Commercial Cooking

The OEM and Installers Guide to Control Components for Kitchen Equipment

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Everything under control.

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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 36-month 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 Terms

Auxiliary Equipment:
Equipment not directly involved in the cooking process that improves commercial kitchen performance. Examples include beverage dispensers, ice makers, and dishwashers.

Beverage Dispenser:
Machines with nozzles and controls used to dispense beverages at a desired temperature. Types include coffee, soda, and beer dispensers.

Commercial Cooking:
Using specialized equipment in a professional kitchen to produce and serve food to others at scale. Equipment can include ovens, fryers, grills/griddles, roasters, and smokers.

Commercial Kitchen:
A facility in a public location, such as a restaurant, with heavy-duty appliances in which food is prepared for sale at scale.

Department of Health:
Government agency at the city or state level that is responsible for inspecting and approving commercial kitchens.

Dishwasher:
An appliance used to clean and sanitize large volumes of kitchen equipment. More effective and efficient than sink washing stations.

Electric Doors:
Automated or motorized doors designed to open and close electronically for kitchen safety and convenience.

Floor Cleaning Equipment:
Machines such as scrubbers, sweepers, and vacuums that are used to clean and maintain kitchen floors.

Food Preparation:
Actions taken to turn raw ingredients into a form that can be consumed safely. Equipment can include mixers, slicers, and food processors.

Food Processor:
A motor-driven device used to quickly and efficiently chop, shred, grind, and/or blend ingredients to aid in food preparation.

Food Storage:
Keeping cooked and/or raw materials in appropriate conditions for future use. Equipment can include refrigerators and freezers.

Freezer:
An appliance, or a walk-in unit, that dispels heat to keep cooking ingredients within a space frozen for quality, safety, and longevity.

Fryer:
An appliance which holds and heats oil. Food is placed in a basket and submerged into the oil for fry cooking.

Grill / Griddle:
An appliance with a grate that allows food to cook over a heat source. Griddles replace grates with a smooth, flat surface.

HVAC System:
System that provides heating, ventilation, and/or air conditioning to a commercial kitchen.

Ice Maker:
An appliance that produces and stores large quantities of ice as water is pumped in and its heat is absorbed to form ice in a mold.

Mixer:
A device that uses a gear mechanism to quickly combine wet and/or dry ingredients into a desired consistency.

NFPA 96:
The National Fire Protection Agency (NFPA) standard for ventilation control and fire protection in commercial cooking operations.

Occupational Safety and Health Administration (OSHA):
Government agency that provides regulations that promote safety around commercial kitchen equipment.

Oven:
An appliance used for baking, heating, or drying food in a chamber. Types include commercial, convection, combination, and conveyor ovens.

Packaging & Material Handling Equipment:
Equipment designed to provide containment, protection, convenience, communication, and distribution. Equipment can include vacuum sealers and conveyors.

Refrigerator:
An appliance, or walk-in cooler, that dispels heat from a space in order to keep cooking ingredients cool for quality and safety.

Slicer:
A device with a rotating blade that is used to create uniform slices of various types of food.

UL 197:
The Underwriters Laboratories (UL) standard for safety commercial electric cooking appliances rated 600V or less.

Industry Outlook

For more than 50 years, c3controls has been a leading manufacturer of quality electrical controls for commercial cooking equipment. Our experience serving this large and demanding industry has given us a deep understanding of the challenges commercial cooking equipment manufacturers face and the control solutions needed to address them. Today's commercial cooking industry must support evolving dining, takeout, and delivery models while meeting increasingly demanding requirements such as:

- **Supply chain issues** that bring long lead times for critical system components and subsequent delays.
- **Workforce shortages** that limit productivity and increase the need for automation.
- **High regulations** that ensure that processes, machines, and their components are up to code.
- **Health and safety demands** that cover everything from food to cleaning and HVAC systems.
- **Calls for energy efficiency** that demand innovation in the form of flexible, multi-purpose equipment.

With these challenges come opportunities for commercial cooking equipment manufacturers to improve efficiency, reliability, and performance. As the industry continues to evolve, having the right products, people, and processes can help your application adapt to changing requirements, incorporate new technologies, and meet the expectations of today's commercial kitchens.

c3controls can help you succeed. Our vertically integrated approach allows us to operate efficiently, respond quickly to changing market conditions, and provide reliable electrical control products with fast delivery. Our solutions support a wide range of commercial cooking applications, including:

- **Food Storage**
- **Food Preparation**
- **Cooking**
- **Cleaning**
- **& more!**

With over seventeen million product configurations from c3controls and custom UL 508A-certified panel solutions from Covenant Panelworks (CPW), you have a trusted source for complete electrical control solutions. Contact us today and discover how our expertise can help you meet demanding regulations and requirements while improving the reliability, efficiency, and performance of your commercial cooking equipment.

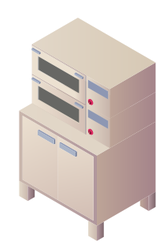
Kitchen Isometrics

Here is an example of a commercial kitchen layout and some common appliances:

Commercial Kitchen

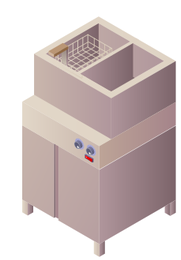
Appliances

Oven



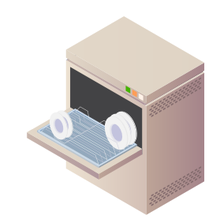
Grill

Fryer



Freezer

Dishwasher



Products for Cooking Applications

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

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

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

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)

Pilot Devices

- Modular range of 30mm, 22mm, 16mm & 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

Control Stations (+ E-Stops and Alarm Silence 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

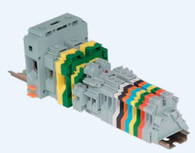
Tower Lights

- 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

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

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

General Purpose Relays

- Octal Base with pin terminals and Square Base with blade-style terminals
- Various pole combinations and coil voltages
- Color-coded push buttons for distinguishing AC and DC
- Built-in retainer clips in relay sockets
- Marking plates on relays and sockets

Industrial Power Supplies

- Designed to deliver the power with up to 93% efficiency
- Adjustable voltage options in 12, 24 and 48V
- Output power range from 60W to 480W
- DC OK relay contacts are standard on 240W and 480W
- Compact design - 43mm wide, up to 60mm

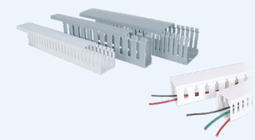
Control Circuit Transformers

- Ratings from 20 to 300VA
- Operating voltages from 120V to 480V on primary side, and 24V on secondary side
- Over-current protection options; inherent or non-inherent, or manual resettable circuit breaker
- Integrated grounding system and space-saving footprint
- Versatile for Class 2, Class 3, and general purpose applications

Control Power Transformers

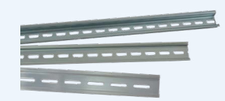
- Open-type control transformers ranging from 50 to 5000VA
- Integrated terminal blocks and a finger-safe terminal guard, with IP20 protection on primary and secondary sides
- Each transformer variant features a Class H insulation system
- Capable of handling dynamic loads effectively, suitable for applications with fluctuating power demands
- Ability to provide multiple voltage outputs from a single unit

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

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

c3controls Product Portfolio

Our 17 million+ product configurations deliver durability and reliability—even in the most punishing environments—meeting and exceeding global standards for quality and safety.

- series DS — DISCONNECT SWITCHES NON-FUSED & ENCLOSED
- series 1100 series 1110 — MINIATURE CIRCUIT BREAKERS
- series 300 non-reversing series 310 reversing — CONTACTORS & CONTROL RELAYS
- series 320 — OVERLOAD RELAYS
- series 620 — DIRECT-ON-LINE STARTERS CONTACTOR + OVERLOAD RELAY
- series E620 — ENCLOSED DIRECT-ON-LINE STARTERS CONTACTOR + OVERLOAD RELAY
- series 330 series E330 — MOTOR PROTECTION CIRCUIT BREAKERS OPEN & ENCLOSED
- series 630 — DIRECT-ON-LINE STARTERS MOTOR PROTECTION CIRCUIT BREAKER + CONTACTOR
- series E630 — ENCLOSED DIRECT-ON-LINE STARTERS MOTOR PROTECTION CIRCUIT BREAKER + CONTACTOR
- series 30 industrial series 30 hazardous — 30MM PILOT DEVICES FOR INDUSTRIAL & HAZARDOUS LOCATION
- series 22 iec series 22 nema — 22MM PILOT DEVICES IEC & NEMA
- series WTL — WORLD TOWER LIGHTS
- series CS — CAM SWITCHES
- series 16 — 16MM PILOT LIGHTS
- series 13 — 13MM PILOT LIGHTS
- series EC — CONTROL STATION ENCLOSURES
- series ECP 300 — ENCLOSED UL508A COMBINATION MOTOR STARTERS
- series EPS — ENCLOSED POWER SUPPLIES
- series ECP BP — VFD BYPASS PANELS
- series IPS — INDUSTRIAL POWER SUPPLIES
- series CCT — CONTROL CIRCUIT TRANSFORMERS
- series CPT — CONTROL POWER TRANSFORMERS
- series TB — TERMINAL BLOCKS
- series TBR — TERMINAL BLOCK RELAYS
- series ETR — ELECTRONIC TIMING RELAYS
- series 200 series 210 — GENERAL PURPOSE RELAYS
- series WD — WIRING DUCT
- series DIN — DIN RAIL

White Papers

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

What is UL Certification?
The Difference Between UL Recognized and UL Listed

What is UL Certification? The Difference Between UL Recognized and UL Listed

Learn why and when your products need to meet UL and the difference between UL recognized vs UL Listed.

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

Pilot Devices for Indication and Actuation:
Pilot Devices Indicator Lights

Industrial Control Basics 4: Pilot Devices for Indication and Actuation

While pilot devices are seemingly quite simple control, there is more to them than the Merriam Webster definition. They have their own terminologies, color coding, functions and standards. Click to find out more.

READ WHITEPAPER

PANEL ESSENTIALS SERIES 5:
Control Panel Industry Trends

Panel Essentials Series 5: Control Panel Industry Trends

Supply chain issues, workforce shortages, rising costs and new industry standards are pushing businesses to automate more of their processes. Learn all about industry trends and areas of growth for panel builders in this edition of Panel Essentials.

READ WHITEPAPER

Commercial HVAC Industry
New Trends in Technology

Commercial HVAC Industry - New Trends in Technology

HVAC has evolved and grown over the past 120 years and there are numerous facets of developing technology still emerging. In this paper, we touch on how Smart Systems, Smart Sensors, and Internet of Things (IoT) are changing many aspects of how the industry will conduct business today. Click to learn about some of these advancements.

READ WHITEPAPER

Commercial Boiler Industry
New Trends in Technology

Commercial Boiler Industry - New Trends in Technology

Boilers are perhaps the largest unseen, unknown and therefore, underappreciated part of the lives of nearly everyone on the planet. Besides the boiler that sometimes stopped working in elementary school, few people appreciate their importance. Check out our paper to find out what trends are emerging in boilers and boiler control.

READ WHITEPAPER

Why choose c3controls

Integrated Manufacturing

Vertical integration is the cornerstone of c3controls as it places innovation, development, design, manufacturing, testing, and shipping all within our control. With Everything Under Control, we can ensure the highest quality and customer satisfaction.

Innovation

Product innovation is in our DNA. We approach our products as solutions. Unlike our competition, our business model allows us to provide customers with premium controls without the premium price.

Same-Day Shipping

Reduce inventory. Improve cash-flow. Save money. Our customers enjoy peace of mind knowing they'll get what they need, when they need it. Our promise, guaranteed!

36-Month Warranty

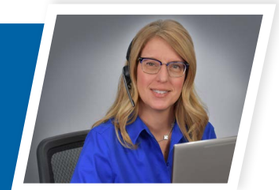
With total control over engineering and manufacturing, we are able to guarantee the highest quality products on the market—products free of defects in material, workmanship, and design.

Advantage Pricing

Total control means lower overhead and direct sales. For our customers, this translates to savings of up to 40+% on c3controls premium products.

Customer First

Commitment to the success of our customers is a core value and the driving force behind all we do. We promise concierge style service that makes doing business easy, personalized, and responsive.



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