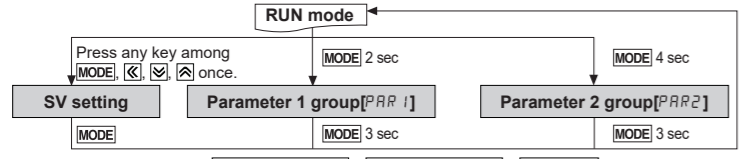
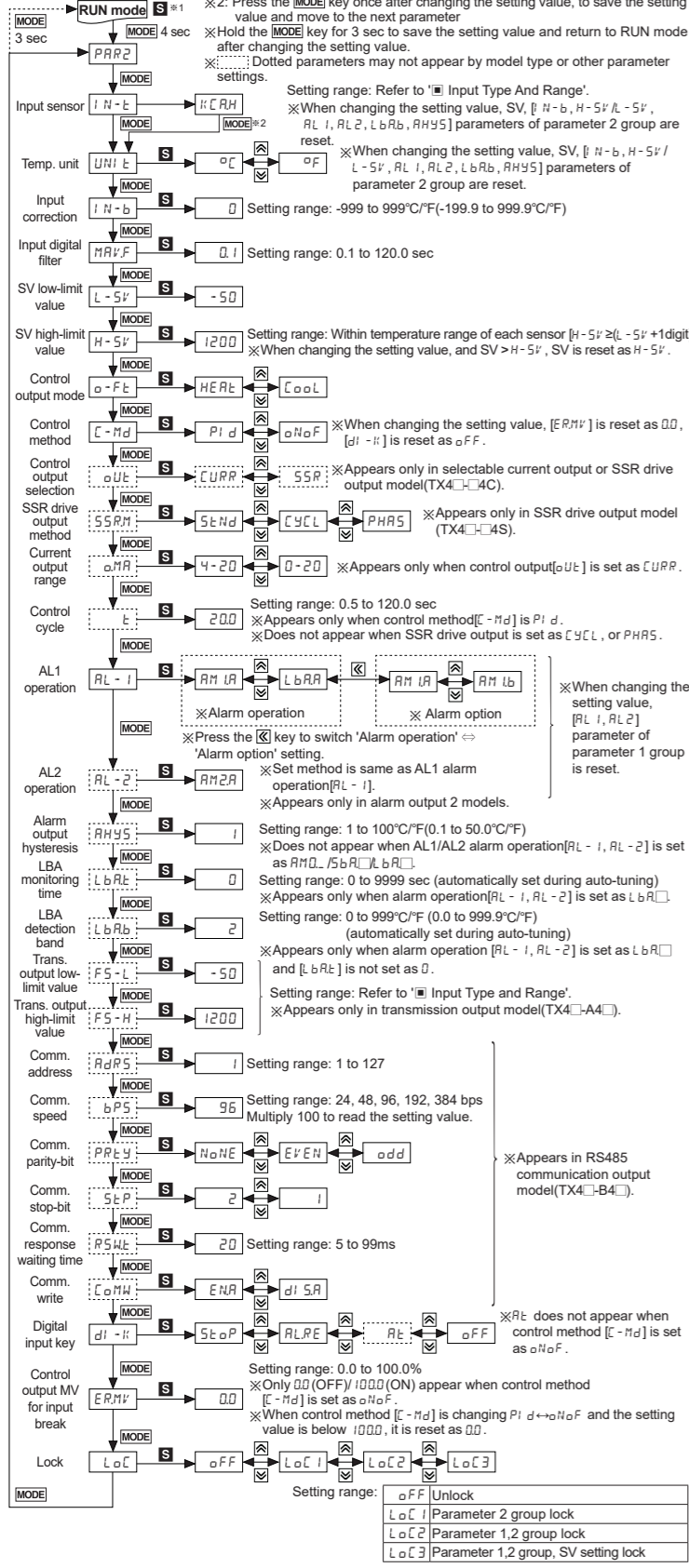


Parameter Groups

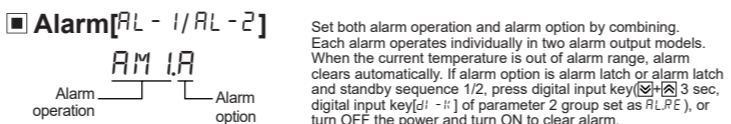
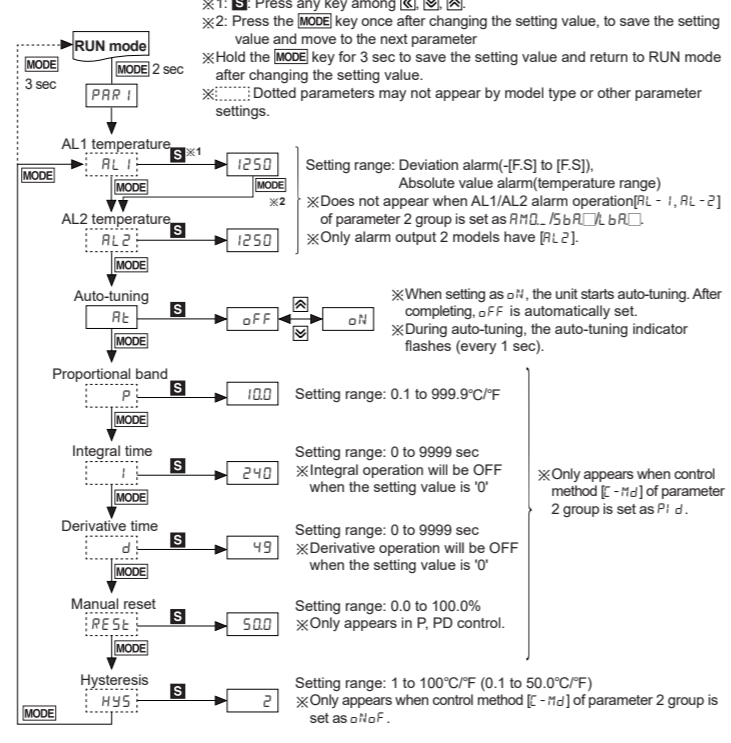


- Order of parameter setup: Parameter 2 group → Parameter 1 group → SV setting
- All parameters are related one another. Set the parameters as above order.
- If there is no key input for 30 sec while setting parameters, the new settings are ignored, and the unit will return to RUN mode with previous settings.
- When returning to RUN mode by holding the [MODE] key for over 3 sec, press the [MODE] key within 1 sec to re-enter the first parameter of previous parameter group.
- Hold the [X] + [H] keys for 5 sec in RUN mode, to enter re-set parameter menu. Select 'YES' and all parameters are reset as factory default.

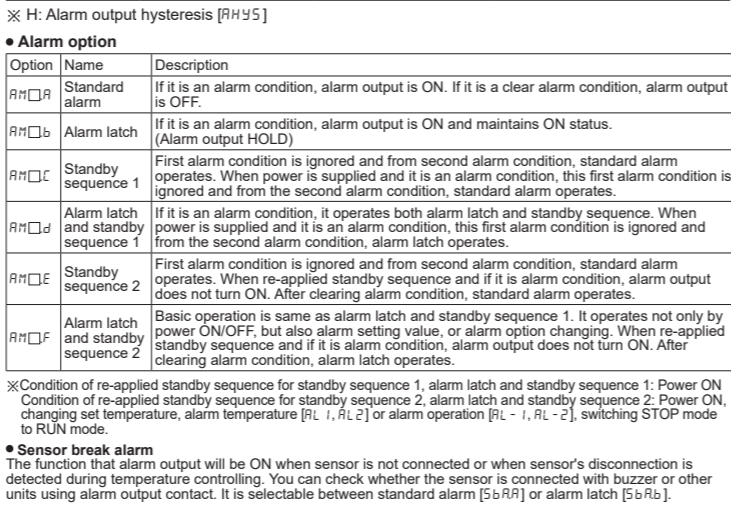
Parameter 2 group



Parameter 1 group



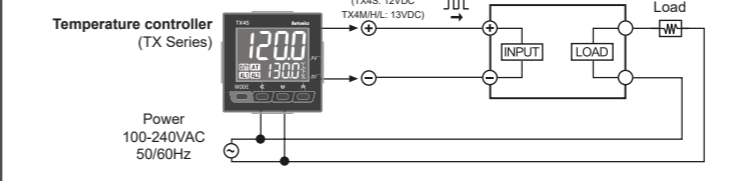
Mode	Name	Alarm operation	Description
AL0			No alarm output
AL1	Deviation high-limit alarm	OFF → ON (P.V. 100°C, S.V. 110°C) High-limit deviation: Set as 10°C	If deviation between PV and SV as high-limit is higher than set value of deviation temperature, the alarm output will be ON.
AL2	Deviation low-limit alarm	ON → OFF (P.V. 90°C, S.V. 100°C) Low-limit deviation: Set as -10°C	If deviation between PV and SV as low-limit is higher than set value of deviation temperature, the alarm output will be ON.
AL3	Deviation high/low-limit alarm	ON → OFF (P.V. 90°C, S.V. 100°C) High, Low-limit deviation: Set as 10°C	If deviation between PV and SV as high/low-limit is higher than set value of deviation temperature, the alarm output will be ON.
AL4	Deviation high/low-limit reserve alarm	OFF → ON (P.V. 90°C, S.V. 100°C) High, Low-limit deviation: Set as 10°C	If deviation between PV and SV as high/low-limit is higher than set value of deviation temperature, the alarm output will be OFF.
AL5	Absolute value high limit alarm	OFF → ON (P.V. 90°C, S.V. 100°C) Alarm absolute-value: Set as 90°C	If PV is higher than the absolute value, the output will be ON.
AL6	Absolute value low limit alarm	ON → OFF (P.V. 90°C, S.V. 100°C) Alarm absolute-value: Set as 90°C	If PV is lower than the absolute value, the output will be ON.
Sb	Sensor break alarm		It will be ON when it detects sensor disconnection.
Lb	Loop break alarm		It will be ON when it detects loop break.



Functions

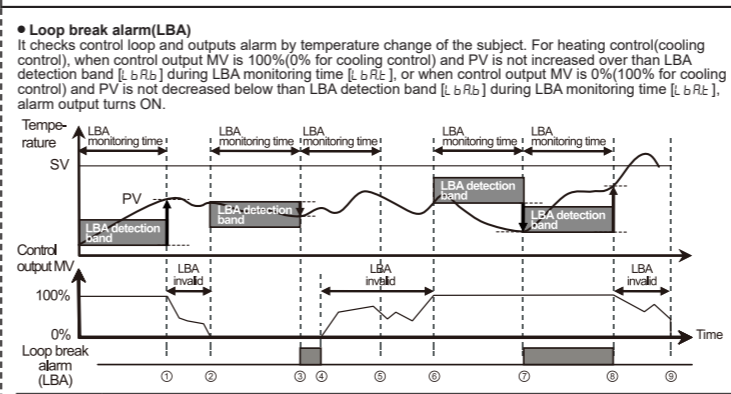
- Input correction [N-b]**: Controller itself does not have errors but there may be error by external input temperature sensor. This function is for correcting this error. Ex) If actual temperature is 80°C but controller displays 78°C, set input correction value [N-b] as '2' and controller displays 80°C.
- Input digital filter [HF]**: If current temperature (PV) is fluctuating repeatedly by rapid change of input signal, it reflects to MV and stable control is impossible. Therefore, digital filter function stabilizes current temperature value. For example, set input digital filter value as 0.4 sec, and it applies digital filter to input values during 0.4 sec and displays these values. Current temperature may be different by actual input value.

- SSR drive output method (SSRP function) [SRM]**: SSRP function is selectable one of standard ON/OFF control, cycle control, phase control by utilizing standard SSR drive output. This function parameter appears only in SSR drive output model (TX4□□4S).



- When selecting cycle or phase control mode, the power supply for a load and a temperature controller must be the same.
- Control cycle: [] is able to set only when control method [C-Md] of parameter group 2 is set as P1d and SSR drive output method [SRM] is set as 5SRM.
- Standard ON/OFF control [5SRM]: Controls ON (100% output)/OFF (0% output) as same as standard relay output.
- Cycle control [CYCL]: Controls the load by repeating output ON/OFF according to the rate of output within setting cycle based on certain period (50-cycle). Control accuracy is almost the same with phase control.
- Phase control [PHAS]: Controls the load by controlling the phase within AC half cycle. Serial control is available. Must use random turn-on SSR for this mode.

- Current output range [PMR]**: In case of selectable current output or SSR drive output model (TX4□□4C), when control output [OUT] of parameter 2 group is set as CURP, you can select high/low-limit range, 4-20mA [4-20] or 0-20mA [0-20] of current output.
- Hysteresis [HYS]**: Set interval between ON and OFF of control output for ON/OFF control. If hysteresis is too narrow, hunting (oscillation, chattering) could occur due to external noise.



- Loop break alarm (LBA)**: It checks control loop and outputs alarm by temperature change of the subject. For heating control (cooling control), when control output MV is 100% (0% for cooling control) and PV is not increased over than LBA detection band [LbRb] during LBA monitoring time [LbRt], or when control output MV is 0% (100% for cooling control) and PV is not decreased below than LBA detection band [LbRb] during LBA monitoring time [LbRt], alarm output turns ON.
- Major Products**: Photovoltaic Sensors, Fiber Optic Sensors, Door Sensors, Area Sensors, Proximity Sensors, Pressure Sensors, Rotary Encoders, Connector/Sockets, Switching Mode Power Supplies, Control Switches/Lamps/Buzzers, I/O Terminal Blocks & Cables, Stepper Motors/Drivers/Motion Controllers, Graphic/Logic Panels, Field Network Devices, Laser Marking System, Laser Welding/Cutting System, Temperature Controllers, Temperature/Humidity Transducers, SSR/Power Controllers, Counters, Timers, Panel Meters, Tachometer/Pulse/Rate/Meters, Display Units, Sensor Controllers.

Digital input key [d1 - dk]

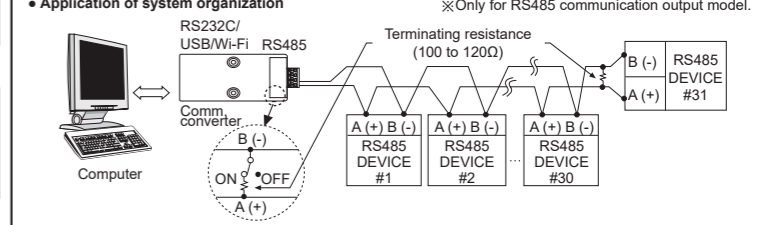
Parameter	Operation
OFF	oFF It does not use digital input key function.
RUN/STOP	5t oP Pauses control output. Auxiliary output (except loop break alarm, sensor break alarm) except control output operates as setting. Hold the digital input keys for 3 sec to restart. Digital input key (t: over 3 sec)
Clear alarm	RLRE Clears alarm output by force. (Only when alarm option is alarm latch, or alarm latch and standby sequence 1/2.) This function is applied when present value is out of alarm operation range but alarm output is ON. Alarm operates normally right after clearing alarm.
Auto-tuning	Rt Starts/Stops auto-tuning. This function is same as auto-tuning [Rt] of parameter 1 group. (You can start auto-tuning [Rt] of parameter 1 group and stop it by digital input key.) This parameter Rt appears only when control method [C-Md] parameter 2 group is set as P1d. When control method [C-Md] parameter 2 group is set as oN oF, this parameter is changed as oFF.

Control output MV for input break [ERMV]
When input sensor is break, set control output MV.
When control method [C-Md] of parameter 2 group is set as oN oF, set control output MV as 00 (OFF) or 1000 (ON). When control method [C-Md] is set as P1d, setting range for control output MV is 00 to 1000.

Communication Setting

It is for parameter setting and monitoring via external devices (PC, PLC, etc.). Applicable for models with RS485 communication output through option output (TX4□□B4□). Please refer to 'Ordering Information'.

Comm. protocol	Modbus RTU	Comm. speed	4800, 9600 (default), 19200, 38400, 115200 bps
Connection type	RS485	Response waiting time	5 to 99ms (default: 20ms)
Application standard	EIA RS485 Compliance with	Start bit	1-bit (fixed)
Max. connection	31 units (address: 01 to 127)	Data bit	8-bit (fixed)
Synchronous method	Asynchronous	Parity bit	None (default), Odd, Even
Comm. method	Two-wire half duplex	Stop bit	1-bit, 2-bit (default)
Comm. effective range	Max. 800m		



It is recommended to use Autonics communication converter: SCM-WF48 (Wi-Fi to RS485-USB wireless communication converter, sold separately), SCM-U481 (USB to RS485 converter, sold separately), SCM-381 (RS232C to RS485 converter, sold separately), SCM-US (USB to Serial converter, sold separately). Please use twisted pair wire, which is suitable for RS485 communication, for SCM-WF48, SCM-U481 and SCM-381.

Manual

For the detail information and instructions of communication setting and Modbus mapping table, please refer to user manual for communication, and be sure to follow cautions written in the technical descriptions (catalog, homepage). Visit our homepage (www.autonics.com) to download manuals.

Error

Display	Description	Troubleshooting
oPEN	Flashes when input sensor is disconnected or sensor is not connected.	Check input sensor status.
HHHH	Flashes when measured value is higher than input range.	When input is within the rated input range, this display disappears.
LLLL	Flashes when measured value is lower than input range.	

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
- Check the polarity of the terminals before wiring the temperature sensor.
- For RTD temperature sensor, wire it as 3-wire type, using cables in same thickness and length. For thermocouple (CT) temperature sensor, use the designated compensation wire for extending wire.
- Keep away from high voltage lines or power lines to prevent inductive noise. In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.
- Do not use near the equipment which generates strong magnetic force or high frequency noise.
- Do not apply excessive power when connecting or disconnecting the connectors of the product.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Do not use the unit for other purpose (e.g. voltmeter, ammeter), but temperature controller.
- When changing the input sensor, turn off the power first before changing. After changing the input sensor, modify the value of the corresponding parameter.
- Do not overlapping communication line and power line.
- Use twisted pair wire for communication line and connect ferrite bead at each end of line to reduce the effect of external noise.
- Make a required space around the unit for radiation of heat. For accurate temperature measurement, warm up the unit over 20 min after turning on the power.
- Make sure that power supply voltage reaches to the rated voltage within 2 sec after supplying power.
- Do not wire to terminals which are not used.
- This unit may be used in the following environments.
 - Indoors (in the environment condition rated in 'Specifications')
 - Altitude max. 2,000m
 - Pollution degree 2
 - Installation category II

Autonics Corporation
http://www.autonics.com

HEADQUARTERS:
18, Bamsong-ro 513beon-gil, Haendae-gu, Busan, South Korea, 48002
TEL: 82-51-619-3232
E-mail: sales@autonics.com

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