

Food & Beverage Processing

*The OEM and Installers Guide to Control
Components for Food & Beverage
Processing Equipment*



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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 Processing Terms

- Baking / Roasting:**
The process of heating food to change texture/flavor or preserve. Equipment includes ovens.

Blanching:
The process of using heated water or steam to improve item quality by reducing microorganisms/enzymes that cause spoilage. Equipment includes blanchers.

Cleaning:
The process of removing contaminants from raw materials. Equipment includes washers, sterilizers, and separators.

Dehydration:
The process of using heat to evaporate water from an item in order to increase shelf life. Equipment includes vacuums and dryers.

Food & Beverage Processing:
Transforming raw agricultural commodities into consumer-ready food & beverage products.

Food and Drug Administration (FDA):
Government agency responsible for protecting public health by regulating food and beverage products.

Frying:
The process of heating food directly in fat or oil in order to change texture and increase shelf life. Equipment includes fryers.

Heat Processing Equipment:
Equipment used to direct heat towards or away from a material which can result in physical and/or chemical changes. Operations include baking/roasting, blanching, dehydration, frying, pasteurization, and sterilization.

Homogenization:
The process of reducing particle size but increasing the consistency of an item. Equipment includes emulsifiers, homogenizers, mixers, and mills.

HVAC System:
System that provides heating, ventilation, and/or air conditioning to food and beverage processing plants.

Mechanical Processing Equipment:
Equipment used to change a material's physical form in any way. Operations include size reduction or enlargement, homogenization, and mixing.

Mixing:
The process of combining components to create a uniform mixture. Equipment includes mixers, tanks, and blenders.
- Packaging and Material Handling Equipment:**
Equipment designed to provide containment, protection, convenience, communication, and distribution. Examples include printers (for material creation), fillers (for filling), seamers (for sealing), checkweighers (for quality control), and conveyors (for distribution).

Pasteurization:
The process of placing an item under medium heat in order to inactivate most microorganisms/enzymes that cause spoilage. Best for products with a limited shelf life. Equipment includes pasteurizers and heat exchangers.

Peeling:
The process of removing undesirable material from a product. Equipment includes pressure vessels, blades, rollers, and conveyors.

Preparation Equipment:
Equipment that prepares materials for future processes. Operations include cleaning, sorting & grading, and peeling.

Preservation Equipment:
Equipment designed to prevent or limit spoilage and increase shelf life. Examples include smokers (chemical preservation), heat exchangers (heat processing preservation), accelerators (irradiation preservation), and chillers/freezers (refrigeration preservation).

Processing Plant:
A factory where raw materials are turned into goods for human consumption.

Size Reduction or Enlargement:
The process of reducing or enlarging the size of an item. Equipment includes mills and grinders (for reduction) and extruders and molders (for enlargement).

Sorting & Grading:
The process of sorting materials based on a measurable characteristic. Equipment includes processors, conveyors, and separators.

Sterilization:
The process of placing an item under high heat in order to inactivate all microorganisms/enzymes that cause spoilage. Best for products with a long shelf life. Equipment includes sterilizers and heat exchangers.

Overcoming Industry Challenges

For over 45 years, c3controls has been a leading manufacturer of quality electrical controls for food & beverage processing. Our experience serving the processing industry, one of the oldest and largest industries in the world, has provided a deep understanding of challenges and how to solve them. The post-pandemic food & beverage processing industry we see today presents a variety of hurdles such as:

- **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.
- **High regulations** that ensure that production practices, machines, and their components are up to code.
- **Health and safety demands** that cover everything from cleaning to HVAC systems.
- **Calls for energy efficiency** that demand innovation in processing, material handling, packaging, and more.

With these great challenges come great opportunities for the industry and your business. With the right parts, people, and processes, your food and/or beverage processing application can stand out from the rest.

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 your industrial control product needs.

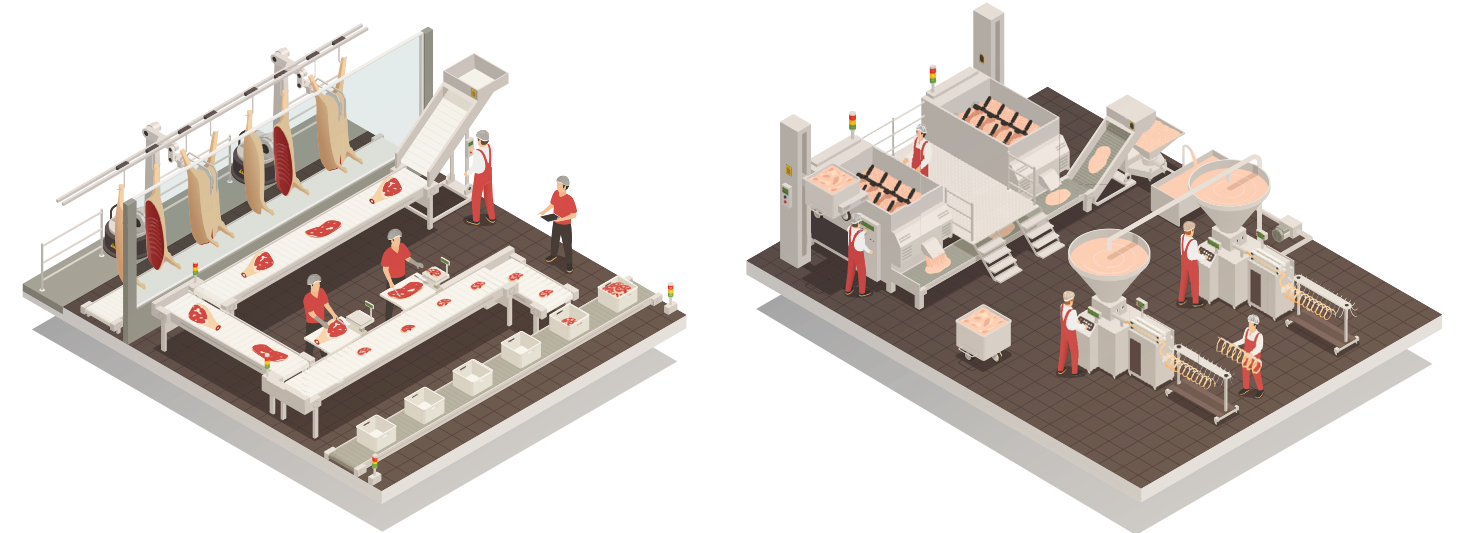
Vertical integration also allows us to guarantee top quality — all products are UL certified, CE marked, and backed with a limited lifetime warranty. Premium performance for the most demanding applications, without the premium price.

With over fifteen million available product configurations, and our own UL508A panel shop, c3controls has the resources you need to meet challenging regulations and demands while capitalizing on your food and/or beverage processing business opportunities!

Processing Isometrics

c3controls has electrical component solutions for meat, poultry, eggs, dairy, and all your food & beverage processing needs!

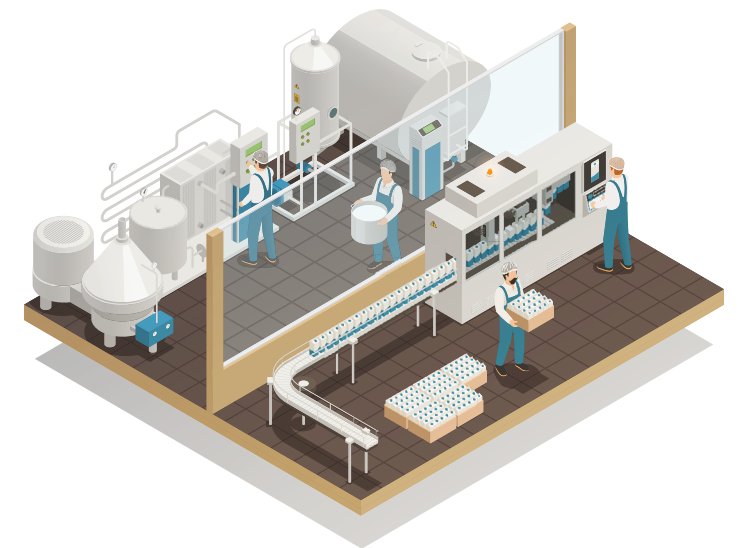
Meat



Eggs



Dairy




Products for Processing Applications

c3controls has component and finished solutions for all key function areas in your food and/or beverage processing application.

Power & Actuation


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

1




Disconnect Switches
(+ Enclosed Disconnect Switches)

2




Direct-On-Line Starters
(+ Enclosed Direct-On-Line Starters)

3



Miniature Circuit Breakers

4




IEC Contactors

Human Machine Interface


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

5




22mm IEC Pilot Devices

6




Control Stations
(+ E-Stops and Alarm Silence Stations)

7



Tower Lights

8

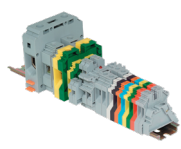


Cam Switches

Control Logic


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

9



IEC Terminal Blocks

10

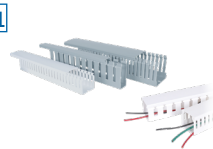


Electronic Timing Relays

Panel Solutions


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

11




Wire Duct


12











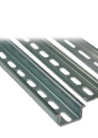
DIN Rail



Enclosures



Electrical Panels

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 @ 480V/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.

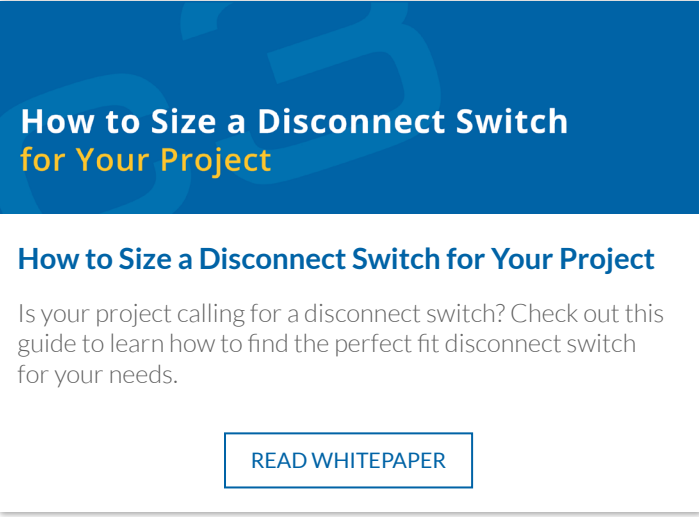

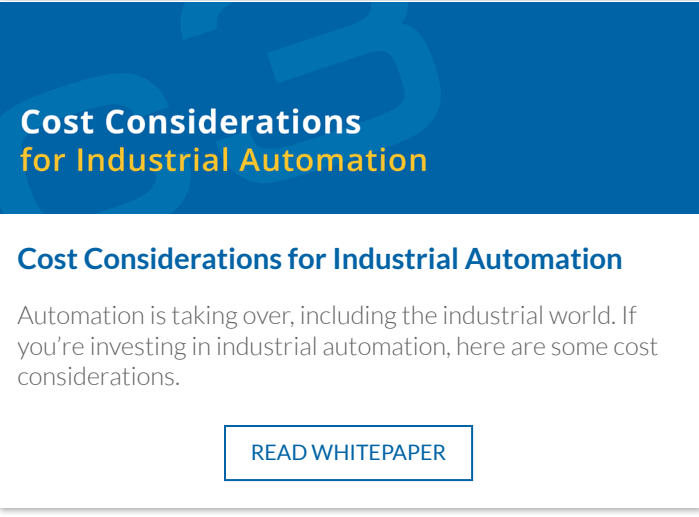



Product Portfolio

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

 <p>DISCONNECT SWITCHES</p>	 <p>ENCLOSED DISCONNECT SWITCHES</p>	 <p>MINIATURE CIRCUIT BREAKERS</p>	 <p>DEFINITE PURPOSE CONTACTORS</p>
 <p>CONTACTORS</p>	 <p>MINIATURE CONTACTORS & CONTROL RELAYS</p>	 <p>OVERLOAD RELAYS</p>	 <p>DIRECT-ON-LINE STARTERS CONTACTOR + OVERLOAD RELAY</p>
 <p>ENCLOSED DIRECT-ON-LINE STARTERS CONTACTOR + OVERLOAD RELAY</p>	 <p>MOTOR PROTECTION CIRCUIT BREAKERS</p>	 <p>ENCLOSED MOTOR PROTECTION CIRCUIT BREAKERS</p>	 <p>DIRECT-ON-LINE STARTERS MOTOR PROTECTION CIRCUIT BREAKER + CONTACTOR</p>
 <p>ENCLOSED DIRECT-ON-LINE STARTERS MOTOR PROTECTION CIRCUIT BREAKER + CONTACTOR</p>	 <p>30MM INDUSTRIAL PILOT DEVICES</p>	 <p>30MM PILOT DEVICES FOR HAZARDOUS LOCATION</p>	 <p>22MM IEC PILOT DEVICES</p>
 <p>WORLD TOWER LIGHTS</p>	 <p>CAM SWITCHES</p>	 <p>22MM NEMA PILOT DEVICES</p>	 <p>16MM PILOT LIGHTS</p>
 <p>13MM PILOT LIGHTS</p>	 <p>CONTROL STATION ENCLOSURES</p>	 <p>ENCLOSED UL508A COMBINATION MOTOR STARTERS</p>	 <p>TERMINAL BLOCKS</p>
 <p>TERMINAL BLOCK RELAYS</p>	 <p>ELECTRONIC TIMING RELAYS</p>	 <p>GENERAL PURPOSE RELAYS</p>	 <p>WIRING DUCT</p>

White Papers

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

 <p>How to Size a Disconnect Switch for Your Project</p> <p>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.</p> <p>READ WHITEPAPER</p>	 <p>Selecting and Installing Machine Tower Lights</p> <p>Tower lights are important when the status of a machine or process needs to be known. Learn about their functions, features, configurations, and more.</p> <p>READ WHITEPAPER</p>
 <p>Cost Considerations for Industrial Automation</p> <p>Automation is taking over, including the industrial world. If you're investing in industrial automation, here are some cost considerations.</p> <p>READ WHITEPAPER</p>	 <p>Understanding UL Standards for Industrial Electrical Controls</p> <p>Searching for information about UL standards? Our complete guide will inform you of everything you need to know.</p> <p>READ WHITEPAPER</p>
 <p>Material Handling Applications Overview</p> <p>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!</p> <p>READ WHITEPAPER</p>	 <p>Consumer Packaged Goods Industry New Robotic Advancements</p> <p>Trends in Consumer Packaged Goods Industry</p> <p>The Consumer Packaged Goods Industry has always had to deal with the issue of people in close proximity to, or being involved in the packaging process. One impact of COVID-19 has been further automating packaging processes to mitigate the issues. Read our latest paper to find out how automation and robotics will keep things moving.</p> <p>READ WHITEPAPER</p>

10.




Innovation

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