

Plastics Manufacturing

*The OEM and Installers Guide to Control
Components for Plastics Machinery*

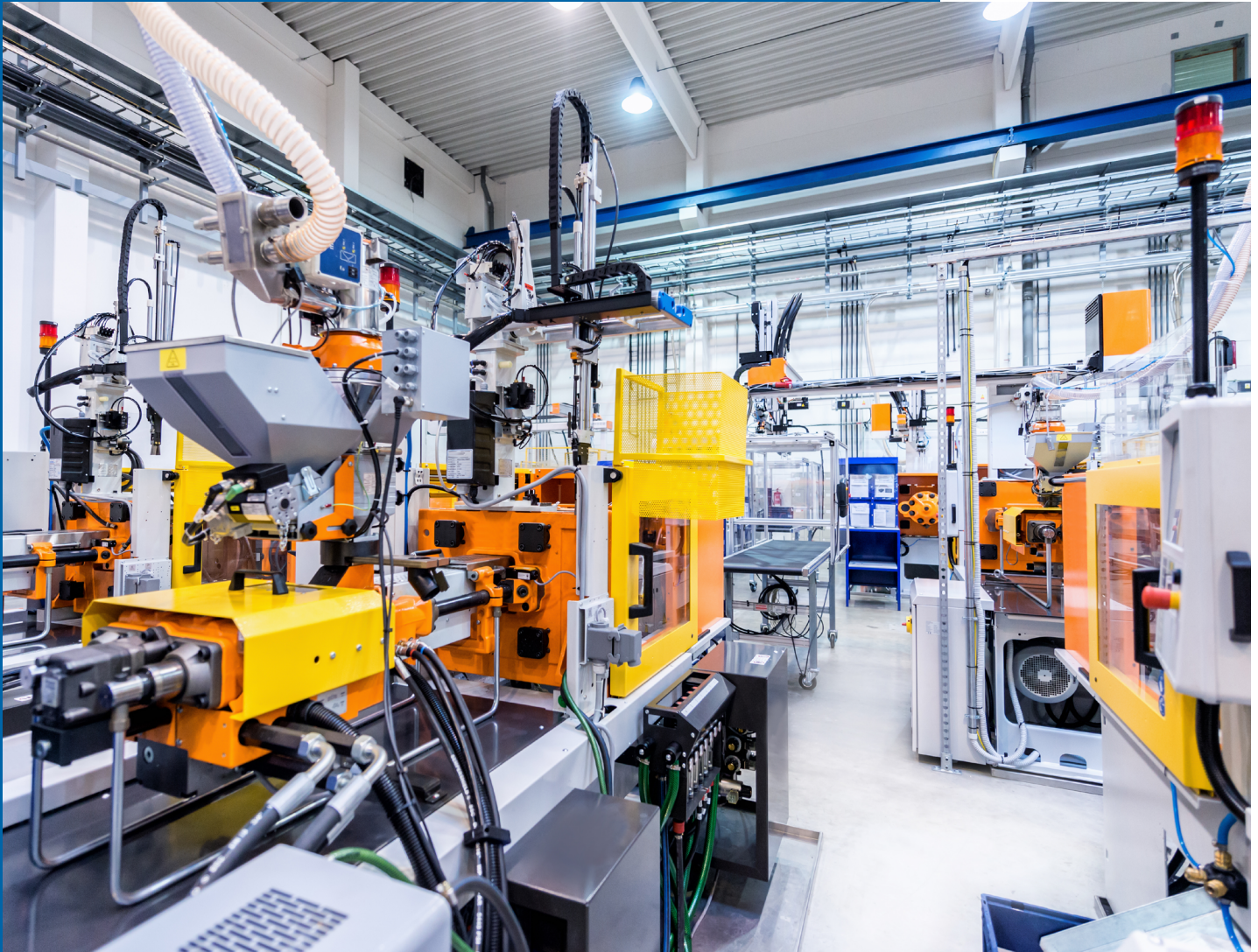


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About c3controls

Since 1976 c3controls (c3controls.com) has provided OEMs and electrical equipment builders a comprehensive portfolio of industrial control products that meet the most demanding applications. By maintaining strict control over the development and manufacturing of all products, c3 can provide customers extraordinary value through unmatched quality, competitive pricing, same-day shipping and a lifetime product warranty. This vertically integrated approach coupled with a direct sales model brings c3 closer to the end-user, fostering a degree of innovation that leads the industry.



Glossary of Plastics Terms

Auxiliary Equipment:
Peripheral equipment used to improve or optimize any part of the plastics manufacturing process.

Blow Molding:
Creating hollow plastic parts by inflating a heated plastic inside of a mold until it forms the intended shape.

CNC Lathe:
A Computer Numerical Control (CNC) lathe machine is a form of subtractive manufacturing. A moving cutting tool follows a digital path in order to remove material from a solid block of plastic and reach an intended shape.

Compounding:
Adding additives to raw material plastics in order to achieve color, property, and/or performance. Machines include kneaders, mixers, pelletizers, blenders and grinders.

Extrusion:
Pushing a heated plastic through a die to create a continuous form. The shape of the die is a cross section of the final product.

Film Blowing:
Heating and melting plastic particles which are then blown into a film.

Heating & Cooling:
Temperature control essential for the creation and solidification of plastic molds. Machines include chillers, dryers, cooling towers, and heat exchangers.

Injection Molding:
The most common manufacturing method for solid plastic parts in which molten plastic is injected into a mold to form an intended shape.

Machinery:
Any mechanical or electrical operated device used in the plastics manufacturing process. Common categories include compounding, molding, secondary processing, and auxiliary.

Manufacturing Process:
Any method used to turn raw material plastics into finished parts or products. Common processes include 3D printing, CNC machining, casting, and molding.

Material Handling:
Using equipment to move, protect, store, and control materials throughout the plastics manufacturing process. Machines include feeders and conveyors.

Molding:
Entering liquid plastic into a negative cavity with force in order for it to eventually form an intended shape. Common processes include blow, injection, rotational, extrusion, and thermoforming molding.

Plastics:
A synthetic or semi-synthetic material made from a wide range of polymers. Common types are thermoplastics (can be melted) and thermosets (cannot be melted).

Polymer Casting:
Entering liquid plastic into a negative cavity and allowing atmospheric pressure to eventually form an intended shape.

Recycling:
Reprocessing plastic waste into new parts or products.

Resin:
A common substance in the plastics industry that is combined with a hardening agent to produce plastic.

Rotational Molding:
Rotating a heated mold until the material inside sticks to the walls of the mold and forms a hollow part.

Scrap Reclaim:
Plastic that is reused in its same form. The industry typically targets 20-25% or less for blending regrind into virgin resin.

Secondary Processing:
A post-processing step in which plastic parts or products are customized to specific needs. Machines include welders, stampers, and printers.

Thermoforming:
Transforming a plastic sheet into a three dimensional shape in a mold by using heat, a vacuum, and pressure.

3D Printing:
A form of additive manufacturing in which a printer follows a computer-aided design (CAD) in order to create a three dimensional object layer by layer.

Plastics Industry Outlook

For over 45 years, c3controls has been a leading manufacturer of quality electrical controls for plastics manufacturing. Our experience serving plastics, one of the largest manufacturing industries in the world, has provided a deep understanding of challenges and how to solve them. The post-pandemic plastics manufacturing industry is up against a variety of hurdles:

- **Supply chain issues** that bring long lead times for critical system components and subsequent production delays.
- **Workforce shortages** that limit productivity and increase the need for automation.
- **Cost pressures** that demand improved materials, inventory tracking, and purchasing.
- **Complex controls** that call for the technological advancement of electronics.
- **Calls for sustainability** that demand innovation in processing, material handling, packaging, recycling and more.

Increased demand for plastic parts and products along with these challenges make now the ideal time to find solutions for your business. With the right parts, people, and processes, your plastics manufacturing application can effectively achieve mass production and mass customization.

c3controls can help you succeed. We manufacture our products and do not source any major products from China. This allows us to operate more efficiently and respond to market conditions quicker. That means faster delivery for industrial control products serving:

- **Injection & Blow Molding**
- **Extrusion & Thermoforming**
- **3D Printing**
- **Process Cooling**
- **Auxiliary Equipment**
- **& more!**

With over fifteen million available product configurations, and our own UL508A panel shop, c3controls has the resources you need to adapt and capitalize on your plastics manufacturing business opportunities!

Machinery Example

Here is an example of an injection molding machine, the most common type of plastics machinery:

Injection Molding Machine

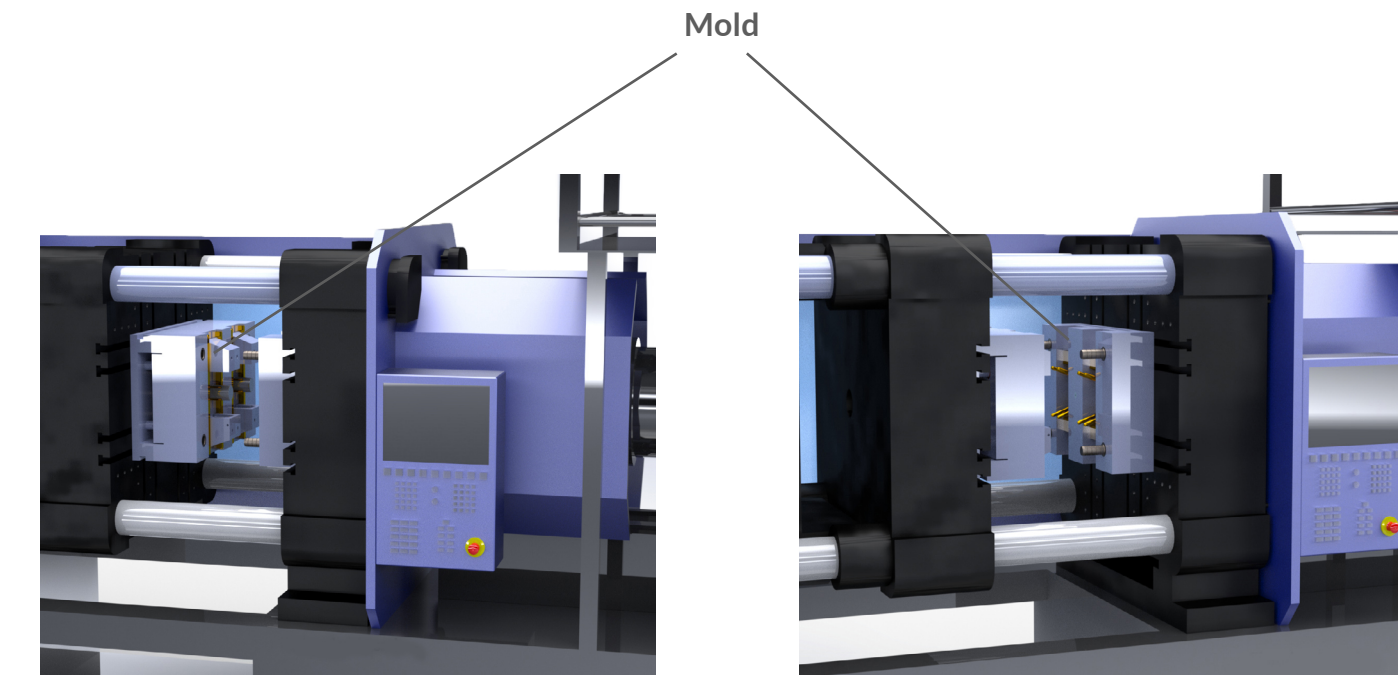
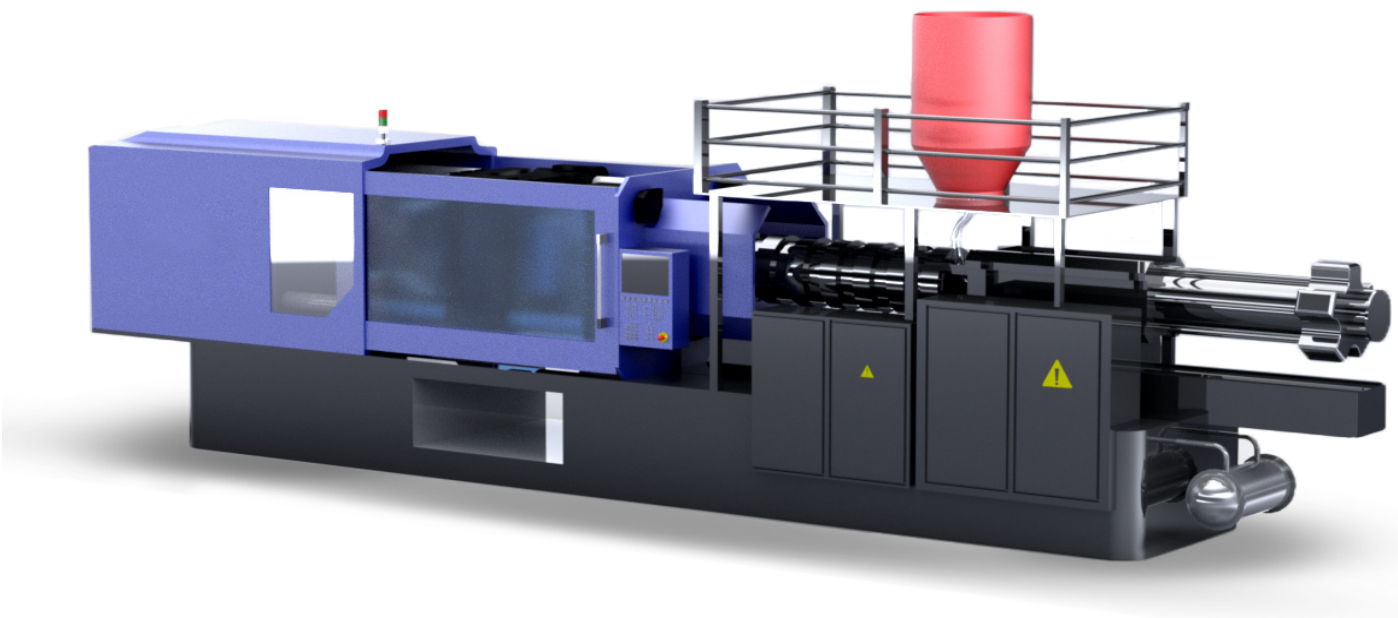


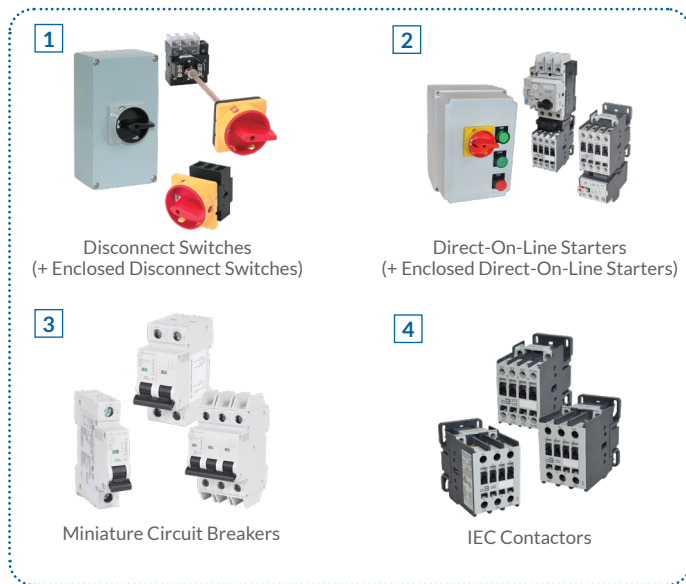
Image Source: GrabCAD

Products for Plastics Applications

c3controls has component and finished solutions for all key function areas in your plastics manufacturing application.

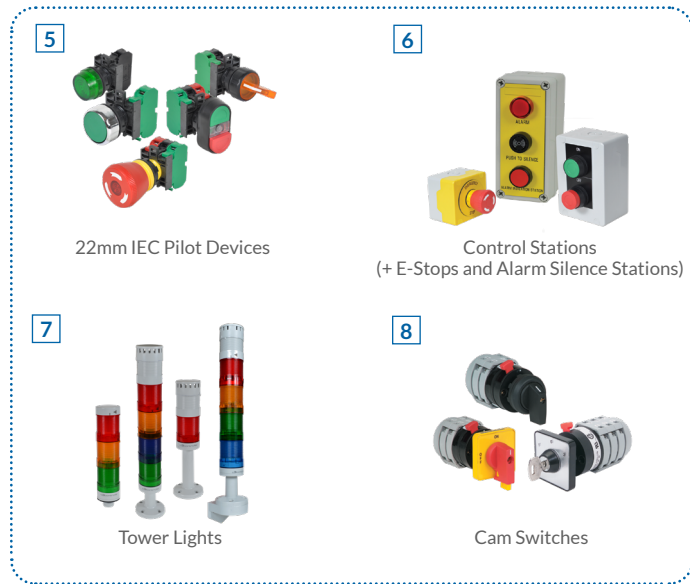
Power & Actuation

Disconnect, control, and/or protect a circuit from a ground fault, short-circuit, or overload current.



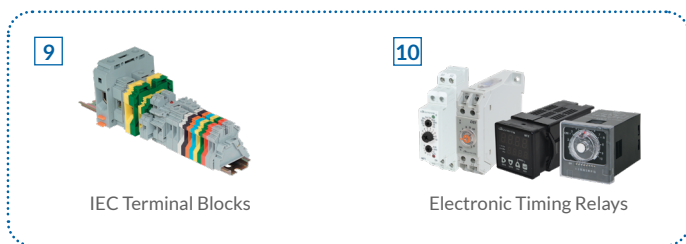
Human Machine Interface

Actuated by a person to direct the operation of another device and/or indicate the status of an operating system.



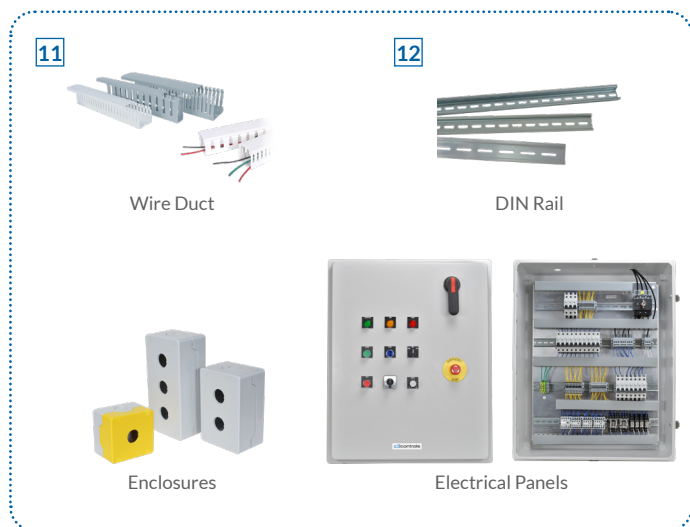
Control Logic

Devices that control other products in a control circuit in a logical sequence or based on a defined period of time.



Panel Solutions

Support and protect electrical components that control and monitor a number of mechanical processes.



1		UL 508 Disconnect Switches (+enclosed)	Door mount, panel-base mount, and panel mount with integral operator	Certified for use in Manual Motor Controller applications suitable as Motor Disconnects	16 - 125 Amps in 3, 4, and 5 pole configurations	Variety of operating handle styles and colors rated for Type 1, 2, 3, 3R, 4/4X, 12, and 13, IP55 and IP65	ABS plastic, polycarbonate, and carbon steel enclosures with Type 1, 4X, 12, 13 and IP65 ratings
2		Direct-On-Line Starters (+enclosed)	Open-style starters consist of either a Contactor & Overload Relay, or a Motor Protection Circuit Breaker & Contactor	Enclosed starters come pre-wired with a variety of pilot device options	Factory assemblies provide the convenience of a single catalog number and shorter control panel bill of material		
3		Miniature Circuit Breakers	UL 489 & UL 1077	1, 2 and 3 Pole combinations	10kA SCCR @ 480Y/277VAC	Current ratings up to 63 Amps	B, C and D curve ratings
4		IEC Contactors	9 to 105 Amps	100kA SCCR @ 480V and 600V with Class J fuses	AC and DC - electronic coil control on DC devices	Integral auxiliary	Up to 75 HP @ 400V (55kW @ 400V)
5		Pilot Devices	Modular range of 30mm, 22mm, 16mm, and 13mm	Type 1, 2, 3, 3R, 4/4X, 12, and 13	Non-Illuminated, Illuminated and Keyed Operators in both maintained and momentary operations	Color-coded, snap-on contact blocks with angled captive screws and pressure plates	Full voltage, multi-voltage, resistor, and dual input light units in a wide range of voltages up to 600VAC/VDC
6		Control Stations	Available as standard pre-configured assemblies of 30mm and 22mm pilot devices	Enclosure constructions in Polycarbonate, Polyester, and Die Cast Aluminum	Operator options in both non-illuminated and illuminated	Each assembly comes with laminated, laser engraved legend plates	Fully assembled and ready to use out of the box
7		Tower Lights	Stackable design for up to 5 modules in a single assembly	Mounting options in three styles: 50mm direct mount, 50mm panel-mount short base, and 50mm panel-mount tall base	Voltage options available in 24V AC/DC, 120V AC, and 240V AC	Three styles of illumination: continuous, flashing and rotary	Continuous or intermittent sound modules with 80dB or 100dB sound output
8		Cam Switches	Certified as Manual Motor Controllers per UL	Rated 10A to 32A up to 690V AC	Switch configurations in 45°, 60° & 90°, and up to 6 poles	A variety of operator types including key lock, lever, and lockable lever	Operators mount in a standard 22.5mm hole
9		IEC Terminal Blocks	Screw Clamp, Spring Clamp, and Miniature	5mm - 25mm widths	25 - 230 Amps	Feed Through, Ground, Multi-Conductor, Double & Triple Level, Fuse Holder, Power Distribution, and more	DIN Rail mounting; snap-on, snap-off assembly
10		Electronic Timing Relays	Compact design, sizes in 17.5mm, 22.5mm, and 45mm widths	Single, dual and multi-functions	Timing ranges from 0.01 seconds to 9,999 hours	DIN Rail, Panel, Socket, and enclosure door mountings	Voltage inputs 20-240 VAC and 12-240 VDC
11		Wire / Cable Duct	13 Selectable dimensions from 25mm wide up to 80mm, and up to 2m in length	Narrow and Wide Slot	Rigid "U" shaped duct with non-slip cover in gray or white	Optional adhesive backing	
12		DIN Rail	35mm rails in steel and aluminum	1m (3.28ft) or 2m (6.56ft) lengths	Each simply fasten by screws to the mounting surface	Standard package quantities, or pallet options available	

For illustration purposes only. Other solutions may be applicable depending on your application design requirements.

c3controls Product Portfolio

Our 15 million+ product configurations deliver durability and reliability—even in the most punishing environments—meeting and exceeding global standards for quality and safety.



DISCONNECT SWITCHES




ENCLOSED DISCONNECT SWITCHES



MINIATURE CIRCUIT BREAKERS



DEFINITE PURPOSE CONTACTORS



CONTACTORS



MINIATURE CONTACTORS & CONTROL RELAYS



OVERLOAD RELAYS



DIRECT-ON-LINE STARTERS
CONTACTOR + OVERLOAD RELAY



ENCLOSED DIRECT-ON-LINE STARTERS
CONTACTOR + OVERLOAD RELAY



MOTOR PROTECTION CIRCUIT BREAKERS



ENCLOSED MOTOR PROTECTION CIRCUIT BREAKERS



DIRECT-ON-LINE STARTERS
MOTOR PROTECTION CIRCUIT BREAKER + CONTACTOR



ENCLOSED DIRECT-ON-LINE STARTERS
MOTOR PROTECTION CIRCUIT BREAKER + CONTACTOR




30MM INDUSTRIAL PILOT DEVICES



30MM PILOT DEVICES FOR HAZARDOUS LOCATION




22MM IEC PILOT DEVICES



WORLD TOWER LIGHTS



CAM SWITCHES



22MM NEMA PILOT DEVICES



16MM PILOT LIGHTS



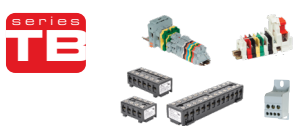
13MM PILOT LIGHTS




CONTROL STATION ENCLOSURES



ENCLOSED UL508A COMBINATION MOTOR STARTERS



TERMINAL BLOCKS



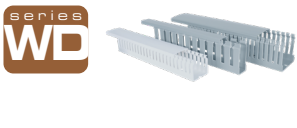
TERMINAL BLOCK RELAYS



ELECTRONIC TIMING RELAYS



GENERAL PURPOSE RELAYS



WIRING DUCT

White Papers

Product professionals AND subject experts!
Check out c3controls' extensive library of white papers:

What is Reverse Logistics? Hint: It's Probably Not What You Think

What is Reverse Logistics?

Everyone likes to reuse products and materials. So, what is reverse logistics and how does it help you do that? Get your questions answered, today!

[READ WHITEPAPER](#)

Cost Considerations for Industrial Automation

Cost Considerations for Industrial Automation

Automation is taking over, including the industrial world. If you're investing in industrial automation, here are some cost considerations.

[READ WHITEPAPER](#)

Material Handling Applications Overview

Material Handling - Applications Overview

As a process, material handling incorporates a wide range of manual, semi-automated and automated equipment and systems that support logistics and make the supply chain work. We have written a paper on the ABC's of a material handling conveyor system to help you understand or review the concepts behind this science. We hope you find it moving!

[READ WHITEPAPER](#)

Control Panel Industry Trends

Control Panel Industry Trends

Supply chain issues, workforce shortages, rising costs and new industry standards are pushing businesses to automate more of their processes. Increased automation means increased opportunities for control panel builders. It's a simple formula: More automation = more control panels = more business! Learn all about industry trends and areas of growth for panel builders.

[READ WHITEPAPER](#)

How to Size a Disconnect Switch for Your Project

How to Size a Disconnect Switch for Your Project

Is your project calling for a disconnect switch? Check out this guide to learn how to find the perfect fit disconnect switch for your needs.

[READ WHITEPAPER](#)

Selecting and Installing Machine Tower Lights

Selecting and Installing Machine Tower Lights

Tower lights are important when the status of a machine or process needs to be known. Learn about their functions, features, configurations, and more.

[READ WHITEPAPER](#)

10.



Innovation

Same-Day Shipping

Limited Lifetime Warranty

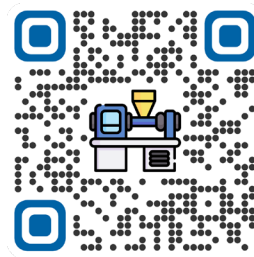
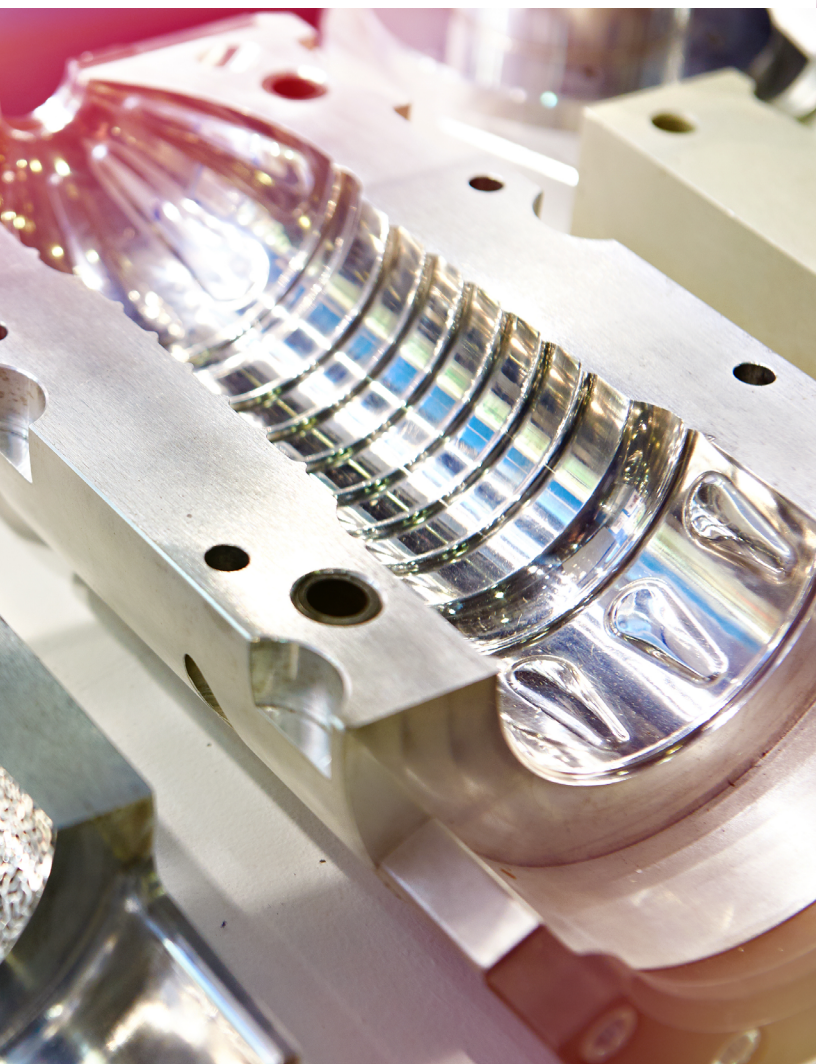
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Customer First



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