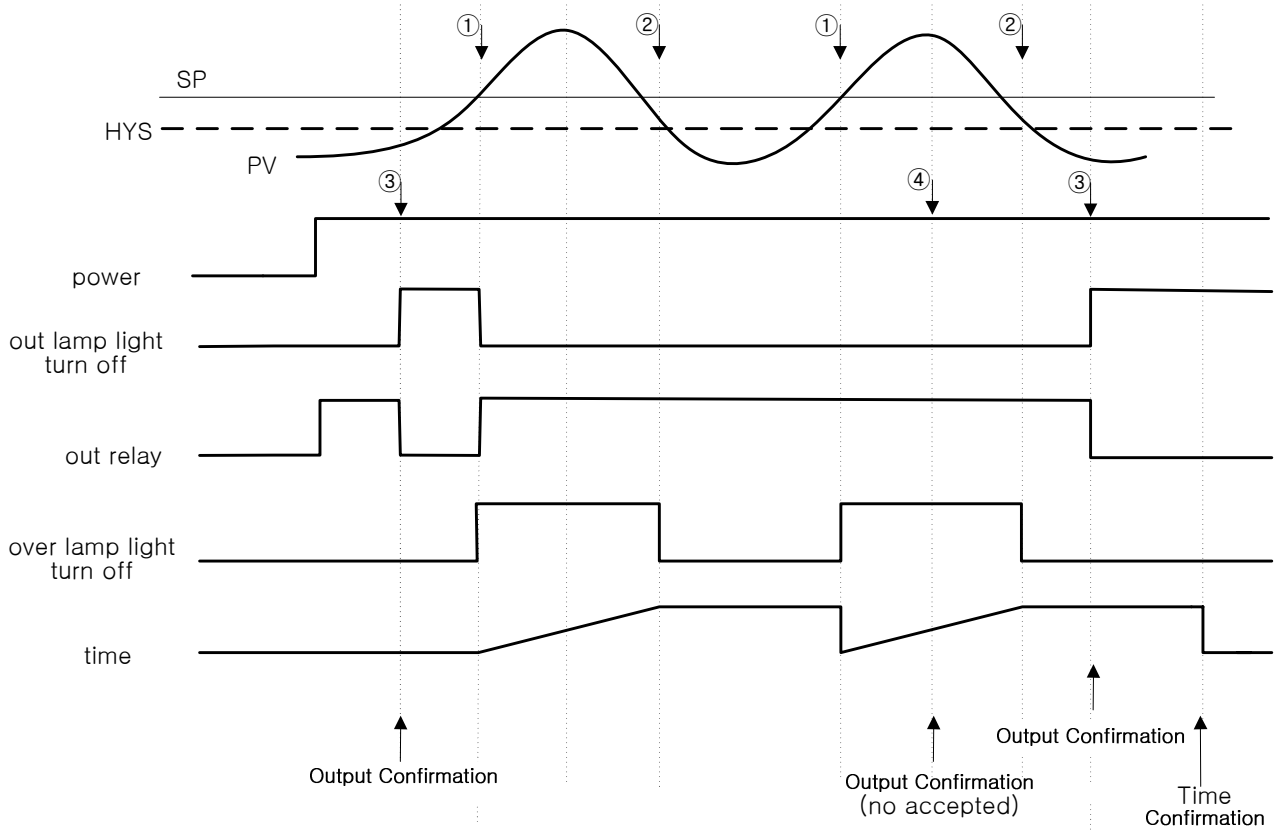
5-2-1-2 O.ACT=REV when HI.LO=HIGH, R.MD=ON



(Fig 4 : Out operation when R.MD = ON, O.ACT=REV)

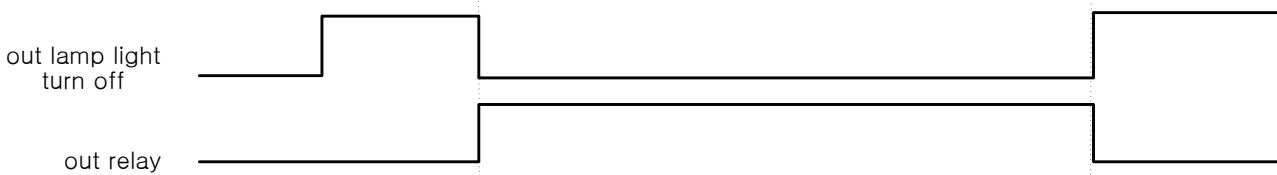
5-2-1-3 HI.LO=HIGH, R.MD=OFF시, O.ACT=FWD

- If PV value is over then SP value, "OVER" LAMP and "OUT" RLY is ON .(①)
- PV value returns normal status, "OVER" LAMP is OFF. However, "OUT" RLY is remaining.(②)
- Operator press "RESET" Key(③) for Confirmation, "OUT" LAMP is OFF, "OUT" RLY is OFF.
- When PV value is over SP value, Reset function is not working in.(④)



(그림 5 : Over, Out operation when R.MD=OFF, O.ACT=FWD)

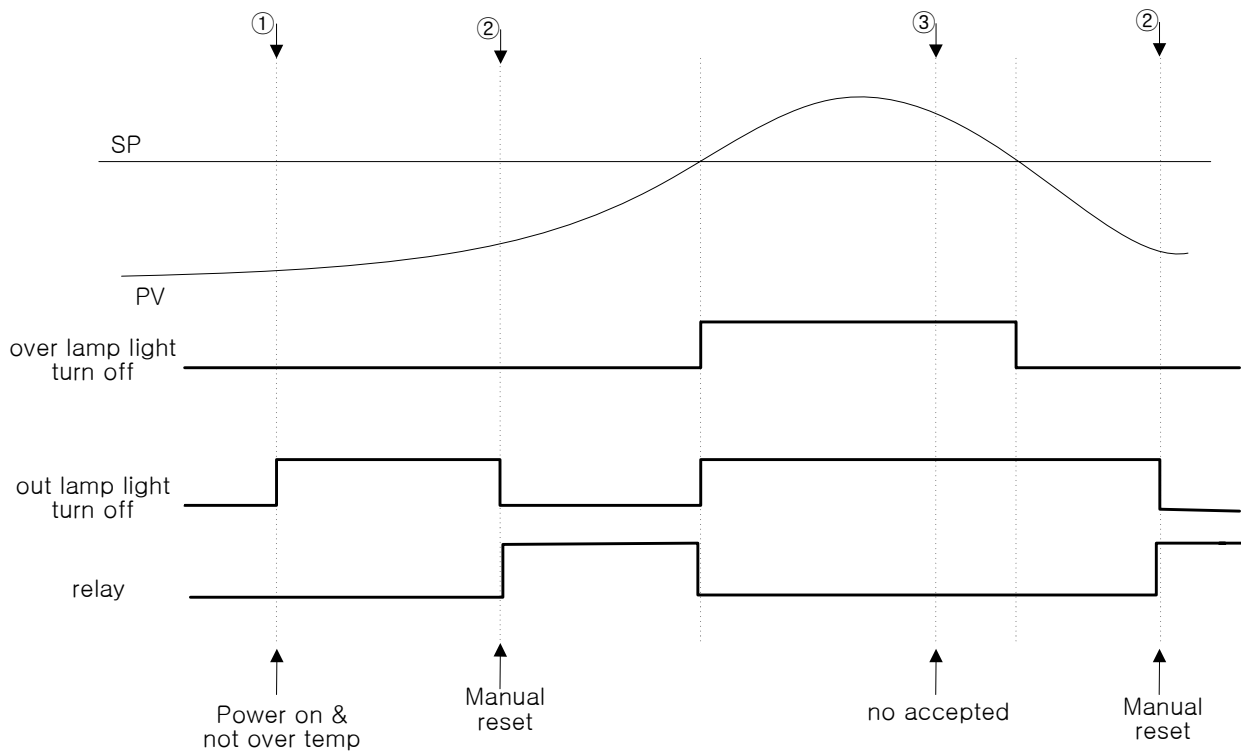
5-2-1-4 HI.LO=HIGH, R.MD=ON시, O.ACT=FWD



(그림 6 : Out operation when R.MD=ON, O.ACT=FWD)

5-2-2 'POWER ON' Status (Manual reset, When HI.LO=HIGH)

- ① When Power ON
  - \* PV value is not over SP value, the status of OVER LAMP is OFF.
  - \* PV value is not over SP value, the status of OUT LAMP is ON.
  - \* PV value is not over SP value, the status of RELAY OUTPUT is OFF.
  - (NC Terminal : CLOSE, NO Terminal : OPEN)
- ② Manual Reset
  - \* When OVER LAMP OFF, Press Manual Reset RELAY is ON.
  - (NC Terminal : OPEN, NO Terminal : CLOSE)
- ③ When OVER LAMP ON, Press Manual Reset RELAY is not ON.

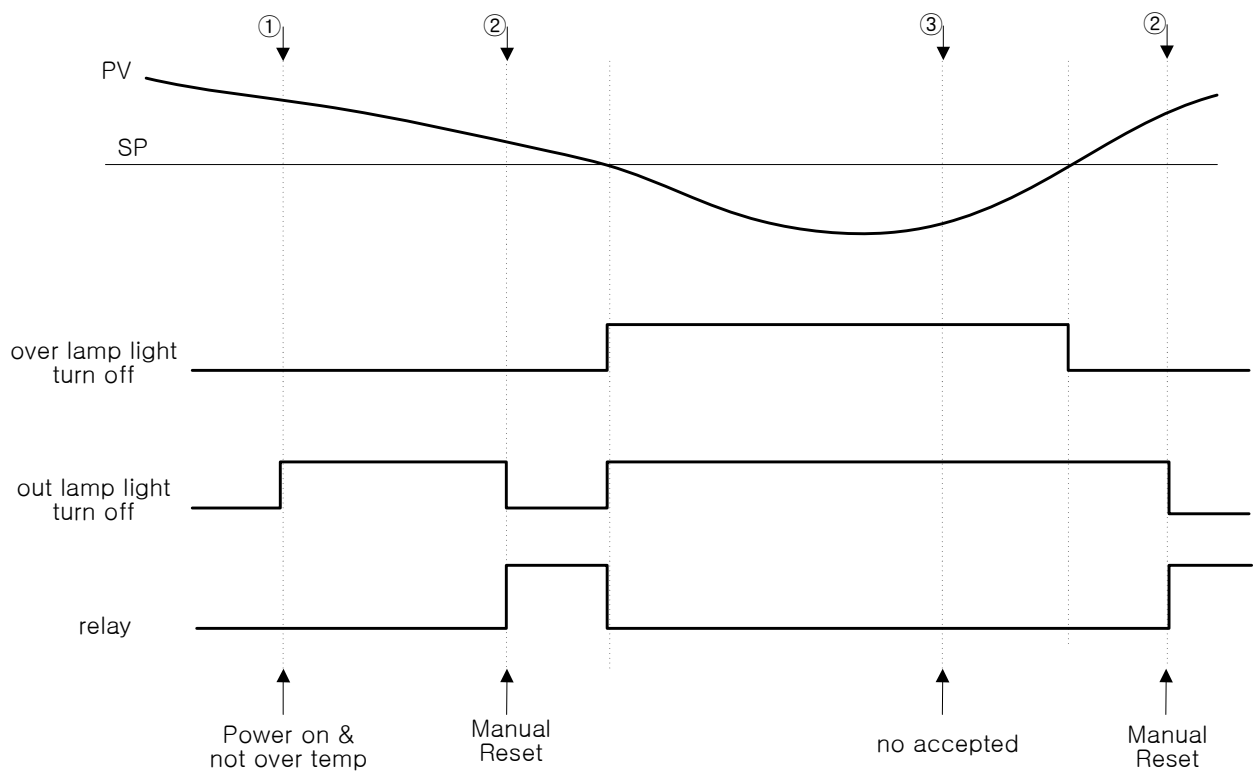


(Fig 7 : Output Relay operation)



5-2-3 'POWER ON' Status (Manual reset, When HI.LO=LOW)

- ① When Power ON
  - \* PV value is not over SP value, the status of OVER LAMP is OFF.
  - \* PV value is not over SP value, the status of OUT LAMP is ON.
  - \* PV value is not over SP value, the status of RELAY OUTPUT is OFF.
  - (NC Terminal : CLOSE, NO Terminal : OPEN)
- ② Manual Reset
  - \* When OVER LAMP OFF, Press Manual Reset RELAY is ON.
  - (NC Terminal : OPEN, NO Terminal : CLOSE)
- ③ When OVER LAMP ON, Press Manual Reset RELAY is not ON.



(Fig 7 : Output Relay operation)

#### 5-2-4 LIMIT CONFIRMATION PANEL.

- When PV value is over the SP value, it is "OFF".( Second operation display)
- When PV value returns regular status, it is "ON" after press "RESET"KEY for confirmation(Second operation display)
- If PV value over the SP value even if operator press "RESET"KEY for confirmation, it remains "OFF".

#### 5-2-5 DURATION DISPLAY PANEL

- When PV value is over SP value, it counts and displays the Time.(Third operation display)
- Time Count will be clear when power on or press "Reset"key in Time display, and "0.0" displays in LED until PV value is over SP value.  
over the SP value
- It can not be cleared TIME when PV value is over the SP value.
- Display Range : 0.0 – 999.9 MIN

#### 5-2-6 MIN, MAX Function

- It is cleared by pressing "RESET" Key in 'MIN', 'MAX' display.
- It is cleared for MIN/MAX value when Power on, and it is remaining MIN, MAX value in initial PV value.

#### 5-2-7 ALARM, Communication Function

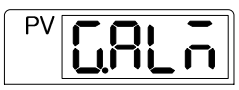

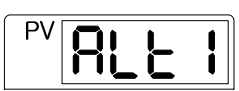
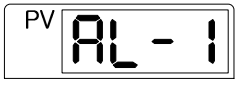


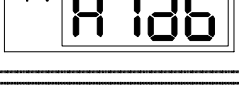

- It is same NOVA.

#### 5-2-8 Retransmission Function

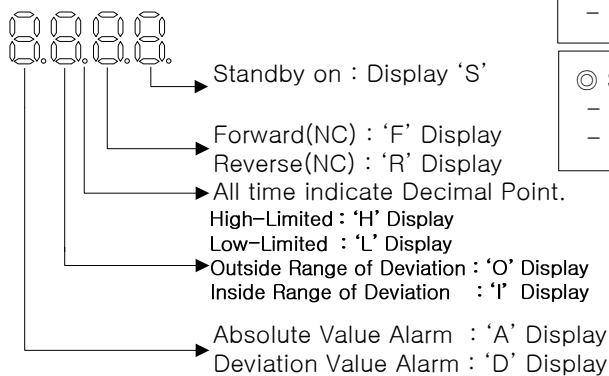
- PV, SP(Initial Value : PV)

Sym	Parameter	Setting Range	Unit	Initial	Remark
SP	Set Point	EU(0.0~100.0%)	EU	EU(0.0%)	All time indicate
HI.LO	HIGH OR LOW SELECT	HI, LO	ABS	HI	All time indicate
R.MD	RESTART MODE SELECT	ON, OFF	ABS	OFF	All time indicate
O.ACT	Reverse and Forward	REV, FWD	ABS	REV	All time indicate
R.HYS	HYSTERESIS	EUS(0.0~10.0%)	EUS	EUS(0.5%)	All time indicate
SPRH	Set Point Range High	EU(0.0 ~ 100.0%)	EU	EU(100.0%)	All time indicate
SPRL	Set Point Range Low	EU(0.0 ~ 100.0%)	EU	EU(0.0%)	All time indicate
LOCK	Key Lock	OFF, ON (No Editing)	ABS	OFF	All time indicate
U.PWD	User password	0~9999	ABS	0	All time indicate
TMU	Time Unit	HH.MM, MM.SS	ABS	HH.MM	All time indicate
INIT	Parameter Initialization	OFF, ON	ABS	OFF	All time indicate

### 5.3 Alarm Group(G.ALM)

	<p>Press SET/ENT Key to select Alarm Group after press ▲ or ▼ Key in Menu display.</p> <div style="text-align: center;">  </div>
	<p>The parameter to set Alarm-1. The type of Alarm shown as 'Table 2 Type of Alarm'</p>
	<p>The parameter to set Alarm point by setting 'ALT1'. (Display in the case of Upper-and-Lower-Limit alarm of set point)</p>
	<p>Upper-Limit alarm in the case of Upper-Limit of Deviation, Upper-and-Lower-Limit alarm and within Upper-and-Lower-Limit Range of Deviation</p>
	<p>Lower-Limit alarm in the case of Lower-Limit of Deviation, Upper-and-Lower-Limit alarm and within Upper-and-Lower-Limit Range of Deviation</p>
	<p>The parameter to set DEAD BAND (hysteresis) of Alarm-1.</p>
	<p>The parameter to set Delay Time of Alarm-1 output.</p>

※ Alarm Type and Display



◎ Output

- Forward : 'ON' in Alarm occur, otherwise 'OFF'.
- Reverse : 'Off' in Alarm occur, otherwise 'ON'.

◎ Standby Condition

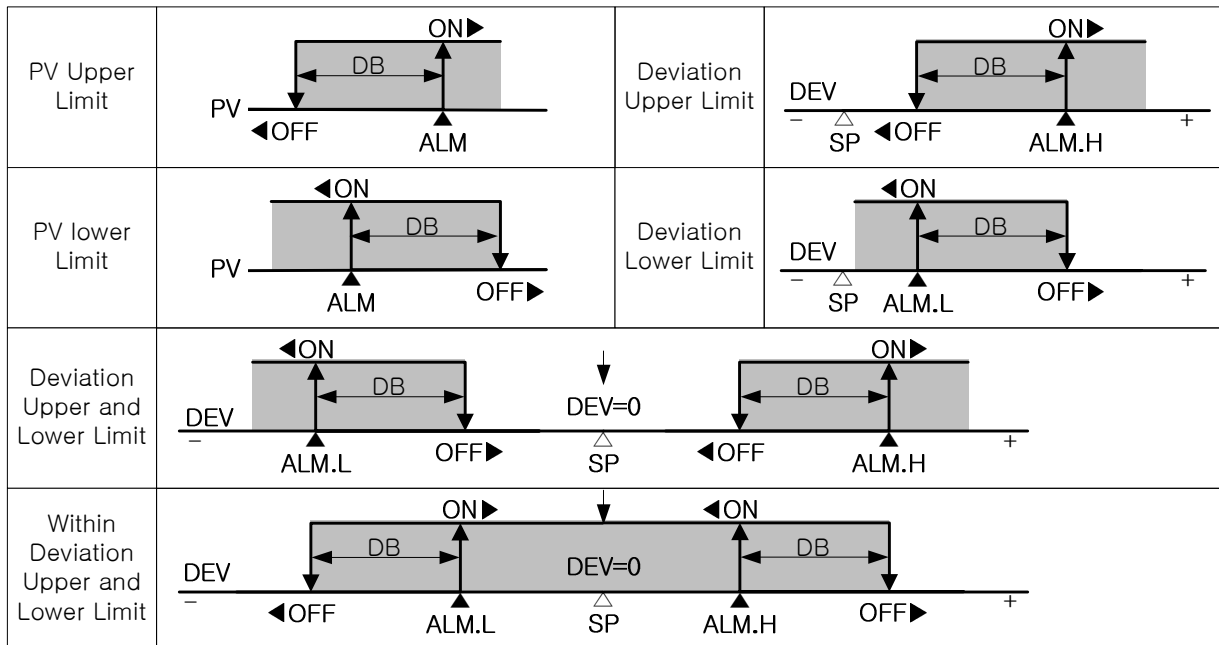
- When Power on and change the type of Alarm
- when change the SP value

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Sym	Parameter	Setting Range	Unit	Initial	Remark
ALT1	Alarm Type 1	Refer to (Table 3 : Type of Alarm)	ABS	AH.F	All time indicate
AL-1	Set value of ALT1	EU(-100.0~100.0%)	EU	EU (100.0%)	Not deviation alarm
AL1.H	Upper-Limit of set value ALT1	EUS(-100.0~100.0%)	EUS	EUS (0.0%)	Deviation alarm
AL1.L	Lower-Limit of set value ALT1	EUS(-100.0~100.0%)	EUS	EUS (0.0%)	Deviation alarm
A1DB	Alarm Type1 DB	EUS(0.0~100.0%)	EUS	EUS (0.5%)	Deviation alarm
A1DY	Delay Time of Alarm 1	0.00 ~99.59	MM.SS	0.00	Deviation alarm

(Table 2 : Type of Alarm)

No.	Alarm Type	Output Direct		Standby		Display Data
		For	Rev	On	Off	
1	Absolute-Value Upper-Limit Alarm	○		○		AH.F
2	Absolute-Value Lower-Limit Alarm	○		○		AL.F
3	Upper-Limit Alarm of Deviation	○		○		DH.F
4	Lower-Limit Alarm of Deviation	○		○		DL.F
5	Upper-Limit Alarm of Deviation		○	○		DH.R
6	Lower-Limit Alarm of Deviation		○	○		DL.R
7	Upper-and-Lower-Limit alarm of Deviation	○		○		DO.F
8	Upper-and-Lower-Limit Range of Deviation	○		○		DI.F
9	Absolute-Value Upper Limit Alarm		○	○		AH.R
10	Absolute-Value Upper Limit Alarm		○	○		AL.R
11	Absolute-Value Upper-Limit Alarm with Standby	○			○	AH.FS
12	Absolute-Value Lower-Limit Alarm with Standby	○			○	AL.FS
13	Upper-Limit Alarm of Deviation with Standby	○			○	DH.FS
14	Lower-Limit Alarm of Deviation with Standby	○			○	DL.FS
15	Lower-Limit Alarm of Deviation with Standby		○		○	DH.RS
16	Upper-Limit Alarm of Deviation with Standby		○		○	DL.RS
17	Upper-and-Lower-Limit Alarm of Deviation with Standby	○			○	DO.FS
18	Upper-and-Lower-Limit Range Alarm of Deviation with Standby	○			○	DI.FS
19	Absolute-Value Upper-Limit Alarm with Standby		○		○	AH.RS
20	Absolute-Value Lower-Limit Alarm with Standby		○		○	AL.RS

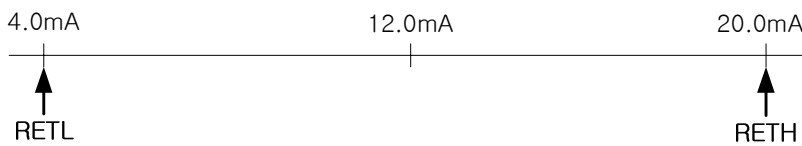


(Fig 9 : Alarm Operation)

### 5.4 Retransmission Group(G.RET)

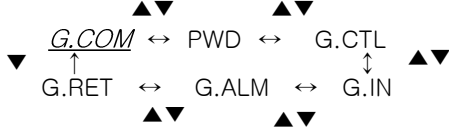
<div style="border: 1px solid black; padding: 2px; display: inline-block;">                 PV <span style="font-family: monospace; font-size: 1.2em;">G.rEt</span> </div>	Press SET/ENT Key to select Retransmission Group after press ▲ or ▼ Key in Menu display. <div style="text-align: center; margin-top: 10px;"> </div>
<div style="border: 1px solid black; padding: 2px; display: inline-block;">                 PV <span style="font-family: monospace; font-size: 1.2em;">rEt</span> </div>	The parameter to set the type of retransmission. There are 'LPS', 'PV', 'SP' in the type of retransmission. Its initial setting is 'PV'. (LPS : Sensor Supply Power, 18V)
<div style="border: 1px solid black; padding: 2px; display: inline-block;">                 PV <span style="font-family: monospace; font-size: 1.2em;">rEtH</span> </div>	The parameter to set High and low limits for a Retransmission output. The output range is scaled according to the RETH and RETL setting. (High Limit : 20mA output scale, Low Limit : 0 or 4mA output scale)  its initial setting is RETH = I N.RH (IN.SH), RETL = IN.RL (IN.SL).
<div style="border: 1px solid black; padding: 2px; display: inline-block;">                 PV <span style="font-family: monospace; font-size: 1.2em;">rEtL</span> </div>	

※ In Case the Type of Retransmission is 'PV' or 'SP'.



Sym	Parameter	Setting Range	Unit	Initial	Remark
RET	Select RET	LPS, PV, SP	ABS	PV	All time indicate
RETH	High-Limit value of Retransmission	T/C, RTD : INRH ~ INRL mV, V : INSH ~ INSL However, RETH > RETL	EU	INRH	All time indicate
RETL	Low-Limit value of Retransmission		EU	INRL	All time indicate

### 5.5 Communication Group(G.COM)

<p>PV <b>G.COM</b></p>	<p>Press SET/ENT Key to select Communication Group after press ▲ or ▼ Key in Menu display.</p>  <pre>           ▲▼                 G.COM ↔ PWD ↔ G.CTL     ▲   ▲   ▲   ▲                       G.RET ↔ G.ALM ↔ G.IN           ▲▼   ▲▼         </pre>
<p>PV <b>COM.P</b></p>	<p>The parameter to set communication Protocol.</p>
<p>PV <b>BAUD</b></p>	<p>The parameter to set communication speed (BAUD RATE). The setting range of BAUD RATE is 600 ~ 19200 bys. Its initial setting is '9600'bps.</p>
<p>PV <b>Prty</b></p>	<p>The parameter to set Communication Parity. The setting range are 'None', 'Even', 'ODD'. Its initial setting is 'None'.</p>
<p>PV <b>Stbit</b></p>	<p>The parameter to set Communication Stop Bit. The setting range is '1' or '2'. Its initial setting is '1'.</p>
<p>PV <b>dLen</b></p>	<p>The parameter to set Communication Data Length. The setting range is '7' or '8'. Its initial setting is '8'. Parameter 'DLEN' is not display when 'COM.P' sets 'MODBUS ASCII' or 'RTU'.</p>
<p>PV <b>Addr</b></p>	<p>The parameter to set Communication Address for controller. The setting range is 1 ~ 99 Pcs Address. its initial setting is '1'.</p>
<p>PV <b>rPtm</b></p>	<p>The parameter to set Communication Response Time. The RP.TM is a Waiting Time to return upper device after processing received commands when controller received it from upper device. The setting of RP.TM is setting by 10 msec times. In case of RP.TM = 0, If the processing of commands is over, it returns response to upper device.</p>



Sym	Parameter	Setting Range	Unit	Initial	Remark
COM.P	Communication Protocol	PCC0, PCC1, MODBUS ASCII, MODBUS RTU	ABS	PCC0	Option
BAUD	Baud Rate	600, 1200, 2400, 4800, 9600, 19200	ABS	9600	Option
PRTY	Parity	None, Even, Odd	ABS	None	Option
SBIT	Stop Bit	1, 2	ABS	1	Option
DLEN	Data Length	7, 8(SKIP when MODBUS)	ABS	8	Option
ADDR	Address	1 ~ 99(Max 31 can connect)	ABS	1	Option
RP.TM	Response Time	0 ~ 10( ×10ms)	ABS	0	Option

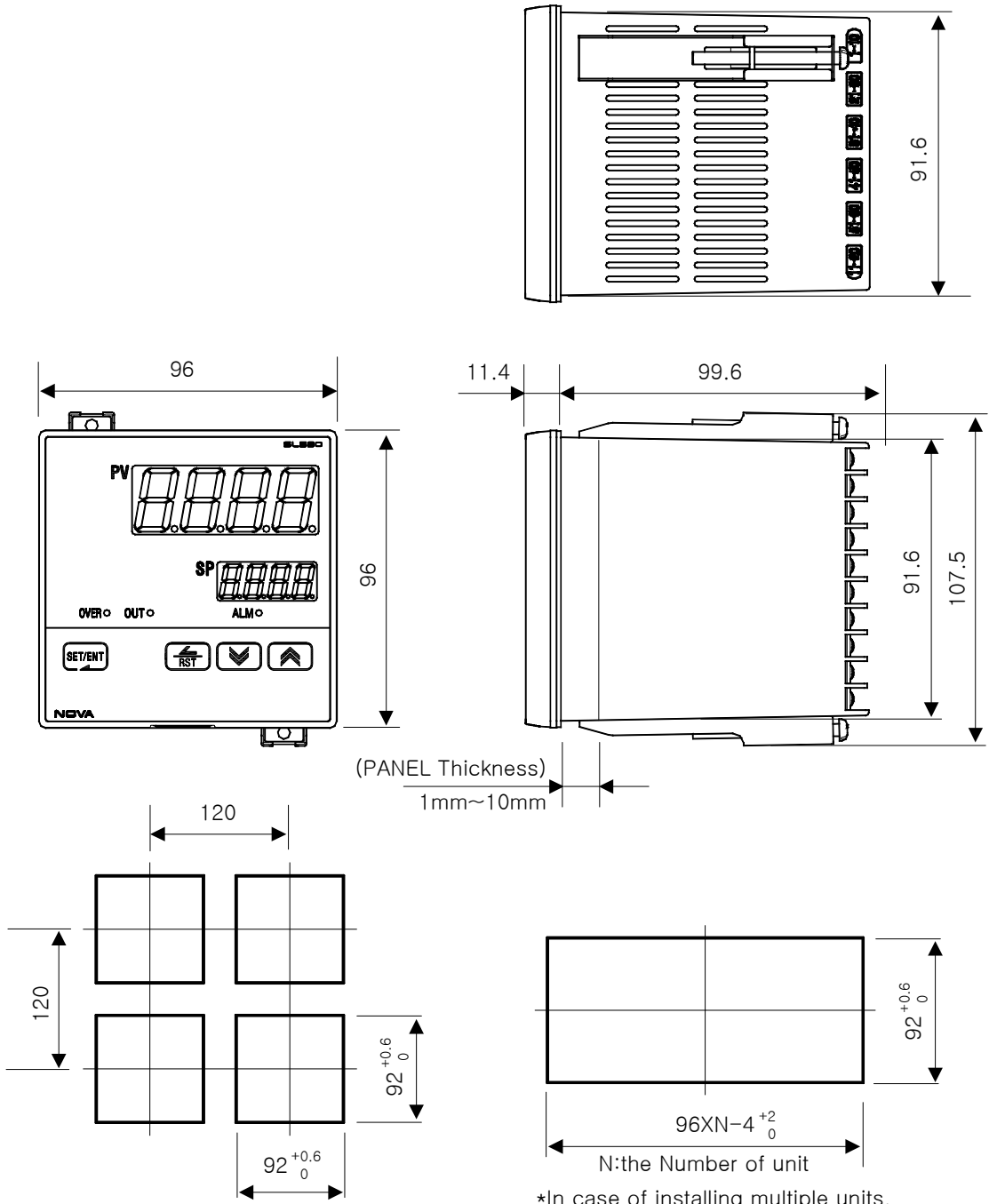
**6. Display Error and Correction**

Display ERROR	ERROR Contents	Correction
E.SYS	EEPROM, DATA Loss	Ask repair
E.RJC	RJC SENSOR Failure	Ask repair
Flash Decimal point of SP	Communication Failure	Comm Cable CHECK
S.OPN	SENSOR Open	SENSOR CHECK

7. Installation

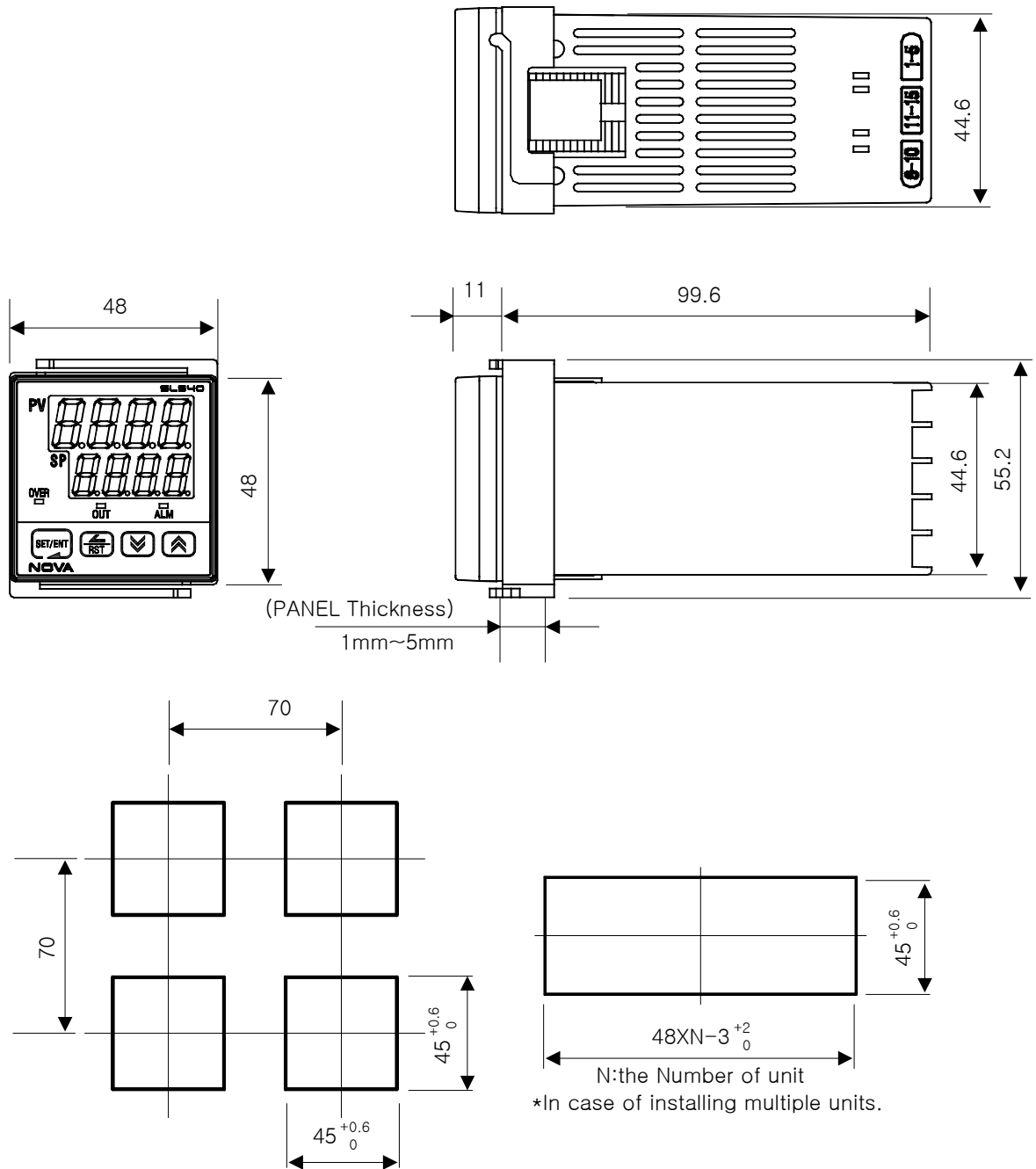
7.1 Dimension and Panel Cutout

SL590



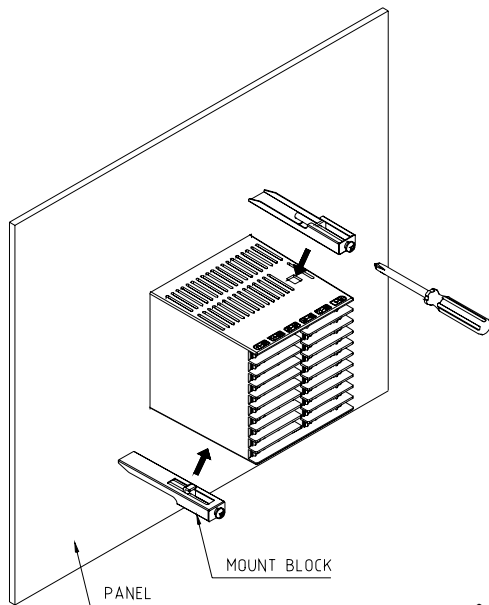
\*In case of installing multiple units.

SL540

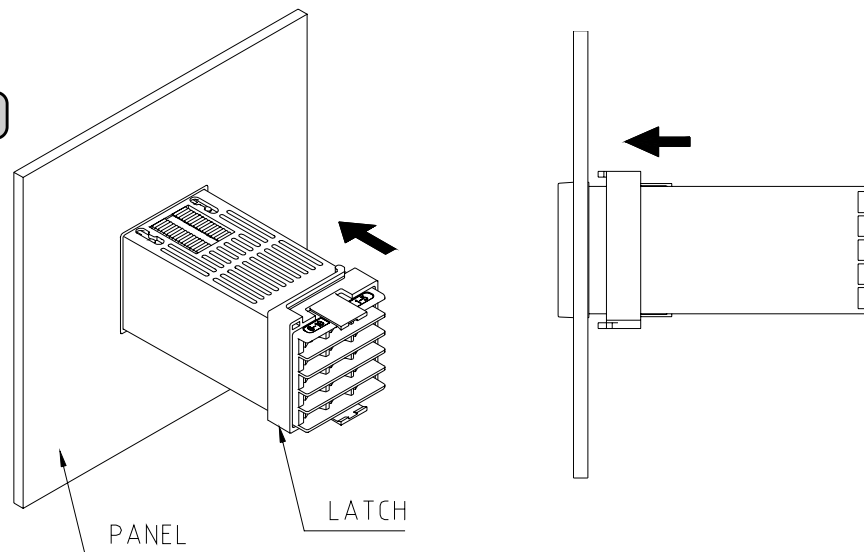


## 7.2 How to install Mount

SL590



SL540



- 1) Cut the mounting panel. (Refer to 7.1 Dimension and Panel Cutout)
- 2) Insert the controller into the panel cutout with the rear terminal board facing ahead.
- 3) Attach the right and left mount and fix it to the panel.(Use driver)



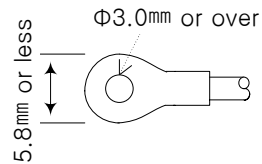
Do not excessively tighten the clamp screws, protecting the controller housing and mount against being damaged.

### 7.3 Power Cable Specification

Vinyl insulated wire 0.9~2.0mm<sup>2</sup> (Allowed Rating Voltage 300V max)

### 7.4 Terminal Specification

Use M3.5 screw-compatible crimp-on terminals with insulating sleeve as shown below.



First Turn off the source circuit breaker, check to ensure that the power cable is not conducting electricity using a tester, and then proceed with wiring in the manner.

- Never touch the terminal in the rear panel to prevent electric shock when power is supplied to the controller.
- Be sure to turn off the electric power before wiring.

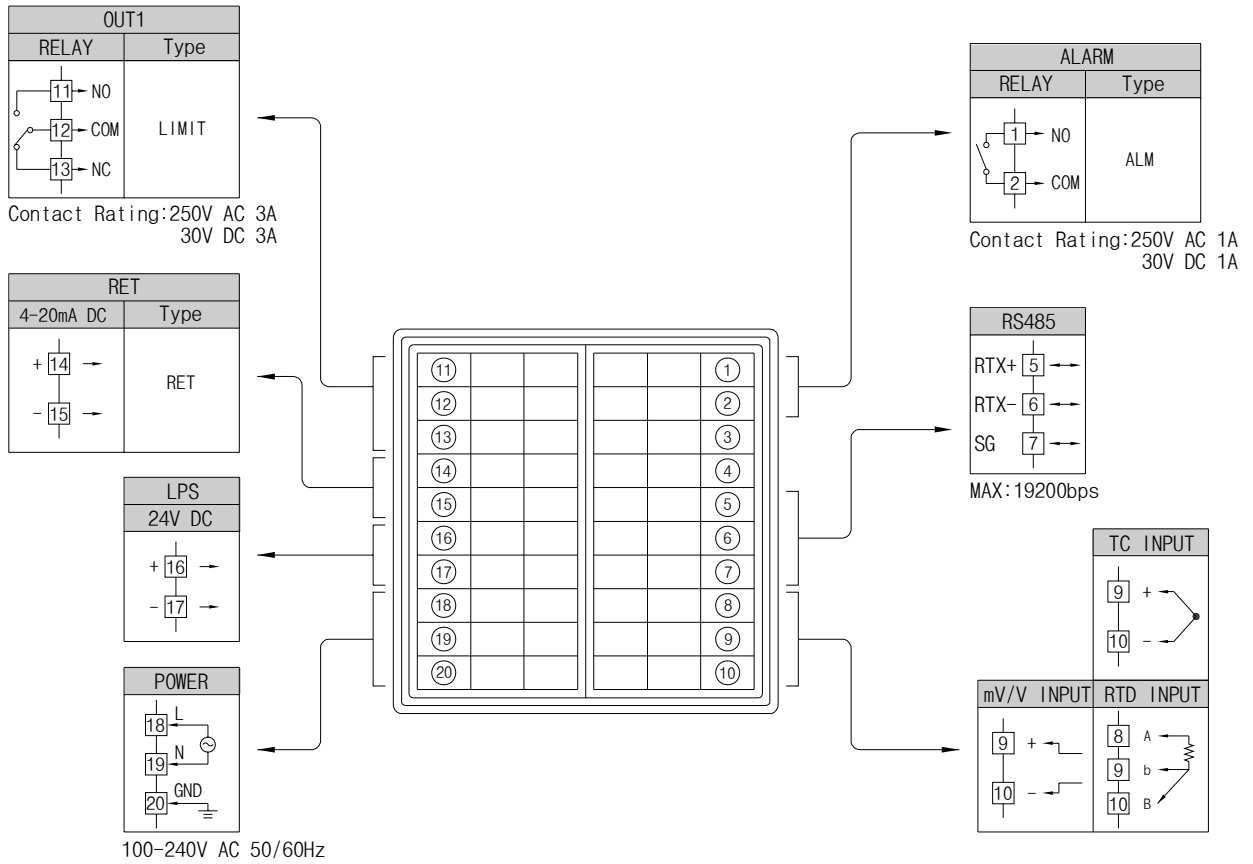


Bind the wires connected to the controller terminals neatly together in order to prevent electromagnetic wave radiation.

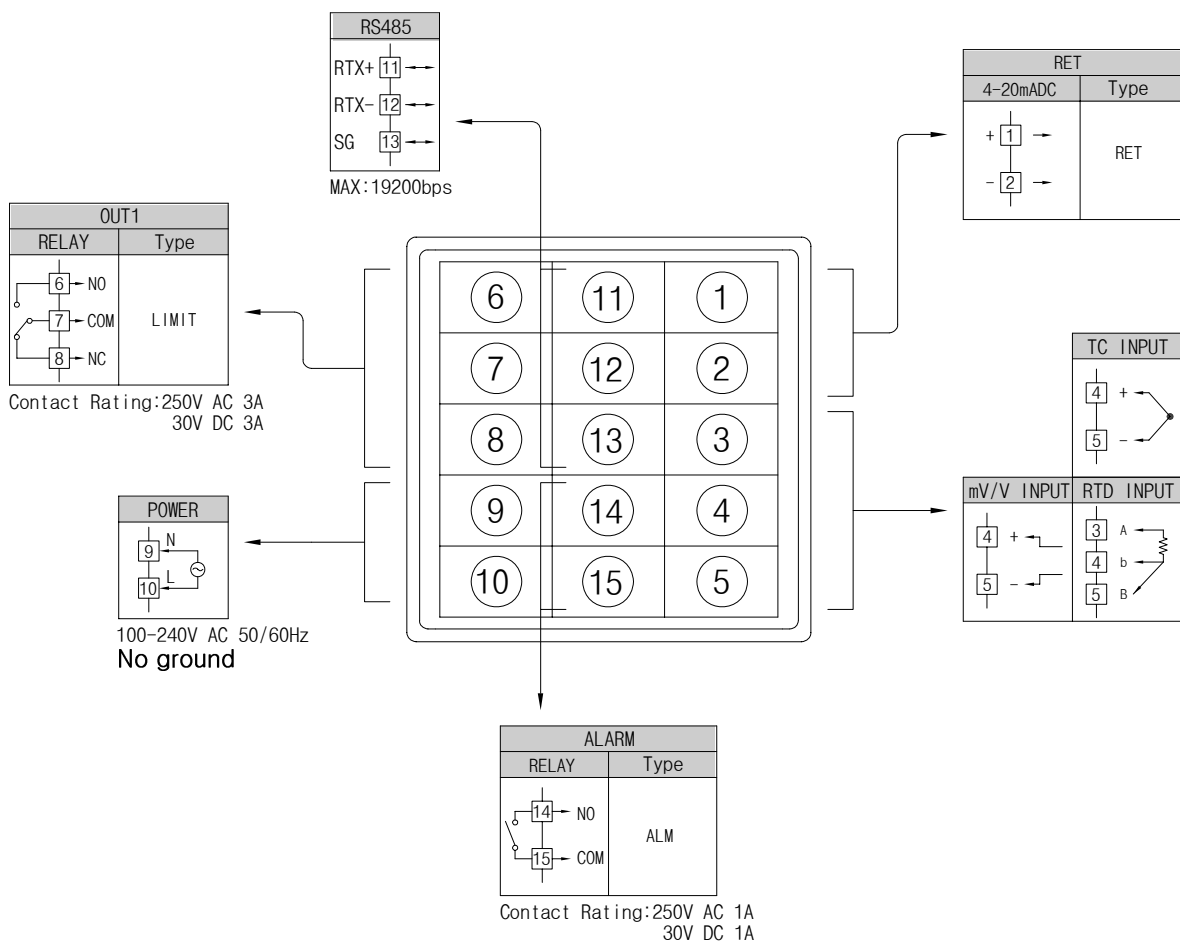
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### 7.5 Terminal Arrangement and External wiring

SL590



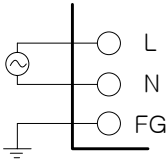
SL540





### 7.6 Grounding and Power Cable Connection.

- Use a thick grounding cable (2 mm<sup>2</sup> or thicker and shorter than 20m) for class-3 grounding or higher (grounding resistance : 100 Ω below)
- Be sure to ground from the grounding terminal to an independent grounding point(1 point grounding)
- Use Vinyl insulation wire 0.9~2.0mm<sup>2</sup> (Allowed Rating Voltage 300V max) or higher leveled cable for power cable connection.



Be sure to ground FRAME GROUND (FG).  
Be sure to keep L(Hot) and N(neutral) status connection.  
Otherwise, it may result for operation default and defect.



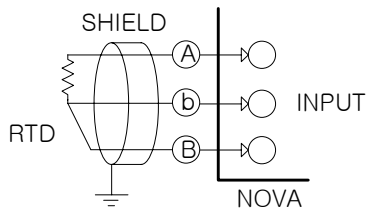
To prevent electric shock, be sure to turn off the controller and the source circuit breaker before wiring.



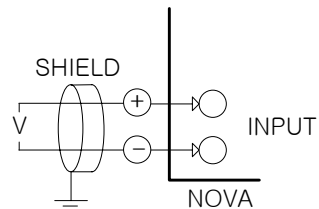
- Be sure to connect to correct polarities, Connecting to a wrong polarity may cause unexpected malfunction.
- Use shielded wires and ground the shielding to an independent grounding point.
- Keep the input circuit wiring as far as possible away from the power and ground circuit.
- Use a wire having a low conductor resistance and no three-wire resistance differential.

### 7.7 Analog Input Connection.

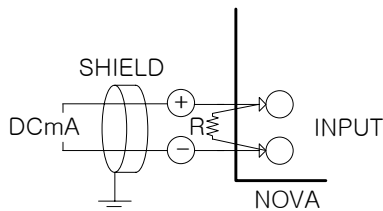
(1) RTD Input.



(2) DC VOLTAGE Input.



(3) DC CURRENT Input.



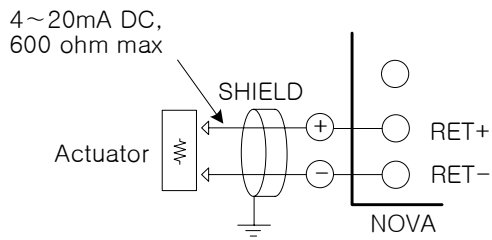
### 7-8. Retransmission Output Connection(RET)



To prevent electric shock, be sure to turn off the Nova Controller and the source circuit breaker before wiring.

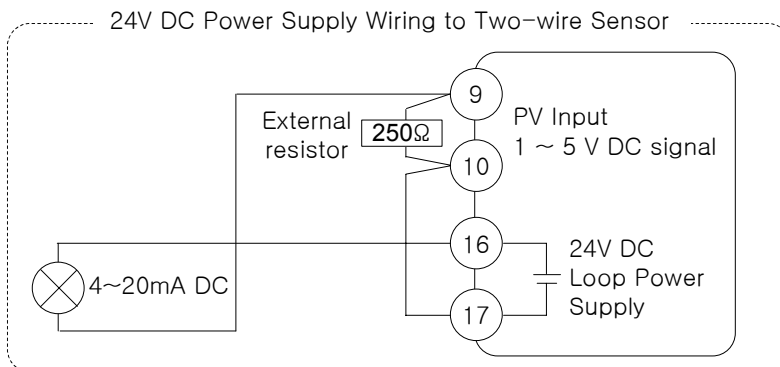


- Be sure to connect to correct polarities. Connecting to a wrong polarity may cause serious trouble.
- Use shielded wires for the wiring and, Be sure to connect independently(1 point grounding)



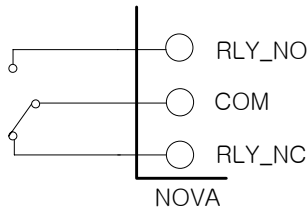
To prevent electric shock, be sure to turn off the Nova controller and the source circuit breaker before connection/disconnection of the actuator as well as wiring.

### 7.9 Loop Power Supply Output Connection(LPS)



TYP 24±0.5V 30mA  
 MAX 22±0.5V 0.85W

### 7.10 External Contact Output Connection(RELAY)



To protect electric shock, be sure to turn off the Nova controller and the source circuit breaker before wiring

### 7.11 Use an Auxiliary Relay.

■ When using an auxiliary relay or inductance load (L) such as solenoid, be sure to insert a CR filter (for AC) or diode (for DC) in parallel as a surge-suppressor circuit to reject sparks, preventing malfunction or damage.

Recommended CR filters are as follows.

■ Recommended CR FILTER

- ▶ Seong Hoo Electronics : BSE104R120 25V (0.1μ+120Ω)
- ▶ HANA PARTS CO. : HN2EAC
- ▶ Songmi Eolectic co.,Ltd : CR UNIT 953, 955 etc
- ▶ Jiwol Electric Co.,Ltd : SKV, SKVB etc
- ▶ Shinyoug Communications Co.,Ltd : CR-CFS, CR-U etc



If inductance load is over as per the controller specifications, it is needed to set frequent On/Off relay operations.

(1) In case of DC RELAY



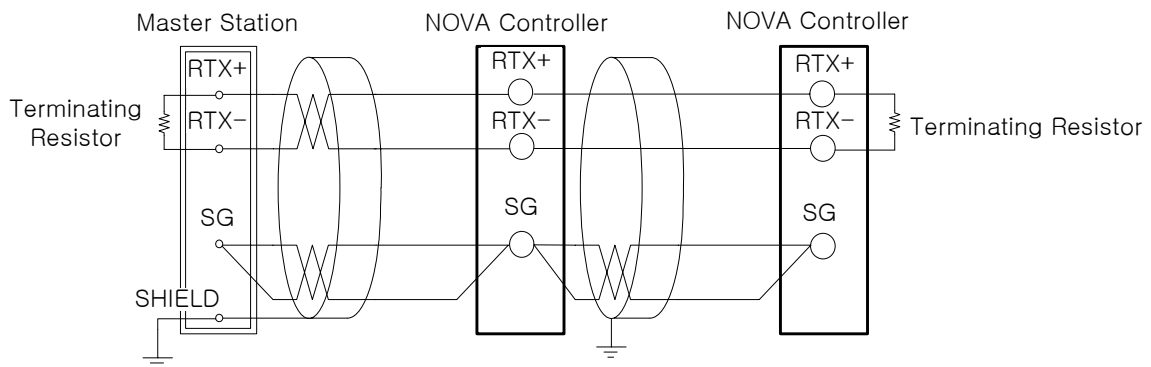
RELAY  
(Rating Specification of RELAY COIL should be used lower than the Contact Rating of Controller)

(2) In case of AC RELAY



RELAY  
(Rating Specification of RELAY COIL should be used lower than the Contact Rating of Controller)

## 7.12 Communication Wiring (RS485)



- Up to 31 slave controllers (Nova series instruments equipped with communication option) can be multidrop-connected.
- Be sure to connect terminating resistors (220Ω, 1/4W) to slave and master controllers at communication-channel ends as shown above.



To prevent electric shock, be sure to turn off the NOVA controller and source circuit breaker before wiring.

\* D-Register

NO.	PROCESS	FUNCTION	SET POINT	SIGNAL	ALARM	PID	IN/OUT
	0	100	200	300	400	500	600
0							
1	NPV		SP		ALT1		IN-T
2	NSP						INT-U
3							IN.RH
4							IN.RL
5							IN.DP
6					AL-1		IN.SH
7							IN.SL
8							IN.FL
9							BSL
10	NOWSTS						RSL
11			SPRH		A1DB		BSP1
12			SPRL				BSP2
13							BSP3
14	ALSTS		TMU				D.FL
15							BS0
16					A1DY		BS1
17							BS2
18							BS3
19							BS4
20							
21					AL1.H		
22							
23							
24							
25							
26					AL1.L		
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							O.ACT
37		LOCK					
38	HI.VALUE						
39	LO.VALUE						
40	KEEP.TIME						
41		HI.LO					
42		R.MD					
43							

NO.	PROCESS	FUNCTION	SET POINT	SIGNAL	ALARM	PID	IN/OUT
	0	100	200	300	400	500	600
44							
45							HYS
46							
47							
48							
49							
50							
51							RET
52							RETH
53	U						RETL
54	s						
55	e						
56	r						
57							
58	A						
59	r						
60	e						
61	a						COM.P
62							BAUD
63							PRTY
64							SBIT
65							DLEN
66							ADDR
67							RP.TM
68							
69							
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85							
86							
87							

NO.	PROCESS	FUNCTION	SET POINT	SIGNAL	ALARM	PID	IN/OUT
	0	100	200	300	400	500	600
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							

(※ Thick line : Read Only)



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