

EUROTHERM FLEXIBLE SOLUTIONS

MACO[®]/EM-3

Leading the way in plastics...



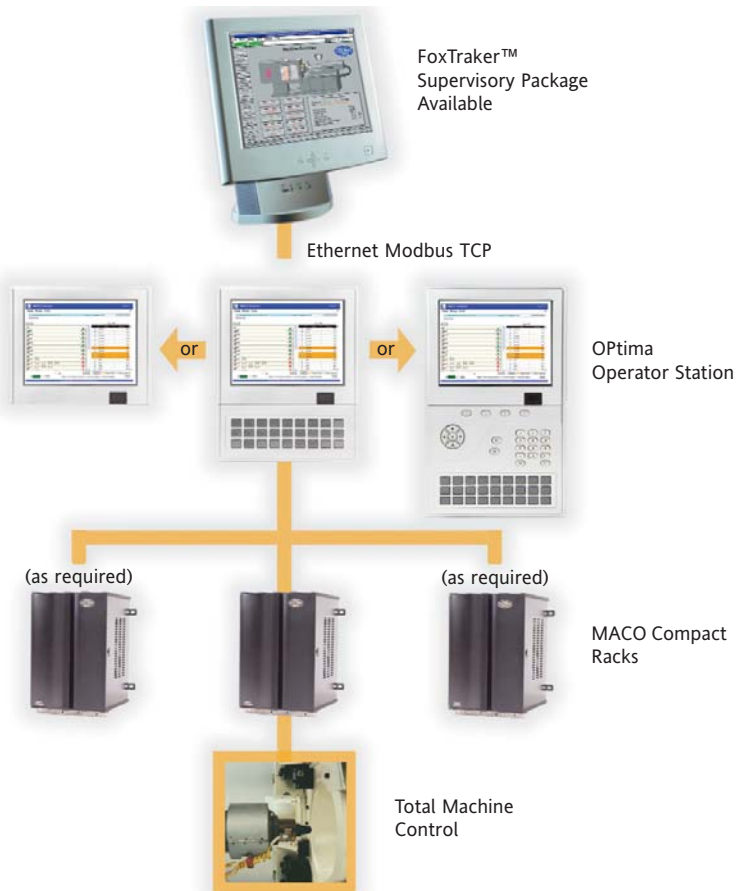
... controlling to a higher standard

Injection Molding with the MACO[®] Compact

The MACO Compact is a cost competitive application specific programmable logic controller with the advantages of integrated, total machine control in a compact package. It is an expandable system, similar to the industry standard MACO 4000, but designed for lower cost without sacrificing high-tech performance.

The MACO Compact supports either open or closed loop (IMPACT™ II) injection process control. Run the machine for a few cycles, and IMPACT II creates a theoretical model of the process. It uses this model along with hundreds of rules to automatically optimize the process to compensate for short and long term deviations in the injection molding process.

Precise adaptive automatic tuning is included for temperature control. SPC calculations and charts can be viewed on Eurotherm's new line of OPTIMA touch screen displays.



Chassis

- 4 Slot Backplane
- Closed Cover

Temperature Card

- Adaptive Autotune Temperature
- 8 Thermocouple Inputs
- 16 Logic Outputs (low current)
- 24 Vdc Power Supply Interface

Motion Control Card

- Patented Autotune Injection
- 10 Step Velocity or Pressure Fill
- Transfer on Pressure, Time or Position
- Multiple Steps of Pack and Hold with Ramping
- 10 Steps of Back Pressure Control
- RPM Control
- Clamp Control
- Fast On Card Instruction List Programming
- Sequence Control
- Ethernet Modbus TCP Port
- 6Ch. +/-10Vdc or 4-20mA Input
- 4Ch +/- 10Vdc Output
- 16 Bit Resolution
- 4Ch. Logic Outs/4Ch. Logic Ins
- 2 Slots for Add-On Cards

32/32 Logic I/O Card

- 32Ch. Logic In
- 32Ch. Logic Out @2A

Operator Station

- Large 12.1" Color Display
- Touch Screen
- Windows CE Operating System
- Choice of 3 Optional Button Panels
- Line Graphs
- Multi-lingual
- Compact Flash Screen Storage
- USB Memory Stick Recipe Storage

Optional Cards

- 2Ch. Encoder Add-On Card
- 8Ch. Logic I/O Add-On Card
- 2Ch. Analog Input Add-On Card
- 24/24Ch. Logic I/O Card
- 32/32Ch. Logic I/O Card

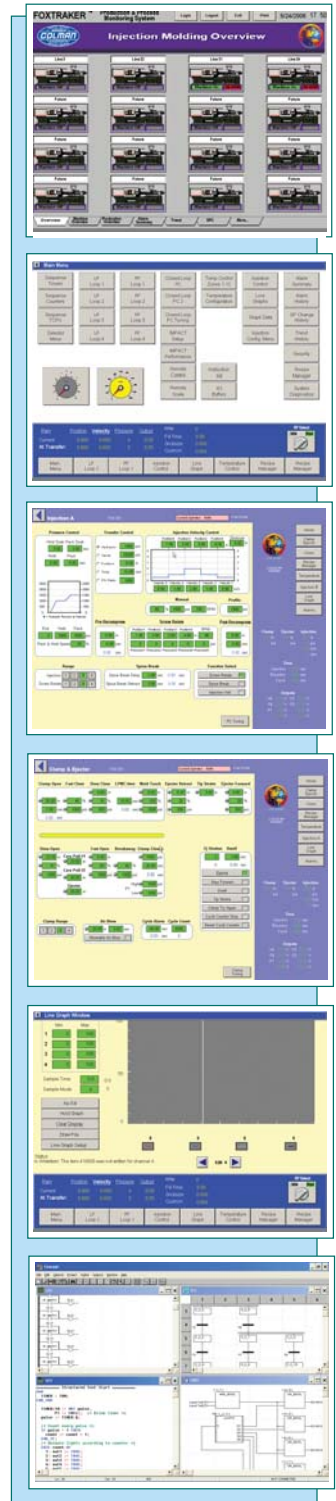
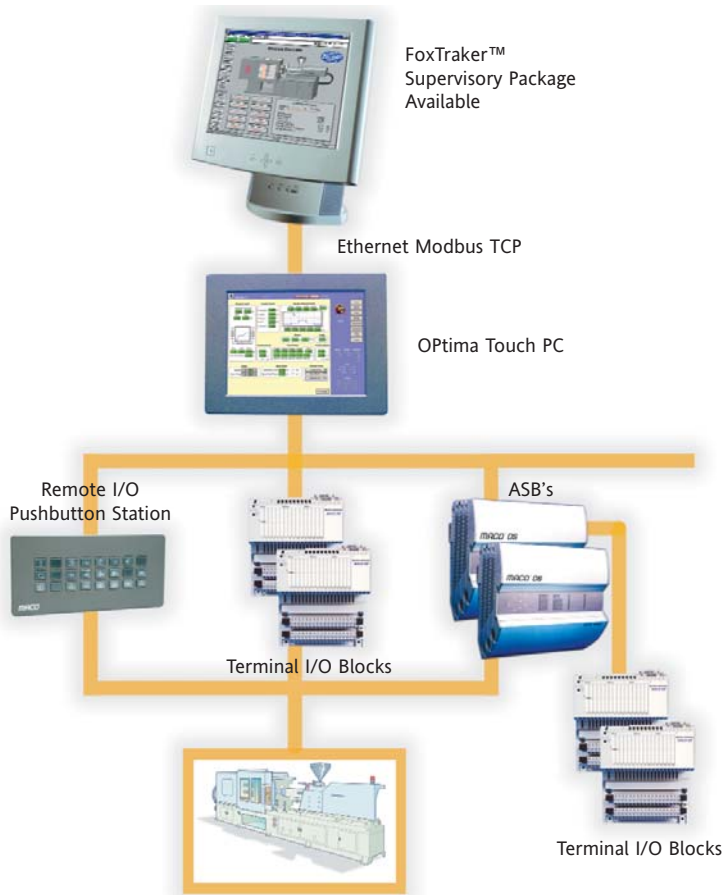
Features and Benefits

- High Speed Display Updates for Better Monitoring
- Ethernet Communications for Seamless Connection to Plant Wide Systems
- Recipe Storage to USB Memory Sticks
- Web Accessible Online RLD Diagnostics
- Chassis Configuration for Centralized Wiring
- High Speed Closed Loops with Enhanced Loop Coordination Provide Improved Part Quality
- Large Color Touch Screen for Ease of Use
- Statistical Process Control for Proactive Problem Predictions
- Advanced Impact Injection Control for Improved Productivity

Injection Molding with the MACO® DS

The MACO DS (Distributed System) is by far the best, easiest to use distributed injection molding machine controller for hydraulic and electric machines. The revolutionary IMPACT™ advanced Injection Process Control provides closed loop control with tighter part weight tolerances, improved dimensional stability, and greater overall consistency from shot to shot.

The MACO DS is a complete family of building block automation components that can be networked to form an injection molding control system. Applied as a total machine controller or as individual components, the MACO DS meets your needs today, and its adaptability ensures a perfect fit for the future.



Features and Benefits

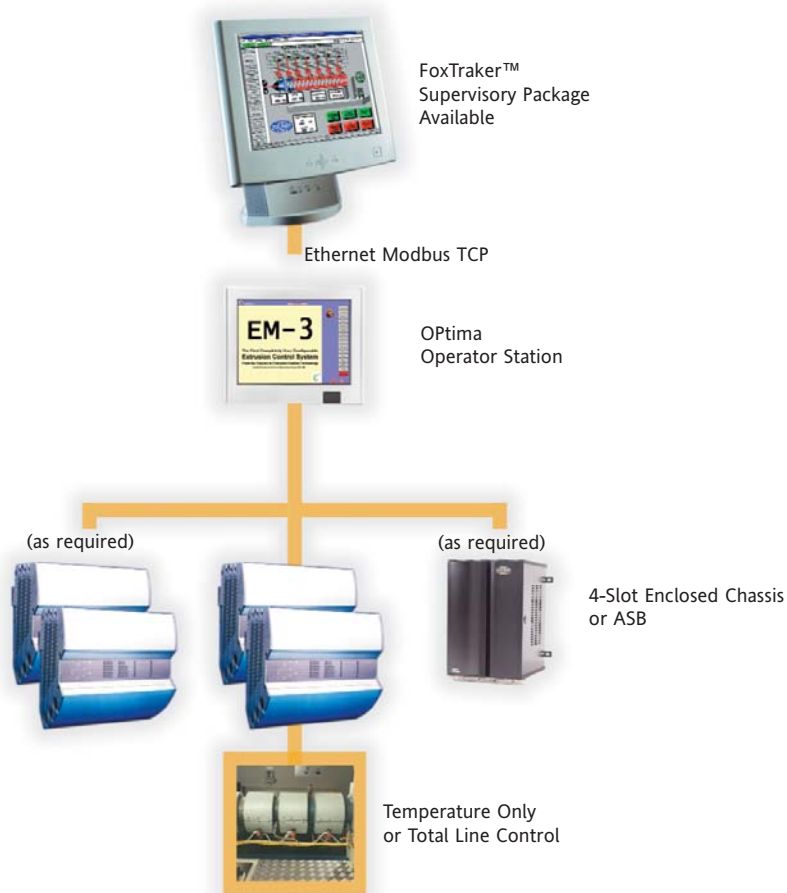
- Advanced Control means Higher Productivity
- Scaleable - One Control Solution for Large and Small Machines
- Fast Installation - DIN Rail Mounting
- Shared Data Base between Screen Editor (Wonderware® InTouch™) and Sequence Editor
- Nozzle Sequencing for Structural Foam Applications
- Internationally Accepted IEC 61131-3 Programming
- High Density ASBs or Racks Reduce Panel Space
- Large Color Graphical Interface for Easy Use
- Pre-Configured Screens and Sequence for Rapid Start-Ups
- Sequence Editor Features On-Line Editing, Diagnostics and Simulation

Extrusion with the MACO® EM-3e

The EM-3e is specifically designed for small extruders but is packed with the features of the popular EM-3 Extrusion Control System. The EM-3e uses the cost effective OPTIMA display and can be used just for extruder temperature and pressure control or complete line control.

Built-in functions manage temperature, pressure, and line speed. Ramping and bumpless transfer ensures smooth processing. The temperature card is designed specifically for single-screw, twin-screw, co-extrusion or blown film applications. Fully automatic adaptive tuning (as well as conventional tuning) is provided.

Predefined screens and sequence logic greatly simplify installation and setup. Applications that match the predefined screens and logic will not require additional programming. For applications that differ, installers can use the predefined application as the basis for custom control.



Features and Benefits

- Adaptive Auto-tuning Temperature Control for Precise Control
- Preconfigured Screens and Sequence Reduces Installed Cost
- Auto-tuning for Optimized Melt Pressure Control
- Labor and Material Savings by Directly Wiring to Terminal I/O Blocks
- Multi-lingual for Global Use
- Ethernet Communications for Simplified Installation

General

- Adaptive Autotune Temperature Control
- Ethernet Modbus TCP Comms
- Autotune Pressure Control

Operator Station

- 12.1 inch Color Screen
- Touch Screen
- USB Port for Recipe Storage
- Windows™ Operating System

ASB (Application Specific Block)

- 12Ch. Thermocouple Card
- 32/32Ch. Logic I/O Card
- Ethernet Modbus TCP Comms

ASB Options

- 12Ch. Thermocouple Card
- Or
- 9Ch. Thermocouple and multiplexing current monitoring
- Or
- 6Ch. Thermocouple and 6Ch. 0-10/4-20mA inputs

Optional Alarm Block

- 16Ch Logic Output
- 16Ch Logic Input
- PLC with Ethernet Modbus TCP and Modbus Ports
- High/Low/Deviation Alarms
- Heater Failure Alarm
- Sensor Break

Optional Analog Block

- 2 Pressure Inputs (Closed Loop Pressure Control)
- Ramping
- Bumpless Transfer
- Ratio Control
- 2 RPM Inputs
- 2 Load Inputs
- 8Ch. Logic Output
- 8Ch. Logic Input

Applications

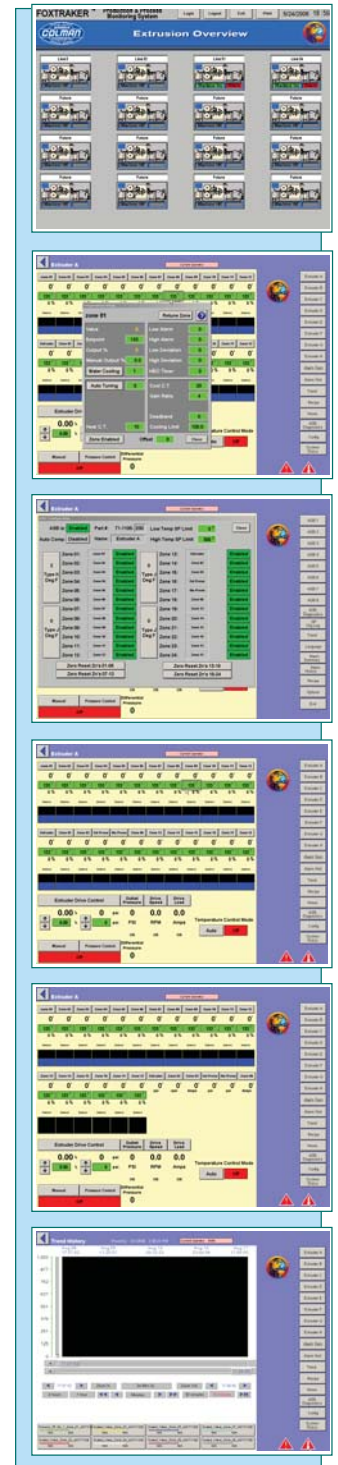
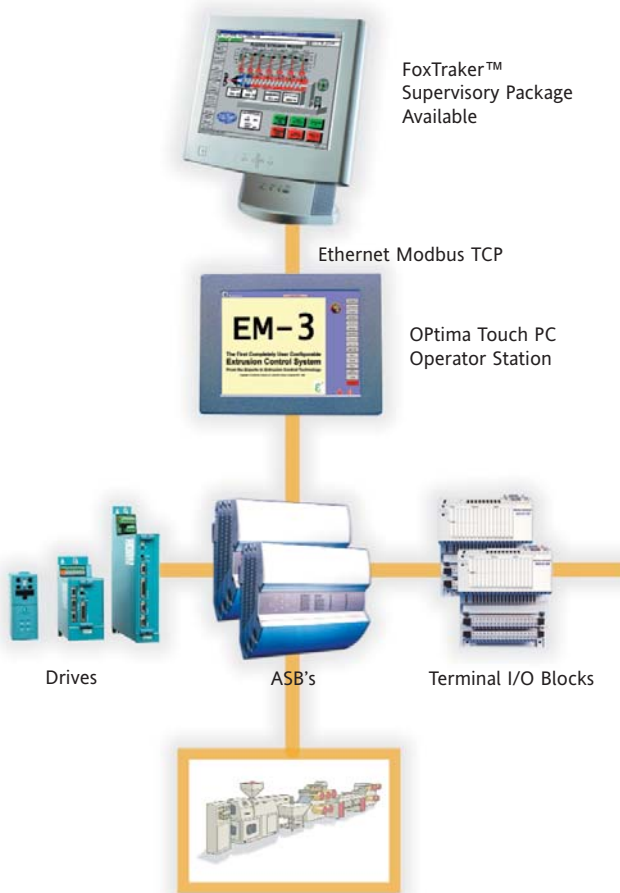
- Pipe Extrusion
- Profile Extrusion
- Compounding
- Cast Film
- Blown Film
- Rigid Sheet
- Wire and Cable Coating
- Thermoforming
- Temperature Control
- Melt Pressure Control
- Drive Coordination
- Rubber Extrusion

Extrusion with the MACO® EM-3

The Extrusion Master 3 offers the advantage of a totally integrated package with the simplicity typically found in single loop temperature or pressure controllers. A building block architecture is used to create an extrusion control system applicable to a large array of extrusion processes.

Standard control system definitions have been developed for Application Specific Blocks, which saves valuable engineering time and expense. Preprogrammed components can be connected for true out-of-the box performance.

The operator interface is the rugged OPTima Touch PC running Wonderware InTouch™. To avoid costly programming, a predefined InTouch application is provided. This unique application allows clients to accomplish a number of commissioning tasks from the “runtime” environment, thus eliminating the need for complex programming.



Features and Benefits

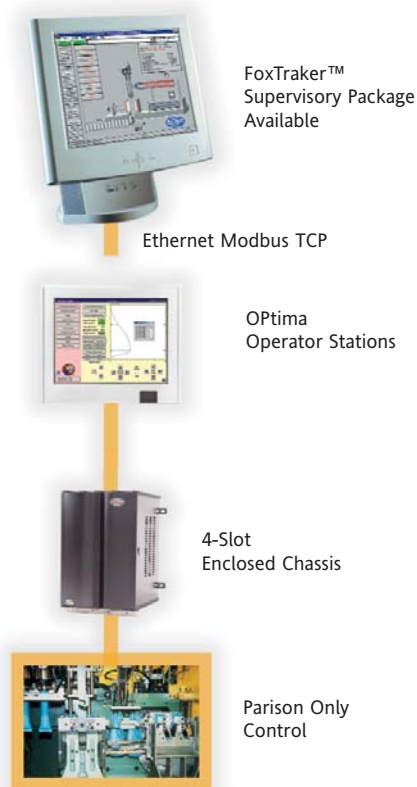
- Building Block Architecture for Easy Line Reconfiguration
- Over 600 Communication Drivers for Integrated Line Control
- Automated Heat Startup for Decreased Energy Use
- On-line Trending
- Hot Swappable Blocks to Reduce Downtime
- Drive Ratio Control
- Multiple Operator Station Capability
- Online Help Screens

Blow Molding with the MACO® Breeze II

The MACO Breeze II controller brings parison only wall thickness control capability to the average operator, and added productivity and profit to blow molders. It can be specified on new machines or added as a retrofit to a wide variety of machines to provide consistent wall thickness for improved product quality, less material consumption and reduced scrap.

The user needs only specify the type of machine and the unit will be factory programmed and wired for that type of machine. Once the unit is installed, calibrate the tool/accumulator and enter the desired parison profile. The 100 point parison profile is displayed graphically on a large display, which allows the profile to be quickly modified and compared to the actual process value. The entered profiles can then be stored internally or on removable USB memory sticks.

The MACO Breeze II utilizes the same cards as the MACO® DS, which means that the Breeze II can be expanded to provide total machine control. It also allows users to stock fewer spare parts while providing the highly precise parison control of the MACO DS. Parison tooling position is updated every 0.1 milliseconds to minimize material usage and improve part quality.



Features and Benefits

- Pre-configured for Common Machines (Time or Position)
- 100 Point Parison Profile
- 100 Point Velocity Pushout Control
- Graphically Enter and Display the Parison Profile
- Actual Tooling Performance versus Entered Profile Displayed
- Separate Weight and Die Gap Settings
- Very High Speed Loop Closure - 0.1ms
- Multiple Security Levels
- Large Color Touch Screen
- Store Parison Setups to Internal Memory or USB Sticks
- Common Boards with the MACO DS Controller
- Expandable to Total Machine Control

FoxTraker™ Supervisory Package

FoxTraker is a complete, ready-to-run system for production monitoring and reporting of injection molding, blow molding or extrusion machines. The use of standard hardware and software in an open architecture permits easy expansion when you're ready to grow the system.

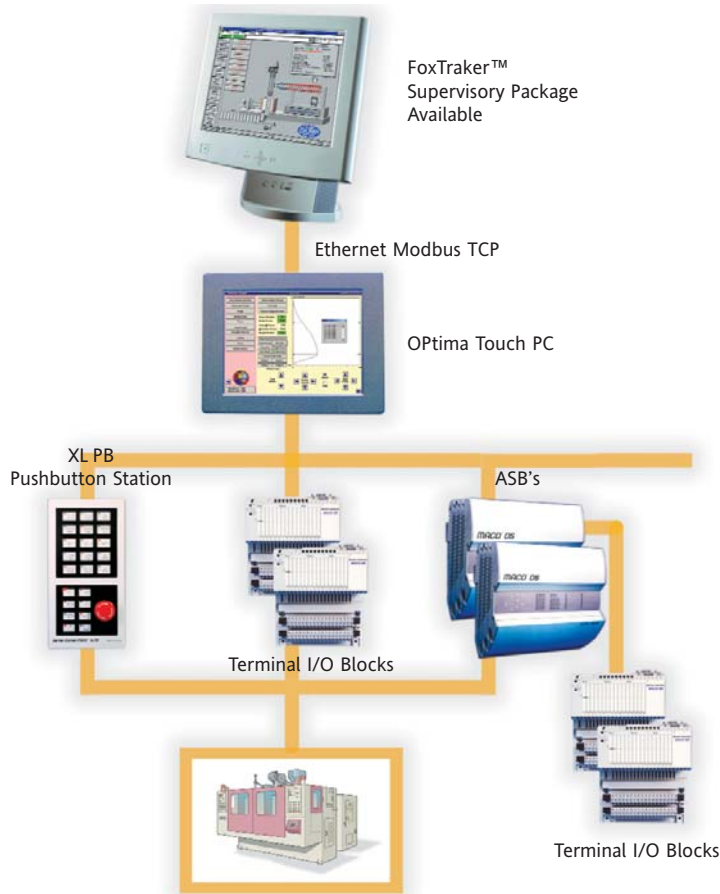
- Flexibility to Grow from a Single Machine to an Enterprise-wide System
- Complete Access to Plant Data Including Machine and Job Status
- Production Monitoring, Records and Reports
- Data Acquisition and Direct Machine Control
- Real-time, Usable Information with an Intuitive Interface



Blow Molding with the MACO® DS

The MACO DS distributed controller provides total machine control of accumulator-based, reciprocating screw or continuous blow molding processes. The MACO DS is a totally integrated package that offers state of the art closed loop parison, clamp, blow pin, push-out, carriage control and operator friendliness.

The MACO DS system is a complete family of building block automation components that can be networked to form a blow molding control system. Applied as a total machine controller or as individual components, the MACO DS meets your needs today, and its adaptability ensures a perfect fit for the future.

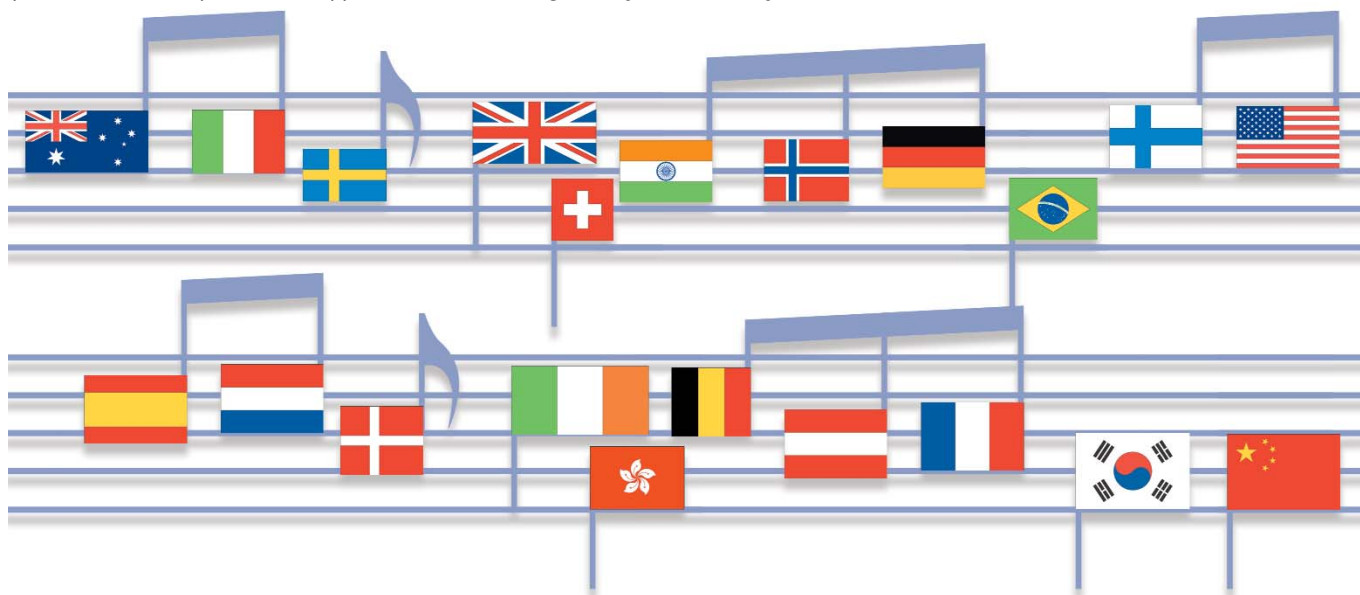


Features and Benefits

- Synchronous Shoot & Fill for Consistent Quality of Double Sided Accumulator Machines
- Independent Machine and Part Recipes for Fast Job Changes
- Internal Parison Setpoint Interpolation Every 2ms for Simplified Parison Profile Entry
- Preconfigured for PWDS (Partial Wall Thickness Distribution)
- Network Ready Pushbutton Stations Reduce Wiring Costs
- EZ PRO Closed Loop Velocity Control for Fast Blow Pins, Clamps and Shuttles
- On-line Security Code Changes for Enhanced Security
- Setpoint Change Logging for Problem Analysis
- Remote Diagnostics to Reduce Support Costs
- User Defined Function Blocks for Unique Applications

Eurotherm International Sales and Service

Providing local support is a key part of Eurotherm's business. Complementing worldwide Eurotherm offices are an entire range of partners and a comprehensive support team - a soothing melody in tune with your needs.



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