

RAST2.5 SEMI-AUTOMATIC TERMINATOR MACHINE
For Appli-Mate™ Connectors
Instruction Manual
Order No. 62300-6200



- Description
- Operation
- Maintenance

WARNING

NEVER USE THIS FIXTURE WITHOUT THE GUARDING OR OTHER SAFETY DEVICES IN PLACE, GUARD DOORS CLOSED AND GUARD OVERRIDE SWITCHED "OFF".

FIXTURE GUARDING IS DESIGNED TO PREVENT HANDS FROM REMAINING IN THE DANGER AREAS OF THE FIXTURE.

RUNNING THIS FIXTURE WITHOUT GUARDS, UNDER ANY CIRCUMSTANCES, CAN CAUSE SERIOUS INJURY.

NEVER OPERATE, SERVICE OR ADJUST THIS FIXTURE WITHOUT PROPER INSTRUCTION AND WITHOUT FIRST READING AND UNDERSTANDING THE INSTRUCTIONS IN THE OPERATING MANUAL.

NEVER SERVICE THIS FIXTURE WHILE IT IS CONNECTED TO ANY ELECTRICAL POWER SOURCE. DISCONNECT POWER BY SWITCHING OFF THE MAINS ISOLATOR.

WORK SAFELY AT ALL TIMES

**For Service, Contact Your
Local Molex Sales Office**

**Molex Application Tooling Group
2200 Wellington Court
Lisle, Illinois 60532
Tel: 630-969-4550
Fax: 630-505-0049**

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Section 1

General Description

- 1.1. Description
- 1.2. Technical Specifications
- 1.3. Applicable Products and Wires
- 1.4. Delivery Check
- 1.5. Ce Compliance

1.1 Description

The 62300-6200 APPLI-MATE™ (Rast 2.5) Semi-Automatic Terminator Machine, is designed to terminate the APPLI-MATE™ (Rast 2.5) female connector series (See Section 6) onto discrete wire (0.22 mm² or 0.38 mm²). This machine will accommodate circuit size 2 through 20.

1.2 Technical Specifications

Power Specifications:

To function correctly, these fixtures require the following services:

Electrical Service

115/220 VAC 50/60 HZ 1 Phase 2 AMPS

Pneumatic Service

6 BAR (85 psi) Minimum Clean, Dry and Filtered Air Source

Pressure Gauge Settings

Main supply to machine - 6 BAR (85 psi)

1.3 Applicable Products And Wires

Connectors

Appli-Mate™ RAST 2.5 connector series 90871, 90872, 91716, 91717, and 92332. See Connector Chart in Section 6.

Wires

Conductor: 0.22mm² or 0.38mm²
Insulation outer diameter: 1.60mm maximum

1.4 Delivery Check

Carefully remove this machine from its shipping container and determine that the following items are included in the package.

Order No.

62300-6200 Semi-Automatic Terminator Machine for APPLI-MATE™ (Rast 2.5)

ATS-623006200 Instruction Manual

1.5 CE Compliance

Complies with the general health and safety requirements in accordance with:

- Council Directive 98/37/EEC
- Council Directive 89/336/EEC and amended by 92/31/EEC
- Council Directive 73/23/EEC

This machinery has been designed and manufactured in accordance with the following transposed harmonised European standards.

- EN292: parts 1 and 2: 1991, Safety of Machinery - Basic concepts, general principles for design.
- EN294: 1992, Safety of Machinery - Safety distances to prevent danger zones reached by the upper limbs.
- EN349: 1993, Safety of Machinery - Minimum gaps to avoid crushing of parts of the human body.
- EN418: 1992, Safety of Machinery - Emergency stop equipment, functional aspects - Principles for design.
- EN60204 part 1: 1993, Safety of Machinery - Electrical equipment of machines - Specification for general requirements.

Section 2

Start-Up / Shut Down Procedures

- 2.1. General Operation
- 2.2 Machine Operation and Process Flow
- 2.3 Operator Set Up And Functions

2.1 General Operation

2.1.1 Preliminary

1. Connect air supply to fixture. Use 6mm nylon air hose in the quick-fitting.
2. Turn on mains power Isolator.
3. Release Emergency-stop push buttons if necessary.

2.1.2 System Start-Up (When above conditions are met)

1. Reset the power by pushing the Reset button.
2. Wait approximately 5 seconds for the air supply to reach operating pressure.
3. Home the sensor motor. See section 4.1 (screen 5).
4. Enter the circuit size. See section 4.1.
5. Press Start button.

2.1.3 Start-Up Following A Fault

1. Identify the fault on the touch screen.
2. Correct fault.
3. Reset the power by pushing the Reset button.
4. Wait approximately 5 seconds for the air supply to reach operating pressure.
5. Home the sensor motor.
6. Press Start button.

2.1.4 Start-Up After An Emergency Stop Or Guard Interrupt

1. Release Emergency Stops or close guard doors.
2. Press Reset button on operator panel.
3. Wait approximately 5 seconds for the air supply to reach operating pressure.
4. Home the sensor motor.
5. Press Start button on operator panel

2.1.5 Start-Up After A Power Failure

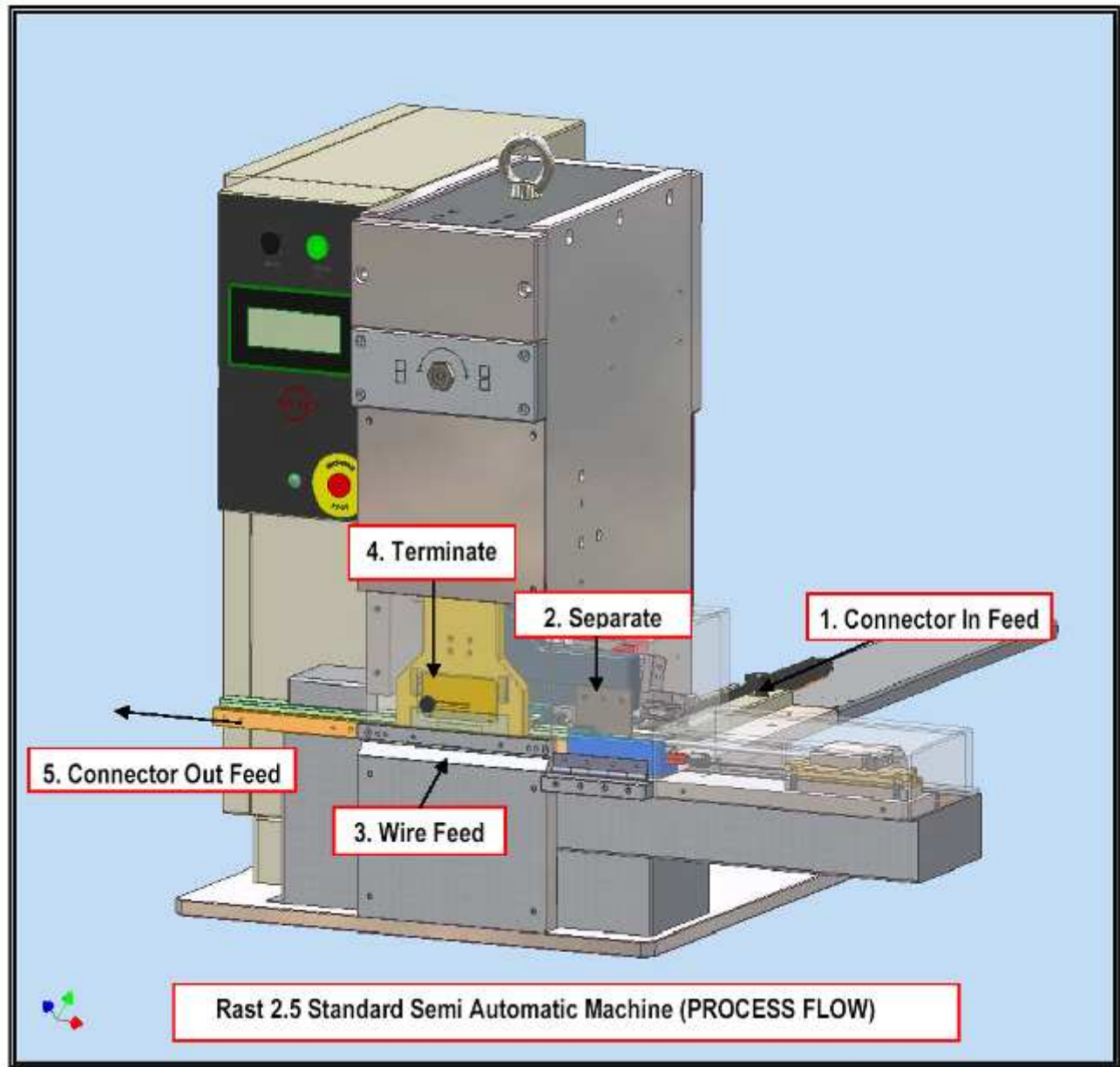
1. Release Emergency Stops or close guard doors.
2. Press Reset button on operator panel.
3. Wait approximately 5 seconds for the air supply to reach operating pressure.
4. Home the sensor motor.
5. Enter the Circuit size.
6. Press Start button on operator panel

2.1.6 System Shut Down

1. Press the Emergency Stop button.
2. For extended periods of shutdown (i.e. Holidays), switch off the Mains Isolator.

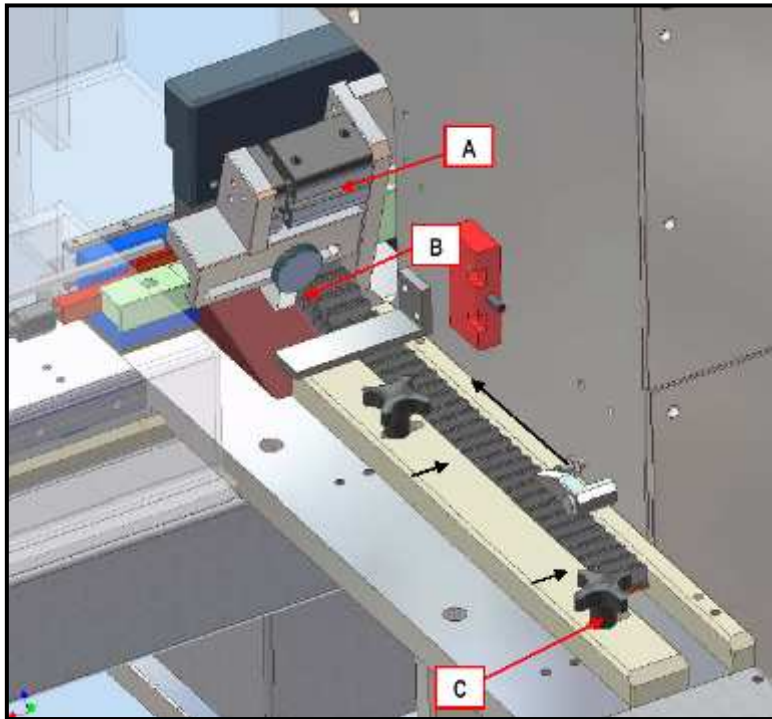
CAUTION: NEVER OPERATE THIS FIXTURE WITHOUT GUARDS IN PLACE.

2.2 Semi-Automatic Terminator Machine Operation and Process Flow



2.2.1 Connector Infeed

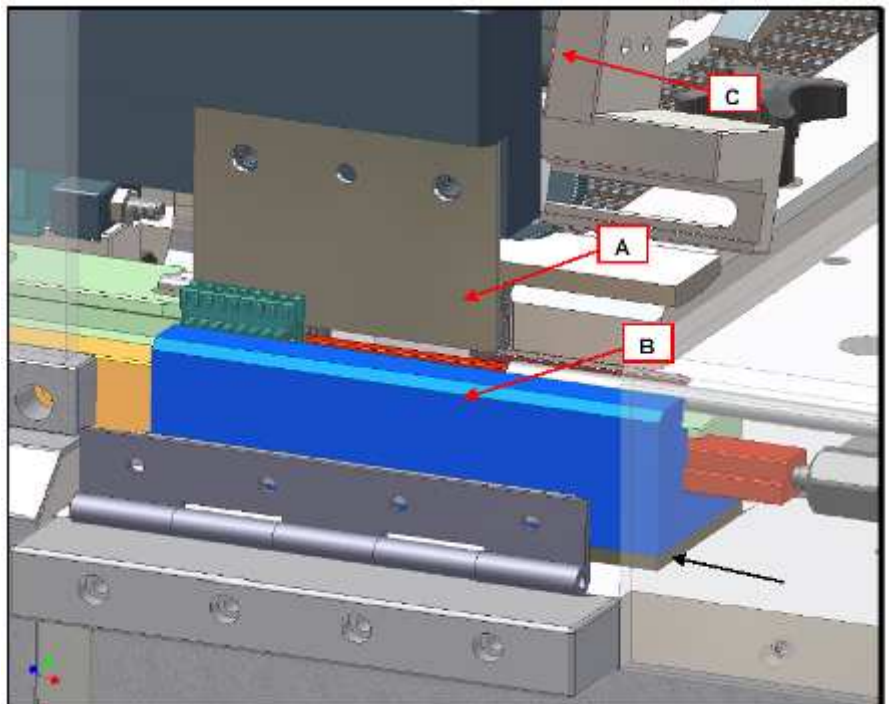
The strips of connectors are inserted into the adjustable locator. For operator instruction see *section 2.3 (operator set up and functions)* The gripper then clamps the connectors and transports it into the next part of the process, the cut station. This machine is designed to run one chain of connectors at a time. Connector chains should not be stacked side-by-side.



- A Clamping Cylinder
- B Knurled Screw to tighten/release the adjustable gripper jaw
- C Clamp Screw

2.2.2 Connector Separate (Cut Loose)

1. In the automatic mode the connectors are transferred to the cut station by the connector feed cylinder.
2. The cut support track automatically moves in behind the first row of connectors.
3. The cut blade separates the first row of connectors from the chain, so it can be fed to the next station.
(The connector feed cylinder remains forward until after the cut.)
4. Note: Cutting loose happens simultaneously with termination.

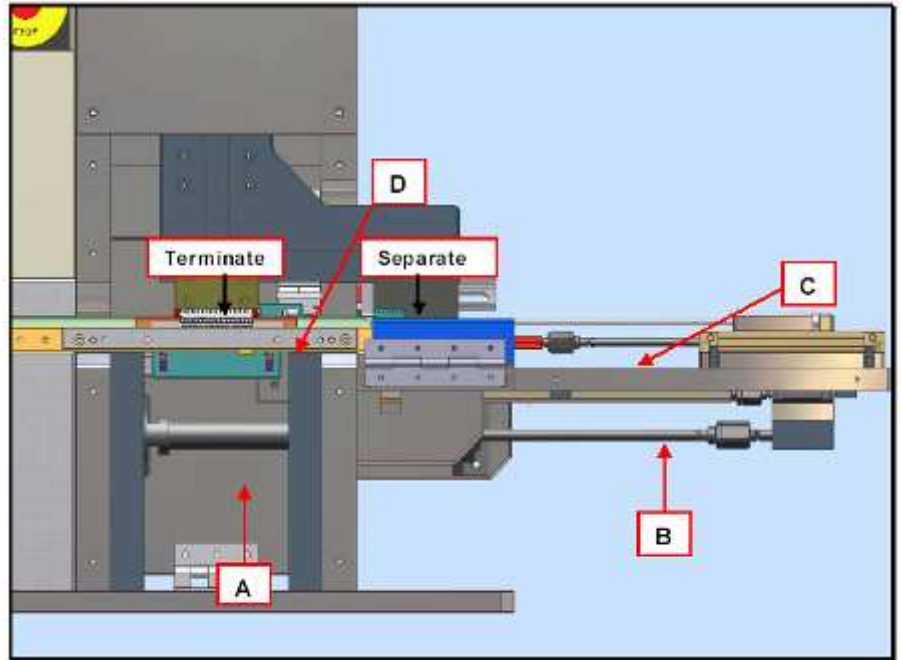


- A Cut Loose Blade
- B Cut Support Track
- C Connector Feed Cylinder

2.2.3 Connector Transfer

1. After a row of connectors has been separated they are transferred to the termination position.
2. After a connector has been inserted with wires and has been terminated the finished assembly is transferred out of the terminating station while the newly separated connector enters.
3. The connector transfer and the out feed are one motion.

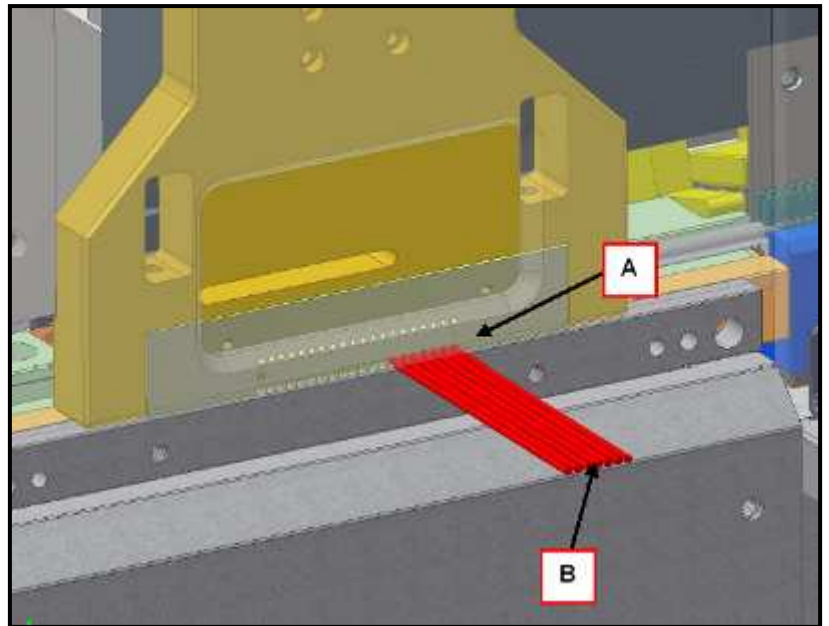
- A Transfer Cylinder
- B Connecting Rod
- C Transfer Rod
- D Out feed Pawl



2.2.4 Wire Feed (Mask Tooling)

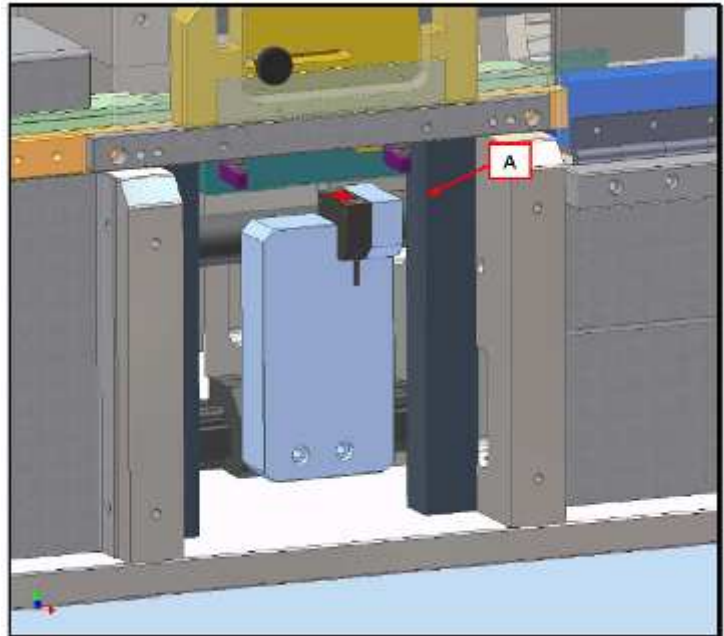
1. After the connector has been transferred from the cut station to the termination station the operator manually inserts the wires into the connector.
2. This is aided by using a numbered plate (mask tooling) that slides down in front of the connector.
3. This slide centers the connector with location tooling on the mask tooling.
4. The operator can then use the mask tooling to guide the wires into the connector. See Section 2.3.4 (operator set up and functions)

- A Mask Tooling (numbered plate)
- B Manually inserted wires



2.2.5 Wire Feed (Laser Sensor)

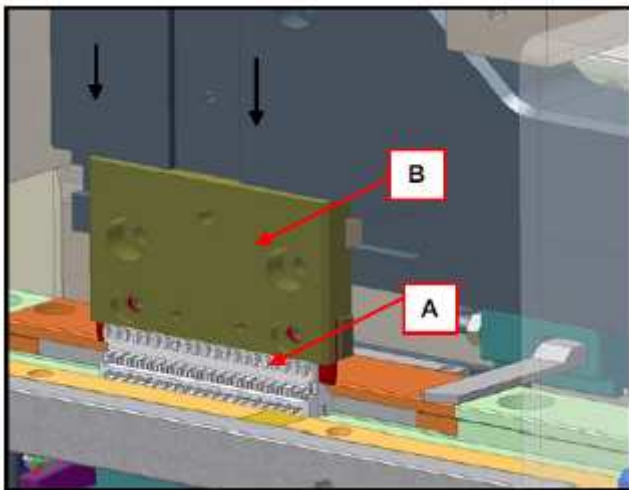
1. The Inserted wires push out a spring loaded pin at the back of the housing. A Laser Sensor senses the movement of the pin.
2. According to the connector circuit size and corresponding program selected by the operator (See section 2.3.4) the machine detects when the correct amount of wires have been inserted successfully.
3. After all wires have been inserted successfully, the machine automatically terminates the connector.



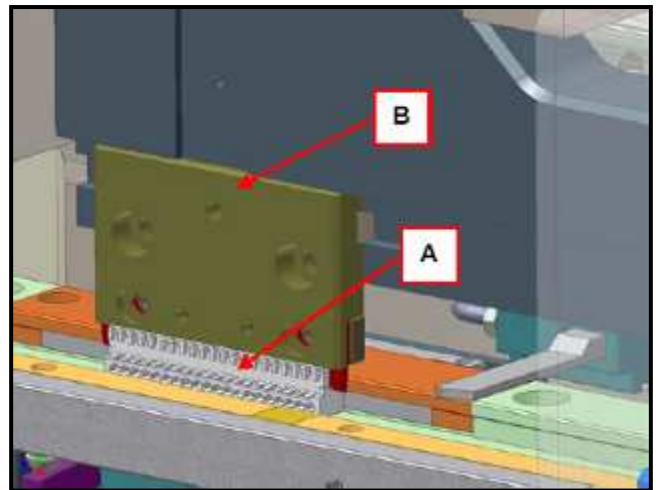
A Laser Sensor

2.2.6 Termination Station

1. The connector is automatically terminated after all the wires have been inserted correctly.
2. The termination tool moves downwards and closes the connector, terminating the inserted wires.
3. At the same time a new row of connectors is being cut free from the chain.
4. The out feed pawl then removes the finished assembly to the end of the track.



A Open Connector
B Termination Tool



A Closed Connector
B Termination Tool

2.3 Operator Set-Up and Functions

2.3.1 Machine Run

To Power Up

1. Turn on main disconnect switch on electrical cabinet door.
2. Touch screen will reset.
3. Laser sensor motor will automatically home itself or request operator to press home button.

To Set Up (Touch Screen)

1. Press "Manual"
2. Press "Set up"
3. Select circuit size (3 – 20)
4. Select positions of wires to be inserted and choose the language.
5. Press "main" to return to start screen.

To Load Connector

1. Press "Manual"
2. Press "Hsg feed open"
3. Press "Hsg cut support"
4. Feed connectors manually to touch face of cut support blade. See section 2.3.3
5. Press "Hsg feed grip"
6. Press "Main"
7. Press "Load"
8. Terminator Machine will automatically feed connectors to cut position.

To Start Run

1. Press "Start"
2. The first connector will be cut the fed to termination position.
3. Mask tooling will lower
4. Operator must manually insert wires into connector. See section 2.3.4. Touch screen will prompt operator position of each wire.

To Correct An Incorrectly Inserted Wire

1. Cycle can be stopped if wrong wire is put into wrong slot by pressing "REDO"
2. Mask tooling will rise allow removal of wire.
Note: other wires may fall out of the connector and may need to be re-inserted.
3. Press "REDO" to restart cycle.

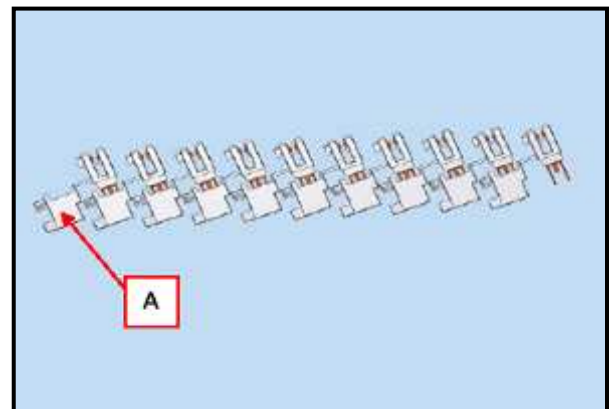
Note: A wire must be inserted for functions "STOP" or "REDO" to be available on the touch screen.

For detailed explanations of touch screens see SECTION 4.

2.3.2 Material Supply

1. The connectors are supplied in continuous chains and can be connected or disconnected at the trailing end of the chain.
2. A sensor detects when the machine is running low on connectors.
3. The operator then connects the upper housing of the chain in the machine into the lower housing of the new chain. The connector splicing tool should be used to ensure the proper pre-load height.

The operator **MUST** remove the first part of the connector at the beginning of the strip of connectors to be fed into the machine. The strips must begin with a complete connector.



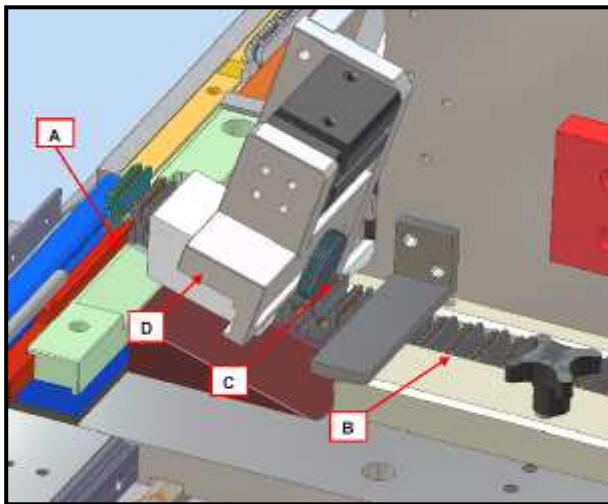
A Removed when loading an empty machine

2.3.3 Setting Up Connector Feed

1. When circuit size is changed the connector feed must be set up.
2. Adjust the guide rail to suit the width of the connectors. This can be set up to 20 positions.

The rail can be moved by opening the clamp screws and simply sliding the rail lightly against the connector chain as shown. The connectors must be able to slide easily. Retighten the clamp screws.

3. Loosen the knurled screw at the clamping cylinder and slide the gripper jaw as far as possible to the right.
4. Insert a strip of connectors into the machine until they bottom out against the cut support track.
5. Slide the gripper jaw to within approximately 2mm of the connectors and tighten the knurled screw.
6. Select the circuit size with wire quantity and position on the touch screen and start the machine. (See Section 2.3.5)



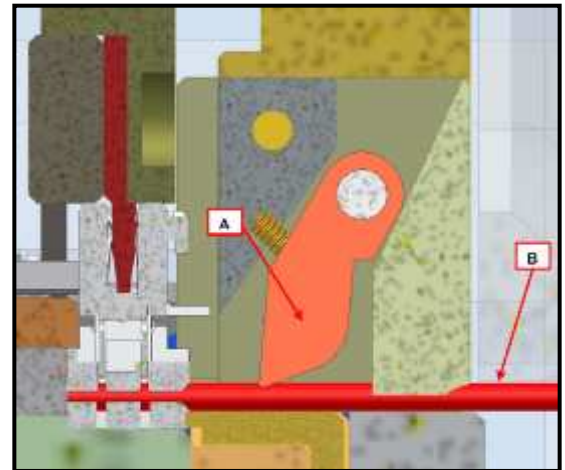
- A Cut Support Track
- B Guide Rail
- C Knurled Screw
- D Gripper Jaw

2.3.4 Wire Feed

1. The Operator must manually insert each connector circuit size with corresponding number of wires.
2. As explained in Section 2.2.5 the operator uses a numbered guide as an aid to insert the wires into the connector. The touch screen prompts the operator to the number slot on the guide to place each wire.
3. After the operator has correctly inserted the wire at the correct position an audio tone will sound, an LED will illuminate, and the operator can

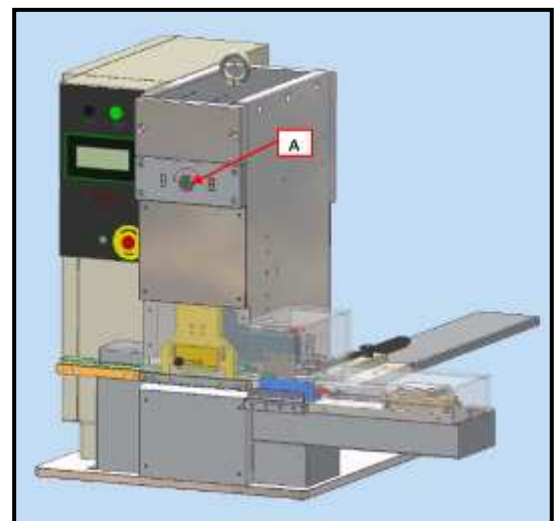
move to the next position (prompted on the touch screen).

4. The mask tooling has spring loaded inserts which will keep the wires held in position until the connector has been terminated. After the wire is inserted, do not attempt to pull the wire out as the clamp grip may damage the wire. If an insertion error occurs, it is best to use the REDO function.



- A Spring Loaded Wire Clamp
- B Fully inserted Wire

2.3.5 Termination Shut Height Adjustment



- A Shut Height Fine Adjustment Screw

1. The termination shut height may be easily adjusted from the front of the machine.
2. Use a 24mm open-end wrench and an 8mm hex key to finely adjust the shut height.
3. The adjustment screw is situated at the front of machine as shown.

2.3.6 Program Selection (Circuit Size)

1. When circuit size (or number of wires loaded) changes, the program must be changed on the touch screen.
2. The following procedure must be followed when setting up for a new program and circuit size as well as setting up new connector feed. See section 2.3.2.
3. On the touch screen:
 - a. From Ready to Run. Press “Manual”
 - b. From Manual. Press “Set Up”
 - c. From Set Up. “Enter circuit size.” Keypad will appear. Select desired circuit size (3-20 circuit). Size will be displayed on circuit size line.
 - d. From Set Up. Press “Next”
 - e. Select Wire Positions 1-10. Press the number and Y and N will toggle in the box above the number. Y= Wire Present, N= No Wire. Ensure that unused circuit positions

have N. Press “Next” to set up Wire Positions 11-20. Repeat for wires 11-20.

- f. From Select Wire Positions. Press “Main” to return to Ready to Run.
- g. Press “Start” to run automatically. Press “Load” to feed a housing into the feed track.

2.3.7 Machine Errors / Faults

The Operator is responsible for ensuring that machine errors / faults are corrected immediately. If the operator is unable to locate or resolve the fault, they should seek assistance from the line Technician.

See Section 4 for a full listing of faults.

2.3.8 Finished Product

The operator will ensure that the finished products are removed from the end of the machine.

Section 3

Message Fault Display and Maintenance

- 3.1 Fault Displays
- 3.2 Maintenance
- 3.3 Perishable Tooling
- 3.4 Spare Parts

3.1 Fault Displays

3.1.1 Name and Functions

| Name | Location | Function |
|--|--------------------------------------|--|
| Emergency Stop (Red Mushroom knob on yellow background) | LH side of machine. (Control Box) | To stop fixture immediately as well as isolating the mains power and air from the fixture. |
| Power On Lamp (Green Lamp) | Centre of machine. (Control Box). | To Indicate that the machine is ready to run. |
| Reset Button (Blue Switch) | LH side of machine. (Control Box) | To connect mains power and air to the machine. |

3.1.2 Description Of Indicators

| Name | Indicator | Description |
|-------------|----------------|---------------|
| LED (Green) | Solid Green | Wire inserted |
| Speaker | Audible "beep" | Wire inserted |

3.2 Maintenance

3.2.1 Cleaning

The RAST2.5 Semi-Automatic Terminator Machine should be cleaned at least once a day with a soft brush to remove dust and debris.

CAUTION: Using compressed air to clean the Terminator is not recommended as debris could become jammed in the tooling and/or come flying out at the operator

3.2.2 Lubrication

The press requires regular lubrication on a monthly basis. Place a small amount of lubricant with Teflon, such as Permatex "Superlube", on the sliding surfaces.

An example of a maintenance chart is shown below. Copy and use this chart to track the maintenance of your Terminator or use this as a template to create you own schedule or use your company's standard chart, if applicable.

3.2.3 Preventive Maintenance Chart

| Time | Maintenance |
|----------|--|
| Daily | Clean all tooling in the following areas |
| | <ul style="list-style-type: none"> ✓ Slides ✓ Cylinders |
| Weekly | ✓ Check out tooling for signs for of wear. |
| | ✓ Check cutting and termination tools for signs of wear. |
| | ✓ Check condition of slides. |
| | ✓ Check that the air regulator is set to 6 Bar (85 psi). |
| | ✓ Ensure all shock absorbers and stops are tight. |
| Monthly | ✓ Wipe down all tooling in the following areas: slides, cylinders, and carriage rails. |
| | ✓ Carry out Weekly PM. |
| | ✓ Check slide for excessive play (tighten as necessary). |
| | ✓ Check condition of all shock absorbers and stops. |
| | ✓ Check out functionality of all sensors. |
| | ✓ Check for air leaks, loose fittings, damaged airlines, and gauges. |
| 6 Months | ✓ Check General condition of all tooling. |
| | ✓ Carry out Monthly Preventative Maintenance. |

3.3 Perishable Parts

Customers are responsible for maintaining the The RAST 2.5 Semi-Automatic Terminator Machine. Perishable parts are those parts that come in contact with the product and will wear out over time. Molex recommends that all customers keep at least one set of the perishable tool kits in stock at all times. This will reduce the amount of production down time. These parts are identified in the Parts List below.

Perishable Tooling List

| Part No. | Description | Quantity |
|------------|--|----------|
| 62300-6201 | Housing Cut Blade | 1 |
| 62300-6202 | Termination Tool | 1 |
| 62300-6203 | Termination Support Blade | 1 |
| 62300-6204 | Termination Support Blade (side latches) | 1 |
| 62300-6205 | Wire Detect Pin | 1 |

3.4 Spare Parts

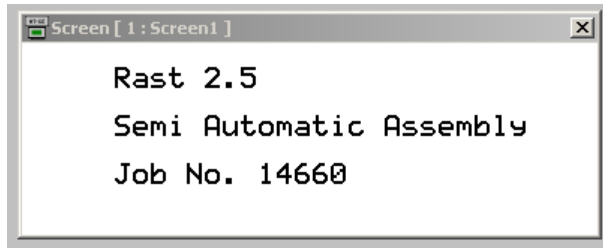
Customers are responsible for maintaining the The RAST 2.5 Semi-Automatic Terminator Machine. Spare parts are available. Moving and functioning parts can be damaged or wear out over time and will require replacement. See assembly drawings and parts lists in Section 5 for additional detail.

Section 4

Touch Screens and Troubleshooting

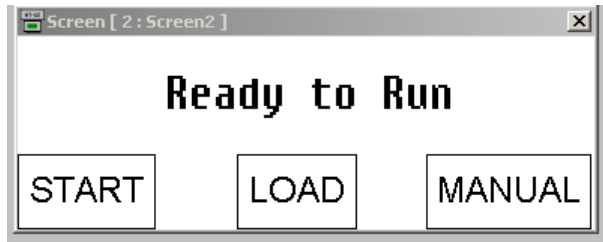
Touch Screens

Screen 1 Start Up Screen



This screen appears after the machine has been powered up. It is only an information screen.

Screen 2 Ready to Run Screen



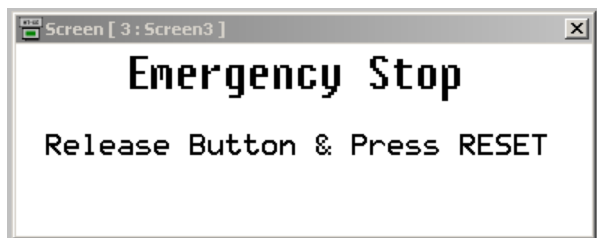
This screen is displayed when the machine is stopped and there are no fault conditions. It has 3 buttons located on the bottom.

START: This button starts the machine.

LOAD: When there is no housing in the feed track, press this button to automatically move a part into the feed track.

MANUAL: Selects manual mode and changes the screen to the Manual #1 [Screen 30].

Screen 3 Emergency Stop Screen



This screen is displayed when the Emergency Stop button has pressed. It also appears after power up and after the Safety Guard Open screen, when the

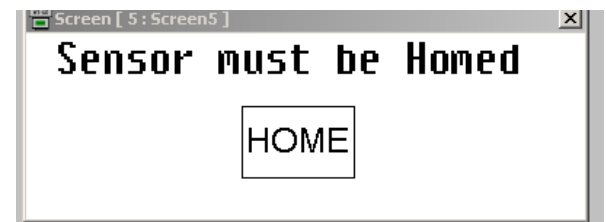
door has been closed. Release the Emergency Stop button and press the blue reset button on the main Panel.

Screen 4 Safety Guard Open Screen



This screen is displayed when the safety guard is open. Close the guard and press the blue reset button on the main panel.

Screen 5 Sensor must be Homed Screen



This is displayed after the machine has been reset. The stepper motor that drives the laser sensor must be homed after a power loss or Emergency Stop to ensure it is in the correct position to detect the wires. Press the **HOME** button and it will home automatically. When the sensor reaches the home position, the Ready to Run screen will be displayed.

Screen 6 Running Screen



This screen is displayed when the machine is running in automatic mode.

Parts Made: Displays how many parts have been made in the current batch.

Insert Wire into Position: Displays the position where the current wire is to be inserted.

STOP: This button stops the automatic mode. The operator must finish inserting all wires into the connector and terminate the connector before the end of cycle is reached.

REDO: This button allows the operator to correct an error on the existing connector. The mask tooling will go up, the wire(s) can be removed and the sensor motor will go to home position. Screen 9 will be displayed when this button is pressed.

Screen 7

Waiting to Stop Screen



This screen is displayed after the stop button has been pressed and before the current cycle has been completed.

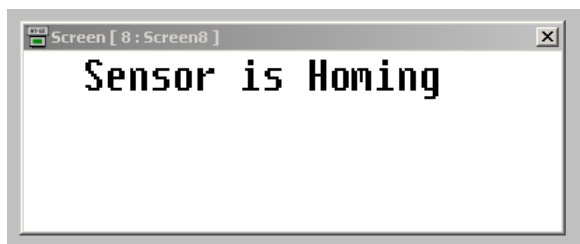
Parts Made: Displays how many parts have been made in the current batch.

Insert Wire into Position: Displays the position where the current wire is to be inserted.

REDO: This button allows the operator to correct an error on the existing housing. The mask tooling will go up, the wires can be removed and the sensor motor will go to home position. Screen 9 will be displayed when this button is pressed.

Screen 8

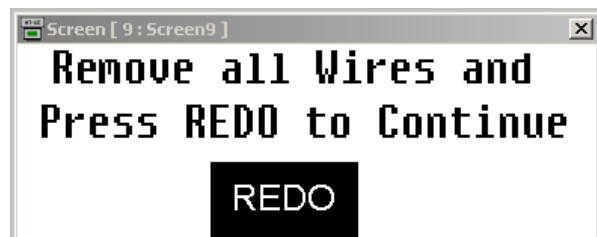
Sensor is Homing Screen



This screen is displayed after the Home Sensor Button has been pressed on Screen 5. When the sensor reaches the home position the Ready to Run Screen will be displayed.

Screen 9

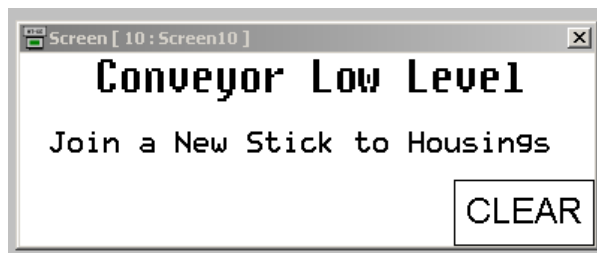
Redo Screen



This screen appears after REDO has been pressed on either Screen 6 or 7. When all the wires have been removed, press REDO to return to Screen 6 or 7.

Screen 10

Conveyor Low Level Fault Screen



This screen is displayed when the connector conveyor level is low. Join another chain to the existing chain and press the CLEAR button to continue.

Screen 11

Housing Cut Support not Out Fault Screen



This screen is displayed when the Housing Cut Support Cylinder fails to activate sensor B0.05. Check to see if the tooling jammed or if something is

stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button. Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

Screen 12
Housing Cut Support Not In Fault Screen.



This screen is displayed when the Housing Cut Support Cylinder fails to activate sensor B0.06. Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

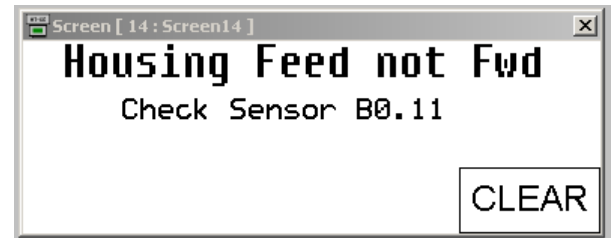
Screen 13
Housing Feed not Back Fault Screen



This screen is displayed when the Housing Feed Cylinder fails to activate sensor B0.10. Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

Screen 14
Housing Feed not Forward Fault Screen



This screen is displayed when the Housing Feed Cylinder fails to activate sensor B0.11. Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

Screen 15
Housing Feed Gripper not Closed Fault Screen



This screen is displayed when the Housing Feed Gripper Cylinder fails to activate sensor B0.09. Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

Screen 16

Housing Feed Gripper Cylinder not Open Fault Screen



This screen is displayed when the Housing Feed Gripper Cylinder fails to deactivate sensor B0.09. Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

Screen 17

Housing Stick Feed not Back Fault Screen



This screen is displayed when the Housing Stick Feed Cylinder fails to activate sensor B0.07. Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

Screen 18

Housing Stick Feed not Forward Fault Screen



This screen is displayed when the Housing Stick Feed Cylinder fails to activate sensor B0.08. Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

Screen 19

Mask Tooling not Up Fault Screen



This screen is displayed when the Mask Tooling Cylinder fails to activate sensor B1.00. Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

Screen 20
Mask Tooling not Down Fault Screen



This screen is displayed when the Mask Tooling Cylinder fails to activate sensor B1.01. Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

Screen 21
Termination Tooling not Up Fault Screen



This screen is displayed when the Termination Tooling Cylinder fails to activate sensor B1.02. Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop,

opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

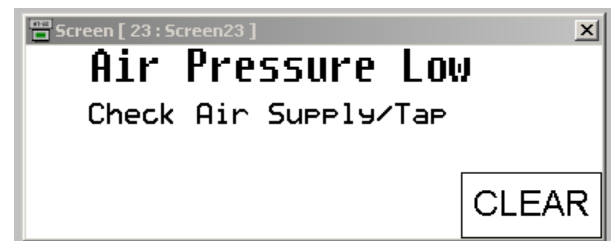
Screen 22
Termination Tooling not Down Fault Screen



This screen is displayed when the Termination Tooling Cylinder fails to activate sensor B1.03 . Check to see if the tooling jammed or if something is stopping the cylinder from completing its stroke. Clear the fault and press **CLEAR** button.

Air may have to be removed from the machine to clear the fault either by pressing Emergency Stop, opening the guard door or disconnecting the air supply. If any of these are done their respective faults (“Emergency Stop”, “Safety Guard Open”, or “Air Pressure Low”) will take precedence on the display.

Screen 23
Air Pressure Low Fault Screen

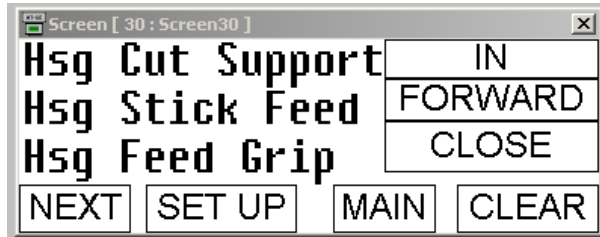


This screen is displayed when the Air Pressure coming to the Machine is Low. Check the following:

1. Factory Air Pressure is OK.
2. Air is connected to the machine.
3. Air Isolating Valve is turned on.
4. Air Pressure is set to 6.0 bar (85 psi)
5. Air Safety valve is on.
6. Air Leaks.

Screen 30
Manual Screen #1

This screen is displayed when Manual has been selected from the Ready to Run Screen or PREV has been selected from the Manual #2 Screen.



Hsg Cut Support Button: This button allows manual operation of the Housing Cut Support Cylinder. Pressing the button once will extend the cylinder (out); pressing it again will retract the cylinder (in). The text on the button will change between **IN** and **OUT** as the button is pressed.

Hsg Stick Feed Button: This button allows manual operation of the Housing Stick Feed Cylinder. Pressing the button once will extend the cylinder (out); pressing it again will retract the cylinder (in). The text on the button will change between **FORWARD** and **BACK** as the button is pressed. The cylinder can only move Forward if the Housing Cut Support is out and can only move Back if the Housing Feed Gripper is open.

Hsg Feed Grip Button: This button allows manual operation of the Housing Feed Gripper Cylinder. Pressing the button once will allow the cylinder to move open, pressing it again will return the cylinder to the closed position. The text on the button will change between **OPEN** and **CLOSE** as the button is pressed.

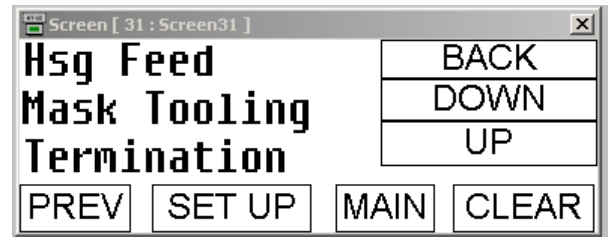
NEXT: Changes the screen to the Manual #2 Screen

SET UP: Selects Set Up mode and changes the screen to the Set Up #1 [Screen 40].

MAIN: Select Automatic mode and changes the screen to Ready to Run [Screen 2].

CLEAR: Clears any faults.

Screen 31
Manual Screen #2



This screen is displayed when the NEXT button is pressed on Manual Screen #1.

Hsg Feed Button: This button allows manual operation of the Housing Feed Cylinder. Pressing the button once will allow the cylinder to move forward, pressing it again will return the cylinder to the back position. The text on the button will change between **FORWARD** and **BACK** as the button is pressed. The cylinder can move **FORWARD** only when the Mask tooling is up.

Mask Tooling Button: This button allows manual operation of the Mask Tooling Cylinder. Pressing the button once will allow the cylinder to move up, pressing it again will return the cylinder to the down position. The text on the button will change between **UP** and **DOWN** as the button is pressed.

Termination Button: This button allows manual operation of the Termination Cylinder. Pressing the button once will allow the cylinder to move down, pressing it again will return the cylinder to the up position. The text on the button will change between **DOWN** and **UP** as the button is pressed. The cylinder can move **Down** only when the Housing Feed is back.

PREV: Changes the screen to Manual Screen #1.

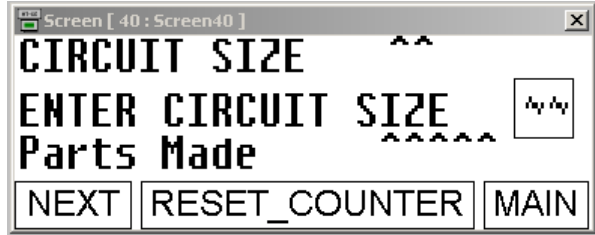
SET UP: Selects Set Up mode and changes the screen to the Set Up #1 [Screen 40].

MAIN: Select Automatic mode and changes the screen to Ready to Run [Screen 2].

CLEAR: Clears any faults.

Screen 40
Set Up #1 Screen

This screen is displayed when the SET UP button is pressed on the Manual Screens or PREV has been selected from the Set Up #2 screen.



CIRCUIT SIZE: This displays the current circuit size of the connectors being processed.

ENTER CIRCUIT SIZE: This button allows the circuit size of the connector to be entered. When the button is pressed a pop-up screen [Screen 65001] will appear. When the ENTER button on the pop-up Screen is pressed, the circuit size will be displayed on the button. Only values between 3 and 20 will be accepted by the display.

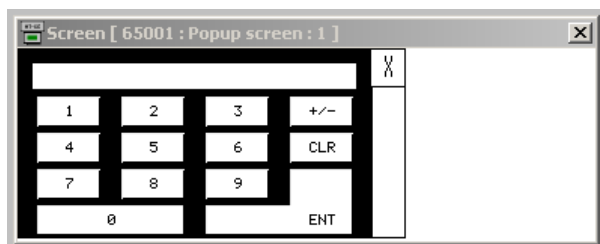
Parts Made: Displays how many assemblies have been made in the current batch.

NEXT: Changes the screen to the Set Up #2 Screen

RESET_COUNTER Button: Resets the value of Parts Made to zero.

MAIN: Select Automatic mode and changes the screen to Ready to Run [Screen 2].

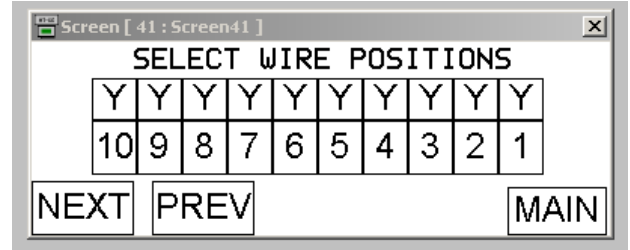
Screen 65001
Pop Up Screen



This screen appears when the Enter circuit Size Button has been pressed on Screen 40. Enter the desired circuit size on the “calculator” screen and press ENT. Only values between 3 and 20 will be accepted.

Screen 41
Set Up Screen #2

This screen is displayed when the NEXT button is pressed on the Set Up #1 Screen.



SELECT WIRE POSITIONS: This allows selection of wires (1-10 only) that are to be loaded in the connector. Pressing the number of the wire position will either select or deselect the presence of a wire in that position. The current status of that position is displayed above the number [Y = wire present, N = no wire].

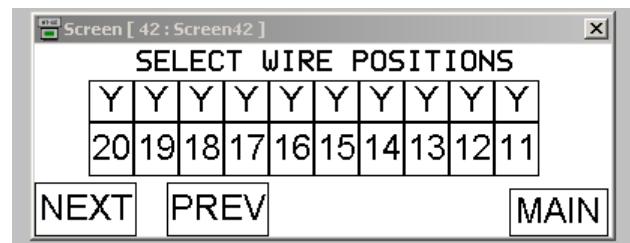
For circuit sizes below 20 please ensure that all positions above the current size are status “N”.

NEXT: Changes the screen to Set Up Screen #3 (Screen 42)

PREV: Changes the screen to Set Up Screen #1 (Screen 40)

MAIN: Changes the screen to Ready to Run Screen (Screen 2)

Screen 42
Set Up Screen #3



This screen is displayed when NEXT button is pressed on the Set Up #2 Screen.

SELECT WIRE POSITIONS: This allows selection of wires (11-20 only) that are to be loaded in the connector. Pressing the number of the wire position will either select or deselect the presence of a wire in that position. The current status of that position is displayed above the number (Y = wire present, N = no wire).

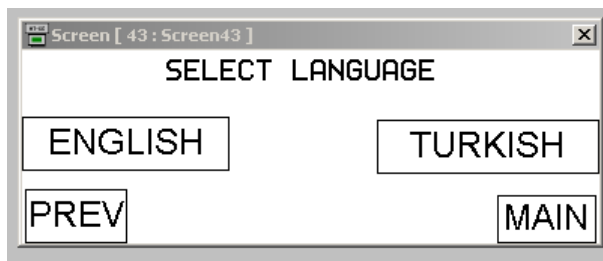
For circuit sizes below 20 please ensure that all positions above the current size are N.

NEXT: Changes the screen to Set Up Screen #4 (Screen 43)

PREV: Changes the screen to Set Up Screen #2 (Screen 41)

MAIN: Changes the screen to Ready to Run Screen (Screen 2)

Screen 43
Set Up Screen #4



This screen is displayed when the NEXT button is pressed on the Set Up #3 Screen.

SELECT LANGUAGE. This allows language selection for the touch screen messages. When the screens are displayed in English pressing TURKISH will automatically redisplay the screen in Turkish. All the Turkish screens have the exact same layout and functions as the English screens.

When the screens are displayed in Turkish pressing ENGLISH will automatically redisplay the screen in English.

PREV: Changes the screen to Set Up Screen #3 (Screen 42)

MAIN: Changes the screen to Ready to Run Screen (Screen 2)

Section 5

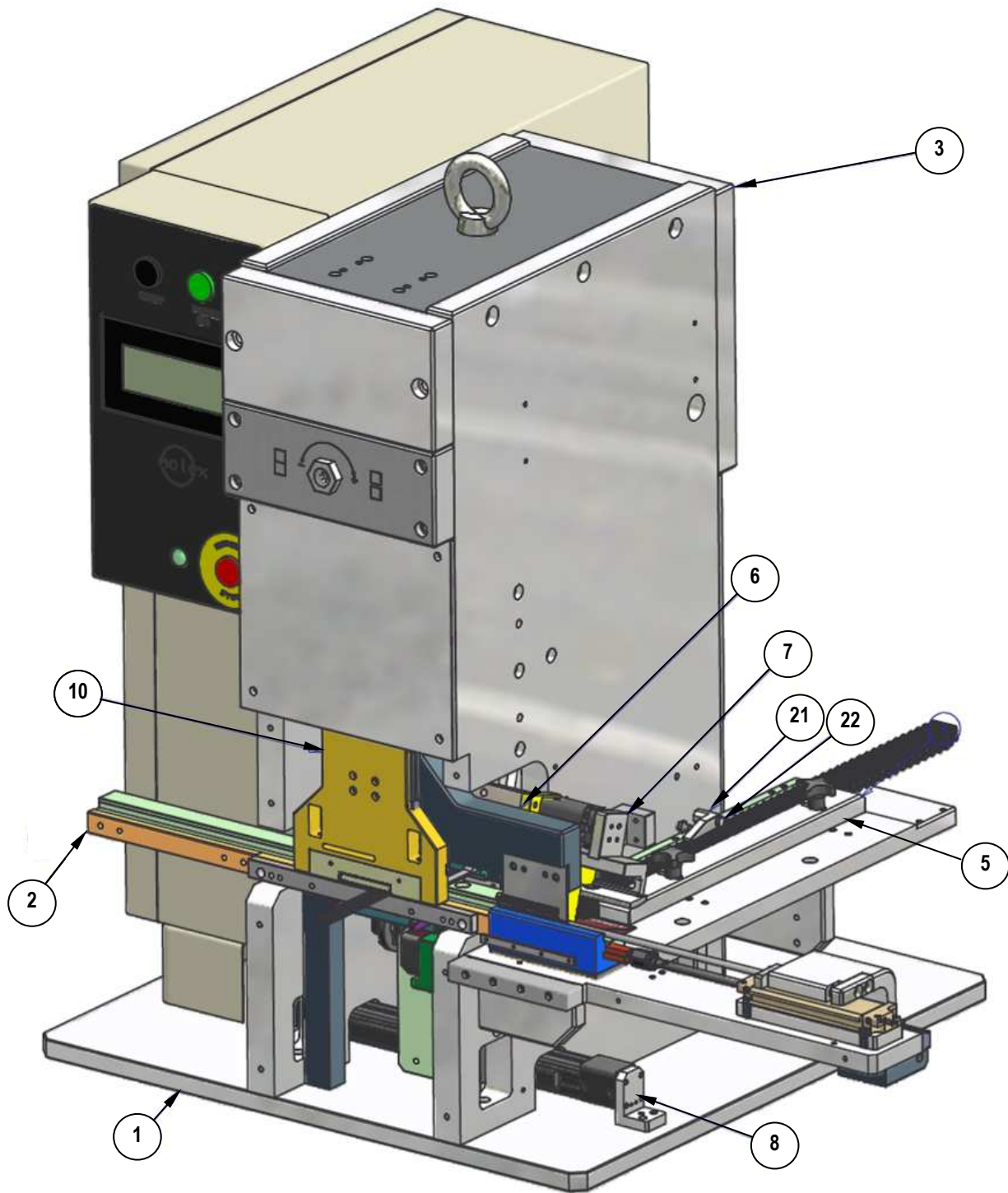
Assembly Drawings, Electrical and Pneumatic Diagrams

- 5.1 Assembly Drawings
- 5.2 Electrical Drawings
- 5.3 Pneumatic Drawings

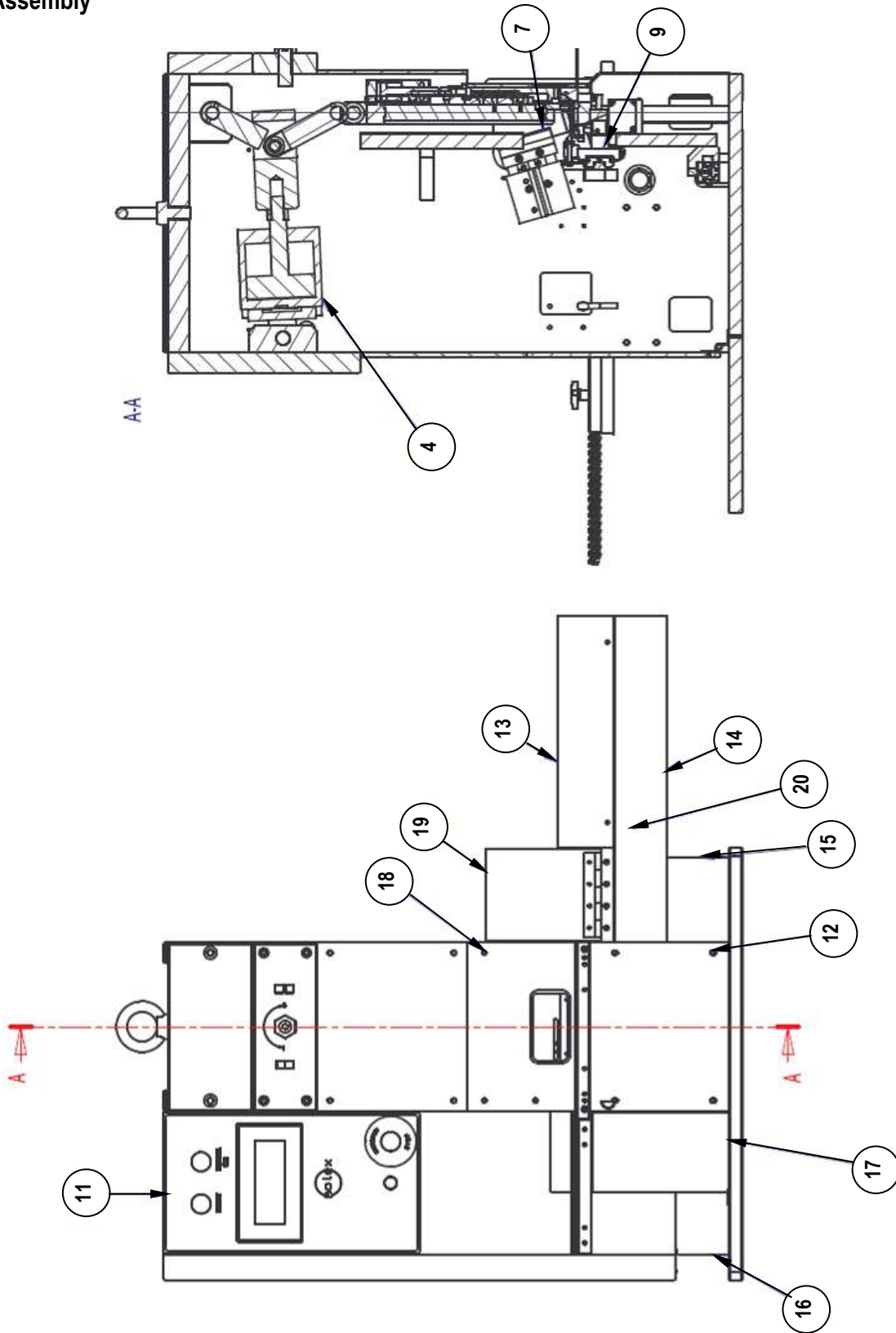
5.1 Main Assembly

| Main Assembly 62300-6200 | | | |
|---------------------------------|------------------|------------------------------------|-------------|
| Item | Order No. | Description | Qty. |
| 1 | 62300-6206 | Table Top | 1 |
| 2 | 62300-6207 | Termination Track Assembly | 1 |
| 3 | 62300-6208 | Frame Assembly | 1 |
| 4 | 62300-6209 | Toggle Joint Assembly | 1 |
| 5 | 62300-6210 | Infeed Table Assembly | 1 |
| 6 | 62300-6211 | Cut and Termination Slide Assembly | 1 |
| 7 | 62300-6212 | Infeed Gripper Assembly | 1 |
| 8 | 62300-6213 | Laser Sensor Assembly | 1 |
| 9 | 62300-6214 | Out-Feed Pawl Assembly | 1 |
| 10 | 62300-6215 | Mask Tooling Assembly | 1 |
| 11 | 62300-6216 | IOP Box Assembly | 1 |
| 12 | 62300-6217 | Guard | 1 |
| 13 | 62300-6218 | Polycarb Guard | 1 |
| 14 | 62300-6219 | Guard | 1 |
| 15 | 62300-6220 | Guard | 1 |
| 16 | 62300-6221 | Cabinet Skirt | 1 |
| 17 | 62300-6222 | Stainless Guard | 1 |
| 18 | 62300-6223 | Polycarb Guard | 1 |
| 19 | 62300-6224 | Hinged Guard | 1 |
| 20 | 62300-6225 | Hinged Guard Support | 1 |
| 21 | 62300-6226 | Proximity Switch | 1 |
| 22 | 62300-6227 | Prox Pivot Pin | 1 |

Main Assembly



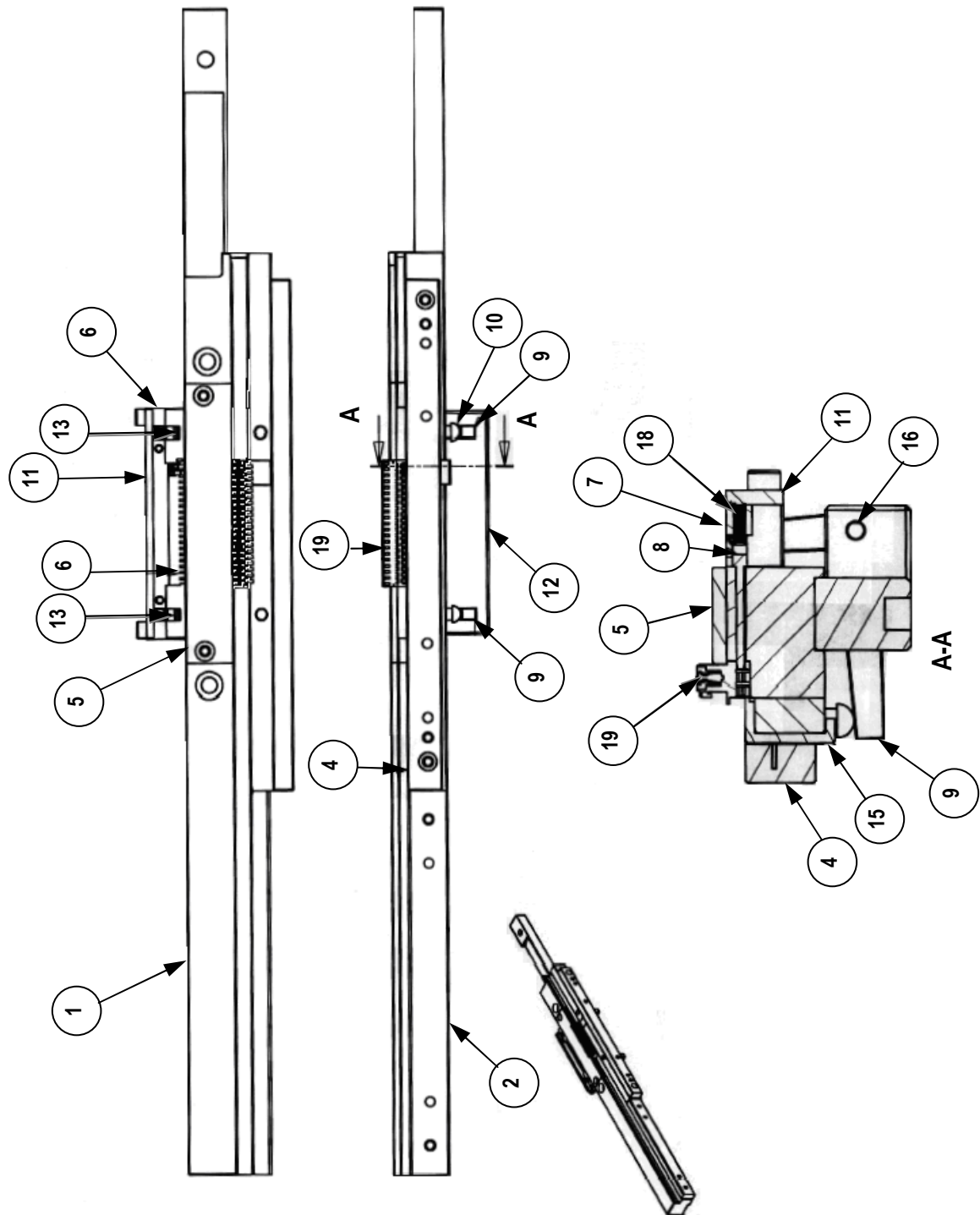
Main Assembly



Termination Track Assembly

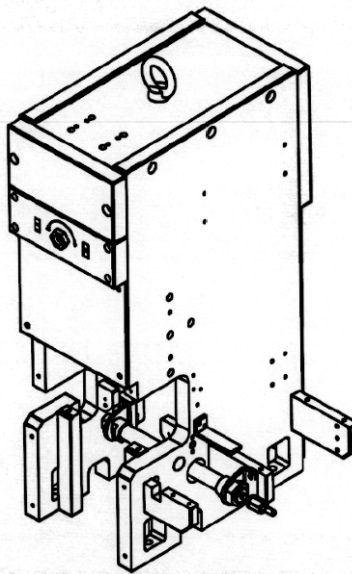
| Terminator Track Assembly 62300-6207 | | | |
|---|------------------|----------------------------|-------------|
| Item | Order No. | Description | Qty. |
| 1 | 62300-6228 | Termination Track | 1 |
| 2 | 62300-6229 | Entry Cover | 1 |
| 3 | 62300-6230 | Exit Cover | 1 |
| 4 | 62300-6231 | Wire Guide Support | 1 |
| 5 | 62300-6232 | Slide Cover Plate | 1 |
| 6 | 62300-6233 | Wire Detect Pin Slide | 1 |
| 7 | 62300-6234 | Spring Block | 1 |
| 8 | 62300-6205 | Wire Detect Pin | 2 |
| 9 | 62300-6235 | Wire Detect Lever | 2 |
| 10 | 62300-6236 | Wire Detect Trigger Pin | 2 |
| 11 | 62300-6237 | Spring Support Plate | 1 |
| 12 | 62300-6238 | Pivot Block | 1 |
| 13 | 62300-6239 | Pivot Pin | 2 |
| 14 | 62300-6240 | Laser Reflect Plate | 1 |
| 15 | 62300-6241 | Termination Brake | 1 |
| 16 | 62300-6242 | Pivot Pin | 2 |
| 17 | N/A | C-Spring Entex #913 | 4 |
| 18 | N/A | C-Spring Entex #3100 | 20 |
| 19 | REF | Customer Product- Rast 2.5 | 1 |

Termination Track Assembly

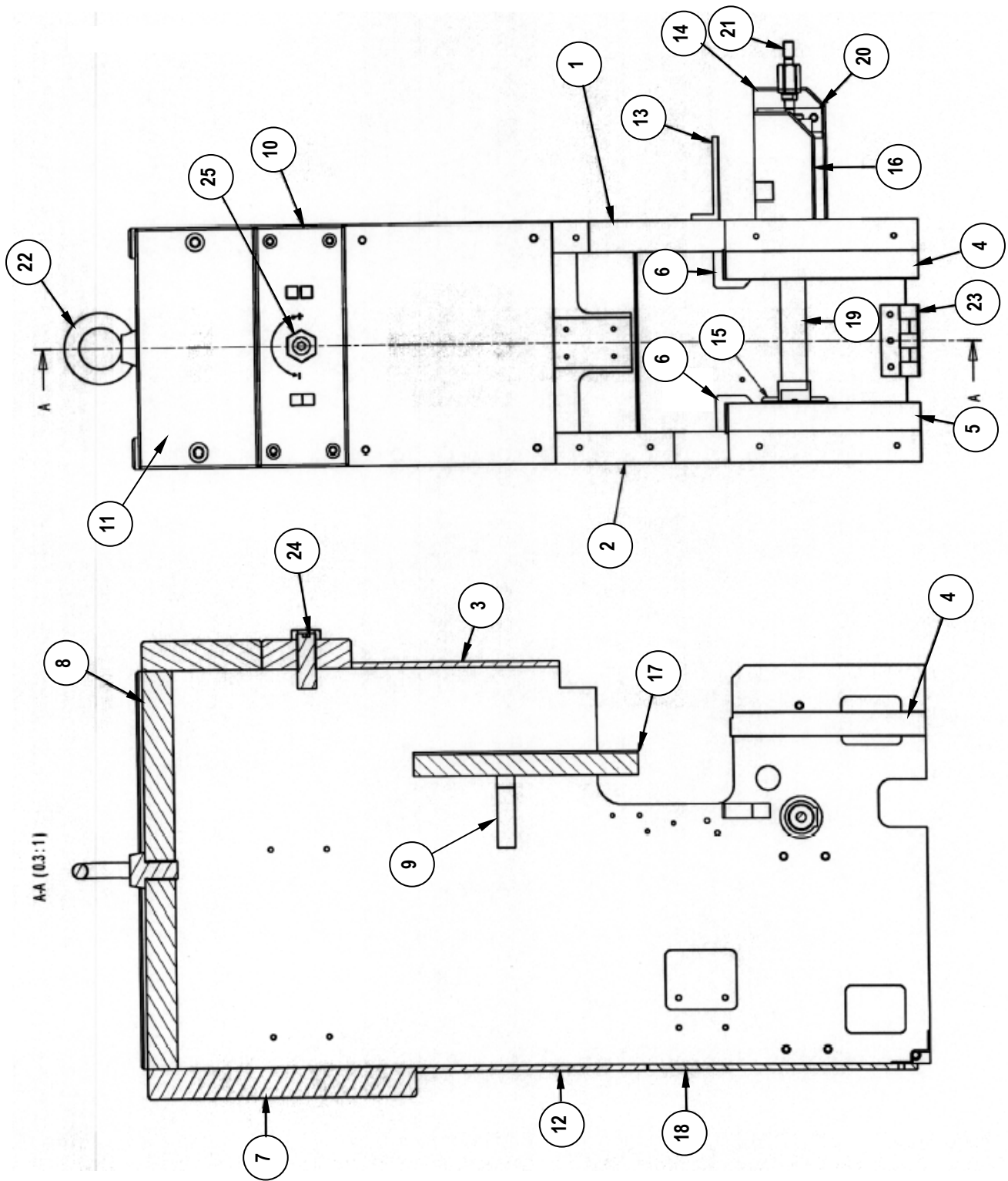


Frame Assembly

| Frame Assembly 62300-6208 | | | |
|---------------------------|------------|---|-----|
| Item | Order No. | Description | Qty |
| 1 | 62300-6243 | Left Frame Upright | 1 |
| 2 | 62300-6244 | Right Frame Upright | 1 |
| 3 | 62300-6245 | Front Cover Plate | 1 |
| 4 | 62300-6246 | Right Track Upright | 1 |
| 5 | 62300-6247 | Left Track Upright | 1 |
| 6 | 62300-6248 | THK Slide Bkt. | 2 |
| 7 | 62300-6249 | Back Frame Upright | 1 |
| 8 | 62300-6250 | Top Plate | 1 |
| 9 | 62300-6251 | Gusset | 2 |
| 10 | 62300-6252 | Termination Adjust Plate | 1 |
| 11 | 62300-6253 | Top Front Plate | 1 |
| 12 | 62300-6254 | Front Cover | 1 |
| 13 | 62300-6255 | Guide Plate | 1 |
| 14 | 62300-6256 | Infeed Table Mtg. Plate | 2 |
| 15 | 62300-6257 | Cylinder Mtg. Plate | 1 |
| 16 | 62300-6258 | Cut Loose St Support Plate | 1 |
| 17 | 62300-6259 | Termination Slide Mtg. Plate | 1 |
| 18 | 62300-6260 | Rear Hinged Cover | 1 |
| 19 | N/A | Transfer Cylinder- Festo -DSNU 20-150-PPV-A-S10 | 1 |
| 20 | N/A | Foot Mtg.- Festo -HBN-20-25x2 | 2 |
| 21 | N/A | Floating Joint- Festo -2062_FK_M8 | 1 |
| 22 | N/A | Lifting Eye Bolt- Misumi -SCHI16 | 1 |
| 23 | N/A | Stepped Hinge- Misumi -HHSD5 | 1 |
| 24 | N/A | Hard Stop- Misumi -ANB 16-45 | 1 |
| 25 | N/A | Nut- Misumi -ANN 16 | 1 |



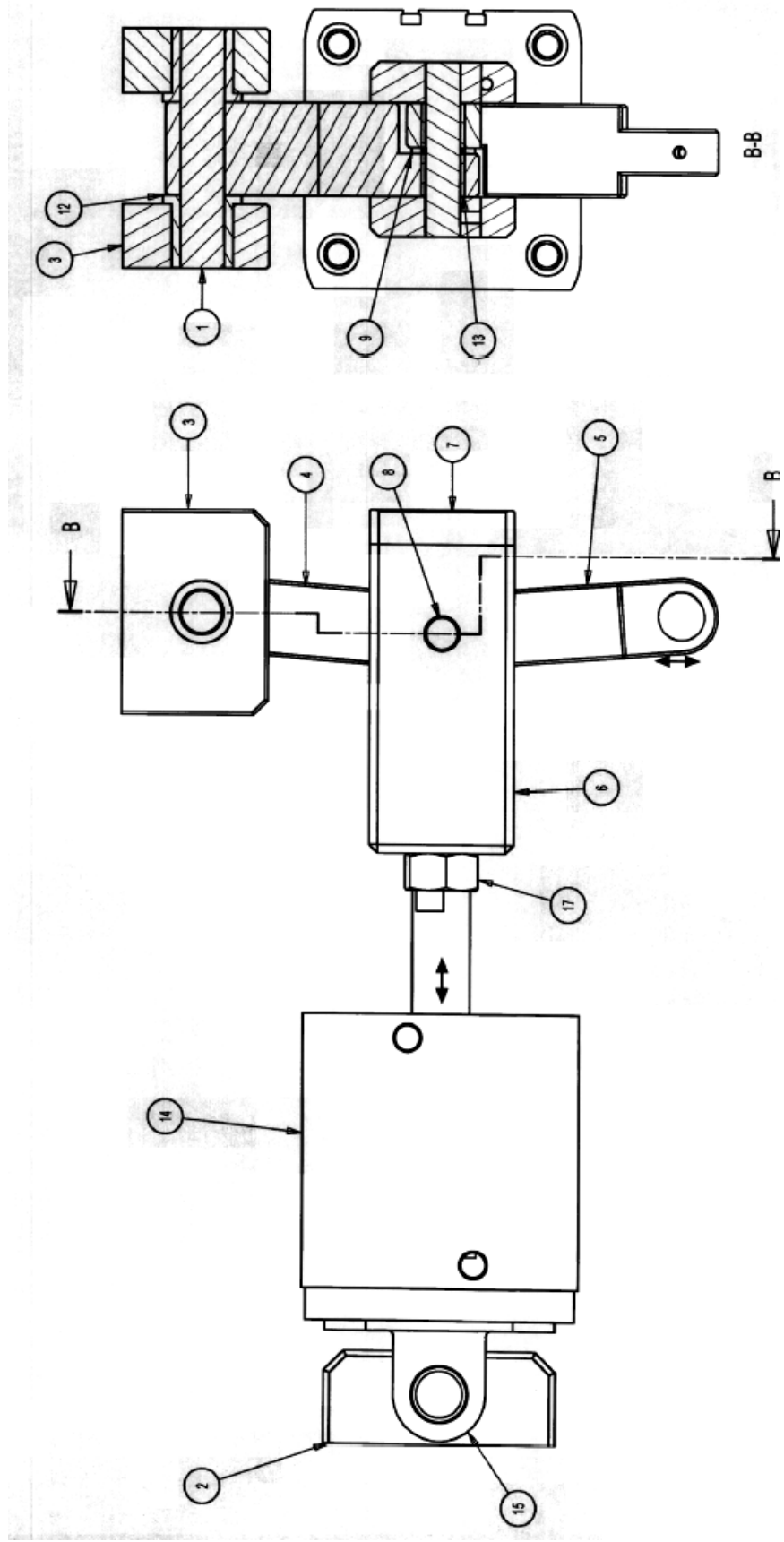
Frame Assembly



Toggle Joint Assembly

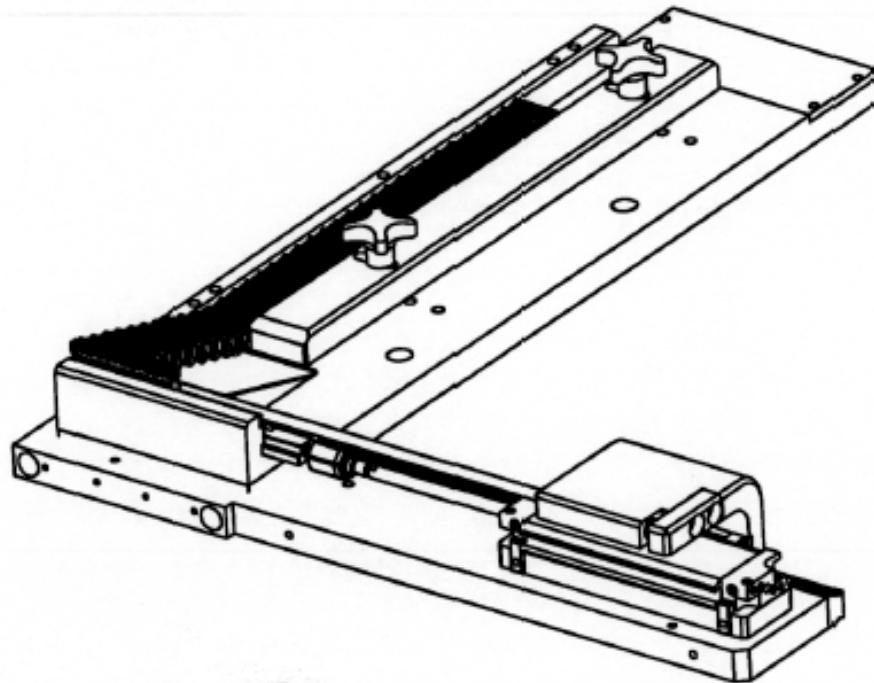
| Toggle Joint Assembly 62300-6209 | | | |
|---|------------------|--|-------------|
| Item | Order No. | Description | Qty. |
| 1 | 62300-6261 | Fixed Pivot Pin | 1 |
| 2 | 62300-6262 | Cylinder Pivot Block | 1 |
| 3 | 62300-6263 | Fixed Pivot Block | 2 |
| 4 | 62300-6264 | Fixed Link Arm | 1 |
| 5 | 62300-6265 | Moving Link Arm | 1 |
| 6 | 62300-6266 | Toggle Joint | 1 |
| 7 | 62300-6267 | End Plate | 1 |
| 8 | 62300-6268 | Toggle Joint Pivot Pin | 1 |
| 9 | 62300-6269 | Brass Washer | 1 |
| 12 | N/A | Flange Bushing- Oilite -AMF1521 25 | 2 |
| 13 | N/A | Straight Bushing- Oilite -AMC1215-16 | 2 |
| 14 | N/A | Compact Cylinder- Festo -ADN-80-40-A-P-A | 1 |
| 15 | N/A | Swivel Flange- Festo -SNCB-80 | 1 |
| 16 | N/A | Straight Bushing- Oilite -AMC1620 12 | 2 |
| 17 | N/A | M16 Nut | 1 |

Toggle Joint Assembly

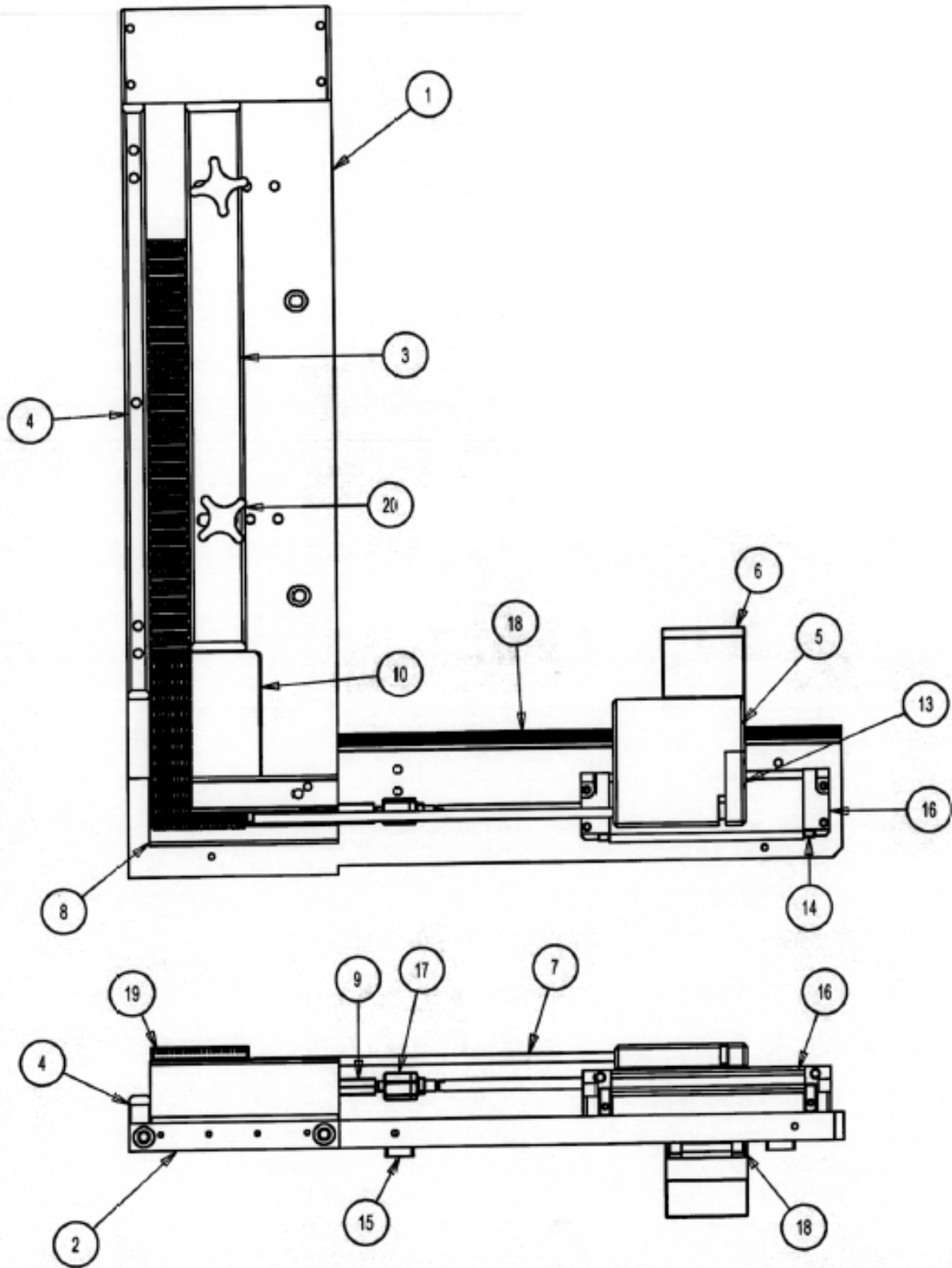


In-Feed Table Assembly

| In-Feed Table Assembly 62300-6210 | | | |
|-----------------------------------|------------|---|------|
| Item | Order No. | Description | Qty. |
| 1 | 62300-6270 | In-feed Table | 1 |
| 2 | 62300-6271 | In Feed Front Plate | 1 |
| 3 | 62300-6272 | Adjustment Side Guide | 1 |
| 4 | 62300-6273 | Fixed Side Guide | 1 |
| 5 | 62300-6274 | Push Bar Mtg. Block | 1 |
| 6 | 62300-6275 | Tie Rod Connect Block | 1 |
| 7 | 62300-6276 | Push Bar | 1 |
| 8 | 62300-6277 | Cut Station Track Section | 1 |
| 9 | 62300-6278 | Gateway Track | 1 |
| 10 | 62300-6279 | Infeed Ramp | 1 |
| 11 | 62300-6280 | Track Spacer | 1 |
| 12 | 62300-6281 | Cylinder Mtg. Plate | 1 |
| 13 | 62300-6282 | Push Bar End Stop | 1 |
| 14 | 62300-6283 | Cylinder Pos Block | 2 |
| 15 | 62300-6284 | Rail Support Block | 2 |
| 16 | N/A | Cylinder- Festo - DZF-12-70-A-P-A | 1 |
| 17 | N/A | Floating Joint- Festo -2061 FK-M6-(0;0) | 1 |
| 18 | N/A | Rail and Carriage- THK- RSH15ZMUU+270L | 1 |
| 19 | REF | Customer Product-RAST 2.5 | 1 |
| 20 | N/A | Knob- Ganter Griff -GN 6335.4-TE-32-M6-25 | 1 |



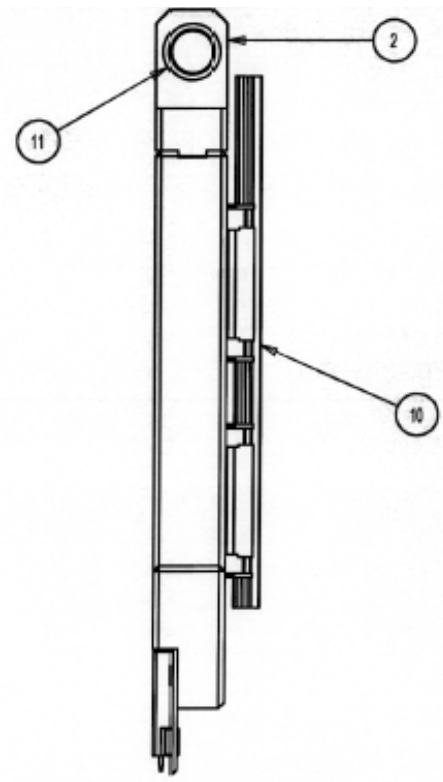
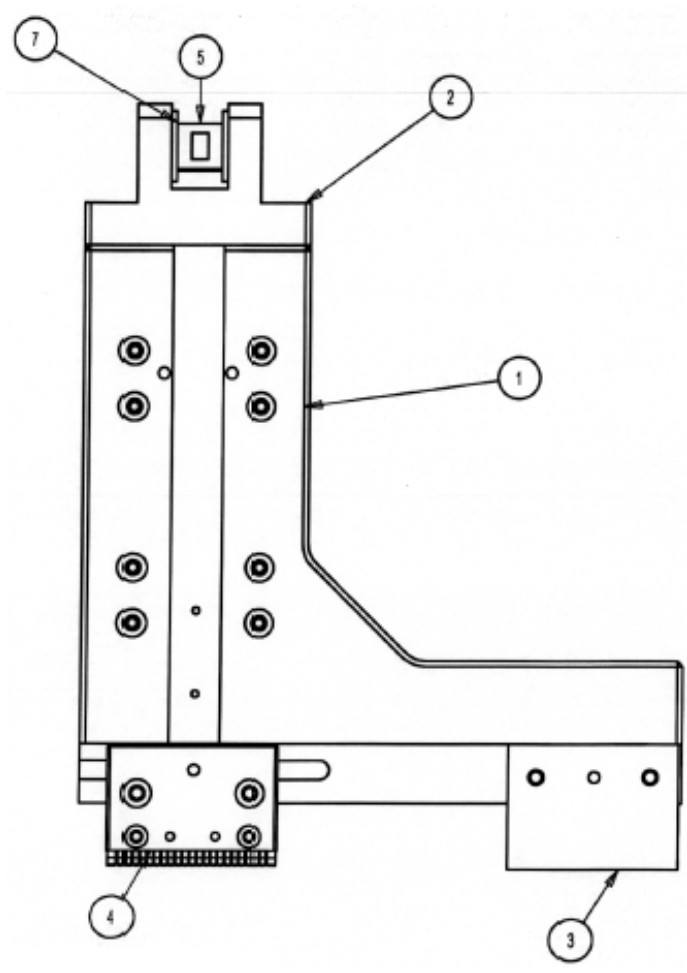
In-Feed Table Assembly



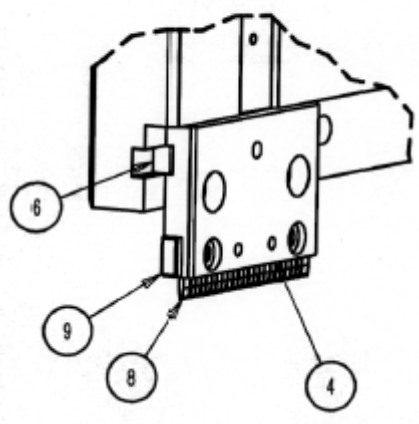
Cut and Termination Assembly

| Cut and Term Slide Assembly 62300-6211 | | | |
|---|------------------|--|-------------|
| Item | Order No. | Description | Qty. |
| 1 | 62300-6285 | Cut and Termination Tooling Plate | 1 |
| 2 | 62300-6286 | Toggle To Slide Linkage | 1 |
| 3 | 62300-6201 | Housing Cut Blade | 1 |
| 4 | 62300-6202 | Termination Tool | 1 |
| 5 | 62300-6287 | Toggle Joint Pin | 1 |
| 6 | 62300-6288 | Cut and Termination Tooling Key | 1 |
| 7 | 62300-6289 | Brass Washer | 2 |
| 8 | 62300-6203 | Termination Support Blade | 1 |
| 9 | 62300-6290 | Termination Insert | 1 |
| 10 | N/A | Rail and Carriage- THK -SRS15WMUU+190L | 1 |
| 11 | N/A | Bush- Oilite -AMC1620 12 | 2 |
| --- | 62300-6204 | Termination Support Blade-Latches | 1 |

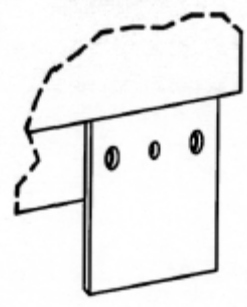
Cut and Termination Assembly



A (1:2)
TERMINATE

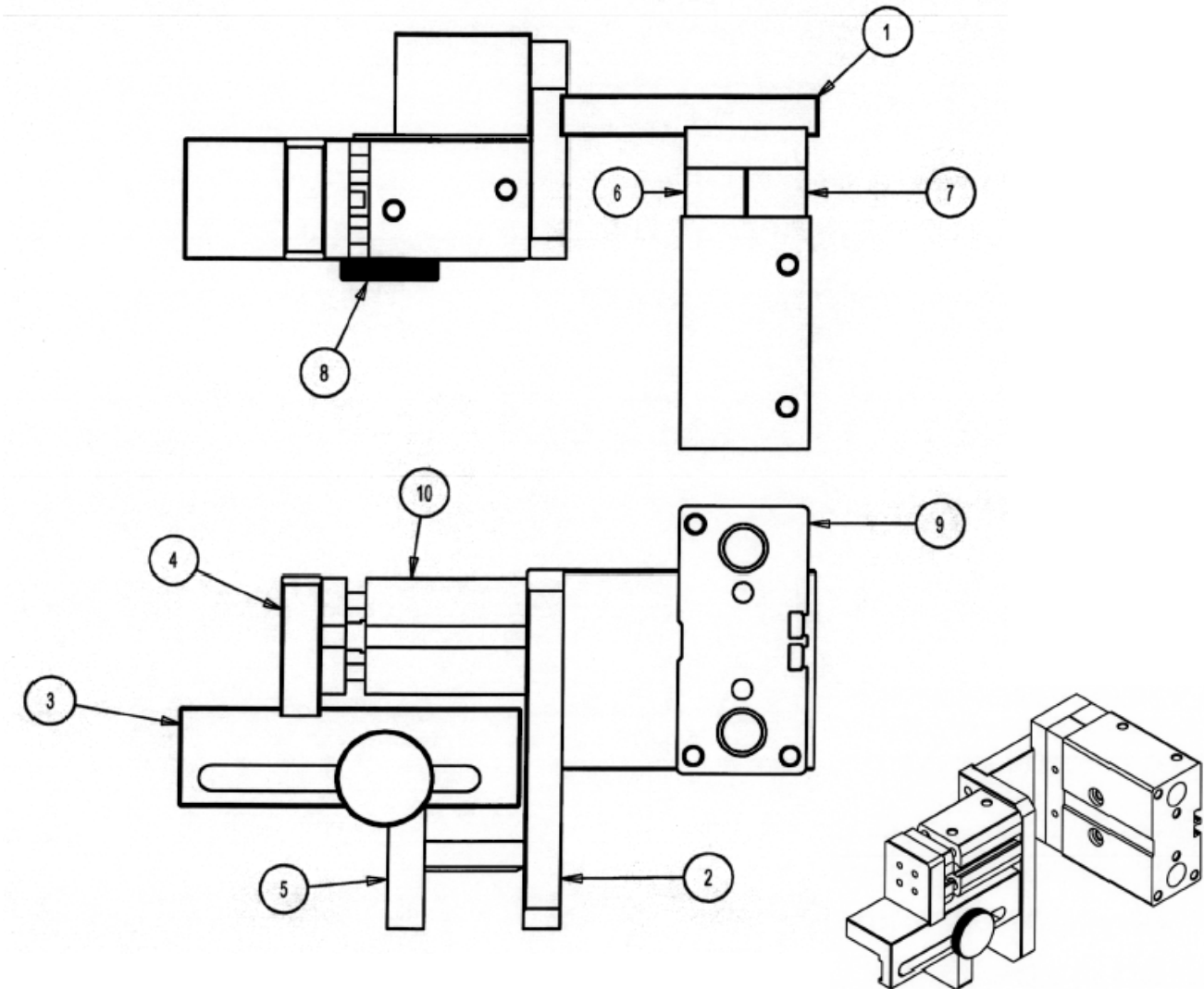


B (1:2)
CUT LOOSE



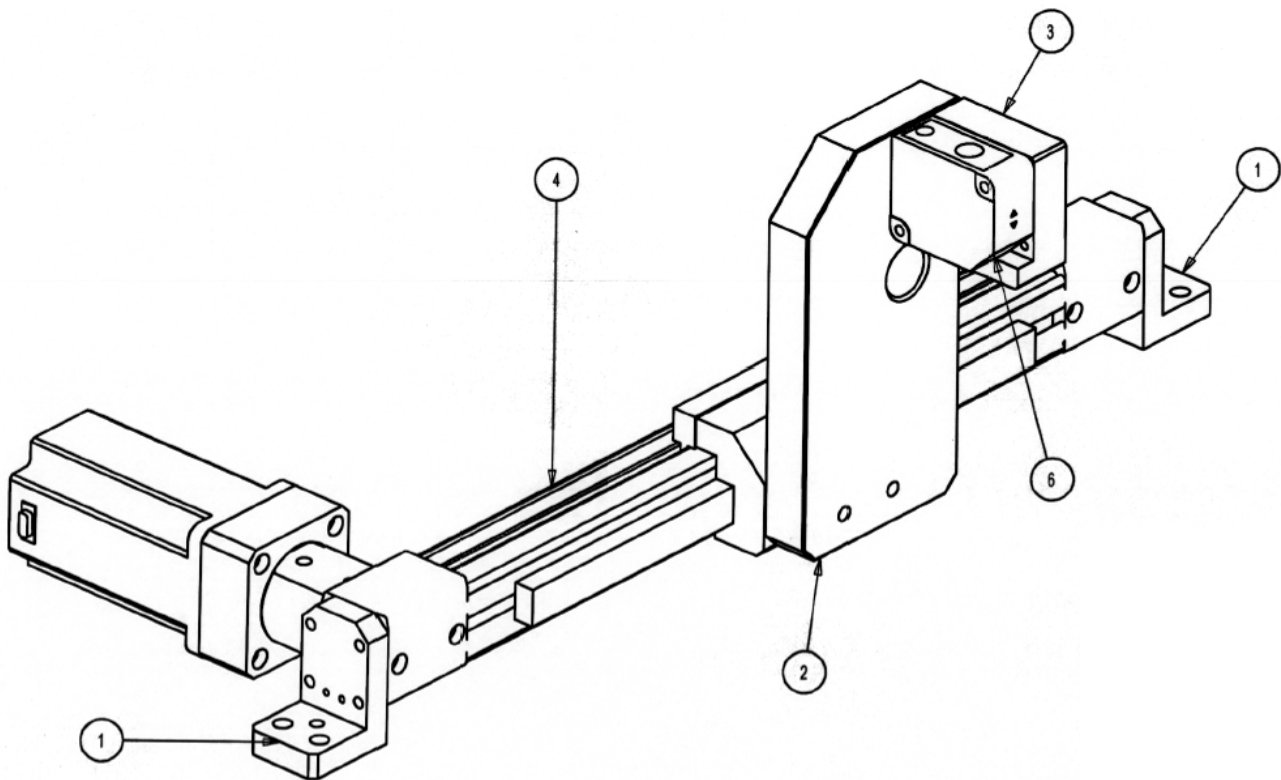
In-Feed Gripper Assembly

| In-Feed Gripper Assembly 62300-6212 | | | |
|-------------------------------------|------------|---|------|
| Item | Order No. | Description | Qty. |
| 1 | 62300-6291 | Infeed Cylinder Mtg. Plate | 1 |
| 2 | 62300-6292 | Fixed Clamp Plate | 1 |
| 3 | 62300-6293 | Adjustable Clamp Plate | 1 |
| 4 | 62300-6294 | Clamp Cylinder Plate | 1 |
| 5 | 62300-6295 | Infeed Moving Clamp | 1 |
| 6 | 62300-6296 | Cylinder Spacer Block | 1 |
| 7 | 62300-6297 | Cylinder Spacer Block | 1 |
| 8 | N/A | Thumbscrew- Ganter Griff -DIN 653-M6-16 | 1 |
| 9 | N/A | Cylinder- Festo- DFM-16-20-P-A-GF | 1 |
| 10 | N/A | Compact Cylinder- Festo -ADNGF-16-5-P-A | 1 |



Laser Sensor Assembly

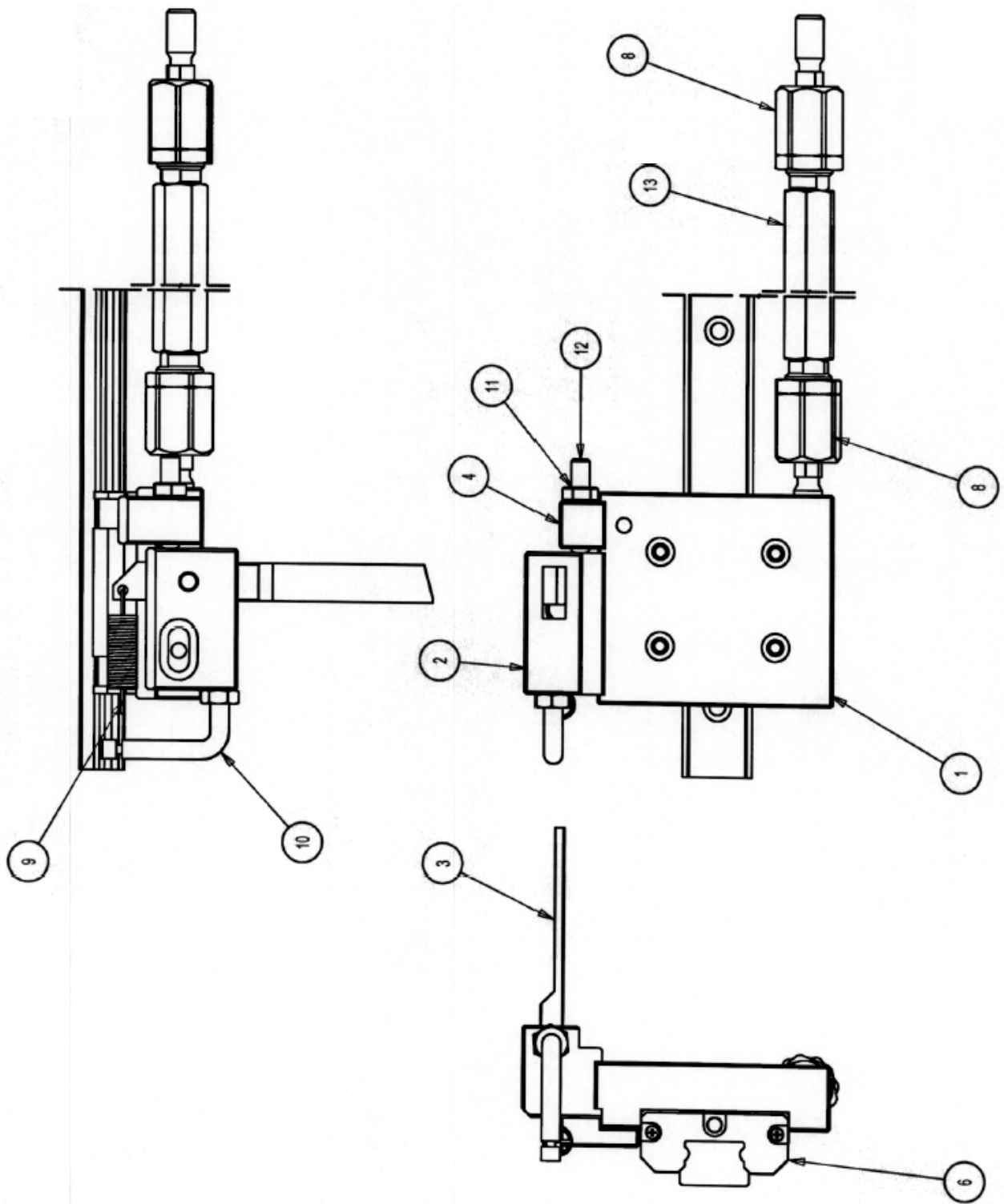
| Laser Sensor Assembly 62300-6213 | | | |
|----------------------------------|------------|---------------------------------------|------|
| Item | Order No. | Description | Qty. |
| 1 | 62300-6298 | Mounting Feet | 2 |
| 2 | 62300-6299 | Slide Mtg. Plate | 1 |
| 3 | 62300-6401 | Sensor Mtg. Block | 1 |
| 4 | N/A | Festo Unit (<i>Items 7 thru 10</i>) | REF |
| 5 | N/A | Location Pins- Festo -150928 ZBS-5 | 2 |
| 6 | N/A | Sensor- Omron - ZX-LD40 | 1 |
| 7 | N/A | Festo -KSE-15-22-D04-D05 | 1 |
| 8 | N/A | Festo -MTR-ST-42-48S-AA | 1 |
| 9 | N/A | Festo -MTR-FL30-ST42 FLANGE | 1 |
| 10 | N/A | Festo -DGE-12-100-ZR-LV-RV-GK-KF-KG | 1 |



Out-Feed Pawl Assembly

| Out-Feed Pawl Assembly 62300-6214 | | | |
|--|------------------|--|-------------|
| Item | Order No. | Description | Qty. |
| 1 | 62300-6402 | Out-Feed Pawl Mtg. Plate | 1 |
| 2 | 62300-6403 | Out-Feed Pawl Body | 1 |
| 3 | 62300-6404 | Out-Feed Pawl Body | 1 |
| 4 | 62300-6405 | Out-Feed Pawl Adjust Block | 1 |
| 5 | 62300-6406 | Pawl Pivot Pin | 1 |
| 6 | N/A | Rail and Carriage- THK -RSH15ZMUU+190L | 1 |
| 8 | N/A | Floating Joint- Festo -2061 FK-M6-(0;0) | 2 |
| 9 | N/A | Tension Spring- Entex - #521 TENSION | 1 |
| 10 | N/A | Spring Post- Misumi -BSPL4-25 | 1 |
| 11 | N/A | Nut- Misumi -ANN 4 | 1 |
| 12 | N/A | Hard Stop- Misumi -ANB 4-20 | 1 |
| 13 | N/A | Hexagonal Post- Misumi - LSBL10-263-F10-M6-N6-FC | 1 |

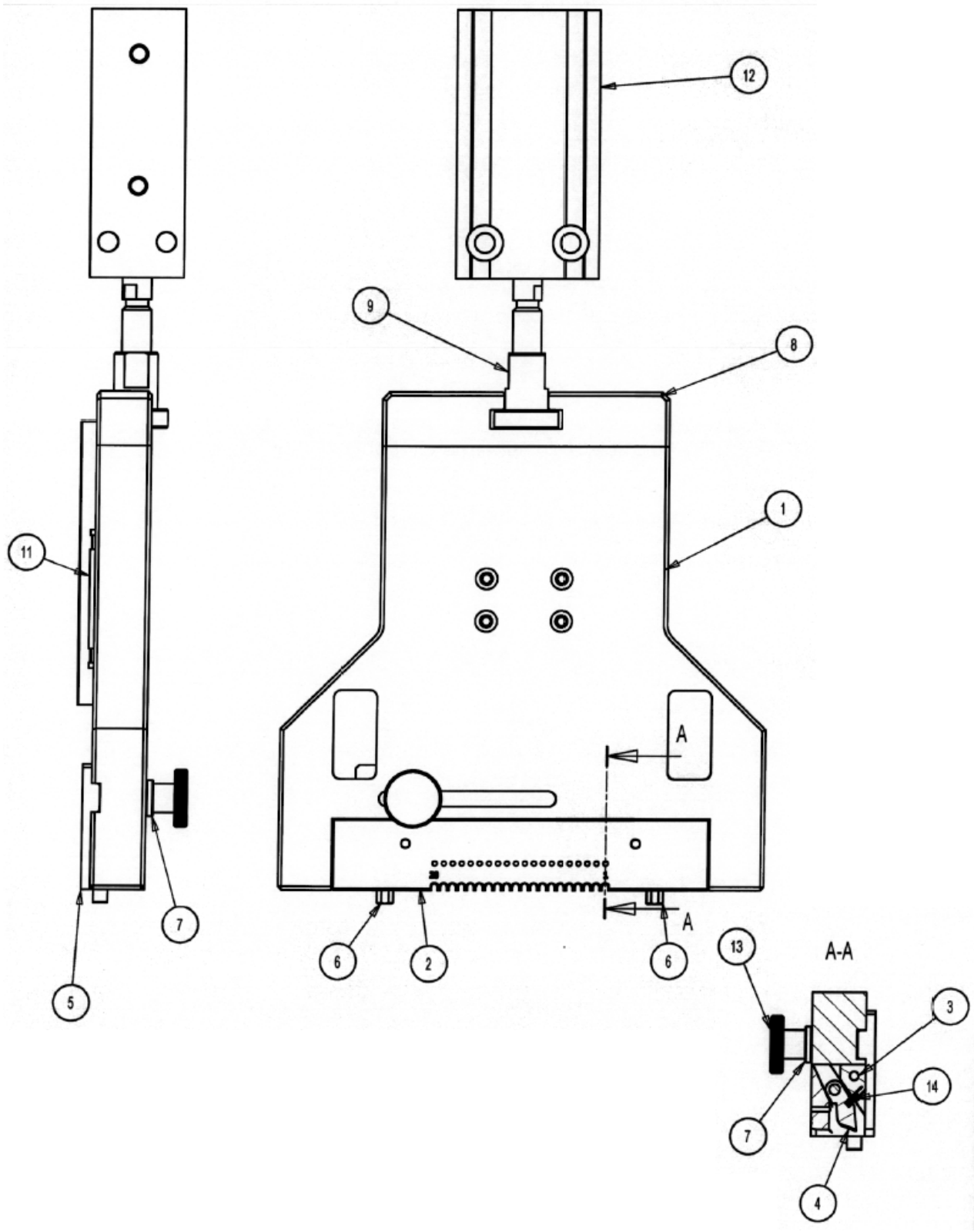
Out-Feed Pawl Assembly



Wire Mask Tooling

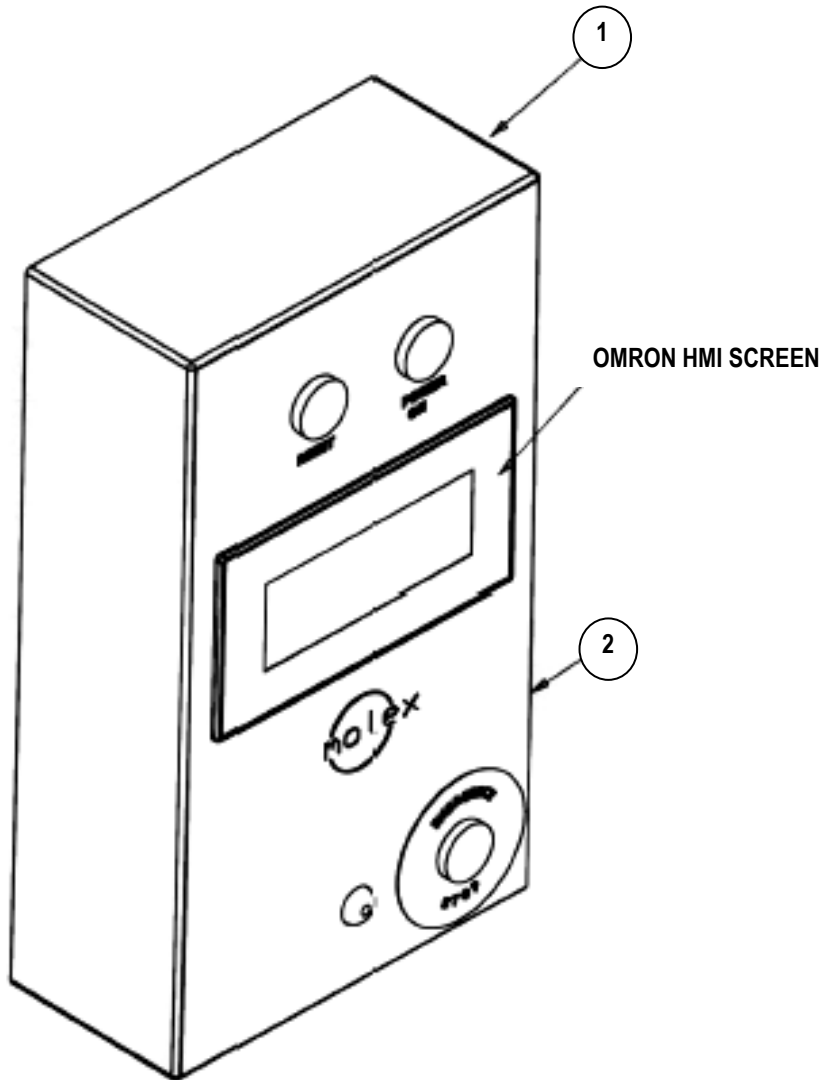
| Wire Mask Tooling 62300-6215 | | | |
|-------------------------------------|------------------|---|-------------|
| Item | Order No. | Description | Qty. |
| 1 | 62300-6407 | Mask Tooling Slide Plate | 1 |
| 2 | 62300-6408 | Mask Tooling | 1 |
| 3 | 62300-6409 | Spring Retaining Block | 1 |
| 4 | 62300-6410 | Cable Gripper | 1 |
| 5 | 62300-6411 | Adjustable Comb Tooling | 1 |
| 6 | 62300-6412 | Wire Detect Trigger Pin | 2 |
| 7 | 62300-6413 | Thumbscrew Washer | 1 |
| 8 | 62300-6414 | Cylinder Clevis | 1 |
| 9 | 62300-6415 | Floating Joint | 1 |
| 10 | 62300-6416 | Gripper Pivot Pin | 1 |
| 11 | N/A | Rail and Carriage- THK -RSH9WZMUU+80L | 1 |
| 12 | N/A | Cylinder- Festo -DMM-20-20-P-A | 1 |
| 13 | N/A | Thumbscrew- Ganter Griff -DIN 464-M4-12 | 1 |
| 14 | N/A | Compression Spring- Entex - #3016 | 20 |

Wire Mask Tooling



IOP Box Assembly

| IOP Box Assembly 62300-6216 | | | |
|-----------------------------|------------|-------------|------|
| Item | Order No. | Description | Qty. |
| 1 | 62300-6417 | IOP Box | 1 |
| 2 | 62300-6418 | Lexan Label | 1 |



5.2 Electrical Parts List

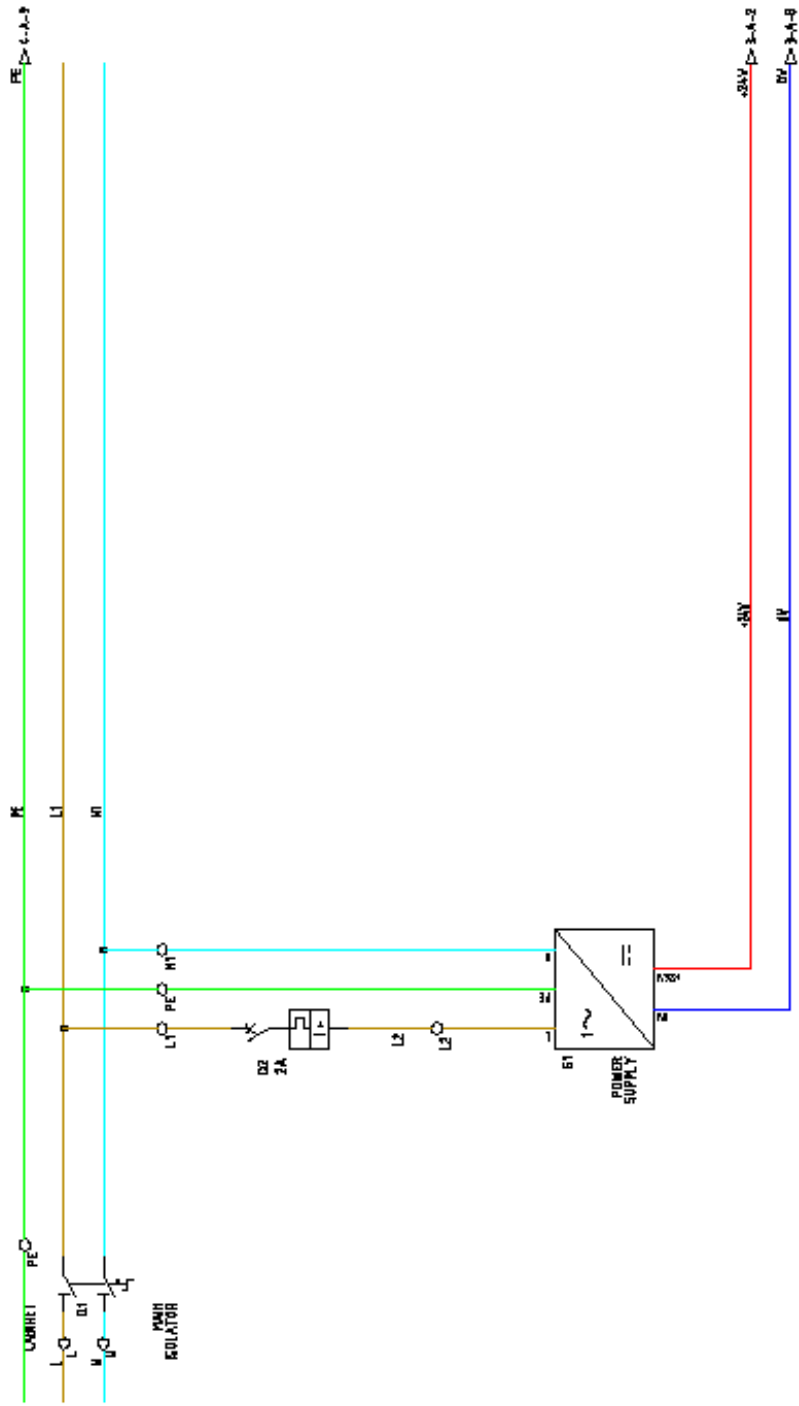
| Manufacturer | Description | Qty |
|----------------|---|-----|
| Allen-Bradley | 440N-S32022 | 1 |
| Omron | CPM2A-60CDT1-D | 1 |
| | NT2S-CN212V1 | 1 |
| | NT3S-ST126BE | 1 |
| | S8VS-12024 | 1 |
| | ZXLD40 | 1 |
| | ZX LDA41 | 1 |
| Wago | 209-501 Customise cards | 20 |
| | 280-402 | 100 |
| | 280-520 | 50 |
| ITW | DE9SF | 1 |
| Moeller | TO-2-1/EZ | 1 |
| Telemecanique | ZB2BZ101 | 1 |
| | ZB2BZ102 | 1 |
| | ZB2BS54 | 1 |
| | ZB2BE102 | 1 |
| | ZB2BA6 | 1 |
| | ZB4BVB3 | 1 |
| | ZB4BV033 | 1 |
| MH | MHDM-9-K | 1 |
| Merlin Gerin | C60HD102 | 1 |
| CML | 19210351 LED Green | 1 |
| PILZ | 774310 PNOZ X3 24VAC 24VDC Safety Relay | 1 |
| Radionics | 622-1449 | 1 |
| SMC Pneumatics | AS1001F-04 Speed Control | 10 |
| | KGL04-M5 - elbows | 10 |
| Festo Ltd | 150387 SIEN-M8B-PS-S-L Proximity Switch,M8 | 1 |
| | 150857 SME-8-S-LED-24 Proximity Switch | 11 |
| | 151687 MSSD-EB Plug Socket | 2 |
| | 153344 QSML-4 Fitting | 5 |
| | 153347 QSML-4H Fitting | 5 |
| | 159421 SIM-M8-3GD-5-PU Proximity Switch Socket, Straight | 13 |
| | 159423 SIM-M8-3WD-5-PU Proximity Switch Socket, Right Angle | 1 |
| | 161419 UC-1/8 Silencer | 2 |
| | 163142 CPE18-M1H-5L-1/4 | 1 |
| | 164274 PEV-1/4-WD-LED-24 Angled Socket | 1 |
| | 165004 UC-1/4 Silencer | 2 |
| | 175095 SMBR-8-20 Mounting Kit | 2 |
| | 185781 LFR-1/4-D-MINI-KG Servis Combination | 1 |
| | 193740 DGE-12-100-ZR-LK-KG-KF-GK Toothed Belt Axis | 1 |
| | 2061 FK-M6 | 2 |
| | 2061 FK-M6 | 1 |
| 2062-FK-M8 | 1 | |

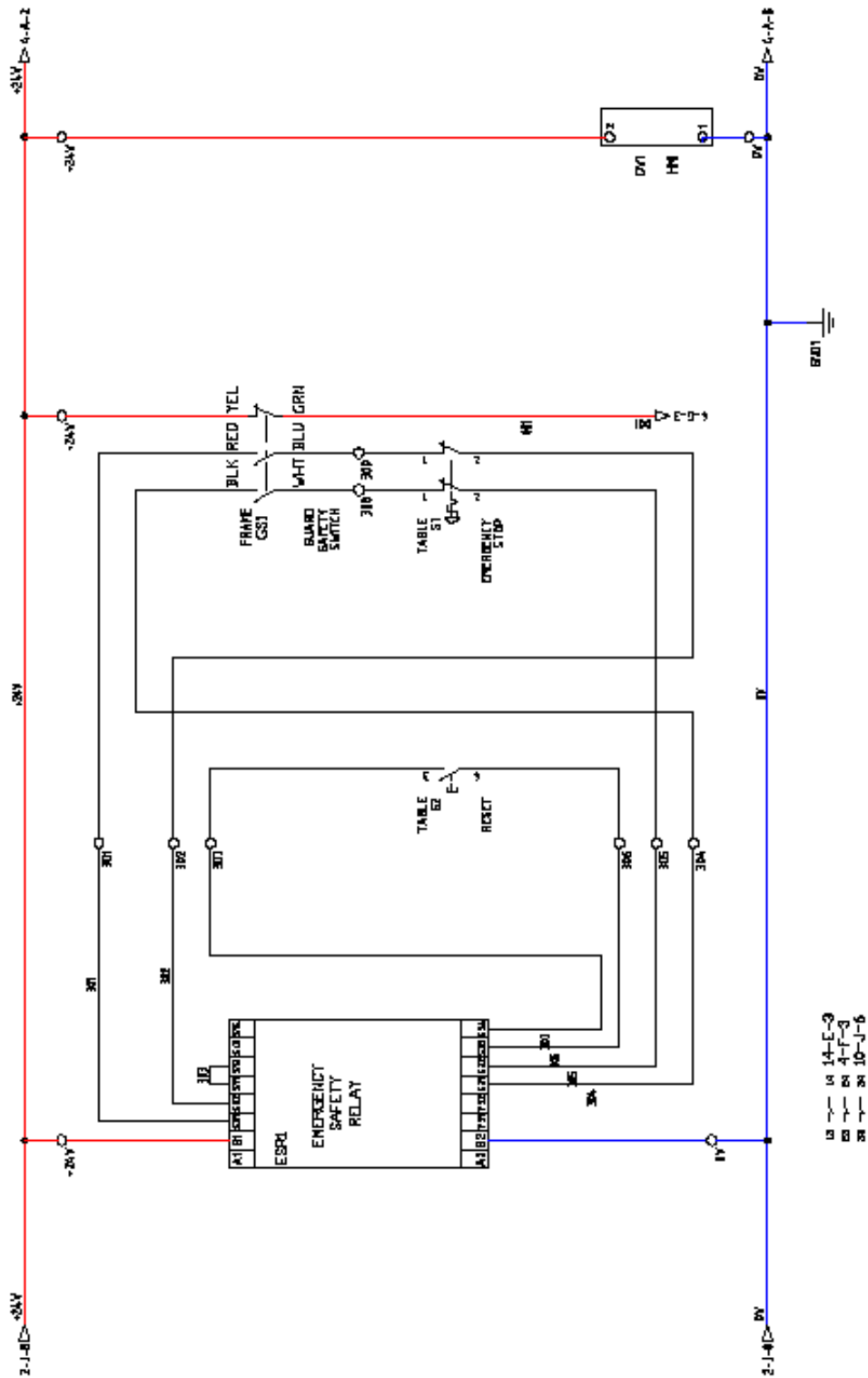
| Manufacturer | Description | Qty |
|--------------|--|-----|
| Festo Ltd | 525675 CPV-SC-MP-VI Valve Terminal [80P-10-1MS-PF-N-SLG-MJJ3MLL+CP] | 1 |
| | 525911 SMT-8F-24V-K7,5-OE Proximity Switch | 2 |
| | 530059 MTRE-ST-42-48S-AA Stepper Motor | 1 |
| | 530079 MTR-FL30-ST42 Motor Flange | 1 |
| | 530084 KSE-15-22-D04-D05 Coupling | 1 |
| | ADN-80-40-A-P-A | 1 |
| | ADNGF-16-5-P-A | 1 |
| | DFM-16-20-P-A-GF | 1 |
| | DMM-20-20-P-A | 1 |
| | DSNU 20-150-PPV-A-S10 | 1 |
| | DZF-12-70-A-P-A | 1 |
| | SIEN-M5B-PS-S-L | 1 |
| | SNCB-80 | 1 |

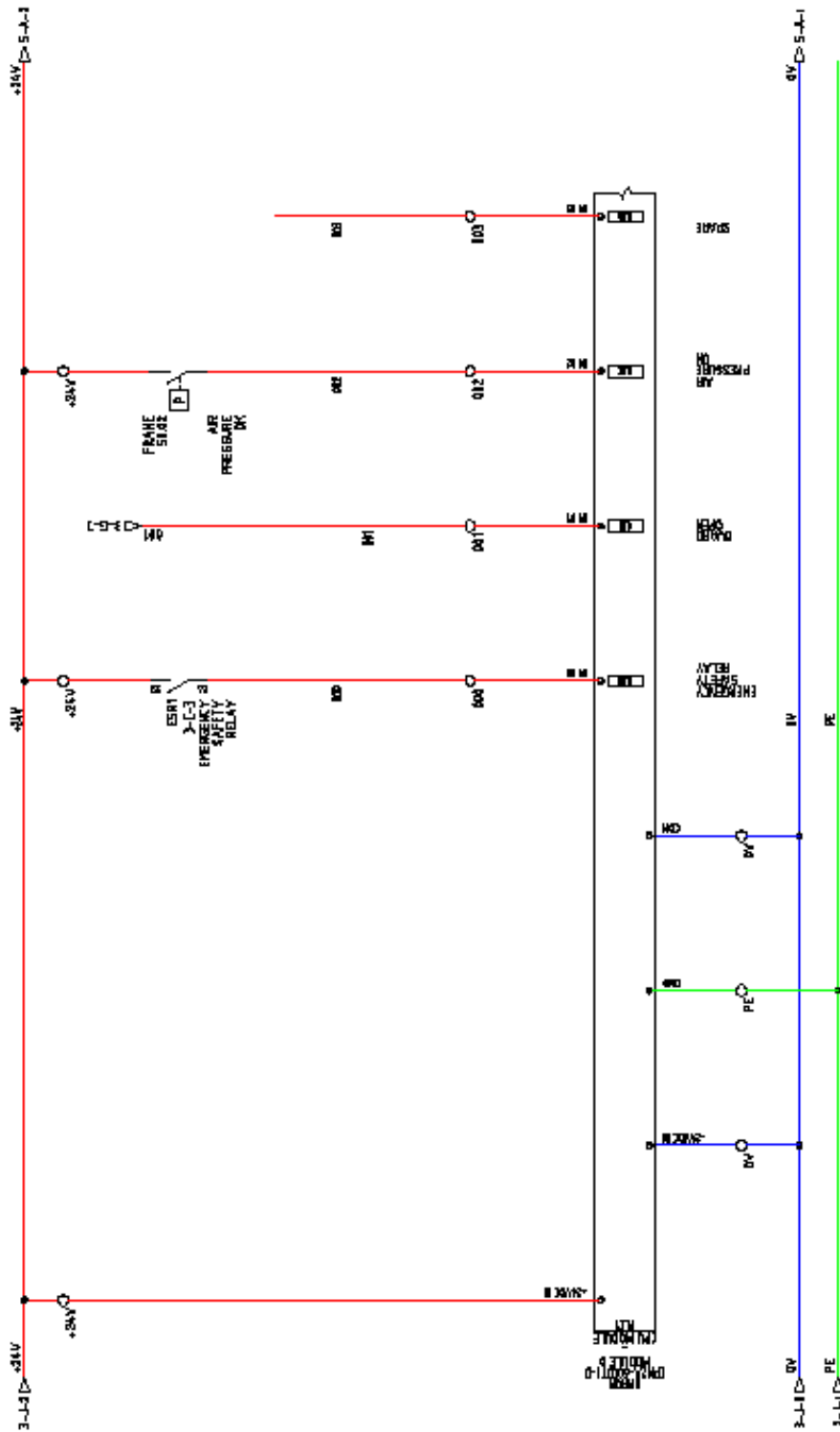
Commercial Hardware

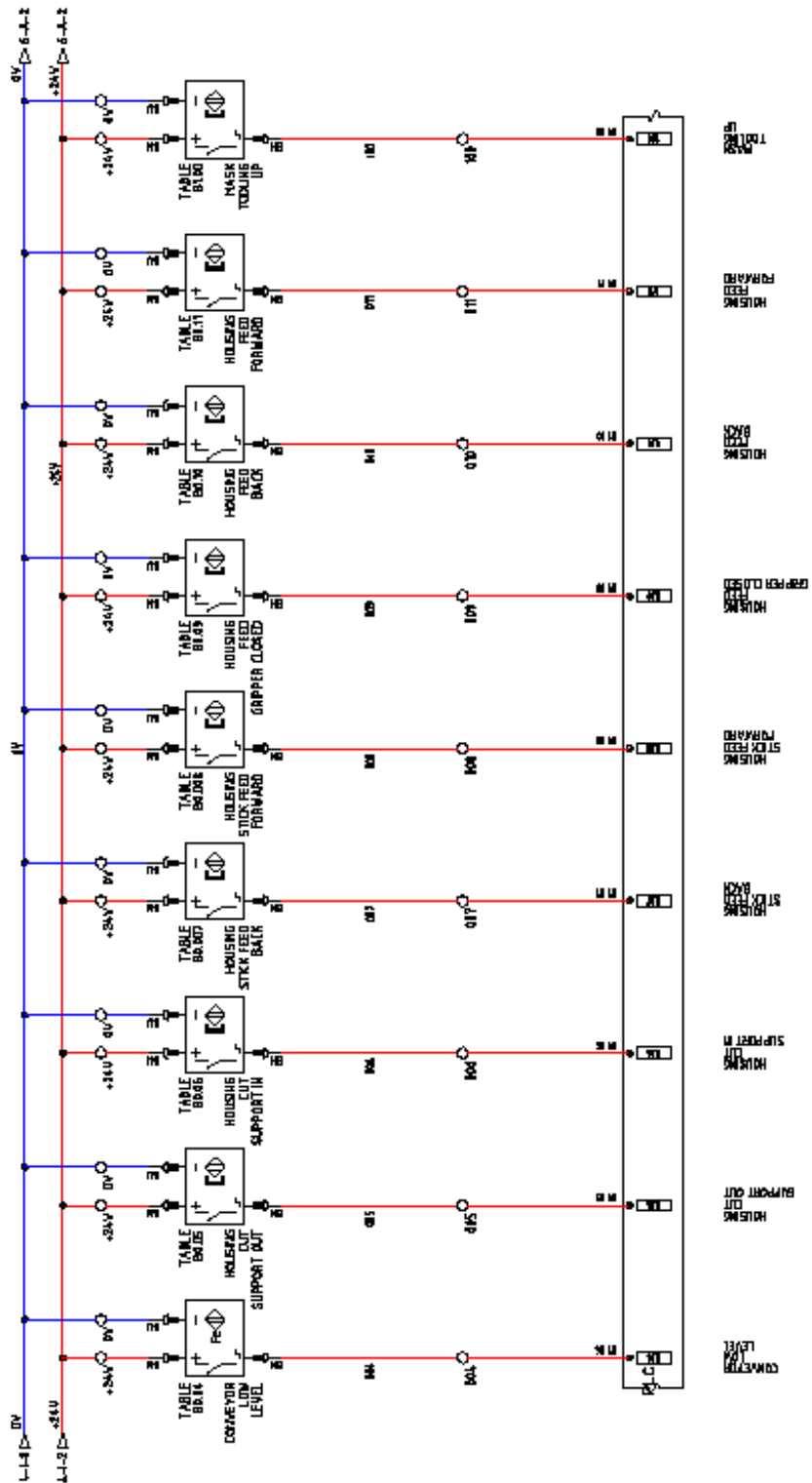
| Manufacturer | Description | Qty |
|---------------------------------|-------------------------|-----|
| FHB | 600 X 400 X 200 Cabinet | 1 |
| Kato-Entex | Entex No 3016 | 50 |
| | Entex No 913 | 10 |
| | Entex No 3022 | 50 |
| | Entex No 3096 | 50 |
| | Entex No 3100 | 50 |
| | Entex No 3302 | 1 |
| Misumi | ANB16-45 | 1 |
| | BSPL4-25 | 1 |
| | HHKS100 | 1 |
| | HHKST100 | 1 |
| | HHSD5 | 1 |
| | LBRFNF6-283-10-PC-QC | 1 |
| | SCHI16 | 1 |
| THK | 2SRS15WMUU+190L | 1 |
| | SRS 9WM UU +80L | 1 |
| | RSH15ZMUU+230L | 1 |
| | RSH15ZMUU+270L | 1 |
| Royal Diversified Products Inc. | MQB 1.59 63) | 27 |
| | MQB 1.60 X 63) | 27 |
| TED Ltd | DIN 464-M4-12 | 1 |
| | DIN 464-M4-20 | 1 |
| | DIN 653 M6-16 | 1 |
| | GN 6335.4-TE-32-M6-25 | 2 |
| | GN 6335.4-TE-32-M6-45 | 2 |

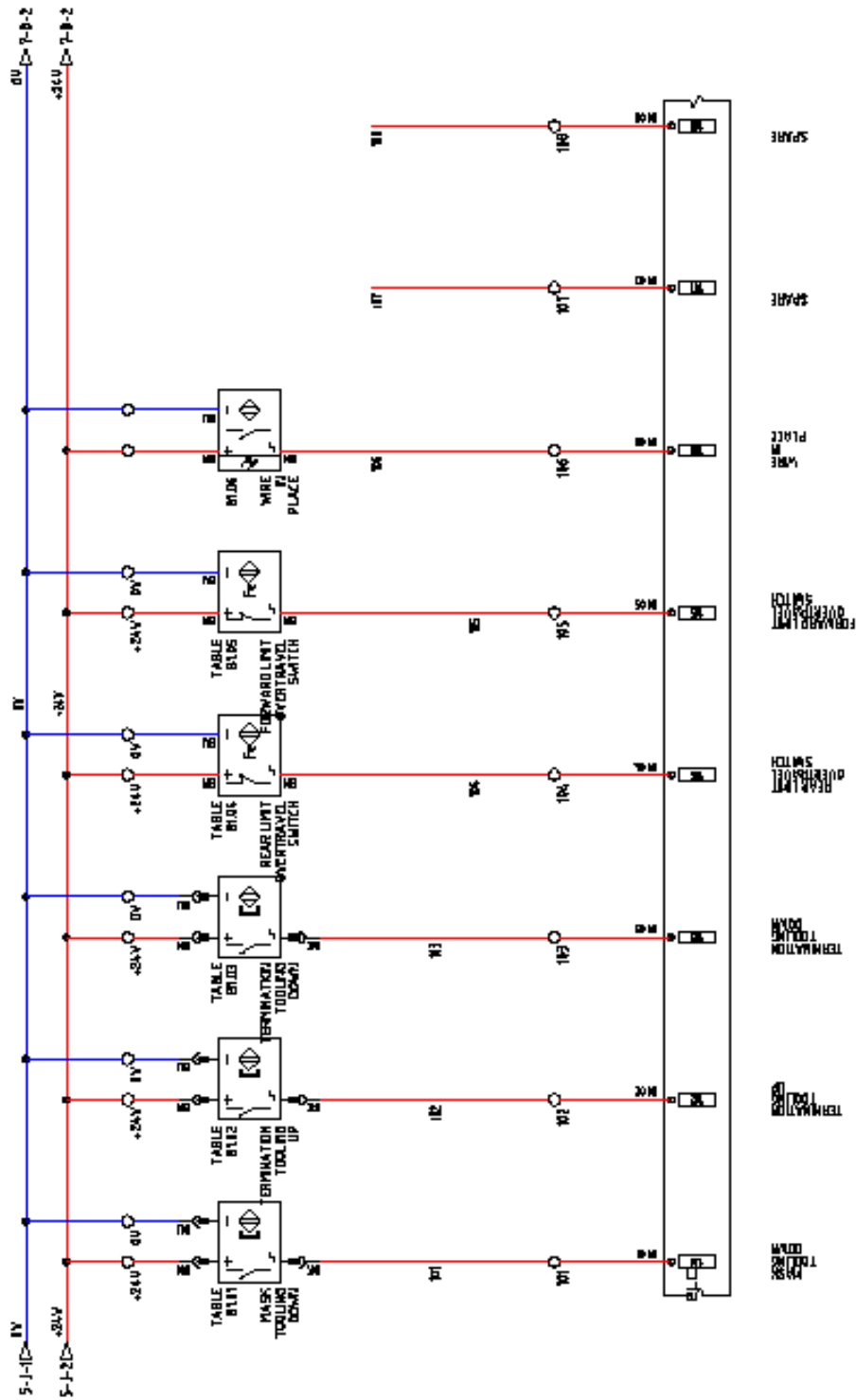
5.2 Electrical Drawings

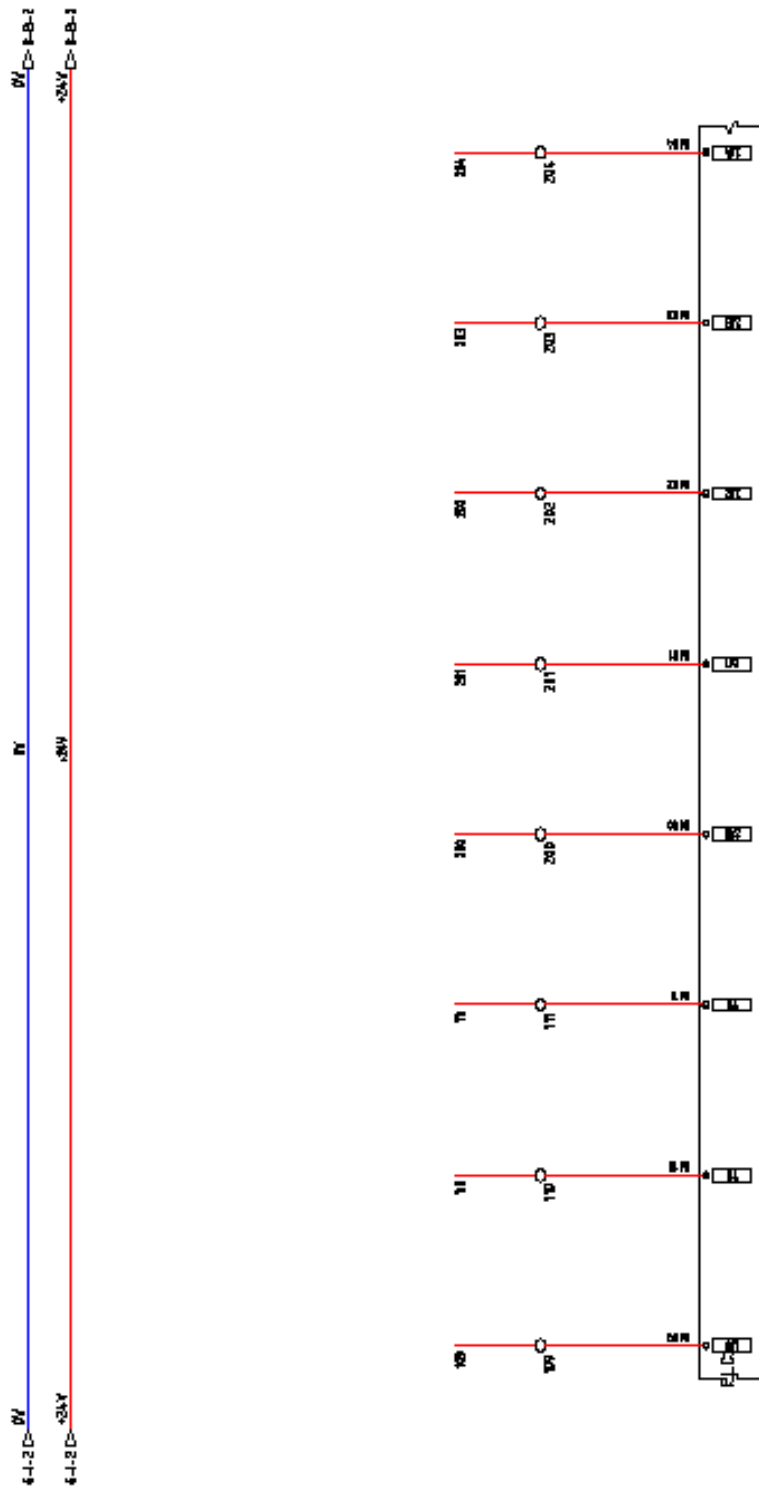


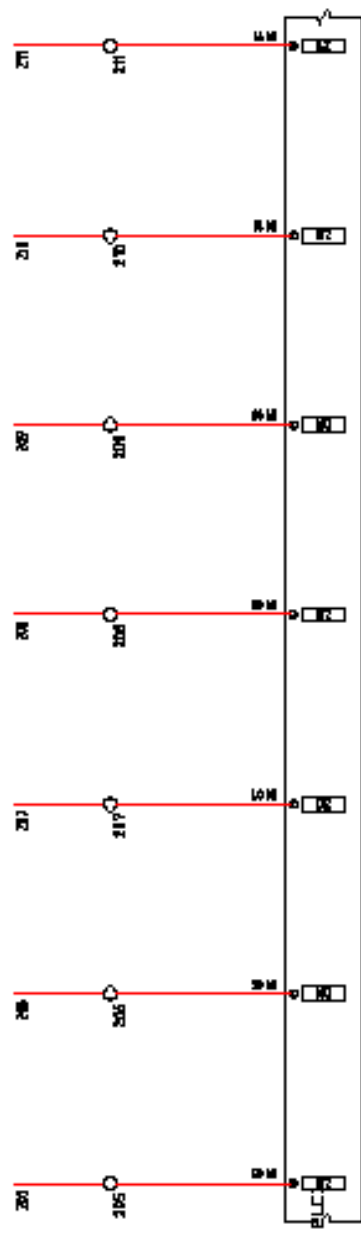
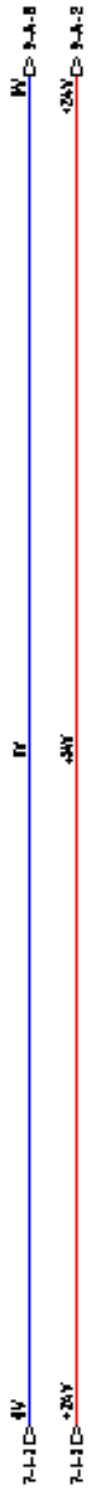


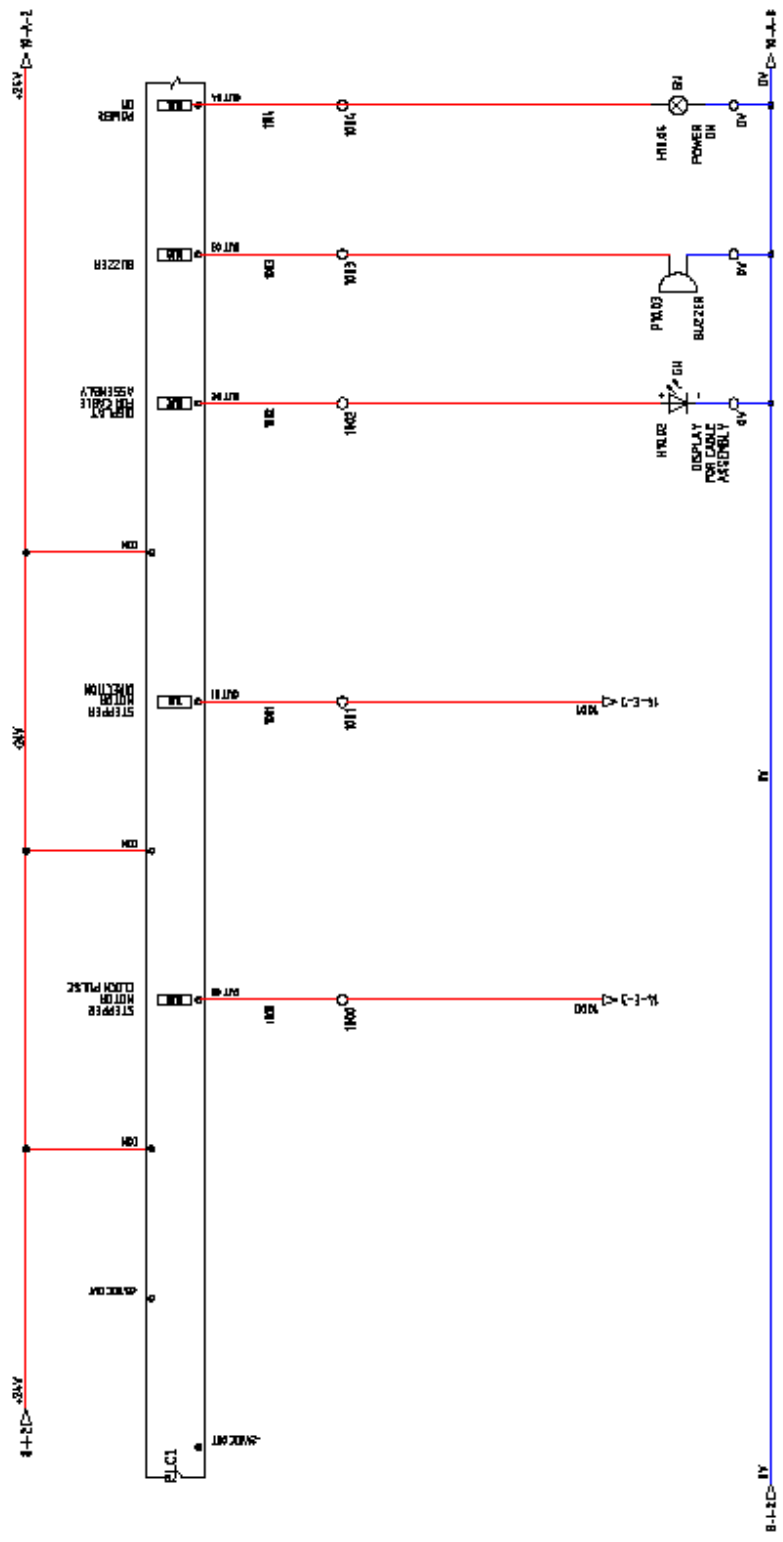


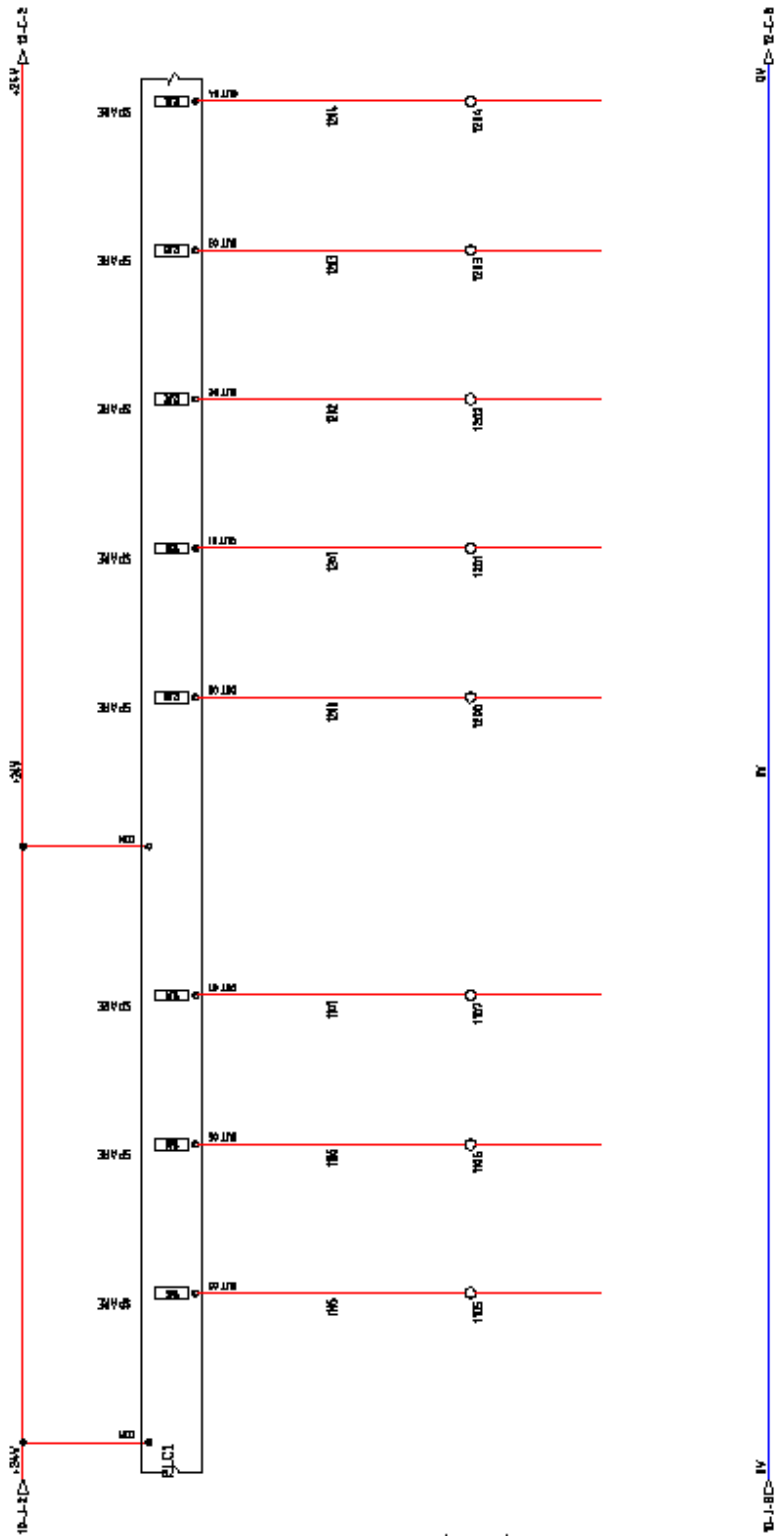


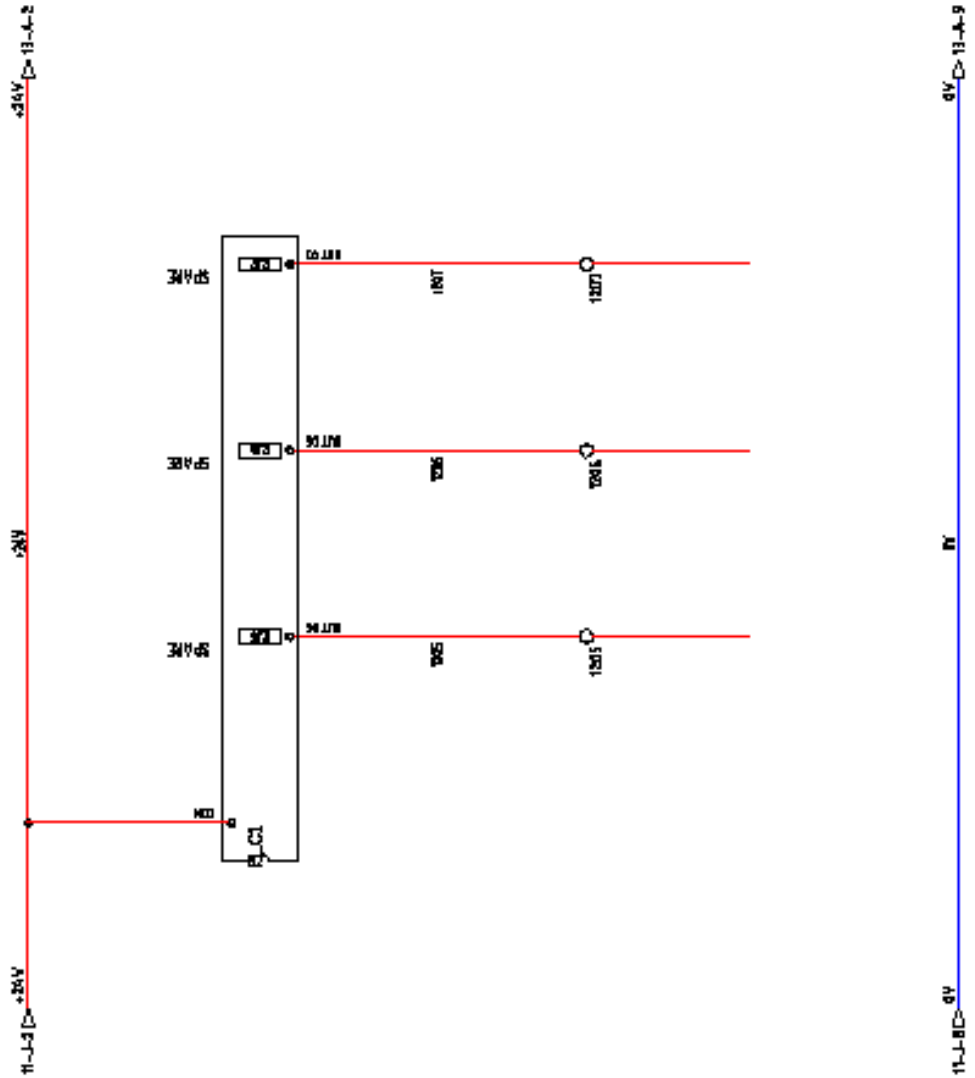


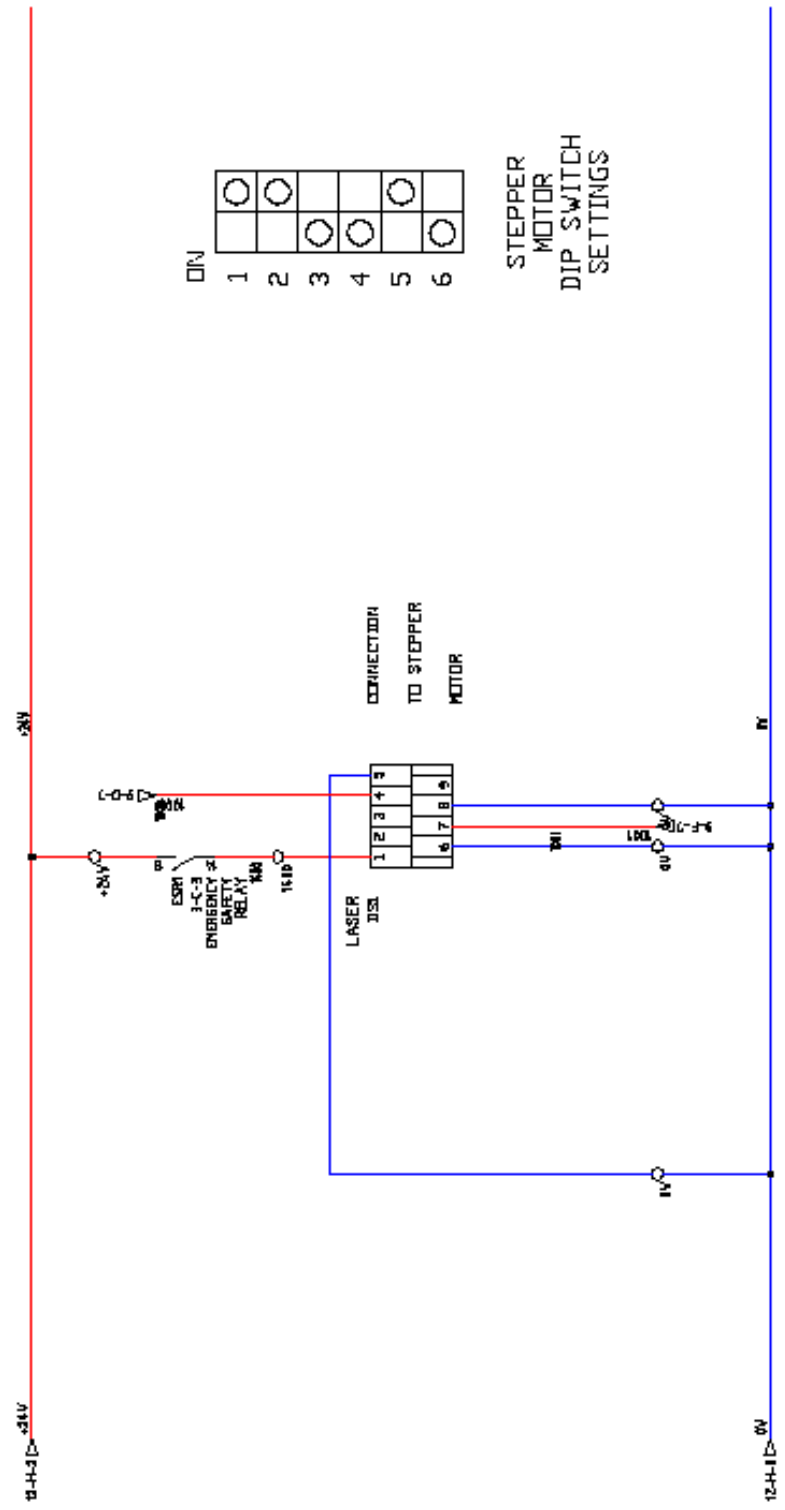












BILL OF MATERIALS

| SUPPLIER | REF | QTY | SUPPLIER PART | CATALOG | DESCRIPTION |
|----------|---------------|-----|---------------|--------------------------|---|
| RADIUMCS | | | | | |
| FARNELL | AWJ | 1 | 522-1449 | KSC3524 | Buzzer |
| FARNELL | | 1 | 53074 | 07-5228 | Solder Bucket Socket 19 Way |
| FARNELL | | 1 | 430-3430 | 430-3430 | DIE CAST SUB D HOOD (9 WAY) |
| FARNELL | | 1 | 430-3430 | 464-004 | 24V LED GREEN |
| FESCO | | 1 | 163142 | CP18-MH-SL-174 | SOLENOID VALVE |
| FESCO | | 1 | 563675 | CPV-SC-ME-VI | VALVE TERMINAL |
| FESCO | | 1 | 193740 | DIE-12-00-28-LK-KG-RF-GK | TOOTHED BELT AXIS |
| FESCO | | 1 | 530084 | KSE-15-22-004-005 | COUPLER |
| FESCO | | 1 | 165761 | LFR-174-1-MINIKG | SERVO COMBINATION |
| FESCO | | 2 | 151687 | MS31-ER | PLUG SOCKET |
| FESCO | | 1 | 531079 | MTR-FL30-S742 | MOTOR FLANGE |
| FESCO | | 1 | 530059 | MTR-ST-42-485-AA | STEPPER MOTOR |
| FESCO | | 1 | 164274 | PEV-174-WD-LED-24 | ANGLED SOCKET |
| FESCO | | 1 | 133344 | MSM-4 | FILING |
| FESCO | | 5 | 150387 | MSM-4H | FILING |
| FESCO | | 1 | 150387 | STER-MB-PS-S-I | PROXIMITY SWITCH |
| FESCO | | 13 | 159421 | SIM-M8-360-S-PU | PROXIMITY SWITCH SOCKET STRAIGHT |
| FESCO | | 1 | 159423 | SIM-M8-360-S-PU | PROXIMITY SWITCH SOCKET RIGHT ANGLE |
| FESCO | | 2 | 175095 | SMR-B-20 | MOUNTING KIT |
| FESCO | | 1 | 150857 | SME-BF-S-LED-24 | PROXIMITY SWITCH |
| FESCO | | 1 | 524911 | SMT-BF-24V-K7.5-DE | PROXIMITY SWITCH |
| FESCO | | 2 | 163004 | UC-174 | SILENCER |
| AIK | GUARDMASTER | | | 4401-S32P22 | STEPH GUARD SWITCH SIP |
| FARNELL | MERLIN GERIN | 1 | 434-5661 | 650H102 | 1 POLE 2 AMP MCB |
| FARNELL | MOELLER | 1 | 175-456 | 10-2-172 | 3 POLE ROTARY CAM SWITCH |
| AIC | | 1 | | CPMA-600111-D | CPMA - CPU W/ 60 I/O POINTS |
| AIC | | 1 | | PL28-CR2EVI | PLC TO RT CONNECTING CABLE |
| AIC | | 1 | | PL33-S126DE | HMI TOUCHSCREEN |
| AIC | | 1 | | SEVS-1204 | POWER SUPPLY SA |
| AIC | | 1 | | ZX-L140 | LASER DISPLACEMENT SENSOR HEAD |
| AIC | | 1 | | ZX-L141 | AMPLIFIER AND DISPLAY |
| PLZ | | 1 | 774310 | PM02-X3-24VDC | EMERGENCY STOP & GATE MONITORING |
| SMC | | 1 | | AX1100-TSP3-050 | 1/2 SUB CONNECTOR CABLE |
| FARNELL | TELEMECANIQUE | 1 | 177-611 | Z82B65 | PUSH BUTTON MOMENTARY |
| FARNELL | TELEMECANIQUE | 1 | 175-460 | Z82B102 | ADDITION CONTACT |
| FARNELL | TELEMECANIQUE | 1 | 175-458 | Z82B554 | MUSHROOM HEAD, RELE-LATCH TORN TO RELEASE |
| FARNELL | TELEMECANIQUE | 1 | 175-451 | Z82B101 | SWITCH BODY |
| FARNELL | TELEMECANIQUE | 1 | 175-452 | Z82B102 | SWITCH BODY |
| FARNELL | TELEMECANIQUE | 1 | 305-4883 | Z84BY033 | PILOT LIGHT HEAD FOR LED |
| FARNELL | TELEMECANIQUE | 1 | 305-4731 | Z84BY83 | LED BODY |

COMPONENTS 1

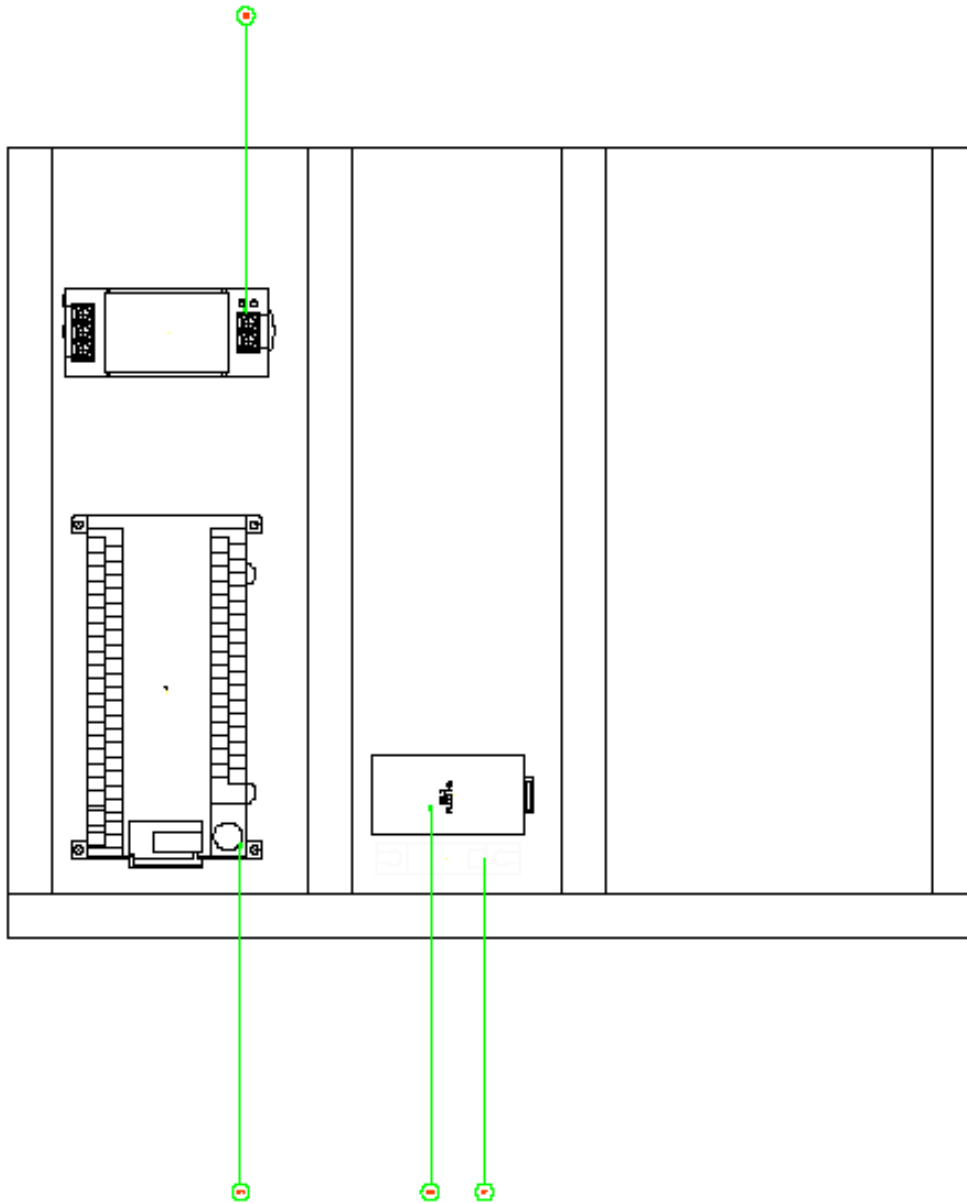
| SH | TAGNAME | CAT | MFG | DE-SI1 | DE-STOP | DE-SI2 |
|----|---------------|-----------------|---------------|-----------|------------|----------------|
| 2 | +CABINET-Q1 | TO-2-1/EZ | MOELLER | MAIN | ISOLATOR | DESIGN |
| 2 | G1 | SBVS-12024 | OMRON | POWER | SUPPLY | |
| 3 | +FRAME-GS1 | 650H102 | MERLIN GERIN | GUARD | SAFETY | SWITCH |
| 3 | +TABLE-S1 | 440N-S32022 | GUARDMASTER | EMERGENCY | STOP | |
| 3 | +TABLE-S2 | Z82B354 | TELEMECANIQUE | RESET | | |
| 3 | IV1 | Z82B2102 | TELEMECANIQUE | HMI | | |
| 3 | ES1 | Z82B102 | TELEMECANIQUE | EMERGENCY | SAFETY | RELAY |
| 3 | PL1 | Z82B86 | TELEMECANIQUE | EMERGENCY | SAFETY | RELAY |
| 4 | +FRAME-S0.02 | Z82B101 | OMRON | RESET | | |
| 4 | PLC1 | NT35-S1T26BE | OMRON | HMI | | |
| 5 | +TABLE-B0.007 | NT35-CN212V1 | PLZ | EMERGENCY | SAFETY | RELAY |
| 5 | +TABLE-B0.008 | PN02-X3-24VDC | | | | |
| 5 | +TABLE-B0.04 | CPM2A-SUC001-1 | OMRON | AIR | PRESSURE | DK |
| 5 | +TABLE-B0.05 | SME-B-S-LED-24 | FESTO | MODULE 0 | | CPU MODULE |
| 5 | +TABLE-B0.06 | SIM-M8-3GD-5-PU | FESTO | HOUSING | STICK FEED | BACK |
| 5 | +TABLE-B0.09 | SIM-M8-3GD-5-PU | FESTO | HOUSING | STICK FEED | FORWARD |
| 5 | +TABLE-B0.10 | SIM-M8-3GD-5-PU | FESTO | CONVEYOR | LOW | LEVEL |
| 5 | +TABLE-B0.11 | SIM-M8-3GD-5-PU | FESTO | HOUSING | CUT | SUPPORT OUT |
| 5 | +TABLE-B1.00 | SIM-M8-3GD-5-PU | FESTO | HOUSING | CUT | SUPPORT IN |
| 5 | +TABLE-B1.01 | SIM-M8-3GD-5-PU | FESTO | HOUSING | FEED | GRIPPER CLOSED |
| 6 | | SIM-M8-3GD-5-PU | FESTO | HOUSING | FEED | BACK |
| 6 | | SIM-M8-3GD-5-PU | FESTO | HOUSING | FEED | FORWARD |
| 6 | | SIM-M8-3GD-5-PU | FESTO | MASK | TOOLING | UP |
| 6 | | SIM-M8-3GD-5-PU | FESTO | MASK | TOOLING | DOWN |

COMPONENTS 2

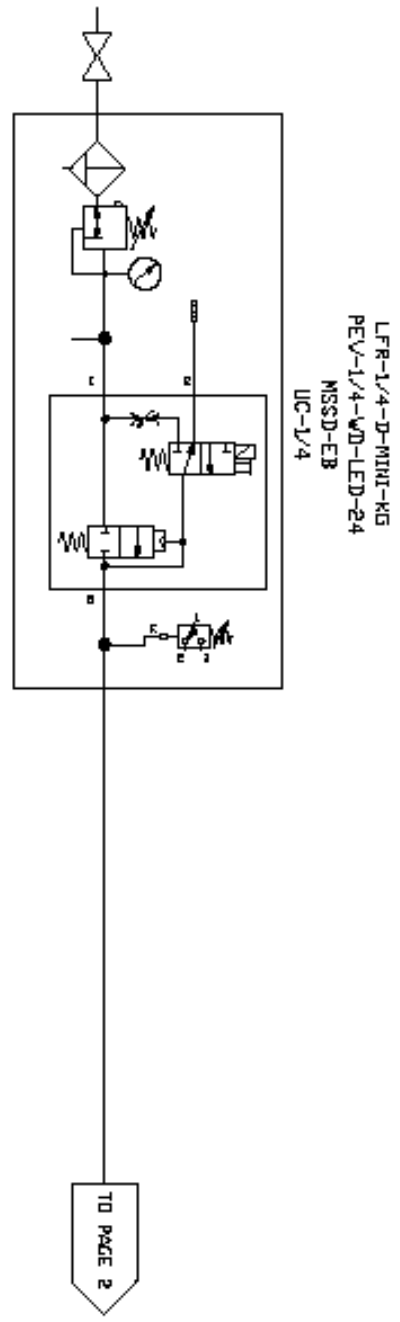
| SH | TAGNAME | CAT | MFG | DESCR | DESCR | QTY |
|----|-------------------|---|--|---------------------------|-------------------------|--------------|
| 6 | +TABLE-B1.02 | SME-B-S-LED-24 SIM-MB-31D-5-P11 | FESTO | TERMINATION | TOOLING | UP |
| 6 | +TABLE-B1.03 | SME-MB-31D-5-P11 | FESTO | TERMINATION | TOOLING | DOWN |
| 6 | +TABLE-B1.04 | SMT-MB-24V-K7.5-DE | FESTO | REAR LIMIT | OVERTRAVEL | SWITCH |
| 6 | +TABLE-B1.05 | SMT-MB-24V-K7.5-DE | FESTO | FORWARD LIMIT | OVERTRAVEL | SWITCH |
| 6 | B1.D6 | SIM-MB-31D-5-P11 | FESTO | WIRE | IN | PLACE |
| 9 | H10.02 | ZX-1-D41 | OMRON | DISPLAY | FOR CABLE | ASSEMBLY |
| 9 | H10.04 | 464-004 | FARNELL | POWER | ON | |
| 9 | P10.03 | Z84BV83 | TELEMECANIQUE | BUZZER | | |
| 10 | +MANIFOLD1-SOL1.1 | KSG3524 | AWD | HOUSING | CUT | SUPPORT |
| 10 | +MANIFOLD1-SOL1.2 | LPV-SL-MP-V1 | FESTO | | | 5 |
| 10 | +MANIFOLD1-SOL1.3 | GSM1-4 | FESTO | | | 5 |
| 10 | +MANIFOLD1-SOL1.4 | GSM1-4H | FESTO | | | |
| 10 | K11.04 | LFR-174-D-MINI-KG | FESTO | HOUSING | FEED | FORWARD |
| | | PEV-1/4-WD-LED-24 | FESTO | HOUSING | FEED | BACK |
| | | MSSD-EB | FESTO | HOUSING | FEED | GRIPPER |
| | | UC-1/4 | FESTO | HOUSING | STICK FEED | |
| 10 | SOL2 | CPE18-MH-SL-174 | FESTO | HOUSING | TOOLING | FEED |
| 10 | WI | MSSD-EB | FESTO | HOUSING | TOOLING | FEED |
| 13 | +LASER-DIS1 | MTR-6-130-26-2.5 MTR-FL30-ST42 KSE-15-22-D04-D05 IGE-12-100-2R-LK-KG-KF-GK 107-5228 430-3430 | FESTO FESTO FESTO FESTO FESTO FESTO FARNELL FARNELL | TERMINATION CONNECTION | & HOUSING TO STEPPER | CUT MOTOR |

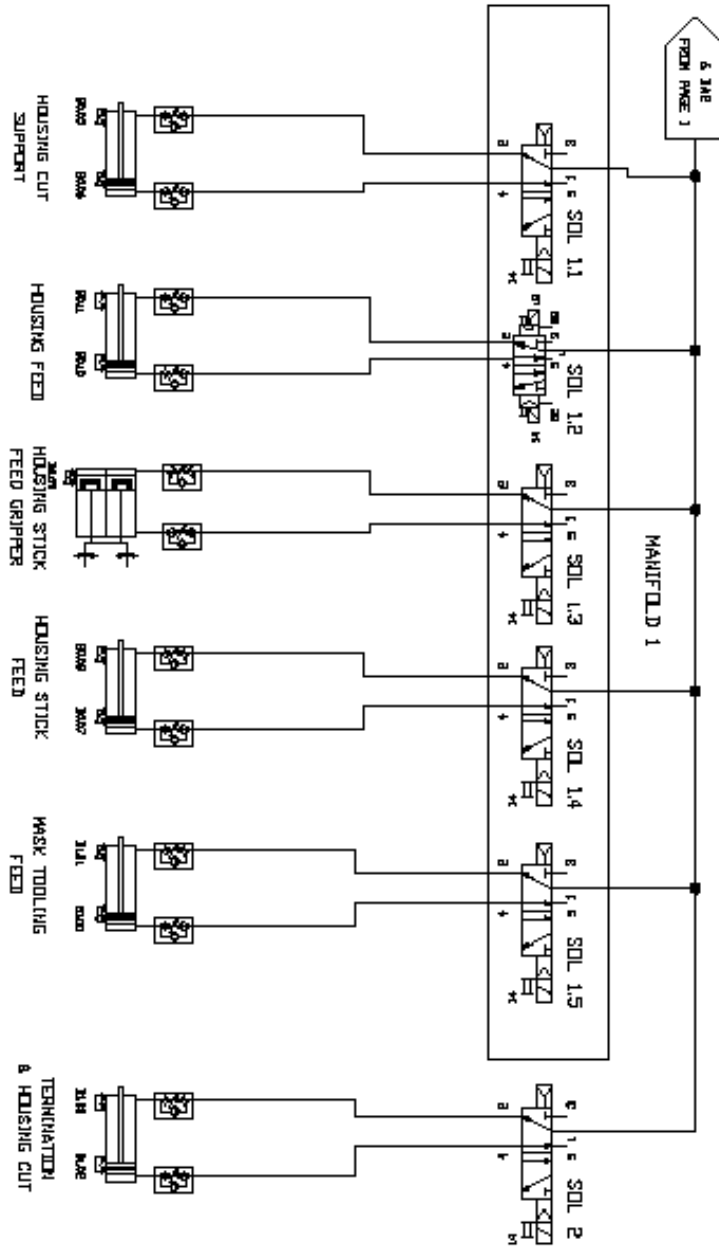
PANEL BILL OF MATERIALS

| ITEM | TAGS | QTY | SUB | MFG | CATALOG |
|------|------|-----|-----|--------------|----------------|
| 1 | PLC1 | 1 | | OMRON | CPM2A-60CDT1-D |
| 3 | G1 | 1 | | OMRON | S8VS-12024 |
| 4 | Q2 | 1 | | MERLIN GERIN | C60HD102 |
| 5 | ESR1 | 1 | | PILZ | PNQZ X3 24VDC |



5.3 Pneumatic Diagrams





Section 6

Connector Series Chart

Products: 2.50mm (.098") Pitch Appli-Mate™ RAST 2.5 IDT Connector Assemblies 2 to 20 Circuits.

| Connector Series No. | Circuit Size | Connector Assembly Order No. | | | | | | |
|----------------------|--------------|------------------------------|------------|------------|------------|------------|------------|------------|
| | | | | | | | | |
| 90871 | 3 | 90871-0001 | 90871-0002 | 90871-0013 | 90871-0014 | 90871-0015 | 90871-0016 | 90871-0017 |
| | | 90871-0018 | 90871-0019 | 90871-0020 | 90871-0021 | 90871-0022 | 90871-0024 | 90871-0034 |
| | | 90871-0041 | 90871-0042 | 90871-0044 | 90871-0251 | 90871-0252 | 90871-0253 | |
| | 4 | 90871-0501 | 90871-0502 | 90871-0503 | 90871-0504 | 90871-0505 | 90871-0506 | 90871-0507 |
| | | 90871-0508 | 90871-0509 | 90871-0530 | 90871-0538 | 90871-0539 | 90871-0540 | 90871-0541 |
| | | 90871-0542 | 90871-0677 | 90871-0678 | 90871-0679 | 90871-0751 | 90871-0752 | 90871-0755 |
| | 5 | 90871-1001 | 90871-1002 | 90871-1003 | 90871-1004 | 90871-1005 | 90871-1006 | 90871-1007 |
| | | 90871-1008 | 90871-1009 | 90871-1251 | | | | |
| | 6 | 90871-1501 | 90871-1502 | 90871-1503 | 90871-1504 | 90871-1505 | 90871-1506 | 90871-1507 |
| | | 90871-1508 | 90871-1509 | 90871-1510 | 90871-1511 | 90871-1512 | 90871-1513 | 90871-1514 |
| | | 90871-1515 | 90871-1516 | 90871-1517 | 90871-1518 | 90871-1519 | 90871-1520 | 90871-1521 |
| | | 90871-1522 | 90871-1523 | 90871-1524 | 90871-1525 | 90871-1526 | 90871-1527 | 90871-1528 |
| | 7 | 90871-1529 | 90871-1751 | 90871-1752 | 90871-1753 | | | |
| | | 90871-2001 | 90871-2002 | 90871-2004 | 90871-2005 | 90871-2006 | 90871-2007 | 90871-2008 |
| | 8 | 90871-2009 | 90871-2251 | 90871-2253 | | | | |
| | | 90871-2501 | 90871-2502 | 90871-2503 | 90871-2504 | 90871-2505 | 90871-2506 | 90871-2507 |
| | 9 | 90871-2508 | 90871-2509 | 90871-2751 | 90871-2752 | 90871-2753 | | |
| | | 90871-3001 | 90871-3002 | 90871-3003 | 90871-3004 | 90871-3251 | 90871-3256 | |
| | 10 | 90871-3501 | 90871-3502 | 90871-3503 | 90871-3751 | 90871-3752 | 90871-3753 | |
| | 11 | 90871-4001 | 90871-4002 | 90871-4251 | | | | |
| 12 | 90871-4501 | 90871-4751 | | | | | | |
| 13 | 90871-5001 | 90871-5002 | 90871-5003 | 90871-5004 | 90871-5005 | | | |
| 14 | 90871-5501 | 90871-5751 | | | | | | |
| 15 | 90871-6001 | 90871-6002 | 90871-6251 | | | | | |
| 16 | 90871-6501 | | | | | | | |
| 17 | 90871-7001 | | | | | | | |
| 18 | 90871-7501 | | | | | | | |
| 19 | 90871-8001 | | | | | | | |
| 20 | 90871-8501 | 90871-8751 | | | | | | |
| 90872 | 2 | 90872-0002 | 90872-0003 | 90872-0004 | 90872-0005 | 90872-0006 | 90872-0007 | 90872-0008 |
| | | 90872-0009 | 90872-0010 | 90872-0011 | 90872-0012 | 90872-0013 | 90872-0014 | 90872-0015 |
| | | 90872-0016 | 90872-0017 | 90872-0018 | 90872-0019 | 90872-0020 | 90872-0021 | 90872-0022 |
| | | 90872-0023 | 90872-0024 | 90872-0351 | 90872-0352 | 90872-0353 | 90872-0354 | 90872-0501 |
| | 3 | 90872-1001 | 90872-1002 | 90872-1003 | 90872-1004 | 90872-1005 | 90872-1007 | 90872-1008 |
| | | 90872-1009 | 90872-1010 | 90872-1011 | 90872-1501 | | | |
| | 4 | 90872-2001 | 90872-2002 | 90872-2003 | 90872-2004 | 90872-2005 | 90872-2006 | 90872-2007 |
| | | 90872-2008 | 90872-2009 | 90872-2010 | 90872-2011 | | | |
| | 5 | 90872-3001 | | | | | | |
| | 6 | 90872-4001 | | | | | | |
| 7 | 90872-5001 | 90872-5002 | | | | | | |
| 8 | 90872-6001 | | | | | | | |
| 91491 | 2 | 91491-0002 | 91491-0022 | 91491-0042 | 91491-0062 | | | |
| | 3 | 91491-0003 | 91491-0023 | 91491-0043 | 91491-0063 | 91491-0143 | 91491-0203 | 91491-0243 |
| | | 91491-0263 | | | | | | |
| | 4 | 91491-0004 | 91491-0044 | 91491-0104 | 91491-0144 | 91491-0304 | 91491-0344 | |
| 5 | 91491-0005 | 91491-0045 | 91491-0305 | 91491-0345 | 91491-0405 | 91491-0445 | | |

| Connector Series No. | Circuit Size | Connector Assembly Order No. | | | | | | | |
|----------------------|--------------|------------------------------|------------|------------|------------|------------|------------|------------|------------|
| 91491 | 6 | 91491-0006 | 91491-0046 | 91491-0506 | 91491-0546 | | | | |
| | 7 | 91491-0007 | 91491-0047 | 91491-0607 | 91491-0647 | | | | |
| | 8 | 91491-0008 | 91491-0048 | 91491-0208 | 91491-0248 | 91491-0708 | 91491-0748 | 91491-2048 | |
| | 9 | 91491-0009 | 91491-0049 | 91491-0509 | 91491-0549 | 91491-0809 | 91491-0849 | | |
| | 10 | 91491-0010 | 91491-0050 | 91491-0210 | 91491-0250 | 91491-0310 | 91491-0350 | 91491-0910 | |
| | | 91491-0950 | | | | | | | |
| | 11 | 91491-0011 | 91491-0051 | 91491-0511 | 91491-0551 | 91491-0611 | 91491-0651 | 91491-1011 | |
| | | 91491-1051 | | | | | | | |
| | 12 | 91491-0012 | 91491-0052 | 91491-0412 | 91491-0452 | 91491-0612 | 91491-0652 | 91491-0852 | |
| | | 91491-1112 | 91491-1152 | | | | | | |
| | 13 | 91491-0013 | 91491-0053 | 91491-1213 | 91491-1253 | | | | |
| | 14 | 91491-0014 | 91491-0054 | 91491-1314 | 91491-1354 | | | | |
| | 15 | 91491-0015 | 91491-0055 | 91491-0215 | 91491-0255 | 91491-1415 | 91491-1455 | | |
| | 16 | 91491-0016 | 91491-0056 | 91491-1516 | 91491-1556 | | | | |
| | 17 | 91491-0017 | 91491-0057 | 91491-1617 | 91491-1657 | | | | |
| | 18 | 91491-0018 | 91491-0058 | 91491-1718 | 91491-1758 | | | | |
| | 91716 | 3 | 91716-0001 | 91716-0002 | 91716-0013 | 91716-0014 | 91716-0015 | 91716-0016 | 91716-0017 |
| | | | 91716-0018 | 91716-0019 | 91716-0020 | 91716-0021 | 91716-0022 | 91716-0023 | 91716-0024 |
| 91716-0034 | | | 91716-0041 | 91716-0042 | 91716-0043 | 91716-0044 | 91716-0045 | 91716-0046 | |
| 4 | | 91716-0501 | 91716-0502 | 91716-0503 | 91716-0504 | 91716-0505 | 91716-0506 | 91716-0507 | |
| | | 91716-0530 | 91716-0538 | 91716-0539 | 91716-0540 | 91716-0541 | 91716-0542 | 91716-0543 | |
| | | 91716-0544 | 91716-0545 | 91716-0546 | 91716-0677 | 91716-0678 | 91716-0679 | | |
| 5 | | 91716-1001 | 91716-1002 | 91716-1003 | 91716-1004 | 91716-1005 | 91716-1006 | 91716-1007 | |
| | | 91716-1008 | 91716-1009 | 91716-1010 | 91716-1011 | 91716-1012 | 91716-1013 | 91716-1014 | |
| | | 91716-1015 | | | | | | | |
| 6 | | 91716-1501 | 91716-1502 | 91716-1503 | 91716-1504 | 91716-1505 | 91716-1506 | 91716-1507 | |
| | | 91716-1509 | 91716-1510 | 91716-1511 | 91716-1512 | 91716-1513 | 91716-1514 | 91716-1515 | |
| | | 91716-1516 | 91716-1517 | 91716-1518 | 91716-1519 | 91716-1520 | 91716-1521 | 91716-1522 | |
| | | 91716-1523 | 91716-1524 | 91716-1525 | 91716-1526 | 91716-1527 | 91716-1528 | 91716-1529 | |
| 7 | | 91716-1531 | 91716-1532 | 91716-1534 | 91716-1535 | 91716-1536 | 91716-1537 | | |
| | | 91716-2001 | 91716-2002 | 91716-2004 | 91716-2005 | 91716-2006 | 91716-2007 | 91716-2008 | |
| | | 91716-2009 | 91716-2010 | 91716-2011 | 91716-2012 | 91716-2013 | 91716-2014 | 91716-2015 | |
| 8 | | 91716-2016 | 91716-2017 | 91716-2018 | 91716-2019 | | | | |
| | | 91716-2501 | 91716-2502 | 91716-2503 | 91716-2504 | 91716-2505 | 91716-2506 | 91716-2507 | |
| 9 | | 91716-2508 | 91716-2509 | 91716-2510 | 91716-2511 | 91716-2512 | 91716-2513 | 91716-2514 | |
| | | 91716-3001 | 91716-3002 | 91716-3003 | 91716-3004 | 91716-3005 | 91716-3006 | 91716-3007 | |
| 10 | 91716-3008 | 91716-3009 | | | | | | | |
| | 91716-3501 | 91716-3502 | 91716-3503 | 91716-3504 | | | | | |
| 11 | 91716-4001 | | | | | | | | |
| 12 | 91716-4501 | 91716-4502 | 91716-4503 | 91716-4504 | 91716-4505 | | | | |
| 13 | 91716-5001 | 91716-5002 | 91716-5003 | | | | | | |
| 14 | 91716-5501 | | | | | | | | |
| 15 | 91716-6001 | 91716-6002 | | | | | | | |
| 16 | 91716-6501 | | | | | | | | |
| 17 | 91716-7001 | | | | | | | | |
| 18 | 91716-7501 | | | | | | | | |
| 19 | 91716-8001 | | | | | | | | |
| 20 | 91716-8501 | | | | | | | | |
| 91717 | 2 | 91717-0002 | 91717-0003 | 91717-0004 | 91717-0005 | 91717-0006 | 91717-0007 | 91717-0008 | |
| | | 91717-0009 | 91717-0010 | 91717-0011 | 91717-0012 | 91717-0013 | 91717-0014 | 91717-0015 | |
| | | 91717-0016 | 91717-0017 | 91717-0018 | 91717-0019 | 91717-0020 | 91717-0021 | 91717-0022 | |
| | | 91717-0023 | 91717-0024 | 91717-0025 | 91717-0026 | 91717-0027 | 91717-0028 | 91717-0029 | |
| | | 91717-0030 | 91717-0031 | 91717-0032 | 91717-0033 | 91717-0035 | 91717-0036 | 91717-0037 | |

| Connector Series No. | Circuit Size | Connector Assembly Order No. | | | | | | |
|----------------------|--------------|------------------------------|------------|------------|------------|------------|------------|------------|
| 91717 | 2 | 91717-0038 | 91717-0039 | 91717-0040 | 91717-0351 | | | |
| | 3 | 91717-1001 | 91717-1002 | 91717-1003 | 91717-1004 | 91717-1005 | 91717-1007 | 91717-1008 |
| | | 91717-1009 | 91717-1010 | 91717-1011 | | | | |
| | 4 | 91717-2001 | 91717-2002 | 91717-2003 | 91717-2004 | 91717-2005 | 91717-2006 | |
| | 5 | 91717-3001 | 91717-3002 | | | | | |
| | 6 | 91717-4001 | 91717-4002 | | | | | |
| | 7 | 91717-5001 | | | | | | |
| | 8 | 91717-6001 | | | | | | |
| | 9 | 91717-7001 | | | | | | |
| | 10 | 91717-8001 | | | | | | |
| 92332 | 3 | 92332-0043 | | | | | | |
| | 5 | 92332-0045 | | | | | | |
| | 8 | 92332-2048 | 92332-2148 | | | | | |
| 92336 | 3 | 92336-0001 | 92336-0002 | 92336-0013 | 92336-0014 | 92336-0015 | 92336-0016 | 92336-0017 |
| | | 92336-0018 | 92336-0019 | 92336-0020 | 92336-0021 | 92336-0022 | 92336-0023 | 92336-0024 |
| | | 92336-0041 | 92336-0042 | 92336-0043 | 92336-0044 | 92336-0045 | 92336-0046 | |
| | 4 | 92336-0501 | 92336-0502 | 92336-0503 | 92336-0504 | 92336-0505 | 92336-0506 | 92336-0507 |
| | | 92336-0530 | 92336-0538 | 92336-0539 | 92336-0540 | 92336-0541 | 92336-0542 | 92336-0543 |
| | | 92336-0544 | 92336-0545 | 92336-0546 | 92336-0677 | 92336-0678 | 92336-0679 | |
| | 5 | 92336-1001 | 92336-1002 | 92336-1003 | 92336-1004 | 92336-1005 | 92336-1006 | 92336-1007 |
| | | 92336-1008 | 92336-1009 | 92336-1010 | 92336-1011 | 92336-1012 | 92336-1013 | 92336-1014 |
| | | 92336-1015 | | | | | | |
| | 6 | 92336-1501 | 92336-1502 | 92336-1503 | 92336-1504 | 92336-1505 | 92336-1506 | 92336-1507 |
| | | 92336-1508 | 92336-1509 | 92336-1510 | 92336-1511 | 92336-1512 | 92336-1513 | 92336-1514 |
| | | 92336-1515 | 92336-1516 | 92336-1517 | 92336-1518 | 92336-1519 | 92336-1520 | 92336-1521 |
| | | 92336-1522 | 92336-1523 | 92336-1524 | 92336-1525 | 92336-1526 | 92336-1527 | 92336-1528 |
| | | 92336-1529 | 92336-1530 | 92336-1531 | 92336-1532 | 92336-1534 | 92336-1535 | 92336-1536 |
| | | 92336-1537 | | | | | | |
| | 7 | 92336-2001 | 92336-2002 | 92336-2004 | 92336-2005 | 92336-2006 | 92336-2007 | 92336-2008 |
| | | 92336-2009 | 92336-2010 | 92336-2011 | 92336-2012 | 92336-2013 | 92336-2014 | 92336-2015 |
| | | 92336-2016 | 92336-2017 | 92336-2018 | 92336-2019 | | | |
| | 8 | 92336-2501 | 92336-2502 | 92336-2503 | 92336-2504 | 92336-2505 | 92336-2506 | 92336-2507 |
| | | 92336-2508 | 92336-2509 | 92336-2510 | 92336-2511 | 92336-2512 | 92336-2513 | 92336-2514 |
| | 9 | 92336-3001 | 92336-3002 | 92336-3003 | 92336-3004 | 92336-3005 | 92336-3006 | 92336-3007 |
| | | 92336-3008 | 92336-3009 | | | | | |
| | 10 | 92336-3501 | 92336-3502 | 92336-3503 | 92336-3504 | | | |
| | 11 | 92336-4001 | | | | | | |
| | 12 | 92336-4501 | 92336-4502 | 92336-4503 | 92336-4504 | 92336-4505 | | |
| | 13 | 92336-5001 | 92336-5002 | 92336-5003 | | | | |
| | 14 | 92336-5501 | | | | | | |
| | 15 | 92336-6001 | 92336-6002 | | | | | |
| | 16 | 92336-6501 | | | | | | |
| | 17 | 92336-7001 | | | | | | |
| 18 | 92336-7501 | | | | | | | |
| 19 | 92336-8001 | | | | | | | |
| 20 | 92336-8501 | | | | | | | |
| 93037 | 3 | 93037-0001 | 93037-0003 | 93037-0004 | 93037-0005 | 93037-0006 | 93037-0007 | 93037-0251 |
| | | 93037-0252 | 93037-0253 | 93037-0254 | 93037-0255 | 93037-0256 | 93037-0257 | 93037-0258 |
| | | 93037-0259 | 93037-0260 | 93037-0261 | 93037-0262 | 93037-0301 | 93037-0302 | 93037-0303 |
| | 4 | 93037-0501 | 93037-0502 | 93037-0503 | 93037-0751 | 93037-0752 | 93037-0753 | 93037-0754 |
| | | 93037-0755 | 93037-0756 | 93037-0757 | 93037-0758 | 93037-0759 | | |
| | 5 | 93037-1001 | 93037-1002 | 93037-1003 | 93037-1251 | 93037-1252 | 93037-1253 | |
| | 6 | 93037-1501 | 93037-1502 | 93037-1503 | 93037-1504 | 93037-1505 | 93037-1506 | 93037-1507 |
| | | 93037-1508 | 93037-1509 | 93037-1751 | | | | |

| Connector Series No. | Circuit Size | Connector Assembly Order No. | | | | | | |
|----------------------|--------------|------------------------------|------------|------------|------------|------------|------------|------------|
| | | | | | | | | |
| 93037 | 7 | 93037-2001 | 93037-2002 | 93037-2003 | 93037-2004 | 93037-2005 | | |
| | 8 | 93037-2501 | 93037-2502 | 93037-2751 | 93037-2752 | | | |
| | 9 | 93037-3001 | 93037-3002 | 93037-3003 | | | | |
| | 10 | 93037-3501 | 93037-3502 | | | | | |
| | 11 | 93037-4001 | 93037-4251 | | | | | |
| | 12 | 93037-4501 | | | | | | |
| 93039 | 2 | 93039-0001 | 93039-0002 | 93039-0003 | 93039-0004 | 93039-0251 | 93039-0252 | 93039-0253 |
| | | 93039-0254 | 93039-0255 | 93039-0256 | | | | |
| | 3 | 93039-1001 | | | | | | |
| | 4 | 93039-2001 | 93039-2002 | | | | | |
| | 5 | 93039-3001 | | | | | | |
| | 6 | 93039-4001 | | | | | | |
| 93050 | 3 | 93050-0001 | 93050-0003 | 93050-0005 | 93050-0006 | 93050-0007 | 93050-0008 | 93050-0009 |
| | | 93050-0012 | 93050-0013 | 93050-0014 | 93050-0016 | 93050-0017 | 93050-0018 | 93050-0019 |
| | | 93050-0020 | 93050-0021 | | | | | |
| | 4 | 93050-0501 | 93050-0502 | 93050-0503 | 93050-0504 | 93050-0505 | 93050-0506 | 93050-0507 |
| | | 93050-0508 | 93050-0509 | | | | | |
| | 5 | 93050-1001 | 93050-1002 | 93050-1003 | 93050-1004 | 93050-1005 | | |
| | 6 | 93050-1501 | 93050-1502 | 93050-1503 | 93050-1504 | 93050-1505 | | |
| | 7 | 93050-2001 | 93050-2002 | 93050-2003 | | | | |
| | 8 | 93050-2501 | 93050-2502 | 93050-2503 | | | | |
| | 9 | 93050-3001 | 93050-3002 | | | | | |
| | 10 | 93050-3501 | 93050-3502 | 93050-3503 | | | | |
| | 11 | 93050-4001 | 93050-4002 | | | | | |
| | 12 | 93050-4501 | | | | | | |
| 13 | 93050-5001 | | | | | | | |
| 93051 | 2 | 93051-0001 | 93051-0002 | 93051-0003 | 93051-0004 | 93051-0005 | 93051-0006 | 93051-0007 |
| | | 93051-0008 | 93051-0012 | 93051-0013 | 93051-0014 | 93051-0015 | 93051-0017 | 93051-0018 |
| | | 93051-0019 | 93051-0020 | 93051-0021 | 93051-0024 | 93051-0025 | 93051-0026 | 93051-0027 |
| | | 93051-0028 | 93051-0029 | | | | | |
| | 3 | 93051-1001 | 93051-1002 | 93051-1003 | 93051-1004 | 93051-1005 | 93051-1006 | 93051-1007 |
| | | 93051-1008 | | | | | | |
| | 4 | 93051-2001 | 93051-2002 | 93051-2003 | 93051-2004 | 93051-2005 | 93051-2006 | |
| | 5 | 93051-3001 | 93051-3002 | | | | | |
| | 6 | 93051-4001 | 93051-4002 | 93051-4003 | 93051-4004 | | | |
| | 7 | 93051-5001 | 93051-5002 | | | | | |

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