5. TEST MODE

Drawing No.

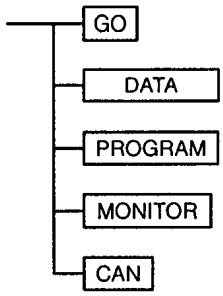
Mode	Test Mode	Function		5-1

Procedures at Initial Test Mode Screen

Message

```
T TEST MODE
PC CMD. INAVLID
 GO ->TEST MODE
 OTHER->CANCEL
```

Key Operation



Operation Procedure & Explanations	Precautions/Remarks
Starting the test mode: GO - - - ► Go to 5-3 Switching to data set mode: DATA - - - ► Go to 7-1 Switching to program mode: PROGRAM - - - ► Go to 8-1 Switching to monitor mode: MONITOR - - - ► Go to 6-2 No screen change: TEST - - - ► This section Switching to initial screen: CAN - - - ► Go to 4-1	Even if test mode operation is designated by pressing the GO key, the test mode will not be established at the A273UHCPU/A171SCPU if axis motion in response to a programmable controller command is in progress. In this case, a "! STARTING ERROR" error will occur. The term "cancel" means switching to another mode.

Notes

Start commands from the programmable controller are invalid when in the test mode.

5

Drawing No.

Mode	Test Mode	Function	Cancel	5-2

Procedures at Test Mode Cancel Screen

Message

```
T TEST MODE
PC COMMAND VALID
  GO ->  TEST END
  CAN->  CANCEL
```

Key Operation

GO

Operation Procedure & Explanations	Precautions/Remarks

The test mode cancel screen will be displayed in test mode operation when another mode key is pressed, or when the CAN key is pressed at the test item selection screen (5-3). A test mode cancel confirmation procedure is then required as shown below.

To cancel the test mode:

GO — If another mode key was pressed immediately prior to the test mode cancel screen being displayed, the initial screen for that mode will be displayed when the GO key is pressed.

To continue the test mode:

CAN — The test mode will not be canceled, and the test mode's item selection screen (5-3) will be displayed.

Notes

5

Drawing No.

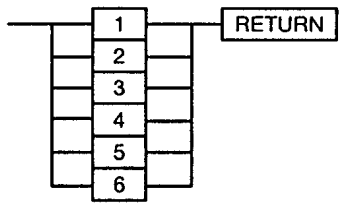
Mode	Test Mode	Function	Test Item Selection	5-3

Test Item Selection Screen (Displayed After Entering Test Mode)

Message

```
T 1 JOG     5 PC  TEST
  2 TEACH   6 SVO. ON
  3 PROG. OPERATION
  4 P. VAL  SETTING
```

Key Operation



Operation Procedure & Explanations	Precautions/Remarks

The test item is selected at this screen.

Selecting JOG operation:

[1] [RETURN] - - - ► Go to 5-4

Selecting teaching:

[2] [RETURN] - - - ► Go to 5-5

Selecting program operation:

[3] [RETURN] - - - ► Go to 5-34

Selecting present value setting:

[4] [RETURN] - - - ► Go to 5-42

Selecting PC test:

[5] [RETURN] - - - ► Go to 5-45

Selecting servo ON:

[6] [RETURN] - - - ► Go to 5-48

Notes

When the key which designates the desired item number is pressed, that item number will be highlighted.

5.1 JOG Operation

Drawing No.

Mode	Test Mode	Function	JOG Operation	5-4

Screen Procedures When JOG Operation is Selected

Message

```
T JOG
 SP.      60000000.00
 OVERRIDE     10.0%
 1!-2147483648.8u
```

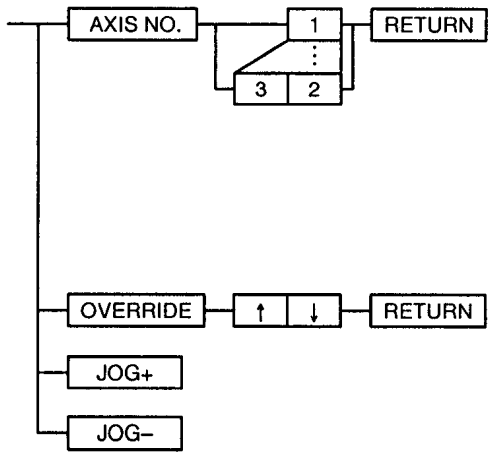
"!" is displayed when Error detection or Servo error detection is ON at the relevant axis.

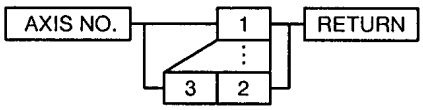
Axis No. display: Axis No. is highlighted when the servo is ON.

```
32!-2147483648.8u
```

When axis No. is a 2-digit number

Key Operation



Operation Procedure & Explanations	Precautions/Remarks
The data settings and procedures required for JOG operation are executed at this screen. The JOG speed is displayed as a "[JOG speed limit value] × [override]" value. The initial override display value is 10.0 %. The selected axis number and the feed present value are displayed at the bottom line of the screen. When the JOG screen is first displayed after being selected at the test item screen, a 1-axis JOG operation will be indicated. Changing the axis:  Select axis No.1 to 32 immediately after pressing the AXIS NO. key. When an axis change is made, the new axis number is indicated at the bottom of the screen. The axis number input range varies according to the CPU type being used. A273UHCPU (8-axis specs.) Axes 1 to 8 A273UHCPU (32-axis specs.) Axes 1 to 32 A171SCPU Axes 1 to 4 JOG operation is possible during an axis number change. Although JOG operation can be started by pressing [AXIS NO.] [JOG+], the AXIS NO. key ON status will be canceled at that time.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! SETTING ERROR" will be displayed.

Notes	
	The JOG+ and JOG– keys are always operative while in the JOG test mode.

Drawing No.

Mode	Test Mode	Function	JOG Operation	5-4.1

Screen Procedures When JOG Operation is Selected

Operation Procedure & Explanations	Precautions/Remarks
Changing the override: [OVERRIDE] — [↑] [↓] — [RETURN] When the OVERRIDE key is pressed, the cursor will be displayed at the override value. 10.[0] % Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ key to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] JOG operation is possible during an override change. JOG operation is possible with the following key operations, but the override setting procedure will be canceled: [OVERRIDE] [JOG+] or [OVERRIDE] [↑] [↓] [JOG+] JOG operation: [JOG+] While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the displayed speed. JOG operation stops when this key is released. [JOG−] While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the displayed speed. JOG operation stops when this key is released.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes

5.2 Teaching

Drawing No.

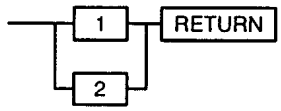
Mode	Test Mode	Function	Teaching	5-5

Procedures at Teaching Item Selection Screen

Message

```
T TEACHING
 1ADDRESS TEACH
 2PROGRAM TEACH
```

Key Operation



Operation Procedure & Explanations	Precautions/Remarks

The teaching type (address teaching or program teaching) is selected at this screen.

Selecting "address teaching":

[1] [RETURN] - - - ► Go to 5-6

Selecting "program teaching":

[2] [RETURN] - - - ► Go to 5-17

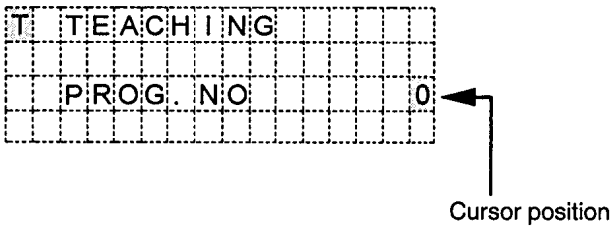
Notes

Drawing No.

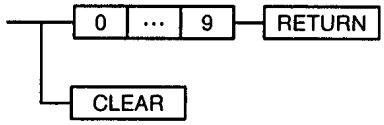
Mode	Test Mode	Function	Teaching (address teaching)	5-6

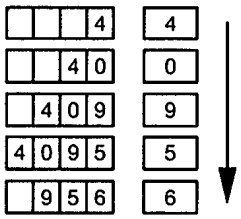
Calling a Designated Program

Message



Key Operation



Operation Procedure & Explanations	Precautions/Remarks
The program to be accessed is designated by using keys 0 to 9 to enter its number. The program number range is 0 to 4095. The effective input digits will be the most recent 4 digits entered. Any input exceeding 4 digits will be invalid.  Each time a digit is entered, the previous digit moves one space to the left. Press the CLEAR key to correct an input. The input field will be cleared. If a program has been read out successfully (when RETURN key is pressed), that program's servo instructions and axis feed present values, etc., will be displayed. - - - ► Go to 5-7	In order to execute the address teach function, a program must first be created in the program mode. When this screen is accessed from the teaching item selection screen (5-5), or accessed due to the CAN key being pressed during an address teach operation, the call program number registered at that time will be displayed as the default. On returning to this screen following address writing by the teaching function, a search will be conducted through all subsequent program numbers for steps where teaching is possible, and the number of the first program where such a step is found will be displayed. If a program number where teaching is impossible (INC, VF, etc.) is designated, the message "! CAN'T SET P.VAL" will be displayed on the fourth line.

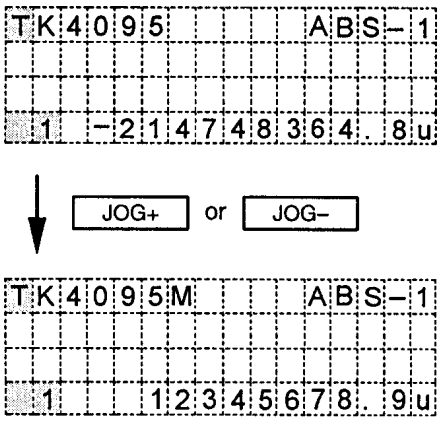
Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-7

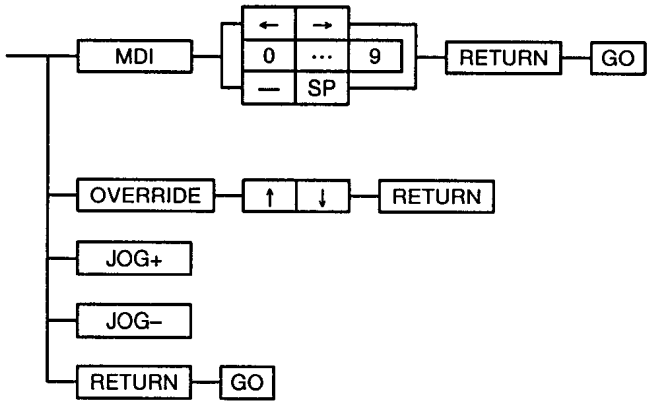
Absolute 1-Axis Positioning

Message



The axis number for which the JOG designation has been made is highlighted.

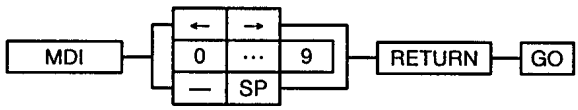
Key Operation



Operation Procedure & Explanations	Precautions/Remarks

When the program's servo instruction designates an absolute 1-axis operation, this is indicated by the display "ABS-1". The program content for the axis numbers designated for the program is displayed on the lower lines.

Numeric input:



When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value.
"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.
At this time, use the ←, → keys to move the cursor to the numeric value which is to be changed, then enter the desired value.
To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).
When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed.

```
GO  -> WRITE
CAN -> CANCEL
```

Notes

Because the absolute 1-axis positioning operation occurs at 1 axis only, there is no axis change procedure.

Operation Procedure & Explanations	Precautions/Remarks
Press the GO key at this time to write the changed numeric value. If the value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE — ↑ ↓ — RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The change procedure is identical to that in the test mode JOG operation, except that the system will return to the absolute 1 axis teaching screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ key to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-7.2

Absolute 1-Axis Positioning

Operation Procedure & Explanations	Precautions/Remarks
JOG operation: JOG+ — While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– — While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Writing the address: RETURN — GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen will then be displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

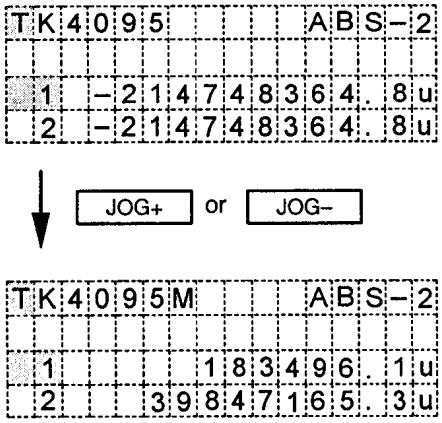
Notes

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-8

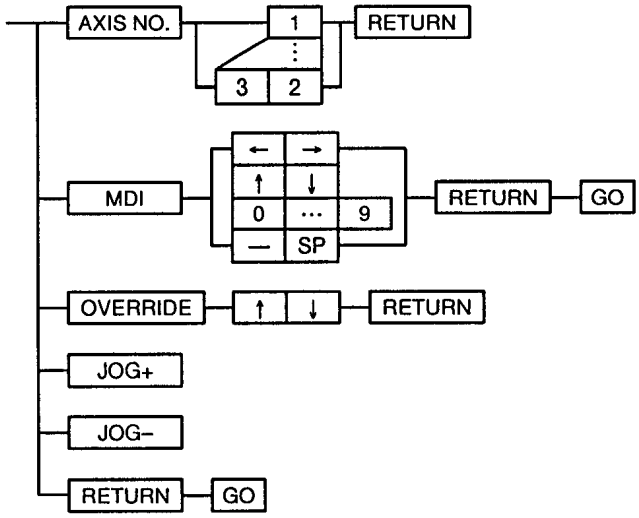
Absolute 2-Axis Linear Interpolation

Message



The axis number for which the JOG designation has been made is highlighted.

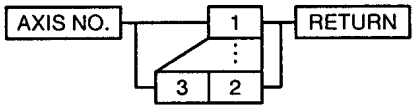
Key Operation



Operation Procedure & Explanations	Precautions/Remarks

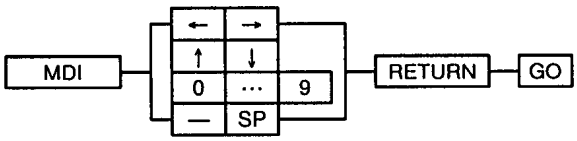
When the program's servo instruction designates an absolute 2-axis operation, this is indicated by display of "ABS-2". The program content for the axis numbers designated for the program is displayed on the lower lines.

Changing the axis:



The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program.
When a JOG axis number is changed, that axis number is highlighted.

Numeric input:



Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-8.1

Absolute 2-Axis Linear Interpolation

Operation Procedure & Explanations	Precautions/Remarks

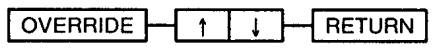
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen).
"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.
At this time, use the ← , → , ↑ , ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value.
To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).
When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed.

```
GO  -> WRITE
CAN -> CANCEL
```

Press the GO key to write the changed numeric value.

If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).

Changing the override:



When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen.
The change procedure is identical to that in test mode JOG operation, except that the system will return to the absolute 2-axis teaching screen when the RETURN key is pressed.

When the JOG screen format is displayed, the cursor will be displayed at the override position.

```
10.0 %
   └── Cursor position
```

At this time, the ↑ , ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value.

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-8.2

Absolute 2-Axis Linear Interpolation

Operation Procedure & Explanations	Precautions/Remarks
The override table contains the values shown below, enabling a selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Writing the address: RETURN — GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen will then be displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

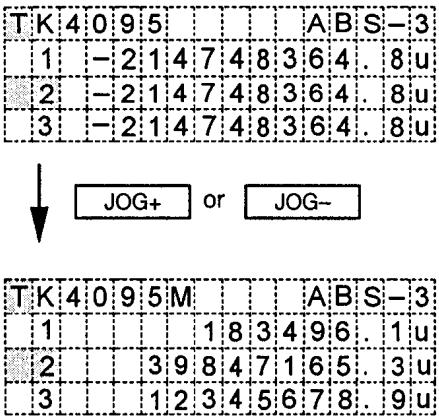
Notes

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-9

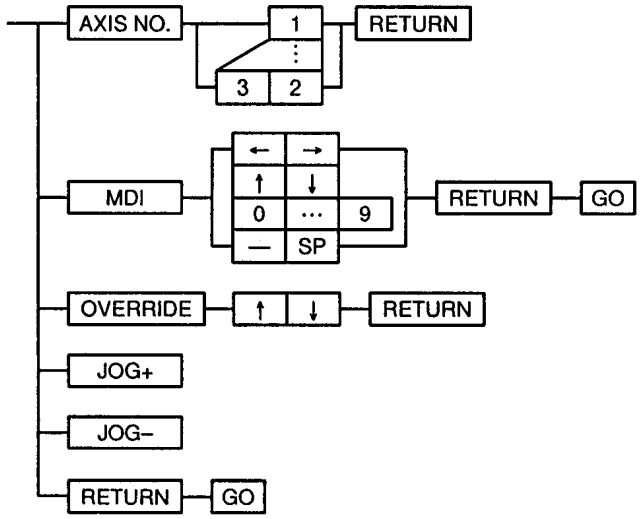
Absolute 3-Axis Linear Interpolation

Message



The axis number for which the JOG designation has been made is highlighted.

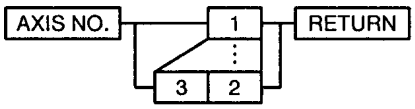
Key Operation



Operation Procedure & Explanations

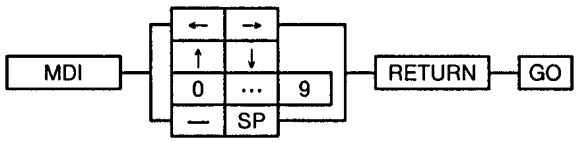
When the program's servo instruction designates an absolute 3-axis operation, this is indicated by display of "ABS-3". The program content for the axis numbers designated for the program is displayed on the lower lines.

Changing the axis:



The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

Numeric input:



Precautions/Remarks

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-9.1

Absolute 3-Axis Linear Interpolation

Operation Procedure & Explanations	Precautions/Remarks
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE — ↑ ↓ — RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen. The change procedure is identical to that in test mode JOG operation, except that the system will return to the absolute 3-axis teaching screen when the RETURN key is pressed.	

Notes	

Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.[0] % └── Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-9.3

Absolute 3-Axis Linear Interpolation

Operation Procedure & Explanations	Precautions/Remarks
Writing the address: RETURN — GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	

Notes	

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-10

Absolute 4-Axis Linear Interpolation

Message

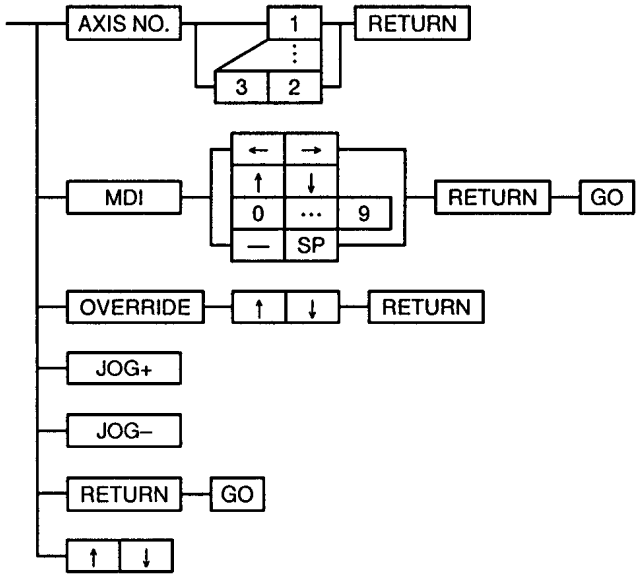
```
TK4095      ABS-4
  1  -2147483648.8u
  2  -2147483648.8u
 11  -2147483648.8u
```

Axis No. display: Axis No. where JOG is designated is highlighted.

↑ ↓ Scroll

```
TK4095      ABS-4
  2  -2147483648.8u
 11  -2147483648.8u
 12  -  12345678.8u
```

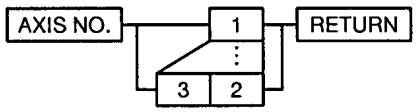
Key Operation



Operation Procedure & Explanations

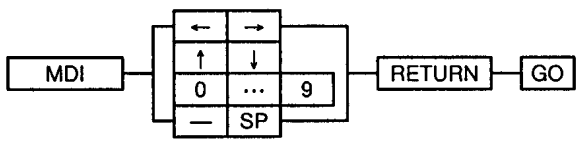
When the program's servo instruction designates an absolute 4-axis operation, this is indicated by display of "ABS-4". The program content for the axis numbers designated for the program is displayed on the lower lines.

Changing the axis:



The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

Numeric input:



Precautions/Remarks

If an axis number outside the range designated by the program is designated, the error message "! SETTING ERROR" will be displayed at the bottom line of the screen and the axis number will not be changed.

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-10.1

Absolute 4-Axis Linear Interpolation

Operation Procedure & Explanations	Precautions/Remarks
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Changing the override: OVERRIDE — ↑ ↓ — RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen. The change procedure is identical to that in test mode JOG operation, except that the system will return to the absolute 4-axis teaching screen when the RETURN key is pressed.	

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-10.2

Absolute 4-Axis Linear Interpolation

Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpalating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes	

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-10.3

Absolute 4-Axis Linear Interpolation

Operation Procedure & Explanations	Precautions/Remarks
Writing the address: RETURN — GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6). Screen scrolling: ↑ ↓ For 4-axis interpolation, the data for all axes cannot be displayed on a single screen. In such cases, use the ↑, ↓ keys to scroll the axis number, etc., 1 line.	

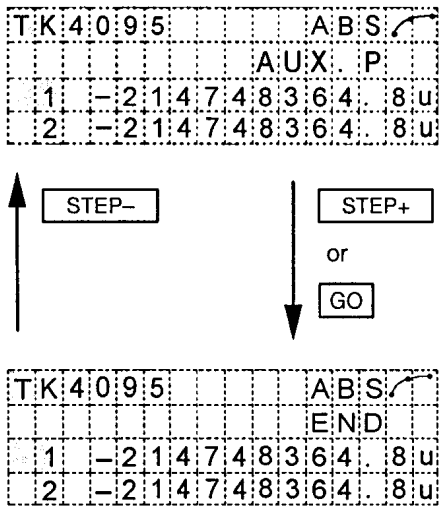
Notes

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-11

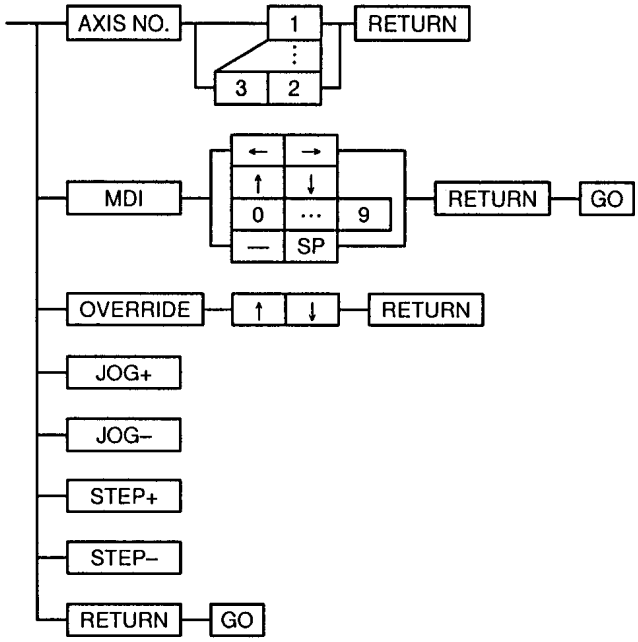
Absolute Circular Interpolation by Auxiliary Point Designation

Message



The axis number for which the JOG designation has been made is highlighted.

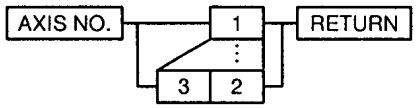
Key Operation



Operation Procedure & Explanations

When the program's servo instruction designates absolute circular interpolation by auxiliary point designation, this is indicated by the display "ABS". The auxiliary point data for the axis number designated by the program is displayed on the line below.

Changing the axis:



The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

Precautions/Remarks

Notes

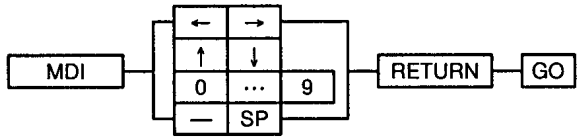
Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-11.1

Absolute Circular Interpolation by Auxiliary Point Designation

Operation Procedure & Explanations	Precautions/Remarks

Numeric input:



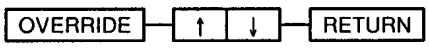
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen).
"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.
At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value.
To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).
When the numeric input is completed, press the RETURN key.
An address writing confirmation screen like that shown below will then be displayed.

```
GO  -> WRITE
CAN -> CANCEL
```

Press the GO key to write the changed numeric value.

If the numeric value is written without error, the system will proceed to the end-point designation screen (if the current screen is the auxiliary point designation screen) where the same procedure is possible. If the GO key is pressed at the end-point designation screen, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).

Changing the override:



When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen.

Notes

Operation Procedure & Explanations	Precautions/Remarks
The override change procedure is identical to that at the test mode JOG operation, except that the system will return to the original screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % └── Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted. When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-11.3

Absolute Circular Interpolation by Auxiliary Point Designation

Operation Procedure & Explanations	Precautions/Remarks
Changing the setting screen: STEP+ Press the STEP+ key at the auxiliary point designation screen to switch to the end-point designation screen. STEP– Press the STEP– key at the end-point designation screen to return to the auxiliary point designation screen. Writing the address: RETURN — GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	

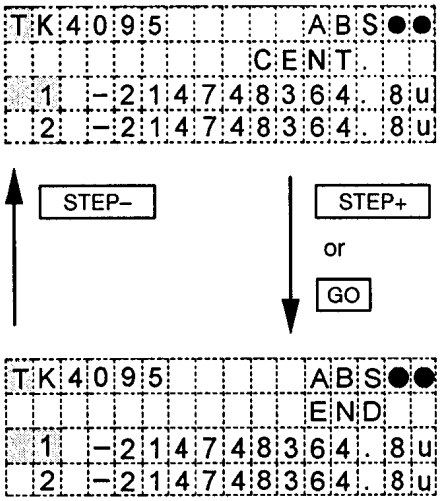
Notes

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-12

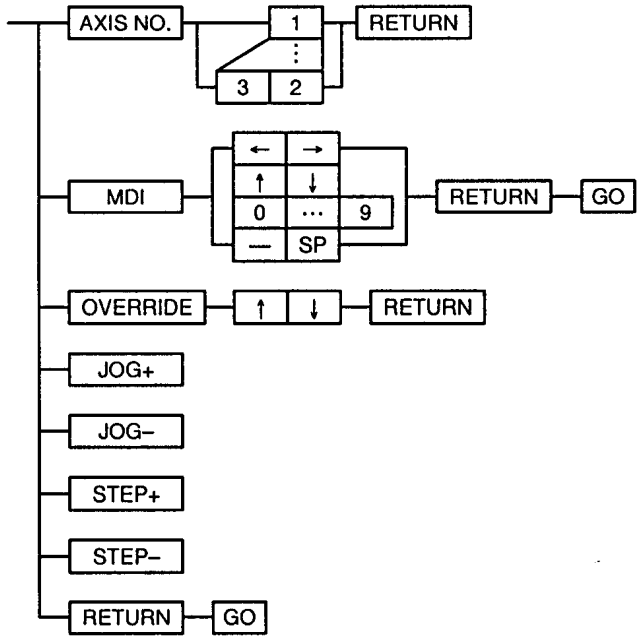
Absolute Circular Interpolation by Center Point Designation

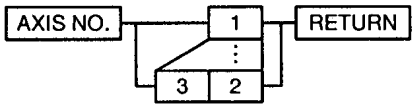
Message



The axis number for which the JOG designation has been made is highlighted.

Key Operation



Operation Procedure & Explanations	Precautions/Remarks
When the program's servo instruction designates absolute circular interpolation by center point designation, this is indicated by display of "ABS●●". The center point data for the axis number designated by the program is displayed on the line below. Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	

Notes	
	The indication for circular interpolation by absolute center point designation is shown as "ABS●●" above, but the actual on-screen display appears in the following 2 ways: "ABS↷", "ABS↶".

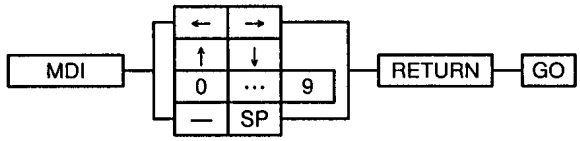
Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-12.1

Absolute Circular Interpolation by Center Point Designation

Operation Procedure & Explanations	Precautions/Remarks

Numeric input:



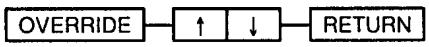
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen).
"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.
At this time, use the ← , → , ↑ , ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value.
To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).
When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed.

```
GO  -> WRITE
CAN -> CANCEL
```

Press the GO key to write the changed numeric value.

If the numeric value is written without error, the system will proceed to the end-point designation screen (if the current screen is the center point designation screen) where the same procedure is possible. If the GO key is pressed at the end-point designation screen, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).

Changing the override:



When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen.

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-12.2

Absolute Circular Interpolation by Center Point Designation

Operation Procedure & Explanations	Precautions/Remarks
The override change procedure is identical to that at the test mode JOG operation, except that the system will return to the original screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.[0] % └── Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolaing axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-12.3

Absolute Circular Interpolation by Center Point Designation

Operation Procedure & Explanations	Precautions/Remarks
Changing the setting screen: [STEP+] Press the STEP+ key at the center point designation screen to switch to the end-point designation screen. [STEP−] Press the STEP− key at the end-point designation screen to return to the center point designation screen. Writing the address: [RETURN] — [GO] Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	

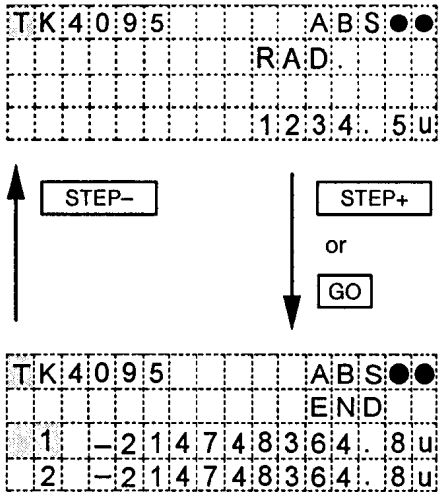
Notes	

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-13

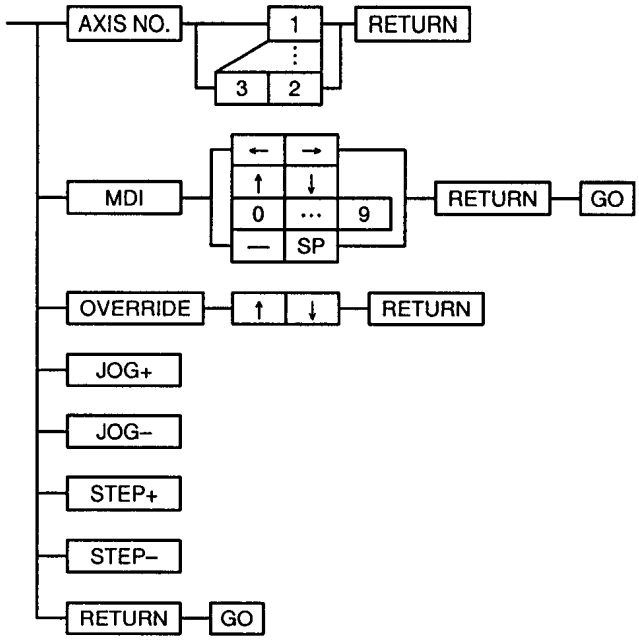
Circular Interpolation by Radius Designation

Message



The axis number for which the JOG designation has been made is highlighted.

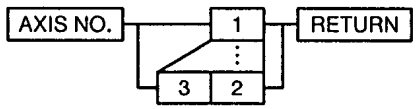
Key Operation



Operation Procedure & Explanations	Precautions/Remarks

When the program's servo instruction designates absolute circular interpolation by radius designation, this is indicated by the display "ABS●●". The radius data designated by the program is displayed on the line below, and cannot be changed.

Changing the axis:



The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.

Notes

The indication for circular interpolation by radius designation is shown as "ABS●●" above, but the actual on-screen display appears in the following 4 ways: "ABS↶", "ABS↷", "ABS↻", "ABS↺".

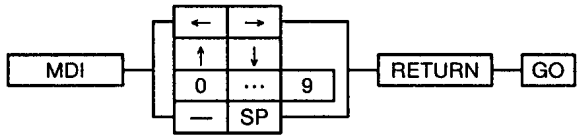
Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-13.1

Circular Interpolation by Radius Designation

Operation Procedure & Explanations	Precautions/Remarks

Numeric input:



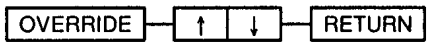
When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen).
"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.
At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value.
To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).
When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed.

```
GO  -> WRITE
CAN -> CANCEL
```

Press the GO key to write the changed numeric value.

If the numeric value is written without error, the system will proceed to the end-point designation screen (if the current screen is the center point designation screen) where the same procedure is possible. If the GO key is pressed at the end-point designation screen, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).

Changing the override:



When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen.

Notes

Operation Procedure & Explanations	Precautions/Remarks
The override change procedure is identical to that in test mode JOG operation, except that the system will return to the original screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted. When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-13.3

Circular Interpolation by Radius Designation

Operation Procedure & Explanations	Precautions/Remarks
Changing the setting screen: STEP+ Press the STEP+ key to switch to the next step screen. STEP– Press the STEP– key to return to the previous step screen. Writing the address: RETURN — GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	

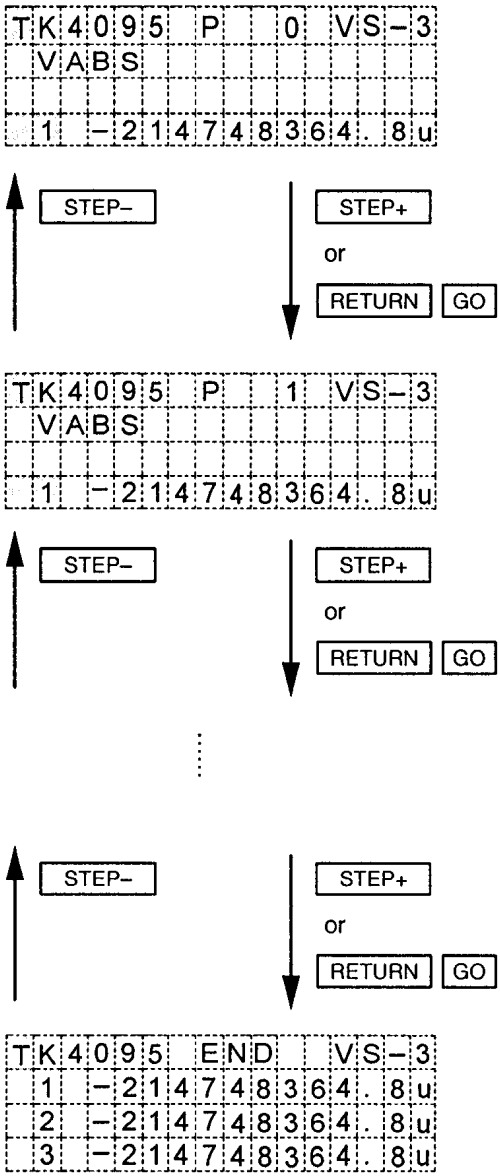
Notes

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-14

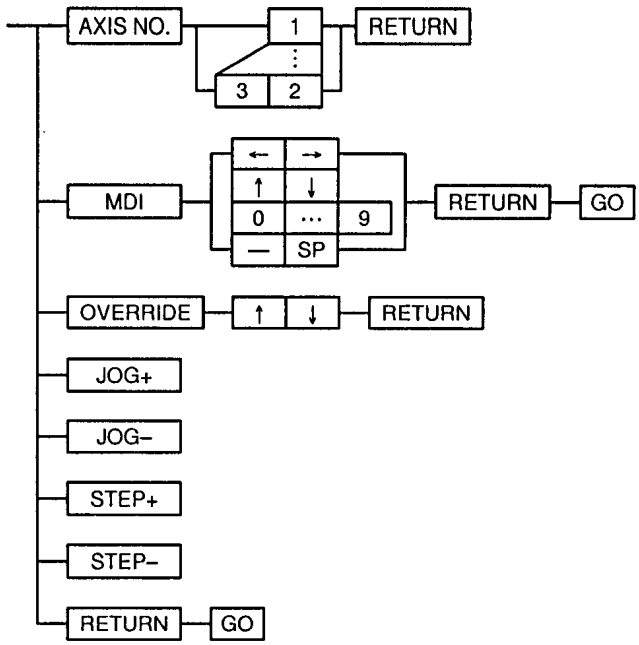
Speed Switching Control

Message



The axis number for which the JOG designation has been made is highlighted.

Key Operation



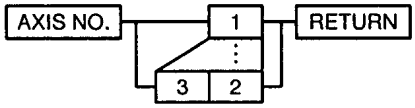
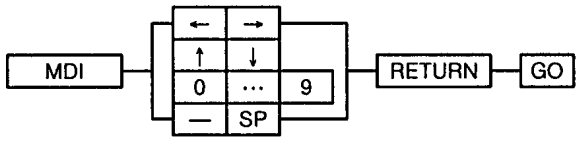
Notes

The first item to be displayed is the first ABS related instruction which appears in the program. Point numbers are assigned in sequence to program steps with addresses, beginning from point "0" (at initial step).
Although INC related instructions can be displayed using the STEP+ and STEP- keys, the teaching function cannot be used with respect to these instructions.

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-14.1

Speed Switching Control

Operation Procedure & Explanations	Precautions/Remarks
Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-14.2

Speed Switching Control

Operation Procedure & Explanations	Precautions/Remarks
Changing the override: OVERRIDE — ↑ ↓ — RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the original screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes

Drawing No.

Mode	Test Mode	Function	Teaching (address teaching)	5-14.3

Speed Switching Control

Operation Procedure & Explanations	Precautions/Remarks
JOG operation: JOG+ : While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– : While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Changing the setting screen: STEP+ : Press the STEP+ key to switch to the next step screen. STEP– : Press the STEP– key to return to the previous step screen. Writing the address: RETURN — GO Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Notes	

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-15

Constant-Speed Control

Message

```
TK4095  P   0  CP-4
 ABS-4
 1  -2147483648.8u
 2  -2147483648.8u
11  -2147483648.8u
12       1234567.8u
```

↑ ↓ Scroll

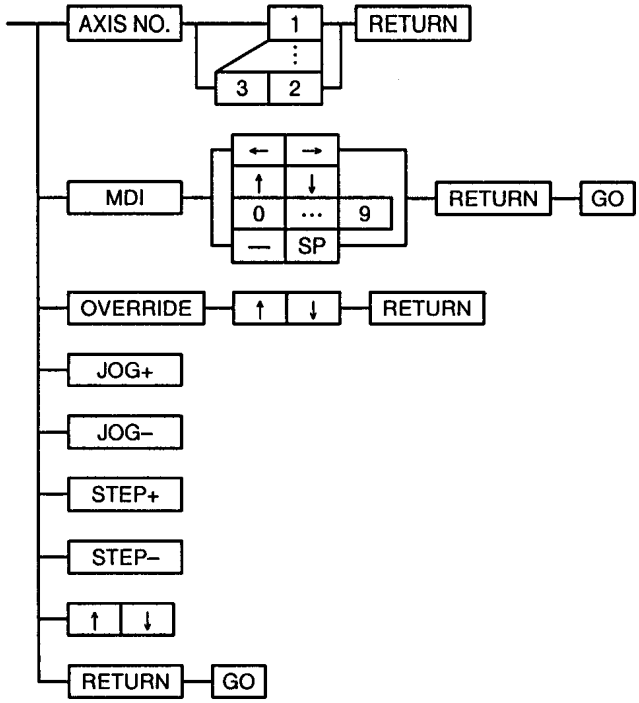
```
TK4095  P   0  CP-4
 ABS-4
11  -2147483648.8u
12       1234567.8u
```

STEP− ; STEP+ or RETURN GO

```
TK4095  P   1  CP-4
 ABS-4
 1  -1234567891.1u
 2  -1234567891.1u
```

The axis number for which the JOG designation has been made is highlighted.

Key Operation



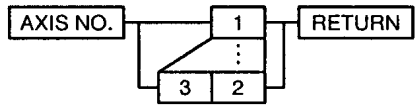
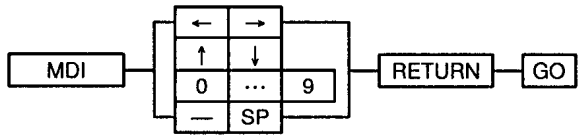
Notes

The first item to be displayed is the first ABS related instruction which appears in the program. Point numbers are assigned in sequence to program steps with addresses, beginning from point "0" (at the initial step).
Although INC related instructions can be displayed using the STEP+ and STEP− keys, the teaching function cannot be used with respect to these instructions.

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-15.1

Constant-Speed Control

Operation Procedure & Explanations	Precautions/Remarks
Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the changed numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	If an axis number outside the range designated by the program is designated, the error message "! SETTING ERROR" will be displayed and the axis number will not be changed.

Notes

Operation Procedure & Explanations	Precautions/Remarks
Changing the override: OVERRIDE — ↑ ↓ — RETURN When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. Data for the axis designated for the JOG operation is displayed at the bottom of the screen. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the original screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.[0] % └── Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-15.3

Constant-Speed Control

Operation Procedure & Explanations	Precautions/Remarks
JOG operation: [JOG+] While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. [JOG–] While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Changing the setting screen: [STEP+] Press the STEP+ key to switch to the next step screen. [STEP–] Press the STEP– key to return to the previous step screen. Screen Scrolling: [↑] [↓] The address displays, etc., for 3 or 4 axes cannot be displayed on a single screen. Use the ↑, ↓ keys for screen scrolling. Writing the address: [RETURN] — [GO] Press the RETURN key to write the currently displayed numeric value to the program. The following address writing confirmation screen is then displayed. GO –> WRITE CAN –> CANCEL Press the GO key to write the numeric value. If the numeric value is written without error, a search will be conducted for the next step where teaching is possible, and that step will be displayed. If no such steps exist in that program, the system will proceed to the program readout screen (5-6).	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed. The ↑, ↓ keys are disabled when the displayed data is for 2 axes or less. If these keys are pressed at this time, the error message "! MIS OPERATION" will be displayed at the bottom of the screen.

Notes

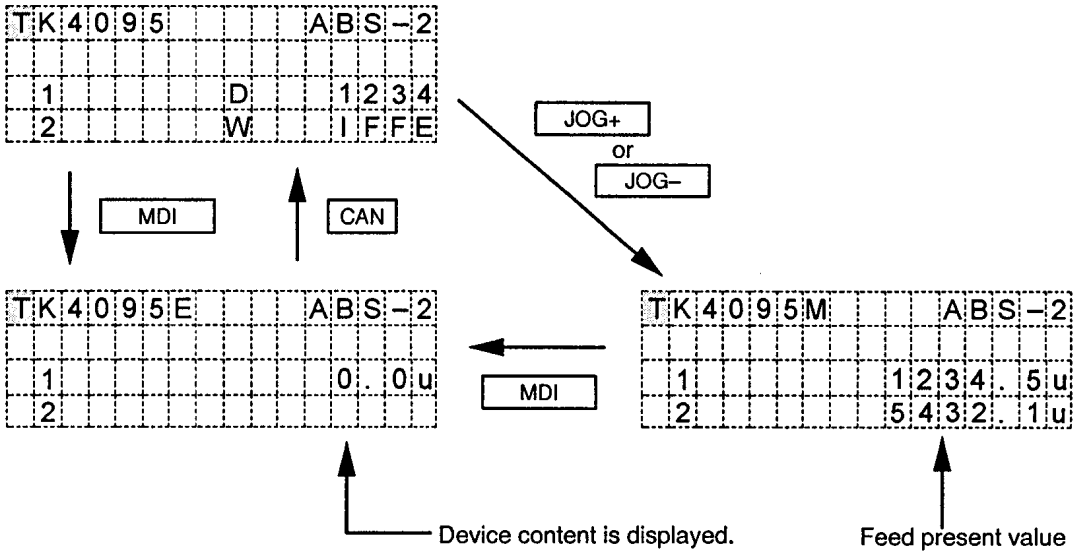
Intermediate points can be switched, and address teaching can be executed at the desired axis by changing the setting screen [STEP+] or [STEP–], and writing addresses [RETURN] — [GO].

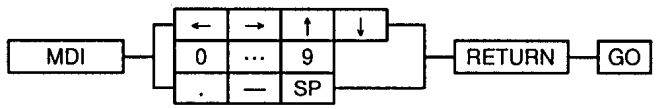
Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-16

Indirect Address Designation

Message



Operation Procedure & Explanations	Precautions/Remarks
At address teaching operations using an indirect address designation format, a designated address is set at the relevant device. Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the axis value (top of screen). When the numeric input is completed, press the RETURN key. An address writing confirmation screen like that shown below will then be displayed. GO –> WRITE CAN –> CANCEL Press the GO key to set the entered numeric value at the relevant device. The system will then return to the device display program.	The numeric value designated at the device will remain valid until the CPU is reset or another value is designated. The device content will be displayed when the MDI is pressed.

Notes

Drawing No.

Mode	Test mode	Function	Teaching (address teaching)	5-16.1

Indirect Address Designation

Operation Procedure & Explanations	Precautions/Remarks
JOG operation: JOG+ — While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– — While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Writing to the device: RETURN — GO Press the RETURN key to set the currently displayed numeric value at the device. The following device writing confirmation screen is then displayed. GO –> WRITE CAN –> CANCEL Press the GO key to set the displayed numeric value at the relevant device. The system then returns to the device display program.	When the direct address designation format is being used, the numeric value displayed when the RETURN, GO keys are pressed is written directly to the program. When the indirect address designation format is being used, the numeric value displayed when the RETURN, GO keys are pressed is written to the relevant device. Indirect address designation is not possible with the program teach function. This should be done using the address teaching function after creating a program (by program writing).

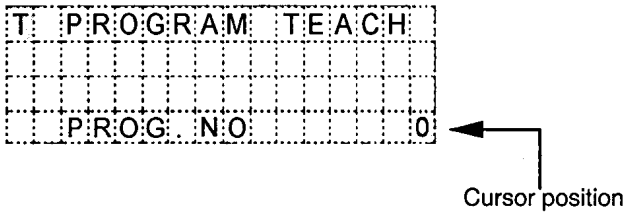
Notes

Drawing No.

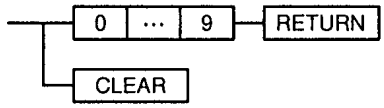
Mode	Test mode	Function	Teaching (program teaching)	5-17

Registering a Program No.

Message

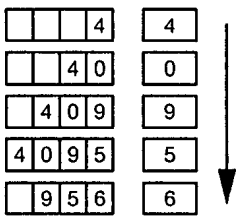


Key Operation



Operation Procedure & Explanations

The program to be registered is designated by using the 0 to 9 keys to enter its number. The program number range is 0 to 4095.
The effective input digits will be the most recent 4 digits entered. Any input exceeding 4 digits will be invalid.



Each time a digit is entered, the previous digit moves one space to the left.

To correct an input, press the CLEAR key to delete the input field.

The program number designated for registration will be checked to determine if it can be registered. If the number is OK, the system will proceed to the servo instruction definition screen. - - - ► Go to 5-18

If the designated program number already exists, the next screen will be displayed together with the message "PROG. ALR. STORED". To replace the existing program number with the newly designated one, press the GO key.

GO –> REWRITE
CAN –> CANCEL

Precautions/Remarks

Notes

If the CAN key is pressed during the program teaching function in order to return to the servo instruction selection screen, and if the program which was being created has been completed, a confirmation message will be displayed asking if the created program should be discarded.

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-18

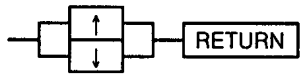
Servo Instruction Definition

Message

```
TK4095
#ABS-1
 ABS-2
 ABS-3
```

Display scrolling is possible.

Key Operation



Operation Procedure & Explanations

Designate the servo instruction for the program being created. The available instructions can be viewed by scrolling. The desired servo instruction is designated by pressing the RETURN key at that instruction's position.
When scrolling, a "#" mark is displayed to the left of the currently selected servo instruction.
The list of servo instructions is shown below.

ABS–1
ABS–2
ABS–3

Initial display range.

ABS–4
ABS
ABS
ABS
ABS
ABS
ABS
ABS
CP–1
CP–2
CP–3
CP–4
VS–1
VS–2
VS–3

Precautions/Remarks

Notes

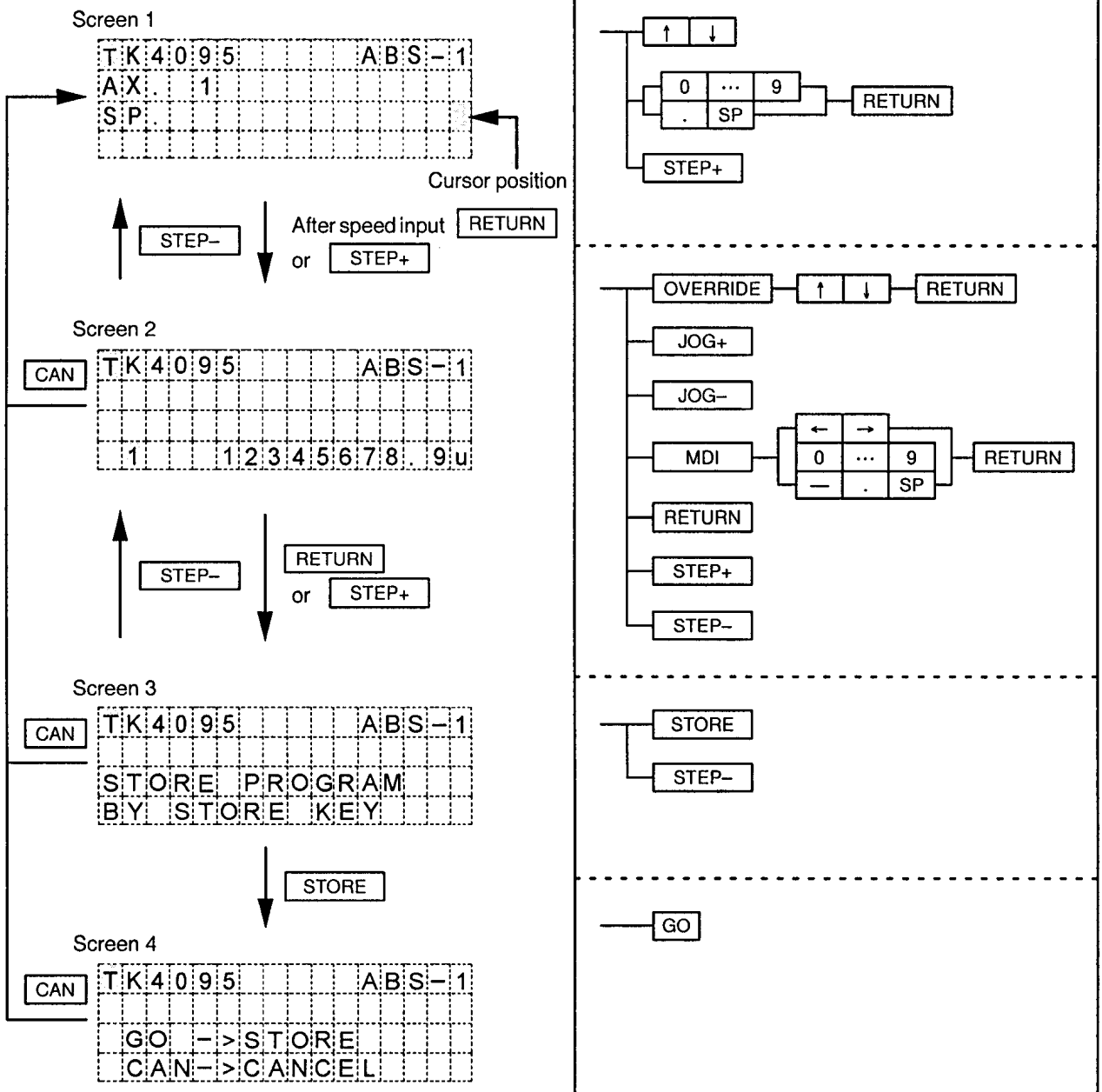
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-19

ABS–1 (Absolute 1-Axis Positioning)

Message

Key Operation



Notes

There is no axis change procedure because the screen 2 "absolute 1-axis positioning program" involves only 1 axis.

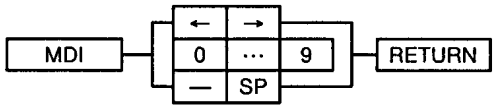
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-19.1

ABS–1 (Absolute 1-Axis Positioning)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed"). Axis No. & speed inputs: [0] [···] [9] [.] [SP] — [RETURN] With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting.	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered.
Switching screens: [STEP+] After confirming the axis number and speed settings, the STEP+ key can be pressed to proceed to screen 2.	When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP– key.
<Screen 2> Changing the override: [OVERRIDE] — [↑] [↓] — [RETURN] When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % └ Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes

Operation Procedure & Explanations	Precautions/Remarks
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen. JOG operation: JOG+ : While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– : While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, → keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Notes

Operation Procedure & Explanations	Precautions/Remarks
Writing the address: [RETURN] The currently displayed numeric value is written to the program. Switching screens: [STEP+] [STEP–] Use the STEP+ and STEP– keys to switch between input screens. <Screen 3 and Screen 4> [STORE] — [GO] When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the GO key to execute program writing. Switching screens: [STEP–] To switch from screen 3 to screen 2, press the STEP– key.	

Notes	

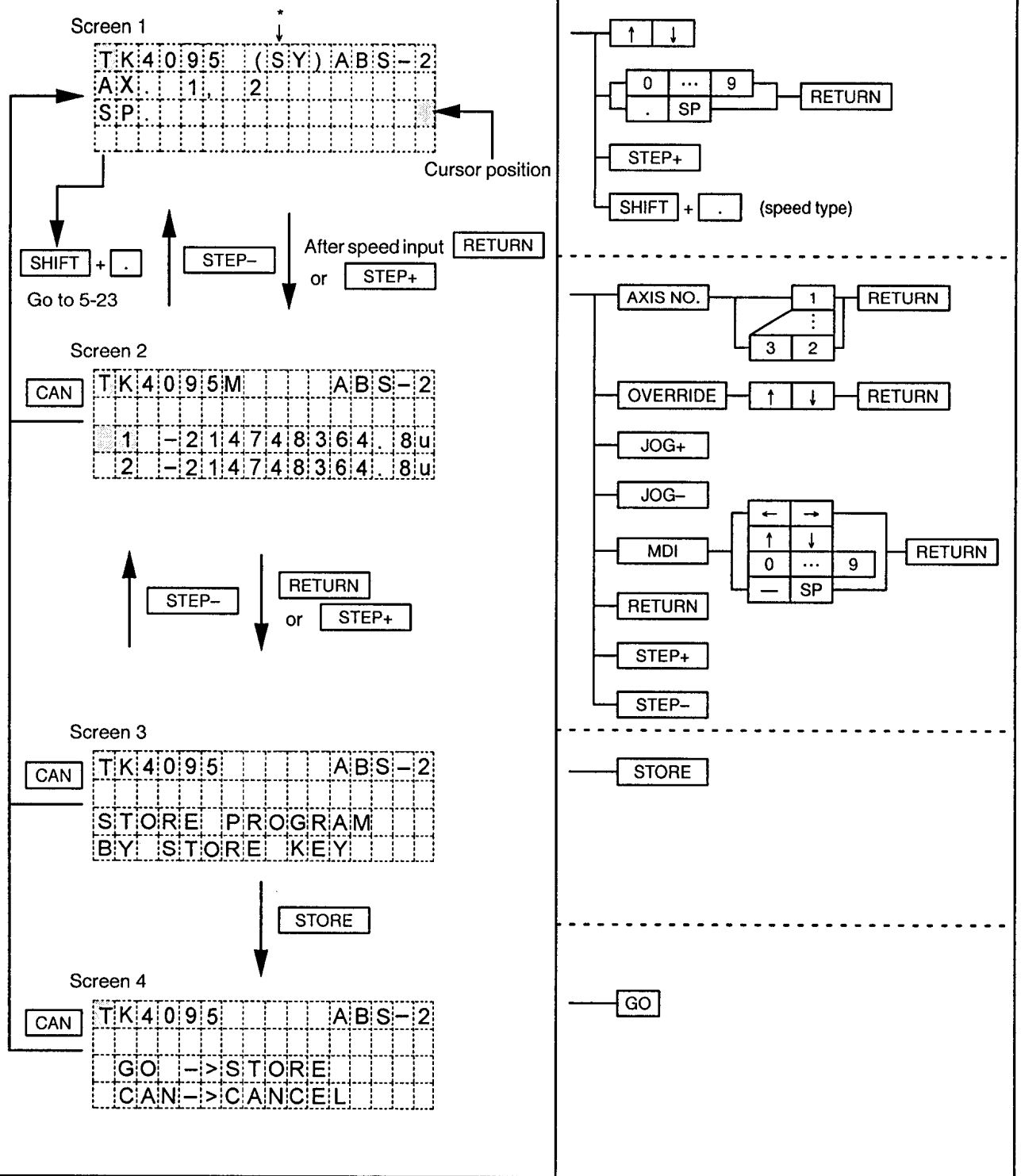
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-20

ABS–2 (Absolute 2-Axis Linear Interpolation)

Message

Key Operation



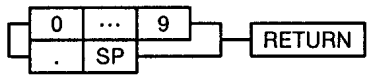
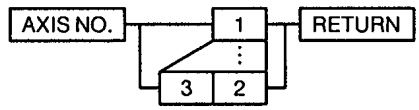
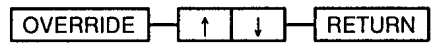
Notes

Display items indicated by an asterisk are abbreviations for the following:
(SY) ..... Synthetic axis speed
(RE) ..... Reference axis speed
(LO) ..... Long axis speed

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-20.1

ABS–2 (Absolute 2-Axis Linear Interpolation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed"). Axis No. & speed inputs:  With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Speed. Selecting and setting the speed type: [SHIFT] + [.] The speed type is selected and designated. Switching screens: [STEP+] After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2. <Screen 2> Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered. For details regarding the display screen and operation procedure after keying in [SHIFT] + [.], see 5-23. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP– key.

Notes

When the reference axis has been designated at screen 1, the message "REF. AX. 1" will be displayed on the line beneath the speed display, and a reference axis input status will be established.

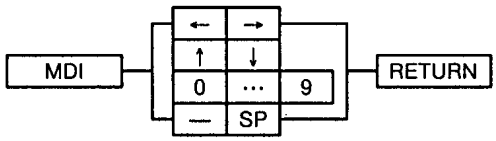
Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % └── Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-20.3

ABS–2 (Absolute 2-Axis Linear Interpolation)

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. Writing the address: [RETURN] The currently displayed numeric value is written to the program. Switching screens: [STEP+] [STEP–] Use the STEP+ and STEP– keys to switch between input screens.	

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-20.4

ABS–2 (Absolute 2-Axis Linear Interpolation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 3 and Screen 4> Program Store: STORE — GO When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the GO key to execute program writing. Switching screens: STEP– To switch from screen 3 to screen 2, press the STEP– key.	

Notes

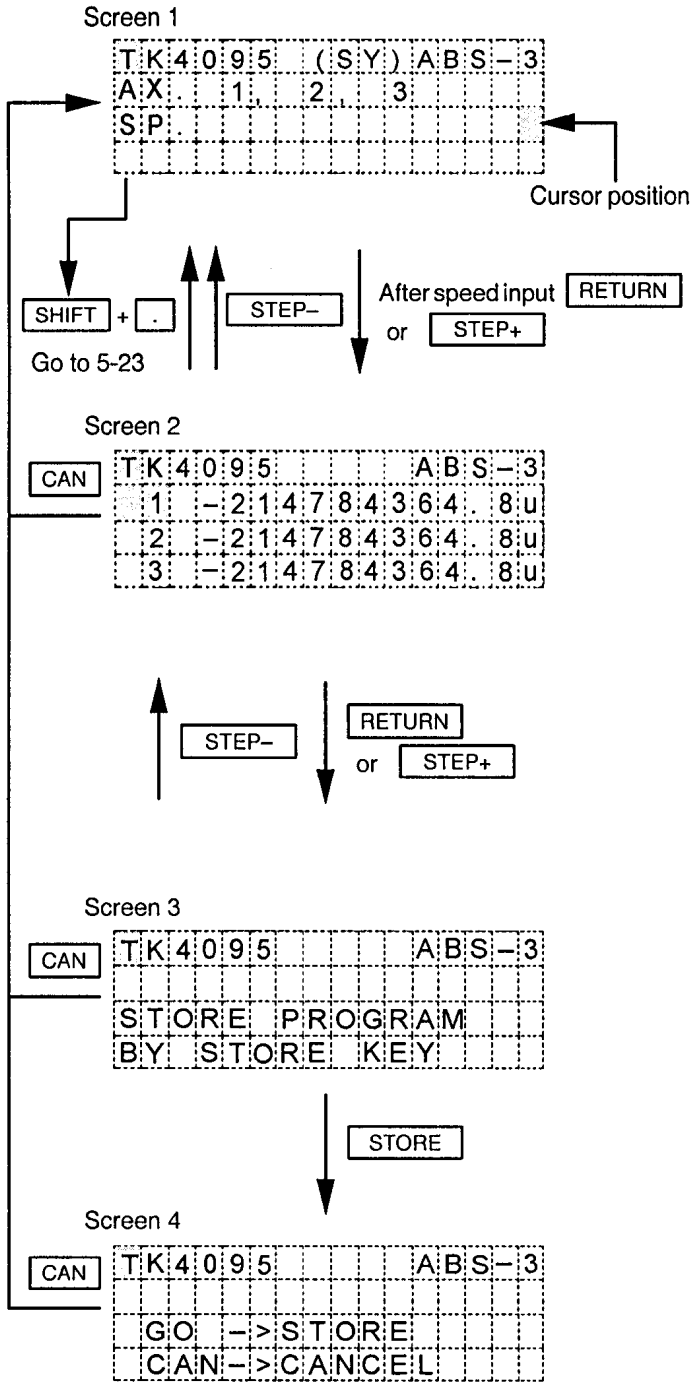
Drawing No.

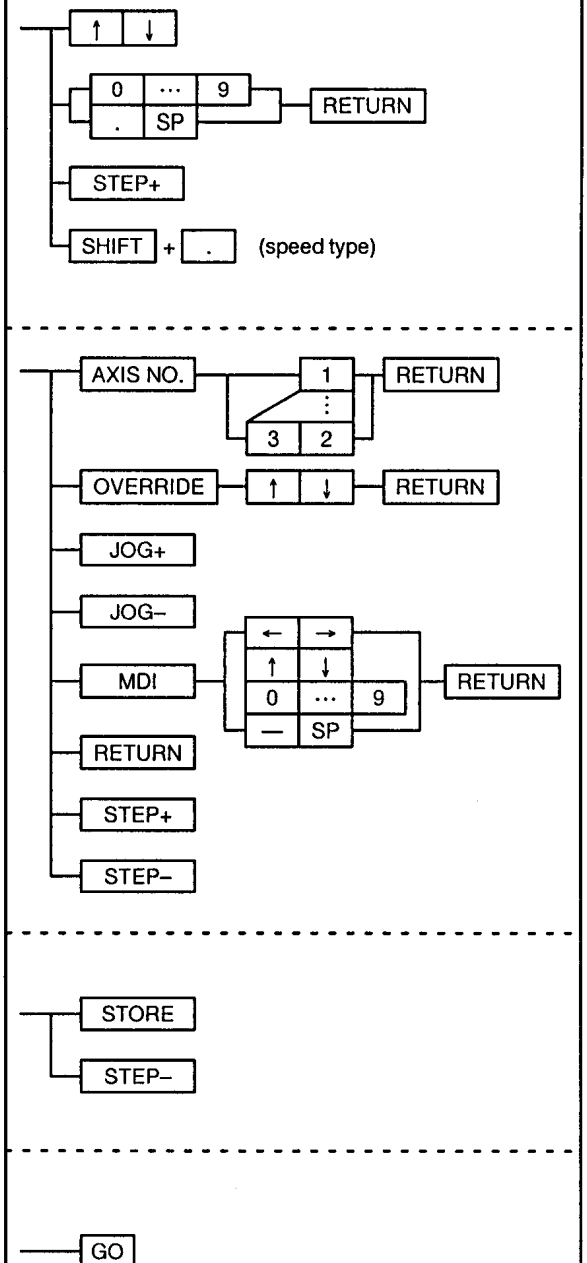
Mode	Test mode	Function	Teaching (program teaching)	5-21

ABS–3 (Absolute 3-Axis Linear Interpolation)

Message

Key Operation



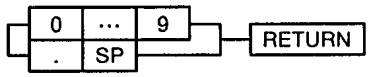
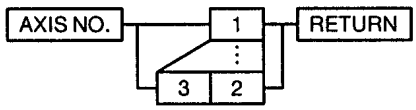
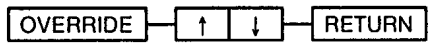


Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-21.1

ABS–3 (Absolute 3-Axis Linear Interpolation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed"). Axis No. & speed inputs:  With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Axis 3 → Speed. Selecting and setting the speed type: [SHIFT] + [.] The speed type is selected and designated. Switching screens: [STEP+] After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2. <Screen 2> Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered. For details regarding the display screen and operation procedure after keying in [SHIFT] + [.], See 5-23. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP– key.

Notes

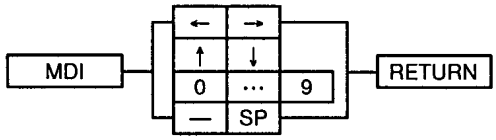
Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	
JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-21.3

ABS–3 (Absolute 3-Axis Linear Interpolation)

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. Writing the address: RETURN — The currently displayed numeric value is written to the program. Switching screens: STEP+ / STEP– — Use the STEP+ and STEP– keys to switch between input screens.	

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-21.4

ABS–3 (Absolute 3-Axis Linear Interpolation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 3 and Screen 4> Program Store: STORE — GO When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the GO key to execute program writing. Switching screens: STEP– To switch from screen 3 to screen 2, press the STEP– key.	

Notes

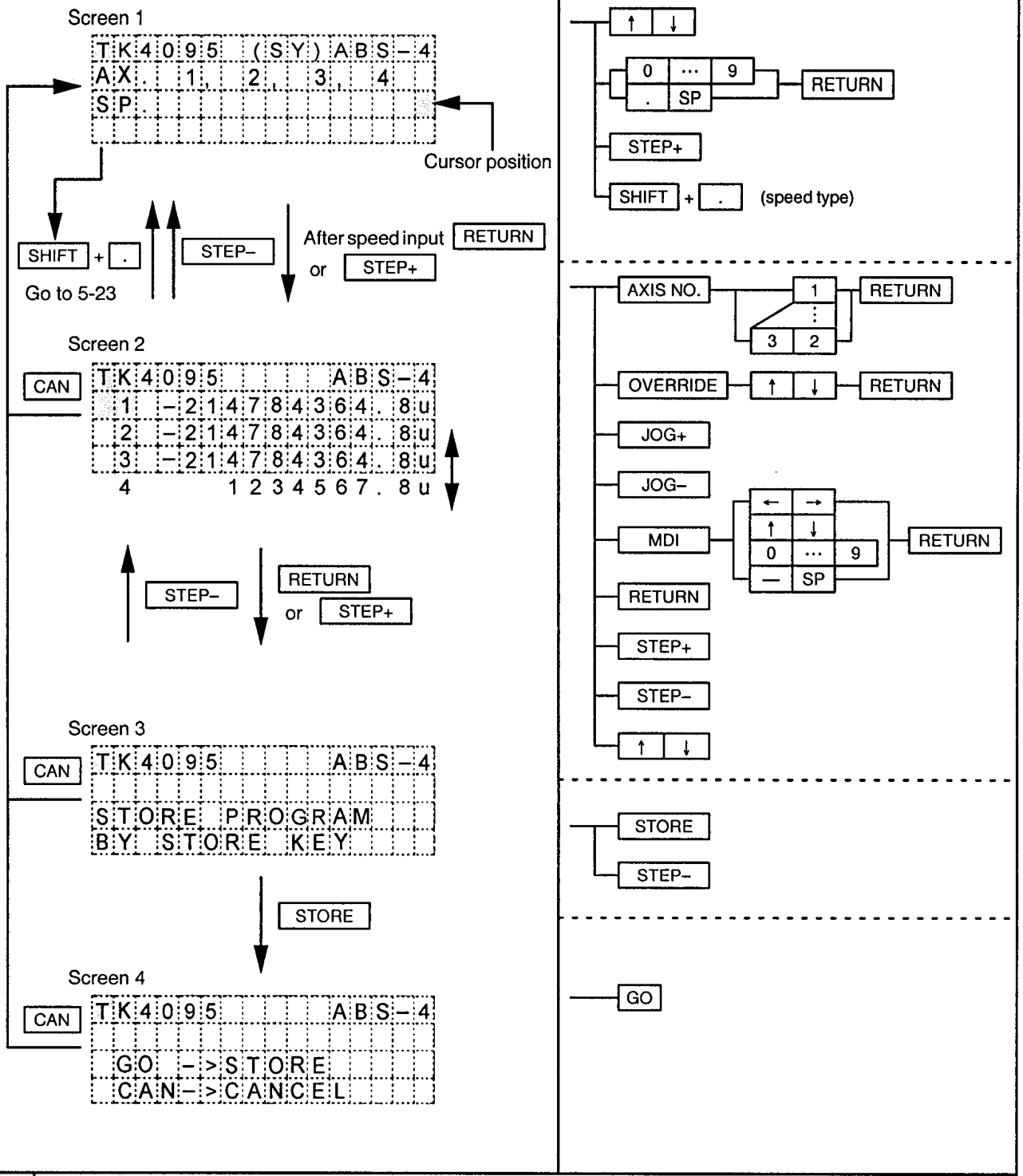
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-22

ABS–4 (Absolute 4-Axis Linear Interpolation)

Message

Key Operation

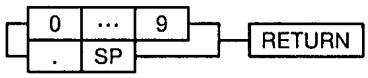
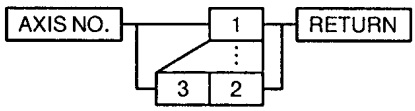
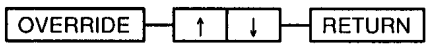


Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-22.1

ABS–4 (Absolute 4-Axis Linear Interpolation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed"). Axis No. & speed inputs:  With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Axis 3 → Axis 4 → Speed. Selecting and setting the speed type: [SHIFT] + [.] The speed type is selected and designated. Switching screens: [STEP+] After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2. <Screen 2> Screen scrolling [↑] [↓] For 4 axes interpolation, the data for all axes cannot be displayed on a single screen. In such cases, use the ↑, ↓ keys to scroll the axis number, etc., 1 line. Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered. For details regarding the display screen and operation procedure after keying in [SHIFT] + [.], See 5-24. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP– key.

Notes

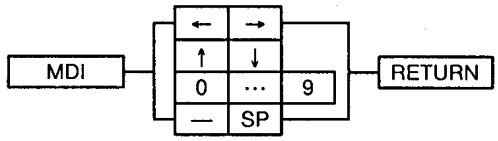
Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % └── Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	
JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-22.3

ABS–4 (Absolute 4-Axis Linear Interpolation)

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. Writing the address: [RETURN] The currently displayed numeric value is written to the program. Switching screens: [STEP+] [STEP–] Use the STEP+ and STEP– keys to switch between input screens.	

Notes

Mode	Test mode	Function	Teaching (program teaching)	5-22.4

ABS–4 (Absolute 4-Axis Linear Interpolation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 3 and Screen 4> Program Store: STORE — GO When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the GO key to execute program writing. Switching screens: STEP– To switch from screen 3 to screen 2, press the STEP– key.	

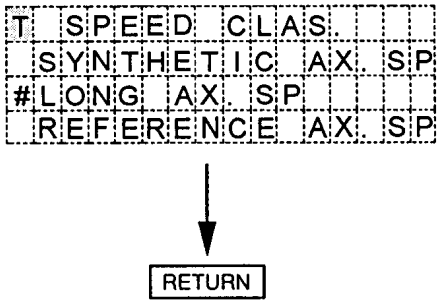
Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-23

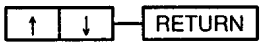
Speed Type Selection Screen

Operation Procedure & Explanations	Precautions/Remarks



Refer to pages 5-20, 5-21, 5-22 screen 2

Selecting the speed type:



Use the ↑, ↓ keys to move the "#" mark to the desired speed type position, then press the RETURN key to register the selection and proceed to page 5-20, 5-21, 5-22 screen 2.

Notes

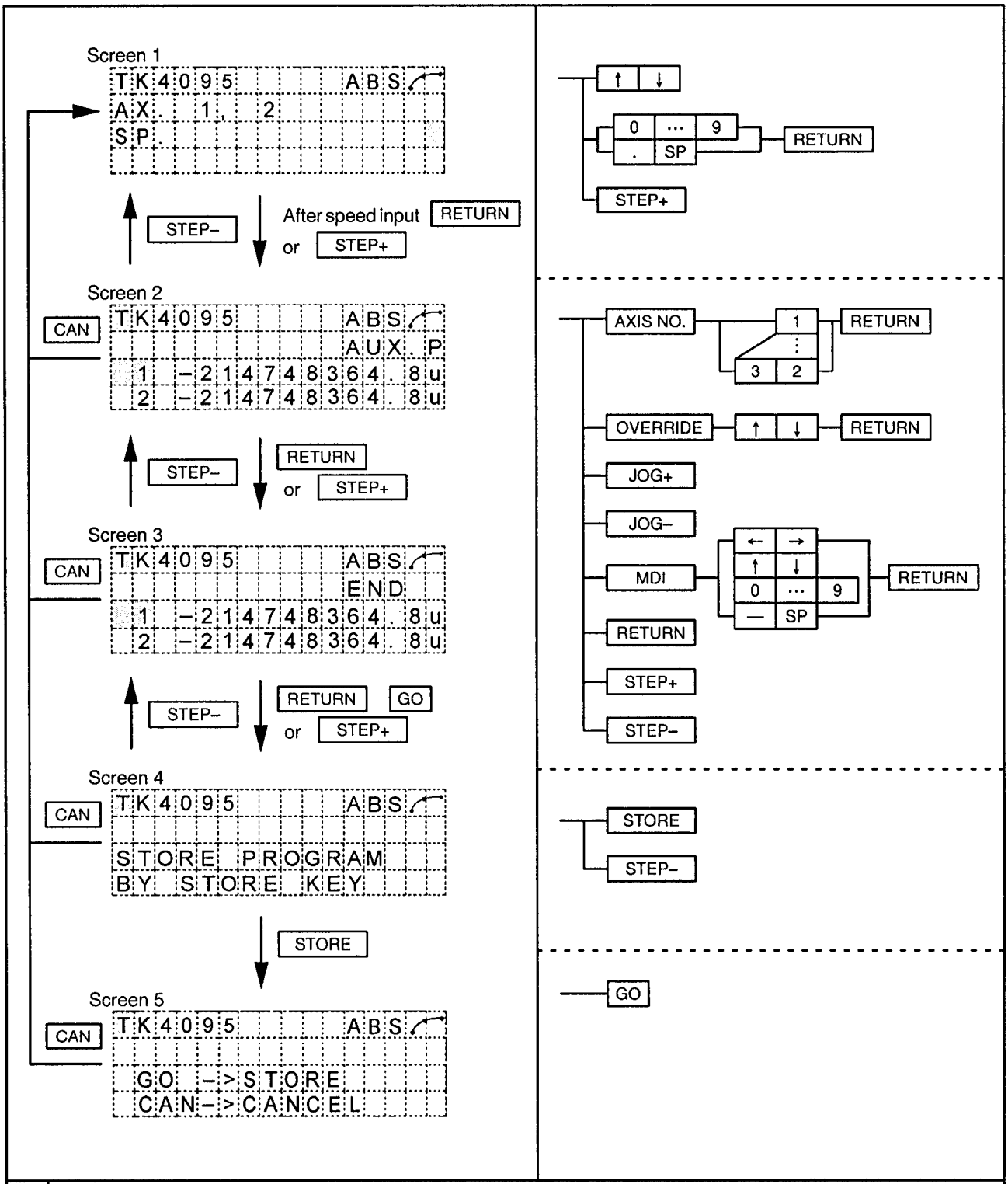
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-24

ABS (Absolute Circular Interpolation by Auxiliary Point Designation)

Message

Key Operation

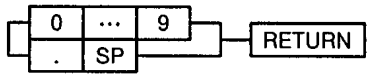
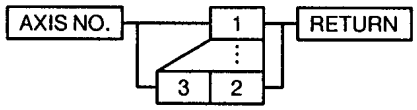
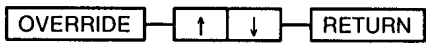


Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-24.1

ABS (Absolute Circular Interpolation by Auxiliary Point Designation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed"). Axis No. & speed inputs:  With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Speed. Switching screens: [STEP+] After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2. <Screen 2, Screen 3> Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP– key.

Notes

Mode	Test mode	Function	Teaching (program teaching)	5-24.2

ABS (Absolute Circular Interpolation by Auxiliary Point Designation)

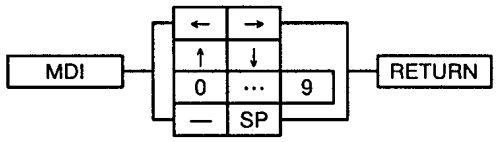
Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % └── Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %.
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
JOG operation:	
JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the JOG+ or JOG− key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
JOG− While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-24.3

ABS (Absolute Circular Interpolation by Auxiliary Point Designation)

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. Writing the address: [RETURN] The currently displayed numeric value is written to the program. Switching screens: [STEP+] [STEP−] Use the STEP+ and STEP− keys to switch between input screens.	

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-24.4

ABS (Absolute Circular Interpolation by Auxiliary Point Designation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 4 and Screen 5> Program Store: STORE — GO When error-free address writing has been executed at screen 2, screen 3 will be displayed for program registration. To switch from screen 3 to screen 4, press the STORE key. At screen 4, press the GO key to execute program writing. Switching screens: STEP– To switch from screen 3 to screen 2, press the STEP– key.	

Notes

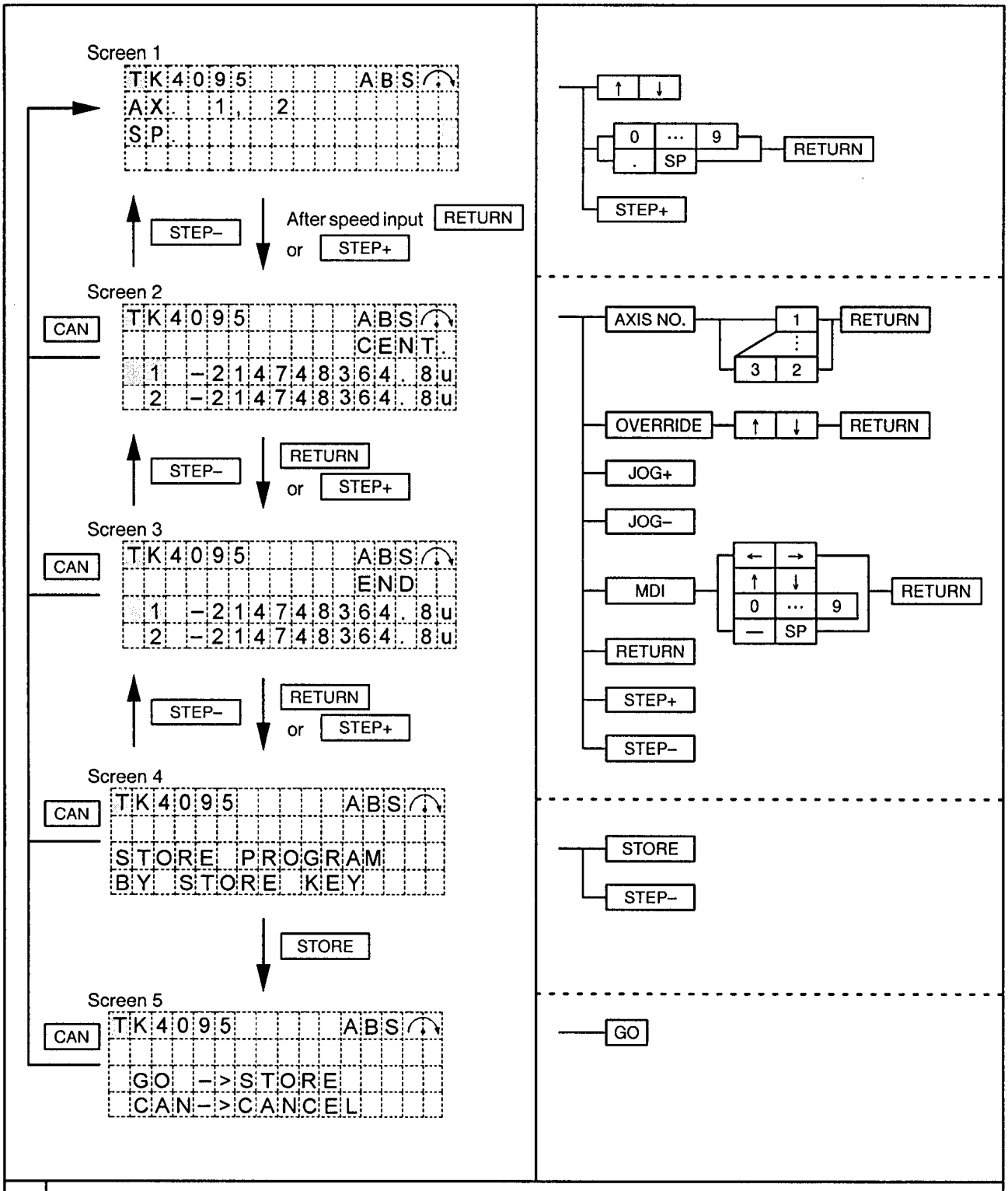
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-25

ABS ↷, ABS ↶ (Circular Interpolation by Absolute Center Point Designation)

Message

Key Operation

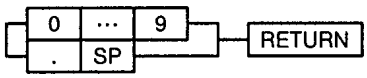
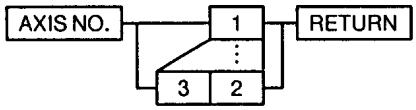
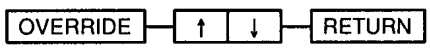


Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-25.1

ABS ↷, ABS ↶ (Circular Interpolation by Absolute Center Point Designation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed"). Axis No. & speed inputs:  With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Speed. Switching screens: [STEP+] After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2.	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP– key.
<Screen 2, Screen 3> Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	

Notes

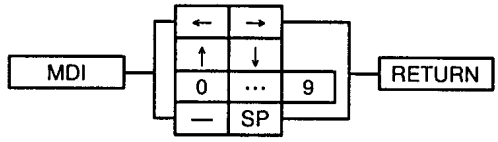
Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % └ Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	
JOG operation:	
JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-25.3

ABS ↷, ABS ↶ (Circular Interpolation by Absolute Center Point Designation)

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. Writing the address: [RETURN] The currently displayed numeric value is written to the program. Switching screens: [STEP+] [STEP−] Use the STEP+ and STEP− keys to switch between input screens.	

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-25.4

ABS ↷, ABS ↶ (Circular Interpolation by Absolute Center Point Designation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 4 and Screen 5> Program Store: STORE — GO When error-free address writing has been executed at screen 3, screen 4 will be displayed for program registration. To switch from screen 4 to screen 5, press the STORE key. At screen 5, press the GO key to execute program writing. Switching screens: STEP– To switch from screen 4 to screen 3, press the STEP– key.	

Notes

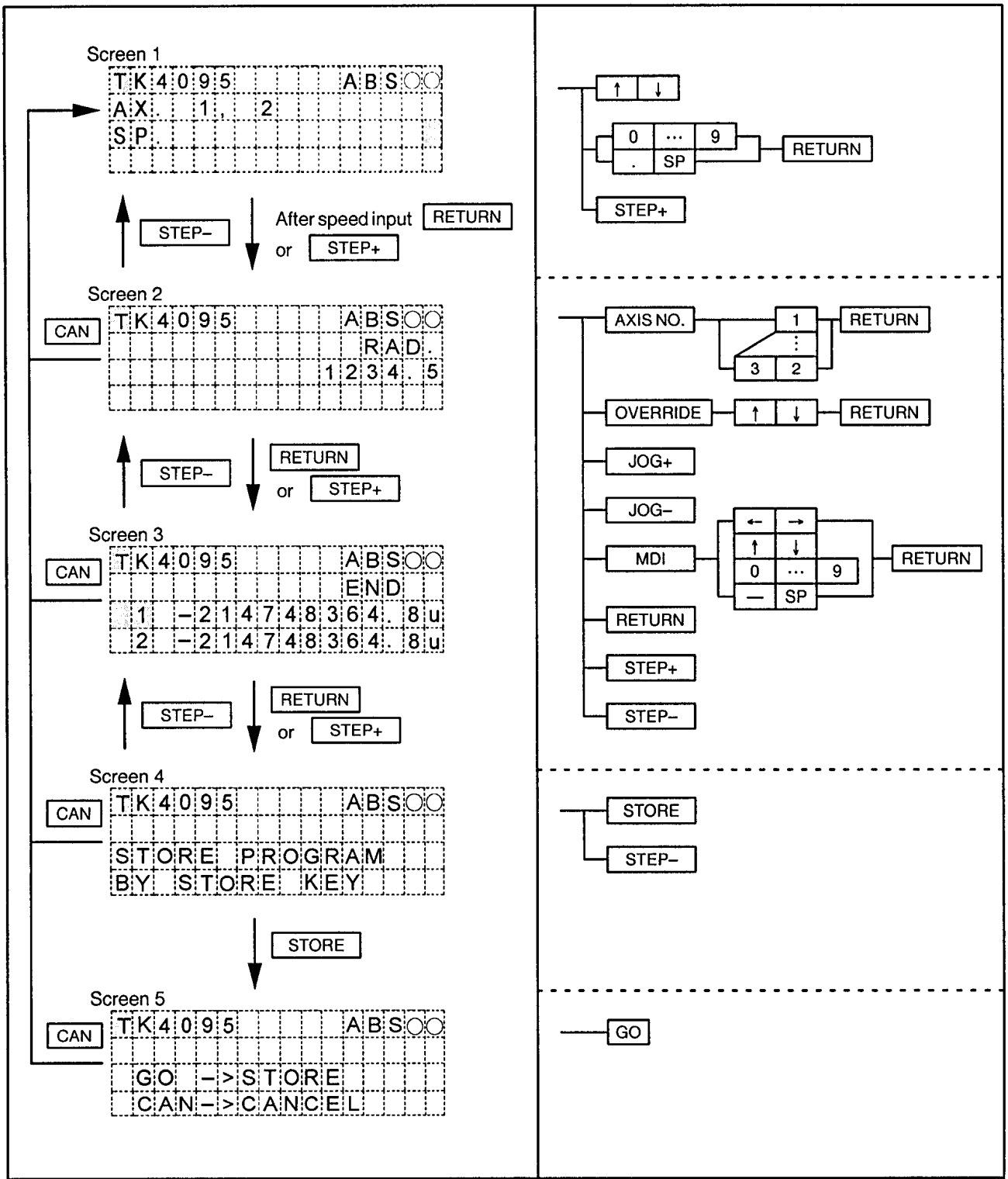
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-26

ABS ↶, ABS ↷, ABS ↶, ABS ↷ (Circular Interpolation by Absolute Radius Designation)

Message

Key Operation



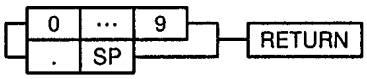
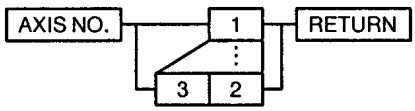
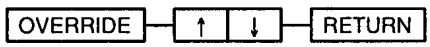
Notes

The indication for circular interpolation by radius designation is shown as "ABS ○○" above, but the actual on-screen display appears in the following 4 ways: "ABS↶", "ABS ↷", "ABS↷","ABS ↶".

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-26.1

ABS ↶, ABS ↷, ABS ↻, ABS ↺ (Circular Interpolation by Absolute Radius Designation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed"). Axis No. & speed inputs:  With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Speed. Switching screens: [STEP+] After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2.	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP– key.
<Screen 2, Screen 3> Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	

Notes

Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % └── Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %.
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
JOG operation:	
JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the JOG+ or JOG− key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
JOG− While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	

Notes

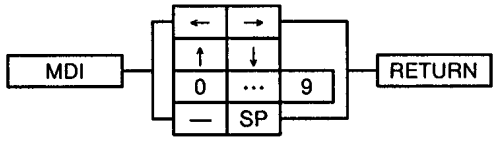
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-26.3

ABS, ABS, ABS, ABS (Circular Interpolation by Absolute Radius Designation)

Operation Procedure & Explanations	Precautions/Remarks

Numeric input:



When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field.
"E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress.
At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value.
To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged).
When the numeric input is completed, press the RETURN key.

Writing the address:

RETURN	The currently displayed numeric value is written to the program.

Switching screens:

STEP+ STEP–	Use the STEP+ and STEP– keys to switch between input screens.

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-26.4

ABS ↶, ABS ↷, ABS ↻, ABS ↺ (Circular Interpolation by Absolute Radius Designation)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 4 and Screen 5> Program Store: STORE — GO When error-free address writing has been executed at screen 3, screen 4 will be displayed for program registration. To switch from screen 4 to screen 5, press the STORE key. At screen 5, press the GO key to execute program writing. Switching screens: STEP– To switch from screen 4 to screen 3, press the STEP– key.	

Notes

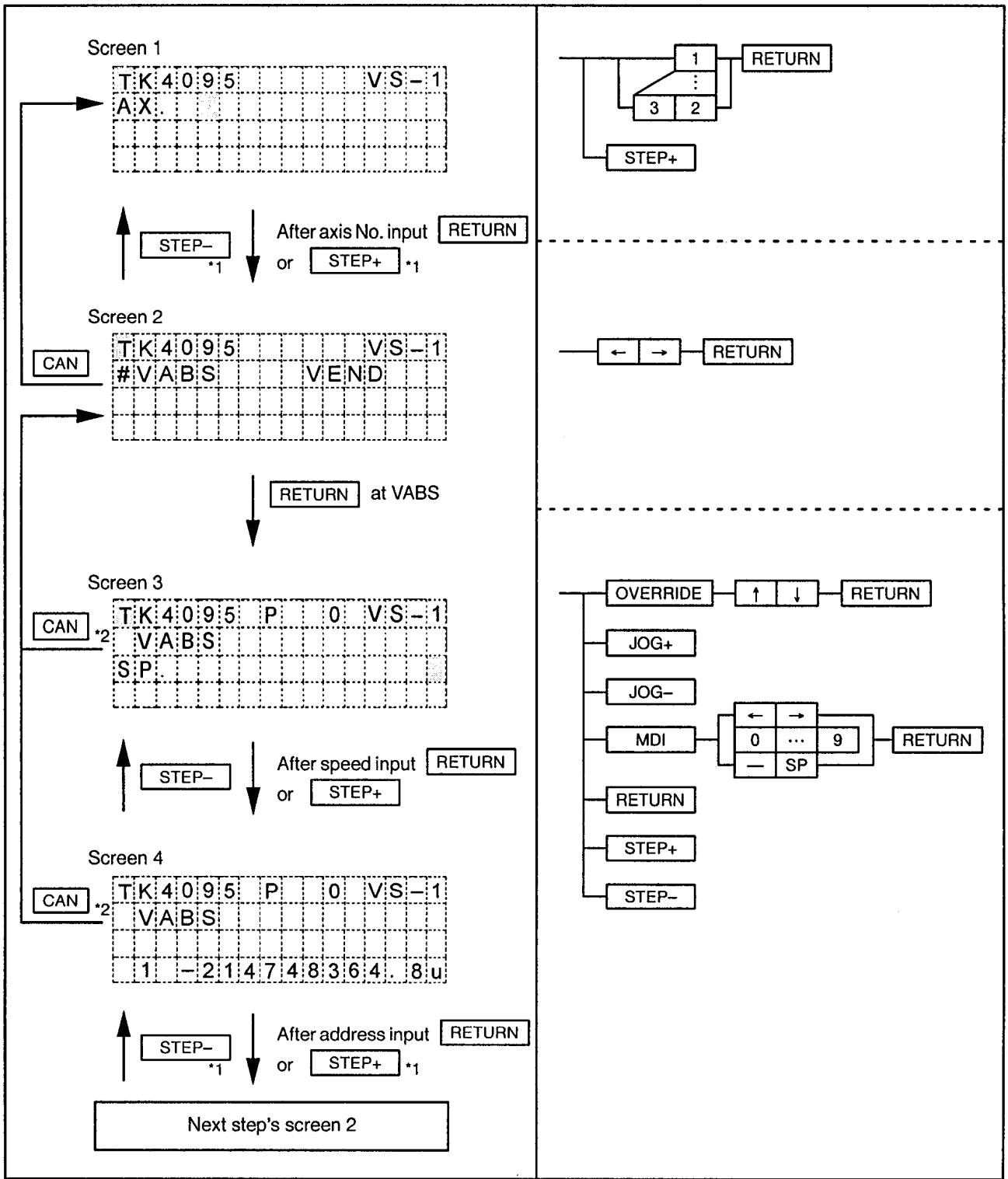
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-27

VS–1 (Speed Switching Control, 1 Axis)

Message

Key Operation



Notes

*1. After designating the required speed & address settings for the VABS selection, then returning to the previous screen (using the CAN or STEP– key), the following will occur when the STEP+ key is pressed:
the servo instruction selection screen (screen 2) will be skipped, and the speed & address setting screens (screen 3, screen 4) will be displayed in page order (P0, P1...).

*2. If the CAN key is pressed while designating a speed or address setting (screen 3, screen 4) at a given step, the system will return to that step's screen 2.

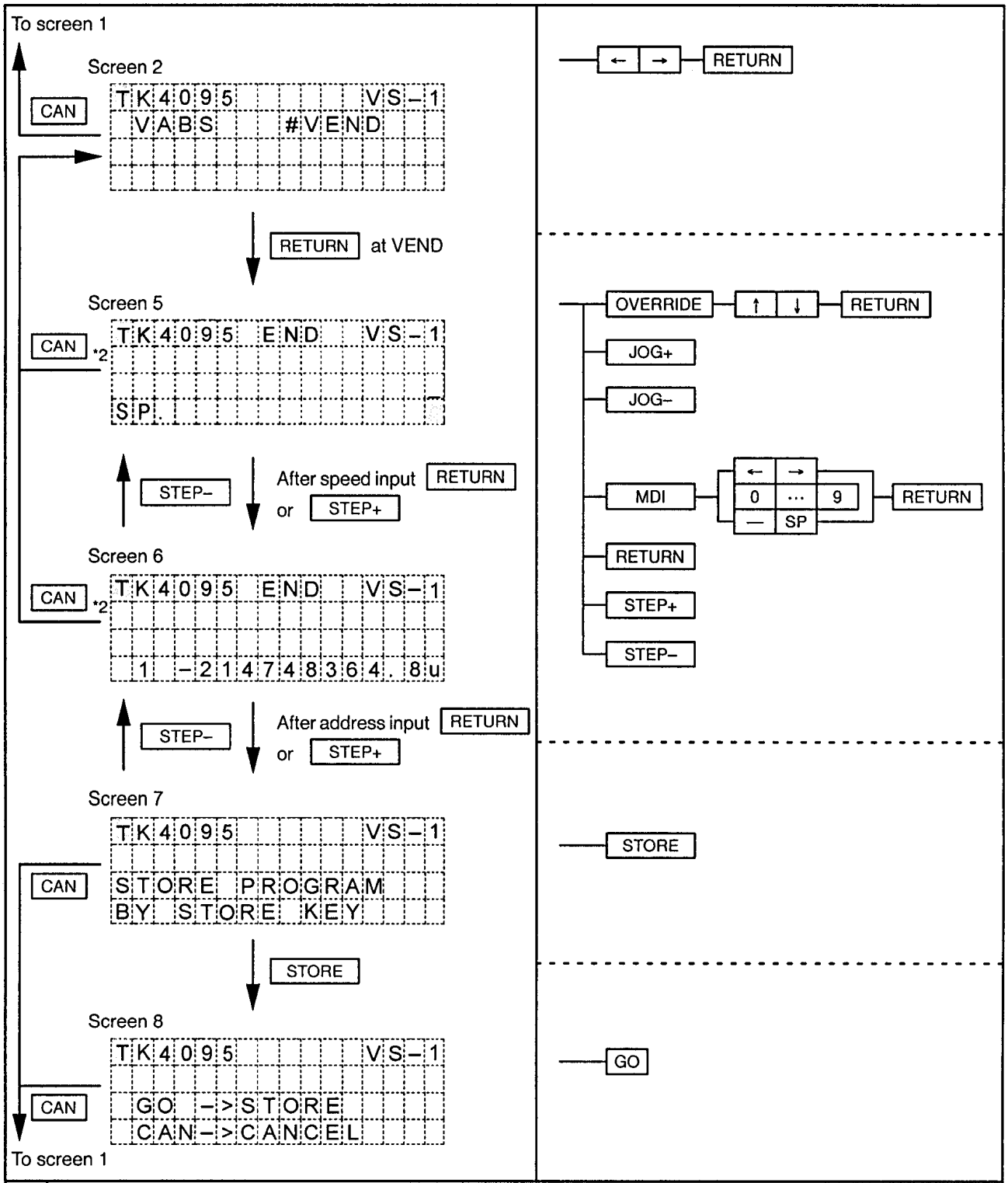
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-27.1

VS–1 (Speed Switching Control, 1 Axis)

Message

Key Operation

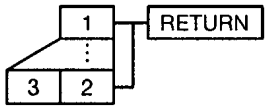
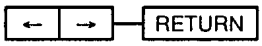
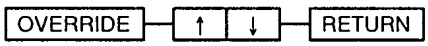


Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-27.2

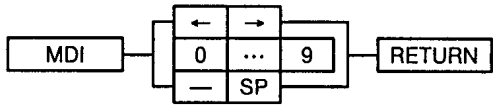
VS–1 (Speed Switching Control, 1 Axis)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Axis No. Input:  With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Switching screens: STEP+ After confirming that axis number setting has been registered, the STEP+ key can be pressed to proceed to screen 2. <Screen 2>  Designate whether the speed switching point setting (VABS) is to be continued or ended (VEND). A "#" mark indicates the currently selected servo instruction. Screen 3 is displayed when VABS is selected, and screen 5 is displayed when VEND is selected. <Screen 3, Screen 4, Screen 5, Screen 6> Changing the override value:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	As this speed change is for 1-axis linear control, only 1 axis can be designated. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP– key.

Notes	

Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % └── Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	
JOG operation:	
JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	

Notes

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, → keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. Writing the address: RETURN The speed and address values for the currently displayed point are written to the program.	

Notes	

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-27.5

VS–1 (Speed Switching Control, 1 Axis)

Operation Procedure & Explanations	Precautions/Remarks
Switching screens: STEP+ STEP– Use the STEP+ and STEP– keys to switch between input screens. When a speed switching point input has been completed, the system will proceed to the next point without going to screen 2 first. <Screen 7, Screen 8> Program Store: STORE – GO When error-free end-address writing has been executed at screen 4, screen 5 will be displayed for program registration. To switch from screen 5 to screen 6, press the STORE key. At screen 6, press the GO key to execute program writing. Switching screens: STEP– To switch from screen 5 to screen 4, press the STEP– key.	

Notes	

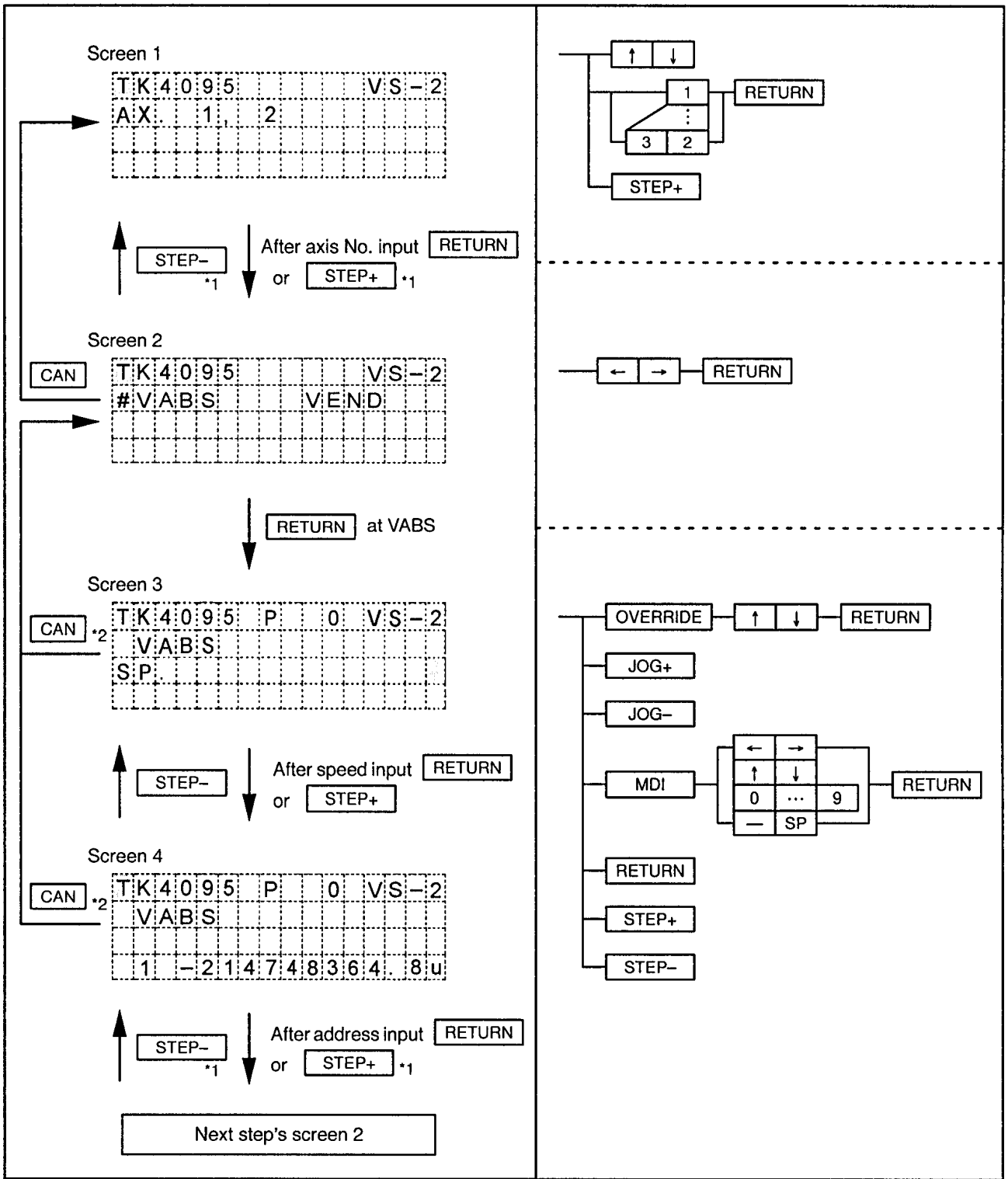
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-28

VS–2 (Speed Switching Control, 2 Axes)

Message

Key Operation



Notes

*1. After designating the required speed & address settings for the VABS selection, then returning to the previous screen (using the CAN or STEP– key), the following will occur when the STEP+ key is pressed:
the servo instruction selection screen (screen 2) will be skipped, and the speed & address setting screens (screen 3, screen 4) will be displayed in page order (P0, P1...).

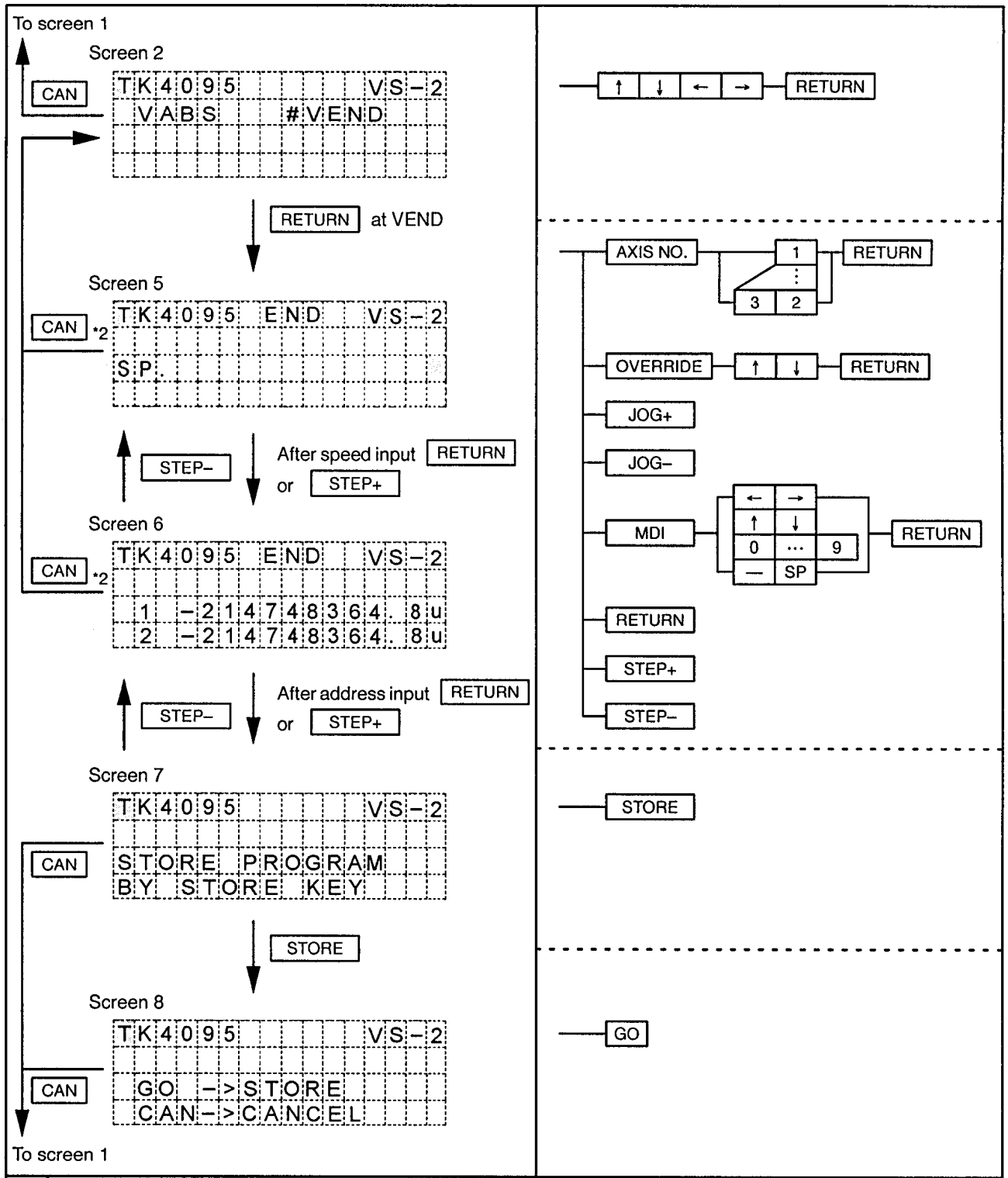
*2. If the CAN key is pressed while designating a speed or address setting (screen 3, screen 4) at a given step, the system will return to that step's screen 2.

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-28.1

VS–2 (Speed Switching Control, 2 Axes)

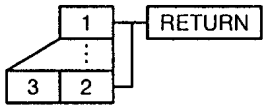
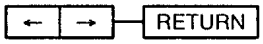
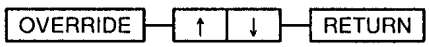
Message / Key Operation



Notes

Mode	Test mode	Function	Teaching (program teaching)	5-28.2

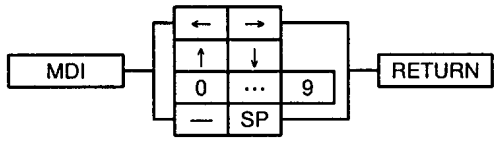
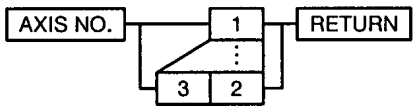
VS–2 (Speed Switching Control, 2 Axes)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed"). Axis No. Input:  With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Switching screens: [STEP+] After confirming that the axis number setting has been registered, the STEP+ key can be pressed to proceed to screen 2. <Screen 2>  Designate whether the speed switching point setting (VABS) is to be continued or ended (VEND). A "#" mark indicates the currently selected servo instruction. Screen 3 is displayed when VABS is selected, and screen 4 is displayed when VEND is selected. <Screen 3, Screen 4, Screen 5, Screen 6> Changing the override value:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	Use the ↑, ↓ keys to move between the "AX. __, __". The speed switching control axis is the first axis which is designated. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP– key.

Notes

Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	
JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	

Notes

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. Writing the address: RETURN — The speed and address values for the currently displayed point are written to the program. Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	Operative only at screen 6

Notes

Operation Procedure & Explanations	Precautions/Remarks
Switching screens: STEP+ STEP– Use the STEP+ and STEP– keys to switch between input screens. When a speed switching point input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3). <Screen 7, Screen 8> Program Store: STORE – GO When error-free end-address writing has been executed at screen 4, screen 5 will be displayed for program registration. To switch from screen 5 to screen 6, press the STORE key. At screen 6, press the GO key to execute program writing. Switching screens: STEP– To switch from screen 7 to screen 6, press the STEP– key.	

Notes	

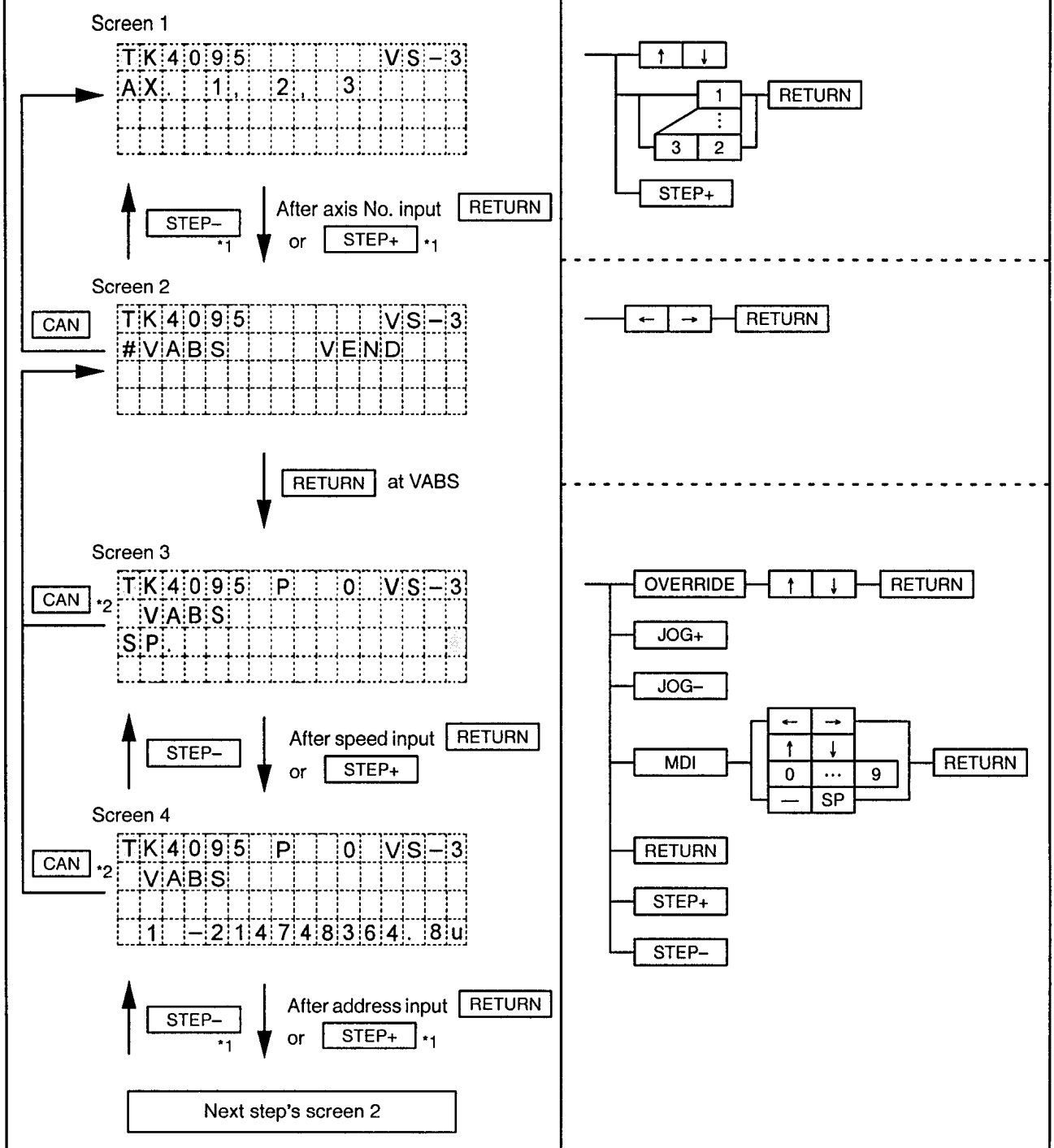
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-29

VS–3 (Speed Switching Control, 3 Axes)

Message

Key Operation



Notes

*1. After designating the required speed & address settings for the VABS selection, then returning to the previous screen (using the CAN or STEP– key), the following will occur when the STEP+ key is pressed:
the servo instruction selection screen (screen 2) will be skipped, and the speed & address setting screens (screen 3, screen 4) will be displayed in page order (P0, P1...).

*2. If the CAN key is pressed while designating a speed or address setting (screen 3, screen 4) at a given step, the system will return to that step's screen 2.

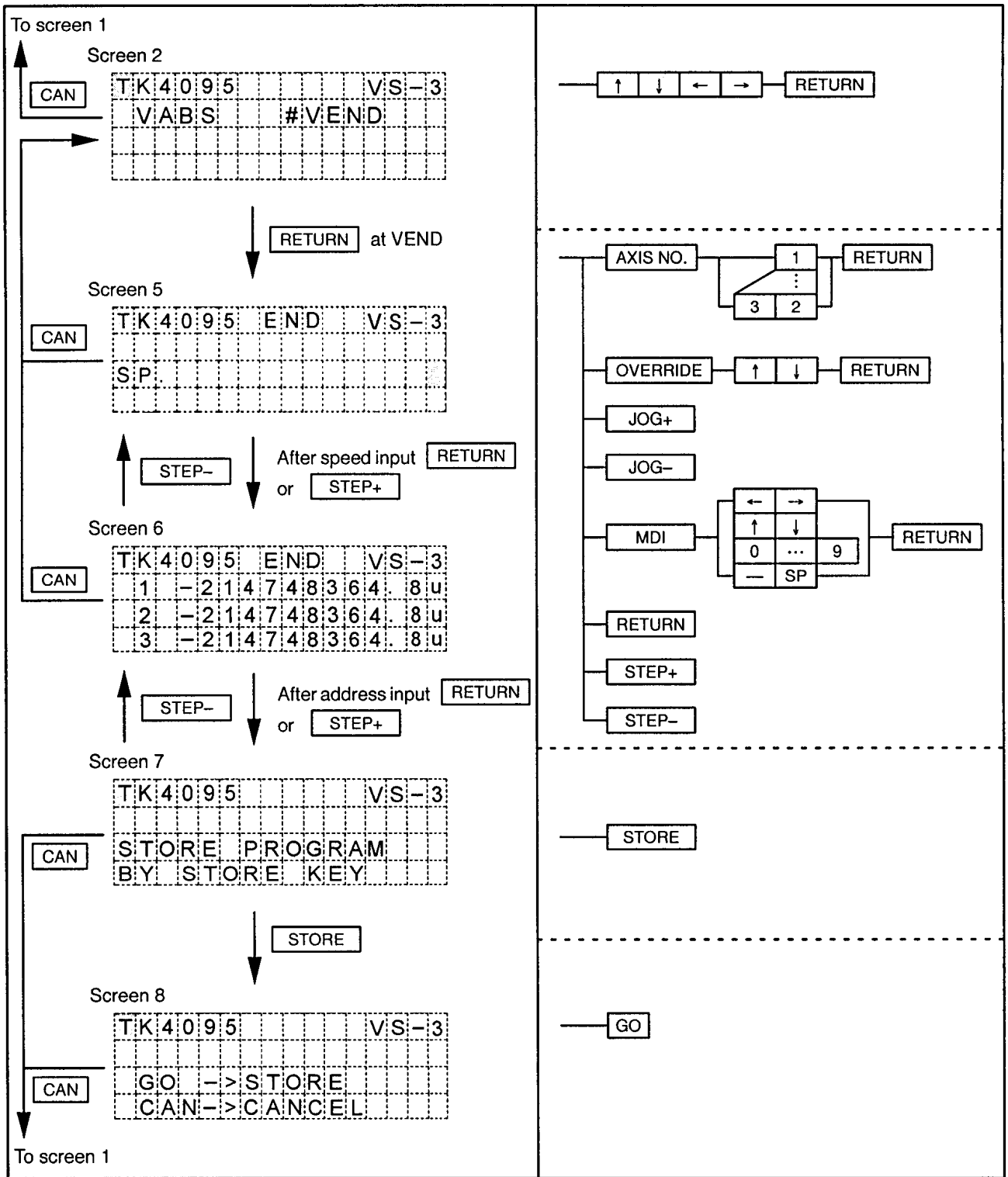
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-29.1

VS–3 (Speed Switching Control, 3 Axes)

Message

Key Operation

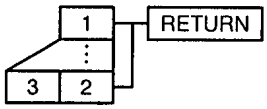
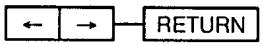
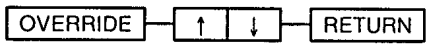


Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-29.2

VS–3 (Speed Switching Control, 3 Axes)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed"). Axis No. input:  With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Switching screens: [STEP+] After confirming that the axis number setting has been registered, the STEP+ key can be pressed to proceed to screen 2. <Screen 2>  Designate whether the speed switching point setting (VABS) is to be continued or ended (VEND). A "#" mark indicates the currently selected servo instruction. Screen 3 is displayed when VABS is selected, and screen 4 is displayed when VEND is selected. <Screen 3, Screen 4, Screen 5, Screen 6> Changing the override value:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed.	Use the ↑, ↓ keys to move between the "AX. __, __, __" The speed switching control axis is the first axis which is designated. When the STEP+ key is operative, a return to screen 1 can be executed by pressing the CAN or STEP– key.

Notes

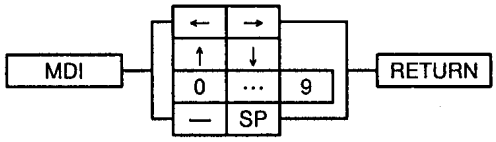
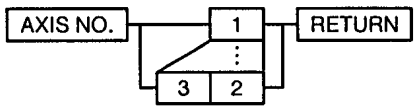
Operation Procedure & Explanations	Precautions/Remarks
When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % └── Cursor position	
At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 %	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.
After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	
JOG operation: JOG+ While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.
When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen).	

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-29.4

VS–3 (Speed Switching Control, 3 Axes)

Operation Procedure & Explanations	Precautions/Remarks
Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the − key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key. Writing the address: RETURN — The speed and address values for the currently displayed point are written to the program. Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted.	Operative only at screen 6

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-29.5

VS–3 (Speed Switching Control, 3 Axes)

Operation Procedure & Explanations	Precautions/Remarks
Switching screens: STEP+ STEP– Use the STEP+ and STEP– keys to switch between input screens. When a speed switching point input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3). <Screen 7, Screen 8> Program Store STORE – GO When error-free end-address writing has been executed at screen 6, screen 7 will be displayed for program registration. To switch from screen 7 to screen 8, press the STORE key. At screen 8, press the GO key to execute program writing. Switching screens: STEP– To switch from screen 7 to screen 6, press the STEP– key.	

Notes

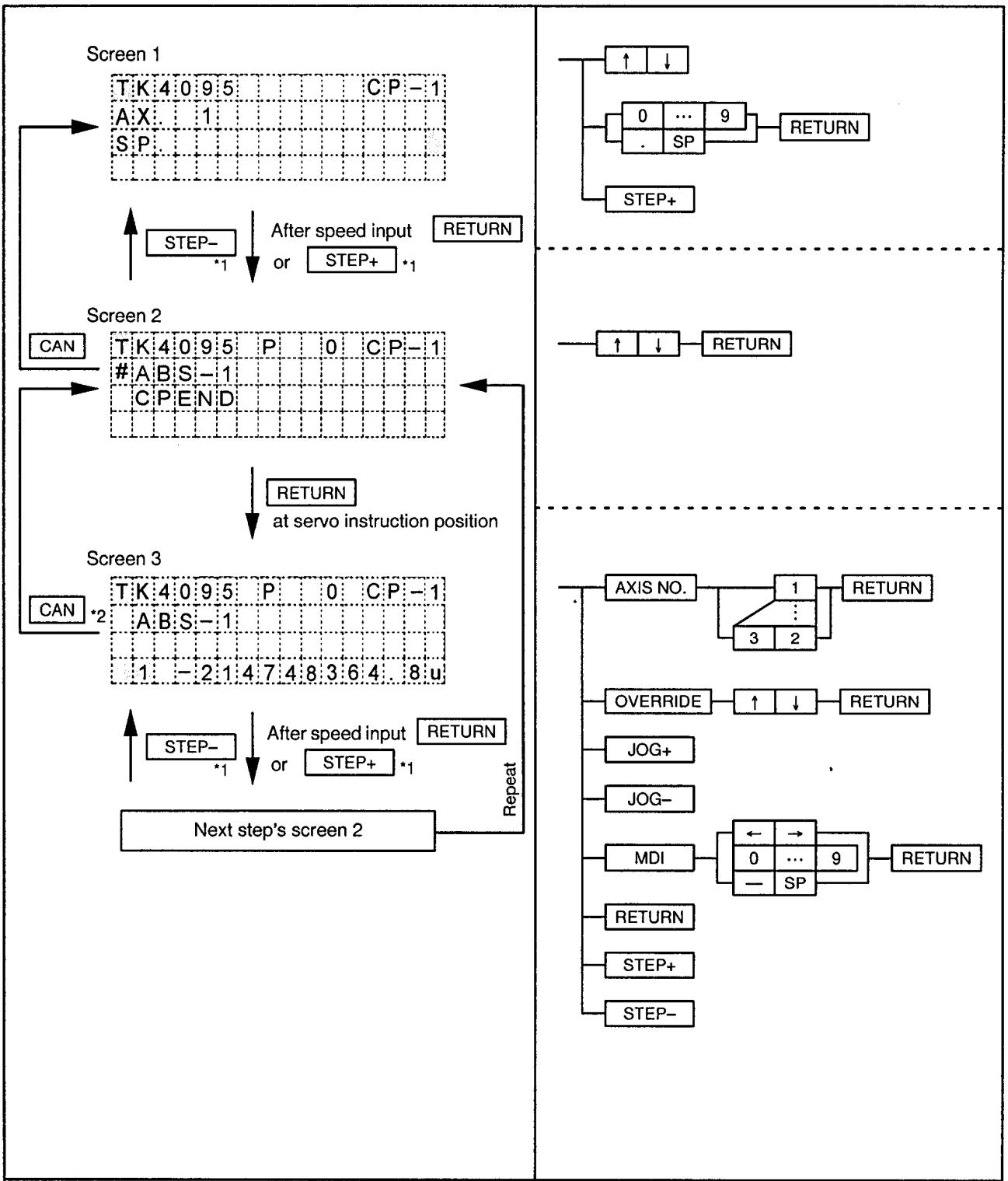
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-30

CP–1 (Constant-Speed Control, 1 Axis)

Message

Key Operation



Notes

*1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the CAN or STEP– key), the following will occur when the STEP+ key is pressed:
the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).

*2. If the CAN key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

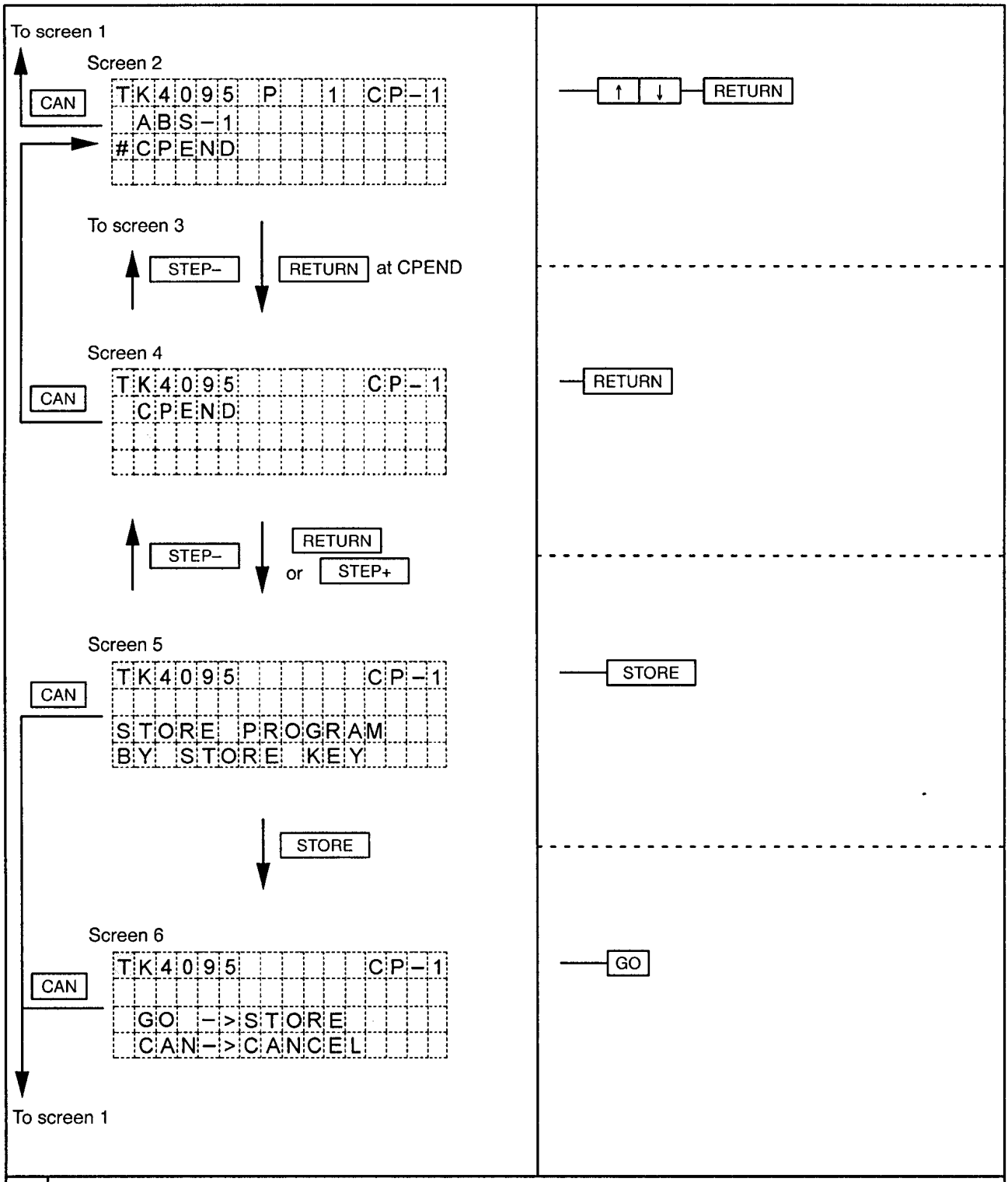
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-30.1

CP–1 (Constant-Speed Control, 1 Axis)

Message

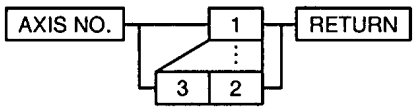
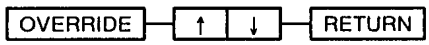
Key Operation



Notes

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed").	Use the ↑, ↓ keys to move between the "AX. _" and "SP. _" items.
Axis No. & speed inputs: [0] [···] [9] [—] [.] [SP] — [RETURN] With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Speed.	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered.
Switching screens: [STEP+] After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2.	When the STEP+ key is enabled, a return to screen 1 can be executed by pressing the CAN or STEP– key.
<Screen 2> [↑] [↓] — [RETURN] Select a servo instruction which designates positioning control to a pass point. When constant-speed control is completed, CPEND is selected. ABS–1 1-axis linear interpolation control CPEND Constant-speed control END	

Notes

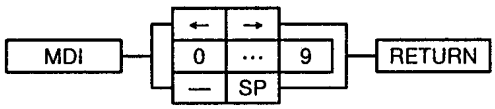
Operation Procedure & Explanations	Precautions/Remarks
<Screen 3> Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override value:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-30.4

CP–1 (Constant-Speed Control, 1 Axis)

Operation Procedure & Explanations	Precautions/Remarks
JOG operation: JOG+ : While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– : While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, → keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Notes

Operation Procedure & Explanations	Precautions/Remarks
Writing the address: RETURN — The servo instruction setting value for the currently displayed point is written to the program. Switching screens: STEP+ / STEP– — Use the STEP+ and STEP– keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3). <Screen 4> RETURN — The CPEND input is executed. <Screen 5, Screen 6> Program Store: STORE → GO When CPEND is selected at screen 2, and the CPEND setting has been completed at screen 4, screen 5 will be displayed for program registration. To switch from screen 5 to screen 6, press the STORE key. At screen 6, press the GO key to execute program writing. Switching screens: STEP– — To switch from screen 5 to screen 4, press the STEP– key.	

Notes	

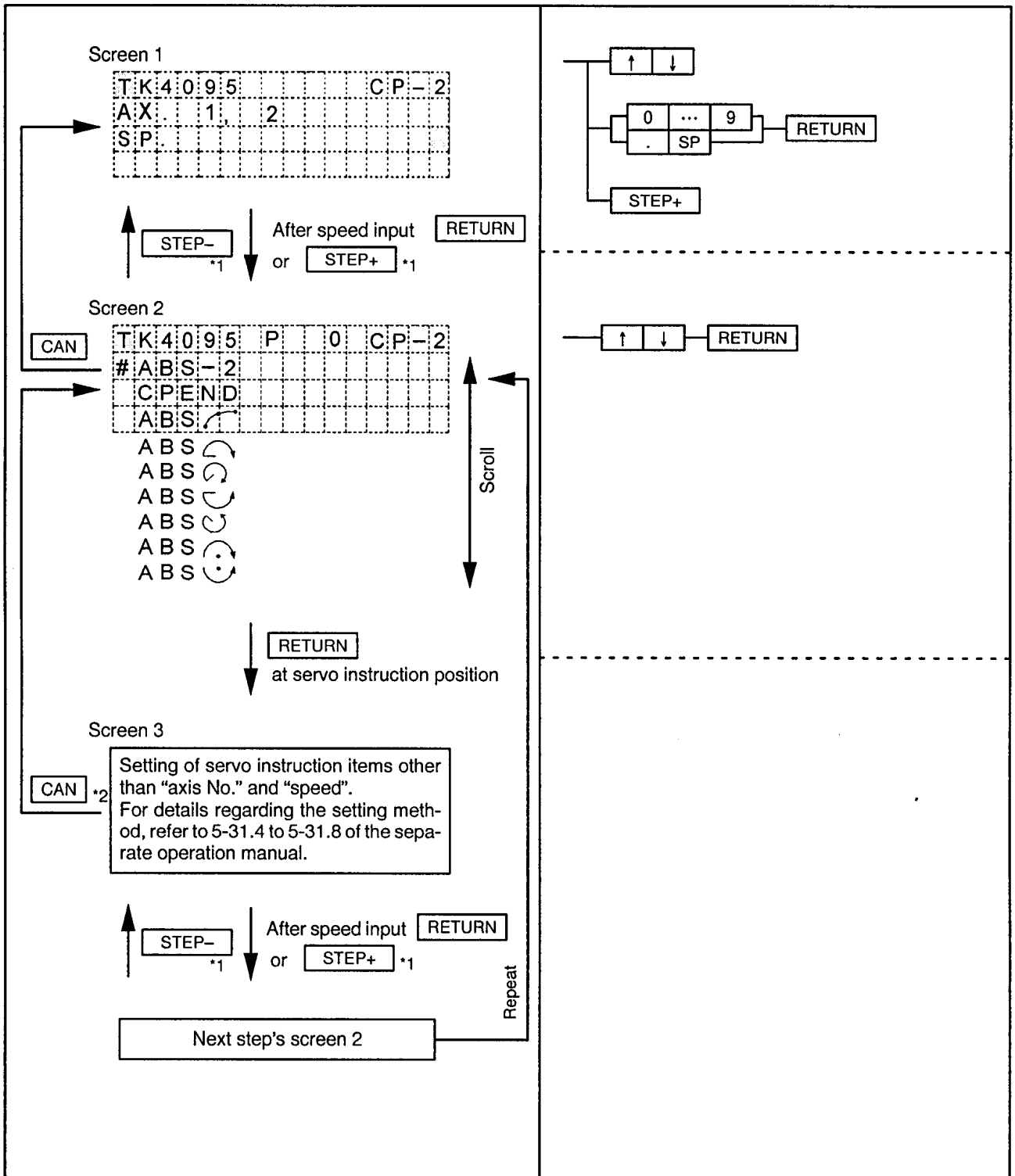
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-31

CP–2 (Constant-Speed Control, 2 Axes)

Message

Key Operation



Notes

*1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the CAN or STEP– key), the following will occur when the STEP+ key is pressed:
the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).

*2. If the CAN key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

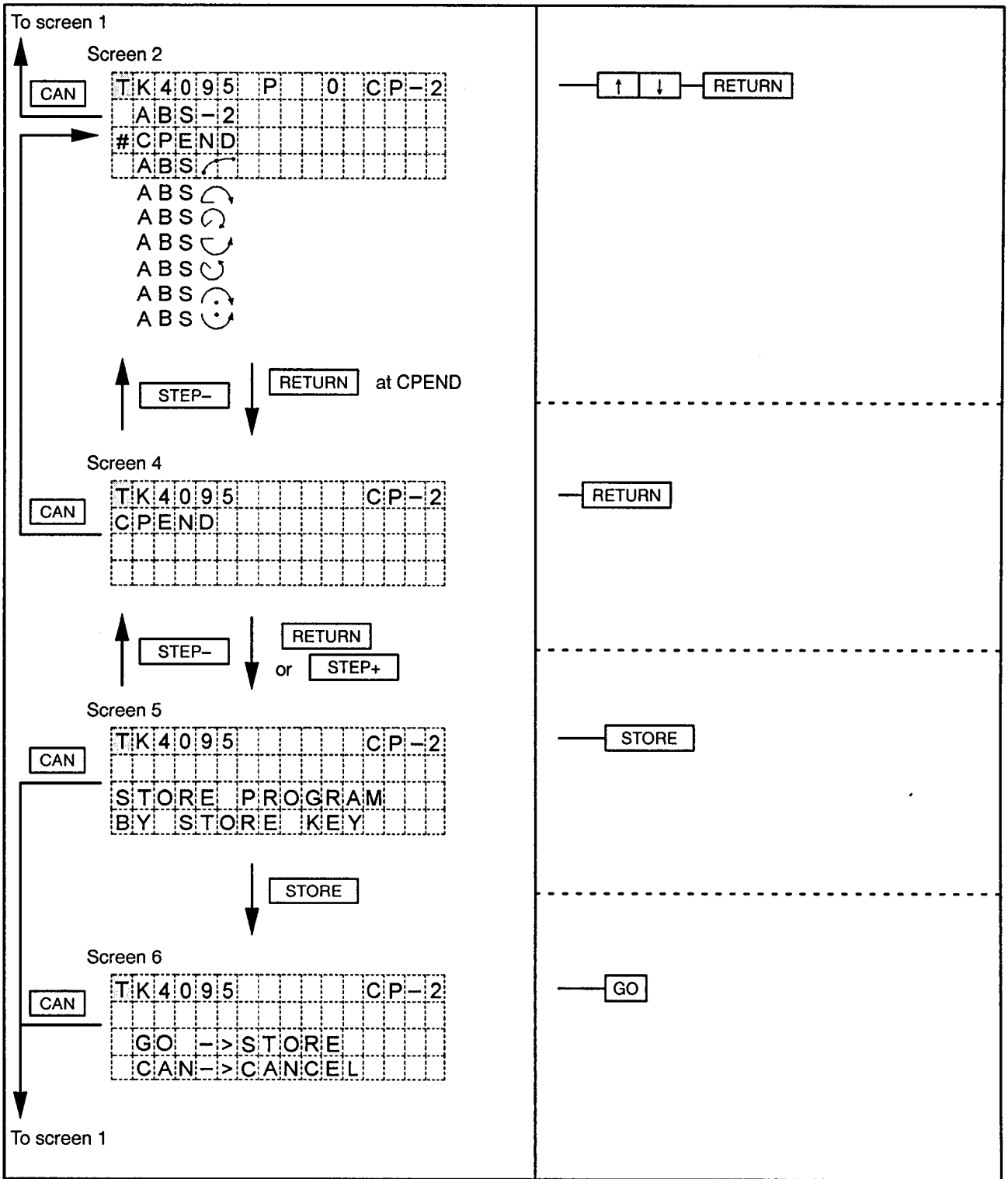
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-31.1

CP–2 (Constant-Speed Control, 2 Axes)

Message

Key Operation



Notes

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed").	Use the ↑, ↓ keys to move between the "AX. _ , _" and "SP. _" items.
Axis No. & speed inputs: [0] [···] [9] [SP] [.] — [RETURN] With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Speed.	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered.
Switching screens: [STEP+] After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2.	When the STEP+ key is enabled, a return to screen 1 can be executed by pressing the CAN or STEP– key.
<Screen 2> [↑] [↓] — [RETURN] Select a servo instruction which designates positioning control to a pass point. When constant-speed control is completed, CPEND is selected. ABS–2 2-axis linear interpolation control → 5-31.4 CPEND Constant-speed control END ABS Circular interpolation by auxiliary point designation → 5-31.4 ABS Circular interpolation by radius designation → 5-31.5 ABS Circular interpolation by radius designation → 5-31.5 ABS Circular interpolation by radius designation → 5-31.5 ABS Circular interpolation by radius designation → 5-31.5 ABS Circular interpolation by center point designation → 5-31.5 ABS Circular interpolation by center point designation → 5-31.5	

Notes

Operation Procedure & Explanations	Precautions/Remarks
<Screen 4> RETURN The CPEND input is executed. <Screen 5, Screen 6> Program Store: STORE — GO When CPEND is selected at screen 2, and the CPEND setting has been completed at screen 4, screen 5 will be displayed for program registration. To switch from screen 5 to screen 6, press the STORE key. At screen 6, press the GO key to execute program writing. Switching screens: STEP– To switch from screen 5 to screen 4, press the STEP– key.	

Notes	

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-31.4

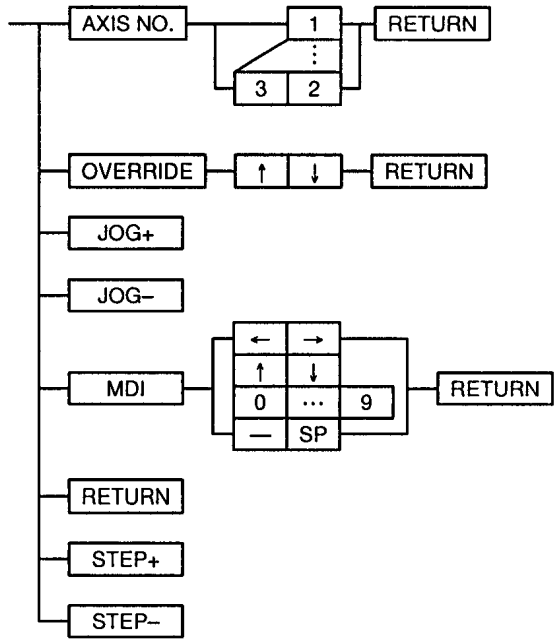
CP–2 (Constant-Speed Control, 2 Axes) Screen 3

Message

Key Operation

ABS–2 (2-axis linear interpolation control)

```
TK4095  P   0  CP-2
 ABS-2
 1  -2147483648.8u
 2  -2147483648.8u
```

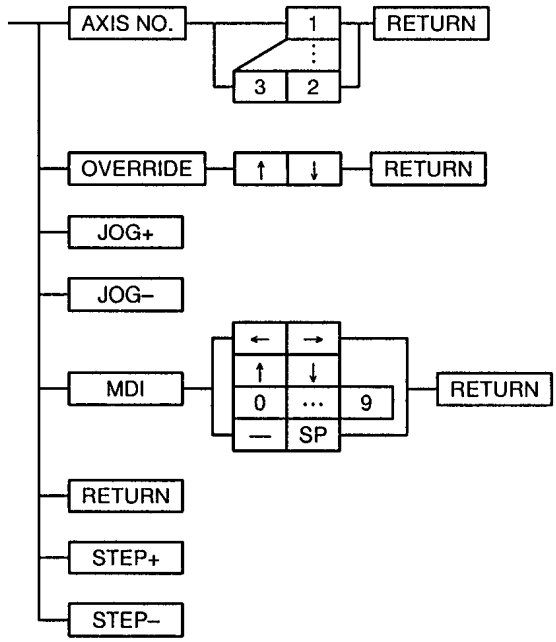


ABS ⌒ (Circular interpolation control by auxiliary point designation)

```
TK4095  P   0  CP-2
 ABS-⌒      AUX.P
 1  -2147483648.8u
 2  -2147483648.8u
```

STEP– ↑ ↓ RETURN or STEP+

```
TK4095  P   0  CP-2
 ABS⌒       END
 1  -2147483648.8u
 2  -2147483648.8u
```



Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-31.5

CP–2 (Constant-Speed Control, 2 Axes) Screen 3

Message

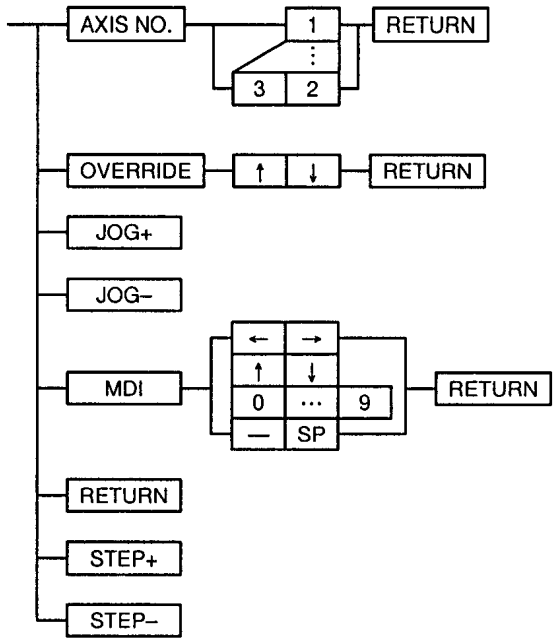
ABS↷ , ABS↶
(Circular interpolation control by center point designation)

T	K	4	0	9	5		P			0		C	P	–	2	
	A	B	S	↷							C	E	N	T	.	
1		–	2	1	4	7	4	8	3	6	4	.		8	u	
2		–	2	1	4	7	4	8	3	6	4	.		8	u	

↑ STEP– ↓ RETURN or STEP+

T	K	4	0	9	5		P			0		C	P	–	2	
	A	B	S	↷							E	N	D			
1		–	2	1	4	7	4	8	3	6	4	.		8	u	
2		–	2	1	4	7	4	8	3	6	4	.		8	u	

Key Operation

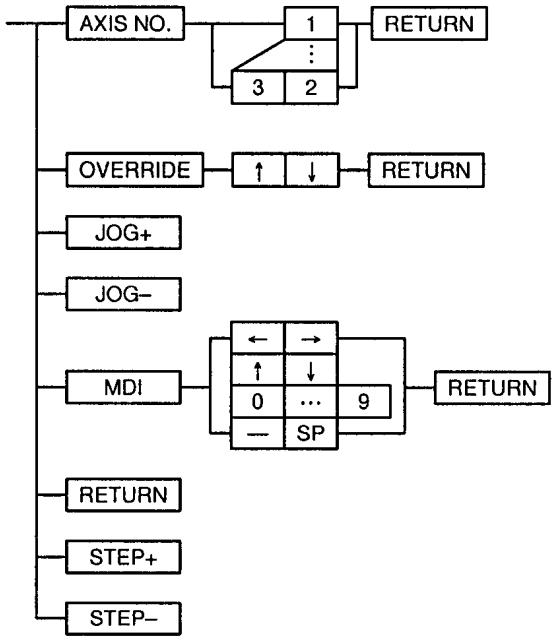


ABS↷ , ABS↶ , ABS↷ , ABS↶
(Circular interpolation control by radius designation)

T	K	4	0	9	5		P			0		C	P	–	2	
	A	B	S	↷							R	A	D	.		
									1	2	3	4	.		5	u

↑ STEP– ↓ RETURN or STEP+

T	K	4	0	9	5		P			0		C	P	–	2	
	A	B	S	↷							E	N	D			
1		–	2	1	4	7	4	8	3	6	4	.		8	u	
2		–	2	1	4	7	4	8	3	6	4	.		8	u	

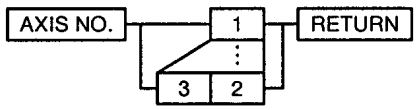
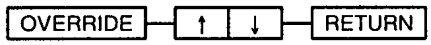


Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-31.6

CP–2 (Constant-Speed Control, 2 Axes) Screen 3

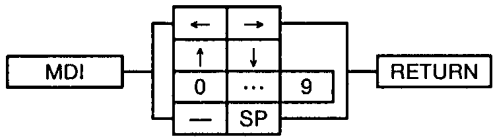
Operation Procedure & Explanations	Precautions/Remarks
Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override value:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes

Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-31.7

CP–2 (Constant-Speed Control, 2 Axes) Screen 3

Operation Procedure & Explanations	Precautions/Remarks
JOG operation: JOG+ : While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– : While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Notes

Mode	Test mode	Function	Teaching (program teaching)	5-31.8

CP–2 (Constant-Speed Control, 2 Axes) Screen 3

Operation Procedure & Explanations	Precautions/Remarks
Writing the address: RETURN — The servo instruction setting value for the currently displayed point is written to the program. Switching screens: STEP+ STEP– Use the STEP+ and STEP– keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3).	

Notes

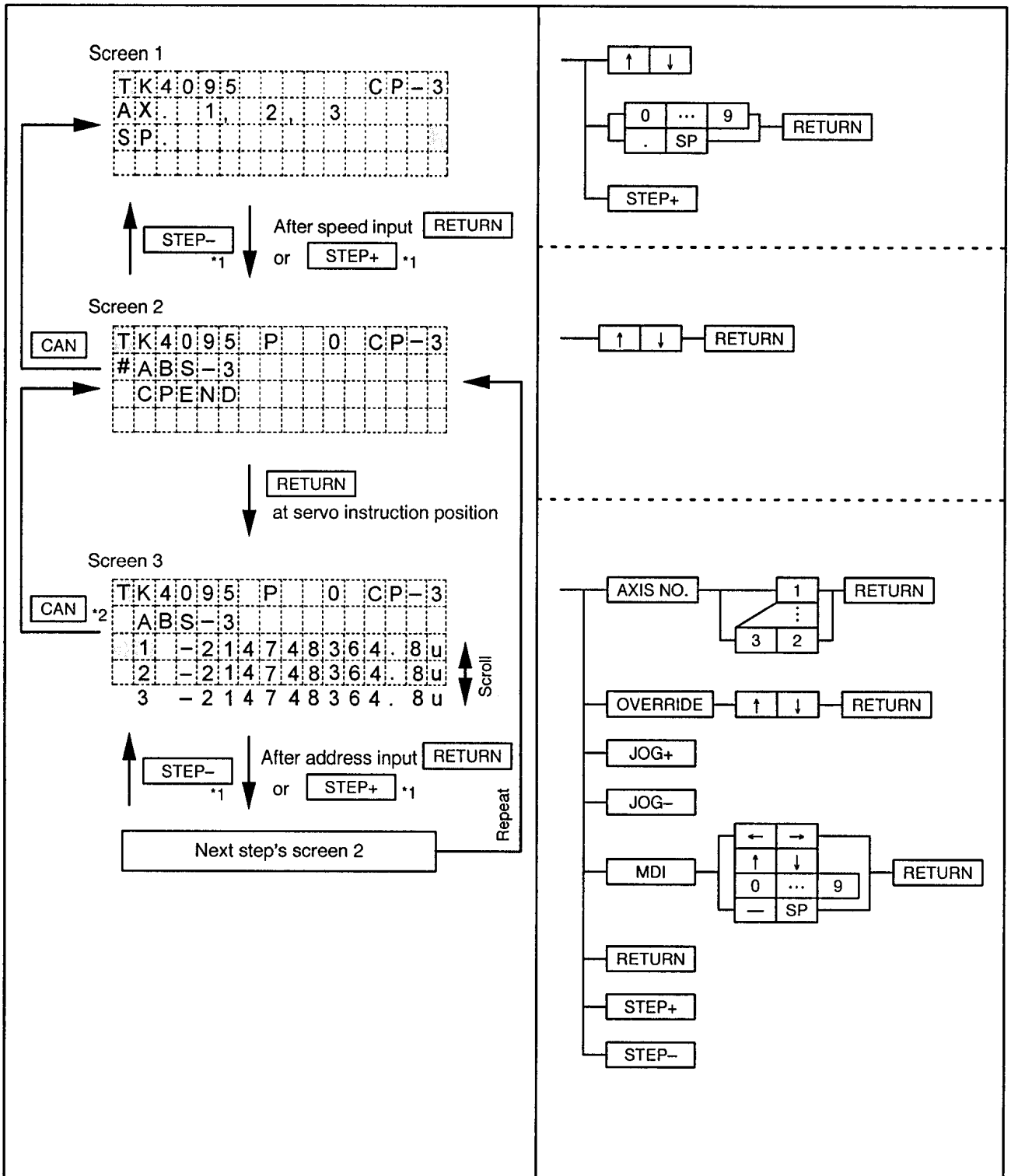
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-32

CP–3 (Constant-Speed Control, 3 Axes)

Message

Key Operation



Notes

*1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the CAN or STEP– key), the following will occur when the STEP+ key is pressed:
the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).

*2. If the CAN key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

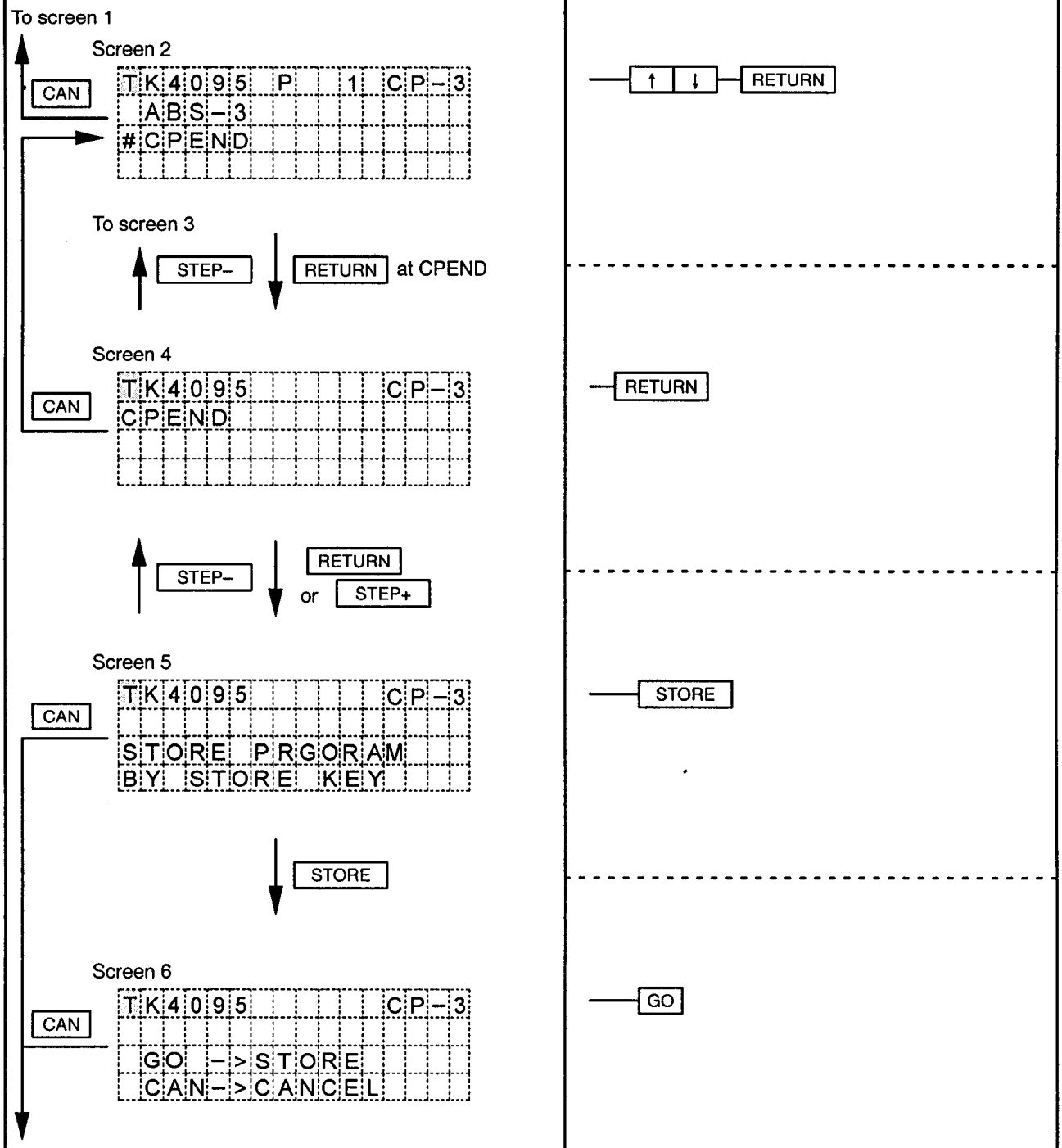
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-32.1

CP–3 (Constant-Speed Control, 3 Axes)

Message

Key Operation



Notes

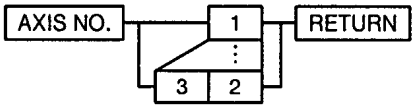
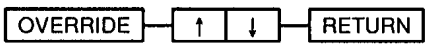
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-32.2

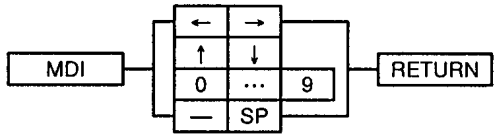
CP–3 (Constant-Speed Control, 3 Axes)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed").	Use the ↑, ↓ keys to move between the "AX. __, __, __" and "SP. __" items.
Axis No. & speed inputs: [0] [···] [9] [—] [.] [SP] — [RETURN] With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Axis 3 → Speed.	Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered.
Switching screens: [STEP+] After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2.	When the STEP+ key is enabled, a return to screen 1 can be executed by pressing the CAN or STEP– key.
<Screen 2> [↑] [↓] — [RETURN] Select a servo instruction which designates positioning control to a pass point. When constant-speed control is completed, CPEND is selected. ABS–3 3-axis linear interpolation control CPEND Constant-speed control END	

Notes

Operation Procedure & Explanations	Precautions/Remarks
<Screen 3> Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Changing the override value:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes

Operation Procedure & Explanations	Precautions/Remarks
JOG operation JOG+ : While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– : While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Notes

Operation Procedure & Explanations	Precautions/Remarks
Writing the address: RETURN — The servo instruction setting value for the currently displayed point is written to the program. Switching screens: STEP+ / STEP– — Use the STEP+ and STEP– keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3). <Screen 4> RETURN — The CPEND input is executed. <Screen 5, Screen 6> Program Store: STORE → GO When CPEND is selected at screen 2, and the CPEND setting has been completed at screen 4, screen 5 will be displayed for program registration. To switch from screen 5 to screen 6, press the STORE key. At screen 6, press the GO key to execute program writing. Switching screens: STEP– — To switch from screen 5 to screen 4, press the STEP– key.	

Notes	

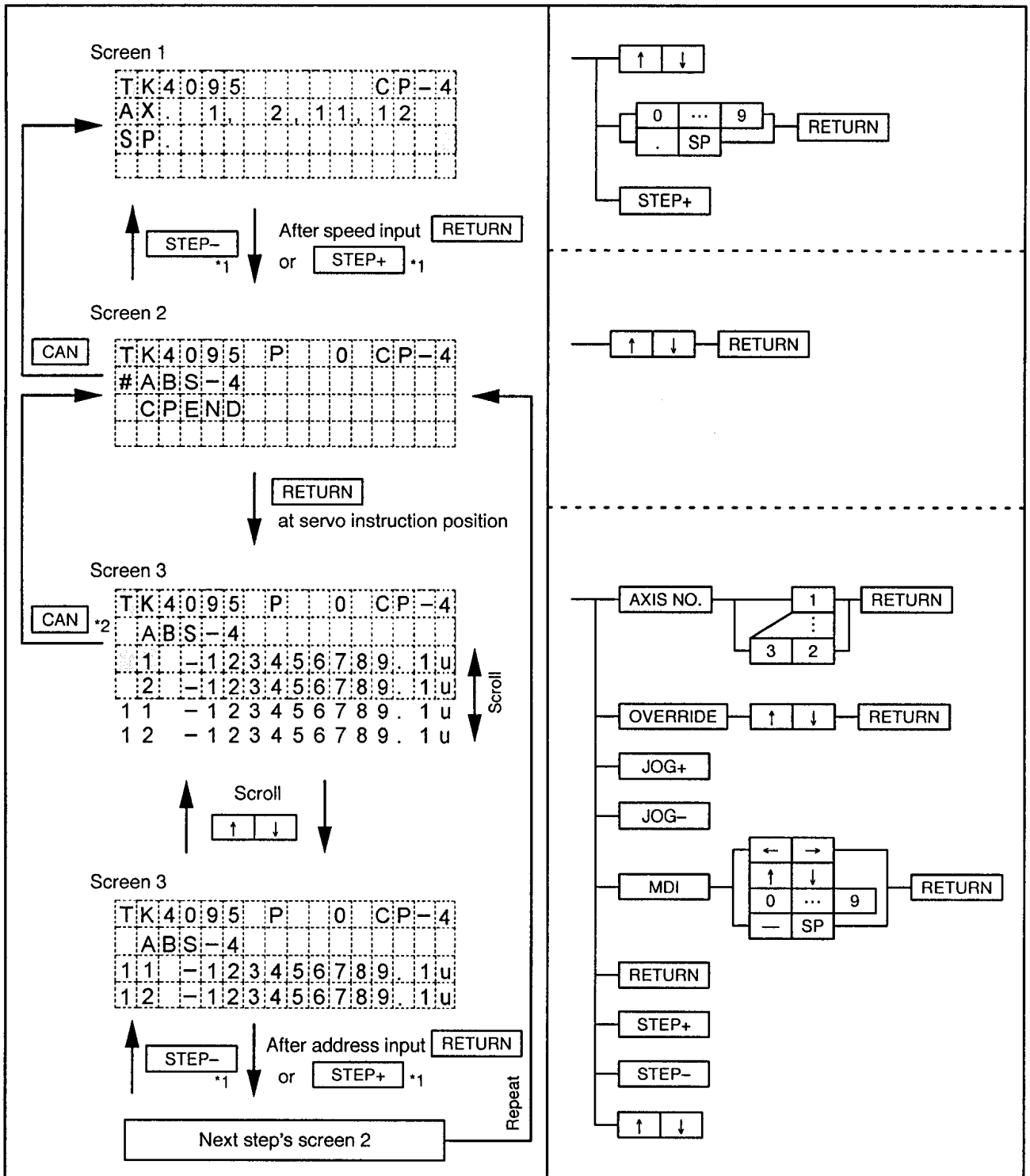
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-33

CP–4 (Constant-Speed Control, 4 Axes)

Message

Key Operation



Notes

*1. After designating the required settings for the servo instruction selection, then returning to the previous screen (using the CAN or STEP– key), the following will occur when the STEP+ key is pressed:
the servo instruction selection screen (screen 2) will be skipped, and the servo instruction setting screen (screen 3) will be displayed in page order (P0, P1...).

*2. If the CAN key is pressed while designating a setting (screen 3) at a given step, the system will return to that step's screen 2.

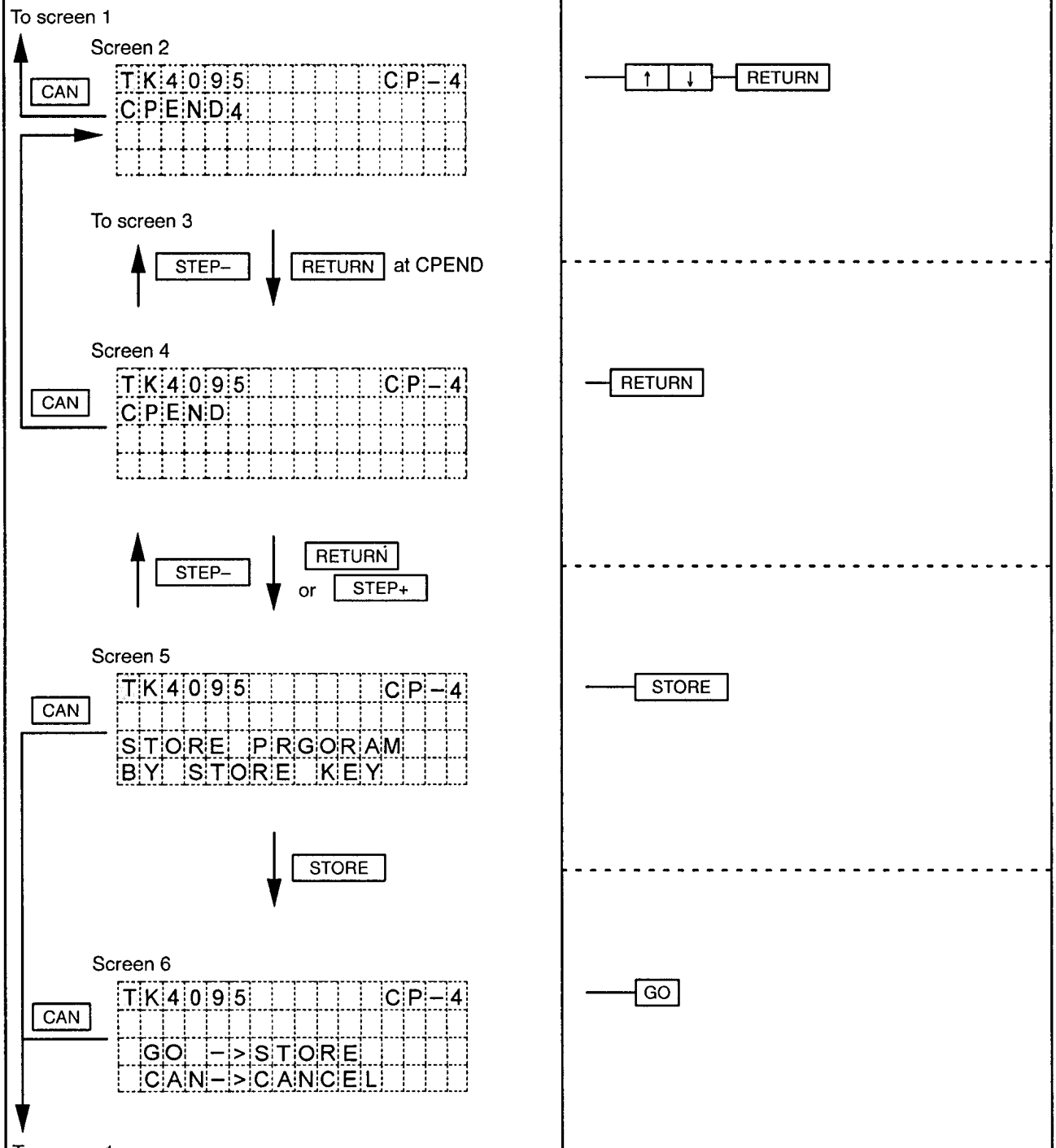
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-33.1

CP–4 (Constant-Speed Control, 4 Axes)

Message

Key Operation



Notes

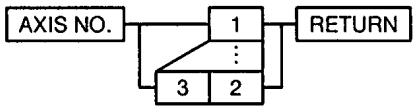
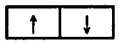
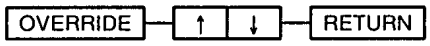
Drawing No.

Mode	Test mode	Function	Teaching (program teaching)	5-33.2

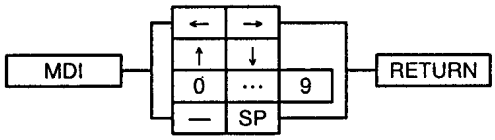
CP–4 (Constant-Speed Control, 4 Axes)

Operation Procedure & Explanations	Precautions/Remarks
<Screen 1> Selecting the setting item: [↑] [↓] Use these keys to switch between the setting items ("axis" and "speed"). Axis No. & speed inputs: [0] [···] [9] [—] [.] [SP] — [RETURN] With the cursor located at the desired position, enter the numeric value directly, then press the RETURN key to register the setting. Each time the RETURN key is pressed, the input item will change as follows: Axis 1 → Axis 2 → Axis 3 → Axis 4 → Speed. Switching screens: [STEP+] After confirming that all axis number and speed settings have been registered, the STEP+ key can be pressed to proceed to screen 2. <Screen 2> [↑] [↓] — [RETURN] Select a servo instruction which designates positioning control to a pass point. When constant-speed control is completed, CPEND is selected. ABS–4 4-axis linear interpolation control CPEND Constant-speed control END	Use the ↑, ↓ keys to move between the "AX. __ , __ , __ , __" and "SP. __" items. Switching to screen 2 is only possible after both the "axis number" and "speed" inputs have been registered. When the STEP+ key is enabled, a return to screen 1 can be executed by pressing the CAN or STEP– key.

Notes

Operation Procedure & Explanations	Precautions/Remarks
<Screen 3> Changing the axis:  The axis where a JOG operation is designated is changed by pressing the AXIS NO. key, entering the axis number where a JOG operation is to occur, then pressing the RETURN key. The axis number which is entered must be within the axis number range designated by the program. When a JOG axis number is changed, that axis number will be highlighted. Screen Scrolling:  For 3 and 4-axis instructions, the data for all axes cannot be displayed on a single screen. In such cases, use the ↑, ↓ keys to scroll the axis number, etc., 1 line.	When data for fewer than 2 axes is displayed, the ↑, ↓ keys are disabled, and the error message "! MIS OPERATION" will be displayed at the bottom line of the screen if they are pressed.
Changing the override value:  When the OVERRIDE key is pressed, the screen will change to the JOG screen display format, with the speed and override displayed at the 2nd and 3rd lines. The override change procedure is identical to that in test mode JOG operation, except that the system will return to the program teaching screen when the RETURN key is pressed. When the JOG screen format is displayed, the cursor will be displayed at the override position. 10.0 % └── Cursor position At this time, the ↑, ↓ keys can be used to display the override table values in order. Press the ↑ to increase the value, and the ↓ key to decrease the value. The override table contains the values shown below, enabling selection of 0.1 % to 100.0 %. 0.1 % 1.0 % 10.0 % 100.0 % 0.2 % 2.0 % 20.0 % 0.4 % 4.0 % 40.0 % 0.8 % 8.0 % 80.0 % After selecting the desired override value, press the RETURN key. The JOG speed will then be determined as follows: [JOG speed] = [JOG speed limit value] × [override] The system will then return to the original display screen.	If the ↑ key is pressed when the override is 100.0 %, the override will become 0.1 %. If the ↓ key is pressed when the override is 0.1 %, the override will become 100.0 %. If the CAN key is pressed during an override change, the change will be aborted, and the original value will be adopted.

Notes

Operation Procedure & Explanations	Precautions/Remarks
JOG operation JOG+ : While this key is pressed, JOG operation will occur at the designated axis in the address increase direction, at the calculated speed. JOG operation stops when this key is released. JOG– : While this key is pressed, JOG operation will occur at the designated axis in the address decrease direction, at the calculated speed. JOG operation stops when this key is released. When JOG operation occurs, the displayed numeric value will change to a display of the feed present values for the interpolating axes. This change is indicated by an "M" which is displayed to the right of the program No. (top of screen). Numeric input:  When the MDI key is pressed, the numeric input mode will be established and the cursor will appear at the right end of the numeric value field. "E" is displayed to the right of the program No. (top of screen) in order to indicate that numeric data editing is in progress. At this time, use the ←, →, ↑, ↓ keys to move the cursor to the numeric value which is to be changed, then enter the desired value. To change the numeric value's sign, press the – key at the numeric input field. A negative value will be changed to a positive value (minus symbol is deleted), and a positive value will be changed to a negative value (minus symbol will be displayed in front of the value). The SP key can also be used in the same manner to change a negative value to a positive value (a positive value will remain unchanged). When the numeric input is completed, press the RETURN key.	When the JOG+ or JOG– key is pressed, the START conditions will be checked. If the conditions are not satisfied, the message "! CAN'T START" will be displayed.

Notes

Operation Procedure & Explanations	Precautions/Remarks
Writing the address: RETURN — The servo instruction setting value for the currently displayed point is written to the program. Switching screens: STEP+ / STEP– — Use the STEP+ and STEP– keys to switch between input screens. When a pass point servo instruction input has been completed, the system will proceed to the next point without going to screen 2 first (remaining at screen 3). <Screen 4> RETURN — The CPEND input is executed. <Screen 5, Screen 6> Program Store: STORE — GO When CPEND is selected at screen 2, and the CPEND setting has been completed at screen 4, screen 5 will be displayed for program registration. To switch from screen 5 to screen 6, press the STORE key. At screen 6, press the GO key to execute program writing. Switching screens: STEP– — To switch from screen 5 to screen 4, press the STEP– key.	

Notes