Addition and setting the special nozzle (YV100Xg)

Contents

Record of changes

It is the description of changes of this manual in the table.

File No.	Description of changes	Date
RE0013	First Edition	June.2006

1. Before setting

An automatic nozzle change function is the method that a machine performs nozzle exchange automatically using the nozzle station (ANC) or the flying nozzle (FNC). It is not mentioned about FNC in this manual.

■Head

- YV100Xg-F

  If the optional nozzle station is equipped, the odd number heads can be used as ANC to change the nozzles.

- YV100Xg-S

  The nozzle station is equipped in standard, so all heads can be used as ANC to change the nozzles.

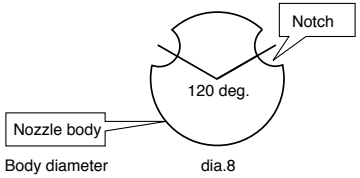
■Nozzle Station

The special nozzles for ANC are classified into the following. It also describes the positional relation of each nozzle's body and the positioning pin in the nozzle station.
Note that as the special nozzle and standard nozzle, the positioning of the notch is different. So, place the special nozzle in the correct position on the nozzle station.

CAUTION

Confirm that the fiber sensor and amplifier are connected to the nozzle station for the special nozzle. If not, it needs the work to connect them.

■ The special nozzles for ANC



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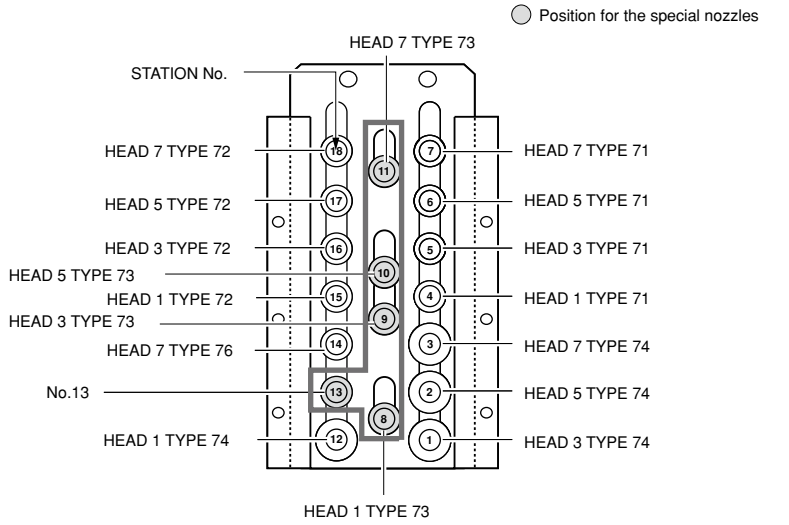
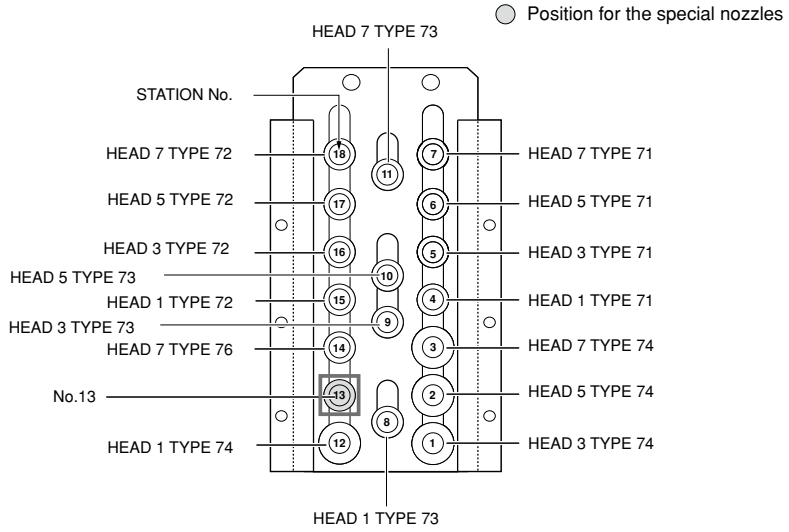
■ YV100Xg-F



R3002-E9-00_0013

■ YV100Xg-S



R3003-E9-00_0013

NOTE

If you have any questions, please consult your distributor or YAMAHA MOTOR CO., LTD.

2. Setting procedures

The special nozzle is set with the following procedures.

2.1 Setting the head specification information

2.2 Setting the mount nozzle specification information

2.3 Setting the nozzle station information

2.4 Adjusting the nozzle sensor sensitivity

2.5 Adjusting the nozzle station coordinates

2.6 Nozzle change check for ANC nozzle

2.7 Setting the vacuum level

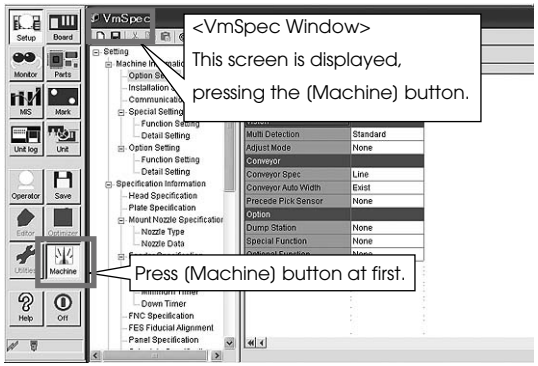
2.8 Continuous nozzle change test

2.9 Setting the component parts information

2.10Setting the offline software

■Open the machine data setting program (VmSpec).

Press [Machine] button as shown below. "VmSpec" windows will be displayed. The various data for the special nozzle is set on this screen.



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NOTE

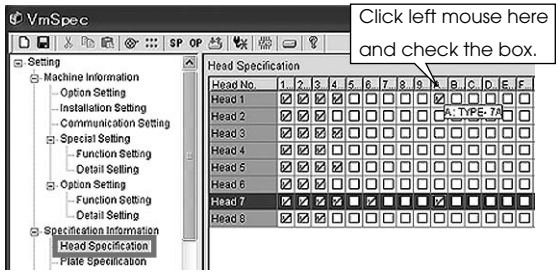
The following type of special nozzle will be set in this manual as an example.
The target model is the "YV100Xg-F".
"Head 1" is used and the automatic nozzle change (ANC) method will be used.
The nozzle name is "Special nozzle A" and the type is "Type-7A".
The nozzle is stored in "Nozzle station No. 8".

2.1 Setting the head specification information

Set up the nozzles which can be used with each head.

If check mark is in the check box, the specified nozzle type is applicable to use as the following.

1. Press [Machine] button and select "Setting" / "Specification Information" / "Head Specification".
2. Click the check box at the "Type-7A" of "Head 1" line to use the special nozzle on head 1.



R4002-E9-00_0013

CAUTION

Please re-read the board data to confirm the contents of adjustment.

2.2 Setting the mount nozzle specification information

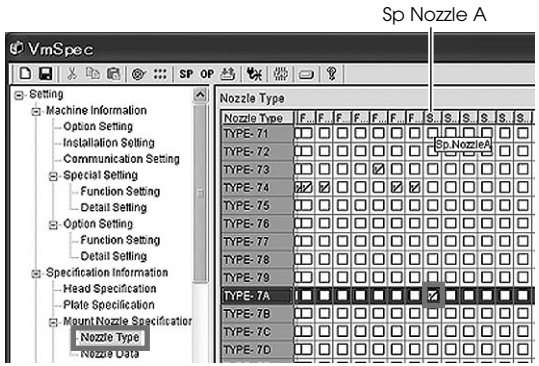
2.2.1 Setting the nozzle type

Set up which type of component can be used with each nozzle.

1. Press [Machine] button and select "Setting" / "Specification information" / "Mount Nozzle Specification" / "Nozzle Type".
2. Select "Type-7A" line.
3. Scroll this screen to the right and find "Sp Nozzle A" column.
4. Click the check box at the "Sp Nozzle A" in "Type-7A" line. When the required nozzle of the component part is the "Sp Nozzle A", the nozzle type, "Type-7A" will be selected in the nozzle station.

CAUTION

Be sure to set up one nozzle type per one required nozzle of the component part. For example, it is not applicable setting the "Sp Nozzle A" is for "Type-7A" and "Type-71" in duplicate.



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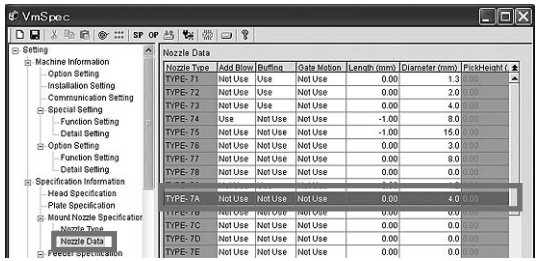
2.2.2 Setting the nozzle data

Press [Machine] button and select "Setting" / "Specification Information" / "Mount Nozzle Specification" / "Nozzle Data".



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Step1 *Setting the "Add Blow" validity*

This is for preventing carrying away the components on the head when mounting.

To add the constant positive pressure to the head, apply "Use" to "Add Blow" column in the Nozzle type line.

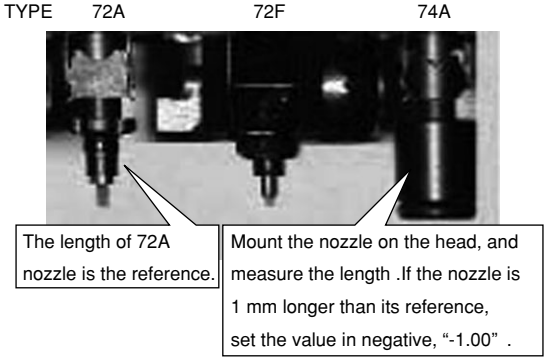
If not required the additional blow, apply it to "Not Use".The type of nozzle with O ring as 74A, the status is always "Use".

Step2 *Setting the "Buffing" validity*

If the head has a spring, the status is "Use" at "Buffing" column. If not, set it to "Not Use".

Step3 *Set the "Nozzle Length"*

Set the length of the special nozzle, when the length of its nozzle differs from the reference nozzle length, 72A regarding the following picture. If the length is longer than its reference, set the difference in negative value. If shorter than that, set it in positive value.



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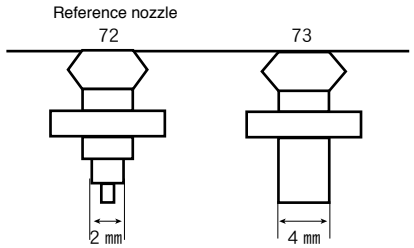
Step4 *Set the "Nozzle Diameter"*

Measure the nozzle's maximum outer diameter with slide calipers and set the value to "Diameter".



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CAUTION

Please re-read the board data to confirm the contents of adjustment.

2.3 Setting the nozzle station information

Store the special nozzle in the nozzle station.

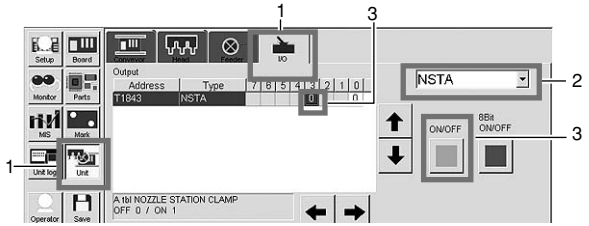
Step1 Press [Emergency Stop] button.

Set the machine in the emergency stop state. Then continue the work with the servo OFF.

Step2 Restore the "Type-66" nozzle in the nozzle station.

Release the clamp. Remove the nozzle attached to the head by hand and restore it to its original position in the nozzle station.

1. *Press (Unit) button and select "I/O" tab.*
2. *Change to "NSTA" (Nozzle Station) on the select window at the Output side.*
3. *Click number "3 ", in line "T184", and press (ON/OFF) button to clamp release.*
4. *The shutter will open. So restore the "Type-72" nozzle attached to the head 1 in the original position on the nozzle station by hand.*



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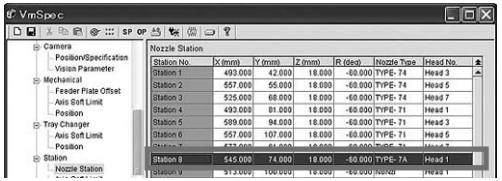
Step3 Store the special nozzle in the empty correct position at the nozzle station

While the shutter is opened, store the special nozzle in "Station no. 8" by hand and close the shutter.

Step4 Set the type of head and the stored position at the nozzle station for the special nozzle in the machine data.The following procedure is the case of storing the special nozzle in the station number 8 in example.

1. *Press (Machine) button. Select "Setting" / "Machine Data" / "Station" / "Nozzle Station".*
2. *Set "Type-7A" to "Nozzle Type" in "Station 8" line.*
3. *Set "Head 1" to "Head No.".*



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CAUTION

Please re-read the board data to confirm the contents of adjustment.

2.4 Adjusting the nozzle sensor sensitivity

Adjust the position sensitivity of the "nozzle sensor" installed on the nozzle station.

Step1 Press [Emergency Stop] button.

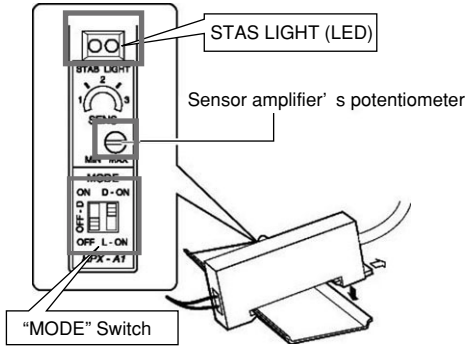
Set the machine in the emergency stop state. Then continue the work with the servo OFF.

Step2 Set the "MODE" switch of sensor amplifier.

Left side: OFF (knob down), right side: D-ON (knob up), regarding the following picture.

Step3 Check the lighting state of the LED on the sensor amplifier.

Store the nozzle into the nozzle station. Check that the "Red + Green" LED turns on, when the nozzle is in the nozzle station. And only "Green" LED turns on, when the nozzle is not stored.



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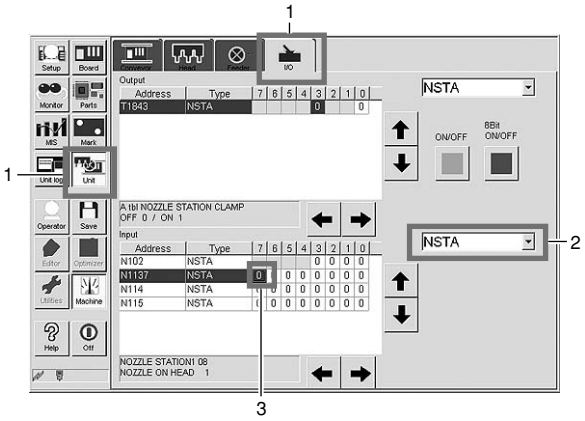
Step4 *Check the state of the sensor detection from the I/O monitor.*

Store the special nozzle into the nozzle station and check the following matter.

1. *Press "Unit" button and select "I/O" tab.*
2. *Change to "NSTA" (Nozzle Station) on the select window at the Input side.*
3. *From "N1130" to "N1157" will be the sensor input flag, regarding the message in the bottom. Click number "0", in line "N113" and in column "7". If the nozzle is into the nozzle station in station number 8, "NOZZLE ON HEAD" in message will be "0" and if not there, the message will be "1".*



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CAUTION

Please re-read the board data to confirm the contents of adjustment.

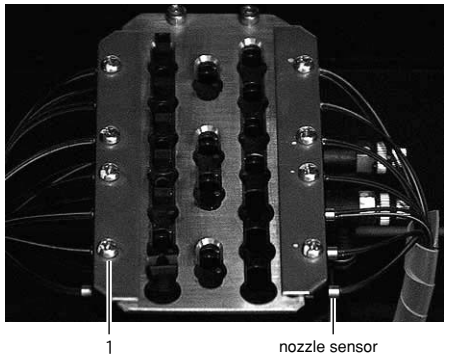
■Solution to adjust the nozzle sensor if the nozzle was not detected correctly.

The position and detection adjustment is needed if the sensor could not detect the nozzles on the nozzle station correctly in Step 3 and 4.

Turn the sensor amplifier's potentiometer with a flat-tip precision screwdriver, and adjust it to the correct position.

If the nozzle sensor still does not react correctly, proceed to the nozzle sensor's position adjustment as follows.

1. Loosen the screw with a Philips screwdriver to remove the clamp plate retainer of the sensor for adjustment.



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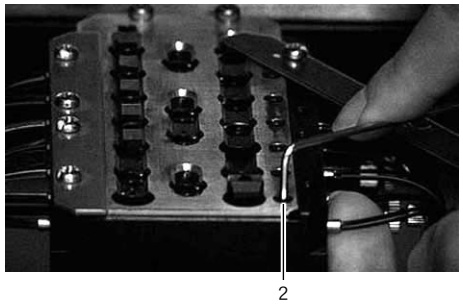
NOTE

If adjusting the sensors in the center of the nozzle station, it does not need to remove the clamp plate. These nozzle sensors are stored between the nozzle holes.

2. Loosen the set screw fixing the nozzle sensor with a hexagon wrench and adjust the sensor's position.



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CAUTION

Make sure that the end of the sensor does not protrude too much and interfere with the nozzle.

3. Once the correct position is determined, temporally tighten the set screw, and adjust the amplifier's potentiometer again.
4. If the sensor reacts correctly, tighten the set screw, and replace the clamp plate to the original position.

2.5 Adjusting the nozzle station coordinates

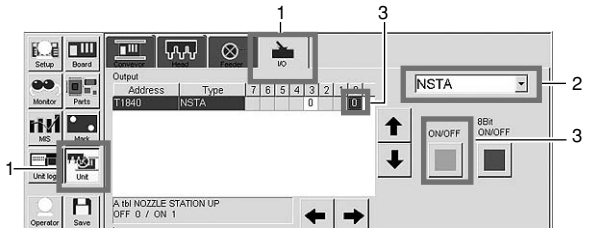
The nozzle station has X, Y, Z and R coordinates. The following procedure applies for the "station no. 8" in example. However, the same steps are used for adjusting the other stations.

Step 1 *Press [Emergency Stop] button.*

Set the machine in the emergency stop state.

Step 2 *Open the nozzle station's shutter*

1. *Press "Unit" button and select "I/O" tab.*
2. *Change to "NSTA" (Nozzle Station) on the select window at the Output side.*
3. *Click "0", in line "T184" line and in column "0", and press (ON/OFF) button for raising the station.*
4. *Click "0", in line "T184" and in column "3", and press (ON/OFF) button for the clamp open.*

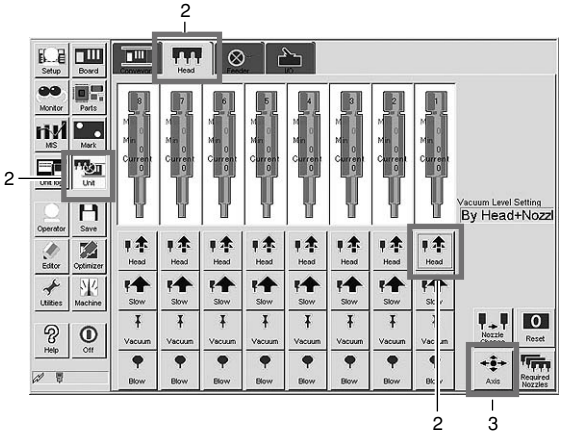


R4024-E9-00_0013

Step 3 *Move the head unit to directly above the nozzle station by hand and measure the coordinates of X, Y, Z and R.*

Use the handle to move the head unit.

1. *Move the head unit to above nozzle station number 8 by hand. Adjust the position of rotation direction (R axis of Head 1). Rotate the main pulley of R coordinate at the surface of head and adjust the leaf spring direction to hold the nozzle securely.*
2. *Cancel (Emergency Stop) button.*
3. *Press (Unit) button and select (Head) tab. Press (Head) button of Head 1 to lower the shaft.*



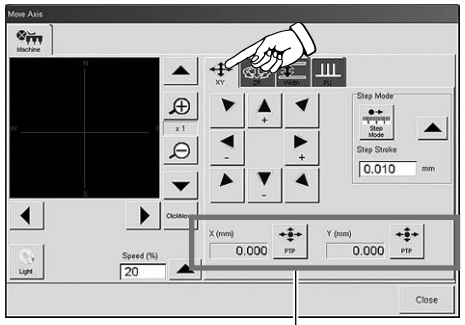
R4009-E9-00_0013

4. *Press (Axis) button. The "Move Axis" screen is displayed, press (Emergency Stop) button again.Move the head unit up and down with both hands and adjust the X, Y and R axes to find the fitting position of the special nozzle to the station no. 8 smoothly.*

NOTE

It is simple to rotate the coupling between the motor and ball screw by hand for the adjustment of the coordinates of X and Y.

5. *Once determine the position for the head to store the nozzle station, take a memo of the value of X and Y coordinates (Head 1) displaying on the screen of (Unit)/ "Head"/"Axis".*



Take a memo of X and Y coordinates

R4010-E9-00_0013

6. *Pull down the head shaft fully to the bottom, and take a memo of the value of Z and R coordinates(Head 1) displaying on the screen of (Unit)/"Head"/"Axis".*
7. *Replace the nozzle in the nozzle station by hand. Press "Head" tab to raise the shaft.*
8. *Back to "I/O" screen in (Unit). Close the shutter and lower the nozzle station, as reverse procedure of step2.*

CAUTION

Pull down the shaft deeply to the bottom when the shaft holds the nozzle.

Step4 *Input the X, Y, Z and R coordinates written down in 4 and 5 of Step 3 in the machine data.*

1. *Press (Machine) button. Select "Setting" / "Machine Data" / "Station" / "Nozzle Station".*
2. *Input the value of X, Y, Z and R coordinates into station no. 8.*

CAUTION

Please re-read the board data to confirm the contents of adjustment.

NOTE

The nozzle station coordinates are provisionally set at "Machine Data"/"Station"/"Nozzle Station", by the time of shipment. It will be easy to use "PTP" function in (Unit)/"Head"/"Axis" screen if taking a note of these coordinates.

■When a special nozzle is set other than head no. 1, take note to the following points.

Adjust the X, Y, Z and R axes by pulling down the air head to fit the nozzle station.

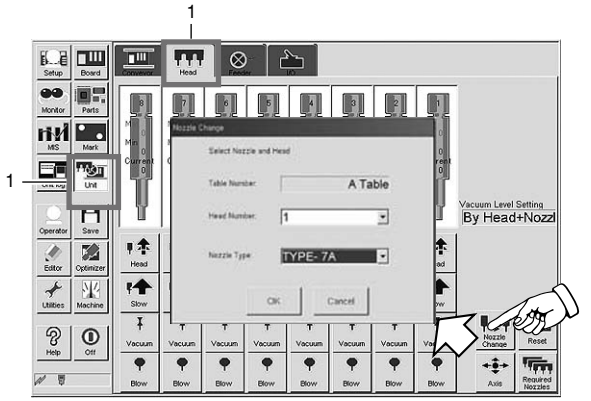
2.6 Nozzle change check of ANC nozzle

Check the coordinates of a special nozzle station by "Nozzle Change" function.

Step1 *Press [Unit] button and select "Head" tab.*

Step2 *Select "Nozzle Change" tab at the lower right of a screen, and set the displayed dialog as following.*

1. *Select "1" for the "Head Number".*
2. *Select "TYPE-7A" for "Nozzle Type".*
3. *Press (OK) button. Confirm that the nozzle is smoothly changed.*



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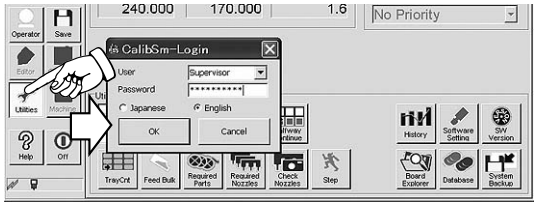
2.7 Setting the vacuum level

Set the reference vacuum level to determine the pickup and mounting the part.
(Whether the parts was picked and removed from the nozzle)

Step1 Log-in

1. Press (Utilities) button.
2. "CalibSm-Login" dialog appears. Select "Supervisor" for "User" and input "specialist" for "Password".



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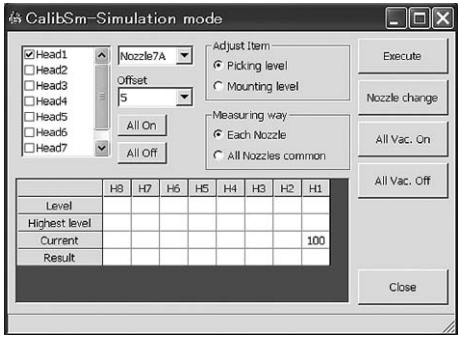
Step2 "CalibSm-Main" screen appears.

1. Press (Vacuum Level) of "Adjust Item" in "Adjustment" tab.
2. Click the check box of the target head number, and select "Nozzle-7A" for the nozzle type.



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Step3 Attach the special nozzle to the head.

If the special nozzle is not attached to the head, press (Nozzle Change) button to attach it.

CAUTION

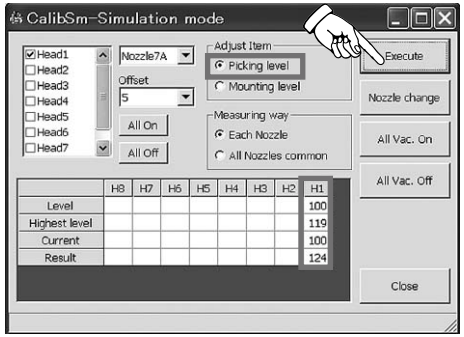
Do not change the offset value from its default setting.

Step4 Move the head unit.

Press (Emergency Stop) button, and move the head unit to the front by hand.

Step5 Measure the Picking level

1. Select "Picking level" in "Adjust Item" tab and press (Execute) button. The result will be shown in "H1" line.
2. Save the measurement result and turn off the vacuum.



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Step6 Measure the Mounting level

1. Select the "Mounting level" in "Adjust Item" tab, and press (Execute) button
2. Vacuum the nozzle hole with carrier tape and clog the nozzle tip.
3. Then, press (OK) button in the dialog appeared. The result will be shown in "H1" line.

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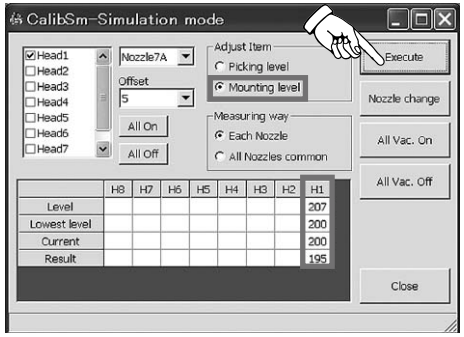
4. Save the measurement result and turn off the vacuum.



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CAUTION

Be careful not to fall the carrier tape in the machine when the vacuum was off.

Step7 Cancel "Emergency Stop" button.

CAUTION

Please re-read the board data to confirm the contents of adjustment.

2.8 Continuous nozzle change test

Check whether the special nozzle is changed smoothly as its setting.

Step1 Log-in

1. Press (Utilities) button.

2. "CalibSm-Login" dialog appears. Select "Supervisor" for "User" and input "specialist" for "Password".

Step2 Displays the "CalibSm-Main" screen.

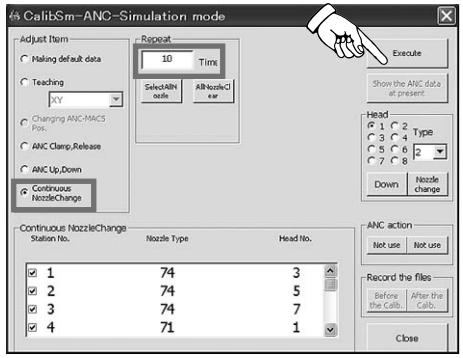
Press "ANC" button in "Adjustment" / "Option".

Step3 Set the details of "Continuous Nozzle Change" function.

1. Select "Continuous Nozzle Change" in "Adjust Item".

2. Recommend around 10 times for "Frequency".

3. Check the mark to the station number for changing the nozzles.



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Step4 Test for the change nozzles.

Press "Execute" button. The continuous nozzle change is executed by the machine.

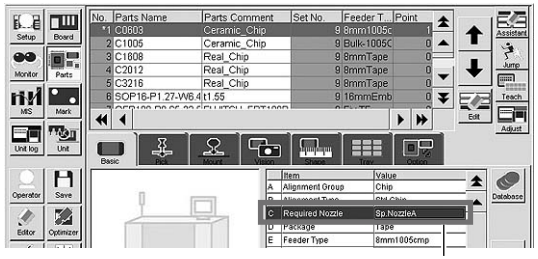
NOTE

If the errors occur, please re-try to adjust the coordinates of X, Y, Z and R.

2.9 Setting the component parts information

Change the component parts information which uses the special nozzle for picking up and mounting.

1. Press [Parts] button.
2. Select the parts no. in the list using the special nozzle for picking up and mounting.
3. Select "Sp Nozzle A" for "Required Nozzle" in "Basic" tab.Repeat the above steps for each component part.



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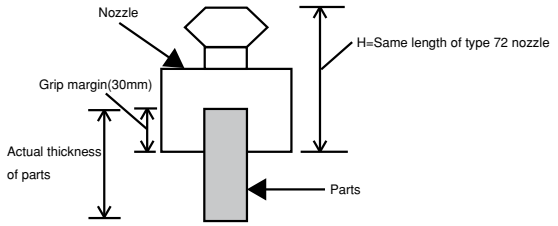
■ Setting the parts information using the gripper nozzle.

The gripper nozzle has grip margin, 3.00 mm. So please set the Component Parts information as follows.

- Press "Pick" tab and input 3.00mm from its default value, 0.00mm for "Pick Height".
- Press "Mount" tab and input around 0 to 0.5mm value for "Mount Height".
- Press "Shape" tab and input t minus 3.00 mm value from its actual part thickness for "Body Size Z".



R3008-E9-00_0013

CAUTION

Please re-read the board data to confirm the contents of adjustment.

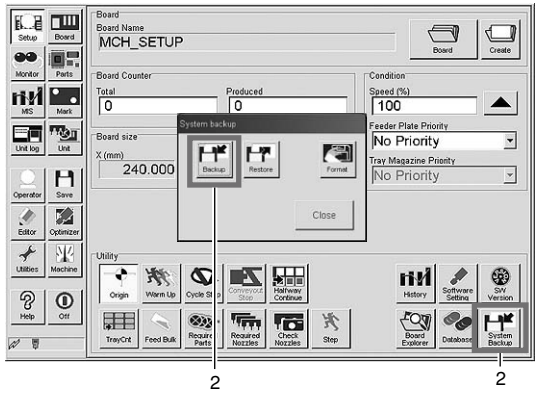
2.10 Setting the offline software

CAUTION

Offline software setting is also needed to create a board data and others, when setting the special nozzle to the machine.

Step 1 Make a backup of the machine setting data.

1. *Insert the floppy disk into the floppy disk drive.*
2. *Press "System Backup" in "Setup" button. Then press "Backup" button in displayed dialog.*
3. *The machine data will be saved on the floppy disk.*



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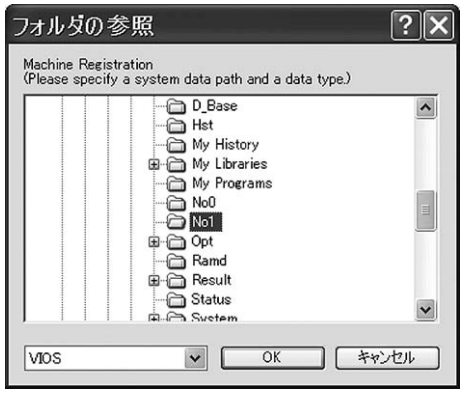
Step2 Update the machine information registered in the offline software.

■ *For YVOX Version V.3.10 and above*

1. *Start up the board Explorer.*
2. *Click on the target machine's line icon with right mouse button and select "Line & Machine Registration".*
3. *Insert the backup floppy disk created in Step 1 into the personal computer.*
4. *Press "Create" button to register the machine (Overwrite the machine data) on the target machine line.*

■ *For YGOS V2.xx*

1. *Start up the board Explorer.*
2. *Click on the target machine's line icon with right mouse button and select "Re-Register Machine". The select dialog appears.*
3. *Insert the backup floppy disk created in Step 1 into the personal computer.*
4. *Select the backup floppy disk in the dialog. Select "No1" folder in Floppy disk and press (OK) button. The machine data is overwritten.*



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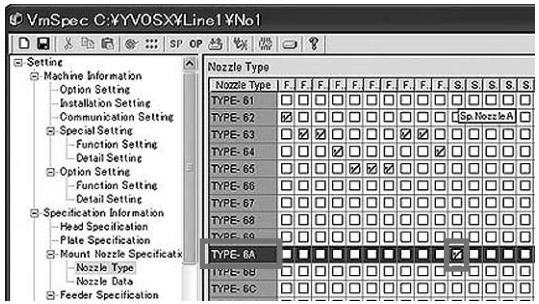
Step3 Change the nozzle information registered in the offline software.

■ *For YVOX Version V.3.10 and above*

1. *Start up the board Explorer.*
2. *Click on the target machine's line icon and select "Properties".*
3. *Select "Setting"/"Specification Information"/"Mount Nozzle Information"/"Nozzle Type".*
4. *Check the mark on the "Sp. Nozzle A" column of "Type-7A" line.(Refer to 2.2 Setting the mounting nozzle specification information)*
5. *Press "Save" button and close the screen.*



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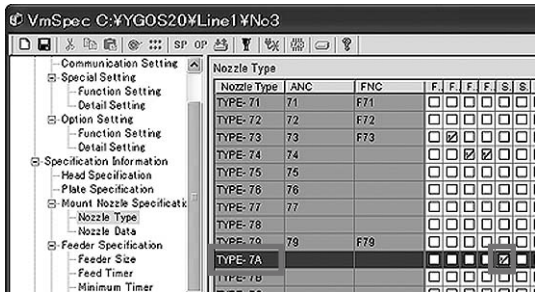
■ *For YGOS V2.xx*

1. *Start up the board Explorer.*
2. *Click on the target machine's line icon and select "Machine Property".*
3. *Select "Setting"/"Specification Information"/"Mount Nozzle Information"/"Nozzle Type".*
4. *Check the mark on the "Sp. Nozzle A" column of "Type-7A" line.(Refer to 2.2 Setting the mounting nozzle specification information)*
5. *Press "Save" button and close the screen.*



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CAUTION

Please re-read the board data to confirm the contents of adjustment.