1. SWITCHING BETWEEN MODES **Quick Operation** FZ110/FZ400/FZ900 Manual

All Rights Reserved, Copyright © 2016, RKC INSTRUMENT INC. ng this RKC product. In order to achieve maximum performance and ensure instrument, carefully read all the instructions in this manual. Please place lient location for easy reference. This manual descries basic key operations

For detailed handling procedures and key operations, refer to separate FZ110/FZ400/FZ900 Instruction Manual.
The manual can be downloaded from the official RKC website: https://www.rkcinst.co.jp/english/download-center/

■ Notes for the display ■

FZ110/400/900 are available in two types: single input type and dual input type. The dual input type is further categorized into two types: Dual PV type (for FZ400/900) and PV + Remote setting type (for FZ110/400/900). For a dual input model, the same parameter may exist in both Input 1 and Input 2. "1." or "2." is added to the top of the parameters for identification.

Input 1_Set value (SV) Input 2_Set value (SV) SY SV l. f the dual input Ω

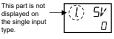
"1." is not added to the top of the parameters list for the single input type

Display example of a single input



This manual uses the dual inputs for explanation. For other types such as a single input type, ignore the first character "1." at the top of the parameter.

Parameters used only for the second input are shown in the colored background.





Power ON

FZ900

LINP

1372

οŗ

Model, Input type

and Input range

-Model FZ110, FZ400 or FZ900 (Example: FZ900)

- Input 1_Input range high

Input 1_Input range low

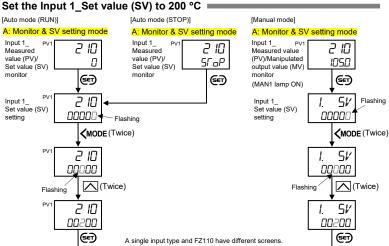
cally (in 1 second)

•Unit for input 1 Unit for input 1
 Temperature input: °C or °F Voltage/Current input: No display •Input type for input 1 (Refer to the Input type symbol table)

Automatically (in 1 second)

Automatically (in 1 second)

3. SET THE SET VALUE (SV)



To return to the top of the list, press the MONI key or the (SET) key until the first parameter is displayed (for FZ400/900). Press the (set) key until the first parameter is displayed (for FZ110)

4. SET AUTOTUNING (AT)

Display of

each mode

SET+<MODE

for 60 seconds

No key is operated

Any one of the above

MONI

€ET)+<MODE

(2 seconds)

AREA

€

≺MODE

(2 seconds)

€

(4 seconds

€ET)+<MODE

(2 seconds)

⚠ WARNING Parameters in the Engineering mode should be set according to the application before setting any parameters 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, RKC will not bear any

responsibility for malfunction or failure as a result of improper changes in the Engineering mode.

Memory area

transfer mode

(Only FZ400/900 *)

For FZ110, the Memory area

Monitor and SV setting mode

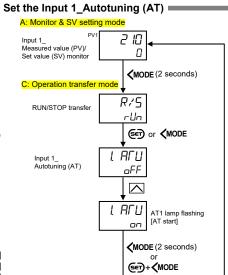
Operation transfer

mode

Setting lock mode

transfer can be found in the

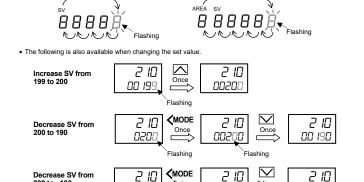
The Autotuning (AT) function automatically measures, computes and sets the optimum PID values.



2. CHANGING SET VALUE

• The flashing digit indicates which digit can be set. Press **MODE** key to go to a different digit. Every time the shift key is pressed, the flashing digit moves as follows.

All modes except SV setting mode



eter, always press the 🗺 key. The display ch keys. In the Operation transfer mode, however, the selected mode will be valid only by the operation

Twice

00500

-0 100

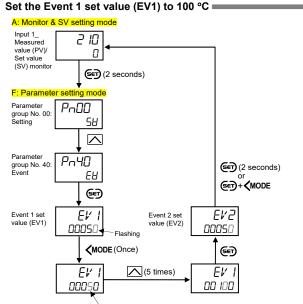
00200

In case of the Set value (SV), the instrument can be configured in the H: Engine modified set value will be adopted 2 seconds after the change without pressing the (SET) key.

• In case no operation is performed within 60 seconds after the change of the setting, the mode will return to A: Monitor and SV setting mode. The modified data will not be registered in this case

5. SET THE EVEVT SET VALUE

As shown below, the Event trigger values are set according to the preset event types.



6. RUN/STOP TRANSFER

Set value (SV)

The control is switched between RUN and STOP. The instrument must be stopped before attempting the setting in the Engineering mode.

Change form RUN to STOP = [Auto mode (RUN)] [Auto mode (STOP)] Input 1_ Input 1_ 2 10 2 10 Measured value (PV)/ value (PV). Sr_oP Set value (SV) monito (SV) monito **≺**MODE **≺**MODE (2 seconds) €ET+ < MODE R/5 \wedge R/5 RUN/STOP SraP rUn RUN state

Change form STOP to RUN = [Auto mode (STOP)] [Auto mode (RUN)] A: Monito Input 1_ Measured 2 10 2 10 value (PV)/ Set value value (PV) Sr_oP Π Set value (SV) monito (SV) monito **≺**MODE **⟨MODE**(2 seconds) (2 seconds) €£)+**〈**MODE R/5 \bigvee R/5 RUN/STOP SraP rUn

■ STOP display

Set value (SV) setting

X + Y: Press X and Y keys simultaneously

Automatically

function is activated.

〈MODE+ ✓

(SET)+**⟨**MODE

€€T)+**〈**MODE

(2 seconds)

€

(2 seconds)

Auto-

Monitor & SV setting

mode

Engineering mode

Press X key n times
): Press and hold X key for n sends): Press and hold X and Y keys

Parameter select

mode

Parameter setting

mode

Setup setting

mode

Y | J | T | S | r | E | b | n | P

ū U L Pr PΓ JP U

The table below shows the actual RUN/STOP modes and displays under different combinations of settings by Key operation, Communication, and Digital input (DI)

Setting via front keys or through communication	Setting via Digital Input (DI)	Instrument status	STOP display	
RUN	RUN	RUN	_	
	STOP	STOP	dSFP	
STOP	RUN		ESLE	
	STOP		SraP *	
* The instrument without PLIN/STOR quitebing by DL will have the same display				

STOP character displ	<u>ay</u>	
Monitor & SV setting	Monitor & SV setting	Monitor & SV setti
mode	mode	mode
PV/SV monitor	PV/SV monitor	PV/SV monitor
2 ID	2 10	2 ID
5rap	ESCP	4SCP
STOP with the key	STOP with the key	STOP with the D
(No RUN/STOP	(RUN/STOP transfer	(RUN/STOP trans
transfer by DI)	by DI: RUN)	by key: RUN)

To change the mode from $dS\Gamma P$ to RUN, you have to close the digital input (DI) terminals" to which RUN/STOP is assigned or disable the RUN/STOP transfer function by digital input (DI). You can disable the RUN/STOP transfer function at DI function selection

FZ110: Terminal Nos. 15-16 or Nos. 13-16 (Factory set value [Based on Model code]
FZ400/900: Terminal Nos. 27-31 (Factory set value)

7. AUTO/MANUAL TRANSFER

Switching Input 1 to Manual mode = [Auto mode (RUN)] A: Monitor & SV A: Monitor & ettina mode 2 10 Input 1_ 2 10 value (PV)/ 105.0 **∠**MODE (2 seconds) R/5 RUN/STOP transfe €£)+**〈**MODE rUn (Several times) $\overline{}$ L A/M I. R/M RUГ<u>o</u> ñΑn Auto mode Manual mode (MAN1 lamp ON)

Manipulated output value setting

in manual mode ____ After the Manual mode is selected using the Auto/Manual transfer, set the Manipulated output value (MV) on the PV/MV monitor in the A: Monitor & SV setting mode using the and keys.

[Manual mode]

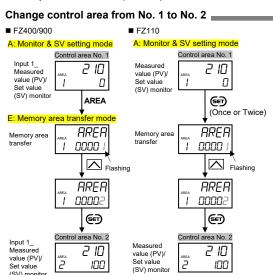
A: Monitor & SV setting mo riput 1_Measured PV1
value (PV)/Manipulated
output value (MV) 2 10 (MAN1 lamp ON) 105.0

- Press the key to increase the Manipulated output value (MV).
- Press the key to decrease the Manipulated output value (MV).
- If the or was key is kept pressing, the changing rate of the Manipulated output value (MV) will be accelerated.

The output value adjusted with the and keys will be valid

8. MEMORY AREA TRANSFER

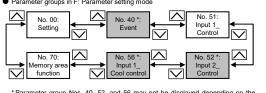
ory area to be used for control (control area) can be switched to the desired area



Outline of memory area

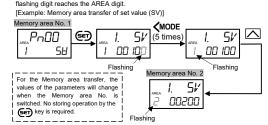
The Memory area function is to store up to 16 areas (patterns) of parameters such as a Set value (SV). This parameter can be found in the F: Parameter setting mode. Any one area out of 16 areas can be called up for the control.

Parameter groups in F: Parameter setting mode



*Parameter group Nos. 40, 52, and 56 may not be displayed depending on the

- mory area consists of six parameter groups
- To change a memory area number to another, when a certain parameter is displayed, press the MODE key to shift the flashing digit to the left until the flashing digit reaches the AREA digit. [Example: Memory area transfer of set value (SV)]



9. SWITCHING TO THE ON/OFF ACTION

To switch to the ON/OFF action, set the Proportional band to zero (0)

Control the Input 1 with the ON/OFF action =

A: Monitor & SV setting mode (2 seconds) value (PV)/ Set value (S€T)+ ****MODE (SV) monitor (2 seconds) Input 1 I. PRI F: Para Parameter Pn00 group No. 00 Setting Set the ON/OFF action differential gap (lower) followed by pressing the SH (Once or Twice) I. oHĹ PnS I 0000 / group No. 51 Input 1_ lConf € (SET) key I. aHH 000304 Change to the ON/OFF action **∠**MODE (Once)

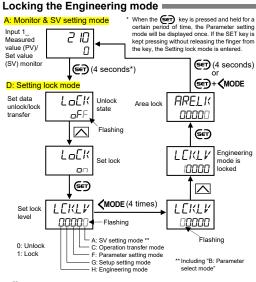
00030

ρ

00000

10. SET DATA UNLOCK/LOCK TRANSFER

This is a function to lock the set data to restrict the change of the set data



The Set lock level can be changed even after the set data lock has been set

11. CHANGE OF THE INPUT TYPE

The Input related parameters may include: Input type, Display unit, Decimal point position, Input range high, and [Data range of decimal point position] Changing the Input 1 to Thermocouple type J (0 to 800°C) IPGJP 0: No decimal place I. PoV Assuming that the present Input 1 is configured to Thermocouple type K (-200 to +1372 °C). One decimal place 2 10 00000 : Two decimal places 00840 value (PV)/ Three decimal places 2 10 4: Four decimal places € €F)+**〈**MODE value (PV)/ Set value Fn2 1 [Data range of input type] 0 [Data range of Input range high IPGSH Input range table •TC input **〈MODE** (2 seconds) Input range low to Maximum value of input range € 0 1200 Input 1_ 2 10 Thermocouple S Measured value (PV)/ Thermocouple B R/5 RUN/STOP LINP Thermocouple N rUn 00000, Thermocouple T **✓MODE** (2 seconds) IPG5H \triangle W5Re/W26Re 9: Thermocouple PLII 10: Thermocouple U 00800 LINP € RUN/STOP 12: Thermocouple PR40-20 STOP state 0000 | 13: RTD Pt100 R/5 SraP 13: RTD Pt100
14: RTD JPt100
15: Current 0 to 20 mA DC
16: Current 4 to 20 mA DC
17: Voltage 0 to 10 V DC
18: Voltage 0 to 10 V DC
19: Voltage 0 to 5 V DC
20: Voltage 0 to 1 V DC
21: Voltage -10 to +10 V DC
22: Voltage -5 to +5 V DC
23: Voltage 0 to 10 W DC
24: Voltage 0 to 10 mV DC
24: Voltage 0 to 10 mV DC
24: Voltage 0 to 10 mV DC [Data range of Input range low] IPGSL STOP state Minimum value of input range to Input range high SCOP € -0200 \bigvee €ET)+

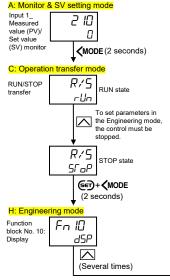
MODE ILINI T Set the "0 00000 rUn IPGSL 0 to 2534 °F rogrammable ran -19999 to +99999 € **∠MODE** (2 seconds) nnnnn (S€T)+**⟨**MODE € (Twice)

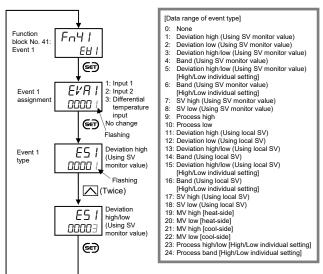
12. CHANGE OF THE EVENT TYPE

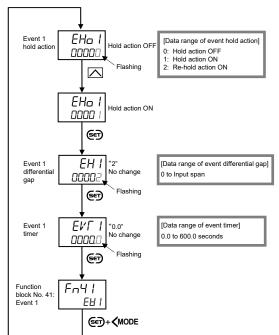
The event related parameters may include: Event assignment, Event type, Event hold action, Event differential gap and Event timer. These parameters can be set in the H: Engineering mode.

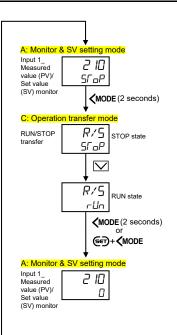
Changing Event 1 to Deviation high/low (Using SV monitor value)

Assuming that the present Event 1 is configured to Deviation high (Using the SV monitor value). Other setting · · · Event assignment: Input 1, Event hold action: Hold action ON, Event differential gap: 2, Event timer 0.0









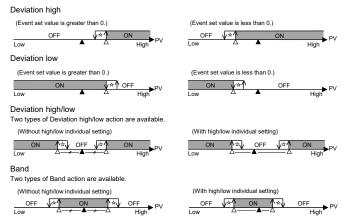
Description of event action

Some examples of event action are described in the following

ON: Event action turned on
OFF: Event action turned off
(▲: Set value (SV) △: Event set value ☆: Event differential gap)

• Deviation action (High, Low, High/low, Band)

When the deviation (PV - SV) reaches the Event set value, event ON occurs.



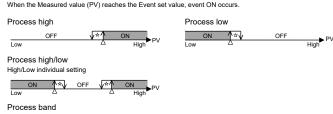
Set value action (High, Low)

When the Set value (SV) reaches the Event set value, event ON occurs.



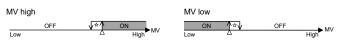
• Input value action (High, Low, High/low, Band)

When the Measured value (PV) reaches the Event set value, event ON occurs.



• Manipulated output value action (High, Low)

OFF V* ON A OFF PV



SV monitor value type and Local SV type

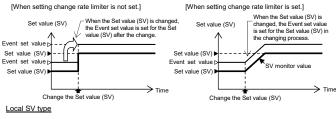
The Event set value is set for the SV monitor value.

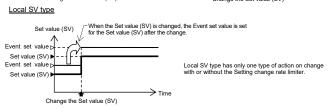
Setting change rate limiter adjusts the Event set value to follow the same change rate of SV monitor value

Local SV type

The Event set value is set for the Set value (SV) [Local SV].

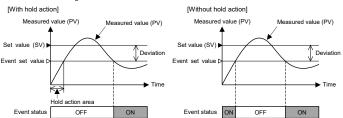
SV monitor value type





Description of event hold action =

When hold action is ON, the event action is suppressed at start-up or STOP to RUN until the measured value has entered the non-event range.



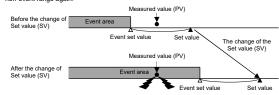
Re-hold action

When re-hold action is ON, the event action is also suppressed at the control set value change until the me value has entered the non-event range.

The re-hold action is invalid for any of the following. However, the hold action is valid

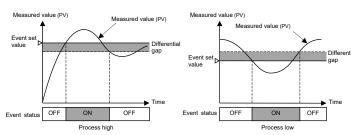
When Setting change rate limiter other than "0" are set
When operation mode is remote mode

[Example] When Event 1 type is the deviation low When re-hold action is OFF and event output type is deviation, the event output is produced due to the Set value (SV) change. The re-hold action suppresses the alarm output until the measured value has entered the



Description of event differential gap

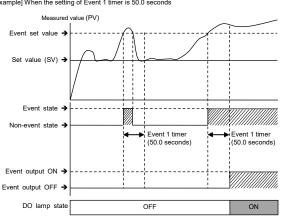
It prevents chattering of event output due to the measured value fluctuation around the Event set value



Description of event timer

When an event condition becomes ON, the output is suppressed until the Event timer set time elapses. If the even output is still ON after time is up, the output will resume

[Example] When the setting of Event 1 timer is 50.0 seconds



The Event timer is also activated for the following reasons:

- . When set to the event state simultaneously with power turned on When set to the event state simultaneously with control changed to RUN (control start) from STOP
- In the event wait state, no event output is turned on even after the Event timer preset time has elapsed.
- The Event timer is reset for the following reasons
 - When power failure occurs while the Event timer is being activated
 When control is changed to STOP (control stop) from RUN (control start) while the Event timer is being activated

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