

# DIGITAL CONTROLLER

## SERIES SR17

- $\pm 0.3\%$  High Accuracy Indication & Setting
- Control Modes Include 2-Position, Auxiliary 2-Position, 3-Position, Proportioning, P.I.D., Proportional Positioning (Servo) Proportional & Proportional Positioning (Servo) P.I.D.
- Control Outputs Include Contact, SSR Voltage, Current (4~20mA DC) & Voltage (0~10V DC).
- Proportional Positioning (Servo) Type Can Operate Motorized Valve or Damper.
- Optional Functions Available
  - Monitor Analog Output
  - Higher/Lower Deviation Alarm



### SPECIFICATIONS

Display:	Digital (red, 7-segment LED)	Setting Accuracy:	$\pm 0.3\%$ of measuring range
Display Tolerance:	$\pm 0.3\%$ + 1 digit of measuring range (at 25°C $\pm 5^\circ\text{C}$ tempe range)	Main Setting:	3-digit or 3.5-digit digital switch
Indication Range:	See Measuring Range Codes.	Higher/Lower Alarm Setting:	2-digit digital switch
A/D Conversion:	Double integration type	Auxiliary Deviation Setting:	Potentiometer
Display Range:	3-digit or 3.5-digit	Analog Output:	
Input:		Accuracy:	$\pm 0.3\%$ of measuring range
Thermocouple:	T, J, E, K, R, S, B	Voltage:	0~10mV DC
Cold junction temp. compensation range:	5~45°C	Output resistance:	10 $\Omega$
Burnout circuit:	Standard	Current:	4~20mA DC
Input resistance:	200k $\Omega$	Load resistance:	300 $\Omega$ max.
External resistance tolerance:	100 $\Omega$ max.	Output circuit isolation:	Non-isolation
R.T.D.:	Pt100	Operating Ambient Temperature Range:	-10~+50°C
Amperage:	2mA	Operating Ambient Humidity:	90% RH max.
Lead wire tolerable resistance:	5 $\Omega$ max./wire	Power Supply:	See Ordering Information.
Voltage:	0~10mV DC Linear	Power Consumption:	Approx. 8VA
Input impedance:	200k $\Omega$	Insulation Resistance:	500V DC, 20M $\Omega$ min. between input terminal and power supply terminal
Current:	4~20mA DC Linear		500V DC, 20M $\Omega$ min. between power supply terminal and earth terminal
Receiving impedance:	250 $\Omega$	Dielectric Strength:	1 min. at 500V AC between input terminal and power supply terminal
Alarm:			1 min. at 1000V AC between power supply terminal and earth terminal
Higher/lower alarm setting range:	See Measuring Range Codes.	External Dimensions:	96(H) $\times$ 96 (W) $\times$ 166 (D) mm
Alarm action mode:	Selector switch (standby/non-standby)	Weight:	Approx. 900g
Alarm output:	Contact (one circuit)		
Alarm action display:	LL (Lower Limit) Green lamp HL (Higher Limit) Red lamp		

**ORDERING INFORMATION**

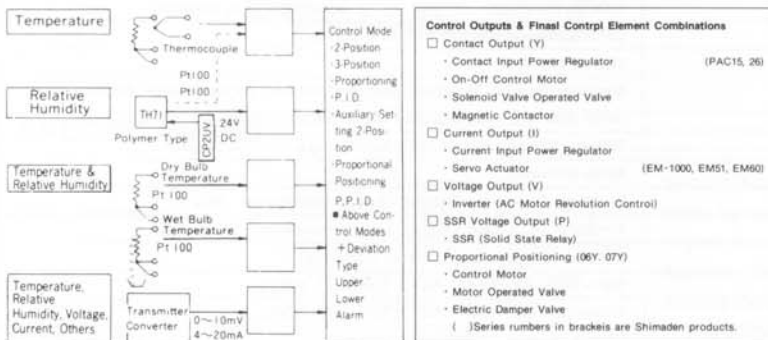
ITEMS		CODE		SPECIFICATIONS	
SERIES	SR17-			Multi-Function Digital Controller	
INPUT		1		Thermocouple, Input Resistance: 200k Ω	
		2		R.T.D. (Pt100), Amperage: 2mA DC	
		3		Voltage, 0~10mV DC Linear, Input Resistance: 200k Ω	
		4		Current, 4~20mA DC Linear, Receiving Impedance: 250 Ω	
		9		Others (Please consult before ordering.)	
CONTROL MODE		01		Proportioning, PB: 1~20% FS, Manual Reset	
		02		On/Off (2-position), Not available with control output I or V.	
		03	*	3-Position, Not available with control output I, P or V.	
		05		P.I.D. PB: 1~20% FS, IT: 0.1~10 min. DT: 0~5 min.	
		06	*	Proportional Positioning (Servo) Proportional PB: 1~20%	
		07	*	Proportional Positioning (Servo) P.I.D. PB: 1~20%	
		21	* Δ	Lower 1-Step Auxiliary Setting, 2-Position (2-Step Heating)	
		22	* Δ	Higher 1-Step Auxiliary Setting, 2-Position (2-Step Cooling)	
		99		Others (Please consult before ordering.)	
CONTROL OUTPUT		Y-		Contact 240V AC, 3A/Resistive Load, 1A/Inductive Load	
		I-		Current 4~20mA DC, with RA/DA Selector Switch ※ ※	
		P-		SSR Voltage, 15V DC, 20mA max., Only RA Available.	
		V-		Voltage 0~10V DC, with RA/DA Selector Switch ※ ※	
		X-		Others (Please consult before ordering.)	
FEEDBACK RESISTANCE		0		None Provided (Control Modes 01, 02, 03, 05, 21 and 22)	
		5		135 Ω (3-Wire)	Feedback resistance can only be provided when control mode 06 or 07 (proportional positioning) is selected.
		6		500 Ω (3-Wire)	
		7		1000 Ω (3-Wire)	
		9		Others (Please consult before ordering.)	
ALARM		00		None Provided	
		09		Separate Setting, Separate Output Deviation, Higher/Lower Alarm (with Standby/Non-Standby Mode Selector Switch)	
		99		Others (Please consult before ordering.)	
ANALOG OUTPUT		0		None Provided	
		3		0~10mV DC Linear Output, Output Resistance: 10 Ω	
		4		4~20mA DC Linear Output, Load Resistance: 300 Ω max.	
		9		Others (Please consult before ordering.)	
POWER SUPPLY		11-		100~110V/200~220V AC ±10%, 50/60Hz	
		12-		110~120V/220~240V AC ±10%, 50/60Hz	
		99-		Others (Please consult before ordering.)	
INPUT STANDARD		N		None	
		J		JIS	
		F		JIS (New Pt100-JIS)	
		D		DIN	
		A		ANSI	
		X		Others (Please consult before ordering.)	
TYPE OF INPUT		T		Thermocouple (T)	
		J		Thermocouple (J)	
		E		Thermocouple (E)	
		K		Thermocouple (K)	
		S		Thermocouple (S)	
		R		Thermocouple (R)	
		B		Thermocouple (B)	
		P		R.T.D. (Pt100)	
		L		Linear — Voltage and Current Inputs	
		X		Others (Please consult before ordering.)	
MEASURING RANGE			<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	See Measuring Range Codes.	
LEGEND		N		No Legend	
		C		°C Temperature	
		F		°F Temperature	
		H		%RH Humidity	
		P		% Percent	
		V		V Voltage	
		E		mV Voltage	
		A		A Current	
		I		mA Current	
	X		Others (Please consult before ordering.)		
REMARKS		0		Without	
		9		With (Please consult before ordering.)	

## MEASURING RANGE CODES

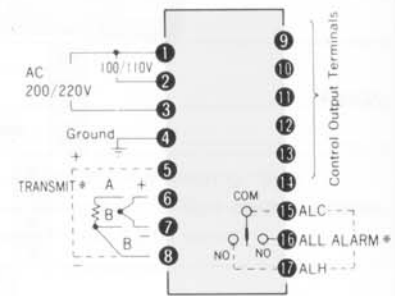
INPUT	RANGE	CODE	ALARM SETTING RANGE	
R.T.D. (Pt100)	-99.9 ~ +99.9 °C	579	0.1 ~ 9.9	
	-99.9 ~ +199.9 °C	580	0.1 ~ 9.9	
	0 ~ 99.9 °C	781	0.1 ~ 9.9	
	0 ~ 199.9 °C	786	0.1 ~ 9.9	
	0 ~ 299 °C	789	1 ~ 99	
Thermocouple	T	-199 ~ +199 °C	573	1 ~ 99
	J	0 ~ 399 °C	792	1 ~ 99
	E	0 ~ 399 °C	792	1 ~ 99
	K	0 ~ 399 °C	792	1 ~ 99
		0 ~ 799 °C	871	1 ~ 99
		0 ~ 999 °C	874	1 ~ 99
	S	0 ~ 1699 °C	885	1 ~ 99
	R	0 ~ 1699 °C	885	1 ~ 99
	B	0 ~ 1799 °C	886	1 ~ 99
	Voltage/ Current	0 ~ 99.9%	781	0.1 ~ 9.9
0 ~ 99.9%RH		781	0.1 ~ 9.9	

INPUT	RANGE	CODE	ALARM SETTING RANGE	
R.T.D. (Pt100)	-99.9 ~ +199.9 °F	580	0.1 ~ 9.9	
	0 ~ 199.9 °F	786	0.1 ~ 9.9	
	0 ~ 299 °F	789	1 ~ 99	
	0 ~ 499 °F	795	1 ~ 99	
	0 ~ 799 °F	871	1 ~ 99	
Thermocouple	J	0 ~ 499 °F	795	1 ~ 99
	J	0 ~ 799 °F	871	1 ~ 99
		0 ~ 999 °F	874	1 ~ 99
		0 ~ 1499 °F	881	1 ~ 99
	E	0 ~ 799 °F	871	1 ~ 99
	K	0 ~ 799 °F	871	1 ~ 99
		0 ~ 1499 °F	881	1 ~ 99
		0 ~ 1999 °F	887	1 ~ 99
	S	0 ~ 2499 °F	891	1 ~ 99
	S	0 ~ 3199 °F	894	1 ~ 99
R	0 ~ 3199 °F	894	1 ~ 99	
B	0 ~ 3199 °F	894	1 ~ 99	

## BASIC CONFIGURATION



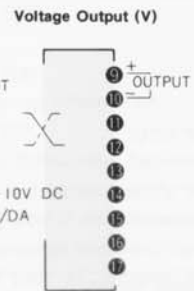
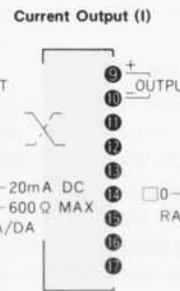
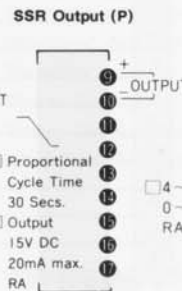
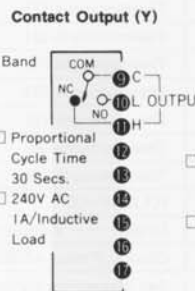
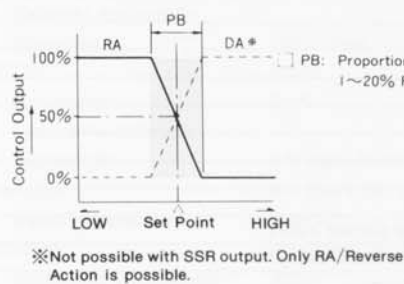
## COMMON TERMINAL ARRANGEMENT



\* Analog output & alarm are optional.  
\* \* TRANSMIT: Analog Output

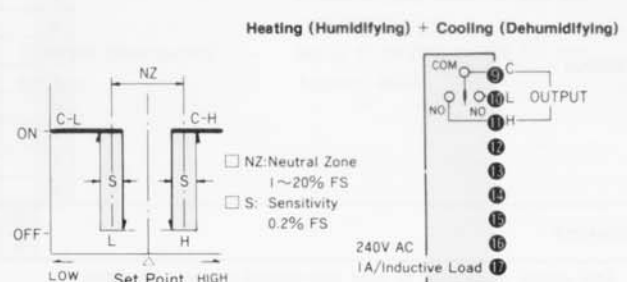
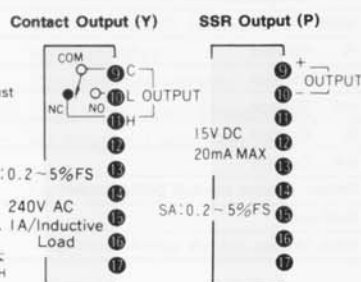
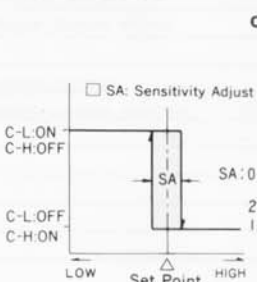
## CONTROL ACTION, ALARM CONFIGURATIONS AND OUTPUT TERMINAL ARRANGEMENT

### Proportional, Control Code 01



### On-Off (2-Position) Control Code 02

Note: For SSR, only heating or humidifying is possible. **3-Position, Control Code 03**

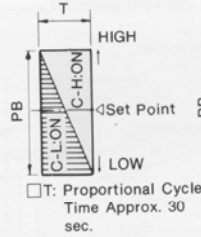


**PID, Control Code 05**

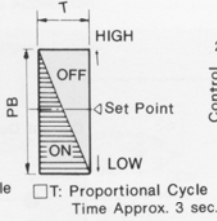
**P.I.D Action**

- Proportional Output (P): Output in proportion to deviation
- Integral Action (I): Deviation is corrected until zero deviation is achieved.
- Derivative Output (D): Output in proportion to varying velocity of input

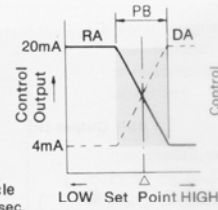
**Contact Output (Y)**



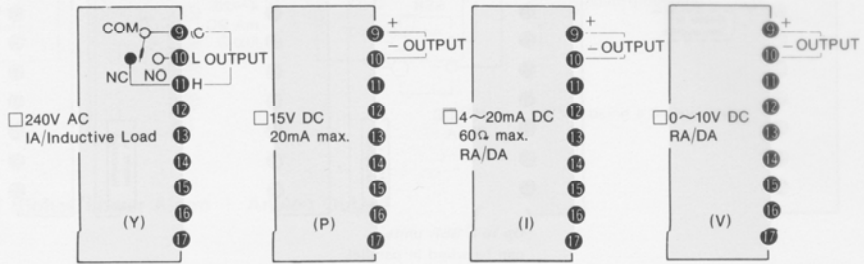
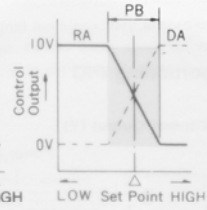
**SSR Output (P)**



**Current Output (I)**



**Voltage Output (V)**



- Proportional Band (PB): 1~20% FS
- Integral Time: 0.1~10 min.
- Derivative Time: 0~5 min.

**Proportional Positioning (Servo), Control Code 06, 07**

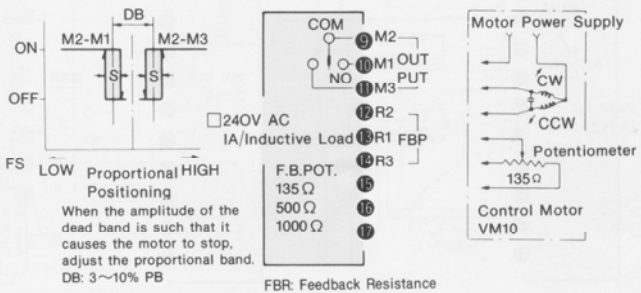
- For the proportional positioning (servo) control mode, a control motor (with potentiometer), motor operated valve or electric damper valve can be operated.

**Proportional, Control Code 06**

- Proportional Band (PB): 1~20% FS
- Manual Reset (MR): Provided
- Dead Band (DB): 3~10% PB
- Sensitivity (S): 2% PB

**PID, Control Code 07**

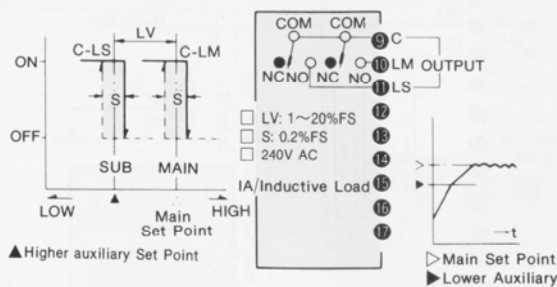
- Proportional Band (PB): 1~20% FS
- Integral Time (IT): 0.1~10 min.
- Derivative Time (DT): 0~5 min.
- Dead Band (DB): 3~10% PB
- Sensitivity (S): 2% PB



**Higher or Lower One-Step Auxiliary Setting On/Off, Control Code 21, 22**

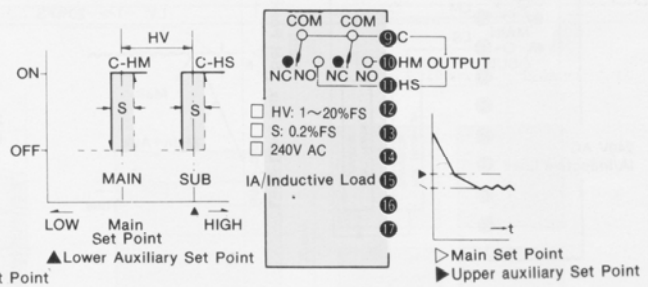
**Lower One-Step Auxiliary Setting On/Off, Control Code 21**

- 2-Step Heating or Humidifying



**Upper One-Step Auxiliary Setting On/Off, Control Code 22**

- 2-Step Cooling or Dehumidifying

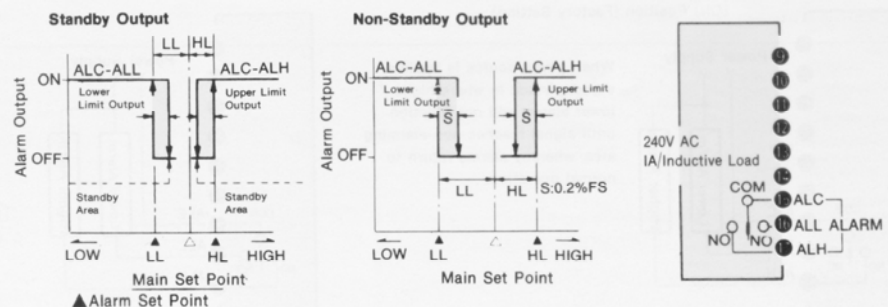


**Deviation Type Higher/Lower Alarm, Control Code 09**

Note: The higher and lower alarm setting range is not the same as the measuring range. (See Measuring Range Codes.)

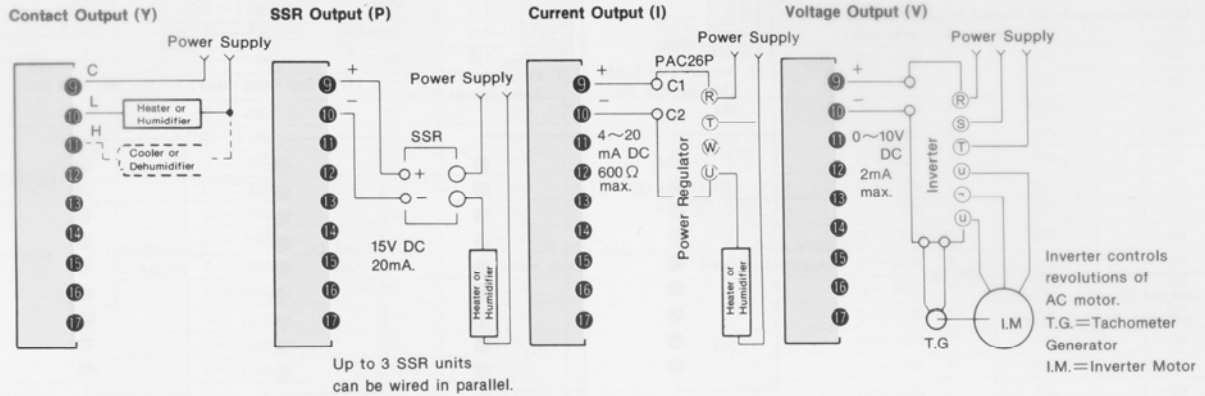
- Provided with standby/non-standby mode selector switch.
- Standby Mode: For alarm action
- Non-Standby Mode: For auxiliary control action
- Factory setting is standby mode.

Note: Standby/non-standby mode selection is for both upper and lower limit operation. Separate upper and lower limit mode selection is not possible.

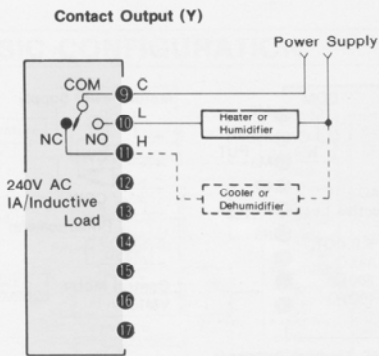


# APPLICATION EXAMPLES

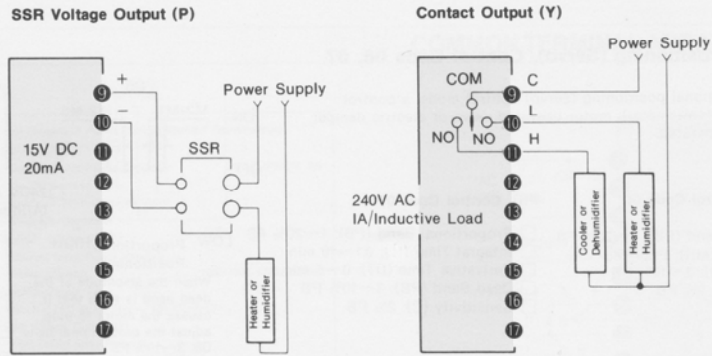
## Proportioning PID



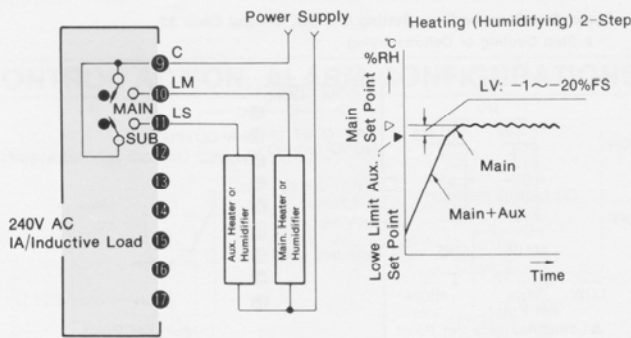
## On/Off (2-Position)



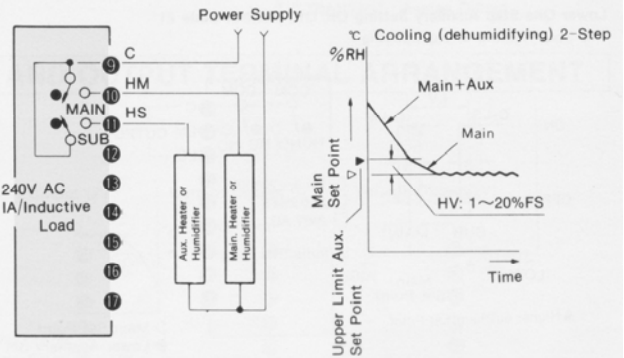
## 3-Position



## Lower One-Step Auxiliary Setting On/Off

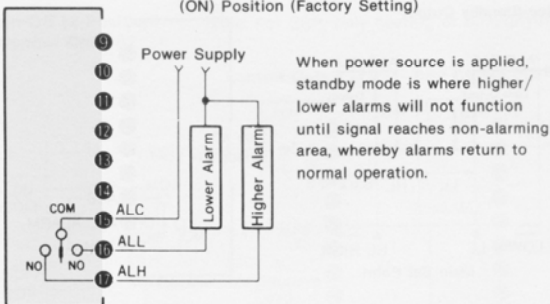


## Upper One-Step Auxiliary Setting On/Off

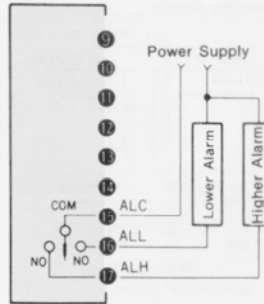


## Deviation Type Higher/Lower Alarm

Alarm Application...Internal Selector Switch in Standby Mode (ON) Position (Factory Setting)



Auxiliary Control Action Application...Internal Selector Switch in Non-Standby Mode (OFF) Position



— Application —

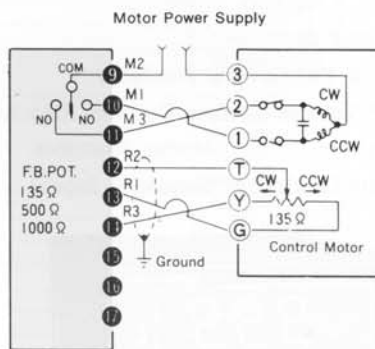
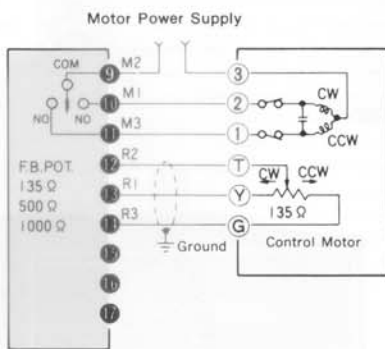
- Lower Limit
  1. Aux. Heater or Humidifier
  2. Sequence Signal
- Higher Limit
  1. Aux. Cooler or Dehumidifier
  2. Sequence Signal
- Lower Limit Aux. + Higher Limit Alarm
- Higher Limit Aux. + Lower Limit Alarm

\* In this application, when power source is applied, alarm signal will be emitted until temperature adjusts to non-alarming area.

**Proportional Positioning (Servo) Proportional and PID**

Heating (Cooling) Application

Cooling (Heating) Application



Motor terminal markings vary according to manufacturer. Please make sure that wiring is in compliance with manufacturer's instructions.

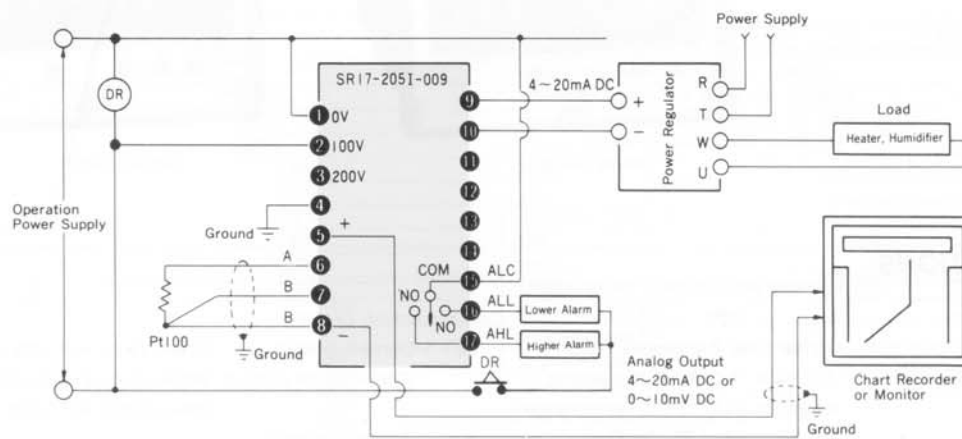
— Note —

- CW: Clockwise
- CCW: Counterclockwise
- FBR: Feedback Resistance
- Use a shield wire (3-wire) and one-point grounding.

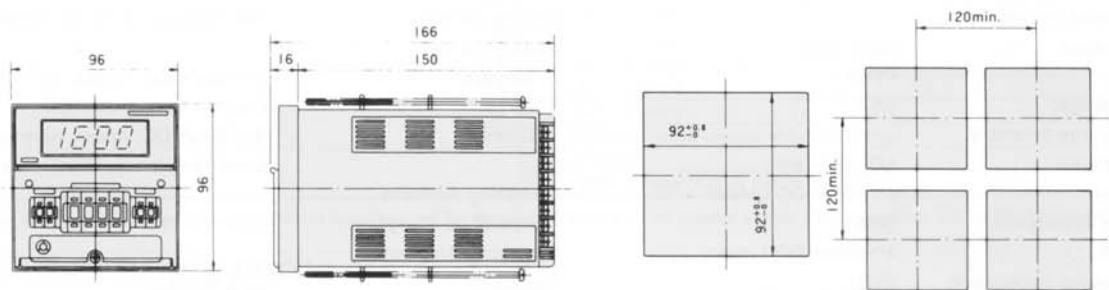


• When using a 3-way valve

**Current Output PID Deviation Type Higher/Lower Alarm + Analog Output**



**EXTERNAL DIMENSIONS & PANEL CUTOUT**



Unit : mm