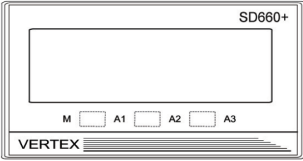


INSTRUCTION MANUAL FOR SD660+ MICROPROCESSOR INDICATOR

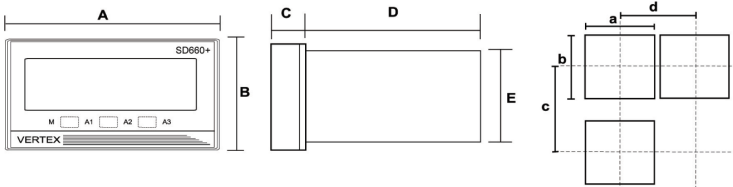
FRONT PANEL DESCRIPTION



- (1) M — Control output status indicator
- (2) A1 — Alarm 1 output status indicator
- (3) A2 — Alarm 2 output status indicator
- (4) A3 — Alarm 3 output status indicator

- (1) The key between these two led indicators M A1 is **SET** SEL KEY.
Press once to access the next programmable parameter.
Press for 5 seconds to move from one programming level to next.
- (2) The key between these two led indicators A1 A2 is **▲** UP KEY.
Press to increase the set point or parameter value.
- (3) The key between these two led indicators A2 A3 is **▼** DOWN KEY.
Press to decrease the set point or parameter value.
- (4) **SET** + **▲** Press the SET and UP keys once to return to normal Process Value display.
- (5) **SET** + **▼** Press the SET and DOWN keys simultaneously for 5 seconds to access "LnLo" and "LnHi" parameters.

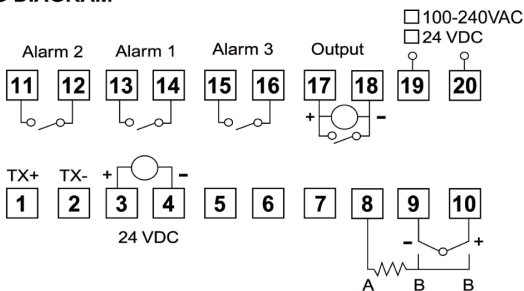
PANEL CUTOUT



Model	A	B	C	D	E	a	b	c	d
SD660+	96	48	9	80	45	92±0.5	45±0.5	48	120

(Unit:mm)

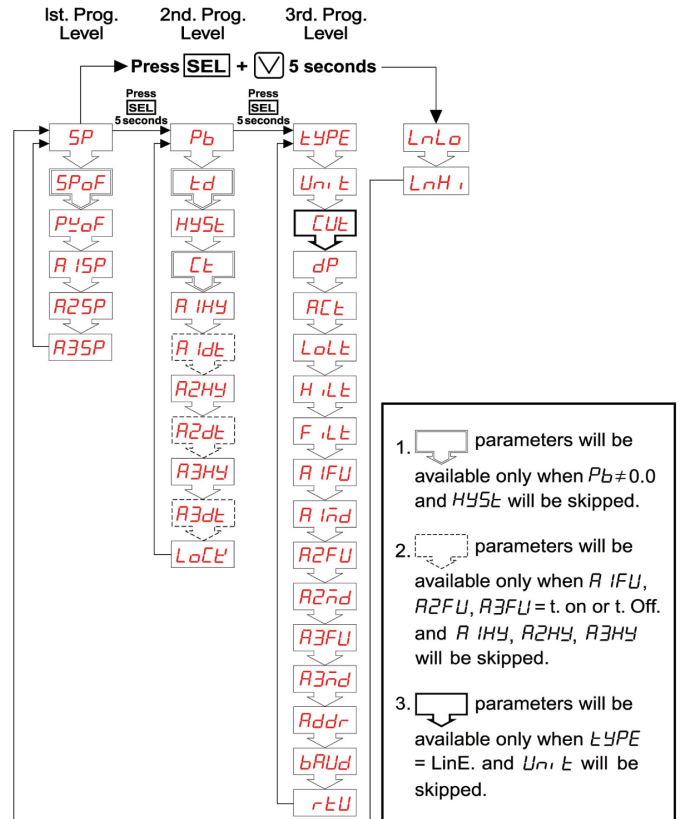
WIRING DIAGRAM



WIRING PRECAUTIONS

1. Before wiring, verify the controller label for correct model number and option.
2. For thermocouple input, use the appropriate compensation wire. And note the polarity of input signal.
3. To avoid noise induction, keep input signal wire away from instrument power line, load lines and power lines of other electric equipment.

PROGRAMMING LEVEL PARAMETERS



1. parameters will be available only when $P_b \neq 0.0$ and $HYSL$ will be skipped.
2. parameters will be available only when $RIFU$, $R2FU$, $R3FU = t.$ on or t. Off. and $R1HY$, $R2HY$, $R3HY$ will be skipped.
3. parameters will be available only when $LTYPE = LinE$. and $LnLo$ and $LnHi$ will be skipped.

PARAMETER DESCRIPTION

FIRST PROGRAMMING LEVEL PARAMETERS

CODE	DESCRIPTION	RANGE	DEFAULT
SP	Set point value of control	LoLt — HiLt	500
SPoF	Set point offset : Offset (manual reset) value for P control only.	-1000-1000 (-100.0-100.0)	0
PyoF	Process value offset : Use to offset the PV indication from the actual PV	-1000-2000 (-100.0-200.0)	0
A1SP	Alarm 1 setting value	-1999—9999	10
A2SP	Alarm 2 setting value	-1999—9999	10
A3SP	Alarm 3 setting value	-1999—9999	10

SECOND PROGRAMMING LEVEL PARAMETERS

CODE	DESCRIPTION	RANGE	DEFAULT
Pb	Proportional band variable. Set to 0.0 for ON/OFF control mode.	0.0-300.0%	0.0
td	Derivative (Rate). When $P_b = 0.0$, this parameter will not appear.	0-900sec	0
HYSL	Hysteresis for ON/OFF control action on output. When $P_b \neq 0.0$ this parameter will not appear.	0-2000 (0.0-200.0)	1
CL	Proportional cycle time of control output. When $P_b = 0.0$ this parameter will not appear. Set to 15 or 20 for relay output. Set to 1 or 2 for SSR output. Set to 0 for current output.	0-100sec	15
A1HY	Hysteresis of alarm 1 action. When $RIFU = t.$ on or t.Off, $A1HY$ is not displayed.	0-2000	0

A1dt	Delay time of alarm 1 action when AlFu = t.on or t.Off	99 MM. 59 SS. 99 HH. 59MM.	
A2Hy	Hysteresis of alarm 2 action. When A2Fu = t.on or t.Off, A2Hy is not displayed.	0-2000	0
A2dt	Delay time of alarm 2 action when A2Fu = t.on or t.Off	99 MM. 59 SS. 99HH. 59 MM.	
A3Hy	Hysteresis of alarm 3 action. When A3Fu = t.on or t.Off, A3Hy is not displayed.	0-2000	0
A3dt	Delay time of alarm 3 action when A3Fu = t.on or t.Off	99 MM. 59 SS. 99HH. 59 MM.	
LoCk	Parameter lock. This security feature locks out selected levels or single parameters prohibiting tampering and inadvertent programming changes.		0100
	000 All parameters are locked.		
	0001 Only SP is adjustable.		
	0010 USE (level) and A1(parameter) are adjustable.		
	0011 USER · PID(level) and A1 · A2(parameter) are adjustable.		
	0100 USER · PID · OPT1(level) and A1 · A2(parameter) are adjustable.		
	1000 Additional A3(par meter). All parameter you can find out, but can't adjustable.		
	1001 Additional A3(parameter) · only SP is adjustable.		
	1010 Addit onal A3(parameter). USER(level) and A1(parameter) are adjustable.		
	1011 USER · PID (level) and A1 · A2 · A3 (parameter) are adjustab e.		
1100 All parameters in all level are opened.			

Act	Control Output action.	reU : Reverse action for heating. dir : Direct action for cooling.	reU
LoLt	Low limit of span or range. Set the low limit lower than the lowest expected SV and PV display.	Full range	0
HiLt	High limit of span or range. Set the high limit higher than highest expected SV and PV display.	Full range	1000
FiLt	Input signal filter.	0.0-99.9	10.0
AlFu	Alarm 1 function. Refer to alarm function section for detail.	A.oFF, A.Hi, A.Lo, A.di.H, A.di.L, A.bd.H, A.bd.L, A.t.on, A.t.oF, b.oFF, b.Hi, b.Lo, b.di.H, b.di.L, b.bd.H, b.bd.L, b.t.on, b.t.oF	AdiH
Alnd	Alarm 1 mode. Refer to alarm mode section for detail.	A.oFF,Stdy, Lath, St.La HH.mm, mm.SS n.mS, nH.m	RoFF
A2Fu	Alarm 2 function. Refer to alarm function section for detail	A.oFF, A.Hi, A.Lo, A.di.H, A.di.L, A.bd.H, A.bd.L, A.t.on, A.t.oF, b.oFF, b.Hi, b.Lo, b.di.H, b.di.L, b.bd.H, b.bd.L, b.t.on, b.t.oF	AdiL
A2nd	Alarm 2 mode. Refer to alarm mode section for detail.	A.oFF, Stdy, Lath, St.La HH.mm, mm.SS n.mS, nH.m	RoFF
A3Fu	Alarm 3 function. Refer to alarm function section for detail	A.oFF, A.Hi, A.Lo, A.di.H, A.di.L, A.bd.H, A.bd.L, A.t.on, A.t.oF, b.oFF, b.Hi, b.Lo, b.di.H, b.di.L, b.bd.H, b.bd.L, b.t.on, b.t.oF	AdiL
A3nd	Alarm 3 mode. Refer to alarm mode section for detail.	A.oFF, Stdy, Lath, St.La HH.mm, mm.SS n.mS, nH.m	RoFF
Addr	Address of controller when communication with master device.	0-255	0
baud	Communication baud rate. 2.4k=2400bps, 4.8k=4800 bps, 9.6k=9600 bps, 19.2k=19200 bps	2.4k, 4.8k, 9.6k, 19.2k	9.6k
reU	Communication data format, data length bit : 8 bits, stop bit : 1.2 bits	n81 n82	n82

THIRD PROGRAMMING LEVEL PARAMETERS

CODE	DESCRIPTION	RANGE	DEFAULT		
tyPE	Input type selection	Refer to figure	K		
	TYPE			RANGE(°C)	RANGE(°F)
	J			-50 ~ 1000	-58 ~ 1832
	K			-50 ~ 1370	-58 ~ 2498
	T			-270 ~ 400	-454 ~ 752
	E			-50 ~ 750	-58 ~ 1382
	B			0 ~ 1800	32 ~ 3272
	R			0 ~ 1750	32 ~ 3182
	S			0 ~ 1750	32 ~ 3182
	N			-50 ~ 1300	-58 ~ 2372
	C			-50 ~ 1800	-58 ~ 3272
	D-PT			-200 ~ 850	-328 ~ 1652
	J-PT			-200 ~ 650	-328 ~ 1202
LINE	-1999 ~ 9999				
Un it	Unit of process value. This parameter is not displayed when tyPE = LinE	oC : Degrees C oF : Degrees F	°C		
CUt	Used to specify the process value when linear input (type=line) signal is out of range. None = this function is not used. Lo = The process value will be limited to LoLt when input signal is lower than the scale range. Hi = The process value will be limited to HiLt when input signal is higher than the scale range. Lo.Hi = The process value will be limit within the range of LoLt to HiLt when input signal is out of scale.	nonE · Lo Hi · Hi.Lo	nonE		
dP	Decimal Point selection. 0000 : No decimal point. 000.0 : 0.1 resolution 00.00 : 0.01 resolution, used for linear input only. 0.000 : 0.001 resolution, used for linear input only. After change decimal point, make sure all other setting of parameters are correct.	0000 000.0 00.00 0.000	0000		

Scaling for Linear Input

- Press the SET and DOWN keys simultaneously for 5 seconds to access "LnLo" parameter.
- Adjust "LnLo" setting to correspond the low scale and after adjustment press **SET** key once to access "LnHi" parameter.
- Adjust "LnHi" setting to correspond the high scale and after adjustment press **SET** key once for normal operation.

Code	Description	Range	Default
LnLo	Low Scale of Linear Input	-1999~9999(-199.9~999.9)	0.0
LnHi	High Scale of Linear Input	-1999~9999(-199.9~999.9)	100.0

ALARM FUNCTION

Select the alarm function

A.oFF – Alarm action off.

A.Hi – Process high alarm with Form A contact

A.Lo – Process low alarm with Form A contact

A.di.H – Deviation high alarm with Form A contact

A.di.L – Deviation low alarm with Form A contact

A.bd.H – Deviation band high alarm with Form A contact

A.bd.L – Deviation band low alarm with Form A contact

A.t.on – On-timer with Form A contact

A.t.oF – Off-timer with Form A contact

b.noE – Alarm action off

b.Hi – Process high alarm with Form B contact

b.Lo – Process low alarm with Form B contact

b.di.H – Deviation high alarm with Form B contact

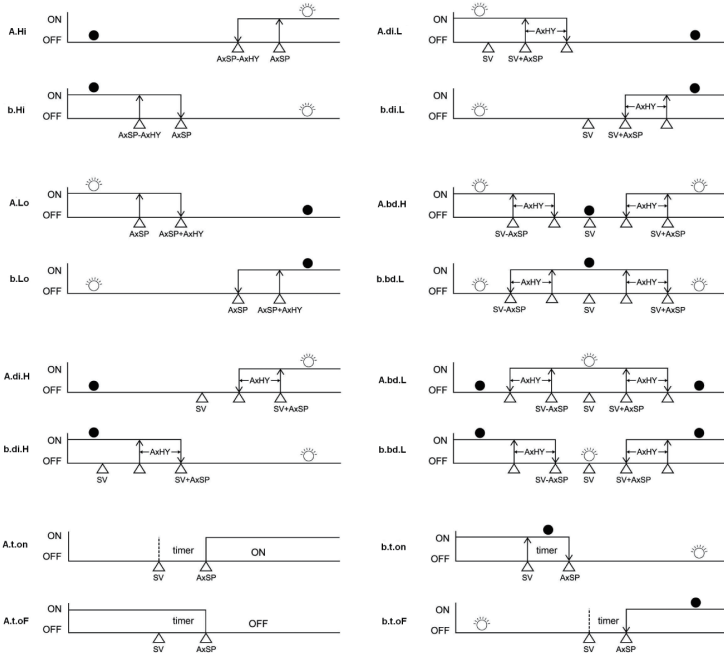
b.di.L – Deviation low alarm with Form B contact

b.bd.H – Deviation band high alarm with Form B contact

b.bd.L – Deviation band low alarm with Form B contact

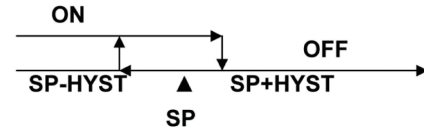
b.t.on – On-timer with Form B contact

b.t.oF – Off-timer with Form B contact



$\overline{nn}SS$	99Minutes 59Seconds Time scale of timer alarm (Hour/Minute) with latch. The timer start countdown when alarm occurs. the timer will not be reset even if the alarm condition has been cleared
$nH\overline{n}$	Time scale of timer alarm (Hour/Minute) without latch, the timer start countdown when alarm occurs and the timer is reset if the alarm condition has been cleared.
$n\overline{n}S$	Time scale of timer alarm (Minute/Second) without latch, the timer start countdown when alarm occurs and the timer is reset if the alarm condition has been cleared.

The controller can also be set to ON/OFF, P and PD control mode. Set Pb = 0 for ON/OFF control mode. The Hysteresis (dead band) of ON/OFF control can be set as follow :



ERROR MESSAGE AND TROUBLESHOOTING

Symptom	Probable	Solution
$oPEr$	-Sensor break error -Sensor not connected	-Replace sensor -Check the sensor is connected correctly
$AdEr$	-A/D converter damage	-Unit must be repaired or replaced. -Check for outside source of damage such as transient voltage spikes.
$AtEr$	-Auto tune time out error	Set Pb, ti, td manually.
Keypad no function	-Keypads are locked -Keypads defective	-Set "Lock" to a proper value -Replace keypads
Process value unstable	-Improper setting of Pb, Ti, Td and CT	-Start AT process to set Pb, Ti, Td automatically -Set Pb, Ti, Td manually
No heat or output	-No heater power or fuse open -Output device defective or incorrect output used	-Check output wiring and fuse -Replace output device
All LED's and display not light	-No power to controller -SMPS failure	-Check power lines connection -Replace SMPS
Process Value changed abnormally	-Electromagnetic Interference (EMI) -Radio Frequency Interference (RFI)	-Suppress arcing contacts in system to eliminate high voltage spike sources. -Separate sensor and controller wiring from "dirty" power lines. Ground heaters
Entered data lost	-Fail to enter data to EEPROM	-Replace EEPROM

ALARM MODE

A1MD/A2MD	DESCRIPTION
$nonE$	Normal alarm mode/ When timer function is selected, PV<SV timer function is not available.
$Stdy$	Standby mode When selected, in any alarm function, prevents an alarm on power on. The alarm is enabled only when the process value reach alarm set point. Also known as "Startup inhibit" and is useful for avoiding alarm trips during startup.
$LA\overline{t}H$	Latch mode. When selected, the alarm output and indicator latch as the alarm occurs. The alarm output and indicator will be energized even if the alarm condition has been cleared unless the power is shut off.
$StLA$	Standby and latch mode
$HH\overline{nn}$	99Hours 59 Minutes Tme scale of timer alarm (Hour/Minute) with latch. The timer start countdown when alarm occurs. the timer will not be reset even if the alarm condition has been cleared