

F1300N ROTARY TABLE



OPERATING MANUAL



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Table of Contents

SECTION 1: Introduction	5
1. Safety Precautions	6
2. Package contents	7
3. Connector and switch location	9
3.1. Front View	9
3.2. Back View	10
SECTION 2: Setup	11
1. Unpacking the Rotary Table	12
2. Removing the Rotary Table	12
3. Setup	13
3.1. Drive Cylinder Setup	15
SECTION 3: Teaching Overview	16
1. Teaching Overview	17
2. Rotary Table Menu Summary	18
2.1. Production Screen	18
2.2. Test Screen	20
2.3. Setup Screen	22
SECTION 4: Programming Example	24
1. Programming examples	25
1.1. Glue Timings	25
1.2. Motor Timings	26
1.3. Cylinder Timings	26
1.4. Example Program	27
2. Optimizing Dispense Cycle	29
2.1. Dispense Pressure	29
2.2. Rotation Speed	29
2.3. Dispense Angle	29
2.4. Tail Angle	29
2.5. Rotation Delay	29
2.6. Dispense Delay	29
3. Changing the Program Number	30
SECTION 5: Error Messages and Specification	32
1. Error Messages	33
1.1. Door Error	33
1.2. Emergency	33
1.3. I/O Alarm	33
2. I/O Specifications	34
2.1. I/O Pin Assignment	34
2.2. I/O System Specification	35
2.3. Ext. Control Pin Assignments	36
3. System Specification	37
4. Machine Dimensions	38
4.1. Work Table Dimensions	39

SECTION 6: Maintenance and Periodic Inspection	40
1. Check Cycles and Methods	41
1.1. General Considerations	41
1.2. Check Cycles and Points	41
1.3. Check Methods	41
2. Mechanical Parts List	44

SECTION 1: Introduction

1 Safety Precautions

- 1.1 **In order to meet the requirements of the European Community (CE) safety directives, the rotary table must be placed in an enclosure supplied by Fisnar Inc. distributors.** The enclosure will prevent the operator from entering the rotary table work area and will generate an emergency stop signal if the enclosure's door switch is opened while the rotary table is running.
- 1.2 Make sure the rotary table and accessories are connected to a properly grounded power source.
- 1.3 Do not drop or spill foreign objects or material such as screws or liquids into the rotary table.
- 1.4 Do not touch any moving parts while the rotary table is running.
- 1.5 Loading and unloading of parts and material must be done when the rotary table is not running.
- 1.6 Changing of fixtures or tooling must be done with the power source disconnected.
- 1.7 The F1300N Rotary Table should only be operated in an environment of 0 to 40 degrees centigrade and humidity of 20 to 95 percent with no condensation.
- 1.8 Do not store or install the rotary table in an area where it is exposed to direct sunlight.
- 1.9 Do not operate the rotary table where electrical noise is present.
- 1.10 Only use a neutral detergent for cleaning. Do not use alcohol, benzene or thinner.

2 Package Contents

In addition to this operating manual, the following items should be included with the rotary table:



Main Unit



**Moveable Post Y axis
(mounting screws)**



X Axis Post



Drive Cylinder Z axis



6mm Mains air out Plug



**Barrel Holder
(holder accessories)**



Mains Air Piping 8mm



Power Cables



Shorted Ext. Connector Plug



Open Ext. Connector Plug



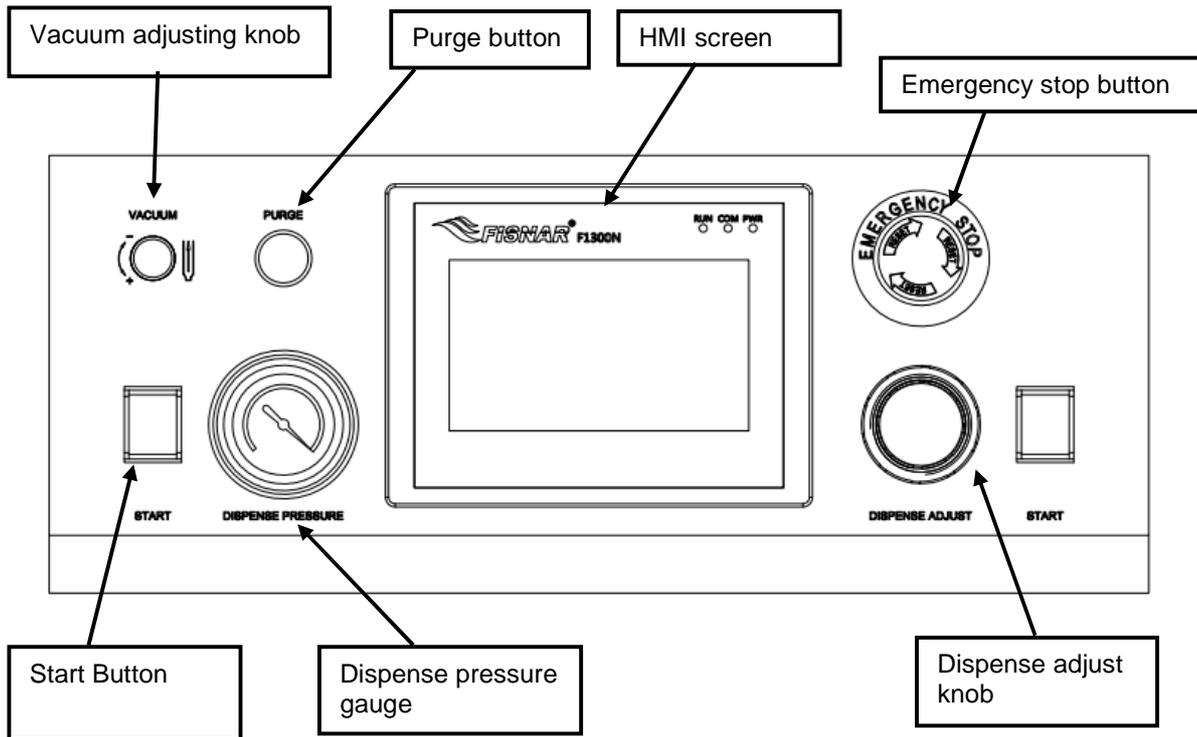
Foot Pedal



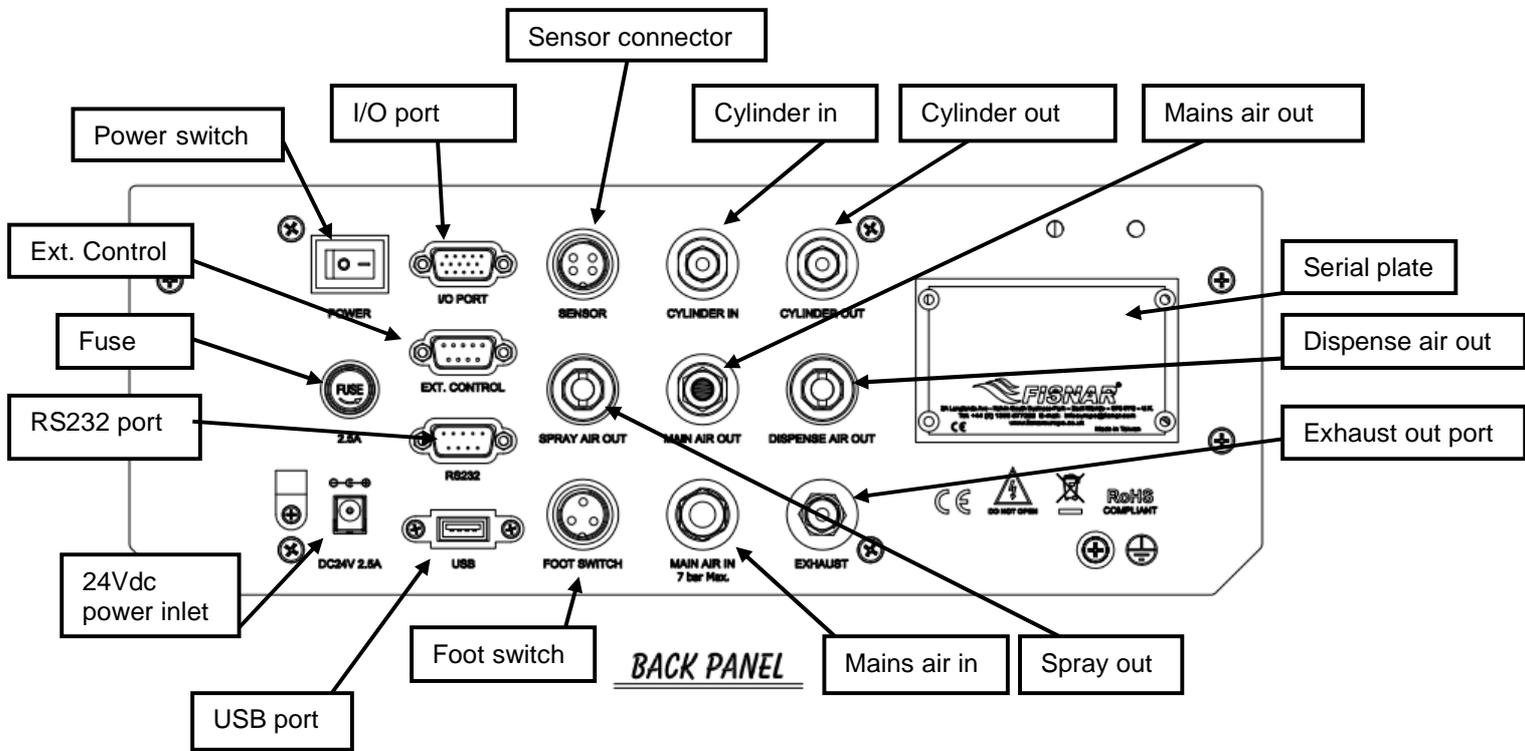
I/O Port Connector

3 Connector and Switch Locations

3.1 Front View



3.2 Back View



- CYLINDER IN : 4mm push-in
- CYLINDER OUT : 4mm push-in
- MAIN AIR OUT : 6mm push-in
- DISPENSE AIR OUT : 2004BA Quick connector
- MAIN AIR IN : 8mm push-in
- EXHAUST : 4mm push-in
- SPRAY AIR OUT : 2004BA Quick connector

SECTION 2: Setup

1 Unpacking the Rotary table

- Unpacking the rotary table will require a minimum of two people. Do not attempt to lift the rotary table without assistance.
- Always lift the rotary table from the base.
- Remove all accessories from the shipping package before attempting to remove the rotary table.
- Place the rotary table on a stable workbench.
- Do not discard the packing material or the robot's shipping bracket as these items may be needed if the rotary table is shipped or moved in the future.

2 Remove

All units are shipped from the factory with Foaming Covers installed. The shipping Foaming Covers secure the worktable to Y Axis and X/Z head to prevent movement and damage during shipment.

Remove the shipping Foaming Covers removing the secured tapes.
Keep the Foaming Covers and packages in a safe place for future use.



3 Setup

The F1300N Rotary tables are available in many different configurations. The configuration of each machine and the accessories used with each system will depend on the customer's application.

The steps required to setup a system using a 30 cc or 55 cc barrel are listed below.

- 3.1. If the system is being used in the European Community, the rotary table must be placed in an enclosure supplied by Fisnar Inc. distributors. The enclosure will prevent the operator from entering the rotary tables work area and will generate an emergency stop signal if the enclosure's door switch is opened while the rotary table is running. Connect the external start / stop box and door switch or light curtain to the Ext. Control connector on the main unit. For further information, see *Error! Reference source not found.* **Ext. Control Connector.**

If an enclosure is NOT being used, the enclosure door switch can be bypassed by connecting the plug labeled SHORTED (included in the rotary table accessories box) to the Ext. Control Connector.

- 3.2. Standard systems are shipped with a barrel holder, which must be mounted on the Z head of the rotary table. The barrel holder will hold a 30 cc or 55 cc barrel on the rotary tables head. An optional valve / cartridge bracket assembly may be used as a replacement for the barrel holder if the application so requires.
- 3.3. Mount the barrel holder or valve bracket assembly on the Z axis head as shown, using two screws. The barrel holder has several sets of mounting holes to allow it to be mounted at different heights. Choose mounting holes which give maximum work piece clearance but allow the tip to reach all areas on the work piece where dispensing is required.



- 3.4. When the Rotary table base is set on a secure work table, take the X axis mounting post and fix it to the mounting table top, use the M5 x 25 cap head screws supplied with the post.
- 3.5. Mount the secondary Y axis post to the X axis post at an appropriate height for the application. The post's height is locked in place using the threaded locking handle and slotted mounting bracket.
- 3.6. Mount the air cylinder Z axis moving plate onto the Y axis mounting post, the mounting bracket will slide on the post into position based on the application specified. The air cylinder's Y axis position and dispense angle can be locked in place using the threaded locking handle. The "cylinder in" must be at the bottom of the drive cylinder or the Z axis will travel in the wrong direction.
- 3.7. Connect the pneumatic pipes to the matching labelled tube to tube fittings. I.e. pipe labelled "cylinder out" to back panel 4mm push connector labelled "cylinder out". Connect the cylinder in pipe to the cylinder in 4mm push connector. The Z axis drive cylinder sensors connector to the back panel 4 pin connector labelled "sensor"
- 3.8. Connect the extras from the accessory box. Pneumatic plug into mains air out. Shorted ext. connector to link the emergency stop signal. Mains air in, 6mm air fitting. Connect the power plug to a 230vac mains power plug.
- 3.9. Check all connections are secure, and none of the pneumatic connections are leaking air.
- 3.10. Tie back all cables and air lines so that they will not interfere with the rotary tables motion when the rotary table is operating. Be sure that the cables and air lines do not restrict the motion of the rotary tables, Z axis drive cylinder and of the rotary tables motor and make sure that they cannot become jammed as the rotary table moves in the work area.
- 3.11. The mounting posts can but moved and slid into place and aligned with the area of dispense of the specified part.
- 3.12. It is recommended to setup the flow control valves that regulate the drive cylinder before positioning the dispense tip to the application. This can be done when driving the cylinder in the "test screen". Set the flow control to drive the cylinder at a controlled speed that meets application requirements.

Note that this unit ships with a Shorted External Control Connector. This is not connected when shipped. Unless this is plugged in, the unit will display an EMG ERROR (Emergency Stop). Please insert the Shorted Connector.

3.1 Drive cylinder Setup

To correctly set up the drive cylinder for application usage:

- After plumbing in the mains air supply to the 8mm fitting on the back of the rotary table, and the 4mm cylinder in and cylinder out pipes into the correct flow regulator fittings. Use a dummy program to set up the cylinder movement speeds
- Fully close both flow regulators before beginning.
- Start the Dummy program to actuate the pneumatics and begin to move the drive cylinder.
- Slowly open the "Cylinder In" flow regulator to release the air pressure in the drive cylinder and begin the movement down towards the dispense location
- When the cylinder is moving at a speed appropriate for the application use the locking nut to set the flow regulator parameter.
- After the Cylinder in flow regulator is set, then repeat the above to set the "Cylinder Out" flow regulator the same way, by opening until the required speed is set and lock it in place
- The flow regulators are pneumatic dampeners, meaning they act as slow air release air cushions to control the movement speed of the drive cylinder.



Cylinder out flow regulator, showing locking nut and adjustable knob for flow rate.

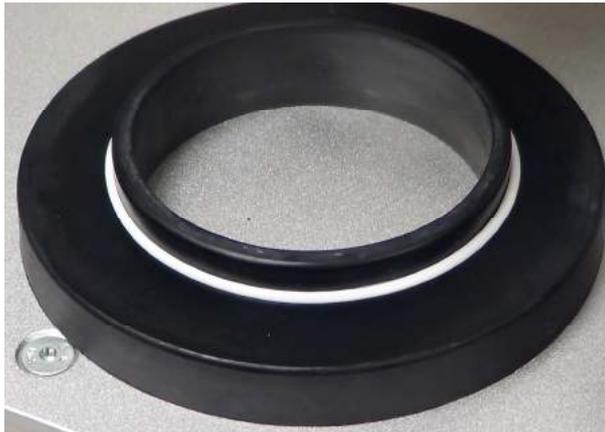
SECTION 3: Teaching Overview

1 Teaching Overview

A program consists of a series of parameters stored in the main unit memory. Each parameter is stored in a numbered program memory. The programs consist of motor rotation angle, speed and control delays.

When the program is executed, the rotary table will actuate the Z axis drive cylinder to travel to dispense position set mechanically during set up. When the cylinder reaches travel distance the delay timers start and begin the parameter set dispense sequence.

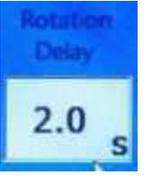
The rotary table applications are for full circular dispensing applications. Being internal gaskets or external gaskets on a rounded object. Or an application for a rounded dispense less than a full circle.

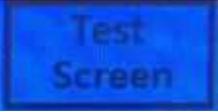


2 Rotary Table Menu Summary

2.1 Production Screen

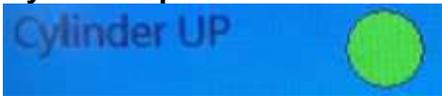
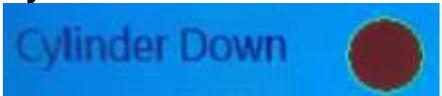
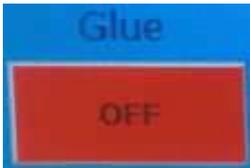
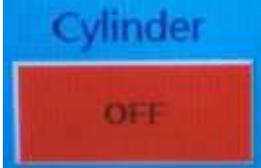
Below is a list of functions, which are found under the **Production Screen**:

<i>Function</i>	<i>Description</i>
<p>Dispense Angle</p> 	<p>Sets the parameter for the angle of rotation of the motor during the dispense cycle</p>
<p>Tail Angle</p> 	<p>Sets the parameter for the angle of rotation for after the dispense angle is complete (no material is dispensed on this angle)</p>
<p>Rotation Delay</p> 	<p>This is a time in seconds to create a delay before beginning the dispense angle rotation. This time starts once the drive cylinder moves into place.</p>
<p>Dispense Delay</p> 	<p>This is a time in seconds to create a delay before the start of material dispense. This time starts once the drive cylinder moves into place.</p>
<p>Rotation Speed</p> 	<p>This is the speed of motor rotation during the dispense cycle. Measured in RPM.</p>

<i>Function</i>	<i>Description</i>
setup screen 	This button opens the settings menu on the HMI touch screen. This menu is password protected.
Test Screen 	This button opens the Test screen on the HMI touch screen. This menu is password protected.

2.2 Test Screen

Below is a list of functions, which are found under the **Test Screen**:

<i>Function</i>	<i>Description</i>
Cylinder Up 	Shows a red or green light to show when this function is active or in active. When active it shows the drive cylinder is at the top of its location. And when inactive it shows the cylinder isn't at the top of its location.
Cylinder Down 	Shows a red or green light to show when this function is active or in active. When active it shows the drive cylinder is at the bottom of its location. And when inactive it shows the cylinder isn't at the bottom of its location.
Motor 	Shows a red or green light to show when this function is active or in active. When active it shows the motor is rotating at the speed set in the production screen. And when inactive it shows the motor isn't moving.
Glue 	Shows a red or green light to show when this function is active or in active. When active it shows the dispense solenoid is active and the rotary table is dispensing fluid. When inactive the solenoid is close and no fluid is being dispensed.
Glue On/Off 	This button actuates the dispense solenoid in the rotary table system to test if it is functioning correctly. On, opens the solenoid to dispense fluid. Off, closes the solenoid and stops fluid from being dispensed.
Cylinder On/Off 	This button actuates the drive cylinder to move from its top position, to its bottom position. On, drives the cylinder from its top position to its bottom position. Off, drives the cylinder from its bottom position to its top position.
Motor On/Off 	This button activates the motor to rotate at the speed set in the production screen. On, starts the motor rotation. Off, stops the motor rotation.

<i>Function</i>	<i>Description</i>
<p>Spray On/Off</p> 	<p>This button activates the atomizing air solenoid in the rotary table. On, the solenoid is open and atomizing air is on. Off, the solenoid is closed and the atomizing air is off.</p>

2.3 Setup Screen

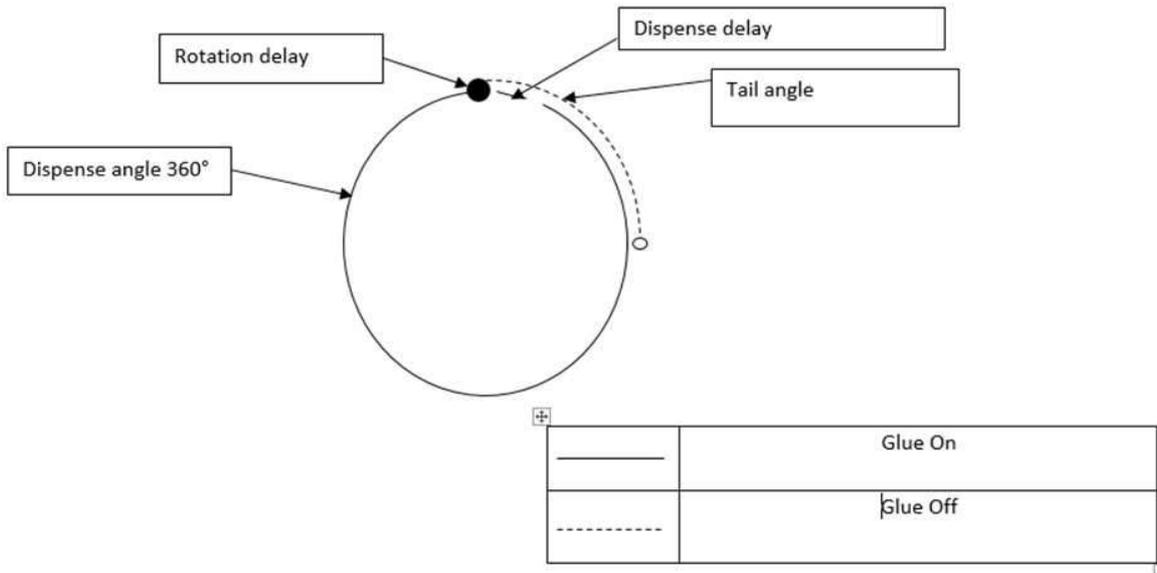
Below is a list of functions, which are found in the **Setup Screen**:

<i>Function</i>	<i>Description</i>
Language	This opens a drop-down menu to choose a language to set the machine in.
Motor acceleration Time	The Motor Acceleration time is a parameter which sets the speed it takes for the motor to reach the set RPM from the production screen. The time is set in milliseconds. The higher the value the longer the time of increased speed. Speeds can be set from 50ms – 999ms.
Auto Cycle Delay	This chooses a time in seconds, to have as a delay between automatic cycles.
Test Screen	This is where to set the password for the Test Screen
Setup Screen	This is where to set the password for the Setup Screen
Screen Lock	This button stops the parameters in the production screen from being changed within the program.
Reset Count	This resets the total cycle count being counted in the Setup Screen to 000000000.
Cycle Count Limit	This sets a value in the setup menu which creates a limit of cycles when reached will send a service requirement alert.
Program Select	This opens a drop down menu to select which program to have the rotary table work in. being from program 1 – 9.
Firmware Version	This shows which software version the rotary table is using.

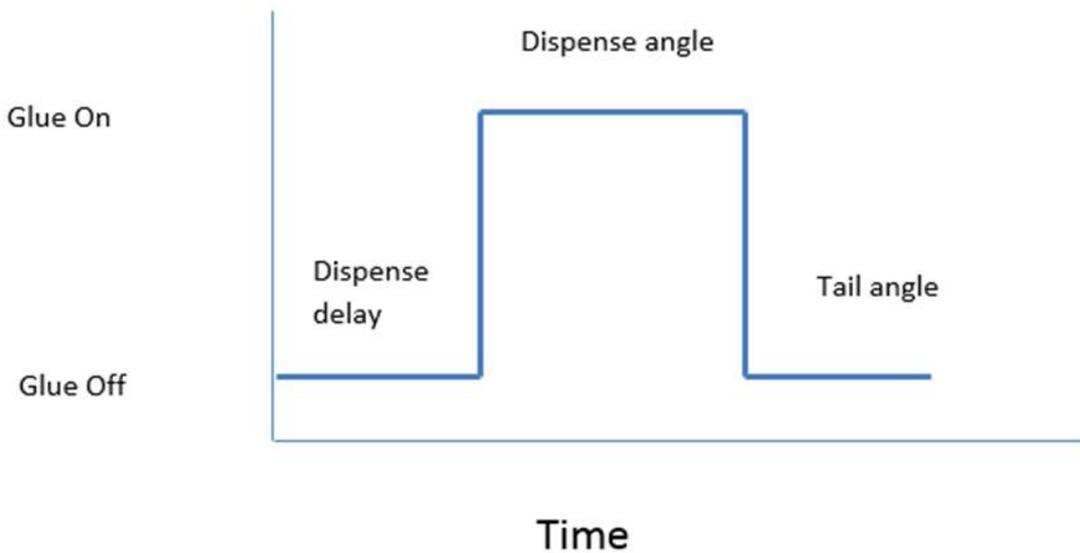
<i>Function</i>	<i>Description</i>
Total On Time	Shows the total number of Minutes the rotary table has been active.
Total Cycles	Shows the total number of complete dispense cycles the rotary table has run.
Current Cycle Count	This shows the total number of complete dispense cycles run, during the time the rotary table has been active. This number resets to 000000000 when the rotary table is turned off.

SECTION 4: Programming Example

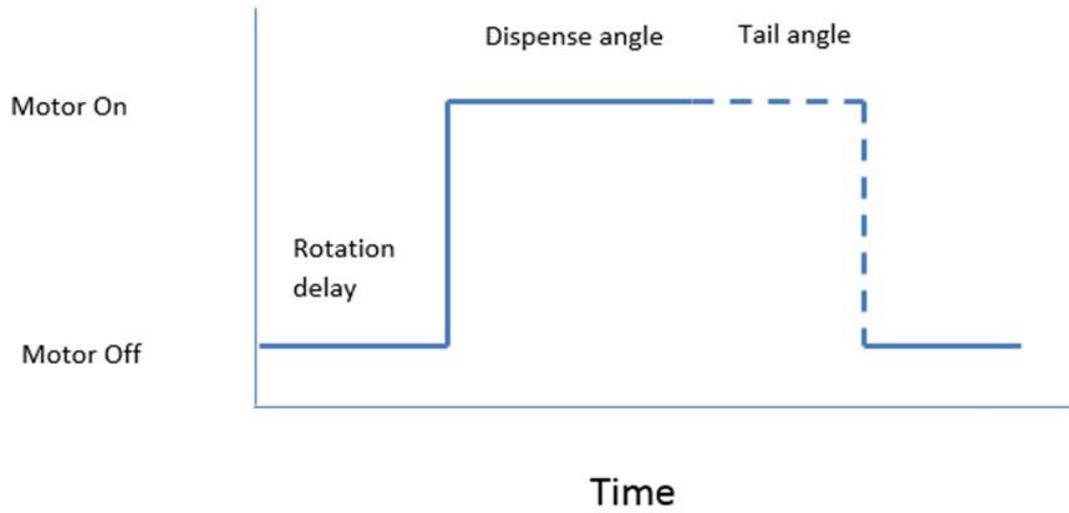
1 Programming Example



Glue timings

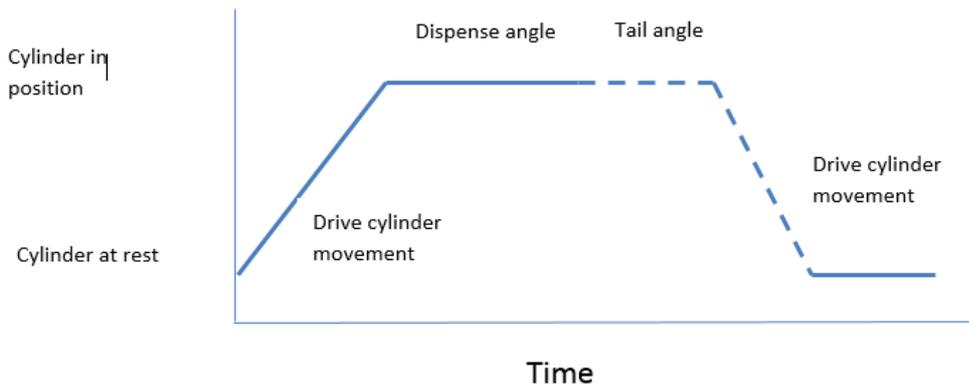


Motor timings



Cylinder timings

Drive cylinder movement is depended on the flow regulation of the regulation fittings



	<i>Instruction</i>	<i>Display Shows</i>
1	Turn on Rotary table and touch the HMI screen to open the production Screen	
2	Open the test screen and press the cylinder on/off, to turn it "ON" and drive the cylinder to the bottom position.	
3	Maneuver the tip into the required location on the part to be dispensed onto and lock the axis into place.	
4	When the tip is in the correct position, press the cylinder on/off button, to turn it "OFF" and drive the cylinder back to the top position.	
5	Open the Production screen, to start teaching.	
6	Touch the values box for the Dispense angle on the HMI screen to open the numbers box and select the required angle of dispense.	
7	Touch the values box for the tail angle on the HMI screen to open the numbers box and select the required angle of tail for the end of the material.	
8	Touch the values box for the rotation delay on the HMI screen to open the numbers box and select the required time delay required for the application.	
9	Touch the values box for the Dispense delay on the HMI screen to open the numbers box and select the required time delay required for the application	
10	Touch the values box for the rotation speed on the HMI screen to open the numbers box and select the required rotation speed for the application	

	<i>Instruction</i>	<i>Display Shows</i>
11	Press the start button to start the dispense cycle, if the previous set parameters aren't correct edit them to improve the dispense.	

2 *Optimizing Dispense Cycle*

Ways to improve and adapt the quality and finish of the dispense bead.

Dispense Pressure:

- An increase in the dispense pressure will increase the flow rate of materials from the mounted syringe, cartridge or valve being used for the application. Higher flow rate means, higher volume of material.

Rotation Speed

- An increase in rotation speed will change the total time of the dispense tip being in one location on the work piece. This will cause less volume of material to be dispensed onto this area. Meaning the higher the speed the thinner / lower volume of material to be dispensed.

Dispense Angle

- An increase in the dispense angle may lead to an over lapping of material over a certain value of degrees. 360°, is one full circle. 450°, is one full rotation plus 90° over lapping of material.

Tail Angle

- The tail angle can be used to over travel past the point of gasket connection or end of the material bead. This can drag or pull thicker material to stop a “stringing” affect at the end of the dispense cycle

Rotation Delay

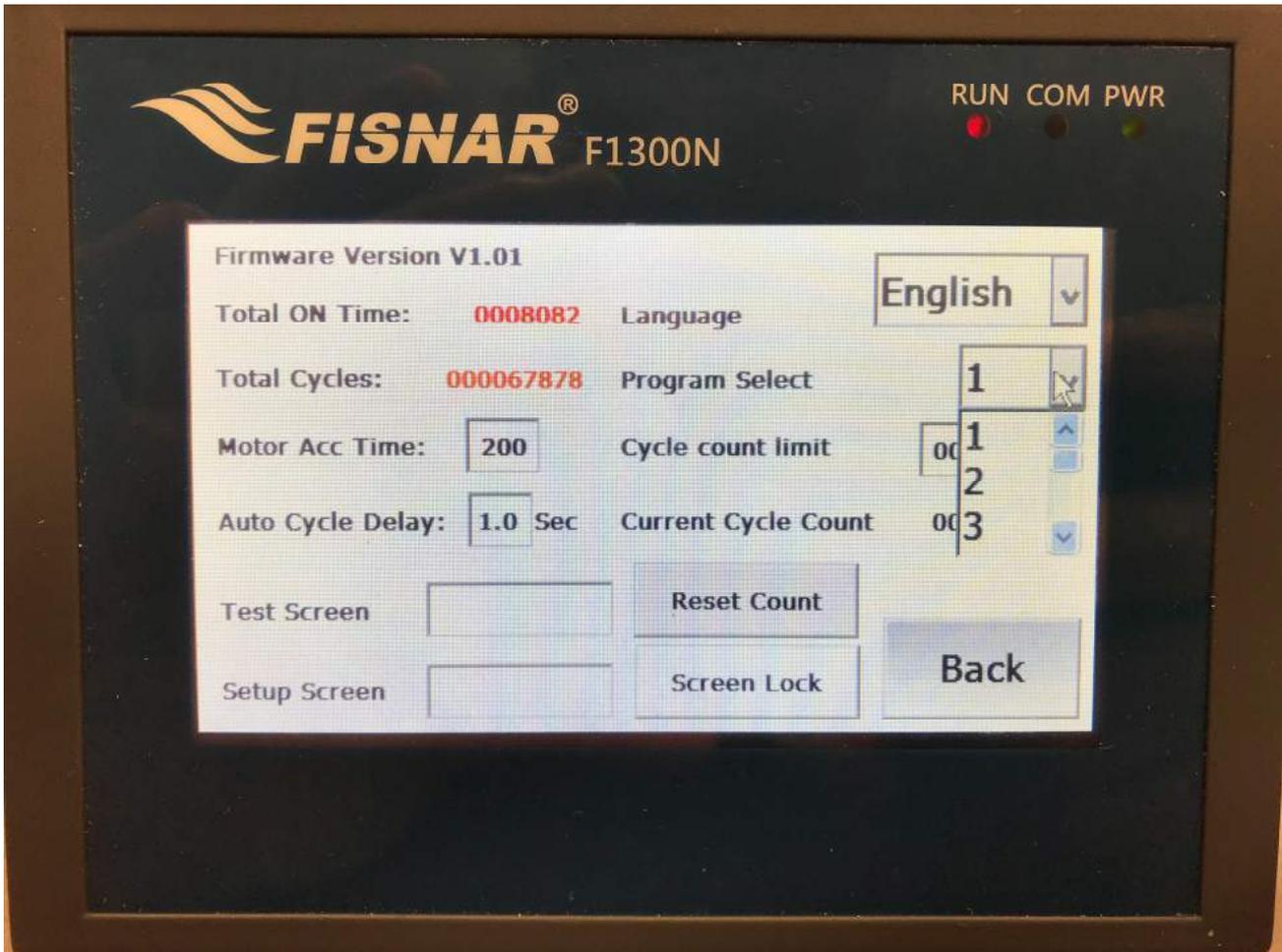
- An increase in the rotation delay will show a rise in the time before the motor starts moving. This will allow material with a higher viscosity or low flow rate to be dispensed onto the work piece without a gap in the gasket.

Dispense Delay

- An increase in this time value will delay the start of the material flow during dispense. This can be adjusted to match dispense flow with work piece movement to reduce a buildup of material at the beginning of a dispense cycle.

3 Changing the Program Number

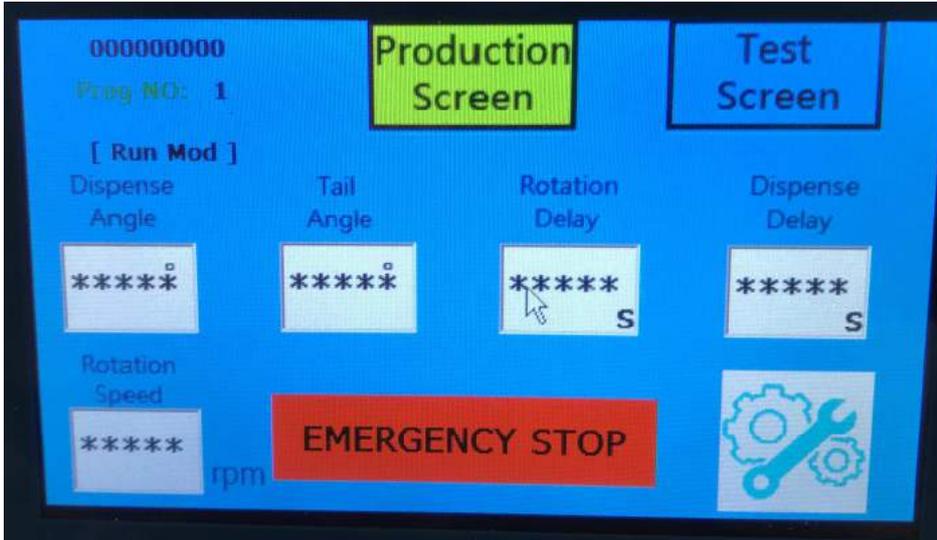
Enter the setup screen and open the program select drop down menu and choose which program number is required.



SECTION 5: Error Messages and Specifications

1 Error Messages

1.1 Door Error



This is the error message show when there is a fault or breaking in connection in the Door switch or Emergency Switch in the Ext. Control I/O.

1.2 Emergency Error

Screen goes blank

1.3 Password Error

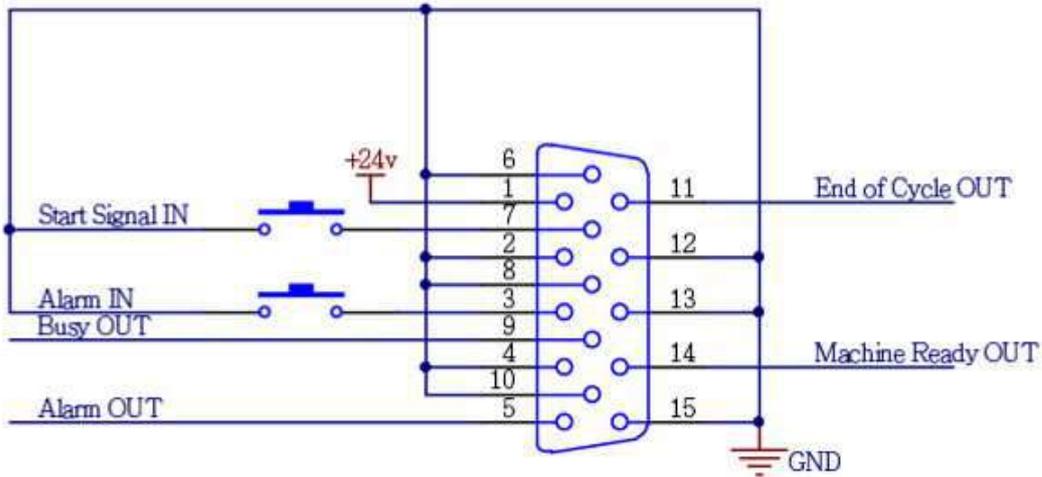
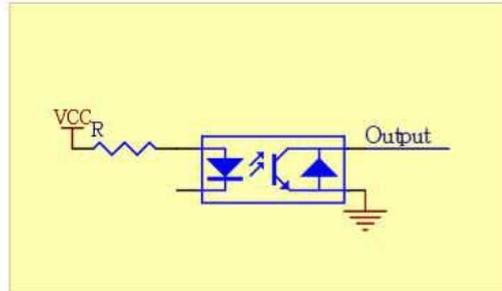
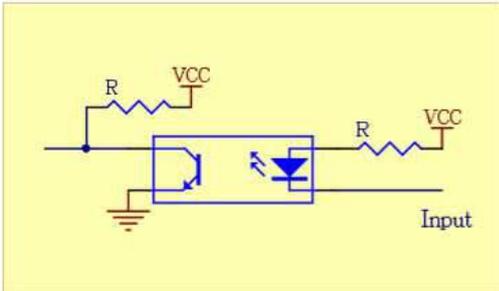
Doesn't show up. The word enter just disappears

2 I/O Specifications

2.1 I/O Pin Assignments

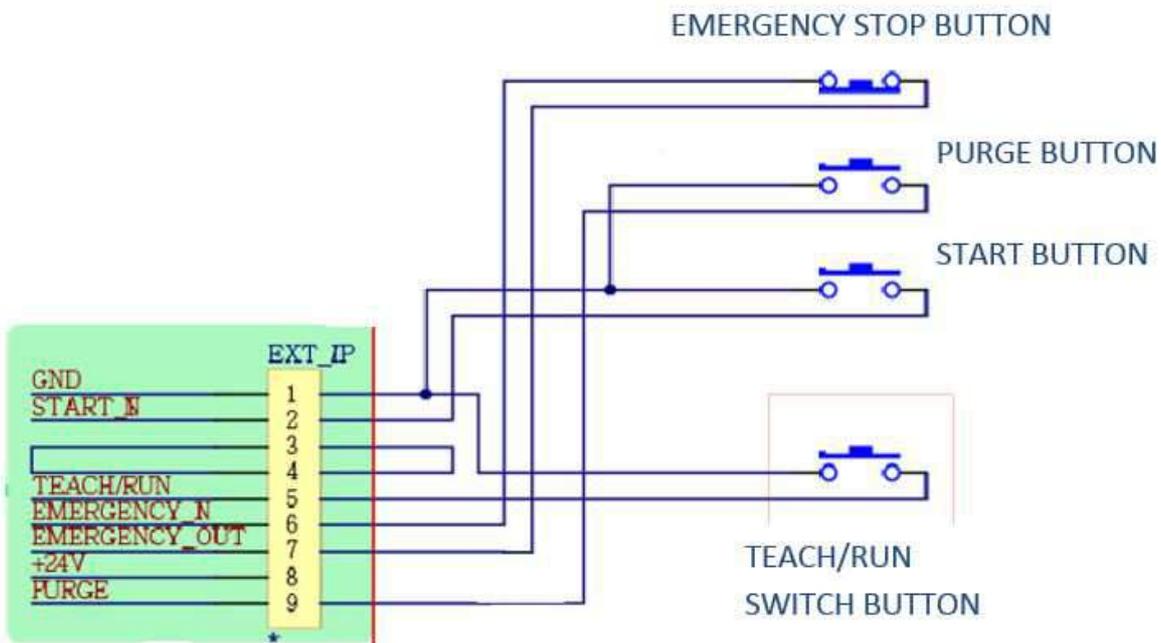
D-type connector-15P	
1	Power + (24V DC)
2	Power – (0V DC)
3	Input (contact 1) - Alarm IN 1
4	Input (contact 1) - Alarm IN 1(GND)
5	Alarm OUT Positive
6	Alarm OUT Negative (GND)
7	Start Signal\Initialize IN Positive
8	Start Signal\Initialize In Negative (GND)
9	Busy OUT Positive
10	Busy OUT Negative (GND)
11	End of Cycle OUT Positive* (* 5ms pulsed output)
12	End of Cycle OUT Negative (GND)* (* 5ms pulsed output)
13	Ground
14	Machine Ready OUT Positive
15	Machine Ready OUT Negative (GND)

2.2 I/O System Specification



2.3 Ext. Control Pin Assignments

Pin	Description
1	GND
2	Start Input
3	Door COM
4	Door NC
5	Teach/Run switch
6	Emergency _ In
7	Emergency _ OUT
8	+24Vdc
9	Purge Ext.



3 System Specifications

F1300N Rotary Table

The F1300N rotary table provides an efficient method of dispensing a circular pattern on areas that are difficult to access. The tilting Z-axis allows controlled rotary dispensing on an angle.

The F1300N dispenses adhesives, silicones, grease and lubricants and is fully adjustable in rotation speed, circle diameter and dispensing time. Dispense from barrels, cartridges or valves mounted on the Z-axis.



The Z-axis tilt is easily adjusted to dispense either on a vertical wall within a cylindrical part or on an outside wall. The system is fully programmable to control dispense delay, degree of rotation and wait period before cycling using the intuitive user friendly HMI display.

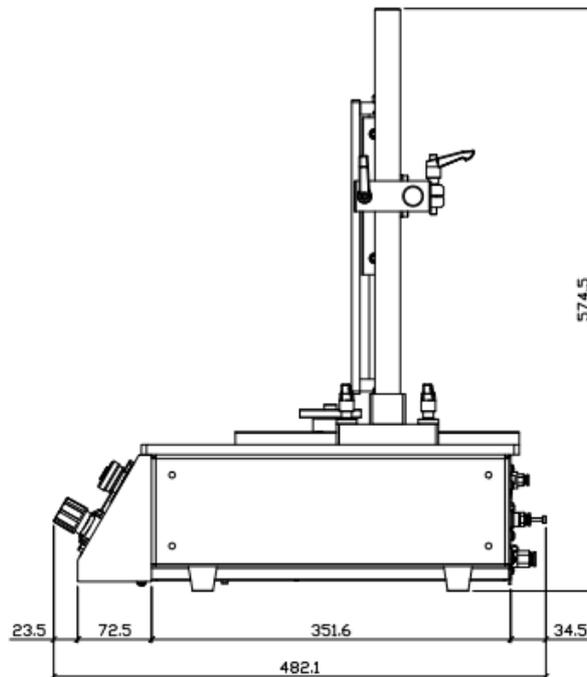
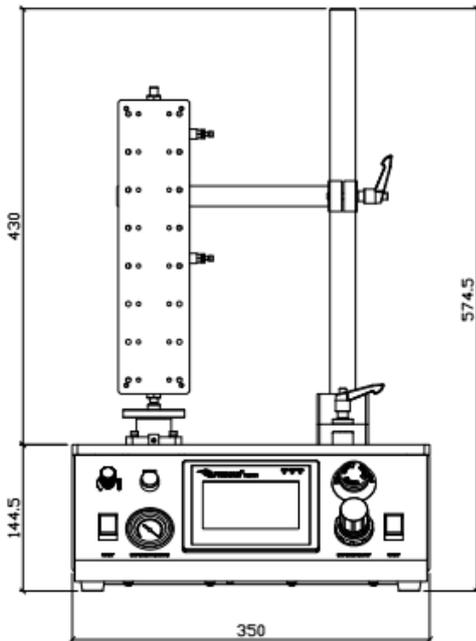
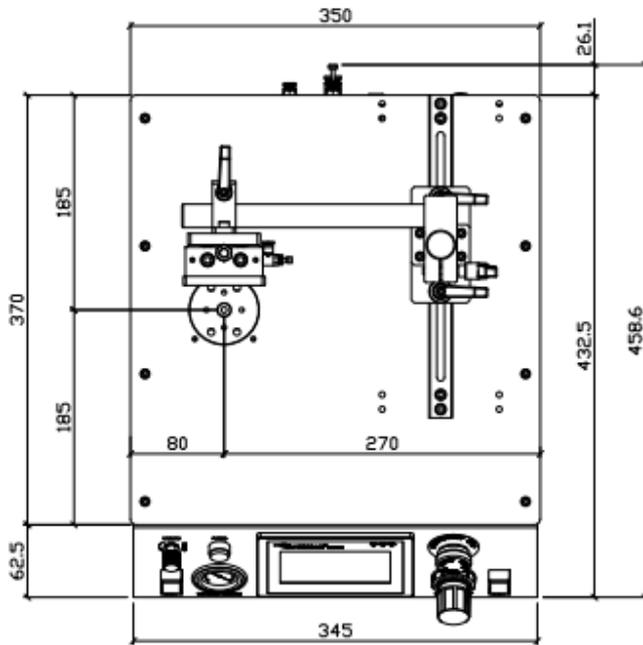
Features:

- Adjustable Z-axis including tilt control.
- Variable speed table.
- Simple to set up and operate.
- Fully programmable for perfect dispensing.
- Fluid purge button.

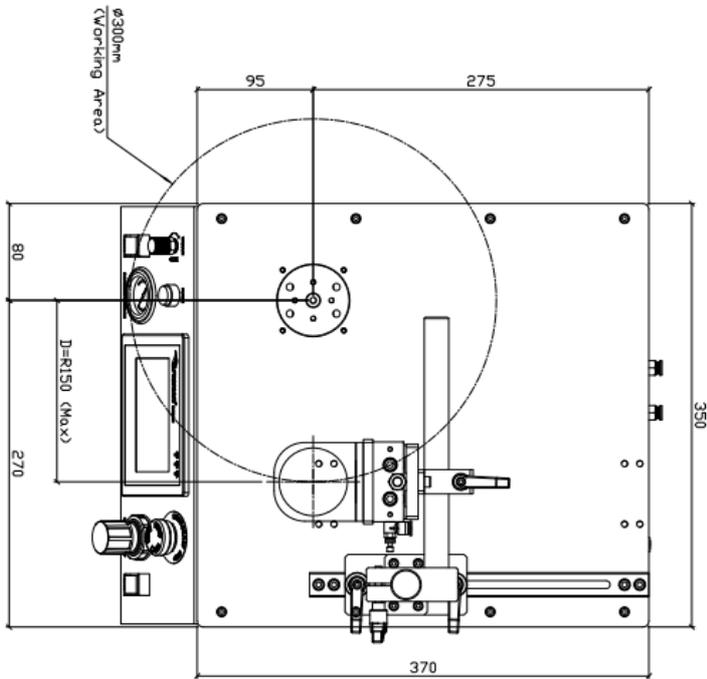
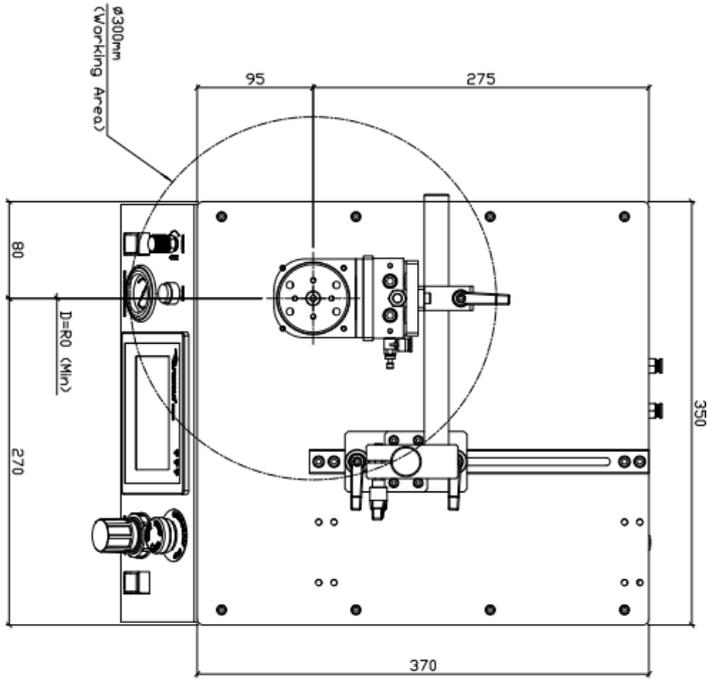
Specifications:

Dispenser:	DSP501LF (not included)
Working Area:	300mm / 12"
Cycle Initiation:	Manual or Automatic
Vertical Travel:	100mm
Rotation Speed:	0-60rpm
Air input:	70-100 psi (5-7 bar)
Air output:	1-100 psi (0.1-7 bar)
Dimensions (WxDxH):	350 x 433 x 575 mm
Weight:	11kg

4 Machine Dimensions



4.1 Work Table Dimensions



SECTION 6: Maintenance and Periodic Inspection

1 Check Cycles and Methods

1.1 General Consideration

It is essential to correctly and periodically inspect and maintain the rotary table to prevent unexpected failures or malfunctions, thus ensuring safe operation and lengthening the machine's life.

The outside parts of the machine should be kept clean. Use vacuum cleaner or soft cloth to clean the rotary table. Do not use compressed air or chemical products to clean the machine, as they can damage the internal and external cables and other components of the unit.

1.2 Check Cycles and Points

The check cycles of the machine are classified in the following categories:

- Daily check
- Weekly check
- Check after 3 months of operation
- Check after 3 years of operation

These cycles are based on a daily 8 hours of operation.

The check points are as follows:

Check point	Check cycle			
	Daily	Weekly	Every 3 months	Every 3 years
Tilt or deviation of Cylinder	x			
Status of cables and hoses	x			
Appearance	x			
Stability on the work bench	x			
Motor running condition		x		
Motions of drive cylinder		x		
Unfastened / loose bolts and screws			x	
Internal wires and connectors			x	
Accuracy and precision			x	
Overhaul				x

1.3 Check Methods

Check Point	Check Action (see if)	Corrective action
Tilt or deviation of axis	<ul style="list-style-type: none"> - The rotary table tip is out of position 	Reset the tip to the correct location and lock up the axis adjustment handles
Status of cables and hoses	<ul style="list-style-type: none"> - The electrical and pneumatic hoses and excessively twisted bent or squeezed - Air leakage between pneumatic hoses and fittings 	Remove the causes of twisting, bending or squeezing Cut away the damaged parts of hose and make new connections or replace damaged fittings.
Appearance	<ul style="list-style-type: none"> - Damage from usage in production or from chemical erosion 	Remove any obstacles from the movement area of the rotary tables Keep rotary table surface clean
Stability on work bench	<ul style="list-style-type: none"> - Rotary table is too close to edge of the work table - Rotary table is unstable 	Rearrange the position of the rotary table Remove objects causing instability Balance out the rotary tables base
Motor running condition	<ul style="list-style-type: none"> - Motor running slow or over running angles or under running angles 	Replace cables Replace motor driver card
Motion of drive cylinder	<ul style="list-style-type: none"> - Cylinder moving too quickly 	Inspect sensors for operation ability Inspect the flow regulator fittings for functionality, replace if necessary
Unfastened / loose bolts and screws	<ul style="list-style-type: none"> - Loose Axis, bolts or screws on the rotary table 	Using the correct sized Allen key or screw driver tighten up the loose parts
Internal and External wires and connectors	<ul style="list-style-type: none"> - Misconnections or loose wires - No signals from I/O 	Replace damaged cables with appropriate spares

Accuracy and precision	- If the tip is out of position in any axis direction	Contact agent Inspect the tightness of the axis brackets and tighten if needed
Overhaul	- Diagnose the whole system and take a decision for the overhaul	Contact agent for advice and spares

Part Lists – F1300N

Mechanical Parts

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