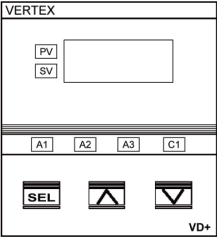


INSTRUCTION MANUAL FOR VD+ SERIES LOW COST TEMPERATURE CONTROLLER

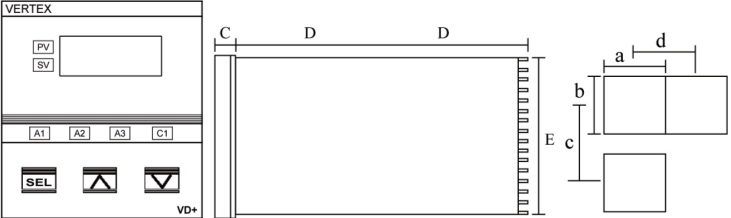
FRONT PANEL DESCRIPTION



- (1) PV - Process Value
- (2) SV - Setting Value
- (3) C1 - Control 1 LED
- (4) A1 - Alarm 1 LED
- (5) A2 - Alarm 2 LED
- (6) A3 - Alarm 3 LED

- (1) **SET** - SET KEY. Press once to access the next programmable parameter. Press for 5 seconds to move from one programming level to next.
- (2) **UP** - UP KEY. Press to increase the set point or parameter value.
- (3) **DOWN** - DOWN KEY. Press to decrease the set point or parameter value.
- (4) **SET** **DOWN** - Press the SET and DOWN keys once to return the normal Process Value display.
- (5) **SET** **DOWN** - Press the SET and DOWN keys simultaneously for 5 seconds to access "LnLo" and "LnHi" parameters.

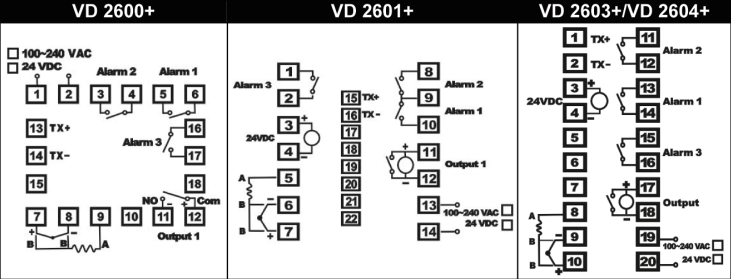
PANEL CUTOUT



Model	A	B	C	D	E	a	b	c	d
VD2600+	48	48	6	100	45	45±0.5	45±0.5	60	48
VD2601+	72	72	9	80	67	68±0.5	68±0.5	90	72
VD2603+	96	48	9	80	45	92±0.5	45±0.5	48	120
VD2604+	96	96	10	80	91	92±0.5	92±0.5	120	96

(Unit:mm)

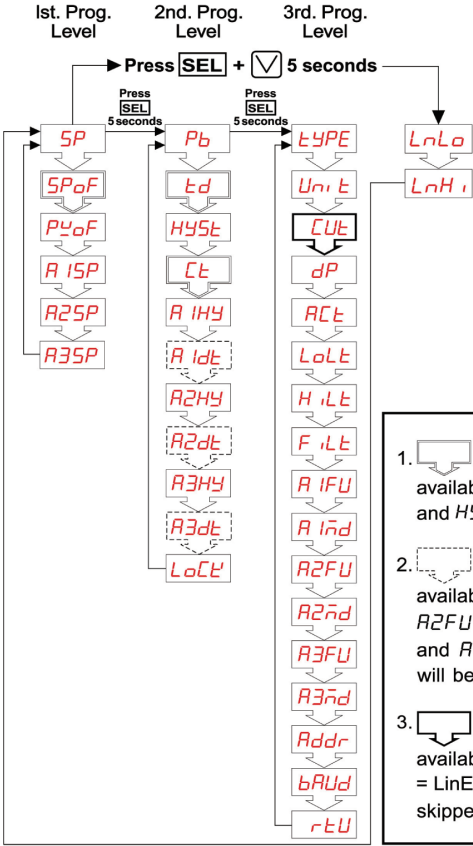
WIRING DIAGRAM



WIRING PRECAUTIONS

- Before wiring, verify the controller label for correct model number and option.
- For thermocouple input, use the appropriate compensation wire. And note the polarity of input signal.
- 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



- parameters will be available only when $Pb \neq 0.0$ and $HYSt$ will be skipped.
- parameters will be available only when $A1FU$, $A2FU$, $A3FU = t$. on or t. Off. and $A1HY$, $A2HY$, $A3HY$ will be skipped.
- parameters will be available only when $tYPE = LinE$. and UnL will be skipped.

PARAMETER DESCRIPTION

FIRST PROGRAMMING LEVEL PARAMETERS

CODE	DESCRIPTION	RANGE	DEFAULT
SP	Set point value of control	LoL — HiL	500
SPoF	Set point offset : Offset (manual reset) value for P control only.	-1000-1000 (-100.0-100.0)	0
PLoF	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 $Pb = 0.0$, this parameter will not appear.	0-900sec	0
HYSt	Hysteresis for ON/OFF control action on output. When $Pb \neq 0.0$ this parameter will not appear.	0-2000 (0.0-200.0)	1

CE	Proportional cycle time of control output. When Pb = 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
R1HY	Hysteresis of alarm 1 action. When R1FU = t.on or t.Off, R1HY is not displayed.	0-2000	0
R1dt	Delay time of alarm 1 action when R1FU = t.on or t.Off	99 MM. 59 SS. 99 HH. 59 MM.	
R2HY	Hysteresis of alarm 2 action. When R2FU = t.on or t.Off, R2HY is not displayed.	0-2000	0
R2dt	Delay time of alarm 2 action when R2FU = t.on or t.Off	99 MM. 59 SS. 99 HH. 59 MM.	
R3HY	Hysteresis of alarm 3 action. When R3FU = t.on or t.Off, R3HY is not displayed.	0-2000	0
R3dt	Delay time of alarm 3 action when R3FU = t.on or t.Off	99 MM. 59 SS. 99 HH. 59 MM.	
LoCE	Parameter lock. This security feature locks out selected levels or single parameters prohibiting tampering and inadvertent programming changes.		0100
	0000 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 · OPTI(level) and A1 · A2(parameter) are adjustable.		
	1000 Additional A3(parameter). All parameter you can find out, but can't adjustable.		
	1001 Additional A3(parameter) · only SP is adjustable.		
	1010 Additional A3(parameter). USER(level) and A1(parameter) are adjustable.		
	1011 USER · PID (level) and A1 · A2 · A3 (parameter) are adjustable.		
1100 All parameters in all level are opened.			

THIRD PROGRAMMING LEVEL PARAMETERS

CODE	DESCRIPTION	RANGE	DEFAULT		
TYPE	Input type selection		Refer to figure	K	
	TYPE	RANGE(℃)			RANGE(℉)
	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				
Unit	Unit of process value. This parameter is not displayed when TYPE = LinE		°C : Degrees C °F : Degrees F	℃	
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
ACE	Control Output action.	REY : Reverse action for heating. d r : Direct action for cooling.	REY
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
RIFU	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	Rd iH
RInd	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
R2FU	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	Rd iL
R2nd	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
R3FU	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	Rd iL
R3nd	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
rtU	Communication data format, data length bit : 8 bits, stop bit : 1.2 bits	n8 1 n82	n82

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.

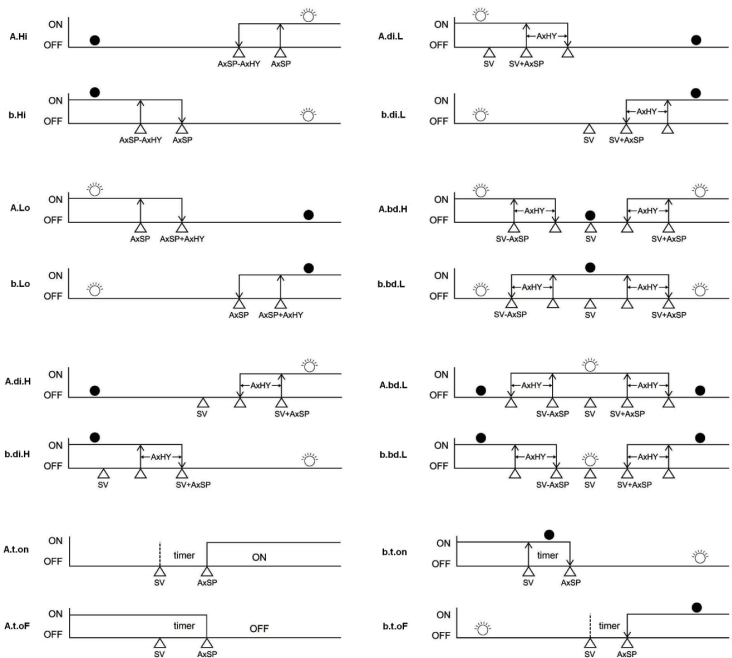
Code	Description	Range	Default
LnLo	Low Scale of Linear Input	-1999~9999(-199.9~999.9)	0.0
LnHi	High Scale of Linear Input	-1999~9999(-199.9~999.9)	100.0

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

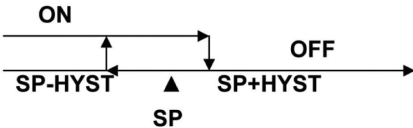


ALARM MODE

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.
LAteH	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.
SELA	Standby and latch mode
HHn	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

nn55	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
nHn	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.
nn5	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) 0f 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