Low Voltage Motor Control Centers

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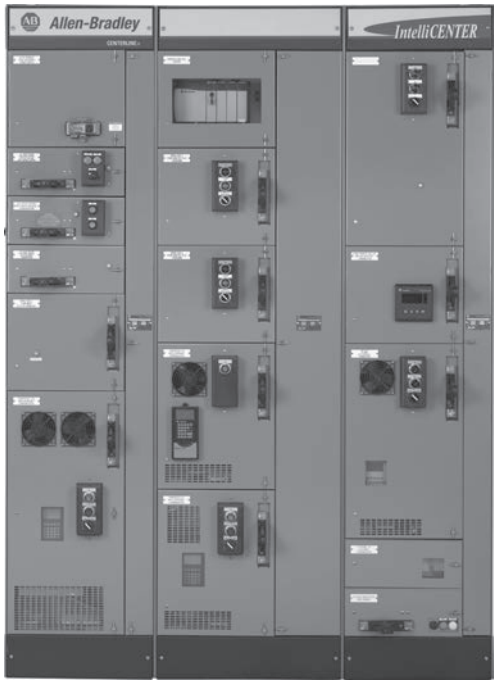
CENTERLINE Motor Control Centers



The Allen-Bradley family of CENTERLINE motor control centers (MCCs) is designed to meet global needs with the CENTERLINE® 2100 MCC and CENTERLINE® 2500 MCC.

CENTERLINE motor control centers integrate control and power in one centralized package that enhances safety and allows maximum flexibility.

CENTERLINE MCCs use the time proven and industry-leading CENTERLINE bus. No other MCC manufacturer offers you the same protection for personnel and equipment, including high levels of isolation from hazardous voltages, superior fault containment, and a solid grounding system.

Offering technology beyond the bounds of traditional MCCs, CENTERLINE Motor Control Centers include the latest in intelligent motor control devices, such as drives, soft starters, and electronic overload relays.

For users demanding a premium-quality MCC, the CENTERLINE MCC family offers a rugged, high-performance packaging solution for all your motor control needs.

	CENTERLINE 2100 MCC	CENTERLINE 2500 MCC
Enclosure Types Available	NEMA Types 1, 1G, 3R, 4, 12	IP20, IP42, IP54
Arc-Resistant Enclosure	Yes (IEEE C37.20.7c)	Optional
Standards	UL 845 CSA C22.2, No. 254	IEC 61439-1 IEC 60529
Section Height	90 in. (71 in. available)	2300 mm
Section Width (for Plug-in Units)	20 or 25 in.	700, 800, 900, or 1000 mm
Section Depth	15 or 20 in.	600 or 800 mm
Unit Density	Up to twelve units per vertical section	24 modules per column (one module = 80 mm)
Horizontal Bus Current Rating	600…3000 A	800…4000 A
Section Load Capacity	600 or 1200 A	600 or 1200 A
Rated Voltage	up to 600V	up to 690V
Short Circuit Withstand Ratings	42, 65, or 100 kA rms Symmetrical	50 or 80 kA for one second
Units Available:		
Full-Voltage Non-Reversing Starters	Yes	Yes
Full-Voltage Reversing Starters	Yes	Yes
Starters for Two-Speed Motors	Yes	Yes
Soft Starters	Yes	Yes
AC Drives	Yes	Yes
Power Monitoring Equipment	Yes	Yes
Fusible and Circuit Breaker Feeders and Mains	Yes	Yes
PLC and Controllers	Yes	Yes
Lighting Panels	Yes	Yes
Transformers	Yes	Yes
Built-in Network	Available	Available
IntelliCENTER Software	Available	Available
Preconfigured Network	Available	Available

For more information, see the following publications:

CENTERLINE 2100 MCC Product Profile	2100-PP020*
CENTERLINE 2100 MCC Catalog	2100-CA001*
CENTERLINE 2500 MCC Product Profile	2500-PP001*
CENTERLINE 2500 MCC Selection Guide	2500-SG001*
IntelliCENTER® Technology Product Profile	2100-PP017*
CENTERLINE 2100 MCC with ArcShield™ Product Profile	2100-PP019*

IntelliCENTER® Technology

Integrated Intelligence within a Motor Control Center

CENTERLINE Motor Control Centers (MCCs) with IntelliCENTER technology combine motor control and protection devices with the advanced networking and diagnostic capabilities to give you an inside look at your motor control application. IntelliCENTER technology features built-in DeviceNet, intelligent motor controls, and pre-configured and tested networks. CENTERLINE MCCs with IntelliCENTER technology are a cost-effective solution to solve even your most complex motor control needs.

Reduce Costs

Your startup is faster with built-in Industrial Class 1, DeviceNet cabling because complex interwiring is reduced to a single DeviceNet cable. The preconfigured and validated DeviceNet network reduces your need to make device connections, set baud rate, or assign node addresses. This network has been rigorously tested to ODVA specifications to help assure reliable communications.

Maintain and Diagnose (Improved Uptime)

The addition of IntelliCENTER software provides the ultimate window into your MCC. The software puts both real-time diagnostics and MCC documentation at your fingertips to maximize MCC and related equipment performance. Graphical views of individual MCC units display device data allowing you to quickly view critical status information. IntelliCENTER technology reduces installation time with its plug-and-play setup and minimizes your downtime by quickly providing intelligent diagnostic and predictive failure information.

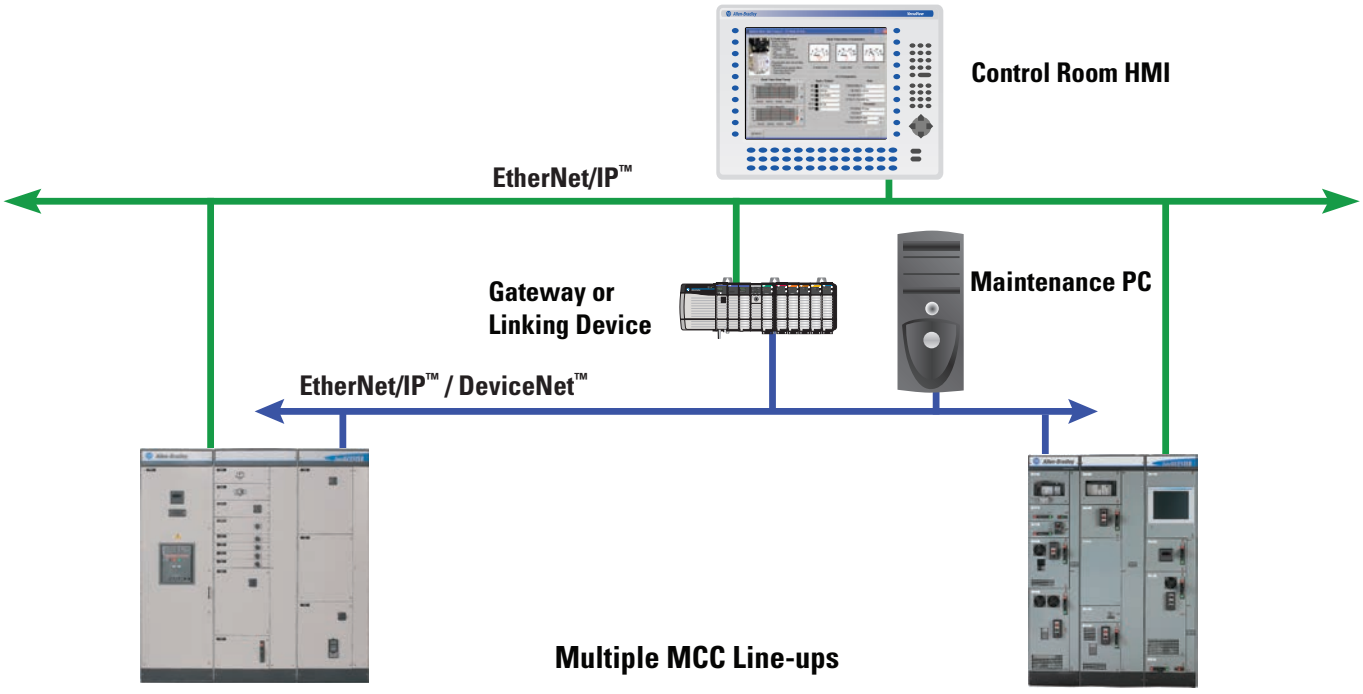
Enhanced Personnel Safety

Enhanced safety is realized with access to real-time data by remote monitoring, configuration, and troubleshooting of intelligent motor control devices. IntelliCENTER Software harnesses the power of the Integrated Architecture system to allow you access to critical MCC information from anywhere in your facilities.

Power of Integrated Architecture

IntelliCENTER technology increases your access to information, minimizes mechanical wear and tear with realtime motor control diagnostics, and increases productivity with complete packaged and pre-engineered solutions for your most challenging applications.

Architecture Network Diagram



ArcShield™

CENTERLINE 2100 and 2500 Motor Control Centers with ArcShield reduce the risk of arc flash injury through the use of the industry-leading arc containment design, which has been tested to meet the arc resistant standards for medium voltage equipment, *ANSI C37.20.7: IEEE Guide for Testing Medium-Voltage Metal-Enclosed Switchgear for Internal Arcing Faults*.

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CENTERLINE Medium Voltage Motor Control Centers

Allen-Bradley medium voltage motor controllers are available in a wide range of control formats allowing the flexibility to select the best match for the application. Medium voltage full-voltage controllers, reduced-voltage controllers, solid-state reduced-voltage controllers, two-speed controllers, synchronous controllers, and load break switches provide integrated intelligence and the lowest-cost solution for starting motors. Visit medium voltage motor controllers on the Web at: http://www.ab.com/mvb/.

Allen-Bradley Medium Voltage MCC Competitive Advantage

ArcShield™ — Rockwell Automation has enhanced the safety of its world-recognized medium voltage control products to include an optional arc resistant class of medium voltage control equipment. ArcShield™ controllers provide the additional arc resistant safety features required by some industries. Most medium voltage control products can be provided with the ArcShield enclosure design which meets the arc resistant testing requirements of IEEE C37.20.7. ArcShield controllers use the same standard reliable internal components that continue to serve industries world wide.

SMC™ Flex — Solid-state reduced voltage controllers apply reduced voltage to a medium voltage AC motor to allow soft starting and stopping, limitation of the inrush current, and reduction of the effects of water hammer in pumping systems. Allen-Bradley medium voltage SMC Flex controllers include motor protection, communication and diagnostic capabilities, and high flexibility, making it ideal for virtually any application.

IntelliCENTER® — MCC users are provided with an integrated hardware, software, and communication solution. The IntelliCENTER features pre-configured software which shows real-time data, trending, component history, wiring diagrams, user manuals, and spare parts. The IntelliCENTER reduces installation time with its plug-and-play set-up and minimizes facility downtime by quickly providing intelligent diagnostic and predictive failure information.

For more information, see the following publications:

Medium Voltage Controllers Selection Guide	1500-SG001*
Medium Voltage Controllers Specification Guide	1500-SR020*
OEM Products: Medium Voltage Controllers Application Guide	1503-BR010*

Description of Features

The Allen-Bradley medium voltage motor controller offers:

- Three isolated compartments:
  - Power bus
  - Low voltage
  - Power cell
- Large swing-out low voltage panel painted white for high visibility
- Test circuit and plug for remote control power supply
- External operating handle to operate the isolation switch
- Bolted power cell door(s)
- CENTERLINE horizontal power bus with removable cover plates for accessibility
- 1/4 x 2 in. continuous copper ground bus
- Line, load, and control wire conduit openings with removable cover
plates at the top or bottom of the structure
- Base mounting sill channels with mounting holes and removable lifting means
- Hybrid epoxy powder paint finish

Controller Standard Features

- NEMA Class E2 design
- Removable lifting angles or brackets
- Non-removable sill channels
- Removable backplates
- Top or bottom plates to accommodate cable entry/exit
- Tin-plated copper horizontal power bus located in an isolated compartment
- 1/4 x 2 in. continuous bare copper ground bus
- Main non-load break isolation switch with visible blades and shutter mechanism, and operating handle
- Mechanical and electrical interlocks between isolation switch, vacuum contactor, and medium voltage door
- Vacuum contactor(s)
- Three current-limiting power fuses for NEMA Class E2 operation
- Three current transformers
- Control circuit transformer with primary and secondary fuses
- Low voltage control panel
- Space for necessary auxiliary control and metering devices
- Polycarbonate viewing window in power cell door
- IntelliVAC™ control module for each vacuum contactor, mounted in low voltage panel, with advanced features:
  - – Universal input voltage (110…240V AC, 50/60 Hz or 100…250V DC)
  - – Selectable vacuum contactor drop-out time and consistent pickup time
  - – Altitude compensation
  - – Power loss ride-through (TDUV) – may require additional hardware (external capacitor)
  - – Anti-kiss and anti-plugging protection
  - – Delayed motor re-start and temporary motor jog function
  - – One device is suitable for all contactors and control schemes

Input Voltage

- 2400V, 3300V, 4200V, 6600V or 6900V AC (+5/-10%)
- 3-phase 50/60 Hz (± 3%)

Ambient Temperature

- 0…40 °C (32…104 °F) with relative humidity of up to 95% (non-condensing)

Enclosure Types

- NEMA Type 1 – General purpose (IP10)
- NEMA Type 1 w/g – General purpose with gasket (IP21)
- NEMA Type 12 – Dust-tight and drip proof (IP52)
- NEMA Type 3R – Non walk-in weatherproof (IP34)
- Arc Resistant (NEMA Type 12)
  - – Accessibility Type 2
  - – Tested per IEEE C37.20.7-2001

Standards

• Canadian Standards Association (CSA), Industrial Control Equipment C22.2 No. 14 and TIL D-21
• American Nation Standards Institute (ANSI), Instrument Transformers C57.13
• Institute of Electrical & Electronic Engineers (IEEE)
• National Electrical Code (NEC)
• Occupational Safety & Health Act (OSHA)
• Guide for Harmonic Control and Reactive Compensation of Static Power Converters (IEEE 519-1992)
• National Electrical Manufacturers Association (NEMA), Medium Voltage Controllers Rated 1501…7200V AC ICS 3-2 (formerly ICS 2-324)
• Underwriters Laboratories, Inc. (UL), High Voltage Industrial Control Equipment 347
• European Directives for EMC

Paint Finishes

• Description Hybrid epoxy power paint
• Color ANSI 49 – medium light grey (standard)
ANSI 61 – light grey (optional)
• Procedure Continuous paint line. All parts are painted before assembly
• Preparation Alkaline wash/rinse/iron phosphate
rinse/iron-chrome sealer
rinse/recirculated de-ionized water
rinse and virgin de-ionized water rinse
• Painting Air-atomized electrostatic spray
Total paint thickness – 0.002 in. (0.051 mm) minimum
• Baking Natural gas oven at 179 °C (355 °F) minimum

Power Bus (Optional)

• Located at the center rear of the structure
• Mounted on the edge to a molded bus support insulator in a common vertical plane
• CENTERLINE horizontal tin-plated copper bus – optional silver-plated or insulated
• 1200/2000/3000 A
• Front/rear access

Ground Bus

• Continuous bare copper ground bus 6 x 52 mm (1/4 x 2 in.) as standard
• #8…#1/0 AWG or #6…250 MCM mechanical lug supplied at the incoming end of the lineup

Components

Advanced Digital Control of Vacuum Contactors

The Allen-Bradley Bulletin 1503VC IntelliVAC controller offers a superior and efficient means of controlling vacuum contactors. IntelliVAC controllers are a quantum leap beyond traditional electromechanical control circuits. Here are just a few of the beneficial characteristics:

• The performance and flexibility of digital control, allowing the control of a wide array of contactor types (400 A, 800 A electrically held, and mechanical latch)

• Enhanced reliability as a result of embedded self diagnostics and better coordination between unit power fuses and the vacuum contactor drop-out time

• Increased productivity with features like power loss ride through (TDUV) and contactor anti-kiss, whichwere previously offered as optional features

• Motor and process protection with delayed restart built in

Non-Load Break Isolation Switch

• Electrical and mechanical interlocks prevent the switch from opening when the contactor is energized

• Ensures normal operation only when the switch is fully closed

• Allows for separate source testing when in the OFF position

• Grounded in the OFF position

• When in the open position, a visible barrier isolates the power cell from the power bus compartment

• Status of the isolation switch can be viewed through a window in the power cell door

Handle and Interlock Mechanism

• Simple direct drive mechanism improves reliability and ensures operator safety

• Mechanical interlock mechanism remains part of the enclosure to eliminate setup adjustment

• Power cell door is interlocked with the handle mechanism to prevent the door from being opened when the cell is energized

Low Voltage Compartment

• Separate 120V source is required for Test position control power
• Allows testing and troubleshooting of the power cell without exposing personnel to medium voltage
• Prevents backfeeding medium voltage through the control transformer, in Test mode
• All low voltage components are located in the low voltage panel
• Low voltage panel interior painted white for better visibility

Power Cell Compartment

• Power cell, low voltage panel, and bus compartment are isolated from each other for better fault containment
• Swing out low voltage panel for easy access to install load cables
• Isolated load cable compartments between top and bottom power cell
• Easy access for cable installation and stress cones
• Bar type current transformers are supplied as standard for overload protection and metering

Power Bus Compartment

• CENTERLINE bus designed as an integral part of the structure
• Dissipates heat more efficiently
• Edge-to-edge configuration maximizes resistance to magnetic forces and minimizes moisture or dust collection
• Molded bus brace reduces maintenance and provides better distribution of forces during a fault
• Accessible without a ladder, for installation and maintenance
• Allows for incoming line cables to enter through the top or bottom of the compartment

Rockwell Automation Medium Voltage MCC Competitive Advantage Details

ArcShield

The Allen-Bradley CENTERLINE ArcShield arc resistant controller provides rugged process control for applications requiring a higher level of personnel protection. ArcShield products are compliant to the IEEE C37.20.7 standard, and provide Type 2 protection. During an arc flash, the ArcShield controller safely redirects the arc flash energy out the top of the unit and away from personnel. This level of protection is also maintained when the low voltage door is open for maintenance purposes. Listed below are some product highlights.

Arc “pressure relief” vent
• Safely vents arc gases and material away from personnel during an arc flash
• Arc gases are vented out the top of the enclosure through the plenum exhaust structure

Heavy duty enclosure design
• Reinforced side sheets, doors, roof, and back plates designed to contain arc flash energy while vents open
• Added support plates secured with multiple bolts provide increased rigidity and security

Robust power cell door design
• Multi-point latching mechanism, reinforced cross bracing and gasket sealing provide arc containment
• A viewing window in the power cell door allows the operator to view the status of the isolation switch before opening the door
• Once the latching mechanism is engaged, the power cell door is bolted shut for added protection

The ArcShield products are available in a number of different controller configurations.
These are just a few of the products available:
• Bulletin 1591A Incoming units
• Bulletin 1512A/AT One high controller
• Bulletin 1512B/BT Two high controller
• Bulletin 1562E MV SMC Flex controller
• Bulletin 1506 Reversing Starter

SMC Flex

SMCs provide many features to benefit your system:
• Minimize mechanical damage resulting from full voltage starting of AC induction motors, enabling longer system life
• Limit line disturbances from inrush currents, resulting in reduced downtime
• Multiple Start/Stop modes increase functionality
• Diagnostic monitoring helps prevent problems before they occur
• Satisfy electrical distribution restrictions by reducing inrush currents

SMCs are ideal for applications where:
• Belts, gears, and chains can be damaged by across-the-line starting
• Materials can be damaged by sudden starts and stops
• A step change in torque can damage equipment
• Power company line current restrictions are imposed

With SMC soft starters you benefit from:
• Advanced diagnostics, increasing system performance
• Greater product functionality for increased system flexibility
• Decreased downtime due to advanced protection of motor winding, equipment, and materials

Medium Voltage SMC Flex Smart Motor Controller offers:
• Standard control module
  - Soft start - with selectable kickstart
  - Soft stop
  - Current limit start - with selectable kickstart
  - Linear speed acceleration* - with selectable kickstart
  - Linear speed deceleration
  - Full voltage
  - Preset slow speed

• Optional control module
  - Pump control with separate start and stop profiles (eliminates water hammer)

Standard features of SMC Flex Controller
• Electronic motor overload protection
• Metering
• Diagnostics
• Built-in DPI communications (other communication options available)
• Two-line, 16-character backlit LCD display keypad programming
• Three programmable auxiliary contacts Medium Voltage SMC Flex Power Module
• Current loop gate drive (patent pending)
• Efficient heat sink profile

* Requires motor tachometer.

IntelliCENTER

• Spare parts lists specific to each unit
• AutoCAD® elevation and on-line drawings
• User manuals specific to each unit
• Event logging, warnings, faults, parameter edits
• Features pre-configured screens for each unit
• Allows MCC monitoring from anywhere in the user’s facilities
• Contains ActiveX controls to allow easy integration into RSView®