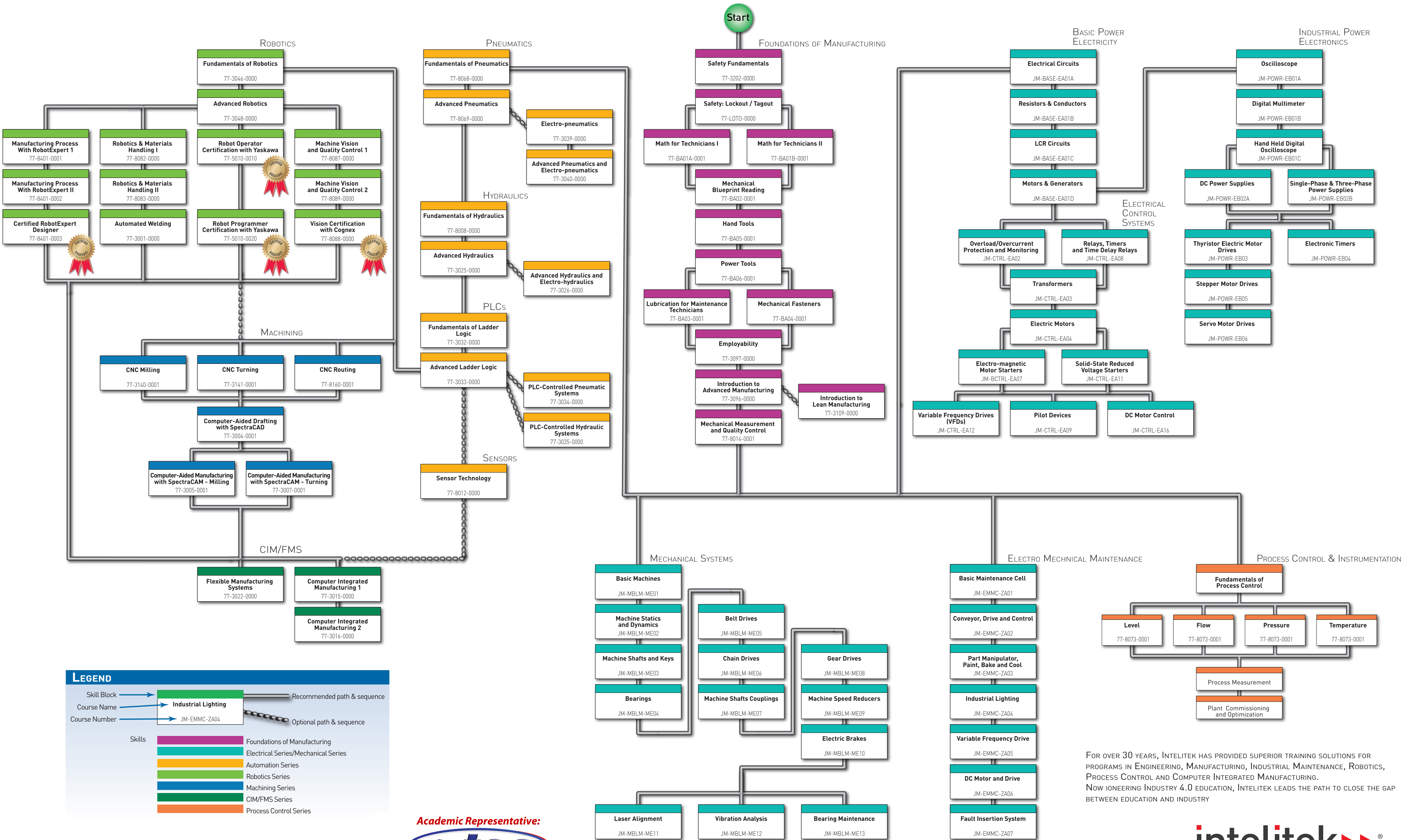




CAREER SKILLS TRAINING

Map of Intelitek Courses



FOR OVER 30 YEARS, INTELITEK HAS PROVIDED SUPERIOR TRAINING SOLUTIONS FOR PROGRAMS IN ENGINEERING, MANUFACTURING, INDUSTRIAL MAINTENANCE, ROBOTICS, PROCESS CONTROL AND COMPUTER INTEGRATED MANUFACTURING. NOW PIONEERING INDUSTRY 4.0 EDUCATION, INTELITEK LEADS THE PATH TO CLOSE THE GAP BETWEEN EDUCATION AND INDUSTRY



CAREER SKILLS TRAINING

Guide to Skills Coverage

FOUNDATIONS OF MANUFACTURING

SAFETY FUNDAMENTALS Introduction to OSHA and Safety Responsibilities/ Safety in the Workplace Personal Protective Equipment (PPE) Safety Procedures Production Team Training & Responsibilities Product Development & Customer Service Customer Service	77-3202-0000	MECHANICAL MEASUREMENT AND QUALITY CONTROL Introduction Accuracy, Precision and Measurement Tools Units of Measurement and Conversion Fractions, Decimals, and Rounding Scaled Measurement Tools Vernier, Dial, and Digital Calipers Micrometers and Dial Indicators Fixed Gauges Transfer Measurement Tools Statistical Analysis Statistical Process Control Nominal Dimensions and Tolerance Parts Inspection and Inspection Reports Conclusion - Quality Control in Industry	77-8014-0001
SAFETY- LOCKOUT / TAGOUT Assessing Lockout/Tagout Basics Attaching Lockout Devices Completing and Attaching Tagout Devices Conduct energy control analysis Perform lockout/tagout procedure Perform lockout/tagout release	77-LOTO-0000		
MATH FOR TECHNICIANS I Working with Arithmetic and Algebra Working with Whole Numbers Working with Fractions Working with Decimals Working with Percentages Working with Ratios and Proportions Working with Systems of Measurement Working with Geometry Working with Trigonometry	77-BA01A-0001	INTRODUCTION TO ADVANCED MANUFACTURING Understanding the Definition of Manufacturing Understanding the History of Manufacturing Considering Career Choices Conducting a Job Search Preparing a Resume Writing a Cover Letter Planning and Staffing a Manufacturing Company Understanding Product and Strategy Selection Identifying Manufacturing Processes Understanding CAD, CAE, CAM, CNC Understanding Statistical Process Control Simulation Modeling Understanding the Role of Automation in Manufacturing Understanding the Role of Flexible Manufacturing Systems Understanding Computer Integrated Manufacturing Understanding the Role of Quality Control.	77-3096-0000
MATH FOR TECHNICIANS II Working with Conversion Formulas Applying Mechanical Principles Calculating Drive Ratios Calculating Speed Reducer Service Factor Using Ohm's Law in Series and Parallel Circuits Converting Binary, Binary Coded Decimal (BCD), Hexadecimal and Decimal Numbers Calculating Pressure, Force, Head and Flow Calculating Shim Requirements Selecting Pipe Size	77-BA01B-0001	INTRODUCTION TO LEAN MANUFACTURING Defining Lean Manufacturing Applying the 5S Method Identifying Wastes in a Workplace Designing the Manufacturing Workplace Redesigning a Workstation Mistake Proofing Fundamental Concepts in Lean Designing Lean Production Processes Applying Lean to a Household Task Task Analysis and Design Lean Production Scheduling Systems Problem Solving Tools Designing a Lean Production Process	77-3109-0000
EMPLOYABILITY Time-Management Techniques Personal Qualities Desirable for the Workplace Interpersonal Communication Conflict Resolution Teamwork Problem-Solving Techniques Decision-Making Skills Business and Personal Ethics Business Etiquette and Ethical Computer Behavior Employer-Employee Relationships Proper Communication with Diverse Populations Career Goals Resumes and Cover Letters Job Applications Potential Employer Interviews Interviewing Skills	77-3097-0000		
MECHANICAL BLUEPRINT READING Identify lines and their functions Single, multiple, and auxiliary views Reading and locating blue print dimensions Determine tolerances Identify thread dimensions Identify tapers and machined surface symbols Cutting planes and sections Geometric dimensions, wear limits and assembly Identify welding symbols Reading plot plans Reading footing, foundation, and floor plans Read reinforced concrete and structural steel plans	77-BA02-0001	ROBOTICS FUNDAMENTALS OF ROBOTICS Introduction to Robotics How Robots Work Using Robotic Control Software Recording Robot Positions Programming a Simple Pick and Place Task Absolute and Relative Positions Basic Robotic Programming Tools Block Alignment Project Feeders and Templates Peripheral Devices Linear Slidebase Project Encoders Roll and Pitch Programming the Robot to Execute Linear and Circular Movements Final Project: Drawing a House	77-3046-0000
LUBRICATION FOR MAINTENANCE TECHNICIANS Lubrication Fundamentals Lubrication Terms Identifying Lubricating Oils Identifying General Purpose Greases Identifying Special Purpose Greases Applying Lubricating Oils Applying Lubricating Greases Bearing Lubrication Setting Up a Lubrication Schedule Selecting Synthetic Lubricants Grease Guns Bearing Packers Grease Lubricators Drop Feed Oilers Electric Chain Oilers	77-BA03-0001	ADVANCED ROBOTICS Review of Robotic Fundamentals Programming with Subroutines Digital Inputs Digital Outputs Project #1 - Delivering Materials with a Conveyor Conditional Branching Project #2 - Programming with Conditional Branching Analog Inputs and Outputs Loops and Counters Contact and Non-Contact Sensors Programming a Sorting System Project	77-3048-0000
MECHANICAL FASTENERS Screws and Bolts Threaded Fastener Selection Thread Standards Creating and Repairing Threads Nuts Torque Wrenches Bolt Extractor Washers Rivets Adhesives Hook and Loop Fasteners Cable Ties	77-BA04-0001	ROBOTICS & MATERIALS HANDLING 1 Introduction to Robotics Robotic Control Software Recording Robot Positions Writing and Running a Robot Program Cartesian Coordinates Inputs and Program Jumps Outputs Joint and XYZ Coordinate Systems Linear Slidebase Project Latching and Unlatching Outputs Improving Elevator Control Timers Counters Sequential Operation with Two Double-Acting Cylinders Solving Opposing Control Signals Solving Opposing Control Signals in a Three Cylinder System Controlling a System with a Variable Timer	77-8082-0000
HAND TOOLS Shop Safety Rulers and Tape Measures List how hand tools may be misused or abused Calipers and Feeler gauges Squares and Levels Knives Scribes and Punches Work Holding Devices Hammers Chisels Saws Pliers Cutters Files & Deburring Tools Drivers Hex Keys Wrenches Socket and Torque Wrenches	77-BA05-0001	ROBOTICS & MATERIALS HANDLING 2 Basic Robotic Programming Tools Manipulating Blocks Project Programming the Robot to Execute Circular Movements Drawing a House Roll and Pitch Block Alignment Project Feeders and Templates Peripheral Devices Linear Slidebase Project Programming Using Encoder Values Conditional Branching Programming with Conditional Branching Analog Inputs and Outputs Programming a Sorting System Project	77-8083-0000
POWER TOOLS Shop Safety Power Drills Drill Presses Rotary Tools Jigsaws Reciprocating Saws Circular Saws Table Saws Band Saws Sanders	77-BA06-0001	ROBOTICS & MATERIALS HANDLING 3 Basic Robotic Programming Tools Manipulating Blocks Project Programming the Robot to Execute Circular Movements Drawing a House Roll and Pitch Block Alignment Project Feeders and Templates Peripheral Devices Linear Slidebase Project Programming Using Encoder Values Conditional Branching Programming with Conditional Branching Analog Inputs and Outputs Programming a Sorting System Project	77-8084-0000

MACHINING

CNC MILLING Introduction to CNC Safety Fundamentals CNCMotion Control Software Routing the Workpiece Tooling Reference Positions Verifying a Program Running a Program Fundamentals of NC Programming Project #1 - Programming the House Arc Programming Project #2 - Programming the Star Project #3 - Programming Your Initials	77-3140-0001	COMPUTER-AIDED MANUFACTURING WITH SPECTRA-CAM - TURNING Using SpectraCAM Starting a Project Drawing the CAD Drawing Geometry Duplication and Rough Tool Path Generation Finish Tool Path and NC File Generation Advanced Project Setup Creating the Part Drawing Final Geometry and Tool Paths Tool Paths and NC Code Creating the Lighter Geometry Final Geometry and Tool Paths Final Tool Paths and NC Code	77-3007-0001
CNC TURNING Introduction to CNC Safety Fundamentals CNCMotion Control Software Routing the Workpiece Tooling Reference Positions Verifying a Program Running a Program Fundamentals of NC Programming Project #1 - Machining Arc Programming Project #2 - Programming the Star Project #3 - Final Project	77-3141-0001	CNC ROUTING Getting Started with Routers Safety Fundamentals Axis of Travel Securing the Work Piece Installing a Tool Setting Part Zero Dust Collection Mach3 Layout Homing the Router Jogging the Router Spot Welding System G-Code Editing Cutting a Sample Part Introduction to Vectric VCarve Pro Creating a Clock Drawing Importing Pictures Importing a Drawing DXF/DWG/SVG 3D Dinosaur Project	77-8160-0001
COMPUTER-AIDED DESIGN WITH SPECTRA-CAD Using spectracAD Applying Mechanical Principles Calculating Drive Ratios Calculating Speed Reducer Service Factor Using Ohm's Law in Series and Parallel Circuits Converting Binary, Binary Coded Decimal (BCD), Hexadecimal and Decimal Numbers Calculating Pressure, Force, Head and Flow Calculating Shim Requirements Selecting Pipe Size	77-3004-0001	COMPUTER-AIDED DESIGN WITH SPECTRA-CAD Using spectracAD Applying Mechanical Principles Calculating Drive Ratios Calculating Speed Reducer Service Factor Using Ohm's Law in Series and Parallel Circuits Converting Binary, Binary Coded Decimal (BCD), Hexadecimal and Decimal Numbers Calculating Pressure, Force, Head and Flow Calculating Shim Requirements Selecting Pipe Size	77-3005-0001
INTRODUCTION TO LEAN MANUFACTURING Defining Lean Manufacturing Applying the 5S Method Identifying Wastes in a Workplace Designing the Manufacturing Workplace Redesigning a Workstation Mistake Proofing Fundamental Concepts in Lean Designing Lean Production Processes Applying Lean to a Household Task Task Analysis and Design Lean Production Scheduling Systems Problem Solving Tools Designing a Lean Production Process	77-3109-0000	ADVANCED PNEUMATICS Introduction to Logic The Logic Function AND Implementing AND in a Pneumatic Circuit The Logic Function OR Implementing OR in a Pneumatic Circuit Circuit with Two Double-Acting Cylinders Sequential Cycle A Delay Sequential Control with a Timed Delay Opposing Control Signals Timing Diagrams Using a Single Pilot Valve to Prevent Opposing Control Signals Using a Single Pilot Valve in a Pneumatic Circuit	77-8069-0000
MACHINE VISION & QUALITY CONTROL WITH COBEX LAB 1 Intro to Vision Systems How Cameras Work Digitalization Intro to In-Sight Explorer Analytical Tools Image Types Optics and Lighting Lighting Techniques Image Setup, Lighting, and Calibration Image Enhancements and Operations Filters and Noise Elimination Blobs Counting Tools	77-8087-0000	ADVANCED PNEUMATICS Introduction to Logic The Logic Function AND Implementing AND in a Pneumatic Circuit The Logic Function OR Implementing OR in a Pneumatic Circuit Circuit with Two Double-Acting Cylinders Sequential Cycle A Delay Sequential Control with a Timed Delay Opposing Control Signals Timing Diagrams Using a Single Pilot Valve to Prevent Opposing Control Signals Using a Single Pilot Valve in a Pneumatic Circuit	77-8088-0000
MACHINE VISION & QUALITY CONTROL WITH COBEX LAB 2 Types of Vision Systems Vision Systems and Manufacturing I/O and Communication Deployment Setting Up an Emulator Calibration Vision Tools and the Emulator Spreadsheet Logic Image Analysis with the Emulator Image Enhancements with the Emulator	77-8089-0000	ADVANCED PNEUMATICS Introduction to Logic The Logic Function AND Implementing AND in a Pneumatic Circuit The Logic Function OR Implementing OR in a Pneumatic Circuit Circuit with Two Double-Acting Cylinders Sequential Cycle A Delay Sequential Control with a Timed Delay Opposing Control Signals Timing Diagrams Using a Single Pilot Valve to Prevent Opposing Control Signals Using a Single Pilot Valve in a Pneumatic Circuit	77-8089-0000
MANUFACTURING PROCESS WITH ROBOTEXPERT 1 Manufacturing Process - Overview RobotExpert Software Layout Download and install the software CAD Import - Basic Environment Modeling Layout	77-8401-0001	ADV. PNEUMATICS AND ELECTRO-PNEUMATICS The Single-Acting Cylinder The 5/3 Closed-Center Valve The Manual 5/2 Valve Sequential Operation Vacuum Generator and Pad Pneumatic Counting Quick Exhaust Valve Switches and Relays 5/2 Solenoid Spring-Return Valve Pressure Sensor Latching a Relay Overlapping Control Signals Timing Diagram Overlapping Signals Solution Using a Timer Using a Counter	77-3039-0000
MANUFACTURING PROCESS WITH ROBOTEXPERT 2 Path Creation OLP- Off Line Programming Publishing	77-8401-0001	ADV. PNEUMATICS AND ELECTRO-PNEUMATICS The Single-Acting Cylinder The 5/3 Closed-Center Valve The Manual 5/2 Valve Sequential Operation Vacuum Generator and Pad Pneumatic Counting Quick Exhaust Valve Switches and Relays 5/2 Solenoid Spring-Return Valve Pressure Sensor Latching a Relay Overlapping Control Signals Timing Diagram Overlapping Signals Solution Using a Timer Using a Counter	77-3040-0000
PLCs FUNDAMENTALS OF LADDER LOGIC Examining Input/Output Relationships PLC Monitoring Tools Writing and Simulating a Basic Ladder Diagram Project: Controlling a Sorting System NOT Logic AND Logic OR Logic Project: Arsenic Filling Station Latching and Unlatching Outputs Improving Elevator Control Timers Counters Sequential Operation with Two Double-Acting Cylinders Solving Opposing Control Signals Solving Opposing Control Signals in a Three Cylinder System Controlling a System with a Variable Timer	77-3032-0000	PLC-CONTROLLED PNEUMATIC SYSTEMS The Single-Acting Cylinder The 5/3 Closed-Center Valve The Manual 5/2 Valve Sequential Operation Vacuum Generator and Pad Pneumatic Counting Quick Exhaust Valve Switches and Relays 5/2 Solenoid Spring-Return Valve Pressure Sensor Latching a Relay Overlapping Control Signals Timing Diagram Overlapping Signals Solution Using a Timer Using a Counter	77-3034-0000
ADVANCED LADDER LOGIC Bits and Words Counter Up and Reset Counter Down Project: Implementing CTU and CTD The Equal (EQU) Instruction The Not Equal (NEQ) Instruction Project: Applying Equal and Not Equal The Less Than (LES) Instruction The Greater Than (GRT) Instruction	77-3033-0000	PLC-CONTROLLED PNEUMATIC SYSTEMS The Single-Acting Cylinder The 5/3 Closed-Center Valve The Manual 5/2 Valve Sequential Operation Vacuum Generator and Pad Pneumatic Counting Quick Exhaust Valve Switches and Relays 5/2 Solenoid Spring-Return Valve Pressure Sensor Latching a Relay Overlapping Control Signals Timing Diagram Overlapping Signals Solution Using a Timer Using a Counter	77-3035-0000

BASIC POWER ELECTRICITY

ELECTRICAL CIRCUITS Performing Lockout/Tagout Connecting a Basic Circuit Identifying Switches Connecting a Momentary Switch Connecting a Toggle Switch Identifying Sources of Electricity Measuring DC Voltage Constructing a Series Circuit Constructing a Parallel Circuit Testing an Electrolytic Cell Testing a Battery Testing a Thermocouple Testing a Solar Cell	JM-BASE-EA01A
RESISTORS & CONDUCTORS Measuring Resistance in Series and Parallel Circuits Drawing and Reading Resistor Symbols Testing an Adjustable Resistor Measuring Wire Size Applying Resistance And Wire Size Calculating Wire Size Determining Losses in a Conductor	JM-BASE-EA01B
LCR CIRCUITS Connecting a Capacitor & Testing a Capacitor Determining Capacitance Applying Capacitance Principles Inducting a Magnetic Field Assembling an Electromagnet Applying Electromagnetic Principles Inducing Voltage Inducing DC Voltage Assembling and Operating Transformers Applying Inductance Principles Operating Electromagnets Drawing Inductance Symbols	JM-BASE-EA01C
MOTORS & GENERATORS Operating a PMDC Motor Operating a DC Generator Operating an AC Generator Operating a Series Motor Demomg Principles of Reactance and Impedance Applying Phase Relationship Principles Illustrating Three-Phase Power Measuring AC Voltage	JM-BASE-EA01D

HYDRAULICS

FUNDAMENTALS OF HYDRAULICS What is Hydraulics? Pressure and Force Pressure Gauges Hydraulic Power Transmission Hydraulic Power Source Determining Component Characteristics Controlling the Flow Rate Flow Control Valves 4/3 Closed-Center Valve - Construction and Function 4/3 Closed-Center Valve - Characteristics Power Transformation Using a Double-Acting Cylinder Loading a Piston Controlling the Piston Location Task: Building a Circuit	77-8008-0000
ADVANCED HYDRAULICS Mechanronics and Hydraulic Systems Building a Dowel Insertion System Controling a Hydraulic Press Controlling a Barricade Sequential Operation Grain Gate Valves Controlling a Cargo Airplane Door Increasing System Efficiency The Relay Latching a Relay Semi-Automatic Press System The Time Irrigation System Improving Control in a Circuit with Sequential Operation	77-3025-0000
ADVANCED HYDRAULICS AND ELECTRO-HYDRAULICS Hydraulic Systems Usage and Control Electrical Control Signals Controlling Piston Speed Non-Return Pilot Valve Bi-Directional Motor Pressure Relief Valve 4/3 Closed-Center Valve vs. 4/3 Tandem-Center Valve Simultaneous Operation of Two Double-Acting Cylinders Controlling Two Actuators Using Two Valves Roller Valves Limit Switch Sequence Valve Sequential Operation Pressure-Reducing Valve Latching a Relay Timers Automatic Cycle	77-3026-0000

COMPUTER INTEGRATED MANUFACTURING 1 Introduction to CIM Introducing OpenCIM Software Parts and Production Flow Storage Setup Production Planning Processes and Machine Definition Part Definition Defining a Product Part Producing a New Part Timing and Optimization View Production Details in the Device View and Storage View Defining Part Production in the Lathe Integrated Production Tracking Integrated Production	77-3015-0000
COMPUTER INTEGRATED MANUFACTURING 2 Mass Production and CIM Robotic Systems Location Planning QC Devices Feeders Adding an Assembly Station Assembled Part Production Assembled Product Characteristics Expanding Assembly Capabilities Sub-assemblies and Multi-Level Assembly Purchase Orders and MRP Multi-Level Assembly Production CIM Databases	77-3016-0000

ELECTRICAL CONTROL SYSTEMS

OVERLOAD/OVERCURRENT PROTECTION AND MONITORING Drawing and Reading Circuit Protection Symbols Sizing and Installing Fuses Adjusting and Replacing Fuses Preventive Maintenance and Troubleshooting Fuse Blocks Sizing Circuit Breakers Testing and Resetting a Circuit Breaker Sizing and Installing an Overload Heater Adjusting and Testing the Overload Relay Installing and Setting Up a Three-Phase Monitor	JM-CTRL-EA02
TRANSFORMERS Apply Transformer Principles Draw and Read Transformer Symbols Install a Control Transformer Install a Station Transformer Troubleshoot Transformer Connect Transformer as an Auto Transformer for Buck and Boost Operation Connect Transformers in Delta and Wye Inspect and Service a Transformer Size a Transformer	JM-CTRL-EA03
ELECTRIC MOTORS Disconnecting and Operating a Split-Phase Motor Connecting and Operating a Capacitor-Start Motor Connecting and Operating a Shaded-Pole Motor Connecting and Operating a Three-Phase Motor Performing Visual Inspections Lubricating a Motor Performing DMM and Motor Megger Tests Troubleshooting a Split-Phase Motor Connecting and Operating a Capacitor-Start Motor Troubleshooting a Shaded-Pole Motor Troubleshooting a DC Motor Troubleshooting a Three-Phase Motor Testing Motors with Adjustable Loads	JM-CTRL-EA04
ELECTRO-MAGNETIC MOTOR STARTERS Connect, Set Up, and Operate an In-Circuit Connecting, Adjusting and Operating a Single Magnetic Starter Testing and Resetting Overload Protection Connect, Adjust, and Operate a Three-phase Reversing Starter Connect and Operate a Magnetic Starter for Jogging Troubleshoot a Three-phase Motor Control Circuit Troubleshoot a Reversing Three-phase Motor Control Circuit Performing Preventive Maintenance on Magnetic Starters	JM-CTRL-EA07

PROCESS CONTROL

FUNDAMENTALS OF PROCESS CONTROL Basics of Control Theory and Process Control Terms Controller and Tuning Process Control Loop Intro to Measurement of Level, Flow, Temperature, & Pressure	
PROCESS MEASUREMENT Properties of Matter (Liquid/Air) Pressure Measurement Level Measurement Mass and Inertia Energy Mechanical Advantage Inclined Planes Wedges Screws Levers Wheels and Axes Pulleys	
PLANT COMMISSIONING AND OPTIMIZATION Plant Commissioning Process Control Loop Process Behavior Effect of Disturbance in Process Characteristic of Proportional, Integral, and Derivative PID Tuning using Different Methods Ziegler-Nichols & Cohen Coon	
ACTIVITY Plant start up and commissioning Process Control Loop Understand the process behavior Proportional, Integral, & Derivative Control Loop tuning - Ziegler-Nichols and Cohen Coon	

CIM/FMS

FLEXIBLE MANUFACTURING SYSTEM CNC Machining RoboCell Simulation and Control Software Designing an FMS Workcell Expanding the Workcell Writing a Program Programming Mill Operations Conditional Programming Storing Finished Parts Multiple Part Programming Lathe Operations Program Integration Designing and Running the Final Project	77-3022-0000
BELT DRIVES Demonstrating Belt Drive Ratio Principles Installing Belt Drives Aligning a Belt Drive Belt Tensioning Installing Adjustable Speed Sheaves Installing Positive Drive Systems Belt Troubleshooting & Maintenance	JM-MBLM-ME05
CHAIN DRIVES Demonstrating Roller Chain & Sprocket Principles Sizing Chain Installing & Aligning Sprockets Installing Chain Drives Adjusting Slack Troubleshooting & Maintenance	JM-MBLM-ME06
COMPUTER INTEGRATED MANUFACTURING 1 Introduction to CIM Introducing OpenCIM Software Parts and Production Flow Storage Setup Production Planning Processes and Machine Definition Part Definition Defining a Product Part Producing a New Part Timing and Optimization View Production Details in the Device View and Storage View Defining Part Production in the Lathe Integrated Production Tracking Integrated Production	77-3015-0000
COMPUTER INTEGRATED MANUFACTURING 2 Mass Production and CIM Robotic Systems Location Planning QC Devices Feeders Adding an Assembly Station Assembled Part Production Assembled Product Characteristics Expanding Assembly Capabilities Sub-assemblies and Multi-Level Assembly Purchase Orders and MRP Multi-Level Assembly Production CIM Databases	77-3016-0000

INDUSTRIAL POWER ELECTRONICS

OSCILLOSCOPE Oscilloscope Screen Oscilloscope Controls Setting Up and Operating the Oscilloscope Adjusting Probe Compensation Performing AC Voltage Calculations Measuring AC Voltage and Frequency Performing DC Voltage Calculations Measuring DC Voltage	JM-POWR-EB01A	Connecting and Operating a Bleeder Resistor Connecting and Operating a Voltage Divider Troubleshooting a DC Power Supply Confirming Three-Phase Bridge Rectifier Operation Testing a Three-Phase Bridge Rectifier Connecting and Operating a Three-Phase Bridge Rectifier Troubleshooting a Three-Phase Bridge Rectifier
DIAGNOSTIC MULTIMETER Digital Multimeter Safety DMM Controls and Features Locating and Reading DMM Icons and Symbols Reading the Liquid Crystal Display Setting Up the DMM for Reading AC Voltage Measuring AC Voltage Calculating & Converting AC Voltage Measuring DC Voltage Measuring Resistance Discharging a Capacitor Measuring Capacitance Testing Capacitors Measuring Current Measuring DC Millivolts Performing Continuity Tests Testing Grounds and Bonds Measuring Frequency	JM-POWR-EB01B	Connecting and Operating a Schmitt Trigger-Controlled TRIAC AC Motor Drive Troubleshooting a TRIAC Motor Drive Locating the TRIAC and Drawing the TRIAC Symbol Testing a TRIAC Demonstrating TRIAC Control Principles Locating a DIAC and Drawing the Schematic Symbol Connecting and Operating a DIAC-Controlled TRIAC AC Motor Drive Connecting and Operating a Schmitt Trigger-Controlled TRIAC AC Motor Drive Troubleshooting a TRIAC Motor Drive Demonstrating PWM Principles Connecting and Operating a PWM DC Motor Drive
HAND HELD DIGITAL OSCILLOSCOPE Reading the Oscilloscope Screen Identifying and Using Oscilloscope Controls Setting Up and Operating the Oscilloscope Performing AC Voltage Calculations Measuring AC Voltage and Frequency Performing DC Voltage Calculations Measuring DC Voltage Storing and Recalling Screen Displays	JM-POWR-EB01C	Connecting and Operating a Schmitt Trigger-Controlled TRIAC AC Motor Drive Troubleshooting a TRIAC Motor Drive Locating the TRIAC and Drawing the TRIAC Symbol Testing a TRIAC Demonstrating TRIAC Control Principles Locating a DIAC and Drawing the Schematic Symbol Connecting and Operating a DIAC-Controlled TRIAC AC Motor Drive Connecting and Operating a Schmitt Trigger-Controlled TRIAC AC Motor Drive Troubleshooting a TRIAC Motor Drive Demonstrating PWM Principles Connecting and Operating a PWM DC Motor Drive
DC POWER SUPPLIES Power Supply Block Diagram Schematic Symbols Confirming Stator Winding Connections Locating Diodes and Symbols Testing a Diode Drawing a Half-Wave Rectifier Connecting and Operating a Half-Wave DC PS Confirming Full-Wave DC Power Supply Operation Connecting and Operating a Full-Wave DC PS Confirming Single-Phase Bridge Rectifier Operation Connecting and Operating Single-Phase Bridge Rectifier	JM-POWR-EB02A	Connecting and Operating a Bleeder Resistor Connecting and Operating a Voltage Divider Troubleshooting a DC Power Supply Confirming Three-Phase Bridge Rectifier Operation Testing a Three-Phase Bridge Rectifier Connecting and Operating a Three-Phase Bridge Rectifier Troubleshooting a Three-Phase Bridge Rectifier
SINGLE-PHASE AND THREE-PHASE POWER SUPPLIES Drawing Filter Schematic Diagrams Connecting and Operating a Power Supply Drawing Zener Schematic Symbols Connecting and Operating a Zener Diode Voltage Regulator Locating an IC Voltage Regulator Connecting and Operating a DC Power Supply with an IC Voltage Regulator	JM-POWR-EB02B	Connecting and Operating a Bleeder Resistor Connecting and Operating a Voltage Divider Troubleshooting a DC Power Supply Confirming Three-Phase Bridge Rectifier Operation Testing a Three-Phase Bridge Rectifier Connecting and Operating a Three-Phase Bridge Rectifier Troubleshooting a Three-Phase Bridge Rectifier

ELECTRO MECHANICAL MAINTENANCE CELL

BASIC MAINTENANCE CELL Install and Connect Conveyor Drive Controls Assemble the Base Assemble & Install the Conveyor Mount Support Assembly Install Pull Box, End and Feeder Tube Supports Install Crossbars and Top Members Inspect & Align Completed Frame ENCLOSURES Install Load Center Install Cable Trays Install Wireway Install Pull Boxes Install Equipment Enclosures Install Safety Disconnects CONDUIT & FITTINGS Cut and Ream Conduit Install Flexible Metal Conduit Install EMT Conduit LOW VOLTAGE & CIRCUIT PROTECTION Wire & Connect Main Power Cord Install Cool Down Blower Install Part Count Sensor Install Paint Tunnel Status Indicators PROGRAMMABLE LOGIC CONTROLLER (PLC) Install PLC Rough-in PLC power Program PLC Connect PLC input Sensor Circuits Connect PLC Output Device Circuits Troubleshoot Paint, Bake & Cool System	JM-EMMC-ZA01	CONVEYOR CONTROLS Install and Connect Conveyor Drive Controls Assemble the Base Assemble & Install the Conveyor Mount Support Assembly Install Pull Box, End and Feeder Tube Supports Install Crossbars and Top Members Inspect & Align Completed Frame ENCLOSURES Install Load Center Install Cable Trays Install Wireway Install Pull Boxes Install Equipment Enclosures Install Safety Disconnects CONDUIT & FITTINGS Cut and Ream Conduit Install Flexible Metal Conduit Install EMT Conduit LOW VOLTAGE & CIRCUIT PROTECTION Wire & Connect Main Power Cord Install Cool Down Blower Install Part Count Sensor Install Paint Tunnel Status Indicators PROGRAMMABLE LOGIC CONTROLLER (PLC) Install PLC Rough-in PLC power Program PLC Connect PLC input Sensor Circuits Connect PLC Output Device Circuits Troubleshoot Paint, Bake & Cool System
PART MANIPULATOR PART MANIPULATION Install Part Kicker Install Stacker Part Sensor PAINT, BAKE AND COOL TUNNEL Install Paint Bake Heaters Install Tunnel Install Paint Nozzles Install Cool Down Blower Install Part Count Sensor Install Paint Tunnel Status Indicators PROGRAMMABLE LOGIC CONTROLLER (PLC) Install PLC Rough-in PLC power Program PLC Connect PLC input Sensor Circuits Connect PLC Output Device Circuits Troubleshoot Paint, Bake & Cool System	JM-EMMC-ZA03	CONVEYOR CONTROLS Install and Connect Conveyor Drive Controls Assemble the Base Assemble & Install the Conveyor Mount Support Assembly Install Pull Box, End and Feeder Tube Supports Install Crossbars and Top Members Inspect & Align Completed Frame ENCLOSURES Install Load Center Install Cable Trays Install Wireway Install Pull Boxes Install Equipment Enclosures Install Safety Disconnects CONDUIT & FITTINGS Cut and Ream Conduit Install Flexible Metal Conduit Install EMT Conduit LOW VOLTAGE & CIRCUIT PROTECTION Wire & Connect Main Power Cord Install Cool Down Blower Install Part Count Sensor Install Paint Tunnel Status Indicators PROGRAMMABLE LOGIC CONTROLLER (PLC) Install PLC Rough-in PLC power Program PLC Connect PLC input Sensor Circuits Connect PLC Output Device Circuits Troubleshoot Paint, Bake & Cool System
INDUSTRIAL LIGHTING INDUSTRIAL LIGHTING CIRCUITS Install Fluorescent Task Lighting Install Low Bay Lighting Install High Bay Lighting Install Flood Lighting Install Hazardous Location Lighting Install Emergency Lighting Rough-In Lighting Circuits Megger Test Lighting Circuits INDUSTRIAL POWER CIRCUITS Install Wiring Devices Rough-In Wiring Devices Megger Test Power Circuits Wire Lighting & Lighting Control Install and Test GFCI Circuit Troubleshoot Lighting and Power System	JM-EMMC-ZA04	CONVEYOR CONTROLS Install and Connect Conveyor Drive Controls Assemble the Base Assemble & Install the Conveyor Mount Support Assembly Install Pull Box, End and Feeder Tube Supports Install Crossbars and Top Members Inspect & Align Completed Frame ENCLOSURES Install Load Center Install Cable Trays Install Wireway Install Pull Boxes Install Equipment Enclosures Install Safety Disconnects CONDUIT & FITTINGS Cut and Ream Conduit Install Flexible Metal Conduit Install EMT Conduit LOW VOLTAGE & CIRCUIT PROTECTION Wire & Connect Main Power Cord Install Cool Down Blower Install Part Count Sensor Install Paint Tunnel Status Indicators PROGRAMMABLE LOGIC CONTROLLER (PLC) Install PLC Rough-in PLC power Program PLC Connect PLC input Sensor Circuits Connect PLC Output Device Circuits Troubleshoot Paint, Bake & Cool System
LASER ALIGNMENT Aligning a Belt Drive Aligning a Coupling Correcting for Soft Foot Filling Out an Alignment Report	JM-MBLM-ME11	CONVEYOR CONTROLS Install and Connect Conveyor Drive Controls Assemble the Base Assemble & Install the Conveyor Mount Support Assembly Install Pull Box, End and Feeder Tube Supports Install Crossbars and Top Members Inspect & Align Completed Frame ENCLOSURES Install Load Center Install Cable Trays Install Wireway Install Pull Boxes Install Equipment Enclosures Install Safety Disconnects CONDUIT & FITTINGS Cut and Ream Conduit Install Flexible Metal Conduit Install EMT Conduit LOW VOLTAGE & CIRCUIT PROTECTION Wire & Connect Main Power Cord Install Cool Down Blower Install Part Count Sensor Install Paint Tunnel Status Indicators PROGRAMMABLE LOGIC CONTROLLER (PLC) Install PLC Rough-in PLC power Program PLC Connect PLC input Sensor Circuits Connect PLC Output Device Circuits Troubleshoot Paint, Bake & Cool System
VIBRATION ANALYSIS Reading a Vibration Severity Chart Filling Out a Maintenance Log Measuring the Vibration of a Motor Measuring Shaft Misalignment Troubleshooting Misaligned Shaft Vibration Measuring Coupling Vibration Troubleshooting Belt Shaft Vibration Troubleshooting Defective Shaft Component Vibration Troubleshooting Resonant Vibration Demonstrating Vibration Source Principles	JM-MBLM-ME12	CONVEYOR CONTROLS Install and Connect Conveyor Drive Controls Assemble the Base Assemble & Install the Conveyor Mount Support Assembly Install Pull Box, End and Feeder Tube Supports Install Crossbars and Top Members Inspect & Align Completed Frame ENCLOSURES Install Load Center Install Cable Trays Install Wireway Install Pull Boxes Install Equipment Enclosures Install Safety Disconnects CONDUIT & FITTINGS Cut and Ream Conduit Install Flexible Metal Conduit Install EMT Conduit LOW VOLTAGE & CIRCUIT PROTECTION Wire & Connect Main Power Cord Install Cool Down Blower Install Part Count Sensor Install Paint Tunnel Status Indicators PROGRAMMABLE LOGIC CONTROLLER (PLC) Install PLC Rough-in PLC power Program PLC Connect PLC input Sensor Circuits Connect PLC Output Device Circuits Troubleshoot Paint, Bake & Cool System
BEARING MAINTENANCE Identifying Anti-Friction Bearings Identifying Plain Bearings Using an Arbor Press Using a Bearing Puller Installing and Removing Bushings Using a Cone Heater Loading a Grease Gun Greasing a Pillow Block Hacking a Bearing Using a Bearing Puller Installing and Removing Seal Principles Performing Bearing Failure Analysis	JM-MBLM-ME13	CONVEYOR CONTROLS Install and Connect Conveyor Drive Controls Assemble the Base Assemble & Install the Conveyor Mount Support Assembly Install Pull Box, End and Feeder Tube Supports Install Crossbars and Top Members Inspect & Align Completed Frame ENCLOSURES Install Load Center Install Cable Trays Install Wireway Install Pull Boxes Install Equipment Enclosures Install Safety Disconnects CONDUIT & FITTINGS Cut and Ream Conduit Install Flexible Metal Conduit Install EMT Conduit LOW VOLTAGE & CIRCUIT PROTECTION Wire & Connect Main Power Cord Install Cool Down Blower Install Part Count Sensor Install Paint Tunnel Status Indicators PROGRAMMABLE LOGIC CONTROLLER (PLC) Install PLC Rough-in PLC power Program PLC Connect PLC input Sensor Circuits Connect PLC Output Device Circuits Troubleshoot Paint, Bake & Cool System
GEAR DRIVES Demonstrating Gear Measurement Principles Installing a Worm Gear Drive Installing a Spur Gear Drive Measuring Backlash Installing a Helical Gear Drive Installing a Bevel Gear Drive Maintaining & Troubleshooting Gear Drives	JM-MBLM-ME08	CONVEYOR CONTROLS Install and Connect Conveyor Drive Controls Assemble the Base Assemble & Install the Conveyor Mount Support Assembly Install Pull Box, End and Feeder Tube Supports Install Crossbars and Top Members Inspect & Align Completed Frame ENCLOSURES Install Load Center Install Cable Trays Install Wireway Install Pull Boxes Install Equipment Enclosures Install Safety Disconnects CONDUIT & FITTINGS Cut and Ream Conduit Install Flexible Metal Conduit Install EMT Conduit LOW VOLTAGE & CIRCUIT PROTECTION Wire & Connect Main Power Cord Install Cool Down Blower Install Part Count Sensor Install Paint Tunnel Status Indicators PROGRAMMABLE LOGIC CONTROLLER (PLC) Install PLC Rough-in PLC power Program PLC Connect PLC input Sensor Circuits Connect PLC Output Device Circuits Troubleshoot Paint, Bake & Cool System
MACHINE SHAFT COUPLINGS Installing Shaft Couplings Correcting Soft Foot Aligning Shafts Aligning Rims & Faces Connecting Chain Couplings Connecting Universal Joints	JM-MBLM-ME07	CONVEYOR CONTROLS Install and Connect Conveyor Drive Controls Assemble the Base Assemble & Install the Conveyor Mount Support Assembly Install Pull Box, End and Feeder Tube Supports Install Crossbars and Top Members Inspect & Align Completed Frame ENCLOSURES Install Load Center Install Cable Trays Install Wireway Install Pull Boxes Install Equipment Enclosures Install Safety Disconnects CONDUIT & FITTINGS Cut and Ream Conduit Install Flexible Metal Conduit Install EMT Conduit LOW VOLTAGE & CIRCUIT PROTECTION Wire & Connect Main Power Cord Install Cool Down Blower Install Part Count Sensor Install Paint Tunnel Status Indicators PROGRAMMABLE LOGIC CONTROLLER (PLC) Install PLC Rough-in PLC power Program PLC Connect PLC input Sensor Circuits Connect PLC Output Device Circuits Troubleshoot Paint, Bake & Cool System
ELECTRIC BRAKES Operating Electric Brakes Installing Electric Brakes Maintaining & Troubleshooting Electric Brakes	JM-MBLM-ME10	CONVEYOR CONTROLS Install and Connect Conveyor Drive Controls Assemble