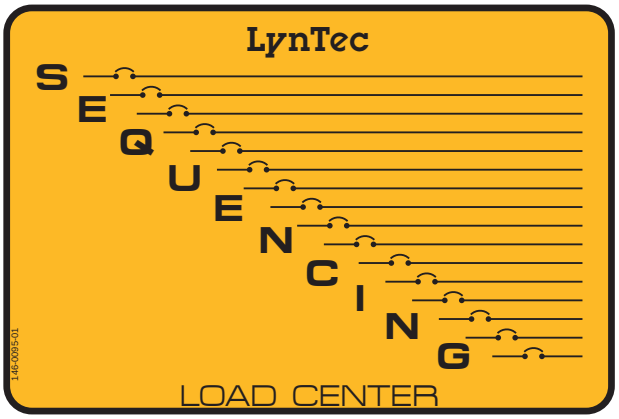
Motorized circuit breakers sequence sound system AC power!



1 second per step sequential turn-on delay

LynTec's SLC series *adds* **branch circuit sequencing** to the main and branch circuit breaker functions normally found in a load center.

How it works: Applies AC to low level electronics... waits for them to stabilize... (clicks and pops are ignored by un-powered power amps)... AC is then sequenced to power amplifiers to spread high inrush currents over time.

Protects valuable loudspeaker systems by delaying turn-on until all low level equipment has stabilized.

SLC series BENEFITS

✔ **ONE TOUCH remote power control**

Immediate visual feedback provided by flashing **ON** switch.

Light stays **ON** to verify sequence completion.

Process is reversed for turn-off sequence.

May be controlled from one to six locations.

May be daisy-chained for multiple sequencing load centers in large facilities.

✔ **Reduced installation labor**

One wall-mounted, load center cabinet feeds ***sequenced*** AC power to all rack and console receptacles.

✔ **Low power consumption**

MB series motorized circuit breakers require no holding current (DC relays) or cooling fans (solid state relays). Runs cool — lasts long.

✔ **High reliability, time proven circuit breakers — UL Listed**

Square D HACR (Heating Air Conditioning Rated) breakers for high inrush capability and 10,000 amp interrupting capacity.

SOUND SYSTEM MAIN BREAKER provides one lever sound system disconnect.

All class 1 components (120/240V or 208/120V) are UL listed.

✔ **Automatic load shedding**

Zip-off system automatically sheds load when power fails.

Stored energy zips-off all circuits 2 seconds after power fails.

Re-sequences when power resumes without operator intervention.

Smart wake-up is great for unattended systems.

Reduces start-up load for auxiliary power units.

Emergency Shutdown option disables sound system 2.5 sec. after contact opening.

✔ **Interfaces with our PDS-8 series small sequencer**

May be used for front-of-house control, the PDS-8 sequences front end equipment first and then turns on SLC load centers for stage or power amplifier locations.

Available in single phase and three phase load centers

SLC 341-41
Loudenboomen Interruptus Maximus

Loudenboomen Interruptus Minimus
SLC 326A-26

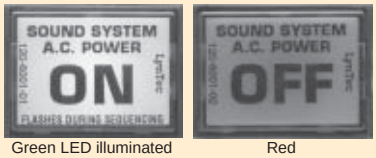
Sequence up to 16, 26 or 41 circuits.

Load Centers daisy-chain for larger systems

UMB series Un-motorized circuit breakers may also be used in remaining breaker spaces for additional unsequenced power.

ONE TOUCH
REMOTE POWER CONTROL

SHOWN ACTUAL SIZE



Green LED illuminated — Red

SS-2 Sequencer Switch Set

One switch set supplied, additional sets optional.

Sequencer supports up to six switch sets for remote control of sound system AC power from several locations.

Mount in 5/8" round holes on 1" centers.
4 – 22 ga. wires required,
10,000 ft. maximum run.

Optional **SS-2PL** Locking Switch Plate

Provides key limited access with visible power verification

The UL listed heart of the Sequencing Load Center

Handle functions as a normal circuit breaker.

When switched off or tripped due to overload, the remote control will not turn on power.

When in the normal ON position, the motorized remote control will turn it off.

The motor does not move the handle... it only opens the high current contacts.

15, 20 & 30 amp.

One, two & three pole breakers available.

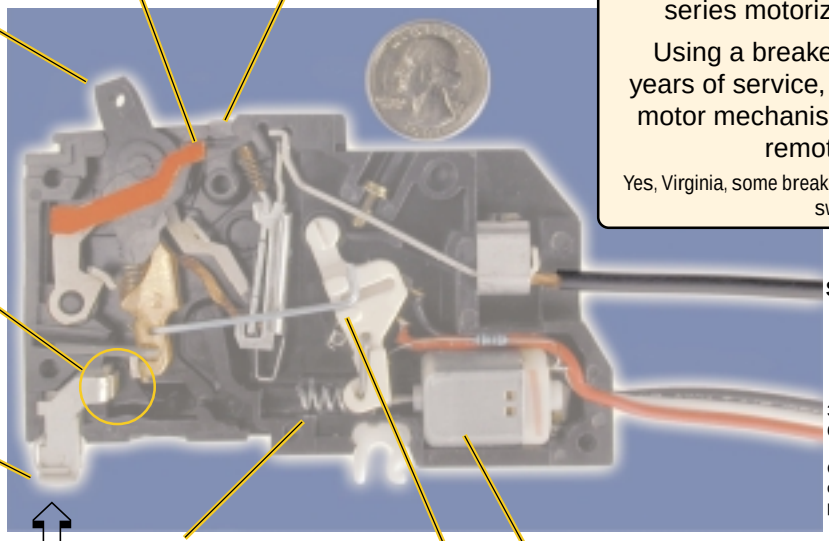
120/240V. AC SWD UL & CSA Listed.

Snap on clip with heavy steel force spring.

Contact is held tightly in place on panel board feeder finger.

Under high current stress, magnetic forces actually increase contact pressure.

Red flag snaps into window when circuit breaker is tripped.



AC POWER IN

Spring used as a worm gear drive.

Actuator arm pulls contact open.

Low voltage motor.

Life rated for 30,000 ON/OFF cycles

The time-proven SQUARE D QOPL series motorized circuit breaker.

Using a breaker proven in over 20 years of service, SQUARE D added a motor mechanism in 1986 to provide remote control.

Yes, Virginia, some breakers are intended to be used as switches!

SEQUENCED AC POWER OUT to receptacles

3 wire, low-voltage, 60" pigtail with 600 volt insulation.

Connects to sequencer in low voltage cabinet to provide 24 volt actuation power for remote control.

Extensive use of LEDs speeds performance testing

Lower left section of load center with covers removed.

LOW VOLTAGE SECTION (NEC class 2 wiring)

HIGH VOLTAGE SECTION (NEC class 1 wiring)

Snap-in, field-installed,
Motorized High Magnetic Breakers

Green **ON** indicator LEDs for each breaker give full visual indication of sequencer action and status.

Red LEDs for each breaker show a short-time glow for normal capacitor charging and motor current.

When continuously lit a **FAULT** is indicated.

A mis-connected breaker or incomplete breaker motor transition will cause a fault.

Local PILOT LED

Sequencer capable of driving the LEDs in up to 6 – **SS-2** Switch Sets.

ON and OFF push-button switches for system troubleshooting.

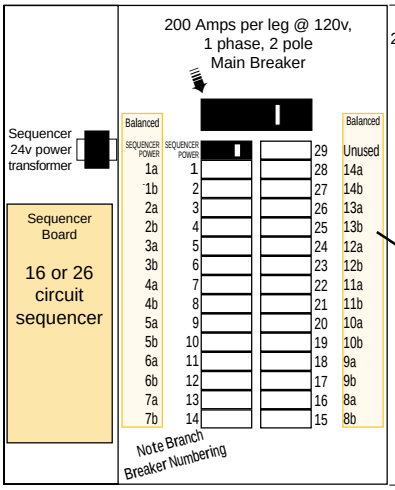
Daisy-chain connections for system expansion

3 wire, low-voltage, 60" pigtail with 600 volt insulation from each motorized breaker.

Connects to sequencer board terminals in low voltage cabinet to provide 24 volt actuation power for remote control.

Control lines to SS-2 Switch Sets
4 conductors, 22 ga., 10,000 ft. run max.

Single Phase, 3 Wire – 120/240Vac or 60v—0—60v Balanced Power



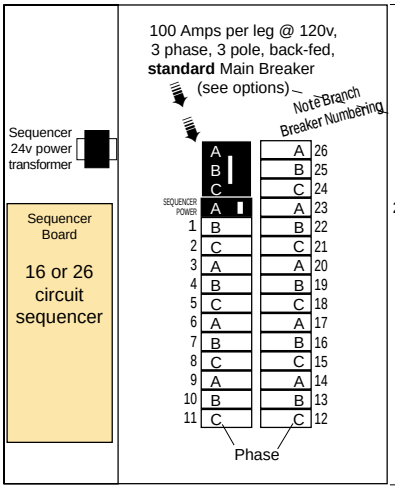
29.75" tall

LynTec Model	Power Type Single phase	Square D reference number (all UL listed)	Main Breaker (Amps.)	Branch Breaker Spaces may be sequenced (**MB**) or un-sequenced (**UMB**)	Sequencer Capacity (Will drive up to this many motorized breakers)
SLC 129-16	**1Ø**,120/240Vac	QO30M200	200	29	**16**
SLC 129-26	**1Ø**,120/240Vac	QO30M200	200	29	**26**
SLC 129-14 Bal	**1Ø**, 60—0—60Vac	QO30M200	200	29	**14 (2 pole)**

See below for circuit breakers to *complete* the SEQUENCING LOAD CENTER **package.**

Each SLC model includes: Load center with surface mount cover, Main breaker, Isolated ground kit, Sequencer circuit board in attached, class 2, low voltage cabinet., One un-motorized 10 Amp. breaker feeding the sequencer power via a UL listed 24v transformer and one remote-mountable SS-2 Sequencer ON/OFF Switch Set.

3 Phase 4 Wire – 208Y/120Vac



29.75" tall

LynTec Model	Power Type 3 phase	Square D reference number (all UL listed)	Main Breaker (Amps.)	Branch Breaker Spaces may be sequenced (**MB**) or un-sequenced (**UMB**)	Sequencer Capacity (Will drive up to this many motorized breakers)
SLC 326A-16	**3Ø**, 208Y/120Vac	QO327M100	100	26	**16**
SLC 326A-26	**3Ø**, 208Y/120Vac	QO327M100	100	26	**26**

Main Breaker options: **-M50**, **-M60**, **-M70**, **-M80**, **-M90**

Each SLC model includes: Load center with surface mount cover, Main breaker, Isolated ground kit, Sequencer circuit board in attached, class 2, low voltage cabinet., One non-motorized 10 Amp. breaker feeding the sequencer power via a UL listed 24v transformer and one remote-mountable SS-2 Sequencer ON/OFF Switch Set.

UL listed circuit breakers needed to *complete* the SEQUENCING LOAD CENTER **package.**

MB-15 **M**otorized **B**reaker, Square D #QO115PL-5393, One pole, **15** Amps. **Special 60" leads.** Square D trip curve: 730-4 (15 and 20 Amp breakers have a HM, High Magnetic rating. HM reduces nuisance breaker trips on high inrush loads like power amplifiers)
MB-20 **M**otorized **B**reaker, Square D #QO120PL-5393, One pole, **20** Amps. **Special 60" leads.** Square D trip curve: 730-4
MB-30 **M**otorized **B**reaker, Square D #QO130PL-5393, One pole, **30** Amps. **Special 60" leads.** Square D trip curve: 730-5

2 pole Motorized Breakers For balanced power on 60v—0—60v balanced systems or 240v in single phase load center or 208v in 3 phase load centers.

MB-215 **M**otorized **B**reaker, Square D #QO215PL-5393, **2** pole, **15** Amps. **Special 60" leads.** Square D trip curve: 730-4
MB-220 **M**otorized **B**reaker, Square D #QO220PL-5393, **2** pole, **20** Amps. **Special 60" leads.** Square D trip curve: 730-4
MB-230 **M**otorized **B**reaker, Square D #QO230PL-5393, **2** pole, **30** Amps. **Special 60" leads.** Square D trip curve: 730-5

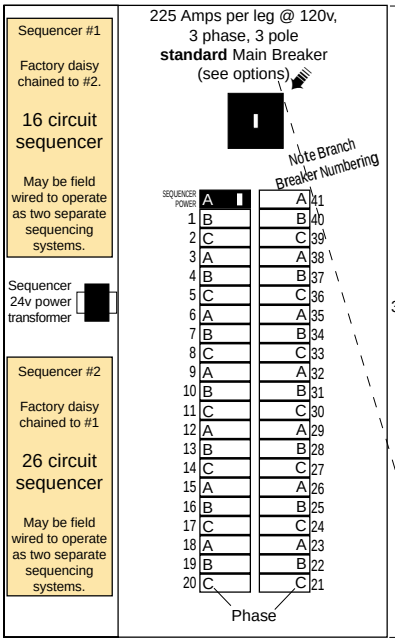
3 pole Motorized Breakers

MB-315, MB-320, or MB-330 **3** pole **M**otorized **B**reakers are also available on special order.

UnMotorized circuit breakers for unsequenced circuits in SLC series Load Centers.

UMB-10, -15, -20 or **-30** are 10, 15, 20 or 30 amp single pole. Square D QO110, QO115HM, QO120HM or QO130. 15s & 20s are High Magnetic.

20.875" wide (all models)



39.25" tall

Remote control options (see back page for special function options or call)

SS-2 Additional **S**equencer ON/OFF **S**witch set. **OFF** and illuminated **ON** push-button switches with built-in legends. 1 set required for each control location.

SS-2PL Locking Switch Plate. SS-2 Switches mounted with a key locking switch on a single gang stainless steel plate. See photo on page 1.

LynTec Model	Power Type 3 phase	Square D reference number (all UL listed)	Main Breaker (Amps.)	Branch Breaker Spaces may be sequenced (**MB**) or un-sequenced (**UMB**)	Sequencer Capacity (Will drive up to this many motorized breakers)
SLC 341-16	**3Ø**, 208Y/120Vac	QO342M225	225	41	**16**
SLC 341-26	**3Ø**, 208Y/120Vac	QO342M225	225	41	**26**
SLC 341-41	**3Ø**, 208Y/120Vac	QO342M225	225	41	**41**

Main Breaker options: **-M50**, **-M60**, **-M70**, **-M80**, **-M90**, **-M100**, **-M150**, **-M200**.

NOTE -M50, -M60, -M70, -M80, -M90, -M100 options replace the large main breaker with a back-fed, clip-on, bracket retained, 3 pole breaker using 3 branch breaker positions, limiting the panel to 38 sequencable slots.

The SLC 341 contains 2 sequencer boards, normally daisy-chained but may be operated as two separate sequencing systems. Example: A 16 breaker sequencer system and a 26 breaker sequencer system, controlled by two different SS-2 Switch Sets.

Controlled circuits

16 drivers capable of driving the 1, 2 or 3 pole **MB** series motorized circuit breakers.

[In 26 circuit sequencers, sequencer steps 7 through 16 drive two breakers each. Step 7 turns on breakers 7 and 17, step 8 turns on breaker 8 and 18 and so on.]

Sequence timing: 60 Hz supply: 1.06 seconds between steps.
50 Hz supply: 1.28 seconds between steps.
ZIP-OFF: 14 msec. between steps. (faster than a speeding zipper)

DELAY and DELAY POSITION jumpers and timing

A delay of 0, 4 or 8 seconds provides stabilization time after circuit 2 or circuit 6. Normally the low level equipment such as preamps, mixing consoles, tuners, tape decks and EQ's are powered from these first 2 or 6 A.C. circuits.

Low level equipment sometimes generates pops or clicks during power-up. Delaying the application of power to the power amplifiers eliminates potential loudspeaker damage due to turn-on transients.

The DELAY and DELAY POSITION settings are adjustable by moving push-on jumpers inside the low voltage cabinet.

The 0 sec. DELAY is used to eliminate delay for daisy-chained sequencers that supply only power amplifiers in large systems.

Energy Storage

A distributed power supply sufficient to ZIP-OFF 16 or 26 motorized circuit breakers 2 seconds after power fails. Zip-off is delayed 2 seconds to prevent power glitch induced sequencing.

Short Protection

A 1/2 amp. fuse protects the sequencer. Power is indicated by the amber LED.

Indicator LEDs

Green LEDs adjacent to each terminal block light when the ON control voltage is available to the circuit breaker motor.

Red **FAULT** LEDs glow temporarily at initial SEQUENCER POWER breaker turn-on and when the breaker motor actuates. This glow indicates normal capacitor charging or motor current. Any incorrectly connected breaker or a breaker that fails to complete the switch function will cause the FAULT LED to light continuously. When the fault is cleared, the FAULT LED extinguishes. This distributed power supply isolates and indicates faults while the rest of the breakers sequence normally.

Remote Control Characteristics

A momentary contact is required to toggle a latching relay in the sequencer to start the ON or OFF sequence. Momentary contacts are necessary when more than one control location is required.

ON/OFF Switch Set Supplied

The supplied SS-2 Sequencer ON/OFF Switch set provides 2 switches with built-in film legends. The ON switch is backlit by an internal 12 v green LED. The SS-2 switches mount in 5/8" round holes on 1" centers. Options: An additional switch set is required for each remote control location. Locking switch plate. (see page 3 bottom)

Remote Pilot LED Output

Pulsed +12 volts DC will drive remote pilot **ON** LEDs up to 200 milliamperes.
All **ON** LEDs flash once per second during the on or off sequence cycle.
All **ON** LEDs glow continuously at the end of the ON cycle if
the VOUCHER SUPPLY – VOUCHER SENSE terminals are bridged by a resistance of less than 100 KΩ.

Power Verification – POWER VOUCHER Sense

The **V–**, **VOUCHER SENSE** input annunciates a completed sequence by switching the flashing **ON** LED to constant, indicating a full **ON** condition.

This AND type input is utilized when LynTec POWER VOUCHERs are used to *prove* all sequenced receptacles have AC present. *(No circuit breakers are off, all receptacles are live*).

Typically, one POWER VOUCHER™ is plugged into a receptacle for each sequenced circuit and each un-sequenced circuits that must be powered for proper system operation.

The POWER VOUCHER contains an indicator LED and an opto-isolator. The opto-isolator's output resistance drops to ≤200Ω when AC line voltage is present.

The POWER VOUCHER output terminals are all connected in series and then back to the SLC's **VOUCHER SUPPLY** and **VOUCHER SENSE** terminals.

When the **ON** sequence is completed AND *all* POWER VOUCHERs are energized from the receptacles, the pilot **ON** LEDs glow continually. *Any* un-energized POWER VOUCHERs will prevent a continuous pilot **ON** light, indicating to the operator that the system is *not* **ON**. Visually scanning all POWER VOUCHERs for a green light will quickly locate the dead circuit.

Jumper the VOUCHER SUPPLY+ and VOUCHER SENSE terminals if power verification is not used.

ON/OFF Low Voltage Connections

Lever actuated cage clamp terminals accept wire sizes from 18 to 24 gauge.

Motorized Circuit Breaker Low Voltage Connections

Each motorized breaker is powered via a 3 wire low voltage connection on the sequencer circuit board. Connections are screw activated clamp terminal strips.

Control Wire Requirements

From ON/OFF switch location to **one** SLC:
4 conductors, 22 gauge, 10,000 ft. maximum

Between multiple SLC's when daisy chained:
6 conductors, 22 gauge, 10,000 ft. maximum
8 conductors if ON/OFF switches are required at each sequencer location.
10 conductors if POWER VOUCHERs are used.

SEQUENCER POWER

The SEQUENCER POWER circuit breaker mounted in the zero position in the high voltage section is connected to a UL listed 120v to 24v, 40 VA transformer mounted inside the low voltage cabinet.

This 10 amp un-motorized breaker should be left on continuously. This circuit breaker is used primarily as an approved, switchable connection method to the high voltage. The transformer is impedance protected.

The sequencer circuitry is protected by AGC 1/2 amp fuse located on the sequencer board.

Power required: 50/60 Hz, ≤ 10 watts during sequence, ≤8 watts idle.

SLC System Mechanical Characteristics

SLC 129 or SLC 326

Dimensions: 20.875" wide x 29.75" high x 3.875" deep
Weight: 51 pounds maximum. Shipping weight: 55 pounds maximum.
Shipping Dimensions: 26" wide x 35.75" high x 6.5" deep.

SLC 341

Dimensions: 20.875" wide x 39.25" high x 3.875" deep.
Weight: 83 pounds maximum. Shipping Weight: 88 pounds maximum.
Shipping Dimensions: 26" wide x 44.75" high x 6.5" deep.

Special Function Option - others available - please call for more info

SIM-1 Sequencer **I**nterrupt **M**odule (Sequencus Interruptus)

Allows a field selected interrupt point at any step in the power up sequence.
Typical Application: Church production studio wants to power up the front end of the sound system without activating the full sanctuary.
How it works: An additional illuminated STUDIO **ON** switch turns on the studio. A supplied PV-110 Power Voucher™ is plugged into the AC circuit where interrupt is to occur. When the PV-110 is activated, say at step 7, it stops the sequence and holds it, providing power just to the studio. The full sound system may be turned on by pressing the SOUND SYSTEM **ON** switch. One **OFF** switch turns off the full system or the studio. Zip-off functions normally in either mode, shedding the load 2-3 seconds after power fails, resequencing when power resumes.

ARCHITECT'S and **ENGINEER'S SPECIFICATIONS**

A.C. Power Sequencing System

All A.C. power for the sound system shall be supplied from a time sequenced source capable of being remote controlled from as many locations as desired.

Time between sequence steps shall be no less than 1 second.

Un-sequenced circuits, as required, shall be supplied from the same A.C. source so that a single lever main circuit breaker is dedicated to the sound system.

A means of visual operator feedback shall provide an indication of the progress of the power turn-on or turn-off sequence at each control point.

Sequencing shall have an adjustable time delay between the low level equipment circuits and the power amplifier circuits.

The sequencing system shall be capable of shedding the load within 3 seconds after a power failure and re-sequencing when power resumes without operator intervention.

LynTec, Inc. • 8401 Melrose Drive • Lenexa, KS 66214
Voice **800-724-4047** • 913-529-2233 • Fax **888-722-4157** • 913-529-4157

Specifier's Guide for LynTec Modular Sequencing Load Centers

MSLC series part number explanation

For more info and FAQs
Visit our web site
www.LynTec.com

Optional field installed branch circuit breaker numbers

Main breaker option

MSLC 326-24 17/20 4/30 5/UMB20 M70

1 = 1 phase 120/240v, 3 wire
or
3 = 3 phase 208/120v, 4 wire

326
129
338***
341
Number of available circuit breaker spaces

12
24
36
48
Sequencer capacity. Will drive up to this **number** of breakers

Quantity of lowest current sequenced circuit breakers

15
20
30
Current rating

Quantity of higher current sequenced circuit breakers

10
15
20
30
Current rating

Quantity of single pole **Un-Motorized** circuit breakers

Current rating
10
15
20
30

For Brochures, Manuals and FAQs
Visit our web site
www.LynTec.com

MSLC 341-xx

MSLC 326-xx

Factory options

-AR: Auxiliary remote control of circuit breakers #1 & #2. Now a no charge, built-in function.

-RR7: Control of two remotely located 20 Amp, 120v circuits using G-E RR7 relays turned on & off in sync with sequenced breakers #1 and #2.
We supply relays, brackets and drive capability. You mount relays in your remote box. 5 low voltage interconnect wires required.
Add $100.

RTS-26 A rain tite low voltage cabinet to be mounted next to a Square D QO load center or QO panelboard furnished by others.

Contains 24v power transformer and sequencer circuit board to sequence up to 26 motorized circuit breakers.

Long lead motorized circuit breakers available separately.
See pages 5 or 7.

Call 800-724-4047 for details

Main breaker options

The SINGLE PHASE MSLC 129-xx have a factory installed, two pole, 200 Amp main breaker, no options are available.

Small 3 Phase Panel

The standard MSLC 326-xx have a snap-on, back-fed, 3 pole, 100 Amp main breaker.
In some instances a smaller isolation transformer feeding the panel requires the use of a smaller main breaker.

Optional main breakers available: 30, 35, 50, 70 or 90 Amps.

Use part number suffix **M30** (When a 7.5 kVA transformer is source), **M35** (10 kVA), **M50** (15 kVA), **M70** (20 kVA), or **M90** (25 kVA).
Add $50 to contractor C.O.D. prices for exchange at time of order. Field exchange price: $100.

Large 3 Phase Panel

The MSLC 341-xx has a factory installed, 3 pole, 225 Amp main breaker (65 kVA).

200 Amp or 150 Amp main breakers are available on special order. Use part number suffix **M200** (60 kVA) or **M150** (45 kVA).
Add $100 to contractor C.O.D. prices. Field exchange price: $150.

***Smaller main sizes are also available by replacing large main breaker with a 3 pole, back fed breaker: **M30** (7.5 kVA), **M35** (10 kVA), **M50** (15 kVA), **M70** (20 kVA), or **M90** (25 kVA) or **M100** (30 kVA) Note This modification reduces the number of available branch breaker spaces from 41 to 38, hence a MSLC 341-xx becomes a MSLC 338-xx. Add $50. to contractor C.O.D. prices for exchange at time of order. Field exchange price: $100.