



PACWEL

SINGLE ROW TAKE OUT UNITS USER INSTRUCTION MANUAL FOR

AOKI ISBM

Supplied By



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OVERVIEW

This manual covers the majority of Pacwel's Single Row Takeout Units to suit AOKI Blow moulders.

In this manual we have categorised the models into different 'types' so that the illustrations will not be misleading and will be appropriate.

The listing below will assist in identifying the appropriate type to suit your model.

TYPE "A"

SBIII-250LL-XXS
SBIII-250LL-50H
SBIII-300-50
AL-500-50S

TYPE "B"

SBIII-350LL-100
SBIII-350LL-40
500-150 USA

TYPE "C"

SBIII-500-LL-75

TYPE "D"

SBIII-500-150

TYPE "E"

SBIII-500LL-50
AL-1000LL-50

GENERAL SAFETY

- Before starting the system, please ensure you are familiar with all controls.
- Isolate the drive motors before servicing, cleaning or working on the conveyor system.
- Ensure all equipment is in safe condition before operating.
- Establish the location of fire extinguishers. For live electrical fires, use CO2, Dry Chemical or Vaporising Liquid.
- Do not interfere with any electrical wiring or apparatus.
- Maintain a clean and tidy work environment. Wipe off from walkways, any spill oil which may result from maintenance operations, but never reach over, under or into moving parts with hands, feet, rags or tools.
- Before attempting to retrieve debris from any moving part of machine, ensure the system is immobilised.

DO

- DO** make a commitment to safe working practices.
- DO** insist on proper training of equipment operators, including instruction under emergency situations.
- DO** insist on proper maintenance of equipment by qualified personnel only.
- DO** report deterioration of equipment performance.
- DO** isolate appropriate electrical circuits before commencing service by qualified personnel only.
- DO** establish the cause of a shutdown before attempting a restart.
- DO** remain alert for potential hazards.
- DO** maintain safety guards and devices in serviceable condition.
- DO** establish the location of fire extinguishers and emergency stops.
- DO** maintain safety signs in legible condition.
- DO** maintain a clean, tidy and safe working environment.

DON'T

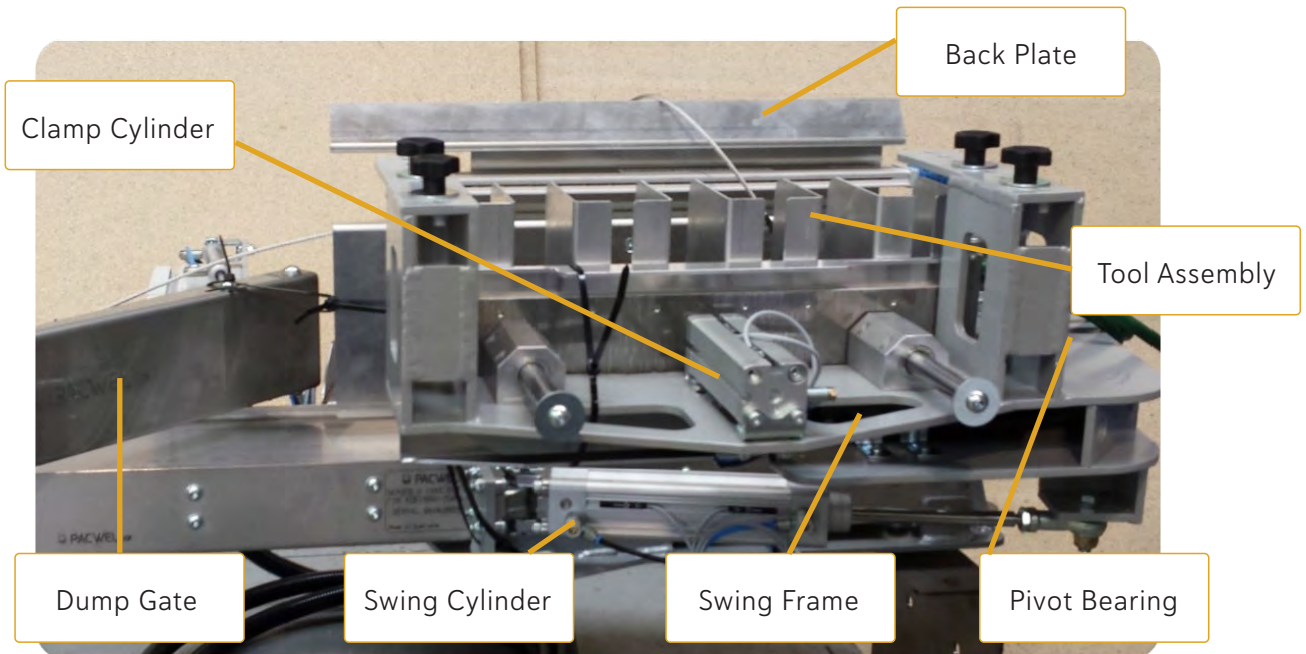
- DON'T** operate equipment unless fully trained in its use - including action in emergency situations.
- DON'T** continue operating equipment which looks or sounds defective until investigated by qualified personnel.
- DON'T** ignore maintenance recommendations.
- DON'T** overload equipment or (where appropriate) process "off specification" items such as damaged pallets, divider boards etc., or material the equipment has not been designed to handle.
- DON'T** allow a build-up of carton glues or sticky products to inhibit efficient operation.
- DON'T** alter settings or damage sensing equipment such as P.E's, proximity or limit switches.
- DON'T** ignore safety warning signs.

DESCRIPTION OF COMPONENTS and THEIR OPERATION

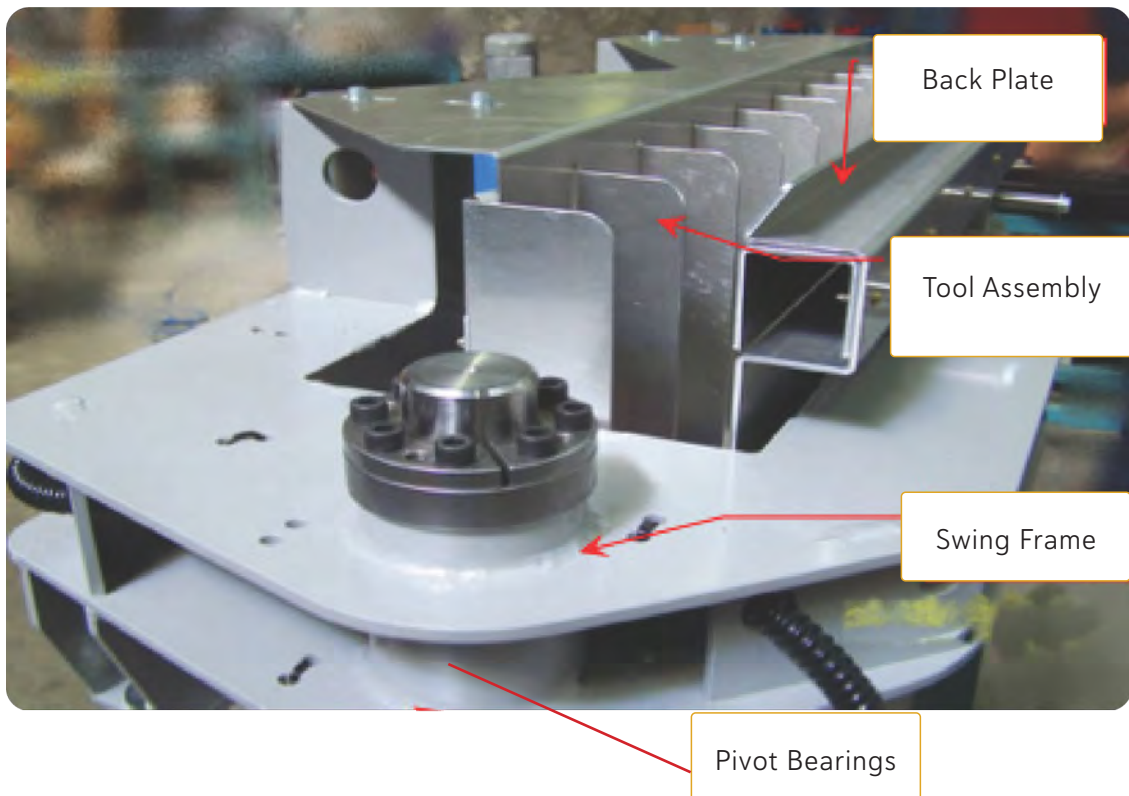
The TOU consists of a variable speed conveyor and a pivoting clamp mechanism. These are operated by a PLC which is interconnected with the blow molders control system.

GENERAL ARRANGEMENT

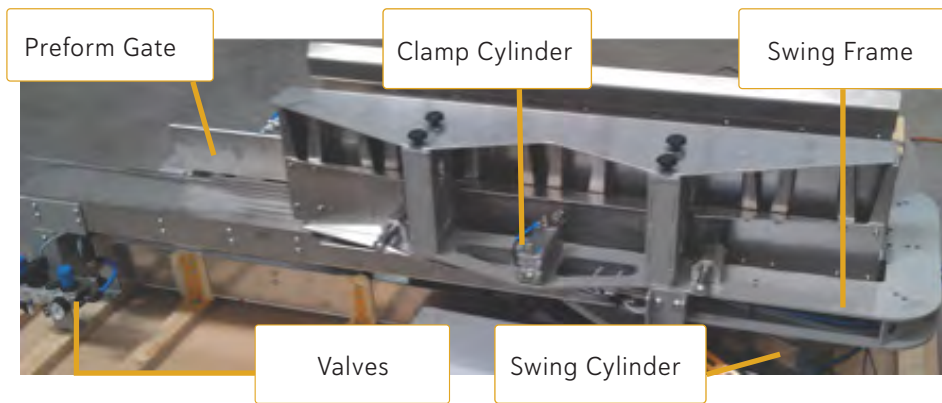
Type "A"



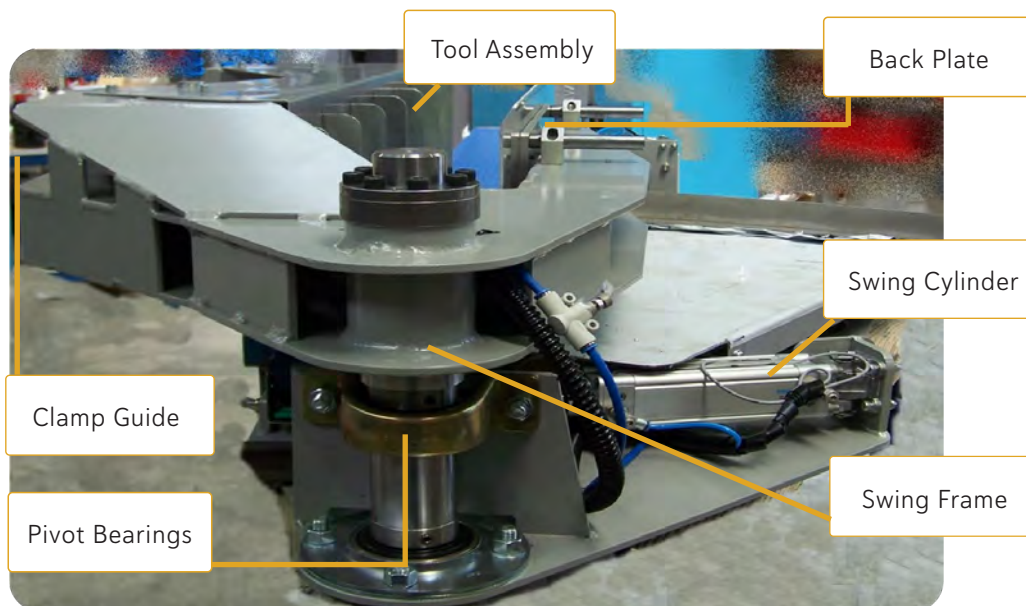
Type "B"



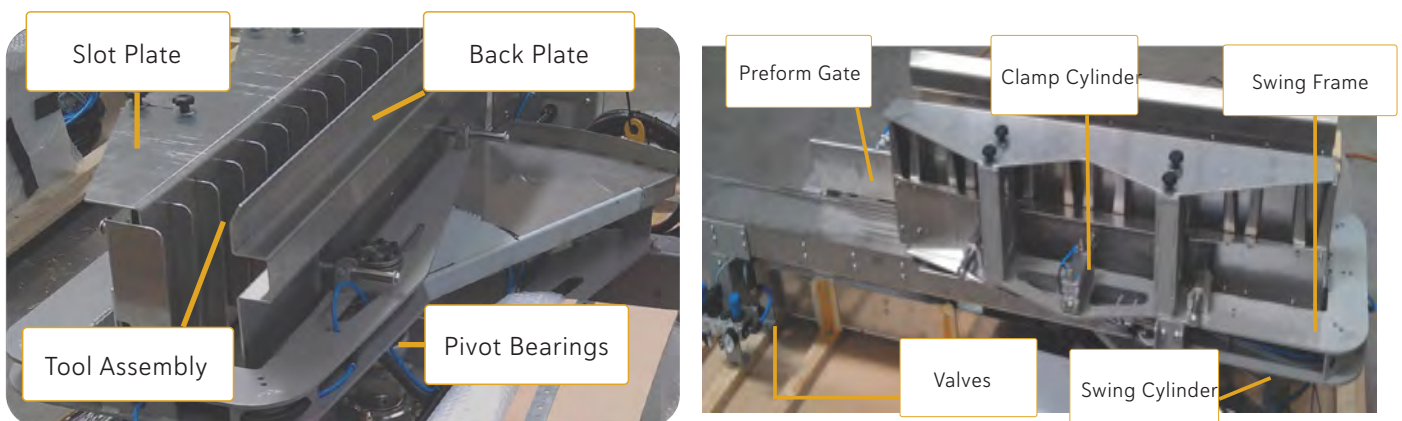
Type "C"



Type "D"



Type "E"



Preform Gate

At the exit end of the clamp mechanism there is a divert gate. This divert gate is operated while the blow signal is not received from the molder, and for a configurable number up to 3 cycles after the blow signal is restored. This will force all preforms and start-up product to be diverted through to the dump gate.

Tool Clamp and Backplate

The tool, clamp and backplate form the tooling of the takeout unit. The tool assembly is generally designed and built for the number of cavities in the molder. This is changed when the number of cavities is changed. This allows most containers to be handled by a minimum number of tools. Some unusual products may require special tools.

Swing Frame

The swing assembly pivots the tool clamp and backplate on the pivot bearing, moving it from the eject station to the conveyor position. This movement is actuated by the swing cylinder, which is triggered and timed by the PLC, by the eject signal from the molder.

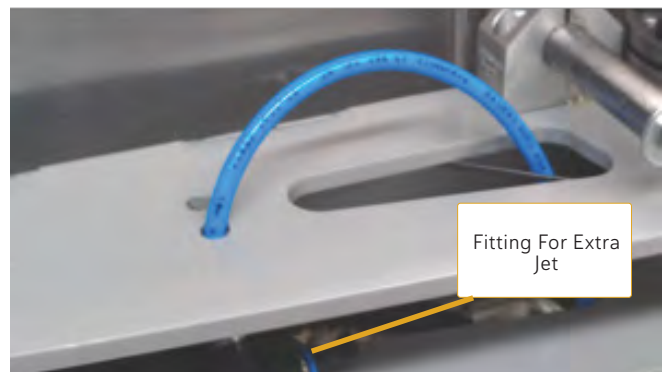
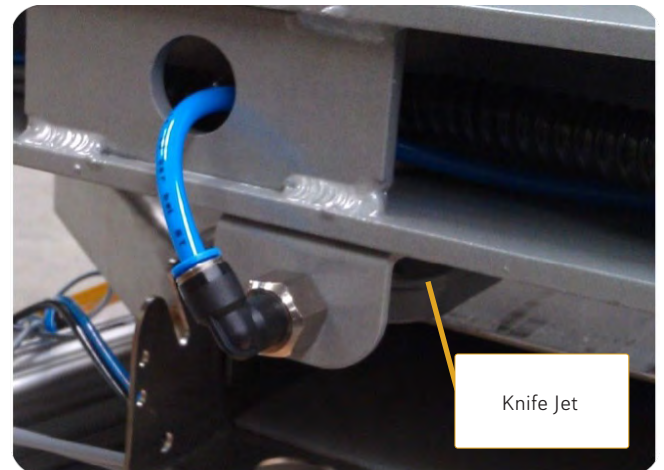
Conveyor

The conveyor is on a timed operation and runs for a predetermined time triggered by the opening of the tool clamp in the conveyor position. The acceleration and ultimate speed of this conveyor is adjustable within the variable speed controller. The run time is controlled by the PLC.

Air Blast

During the preform operation, some problem preforms require assistance to exit the tool clamp. This can be assisted by the Air Blast. This provides air jets to free problem preforms during unload. Settings are available in the settings menu of the optional control pendant to change the characteristic of its operation. On Type "C" machines an additional jet may be fitted halfway along the backplate by bending the tab and installing the supplied parts.

Air Blast Adjustment on Type "A" machines





Perforation for additional jet on longer models



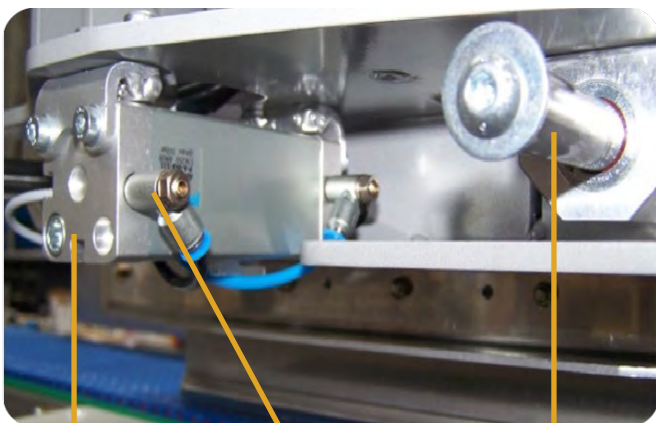
Air Volume Adjustment

ADJUSTMENTS

Clamp Cylinder

There are two adjustment screws for this cylinder, which adjust the stroke speed: The speed is adjusted by controlling the rate the air is exhausted from the cylinder by adjustment of the flow control valve in each air connection fitting. Turning the adjusting screw clockwise will decrease the stroke speed and vice versa.

Types "A" "B", and "D"

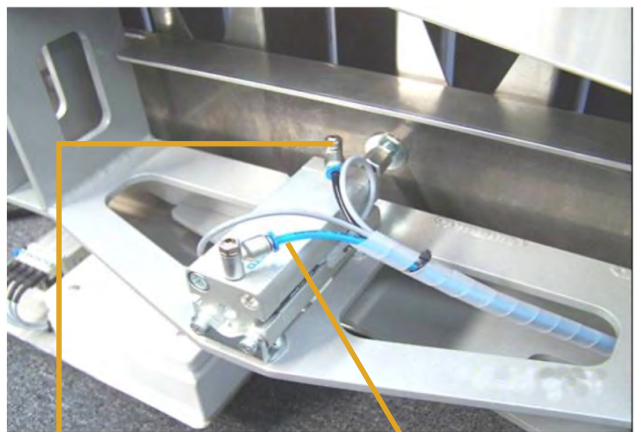


Clamp Cylinder

Clamp Guide

Speed Adjustment

Type "C"



Speed Adjustment

Clamp Cylinder

Swing Cylinder

There are two adjustments for this cylinder.

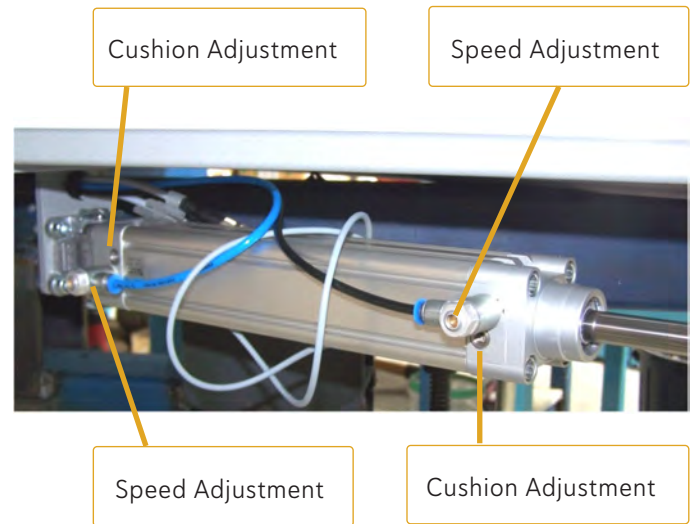
Stroke speed: The speed is adjusted by controlling the rate the air is exhausted from the cylinder by adjustment of the flow control valve in each air connection fitting. Turning the adjusting screw clockwise will decrease the stroke speed and vice versa.

End cushioning: At each end of the cylinder there is a small screw built into the casting next to the location of the air fitting. By screwing these clockwise the cylinders end of stroke will be cushioned to eliminate harsh landings. Should this screw be too tight, there will be a bouncing effect at the end of stroke. Adjust this screw until there is a smooth end of stroke movement without bounce.

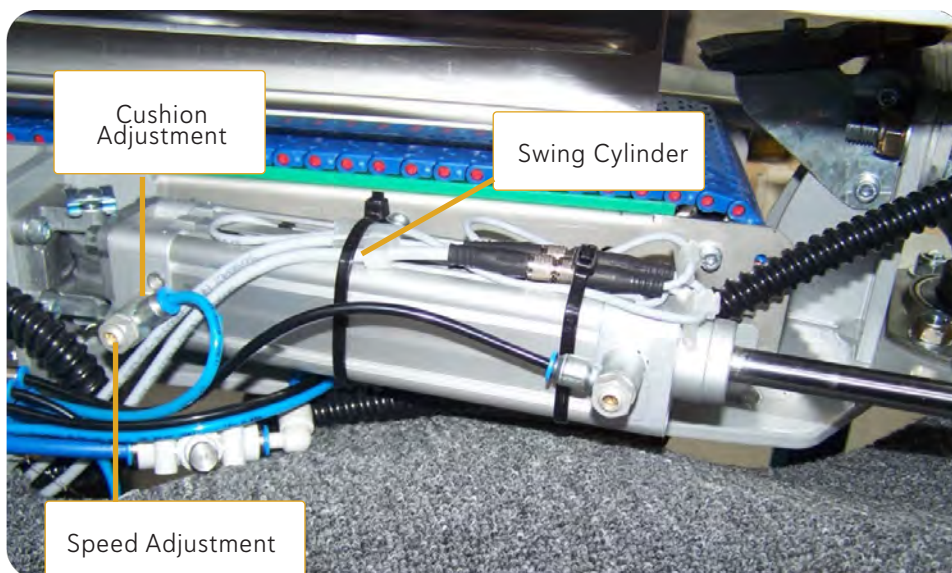
There must be a smooth transition of the speed between the controls of the flow control valve to the cushioning cycle of the cylinder (the last 5-10mm of stroke).

Adjustment of operation of this cylinder can be checked by using the manual override of the valve using a screwdriver or by using the manual operation on the optional control pendant.

Types "C"



Types "A" & "B"



Stroke Adjustment

WARNING

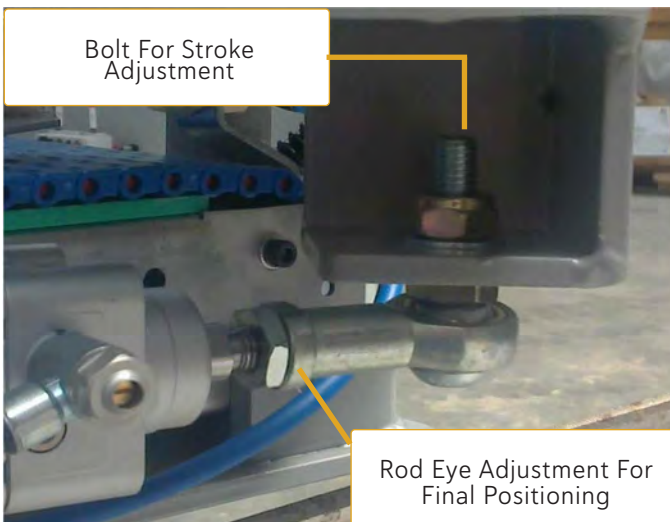
Isolate the power supply to the takeout during this operation to prevent automatic operation.

Position of the product clamp tooling can be adjusted by lengthening or shortening of the rod eye at the end of the cylinder rod (first loosen the locknut and re-tighten after adjustment has been made).

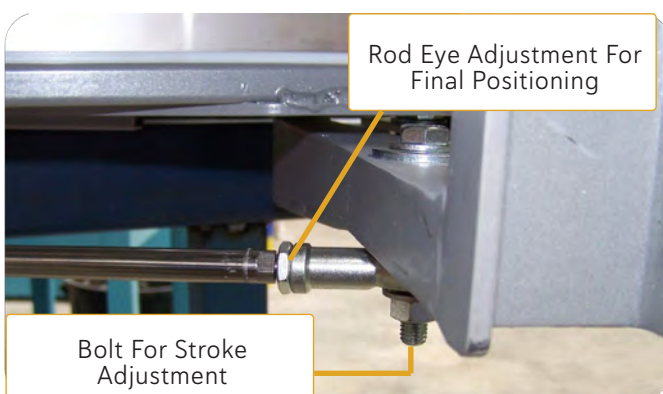
This will alter the release position of the tooling and may require an adjustment to the mounting position of the rod end of the swing cylinder.

This can be done by loosening the 8mm mounting bolt and moving the mount along the slot provided in the base of the takeout.

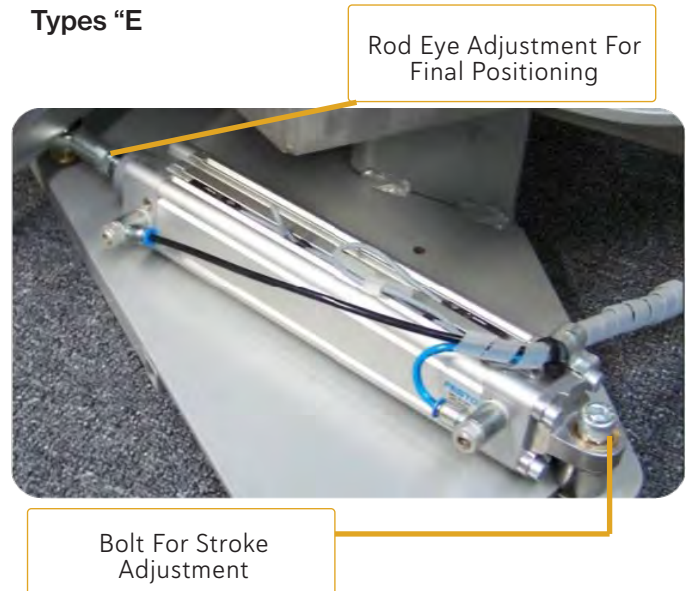
Types "A" , "B" and "D"



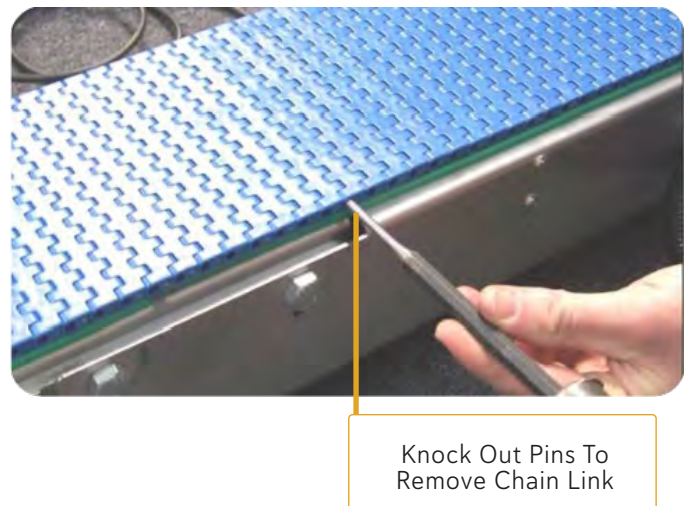
Types "C"



Types "E"



Conveyor Chain



The conveyor chain carries the product from the Blow molder.

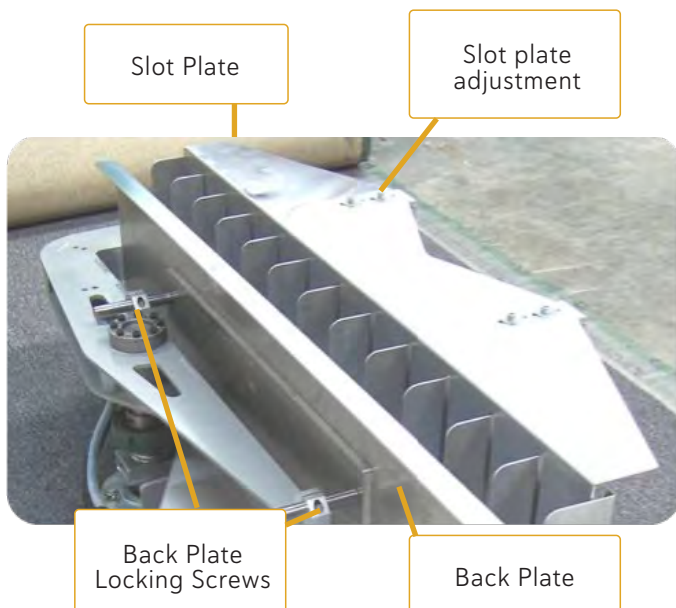
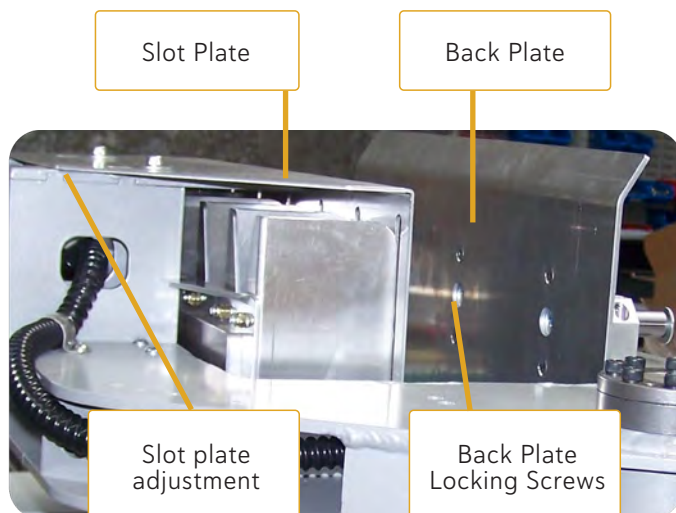
The link chain runs on solid stainless-steel bed. If adjustment is necessary it can be carried out by removing a link from the chain, adjustment should be checked every 6 months.

Tooling Adjustment

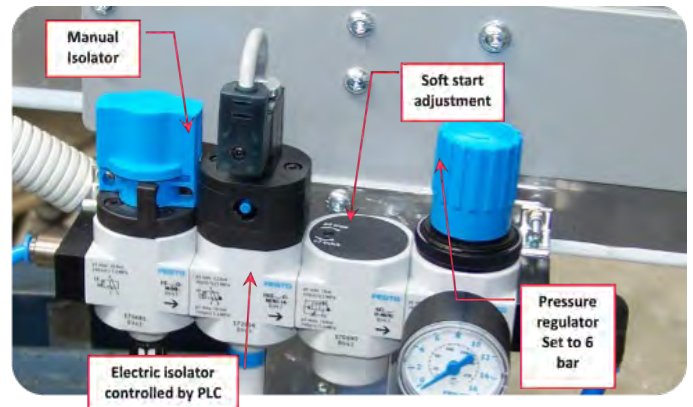
The generic tooling for this model is specific to the number of cavities in the mold. Adjustments can be made to suit the width between the back plate and tooling slot plate.

The method to follow is to:

- Apply air to the system and ensure the swing is in the fully in position.
- With containers in the molders neck splits, lower them into the takeout unit.
- Adjust the back plate so there is about 7mm clearance from each container.
- Adjust the slot plate so there is also about 7mm clearance from each container.
- Ensure locking bolts are tight.



PNEUMATICS



The air service pressure needs to be set to 6 bar. If the incoming pressure exceeds 9 bar, the soft start adjustment may have to be set faster or slower as required. The soft starter reduces the “whipping” usually associated with initially charging a pneumatic system.

OPERATION

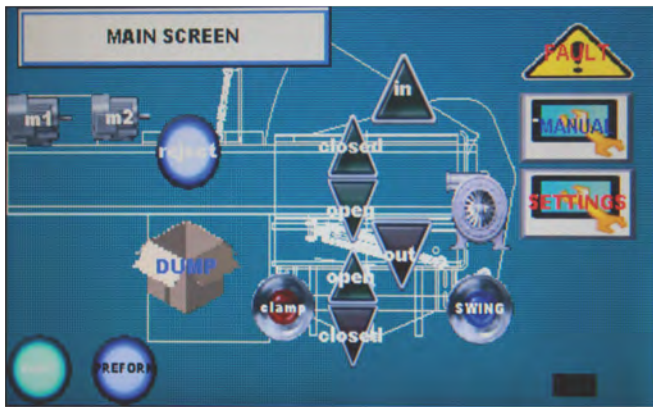
Powering the take out will start it in automatic, and perform an empty cycle to clear itself of any product. This cycle and a configurable number of additional cycles more will be diverted to the preform chute.

An optional pendant control is available to access manual control, monitoring and diagnostic functions (detailed on the next page).

Self-diagnosis of faults and jamb ups is provided, but without the pendant controller only raises a fault signal that may be monitored by external sources.

This fault condition is maintained till the unit is powered off and on or cleared at the control pendant. Diagnosed faults do not stop the automatic operation of the unit, as the fault cause may have been momentary.

Control Pendant



The optional control pendant provides monitoring, fault diagnosis and manual control of the takeout. This is not required for normal operation. When connected to the control cabinet, the display will display the main screen. For operating instructions for the control pendant, refer to the pendant manual (separate).

Motor Adjustment

The conveyor variable speed drive controls the acceleration, deceleration and maximum speed of the conveyor. The method for setting these is outlined in the appendices. In essence the conveyor should be set to twice the speed that would be needed to displace the length of the clamp tool in the time required. Then the acceleration and deceleration to approximately the RUN time in the takeout settings menu. The acceleration time can then be reduced to unload the tool quicker, if required, without risking the stability of the product. There are a number of factors to consider with these adjustments and the factory settings should accommodate 90% of applications. Trial and error may be required for some applications. Pacwel will assist in configuring the system for your application.

Initial Inverter Parameters

All default except:

- 1 = 120
- 2 = 30 to 90 depending on max speed needed
- 3 = 1.6 to 4 Acceleration time in seconds
- 4 = 1.6 to 4 Deceleration time in seconds
- 5 = 2 parameter write selection
- 6 = .18kw
- 7 = 230volts

84= 50hz

192 = 0 Output ABC motor running

MAINTENANCE

A) MAINTAIN CLEANLINESS

The most important aspect of the system maintenance is system cleanliness. Dirt and other foreign matter can cause havoc if lodged in the moving components.

Cleanliness is and should be considered the prime responsibility of the maintenance department as well as with other employees who come in contact with the equipment.

B) KEEP NUTS AND BOLTS SNUG

Majority of the components are mounted, secured and connected with nuts, bolts and lock washers.

Very few components are welded in place. This provides flexibility for possible future changes or replacements. To ensure problem free operation, nuts and bolts should be checked and tightened regularly

C) SAFETY FIRST

So far as is practical, maintenance on equipment should be performed with the power off.

It is necessary to power off the equipment while performing maintenance. Extreme care should be taken to avoid catching clothing, fingers, tools, etc, in the moving parts.

D) DRIVE-UNITS

Geared motors or worm-boxes have been used in the equipment.

The gearboxes of these units are factory filled with oil and we recommend the oil be changed annually, assuming 40 hours per week operation, in accordance with lubrication schedule.

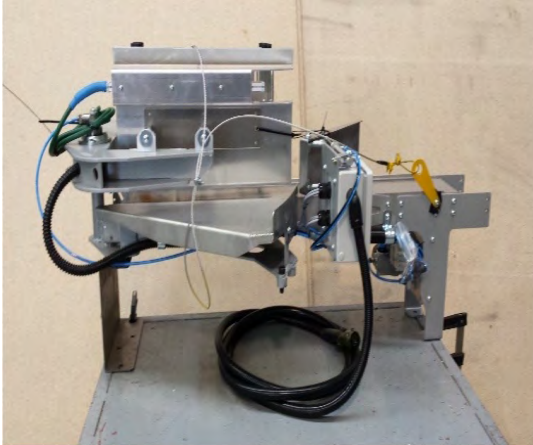
INSTALLATION & TECHNICAL

For shipping purposes, typically the takeout unit is shipped in components.

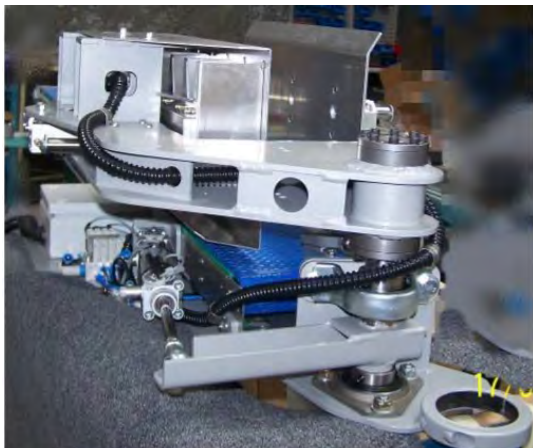
These are:

Main Base Assembly

Type "A"



Type "B"



Conveyor extension



Cable assemblies

Control Pendant



Control Cubicle



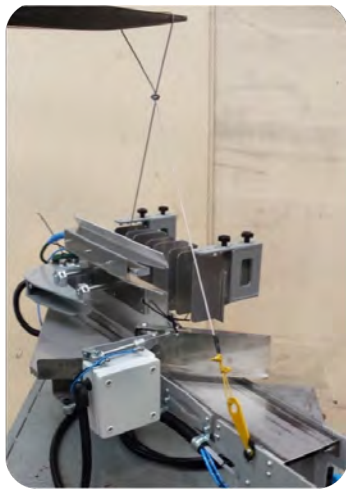
and necessary brackets, fasteners, regulator stop valve and conveyor belt.

To install into the Aoki molder, follow the following steps.

Type "A" Installation

1. Turn off the power to the molder.
2. Decide on position of control cubicle and mount it into position.
3. Identify and electrically connect the Molder to takeout cable and connect as per the wiring diagrams.
4. Remove any existing chutes installed in the molder.
5. Ensure the Molders base is clean, and the existing chute mount tapped holes are clear.

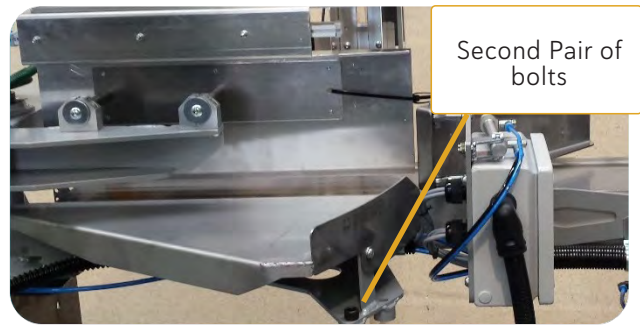
6. Lift the main base assembly using the cable and lifting eyes supplied. It is important that the assembly is not lifted by the swing frame, as this may damage and misalign the frame.



7. Lower and locate the supplied mounting bolts through the baseplate at the pivot end and into the molder's tapped holes.



8. Then fit the other pair of bolts into the opposing end.



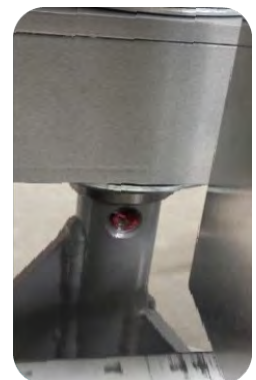
9. Tighten all four bolts and check alignment.

10. Remove the yellow lifting eyes and replace the bolts.

11. Fit the conveyor belt idler axle assembly into the slots at the pivot end of the conveyor.



12. Fit the preform air blast nozzle to the pivot shaft.



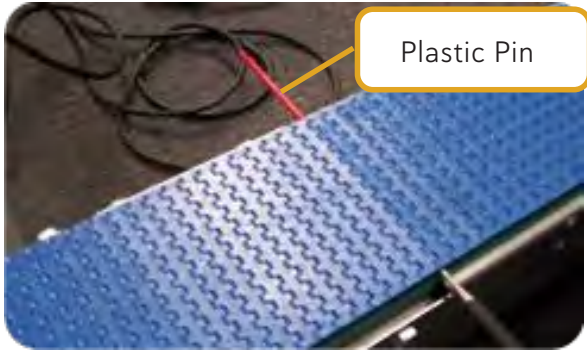
13. Fit and adjust the feet supplied to the cantilevered end of the conveyor.

14. Carefully slide the drive end extension piece up to the main conveyor section.

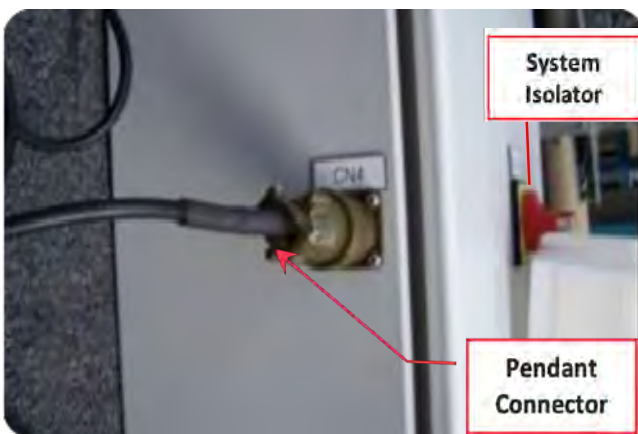
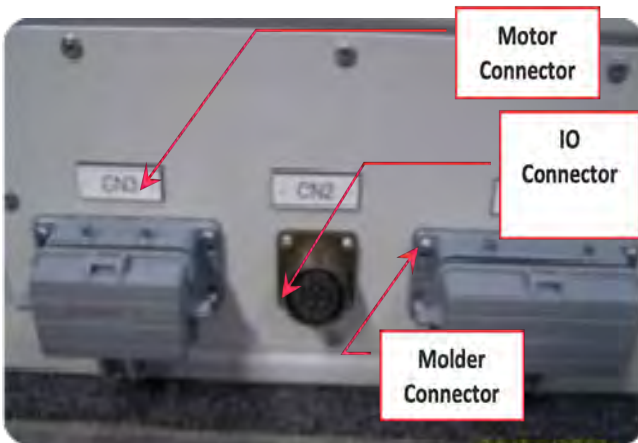
15. Align and install the splice bolts.



16. Feed the conveyor belt carefully around the drive sprockets and join the belt with the blue plastic pin. Ensure the pin is pushed home.



17. Connect the control cables, routing the cables carefully so that they cannot be damaged during operation.
18. Find a suitable position for the mounting of the supplied air regulator and stop valve outside the molders safety enclosure. Mount and connect to the valve block with 8mm poly tube.



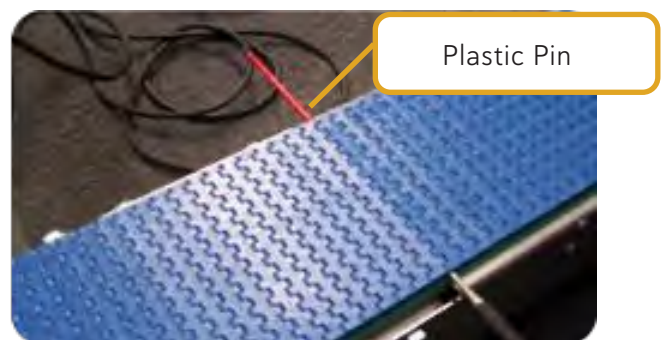
19. Carry out tooling adjustments as per the adjustment section of this manual.
20. Power up and test

Type "B,C,D" Installation

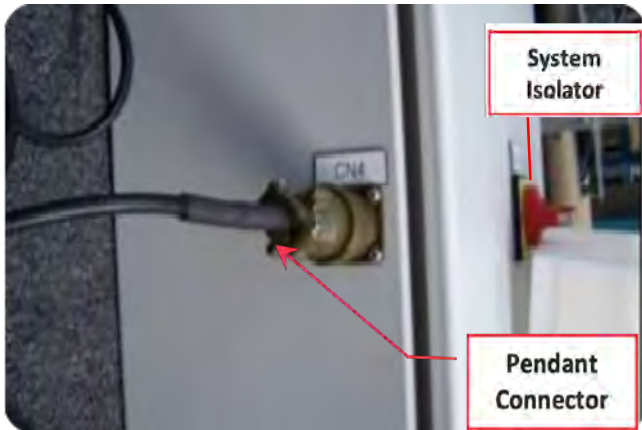
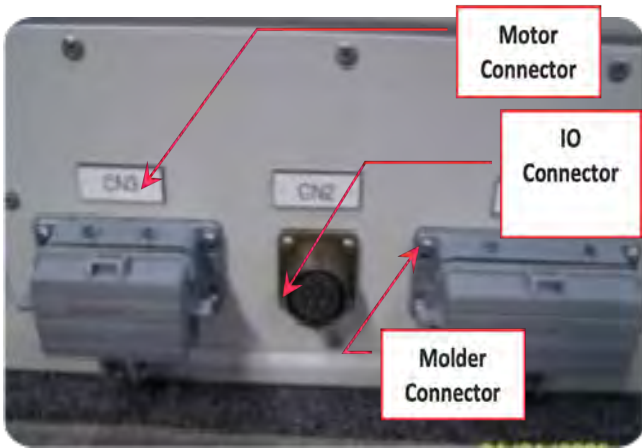
1. Turn off the power to the molder.
2. Decide on position of control cubicle and mount it into position.
3. Identify and electrically connect the molder to takeout cable and connect as per the wiring diagrams.
4. Remove any existing chutes installed in the molder.
5. Fit Conveyor support bracket to the conveyor end on the main base assembly.
6. Carefully place the main base assembly into position and attach it to the molders main base with the bolts provided.
7. Fit and adjust the feet supplied until the base is level.



8. Carefully slide the extension piece up to the main conveyor section, ensuring the long wear strips sit on the base of the main section conveyor.
9. Feed the conveyor belt carefully around the drive sprockets and join the belt with the red plastic pin. Ensure the pin is pushed home.



10. Connect the control cables, routing the cables carefully so that they cannot be damaged during operation.



4. Remove any existing chutes installed in the molder.
5. Fit Conveyor support bracket to the conveyor end on the main base assembly.
6. Carefully place the main base assembly into position and attach it to the molders casting with the 4 x 6mm bolts provided.
7. Carefully slide the extension piece up to the main conveyor section, ensuring to support the motor while installing the 6mm splice bolts.



11. Find a suitable position for the mounting of the supplied air regulator and stop valve outside the molders safety enclosure. Mount and connect to the valve block with 8mm poly tube.
12. Carry out tooling adjustments as per the adjustment section of this manual.
13. Power up and test.

Type "C" Installation

To install into the Aoki molder, follow the following steps.

1. Turn off the power to the molder.
2. Decide on position of control cubicle and mount it into position.
3. Identify and electrically connect the molder to takeout cable and connect as per the wiring diagrams. It is recommended that a relay and circuit breaker be fitted to the power feed to the takeout, which can be controlled by the molders door safety circuits.

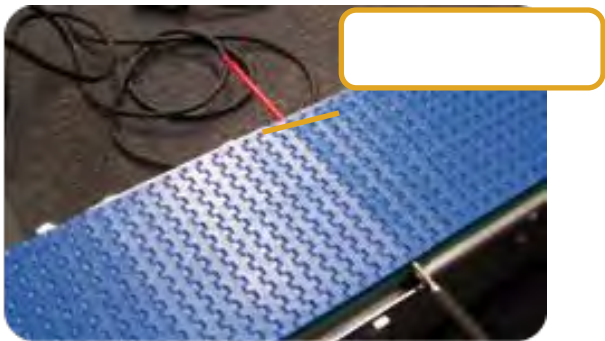
8. Align and install the 8 splice bolts.



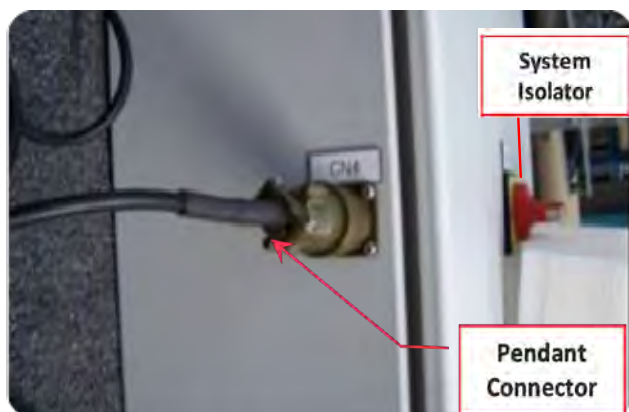
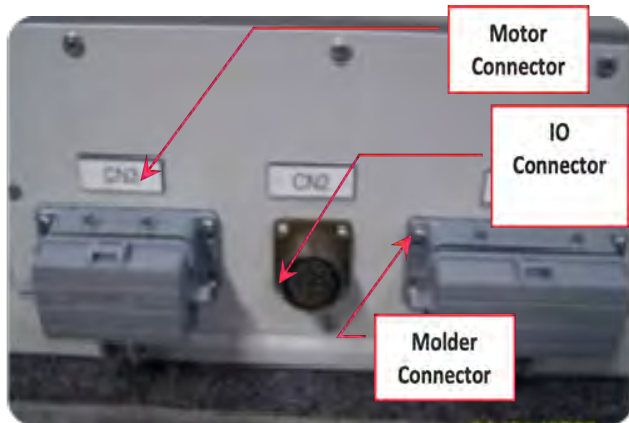
9. Install the idler sprocket assembly into the slots at the end of the conveyor.



10. Feed the conveyor belt carefully around the drive sprockets and join the belt with the red plastic pin. Ensure the pin is pushed home.



11. Connect the control cables, routing the cables carefully so that they cannot be damaged during operation.



12. Connect the air supply from the molders low pressure air circuit to the supplied isolation valve with the supplied fittings and 8mm tube.
13. Carry out tooling adjustments as per the adjustment section of this manual.
14. Power up and test.



PACWEL

TAKE OUT UNIT CONTROL SYSTEM USER INSTRUCTION MANUAL

**FOR AOKI ISBM
Model "S"
PLC Ver. 1A
HMI GOT 2000 Ver. D1 030621**

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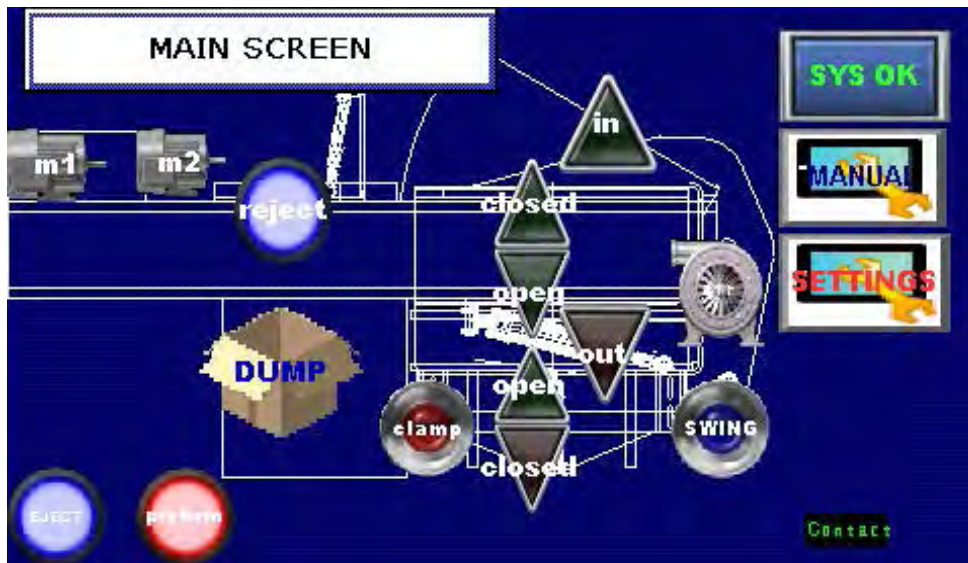
This manual is to read in conjunction with the maintenance and service manual for your appropriate take out unit.

Operation

An optional pendant control is available to access manual control, monitoring and diagnostic functions. While the control pendant provides the ability to set timers and perform additional functions, it is not necessary for normal operation.

It is recommended that one pendant per site is required. The pendant suits all Pacwel Takeouts with version 5E PLC code and will operate on both single and Dual row takeouts. Parameters are kept in the PLC, and no non-volatile parameters are kept in the HMI. Some timings and displays are intended for dual row takeout's and are displayed even though they may not apply to your system.

Control Pendant



Passwords

In using the control pendant, to enter Manual mode or the Settings screen you will be asked to enter a password. The default password of 1234 will allow entry to the Manual screen. The Password or 7099 will allow entry to both Manual and Settings screens. It is best to reveal only the manual password to the machine operator.

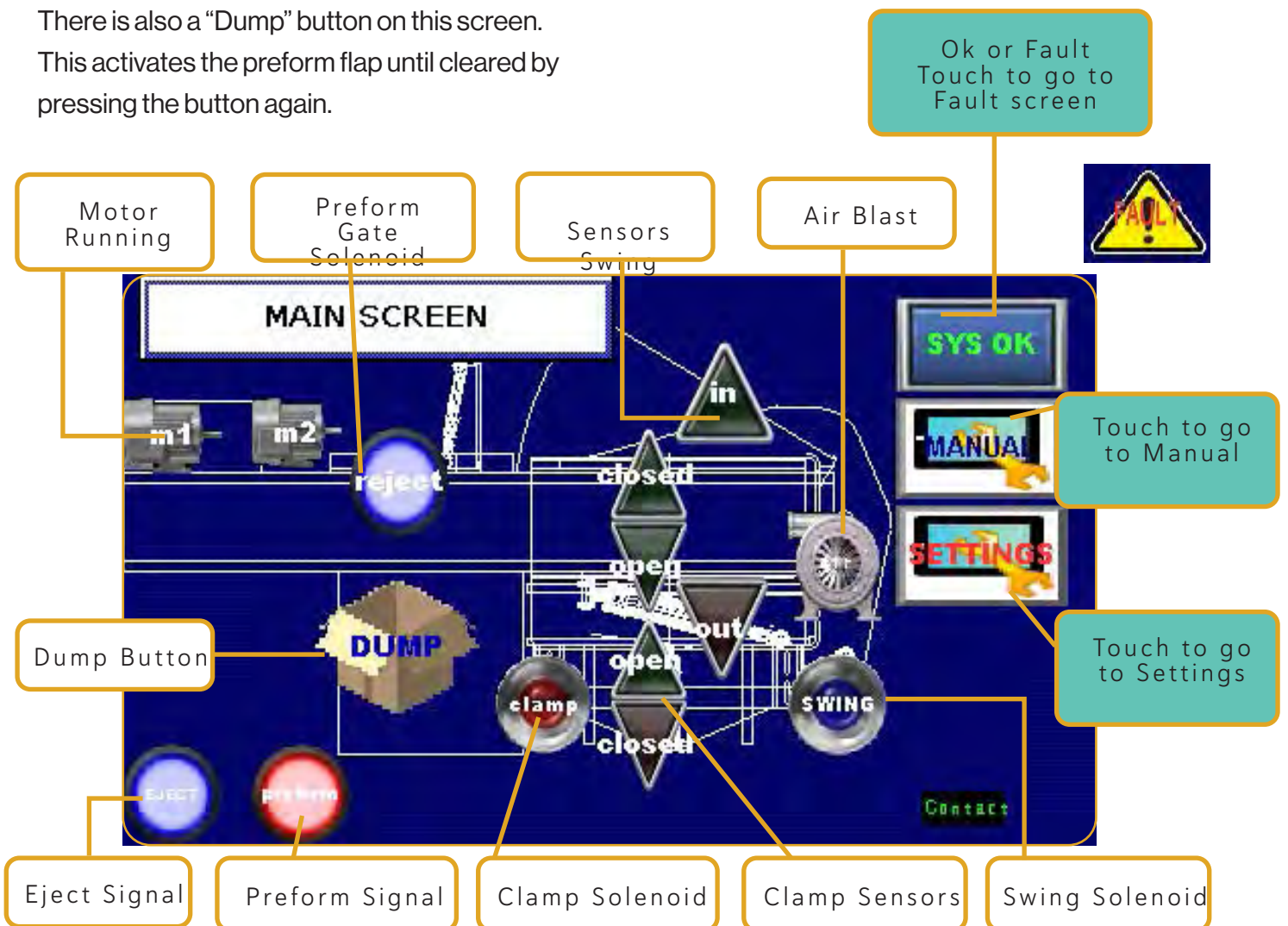
As a convention in this manual, all references to operator usable buttons in the controls system will be shown like this.

Main Screen

This is a screen that monitors the PLC inputs and outputs, showing the states of the sensors, solenoids and motor control. The system will remain in automatic mode unless you switch to Manual. The items on the screen change state as the components do. Most of the screen items are indicators only. The function buttons provided are the Fault, Settings change and Manual screen entry buttons.

Any selection apart from Manual, will leave the system in automatic mode. If in the settings screen, fault bypass is selected, a message will be displayed across the screen, to indicate it is not in normal operation. If the fault system is bypassed, this will be indicated on the top of the screen.

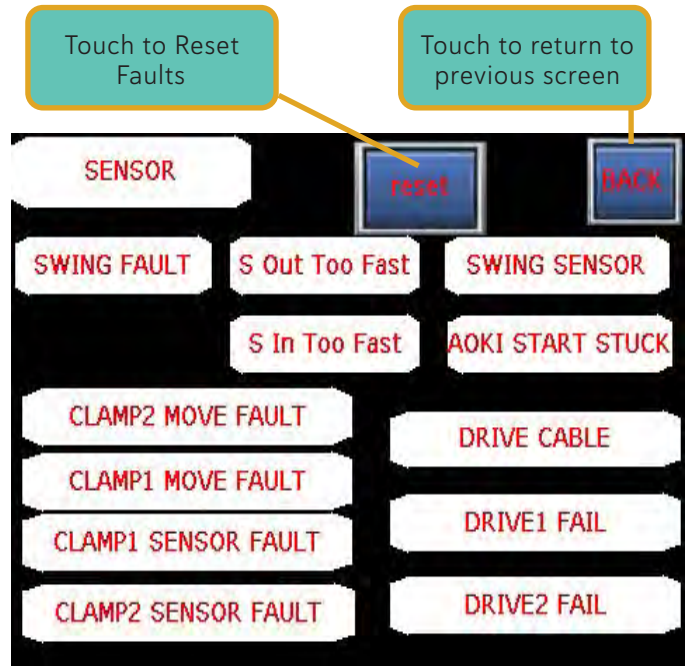
There is also a "Dump" button on this screen. This activates the preform flap until cleared by pressing the button again.



Fault Screen

This screen displays faults that may be diagnosed by Takeout system. When a fault has occurred, the OK display will change to Reset. By touching Reset the fault record will be cleared. Press Back to return to the previous screen. This is a guide when diagnosing the system.

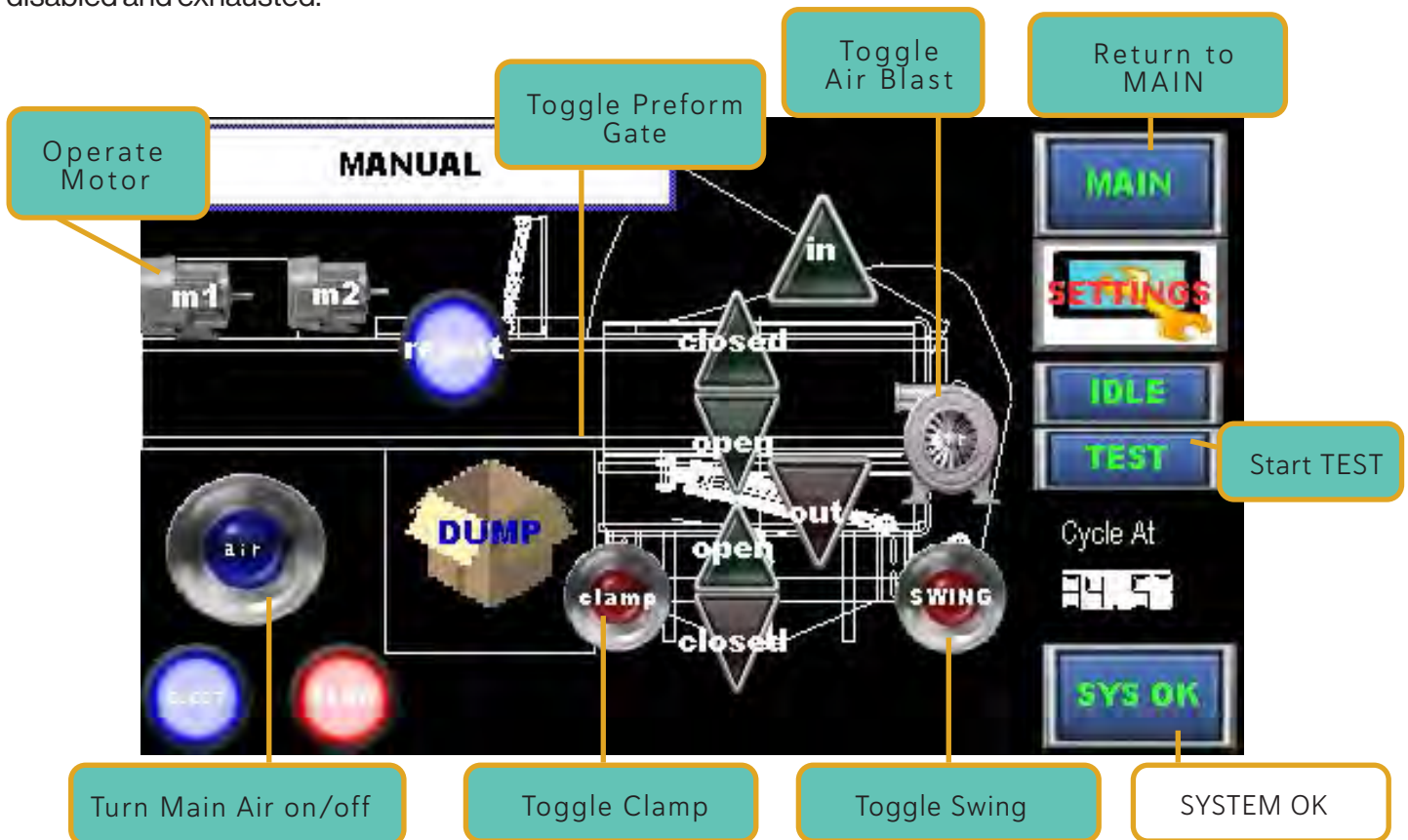
Move faults are based upon any movement taking more than 2 to 4 seconds. Sensor faults are when there are illogical states for the operation state, or a fault in the servo operated swing drive.



Manual Screen

This screen allows the operator to control individual aspects of the Takeout unit. Pressing TEST cycles the takeout until STOP is pressed. Press MAIN to return to Auto mode. When entering Manual mode, the system will drop out of automatic, and the main air connection will be disabled and exhausted.

When manual movement is required, the air must be turned on first. When returning to Main, the air will be automatically re-established.



Setting Screen

This screen allows the operator to access and adjust timers and counters within the Takeout unit.

These timers usually do not need adjustment unless you wish to address some operational issues or optimise the timing of the system.

Timers can be adjusted while the system is operational in automatic mode. All settings are automatically saved and will remain through power off/on.

To adjust the timers, tap on the number and a entry screen will appear. There you may enter the new number.

The screenshot shows the 'Setting Screen' with the following sections and callouts:

- PROCESS DELAYS**
 - SWING OUT: 5.6
 - SWING IN: 5.6
 - CONVEYOR 1 START: 5.6
 - CONVEYOR 2 START: 5.6
 - CLAMP OPEN: 5.6
 - CLAMP CLOSE: 5.6
 - CONVEYOR 1 RUN TIME: 5.6
 - CONVEYOR 2 RUN TIME: 5.6
- PREFORM SIGNAL ACTIONS**
 - PREFORM CYCLES: 6
 - AIR BLAST ON TIME: 5.6
 - AIRBLAST PULSE COUNT: 6
 - PREFORM EARLY RUN: 5.6
 - AIR BLAST OFF TIME: 5.6
- ACTUAL TIMING**
 - CLAMP OPEN: 5.6
 - CLAMP CLOSE: 5.6
 - TOTAL: 45.6
 - SWING IN: 4.56
 - SWING OUT: 4.56
- Navigation Buttons (Right Side):**
 - Return to Main (Callout: Return to Main)
 - RETURN TO MAIN (Callout: Swing Setup Page)
 - SERVO SWING SETUP (Callout: Enters Defaults Page)
 - SAVED SETTINGS (Callout: Enters Defaults Page)
 - BYPASS FAULTS (Callout: Bypasses Fault signals)
 - PACWEL UTILITIES (Callout: Enters Manufacturers Settings Page)
- Bottom Right:**
 - PLC Ver: AB
 - HMI Ver: S2

A quick description of the timers is as follows.

SWING OUT - The time after the eject signal is received from the blow molder till swing frame operates. Allows time for the product to fully enter the tool before moving. It also allows for premature signals from the molder. The usual settings are between 0.2 and 0.5 seconds.

SWING IN - Time before the swing frame returns back into the moulders eject position after the tool is commanded to close. Usually 0.0 to 0.3 seconds.

CLAMP OPEN - The delay before opening the clamp after the swing frame is in the unloading position. This allows unstable product to settle before opening. Usually 0.0 to 0.4 seconds, more may be required for very unstable products.

CLOSE - This are the time the clamp remains open and in the unload position before closing. Increase or decrease this to allow product to exit. Varies with model of takeout unit and the speed and acceleration of the conveyor. Should be from 2 to 4 seconds and is about the same as

the conveyor RUN time.

CONV1 START - Time from the opening of the clamp till the conveyor starts in normal operation. 0.0 to 0.3 seconds. This applies to the single row single drive.

CONV2 START - Used on the dual row Takeouts. Time from the opening of the clamp till the conveyor starts in normal operation. 0.0 to 0.3 seconds. In the case of dual row operation, the timing and running of these conveyors is crucial to the merging of the containers. Takeouts are setup from the factory to suit your operation. These settings should be recorded for future use, if necessary.

CONV1 RUN TIME - The time the conveyor accelerate signal is raised. This is usually about 0.2 seconds less than the accelerate time set in the motor controller and about the same as the CLOSE time. This can be adjusted along with the maximum speed in the motor controller to optimise cycle time or allow longer for products to exit the swing clamp assembly. Usually about 2.0 to 4 Seconds.

CONV2 RUN TIME - (Used on Dual Row units) The time the conveyor accelerate signal is raised. This is usually about 0.2 seconds less than the accelerate time set in the motor controller and about the same as the CLOSE time. In the case of dual row operation, the timing and running of these conveyors is crucial to the merging of the containers. Takeouts are setup from the factory to suit your operation. These settings should be recorded for future use, if necessary.

PREFORM CYCLES - This is the number of cycles that the system will operate in preform mode

after the blow signal from the molder is re-established. 2 is the default. Used to divert "test" and early product to the reject chute. Range 0 to 6.

PRE EARLY RUN - When preforms are not being blown into containers, the conveyor can be started before the swing frame has reached the unloading position. This can assist in the preform injection gate passing cleanly across the conveyor. This timer allows the conveyor to be started early during the preform or non-blowing cycles. The time displayed is from the start of the SWING OUT to the start of the conveyor and should be set to 0.2 seconds less than the real OUT time. (Which can be seen on the Timing screen. 0.6 to 1.0 seconds.

AIRBLAST PULSE COUNT - This relates to the preform air blast system. It is the number of posts preform cycles the air blast system operates for. This allows the air blast to be nonoperational once containers are being blown, so that they may exit the dump gate "gracefully".

AIRBLAST ON AND OFF TIME - These relate to the preform air blast system. When active the first timer is the time of the initial blast which occurs when the clamp opens, and the second is the pause Between blasts. 0.3 for both is a good starting position.

BYPASS FAULTS - This inhibits the internal function of fault detection from stopping the ready signal to the molder. Maybe used in emergency by maintenance personnel to allow operation to continue.

Servo Swing Setup Screen

This screen allows adds the ability to specify the takeout style and swing mechanism to adapt the control system to operate it correctly. This will be set at the factory and should not be altered. It also provides the functionality for the technician to adjust the inner and outer positions of the swing frame after it has homed. Instructions are on the screen and can be easily followed.

Adjusting the Swing movement

This is only applicable to the servo driven model takeouts. After starting the takeout normally with all the safety circuits in the healthy state, the takeout will HOME to define a reference position.

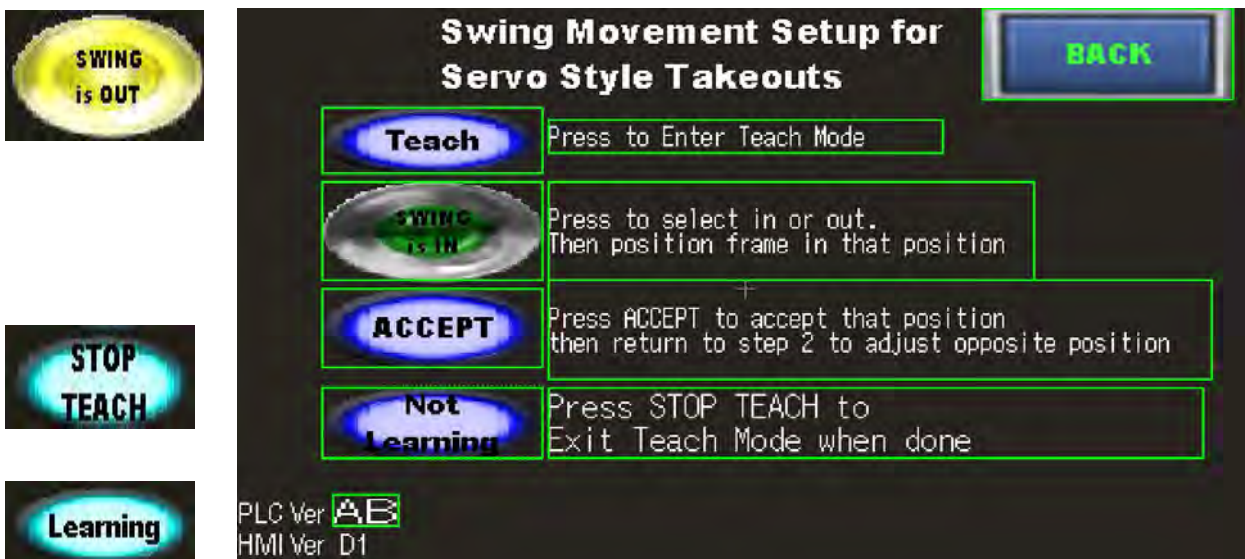
NB: It is extremely important the takeout has homed before starting the process of adjusting the swing movement. Care must be taken to not jump belt teeth while manually manipulating the arm.

After it has homed, you may press the teach button on the screen to enter the teach mode. Then you can open the Aoki doors and the drive

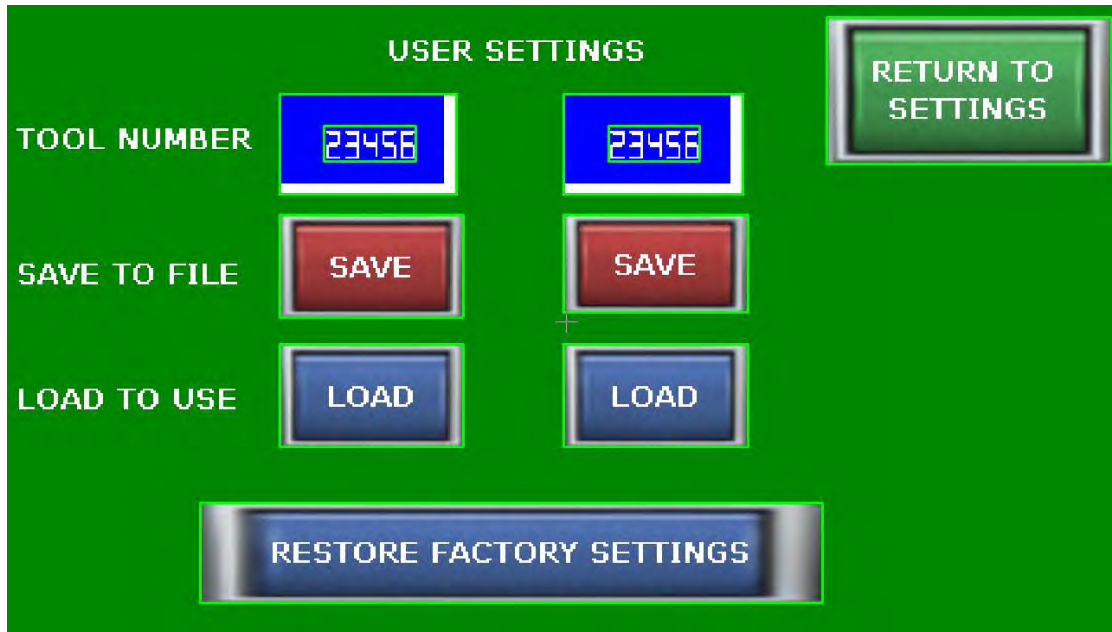
should become electrically dead.

Press the second button down to choose between the swing in or swing out positions. Physically swing the arm to the desired position, then push the Accept button to allow the system to record it.

Repeat for the opposing position if required. When complete press the “stop Teach” button to complete the operation and exit the teach mode. You can now return to normal operations.



Defaults Screen



This screen allows the operator to save and load settings within the system or reset to factory defaults. Each tool number can be edited to a numeric value of 15000. By using the SAVE button, the current settings are recorded to a file for later recalling. Pressing the LOAD button will recall the settings to operation. By Pressing the RESTORE FACTORY SETTINGS button all settings will be set to initial working settings used in factory setup and testing, but fine tuning may be required to cater for some applications.