17. Applications

17.1 RAMP & SOAK

- **RAMP**:
  I. SET2.1=1 → To display AL3
  II. SET4.1=1 → To display ALD3
  III. ALD3=9 → Open RAMP option
  IV. Then, AL3 will not display. It was replaced by RAMP.

<table>
<thead>
<tr>
<th>RAMP</th>
<th>0 0.0 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range: 0.00 ~ 99.99 (°C/min)</td>
<td></td>
</tr>
<tr>
<td>(If RAMP is not used, please set ALD3 to 0)</td>
<td></td>
</tr>
</tbody>
</table>

- **SOAK**:
  I. ALD1/ALD2=19 → To use Sock Timer.
  II. AL1/AL2 will display as below:

<table>
<thead>
<tr>
<th>AL1</th>
<th>0 0.0 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range: 0.00 ~ 99.59 (Hour:Minute)</td>
<td></td>
</tr>
</tbody>
</table>

- **Example**:
  SV=100°C, RAMP=10.00 (°C/min), AL1=00.10 min, PV=25°C

![](image)
17.2 TTL Communication : SV output and RATE function

- Open RATE function (use for slave controller)
  Display AL3 : SET2.1=1
  Display ALD3 : SET4.1=1
  Display RATE(AL3 will be replaced) : SET0.2=1
  Set ALD3 to 0. (In Level 3)
  Slave SV = \((\text{RATE} + 9999) \times \text{master SV}\)

- Example :

  **Connection Diagram**

  **Time Chart**

  ( Three controllers reach to the max value at the same time )
17.3 1 φ Phase angle control (By SCR module)

- Available Models: FY900 / PFY900, FY700 / PFY700
- OUT1: 1 φ SCR phase angle control
- Parameter setting: OUTY=4
  CLO1=0, CHO1=4500 if use for resistance load
  CLO1=0, CHO1=4000 if use for inductor load

**Controller source phase must be same as load source phase**
17.4 1φ Phase angle control (By TRIAC)

- Available Models: FY900 / PFY900, FY700 / PFY700
- OUT1: 1φ SCR phase angle control
- Parameter setting: OUTY=4
  CLO1=0, CHO1=4500 if use for resistance load
  CLO1=0, CHO1=4000 if use for inductor load

** Controller source phase must be same as load source phase
17.5 3φ Phase angle control (By DIODE/SCR module)

- Available Models: FY900 / PFY900
- OUT1: 3φ SCR phase angle control
- Parameter setting: OUTY=5
  - CLO1=0, CHO1=4500 only if use for resistance load
  - CLO1=0, CHO1=4000 if use for inductor load
17.6  1φ Zero crossing control (By SCR module)

- Available Models: FY900 / PFY900, FY700 / PFY700, FY400 / PFY400
- OUT1: 1φ SCR zero cross control
- Parameter setting: OUTY=0, CYT1=1

![Circuit Diagram]

TIME CHART:

ON  OFF

CYCLE TIME = 200 mSEC.
17.7 1ϕ Zero crossing control (By TRIAC)

- Available Models: FY900 / PFY900, FY700 / PFY700, FY400 / PFY400
- OUT1: 1ϕ SCR zero cross control
- Data Change: OUTY=0, CYT1=1

![Diagram of 1ϕ Zero crossing control (By TRIAC)]
17.8 3φ Zero crossing control (By SCR module)

- Available Models: FY900 / PFY900
- OUT1: 3φ SCR zero cross control
- Data Change: OUTY=0, CYT1=1

**Diagram:**

- RG 1
- RG 2
- RG 2
- TG 1
- TG 2
- SCR Module
- FAST FUSE
- WE CAN SUPPLY HEATER SINK
- CONTROLLER
  - RG 1
  - RG 2
  - TG 1
  - TG 2
- PROT
- Short

**Time Chart:**

- Cycle time = 200 mSEC.
17.9  3\( \phi \) Zero crossing control (By TRIAC)

- Available Models: FY900 / PFY900
- OUT1: 3\( \phi \) SCR zero cross control
- Data Change:
  - OUTY = 0
  - CYT1 = 1

![Diagram of 3\( \phi \) Zero crossing control](image-url)
17.10 3 wires proportional motor valve control

- Available Models: FY900 / PFY900, FY700 / PFY700, FY800 / PFY800, FY600 / PFY600, FY400 / PFY400

- Data Change: OUTY=3
  CYT1=1 ~ 100sec.
  (Manufacturing default setting “5” seconds.)
  RUCY=5 ~ 200 seconds.

1. CYT1 is the cycle time of Open / Close
2. RUCY is the 0 ~ 100% running time of motor valve

MOTOR VALVE

CONTROLLER

OUT2 Relay
OUT1 Relay

CLOSE
OPEN
COM
17.11 Wiring diagram of PC communication

RS232 Connection Diagram

<table>
<thead>
<tr>
<th>Pin 3 (T)</th>
<th>Pin 2 (R)</th>
<th>Pin 5 (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM PORT : 9PIN ( DTE )</td>
<td>Controller</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pin 2 (T)</th>
<th>Pin 3 (R)</th>
<th>Pin 7 (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM PORT : 25PIN ( DTE )</td>
<td>Controller</td>
<td></td>
</tr>
</tbody>
</table>

NOTE:
1. The length of cable be connected between controller and PC can't exceed 15 meter.
2. One Com Port can only be connected to one controller. If more than one controller is connected to one Com Port, communication will be failed.
3. Ensure that the controller's IDNO and BAUD settings are the same with PC software's settings.
4. For the software communication format please refer to communication manual.

RS485 Connection Diagram

<table>
<thead>
<tr>
<th>(T+)</th>
<th>(R+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Converter</td>
<td>Cable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DX -</th>
<th>DX +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller</td>
<td></td>
</tr>
</tbody>
</table>

NOTE:
1. The length of cable be connected between Converter and Controller can't exceed 1.2 KM. Suggestion: choose "Shielded Cable".
2. One Com Port can be connected up to a maximum of 30 Controllers.
3. Ensure that the Controller's IDNO and BAUD settings are the same with PC software's settings.
4. For the software communication format, please refer to communication manual.