

Model 6 Export Motor Control Centers

Class 8998



- Merlin Gerin**
- Modicon**
- Square D**
- Telemecanique**

Schneider Electric Brands

CONTENTS

Description	Page
Product Description	3
Technical Overview	17
Application and General Information	19
Dimensions	51
Sample Specifications	79
Appendix	87



SQUARE D
Schneider Electric

SECTION CONTENTS

SECTION 1—PRODUCT DESCRIPTION 4

- Introduction 4
- Structural Features 6
- Functional (Outgoing) Unit Features 8
- Bus Bar Features 11
- Incoming Device Features 13
- Internal Separation Features 14
- Options 15



Model 6 Export Motor Control Centers

Product Description

SECTION 1—PRODUCT DESCRIPTION

Introduction

The Model 6 Export Motor Control Center (MCC) from Square D is a North American Low Voltage MCC that complies with International Electrotechnical Commission (IEC) standard 60439-1. Components of the Model 6 Export MCC meet IEC standards and include devices that are available worldwide, such as:



- TELEMECANIQUE® contactors
- MERLIN GERIN® circuit breakers
- TELEMECANIQUE pilot devices
- TELEMECANIQUE relays

MERLIN GERIN COMPACT® NS Circuit Breaker



TELEMECANIQUE Contactors, Pilot Devices, and Relays

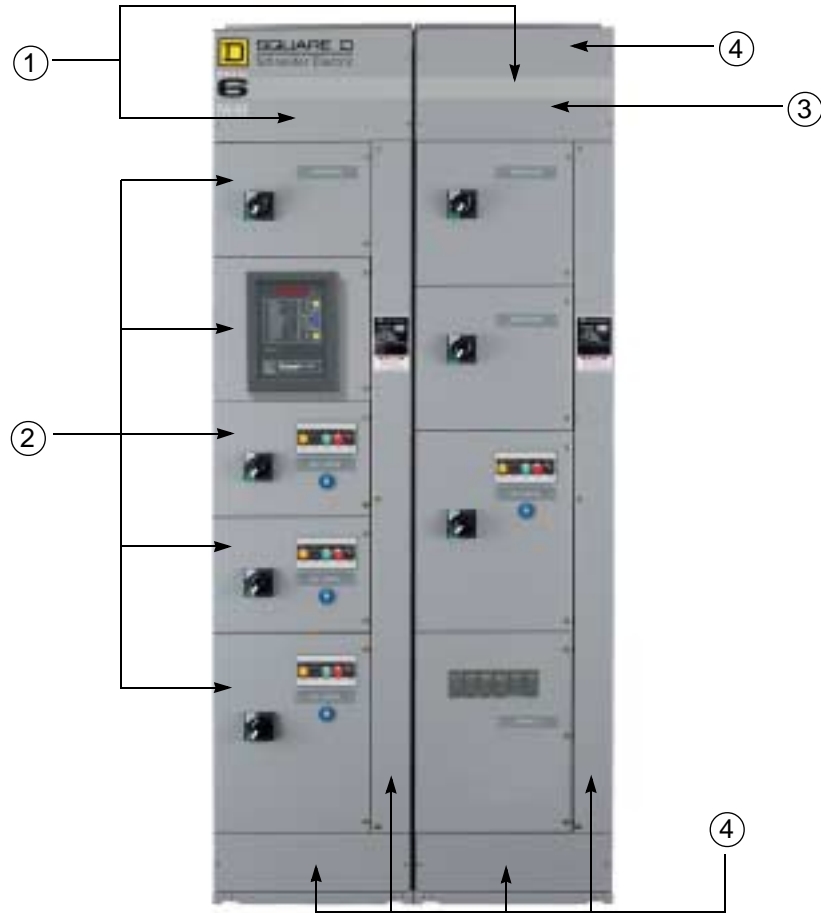


The Model 6 Export MCC is certified to be IEC compliant. Square D has modified its National Electrical Manufacturers Association (NEMA) compliant Model 6 Motor Control Center to meet the requirements of the IEC standard for MCCs—IEC 60439-1, *Low voltage switchgear and controlgear assemblies*.

Model 6 Export Motor Control Centers Product Description

North American motor control centers provide a method for grouping electrical motor control, automation, and power distribution in a compact economical package. Motor control centers consist of:

1. Totally enclosed, dead front, freestanding structures bolted together
2. Modular functional units housed and supported by the structures
3. Common bus bars for distributing main power to the functional units
4. A network of wire trough and conductor entrance areas that accommodate outgoing load and control wires



Model 6 Export MCCs include a wide range of motor starters and circuit breakers in order to meet numerous low voltage motor control and power distribution applications, including:

- Full Voltage Non-Reversing (FVNR) starters up to 300 kW
- Full Voltage Reversing (FVR) starters up to 200 kW
- Reduced Voltage Auto Transformer (RVAT) starters up to 300 kW
- Main lug compartments up to 2500 A
- Main circuit breakers up to 2000 A
- Branch circuit breakers up to 1200 A
- System voltages from 220–690 V



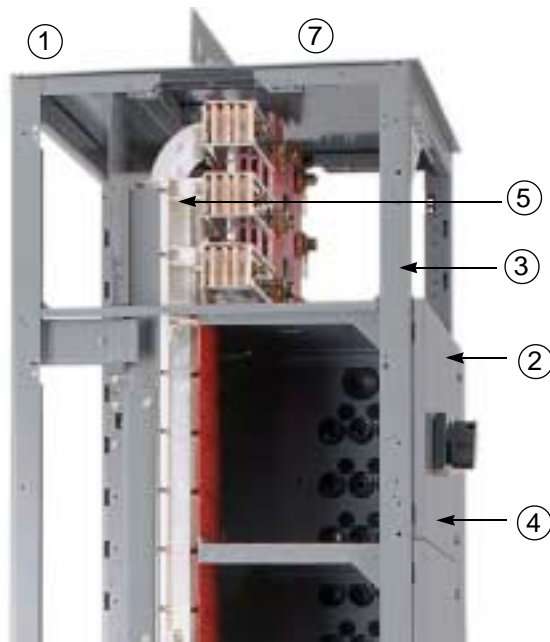
Model 6 Export Motor Control Centers

Product Description

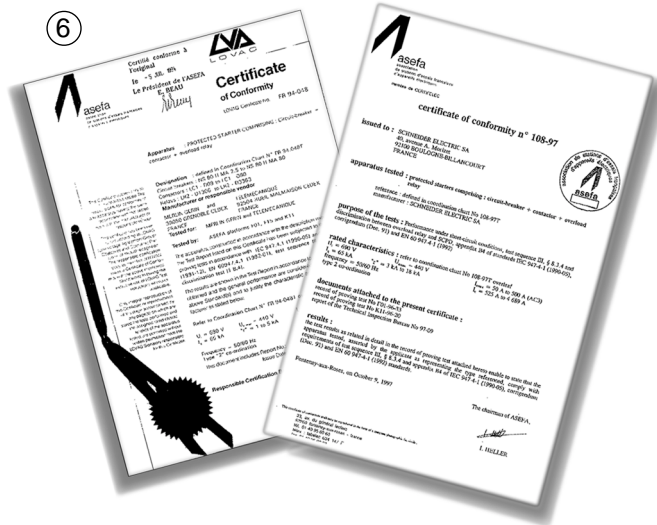
Structural Features

1. Structures are totally enclosed, freestanding assemblies capable of being bolted together to form a single assembly. Standard section dimensions are 90 in. high x 15 or 20 in. deep x 20 in. wide (2286 mm high x 381 or 508 mm deep x 508 mm wide).
2. Each section provides 72 in. (1829 mm) of mounting space for functional units. Special sections are required for some units, such as autotransformer starters and some incoming main devices.
3. MCCs are constructed with a welded 12-gauge (2.6 mm) steel frame for exceptional structural rigidity.
4. Structures are coated with a durable, American National Standards Institute (ANSI) 49 medium light gray color baked exterior finish.
5. Structures and bus are braced for 50 kA rms short-time current (I_{CW}) for one second, and for 105 kA rms peak withstand current (I_{PK}) per IEC 60439-1.
6. The Model 6 Export MCC meets the definition of Type Tested Assemblies (TTA) in compliance with IEC 60439-1.
7. Each MCC section contains a removable top and bottom plate for better access to cut cable entry openings.

MCC Structural Features and Bus Bracing

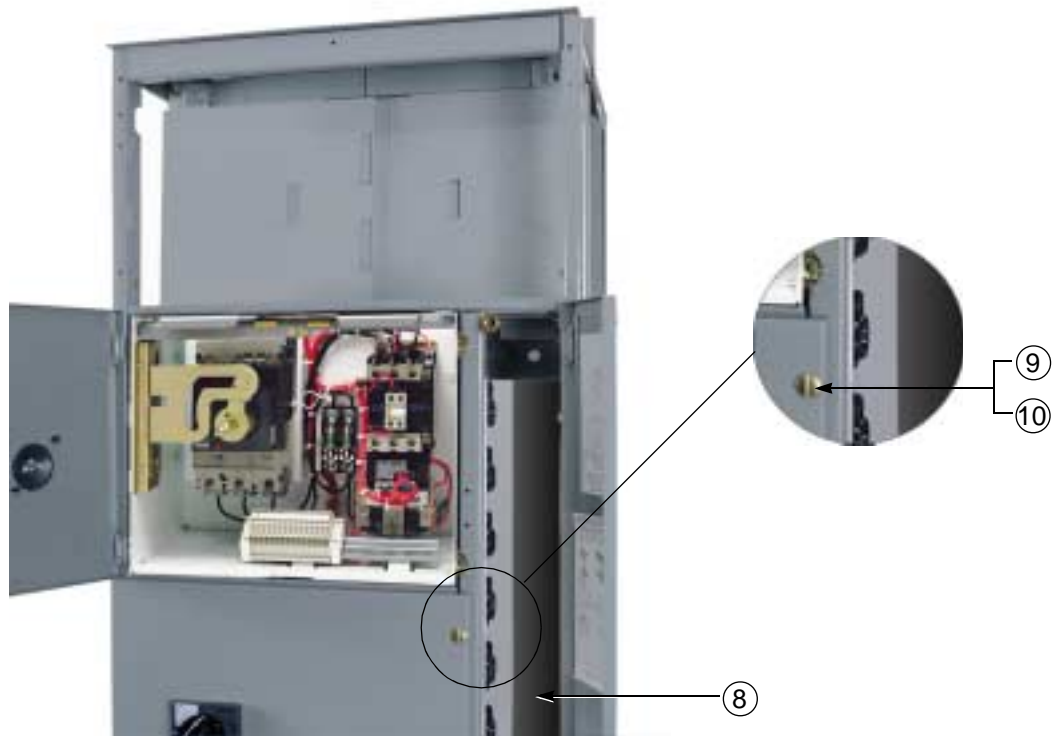


Type Tested Assemblies (TTA) Certification



- 8. The vertical wireway spans the full depth of the MCC structure, providing maximum room for wire pulling and wire separation.
- 9. The exterior hardware is iridescent chromate plated, providing increased corrosion resistance.
- 10. The unit and wireway doors are secured by rugged quarter-turn fasteners.

Quarter-turn Fasteners and Vertical Wireway

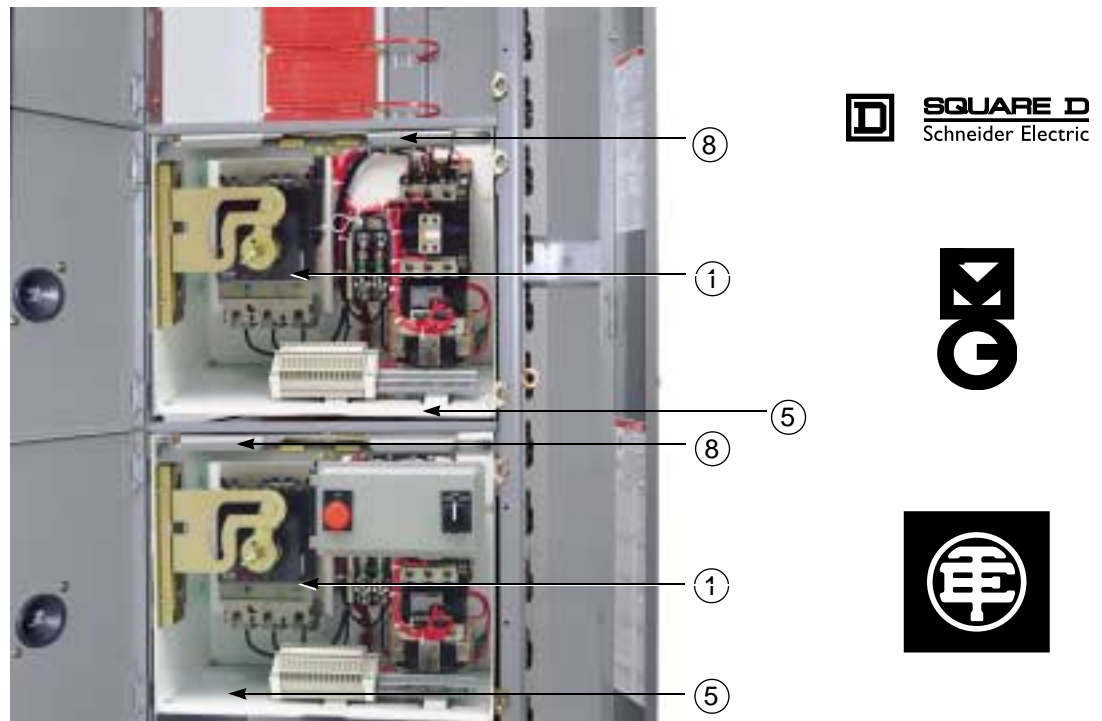


Model 6 Export Motor Control Centers Product Description

Functional (Outgoing) Unit Features

1. Functional units contain MERLIN GERIN® molded case circuit breakers as disconnects up to and including 600 A. Motor starter units contain magnetic trip or electronic trip circuit breakers. Branch feeder units contain thermal magnetic trip or electronic trip circuit breakers. All circuit breakers meet IEC standards.
2. Motor starter units contain TELEMECANIQUE® IEC contactors and bimetallic overloads. Solid state (LT6) overloads with serial communication are optional.
3. Starter and contactor combinations meet Type 2 coordination according to IEC 947-4-1 up to 480 V. Motor starters from 660–690 V meet Type 1 coordination.

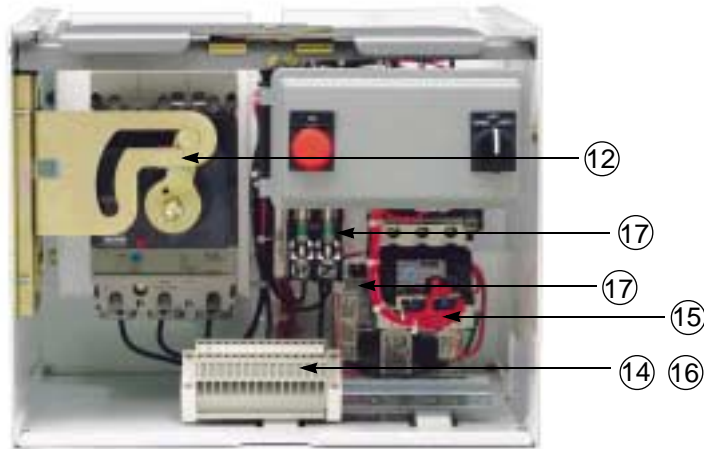
MCC Structure with Motor Starter Units



4. The combination of MERLIN GERIN and TELEMECANIQUE components in this catalog are globally documented and available worldwide from Square D/Schneider Electric.
5. Functional units are fully compartmentalized. The interior walls of the solid bottom, side, and rear plates are painted white for optimal visibility.
6. Functional units contain finger-safe components.
7. All conducting parts on the line side of the unit disconnect are shrouded by insulating materials.
8. The twin handle cam mechanism works with the unit's "hook and hang" feature to provide proper stab alignment. The mechanism also provides for withdrawable line connections on all starters and branch feeders up to and including 600 A.
9. All functional units contain load and auxiliary connections that are fixed—they must be disconnected by using a tool. Motor starter terminals are conveniently located next to the vertical wireway, making motor lead connection quick and easy.
10. Control power to the unit is a withdrawable connection, when the control power transformer is included in the unit. Control power is disconnected when the unit is removed from the MCC section or the unit disconnect is turned off.

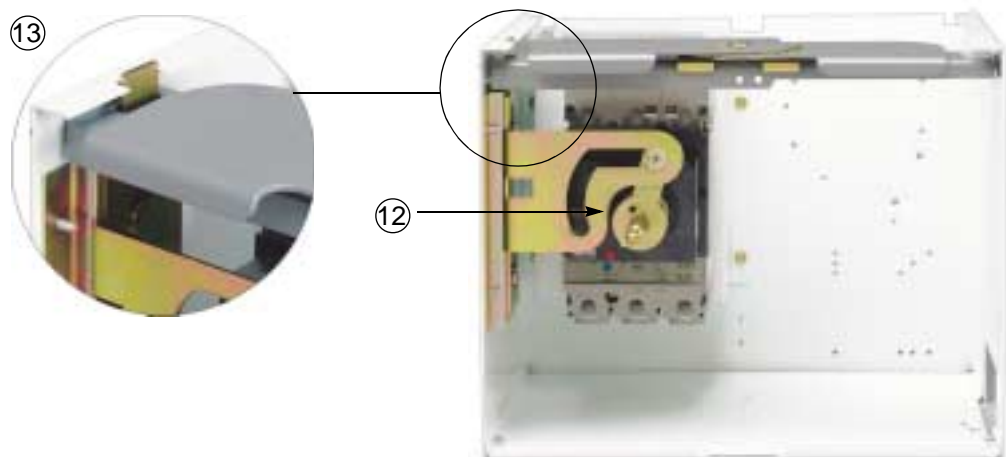
Model 6 Export Motor Control Centers Product Description

Motor Starter Unit



11. Starters and branch feeders up to 600 A are removable units. All other units are designed for fixed installation.
12. The removable units are fitted with a mechanical interlock to prevent the unit door from being opened when the disconnect is in the ON position.
13. A non-defeatable interlock between the disconnect and structure prevents removal or re-insertion of removable units unless the disconnect is in the OFF position.
14. Units contain DIN rail-mounted IEC style terminal blocks for accepting #22–10 AWG solid or stranded copper wire (0.5–4 mm² stranded). Ten blocks rated for 30 A is standard; more than 10 blocks are available as an option.
15. Internal unit wiring is red #14 AWG, with green ground wires where necessary. Marking of the wire is an option the user must specify.
16. User field control wiring connects directly to the control terminal blocks in the unit. User field load wiring connects directly to the device load terminals. This is equivalent to NEMA Class 1B-D wiring.
17. Each starter unit can include an optional control power transformer that provides auxiliary power to the starter. The transformer is protected by UL Class CC fuses and has finger-safe terminals.

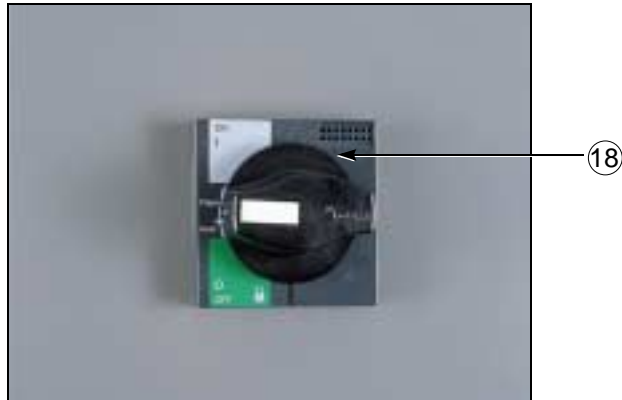
Branch Feeder Unit



Model 6 Export Motor Control Centers Product Description

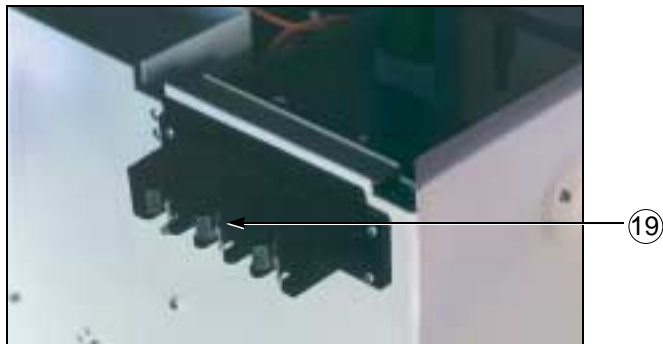
18. A rotary handle is used for unit disconnects 600 A and below. A toggle handle is used on units above 600 A and on COMPACT™ 6 motor starter units. All handles show a clear indication of “I” (ON), “O” (OFF), and TRIP. All handles can support up to three padlocks in the OFF position.

Rotary Handle on Unit Door



19. Tin-plated copper power stabs are spring reinforced to exert the proper clamping force when they are connected to the vertical bus. The stabs are shrouded to protect them from damage during unit maintenance.

Typical Shrouded Power Stabs



20. A first make/last break stab is used to connect functional units to the Protective Conductor (PE) or ground bus before connecting to the power bus.
21. The control station plate can support up to five 22 mm Telemecanique IEC pilot devices.

Control Station Plate



Model 6 Export Motor Control Centers

Product Description

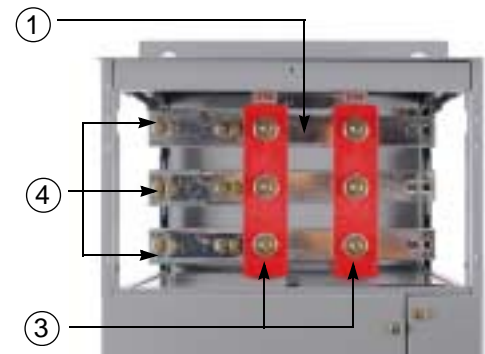
Bus Bar Features

1. The main horizontal bus is located at the top of the structure for easy installation, inspection, and maintenance. Partitions completely separate all bus bars from the rest of the assembly.
2. The main horizontal bus bars are tin-plated to make an excellent electrical connection. Current ratings can be increased from 600–2500 A by increasing the number of bars.
3. Bus bar supports meet 50 kA rms short-time current (I_{CW}) for one second per IEC 60439-1 tests. A 70 kA rating is optional.
4. Captive horizontal splice bars have self-contained nuts and hardware to ease installation and reduce the possibility of splice bar loss.

Horizontal Bus Bar Partitions

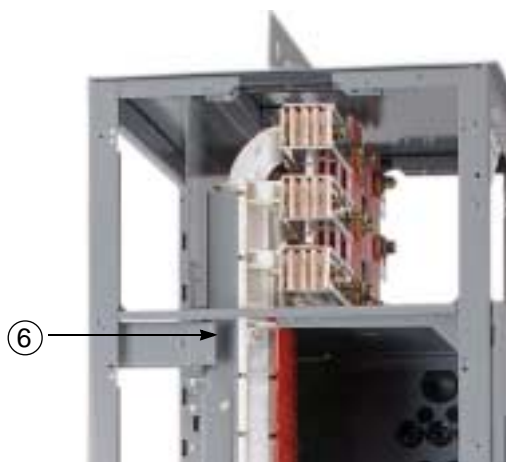


Tin-Plated Main Horizontal Bus Bars

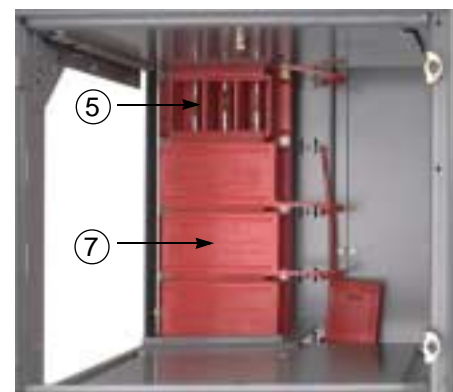


5. The vertical bus contains distribution bus bars within each section that are rated for 600 A of outgoing unit loads. These vertical bars are made of the same material and plating as the horizontal main bus, and are partitioned from the rest of the assembly by insulating material.
6. Each section with vertical bus contains a vertical ground bus (a protective conductor per IEC 60439-1). This bus mates with ground stabs on the rear of each plug-on unit to create a positive ground connection.
7. Vertical bus barriers and wireway openings are built in 3 in. (76 mm) increments. This allows more flexibility when mounting units and decreases wasted enclosure space. The barriers and openings have removable shutters that must be manually removed and replaced.

Insulated Vertical Bus in the MCC



Manual Bus Shutters

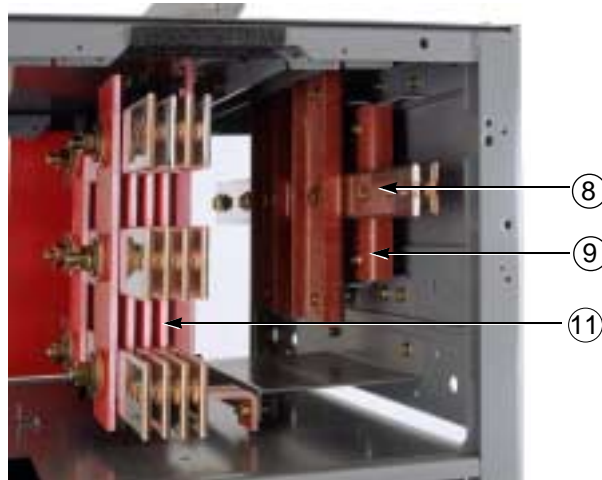


Model 6 Export Motor Control Centers

Product Description

8. Neutral bus is optional. If supplied, the neutral bus is made of the same material as the horizontal main power bus. The current rating of the neutral bus is rated at a minimum of 50% of the current rating of the main power bus.
9. At the customer's request, the optional neutral conductor is connected to outgoing functional units by fixed cable connections wired to each unit that requires a neutral.
10. Each section includes a horizontal ground bus (as a protective conductor per IEC 60439-1) with a captive splice bar. This creates a continuous earthing point for the entire MCC assembly. All conductive structural parts, internal barriers, and units are electrically connected throughout the ground bus system. The horizontal ground bus consists of two 0.25 in. x 2 in. (6 mm x 51 mm) tinned copper bars. Each section's horizontal ground bus has provisions for up to 6 copper or aluminum conductors with cross section dimensions of 10 mm².
11. Bussing meets the temperature rise requirements of type tests per IEC 60439-1.

Neutral Bus



Horizontal Ground Bus



Model 6 Export Motor Control Centers

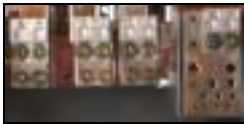
Product Description

Incoming Device Features

1. The Model 6 Export MCC contains separate partitioned compartments for incoming main power cables. All compartments have front access; rear access is not available. The incoming device compartments can be on the left or right end of the MCC line-up.
2. Circuit breakers are available for applications up to 2000 A. Main lugs with mechanical compression (cage) terminals are available for applications up to 2500 A.
3. Incoming devices can enter through the top or bottom of the structure. The compartment is located at the top of the structure in top entry, and at the bottom of the structure in bottom entry.
4. All circuit breaker disconnects 600 A and below, use a rotary handle. Units from 800–1000 A use a toggle handle. All types of handles clearly indicate the ON (I), OFF (O), and TRIP positions. The unit door cannot be opened while the disconnect is ON. Both rotary and toggle handles can support up to three padlocks in the OFF position.
5. Units have fixed main incoming connections, and cannot be removed or withdrawn from the structure.
6. A neutral terminal can accommodate four-wire systems.
7. Circuit breaker type incoming devices up to 600 A are equipped with MERLIN GERIN COMPACT® NS circuit breakers. Circuit breaker type incoming devices over 600 A are equipped with IEC-rated thermal magnetic circuit breakers manufactured by Square D. High interrupting circuit breakers provide circuit protection and isolation per IEC standard 60947-2.
8. Power system monitors—such as circuit monitors or power meters from POWERLOGIC®—are an option with the incoming device.

Main Lugs

②



Thermal Magnetic Circuit Breaker

⑦



POWERLOGIC Circuit Monitor

⑧



Model 6 Export Motor Control Centers

Product Description

Internal Separation Features

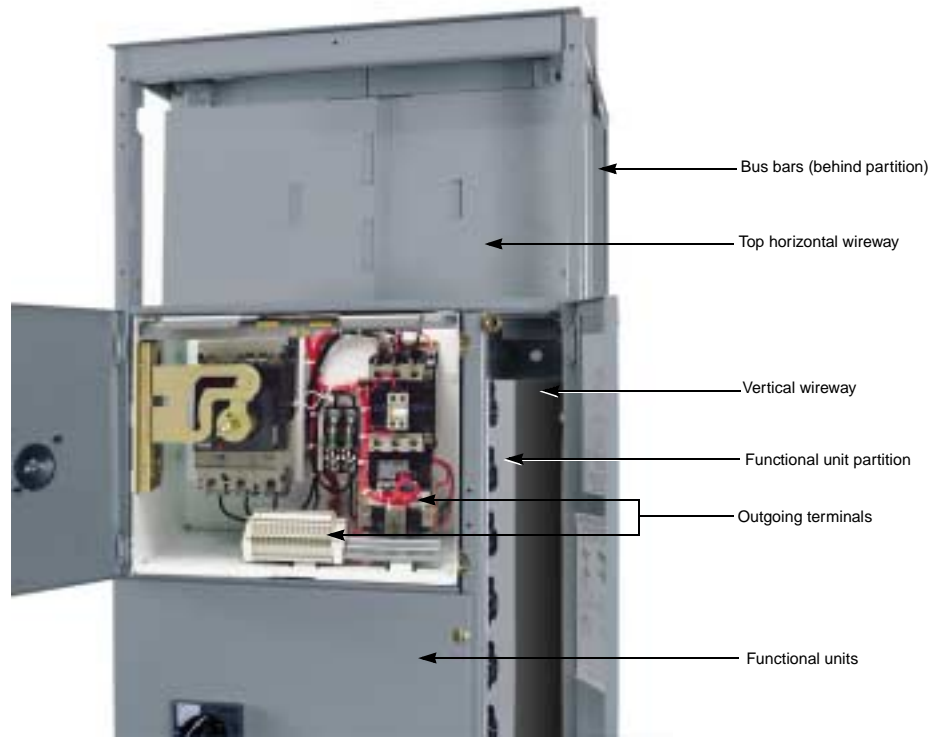
1. The Model 6 Export MCC is divided into three areas:

- Bus bars
- Functional units
- Wireways

Terminals for external conductors are part of the functional units.

2. Internal barriers separate units, bus bars, and wireways in order to meet *Forms of Separation 2b* and *4a* per IEC 60439-1. All barriers achieve the IP 20 degree of protection between compartments.
3. All partitions consist of either grounded metal or insulating material.

Internal Barriers of the MCC



Model 6 Export Motor Control Centers Product Description

Options

The following options are available with Model 6 Export MCCs.



- CE marking
- 70,000 A short-time current (I_{CW}) rating for one second (50,000 A is standard)
- A neutral terminal in an incoming device or four-pole circuit breaker for incoming power
- A neutral conductor wired to each functional unit
- IEC symbols on electrical wiring diagrams
- LT6 solid state overloads on starter units, in place of bimetallic overloads
- Electronic trip circuit breakers with increased trip functions and alarms
- Additional IEC-style relays and timers for starter units
- Up to four auxiliary interlocks wired for remote use in starters
- Wire marking at the ends of wire, based on customer designations
- Factory interwiring and testing between units, complete with drawings
- COMPAC™ 6 starter units through 22 kW
- Automation devices—such as Programmable Logic Controllers (PLCs), remote I/O, and network compatible devices—from MODICON® brand components. These components can accommodate multiple communication protocols, such as MODBUS® PLUS, PROFIBUS®, and DeviceNet®.

COMPAC™ 6 Six-Inch (152 mm) Unit



PLC Family



QUANTUM™ Unit-Mounted Package



Model 6 Export Motor Control Centers
Product Description



SECTION CONTENTS

SECTION 2—TECHNICAL OVERVIEW 18

- Standards 18
- Certifications 18
- Rated Voltages 18
- Rated Currents 18
- Mechanical Data 18
- Service Conditions 18



Model 6 Export Motor Control Centers

Technical Overview

SECTION 2—TECHNICAL OVERVIEW

Standards

- IEC 60439-1 Type Tested Assemblies (TTA)
- EN 60439-1 Type Tested Assemblies (TTA)
- IEC 60947-1, 60947-2, 60947-3, 60947-4 (Short Circuit Ratings, Type 2)
- IEC 60529 (Enclosure Degree of Protection)

Certifications

- ASEFA, Low Voltage Agreement Group (LOVAG)
- CE Mark (optional)

Rated Voltages

Rated insulation voltage	690 Vac
Rated operational voltage	up to 690 Vac
Rated impulse withstand voltage	12 kV
Rated frequency	up to 60 Hz

Rated Currents

Horizontal bus bar (I_n)	600, 800, 1200, 1600, 2000, 2500 A, ac
Vertical bus bar (I_n)	600 A, ac
Rated diversity factor	1.0
Rated short-time current (I_{CW})	50 kA rms for 1 second (70 kA optional)
Rated peak withstand current (I_{PK})	105 kA rms (154 kA rms optional)
Main circuit breakers	125–2000 A, ac
Main lug compartments	600–2500 A, ac
Branch feeder circuit breakers	16–1200 A, ac
Motor starters	up to 500 A, ac max.

Mechanical Data

Degrees of protection (enclosure type) according to IEC 60529	IP20 (similar to NEMA Type 1)
	Option for IP52 (similar to NEMA Type 12)
	Option for IP24 for outdoors (similar to NEMA Type 3R)
Forms of separation according to IEC 60439-1	2b, 4a
Electrical connections according to IEC 60439-1	
Motor starter units	WFF (FFF for RVAT above 225 A)
Circuit breaker units	WFF (up to 600 A)/FFF (800-2000 A)

Service Conditions

Operating temperature	0 to 40° C
Storage temperature	0 to 40° C
Humidity	0–95% non-condensing
Pollution degree	3 per IEC 60947-1
Altitude	1000 m



Model 6 Export Motor Control Centers Application and General Information

SECTION CONTENTS

SECTION 3—APPLICATION AND GENERAL INFORMATION	21
Enclosure Types	21
NEMA Enclosure Types	21
IEC Degrees of Protection	22
Surface Appearance and Color	24
Main Bus Amps and Material	25
Incoming Devices	26
General Information	26
Main Lug Compartments	26
Main Circuit Breakers	28
Wire Size Range for Standard Mechanical Lugs	30
Three-Phase, Four-Wire Systems	31
POWERLOGIC® Monitoring	32
POWERLOGIC® Power Meter	33
Branch Feeder Units	35
Motor Starter Units	38
Circuit Breaker/Contactor Coordination	38
Contactor Utilization	48
IEC Certification	49
ASEFA/LOVAG Certifications	49
CE Marking	50

TABLES

Model 6 Export Enclosure Selections	21
IEC 60529 Enclosure Classification Designations—First Characteristic Numeral	22
IEC 60529 Enclosure Classification Designations—Second Characteristic Numeral	23
Structural Steel Gauge	24
Structure Options and Modifications	24
Bussing Options and Modifications	25
Top-Located Main Lug Compartments	27
Bottom-Located Main Lug Compartments	27
Main Circuit Breaker Unit Interrupting Ratings per IEC 439	29
Top-Located Main Circuit Breakers	29
Bottom-Located Main Circuit Breakers	29
Main Lug Compartments	30
Main and Branch Circuit Breaker Compartments	30
Neutral Lug Terminations	30
Four-Wire Options	31
POWERLOGIC Circuit Monitor Space Requirements	32
POWERLOGIC Power Meter Space Requirements	34
Branch Circuit Breaker Unit Interrupting Ratings per IEC 439	36
Space Requirements for Circuit Breaker Branch Feeder Units	37
Motor Starter Unit Interrupting Ratings per IEC 60947-4-1	39
Control Voltage Selections	40
Full Voltage Non-Reversing (FVNR) Starters with Circuit Breaker Disconnects (kW Rated)	41



Model 6 Export Motor Control Centers
Application and General Information

Full Voltage Non-Reversing (FVNR) Starters with Circuit Breaker Disconnects (HP Rated) . . . 43
Full Voltage Reversing (FVR) Starters with Circuit Breaker Disconnects (kW Rated) 44
Full Voltage Reversing (FVR) Starters with Circuit Breaker Disconnects (HP Rated) 46
Reduced Voltage Autotransformer (RVAT) Starters with Circuit Breaker Disconnects
(kW Rated) 47
Reduced Voltage Autotransformer (RVAT) Starters with Circuit Breaker Disconnects
(HP Rated) 47
Utilization Categories for Contactors Conforming to IEC 60947-4 48



Model 6 Export Motor Control Centers Application and General Information

SECTION 3—APPLICATION AND GENERAL INFORMATION

Enclosure Types

The Model 6 Export MCC is available in three enclosure classifications per IEC 60529: IP 20, IP 24, and IP 52. The customer should choose the enclosure classification that meets the installation requirements, considering environment and use. In addition to meeting the IEC Degrees of Protection of IP 20, IP 24, and IP 52, the Model 6 Export can meet the NEMA Enclosure Type numbers as shown in the following table.

Model 6 Export Enclosure Selections

Meets IEC Enclosure Classification	Similar to NEMA Enclosure Type Number	Protection Characteristics
IP 20	1	Protected against the penetration of solid objects that have a diameter greater than or equal to 12.5 mm (0.5 in.) per IEC 60529 test. Protected against direct finger contact per IEC 60529 test. Not protected against penetration of water per IEC 60529 test. Protected against falling dirt per UL 50 test. Rust resistant per UL 50 test.
IP 24	3R	Protected against the penetration of solid objects that have a diameter greater than or equal to 12.5 mm (0.5 in.) per IEC 60529 test. Protected against direct finger contact per IEC 60529 test. Protected against splashing water per IEC 60529 test. Rainproof per UL 50 test. External icing per UL 50 test. Rust resistant per UL 50 test.
IP 52	12	Dust protected per IEC 60529 test. Protected against direct contact with a 1 mm (0.04 in.) diameter wire per IEC 60529 test. Protected against splashing water per IEC 60529 test. Dust tight per UL 50 test. Drip tight per UL 50 tests. Rust resistant per UL 50 test.

The NEMA types meet or exceed the test requirement for the associated IEC classifications. NEMA Standards Publication 250 and the UL 50 Standard test for environmental conditions such as corrosion and rust. For this reason, and because tests and evaluations for other characteristics are not identical, the IEC enclosure classifications in the table above cannot be used to convert IEC classification designations to NEMA types.

NEMA Enclosure Types

- **Type 1:** Intended for indoor use only. Type 1 enclosures are primarily designed to provide protection against contact with an energized interior. Type 1 enclosures are designed for use in locations where normal service conditions exist.
- **Type 3R:** Intended for outdoor use only. Type 3R enclosures are primarily designed to provide protection against falling rain and sleet, and to remain undamaged by ice formation on the enclosure. They are *not* intended to provide protection against conditions such as dust, internal condensation, or internal icing. They are not intended for extreme weather conditions.
- **Type 12:** Intended for indoor use only. Type 12 enclosures are primarily designed to provide some protection against dust, falling dirt, and dripping water. They are not intended to provide protection against conditions such as internal condensation.



Model 6 Export Motor Control Centers

Application and General Information

IEC Degrees of Protection

IEC publication 60529, *Classification of Degrees of Protection Provided by Enclosures*, provides a system for specifying the enclosures of electrical equipment based on the degree of protection they provide.

The IEC designation consists of the letters “IP,” which are usually followed by two numerals (for example, “IP 55”). The first characteristic numeral indicates the degree of protection provided by the enclosure with respect to persons and solid foreign objects entering the enclosure. The second characteristic numeral indicates the degree of protection provided by the enclosure with respect to the harmful ingress of water. The following tables explain the meaning of the two classification numbers.

IEC 60529 Enclosure Classification Designations—First Characteristic Numeral

First Characteristic Numeral		Protection of the Equipment	Protection of Personnel
Corresponds to protection of the equipment against penetration of solid objects and protection of personnel against direct contact with live parts.			
0		Not protected	Not protected
1	<p>Ø 50 mm</p>	Protected against the penetration of solid objects having a diameter greater than or equal to 50 mm (2 in.).	Protected against direct contact with the back of the hand (accidental contacts).
2	<p>Ø 12.5 mm</p>	Protected against the penetration of solid objects having a diameter greater than or equal to 12.5 mm (0.5 in.).	Protected against direct finger contact.
3	<p>Ø 2,5 mm</p>	Protected against the penetration of solid objects having a diameter greater than or equal to 2.5 mm (0.1 in.).	Protected against direct contact with a 2.5 mm (0.1 in.) diameter tool.
4	<p>Ø 1 mm</p>	Protected against the penetration of solid objects having a diameter greater than 1 mm (0.04 in.).	Protected against direct contact with a 1 mm (0.04 in.) diameter wire.
5		Dust-protected (no harmful deposits).	Protected against direct contact with a 1 mm (0.04 in.) diameter wire.
6		Dust-tight.	Protected against direct contact with a 1 mm (0.04 in.) diameter wire.









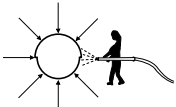
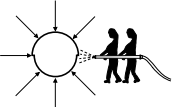

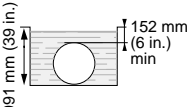

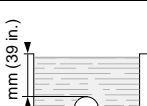


Model 6 Export Motor Control Centers Application and General Information

IEC 60529 Enclosure Classification Designations—Second Characteristic Numeral

Second Characteristic Numeral

Corresponds to protection of equipment against penetration of water with harmful effects.

0	Not protected	
1 		Protected against vertical dripping water (condensation).
2		Protected against dripping water at an angle of up to 15°.
3 		Protected against rain at an angle of up to 60°.
4 		Protected against splashing water in all directions.
5 		Protected against water jets in all directions.
6		Protected against powerful jets of water and waves.
7 		Protected against the effects of temporary immersion.
8 		Protected against the effects of prolonged immersion under specified conditions.



Model 6 Export Motor Control Centers Application and General Information

Surface Appearance and Color

All metal structural and unit parts are completely painted using an Electro-deposition process, so that interior and exterior surfaces have a complete finish coat both on and between them. The basic process consists of using an iron phosphate pretreatment to improve paint adhesion and a non-chrome sealer rinse to enhance corrosion resistance. The paint process consists of cleaning, rinses, phosphating, non-chrome sealer rinses, prepaint rinses, painting, post-paint rinse, a bake cure, and a cool down.

- Paint is UL-recognized acrylic Electro-deposition baked enamel American National Standards Institute (ANSI) 49 medium light gray.
- All painted parts are able to pass at least 300 hours of salt spray per the American Society for Testing and Materials (ASTM) b117 with less than 1/8 in. (3 mm) loss of paint from a scribed line.

Structural Steel Gauge

Part Description	Thickness (Gauge)	Thickness (Millimeters)
Corner channels	12	2.6
Back plates: 20–30 in. wide	16	1.4
35 in. wide	14	1.9
End closing plates	16 (Outdoor IP 24: 12 gauge)	1.4
Unit doors	14 and 16 (Outdoor IP 24: 12 gauge on outer door)	1.9 and 1.4
Side channels	11	2.9
Top and bottom frame	12	2.6
Top and bottom plates	14	1.9
Base channels	10	3.4
Lifting angle	7	4.6

Structure Options and Modifications

Description	Standard or Optional
12-in. (305 mm) high pull box	Optional
18-in. (457 mm) high pull box	Optional
Bottom plate for MCC section	Standard
9-in. (229 mm) wide vertical wireway (This option applies only to 25-in./ 635 mm wide sections with plug-in units.)	Optional
Wire tie retainers in vertical wireway	Optional
Vertical bus barrier closing shutters	Standard
Non-standard exterior color (includes one coat of paint selected by Square D) <i>Consult the factory for specifications that detail primers, paint, thickness, and the application process.</i>	Optional
Fishtape barrier (Prevents fishtapes that enter through the bottom of the structure from rising into the wireway.)	Standard
Rodent barriers	Standard
CE Marking (Provides documentation and CE label on the MCC. The customer must choose either a Certificate for Declaration of Incorporation or a Certificate for Declaration of Conformity.)	Optional



Model 6 Export Motor Control Centers Application and General Information

Main Bus Amps and Material

- 600 A tin-plated copper
- 800 A tin-plated copper
- 1200 A tin-plated copper
- 1600 A tin-plated copper—*20-in. (508 mm) deep structures only*
- 2000 A tin-plated copper—*20-in. (508 mm) deep structures only*
- 2500 A tin-plated copper—*20-in. (508 mm) deep and IP 20 structures only*

Bussing Options and Modifications

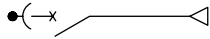
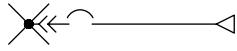
Description		Standard or Optional
600 A vertical bus — tin-plated copper		Standard
Bus withstand rating (I_{CW}) (Modifications to increase the bus system withstand to meet available fault current requirements)	50,000 A rms	Standard
	70,000 A rms	Optional
Tin-plated copper vertical ground bus		Standard
Copper horizontal ground bus — 1/4 in. x 2 in. (6 mm x 51 mm) — 2 bars		Standard
2-in. (51 mm) main/horizontal bus — tin-plated copper		Standard



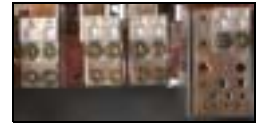
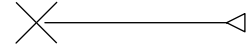
Model 6 Export Motor Control Centers

Application and General Information

Incoming Devices



Main Circuit Breaker



Main Lugs

General Information

Incoming—or main—devices connect power to the motor control center. In most MCC applications, the power system is configured as 3-phase, 4-wire, and the system neutral is not connected to the MCC. If a neutral wire connection is required, a neutral option can be added at the customer's request (see "Three-Phase, Four-Wire Systems" on page 31). The main power connection to the MCC bus is located at the top or bottom of the structure, entering from the front. Rear connections are not available.

Typically, a main lug or main circuit breaker is used to connect power to the MCC. One of these devices is connected to the horizontal or main bus with a hard bus. The incoming device must be mounted at the top or bottom of the structure, as determined by the customer and the incoming direction of the power connections. The top or bottom location orients incoming device terminals toward the incoming connection for ease of installation.

Main Lug Compartments

- Main lug compartments must be specified in the absence of other incoming line provisions.
- Three-phase, 4-wire main lugs include a neutral assembly for cable connection to other units with solid neutrals.
- Main lug unit short circuit ratings up to 70,000 (I_{CW}) are optional, and can be included at the customer's request.



Model 6 Export Motor Control Centers Application and General Information

Top-Located Main Lug Compartments

System	Amps	Space (Inches)	Space (Millimeters)
3-phase 3-wire	600	6	152
	800		
	1200	12	305
	1600 ★	72	1829
	2000 ★		
	2500 ★		
3-phase 4-wire	600	9	229
	800		
	1200 ●	12	305
	1600 ★	72	1829
	2000 ★		
	2500 ★		

★ 30 in. (762 mm) wide by 20 in.(508 mm) deep section

● 25 in. (635 mm) wide section with a 9 in. (229 mm) wireway

Bottom-Located Main Lug Compartments

System	Amps	Space (Inches)	Space (Millimeters)
3-phase 3-wire	600	18	457
	1200 ★	36	914
	1600 ●	72	1829
	2000 ●		
	2500 ●		
3-phase 4-wire	600	18	457
	1200 ★	36	914
	1600 ●	72	1829
	2000 ●		
	2500 ●		

★ 25 in. (635 mm) wide section with a 9 in. (229 mm) wireway

● 30 in. (762 mm) wide by 20 in.(508 mm) deep section



Model 6 Export Motor Control Centers Application and General Information

MERLIN GERIN® COMPACT® NSJ400 Circuit Breaker



Main Circuit Breakers

- Main circuit breaker units are provided with MERLIN GERIN® COMPACT® NS circuit breakers up to 600 A. For circuit breakers above 600 A, Square D IEC-rated thermal magnetic circuit breakers are provided.
- Units are of fixed or removable construction as indicated in the tables on page 29.
NOTE: Removable units have line connections that are withdrawable and fixed load connections (IEC 60439-1 type WFF).
- Circuit breakers provide circuit protection and isolation per IEC standard 947-2.
- MERLIN GERIN disconnect handles are rotary. Square D circuit breaker handles are toggle (M-frame) or rotary (P-frame).
- Disconnect handles are interlocked with the door to prevent the door from opening while the circuit breaker is closed. ON (I), OFF (O), and TRIP positions are clearly indicated on the handle.
- MERLIN GERIN COMPACT NS100, NS160, NS250, and M-frame or P-frame circuit breakers include thermal magnetic trip units as standard. STR22SE electronic trip units are optional (at the customer's request) on NS100, NS160, and NS250 circuit breakers.
- MERLIN GERIN COMPACT NS400 and NS630 circuit breakers include STR23SE electronic trip units as standard. STR53UE full function electronic trip units are optional at the customer's request.
- MICROLOGIC® trip systems are available as an option (at the customer's request) on Square D thermal magnetic circuit breakers.
- Interrupting ratings (I_{CU}) for all circuit breaker units are shown in "Main Circuit Breaker Unit Interrupting Ratings per IEC 439," on page 29.
- All main circuit breakers are high interrupting type "H."
- Main circuit breakers are 3-pole versions only.



Model 6 Export Motor Control Centers Application and General Information

Main Circuit Breaker Unit Interrupting Ratings per IEC 439

Circuit Breaker Type	220/240 Vac 50/60 Hz	380/400/415 Vac 50/60 Hz	440 Vac 50/60 Hz	660/690 Vac 50/60 Hz
NS160H	70 kA	70 kA	65 kA	10 kA
NS250H				20 kA
NS400H				
NS630H				
MH	65 kA	65 kA	65 kA *	Not available
ME				
MX				
PH	70 kA	70 kA	70 kA *	
PE				
PX				

★ Self-certified

NOTE: All units are for 3-phase, 3-wire systems. For 3-phase, 4-wire applications, see page 31.

Top-Located Main Circuit Breakers

Circuit Breaker Trip Rating (Amps)	Circuit Breaker Type	Circuit Breaker Frame	Space (Inches / Millimeters)
125	NS160H	160 A 3-pole	15 / 381 (removable)
160			
200	NS250H	250 A 3-pole	
250			
400	NS400H	400 A 3-pole	24 / 610 (removable)
600	NS630H	630 A 3-pole	
800	MH/ME/MX	1000 A 3-pole	72 / 1829 (25W x 20D / 635W x 508D)
1000	MH		
1200	PH/PE/PX	2000 A 3-pole	72 / 1829 (30W x 20D / 762W x 508D)
1600			
2000			

Bottom-Located Main Circuit Breakers

Circuit Breaker Trip Rating (Amps)	Circuit Breaker Type	Circuit Breaker Frame	Space (Inches / Millimeters)
125	NS160H	160 A 3-pole	15 / 381 (removable)
160			
200	NS250H	250 A 3-pole	
250			
400	NS400H	400 A 3-pole	30 / 762 (removable)
600	NS630H	630A 3-pole	
800	MH/ME/MX	1000 A 3-pole	72 / 1829 (25W x 20D / 635W x 508D)
1000	MH		
1200	PH/PE/PX	2000 A 3-pole	72 / 1829 (30W x 20D / 762W x 508D)
1600			
2000			



Model 6 Export Motor Control Centers

Application and General Information

Wire Size Range for Standard Mechanical Lugs

Main Lug Compartments

Main Lug Amps	Lug Wire Range (mm ² AWG)	Lugs Per Phase/Neutral
600	85-240 3/0 AWG-500 kcmil	2
800	85-240 3/0 AWG-500 kcmil	3
1200	85-240 3/0 AWG-500 kcmil	4
1600	95-400 3/0 AWG-750 kcmil	6
2000	95-400 3/0 AWG-750 kcmil	6
2500	95-400 3/0 AWG-750 kcmil	6

Main and Branch Circuit Breaker Compartments

Circuit Breaker Frame	Amps	Lug Wire Range (mm ² AWG)	Lugs Per Phase
NS100	100	1.5-9.5 #16-3/0	1
NS125	125		
NS160	160		
NS200	200		
NS250	250		
NS400	400	35-300 #2 AWG-600 kcmil	2
NS630	600	85-240 3/0 AWG-500 kcmil	
MA/MH	800	95-240 3/0 AWG-500 kcmil	3
	1000	95-400 3/0 AWG-750 kcmil	
PA/PH	1200-2000	95-400 3/0 AWG-750 kcmil	6

Neutral Lug Terminations

Application	Lug Wire Range (mm ² AWG)
100 A main or branch	(1) 4-50 (1) #12-1/0
200/225 A main or branch	(1) 25-150 (1) #4-300 kcmil
400 A main or branch	(1) 50-300/(2) 50-120 (1) #1-600 kcmil/(2) #1-250 kcmil
600 A top-located main circuit breaker	(3) 95-240 (3) 3/0-500 kcmil
600 A branch or bottom main circuit breaker/ fusible switch	
800-2000 A main or branch	(4) 95-300 (4) 3/0-750 kcmil
600-2500 A main lugs	See the table, "Main Lug Compartments" above
Neutral rating 1200 A max.	(4) 95-300/(1) 25-185 (4) 3/0-750 kcmil/(1) #6-300 kcmil



Model 6 Export Motor Control Centers Application and General Information

Three-Phase, Four-Wire Systems

If the motor control center contains only motor loads, and no future four-wire loads are anticipated, it is not necessary to bring the neutral conductor into the MCC. If the customer requests, an optional neutral lug assembly can be provided in the incoming main section in order to terminate a neutral conductor. Additional lugs can be added for connections to the neutral.

When four-wire loads are present in the MCC, solid neutral bussing can be provided in individual sections and connected to provide a continuous neutral bar. To increase accessibility, incoming and outgoing neutral conductors can be terminated at the neutral lug assembly located in each vertical wireway. Lugs are not provided, but holes are pre-drilled to accommodate user-mounted lugs.

Four-Wire Options

Description	Application	Space
Neutral lug termination ★ (Provides termination for the fourth wire on 3-phase/4-wire systems)	100 A branch	0
	160/250 A main or branch	
	400 A main or branch ★	
	600 A top main	
	600 A bottom main or branch	
	800 A main or branch	
	1000 A main or branch	
	1200 A main or branch	
	1600–2500 A main or branch	
	600–2500 A main lugs	See the main lug compartment tables on page 27.
Solid neutral bus★ (Price per section—20 in. (508 mm) deep sections required)	600–800 A (1) 1.5 in. x 0.25 in. cu (38 mm x 6 mm)	0
	1200–2500 A (2) 1.5 in. x 0.25 in. cu (38 mm x 6 mm) Max 100% rating is 1200 A	
Neutral bus drop★	Provides vertical extension of solid neutral bus into the vertical wireway to facilitate neutral connections from units.	

★ As an option, neutrals in units can factory connected at the customer's request.

Four-Wire Examples

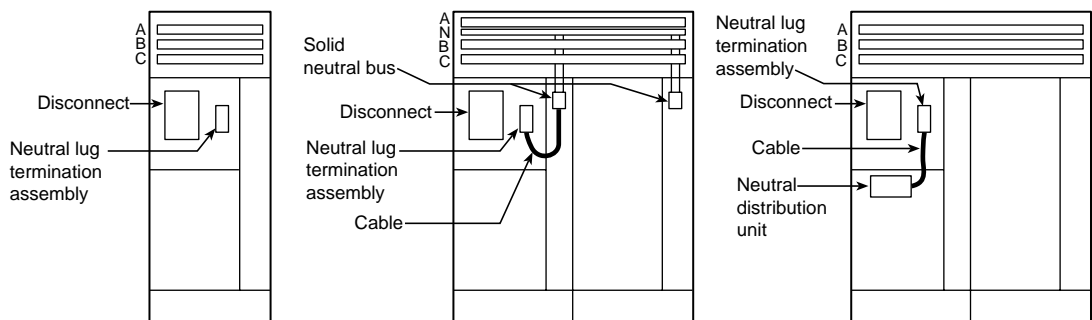


Figure 1

Figure 2

Figure 3



Model 6 Export Motor Control Centers Application and General Information

POWERLOGIC® Monitoring



The POWERLOGIC Circuit Monitor from Schneider Electric is a multifunction instrumentation, data acquisition, and control device that replaces conventional metering, data acquisition, and control equipment. POWERLOGIC monitors replace discrete meters due to their ability to communicate metering information via an RS-485 (RS-422 compatible) communication channel to a personal computer, local display, PLC, or DCS system.

Circuit Monitor Model	Application	Space
CM-2250 (3-phase, 3-wire system)	Instrumentation and waveform capture	See "POWERLOGIC Circuit Monitor Space Requirements" below
CM-2350 (3-phase, 3-wire system)	Instrumentation, waveform capture, and extended memory	
IOM-11	I/O module with 4 status inputs, 1 KYZ pulse output	0
IOM-44	I/O module with 4 status inputs, 1 KYZ pulse output, and 3 form-C relay outputs	
IOM-4444-20	I/O module with 4 status inputs, 1 KYZ pulse output, 3 form-C relay outputs, 4 analog inputs, and 4 analog outputs (4–20 mA dc)	

POWERLOGIC Circuit Monitor Space Requirements

Main Device Type	Space (Inches / Millimeters)
Main Lugs	
Top- or bottom-located, 600–1200 A	15 / 381
Top- or bottom-located, 1600–2500 A	0
Main Breaker	
Top- or bottom-located, 250 A	21 / 533
Top- or bottom-located, 400 A	15 / 381
Top- or bottom-located, 600 A without Form U231 (neutral lug termination)	
Top-located, 600 A with Form U231 (neutral lug termination)	30 / 762
Bottom-located, 600 A with Form U231 (neutral lug termination)	27 / 686
Top- or bottom-located, 800–2000 A	0



Model 6 Export Motor Control Centers Application and General Information

POWERLOGIC® Power Meter



The POWERLOGIC Power Meter is designed for use in basic power metering applications. It can replace conventional metering devices such as ammeters, voltmeters, and watt-hour meters, and provides powerful capabilities not offered by analog metering. The MCC Power Meter option includes the Power Meter module, front mounted display for easy viewing, required current transformers, and control power fusing. The Power Meter is available on incoming main devices or branch feeder devices. This option can offer an economical advantage in MCCs that require multiple analog meters for voltage, current, and watt-hours.

Power Meter Model	Application	System	Space
PM600 and PMD32	Power Meter display plus module with instrumentation functions and 0.25% accuracy	3PH3W MCC	See the table, "POWERLOGIC Power Meter Space Requirements," on page 34.
		3PH4W MCC	
PM620 and PMD32	Power Meter display plus module with PM-600 functions, date/time stamp, THD/thd, neutral current, and demand values	3PH3W MCC	
		3PH4W MCC	
PM650 and PMD32	Power Meter display plus module with PM-620 functions, min./max. readings, alarm/relay functions, and event and data logging	3PH3W MCC	



Model 6 Export Motor Control Centers Application and General Information

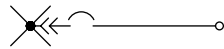
POWERLOGIC Power Meter Space Requirements

Device Type	Additional Space Requirements (Inches/Millimeters)
Main Lugs	
Top-located, 600–1200 A	9 / 229
Bottom-located, 600–1200 A	
Top- or bottom-located, 1600–2500 A	0
Main Circuit Breaker	
Top- or bottom-located, 125–250 A	9 / 229
Top- or bottom-located, 400 A	
Top- or bottom-located, 600 A, without Form U231 (neutral lug termination)	
Top-located, 600 A, with Form U231 (neutral lug termination)	6 / 152
Bottom-located, 600 A, with Form U231 (neutral lug termination)	9 / 229
Top- or bottom-located, 800–2000 A	0
Branch Circuit Breaker	
16–100 A	9 / 229
125–250 A	
400–600 A	
800–1200 A	0



Model 6 Export Motor Control Centers Application and General Information

Branch Feeder Units



Circuit Breaker Branch



Branch feeder units include the following features:

- MERLIN GERIN® COMPACT® NS circuit breakers up to 600 A. For circuit breakers above 600 A, Square D IEC-rated thermal magnetic circuit breakers are provided.
- Units are of fixed or removable construction as indicated in the table, "Space Requirements for Circuit Breaker Branch Feeder Units," on page 37.
NOTE: Removable units have line connections that are withdrawable and fixed load connections (IEC 60439-1 type WFF).
- Circuit breakers provide branch circuit protection and isolation per IEC standard 947-2.
- Standard interrupting ratings are shown in the table, "Branch Circuit Breaker Unit Interrupting Ratings per IEC 439," on page 36. At the customer's request, optional high interrupting or electronic trip circuit breakers can be supplied.
- MERLIN GERIN disconnect handles are rotary. Square D circuit breaker handles are toggle (M-frame) or rotary (P-frame).
- Disconnect handles are interlocked with the door to prevent the door from opening while the circuit breaker is closed. ON (I), OFF (O), and TRIP positions are clearly indicated on the handle.
- MERLIN GERIN COMPACT NS100, NS160, NS250, and M-frame or P-frame circuit breakers include thermal magnetic trip units as standard. STR22SE electronic trip units are optional (at the customer's request) on NS100, NS160, and NS250 circuit breakers.
- MERLIN GERIN COMPACT NS400 and NS630 circuit breakers include STR23SE electronic trip units as standard. STR53UE full function electronic trip units are optional at the customer's request.
- MICROLOGIC® trip systems are available as an option (at the customer's request) on Square D thermal magnetic circuit breakers.
- Interrupting ratings (I_{CU}) for all breaker units are shown in the table, "Branch Circuit Breaker Unit Interrupting Ratings per IEC 439," on page 36.

Model 6 Export Motor Control Centers Application and General Information

Branch Circuit Breaker Unit Interrupting Ratings per IEC 439

Circuit Breaker Type	220/240 Vac 50/60 Hz	380/400/415 Vac 50/60 Hz	440 Vac 50/60 Hz	660/690 Vac 50/60 Hz
Standard Interrupting				
NS100N	70 kA	25 kA	25 kA	8 kA
NS160N		36 kA	35 kA	
NS250N		45 kA	42 kA	10 kA
NS400N				
NS630N				
MA	30 kA	30 kA	30 kA *	Not available
PA	50 kA	50 kA	50 kA *	
High Interrupting				
NS100H ●	70 kA	70 kA	65 kA	10 kA
NS160H ●				
NS250H ●				
NS400H ●				
NS630H ●				
MH ●	65 kA	65 kA	65 kA *	Not available
PH ●	70 kA	70 kA	70 kA *	
Standard Electronic Trip				
NS100N ●	70 kA	25 kA	25 kA	8 kA
NS160N ●		36 kA	35 kA	
NS250N ●		36 kA	35 kA	
NS400N		45 kA	42 kA	10 kA
NS630N		45 kA	42 kA	
NS100H ●		70 kA	65 kA	
NS160H ●				
NS250H ●				
NS400H				
NS630H		20 kA		
MX ●	65 kA		65 kA	65 kA *
PX ●	70 kA	70 kA	70 kA *	Not available
Full Function Electronic Trip				
NS400N ●	70 kA	45 kA	42 kA	10 kA
NS630N ●		70 kA	65 kA	20 kA
NS400H ●				
NS630H ●				
ME ●	65 kA	65 kA	65 kA *	Not available
PE ●	70 kA	70 kA	70 kA *	

★ Self-certified
● Optional feature added at the customer's request



Model 6 Export Motor Control Centers Application and General Information

Space Requirements for Circuit Breaker Branch Feeder Units

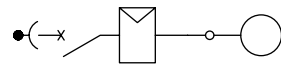
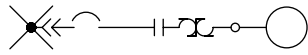
Circuit Breaker Trip Rating (Amps)	Circuit Breaker Type	Circuit Breaker Frame	Space (Inches/Millimeters)
16	NS100N	100 A 3-pole	12 / 305 (removable)
25			
32			
40			
50			
63			
80			
100			
125	NS160N	160 A 3-pole	15 / 381 (removable)
160			
200	NS250N	250 A 3-pole	30 / 762 (removable)
250			
400	NS400N	400 A 3-pole	72 / 1829 (25W x 20D / 635W x 508D)
600	NS630N	630 A 3-pole	
800	MA	1000 A 3-pole	72 / 1829 (25W x 20D / 635W x 508D)
1000			
1200	PA	2000 A 3-pole	72 / 1829 (30W x 20D / 762W x 508D)



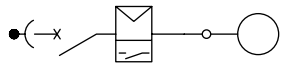
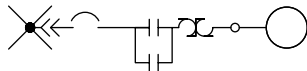
Model 6 Export Motor Control Centers Application and General Information

Motor Starter Units

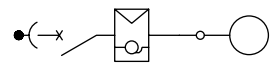
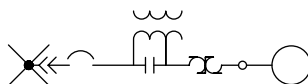
Full Voltage Non-Reversing (DOL) Starter



Full Voltage Reversing Starter



Reduced Voltage Autotransformer Starter



Circuit Breaker/Contactor Coordination

The IEC standard for motor starters and contactors—947-4-1—defines two levels (Type 1 and Type 2) of protection/coordination for motor starters under short circuit conditions. Both levels of protection are achieved by using a specific combination of motor starter and short circuit protection devices.

Type 1 Coordination: Under short circuit conditions, the contactor or starter shall cause no danger to persons or installation, and *may not* be suitable for further service without repair and replacement of parts.

Faults in electrical systems are most likely to be low level. Motor controllers built to meet Type 1 coordination standards handle these types of faults well. After a fault is cleared, the only necessary actions are to inspect the motor controller to determine if device repair or replacement is necessary, and



Model 6 Export Motor Control Centers Application and General Information

to reset the circuit breaker or replace the fuses. In situations where available fault currents are high and any period of maintenance downtime is crucial, a higher degree of coordinated protection may be desirable.

Many industries depend on continuous operation of a critical manufacturing process. Under these conditions, Type 1 protection may not adequately prevent damage to motor starter components, and Type 2 coordination is needed.

Type 2 Coordination: Under short circuit conditions, the contactor or starter shall cause no danger to persons or installation, and *shall be* suitable for further use. The risk of contact welding is recognized, in which case the manufacturer shall indicate the measures to take in regards to equipment maintenance.

Type 2 coordination does not permit damage to the starter beyond light contact welding, which is easily separated by a screwdriver or several coil operations. Type 2 coordination does not allow parts replacement (except for fuses), and requires that all parts remain in service. In addition to providing basic electrical and fire protection, it also minimizes lost production and unscheduled disruptions by eliminating the downtime needed to replace or repair a starter.

To achieve Type 2 coordination in a motor starter, the manufacturer must:

- Select the proper circuit breaker, motor contactor, and overload relay according to the motor current rating.
- Select the circuit breaker according to the short circuit current that will be broken.
- Verify that the components perform properly during short circuit current breaking operations. For example, the manufacturer verifies that there is no contactor or overload relay damage in the event of a short circuit.

The Model 6 Export MCC starter units below 660 V are coordinated for Type 2 protection levels per IEC 947-4-1. The combination of starter and circuit breakers below 660 V in this catalog have undergone full scale testing, according to IEC 947-4-1 in European laboratories. The level of coordination of starters and circuit breakers meets Type 2 requirements at the level of short circuit current listed in the selection table below.

The Type 2 coordination tests have been witnessed, and IEC third parties (ASEFA/LOVAG) have certified the results.

Motor Starter Unit Interrupting Ratings per IEC 60947-4-1 ★

Circuit Breaker Type	220/240 Vac 50/60 Hz ★	380/400/415 Vac 50/60 Hz ★	440/480 Vac 50/60 Hz ★	660/690 Vac 50/60 Hz
NS100N	70 kA	25 kA	25 kA	8 kA
NS160N		36 kA	35 kA	
NS250N				
NS80H	70 kA	70 kA	65 kA	6 kA
NS100H				10 kA
NS160H				
NS250H				
NS400H				
NS630H				20 kA

★ ASEFA/LOVAG certificates are available.

Note: Type N (standard interrupting) circuit breakers are supplied as standard, unless the customer's short circuit current rating exceeds the interrupting rating listed for the Type N circuit breakers. Type H (high interrupting) circuit breakers are supplied for applications that exceed the Type N ratings. Type H circuit breakers can also be supplied as an option at the customer's request.



Model 6 Export Motor Control Centers

Application and General Information

Starter units in the Model 6 IEC MCC include the following:

- MERLIN GERIN® COMPACT® NS magnetic circuit breakers. Optional: an electrical trip unit can be substituted for a standard magnetic-only trip unit at the customer's request.
- TELEMECANIQUE® D-line or F-line ac contactors rated for IEC utilization category AC-3 inductive applications.
- TELEMECANIQUE LR2 or LR9 solid state overload relays rated for class 10 trip class motor protection. Optional: Class 20 or LT6 multifunction protection relays can be substituted for the standard class 10 protection at the customer's request.
- Units below 660 V contain control power transformers for contactor control per the standard control voltage (see the table below, "Control Voltage Selections").
- UL Class CC fuses in the starter unit for primary and secondary protection of the control power transformer.
- Optional control voltages for contactor and remote control are available at the customer's request (see the table below, "Control Voltage Selections").
- Plug-on construction that meets the definition of a removable part per IEC 60439-1. The power connections on the line side are withdrawable. External connections for the motor and control terminals are fixed connections (IEC 60439-1 Type WFF).

Control Voltage Selections

Main Voltage	Standard Control Voltage	Optional Control Voltage (customer request)
220/240 Vac, 50 Hz	110 V, 50 Hz	220 V, 50 Hz (line to line) 24 V, 50 Hz
380/400/415 Vac, 50 Hz	110 V, 50 Hz	220 V, 50 Hz (transformer secondary) 220 V, 50 Hz (line to neutral) 24 V, 50 Hz 380 V, 50 Hz (line to line)
440 Vac, 50 Hz	110 V, 50 Hz	220 V, 50 Hz (transformer secondary) 24 V, 50 Hz
660/690 Vac, 50 Hz ★	110 V, 50 Hz	220 V, 50 Hz 24 V, 50 Hz 380 V, 50 Hz
480 Vac, 60 Hz	120 V, 60 Hz	24 V, 60 Hz 480 V, 60 Hz (line to line)

★ The customer must supply separate control power to these units.



Model 6 Export Motor Control Centers Application and General Information

Full Voltage Non-Reversing (FVNR) Starters with Circuit Breaker Disconnects (kW Rated)

Motor Kilowatt Rating				Unit Amp Rating	AC-3 Duty IEC Contactor Type	Overload Relay	Circuit Breaker Type	C/B Amps	Space (In./mm)
220/230/240 V	380/400/415 V	440 V	660/690 V ★						
0.09/0.12	0.18/0.25	0.25	–	0.63–1	LC1D09	LR2D1305	NS080HMA	1.5	6 / 152 ●
0.18	0.37	0.37/0.55	0.75	1–1.6		LR2D1306		2.5	
–	–	–	1	1.2–2		LR2D13X6		6.3	
0.25–0.37	0.55/0.75	0.75/1.1	1.5	1.6–2.5		LR2D1307			
–	–	–	2.2/3	2.5–4	LC1D18	LR2D1308	25		
0.55/0.75	1.1/1.5	1.5	–	4–6	LC1D09	LR2D1310		50	
–	–	–	4		LC1D25				
1.1	2.2	2.2/3	–	5.5–8	LC1D09	LR2D1312	25		
–	–	–	5.5		LC1D32				
1.5	3	4	–	7–10	LC1D12	LR2D1314	50		
–	–	–	7.5		LC1D32				
2.2	4	–	–	9–12	LC1D18	LR2D1316	25		
3	5.5	5.5	–						
–	–	–	10	12–18	LC1D25	LR2D1321	50		
–	–	–	15						
4	7.5	7.5	–	17–25	LC1D32	LR2D1322	25		
–	–	–	18.5						
5.5/6.3	10/11	10/11	–	23–32	LC1D40	LR2D3353	50		
7.5	15	15	–						
–	–	–	30	30–40	LC1D50	LR2D3355	50		
10	18.5	18.5/22	–						
–	–	–	33	37–44	LC1D50	LR2D3357	50		
11	22	–	–						

★ The 660/690 V units are self-certified for Type 1 coordination per IEC 947-4-1.

● COMPAC™ 6 units



Model 6 Export Motor Control Centers Application and General Information

Full Voltage Non-Reversing (FVNR) Starters with Circuit Breaker Disconnects (kW Rated) (Continued)

Motor Kilowatt Rating				Unit Amp Rating	AC-3 Duty IEC Contactor Type	Overload Relay	Circuit Breaker Type	C/B Amps	Space (In./mm)	
220/230/240 V	380/400/415 V	440 V	660/690 V ★							
0.18	0.37	0.37/0.55	0.75	1–1.6	LC1D09	LR2D1306	NS100-MA	2.5	12 / 305	
–	–	–	1	1.2–2		LR2D13X6				
0.25/0.37	0.55/0.75	0.75/1.1	1.5	1.6–2.5		LR2D1307				
0.55/0.75	1.1/1.5	1.5	2.2/3	2.5–4	LC1D40	LR2D1308	6.3			
1.1	2.2	2.2/3	4	4–6		LR2D1310				
–	–	–	5.5	5.5–8		LR2D1312				
1.5	3	4	–		7–10	LC1D12	12.5			
–	–	–	7.5	LC1D40		LR2D1314				
2.2	4	–	–	9–12	LC1D40	LR2D1316	25			
3	5.5	5.5	–	9–13				LC1D18		
–	–	–	10	12–18	LC1D25	LR2D1321				
–	–	–	15		LC1D40					
4	7.5	7.5	–	17–25	LC1D32	LR2D3322				
–	–	–	18.5		LC1D40					
5.5/6.3	10/11	10/11	–	23–32	LC1D80	LR2D3353		50		
7.5	15	15	–		30–40					LC1D40
–	–	–	30	37–50	LC1D50	LR2D3357				
–	–	–	33		LC1D80					LR2D3355
10/11	18.5	18.5/22	–	37–50	LC1D65	LR2D3357				
–	–	–	37		LC1D80		LR2D3359			
–	–	–	45	48–50	LC1D115	LR9D5367	100			
15	–	–	–							60–100
–	–	–	55	48–64	LC1D80	LR2D3359	12 / 305			
18.5	30	30/37	–							63–76
22	37	45	–	60–100	LC1D115	LR9D5367	21 / 533			
–	–	–	75					90–115		LR9D5369
37/45	75	75/90	90/110	90–150	LC1D150	NS160-MA	150			
–	–	–	132/160	132–220	LC1F265	LR9F5371	NS250-MA	220		42 / 1067
55	90	110	–	132–185	LC1F185					
–	110	132	–	132–220	LC1F225	LR9F7375	NS400-MA	320		48 / 1219
–	–	–	200/220	200–320	LC1F330					
75	132	160	–	200–265	LC1F265		NS630-MA	500	72 / 1829	
–	–	–	250	200–300	LC1F400		NS400-MA	320	48 / 1219	
–	–	–	200/220	200–320	LC1F330	LR9F7379	NS630-MA	500	72 / 1829	
–	–	–	335	300–500	LC1F500					
110	200	220/250	–	300–400	LC1F400	LR9F7379	NS630-MA	500	72 / 1829	
132/150	220/250	300	–	300–500	LC1F500					

★ The 660/690 V units are self-certified for Type 1 coordination per IEC 947-4-1.

● COMPAC™ 6 units



Model 6 Export Motor Control Centers Application and General Information

NOTE: The component selections below are based on motor full load amps per the National Electrical Code Table 430-150 for 1800 rpm, NEMA Design B motors. For motors with rated speeds of 1200 rpm or lower, or non-NEMA Design B, obtain the actual motor full load amps and consult the factory.

Full Voltage Non-Reversing (FVNR) Starters with Circuit Breaker Disconnects (HP Rated)

Motor Horsepower Rating @ 480 V	Unit Amp Rating	AC3 Duty IEC Contactor Type	Overload Relay Type	Circuit Breaker Type ★	C/B Amps	Space (In./mm)	
0.33	0.63–1	LC1D09	LR2D1305	NS080HMA	1.5	6 / 152 ●	
0.5/0.75	1–1.6		LR2D1306		2.5		
1	1.6–2.5		LR2D1307		6.3		
1.5/2	2.5–4	LC1D18	LR2D1308		12.5		
3	4–6	LC1D25	LR2D1310		25		
5	5.5–8	LC1D32	LR2D1312		50		
7.5	9–12		LR2D1316				
10	12–18		LR2D1321				
15	17–25	LC1D40	LR2D3322		NS100-MA		12 / 305
20	23–32	LC1D40	LR2D3353				
25/30	30–40	LC1D50	LR2D3355				
0.5/0.75	1–1.6	LC1D09	LR2D1306	2.5			
1	1.6–2.5	LC1D40	LR2D1307	6.3			
1.5/2	2.5–4		LR2D1308	12.5			
3	4–6		LR2D1310	25			
5	5.5–8		LR2D1312	50			
7.5	9–12		LR2D1316	100			
10	12–18		LR2D1321				
15	17–25	LC1D80	LR2D3322	NS160-MA	21 / 533		
20	23–32	LC1D80	LR2D3353				
25	30–40	LC1D80	LR2D3355				
30	37–50	LC1D80	LR2D3357				
40	48–63	LC1D80	LR2D3359				
50/60	63–80	LC1D80	LR2D3363				
75	60–100	LC1D115	LR9D5367	NS250-MA	42 / 1067		
100	90–150	LC1D150	LR9D5369				
125	132–185	LC1F185	LR9F5371	NS400-MA	48 / 1219		
150	132–220	LC1F225					
200	200–265	LC1F265	LR9F7375	NS630-MA	72 / 1829		
250	200–330	LC1F330					
300/350/400	300–500	LC1F500	LR9F7379				

★ The "–" is replaced with an "N" for standard interrupting, or "H" for high interrupting.

● COMPAC™ 6 units



Model 6 Export Motor Control Centers

Application and General Information

Full Voltage Reversing (FVR) Starters with Circuit Breaker Disconnects (kW Rated)

Motor Kilowatt Rating				Unit Amp Rating	AC3 Duty IEC Contactor Type	Overload Relay	Circuit Breaker Type ●	C/B Amps	Space (In./mm)
220/230/240 V	380/400/415 V	440 V	660/690 V ★						
0.09/0.12	0.18/0.25	0.25	–	0.63–1	D09	LR2D1305	NS080HMA	1.5	6 / 152 ■
0.18	0.37	0.37/0.55	0.75	1–1.6		LR2D1306		2.5	
–	–	–	1	1.2–2		LR2D13X6			
0.25/0.37	0.55/0.75	0.75/1.1	1.5	1.6–2.5		LR2D1307			
–	–	–	2.2/3	2.5–4	D18	LR2D1308		6.3	
0.55/0.75	1.1/1.5	1.5	–			4			
–	–	–	4	4–6	D25	LR2D1310			
1.1	2.2	2.2/3	–			D09			
–	–	–	5.5	5.5–8	D32	LR2D1314		12.5	
1.5	3	4	–						
–	–	–	7.5	7–10	D32	LR2D1316			
2.2	4	–	–						
3	5.5	5.5	–	9–12	D25	LR2D1321	25		
–	–	–	10	9–13					
–	–	–	15	12–18	D32	LR2D1322	50		
4	7.5	7.5	–					17–25	
–	–	–	18.5						
0.18	0.37	0.37/0.55	0.75	1–1.6	D09	LR2D1306	NS100–MA	2.5	12 / 305
–	–	–	1	1.2–2		LR2D13X6			
0.25/0.37	0.55/0.75	0.75/1.1	1.5	1.6–2.5		LR2D1307			
0.55/0.75	1.1/1.5	1.5	–	2.5–4	D40	LR2D1308		6.3	
–	–	–	2.2/3			D09			
1.1	2.2	2.2/3	–	4–6	D40	LR2D1310			
–	–	–	4			D09			
–	–	–	5.5	5.5–8	D40	LR2D1314		12.5	
1.5	3	4	–						
–	–	–	7.5	7–10	D40	LR2D1316			
2.2	4	–	–						
3	5.5	5.5	–	9–12	D25	LR2D1321		25	
–	–	–	10	9–13					
–	–	–	15	12–18	D40	LR2D1321	24 / 610		
4	7.5	7.5	–					12–18	

★ The 660/690 V units are self-certified for Type 1 coordination per IEC 947-4-1.

● The “–” is replaced with an “N” for standard interrupting, or “H” for high interrupting.

■ COMPACT™ 6 units



Model 6 Export Motor Control Centers Application and General Information

Full Voltage Reversing (FVR) Starters with Circuit Breaker Disconnects (kW Rated) (Continued)

Motor Kilowatt Rating				Unit Amp Rating	AC3 Duty IEC Contactor Type	Overload Relay	Circuit Breaker Type ●	C/B Amps	Space (In./mm)	
220/230/240 V	380/400/415 V	440 V	660/690 V ★							
–	–	–	18.5	17–25	D32	LR2D1322	NS100–MA	50	12 / 305	
5.5/6.3	10/11	10/11	–		D40	LR2D3322		25	24 / 610	
7.5	15	15		23–32	D80	LR2D3353				
–	–	–	30	30–40	D40	LR2D3355				
–	–	–	33	37–50	D50	LR2D3357				
10/11	18.5	18.5/22		30–40	D80	LR2D3355				
–	–	–	37	37–50	D65	LR2D3357				
–	22	–			D80	LR2D3359				
15	–	–		48–50				LR2D3357		
–	–	–	45	37–50				100	30 / 762	
–	–	–	55	60–100	D115	LR9D5367	24 / 610			
18.5	30	30/37		48–63	D80	LR2D3359	NS160–MA	100	30 / 762	
22	37	45		63–80		LR2D3363				
30	45	55	75	60–100	D115	LR9D5367		100	30 / 762	
–	55	–		90–115		LR9D5369				
37/45	75	75/90	90/110	90–150	D150			150		
–	–	–	132/160	132–220	F265	LR9F5371		NS250–MA	220	54 / 1372
55	90	110		132–185	F185					
–	110	132		132–220	F225					
–	–	–	200/220	200–320	F330	LR9F7375		NS400–MA	320	72 / 1829
75	132	160		200–265	F265					
–	–	–	250	200–300	F400					
90	160	200		200–320	F330		NS630–MA			
							NS400–MA	320		

★ The 660/690 V units are self-certified for Type 1 coordination per IEC 947-4-1.

● The "–" is replaced with an "N" for standard interrupting, or "H" for high interrupting.

■ COMPACT™ 6 units



Model 6 Export Motor Control Centers Application and General Information

NOTE: The component selections below are based on motor full load amps per National Electrical Code Table 430-150 for 1800 rpm, NEMA Design B motors. For motors with rated speeds of 1200 rpm or lower, or non-NEMA Design B, obtain the actual full motor load amps and consult the factory.

Full Voltage Reversing (FVR) Starters with Circuit Breaker Disconnects (HP Rated)

Motor Horsepower Rating @ 480 V	Unit Amp Rating	AC3 Duty IEC Contactor Type	Overload Relay Type	Circuit Breaker Type ★	C/B Amps	Space (Inches/ Millimeters)		
0.33	0.63–1	D09	LR2D1305	NS080HMA	1.5	6 / 152 ●		
0.5/0.75	1–1.6		LR2D1306		2.5			
1	1.6–2.5		LR2D1307		6.3			
1.5/2	2.5–4	D18	LR2D1308		12.5			
3	4–6	D25	LR2D1310		25			
5	5.5–8	D32	LR2D1312		NS100–MA		2.5	24 / 610
7.5	9–12		LR2D1316	6.3				
10	12–18		LR2D1321	12.5				
0.5/0.75	1–1.6	D09	LR2D1306	NS100–MA		25	30 / 762	
1	1.6–2.5		LR2D1307			50		
1.5/2	2.5–4		D40			LR2D1308		
3	4–6	LR2D1310			NS160–MA	150		
5	5.5–8	LR2D1312						
7.5	9–12	LR2D1316						
10	12–18	LR2D1321						
15	17–25	LR2D3322						
20	23–32	D80	LR2D3353	NS250–MA	220	54 / 1372		
25	30–40		LR2D3355					
30	37–50		LR2D3357					
40	48–63		LR2D3359					
50/60	63–80		LR2D3363					
75	60–100	D115	LR9D5367	NS400–MA	320	72 / 1829		
100	90–150	D150	LR9D5369					
125	132–185	F185	LR9F5371	NS400–MA	320	72 / 1829		
150	132–220	F225	LR9F7371					
200	200–265	F265	LR9F7375	NS400–MA	320	72 / 1829		

★ The "–" is replaced with an "N" for standard interrupting, or "H" for high interrupting.

● COMPAC™ 6 units



Model 6 Export Motor Control Centers Application and General Information

Reduced Voltage Autotransformer (RVAT) Starters with Circuit Breaker Disconnects (kW Rated)

Motor Kilowatt Rating			Unit Amp Rating	AC3 Duty IEC Contactor Type	Overload Relay Type	Circuit Breaker Type *	C/B Amps	Space (In./mm)			
220/230/240 V	380/400/415 V	440 V									
10/11	18.5	18.5/22	30-40	LC1D80	LR2D3355	NS100-MA	50	60 / 1524 (20D / 508 D)			
-	-	-	37-50	LC1D65	LR2D3357						
-	22	-		LC1D80	LR2D3359						
15	-	-	48-50	LC1D115	LR9D5367						
-	-	-	60-100	LC1D80	LR2D3359						
18.5	30	30/37			48-63				LR2D3363		
22	37	45			63-80				LR9D5367		
30	45	55	60-100	LC1D115	LR9D5369				NS160-MA	150	72 / 1829 (20D / 508 D)
-	55	-	90-115	LC1D150	LR9F5371				NS250-MA	220	
37/45	75	75/90	90-150	LC1F265	LC1F185						
-	-	-	132-220	LC1F225	LC1F265	LR9F7375	NS400-MA	320			
55	90	110	132-185	LC1F400	LC1F400				NS630-MA	500	
-	110	-	132-220	LC1F330	LC1F330				NS400-MA	320	
75	132	132/160	200-265	LC1F500	LC1F400				LR9F7379	NS630-MA	
-	-	-	200-300	LC1F400	LC1F400						
90	160	200	200-320	LC1F500	LC1F400						
-	-	-	300-500	LC1F500	LC1F500	LR9F7379	NS630-MA	500			
110	200	220/250	300-400	LC1F500	LC1F500						
132/150	220/250	300	300-500	LC1F500	LC1F500						

* The "-" is replaced with an "N" for standard interrupting, or an "H" for high interrupting.

NOTE: Sections with RVAT starters require single shipping splits.

NOTE: The component selections below are based on motor full load amps per the National Electrical Code Table 430-150 for 1800 rpm, NEMA Design B motors. For motors with rated speeds of 1200 rpm or lower, or non-NEMA Design B, obtain the actual motor full load amps and consult the factory.

Reduced Voltage Autotransformer (RVAT) Starters with Circuit Breaker Disconnects (HP Rated)

Motor Horsepower Rating @ 480 V	Unit Amp Rating	AC3 Duty IEC Contactor Type	Overload Relay Type	Circuit Breaker Type *	C/B Amps	Space (In./mm)	
25	30-40	LC1D80	LR2D3355	NS100-MA	50	60 / 1524 (20D / 508 D)	
30	37-50		LR2D3357		100		
40	48-63		LR2D3359				
50/60	63-80		LR2D3363				
75	60-100	LC1D115	LR9D5367	NS160-MA	150	72 / 1829 (20D / 508D)	
100	90-150	LC1D150	LR9D5369	LR9F5371	NS250-MA		220
125	132-185	LC1F185	LC1F225				
150	100-225	LC1F225	LC1F265	LR9F7375	NS400-MA		320
200	200-265	LC1F265	LC1F330				
250	200-320	LC1F330	LC1F400	LR9F7379	NS630-MA	500	
300	300-400	LC1F400	LC1F500				
350/400	300-500	LC1F500	LC1F500				

* The "-" is replaced with an "N" for standard interrupting, or an "H" for high interrupting.

NOTE: Sections with RVAT starters require single shipping splits.



Model 6 Export Motor Control Centers

Application and General Information

Contactors Utilization

IEC standard 947-4-1 establishes utilization categories for contactors. The four categories (AC-1, AC-2, AC-3, and AC-4) determine the operating frequency and endurance of a contactor. The utilization category is a combination of application and duty cycle rates defined by the following:

- The type of application (inductive motor loads or resistive loads)
- The conditions under which making or breaking current takes place (motor starter or running, reversing, plugging or jogging, locked rotor, or stalled motor)
- The number of making and breaking operations (or cycles) required for the life of the contactor

Utilization Categories for Contactors Conforming to IEC 60947-4

Type of Application	Utilization Category	Definition
AC Applications	Category AC-1	This category applies to AC loads with a power factor greater than or equal to 0.95 ($\cos \varphi \geq 0.95$). Application examples: heating, distribution.
	Category AC-2	This category applies to starting, plugging, and inching of slip ring motors. On closing, the contactor makes the starting current, which is about 2.5 times the rated current of the motor. On opening, it must break the starting current at a voltage less than or equal to the main supply voltage.
	Category AC-3	This category applies to squirrel cage motors with breaking during normal running of the motor. On closing, the contactor makes the starting current, which is about 5 to 7 times the rated current of the motor. On opening, it breaks the rated current drawn by the motor; at this point, the voltage at the contactor terminals is about 20% of the main supply voltage. Breaking is light. Application examples: all standard squirrel cage motors — such as lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, and air conditioning units.
	Categories AC-4 and AC-2	These categories cover applications with plugging and inching of squirrel cage and slip ring motors. The contactor closes at a current peak which may be as high as 5 or 7 times the rated motor current. On opening, it breaks this same current at a voltage which is higher as the motor speed lessens. This voltage can be the same as the main voltage. Breaking is severe. Application examples: printing machines, wire drawing machines, cranes, hoists, metallurgy industry.

The contactors in the motor starters for the Model 6 Export MCC are selected for the AC-3 utilization category. All combination starter components are sized based on average motor currents using kilowatt ratings (per IEC conventions) or horsepower ratings (per the National Electric Code). Variance in motor full load current can occur due to motor design, full load rpm rating, and efficiency rating. Refer to the actual motor nameplate for full-load current values.



Model 6 Export Motor Control Centers Application and General Information

IEC Certification

Model 6 Export Motor Control Centers are manufactured to meet the applicable IEC standards listed below:

- IEC 60439-1 Type Tested Assemblies (TTA)
- EN 60439-1 Type Tested Assemblies (TTA)
- IEC 60947-1, 60947-2, 60947-3, 60947-4 (Short Circuit Ratings, Type 2)
- IEC 60529 (Enclosure Degree of Protection)

By including IEC components, the Model 6 Export Motor Control Center provides components that meet applicable IEC component standards. Wherever reasonably practical, European standards reflect international standards (IEC). The EN standard listed above has been established in conjunction with, and approval of, the relative bodies within various CENELEC member countries (the European Economic Community, or EC, and the European Free Trade Association, or EFTA).

MERLIN GERIN circuit breakers and TELEMECANIQUE D-line and F-line contactors, overload relays, and accessories satisfy most national, European, and international standards for promoting worldwide product acceptance. These product standards precisely define the performance of the designated products (such as EN 60937 for low voltage equipment).

Square D/Schneider Electric can provide proof of conformity of its production, in accordance with the selected standards. Upon request, and depending on the situation, Schneider Electric can provide the following:

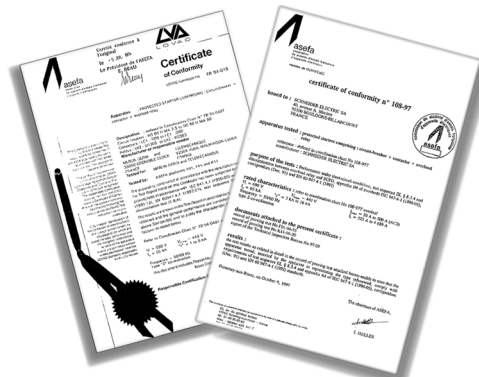
- A declaration of conformity
- A certificate of conformity

ASEFA/LOVAG Certifications

The function of ASEFA (Association des Stations d'Essais Française d'Appareils Electriques— Association of French Testing Stations for Low Voltage Industrial Electrical Equipment) is to perform tests for conformity to standards, and to issue certificates and test reports. ASEFA laboratories are authorized by the European-based National Testing Network (RNE).

ASEFA is now effectively a member of the European accord group, LOVAG (Low Voltage Agreement Group). This means that any certificates issued by LOVAG/ASEFA are recognized by all the members of the group and carry the same validity as certificates issued by and of the individual member authorities.

ASEFA/LOVAG certificates of conformity for Model 6 Export Motor Control Centers are available at the customer's request for standard features listed in this catalog. If third party certificates are unavailable, optional features may be self-certified. Customers should specify the need for a certificate with their order.



Model 6 Export Motor Control Centers Application and General Information



CE Marking

Optionally, at the customer's request, the Model 6 Export Motor Control Center can be provided with CE marking and a Manufacturer's Declaration of Conformity.

Significance of the CE marking:

- The CE marking is affixed to a product to signify the manufacturer's certification of the product as conforming to the relevant European Directives. The marking is mandatory for a product—subject to one or more of the European Directives—before it can be freely distributed within the EC (now referred to as the European Union or EU) and EFTA.
- The CE marking is intended solely for national market control authorities within the EC.
- The CE marking should not be confused with a conformity marking.

The two areas that have agreed to abide by the same CE marking requirements are the EU and EFTA. There are 19 countries in these areas, as listed below. They are now called the European Economic Area (EEA).

EEA Countries

Austria	Ireland	Belgium	Luxembourg	Denmark
Netherlands	Finland	Portugal	France	Spain
Germany	Sweden	Greece	United Kingdom	Italy
Turkey	Iceland	Norway	Liechtenstein	

Square D/Schneider Electric has taken measures to ensure that the Model 6 Export MCC conforms to the essential requirements of the following two directives:

- The Low Voltage Directive 73/23/EEC amended by the Directive 93/68/EEC
- The Electromagnetic Compatibility Directive 89/336/EEC, amended by the Directives 92/31/EEC and 93/68/EEC



Model 6 Export Motor Control Centers Dimensions

SECTION CONTENTS

SECTION 4—DIMENSIONS	52
IP 20 and IP 52 Enclosures (Similar to NEMA/EEMAC 1 and 12, Respectively)	52
IP 24 Non-Walk-In Basic Enclosures (Similar to NEMA/EEMAC Type 3R Non-Walk-In)	53
Standard Sections—15 Inches (381 mm) Deep, Bottom View	54
Relay Sections—15 Inches (381 mm) Deep, Bottom View	58
Standard Sections—20 Inches (508 mm) Deep, Bottom View	61
Relay Sections—20 Inches (508 mm) Deep, Bottom View	65
Main/Branch Devices and Relay Sections—20 Inches (508 mm) Deep, Bottom View	67
Additional Conduit Entry Information for IP 24 (Similar to NEMA/EEMAC Type 3R) Enclosures	70
Standard Sections—15 Inches (381 mm) Deep, Top View	71
Relay Sections—15 Inches (381 mm) Deep, Top View	73
Standard Sections—20 Inches (508 mm) Deep, Top View	75
Relay Sections—20 Inches (508 mm) Deep, Top View	77
Shipping Weights	78



Model 6 Export Motor Control Centers Dimensions

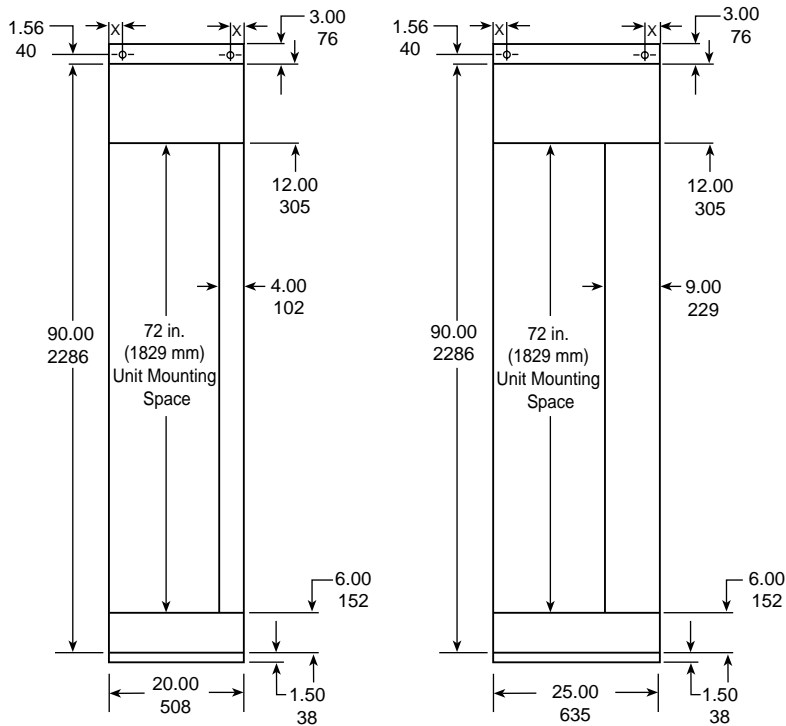
SECTION 4—DIMENSIONS

Standard sections contain both a vertical bus system and a vertical wireway. A relay section contains neither, but does have horizontal power and ground bus for splicing to other sections. A relay section is equipped with a relay pan for customer-mounted equipment and devices.

NOTE: All cross-hatched areas in this section represent conduit entry. Numbers in circles indicate vertical clearance (in inches and millimeters) to the nearest obstruction.

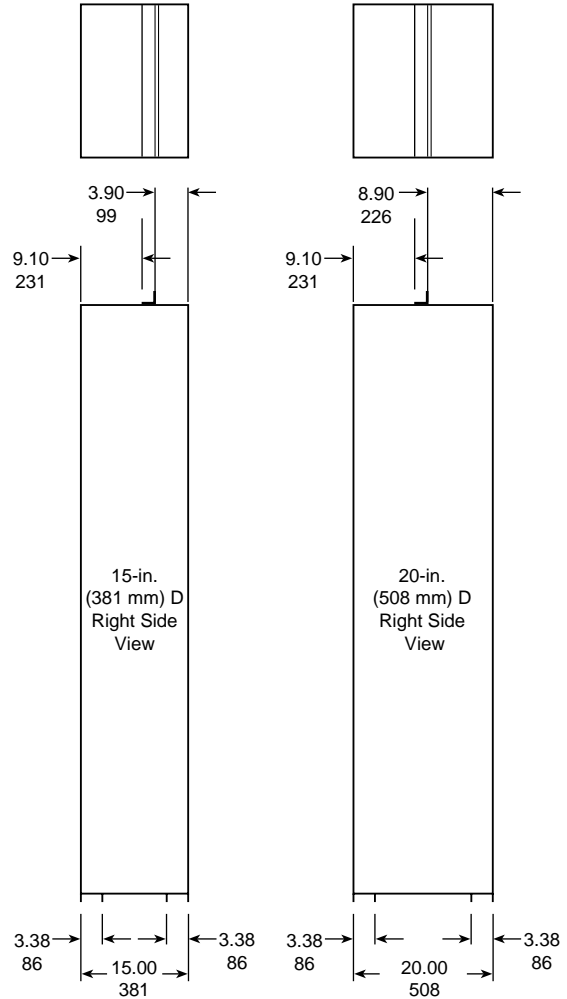
IP 20 and IP 52 Enclosures (Similar to NEMA/EEMAC 1 and 12, Respectively)

Number of Sections Per Shipping Assembly	Dimension "X" (Inches / Millimeters)
1	1.90 / 48
2	5.00 / 127
3	10.00 / 254



20-in.(508 mm)-Wide Section with Standard Vertical Wireway

25-in.(635 mm)-Wide Section with Optional Vertical Wireway



15-in.
(381 mm) D
Right Side
View

20-in.
(508 mm) D
Right Side
View

Notes:

All dimensions are shown in inches (top) and millimeters (bottom).

Depths shown indicate actual depth of the structure.

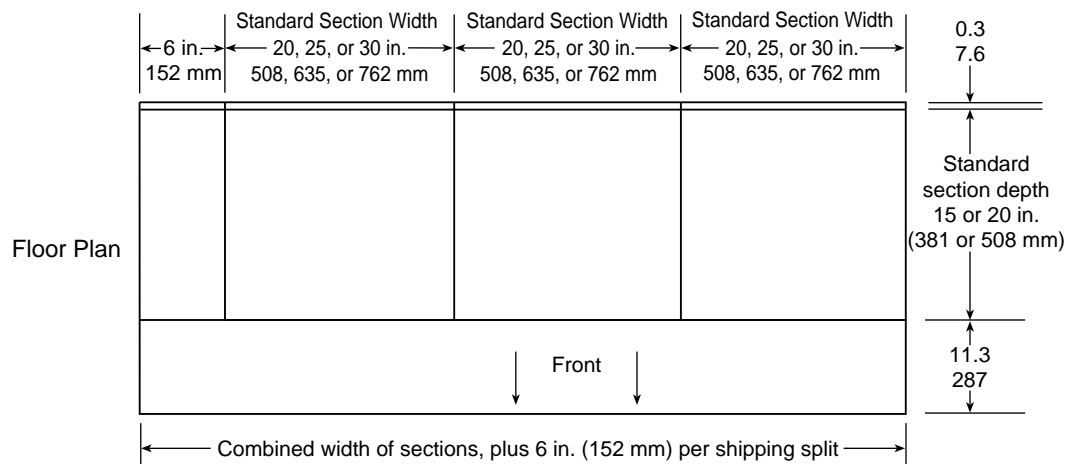
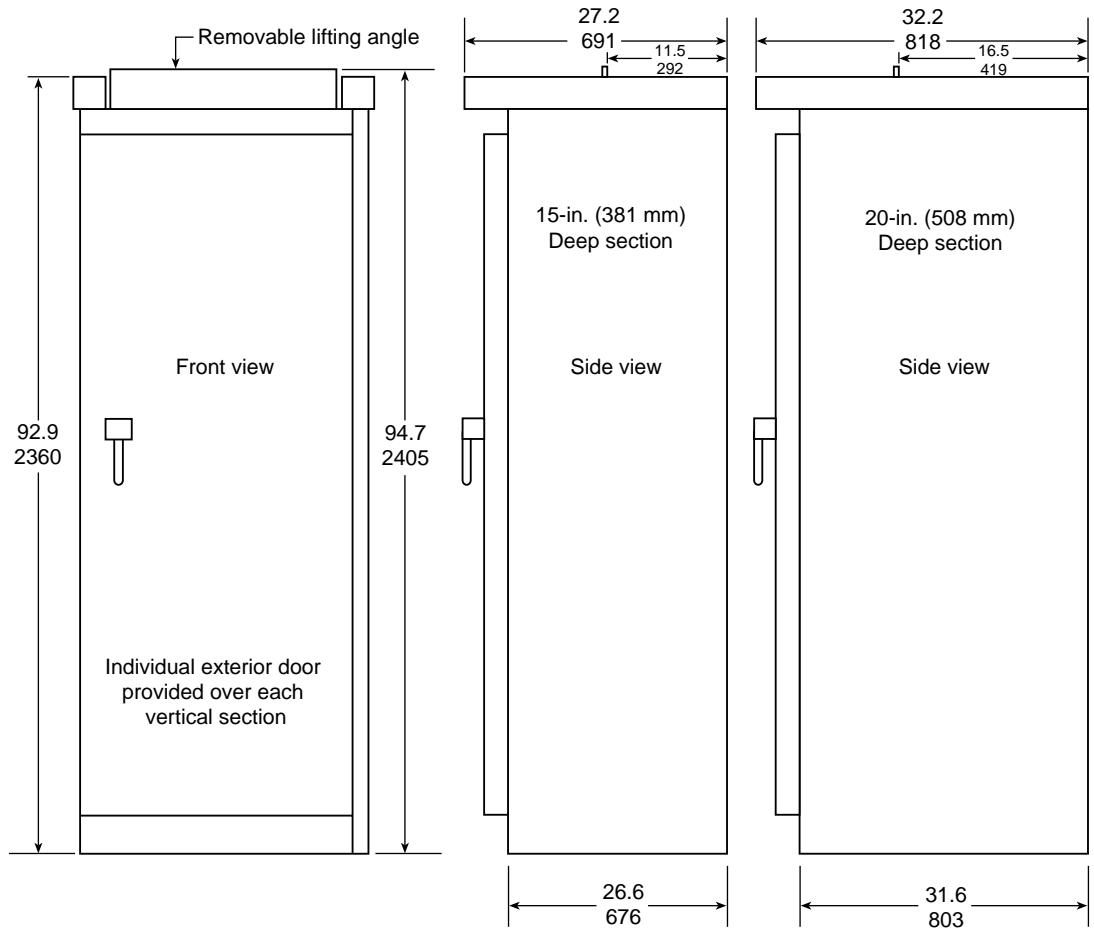
Handles and door-mounted devices extend forward 2.45 inches (62 mm) or less.

Standard door swing extends forward 15.38 inches (391 mm) for unit doors. On full-section units, 20, 25, or 30 inches (508, 635, or 762 mm) is required for doors.



Model 6 Export Motor Control Centers Dimensions

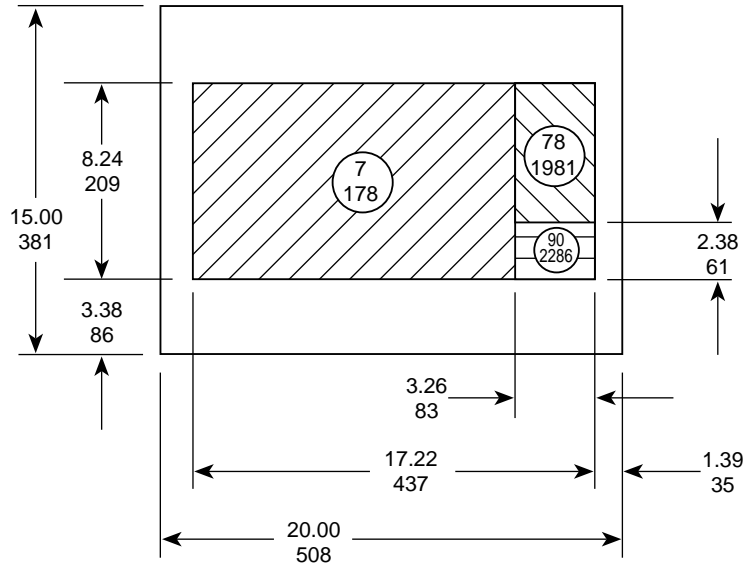
IP 24 Non-Walk-In Basic Enclosures (Similar to NEMA/EEMAC Type 3R Non-Walk-In)



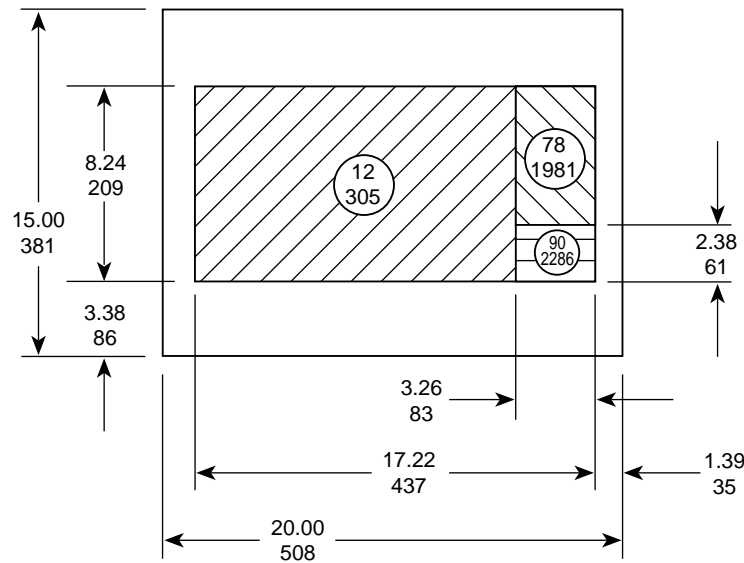
Model 6 Export Motor Control Centers Dimensions

Standard Sections—15 Inches (381 mm) Deep, Bottom View

15-in. (381 mm) Deep Standard Section
IP 20 and IP 24 ★



15-in. (381 mm) Deep Standard Section with Bottom Main
Lug Compartment
IP 20 and IP 24 ★



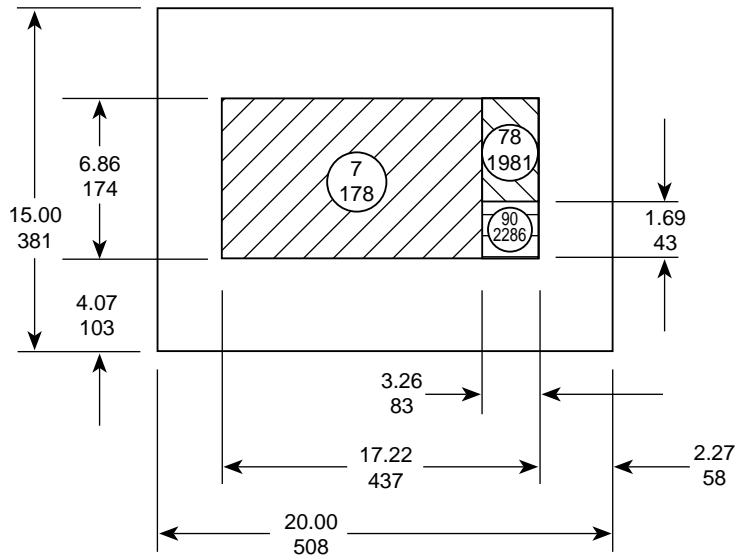
★ See page 70 for additional IP 24 (similar to NEMA/EEMAC Type 3R) information.

NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

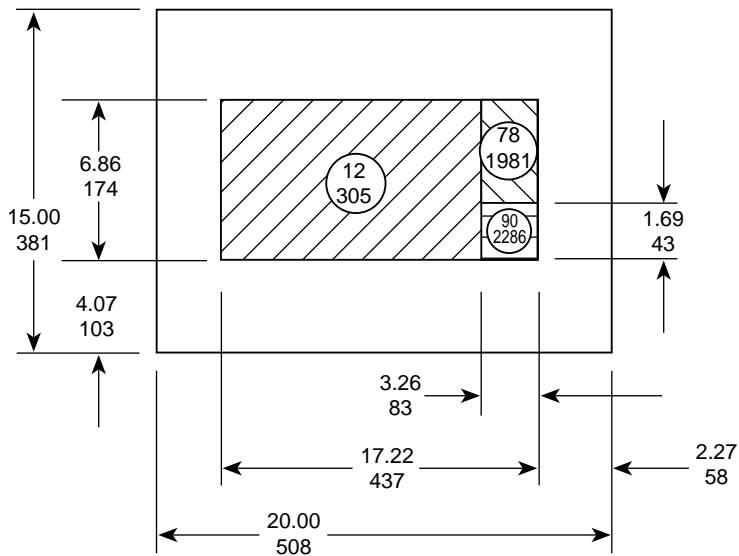


Model 6 Export Motor Control Centers Dimensions

15-in. (381 mm) Deep Standard Section
IP 52



15-in. (381 mm) Deep Standard Section with Bottom Main Lug Compartment
IP 52

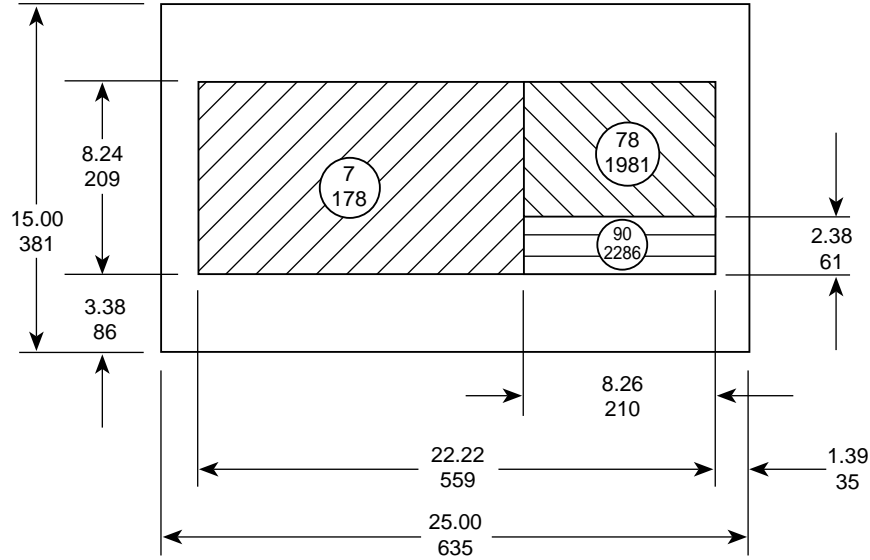


NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

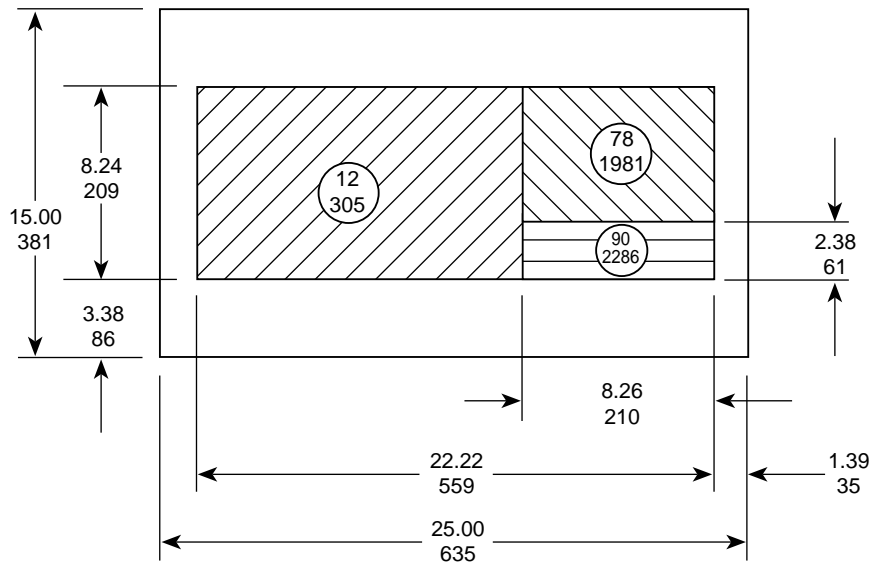


Model 6 Export Motor Control Centers Dimensions

15-in. (381 mm) Deep Standard Section with 9-in. (229 mm) Vertical Wireway
IP 20 and IP 24 ★



15-in. (381 mm) Deep Standard Section with Bottom Main Lug Compartment and 9-in. (229 mm) Vertical Wireway
IP 20 and IP 24 ★



★ See page 70 for additional IP 24 (similar to NEMA/EEMAC Type 3R) information.

NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

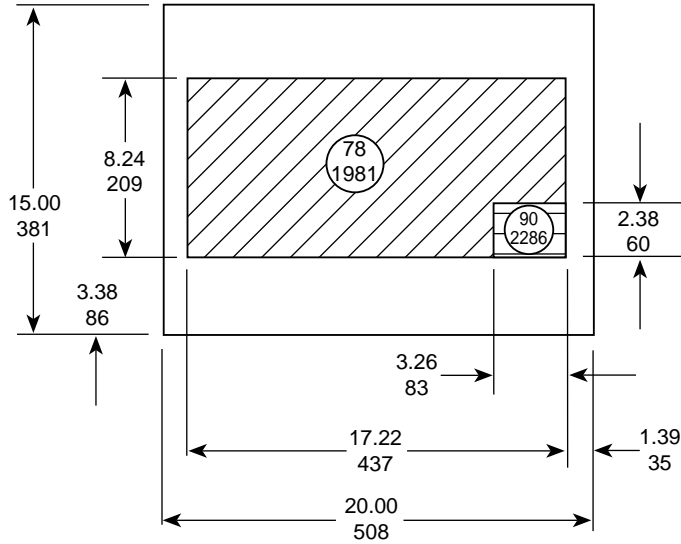


Model 6 Export Motor Control Centers Dimensions

Relay Sections—15 Inches (381 mm) Deep, Bottom View

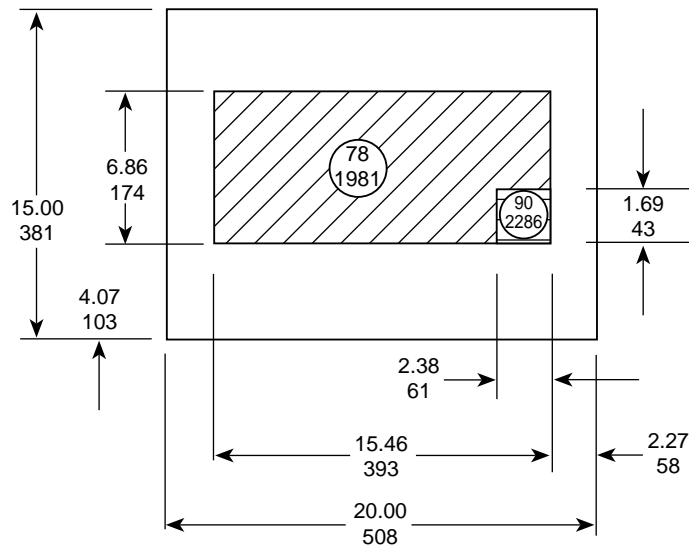
15-in. (381 mm) Deep/20-in. (508 mm) Wide Relay Section

IP 20 and IP 24 ★



15-in. (381 mm) Deep/20-in. (508 mm) Wide Relay Section

IP 52



★ See page 70 for additional IP 24 (similar to NEMA/EEMAC Type 3R) information.

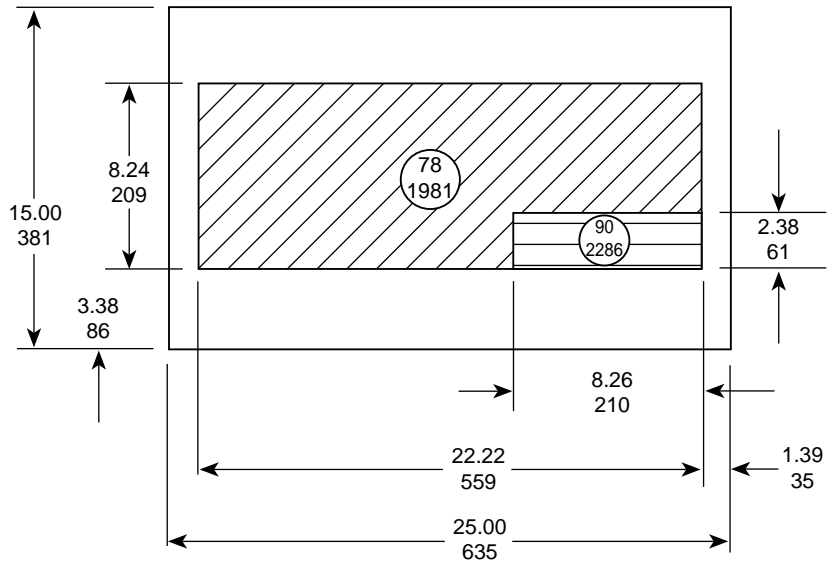
NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



Model 6 Export Motor Control Centers Dimensions

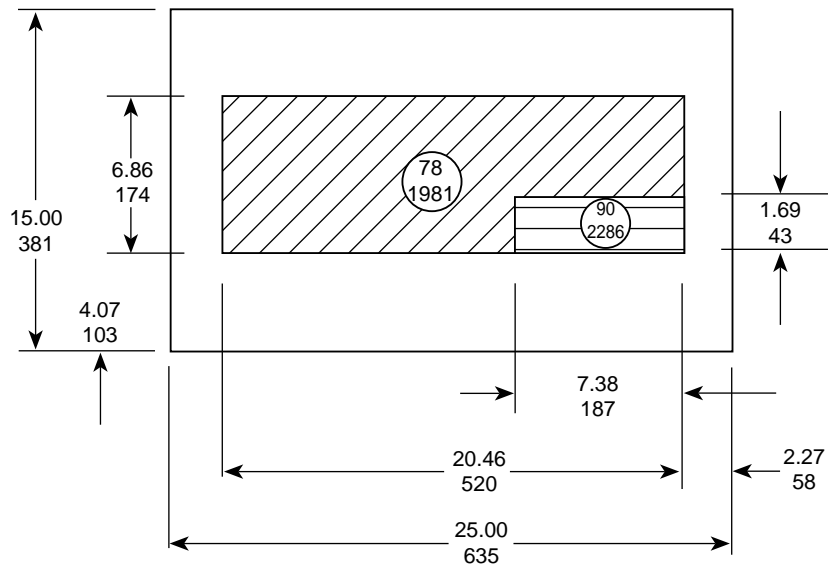
15-in. (381 mm) Deep/25-in. (635 mm) Wide Relay Section

IP 20 and IP 24 ★



15-in. (381 mm) Deep/ 25-in. (635 mm) Wide Relay Section

IP 52



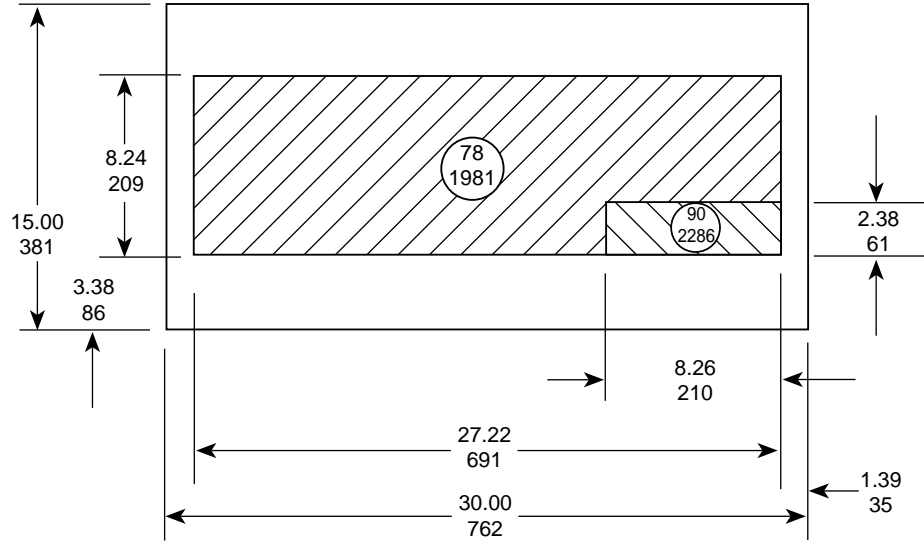
★ See page 70 for additional IP 24 (similar to NEMA/EEMAC Type 3R) information.

NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

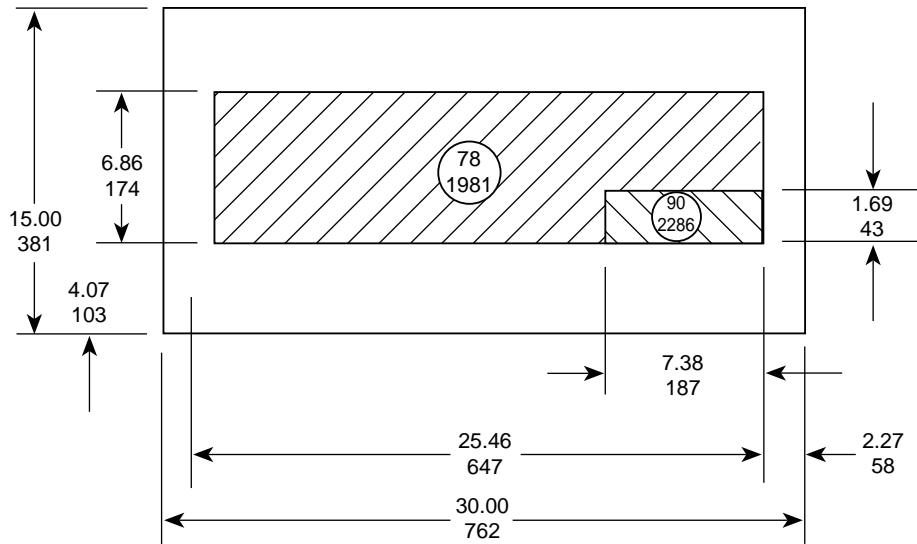


Model 6 Export Motor Control Centers Dimensions

15-in. (381 mm) Deep/30-in. (762 mm) Wide Relay Section
IP 20 and IP 24 ★



15-in. (381 mm) Deep/30-in. (762 mm) Wide Relay Section
IP 52



★ See page 70 for additional IP 24 (similar to NEMA/EEMAC Type 3R) information.

NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

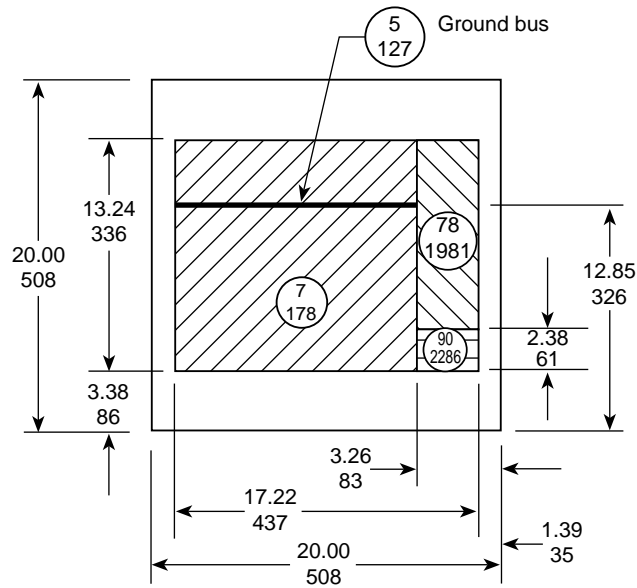


Model 6 Export Motor Control Centers Dimensions

Standard Sections—20 Inches (508 mm) Deep, Bottom View

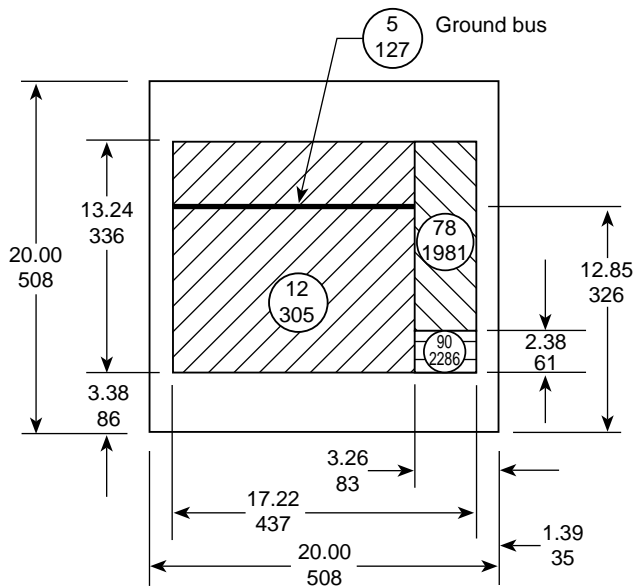
20-in. (508 mm) Deep Standard Section

IP 20 and IP 24 ★



20-in. (508 mm) Deep Standard Section with Bottom Main Lug Compartment

IP 20 and IP 24 ★



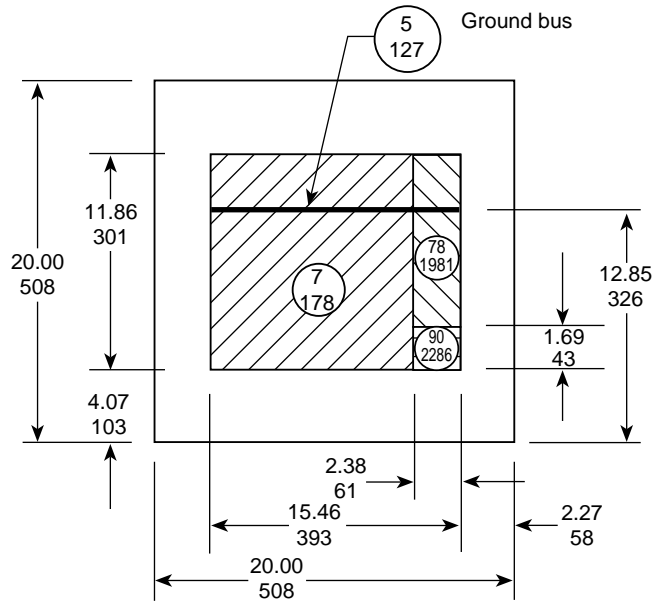
★ See page 70 for additional IP 24 (similar to NEMA/EEMAC Type 3R) information.

NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

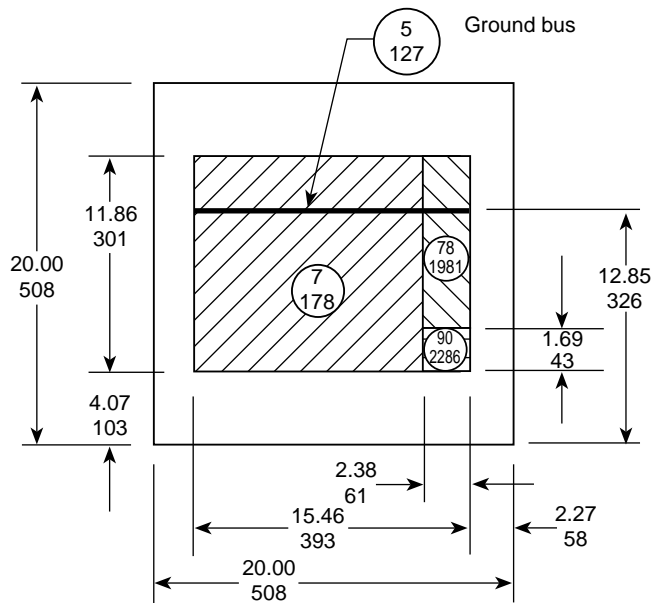


Model 6 Export Motor Control Centers Dimensions

20-in. (508 mm) Deep Standard Section
IP 52



20-in. (508 mm) Deep Standard Section with Bottom Main
Lug Compartment
IP 52

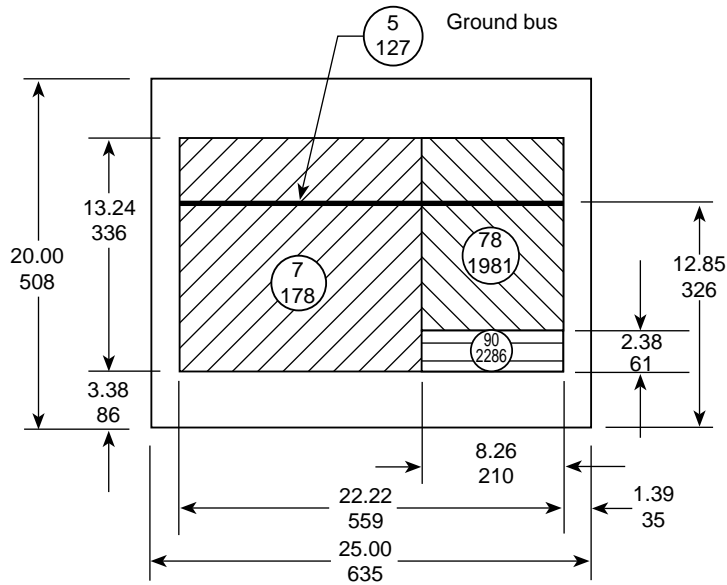


NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

Model 6 Export Motor Control Centers Dimensions

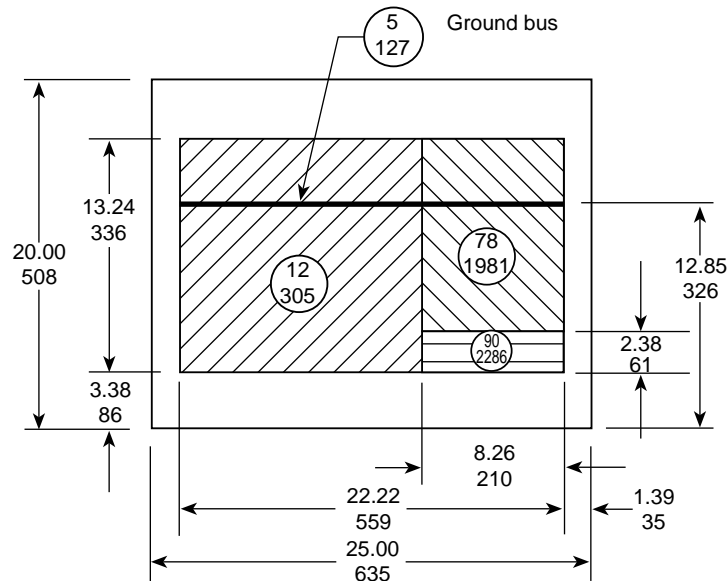
20-in. (381 mm) Deep/25-in. (635 mm) Wide Standard Section

IP 20 and IP 24 ★



20-in. (381 mm) Deep/25-in. (635 mm) Wide Standard Section with Bottom Main Lug Compartment

IP 20 and IP 24 ★



★ See page 70 for additional IP 24 (similar to NEMA/EEMAC Type 3R) information.

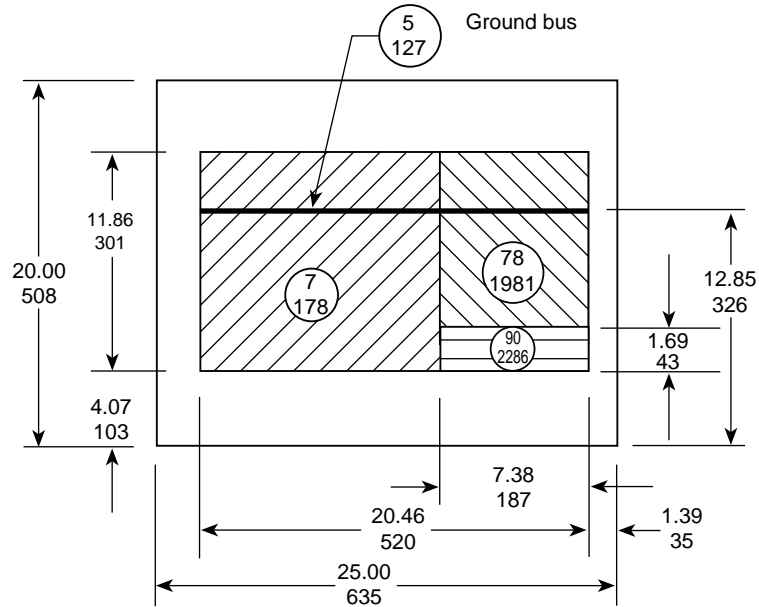
NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



Model 6 Export Motor Control Centers Dimensions

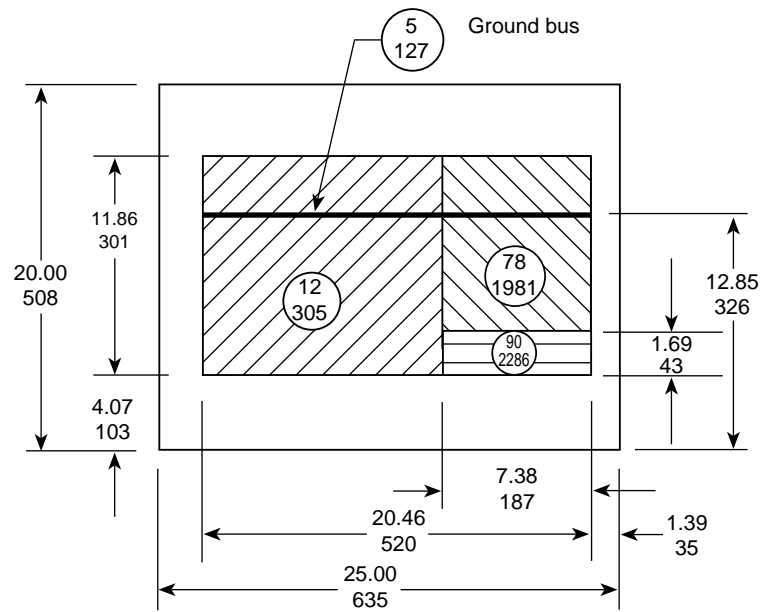
20-in. (508 mm) Deep/25-in. (635 mm) Wide Standard Section

IP 52



20-in. (508 mm) Deep/25-in. (635 mm) Wide Standard Section with Bottom Main Lug Compartment

IP 52



NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

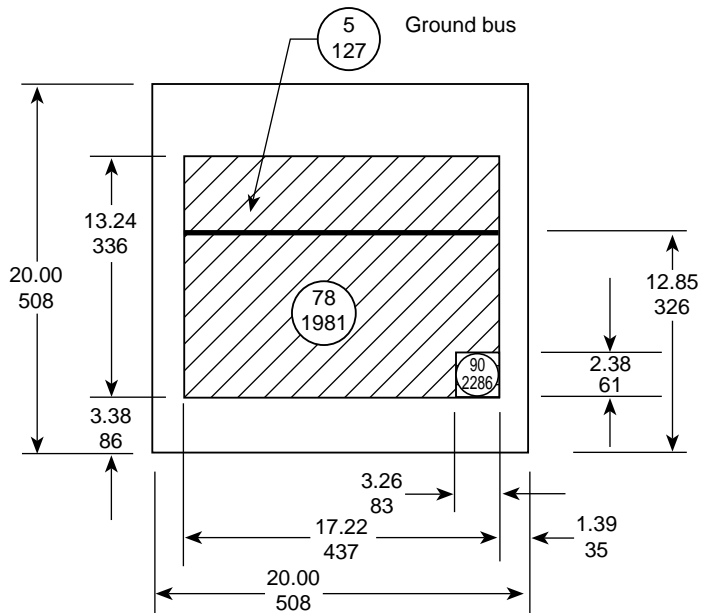


Model 6 Export Motor Control Centers Dimensions

Relay Sections—20 Inches (508 mm) Deep, Bottom View

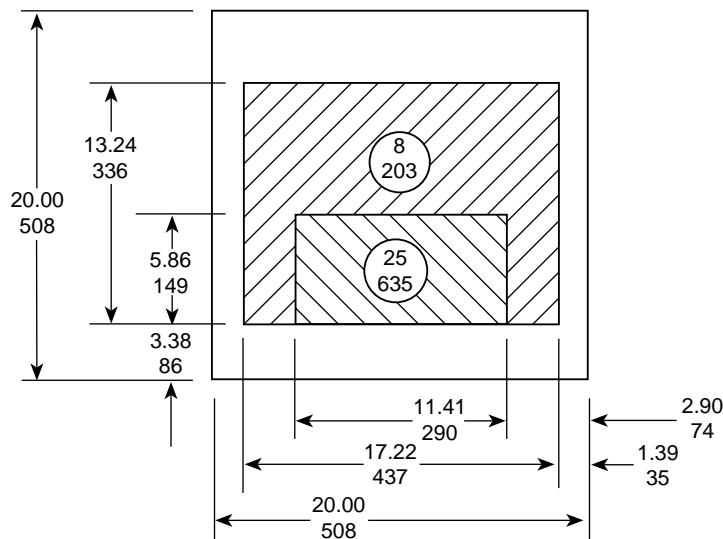
20-in. (508 mm) Deep/20-in. (508 mm) Wide Relay Section

IP 20 and IP 24 ★



20-in. (508 mm) Deep/20-in. (508 mm) Wide Autotransformer Starter Section with IEC F225 Contactors and Below

IP 20 and IP 24 ★



★ See page 70 for additional IP 24 (similar to NEMA/EEMAC Type 3R) information.

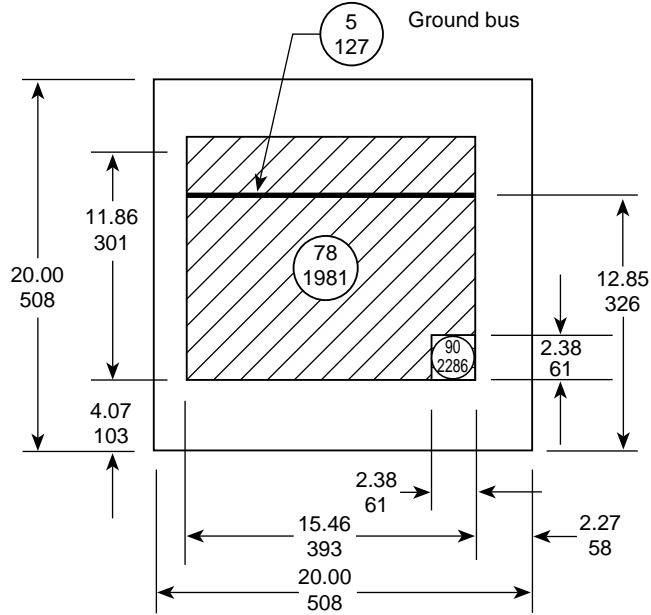
NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



Model 6 Export Motor Control Centers Dimensions

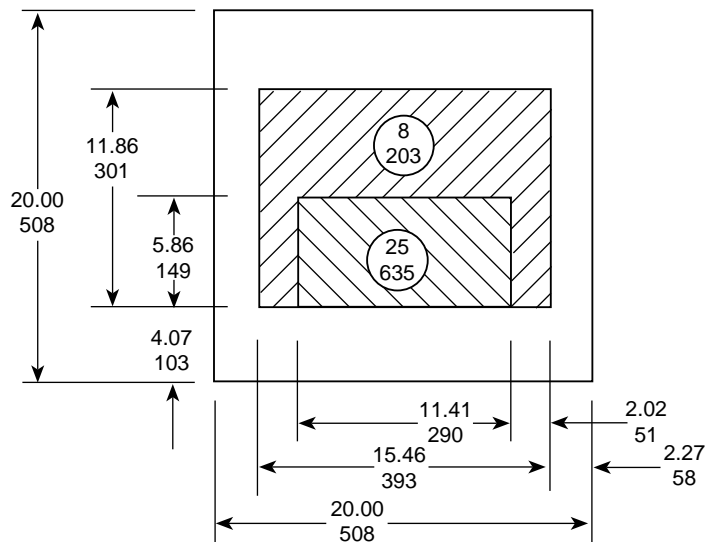
20-in. (508 mm) Deep/20-in. (508 mm) Wide Relay Section

IP 52



20-in. (508 mm) Deep/20-in. (508 mm) Wide Autotransformer Starter Section with IEC F225 Contactors and Below

IP 52



NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

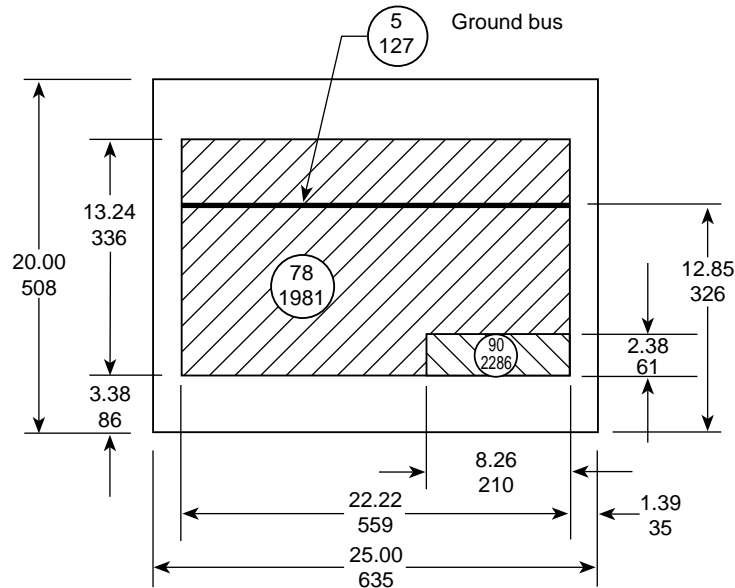


Model 6 Export Motor Control Centers Dimensions

Main/Branch Devices and Relay Sections—20 Inches (508 mm) Deep, Bottom View

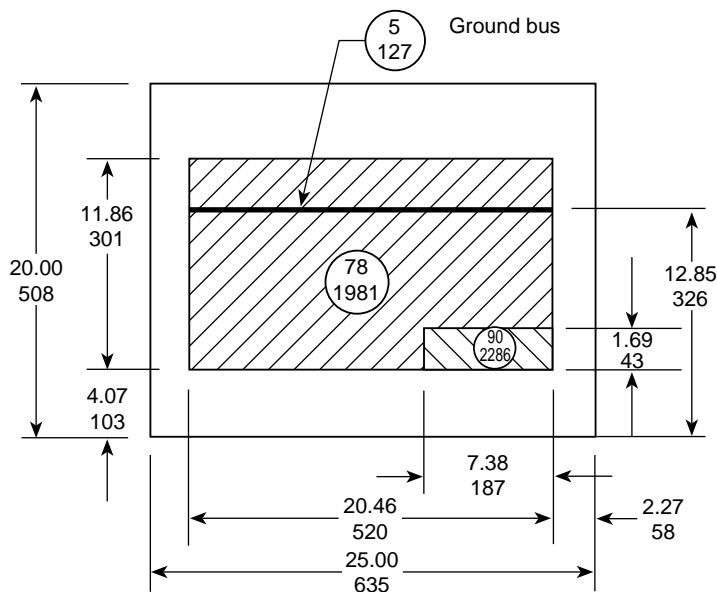
800–1200 A Main, Branch, or 20-in. (508 mm) Deep/25-in. (635 mm) Wide
Relay Section ●

IP 20 and 24 ★



800–1200A Main, Branch, or 20-in. (508 mm) Deep/25-in (625 mm) Wide
Relay Section ●

IP 52



★ See page 70 for additional IP 24 (similar to NEMA/EEMAC Type 3R) information.

● When the section contains a main, branch feeder, and a switch, the vertical clearance becomes approximately 30 inches (762 mm).

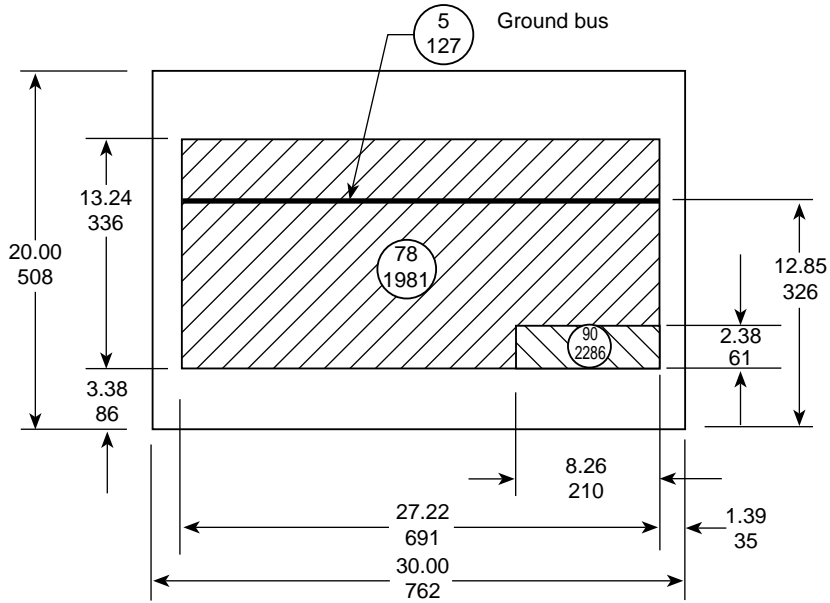
NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



Model 6 Export Motor Control Centers Dimensions

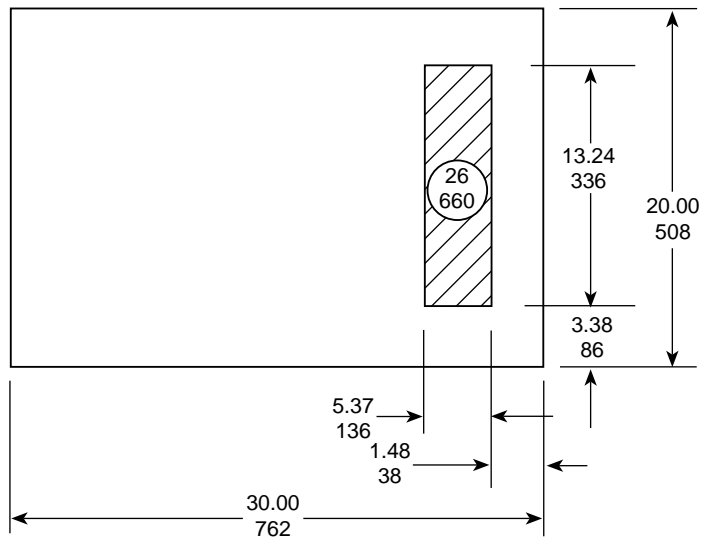
1800–2000 A Main, Branch, or 20-in. (508 mm) Deep/30-in. (762 mm) Wide Relay Section ●

IP 20 and IP 24 ★



20-in. (508 mm) Deep Autotransformer Starter Section with IEC F265 Contactors and Above

IP 20 and IP 24 ★



★ See page 70 for additional IP 24 (similar to NEMA/EEMAC Type 3R) information.

● When the section contains a main, branch feeder, and a switch, the vertical clearance becomes approximately 30 inches (762 mm).

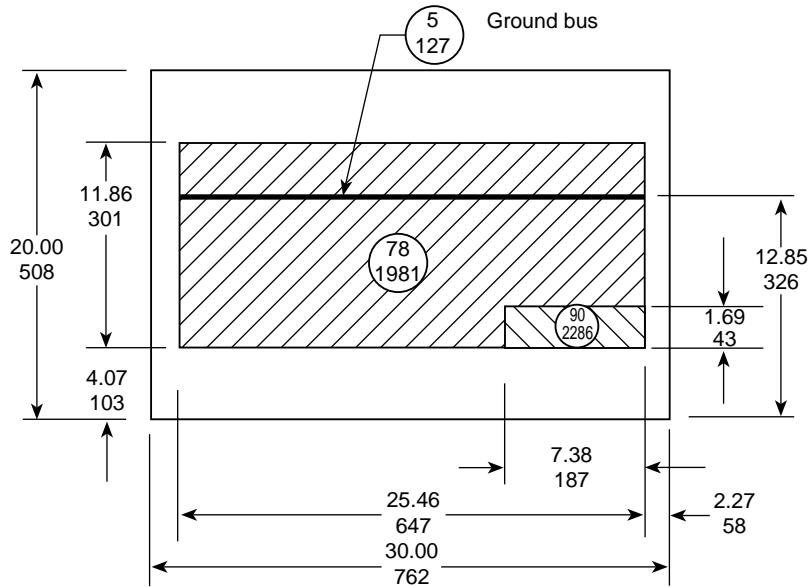
NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



Model 6 Export Motor Control Centers Dimensions

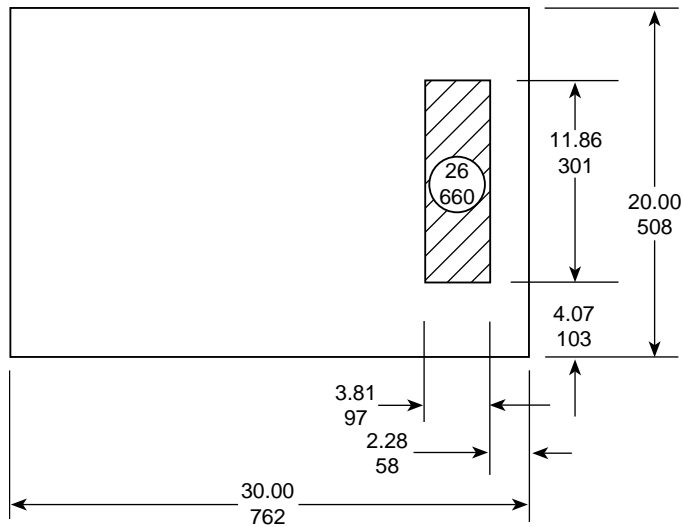
600–1200 A Main, Branch, or 20-in. (508 mm) Deep/30-in. (762 mm) Wide Relay Section ●

IP 52



20-in. (508 mm) Deep SC/B Autotransformer Starter Section with IEC F265 Contactors and Above

IP 52



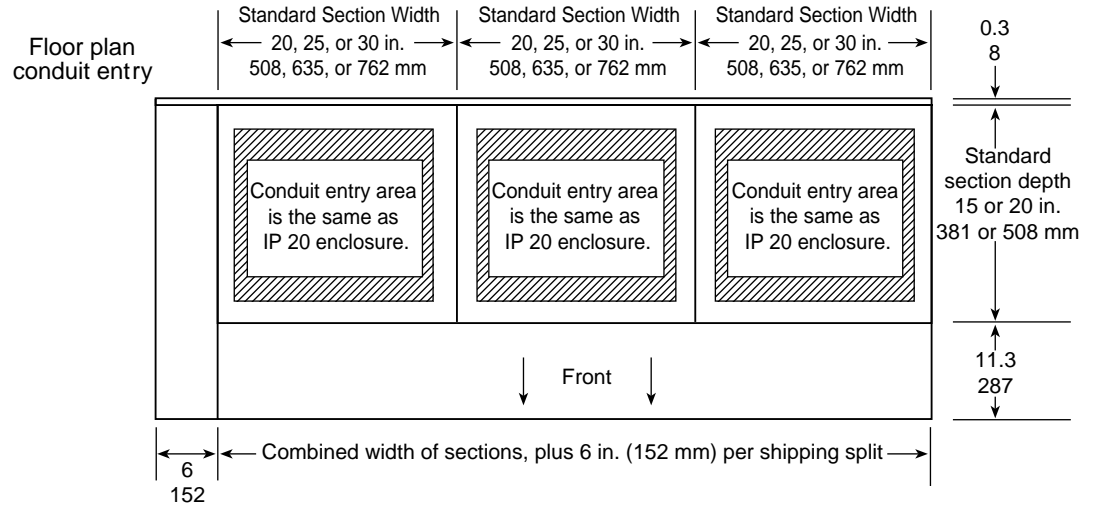
- When the section contains a main, branch feeder, and a switch, the vertical clearance becomes approximately 30 inches (762 mm).

NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



Model 6 Export Motor Control Centers Dimensions

Additional Conduit Entry Information for IP 24 (Similar to NEMA/EEMAC Type 3R) Enclosures



NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

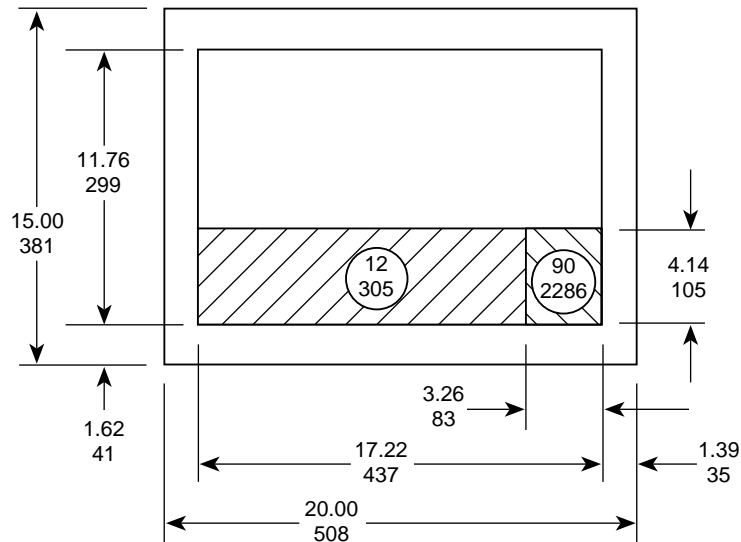


Model 6 Export Motor Control Centers Dimensions

Standard Sections—15 Inches (381 mm) Deep, Top View

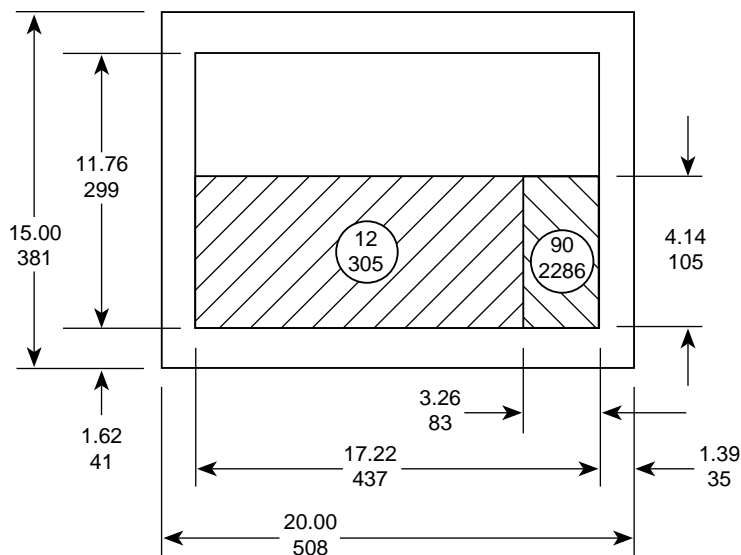
20-in. (508 mm) Wide/15-in. (381 mm) Deep Standard Section

IP 20 and IP 52



20-in. (508 mm) Wide/15-in. (381 mm) Deep Standard Section with Top- Located Main Lug Compartment ●

IP 20 and IP 52



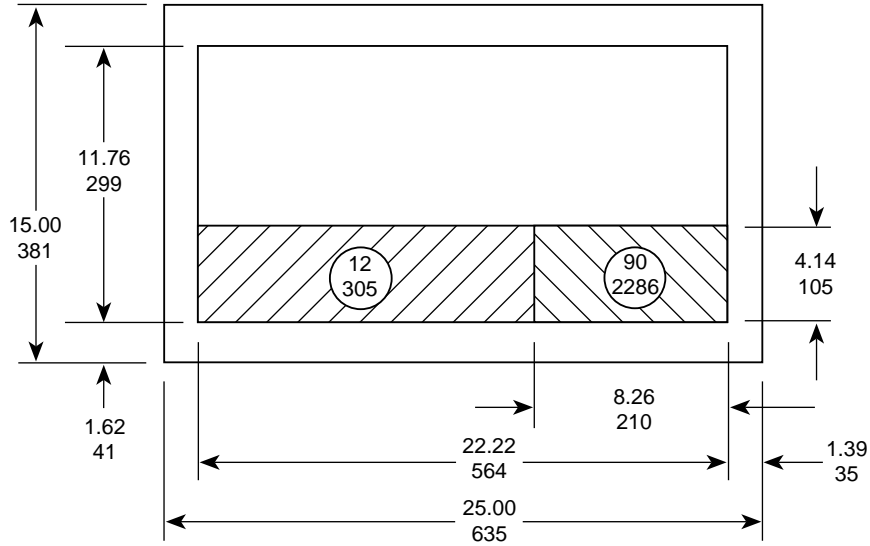
- A 90-in. (2286 mm) vertical wireway area is not available for a 1200 A main lug compartment.

NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

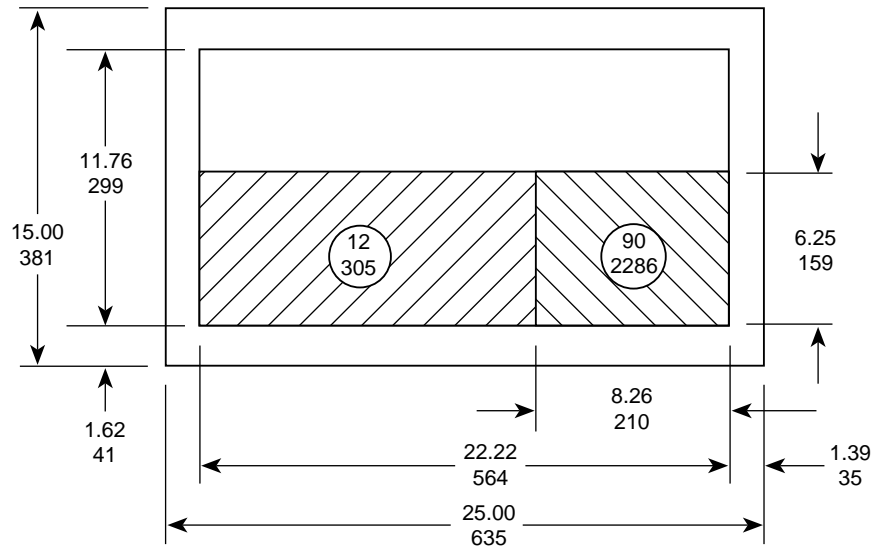


Model 6 Export Motor Control Centers Dimensions

25-in. (635 mm) Wide/15-in. (381 mm) Deep Standard Section with 90-in. (2286 mm) Vertical Wireway
IP 20 and IP 52



25-in. (635 mm) Wide/15-in. (381 mm) Deep Standard Section with Top-Located Main Lug Compartment ●
IP 20 and IP 52



● A 90-in. (2286 mm) vertical wireway area is not available for a 1200 A main lug compartment.

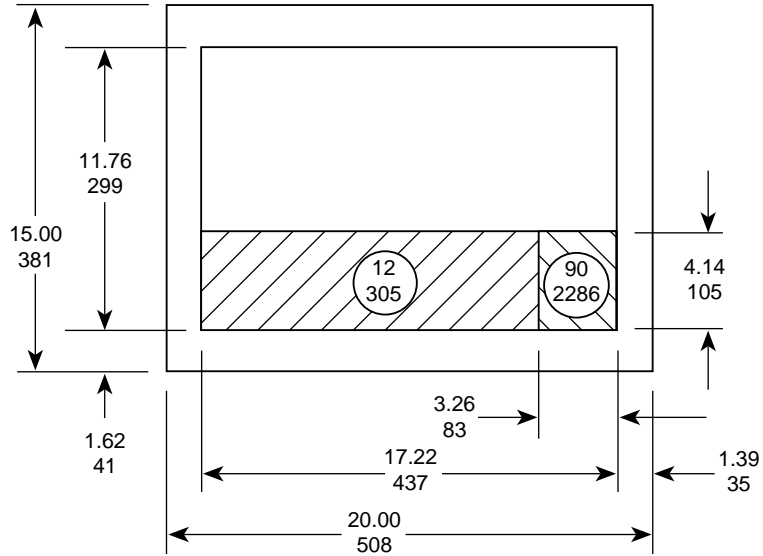
NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



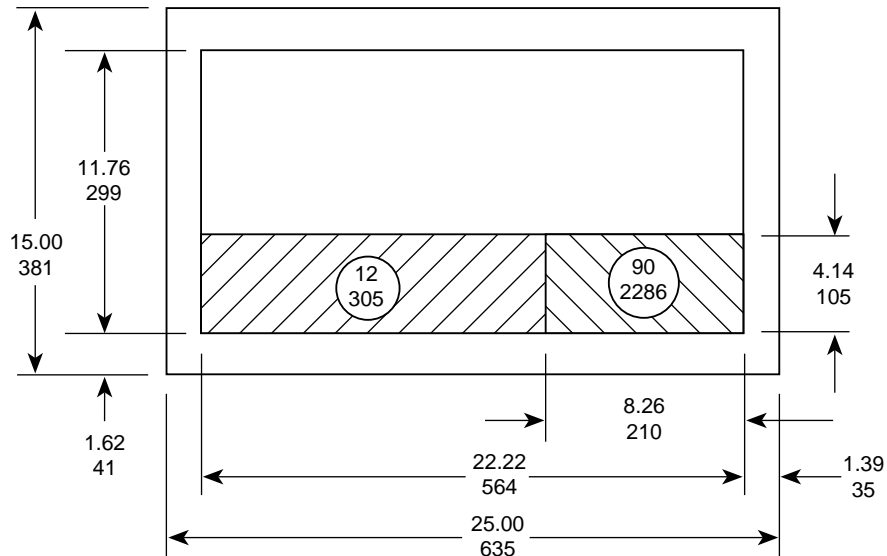
Model 6 Export Motor Control Centers Dimensions

Relay Sections—15 Inches (381 mm) Deep, Top View

20-in. (508 mm) Wide/15-in. (381 mm) Deep Relay Section
IP 20 and IP 52



25-in. (625 mm) Wide/15-in. (381 mm) Deep Relay Section
IP 20 and IP 52

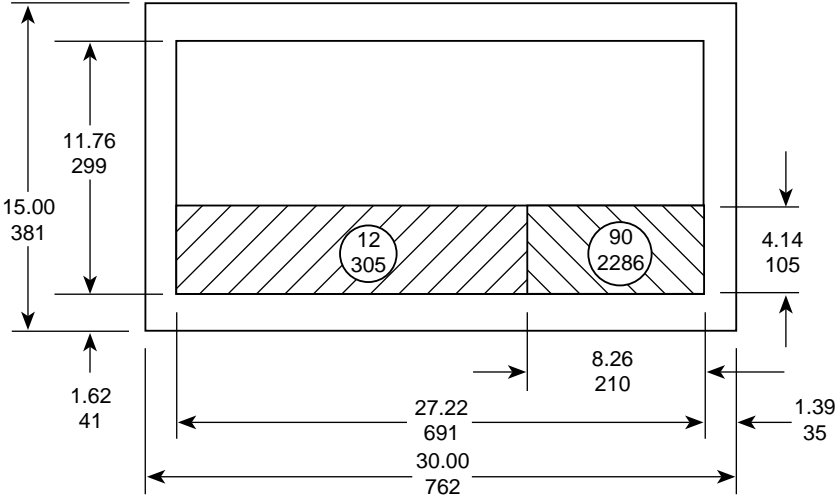


NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



Model 6 Export Motor Control Centers Dimensions

30-in. (762 mm) Wide/15-in. (381 mm) Deep Relay Section
IP 20 and IP 52



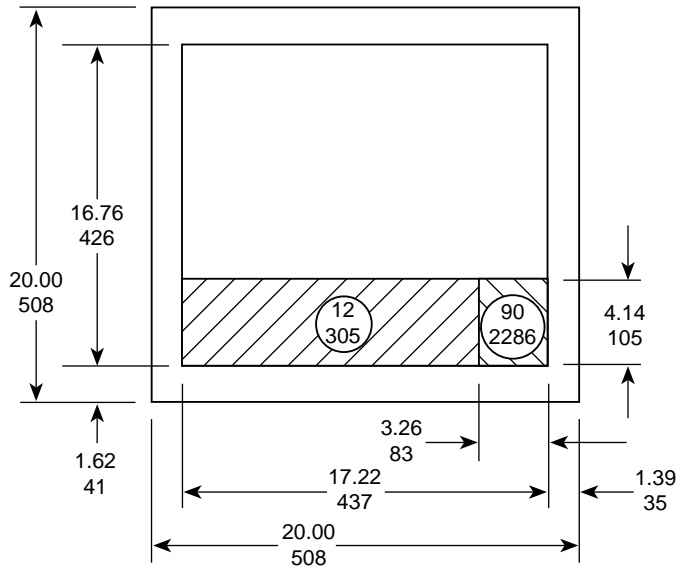
NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



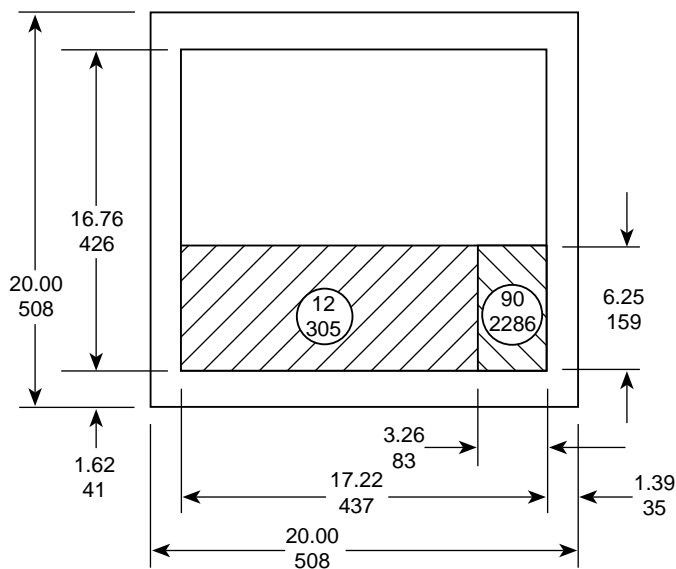
Model 6 Export Motor Control Centers Dimensions

Standard Sections—20 Inches (508 mm) Deep, Top View

20-in. (508 mm) Wide/20-in. (508 mm) Deep Standard Section
IP 20 and IP 52



20-in. (508 mm) Wide/20-in. (508 mm) Deep Standard Section with
Top-Located Main Lug Compartment ●
IP 20 and IP 52



- When the section contains a main, branch breaker, and a switch, the vertical clearance becomes approximately 30 inches (762 mm).

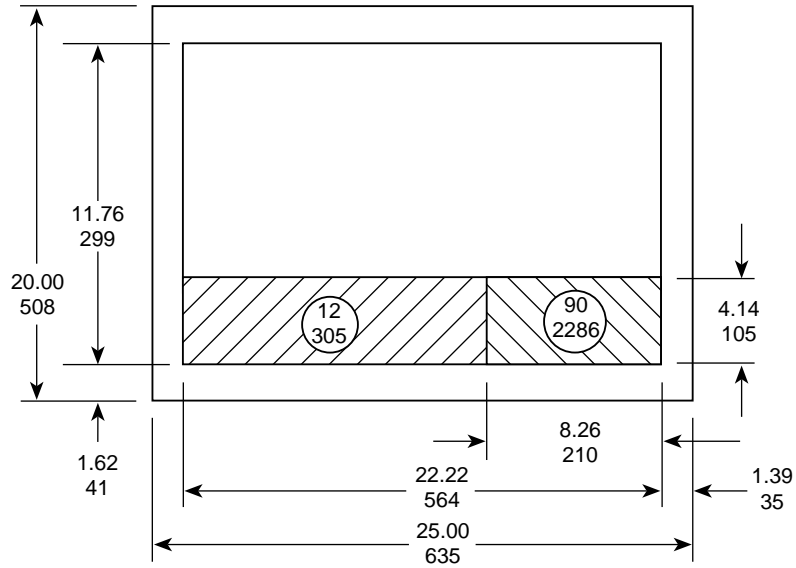
NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



Model 6 Export Motor Control Centers Dimensions

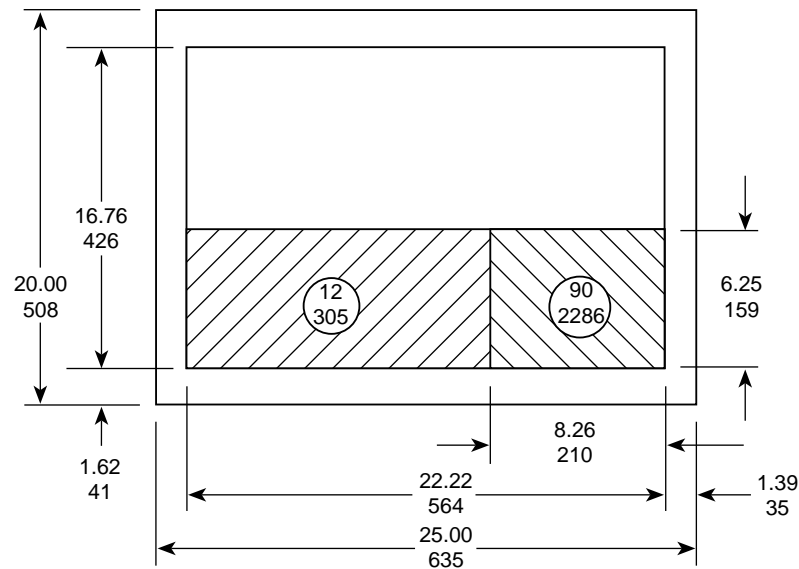
25-in. (635 mm) Wide/20-in. (508 mm) Deep Standard Section with 9-in. (229 mm) Vertical Wireway

IP 20 and IP 52



25-in. (835 mm) Wide/20-in. (508 mm) Deep Section with Top-Located Main Lug Compartment ● and 9-in. (229 mm) Vertical Wireway

IP 20 and IP 52



- When the section contains a main, branch breaker, and a switch, the vertical clearance becomes approximately 30 inches (762 mm).

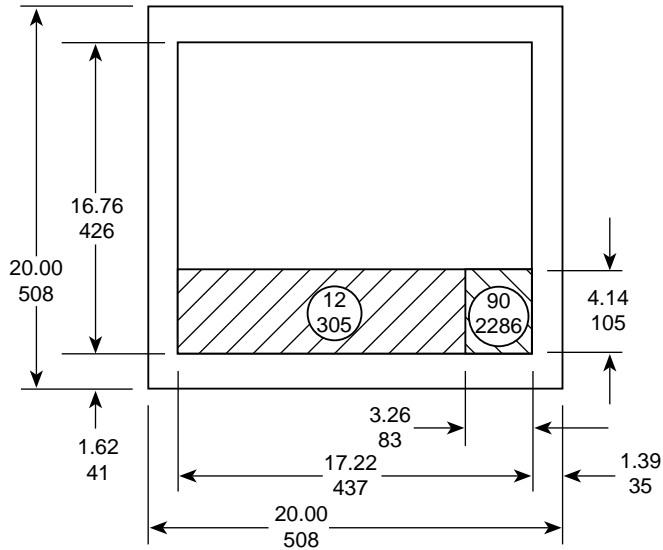
NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



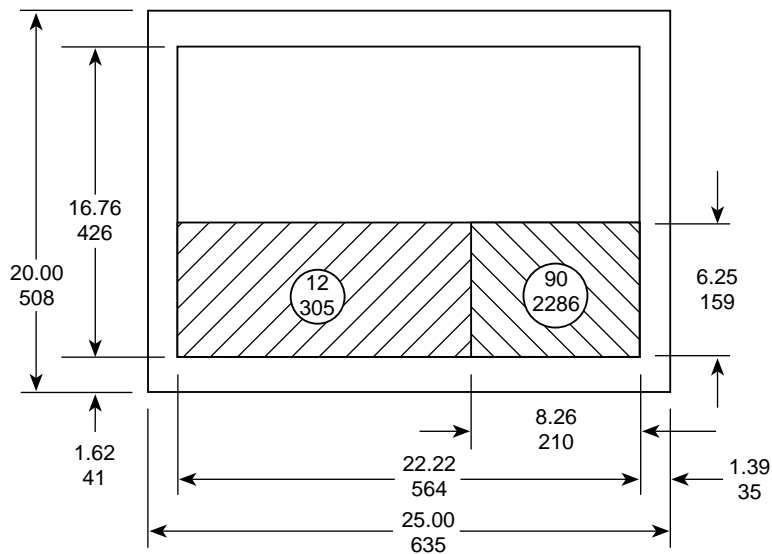
Model 6 Export Motor Control Centers Dimensions

Relay Sections—20 Inches (508 mm) Deep, Top View

20-in. (508 mm) Wide/20-in. (508 mm) Deep Relay Section ●



25-in. (635 mm) Wide/20-in. (508 mm) Deep Relay Section ●



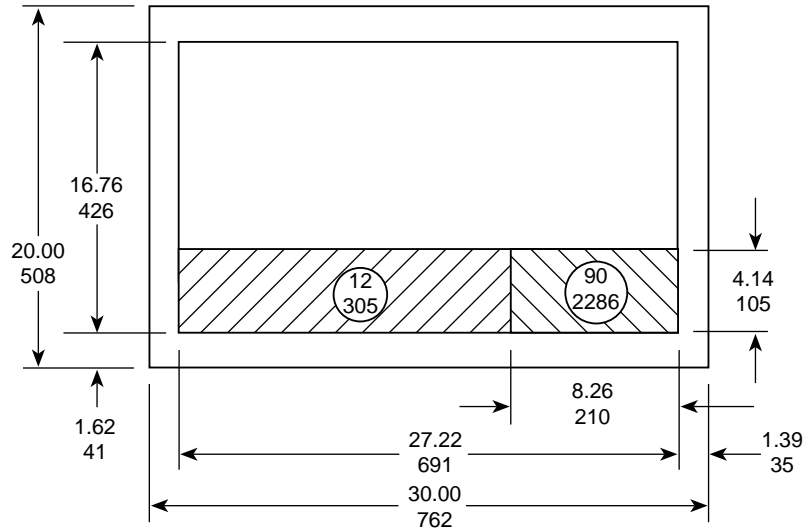
● When the section contains a main, branch breaker, and a switch, the vertical clearance becomes approximately 30 inches (762 mm).

NOTE: All dimensions are shown in inches (top) and millimeters (bottom).



Model 6 Export Motor Control Centers Dimensions

30-in. (672 mm) Wide/20-in. (508 mm) Deep Relay Section ●



- When the section contains a main, branch breaker, and a switch, the vertical clearance becomes approximately 30 inches (762 mm).

NOTE: All dimensions are shown in inches (top) and millimeters (bottom).

Shipping Weights

One, two, or three vertical sections can be shipped together on a pallet. Larger MCCs are split into shipping blocks of three sections maximum. The following table lists typical approximate shipping weights for a normal combination of MCC equipment.

Approximate MCC Shipping Weights

Enclosure Type	Depth (Inches)	Depth (mm)	1 Section (lbs. / kg)	2 Sections (lbs. / kg)	3 Sections (lbs. / kg)
IP 20 and IP 52 (similar to NEMA Type 1 and 12)	15	381	600 / 272.2	1200 / 544.3	1800 / 816.5
IP 24 Outdoor (similar to NEMA Type 3R Non-Walk-In)	15 (26.6 in. overall)	381 (676 mm overall)	900 / 408.2	1800 / 816.5	2700 / 1224.7
IP 20 and IP 52 (similar to NEMA Type 1 and 12)	20	508	750 / 340.2	1500 / 680.4	2250 / 1020.6
IP 24 Outdoor (similar to NEMA Type 3R Non-Walk-In)	20 (31.6 in. overall)	508 (803 mm overall)	1050 / 476.3	2100 / 952.6	3150 / 1428.8



SECTION CONTENTS

SECTION 5—SAMPLE SPECIFICATIONS	80
Submittals	80
Regulatory Requirements	80
Packing/Shipping	80
Storage	80
Warranty	80
Manufacturers	80
Materials	80
MCC Finish	81
Structures	81
Wireways	81
Barriers	82
Bussing	82
Typical Unit Construction	83
Components for Typical Units	83
Six-Inch (152 mm) Unit Construction	84
Components for Six-Inch (152 mm) Units	85
Quality Control	86
Location	86



Model 6 Export Motor Control Centers Sample Specifications

SECTION 5—SAMPLE SPECIFICATIONS

This section includes requirements for an IEC-based motor control center (MCC) and all required control devices as shown on the drawings and specified to be part of the MCC equipment. The MCC shall be [380V, 3-Phase, 3-Wire, 50Hz] [380V, 3-Phase, 4-Wire, 50Hz] [415V, 3-Phase, 3-wire, 50Hz] [400V, 3-Phase, 3-Wire, 50Hz] [440V, 3-Phase, 3-Wire, 50Hz] [480V, 3-Phase, 3-Wire, 60 Hz] [480V, 3-Phase, 4-Wire, 60Hz] [220V, 3-Phase, 3-Wire, 50Hz] [240V, 3-Phase, 3-Wire, 50Hz] [660V, 3-Phase, 3-Wire, 50Hz] [660V, 3-Phase, 4-Wire, 50Hz] [690v, 3-Phase, 3-Wire, 50Hz].

Submittals

Submit with the delivery of the MCC an Installation and Maintenance Manual and one (1) copy of the manufacturer's drawings per shipping block.

Regulatory Requirements

The MCC must conform to IEC Standard 60439-1 (fourth edition), IEC 60947-3 (1999), IEC 60947-4 (1990), and IEC 60529 (1989). The MCC must be manufactured in an ISO 9001 certified facility.

Packing/Shipping

The MCC shall be separated into shipping blocks no more than three vertical sections each. Shipping blocks shall be shipped on their sides to permit easier handling at the jobsite. Each shipping block shall include a removable lifting angle, which will allow an easy means of attaching an overhead crane or other suitable lifting equipment.

Storage

If the MCC cannot be placed into service reasonably soon after its receipt, store it in a clean, dry and ventilated building free from temperature extremes. Acceptable storage temperatures are from 32° F (0° C) to 104° F (40° C) .

Warranty

The MCC shall be warranted to be free from defects in materials and workmanship for a period of eighteen (18) months from the date of invoice from the manufacturer or authorized sales channel.

Manufacturers

- A. Shall be Schneider Electric/Square D Company or equal.
- B. Additions to existing MCCs shall be the same as the original manufacturer.

Materials

- A. Steel material shall comply with UL 845 and CSA requirements.
- B. Each MCC shall consist of one or more vertical sections of heavy gauge steel bolted together to form a rigid, free-standing assembly. Removable 7-gauge structural steel lifting angles shall be mounted along the full width of the MCC lineup at the top. Removable 7-gauge bottom channel sills shall be mounted underneath the front and rear of the vertical sections, extending the full width of the lineup. Vertical sections made of welded side-frame assembly shall be formed from a minimum of 12-gauge steel. Internal reinforcement structural parts shall be of 12- and 14-gauge steel to provide a strong, rigid assembly. The entire assembly shall be constructed and packaged to withstand normal stresses included in transit and during installation.



Model 6 Export Motor Control Centers Sample Specifications

MCC Finish

- A. All steel parts shall be provided with UL and CSA listed acrylic/alkyd baked enamel paint finish, except plated parts used for ground connections. All painted parts shall undergo a multi-stage treatment process, followed by the finishing paint coat.
- B. Pre-treatment shall include:
 - 1. Hot alkaline cleaner to remove grease and oil.
 - 2. Iron phosphate treatment to improve adhesion and corrosion resistance.
- C. The paint shall be applied using an electro-deposition process to ensure a uniform paint coat with high adhesion.
- D. The standard paint finish shall be tested to UL 50 per ASTM B117 (5% ASTM Salt Spray) with no greater than 0.125 in (3 mm) loss of paint from a scribed line.
- E. Paint color shall be #49 medium light gray per ANSI standard Z55.1-967 (60-70 gloss) on all surfaces unless specified otherwise. Control station plates and escutcheon plates shall be painted a contrasting gray. All unit interior saddles shall be painted white for better visibility inside the unit.

Structures

- A. Structures shall be totally enclosed, dead-front, freestanding assemblies. Structures shall be capable of being bolted together to form a single assembly.
- B. The overall height of the MCC shall not exceed 90 in. (2286 mm) (not including base channel or lifting angle). Base channels of 1.5 in. (38 mm) in height, and lifting angles of 3 in. (76 mm) in height shall be removable. The total width of one section shall be 20 in. (508 mm). [Widths of 25 in. (630 mm), 30 in. (760 mm), and 35 in. (890 mm) can be used for larger devices].
- C. Structures shall be IEC 60529 classification [IP 20 (indoor general purpose)] [IP 52 (indoor industrial duty)] [IP 24 outdoor non-walk-in (rainproof)].
- D. Each 20 in.- (508 mm) wide standard section shall have all the necessary hardware and bussing for modular plug-in units to be added and moved around. All unused space shall be covered by hinged blank doors and equipped to accept future units. Vertical bus openings shall be covered by manual bus shutters.
- E. Each section shall include a top plate (single piece or two-piece) and shall also include a bottom plate. Top and bottom plates shall be removable for ease in cutting conduit entry openings.

Wireways

- A. Structures shall contain a minimum 12 in.- (305 mm) high horizontal wireway at the top of each section and a minimum 6 in.- (152 mm) high horizontal wireway at the bottom of each section. These wireways shall run the full length of the MCC to allow room for power and control cables to connect between units in different sections.
- A. A full-depth vertical wireway shall be provided in each MCC section that accepts modular plug-in units. The vertical wireway shall connect with both the top and bottom horizontal wireways and shall be isolated from unit interiors by a full-height barrier. The vertical wireway shall be 4 in. (102 mm) wide minimum with a separate hinged door. There should be a minimum of 4,000 in.³ (65, 548 cm³) of cabling space available. Access to the wireways shall not require opening control unit doors. Structures that house a single, full-section control unit are not required to have vertical wireways. Those control units must open directly into the MCC horizontal wireways.



Model 6 Export Motor Control Centers

Sample Specifications

Barriers

- A. All power bussing and splice connections shall be isolated from the unit compartments and the wireways. The horizontal bus shall be mounted onto a glass-filled polyester support assembly that braces the bus against the forces generated during a short circuit. The horizontal bus shall be isolated from the top horizontal wireway by a two-piece plastic barrier. This barrier shall be removable to allow access to the bus and connections for maintenance.
- B. The vertical bus shall be housed in a molded glass-filled polyester support that provides bus insulation and braces the bus against the forces generated during a short circuit. These supports shall have openings every 3 in. (75 mm) for unit stab-on connections. Each opening shall be provided with a manual shutter to close off the stab opening. These shutters shall be attached to the structure so that when they are removed (to allow a stab connection) they are retained in the structure and are readily accessible for use should a plug-in unit be removed from the MCC.
- C. Barriers shall be provided in the vertical structure and unit designs to prevent the contact of any energized bus or terminal by a fishtape inserted through the conduit or wireway areas.
- D. MCCs shall contain a system of internal partitions to meet form of separation 4a per IEC 60439-1.

Bussing

- A. All bussing and connectors shall be [tin-plated] [silver-plated] copper .
- B. The main horizontal bus shall be rated at [600 A] [800 A] [1200 A] [1600 A] [2000 A] [2500 A] continuous and shall extend the full length of the MCC. Bus shall be type tested assemblies (TTA) for temperature and short circuit withstand strength per IEC 60439-1. Provisions shall be provided for splicing additional sections onto either end of the MCC.
- C. The horizontal bus splice bars shall be pre-assembled into a captive bus stack. This bus stack is installed into the end of the MCC power bus to allow the installation of additional sections. The main bus splice shall utilize four bolts, two on each side of the bus split, for each phase. Additional bolts must not be required when splicing higher amperage bus. The splice bolts shall secure to self-clenching nuts installed in the bus assembly. It shall be possible to maintain any bus connection with a single tool. "Nut and bolt" bus connections to the power bus shall not be permitted.
- D. Each section that accepts plug-in units shall be provided with a vertical bus for distributing power from the main bus to the individual plug-in starter units. This bus shall be of the same material and plating as the main bus, and shall be rated at 600 A continuous. The vertical bus shall be connected directly to the horizontal bus stack without the use of risers or other intervening connectors. It shall be possible to maintain the vertical to horizontal bus connection with a single tool. "Nut and bolt" bus connections to the power bus shall not be permitted.
- E. A tin-plated copper ground bus shall be provided that runs the entire length of the MCC. The ground bus shall consist of two (2) 0.25 in. (6.0 mm) x 1.0 in. (25 mm) bars and be rated for 600 amps. A compression lug shall be provided in the MCC for a 4/0-250 kcmil ground cable. The ground bus shall be provided with (6) 0.38 in. (10 mm) holes for each vertical section to accept customer-supplied ground lugs for any loads requiring a ground conductor.
- F. Each vertical section with vertical power bus shall have a tin-plated copper vertical ground bus that is connected to the horizontal ground bus. This vertical ground bus shall be installed so that the plug-in units engage the ground bus prior to engagement of the power stabs and shall disengage only after the power stabs are disconnected upon removal of the plug-in unit.
- G. The system shall be rated for an available short circuit capacity of [22,000] [42,000] [50,000] [65,000] [70,000] rms amperes, and be rated with a short-time current (I_{CW}) of [22,000] [42,000] [50,000] [65,000] [70,000] rms amperes for 1 second.



Model 6 Export Motor Control Centers Sample Specifications

Typical Unit Construction

- A. All surfaces (back, side, and bottom plates) of the unit interior shall be painted white.
- B. Units with circuit breaker disconnects through a 600 A frame shall connect to the vertical bus through a spring-reinforced stab-on connector. Units with larger disconnects shall be connected directly to the main horizontal bus with appropriately sized cable or riser bus. Stabs on all plug-on units shall be solidly bussed to the unit disconnect. Cabled stab assemblies are not permitted.
- C. All conducting parts on the line side of the unit disconnect shall be shrouded by a suitable insulating material to prevent accidental contact with those parts.
- D. Unit mounting shelves shall include hanger brackets to support the unit weight during installation and removal. All plug-on units shall use a twin-handle cam lever located at the top of the bucket to rack in and out the plug-on unit. The cam lever shall work in conjunction with the hanger brackets to ensure positive stab alignment.
- E. A handle operator must be provided on the unit door for each disconnect. With the unit stabs engaged onto the vertical phase bus and the unit door closed, the handle mechanism shall allow complete ON/OFF control of the unit disconnect with clear indication of the disconnect's status. All circuit breaker operators shall include a separate TRIP position to clearly indicate a circuit breaker trip condition. It shall be possible to reset a tripped circuit breaker without opening the control unit door.
- F. A mechanical interlock shall prevent the operator from opening the unit door when the disconnect is in the ON position. It shall be possible for authorized personnel to defeat these interlocks.
- G. A non-defeatable interlock shall be provided between the handle operator and the cam lever to prevent installing or removing a plug-on unit unless the disconnect is in the OFF position.
- H. The plug-in unit shall have a grounded stab-on connector which engages the vertical ground bus prior to, and releases after, the power bus stab-on connectors.
- I. Provisions shall be provided for locking all disconnects in the OFF position with up to three padlocks.
- J. Unit construction shall combine with the vertical wireway isolation barrier to provide a fully compartmentalized design.
- K. Internal degree of protection shall be IP 20 between units.

Components for Typical Units

- A. Combination Starters
 - 1. All combination starters shall utilize a unit disconnect as specified in the previous section. Magnetic starters shall be furnished in all combination starter units. All starters shall utilize IEC contactors rated for AC-3 duty. Starters shall be provided with a three-pole, external manual reset and [ambient compensated bimetallic] [solid state] overload relay units.
 - 2. When provided, control circuit transformers shall include two primary protection fuses and one secondary fuse (in the non-ground secondary conductor). The transformer shall be sized to accommodate the contactor(s) and all connected control circuit loads. The transformer rating shall be fully visible from the front when the unit door is opened.
 - 3. When a unit control circuit transformer is not provided, the disconnect shall include an electrical interlock for disconnecting externally powered control circuits.
 - 4. Auxiliary control circuit interlocks shall be provided where indicated. Auxiliary interlocks shall be field convertible to normally open or normally closed operation.
 - 5. Starters shall be mounted directly adjacent to the wireway so that power wiring (motor leads) shall connect directly to the starter terminals without the use of interposing terminals. Large starters shall be arranged so that power wiring may exit through the bottom of the starter cubical without entering the vertical wireway.



Model 6 Export Motor Control Centers

Sample Specifications

B. Terminal Blocks

1. All starter units shall be provided with unit control terminal blocks.
2. Terminal blocks shall be IEC type 600 volt, box lug type, and rated at 30 amps. All current carrying parts shall be tin-plated. Terminals shall be accessible from inside the unit when the unit door is opened. Terminal blocks shall be DIN rail-mounted and secured to the unit bottom plate. The terminals used for field connections shall face forward so they can be wired without removing the unit or any of its components.

C. Nameplates

1. Each MCC and unit compartment shall have engraved phenolic nameplates. They shall be gray background with white letters, measuring a minimum of 1.5 in. (38 mm) H x 6.25 in. (159 mm) W total outside dimensions.

Six-Inch (152 mm) Unit Construction

- A. Units with circuit breaker disconnects through 100 A frame shall connect to the vertical bus through a spring-reinforced stab-on connector. Stabs on all plug-on units shall be cable connected to the unit disconnect.
- B. All conducting parts on the line side of the unit disconnect shall be shrouded by a suitable insulating material.
- C. Unit mounting shelves shall include hanger brackets to support the unit weight during installation and removal. All six-inch plug-on units shall be installable without the assistance of a camming device so as to allow maximum accessibility with the unit installed.
- D. A cast metal handle operator must be provided on each disconnect. With the unit stabs engaged into the vertical phase bus and the unit door closed, the handle mechanism shall allow complete ON/OFF control of the unit disconnect with clear indication of the disconnect's status. All circuit breaker operators shall include a separate TRIP position to clearly indicate a circuit breaker trip condition. It shall be possible to reset a tripped circuit breaker without opening the control unit door.
 1. A mechanical interlock shall prevent an operator from opening the unit door when the disconnect is in the ON position. Another mechanical interlock shall prevent an operator from placing the disconnect in the ON position while the door is open. It shall be possible for authorized personnel to defeat these interlocks.
 2. A non-defeatable interlock shall be provided between the handle operator and the structure to prevent installing or removing a plug-on unit unless the disconnect is in the OFF position. The plug-on unit shall have a grounded stab-on connector which engages the vertical ground bus prior to, and releases after, the power bus stab-on connectors.
- E. Provisions shall be made for locking all disconnects in the OFF position with up to three padlocks.
- F. Handle mechanisms shall be located on the bottom left side of the unit and operate horizontally to encourage operators to stand to the left of the unit being switched.
- G. Unit construction shall combine with the vertical wireway isolation barrier to provide a fully compartmentalized design.
- H. Up to a maximum of twelve six-inch (152 mm) units can be installed per vertical section without placement restrictions in new or existing applications.



Model 6 Export Motor Control Centers Sample Specifications

Components for Six-Inch (152 mm) Units

A. Six-Inch (152 mm) Combination Starters

1. All six-inch (152 mm) combination starters shall use a unit disconnect as specified in the previous article. All starters shall use IEC contactors rated for AC-3 duty. Starter units shall be provided with a 3-pole, external manual reset and ambient compensated bimetallic motor overload protection.
2. When provided, control circuit transformers shall include two primary protection fuses and one secondary fuse (in the non-ground secondary conductor.) The transformer shall be sized to accommodate the contactor(s) and all connected control circuit loads.
3. When a unit control circuit transformer is not provided, the disconnect shall include an electrical interlock for disconnecting externally powered control circuits.
4. Auxiliary control circuit interlocks shall be provided where indicated.
5. Starters shall be mounted directly adjacent to the wireway so that power wiring (motor leads) will connect directly to the starter terminals.

B. Terminal Blocks for Six-Inch (152 mm) Units

1. All starter units shall be provided with unit control terminal blocks.
2. Terminal blocks shall be pull-apart type, 250 V, and rated for 10 amperes. All current-carrying parts shall be tin-plated. Terminals shall be accessible from inside the unit when the unit door is opened. The stationary portion of the terminal block shall be used for factory connections and will remain attached to the unit when the portion used for field connections is removed. The terminals used for field connections shall be accessible so they can be wired without removing the unit or any of its components.

C. Engraved phenolic nameplates shall be provided for each MCC and unit compartment. Each nameplate shall have a gray background, white lettering, and measure a minimum of 1.5 in. H x 6.25 in. W (38 mm H x 150 mm W) total outside dimensions.

D. Each unit to be provided with a control panel for up to four pilot devices [Pilot device control panel can be deleted if no local unit pilot devices are required.] Control panel to be removable by loosening two semi-captive fasteners for customer access.



Model 6 Export Motor Control Centers

Sample Specifications

Quality Control

- A. The entire MCC shall go through a quality inspection before shipment. This inspection will include:
1. Physical Inspection of:
 - a. Structure
 - b. Electrical conductors, including:
 - 1) bussing
 - 2) general wiring
 - 3) units
 2. Electrical Tests
 - a. General electrical tests include:
 - 1) power circuit phasing
 - 2) control circuit wiring
 - 3) instrument transformers
 - 4) meters
 - 5) ground fault system
 - 6) device electrical operation
 - b. AC dielectric tests shall be performed on the power circuit
 3. Markings/Labels, include:
 - a. instructional type
 - b. inspector's stamps
 - c. CE mark (if requested)
- B. The manufacturer shall use integral quality control checks throughout the manufacturing process to ensure that the MCC meets operating specifications.

Location

- A. Motor control centers are not to be placed in hazardous locations. The area chosen shall be well ventilated and totally free from humidity, dust and dirt. The temperature of the area shall be no less than 32° F (0° C) and no greater than 104° F (40° C). For indoor locations, protection must be provided to prevent moisture entering the enclosure .
- B. Motor control centers shall be located in an area with a minimum of 3 ft. (915 mm) of free space in front of front-of-board construction. An additional 3 ft. (915 mm) should be allowed in the rear of back-to-back construction. This free space will give adequate room to remove and install units. A minimum of 0.5 in. (13 mm) space should be provided between the back of front-of-board MCCs and a wall, 6 in. (152 mm) required for damp locations.
- C. The MCCs shall be assembled in the factory on a smooth level surface so that all sections are properly aligned. A similar smooth and level surface shall be provided for installation. An uneven foundation will cause misalignment of shipping blocks, units, and doors. The surface under a MCC shall be of a non-combustible material unless bottom plates are installed in each vertical section.



SECTION CONTENTS

APPENDIX	88
Parts Lists	88
Main and Branch Circuit Breakers	88
Starter Unit Circuit Breakers	89
Starter Unit Contactors	91
Starter Unit Overload Relays	92
Items Subject to Customer Agreement	94



Model 6 Export Motor Control Centers

Appendix

APPENDIX

Parts Lists

Main and Branch Circuit Breakers

Description/Type	Ampacity	Square D Catalog Number (Complete Device)	International Catalog Number (Frame Only)	International Catalog Number (Trip Unit)
Three-Pole COMPACT® Standard Interrupting, Thermal Magnetic				
COMPACT NS100N	16	NFNLE36016	29003	29035
	25	NFNLE36025		29034
	32	NFNLE36032		29037
	40	NFNLE36040		29033
	50	NFNLE36050		29036
	63	NFNLE36063		29032
	80	NFNLE36080		29031
COMPACT NS160N	100	NFNLE360100		29030
	125	NFNPE36125	30403	30431
160	NFNPE36160	30430		
COMPACT NS250N	200	NFNPE36200		31431
	250	NFNPE36250	31430	
Three-Pole COMPACT Standard Interrupting, Std/Electronic				
COMPACT NS100N	16	NFNLE36040E20	29003	29072
	25			
	32			
	40			
	50	NFNLE36100E20		29070
	63			
	80			
COMPACT NS160N	100			
	125	NFNPE36160E20	30403	30470
COMPACT NS250N	160			
	200	NFNPE36250E20	31403	31470
250				
COMPACT NS400N	400	NJNLE36400E20	32403	32420
COMPACT NS630N	600	NJNLE36630E20	32803	
Three-Pole COMPACT Standard Interrupting, Full/Electronic				
COMPACT NS400N	400	NJNLE36400E59	32403	32427
COMPACT NS630N	600	NJNLE36630E59	32803	
Three-Pole COMPACT High Interrupting, Thermal Magnetic				
COMPACT NS100H	16	NFHLE36016	29004	29035
	25	NFHLE36025		29034
	32	NFHLE36032		29037
	40	NFHLE36040		29033
	50	NFHLE36050		29036
	63	NFHLE36063		29032
	80	NFHLE36080		29031
	100	NFHLE36100		29030
COMPACT NS160H	125	NFHPE36125	30404	30431
	160	NFHPE36160		30430
COMPACT NS250H	200	NFHPE36200	31404	31431
	250	NFHPE36250		31430



Model 6 Export Motor Control Centers Appendix

Main and Branch Circuit Breakers (Continued)

Description/Type	Ampacity	Square D Catalog Number (Complete Device)	International Catalog Number (Frame Only)	International Catalog Number (Trip Unit)
Three-Pole COMPACT High Interrupting, Std/Electronic				
COMPACT NS100H	16	NFHLE36040E20	29004	29072
	25			
	32			
	40			
	50	NFHLE36100E20		29070
	63			
	80			
	100			
COMPACT NS160H	125	NFHPE36160E20	30404	30470
	160			
COMPACT NS250H	200	NFHPE36250E20	31404	31470
	250			
COMPACT NS400H	400	NJHLE36400E59	32404	32420
COMPACT NS630H	600	NJHLE36630E59	32804	
Three-Pole COMPACT High Interrupting, Full/Electronic				
COMPACT NS400H	400	NJHLE36400E59	32404	32427
COMPACT NS630H	600	NJHLE36630E59	32803	

Starter Unit Circuit Breakers

Description/Type	Ampacity	Square D Catalog Number (Complete Device)	International Catalog Number (Frame Only)	International Catalog Number (Trip Unit)
Three-Pole Standard Interrupting, Magnetic Only				
COMPACT NS100N	2.5	NFNLE36003M59	29003	29125
	6.3	NFNLE36006M60		29124
	12.5	NFNLE36013M61		29123
	25	NFNLE36025M62		29122
	50	NFNLE36050M63		29121
	100	NFNLE36100M64		29120
COMPACT NS160N	150	NFNPE36150M52	30403	30500
COMPACT NS250N	220	NFNPE36250E53	31403	31500
Three-Pole Standard Interrupting, Electronic				
COMPACT NS100N	2.5	NFNLE36040E40	29003	29173
	6.3			
	12.5			
	25			
	50	NFNLE36050E40		29172
	100	NFNLE36100E40		29170
COMPACT NS160N	150	NFNPE36150E40	30403	30520
COMPACT NS250N	220	NFNPE36250E40	31403	31520
COMPACT NS400N	320	NJNLE36400E48	32403	32431
COMPACT NS630N	500	NJNLE36630E48	32803	
Three-Pole High Interrupting, Magnetic Only				
COMPACT NS80HMA	1.5	28106		
	2.5	28105		
	6.3	28104		
	12.5	28103		
	25	28102		



Model 6 Export Motor Control Centers

Appendix

Starter Unit Circuit Breakers (Continued)

Description/Type	Ampacity	Square D Catalog Number (Complete Device)	International Catalog Number (Frame Only)	International Catalog Number (Trip Unit)
COMPACT NS80HMA	50	28101		
	80	28100		
COMPACT NS100H	2.5	NFHLE36003M59	29004	29125
	6.3	NFHLE36006M60		29124
	12.5	NFHLE36013M61		29123
	25	NFHLE36025M62		29122
	50	NFHLE36050M63		29121
	100	NFHLE36100M64		29120
COMPACT NS160H	150	NFHPE36150M52	30404	30500
COMPACT NS250H	220	NFHPE36220M53	31404	31500
COMPACT NS400H	320	NJHPE36320M36	32404	32430
COMPACT NS630H	500	NJHPE36500M42	32808	
Three-Pole High Interrupting, Electronic				
COMPACT NS100H	2.5	NFHLE36040E40	29004	29173
	6.3			
	12.5			
	25			
	50	NFHLE36050E40		29172
	100	NFHLE36100E40		29170
COMPACT NS160H	150	NFHPE36150E40	30404	30520
COMPACT NS250H	220	NFHPE36250E40	31404	31520
COMPACT NS400H	320	NJHLE36400E48	32404	32431
COMPACT NS630H	500	NJHLE36630E48	32808	



Model 6 Export Motor Control Centers Appendix

Starter Unit Contactors

Description/Type	Ampacity	Catalog Number ★
Full Voltage Non-Reversing (DOL)	9	LC1D0910...
	12	LC1D1210...
	18	LC1D1810...
	25	LC1D2510...
	32	LC1D3210...
	40	LC1D4011...
	50	LC1D5011...
	65	LC1D6511...
	80	LC1D8011...
	115	LC1D11500...
	150	LC1D15000...
	185	LC1F185...
	225	LC1F225...
	265	LC1F265...
	330	LC1F330...
	400	LC1F400...
500	LC1F500...	
Full Voltage Reversing	9	LC2D0911...
	12	LC2D1211...
	18	LC2D1811...
	25	LC2D2511...
	32	LC2D3211...
	40	LC2D4011...
	50	LC2D5011...
	65	LC2D6511...
	80	LC2D8011...
	115	LC2D11500...
	150	LC2D15000...
	185	(2) LC1F185...
	225	(2) LC1F225...
	265	(2) LC1F265...
	330	(2) LC1F330...
	400	(2) LC1F400...
500	(2) LC1F500...	
Reduced Voltage Autotransformer	"Run" Contactor	
	80	LC1D8011...
	115	LC1D11500...
	150	LC1D15000...
	185	LC1F185...
	225	LC1F225...
	265	LC1F265...
	330	LC1F330...
	400	LC1F400...
	500	LC1F500...
	"1S" Contactor	
	80	LC1D8011...
	115	LC1D11500...
	150	LC1D15000...

★ Catalog number must be completed by adding the coil voltage suffix.



Model 6 Export Motor Control Centers

Appendix

Starter Unit Contactors (Continued)

Description/Type	Ampacity	Catalog Number ★
Reduced Voltage Autotransformer	185	LC1F185...
	"2S" Contactor	
	80	LC1D8011...
	115	LC1D11500...
	150	LC1D15000...
	185	LC1F185...
	225	LC1F225...
	265	LC1F265...
	330	LC1F330...
	400	LC1F400...
	500	LC1F500...

★ Catalog number must be completed by adding the coil voltage suffix.

Starter Unit Overload Relays

Description/Type	Ampacity	Catalog Number
Class 10 Bimetallic	0.63–1.0	LR2D1305
	1.0–1.6	LR2D1306
	1.25–2.0	LR2D13X6
	1.6–2.5	LR2D1307
	2.5–4.0	LR2D1308
	4.0–6.0	LR2D1310
	5.5–8.0	LR2D1312
	7–10	LR2D1314
	9–13	LR2D1316
	12–18	LR2D1321
	17–25	LR2D1322
		LR2D3322
	23–32	LR2D3353
	30–40	LR2D3355
	37–50	LR2D3357
	48–65	LR2D3359
63–80	LR2D3363	
Class 10 Solid State	60–100	LR9F5367
		LR9D5367
	90–150	LR9D5369
		LR9F5369
	132–220	LR9F5371
	200–330	LR9F7375
300–500	LR9F7379	
Class 20 Bimetallic	0.63–1.0	LR2D1505
	1.0–1.6	LR2D1506
	1.25–2.0	LR2D15X6
	1.6–2.5	LR2D1507
	2.5–4.0	LR2D1508
	4.0–6.0	LR2D1510
	5.5–8.0	LR2D1512
	7–10	LR2D1514
	9–13	LR2D1516
	12–18	LR2D1521



Model 6 Export Motor Control Centers Appendix

Starter Unit Overload Relays (Continued)

Description/Type	Ampacity	Catalog Number
Class 20 Bimetallic	17-25	LR2D1522
		LR2D3522
	23-32	LR2D3553
	30-40	LR2D3555
	37-50	LR2D3557
	48-65	LR2D3559
	63-80	LR2D3563
Class 20 Solid State	60-100	LR9F5567
		LR9D5567
	90-150	LR9D5569
		LR9F5569
	132-220	LR9F5571
	200-330	LR9F7575
300-500	LR9F7579	
LT6 Multifunction Relay	0.63-6.0	LT6P0M005FM
	6.1-500	LT6P0M025FM



Model 6 Export Motor Control Centers

Appendix

Items Subject to Customer Agreement

IEC Standard 60439-1 Paragraph	Model 6 Export MCC Standard Agreement
4.7 Rated Diversity Factor	1.0
6.1.1.2 Suitability for arctic climate	For outdoor installations of the IP 24 enclosure, the temperature must be maintained above 0 degrees C.
6.1.3 Suitability for operation above 1000 m	The MCC is rated for operation up to and including 1000 m. The customer must request special derating for the MCC above 1000 m.
6.2 Special service conditions	No special conditions are agreed to, other than conditions listed in the Technical Information table on page 18.
6.2.10 Electrical and radiated interferences	Designed for EMC environment 1 per paragraph 7.10.1. Other considerations must be requested by the customer.
6.3.1 Conditions during transport storage and erection	Same conditions as specified in the Technical Information table on page 18.
7.1.3 Terminals for external conductors	For power conductors of main compartments, see the tables on page 30. Load power cables meet IEC 60439 requirements Control connections - see output unit features beginning on page 8. Neutral conductors connections are sized for 50% capacity
7.2.1.1 Degree of protection required for intended installation	IP 20 (indoor) Option for indoor IP 52 Option for outdoor IP 24
7.4.2 Choice of protective measures against direct contact	Tool access is required to enter the external enclosure which is IP 20 minimum degree of protection, provided that installation instructions are followed.
7.4.3 Choice of protective measure against direct contact	Protective circuit method via interconnected bus bar, provided that installation instructions are followed.
7.4.6 Accessibility in service by authorized personnel	Internal form of separation Form 2b and 4a. Inspections, adjustments, replacements, maintenance, and extension should not be performed while the assembly is energized.
7.5.2.3 Values of prospective short circuit current	One incoming unit is provided. Refer to short circuit withstand strength of the main device selected, and the outgoing functional units in this catalog.
7.5.4 Coordination of short circuit protection devices	Outgoing units are selectively coordinated for clearing each faulted circuit without affecting the continuity of supply for the other outgoing units.
7.6.4.1 Insertion interlock	Provided for preventing insertion or removal while under load
7.6.4.3 Degree of protection after removal of a removable part	After removal of an outgoing unit, the form of separation is not maintained unless the vertical bus cover is installed manually.
7.7 Form of separation	Forms 2b and 4a
7.9.1 Input voltage variations for electronic equipment supply	Voltage rating for devices is nominal supply +/- 10%
7.9.4, item b) Supply frequency variation	Deviation of normal frequency of up to +/- 1%
8.2.1.6 Ambient air temperature for temperature-rise test	Between +10 and +40 degrees Celsius
8.2.3.2.3, item d) Value of neutral bar current for short-circuit test	Minimum of 50% of horizontal bus bar rating
8.3.1 Repetition of electrical operation test on site	Full functional test is performed at the factory. Additional site tests must be specified by the user and will be at additional charge.



B

Bus Bars	11
----------------	----

C

CE Marking	15, 18, 24, 50, 86
Certification	49
ASEFA	18, 39, 49
LOVAG	18, 39, 49
Type Tested Assemblies	6
Type Tested Assemblies (TTA)	7, 49
Circuit Breakers	13
Branch	35–36
High Interrupting	13
Main	26, 28
Main and Branch	88–89
MERLIN GERIN COMPACT NS	13, 28, 35, 40, 88–90
Starter Unit	39, 89–90
Thermal Magnetic	8, 13, 28, 35
Contactors Utilization	48
Contactors	
Starter Unit	41–48, 91
Control Power	8–9
Control Station Plate	10
Control Voltage	40
Coordination	
Circuit Breaker/Contactor	38
Type 1	8, 38
Type 2	8, 39

D

Dimensions	51–78
------------------	-------

E

Enclosure Types	21
Conduit Entry	54–78
IEC	22
IP 20 and IP 52	52
IP 24	53
NEMA	21



Model 6 Export Motor Control Centers

Index

F

Features

Bus Bar	11
Functional (Outgoing) Unit	8
Incoming Device	13
Internal Separation	14
Structural	6

H

Handles

Rotary	10, 13, 28, 35
Toggle	10, 13, 28, 35
Horizontal Bus Bars	11, 82
Horizontal Ground Bus	12

I

IEC Degrees of Protection	22
Publication 60529	22
Incoming Devices	26

M

Main Lugs	13, 26
MERLIN GERIN	
Circuit Breakers	4, 13, 28, 35, 40, 88–90

N

Neutral Bus	12, 31
Neutral Lug Assembly	31

O

Options	15
Bussing	25
Four-Wire	31
Structure	24
Overload Relays	
Starter Unit	40, 92–93



P

POWERLOGIC

- Circuit Monitor 13, 32
- Power Meter 13, 33

Programmable Logic Controllers (PLCs) 15

R

Relays

- Starter Unit 15

S

Sections

- Relay - 15 Inches (381 mm) Deep 58–60, 73–74
- Relay - 20 Inches (508 mm) Deep 65–66, 77–78
 - Autotransformer Starters 67–69
 - Main/Branch Devices 67–69
- Standard - 15 Inches (381 mm) Deep 54–57, 71–72
- Standard - 20 Inches (508 mm) Deep 61–64, 75–76

Selections

- Control Voltage 40
- Enclosure 21

Shipping Weights 78

Standards

- ANSI 6
- ANSI Z55.1-967 81
- EN 60439-1 18, 49
- IEC 439 29, 36
- IEC 60439-1 4, 6, 12, 14, 18, 40, 49, 80
- IEC 60529 18, 22, 49, 80–81
- IEC 60947-1 18, 49
- IEC 60947-2 13, 18, 49
- IEC 60947-3 18, 49, 80
- IEC 60947-4 18, 48–49, 80
- IEC 60947-4-1 39
- IEC 947-2 35
- IEC 947-4-1 8, 38–39
- NEMA Standards Publication 250 21
- UL 50 21



Model 6 Export Motor Control Centers
Index

T

TELEMECANIQUE

- Contactors 4, 8, 40
- Pilot Devices 4, 10
- Relays 4, 40

Terminal Blocks 14, 84

Three-Phase, Four-Wire Systems 26, 31

Type Tested Assemblies 6–7, 49

U

Unit

- Branch Feeder 9, 35
- COMPAC 6 10, 15, 41–45, 84–85
- Functional 8, 14
- Motor Starter 9, 38

Utilization Categories 40, 48

V

Vertical Bus 11, 82

W

Wireways 14, 81

Square D Company
1990 Sandifer Blvd.
Seneca, SC 29678
1-888-SquareD
(1-888-778-2733)
www.SquareD.com

Schneider Canada Inc.
19 Waterman Avenue,
M4B 1 Y2
Toronto, Ontario
1-800-565-6699
www.schneider-electric.ca

Catalog No. 8998CT0101 July 2001 © 2001 Schneider Electric All Rights Reserved