Temperature Controller / Indicator

VD2000 / VD2001 / VD2003 / VD2004 Series

- ☑ T/C, RTD, Linear Input selection.
- ☑ P, PD, ON/OFF control mode selective.
- ☑ Universal Power Supply: 90~264VAC, 50/60Hz
- ☑ DC/AC 24V is also available for option
- ☑ Max. 3 Alarm outputs available option
- ☑ Standby and Latch mode can be combined with 8 different alarm function.
- ☑ Retransmission or RS-485 communication (MODBUS RTU) is available for option.

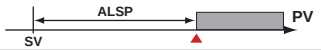
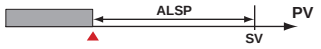
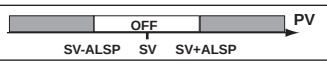
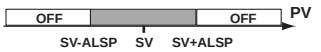
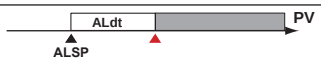
SPECIFICATION

Input	Thermocouple (J, K, R, S, T, E, B, N, C type) DIN Pt100 Ω or JIS Pt100 Ω Linear (4~20mA, 0~50mV, 1~5V, 0~10V.....)
Accuracy	± 1°C for Thermocouple Input ±0.2°C for Pt100 Ω ±3μV for Linear Input
Sampling Time	0.5 sec.
Control Mode	P. band 0.0~300.0% F.S. for P control Hysteresis range 0~2000 for ON/OFF control
Control Cycle	Relay Contact Output 15 sec. Pulsed Voltage Output (SSR) 1sec. Continuous Voltage (Current) Output 0 sec.
Output Mode	Relay Contact Output: 10A/240VAC (Resistive Load) Pulsed Voltage Output to Drive SSR: DC 0/24V (Min. 250 ohm) Continuous Current Output: 4~20mA (Resistive 600 ohm Max.) Continuous Voltage Output: 1~5V, 0~10V (Resistive Min. 600 ohm)
General	Rated Voltage 90~264V AC, 50/60Hz ; DC 24V Ambient Temperature/Humidity: 0~50°C, 0~90% Power Consumption less than 3VA

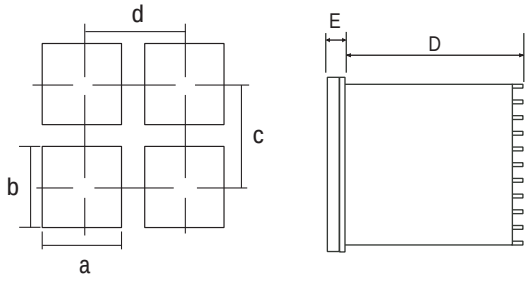
Input Type & Range

TYPE	Range - °C	Range - °F
J	-50~1000°C	-58~1832°F
K	-50~1370°C	-58~2498°F
T	-270~400°C	-454~752°F
E	-50~750°C	-58~1382°F
B	0~1800°C	32~3272°F
R	0~1750°C	32~3182°F
S	0~1750°C	32~3182°F
N	-50~1300°C	-58~2372°F
C	-50~1800°C	-58~3272°F
D-PT	-200~850°C	-328~1652°F
J-PT	-200~650°C	-328~1202°F
Linear	-1999~9999	

Alarm Function (A1FU, A2FU, A3FU)

Symbol	Description	Alarm Output Operation
nonE	No Alarm action	Alarm Output OFF
H,	PV High Alarm	
Lo	PV Low Alarm	
d,FH	Deviation High Alarm	
d,FL	Deviation Low Alarm	
bdH,	Band High Alarm	
bdLo	Band Low Alarm	
t.on	PV high alarm with delay time	
t.oFF	PV low alarm with delay time	

Panel Cutout (unit: mm)



Model No.	(W x H x D)	a	b	c	d	E
VD2000	48.0 x 48.0 x100.0	45+0.5	45+0.5	60	48	6
VD2001	72.0 x 72.0 x 80.0	68+0.5	68+0.5	90	72	9
VD2003	96.0 x 48.0 x 80.0	92+0.5	45+0.5	48	120	9
VD2004	96.0 x 96.0 x 80.0	92+0.5	92+0.5	120	96	10

HOW TO ORDER

VD200 [0] - [K] [4] [R] [1] [O] [A] [N]

Dimension	
0	48x48mm
1	72x72mm
3	96x48mm
4	96x96mm

Input Type	Range	
Please refer to the Input table. Normally, the initial setting is Input type "K" with Low-High limit is 0-400°C if there's no specified.	1	0~100°C
	2	0~200°C
	3	0~300°C
	4	0~400°C
	5	0~500°C
	⋮	⋮
	12	0~1200°C

Output	
R	Relay
P	SSR
A	4~20mA
B	0~20mA
C	0~5V
D	0~10V

Alarm Output	
1	One Alarm Output
2	Two Alarm Outputs
3	Three Alarm Outputs

Control Mode	
O	ON/OFF
P	P
D	PD

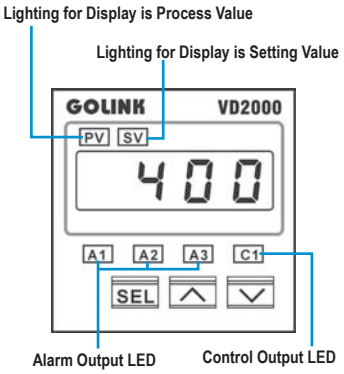
Power	
A	AC 90~264V 50/60Hz
B	DC 24V

OPTION	
N	None
R	Retransmission
C	RS-485 communication

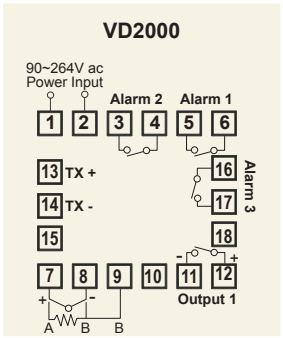
: Function is option with additional charge.

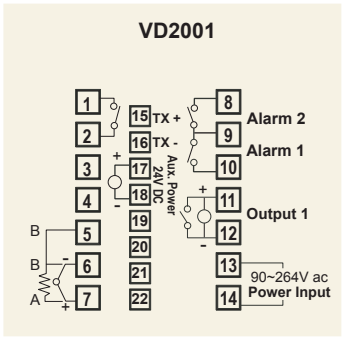
Note : Range for (LoLt & HiLt) could be specified when ordered, ex) 0~200°C, -50~200°C .....

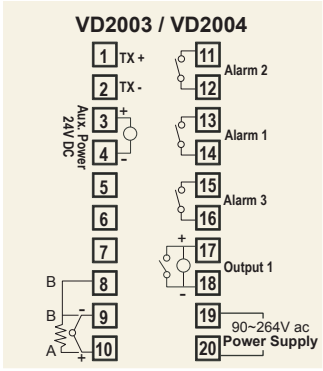
Operation Description VD-Series



Wiring Diagram







① ☞ SEL (Enter the 1st Level / Next Parameter)

② ☞ SEL (Enter the 2nd Level or 3rd Level)
(For 5 sec.)

③ ☞ ∧ (Increase the SV or adjust parameter setting)

④ ☞ ∨ (Decrease the SV or adjust parameter setting)

⑤ ☞ SEL & ∧ (Press both keys for back to PV Display)

LOCK CODE SELECTION

Code	Definition
0000	All parameters are locked
0001	Only SV is adjustable
0010	1st level + A1 parameters are adjustable
0011	1st & 2nd levels + A1 & A2 parameters are adjustable
0100	1st, 2nd, 3rd levels & A1, A2 parameters are adjustable
1000	Additional with A3, but all parameters can't adjustable
1001	Additional with A3, only SV is adjustable
1010	Ditto as 0010, but additional with A3 is adjustable
1011	Ditto as 0011, but additional with A3 is adjustable
1100	Ditto as 0100, but additional with A3 is adjustable

Error Message & Troubleshooting

Message	Probable	SOLUTION
oPEn	1) Sensor break error 2) Sensor not be connected	1) Replace sensor 2) Check the sensor be connected correctly
uuuu	1) Input signal over the High Limit 2) Incorrect input sensor selection	1) Set a higher value to high limit 2) Check connecting input & set correct TYPE
nnnn	1) Input signal below the Low Limit 2) Incorrect input sensor selection	1) Set a lower value to low limit 2) Check connecting input & set correct TYPE
Keypad No function	1) Keypads be locked 2) Keypads defective	1) Change "LOCK" setting with proper value 2) Replace keypads
No Heat or Output	1) No heater power or fuse open 2) Output device defective or incorrect output usage	1) Check output wiring and fuse 2) Replace output device
No any Display	1) No power to controller 2) SMPS failur	1) Check wiring for power source 2) Replace SMPS
PV changed abnormally	1) Electromagetic interference (EMI) or Radio frequency interference (RFI)	1) Suppress arcing contacts in system to eliminate high voltage spike sources. Separate sensor & controller wiring from "dirty" power lines. Ground Heaters.
Data lost	1) Fail to enter data to EEPROM	1) Replace EEPROM

Parameter Description

Symbol	Description	Range	Default
Level ①	Press SEL key for accessing Level 1 from PV/SV		
SPoF	Setpoint Offset for eliminating error offset when P control mode is applied.	-1000~1000 -100.0~100.0	0
PvoF	(PV offset) for offset the PV indication from the actual PV	-1000~2000 -100.0~200.0	0
A1SP	Alarm 1 Setting point	-1999~9999	10
A2SP	Alarm 2 Setting point	-1999~9999	10
A3SP	Alarm 3 Setting point	-1999~9999	10
Level ②	Press SEL key for 5sec. from Level 1 to Level 2		
Pb	Proportional Band (Pb=0.0 for ON/OFF control)	0.0~300.0%	0.0
td	Derivative (Rate), Not appear when Pb=0.0	0~900 sec.	60
HYSt	Hysteresis for ON/OFF control action on output (Not appear when Pb≠0.0)	0~2000 (0.0~200.0)	2
Ct	Proportional cycle time of control output. (Not appear when Pb=0.0)	0~100 sec.	15
A1HY	Hysteresis of Alarm 1 action (Not appear when A1FU=t.on or t.off)	0~2000	0
A1dt	Delay time of alarm 1 action for A1FU=t.on or t.off	99M.59S or	99H.59M
A2HY	Hysteresis of alarm 2 action (Not appear when A2FU=t.on or t.off)	0~2000	0
A2dt	Delay time of alarm 2 action for A2FU=t.on or t.off	99M.59S or	99H.59M
A3HY	Hysteresis of alarm 3 action (Not appear when A3FU=t.on or t.off)	0~2000	0
A3dt	Delay time of alarm 3 action for A3FU=t.on or t.off	99M.59S or	99H.59M
LoCK	Parameter Lock, this security feature locks out selected levels or single parameters prohibiting tampering and inadvertent programming changes. (See description for each lock code as above table)		0100

Symbol	Description	Range	Default
Level ③	Press SEL key for 5sec. from Level 2 to Level 3		
tYPE	Input type selection (See the table)	(As table)	K or as order
Unit	Unit of PV (Not appear when Type=Line)	°C or °F	°C
CUt	For Input type = Line (nonE = no this function, Lo = signal will not lower than the Low limit, Hi=not over the high limit, Lo.Hi=limit within LoLt~HiLt)		nonE
dP	Decimal Point selection. (0000=No decimal point) 000.0=0.1 resolution 00.00=0.01 resolution 0.000=0.002 resolution	0000 000.0 00.00 0.000	0000
Act	Control output action (rEV for heating or dir for cooling)	rEVor dir	rEV
LoLt	Low Limit value for the expected SV & PV display	Full range	0
HiLt	High Limit value for the expected SV & PV display	Full range	500
FiLt	Input signal filter	0.00~9.9	5.0
A1FU	Alarm 1 function (refer to function table)	(As table)	dIFH
A1md	Alarm 1 mode	nonE	nonE
A2FU	Alarm 2 function (refer to function table)	(As table)	dIFH
A2md	Alarm 2 mode	nonE	nonE
A3FU	Alarm 3 function (refer to function table)	(As table)	dIFL
A3md	Alarm 3 mode	nonE	nonE
Addr	Controller address when communication with master device	0~255	0
bAUd	Communication baud rate (2.4K=2400bps, 4.8K=4800bps, 9.6K=9600bps, 19.2K= 19200bps)	2.4K, 4.8K, 9.6K, 19.2K	9.6K

Note) 1. SPoF, td, Ct are available when Pb ≠0 and HYSt will be skipped.
2. A1dt, A2dt, A3dt are available when A1FU, A2FU, A3FU = t.on or t.oFF and A1HY, A2HY, A3HY will be skipped.