

MOTOR CONTROL CENTERS



F2100 PRODUCT OVERVIEW



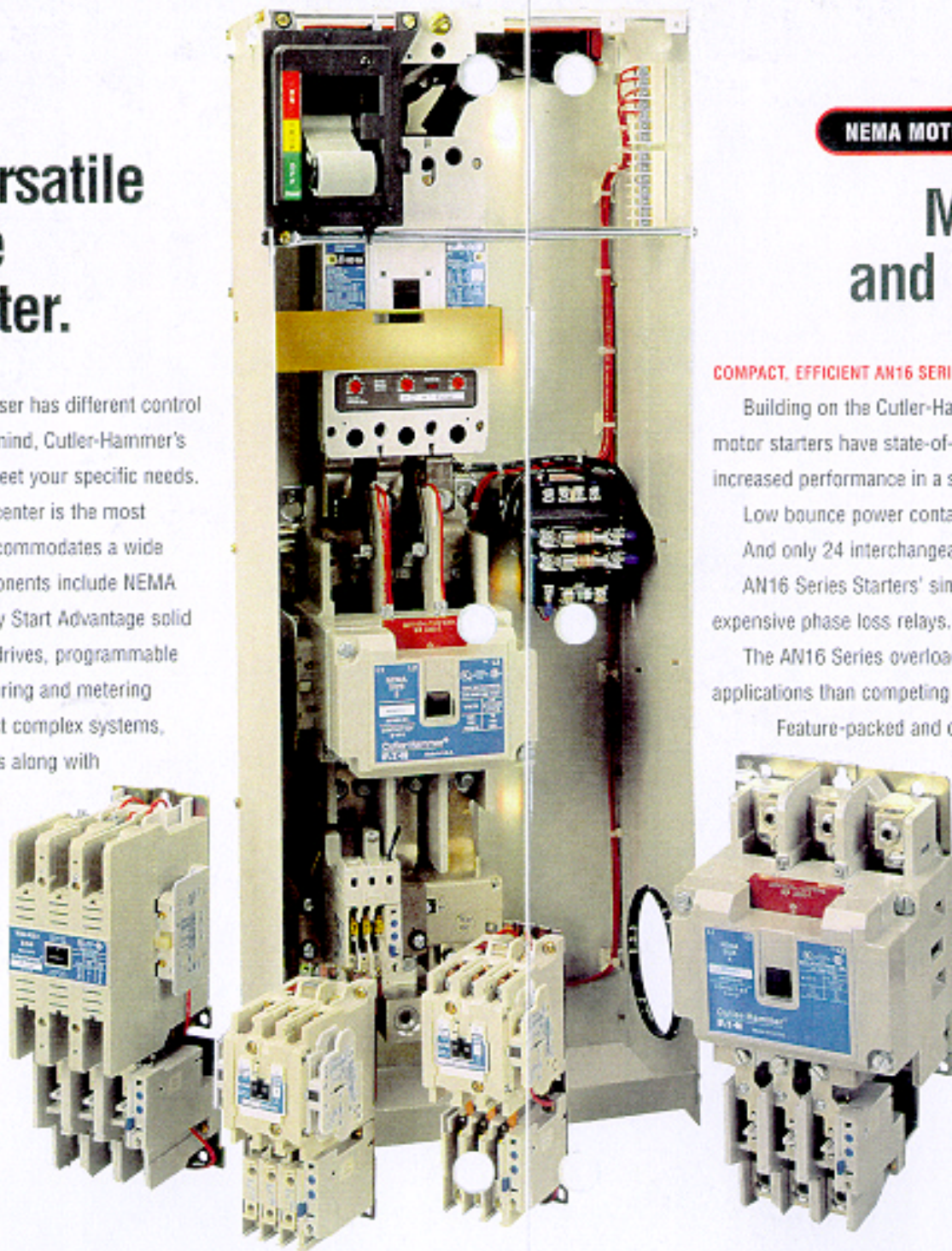
Cutler-Hammer

EATON

F2100 MOTOR CONTROL CENTERS

The World's Most Versatile Industrial Grade Motor Control Center.

No two motor control centers are alike. Every user has different control and power distribution requirements. With this in mind, Cutler-Hammer's F2100 motor control center is uniquely suited to meet your specific needs. The rugged, industrial grade F2100 motor control center is the most space-efficient and flexible design available and accommodates a wide range of state-of-the-art components. These components include NEMA motor starters, Cutler-Hammer's breakthrough Easy Start Advantage solid state starter, AF93 and AF95 adjustable frequency drives, programmable logic controllers and the IQ family of power monitoring and metering devices. From fundamental applications to the most complex systems, F2100 users can integrate these newer components along with conventional products such as lighting contactors, transfer switches, panelboards, transformers and surge suppression systems. To meet your urgent delivery needs, Cutler-Hammer's regional service centers can supply F2100 motor control centers that contain these same state-of-the-art control components. Cutler-Hammer service centers can also provide replacement MCC units and spare parts with stock to five-day delivery. For long lasting service in every application, specify F2100 Motor Control Centers.



NEMA MOTOR STARTERS

Maximum Performance and Reliability.

COMPACT, EFFICIENT AN16 SERIES STARTERS.

Building on the Cutler-Hammer tradition as an innovator in motor control, AN16 Series NEMA motor starters have state-of-the-art features and materials that insure greater flexibility and increased performance in a size efficient package.

Low bounce power contacts provide longer life, and cooler operation.

And only 24 interchangeable heater packs are required for applications up to 400 HP at 480V.

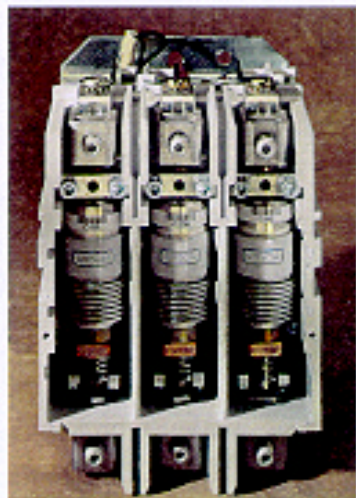
AN16 Series Starters' single-phase technology provides maximum motor protection without expensive phase loss relays.

The AN16 Series overload relay with +/-24% adjustable trip range can fill a wider range of motor applications than competing starters.

Feature-packed and compact, the AN16 Series represents the very best in NEMA starters.

INDUSTRY LEADING VACUUM STARTERS FOR SEVERE DUTY NEEDS.

Cutler-Hammer V200 Series contactors and motor starters are perfectly matched to F2100 motor control centers because of their small size, long service life and low maintenance requirements.



Plug-in Flexibility and Space Savings.



AF95

AF93

ADVANCED TECHNOLOGY — AF 90 SERIES DRIVES.

Cutler-Hammer's AF90 Series adjustable frequency drives installed in standard 20 inch wide MCC structures provide the highest density packaging in the industry. For motors from one to 200 horsepower, the AF93 and AF95 family of adjustable frequency drives contain many features in a small package. Insulated Gate Bipolar Transistors (IGBTs) provide high-performance, silent and efficient motor operation, tight speed regulation and high starting torque.

THE EASY-TO-USE AF 95 KEYPAD.

Configuration and status monitoring are simplified on AF 90 Series drives using the logically arranged keys and a large easy-to-read display.



Supporting a Wide Variety of Applications.

POWERFUL, FLEXIBLE, SOLID STATE STARTERS.

When motor starting applications require soft starting or reduced motor inrush, Cutler-Hammer offers three solid state reduced voltage starter models. These solid state starters provide longer motor life and reduced damage to driven equipment. Completely self-contained, they are all engineered for installation into standard F2100 Motor Control Centers.

THE COMPACT EA.

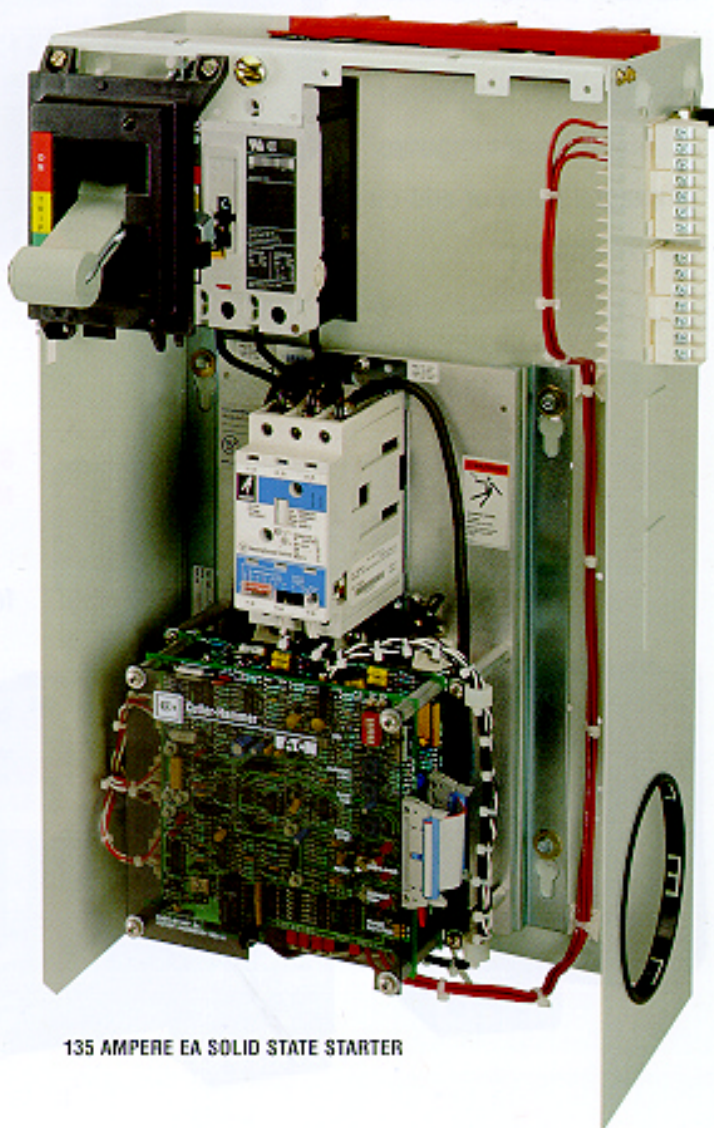
Available in current ranges from 45 to 750 amperes, the EA is the smallest solid state reduced voltage starter in the industry. This results in significantly reduced MCC unit size and makes NEMA 12 and 3R construction possible.

The EA uses SCRs to provide smooth, stepless, acceleration for NEMA three-phase induction motors.

Once the motor reaches full speed, a bypass contactor is automatically energized in parallel to the SCRs to handle the motor's continuous duty requirements. Since the SCRs are conducting current for only a short period of time, heat dissipation is minimized, making bulky heat sinks unnecessary and resulting in a compact design.

HIGH PERFORMANCE EJ AND ES SOLID STATE STARTERS.

For other applications that benefit from solid state starting from a continuous duty SCR controller, the EJ and ES models, ranging from 5 to 600 horsepower are also available in the F2100 MCC.



135 AMPERE EA SOLID STATE STARTER

The Most Advanced Circuit Protection

SPACE SAVING SERIES C MOTOR CIRCUIT PROTECTOR.

The Cutler-Hammer Series C HMCP Motor Circuit Protector is standard in all F2100 MCC combination starters and has a 65,000 amperes interrupting rating. Optional 100,000 amperes interrupting ratings are available without increasing unit size. This valuable space savings is achieved without the extra expense of integral fuses or add-on current limiters.



SERIES C MOLDED CASE CIRCUIT BREAKERS. MAXIMUM PERFORMANCE, MINIMUM SPACE.

Series C circuit breakers applied as main or branch feeder units are available with thermal magnetic or electronic trip devices.

65,000 amperes interrupting capacity is standard, with 100,000 amperes interrupting available as an option. From the HFD 150 ampere frame to the RD 2500 ampere frame, Series C circuit breakers provide maximum cable entrance space while minimizing enclosure space.



**SPB INSULATED CASE POWER CIRCUIT BREAKERS —
ULTIMATE SYSTEM COORDINATION.**

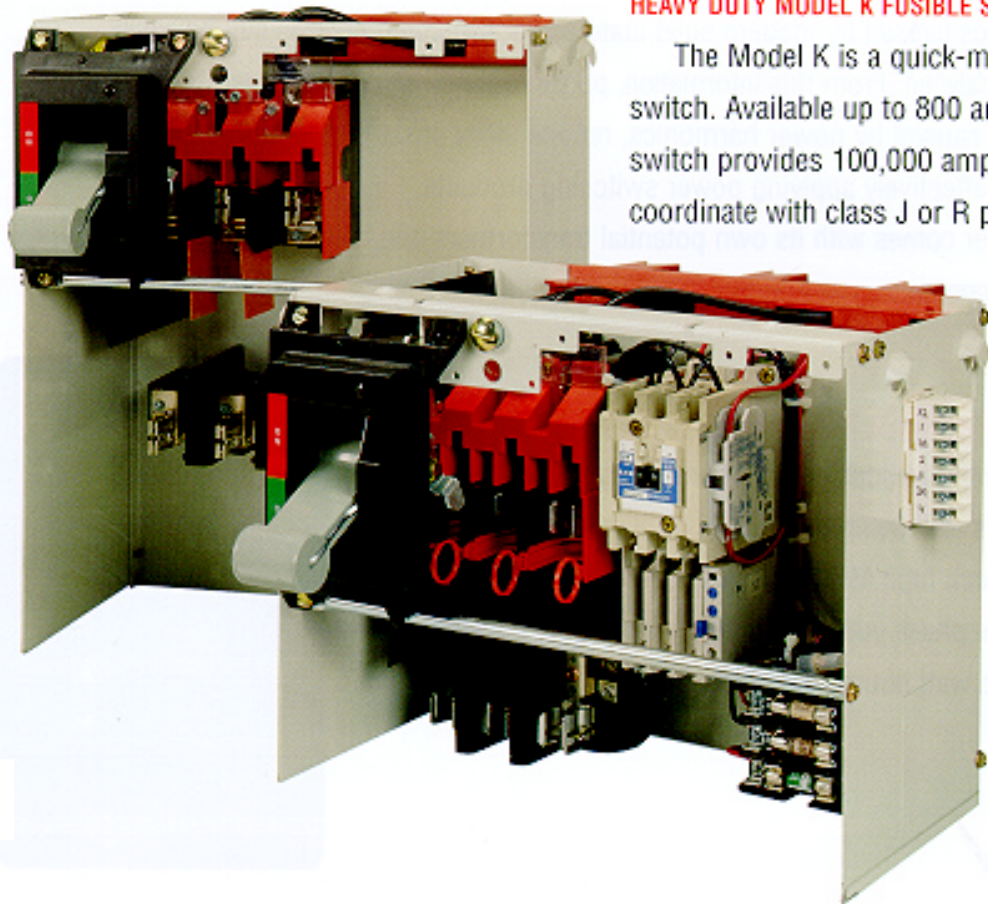
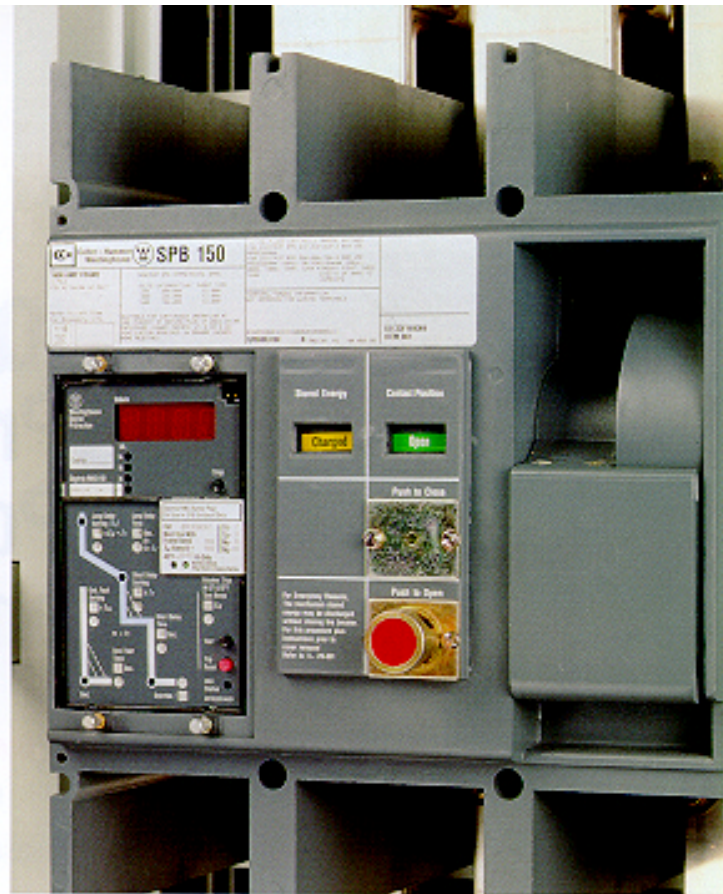
Used as a main circuit breaker, the Cutler-Hammer SPB insulated case power circuit breaker has the

Devices in the Industry.

highest degree of system coordination and 100,000 amperes interrupting capacity.

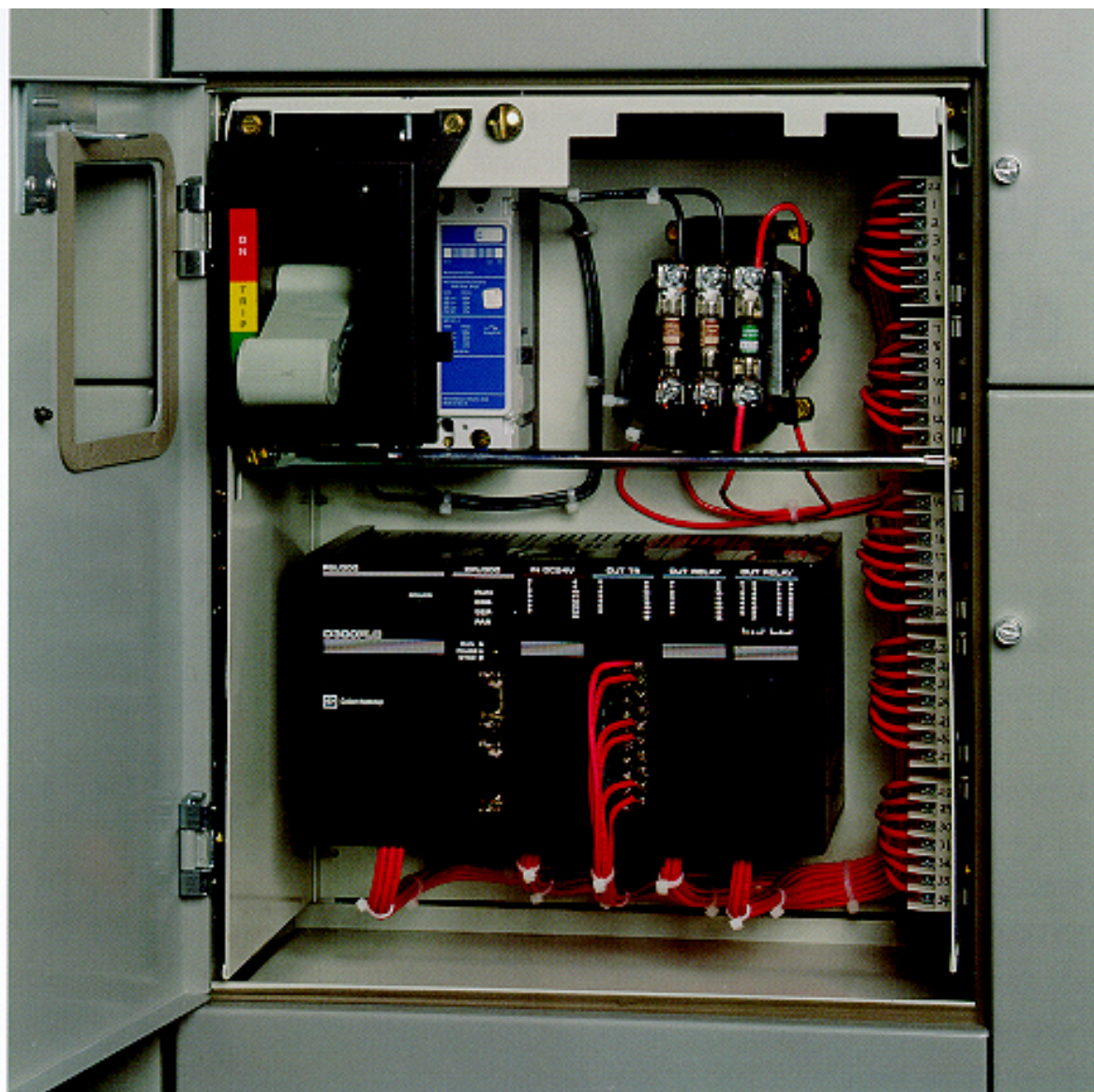
Supplied as standard with Cutler-Hammer's RMS 510 solid state trip units, SPB breakers provide the benefits of short circuit coordination and an optional electrical charging mechanism.

The SPB can be furnished in either fixed mounted or draw out designs from 800 to 2500 amperes.



HEAVY DUTY MODEL K FUSIBLE SWITCH.

The Model K is a quick-make, quick-break visible blade switch. Available up to 800 ampere ratings, the Model K switch provides 100,000 amperes withstand rating and will coordinate with class J or R power fuses. All current carrying parts are tin-plated copper. All parts of the switch are fully accessible and easily replaceable. Changing fuses is made simple with an integral fuse puller.



PROGRAMMABLE LOGIC CONTROL

Reduce Field Wiring Costs.

STATE-OF-THE-ART D300 PROGRAMMABLE LOGIC CONTROLLER.

Complete factory wiring of PLCs to motor starters saves time and labor costs in the field. The D300 programmable logic controller can be installed in an MCC plug-in unit only 18 inches high. Expandable to 544 I/O, the D300 offers RAM and PROM memory, ladder logic language, fast scan time and a large instruction set. Data transfer, data conversions and enhanced self-diagnostics are included as standard. The D300's compact size affords a cost-effective alternative to discrete relaying and timing devices.

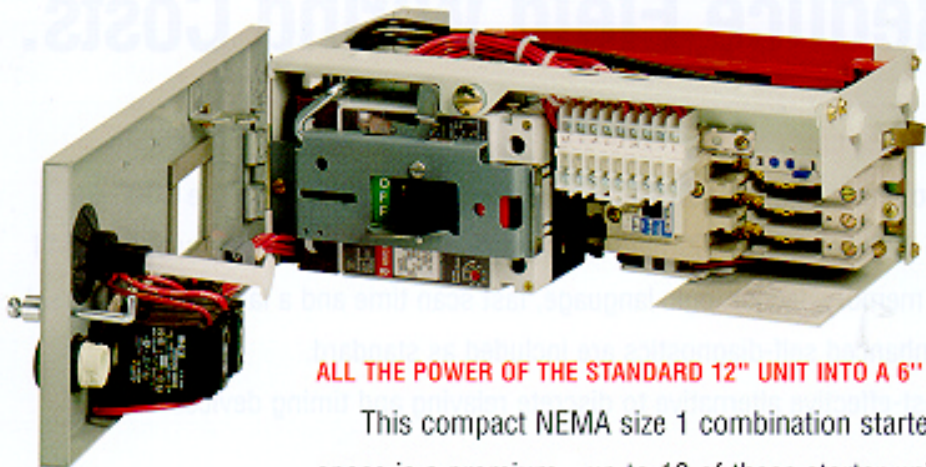
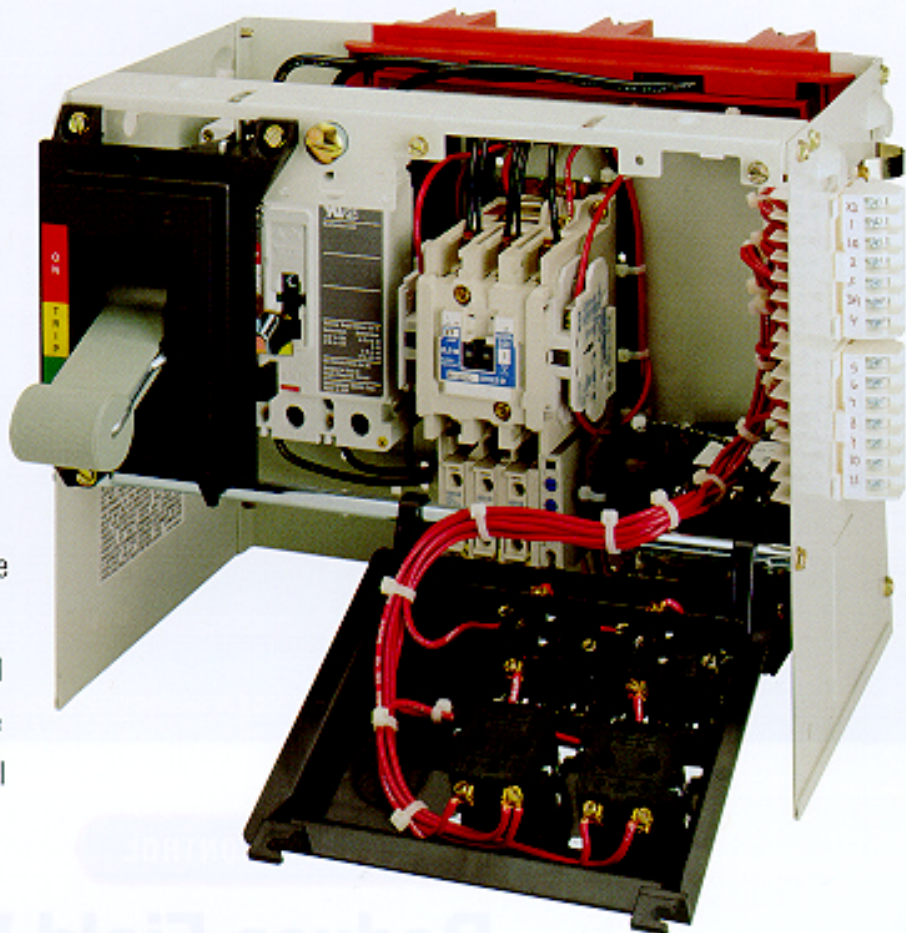
PLUG-IN UNITS

The Widest Variety of Plug-in Starter Units.

F2100 UNITS CONFIGURE TO MEET YOUR UNIQUE APPLICATIONS.

To provide for all motor control application needs, the F2100 motor control center is available with the widest selection of combination starter types.

These include full voltage reversing or non-reversing, two speed one or two winding, auto-transformer, part winding or wye delta reduced voltage starter types. These starter units can be engineered with a variety of terminal blocks, wire types, wire lugs, wiremarkers, control and timing relays.



ALL THE POWER OF THE STANDARD 12" UNIT INTO A 6" PACKAGE.

This compact NEMA size 1 combination starter is designed for use where floor space is a premium—up to 12 of these starter units can be stacked in one MCC structure. Circuit breaker feeder units are also available in this compact design.

Durable and Reliable Features of the F2100.



HEAVY-DUTY T-LINE PILOT DEVICES AND DEVICE PANEL.

The F2100 uses rugged and reliable Cutler-Hammer 10250T pilot devices mounted on an insulated, heavy-duty panel. For ease of maintenance when the door of the unit is open, this panel can swing down allowing increased accessibility to the unit interior and pilot device terminals.

POSITIVE-LATCHING, SIDE-MOUNTED, PULL-APART TERMINAL BLOCKS.

The MCC unit terminal block assures easy unit removal and permanent circuit continuity. To aid installation and wiring, the terminal marking strips for both sides of the block are fully visible from the front of the unit. The 600V terminal block is rated 30 amperes and will accept up to #12 gauge stripped wire.



EASY-TO-READ DISCONNECT HANDLE.

The rugged handle mechanism features a highly visible position indicator that's easy to read, even from a distance. Bright color coded indicators for ON, OFF, TRIPPED and RESET positions clearly show the status of the disconnect device.

SECURE DOOR LATCHES.

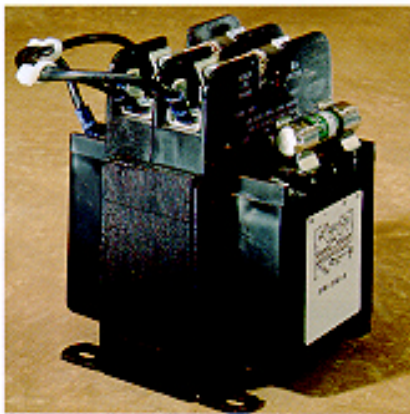
Heavy-duty quarter turn latches provide positive door closure and latch position indication.



RELIABLE AND COMPACT CONTROL POWER TRANSFORMERS.

Integrally fused control power transformers allow easy access and reduced panel space.

The encapsulated design provides a higher degree of protection and reliability.



VERSATILE, FLEXIBLE FRAME DESIGN.

A versatile frame design permits unsurpassed flexibility in component and structure configuration. Just 20 inches wide and 90 inches high, each structure has 72 inches of unit mounting space in six-inch increments. Structures are 16 or 21 inches deep front-mount and only 21 inches deep for back-to-back mounted units.

65KA IS STANDARD.

The F2100 bus system has a standard short circuit withstand rating of 65,000 amperes. For larger distribution systems, this robust bus design can be optionally braced to withstand 100KA. The horizontal bus, located at the top, is mounted edge-to-edge and is available in ratings from 600 amperes up to 2500 amperes.

STRUCTURAL INTEGRITY

The fully-rated vertical bus is available from 300 to 1200 amperes, providing clean designs for power cable entry. This feature translates directly into less floor space and reduced installation costs.

Rugged Structure Means Long Service.

FIELD-PROVEN, TESTED-TOUGH.

A strong, durable frame construction makes the F2100 the strongest motor control center enclosure available. This ruggedness establishes the F2100 as the design of choice for mission critical applications such as pulp and paper mills, petrochemical plants as well as nuclear power facilities. Its design integrity qualifies it for UBC seismic Zone 4 and CBC without modifications.

UNIQUE ANGULAR BUS CONFIGURATION.

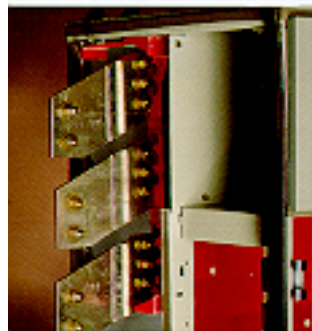
The F2100's angular bus configuration provides independent mechanical strength to withstand fault stresses. Consequently, bus bracing at 65,000 RMS symmetrical amperes is standard. An insulated barrier isolates the vertical bus from the unit compartments.

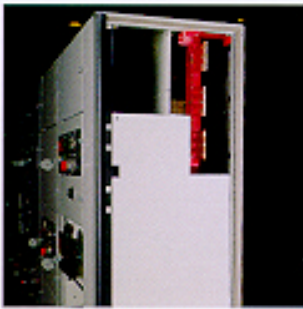
LABYRINTH BUS BARRIER PREVENTS FAULT PROPAGATION.

An optional molded barrier forms a labyrinth around the vertical bus bars to prevent fault propagation and affords complete bus bar insulation and isolation. Unit shutters automatically cover vertical bus bar openings when a unit is removed, adding an extra measure of safety.

SPACE SAVING BUS SPLICE KITS.

Bus bar splice kits are available to link F2100 MCCs to the following Westinghouse and Cutler-Hammer Motor Control Centers: Series 2100/Five Star, Advantage, Freedom Unitrol and F10 Unitrol. Since no bus transition sections are needed, floor space is saved.





OPTIONAL STRUCTURE BARRIERS.

Plug-in unit isolation and singularly strong frame design make isolation barriers unnecessary. Optional, full-length, steel structure barriers are available if specified.



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M. MEXICO
M. MORELOS

Regional Service Centers.

Eight Service Centers strategically located throughout the country enable Cutler-Hammer to respond to urgent delivery needs. As opposed to typical factory quick ship programs, these uniquely resourced facilities are dedicated to delivering fully assembled MCCs and plug-in units as individual situations demand, without typical lead time constraints.

For delivery capability above and beyond the norm, contact your local Cutler-Hammer Service Center.

COMPLETE AFTERMARKET SUPPORT.

Motor Control Centers are major capital investments intended to provide years of service. As such, Cutler-Hammer supports what it sells, offering parts and replacement units for control center designs circa 1940 to present. Supported vintages include:

Advantage MCC	F2100	9800
Freedom Unitrol	Series 2100	F10 Unitrol
Type W	Five Star	11-300

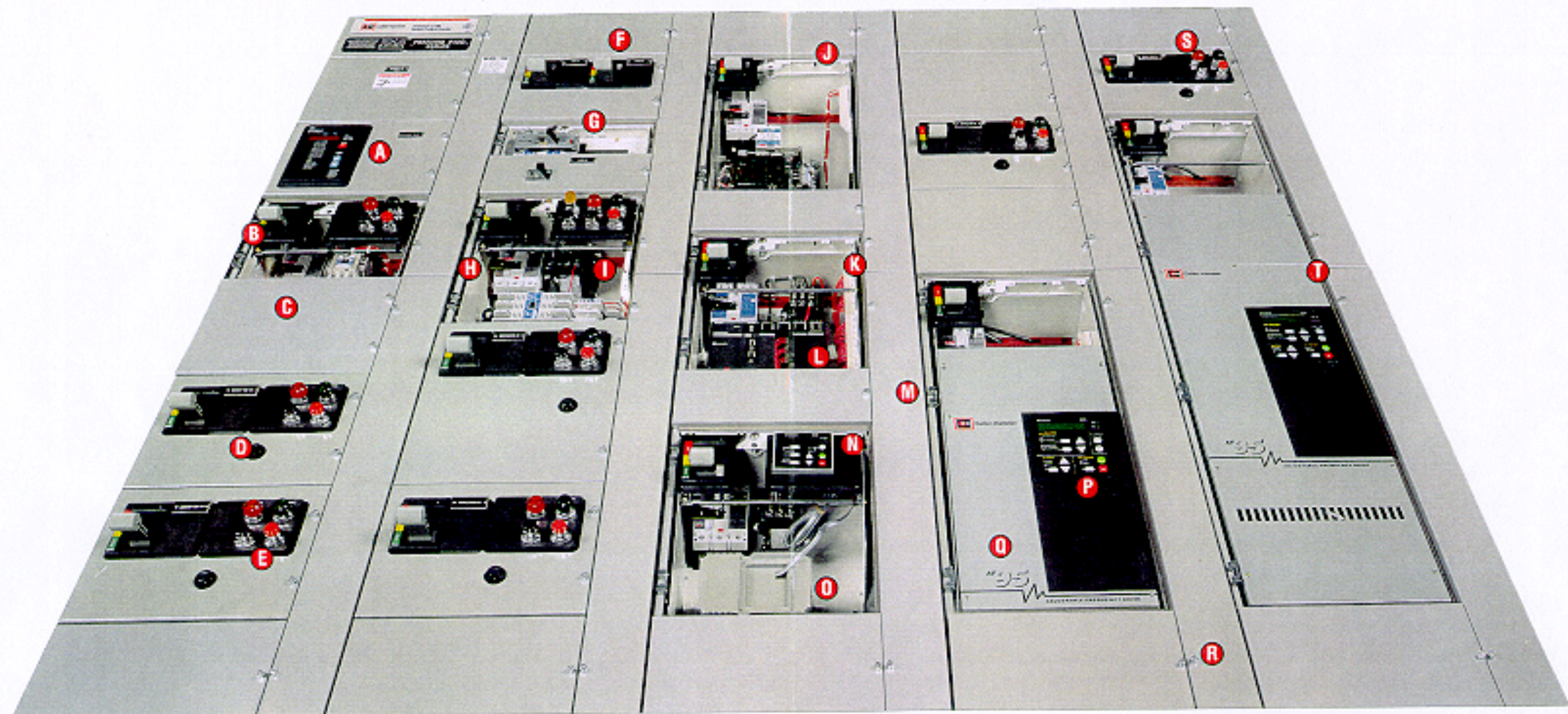
All replacement units are built to factory specifications and include branch circuit protection and handle mechanisms, a new starter, unit power stabs and fused control power transformer. All units are UL listed and labeled.

Regardless of the age of the parent equipment, Cutler-Hammer can provide a rapid replacement parts solution minimizing interruption to plant operations. Additional aftermarket services include: add on structures, transition bus sections and splice kits.

Technology retrofits including vacuum starters, IQ metering and protection devices and Series C breakers are also available. Cutler-Hammer will also retrofit plug-in units from other manufacturers where these technology upgrades are desired.

DESIGN FLEXIBILITY, ADVANCED COMPONENTS, TESTED TOUGH

Cutler-Hammer's F2100 is the Right Choice for Every Application.



A IQ Data Plus II metering unit.

B Combination HMCP Size 1 AN16 NEMA Starter.

C Future space for later expansion.

D Overload relay insulated reset pushbutton.

E Flip down pilot device panel.

F Dual mounted Series C circuit breaker feeder tap unit.

G Compact 6" plug-in HMCP Starter unit.

H Combination HMCP Size 3 AN16 NEMA Starter.

I Encapsulated and fused control power transformer.

J EA SSRV plug-in unit with circuit breaker.

K Latching pull apart terminal block.

L D300 PLC with circuit breaker and GPT in plug-in unit.

M Opposite opening vertical wireway doors.

N AF93 VFD keypad.

O 5 HP AF93 VFD plug-in unit with circuit breaker.

P AF95 VFD keypad.

Q 30HP AF95 VFD plug-in unit with circuit breaker.

R Indicating "L" door latch.

S 10250T pilot devices.

T 75HP AF95 VFD slide-in unit with circuit breaker.



Cutler-Hammer, a part of Eaton Corporation, is a worldwide leader providing customer-driven solutions. From power distribution and electrical control products to industrial automation, Cutler-Hammer utilizes advanced product development, world-class manufacturing, and offers global engineering services and support.

For more information on Cutler-Hammer products and services, call 1-800-525-2000 or 1-732-417-5660, or visit our website at www.cutlerhammer.eaton.com

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