

Some parameters are not displayed depending on the specifications.

1. Monitor Display Mode

Display	Name	Display range	Factory set value
	Measured value (PV) Set value (SV) monitor	PV display: PV is displayed. Input scale low to Input scale high SV display: The target value for control is displayed. Set value (SV) [AUTO mode] Manual manipulated output value (MV) [MAN mode]* *MAN lamp lights	—
	Manipulated output value (MV1) monitor [heat-side]	Within output limiter range	—
	Manipulated output value (MV2) monitor [cool-side]	Within output limiter range	—
	Remaining time monitor	0 minutes 00 seconds to 99 minutes 59 seconds or 0 hours 00 minutes to 99 hours 59 minutes	—

2. SV Setting Mode

Display	Name	Data range	Factory set value
	Measured value (PV) Set value (SV)	Setting limiter low to Setting limiter high The target value for control can be set.	0 (0.0)
	Measured value (PV) Manipulated output value (MV)	PID control: Output limiter low to Output limiter high Heat/Cool PID control: —Output limiter low to +Output limiter high When in MAN mode, Manual manipulated output value (MV) can be set.	0.0

3. Mode Switching

Display and Name	Data range	Factory set value
Auto (AUTO)/Manual (MAN) transfer 	0000: Auto (AUTO) mode 0001: Manual (MAN) mode	0000
Set data unlock/lock transfer * 	0000: Unlock 0001: Lock *Factory shipment: Data lock function OFF (All parameters can be changed) To validate the Data lock function, settings are required in Set lock level of Engineering mode.	0000
Interlock release * 	0000: Interlock release 0001: Interlock state (only monitor) *Factory shipment: Interlock function OFF To validate the Interlock function, it is necessary to set interlock to "1: Used" in Engineering mode.	0000

4. Parameter Setting Mode

Display	Name	Data range	Factory set value
	Set value 1 (SV1)	Setting limiter low to Setting limiter high	0 (0.0)
	Set value 2 (SV2)		0 (0.0)
	Set value 3 (SV3)		0 (0.0)
	Set value 4 (SV4)		0 (0.0)
	SV selection	1 to 4 One of the 4 set values can be selected and used for control. [Effective when Timer function 1 or 2 is selected.]	1
	Timer 1	00 minutes 01 seconds to 99 minutes 59 seconds or 00 hours 01 minutes to 99 hours 59 minutes	00:01
	Timer 2	[Factory set value of time unit of Timer: 0 (min.:sec.)]	00:01
	Timer 3		00:01
	Timer 4		00:01
	Timer function	0 (Unused), 1 (Timer function 1) to 4 (Timer function 4)	0
	Repeat execution times	0 to 9999 (9999: Infinite times) [Effective when Timer function 3 or 4 is selected.]	0
	Setting change rate limiter (up)	1(0.1) to Input span (Unit: °C [°F])/unit time (0: Unused) [Factory set value of unit time: 0 (minute)]	0 (0.0)
	Setting change rate limiter (down)	1(0.1) to Input span (Unit: °C [°F])/unit time (0: Unused) [Factory set value of unit time: 0 (minute)]	0 (0.0)
	Event 1 set value (EV1)	<Displayed when event code A to T, V or W is selected.> Deviation action: -Input span to +Input span Input value or set value action: Same as input range	TC/RTD: 50 (50.0) V/I: 5.0
	Event 1 set value (EV1) [high]	<Displayed when event code U, X, Y or Z is selected.> -Input span to +Input span	TC/RTD: 50 (50.0) V/I: 5.0

Display	Name	Data range	Factory set value
	Event 1 set value (EV1) [low]	<Displayed when event code U, X, Y or Z is selected.> -Input span to +Input span	TC/RTD: -50 (-50.0) V/I: -5.0
	Event 2 set value (EV2)	The data range is the same as Event 1 set value (EV1).	TC/RTD: 50 (50.0) V/I: 5.0
	Event 2 set value (EV2) [high]	The data range is the same as Event 1 set value (EV1) [high].	TC/RTD: 50 (50.0) V/I: 5.0
	Event 2 set value (EV2) [low]	The data range is the same as Event 1 set value (EV1) [low].	TC/RTD: -50 (-50.0) V/I: -5.0
	Event 3 set value (EV3)	The data range is the same as Event 1 set value (EV1).	TC/RTD: 50 (50.0) V/I: 5.0
	Event 3 set value (EV3) [high]	The data range is the same as Event 1 set value (EV1) [high].	TC/RTD: 50 (50.0) V/I: 5.0
	Event 3 set value (EV3) [low]	The data range is the same as Event 1 set value (EV1) [low].	TC/RTD: -50 (-50.0) V/I: -5.0
	Autotuning (AT)	0: PID control 1: AT	0
	Startup tuning (ST)	0: ST unused 1: Execute once 2: Execute always	0
	Proportional band [heat-side]	TC/RTD inputs: 1(0.1) to Input span (Unit: °C [°F]) [Resolution of 0.1 °C (°F); Within 999.9 °C (°F)] Voltage (V)/Current (I) inputs: 0.1 to 100.0 % of Input span 0 (0.0): ON/OFF action	TC/RTD: 30 (30.0) V/I: 3.0
	Integral time	1 to 3600 seconds (0: PD action)	240
	Derivative time	1 to 3600 seconds (0: PI action)	60
	Anti-reset windup (ARW)	1 to 100 % of Proportional band [heat-side] (0: Integral action is always OFF)	100
	Proportional band [cool-side]	1 to 1000 % of Proportional band [heat-side] (ON/OFF control of cool-side only is not possible)	100
	Overlap/Deadband	TC/RTD inputs: -10 (-10.0) to +10 (+10.0) °C [°F] Voltage (V)/Current (I) inputs: -10.0 to +10.0 % of Input span Minus (-) setting results in overlap.	0 (0.0)
	Fine tuning setting	-3 to +3 (0: Unused)	0
	Control loop break alarm (LBA) time	0 to 7200 seconds (0: Unused) [Displayed when event code "2" is selected.]	480
	LBA deadband (LBD)	0 to Input span [Displayed when event code "2" is selected.]	0
	Proportional cycle time [heat-side]	0 to 100 seconds (0: Setting below 1 second is possible for Time setting of proportional cycle time [heat-side] in the Engineering mode F51) [Displayed when OUT1 code M, V, T or D is selected.]	Relay contact output: 20 Voltage pulse output, Triac output, Open collector output: 2
	Minimum ON/OFF time of proportioning cycle [heat-side]	0 to 1000 ms [Displayed when OUT1 code M, V, T or D is selected.]	0
	Output limiter high [Heat-side output limiter (high)]	PID control: Output limiter low to 105.0 % Heat/Cool PID control: 0.0 to 105.0 %	105.0
	Output limiter low [Cool-side output limiter (high)]	PID control *: -5.0 % to Output limiter high * Output limiter high > Output limiter low Heat/Cool PID control: 0.0 to 105.0 %	PID control: -5.0 Heat/Cool PID control: 105.0
	Proportional cycle time [cool-side]	0 to 100 seconds (0: Setting below 1 second is possible for Time setting of proportional cycle time [cool-side] in the Engineering mode F51) [Displayed when OUT2 code M, V, T or D is selected.]	Relay contact output: 20 Voltage pulse output, Triac output, Open collector output: 2
	Minimum ON/OFF time of proportioning cycle [cool-side]	0 to 1000 ms [Displayed when OUT2 code M, V, T or D is selected.]	0
	PV bias	TC/RTD inputs: -1999 (-199.9) to +9999 (+999.9) °C [°F] Voltage (V)/Current (I) inputs: -Input span to +Input span	0 (0.0)
	PV digital filter	0 to 100 seconds (0: Unused)	1
	Manual manipulated output value (MV)	PID control: Output limiter low to Output limiter high Heat/Cool PID control: -Cool-side output limiter (high) to +Heat-side output limiter (high)	0.0

5. Engineering Mode



WARNING

Parameters in the Engineering mode (F21 to F70) should be set according to the application before setting any parameter related to operation. Once the parameters in the Engineering mode are set correctly, no further changes need to be made to parameters for the same application under normal conditions. If they are changed unnecessarily, it may result in malfunction or failure of the instrument. TLV will not bear any responsibility for malfunction or failure as a result of improper changes in the Engineering mode.

5.1 Function block (F□□) structure in the Engineering mode

Setting items are classified into groups (Function block: F□□) within the Engineering mode. Set to meet application requirements.

F00:

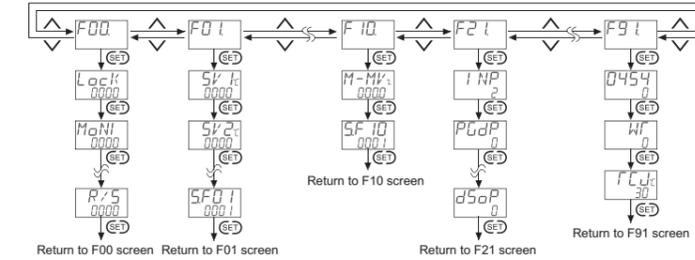
Non-display screen settings (Monitor display mode, Mode switching). Set lock level settings for the Setting data lock function, and RUN/STOP switching in Engineering mode can be selected.

F01 to F10:

The parameter setting screen that is displayed in Parameter setting mode can be hidden.

F21 to F91:

Settings related to the specifications of this product can be selected. However, to display F21 and after, setting ModE (Mode selection [no display]) in F00 to 128 is required.



5.2 Restricting access to the Engineering mode

The relationships between Engineering mode, Set data unlock/lock, and RUN/STOP are shown below.

◎: Can be displayed and changed ○: Can be displayed ●: Cannot be displayed or changed

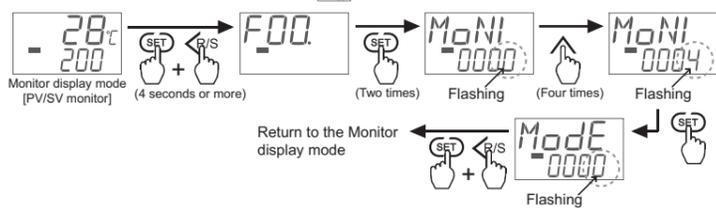
Set data unlock/lock transfer	Engineering mode	RUN/STOP	
		RUN	STOP (STOP lamp lights)
Unlock	F00	◎	◎
	F01 to F10 *	◎	◎
	F21 to F91	○	◎ (Excluding F91)
Lock (Lamp lights)	F00	◎	◎
	F01 to F10 *	◎	◎
	F21 to F91	●	●

* Some setting items in Parameter setting mode are the same as the items in F01 to F10. When the set value of one of these items is changed, the set value of the corresponding item in the other mode also changes. However, with respect to parameters that can be changed in the locked state, this applies only to F□□ parameters that are not locked in the Set lock level setting.

5.3 Function Block 00 (F00)

Display	Name	Data range	Factory set value
	Function block 00	This is first parameter symbol of Function block 00.	
	Set lock level	0 to 10	0
	Monitor selection (no display)	0: Display all 4: Manipulated output value (MV) monitor [no display]* 8: Remaining time monitor [no display] * MV monitors is not displayed with Heat/Cool control type. Refer to setting example.	0
	Mode selection (no display)	0: Display Mode switching screen (Auto/Manual transfer, Set data unlock/lock transfer, Interlock release). 1: Auto (AUTO)/Manual (MAN) transfer [no display] 2: Set data unlock/lock transfer [no display] 4: Interlock release [no display] 8: Disable RUN/STOP key operation 128: Displays F21 and after	0
	RUN/STOP setting	0: RUN 1: STOP (STOP lamp lights)	0

Setting example: Hiding the parameter screen of Manipulated output value (MV) monitor



Set the value of the item that you wish to hide. If there are multiple items that you wish to hide, set the sum of the values of the items.

5.4 Function Block 01 (F01) to 10 (F10)

Display	Name	Data range	Factory set value
	Function block 01	This is first parameter symbol of Function block 01. [Parameters related to Set values [SV]]	
	Set value 1 (SV1)	Setting limiter low to Setting limiter high	0 (0.0)
	Set value 2 (SV2)		0 (0.0)
	Set value 3 (SV3)		0 (0.0)
	Set value 4 (SV4)		0 (0.0)
	SV selection	1 to 4 One of the 4 set values can be selected and used for control. [Effective when Timer function 1 or 2 is selected.]	1

Display	Name	Data range	Factory set value
	F01 block selection (no display)	0: Display 1: No display	1
	Function block 02	This is first parameter symbol of Function block 02. [Parameters related to Timer function]	
	Timer 1	00 minutes 01 seconds to 99 minutes 59 seconds or 00 hours 01 minutes to 99 hours 59 minutes	00:01
	Timer 2	[Factory set value of time unit of Timer: 0 (min.:sec.)]	00:01
	Timer 3		00:01
	Timer 4		00:01
	Timer function	0 (Unused), 1 (Timer function 1) to 4 (Timer function 4)	0
	Repeat execution times	0 to 9999 (9999: Infinite times) [Effective when Timer function 3 or 4 is selected.]	0
	F02 block selection (no display)	0: Display 1: No display	1
	Function block 03	This is first parameter symbol of Function block 03. [Parameters related to Setting change rate limiter]	
	Setting change rate limiter (up)	1(0.1) to Input span (Unit: °C [°F])/unit time (0: Unused)	0 (0.0)
	Setting change rate limiter (down)	[Factory set value of unit time: 0 (minute)]	0 (0.0)
	F03 block selection (no display)	0: Display 1: No display	1
	Function block 04	This is first parameter symbol of Function block 04. [Parameters related to Event set values]	
	Event 1 set value (EV1)	<Displayed when event code A to T, V or W is selected.> Deviation action: -Input span to +Input span Input value or set value action: Same as input range	TC/RTD: 50 (50.0) V/I: 5.0
	Event 1 set value (EV1) [high]	<Displayed when event code U, X, Y or Z is selected.> -Input span to +Input span	TC/RTD: 50 (50.0) V/I: 5.0
	Event 1 set value (EV1) [low]		TC/RTD: -50 (-50.0) V/I: -5.0
	Event 2 set value (EV2)	The data range is the same as Event 1 set value (EV1).	TC/RTD: 50 (50.0) V/I: 5.0
	Event 2 set value (EV2) [high]	The data range is the same as Event 1 set value (EV1) [high].	TC/RTD: 50 (50.0) V/I: 5.0
	Event 2 set value (EV2) [low]	The data range is the same as Event 1 set value (EV1) [low].	TC/RTD: -50 (-50.0) V/I: -5.0
	Event 3 set value (EV3)	The data range is the same as Event 1 set value (EV1).	TC/RTD: 50 (50.0) V/I: 5.0
	Event 3 set value (EV3) [high]	The data range is the same as Event 1 set value (EV1) [high].	TC/RTD: 50 (50.0) V/I: 5.0
	Event 3 set value (EV3) [low]	The data range is the same as Event 1 set value (EV1) [low].	TC/RTD: -50 (-50.0) V/I: -5.0
	F04 block selection (no display)	0: Display 1: No display	0
	Function block 05	This is first parameter symbol of Function block 05. [Parameters related to AT and ST]	
	Autotuning (AT)	0: PID control 1: AT	0
	Startup tuning (ST)	0: ST unused 1: Execute once 2: Execute always	0
	F05 block selection (no display)	0: Display 1: No display	0
	Function block 06	This is first parameter symbol of Function block 06. [Parameters related to PID values, ARW and Fine tuning]	
	Proportional band [heat-side]	TC/RTD inputs: 1(0.1) to Input span (Unit: °C [°F]) [Resolution of 0.1 °C (°F); Within 999.9 °C (°F)] Voltage (V)/Current (I) inputs: 0.1 to 100.0 % of Input span 0 (0.0): ON/OFF action	TC/RTD: 30 (30.0) V/I: 3.0
	Integral time	1 to 3600 seconds (0: PD action)	240
	Derivative time	1 to 3600 seconds (0: PI action)	60
	Anti-reset windup (ARW)	1 to 100 % of Proportional band [heat-side] (0: Integral action is always OFF)	100
	Proportional band [cool-side]	1 to 1000 % of Proportional band [heat-side] (ON/OFF control of cool-side only is not possible)	100
	Overlap/Deadband	TC/RTD inputs: -10 (-10.0) to +10 (+10.0) °C [°F] Voltage (V)/Current (I) inputs: -10.0 to +10.0 % of Input span Minus (-) setting results in overlap.	0 (0.0)
	Fine tuning setting	-3 to +3 (0: Unused)	0
	F06 block selection (no display)	0: Display 1: No display	0
	Function block 07	This is first parameter symbol of Function block 07. [Parameters related to LBA time and the LBD]	
	Control loop break alarm (LBA) time	0 to 7200 seconds (0: Unused) [Displayed when event code "2" is selected.]	480

Display	Name	Data range	Factory set value
	LBA deadband (LBD)	0 to Input span [Displayed when event code "2" is selected.]	0
	F07 block selection (no display)	0: Display 1: No display	0
	Function block 08	This is first parameter symbol of Function block 08. [Parameters related to Proportional cycle time and Output limiter]	
	Proportional cycle time [heat-side]	0 to 100 seconds (0: Setting below 1 second is possible for Time setting of proportional cycle time [heat-side] in the Engineering mode F51) [Displayed when OUT1 code M, V or D is selected.]	Relay contact output: 20 Voltage pulse output, Open collector output: 2
	Minimum ON/OFF time of proportioning cycle [heat-side]	0 to 1000 ms [Displayed when OUT1 code M, V or D is selected.]	0
	Output limiter high [Heat-side output limiter (high)]	PID control: Output limiter low to 105.0 % Heat/Cool PID control: 0.0 to 105.0 %	105.0
	Output limiter low [Cool-side output limiter (high)]	PID control *: -5.0 % to Output limiter high * Output limiter high > Output limiter low Heat/Cool PID control: 0.0 to 105.0 %	PID control: -5.0 Heat/Cool PID control: 105.0
	Proportional cycle time [cool-side]	0 to 100 seconds (0: Setting below 1 second is possible for Time setting of proportional cycle time [cool-side] in the Engineering mode F51) [Displayed when OUT2 code M, V or D is selected.]	Relay contact output: 20 Voltage pulse output, Open collector output: 2
	Minimum ON/OFF time of proportioning cycle [cool-side]	0 to 1000 ms [Displayed when OUT2 code M, V or D is selected.]	0
	F08 block selection (no display)	0: Display 1: No display	0
	Function block 09	This is first parameter symbol of Function block 09. [Parameters related to Input correction]	
	PV bias	TC/RTD inputs: -1999 (-199.9) to +9999 (+999.9) °C [°F] Voltage (V)/Current (I) inputs: -Input span to +Input span	0 (0.0)
	PV digital filter	0 to 100 seconds (0: Unused)	1
	F09 block selection (no display)	0: Display 1: No display	0
	Function block 10	This is first parameter symbol of Function block 10. [Parameters related to Manual manipulated output value (MV)]	
	Manual manipulated output value (MV)	PID control: Output limiter low to Output limiter high Heat/Cool PID control: -Cool-side output limiter (high) to +Heat-side output limiter (high)	0.0
	F10 block selection (no display)	0: Display 1: No display	1

5.5 Function block 21(F21) to 91(F91)

Conditions for displaying F21 and after: Refer to "5.2 Restricting Access to Engineering Mode"

• 128 must be set in Mode selection (no display) [ModE]. Refer to "5.3 Function Block 00 (F00)"

• Settings must be unlocked. Refer to "3. Mode Switching"

Display	Name	Data range	Factory set value
	Function block 21	This is first parameter symbol of Function block 21. [Parameters related to Input type]	
	Input type	0 to 38 [Refer to table 1.]	Depends on model code
	Decimal point position	0 (No decimal place), [Refer to table 1.] 1 (One decimal place) to 3 (Three decimal places)	Depends on model code
	Burnout direction	0: Upscale Valid only when the TC input is selected. 1: Downscale	0
	Input scale high	TC/RTD inputs: Input scale low to Maximum value of the selected input range Voltage (V)/Current (I) inputs: -1999 to +9999 (Varies with the setting of the Decimal point position) Input scale low < Input scale high	TC/RTD: Maximum value of the selected input range V/I: 100.0
	Input scale low	TC/RTD inputs: Minimum value of the selected input range to Input scale high Voltage (V)/Current (I) inputs: -1999 to +9999 (Varies with the setting of the Decimal point position) Input scale low < Input scale high	TC/RTD: Minimum value of the selected input range V/I: 0.0
	Setting limiter high	Setting limiter low to Input scale high	Input scale high
	Setting limiter low	Input scale low to Setting limiter high	Input scale low
	PV flashing display at input error	0: Flashing 1: Non-flashing display	0
	Function block 23	This is first parameter symbol of Function block 23. [Parameters related to DI assignment]	
	DI assignment	0 to 7 [Refer to table 2.]	Depends on model code
	Function block 30	This is first parameter symbol of Function block 30. [Parameters related to Output action at STOP mode and STOP display]	
	Output action at STOP mode	0: Both event output and transmission output (AO) are off. 1: Event output remains unchanged, and transmission output (AO) is off. 2: Event output is off, and transmission output (AO) remains unchanged. 3: Both event output and transmission output (AO) remain unchanged.	0
	STOP display selection	0: STOP on PV display + STOP lamp (green) lights 1: STOP on SV display + STOP lamp (green) lights 2: STOP lamp (green) lights	1

Display	Name	Data range	Factory set value
	Function block 33	This is first parameter symbol of Function block 33. [Parameters related to Transmission output]	
	Transmission output type	0: Manipulated output value (MV1) 1: Measured value (PV) 2: Set value (SV)	1
	Transmission output scale high	When MV1 is selected: Transmission output scale low to +105.0 % When PV or SV is selected: Transmission output scale low to Input scale high	High-limit value of input span
	Transmission output scale low	When MV1 is selected: -5.0 % to Transmission output scale high When PV or SV is selected: Input scale low to Transmission output scale high	Low-limit value of input span
	AO full scale adjustment value	-10.0 to +10.0 %	Adjustment value
	AO zero adjustment value	Do not change the factory set adjustment value for the AO zero adjustment value and/or the AO full scale adjustment value as the accuracy will be changed.	Adjustment value
	Function block 41	This is first parameter symbol of Function block 41. [Parameters related to Event function]	
	Event 1 type	0 to 23 [Refer to table 3.]	Depends on model code
	Event 1 hold action	0: OFF 1: Hold action ON (When power turned on; when transferred from STOP to RUN) 2: Re-hold action ON (When power turned on; when transferred from STOP to RUN; SV changed)	Depends on model code
	Event 1 differential gap	0 to Input span	TC/RTD: 2 (2.0) V/I: 0.2
	Event 1 output action at input burnout	0: Event output is not forcibly turned ON when the Burnout function is activated. 1: ON at overscale; no action at underscale 2: ON at underscale; no action at overscale 3: ON at overscale or underscale 4: OFF at overscale or underscale	0
	Energized/De-energized of Event 1 output	0: Energized 1: De-energized	0
	Event 1 timer	0 to 600 seconds	0
	Event 1 interlock	0: Unused 1: Used	0

Parameters include in the Function block F42 (Event 2) to F43 (Event 3) are the same as those in Function block F41 (Event 1).

Display	Name	Data range	Factory set value
	Function block 51	This is first parameter symbol of Function block 51. [Parameters related to Control action]	
	Direct/Reverse action	0: Direct action 1: Reverse action	Depends on model code
	Cool action	0: Air cooling 1: Water cooling 2: Cooling gain linear	Depends on model code
	ON/OFF action differential gap (upper)	TC/RTD inputs: 0 (0.0) to 100 (100.0) °C [°F] Voltage (V)/Current (I) inputs: 0.0 to 10.0 % of Input span	TC/RTD: 1 (1.0) V/I: 0.1
	ON/OFF action differential gap (lower)	TC/RTD: 1 (1.0) V/I: 0.1	TC/RTD: 1 (1.0) V/I: 0.1
	Control output at burnout	0: Result of control computation 1: Low output limiter value (Output OFF)* * In case of Heat/Cool control type, both heating and cooling outputs are off.	0
	Bumpless mode setting	0: Without bumpless 1: With bumpless	1
	Derivative action	0: Measured value derivative 1: Deviation derivative	0
	Time setting of proportional cycle time [heat-side]	0: 0.1 second (fixed) 1: 0.25 second (fixed) 2: 0.5 second (fixed) When Proportional cycle time [heat-side] is set to 0 second in the Parameter setting mode, this setting item becomes valid for the Proportional cycle time [heat-side].	2
	Time setting of proportional cycle time [cool-side]	0: 0.1 second (fixed) 1: 0.25 second (fixed) 2: 0.5 second (fixed) When Proportional cycle time [cool-side] is set to 0 second in the Parameter setting mode, this setting item becomes valid for the Proportional cycle time [cool-side].	2
	Function block 52	This is first parameter symbol of Function block 52. [Parameters related to AT cycles, AT differential gap time and ST start condition]	
	AT cycles	0: 1.5 cycles 1: 2.5 cycles	0
	AT differential gap time	0 to 50 seconds	10
	ST start condition	0: Activate the ST function when the power is turned on; when transferred from STOP to RUN; or when the Set value (SV) is changed. 1: Activate the ST function when the power is turned on; or when transferred from STOP to RUN. 2: Activate the ST function when the Set value (SV) is changed.	0
	Function block 60	This is first parameter symbol of Function block 60. [Parameters related to Communication function]	
	Communication protocol	0: Proprietary communication 1: Modbus	Depends on model code
	Device Address	0 to 99 (Modbus: 1 to 99)	0 (Modbus: 1)
	Communication speed	0: 2400 bps 1: 4800 bps 2: 9600 bps 3: 19200 bps	3
	Data bit configuration	0 to 11 (Modbus: 0 to 5) [Refer to table 4.]	0
	Interval time	0 to 250 ms	10

Display	Name	Data range	Factory set value
	Communication response monitor	0: Normal response 1: Overrun error 2: Parity error 4: Framing error 8: Receive buffer overflow If two or more errors happen, the sum of errors will be displayed.	0
	Function block 70	This is first parameter symbol of Function block 70. [Parameters related to Setting change rate limiter unit time and Timer time unit]	
	Setting change rate limiter unit time	0: Minute 1: Hours	0
	Timer time unit	0: Min.: sec. 1: Hour: min.	0
	Function block 91	This is first parameter symbol of Function block 91. [Parameters related to Monitor]	
	ROM version monitor	Display the version of loaded software.	---
	Integrated operating time monitor	0 to 9999 hours	---
	Holding peak value ambient temperature monitor	-10 to +100 °C	---

Table 1: Input type (F21.)

	INP	PGDP	Range code	INP		PGDP		Range code																																																													
				J (°F)	T (°F)	S (°F)	R (°F)		E (°F)	B (°F)	N (°F)	PLI (°F)	W5Re/W26Re (°C)	PI100 (°C)	E (°C)	B (°C)	N (°C)	PLI (°C)	W5Re/W26Re (°C)	PI100 (°C)	J (°C)	T (°C)	S (°C)	R (°C)	E (°C)	B (°C)	N (°C)	PLI (°C)	W5Re/W26Re (°C)	PI100 (°C)	J (°C)	T (°C)	S (°C)	R (°C)	E (°C)	B (°C)	N (°C)	PLI (°C)	W5Re/W26Re (°C)	PI100 (°C)																													
K (°C)	0	0	K01, K02	19	1	JC8	20	0	JA1, JA2, JB9	21	1	TC8	22	1	TC7	23	0	TC9	24	0	SA2	25	0	RA2	26	0	EA1, EA2	27	0	BA1, BA2	28	0	NA1, NA2	29	0	AA1, AA2	30	0	WA4	31	1	DA2 to DA9, DB2	32	0	DA10	33	0	DA11	34	0	DA12	35	0	DA13	36	0	DA14	37	0	DA15	38	0	DA16						
																																																																301	401	501	601	701	801
																																																																301	401	501	601	701	801

* The digital point position is selectable (0 to 3)

Do not set to any number which is not described in the input type table above. This may cause malfunctioning.

The Input type can be changed. [Inputs is selectable within each group (TC/RTD input group, Voltage/Current input group).]

Table 2: DI assignment (F23.)

Set value	DI1	DI2
0	Unused (No DI assignment)	
1	SV selection function (SV1 to SV4) 1	
2	SV selection function 2 (SV1 to SV2)	RUN/STOP transfer 3
3	SV selection function 2 (SV1 to SV2)	AUTO/MAN transfer 4
4	SV selection function 2 (SV1 to SV2)	Interlock release 5
5	RUN/STOP transfer 3	AUTO/MAN transfer 4
6	RUN/STOP transfer 3	Interlock release 5
7	AUTO/MAN transfer 4	Interlock release 5

Relations between key operations/communication and DI status

Mode select from keyoperation or communication	DI-switched *	Actual state	Indication lamp
SV selection function	Example: In case of SV selecting function (SV1 to SV2) SV1 is selected	SV2 is selected (Contact closed)	Switched to SV2 SV1 lamp turns off SV2 lamp lights
RUN/STOP transfer		RUN (Contact closed) STOP (Contact open)	RUN STOP lamp turns off
AUTO/MAN transfer		RUN (Contact closed) STOP (Contact open) AUTO (Contact closed) MAN (Contact open) AUTO (Contact closed) MAN (Contact open)	STOP STOP lamp lights AUTO mode MAN lamp turns off MAN mode MAN lamp lights

* Selected status by DI is not back up by EEPROM.

Table 3: Event type (F41. to F43.) [▲: Set value (SV) △: Event set value ☆: Event differential gap]

Set value	Event type code	Action
0	N None	
1	A Deviation high (Using SV monitor value)	(Event set value is greater than 0.)
	E Deviation high with hold action * (Using SV monitor value)	
	Q Deviation high with re-hold action * (Using SV monitor value)	
14	Deviation high (Using local SV)	(Event set value is less than 0.)
	Deviation high with hold action * (Using local SV)	
	Deviation high with re-hold action * (Using local SV)	
2	B Deviation low (Using SV monitor value)	(Event set value is greater than 0.)
	F Deviation low with hold action * (Using SV monitor value)	
	R Deviation low with re-hold action * (Using SV monitor value)	
15	Deviation low (Using local SV)	(Event set value is less than 0.)
	Deviation low with hold action * (Using local SV)	
	Deviation low with re-hold action * (Using local SV)	
3	C Deviation high/low (Using SV monitor value) ◆	
	G Deviation high/low with hold action * (Using SV monitor value) ◆	
	T Deviation high/low with re-hold action * (Using SV monitor value) ◆	
16	Deviation high/low (Using local SV) ◆	
	Deviation high/low with hold action * (Using local SV) ◆	
	Deviation high/low with re-hold action * (Using local SV) ◆	
5	X Deviation high/low (Using SV monitor value) [High/Low individual setting]	
	Y Deviation high/low with hold action (Using SV monitor value)* [High/Low individual setting]	
	Z Deviation high/low with re-hold action (Using SV monitor value)* [High/Low individual setting]	
18	Deviation high/low (Using local SV) [High/Low individual setting]	
	Deviation high/low with hold action (Using local SV)* [High/Low individual setting]	
	Deviation high/low with re-hold action (Using local SV)* [High/Low individual setting]	
4	D Band (Using SV monitor value) ◆	
6	U Band (Using SV monitor value) [High/Low individual setting]	
17	Band (Using local SV) ◆	
19	Band (Using local SV) [High/Low individual setting]	
9	H Process high	◆: If the event setting is set to a negative value, it will be treated as an absolute value and operation will be the same as indicated above.
10	K Process high with hold action *	
	L Process low with hold action *	
7	V SV high (Using SV monitor value)	
20	SV high (Using local SV)	
8	W SV low (Using SV monitor value)	
21	SV low (Using local SV)	
11	2 Control loop break alarm (LBA) **	 * TC/RTD inputs: 0.8 °C [°F] (fixed) Voltage/Current inputs: 0.8 % of span (fixed) A: During temperature rise: Alarm area During temperature fall: Non-alarm area B: During temperature rise: Non-alarm area During temperature fall: Alarm area
13	3 FAIL	Operation stops if FAIL occurs (FAIL output [fixed at de-energized]: contact open when error occurs)
12	4 Monitor during RUN	Event ON at RUN (Event OFF at STOP)
23	5 Output of the communication monitoring result	Event signal is turned on when communication is not properly made for 10 seconds.

** Hold action and re-hold action must be set in Event hold action (EHo1 to EHo3).

** Precautions for LBA setting:

- For Heat/Cool control type, the LBA function cannot be specified.
- The LBA function cannot be activated when AT function is turned on.
- Normally the LBA time of Parameter setting mode should be set to approximately twice the Integral time.
- If LBA setting time does not match the controlled object requirements, the LBA setting time should be lengthened. If setting time is not correct, the LBA will malfunction by turning on or off at inappropriate times or not turning on at all.

Table 4: Data bit configuration (F60.)

Set value	Data bit	Parity bit	Stop bit	Settable communication	Set value	Data bit	Parity bit	Stop bit	Settable communication
0	8	Without	1	Proprietary communication Modbus	6	7	Without	1	Proprietary communication
1	8	Without	2		7	7	Without	2	
2	8	Even	1		8	7	Even	1	
3	8	Even	2		9	7	Even	2	
4	8	Odd	1		10	7	Odd	1	
5	8	Odd	2		11	7	Odd	2	

Modbus is a registered trademark of Schneider Electric. Company names and product names used in this manual are the trademarks or registered trademarks of the respective companies.

TLV CO., LTD.
881 Nagasuna, Noguchi
Kakogawa, Hyogo 675-8511 JAPAN
Tel: 81-(0)79-427-1800