Honeywell

DC1010 - DC1020 - DC1030 - DC1040
DC1050 - DC1060
General Purpose DIGITAL CONTROLLERS

OVERVIEW

The DC1000 family of microprocessor based controllers combine a high degree of functionality and reliability at a very low price. Available in 4 different formats : 1/16 DIN, 1/8 DIN, 3/16 DIN, 1/4 DIN, DIN-rail mounting. These controllers are ideal for regulating temperature in a variety of applications, including :

- Dryers.
- Semiconductor packaging / testing.
- Plastic processing.
- Packaging machinery.
- Painting and coating.
- Climatic chambers.

The DC1000 family provides basic control requirements, plus advanced features such as motor position control, phase angle power control and Setpoint programming.

DC1010 (1/16 DIN)   DC1020 (1/8 DIN)

DC1050 (DIN-Rail)
DC1060 (Eco Dinrail)

DC1030 (3/16 DIN)

DC1040 (1/4 DIN)

FEATURES

Easy to configure
Two different configuration levels provide easy access to parameters. A 4-digit security code prevents unauthorized changes. Parameters can also be hidden to the user to prevent mis-configuration of the unit.

Various Control algorithms
The DC1000 series of controllers provide several different algorithms:
- PID or ON/OFF control.
- Heat/Cool algorithms with 2 different PID sets.
- Motor position control without feedback.
- Single phase control, with or without zero crossover control.
- Three phase control, with or without zero crossover control.

Dual display and Bargraph
Two large 4 digits displays and one 10 LED bargraph display PV, SP and configuration parameters. Up to 8 LEDs display the status of the different Outputs (Control, Alarm, …) and also provides indication of the Auto/Manual and Programmer states.

Setpoint Programming
Two programs are available, with a maximum of 8 segments per program. The 18 programs can be linked together to form a single 144 segments program.

Extended Alarm capability
Three different alarm outputs are available per instrument, 19 alarm modes are configurable. HBA

Autotuning capability.

Communications
RS232C, RS485 Modbus rtu protocol are optionally available. Upto 31 DC1000 Controllers can be connected to a single host computer(RS485). The host computer can change the SP, monitor the PV, the output or change the configuration of the unit.

Remote Setpoint capability.

Manual / Automatic modes.

Universal Power supply
Operates on any voltage from 85Vac to 264Vac at 50/60Hz. 24Vdc operating voltage is optional.

Operating range
These instruments operate, from 0°C to +50°C (32°F~122°F) Humidity=50 to 85% RH

SPECIFICATIONS

Technical data

PV Input	Type of Input	Thermocouples : K, J, R, S, B, E, N, T, W, PL II, L
		RTD : Pt100
		Linear : 4~20mA (*0-20mA, DC volt=0-5/10V, 1-5/2-10V)
	Input Sampling Time	50 ms
	Input Resolution	18 bit (each)
Indication	PV/SP Indication	4-digit, 7 segment display
	Constant Value Storage System	Non-volatile memory (EEPROM)
	Indication Accuracy	+/-0.1%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	Electromechanical relay • SPDT contacts (DC101 :SPST) • 3A/240Vac
	Static relay driver output	Voltage Pulse, 24VDC/20mA
	Current & Voltage outputs	0~20mA, 4~20mA, 0~5V, 0~10V, 1~5V, 2~10V
	Motor Control Output	Motor valve control (open loop circuit)
	Others	Phase angle control : ✓ 1φ SSR, 3φ SSR, 1φ SCR, *3φ SCR
Alarm	Number	Up to 3 (optional, DC101 :2sets) with HBA
	Modes	19 alarm modes available, ability to ignore the alarm the first time it occurs : ✓ Deviation high or low alarms. ✓ Deviation alarms. ✓ Band alarm. ✓ High or low alarm. ✓ RUN of segment alarm. ✓ Program RUN/END indication alarm. ✓ Timer alarm. ✓ HBA(Heater Break Alarm) via CT(max 80/100A)
	Timer	One timer is associated with each alarm.
Retransmission output	Output Signal	SP, PV
	Type of Output	4~20mA, 0~20mA, 0~5V, 0~10V, 1~5V, 2~10V

Note * : Please contact Honeywell.   Note CT : Current Transformer(Measure the AC ampere)

2nd Input	Type of Input	4~20mA, 0~20mA, 0~5V, 0~10V, 1~5V, 2~10V
(Remote SP)	Sampling Time	100 ms.
Programs	Number	18 programs of 8 segments each, totally 144segments.
Communication	Type of Communication	RS232C, RS-485/1.2km. Modus rtu(HEX), ASCII
	Specification	Partity= Odd/Even/None, Data bit= 8bits, Stop bit=1 or 2 bit
	Communication Speed	2.4,4.8,9.6,19.2,38.4,57.6,115.2 kbps
Operating conditions	Rated Power Supply Voltage & Frequency	AC 85 ~ 265V, 50/60Hz DC24V(optional)
	Power Consumption	8VA (110V), 14VA (220V)
	Ambient Temperature	-20°C ~ 65°C (-4°F ~ 149°F)
	Ambient Humidity	50 ~ 85% RH (non condensing)
Approvals		*UL (QUXY2-E201698) CE Mark.

TC & RTD Types & ranges

		°C	°F
TC	**K**	-50.0~600.0 °C -50.0~1200.0 °C	-58.0~999.9 °F -58~2192 °F
	J	-50.0~600.0 °C -50.0~1200.0 °C	-58.0~999.9 °F -58~2192 °F
	R	-50~1760 °C	-58~3200 °F
	S	-50~1760 °C	-58~3200 °F
	B	-50~1820 °C	-58~3308 °F
	E	-50~900 °C	-58~1652 °F
	N	-50~1300 °C	-58~2372 °F
	T	-199.9~400.0 °C -199~400 °C	-199.9~752.0 °F -326~752.0 °F
	W	-50~2320 °C	-58~4208 °F
	PL II	-50~1200 °C 0~1390 °C	-58~2192 °F 0~2372 °F
	L	-50~800 °C	-58~1472 °F
RTD	**Pt 100**	-199.9~850.0 °C -199~850 °C 0~850 °C	-199.9~999.9 °F -326~1562.0 °F 32~1562.0 °F
Linear		0-20mA, 0-1V, 0-5V, 0-10V	-1999~9999 (A)
		4-20mA, 1-5V, 2-10V	

Note * : Please contact Honeywell.

- **PID or ON/OFF control.**
- **Heat/Cool algorithms with 2 different PID sets.**
- **Phase angle control**


Single Phase   Three Phase
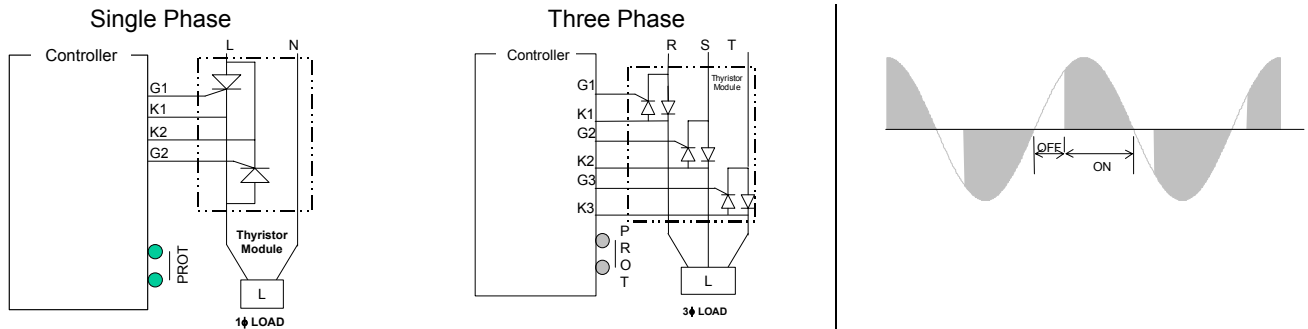
In phase angle control, power is regulated by changing the point at which the SCR is turned on within each 1/2 period.

<u>Single Phase</u> : Output is changed every half-cycle in response to output signals from the Temperature Controller.

<u>Three Phase</u> : The outputs are changed every 120° in response to signals from the Temperature Controller.

Using this form of control, high-precision temperature control is possible.

- **Zero-crossover control**

Single Phase   *Three Phase
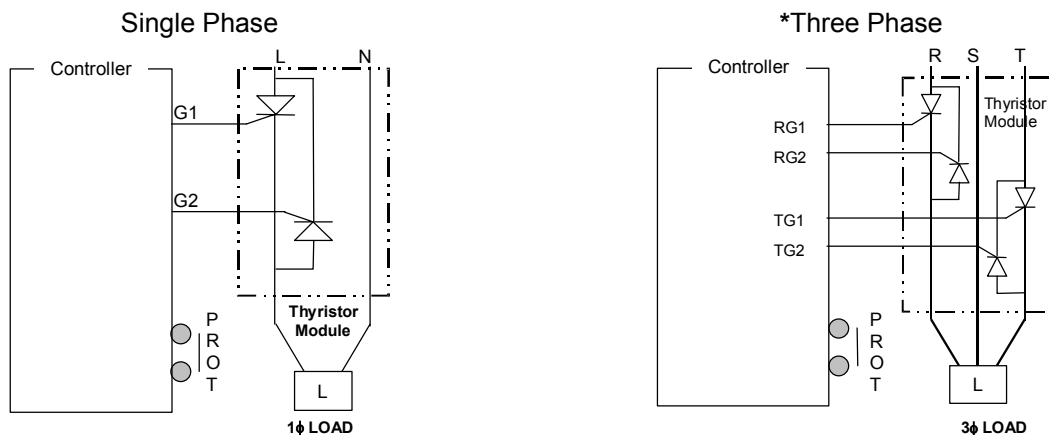
The term Zero-Crossover means that the SCR's are turned on only when the instantaneous value of the sinusoidal wave is zero. Power is then applied for a several continuous half-cycles and then removed for several half-cycles to achieve the desired load power.

- **Motor position control without slidewire Feedback.**
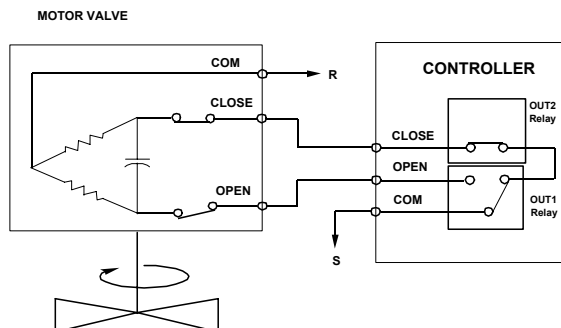
Motor position is achieved by using time proportional control without the need for slidewire feedback from the motor shaft.

Slidewires wear over a period of time, which can result in poor or intermittent control. This type of control reduces maintenance requirements and removes the need for the controller to be calibrated to the motor feed back potentiometer.
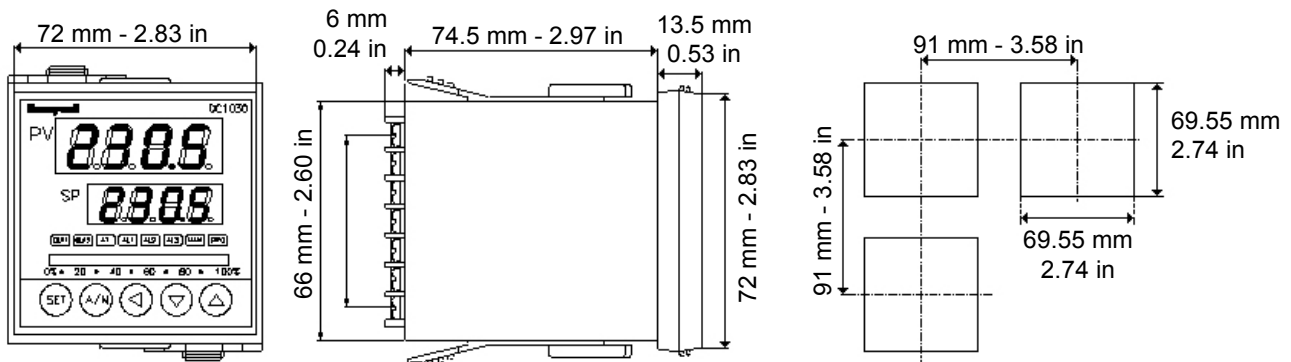
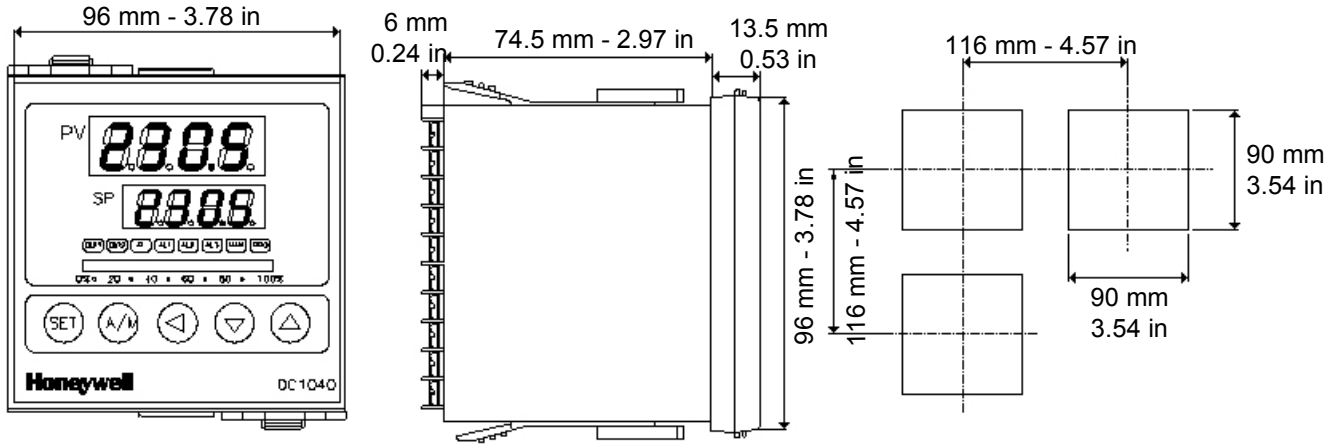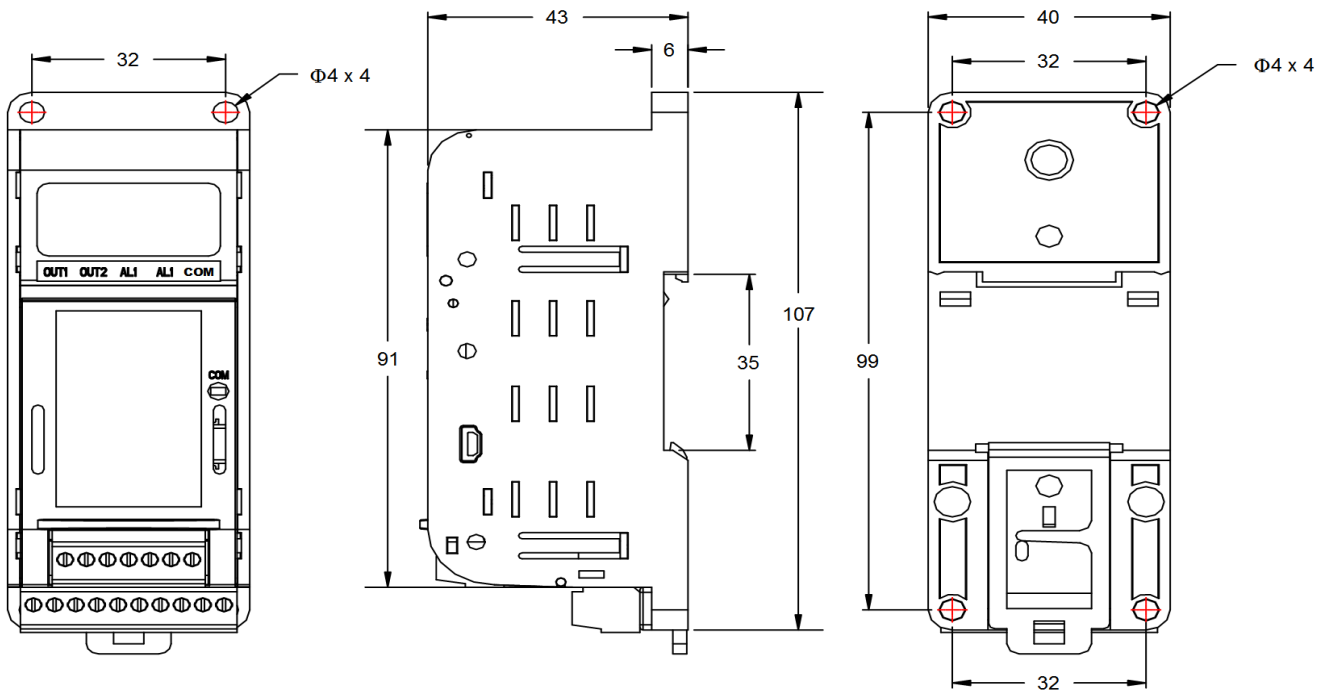## EXTERNAL DIMENSIONS, PANEL CUTOUT

DC1010
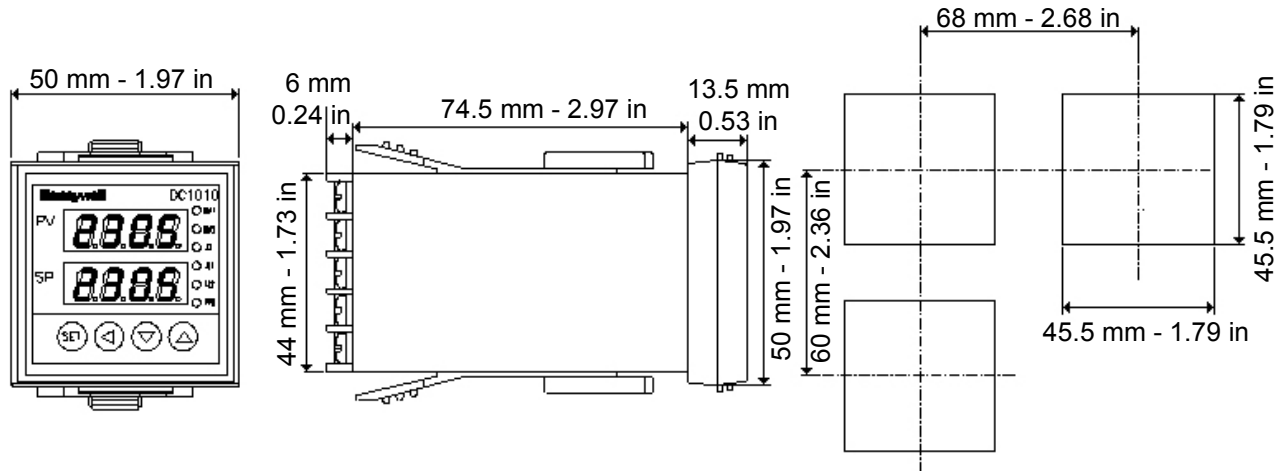
DC1020
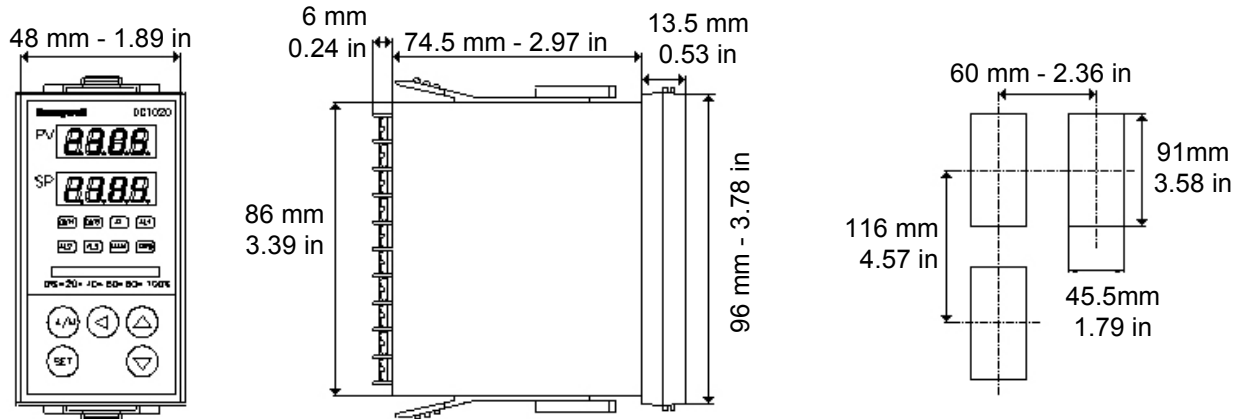
DC1030

EXTERNAL DIMENSIONS, PANEL CUTOUT

DC1040

DC1050 / DC1060

DC1010 - DC1020 - DC1030 - DC1040

Upper display : 4 digits dedicated to display the PV. In configuration mode, this display indicates the value of the parameter or the parameter selected.

Lower display : 4 digits dedicated to display the SP ; In configuration mode, indicates the name of the parameter.

Bargraph : A 10 green LEDs bargraph indicates the value of the output in percentage. For DC1020, DC1030, DC1040

LEDs :
OUT1 :   Status of output 1.
OUT2 :   Status of output 2.
AT :   When the LED is ON an automatic tuning of the parameters is on going.
AL1 :   Status of alarm 1.
AL2 :   Status of alarm 2.
AL3 :   Status of alarm 3.
MAN :   ON if we are in Auto mode. OFF if manual mode. except DC1010
PRO :   ON when a program is running.
         Continuously ON when a program is suspended.
         OFF when no program is running.

SET allows to change from one parameter to another. Pressing it for 5 seconds grants access to the configuration level 1 (PID parameters+locking the instrument).
Pressing simultaneously for 5 seconds on the left arrow and SET grants access to the configuration level 2 (input type, alarmes, SP limits, field calibration, communication parameters, …).

A/M allows to switch from Auto to Manual.

Shift key
When modifying a parameter, pressing this key allows to change the digit to modify.

Down key
Pressing this key decreases the parameter or digit being modified.

Up key
Pressing this key increases the parameter or digit being modified.

DC1050 - DC1060
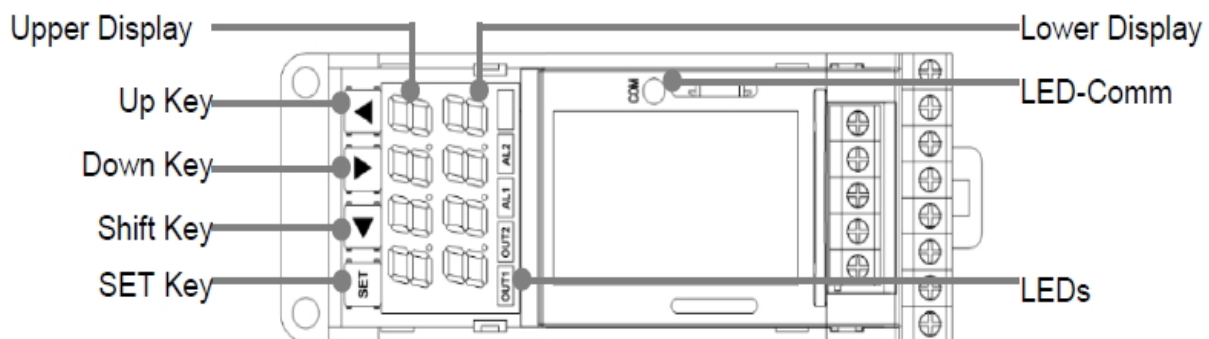
MODEL SELECTION GUIDE

- Select the desired Key Number.
- Make One selection each from Tables I through III.

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Key Number ──  DC10▢▢▢▢ - ▢▢▢ - ▢▢▢ - ▢
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Dimension	Power&Approval
1 48*48mm	0 90-240Vac/CE
2 48*96mm	1 24-50Vdc/CE
3 72*72mm	2 90-240Vac/IP65/CE
4 96*96mm	3 24-50Vdc/IP65/CE
5 DIN Rail	4 90-240Vac/IP65/CE/UL
6 DIN Rail(E)	5 24-50Vdc/IP65/CE/UL

Program	Input
C None	R RTD
P Program	T TC
	L Linear

Table I

Output 1	Output 2	Alarm
0 None	0 None	0 None
1 Relay	1 Relay	1 1 alarm
2 Voltage	2 Voltage	2 2 alarms
3 4~20mA	3 4~20mA	3 3 alarms
5 1 φ SSR	A 0~5V	A HBA
6 3 φ SSR	B 0~10V	B HBA+1alm
7 Motor V	C 1~5V	C HBA+2alm
8 1 φ SCR	D 2~10V	
9 3 φ SCR		
A 0~5V		
B 0~10V		
C 1~5V		
D 2~10V		

Table II

Aux. Output	2nd Input	Comm.
0 None	0 None	0 None
1 4~20mA	1 4~20mA	A RS232
2 0~20mA	2 0~20mA	B RS485
A 0~5V	A 0~5V	
B 0~10V	B 0~10V	
C 1~5V	C 1~5V	
D 2~10V	D 2~10V	

Table III

Manual
E English
F French
I Italian
G German
S Spanish

Distributor :

Honeywell