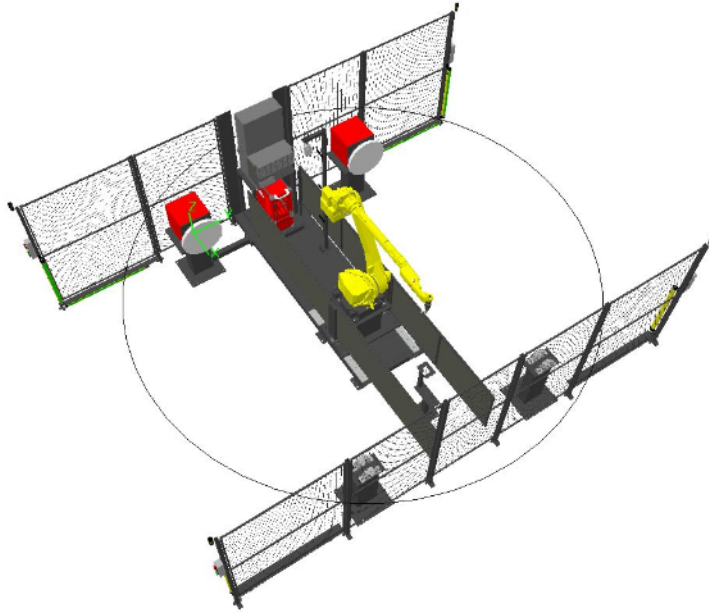


## 2 System Concept



### 3 System Proposal

Lincoln Automation is pleased to provide the following items as part of the main equipment proposal:

#### Robot

##### M-710iC/12L Robot with R-30iB controller

Qty 1

- Through-arm configuration
- 6 axis arm
- 12 kg payload
- 122.0" reach
- Fanuc R-30iB Robot PLUS Controller
- Arctool Software
- 440-575VAC ( $\pm 10\%$ ), 50/60Hz, 3 Phase, 30A Service
- ANSI/RIA Compliant Mechanical Unit/Controller



#### Welding Gear

##### ArLink 25ft Cable Kit

Qty 1

- STT® process sense lead
- Heavy duty control cable
- Gas line assembly
- Cable assembly, Ethernet

##### CoolArc® 55s Water Cooler

Qty 1

Closed circuit cooling system for water-cooled torches. Contains Flow Sensing Switch and ArLink communication.



## Power Wave® R450

Qty 1

Built-In Feeder Control

PowerConnect™ Technology (patent pending) - Automatically adjusts to input power while maintaining a constant welding output throughout the entire input voltage range.

Tribrid™ Power Module - Exceptional welding performance with high power factor and efficiency.

Production Monitoring™ 2.1/Checkpoint – Track equipment usage, store weld data and configure fault limits to aid in production analysis and process improvements.

Input Voltage

208/230/380-415/460/575/3/50/60

Output Range

5 - 550 Amps



## Wire Feeder

### 0.052" Drive Roll Kit

Qty 1

Drive Roll and Guide Tube Kit for feeding 0.052" in solid wire. 4 Roll Kit.

### AutoDrive® 4R220 Wire Feeder

Qty 1

AutoDrive® 4R220 wire feeder unit:

Automatic wire feeder for flux-cored and metal-cored wires.

- Solid Wire size range: 0.023"-1/16" (0.6-1.6 mm)
- Cored Wire size range: 0.035"-5/64" (0.9-2.0 mm)
- Speed range: 30-1200 in/min (0.8-30.5 m/min)



## Torch

### Torch upgrade - Wire Brake

Qty 1

Torch upgrade - Wire Brake

### Extended Length Gooseneck

Qty 1

Torch upgrade - extended length gooseneck - 14 inches.

### Binzel Torch, MIG, Water Cooled

Qty 1

Binzel Torch, MIG, Water Cooled



## Robot Hardware

### Model A IO AID16D

Qty 2

24VDC x 16 Digital Input, Isolated True High, 20mS, PNP

### Model A IO AOR16G

Qty 2

250VAC/30VDC x 16 Digital Relay Output, 2.0A

## Robot Software

### Advanced DCS Package

Qty 1

The Advanced DCS Package includes the following:

- DCS Pos./Speed check
- DCS Safe I/O connect
- 4D Graphics

### Detached Jog

Qty 1

Allows the operator to independently jog the idle axis/axes for part repositioning during production on multi-axis systems. User may select from two types:

1. Continuous D-Jog, where you have continuous motion FWD or REV as long as you holding both Jog Enable button and FWD or REV switch
2. Positioning D-Jog, where you you have a movement to a specific "LOAD" or "UNLOAD" position while holding both Jog Enable button and "LOAD" or "UNLOAD" switch.

The default provided is option 1, unless otherwise specified by the cusotmer.

### **Basic Software Bundle**

**Qty 1**

Basic Software Bundle. Includes:

- Constant Path - this software enables other software to operate on the robot controller, such as (but not including) Touch Sensing, Through-Arc Seam Tracking, the use of positioning equipment, etc.
- Lincoln Weld Equipment Library - this allows selection of Lincoln Electric weld gear when setting up communication between the welding power supply and the robot controller
- Lincoln America Package software - facilitates the use of Lincoln Checkpoint production monitoring data (collected by the welding power supply)
- TorchGuard software includes:
  - Collision Guard software that enables the robot controller to monitor motor feedback (to detect torch collisions),
  - Payload ID software that helps define the mass of the torch on the end of the arm, allowing optimization of robot acceleration
  - Torchmate software that provides tool center point re-calibration by using a touch sensing routine on a sensing block to update the robot's understanding of the welding wire tip location
- Panel Wizard software allows the customer to make custom teach pendant screens
- Integrated PMC (Programmable Machine Control) software, which is used for system controls functions
- Jog Retract and Return software - In the event of a fault (such as running out of wire during a weld), the operator can manually jog the robot away from the location that the fault occurred and manually tend to the issue. Once resolved, the 'Return' function enables the arm to trace the manually jogged path in reverse, safely bringing the robot back to the location where the error took place. The program can be resumed at that time from the operator palmstation.

### **Thick Plate Welding Software Bundle**

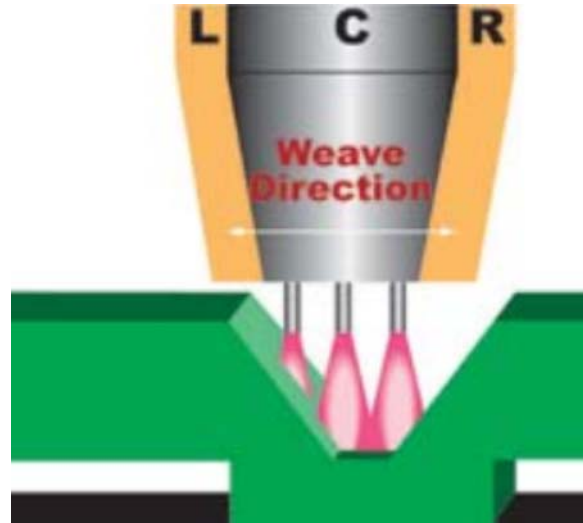
**Qty 1**

This software bundle includes Touch Sensing and Through Arc Seam Tracking software.

Touch sensing enables the robot to touch the welding wire against the workpiece, and

take measurements of the weld joint compared to its expected location. The robot applies an offset to the path location according to the difference that was measured.

Through arc seam tracking software enables the robot to measure variations in the weld current while weaving back and forth across the weld joint (for laps and fillets). By monitoring the feedback, the robot is able to veer off its originally programmed path to stay in the weld seam.



### **Password Protection**

**Qty 1**

Multi-level access allows varying privileges to users for adjusting robot programs, weld schedules, system variables, equipment setup screens, etc.

Includes usage log to document user actions and times, as well as log-on/log-off times.

### **Multi-Group Motion**

**Qty 1**

A motion group defines a set of motors and axes that are combined to accomplish a motion task. FANUC Robotics robots are an example of a motion group, typically Group 1. Additional motion groups are defined to control axes on a piece of equipment other than the robot. The maximum number of groups that can be supported by a controller is eight. Up to four positioner devices can be added as motion groups to the system.

### **Coordinated Motion**

**Qty 1**

The Coordinated Motion Software Option allows two or more motion groups (e.g. two or more robots w/ same controller) to coordinate robot motion and maintain the taught path profile. This option is also used for one or more robots to work as slaves to another master motion group such as tilt and or turn table. This includes the Multi-Group Motion option listed above. Multi Group Motion is listed above for descriptive purposes

only and does not contribute to the system cost.

## System

### FabPak FHS-B2B Dual Zone

Qty 1

Dual station robotic workcell which includes the following:

(2) Floor mounted control stand with the following:

- Light curtain protected work zone entry points for RIA 15.06 compliance
- Light tower with status indicators for work zone safe/ready, work zone unsafe/operational, restricted space compromised (operator in light curtain or in maintenance area), and system fault
- Heavy duty tubular steel frame with wire frame paneling operator protection
- Zone dependent integrated operator control station

(2) Pneumatic arc protection panels between the robot and the positioners to minimize cross-station arc flash.

(1) Common base platform for robot, robot controller, welding power supply, and cable trays. This common base is forklift portable. This unit connects to the station positioners which are floor mounted. The base also features a fence surround enclosure with an access door allowing programming of torch maintenance functions.

### System Span 120"

Maximum tooling or part span of 120".

### System Swing 60"

Maximum tooling or part swing of 60".

## System Positioners

### A8 Single Motor

Qty 2

Alpha 8 3000iF motor with brake, straight shaft and keyway

### Alpha 8 Headstock

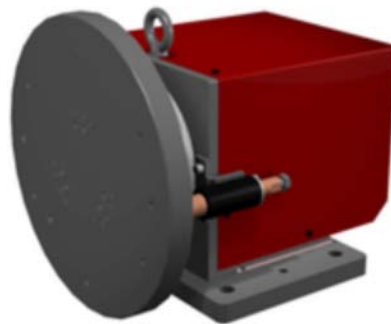
Qty 2

Lincoln electric modular headstock positioners with Fanuc alpha 8/3000iF servo motors and encoders, with RV gear reducers and 15" faceplates.

Positioner characteristics:

- 9,636 in\*lb. workload torque
- 19.6 rpm maximum rotational speed
- +/- 1,180 degrees default rotational range
- 2409 lb. nominal supported load capacity

The overall performance of this positioner will be governed by part eccentricity and load inertia.



## Freight

### System Shipping Cost

System Shipping:

Shipping to the customer facility is included in the system price. See terms for details.

## Miscellaneous

### Installation Assistance

**Qty 1**

Lincoln Automation will provide one factory technician for on-site installation/integration assistance at the customer's facility.

For best results, please make preparations in advance pertaining to site prep, utilities (electricity, shop air, etc.), clearing floor space, provisions for tools (drills for lag bolts, lifting devices...) and necessary personnel to perform the system installation. For optimal efficiency, major component placement, component lagging and utility routing to the system are recommended prior to arrival of the Lincoln technician.

Pricing includes portal to portal travel time and expenses. Overtime hours, where



applicable, will be invoiced according to the rates listed on the terms and conditions page of this quotation.

**Programming Assistance**

**Qty 3**

Lincoln Automation will provide one Factory Technician for (8) hours of on-site programming/weld development assistance (per unit quoted) at the Customer's facility.

For best results, please make preparations in advance pertaining to fixturing, setup of system equipment, and provisions for tools and necessary personnel to assist with the system programming.

Pricing includes portal to portal travel time and expenses. Overtime hours, where applicable, will be invoiced according to the rates listed on the terms and conditions page of this quotation.

**25' Conduit Kit**

**Qty 1**

25' wire conduit and quick disconnect kit for connection of the wire payoff package to the wire drive unit.

**Extended Warranty - R450**

**Qty 1**

Warranty extended from 3 standard warranty to 5 standard years

**Extended Warranty - 4R220**

**Qty 1**

Warranty extended from 3 standard warranty to 5 standard years

**Aux Axis Entended Warranty, 3rd Year**

**Qty 2**

Extend the manufacturer warranty for the unit to the thrid year.

**Gas regulator**

**Qty 1**

Harris Products Model 25 Gas Cylinder Regulator



**Robot Extended Warranty, 3rd Year**

**Qty 1**

Extend the manufacturer warranty for the unit to the third year.

**Lincoln Power REAM® Reaming Station**

**Qty 1**

This package includes the following:

Power REAM® robotic torch cleaner with wire clipper

- 5/8" reamer bit included
- Antispatter fluid spray unit
- Pneumatic wire clipper
- Includes anti-spatter fluid



**500lb Drum Kit**

**Qty 1**

20 inch AccuPak drum payoff kit

