2. OPERATION FLOW

- Set value change and registration
  - The blinking digit indicates which digit can be set. The blinking digit can be moved by pressing the \( \Delta \) key.
  - However, the changed data is not stored by the operation of the \( \Delta \) and \( \nabla \) keys. In order for the new parameter value to be stored, the key must be pressed within 1 minute after the new value is displayed. The new value will then be saved and the display will move to the next parameter.

3. OPERATION MENU

- In this mode, control Set value (SV) and Manual output value (MV) in Manual mode can be set.
- SV Setting Mode
  - Display the temperature \( T \) of control in operation.
  - Set unit of \( T \) to \( F \) or \( C \) or \( K \) or \( °C \) or \( °F \) or \( °K \) or \( °C \).
  - Set unit of \( T \) to \( °C \) or \( °F \) or \( °K \) or \( °C \).

4. SETTING EXAMPLE

- Set set value (SV) to 200 °C
  - Monitor display mode
  - The set value (SV) can also be set in Parameter setting mode.

- Set event set value (EV1) to 20 °C
  - Monitor display mode
  - Set event set value (EV1) can also be set in Parameter setting mode.

- Set Auto-tuning (AT)
  - Monitor display mode
  - Set event set value (EV1) can also be set in Parameter setting mode.

- Set 20 °C for Proportional band (P) of PID control
  - Monitor display mode
  - Set event set value (EV1) can also be set in Parameter setting mode.

- Switch from Auto (AUTO) mode to Manual (MAN) mode
  - Monitor display mode
  - Set event set value (EV1) can also be set in Parameter setting mode.

- Set Manipulated output value (MV) to 50 % in the Manual mode
  - Monitor display mode
  - Set event set value (EV1) can also be set in Parameter setting mode.
6.2 Autotuning (AT)/Start/Stop

The AT function automatically measures, computes, and sets the optimum PID values.

**Caution for using the Autotuning (AT)**

- If a temperature change of 0°C or less per minute during AT operation is not exceeded, the AT will be cancelled.
- A manual setting of PID values may also be necessary if the set value is around the ambient temperature, and the load is increased or decreased.
- If the manipulated output may be limited by the limit setting, the optimum PID values may not be calculated by AT.

**Requirements for Autotuning (AT)**

- A power failure of 50 ms or less will not affect the control function.
- When a power failure of more than 20 ms occurs, the control will not function, and the calculation and settings will return to the previous state when the power is turned on again.
- The event output signal will not be affected by the AT operation.

**Start the AT**

1. The AT will begin when the following conditions are satisfied:
   - **Operation state**: PID control
   - **Parameter setting**: Output limit high = 0.0 %, Output limit low = 0.0 %
   - **Initial values**: The measured value is not undetermined or saturated

**Requirements for Autotuning (AT) cancellation**

- If AT is canceled, the AT function will be discontinued, and the parameters will be set to the previous values.

**Fine Tuning**

- The fine tuning function allows you to change the response of the set PID constant.
- The tuning parameters can be made "faster" or "slower" by changing the Fine tuning setting (levels 1 to 3) in the Parameter setting mode. The PID constant can be kept unchanged, or changed when the setting conditions are satisfied.

**Fine tuning setting**

- Set the response level by selecting "1" to "3" in the Parameter setting mode.
- When the response level is 1, the AT will function faster, and when the response level is 3, the AT will function slower.

6.4 Fine Tuning

The fine tuning function allows you to change the response of the set PID constant. The tuning parameters can be made "faster" or "slower" by changing the Fine tuning setting (levels 1 to 3) in the Parameter setting mode. The PID constant can be kept unchanged, or changed when the setting conditions are satisfied.

**Fine tuning setting**

- Set the response level by selecting "1" to "3" in the Parameter setting mode.
- When the response level is 1, the AT will function faster, and when the response level is 3, the AT will function slower.

6.6 Data Lock Function

The data lock function limits access to unauthorized personnel to the parameter and prevents unauthorized changes by mistake. Refer to the Event Interlock (FL) in Engineering mode, (Factory shipment) data lock function OFF (FL) in Engineering mode.

To validate the data lock function, settings are restricted in Set lock level (Lock) mode setting (Factory shipment: Data lock function OFF (FL) is always enabled).

**Fine tuning setting**

- Set the lock level to "Lock" in the "Parameter Group" F06 through F10 in the Parameter setting mode.

7. ERROR DISPLAY