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

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< 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**

   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).

   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).

   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.

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

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

Data range: 2 (MPa) 3 (bar) 4 (kgf/cm²) 5 (psi)

1 MPa = 10 bar = 10.1972 kgf/cm² = 145.038 psi
Factory set value: 2

Continued on the next page.
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

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

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

Do not change the factory set value.
This setting cannot be used for CZ-100P or CZ-200P.
Continued from the previous page.

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

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)

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

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

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 [ . . . . . ])

Continued on the next page.
Continued from the previous page.

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

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).

Continued on the next page.
Continued from the previous page.

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)

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.

Step 2: Set the MV scaling function

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)

Continued on the next page.
Continued from the previous page.

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)

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 [□□□□□])

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 %.

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.

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

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.

Step 2: Displays the parameter of the zero point adjustment

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.

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)

Continued on the next page.
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.

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.

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 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.

Step 1: Displays the parameter of the full scale point adjustment

Step 2: Adjust the full scale point of the measured value (PV1) of Input 1

Adjustment procedure:
Pressing the shift key for one second while displaying the Auto calibration screen automatically starts Auto calibration operation.
If this Auto calibration operation normally end, the screen returns to the Auto calibration screen.
An error occurs if this Auto calibration operation abnormally end.
To release the error state, press the shift key for one second.
The screen returns to the Auto calibration screen.

For the HA430/HA930, in order to generate the R-cal output it is not necessary to short the cables (blue and orange) on the pressure sensor side.
The result obtained by Auto calibration is reflected to the Input 1_PV ratio (1. Pr). Manual full scale point adjustment can be performed by changing this PV ratio value (P. 11).

When the result of Auto calibration execution is out of the gain range (0.500 to 4.000 mV/V).

The full scale point adjustment is complete.
Next, set the constants of PID control.

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

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

Continued on the next page.
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)

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 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)

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

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

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

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

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

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 %).

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

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.

Continued on the next page.
Continued from the previous page.

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

1. Press the Auto/Manual transfer key (A/M) at the PV1/SV1 monitor screen.

   ⚠️ The balanceless-bumpless function is activated in order to prevent a sudden manipulated output (MV) change when transferred from the Manual mode to the Auto mode. The manipulated output (MV) when transferred to the Auto mode is changed to that (MV) automatically calculated with respect to the set value (SV).

2. After the Auto/Manual transfer 1 screen of the Operation mode (Auto state) is displayed, the display returns to the PV1/SV1 monitor screen.

   ⚠️ 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**

1. Press the Auto/Manual transfer key (A/M) at the PV1/SV1 monitor screen.

   ⚠️ When the operation mode is changed from Auto mode to Manual mode, however, when the mode is transferred to Manual mode, the manipulated output value used in Auto mode will be used as the manual output value in Manual mode.

2. After the Auto/Manual transfer 1 screen of the Operation mode (Manual state) is displayed, the display returns to the PV1/SV1 monitor screen.

   ⚠️ Displays the measured value 1 (PV1).

   Displays the set value 1 (SV1)

   (Manual mode state)

Continued on the next page.
Continued from the previous page.

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

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**

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.)
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

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.)

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.

Continued on the next page.
Continued from the previous page.

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

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**

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

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

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

3. 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:**

<table>
<thead>
<tr>
<th>Mode select from front key</th>
<th>Status of event input (DI)</th>
<th>Actual operation mode</th>
<th>STOP display</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUN (Control RUN)</td>
<td>Contact closed</td>
<td>RUN</td>
<td>STOP is not displayed</td>
</tr>
<tr>
<td></td>
<td>Contact open</td>
<td>STOP (Steady)</td>
<td></td>
</tr>
<tr>
<td>STOP (Control STOP)</td>
<td>Contact closed</td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contact open</td>
<td>Contact open</td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Contact closed *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact open</td>
</tr>
</tbody>
</table>

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

- Memory area number selection (1 to 8)
- Memory area set
- RUN/STOP transfer

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

- Memory area number selection (1 to 8)
- Memory area set
- Auto/Manual transfer

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

- Memory area number selection (1 to 4)
- Memory area set
- RUN/STOP transfer
- Auto/Manual transfer

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

- Auto/Manual transfer
- Operation of decreasing manual value of Input 1
- Operation of increasing manual value of Input 1
- Forced resetting of manual value of Input 1
- RUN/STOP transfer

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
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

R-cal: Shunt resistor

* In our CZ-100P and CZ-200P, terminal numbers 14 and 15 are not used.