




DIGITAL CONTROLLER DC1000
SERIES
PRODUCT MANUAL



Symbol Definitions

The following table lists those symbols used in this document to denote certain conditions.

Symbol	Definition
	This CAUTION symbol on the equipment refers the user to the Product Manual for additional information. This symbol appears next to required information in the manual.
	WARNING PERSONAL INJURY: Risk of electrical shock. This symbol warns the user of the potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 Vdc may be accessible. Failure to comply with these instructions could result in death or serious injury.
	Protective Earth (PE) terminal. Provided for connection of the protective earth (green or green/yellow) supply system conductor.

Contents

1.	Installation.....	1
1.1	Model Number Interpretation.....	1
1.2	Specification	2
1.3	External Dimension	3
1.4	Mounting.....	4
1.5	Wiring Diagrams.....	4
1.5.1	DC1010.....	5
1.5.2	DC1020.....	6
1.5.3	DC1030.....	7
1.5.4	DC1040.....	8
2.	Configuration	9
2.1	Operator Interface	9
2.2	MODE Access	10
2.3	MODEs.....	11
2.3.1	Operation	11
2.3.2	Configuration 1	12
2.3.3	Configuration 2	13
2.4	Alarms	15
2.4.1	Deviation Alarm.....	15
2.4.2	Absolute Value Alarm.....	16
2.4.3	Program Alarm.....	17
2.4.4	System Alarm.....	17
2.5	Function Lock	18
3.	Input Codes	19
3.1	Thermocouples.....	19
3.2	RTDs	20
3.3	Linear Inputs.....	20
4.	Operation	21
4.1	Type of Control	21
4.1.1	Manual Operation	21
4.1.2	ON/OFF Control.....	21
4.1.2	PID Control	21
4.2	Set Point.....	21
4.3	Alarm Set Point	21
5.	Error Message	22

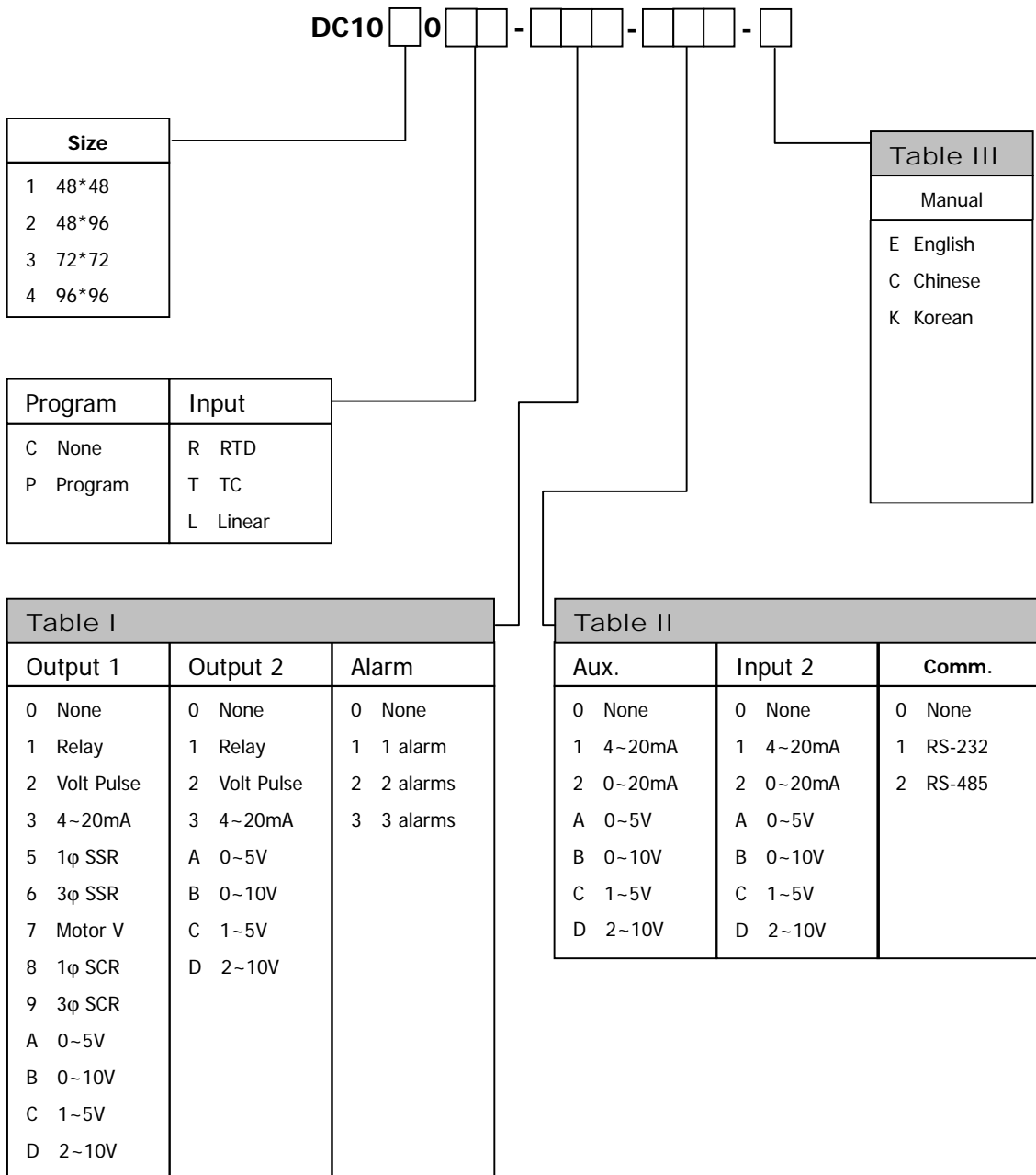
1. Installation



CAUTION

Installation should be performed only by personnel who are technically competent to do so. Local Regulations regarding electrical & safety must be observed.

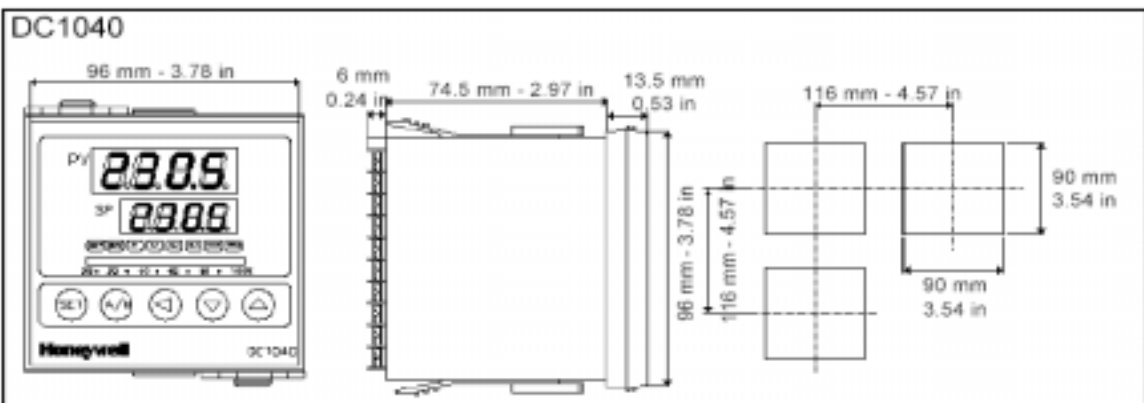
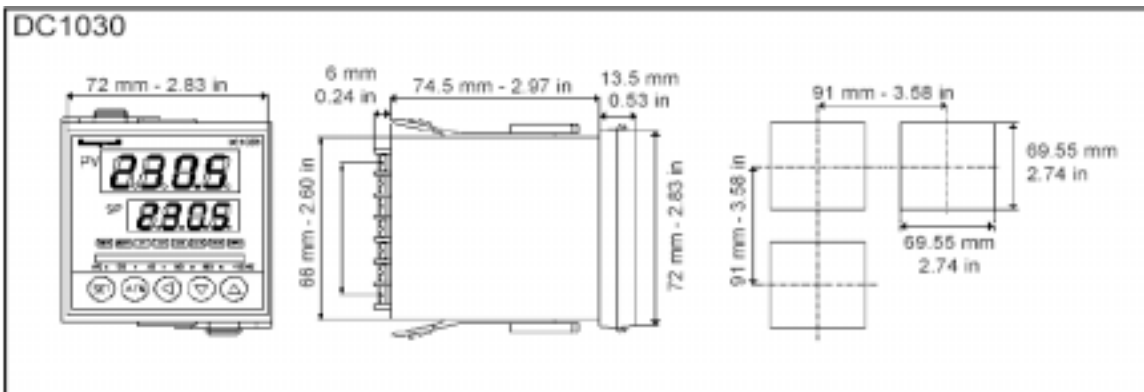
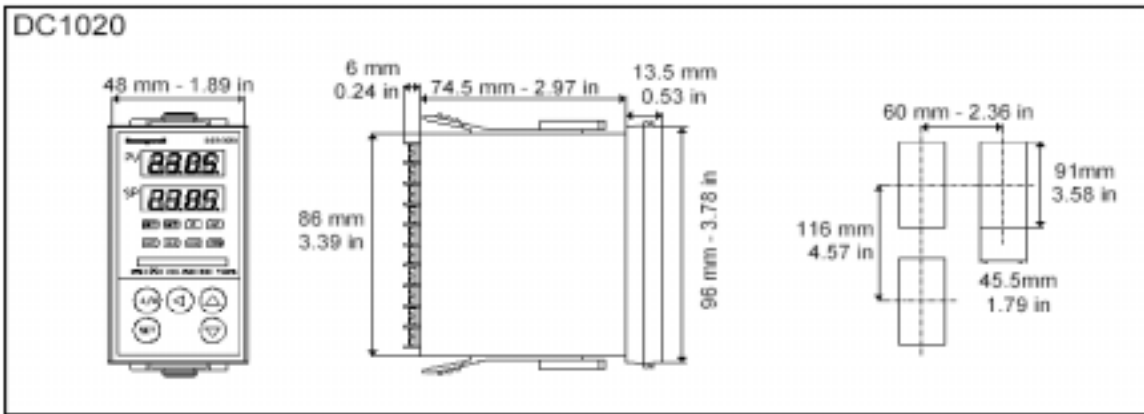
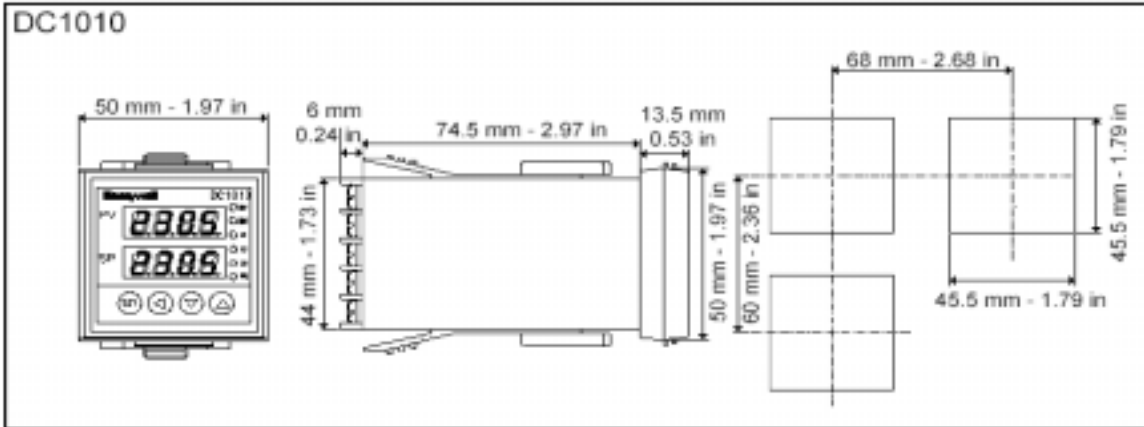
1.1 Model Number Interpretation



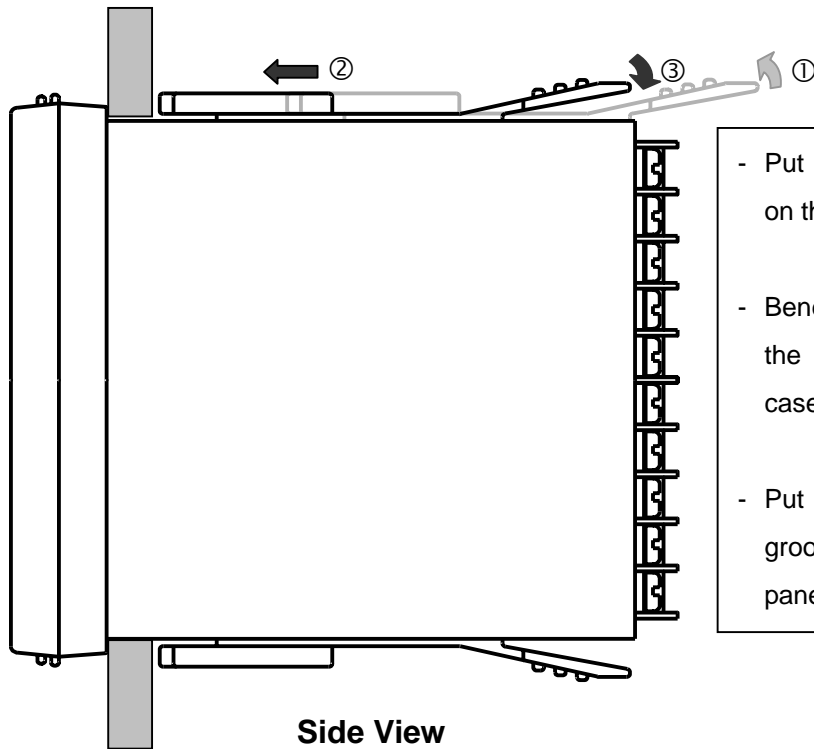
1.2 Specification

TECHNICAL DATA			
PV Input	Type of Input	TC (K, J, R, S, B, E, N, T, W, PL II, U, L) RTD (Pt100Ω, JPt100Ω, JPt50Ω) Linear (-10~10mV, 0~10mV, 0~20mV, 0~50mV, 10~50mV)	
	Input Sampling Time	500 ms	
	Input Resolution	14 bit (each)	
Indication	PV/SP Indication	4-digit, 7 segment display	
	Constant Value Storage System	Non-volatile memory (EEPROM)	
	Indication Accuracy	± 0.5%FS	
Control Mode	Proportional Band (P)	0~200% (On/Off action at P=0)	
	Integral Time (I)	0~3600 sec (PD action at I=0)	
	Derivative Time (D)	0~900 sec (PI action at D=0)	
	Cycle Time	0~150 sec (4~20mA → 0, SSR → 1, relay → 10)	
	Dead Band Time	0~1000 sec (dead time compensation)	
Output	Relay Output	Contact, SPDT, 3A/240VAC	
	Voltage Output	Voltage Pulse, 20VDC/20mA	
	Linear Output	4~20mA, 0~5V, 0~10V, 1~5V, 2~10V	
	Motor Control Output	Servo motor valve control (open loop circuit)	
	Others	1φ SSR, 3φ SSR, 1φ SCR, 3φ SCR	
Alarm	Channel	3 channels (optional)	
	Mode	17 alarm mode available	
	Timer	Flicker alarm, continued alarm, on delay timer alarm	
Aux. Output	Output Signal	SP, PV, MV	
	Type of Output	4~20mA, 0~20mA, 0~5V, 0~10V, 1~5V, 2~10V	
2 nd Input (RSP)	Type of Input	4~20mA, 0~20mA, 0~5V, 0~10V, 1~5V, 2~10V	
	Sampling Time	250 m	
Program	Pattern/Segment	2 pattern/ 8 segment (each)	
	Availability	Pattern link & repeat, program/segment end alarm	
Communication	Type of Communication	RS-232, RS-485	
General Specifications	Rated Power Supply Voltage & Frequency	AC 85~265V, 50/60Hz	
	Power Consumption	4VA	
	Ambient Temperature	-25°C~65°C	
	Ambient Humidity	50~85% RH (no condensation)	
INPUT ACTUATIONS			
TC	K	0.0~200.0, 400.0, 600.0, 800.0, 1000, 1200 °C	
	J	0.0~200.0, 400.0, 600.0, 800.0, 1000, 1200 °C	
	R	0.0~1600, 1769 °C	
	S	0.0~1600, 1769 °C	
	B	0.0~1820 °C	
	E	0.0~800, 1000 °C	
	N	0.0~1200, 1300 °C	
	T	-199.9~400.0, 200.0 °C, 0.0~350.0 °C	
	W	0.0~2000, 2320 °C	
	PL II	0.0~1300, 1390 °C	
	U	-199.9~600.0, 200.0 °C, 0.0~400.0 °C	
	L	0.0~400.0, 800.0 °C	
RTD	Pt100	-199.9~600.0, 400.0, 200.0 °C, 0.0~200.0, 400.0, 600.0 °C	
	JPt100	-199.9~600.0, 400.0, 200.0 °C, 0.0~200.0, 400.0, 600.0 °C	
	JPt50	-199.9~600.0, 400.0, 200.0 °C, 0.0~200.0, 400.0, 600.0 °C	
Linear	AN1	-10~10mV	
	AN2	0~10mV	
	AN3	0~20mV	
	AN4	0~50mV	0~20mA, 0~1V, 0~5V, 0~10V
	AN5	10~50mV	4~20mA, 1~5V, 2~10V

1.3 External Dimension



1.4 Mounting



- Put the mounting bracket in the rail on the top & bottom of the case.
- Bend the grip of the bracket & slide the bracket along the rail until the case is secured against the panel.
- Put the grip of the bracket on the groove to fasten the case to the panel.

1.5 Wiring Diagrams



Electrical Consideration / Precautions

The controller is considered "rack and panel mounted equipment" per EN61010-1, Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements. Conformity with 72/23/EEC, the Low Voltage Directive requires the user to provide adequate protection against a shock hazard. The user shall install this controller in an enclosure that limits OPERATOR access to the rear terminals.

Controller Grounding

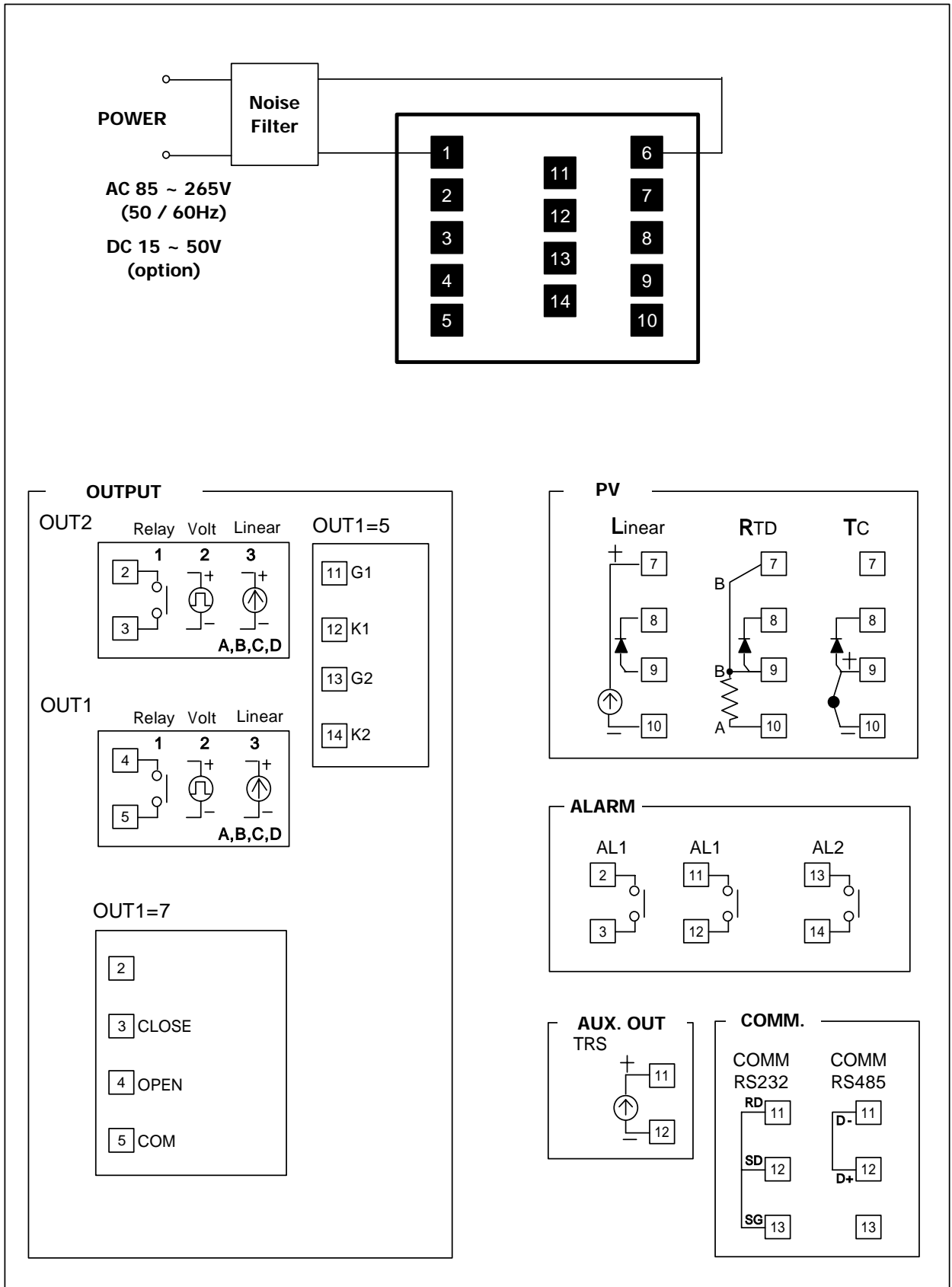
PROTECTIVE BONDING (grounding) of this controller and the enclosure in which it is installed shall be in accordance with National and local electrical codes. To minimize electrical noise and transients that may adversely affect the system, supplementary bonding of the controller enclosure to a local ground, using a No.12(4 mm²) copper conductor, is recommended



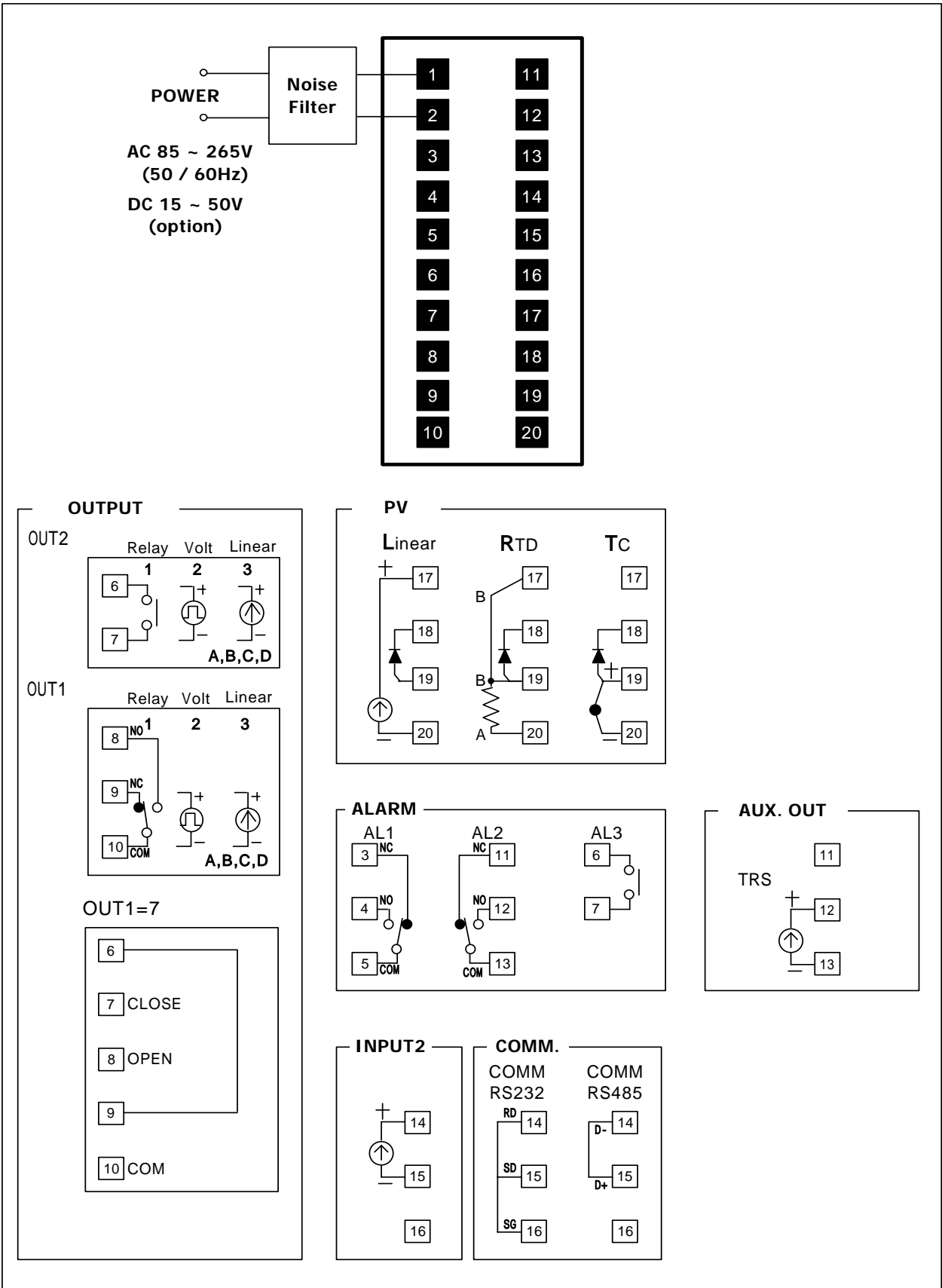
CAUTION

Applying 85-264Vac to a controller rated for 15-50Vdc will severely damage the controller and is a fire and smoke hazard.

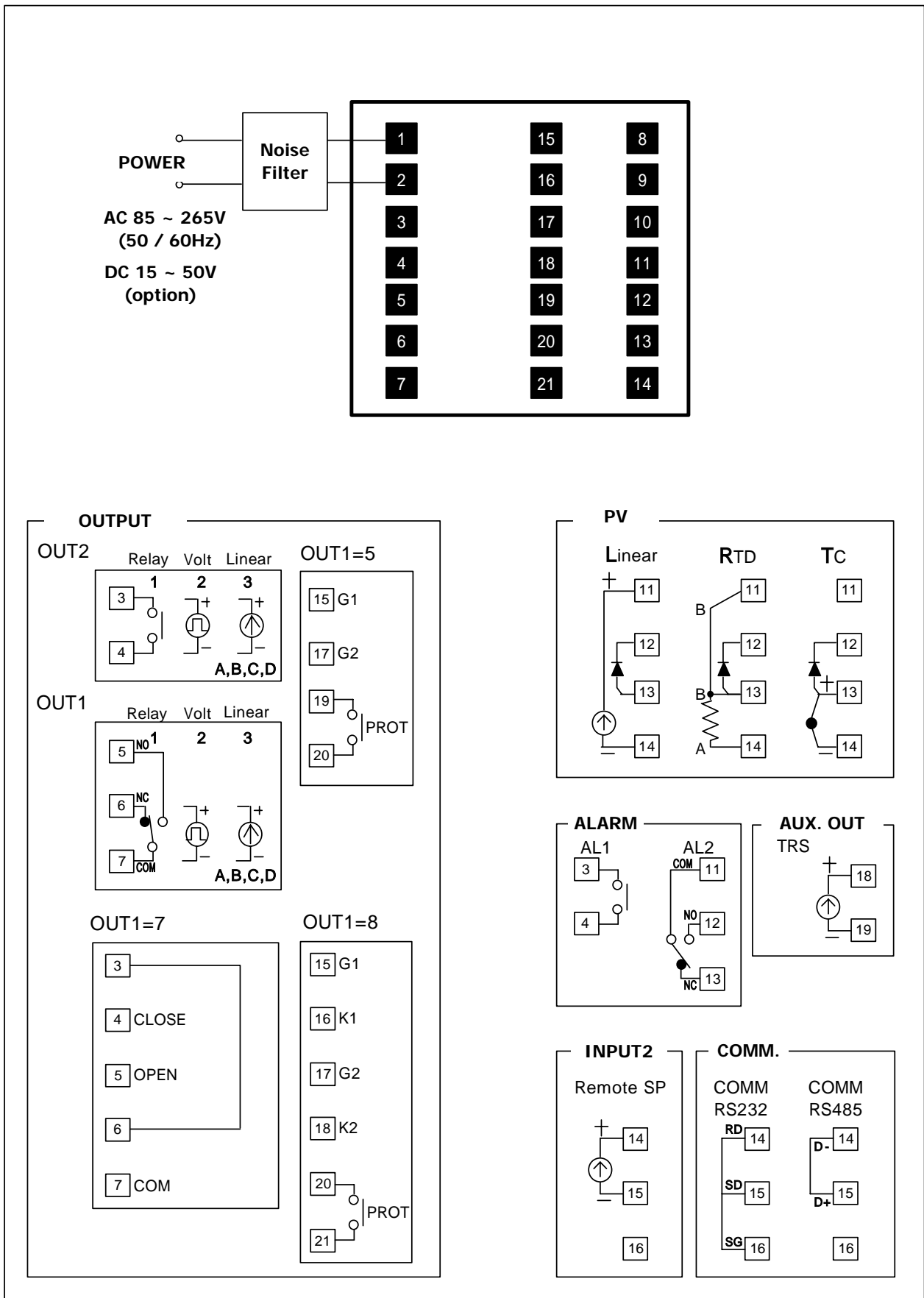
1.5.1 DC1010



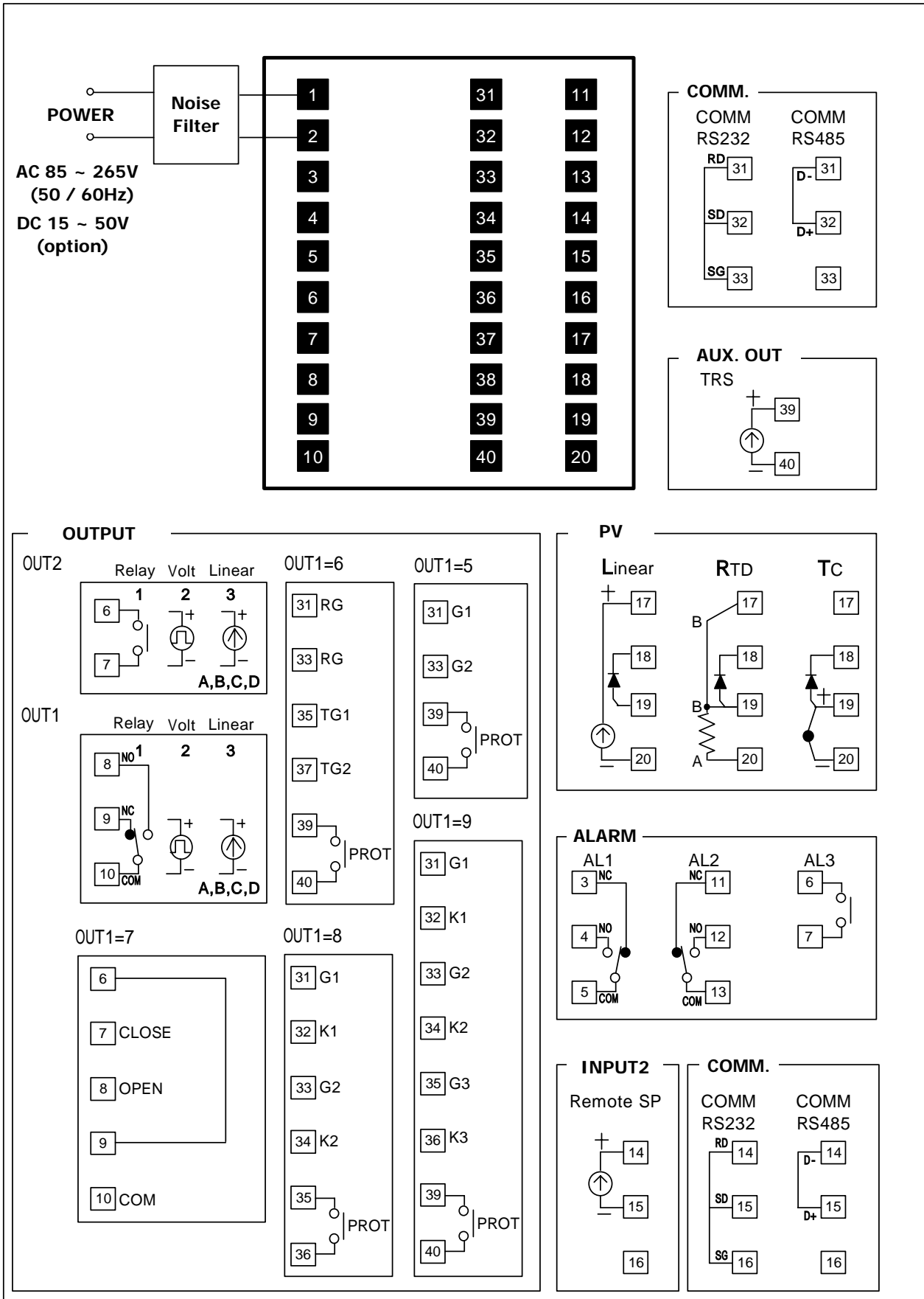
1.5.2 DC1020



1.5.3 DC1030



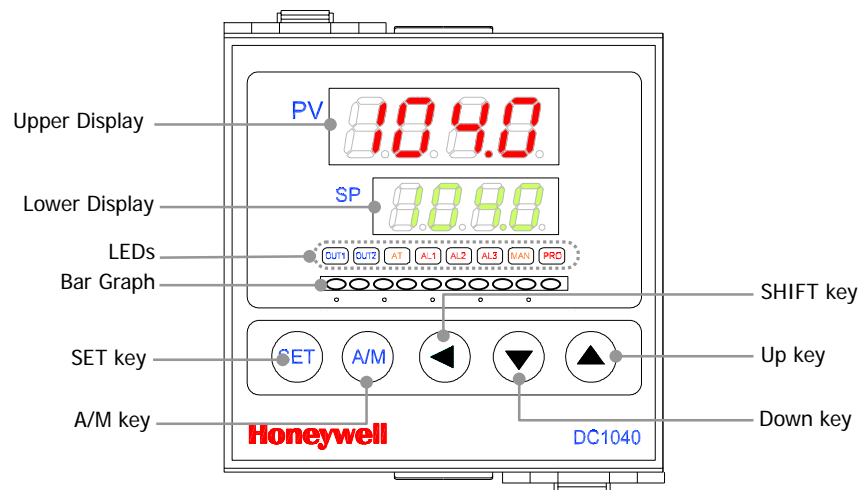
1.5.4 DC1040



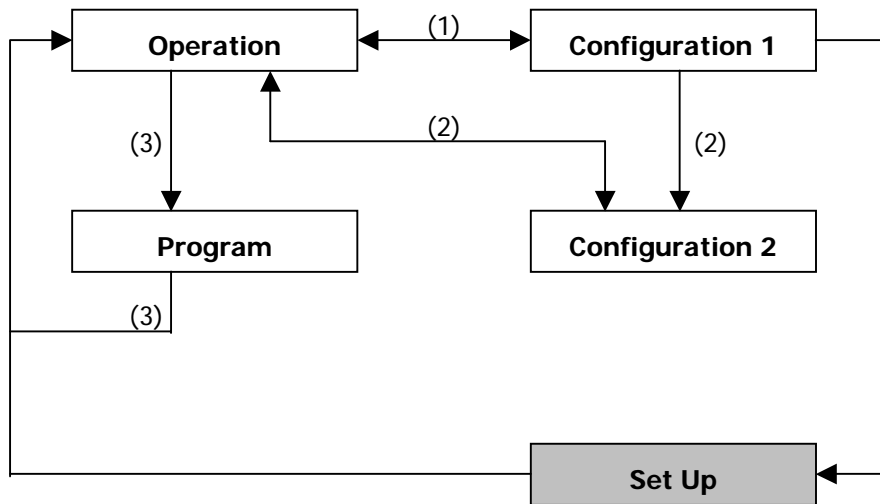
2. Configuration

2.1 Operator Interface

Upper Display	4 digits dedicated to display the PV. In configuration mode, this display indicates the name of parameter.
Lower Display	4 digits dedicated to display the SP. In configuration mode, this display indicates the value of parameter or the status of parameter selected
Bar Graph	A 10 green LEDs' bargraph indicates the value of the output in percentage
LEDs	
OUT1	Status of 'Output 1'
OUT2	Status of 'Output 2'
AT	When the LED is ON, it indicates the controller is in automatic tuning process
AL1	Status of 'Alarm 1'
AL2	Status of 'Alarm 2'
AL3	Status of 'Alarm 3'
MAN	When the LED is ON, it indicates the controller is in manual mode.
PRO	When a program is running, the LED flickers When a program is suspended, the LED is ON When no program is running, the LED is OFF
Keys	
SET	SET key allows moving from one parameter to another or saving a new value of parameter or a status of parameter changed.
A/M	A/M key allows switching from automatic mode to manual mode or from manual mode to automatic mode.
SHIFT	SHIFT key allows shifting the digits to modify parameters
UP	Up key allows increasing the value of a digit selected or changing the status of parameter.
DOWN	DOWN key allows decreasing the value of a digit selected or changing the status



2.2 MODE Access



How to move from a MODE to another

- (1) Press 'SET' key for 5 seconds, it grants access to 'Configuration 1' mode or return to 'Operation' mode from 'Configuration 1' mode.
- (2) Press 'SHIFT' key for 5 seconds while pressing 'SET' key first, it grants access to 'Configuration 2' mode or return to 'Operation' mode.
- (3) All parameters related to program configuration will be displayed next to parameters in 'Operation' mode. (* These parameters will be shown in program model only)








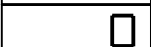






CAUTION

DO NOT access to 'Set Up' mode without instruction from technical assistant.

2.3 MODEs

2.3.1 Operation

	Parameter	Description
	PV Display	
	SP Display	
↓ SET		
	Output Limit	To limit the Maximum of Control Ouput
	Percentage (%)	
↓ SET		
	Auto Tuning	
	Status	* Default 'No'
↓ SET		
	Alarm 1	Enter deviation value or absolute value
	Value of alarm setpoint	depending on alarm mode selected
↓ SET		
	Alarm 2	
	The same with Alarm1	
↓ SET		
	Alarm 3	
	The same with Alarm 1	

* The 'OUTL' is not shown in default mode.

* 'AL2' & 'AL3' are shown only in the model the relevant options are taken.

2.3.2 Configuration 1

'Configuration 1' will be shown by pressing 'SET' key for 5 seconds in 'Operation' mode.

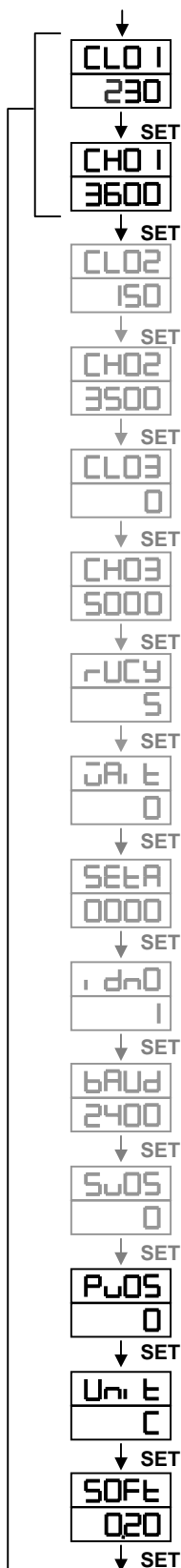
	Parameter	Description
	Main Control (OUT1) P value (Proportional Band)	Range: 0~200% P1=0, ON/OFF Control
	Main Control (OUT1) I value (Integral Time)	Range: 0~3600 seconds I=0, Integral off
	Main Control (OUT1) D value (Derivative Time)	Range: 0~900 seconds D=0, Derivative off
	Main Control Dead-Band Time	* DO NOT CHANGE THE VALUE
	Main Control (OUT1) 'Auto Tuning' offset	Range: 0~ Upper limit value (USPL) Prevent from 'Overshoot' during auto tuning
	Main Control (OUT1) Cycle of Control Output	Output type (SSR → 1, 4~20mA→0, relay→10) Range: 0~150 seconds
	Main Control (OUT1) Actuation of Hysteresis	Just in case of ON/OFF control (P1=0) (Range: 0~1000) ON : PV ≤ (SP-HYS1) OFF : PV > (SP+HYS1)
	Sub Control (OUT2) P value (Proportional band)	The same with the method of P1 configuration
	Sub Control (OUT2) I value (Integral Time)	The same with the method of I1 configuration
	Sub Control (OUT2) D value (Derivative Time)	The same with the method of D1 configuration
	Sub Control (OUT2) Cycle of Control Output	The same with the method of CYT1 configuration
	Sub Control (OUT2) Hysteresis	The same with the method of HYS1 configuration
	Main Control (OUT 1) Gap	Control output is turned off before getting to SP Turning Point = SP-GAP1; OFF (OUT1=Heat)
	Sub Control (OUT2) Gap	Control Output to be turned on before getting to SP Turning Point = SP+GAP2; ON (OUT2=Cool)
	Function Lock	* Refer to '2.3 Function Lock' in P.10

* The parameters are only for 'Output' 2 function, so it will appear only in the model which has the "OUT2" option.

2.3.3 Configuration 2

'Configuration 2' mode will be shown by pressing 'SHIFT' key for 5 seconds WHILE pressing 'SET' key FIRST in 'Operation' or 'Configuration 2' mode.

	Parameter	Description
	Input 1 (INP1)	To define input type & input range * Refer to
↓ SET		
	Input 1 (INP1) Lower limit of linear Input	To be used during the calibration for linear input * DO NOT change this value without technical assistant
↓ SET		
	Input 1 (INP1) Upper limit of linear Input	To be used during the calibration for linear input * DO NOT change this value without technical assistant
↓ SET		
	Decimal Point	Available in linear input only
↓ SET		
	Lower limit of Input range	i.e) Linear input = 4~20mA, when 4mA (0%), set the indication value for lower limit
↓ SET		
	Upper limit of Input range	when 20mA (100%), set the indication value for upper limit
↓ SET		
	Input 2 (INP2) Lower limit of linear input	To be used during the calibration for linear input * DO NOT change this value without technical assistant
↓ SET		
	Input 2 (INP2) Upper limit of linear input	To be used during the calibration for linear input * DO NOT change this value without technical assistant
↓ SET		
	Alarm Code of 'Alarm 1'	* Refer to
↓ SET		
	Time Set for 'Alarm 1'	* Range: 0 - 99 min 59 sec 0= flickering alarm, 99.59= continuant alarm Others = Time delay of alarm
↓ SET		
	Alarm Code of 'Alarm2'	
↓ SET		
	Time Set for 'Alarm 2'	The same configuration method with ALT1
↓ SET		
	Alarm Code of 'Alarm 3'	
↓ SET		
	Time Set for 'Alarm 3'	The same configuration method with ALT1
↓ SET		
	Hysteresis of alarms	To set the hysteresis of alarm actuation (Range: 0 – 1000) ON : PV <= (SP-HYS1) OFF : PV > (SP+HYS1)
↓ SET		



Parameter	Description
CLO1 230	Main Control (OUT1) Lower limit of linear output
CH01 3600	Main Control (OUT1) Upper limit of linear output
CLO2 150	Sub Control (OUT2) Lower limit of linear output
CH02 3500	Sub Control (OUT2) Upper limit of linear output
CLO3 0	Aux. Output Lower limit of linear output
CH03 5000	Aux. Output Upper limit of linear output
rUCY 5	Timer for Motor Control
WAit 0	WAIT function
SEtA 0000	Extra SET
IDnO 1	ID Number
bAUd 2400	Baud Rate
SuOS 0	SP compensation
PVO5 0	PV compensation
Uni t C	Unit of PV & SP
SOFE 0.20	Soft Filter

To adjust the linear control output during the calibration
* DO NOT change the value without technical assistant

To adjust the linear control output during calibration
* DO NOT change the value without technical assistant

The same configuration method with 'CL01'

The same configuration method with 'CH01'

The same configuration method with 'CL01'

The same configuration method with 'CH01'

Full actuation time of TPSC
Range: 5 – 200 sec

To set 'wait' for program operation
0= No wait, others = Wait volume

DO NOT change the value of this parameter

Communication ID number

DO NOT change the value of this parameter

Range: -1000~1000

Range: LSPL~USPL

Selection: C, F, and A (linear)

To adjust PV response time (Range: 0.05 – 1.00)
* The bigger value meanse the faster response.

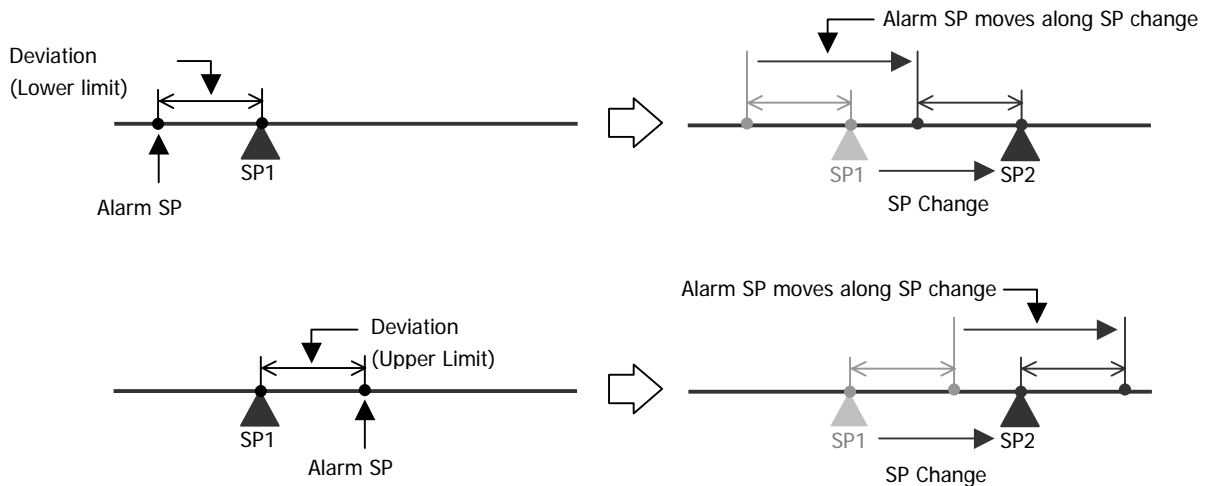
* Those 2 parameters are only for adjusting the linear signal of control output, not for the limitation of the control output or any other purpose. Pls, DO NOT change the values without technical assistant.

Parameter	Description
	* DO NOT change the value
Operation Mode	Heating (direct) or Cooling (reverse)
Control Process	PID or Fuzzy
Frequency	50 or 60Hz
	* Please, check whether the proper frequency is selected

2.4 Alarms

2.4.1 Deviation Alarm

The Alarm SP (Set Point) is to be changed as the SP moves. In this case, the Alarm SP preserves a certain deviation value with the SP. When an alarm is set, a certain deviation value with the preset SP should be defined.



2.4.1.1 Upper Limit Deviation Alarm (Alarm Code 01, Alarm release in the first alarming situation)



2.4.1.2 Upper Limit Deviation Alarm (Alarm Code 11, No alarm release in the first alarming situation)



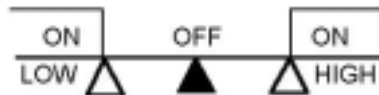
2.4.1.3 Lower Limit Deviation Alarm (Alarm Code 02, Alarm release in the first alarming situation)



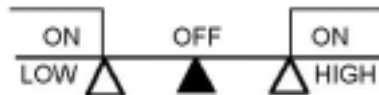
2.4.1.4 Lower Limit Deviation Alarm (Alarm Code 12, No alarm release in the first alarming situation)



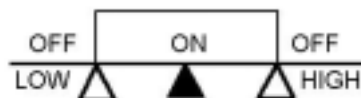
2.4.1.5 Dev. Band Breakaway Alarm (Alarm Code 03, Alarm release in the first alarming situation)



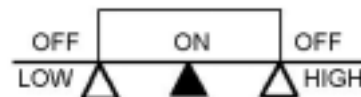
2.4.1.6 Dev. Band Breakaway Alarm (Alarm Code 13, No alarm release in the first alarming situation)



2.4.1.7 Deviation Band Alarm (Alarm Code 04, Alarm release in the first alarming situation)

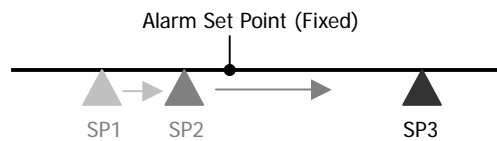


2.4.1.8 Deviation Band Alarm (Alarm Code 14, No alarm release in the first alarming situation)



2.4.2 Absolute Value Alarm

The Alarm SP (Set Point) is to be fixed even though the SP moves. When an alarm is set, the absolute value of the Alarm SP should be defined.



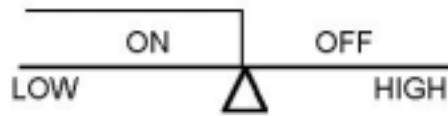
2.4.2.1 Absolute Upper Limit Alarm (Alarm Code 05, Alarm release in the first alarming situation)



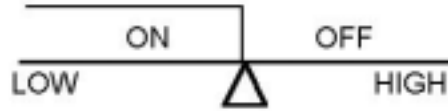
2.4.2.2 Absolute Upper Limit Alarm (Alarm Code 15, No alarm release in the first alarming situation)



2.4.2.3 Absolute Lower Limit Alarm (Alarm Code 06, Alarm release in the first alarming situation)



2.4.2.4 Absolute Lower Limit Alarm (Alarm Code 16, No alarm release in the first alarming situation)



2.4.3 Program Alarm

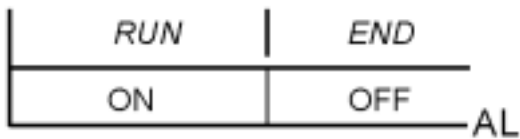
2.4.3.1 Segment End Alarm (Alarm Code 07)

; Once the selected segment is completed, the alarm becomes actuated

- ALD1 – ALD3 Set the Alarm Code 07
- AL1 – AL3 Enter Segment No. for alarms
- ALT1 – ALT3 Define the alarm timing
(0 → Flickering, 99.59 → Continuant, Others → Time Delay)

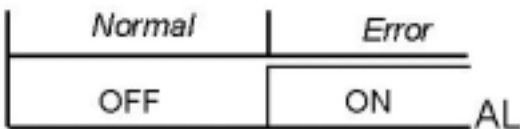
2.4.3.2 Program RUN Alarm (Alarm Code 17)

; While a program runs, the alarm becomes actuated

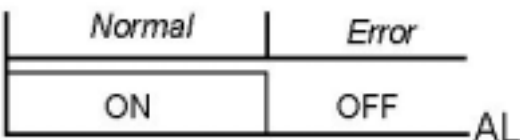


2.4.4 System Alarm

2.4.4.1 System Error Alarm (Alarm Code 08)



2.4.4.2 System Error Alarm (Alarm Code 18)



2.4.4.3 Timer Alarm (Alarm Code 19)

; Once the PV reaches to the SP, the alarm becomes actuated after a certain time delay.

(Range: 00 hour 00 min – 99 hour 59 min)

2.5 Function Lock

According to the status of the parameter “LCK” in ‘Configuration 1’ mode, ‘access to modes’ and ‘change of values’ can be prohibited.

LCK=0000	MODE ACCESS	Access to ‘Operation’, Configuration1 & 2’ modes allowed (* Default)
LCK=0100	MODE ACCESS	Access to ‘Operation’ & ‘Configuration 1’ mode allowed
	VALUE CHANGE	Every value change in each mode allowed
LCK=0110	MODE ACCESS	Access to ‘Operation’ & ‘Configuration 1’ mode allowed
	VALUE CHANGE	Value changes only in ‘Operation’ mode allowed
LCK=0001	MODE ACCESS	Access to ‘Operation’ mode allowed
	VALUE CHANGE	Value change of SP (Set Point) allowed only
LCK=1111	MODE ACCESS	Access to “Set Up” mode allowed
LCK=0101	All access & value changes prohibited except the change of “LCK” status	



CAUTION

Configuration should be performed only by personnel who are technically competent to do so. Local Regulations regarding electrical & safety must be observed.

3. Input Codes

It requires that the input code in 'Configuration 2' mode be selected properly before the operation starts.

3.1 Thermocouples

TYPE	CODE	RANGE	
K	K1	0.0~200.0°C	0.0~392.0°F
	K2	0.0~400.0°C	0.0~752.0°F
	K3	0~600°C	0~1112°F
	K4	0~800°C	0~1472°F
	K5	0~1000°C	0~1832°F
	K6	0~1200°C	0~2192°F
J	J1	0.0~200.0°C	0.0~392.0°F
	J2	0.0~400.0°C	0.0~752.0°F
	J3	0~600°C	0~1112°F
	J4	0~800°C	0~1472°F
	J5	0~1000°C	0~1832°F
	J6	0~1200°C	0~2192°F
R	R1	0~1600°C	0~2912°F
	R2	0~1796°C	0~3216°F
S	S1	0~1600°C	0~2912°F
	S2	0~1796°C	0~3216°F
B	B1	0~1820°C	0~3308°F
E	E1	0~800°C	0~1472°F
	E2	0~1000°C	0~1832°F
N	N1	0~1200°C	0~2192°F
	N2	0~1300°C	0~2372°F
T	T1	-199.9~400.0°C	-199.9~752.0°F
	T2	-199.9~200.0°C	-199.9~392.0°F
	T3	0.0~350.0°C	0.0~662.0°F
W	W1	0~2000°C	0~3632°F
	W2	0~2320°C	0~2372°F
PLII	PL1	0~1300°C	0~2372°F
	PL2	0~1390°C	0~2534°F
U	U1	-199.9~600.0°C	-199.9~999.9°F
	U2	-199.9~200.0°C	-199.9~392.0°F
	U3	0.0~400.0°C	0.0~752.0°F
L	L1	0~400°C	0~752°F
	L2	0~800°C	0~1472°F

* The default of Input Code is 'K2' for the model of thermocouple input type. (DC10X0XT-XXX-XXX-X)

3.2 RTDs

TYPE	CODE	RANGE	
JIS Pt100	JP1	-199.9~600.0°C	-199.9~999.9°F
	JP2	-199.9~400.0°C	-199.9~752.0°F
	JP3	-199.9~200.0°C	-199.9~392.0°F
	JP4	0~200°C	0~392°F
	JP5	0~400°C	0~752°F
	JP6	0~600°C	0~1112°F
DIN Pt100	DP1	-199.9~600.0°C	-199.9~999.9°F
	DP2	-199.9~400.0°C	-199.9~752.0°F
	DP3	-199.9~200.0°C	-199.9~392.0°F
	DP4	0~200°C	0~392°F
	DP5	0~400°C	0~752°F
	DP6	0~600°C	0~1112°F
JIS Pt50	JP1	-199.9~600.0°C	-199.9~999.9°F
	JP2	-199.9~400.0°C	-199.9~752.0°F
	JP3	-199.9~200.0°C	-199.9~392.0°F
	JP4	0~200°C	0~392°F
	JP5	0~400°C	0~752°F
	JP6	0~600°C	0~1112°F

* The default of Input Code is 'DP3' for the model of RTD input type. (DC10X0XR-XXX-XXX-X)

3.3 Linear Inputs

CODE	SIGNAL	INPUT TYPE	RANGE
AN1	-10 - 10mV		-1999~9999
AN2	0 - 10mV		-1999~9999
AN3	0 - 20mV		-1999~9999
AN4	0 - 50mV	0-20mA, 0-1V, 0-5V, 0-10V	-1999~9999
AN5	10 - 50mV	4-20mA, 1-5V, 2-10V	-1999~9999

* The default of Input Code is 'AN4' (4-20mA) for the model of linear input type.
(DC10X0XL-XXX-XXX-X)

* DO NOT change the input type without technical assistant because it requires some hardware changes on the input board in order to select a certain linear input type.

4. Operation

4.1 Type of Control

4.1.1 Manual Operation

The control output can be managed manually. If pressing 'A/M' key, the parameter of 'OUTL' comes up in the upper display and a fixed control output is shown in lower display (% value). Once the value is changed, the control output is changed and fixed again.

4.1.2 ON/OFF Control

The output type must be the relay output (DC10X0XX-1XX-XXX-X). Then, change 'P' value to 0 in 'Configuration 1' mode. Until PV reaches SP, the control output is just ON (100%), and then the control output becomes OFF (0%).

* To prevent the control output from flickering too frequently, the hysteresis ('HYS1' in 'Operation' mode) is to be set

4.1.2 PID Control

PID control is the default control type of this controller. If 'AT' in 'Operation' mode becomes 'YES', the auto tuning process will start. After the auto tuning is completed, the controller gets optimum PID values for the control system and starts the operation automatically. (PID values can be set manually in 'Configuration 1' mode without auto tuning procedure.)

4.2 Set Point

After all the wiring connection is completed and power is applied, the targetted SP (Set Point) is to be entered. When power is applied, the default display is PV & SP display and ready to enter the SP. (Change the value targetted, and press 'SET' key for saving)

4.3 Alarm Set Point

If necessary, each alarm should be set properly.

- Set the Alarm Code required in 'ALd1' (ALd2 / ALd3) in 'Configuration 2' mode
(Alarm Code: 00 to 19)
- Define the alarm timing required for 'ALt1' (ALt2 / ALt3) in 'Configuration 2' mode
'0000' → flickering alarm, '9959' → continuant alarm
'XXXX' → XX min XX sec (Time Delay)
- Enter the deviation value or absolute value in 'AL1' (AL2 / AL3) in 'Operation' mode depending on the Alarm Code selected above.
- Set the hysteresis of alarms in 'HYS1' in 'Configuration 2' mode. (If necessary)

5. Error Message

In case the following messages comes up in the upper display of controller, please check the points as guided below or give us a call for technical service.

Sign	Description	Solution
1 n IE	Open the circuit of 'INPUT 1' (sensor)	Check the wiring
* AdCF	A/D Convert Failure	Service Call required
* CJCE	Cold junction compensation failure	Service Call required
1 n 2E	Open the circuit of 'INPUT 2' (sensor)	Check the wiring
UUU 1	Excess of PV over upper limit (INPUT 1)	- Check sensor wiring & input code - Adjust the range of indication
nnn 1	Shortage of PV under lower limit (INPUT1)	
UUU 2	Excess of PV over upper limit (INPUT2)	
nnn 2	Shortage of PV under lower limit (INPUT2)	
* rAdF	Memory (RAM) failure	Service call required
1 n tF	Interface failure	Check wiring of input
AU tF	Auto tuning failure	Check wiring of output

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective material and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during that period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and **is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.**

While we provide application assistance, personally and through our literature, it is up to the customer to determine the suitability of the product in the application.

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Honeywell serves its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact your local sales office or:

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