

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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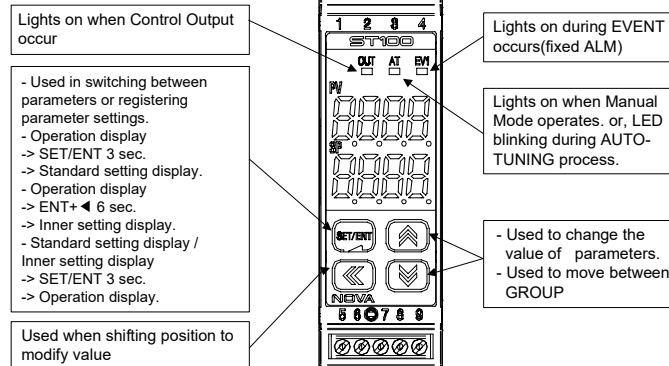
Safety Guide

The following safety symbols are used in this manual.



- 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 and the source circuit breaker before wiring.
 5. The power consumptions are 100-240VAC, 50/60Hz, 10VAmax(24VDC/17VAC) 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, lightning rod etc.
 8. No magnetic disturbances are caused.

Control Keys and Display

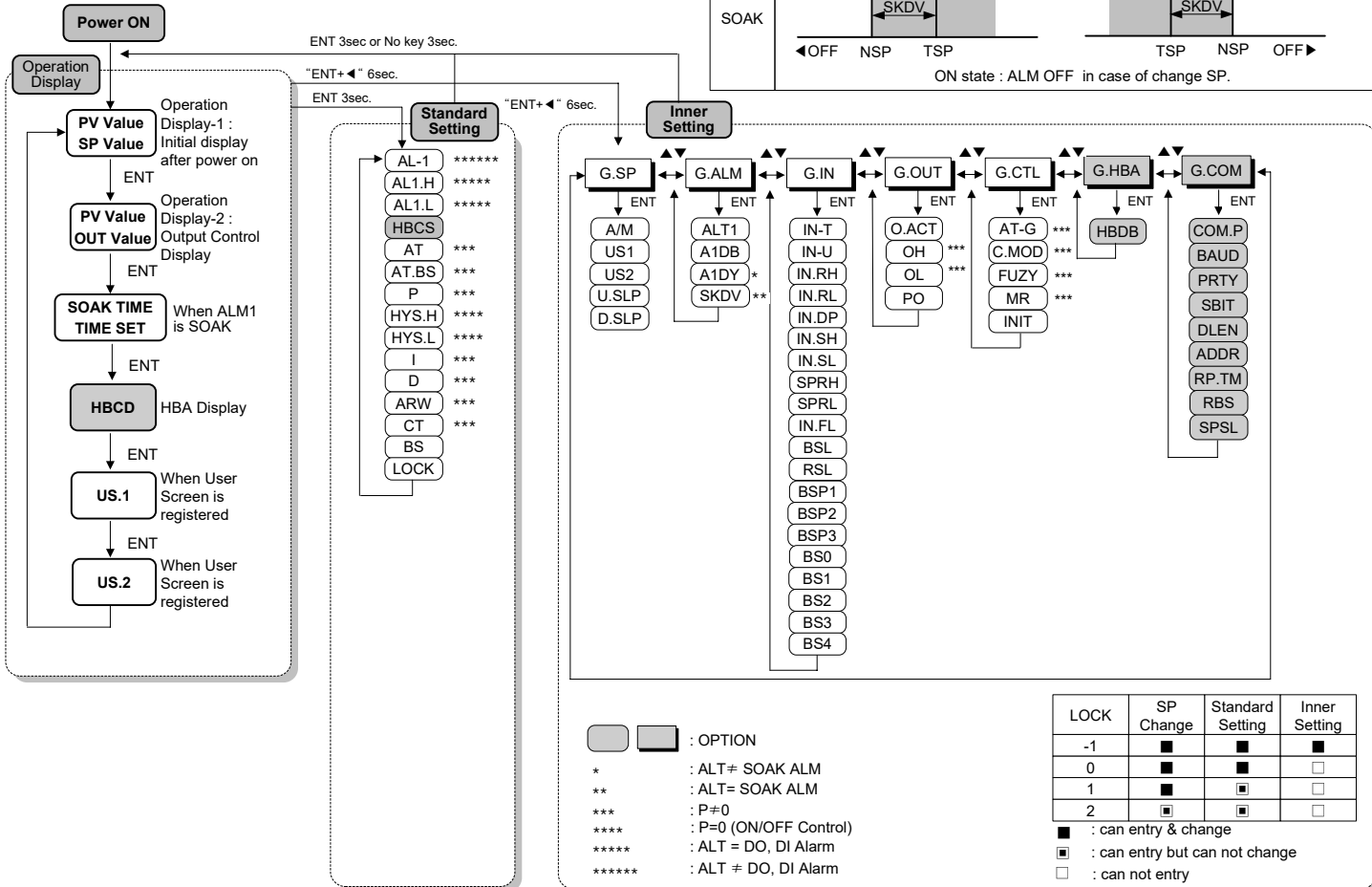


Type of Input Sensor

*display range : -5% ~ +105%

No.	TYPE	Temp.Range(℃)	Temp.Range(℉)	Group	DISP
1	K1	-200 ~ 1370	-300 ~ 2500	T/C	TC.K1
2	K2	-199.9 ~ 999.9	0 ~ 2300		TC.K2
3	K3	0.0 ~ 400.0	32.0 ~ 750.0		TC.K3
4	J	-199.9 ~ 999.9	-300 ~ 2300		TC.J
5	E	-199.9 ~ 999.9	-300 ~ 1800		TC.E
6	T	-199.9 ~ 400.0	-300 ~ 750		TC.T
7	R	0 ~ 1700	32 ~ 3100		TC.R
8	B	0 ~ 1800	32 ~ 3300		TC.B
9	S	0 ~ 1700	32 ~ 3100		TC.S
10	L	-199.9 ~ 900.0	-300 ~ 1600		TC.L
11	N	-200 ~ 1300	-300 ~ 2400		TC.N
12	U	-199.9 ~ 400.0	-300 ~ 750		TC.U
13	W	0 ~ 2300	32 ~ 4200		TC.W
14	Platinel II	0 ~ 1390	32 ~ 2500		TC.PL
15	PTA	-199.9 ~ 650.0	-300 ~ 1200	RTD	PTA
16	PTB	0.0 ~ 400.0	32.0 ~ 750.0		PTB
17	PTC	-150.0 ~ 150.0	-199.9 ~ 300.0		PTC
18	JPTA	-199.9 ~ 500.0	-199.9 ~ 999.9		JPTA
19	JPTB	-150.0 ~ 150.0	-199.9 ~ 300.0	DCV	JPTB
20	0.4 ~ 2.0V	0.400 ~ 2.000V			2V
21	1 ~ 5V	1 ~ 5V			5V
22	0 ~ 10V	0 ~ 10V			10V
23	-10 ~ 20mV	-10 ~ 20mV		mV	20M
24	0 ~ 100mV	0 ~ 100mV			100M

Parameter Map



Type & Suffix Code

Model	Suffix Code	Description	Remark
ST100	-□□/□□	Digital Controller	
Control Output	S	SSR	
	A	SCR(4~20mA)	
	R	RELAY	
Power	0	100~240V AC	
	1	24V DC	
Options	/RS	RS485	
	/HBA	Heater Break Alarm	

Specification

- PV/SP Data Display : each 4 digits
- Sampling Time : 250ms
- Indication Accuracy : ±0.2% of FS (Inquire separately for PTC and JPTB)
- Running Mode : AUTO / MAN
- Control Loops and Mode : Single-Loop Control
- Number of Setpoint(SP) : 1SP(1 Zone PID)
- Communication Protocols : PC-Link, MODBUS(ASCII, RTU), SYNC Master, Slave
- Power Supply and Consumption : 100 ~ 240V AC, 50 ~ 60Hz / Max 10VA below 24V DC(17V AC) / Max 10VA 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)
- Output
 - Control Output : 1 Point
 - Time-proportional PID : Relay, SSR(V-Pulse)
 - Continuous PID : SCR(4 ~ 20mA DC)
- Alarm
 - Alarm Capacity : 1 Point
 - Alarm Type : 21 types(High/Low Temp Limit, Deviation Limit etc)
- HBA
 - CT Spec : use CTL-6-S or 800:1 CT

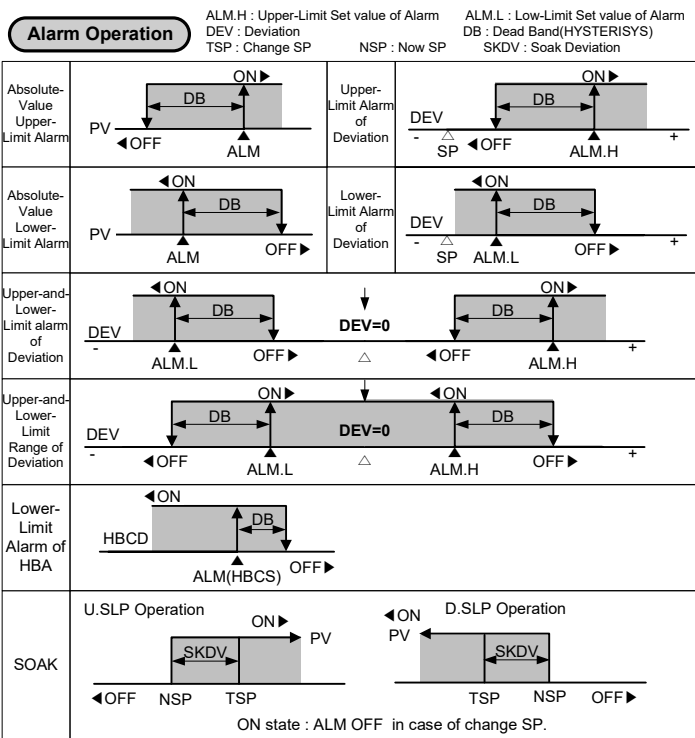
Safety & EMC

- 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 For Rev	Standby Off On	Display Data	No.	Type	Output Direct For Rev	Standby Off On	Display Data
1	Absolute-Value Upper-Limit Alarm	○	○	AH.F	11	Absolute-Value Upper-Limit Alarm	○	○	AH.FS
2	Absolute-Value Lower-Limit Alarm	○	○	AL.F	12	Absolute-Value Lower-Limit Alarm	○	○	AL.FS
3	Upper-Limit Alarm of Deviation	○	○	DH.F	13	Upper-Limit Alarm of Deviation	○	○	DH.FS
4	Lower-Limit Alarm of Deviation	○	○	DL.F	14	Lower-Limit Alarm of Deviation	○	○	DL.FS
5	Upper-Limit Alarm of Deviation	○	○	DH.R	15	Upper-Limit Alarm of Deviation	○	○	DH.RS
6	Lower-Limit Alarm of Deviation	○	○	DL.R	16	Lower-Limit Alarm of Deviation	○	○	DL.RS
7	Upper-and-Lower-Limit alarm of Deviation	○	○	DO.F	17	Upper-and-Lower-Limit alarm of Deviation	○	○	DO.FS
8	Upper-and-Lower-Limit Range of Deviation	○	○	DI.F	18	Upper-and-Lower-Limit Range of Deviation	○	○	DI.FS
9	Absolute-Value Upper-Limit Alarm	○	○	AH.R	19	Absolute-Value Upper-Limit Alarm	○	○	AH.RS
10	Absolute-Value Lower-Limit Alarm	○	○	AL.R	20	Absolute-Value Lower-Limit Alarm	○	○	AL.RS
21	Soak	○		Soak	22	Lower-Limit Alarm of HBA	○		HBA

Alarm Operation



PARAMETER Table

Standard Setting

Symbol	Parameter	Setting Range	Unit	Initial	Remark
AL-1	Set value of ALT1	EUS(-100.0 ~ 100.0%) (Absolute Alarm : EU(-100.0 ~ 100.0%))	EUS EU	EUS(5.0%) EU(100.0%)	Not DO,DI Alarm
AL1.H	Upper-Limit Set value of ALT1	EUS(-100.0 ~ 100.0%)	EUS	EUS(0.0%)	DO,DI Alarm
AL1.L	Low-Limit Set value of ALT1	EUS(-100.0 ~ 100.0%)	EUS	EUS(0.0%)	DO,DI Alarm
HBCS	Heater Break Current Set	OFF, 1 ~ 50A	ABS	OFF	Option
AT	Auto Tuning	OFF, ON	ABS	OFF	AUTO Operation
AT.BS	AT Bias	EUS(-10.0 ~ 10.0%)	ABS	EUS(0.0%)	AUTO Operation
P	Proportional Band	0.0 ~ 999.9%(P=0 ON/OFF Control)	%	10.0%	Always
HYS.H	Hysteresis high	EUS(0.0 ~ 10.0%)	EUS	EUS(0.5%)	ON/OFF Mode
HYS.L	Hysteresis low	EUS(0.0 ~ 10.0%)	EUS	EUS(0.5%)	ON/OFF Mode
I	Integral Time	OFF, 1 ~ 6000sec	sec	120sec	Always
D	Derivative Time	OFF, 1 ~ 6000sec	sec	30sec	Always
ARW	Anti-Reset Wind-Up Select	Auto(0.0) ~ 200.0%	%	100.0%	Always
CT	Cycle Time	1 ~ 300 sec	sec	SSR=2sec RLY=20sec	Output =SSR,RLY
BS	Bias Value	EUS(-100.0 ~ 100.0%)	ABS	0	Always
LOCK	Key Lock	-1, 0, 1, 2	ABS	0	Always

Inner Setting

SP GROUP

Symbol	Parameter	Setting Range	Unit	Initial	Remark
A/M	AUTO, MAN	AUTO, MAN	ABS	AUTO	Always
US1	User Screen	OFF, D-Register Number(1~1299)	ABS	OFF	Always
US2	User Screen	OFF, D-Register Number(1~1299)	ABS	OFF	Always
U.SLP	Up Stop	OFF(0), EUS(0.0%+1digit~100.0%)/min	EUS	OFF(0)	Always
D.SLP	Down Stop	OFF(0), EUS(0.0%+1digit~100.0%)/min	EUS	OFF(0)	Always

ALARM GROUP

Symbol	Parameter	Setting Range	Unit	Initial	Remark
ALT1	Alarm Type 1	refer to "Type of Alarm"	ABS	DH.F	Always
A1DB	Alarm 1 Hys	EUS(0.0 ~ 100.0%)	EUS	EUS(0.5%)	Always
A1DY	Alarm 1 Operation Delay Time	0.00~99.59(MM.SS) ALT1-HH:MM in case of Soak	TIME	0.00	Always
SKDV	Soak Deviation	EUS(0.0 ~ 10.0%)	EUS	EUS(0.0%)	Soak Alarm

IN GROUP

Symbol	Parameter	Setting Range	Unit	Initial	Remark
IN-T	Input Type	refer to "Type of Input Sensor"	ABS	TC.K3	Always
IN-U	Display Range	℃, ℉	ABS	℃	T/C, RTD
IN.RH	Max. Value of Measurement Range	refer to "Type of Input Sensor"	EU	EU(100%)	Always
IN.RL	Min. Value of Measurement Range	However, INRH > INRL	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 rely on the value of IN.DP	ABS	0.0	mV, V
SPRH	Set Point Range High	EU(0.0 ~ 100.0%)	EU	EU(100.0%)	Always
SPRL	Set Point Range Low	EU(0.0 ~ 100.0%)	EU	EU(0.0%)	Always
IN.FL	PV Filter	OFF, 1 ~ 120	sec	OFF	Always
BSL	BOUT SEL	OFF, UP, DOWN	ABS	UP (DCV=OFF)	Always
RSL	RJC SEL	TC, TC.RJ, RJC	ABS	TC.RJ	T/C
BSP1	Reference Bias Point 1~3	EU(0.0~100.0%) RL ≤ BSP1 ≤ BSP2 ≤ BSP3 ≤ RH	EU	EU(100.0%)	Always
BSP2					
BSP3					
BS0	Bias Value for RL Point /	EUS(-100.0 ~ 100.0%)	EUS	EUS(0.0%)	Always
BS1	Bias Value for BSP 1~3 Point /				
BS2	Bias Value for BSP 1~3 Point /				
BS3	Bias Value for RH Point				
BS4					

OUT GROUP

Symbol	Parameter	Setting Range	Unit	Initial	Remark
O.ACT	Reverse and Forward	REV, FWD	ABS	REV	Always
OH	High-Limit value of Output	OL + 1Digit ~ 105.0% (However, OH>OL)	%	100.0%	Always (P=0: SKIP)
OL	Low-Limit value of Output	-5.0% ~ OH - 1Digit (However, OH>OL)	%	0.0%	Always (P=0: SKIP)
PO	Preset Out	-5.0~105.0%	%	0.0%	Always

CTL GROUP

Symbol	Parameter	Setting Range	Unit	Initial	Remark
AT-G	AT Gain	0.1 ~ 10.0	ABS	1.0	AUTO Operation
C.MOD	C. MODE	None, Even, Odd	ABS	D.PV	Always
FUZY	Fuzzy	OFF, ON	ABS	OFF	Always
MR	Manual Reset	-5.0 ~ 105.0%	%	50.0%	I=0
INIT	INIT	OFF, ON	ABS	ON	Always

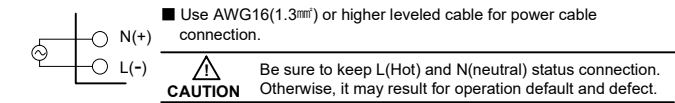
HBA GROUP

Symbol	Parameter	Setting Range	Unit	Initial	Remark
HBDB	Heater Break Current DB	0 ~ 10A	ABS	1	Option

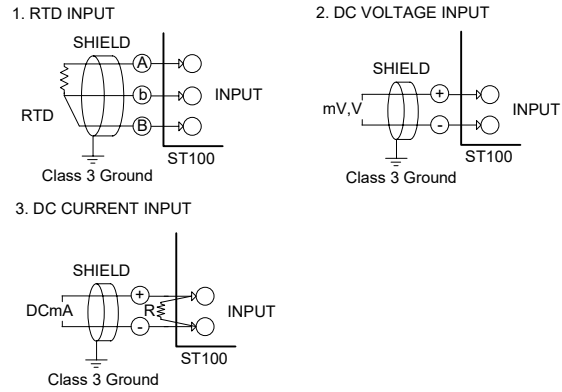
COMM GROUP

Symbol	Parameter	Setting Range	Unit	Initial	Remark
COM.P	Communication Protocol	PCC0, PCC1, MODBUS ASCII MODBUS RTU, SYNC-Master, SYNC-Slave	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
RBS	Remote Bias	EUS(-100.0 ~ 100.0%)	EUS	EUS(0.0%)	SYNC-Slave
SPSL	SP SELECT	LSP, RSP	ABS	LSP	Option

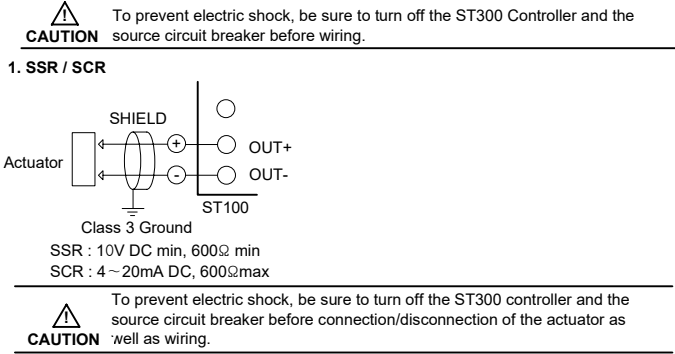
Power Cable Connection



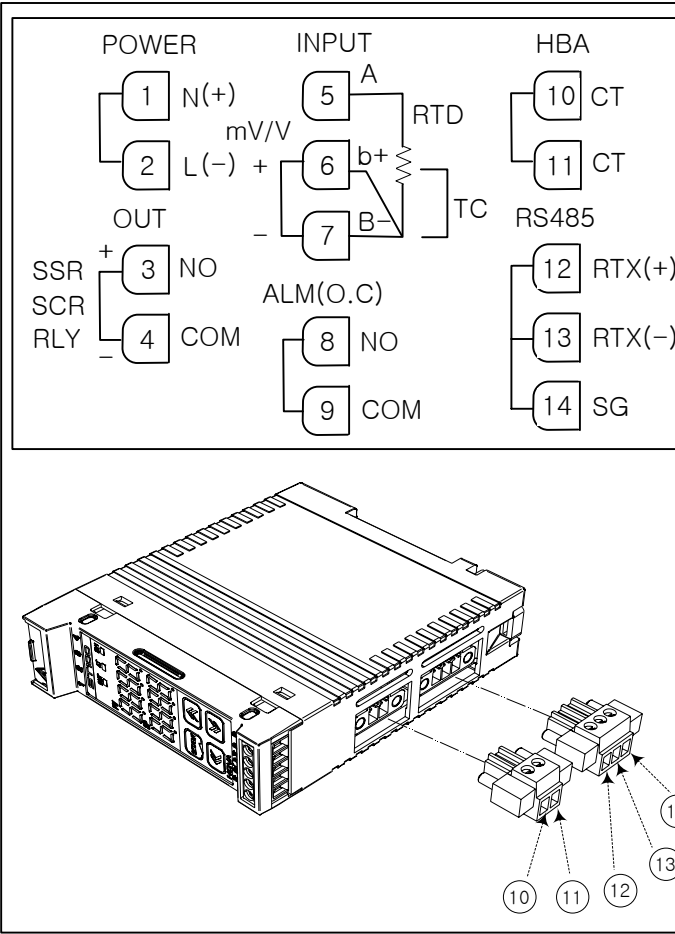
ANALOG INPUT Connection



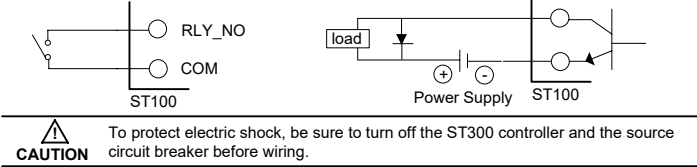
ANALOG OUTPUT Connection



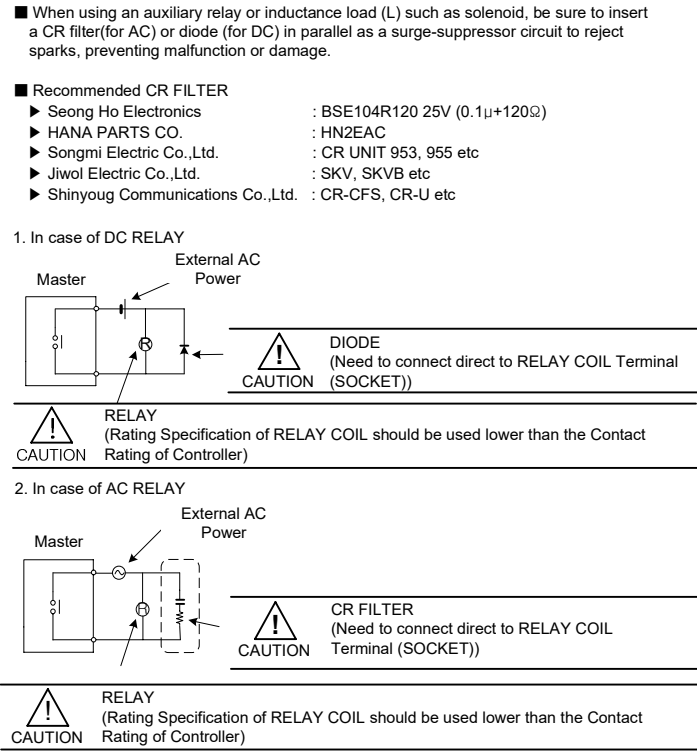
Terminal Arrangement and External wiring



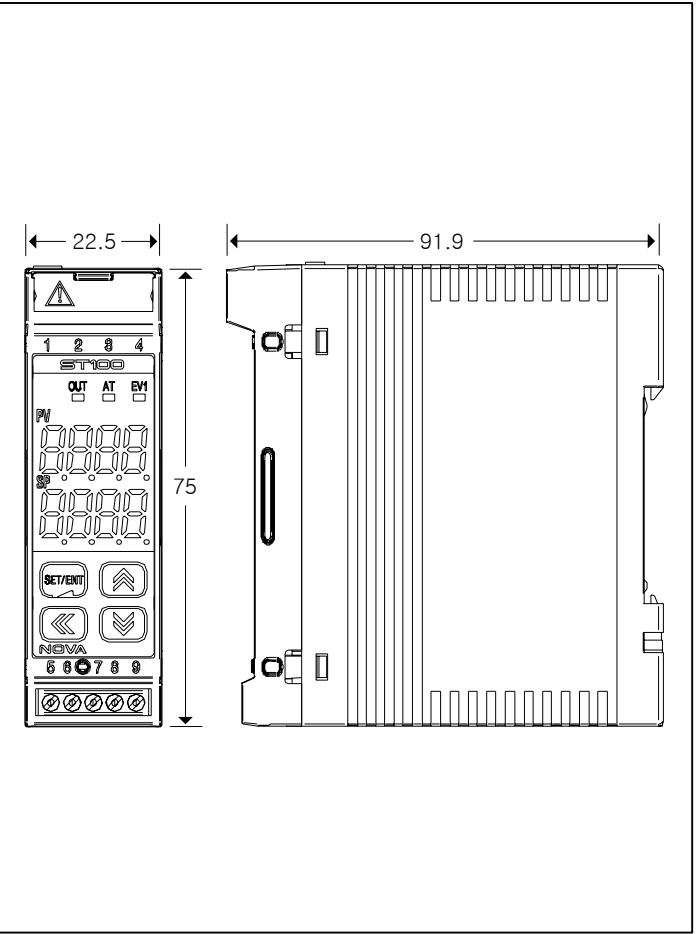
RELAY Connection



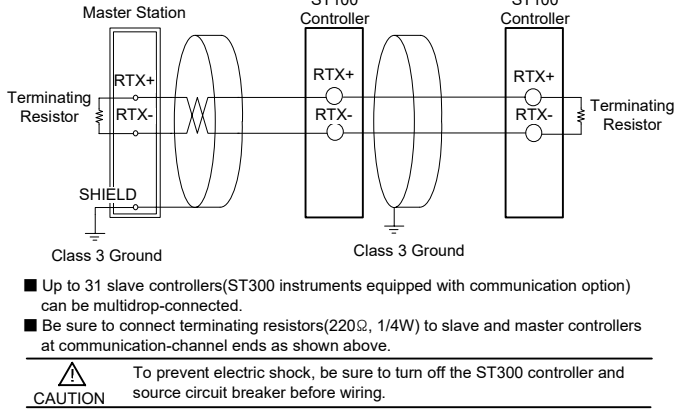
Use an Auxiliary RELAY



Dimension



Communication Wiring (RS485)

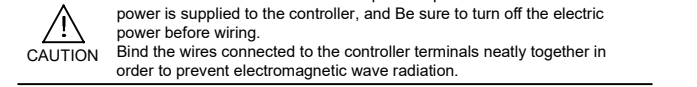


Power Cable Specification

Power Cable Specification(1,2 Terminal) : AWG16(1.3mm²)

Cable Specification

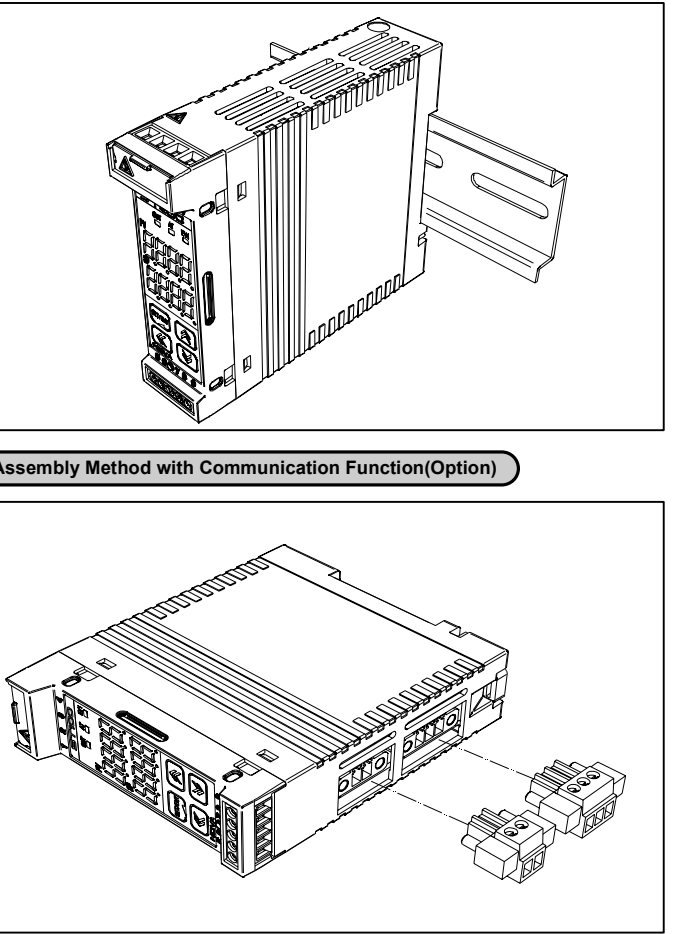
Cable Specification(3~9 Terminal) : AWG26-16(0.13mm² ~ 1.3mm²)



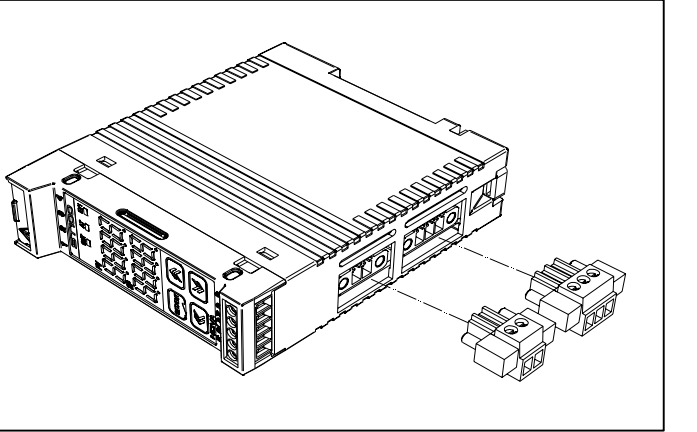
Display Error and Correction

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

RAIL Installation



Assembly Method with Communication Function(Optional)



D-Register

NO	PROCESS	FUNCTION	CONTROL	HBA	ALARM	PID	IN/OUT
0	0	100	200	300	400	500	600
0							
1	NPV		SP	HBCS	ALT1	ARW	IN-T
2	NSP			HBCD		FUZZY	IN-U
3			LOCK	HBDB		P	IN.RH
4			DSP.H			I	IN.RL
5		A/M	DSP.L			D	IN.DP
6	MVOUT				AL-1	MR	BS
7			ONOF			C.MOD	IN.SH
8			INIT				IN.SL
9							IN.FL
10							BSL
11			SPRH		AL1.H	O.ACT	CT
12			SPRL				CT
13							OH
14	ALSTS						OL
15							HYS.H
16			U.SLP		AL1.L		HYS.L
17			D.SLP				PO
18			SKDV				RSL
19							
20							
21		AT			A1DB		
22		AT-G					
23		AT.BS					
24							
25							
26					A1DY		
27							
28							
29							
30							
31							
32							
33							

NO	PROCESS	FUNCTION	CONTROL	HBA	ALARM	PID	IN/OUT
0	0	100	200	300	400	500	600
34							
35		US1					
36		US2					
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60							
61							COM.P
62							BAUD
63							PRTY
64							SBIT
65							DLEN
66							ADDR
67							RP.TM

NO	PROCESS	FUNCTION	CONTROL	HBA	ALARM	PID	IN/OUT
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69							SPSL
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