

The HA430/HA930 Series controllers are a digital controller with a built-in amplifier for the strain gauge type resin pressure sensor. Pressure control is performed by directly connecting our pressure sensor (without amplifier) \* to the Input 1 side. In addition, pressure or temperature control is enabled only by using this controller with either temperature (TC/RTD) or voltage/current input selected on the Input 2 side.

This manual describes procedures from initial settings (zero/full scale adjustment, PI constant setting, etc.) necessary for performing pressure control using the Input 1 side to operation of this controller.

For details of setting parameters other than those in the following and of conducting wiring, refer to the **HA430/HA930 Instruction Manual (IMR01N11-E□)**, or the **HA430/HA930 Operation Manual (IMR01N12-E□)**.

\* CZ-100P, CZ-200P, CZ-GP100, or the other strain gauge type sensors

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### BEFORE OPERATE

#### < Key Operation >

Scrolling through parameters:

- Press to scroll through parameters in the same mode/area. To go back to the first parameter, keep pressing SET keys until it is displayed again.

Changing set value (SV):

- The high-lighted digit indicates which digit can be set. Press Shift key to go to a different digit. Every time the shift key is pressed, the high-lighted digit moves.
- The set value can be selected by pressing the UP or DOWN key.

Registering set value (SV):

- The changed content cannot be registered only by the operation of the UP and DOWN keys.
- To store a new value for the parameter, always press the SET key. The display changes to the next parameter and the new value will be stored.
- After a new value has been displayed by using the UP and DOWN keys, the SET key must be pressed within one minute, or the new value is not stored and the display will return to the PV1/SV1 monitor screen.

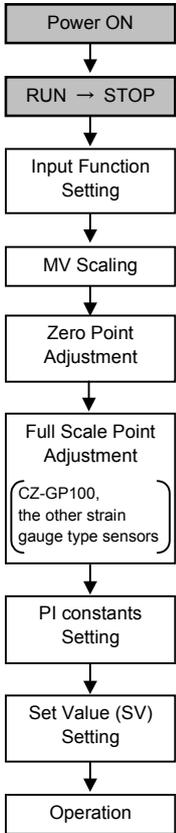
#### < Engineering Mode >

In Engineering mode, it is possible to select operating conditions such as the input/output and control function specific to the customer. Initial setting parameters are included in this Engineering mode. The parameter setting is enabled with the RUN mode suspended (STOP). For parameters that are not necessary to be changed, use the same setting values as the factory set values. **If they are changed unnecessarily, it may result in malfunction or failure of the instrument.**

# PROCEDURES FROM INITIAL SETTING TO OPERATION

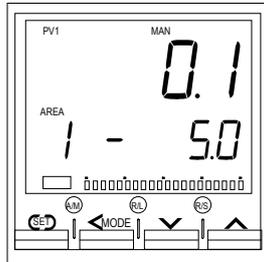
Conduct the procedures from initial setting to operation according to the procedure described below.

## 1. Setting the Input Function (Engineering Mode F21)



### Step 1: Turn on the power to this instrument

SV setting & Monitor mode  
(PV1/SV1 monitor screen)



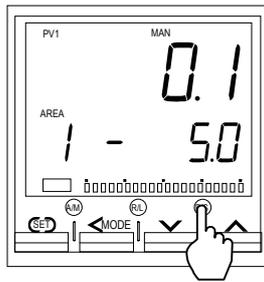
Turn on the power to this controller after being mounted on equipment and then wired. This controller displays the input type symbol and input range just after the power is turned on, and then the PV1/SV1 monitor screen.



A power supply switch is not furnished with this controller. In the Manual mode, operation is started as soon as the power is turned on.

[Factory set value: RUN (Control action start)]

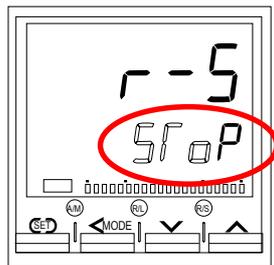
### Step 2: Change from RUN mode to STOP mode



Press the RUN/STOP key (R/S) at the PV1/SV1 monitor screen (SV setting & Monitor mode).



Operation mode  
(RUN/STOP transfer screen)



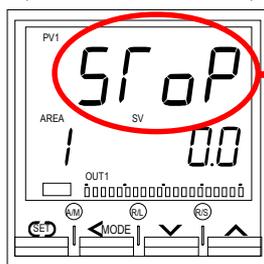
After the RUN/STOP transfer screen in operation mode (STOP state) is displayed, the display returns to the PV1/SV1 monitor screen. The STOP character is displayed on the measured value display unit. The operation mode changes to the STOP state (Control action stop).



The output or function when changed to STOP from RUN is in the same state as that when the power is turned off (excluding the display function).

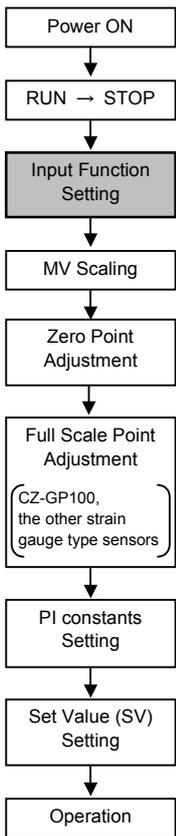


SV setting & Monitor mode  
(PV1/SV1 monitor screen)

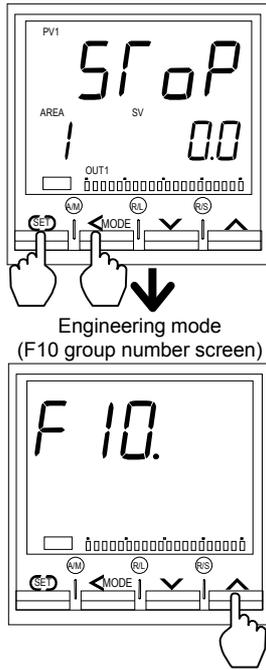


Character is indicated the STOP state (Control action stop).

Next, go to the "Step 3-1" on page 3.

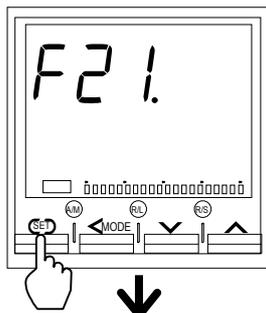


### Step 3-1: Change from F10 to F21 (Engineering mode)



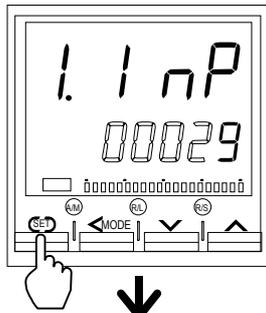
1. To go to the Engineering mode from the PV1/SV1 monitor screen (SV setting & Monitor mode), press the shift key for 2 seconds while pressing the SET key. The F10 group number screen belonging to the head group of the Engineering mode is displayed.
2. To go to the F21 group number screen from the F10 group number screen, press the UP key twice. The F21 group number screen will be displayed.

### Step 3-2: Set the input function



Press the SET key to scroll through parameters in the F21 group number screen. To go back to the F21 group number screen, keep pressing SET keys until it is displayed again.

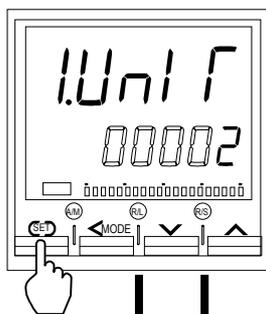
Input 1\_input type selection screen



Check whether or not the displayed value is the pressure sensor input.

Data range: 29 (Pressure sensor input)  
 Input range: 0.0 to 250.0 MPa  
 Factory set value: 29

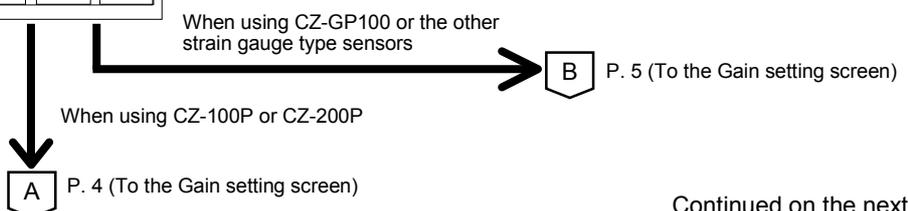
Input 1\_display unit selection screen



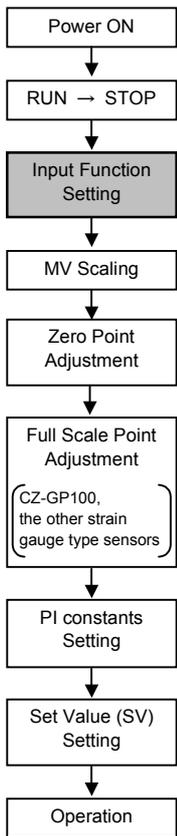
Check whether or not the displayed value is the unit of the pressure sensor input.

Data range: 2 (MPa) 3 (bar) 4 (kgf/cm<sup>2</sup>) 5 (psi)  
 1 MPa = 10 bar = 10.1972 kgf/cm<sup>2</sup> = 145.038 psi

Factory set value: 2



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**A** When using CZ-100P or CZ-200P

Gain setting screen

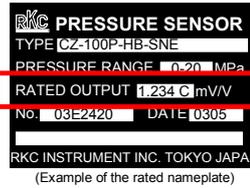


Use to set the gain of the pressure sensor input.

Set the rated output value (mV/V) engraved on the rated nameplate attached to the pressure sensor housing.

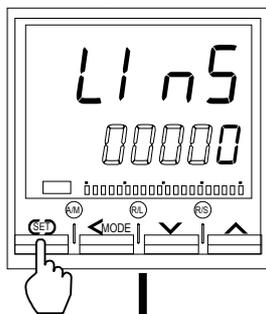
Data range: 0.500 to 4.000 mV/V

Factory set value: 1.500 mV/V



Rated output value 1.234 mV/V

Linearize type selection screen



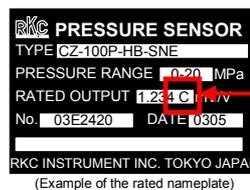
Select the linearizing type symbol engraved on the rated nameplate attached to the pressure sensor housing.

Data range: 0 (Unused),  
1 to 20 (Used)

[Linearizing type selection table]

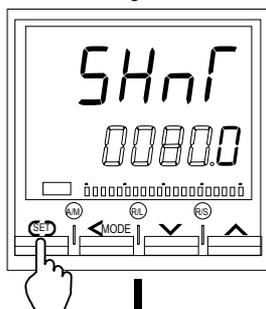
Set Value	Linearizing type symbol	Set Value	Linearizing type symbol	Set Value	Linearizing type symbol
0	No symbol	7	J	14	S
1	C	8	K	15	T
2	D	9	L	16	U
3	E	10	M	17	V
4	F	11	P	18	W
5	G	12	Q	19	X
6	H	13	R	20	Y

Factory set value: 0



The symbol described at the end of the rated output value denotes the linearizing type. In the example at the left, "C" is the symbol of denoting the linearizing type.

Shunt resistance output value setting screen

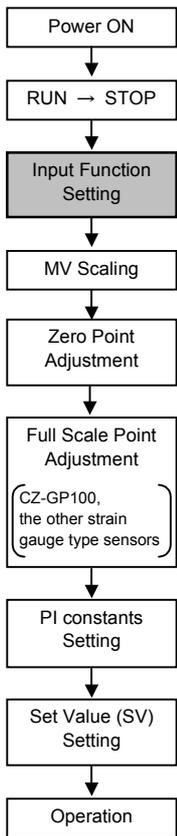


**Do not change the factory set value.**

**This setting cannot be used for CZ-100P or CZ-200P.**

**C** P. 5 (To the Input 1\_decimal point position selection screen)

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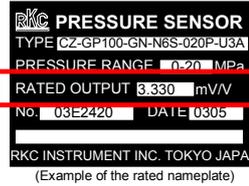
**B** When using CZ-GP100 or the other strain gauge type sensors

Gain setting screen



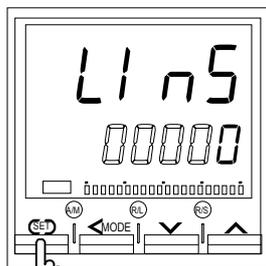
Use to set the gain of the pressure sensor input.  
Set the rated output value (mV/V) engraved on the rated nameplate attached to the pressure sensor housing.

Data range: 0.500 to 4.000 mV/V  
Factory set value: 3.330 mV/V



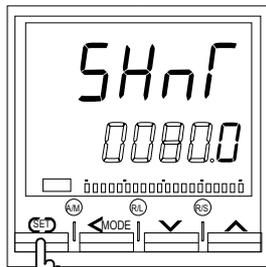
← Rated output value 3.330 mV/V

Linearize type selection screen



**Do not change the factory set value.**  
**This setting cannot be used for CZ-GP100 and the other strain gauge type sensors.**

Shunt resistance output value setting screen



**The factory set value is not necessary to be changed.**

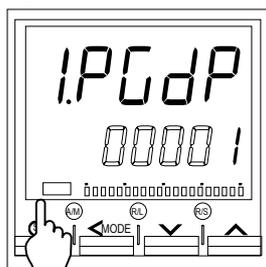
It is set "what percent of the rated output" is output when the full scale point of the Input 1\_measured value (PV1) is adjusted by Auto calibration. For the CZ-GP100, it is so set that the pressure becomes 80 % of the full scale as a factory set value.

Data range: 40.0 to 100.0 %  
Factory set value: 80.0 (Standard value)

For the shunt resistance output value of the other strain gauge type sensors, refer to Instruction Manual for each sensor being used.

**C** To the Input 1\_decimal point position selection screen

Input 1\_decimal point position selection screen



Use to select the decimal point position of the input range.

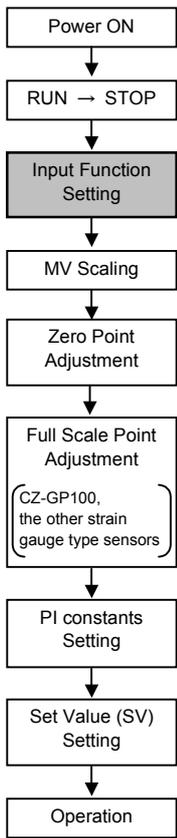
Data range: 0 to 4  
(No decimal place [□□□□□] to  
Four decimal places [□.□□□□])

Less than 1 MPa (Rated pressure): 0 to 4  
Less than 10 MPa (Rated pressure): 0 to 3  
Less than 100 MPa (Rated pressure): 0 to 2  
100 MPa or more (Rated pressure): 0 to 1

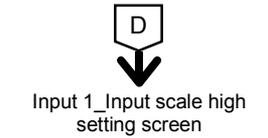
Factory set value: 1 (One decimal place [□□□□.□])

**D** P.6 (To the Input 1\_Input scale high setting screen)

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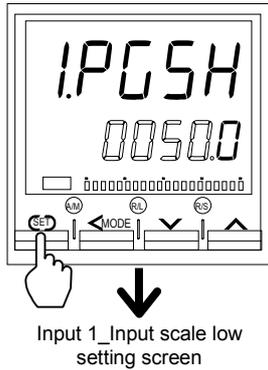
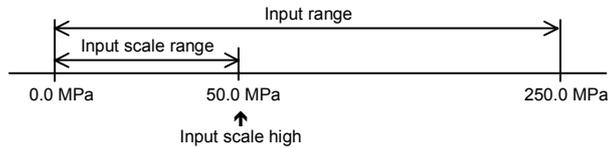


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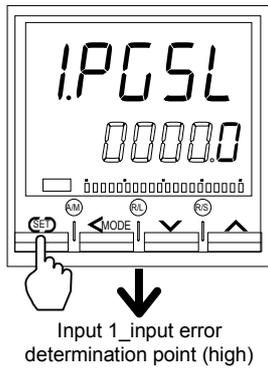
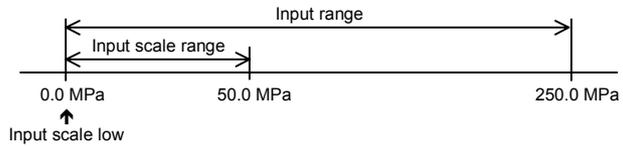
Use to set the value that is high limit of the input scale range. Set the range printed on the pressure sensor as it is.

Data range: Input scale low to Maximum value of the selected input range  
 Factory set value: 50.0



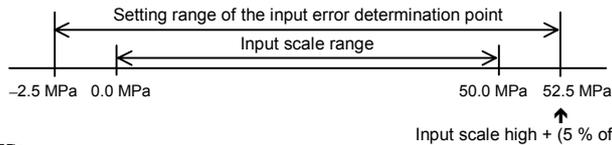
Use to set the value that is low limit of the input scale range. Set the range printed on the pressure sensor as it is.

Data range: Minimum value of the selected input range to Input scale high  
 Factory set value: 0.0

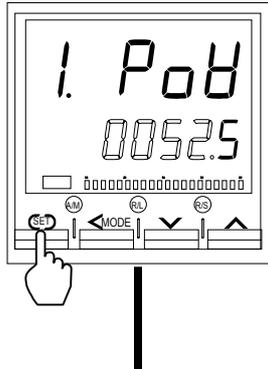


Input Error Determination function is activated when a measured value reaches the limit, and control output value selected by Action at input error will be output. Changing the Input scale high automatically changes the Input error determination point (high).

Data range: Input scale low – (5 % of input span) to Input scale high + (5 % of input span)  
 Factory set value: Input scale high + (5 % of input span)

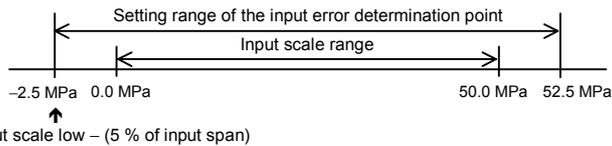


The action at input error is in accordance with setting of the Input 1\_action at input error (high) in F51 (1.AoVE).



Input Error Determination function is activated when a measured value reaches the limit, and control output value selected by Action at input error will be output. Changing the Input scale low automatically changes the Input error determination point (low).

Data range: Input scale low – (5 % of input span) to Input scale high + (5 % of input span)  
 Factory set value: Input scale low – (5 % of input span)

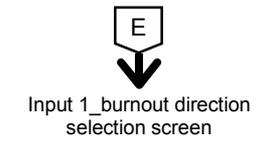
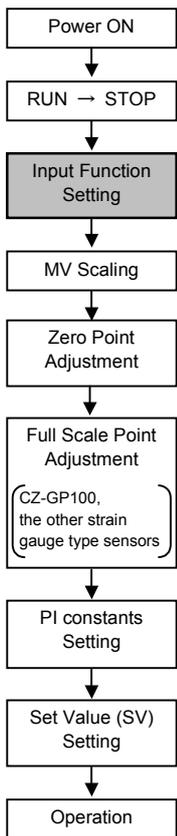


The action at input error is in accordance with setting of the Input 1\_action at input error (low) in F51 (1.AUnE).

E P. 7 (To the Input 1\_burnout direction selection screen)

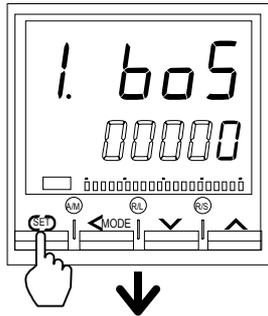
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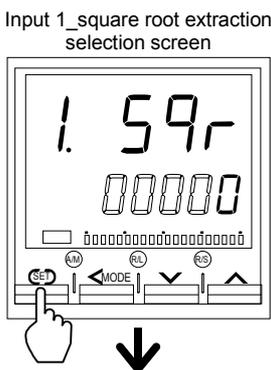


Use to select Burnout Direction in input break. When input break is detected by the controller, the measured value go either Upscale or Downscale according to the Burnout Direction setting.

Data range: 0 (Upscale)  
1 (Downscale)  
Factory set value: 0 (Upscale)



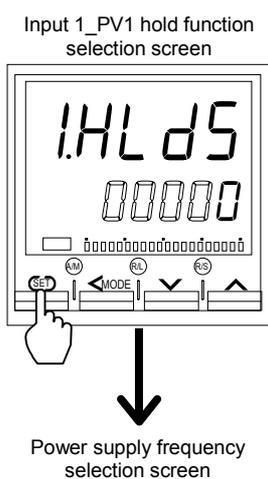
**Do not change the factory set value.  
This setting cannot be used.**



Use to select the presence or absence of the peak hold/bottom hold function for a measured value (PV).

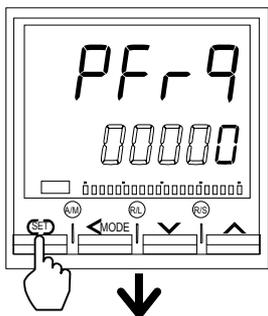
Data range: 0 (Unused)  
1 (Used)  
Factory set value: 0 (Unused)

The peak hold/bottom hold value can check on the PV1 peak hold value monitor screen and the PV1 bottom hold value monitor screen (SV setting & Monitor mode) when set to “1: Used” on the Input 1\_PV1 hold function selection screen.



Use to select the power supply frequency of the controller suited to the application.

Data range: 0 (50 Hz)  
1 (60 Hz)  
Factory set value: 0 (50 Hz)

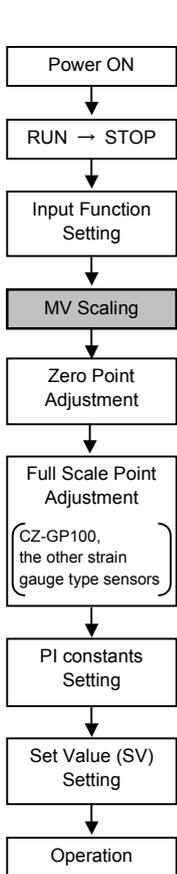


The screen returns to the F21 group number screen.  
Next, set the MV scaling function.

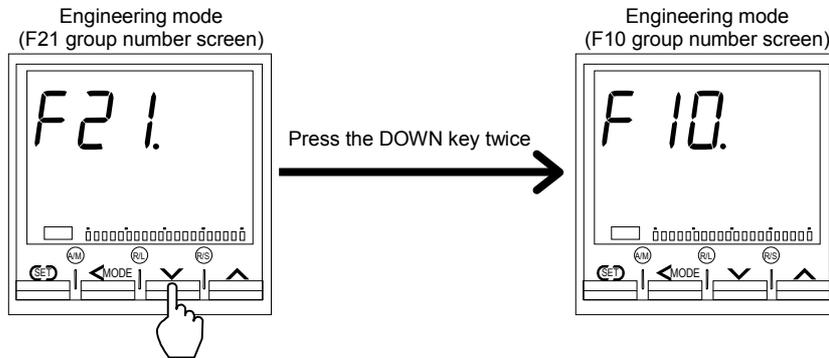
**Go to the “2. Setting the MV Scaling Function (Engineering Mode F10)” on page 8.**

## 2. Setting the MV Scaling Function (Engineering Mode F10)

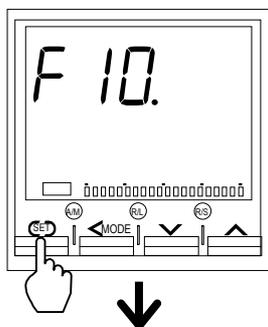
The MV scaling function is used to make scaling of manipulated output value 1 (MV1) from 0 to 100 % between the high and low MV scaling limits as the motor RPM.  
Conduct the setting in accordance with the following procedure.



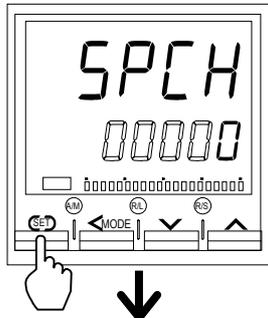
### Step 1: Change from F21 to F10 (Engineering mode)



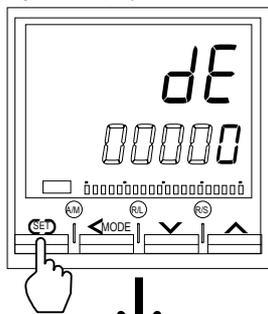
### Step 2: Set the MV scaling function



STOP display selection screen



Bar graph display selection screen



**A** P.9 (To the Bar graph resolution setting screen)

Press to scroll through parameters in the F10 group number screen.  
To go back to the F10 group number screen, keep pressing SET key until it is displayed again.

**The factory set value is not necessary to be changed.**

STOP message for control STOP mode can be displayed either on the upper display or the lower display.  
SPCH is to select the display to show the STOP message.

Data range: 0: Displays on the measured value (PV1/PV2) unit  
1: Displays on the set value (SV) unit

Factory set value: 0 (Displays on the measured value (PV1/PV2) unit)

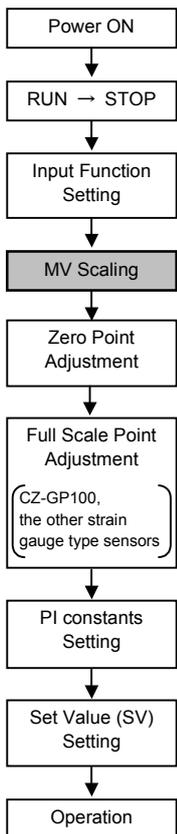
**The factory set value is not necessary to be changed.**

Use to select the contents of the bar graph display.

Data range: 0: No display  
1: Input 1 manipulated output value (MV)  
2: Input 1 measured value (PV)  
3: Input 1 set value (SV)  
4: Input 1 deviation value

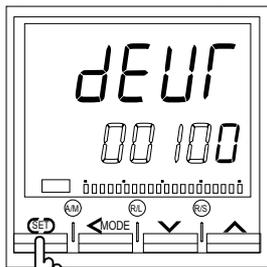
Factory set value: 0 (No display)

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A  
Bar graph resolution setting screen

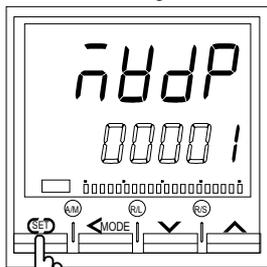


Use to set the bar graph display resolution for the deviation display. If the bar graph display selection is selected to the “4 (Input 1\_deviation value)”, set several digits per 1 dot of the bar graph.

Data range: 1 to 100 digit/dot  
Factory set value: 100

The number of dot points: 10 dots (HA430)  
20 dots (HA930)

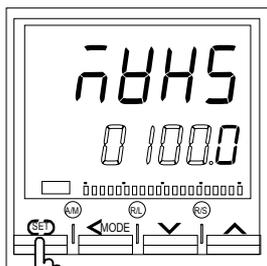
Decimal point position of MV scaling screen



Use to select the decimal point position the MV scaling function.

Data range: 0 to 4  
(No decimal place [□□□□□] to Four decimal places [□.□□□□])  
Factory set value: 1 (One decimal place [□□□□.□])

MV scaling high setting screen

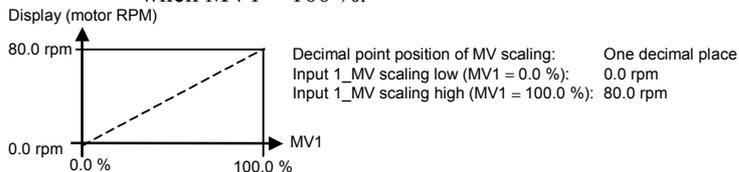


Use to set the high limit value of MV scaling function. Set the motor RPM when MV1 = 100 %.

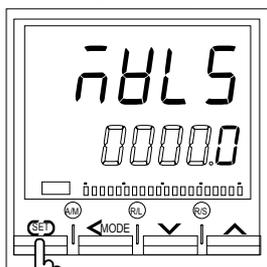
Data range: -1999.9 to +9999.9  
Factory set value: 100.0

MV scaling monitor value is displayed on the SV of PV1/SV1 monitor screen.

[Example] If the motor RPM is set to 80.0 rpm when MV1 = 100 %.



MV scaling low setting screen

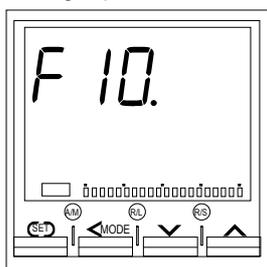


Use to set the low limit value of MV scaling function. Set the motor ROM when MV1 = 0 %.

Data range: -1999.9 to +9999.9  
Factory set value: 0.0

MV scaling monitor value is displayed on the SV of PV1/SV1 monitor screen.

F10 group number screen



The screen returns to the F10 group number screen. Next, adjust the zero point of the measured value (PV1) of Input 1.

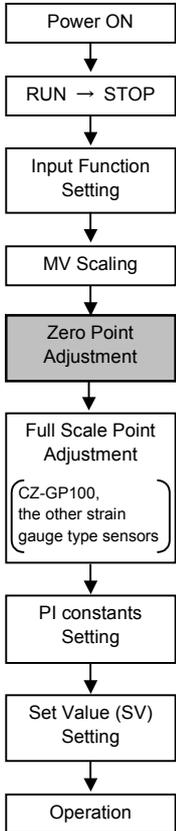
**Go to the “3. Zero Point Adjustment (Setup Setting Mode)” on page 10.**

### 3. Zero Point Adjustment (Setup Setting Mode)

To adjust the zero point of the measured value (PV1) of Input 1, it is necessary to change to the Setup Setting mode. Conduct the adjustment according to the procedure described below.

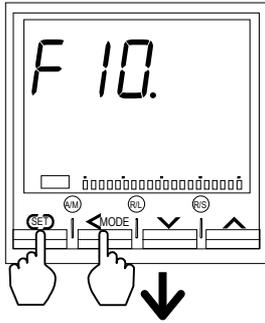
**Prior to adjust the zero point, check each of the following:**

- No load is applied to the pressure sensor.
- The equipment that is mounted the pressure sensor is at the operating temperature.
- The operation mode is always the STOP mode.



#### Step 1: Change from F10 (Engineering mode) to Setup Setting mode

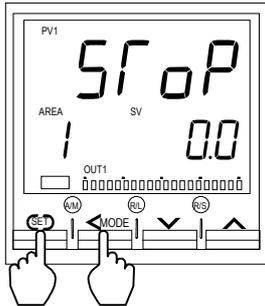
Engineering mode  
(F10 group number screen)



1. To go to the PV1/SV1 monitor screen (SV setting & Monitor mode) from the F10 group number screen (Engineering mode), press the shift key while pressing the SET key. The PV1/SV1 monitor screen will be displayed.
2. To go to the Setup Setting mode from the PV1/SV1 monitor screen, press the shift key while pressing the SET key. The Input 1\_PV bias setting screen will be displayed.

This instrument returns to the PV1/SV1 monitor screen if no key operation is performed for more than 1 minute.

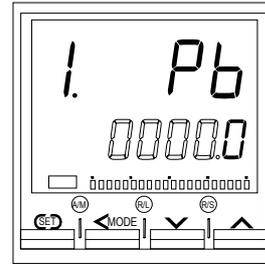
SV setting & Monitor mode  
(PV1/SV1 monitor screen)



Press the shift key while pressing the SET key

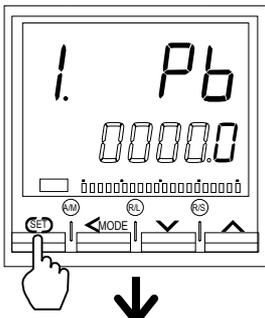


Setup Setting mode  
(Input 1\_PV bias setting screen)



#### Step 2: Displays the parameter of the zero point adjustment

Input 1\_PV bias setting screen



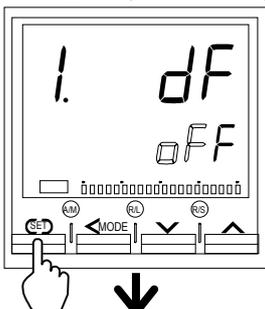
PV bias adds bias to the measured value (PV). The PV bias is used to compensate the individual variations of the sensors or correct the difference between the measured value (PV) of other instruments.

Data range: -Input span to +Input span

Factory set value: 0

The Input 1\_PV bias (1. Pb) value is also reflected to the result of Auto-zero adjustment (P. 12). Manual zero point adjustment can be performed by changing this PV bias value.

Input 1\_PV digital filter setting screen



PV digital filter is the time of the first-order lag filter eliminate noise against the measured input. The PV digital filter is used to eliminate noise against the measured input.

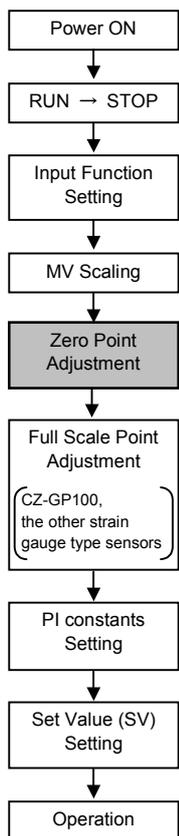
Data range: OFF (Unused), 0.01 to 10.00 seconds

Factory set value: OFF (Unused)

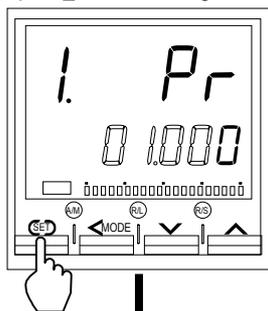
P. 11 (To the Input 1\_PV ratio setting screen)

Continued on the next page.

Continued from the previous page.



Input 1\_PV ratio setting screen



PV ratio is a multiplier to be applied to the measured value (PV). The PV bias is used to compensate the individual variations of the sensors or correct the difference between the measured value (PV) of other instruments.

Data range: 0.500 to 1.500  
 Factory set value: 1.000

●CZ-100P, CZ-200P (Explosionproof specification type):

Set the barrier correction factor of the safety barrier RZB-001 (RKC product) to the Input 1\_PV ratio (1. Pr). Use to correct a pressure indication error caused by the dispersion of RZB-001 internal resistance value. The barrier correction factor is entered on the nameplate of the RZB-001.

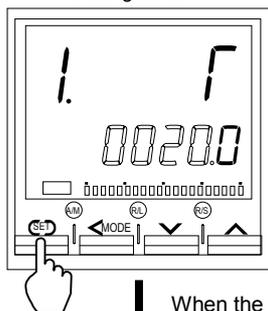
●CZ-100P, CZ-200P (Non-explosionproof specification type) :

As the Input 1\_PV ratio, use a factory set value "1.000."

●CZ-GP100 (without amplifier) or the other strain gauge type sensors :

The result obtained by Auto calibration (P. 13) is reflected to the Input 1\_PV ratio (1. Pr). Manual full scale adjustment can be performed by changing this PV ratio value.

Input 1\_ proportional cycle time setting screen

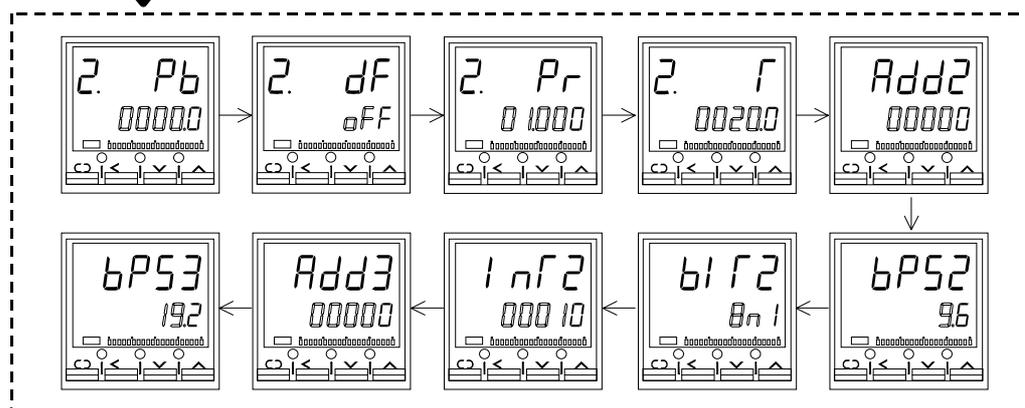


Proportional Cycle Time is to set control cycle time for time based control output such as voltage pulse for SSR, triac and relay output.

Data range: 0.1 to 100.0 seconds  
 Factory set value:

Relay contact output: 20.0 seconds  
 Voltage pulse output and triac output: 2.0 seconds

When the following screen (Input 2\_PV bias, etc.) is displayed, press the SET key successively until the Auto-zero screen is displayed.

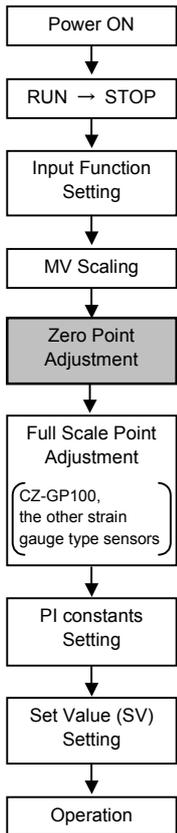


Auto-zero screen

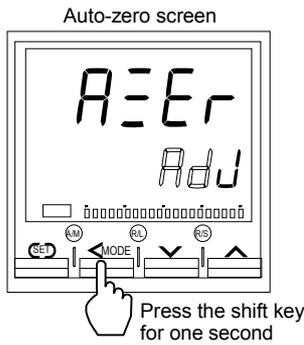


Adjust the zero point of the measured value (PV1) of Input 1.

Next, go to the "Step 3" on page 12.



### Step 3: Adjust the zero point of the measured value (PV1) of Input 1



#### Adjustment procedure:

Pressing the shift key for one second while displaying the Auto-zero screen automatically starts Auto-zero operation.

If this Auto-zero operation normally end, the screen returns to the Auto-zero screen.

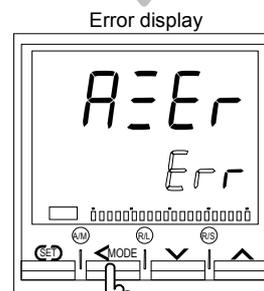
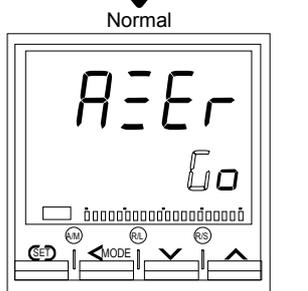
An error occurs if this Auto-zero operation abnormally end.

To release the error state, press the shift key for one second.

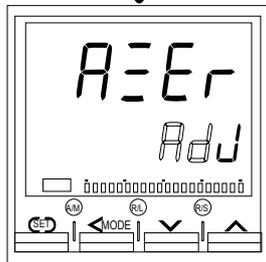
The screen returns to the Auto-zero screen.

The result of Auto-zero adjustment is also reflected to the Input 1\_PV bias (1. Pb) value. Manual zero point adjustment can be performed by changing this PV bias value (P. 10).

When input conversion voltage is out of a range of  $\pm 5$  mV.



The error state is released.



The zero point adjustment is complete.

**When the CZ-GP100 (without amplifier) or the other strain gauge type sensors is used:**

**Go to the “4. Full Scale Point Adjustment (Setup Setting Mode)” on page 13.**

**When the CZ-100P or the CZ-200P is used:**

**Go to the “5. Setting the PI Constants (Parameter Setting Mode)” on page 14.**

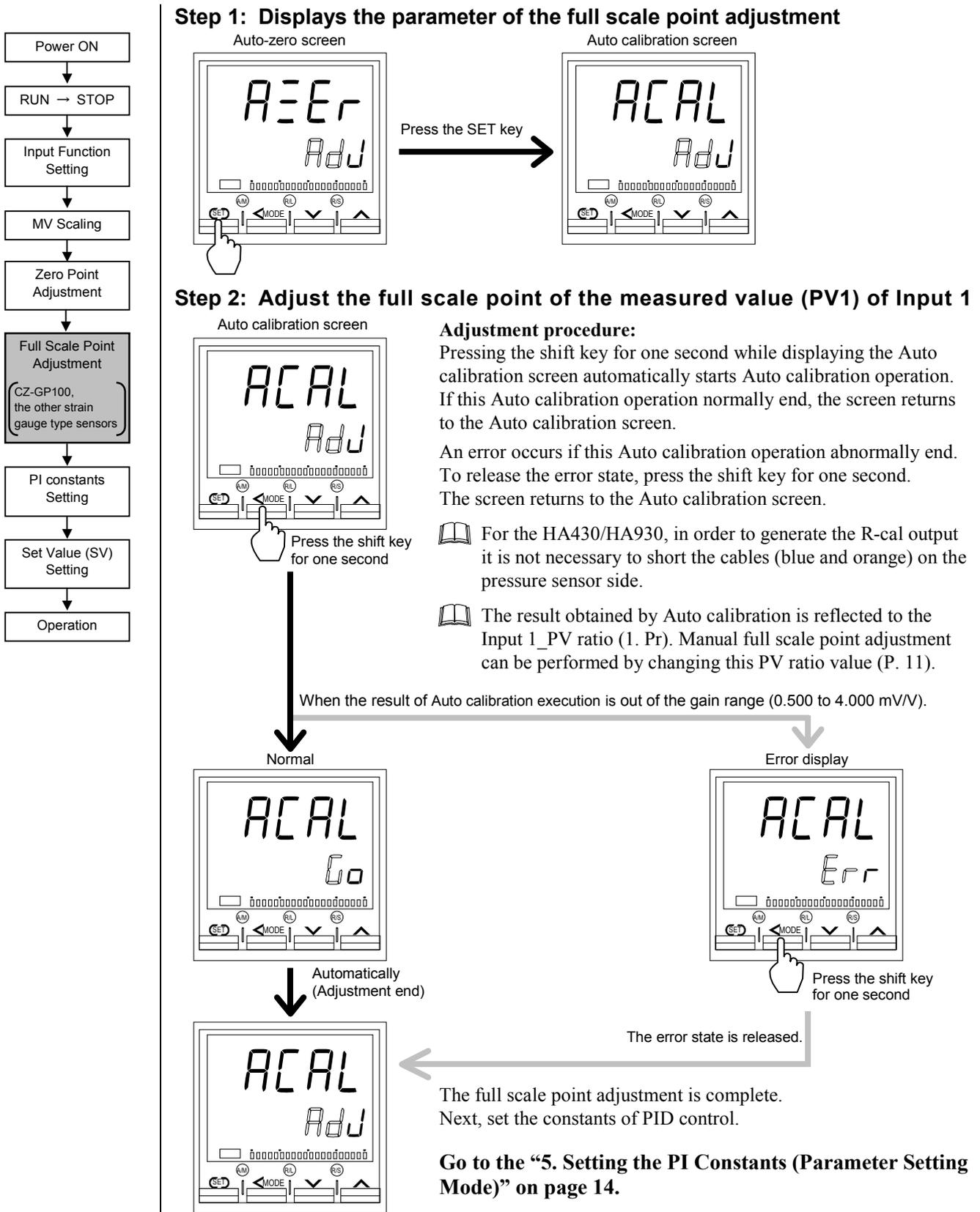
## 4. Full Scale Point Adjustment (Setup Setting Mode) \*

\* CZ-GP100 (without amplifier), the other strain gauge type sensors

To adjust the full scale point of the measured value (PV1) of Input 1, conduct the adjustment according to the procedure described below.

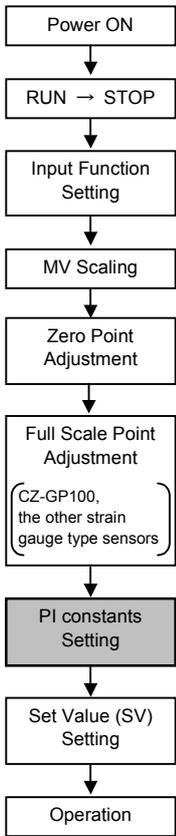
**Prior to adjust the full scale point, check each of the following:**

- No load is applied to the pressure sensor.
- The equipment that is mounted the pressure sensor is at the operating temperature.
- The operation mode is always the STOP mode.



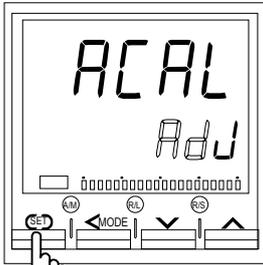
## 5. Setting the PI Constants (Parameter Setting Mode)

To set the PI constants of PID control of Input 1, it is necessary to change to the Parameter Setting mode. Conduct the setting according to the procedure described below.



### Step 1: Change from Setup Setting Mode to Parameter Setting Mode

Setup Setting mode  
(Auto calibration screen)

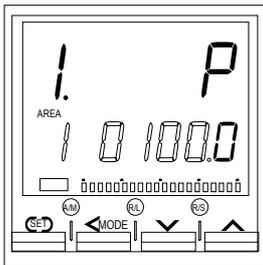


Press the SET key for two seconds

The event related setting screens are displayed ahead of the Input 1\_proportional band setting screen when the event related items are selected.

Press the SET key

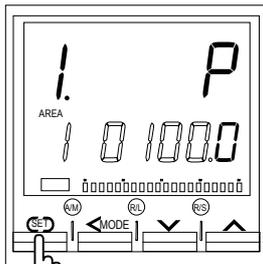
Parameter Setting mode  
(Input 1\_proportional band setting screen)



This instrument returns to the PV1/SV1 monitor screen if no key operation is performed for more than one minute.

### Step 2: Set the PI constants

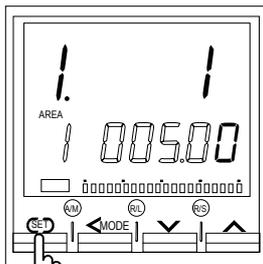
Input 1\_proportional band setting screen



This value expresses a proportional band of the PI and PID control. Set a proportional band to suit the controlled object.

Data range: 0.0 to 1000.0 % of input span  
Factory set value: 100.0

Input 1\_integral time setting screen



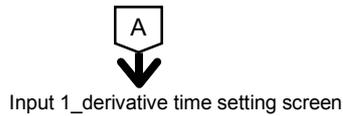
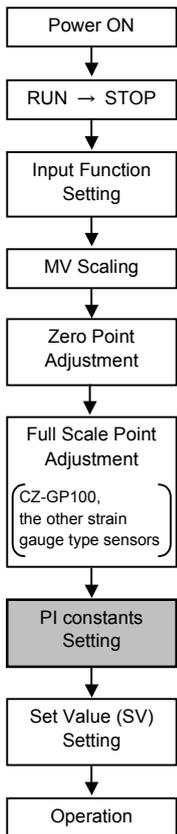
Integral action is to eliminate offset between SV and PV by proportional action. The degree of Integral action is set by time in seconds. Set an integral time to suit the controlled object.

Data range: OFF (PD action),  
1 to 3600 seconds,  
0.1 to 3600.0 seconds, or  
0.01 to 360.00 seconds  
Factory set value: 5.00

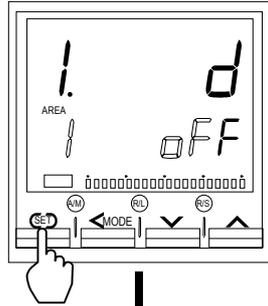
P. 15 (To the Input 1\_derivative time setting screen)

Continued on the next page.

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Input 1\_derivative time setting screen



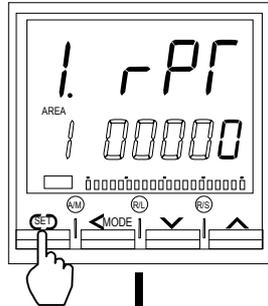
**The factory set value is not necessary to be changed.**

Derivative action is to prevent rippling and make control stable by monitoring output change. The degree of Derivative action is set by time in seconds.

Data range: OFF (PI action),  
1 to 3600 seconds,  
0.1 to 3600.0 seconds, or  
0.01 to 360.00 seconds

Factory set value: OFF (PI action)

Input 1\_control response parameter selection screen



**The factory set value is not necessary to be changed.**

The control response for the set value (SV) change can be selected among Slow, Medium, and Fast.

Data range: 0 (Slow), 1 (Medium), or 2 (Fast)

Factory set value: 0 (Slow)

The Input 2\_proportional band setting screen is displayed for the 2-input controller.

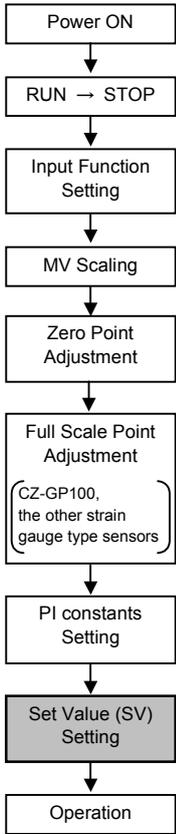
The setting of PI constants of Input 1 is complete. Next, set the SV1 of Input 1.

For details on the parameters displayed after the Input 1\_control response parameter selection screen, see the **HA430/HA930 Operation Manual (IMR01N12-E□)**.

**Go to the “6. Setting the Set Value (SV) (SV Setting & Monitor Mode)” on page 16.**

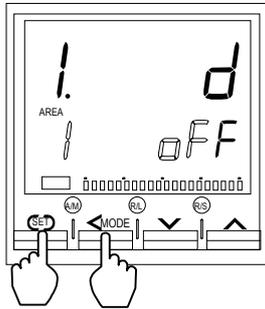
## 6. Setting the Set Value (SV) (SV Setting & Monitor Mode)

To set the set value (SV1) of Input 1, it is necessary to change to the SV setting & Monitor mode. Conduct the setting according to the procedure described below.



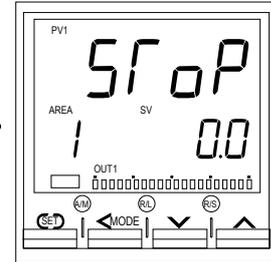
### Step 1: Change from Parameter Setting Mode to SV Setting & Monitor Mode

Parameter Setting mode  
(Input 1\_derivative time setting screen)



Press the shift key for two seconds while pressing the SET key

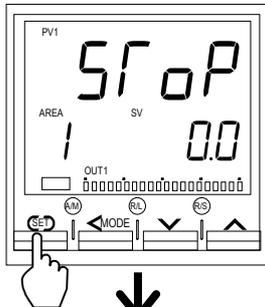
SV Setting & Monitor Mode  
(PV1/SV1 monitor screen)



### Step 2: Set the set value (SV1) of Input 1

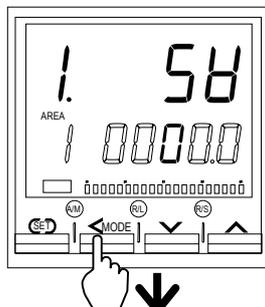
Example: Change the set value (SV1) of Input 1 from 0.0 MPa to 30.0 MPa

PV1/SV1 monitor screen

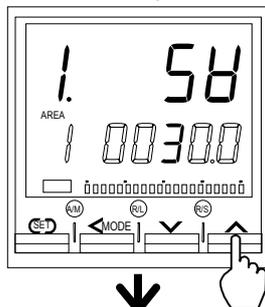


1. Press the SET key at the PV1/SV1 monitor screen.  
The Input 1\_set value (SV1) setting screen is displayed.

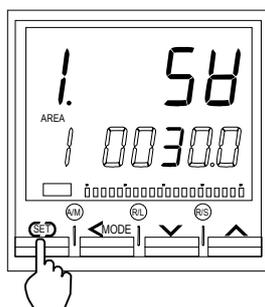
Input 1\_set value (SV1) setting screen



2. Press the shift key to high-light the tens digit.  
The high-lighted digit indicates which digit can be set.



3. Press the UP key to change the number to 3.



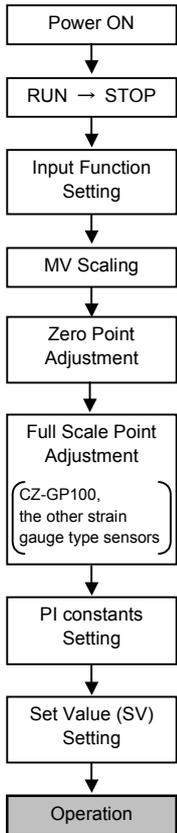
4. Press the SET key to store the new set value.  
The display goes to the next parameter.

Thus, the set value (SV) setting is complete.  
Next, change from STOP mode to RUN mode for starting operation.

Go to the "7. Operation" on page 17.

# 7. Operation

For the Operation start/stop, conduct the operation according to the procedure described below.

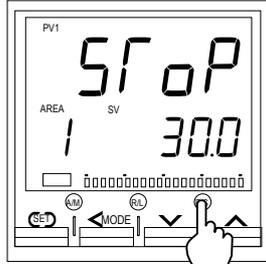


## 7.1 The procedure of operation start

This is an example of showing the procedure for scaling MV1 (0 to 100 %) to the RPM of extruder's main motor from 0.0 to 80.0 rpm by activating the MV scaling function.

### Step 1: Change the Operation mode from STOP mode to RUN mode

SV Setting & Monitor Mode (PV1/SV1 monitor screen)



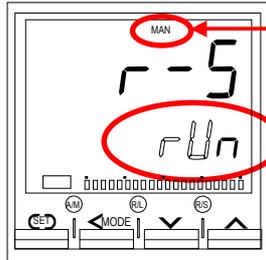
1. Press the RUN/STOP transfer key (R/S) at the SV setting & monitor mode.  
[Left figure example: PV1/SV1 monitor screen (STOP state)]

2. After the RUN/STOP transfer screen in operation mode (RUN state) is displayed, the display returns to the PV1/SV1 monitor screen.

Operation is started in the Manual mode when the operation state is changed from STOP mode to RUN mode. \*

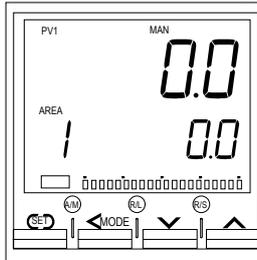
\* Cold start (factory shipment): The controller will automatically go to Manual mode and output from the low output limit value (factory set value: -5.0 %).

Operation Mode (RUN/STOP transfer screen)



Manual (MAN) mode lamp ON

SV Setting & Monitor Mode (PV1/SV1 monitor screen)

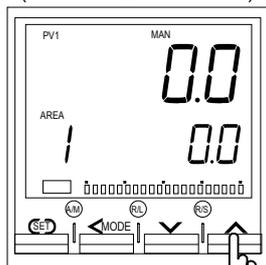


← Displays the Measured value 1 (PV1).

← Displays the motor RPM:  
When the motor RPM is set by the MV scaling high/low (P. 9), the minimum value of the motor RPM is displayed.  
Otherwise, a manual output value is displayed (output limiter low limit: -5.0 %).

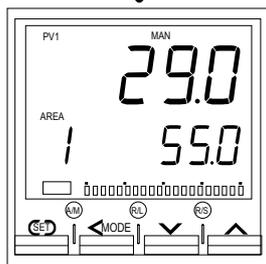
### Step 2: Set the manipulated output value (MV1) of Input 1 (Motor RPM) in the Manual mode

SV Setting & Monitor Mode (PV1/SV1 monitor screen)



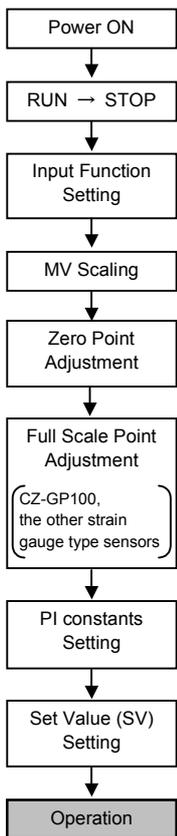
The motor RPM is displayed on the Set value (SV) display. Gradually increase the motor RPM by the UP key so that the Measured value 1 (PV1) will approach the preset pressure.

📖 When no MV scaling function is used, the manual output value (%) is displayed on the Set value (SV) display.

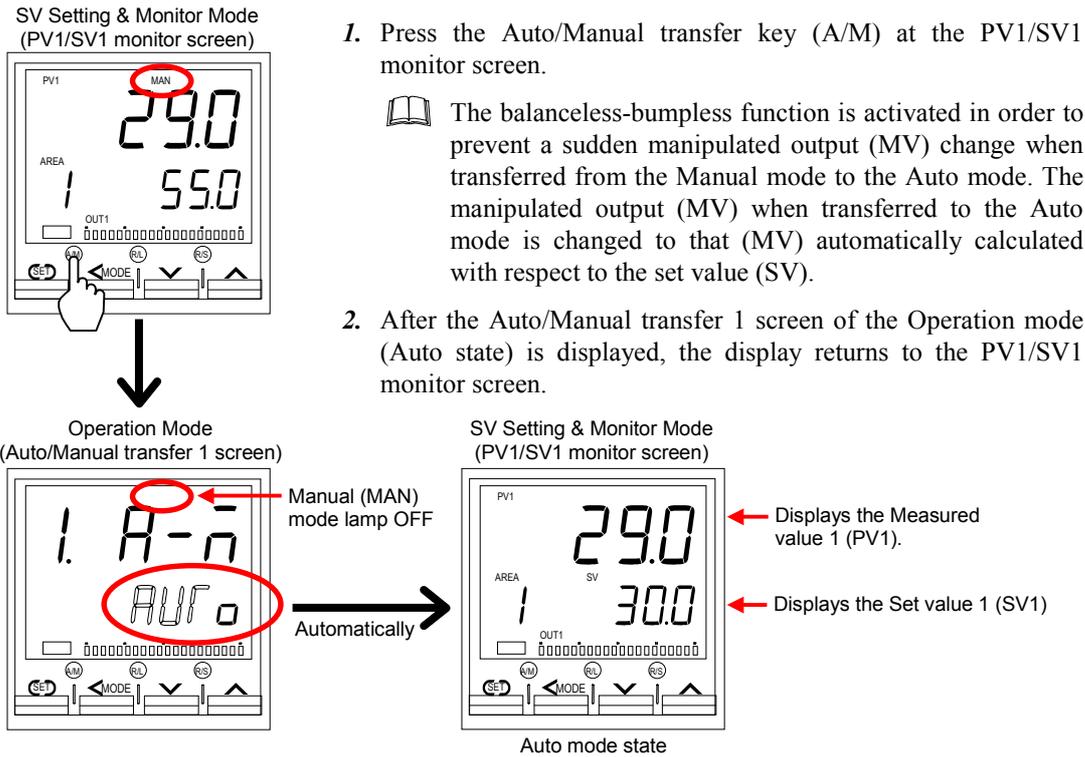


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### Step 3: Change the Operation mode from Manual mode to Auto mode

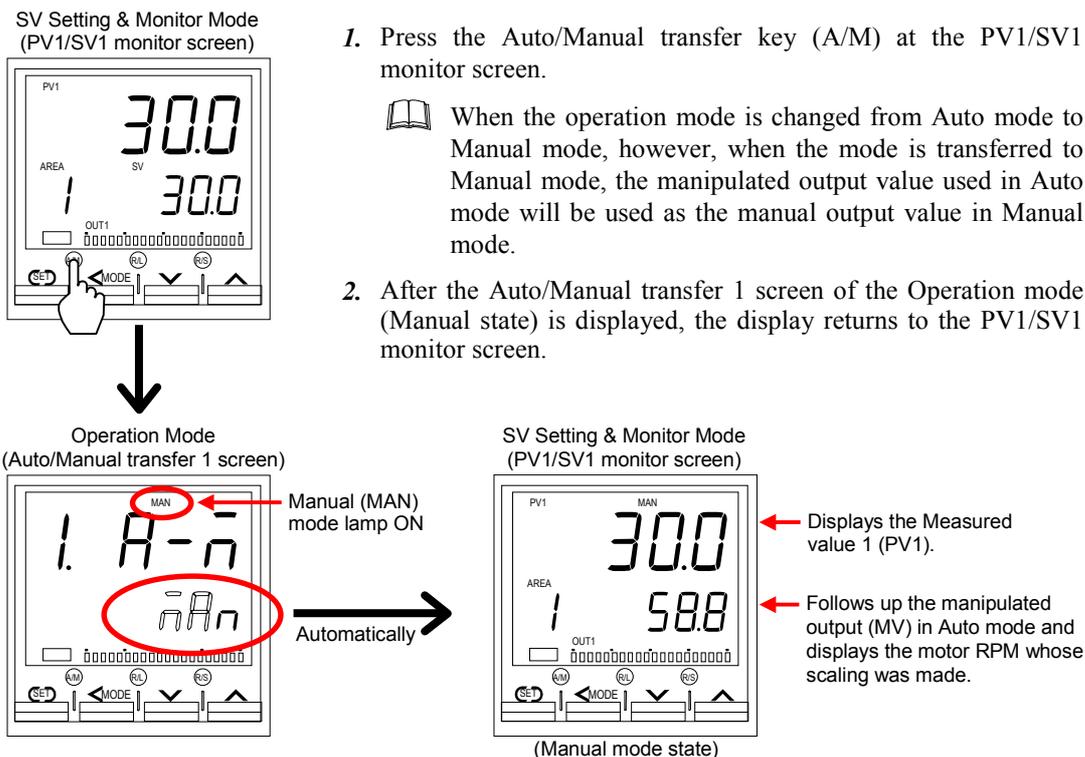


Check the controlled condition, and then adjust the PI constants, if necessary.

See the “5. Setting the PI Constants (Parameter Setting Mode)” on page 14.

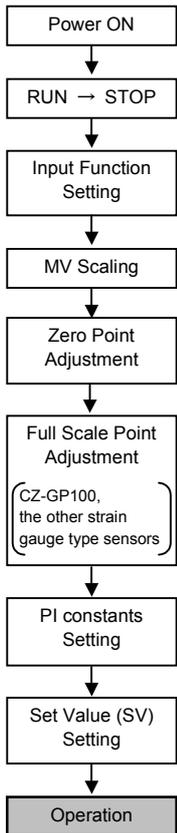
## 7.2 The procedure of operation stop

### Step 1: Change the Operation mode from Auto mode to Manual mode



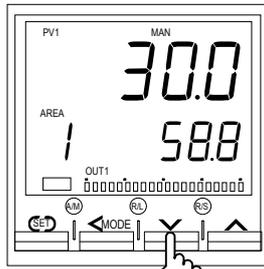
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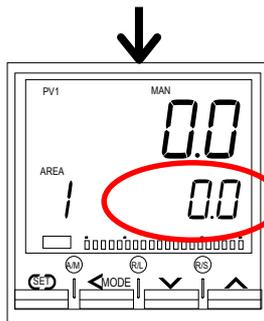
## Step 2: Decrease the manipulated output value (MV1) of Input 1 (Motor RPM) in the Manual mode

SV Setting & Monitor Mode (PV1/SV1 monitor screen)



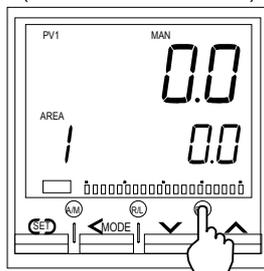
Decrease gradually the motor RPM by the DOWN key to “0.0.”

If a manual output value (%) is displayed on the Set value (SV) display, gradually decrease it to “0.0” by the DOWN key.



## Step 3: Change the Operation mode from RUN mode to STOP mode

SV Setting & Monitor Mode (PV1/SV1 monitor screen)

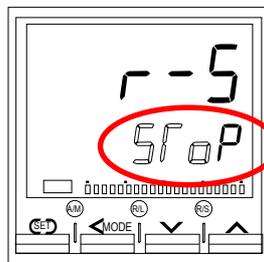


Press the RUN/STOP transfer key (R/S) at the PV1/SV1 monitor screen.

After the RUN/STOP transfer screen of the Operation mode (STOP state) is displayed, the display returns to the PV1/SV1 monitor screen. The STOP character that is indicative of the STOP state is displayed on the Measured value (PV1/PV2) display. Thus, the Operation mode has been changed to the control STOP state.

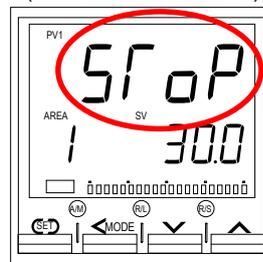
If the controller is transferred to STOP mode from RUN mode, the controller status is the same as the Power-off. (However, with the exception of the display function.)

Operation Mode (RUN/STOP transfer screen)



Automatically

SV Setting & Monitor Mode (PV1/SV1 monitor screen)



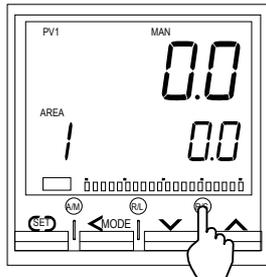
# SELECTION OPERATION BY EXTERNAL CONTACT INPUT (RUN/STOP, Auto/Manual)

The RUN/STOP transfer and the Auto/Manual transfer can be transferred by using an external contact input (event input). For this purpose, it is necessary to select the set value which enables the transfer of RUN/STOP and Auto/Manual by setting the event input logic selection (**dISL**) of the Engineering mode, F23. The procedure for setting the event input logic selection (**dISL**) is described in the following.

The setting procedure of the event input logic selection:

## Step 1: Change the Operation mode from RUN mode to STOP mode

SV Setting & Monitor Mode (PV1/SV1 monitor screen)



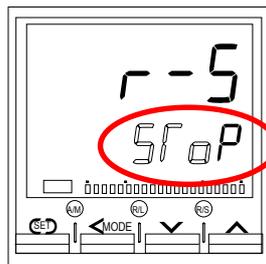
Press the RUN/STOP transfer key (R/S) at the PV1/SV1 monitor screen.

After the RUN/STOP transfer screen in operation mode (STOP state) is displayed, the display returns to the PV1/SV1 monitor screen. The STOP character that is indicative of the STOP state is displayed on the Measured value (PV1/PV2) display. Thus, the Operation mode has been changed to the control STOP state.

If the controller is transferred to STOP mode from RUN mode, the controller status is the same as the Power-off. (However, with the exception of the display function.)

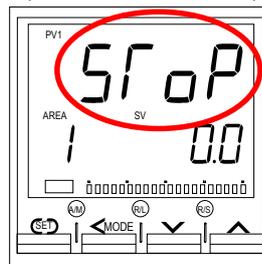


Operation Mode (RUN/STOP transfer screen)



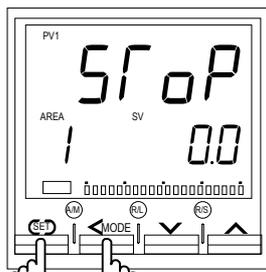
Automatically

SV Setting & Monitor Mode (PV1/SV1 monitor screen)



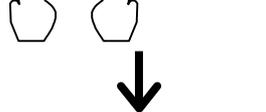
This character indicates STOP state.

## Step 2: Change from F10 to F23 (Engineering mode)

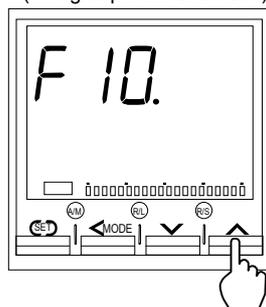


1. Press the shift key for two seconds while pressing the SET key at the PV1/SV1 monitor screen (SV Setting & Monitor Mode) to change to the Engineering mode. The display is the F10 group number screen that is the first group screen of the Engineering mode.

2. Press the UP key four times at the F10 group number screen. The F23 group number screen is displayed.

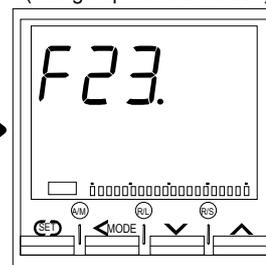


Engineering mode (F10 group number screen)



Press the UP key four times

Engineering mode (F23 group number screen)

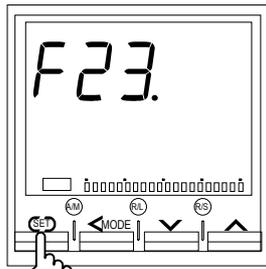


Continued on the next page.

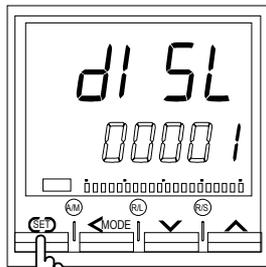
**The setting procedure of the event input logic selection:**

Continued from the previous page.

**Step 3: Select the type of external contact input (Event input).**



Event input logic selection screen



Returns to the F23 group number screen

1. Press the SET key at the F23 group number screen. The Event input logic selection screen is displayed.
2. Press the UP key to select the desired set value from the shaded section in the function assignment table.
3. Press the SET key to store the new set value.

Data range: 0 to 15  
(see the following table and the next page)

Factory set value: 1

**[Function Assignment Table]**

Set value	DI1 (Terminal No. 30-31)	DI2 (Terminal No. 30-32)	DI3 (Terminal No. 30-33)	DI4 (Terminal No. 30-34)	DI5 (Terminal No. 35-36)
0	Unused (No function assignment)				
1	Memory area number selection (1 to 16)				Memory area set
2	Memory area number selection (1 to 16)				Memory area set
3	Memory area number selection (1 to 16)				Memory area set
4	Memory area number selection (1 to 8)			Memory area set	<b>RUN/STOP transfer</b>
5	Memory area number selection (1 to 8)			Memory area set	Remote/Local transfer
6	Memory area number selection (1 to 8)			Memory area set	<b>Auto/Manual transfer</b>
7	Memory area number selection (1 to 8)			Memory area set	Hold reset
8	Memory area number selection (1 to 8)			Memory area set	Interlock release
9	Memory area number selection (1 to 4)	Memory area set		<b>RUN/STOP transfer</b>	<b>Auto/Manual transfer</b>
10	Memory area number selection (1 to 4)	Memory area set		RUN/STOP transfer	Remote/Local transfer
11	Memory area number selection (1 to 4)	Memory area set		Remote/Local transfer	Auto/Manual transfer
12	Memory area number selection (1 to 4)			Memory area set	Hold reset
13	Auto/Manual transfer	RUN/STOP transfer	Remote/Local transfer	Hold reset	Interlock release
14	<b>Auto/Manual transfer</b>	<b>Input 1_manual output down (motor RPM down)<sup>1</sup></b>	<b>Input 1_manual output up (motor RPM up)<sup>2</sup></b>	<b>Input 1_manual output 0% reset (motor RPM reset)<sup>3</sup></b>	<b>RUN/STOP transfer</b>
15	Auto/Manual transfer	Input 2_manual output down (motor RPM down) <sup>1</sup>	Input 2_manual output up (motor RPM up) <sup>2</sup>	Input 2_manual output 0% reset (motor RPM reset) <sup>3</sup>	RUN/STOP transfer

<sup>1</sup> Decreases manipulated output value (motor RPM) under Manual control with contacts closed.

<sup>2</sup> Increases manipulated output value (motor RPM) under Manual control with contacts closed.

<sup>3</sup> The manipulated output value (motor RPM) is reset to 0% based on the edge discrimination of "open" to "closed."

In addition, switched to "Manual Control" regardless of Auto/Manual transfer setting.



**Relationship between RUN/STOP transfer and contact state:**

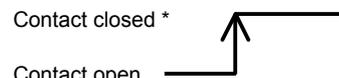
Mode select from front key	Status of event input (DI)	Actual operation mode	STOP display
RUN (Control RUN)	Contact closed	RUN	STOP is not displayed
	Contact open	STOP	dSfP
STOP (Control STOP)	Contact closed		EsfP
	Contact open	SfOP	

**Relationship between Auto/Manual transfer and contact state:**

Mode select from front key	Status of event input (DI)	Actual operation mode	Display lamp
Auto	Contact closed	Auto	MAN mode lamp ON
	Contact open	Manual	MAN mode lamp OFF
Manual	Contact closed		
	Contact open		

**Transfer timing of RUN/STOP and Auto/Manual:**

The selection operation is taken when DI contact is closed from the open condition (Rising edge).

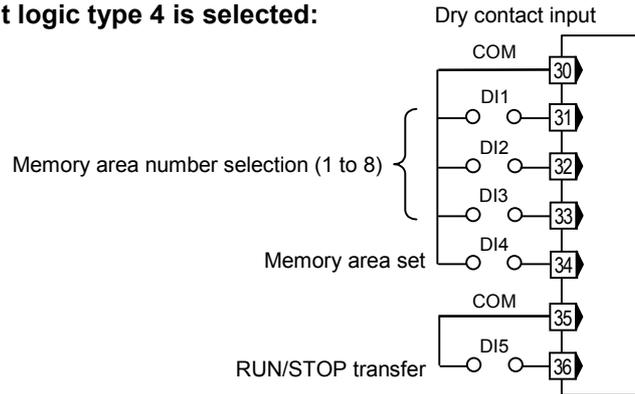


\* To make contact activation valid, it is necessary to maintain the same contact state (contact closed) for more than 200 ms.

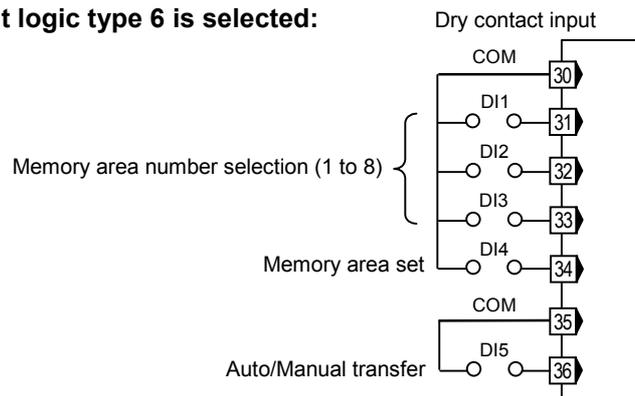
**The logic assignment and the DI terminal configuration:**

Relationship between the setting value in the shaded section of the function assignment and DI terminal is shown in the following.

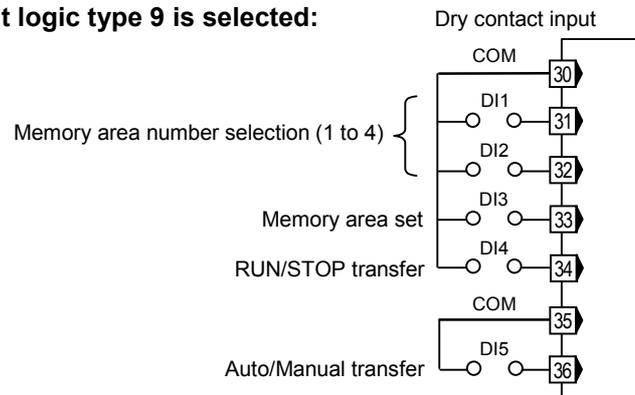
**When the event input logic type 4 is selected:**



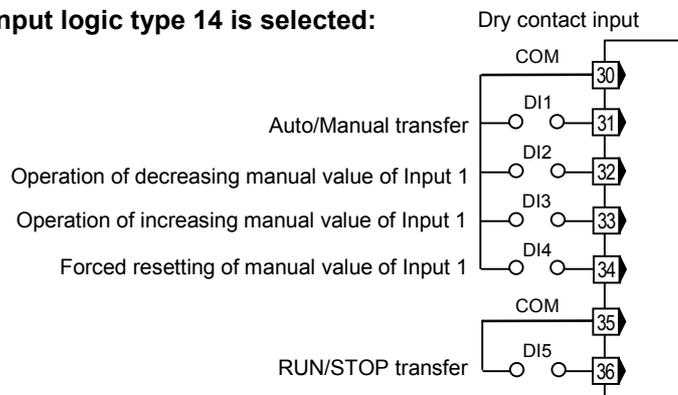
**When the event input logic type 6 is selected:**



**When the event input logic type 9 is selected:**



**When the event input logic type 14 is selected:**

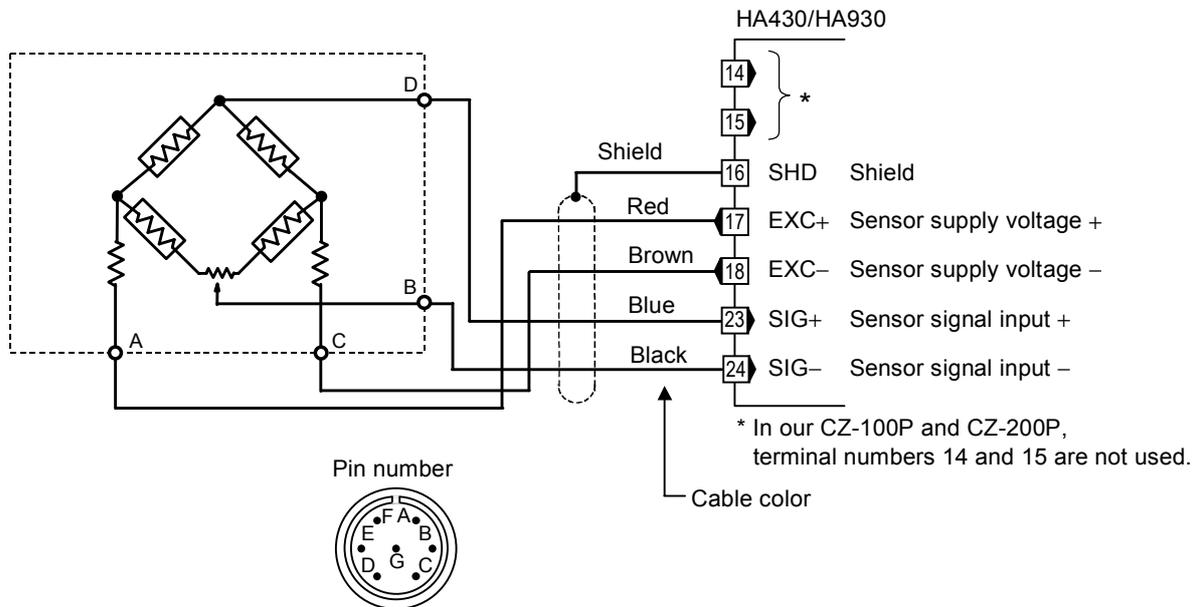


Contact input from external devices or equipment should be dry contact input. If it is not dry contact input, the input should have meet the specifications below.  
 Contact resistance: At OFF (contact open) 500 kΩ or more  
 At ON (contact closed) 10 Ω or less

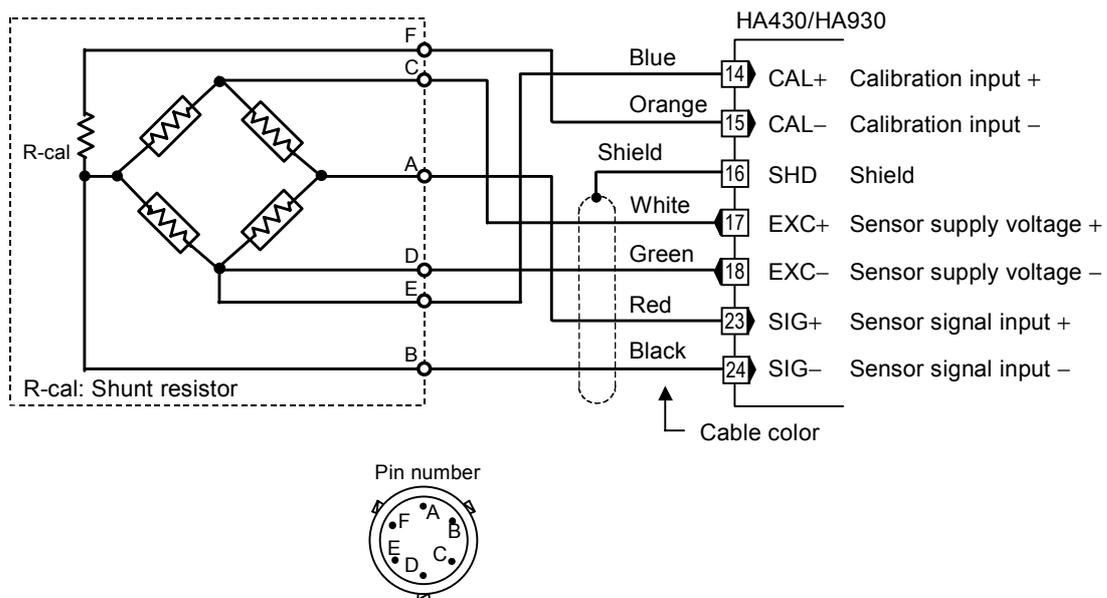
## APPENDIX

### Connection to our CZ-100P, CZ-200P, CZ-GP100, or the other strain gauge type sensors

Wiring example 1: Connection to our CZ-100P or CZ200P



Wiring example 2: Connection to our CZ-GP100 (without amplifier) or the other strain gauge type sensors



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The first edition: OCT. 2003 [IMQ00]  
The second edition: MAY 2004 [IMQ00]

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IMR01N16-E2

MAY 2004