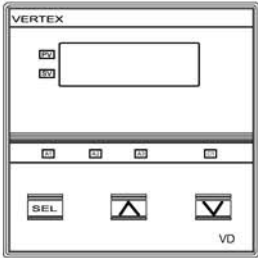


## INSTRUCTION MANUAL FOR VD SERIES LOW COST TEMPERATURE CONTROLLERS

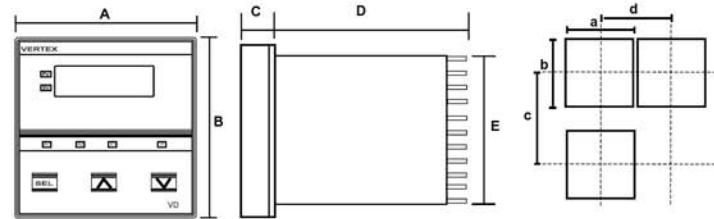
### FRONT PANEL DESCRIPTION:



- (1) PV – Process Value/Parameter indicator
- (2) SV – Setting Value indicator
- (3) C1 – Control output status indicator
- (4) A1 – Alarm 1 output status indicator
- (5) A2 – Alarm 2 output status indicator
- (6) A3 – Alarm 3 output status indicator

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

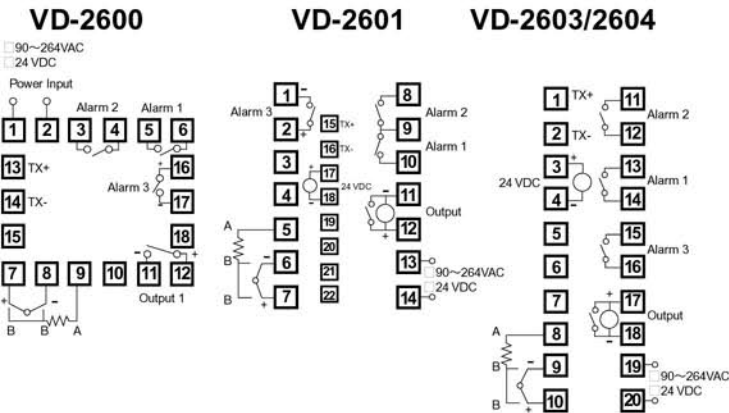
### PANEL CUTOUT:



Model	A	B	C	D	E	a	b	c	d
VD-2600	48	48	6	100	45	45+0.5	45+0.5	60	48
VD-2601	72	72	9	80	67	68+0.5	68+0.5	90	72
VD-2603	96	48	9	80	45	92+0.5	45+0.5	48	120
VD-2604	96	96	10	80	91	92+0.5	92+0.5	120	96

(Unit:mm)

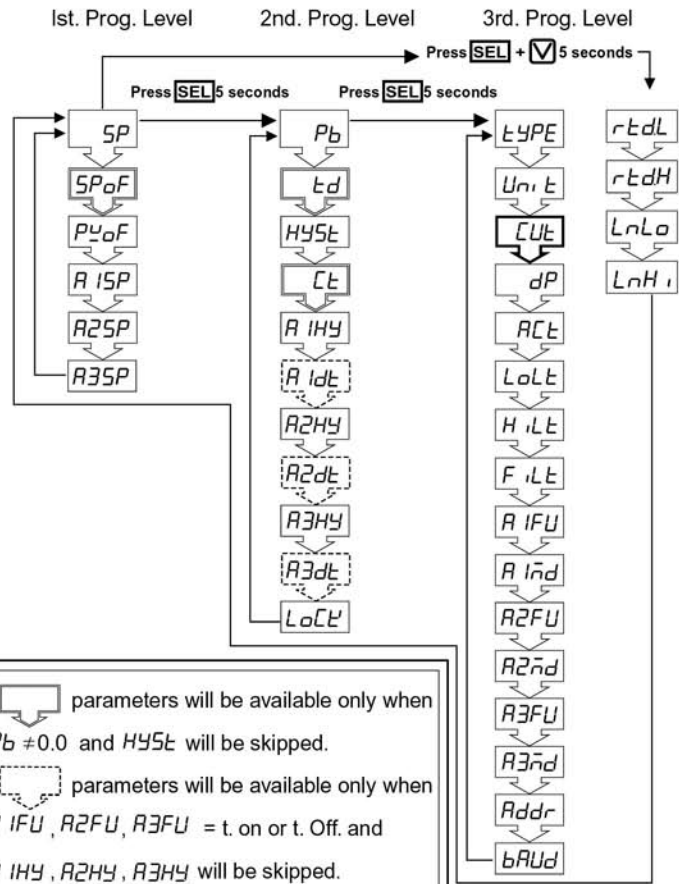
### WIRING DIAGRAM:



### 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  $AIFU, A2FU, A3FU = t.$  on or t. Off, and  $A1HY, A2HY, A3HY$  will be skipped.
2. parameters will be available only when  $TYPE = LinE.$  and  $UnL$  will be skipped.

### FIRST PROGRAMMING LEVEL PARAMETERS (USER LEVEL)

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
PVoF	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 (PID LEVEL)

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
Ct	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 $AIFU = t.$ on or t. Off, $A1HY$ is not displayed.	0-2000	1
A1dL	Delay time of alarm 1 action when $AIFU = t.$ 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	1

<i>R2dt</i>	Delay time of alarm 2 action when <i>R2FU</i> = t.on or t.Off	99 MM. 59 SS. 99 HH. 59MM.		
<i>R3HY</i>	Hysteresis of alarm 3 action. When <i>R3FU</i> = t.on or t.Off, <i>R3HY</i> is not displayed.	0-2000	1	
<i>R3dt</i>	Delay time of alarm 3 action when <i>R3FU</i> = t.on or t.Off	99 MM. 59 SS. 99 HH. 59MM.		
<i>LoL</i>	Parameter lock. This security feature locks out selected levels or single parameters prohibiting tampering and inadvertent programming changes.	0100		
	SETTING			DESCRIPTION
	0000			All parameters are locked.
	0001			Only SP is adjustable.
	0010			USER (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 (OPTION LEVEL)

CODE	DESCRIPTION	RANGE	Default
<i>tYPE</i>	Input type selection.		
	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		
		Refer to figure.	K

<i>Unit</i>	Unit of process value. This parameter is not displayed when <i>tYPE</i> = LinE	<i>αC</i> :Degrees C. <i>αF</i> :Degrees F.	°C
<i>LUE</i>	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
<i>dP</i>	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

<i>Act</i>	Control Output action.	<i>rEY</i> :Reverse action for heating. <i>d ir</i> :Direct action for cooling	<i>rEY</i>
<i>LoL</i>	Low limit of span or range. Set the low limit lower than the lowest expected SV and PV display.	Full range.	0
<i>HiL</i>	High limit of span or range. Set the high limit higher than highest expected SV and PV display.	Full range.	1000
<i>F iL</i>	Input signal filter.	0.0-99.9	10.0
<i>R iFU</i>	Alarm 1 function. Refer to alarm function section for detail.	nonE, Hi, Lo, dif.H, dif.L, bd.Hi, bd.Lo, t.on, t.oFF	<i>d iFH</i>
<i>R iNd</i>	Alarm 1 mode. Refer to alarm mode section for detail.	nonE, StdY, Lath, St.La HH.mm, mm.SS	nonE
<i>R2FU</i>	Alarm 2 function. Refer to alarm function section for detail	nonE, Hi, Lo, dif.H, dif.L, bd.Hi, bd.Lo, t.on, t.oFF	<i>d iFH</i>
<i>R2Nd</i>	Alarm 2 mode. Refer to alarm mode section for detail.	nonE, StdY, Lath, St.La HH.mm, mm.SS	nonE
<i>R3FU</i>	Alarm 3 function. Refer to alarm function section for detail	nonE, Hi, Lo, dif.H, dif.L, bd.Hi, bd.Lo, t.on, t.oFF	<i>d iFL</i>
<i>R3Nd</i>	Alarm 3 mode. Refer to alarm mode section for detail.	nonE, StdY, Lath, St.La HH.mm, mm.SS	nonE
<i>Addr</i>	Address of controller when communication with master device.	0-255	0
<i>bAUd</i>	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

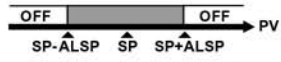
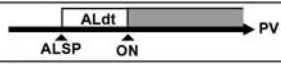
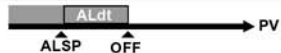
Scaling for Linear Input

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

CODE	DESCRIPTION	RANGE	DEFAULT
<i>rEdL</i>	Low Scale of PT100	Not adjustable	0.0
<i>rEdH</i>	Hight Scale of PT100	Not adjustable	800.0
<i>LnLo</i>	Low Scale of Linear Input	-1999-9999 (-199.9-999.9)	0.0
<i>LnHi</i>	Hight Scale of Linear Input	-1999-9999 (-199.9-999.9)	100.0

ALARM FUNCTION

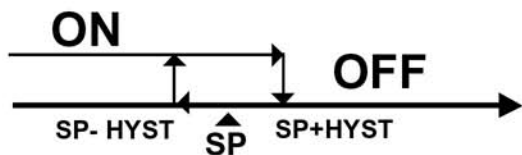
A1FU/A2FU/A3FU	ALARM TYPE	ALARM OUTPUT OPERATION
<i>nonE</i>	Alarm function OFF	Output OFF
<i>Hi</i>	PV high alarm	
<i>Lo</i>	PV low alarm	
<i>d iFH</i>	Deviation high alarm	
<i>d iFL</i>	Deviation low alarm	
<i>bdHi</i>	Band high alarm	

<i>bdLo</i>	Band low alarm	
<i>t.on</i>	PV high alarm with delay time	
<i>t.off</i>	PV low alarm with delay time	

## ALARM FUNCTION

ALMD	DESCRIPTION
<i>nonE</i>	Normal alarm mode
<i>Stdy</i>	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.
<i>LAtH</i>	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.
<i>StLR</i>	Standby and latch mode
<i>HH.n̄n̄</i>	99 Hours 59 Minutes
<i>n̄n̄.55</i>	99 Minutes 59 Seconds

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
<i>oPEr</i>	-Sensor break error -Sensor not connected	-Replace sensor -Check the sensor is connected correctly
Keypad no function	-Keypads are locked -Keypads defective	-Set "LoLk" to a proper value -Replace keypads
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) or 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

\* VERTEX 2007-A

VERTEX is constantly striving to improve its high-quality products, the information contained in this manual is subject to change without notice. Every precaution has been taken in the preparation of this manual.