

Thank you for purchasing Samwontech production. Please use after read instruction manual for safety. Free to contact to our sales Div. for Production Inquiry and After Service.
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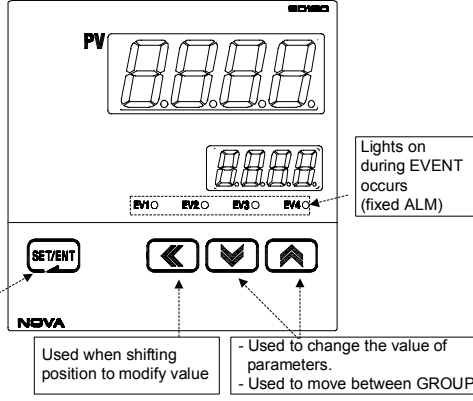
Safety Guide

The following safety symbols are used in this manual.

CAUTION 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. Be sure to operate the controller installed on a panel to prevent electric shock.
2. Keep the input circuit wiring as far as possible away from power and ground circuit.
3. Do not mount front panel facing downward.
4. To prevent electric shock, be sure to turn off the source circuit breaker before wiring.
5. The power consumptions are 100-240V AC, 50/60Hz, 10VAmax and operate without power switching in advance.
6. No work in wet hands(it caused electric shock)
7. Refer the way of grounding connection, however, keep away for grounding to Gas pipe, water pipe, lightening rod etc.

Control Keys and Display



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 | Platinel II | 0 ~ 1390 | 32 ~ 2500 | | TC.PL |
| 14 | PIA | -199.9 ~ 850.0 | -300 ~ 1560 | RTD | PTA |
| 15 | PIB | -199.9 ~ 500.0 | -199.9 ~ 999.9 | | PTB |
| 16 | PtC | -150.0 ~ 150.0 | -199.9 ~ 300.0 | | PTC |
| 17 | JPIA | -199.9 ~ 500.0 | -199.9 ~ 999.9 | | JPTA |
| 18 | JPIB | -150.0 ~ 150.0 | -199.9 ~ 300.0 | | JPTB |
| 19 | 0.4 ~ 2.0V | 0.400 ~ 2.000V | | | DCV |
| 20 | 1 ~ 5V | 1 ~ 5V | | 5V | |
| 21 | 0 ~ 10V | 0 ~ 10V | | 10V | |
| 22 | -10 ~ 20mV | -10 ~ 20mV | | mV | 20M |
| 23 | 0 ~ 100mV | 0 ~ 100mV | | | 100M |

Type & Suffix Code

| Model | Suffix Code | Description | Remark |
|-------------|-------------|-----------------------|----------------|
| SD160 / 190 | - □ □ | Digital Indicator | |
| Type | 0 | Standard | |
| Power | 0 | 100 ~ 240V AC | |
| | 1 | 24V DC | |
| Options | /RET | Retransmission Output | *note1 |
| | /RS | RS422 / 485 | *note1 |
| | /ALM3 | RELAY Output 1 Point | *note2 |
| | /ALM4 | RELAY Output 1 Point | *note1, *note2 |

*note1 : RET, RS, ALM4 to be purchased separately *note2 : It can't use at SD160

Specification

- PV/SP Data Display : each 4 digits
- Indication Accuracy : ±0.2% of FS
- Retransmission Output : 4 ~ 20mA DC (PV) or Loop power supply
- Communication Protocols : PC-Link, MODBUS(ASCII, RTU)
- Power Supply and Consumption : 100 ~ 240V AC, 50 ~ 60Hz / Max 6W below

Sensor

- PV Input : Universal Input(1 Point)
- Type of Input
T/C : K, J, E, T, R, B, S, L, N, U, W, Platinel II
RTD : Pt100, JPt100
DCV : -10 ~ 20mV, 0 ~ 100mV, 0.4 ~ 2.0V DC, 1 ~ 5V DC, 0 ~ 10V DC
(4 ~ 20mA, 0 ~ 20mA, with external 250Ω, 500Ω)

Alarm

- Alarm Capacity : STD 1 Point, Max 4 Points *note3
- Alarm Type : 8 types(High/Low Temp Limit, Deviation Limit etc)

*note3 : SD160 - Max 2 Points

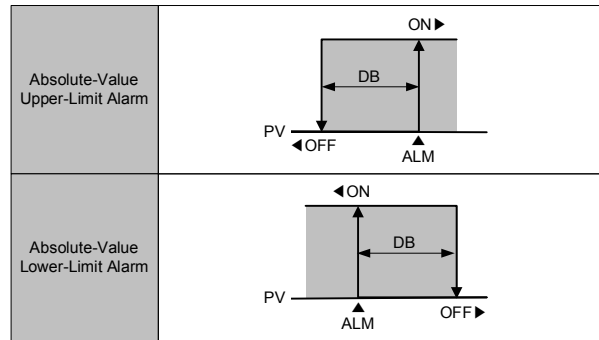
Safety & EMC

- Safety : EN61010-1, UL61010C-1, CAN/CSA-C22.2 No.10101-92, Category II
- EMC : EMI(Emission) - EN61326, ClassA
EMS(Immunity) - EN61326

Type of Alarm

| No. | Type | Output Direct | | Standby | | Display Data |
|-----|----------------------------------|---------------|-----|---------|----|--------------|
| | | For | Ref | Off | On | |
| 1 | Absolute-Value Upper-Limit Alarm | ○ | | ○ | | AH.F |
| 2 | Absolute-Value Lower-Limit Alarm | ○ | | ○ | | AL.F |
| 3 | Absolute-Value Upper-Limit Alarm | | ○ | ○ | | AH.R |
| 4 | Absolute-Value Lower-Limit Alarm | | ○ | ○ | | AL.R |
| 5 | Absolute-Value Upper-Limit Alarm | ○ | | | ○ | AH.FS |
| 6 | Absolute-Value Lower-Limit Alarm | ○ | | | ○ | AL.FS |
| 7 | Absolute-Value Upper-Limit Alarm | | ○ | | ○ | AH.RS |
| 8 | Absolute-Value Lower-Limit Alarm | | ○ | | ○ | AL.RS |

Alarm Operation



PARAMETER Table

Standard Setting

| Symbol | Parameter | Setting Range | Unit | Initial | Remark |
|--------|-------------------|----------------------|------|------------|--------|
| AL-1 | Set value of ALT1 | EU(-100.0 ~ 100.0%) | EU | EU(100.0%) | Always |
| AL-2 | Set value of ALT2 | EU(-100.0 ~ 100.0%) | EU | EU(100.0%) | Always |
| AL-3 | Set value of ALT3 | EU(-100.0 ~ 100.0%) | EU | EU(100.0%) | Option |
| AL-4 | Set value of ALT4 | EU(-100.0 ~ 100.0%) | EU | EU(100.0%) | Option |
| BS | Bias Value | EUS(-100.0 ~ 100.0%) | ABS | 0 | Always |
| LOCK | Key Lock | -1, 0, 1 | ABS | 0 | Always |

Inner Setting

ALARM GROUP

| Symbol | Parameter | Setting Range | Unit | Initial | Remark |
|--------|--------------|--------------------------|------|-----------|--------|
| ALT1 | Alarm Type 1 | refer to "Type of Alarm" | ABS | AH.F | Always |
| A1DB | Alarm 1 Hys | EUS(0.0 ~ 100.0%) | EUS | EUS(0.5%) | Always |
| ALT2 | Alarm Type 2 | refer to "Type of Alarm" | ABS | AH.F | Always |
| A2DB | Alarm 2 Hys | EUS(0.0 ~ 100.0%) | EUS | EUS(0.5%) | Always |
| ALT3 | Alarm Type 3 | refer to "Type of Alarm" | ABS | AH.F | Option |
| A3DB | Alarm 3 Hys | EUS(0.0 ~ 100.0%) | EUS | EUS(0.5%) | Option |
| ALT4 | Alarm Type 4 | refer to "Type of Alarm" | ABS | AH.F | Option |
| A4DB | Alarm 4 Hys | EUS(0.0 ~ 100.0%) | EUS | EUS(0.5%) | Option |

IN GROUP

| Symbol | Parameter | Setting Range | Unit | Initial | Remark |
|--------|---------------------------------|---|------|--------------|----------|
| IN-T | Input Type | refer to "Type of Input Sensor" | ABS | TC.K1 | Always |
| IN-U | Display Range | ℃, °F | ABS | ℃ | T/C, RTD |
| IN.RH | Max. Value of Measurement Range | refer to "Type of Input Sensor" However, INRH > INRL | EU | EU(100%) | Always |
| IN.RL | Min. Value of Measurement Range | | EU | EU(0.0%) | Always |
| IN.DP | Decimal Point Position | 0 ~ 3 | ABS | 1 | mV, V |
| IN.SH | Max Value of Input Scale | Within -1999 ~ 9999 however, INSH > INSL | ABS | 100.0 | mV, V |
| IN.SL | Min Value of Input Scale | The Decimal Point Position is relay on the value of IN.DP | ABS | 0.0 | mV, V |
| IN.FL | PV Filter | OFF, 1 ~ 120 | sec | OFF | Always |
| BSL | BOU SEL | OFF, UP, DOWN | ABS | UP (DCV=OFF) | Always |
| RSL | RJC SEL | TC, TC.RJ, RJC | ABS | TC.RJ | T/C |

CTL GROUP

| Symbol | Parameter | Setting Range | Unit | Initial | Remark |
|--------|--------------------------|--|------|------------|--------|
| PV.LO | PV MIN.Value | EU(-5.0~105.0%) : Read Only | EU | EU(100.0%) | Always |
| PV.HI | PV MAX.Value | EU(-5.0~105.0%) : Read Only | EU | EU(0.0%) | Always |
| M.CLR | MIN MAX CLEAR | OFF, ON | ABS | OFF | Always |
| DSP.H | Display High Limit | EU(-5.0 ~ 105.0%) : However, DSP.L < DSP.H | EU | EU(105.0%) | Always |
| DSP.L | Display Low Limit | EU(-5.0 ~ 105.0%) : However, DSP.L < DSP.H | EU | EU(-5.0%) | Always |
| INIT | Parameter Initialization | OFF, ON | ABS | OFF | Always |

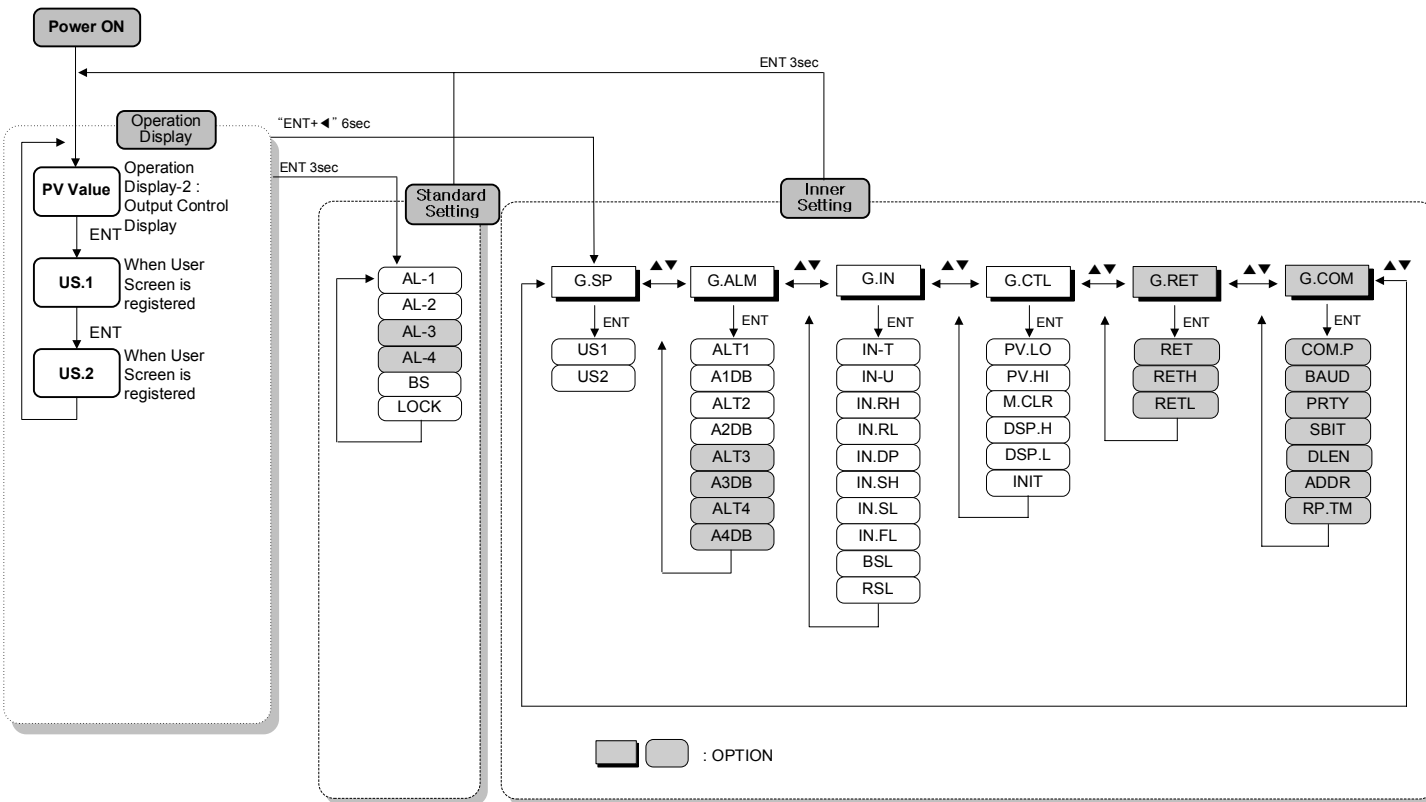
RET GROUP

| Symbol | Parameter | Setting Range | Unit | Initial | Remark |
|--------|--------------------------------------|---|------|---------|--------------------|
| RET | Select RET | LPS, PV | ABS | PV | Option |
| RETH | High-Limited Value of Retransmission | T/C, RTD : INRH ~ INRL mV, V : INSH ~ INSL | EU | INRH | When select RET=PV |
| RETL | Low-Limited Value of Retransmission | | EU | INRL | |

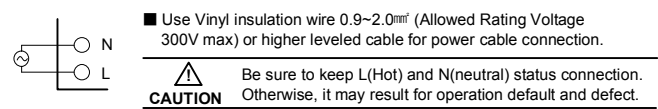
COMM GROUP

| Symbol | 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, 19.2K | 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 in MODBUS) | ABS | 8 | Option |
| ADDR | Address | 1 ~ 99(Max 31 can connect) | ABS | 1 | Option |
| RP.TM | Response Time | 0 ~ 10(x10ms) | ABS | 0 | Option |

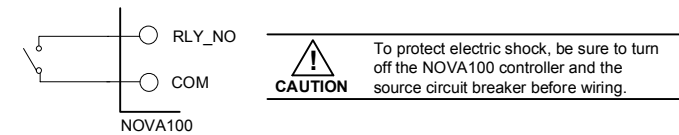
Parameter Map



Power Cable Connection



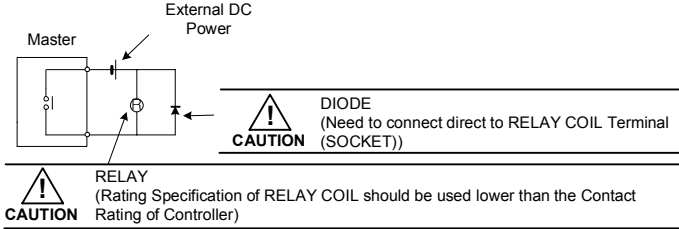
RELAY Connection



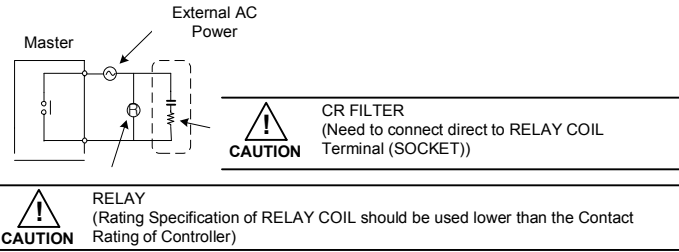
Use an Auxiliary RELAY

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

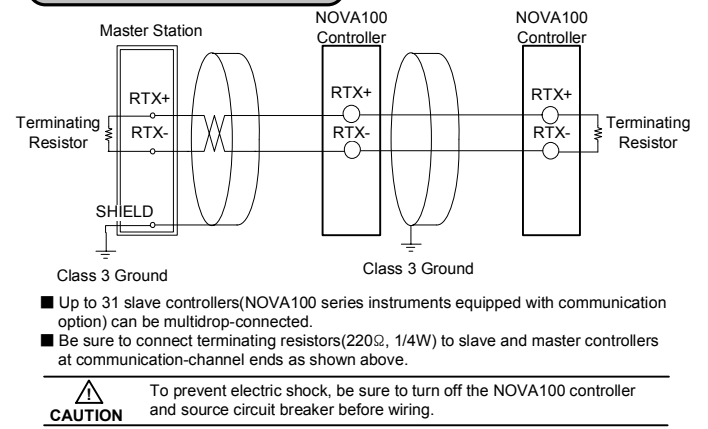
1. In case of DC RELAY



2. In case of AC RELAY



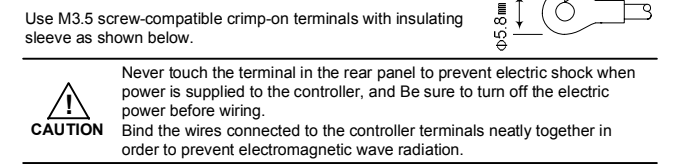
Communication Wiring (RS485)



Power Cable Specification

Vinyl insulated wire 0.9~2.0mm² (Allowed Rating Voltage 300V max)

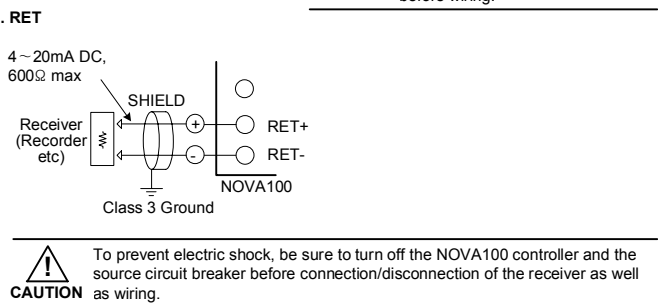
Terminal Specification



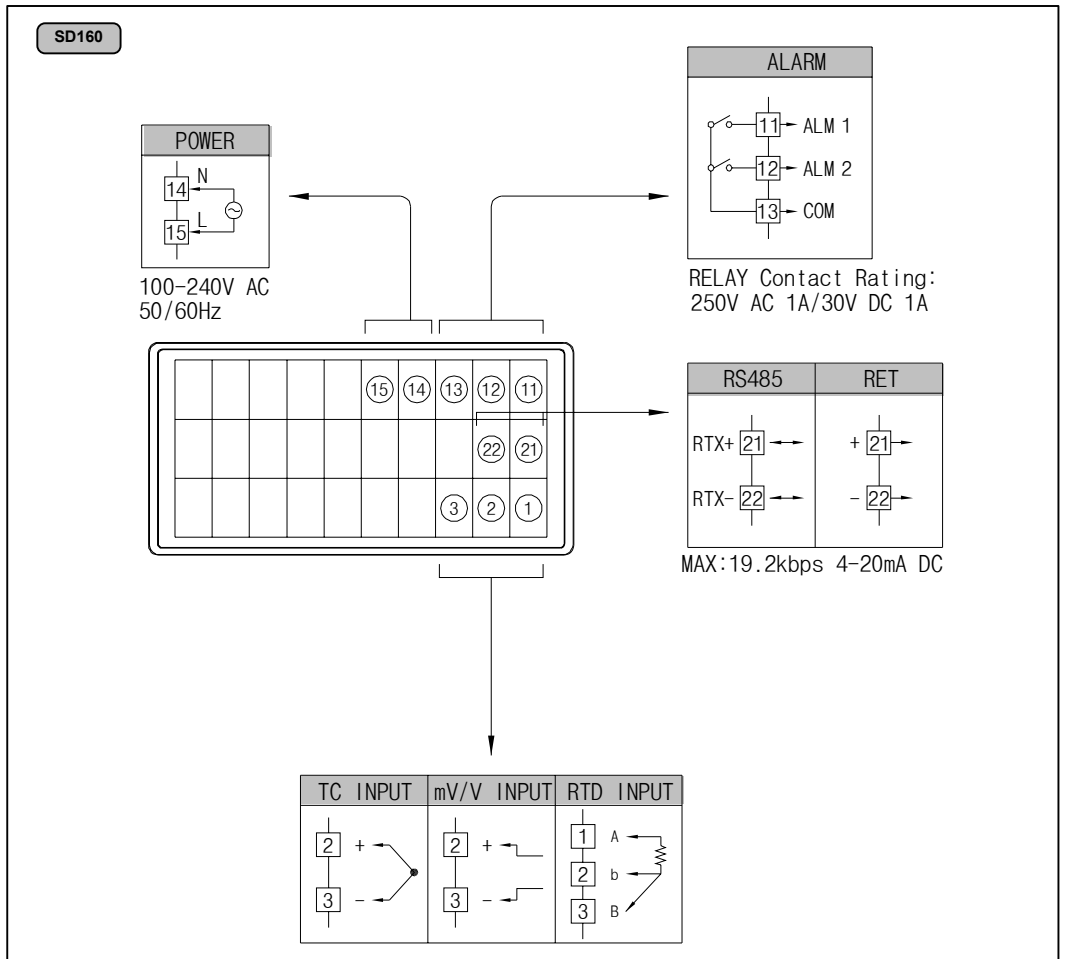
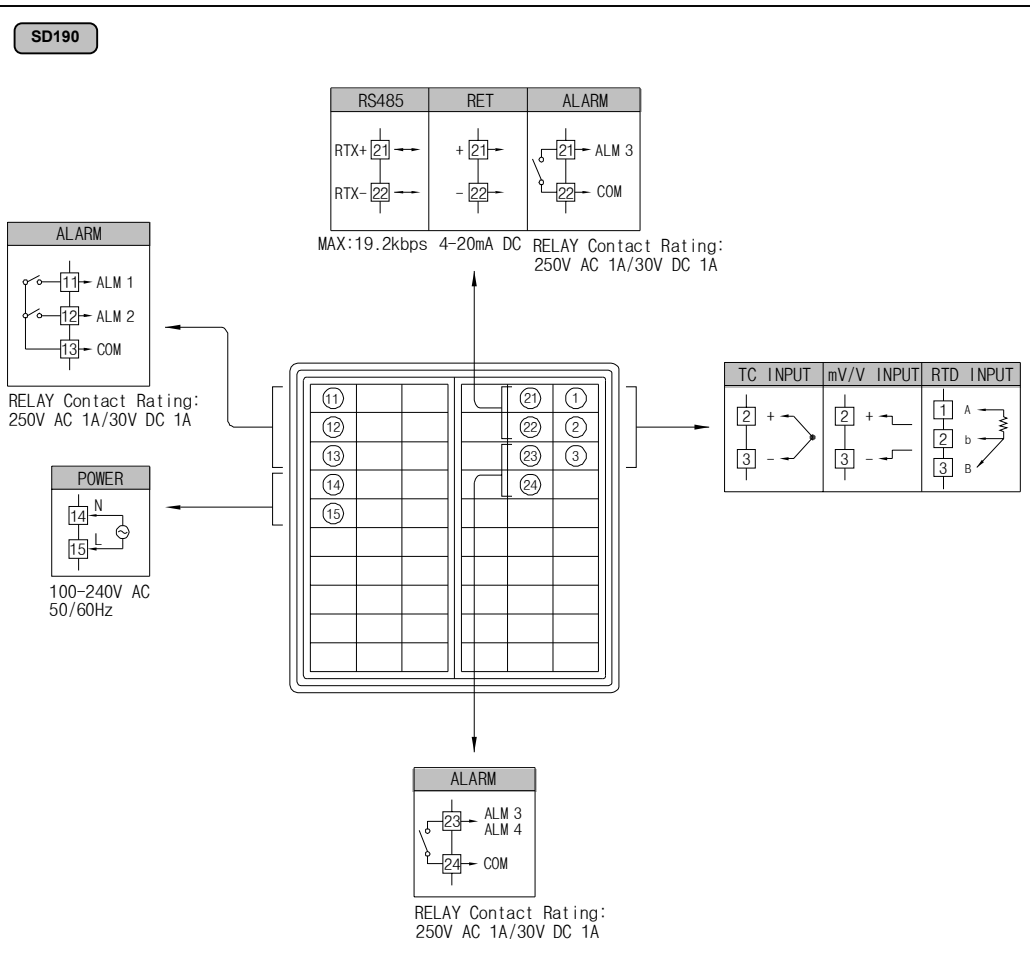
Display Error and Correction

| 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 |
| E.AT | AT Time Out (27h over) | PROCESS CHECK |

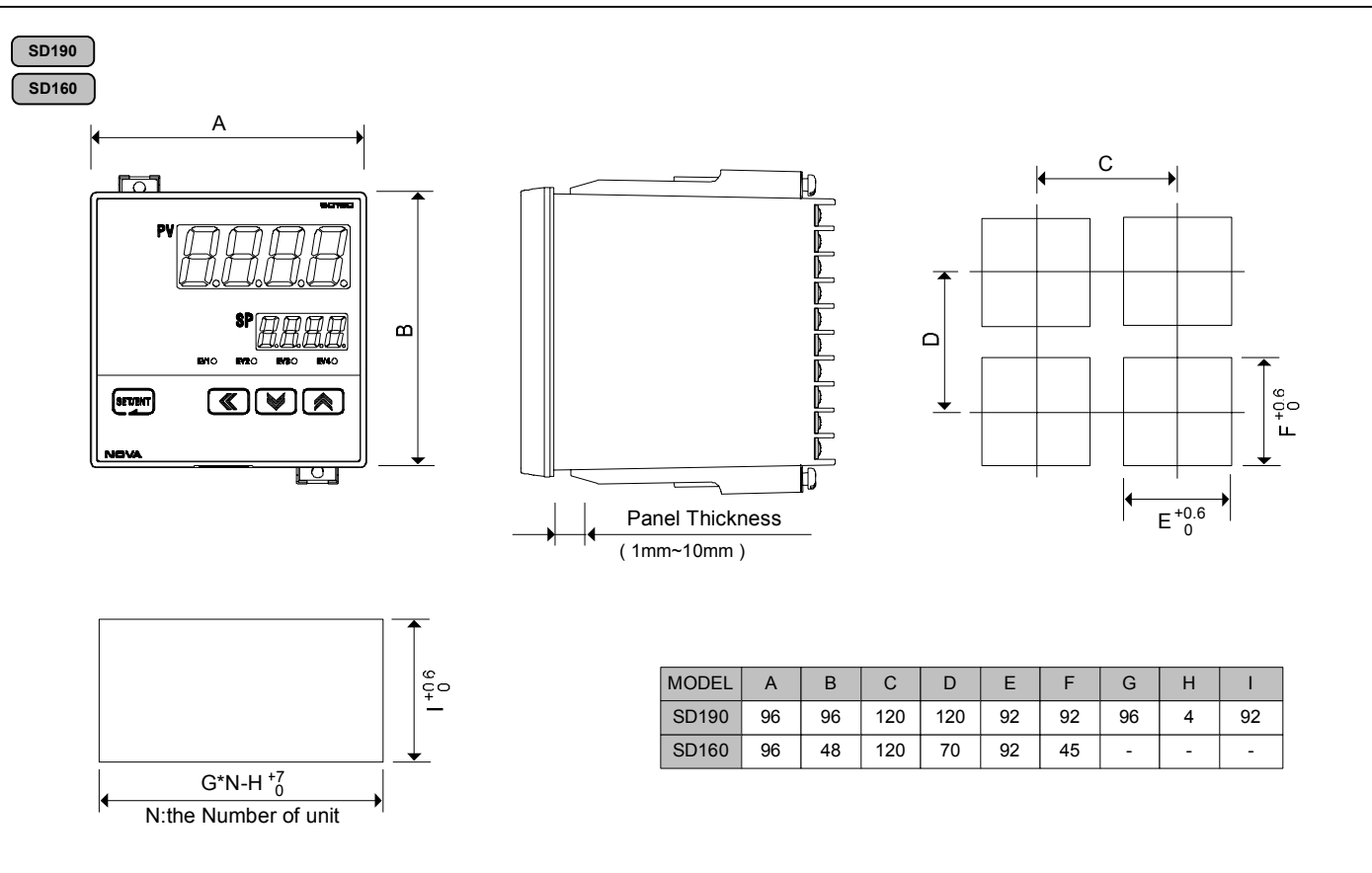
ANALOG OUTPUT Connection



Terminal Arrangement and External wiring



Dimension and Panel Cutout



How to install Mount

