LynTec AC Power Sequencing Products A composite document of Brochures • Installation Instructions • AppNotes

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SOUND SYSTEM A.C. POWER

OPERATING INSTRUCTIONS for

LynTec A.C. Power Sequencing Systems

To turn **ON** the sound system press this button.



The **ON** light will start flashing and continue until the system is fully **ON**.

This sequence will take from 16 seconds to over a minute depending on how many circuits are being sequenced.

The light will stay on constantly when the system is fully powered.

AC Power failure scenario

The sequencer will ZIP-OFF the system 2 seconds after power fails. System will automatically re-sequence ON when power resumes To turn **OFF** the sound system press this button.

The **ON** light will start flashing and continue until the system is **OFF**.

This sequence will take from 16 seconds to over a minute depending on how many circuits are being sequenced.

The **ON** light will extinguish at the end of the **OFF** sequence.

The **OFF** button is not illuminated.

www. LynTec .com

8401 Melrose Dr. • Lenexa, KS 66214 U.S.A. Voice 800-724-4047 • (913) 529-2233 Fax 888-722-4157 • (913) 529-4157

139-0139-02 9/23/99

Multiple Sequencer Hookup Diagram For LynTec **MSLC** and **MSP MODULAR** and **PDS-10** Power Sequencing Products

Showing Low-Voltage Remote ON/OFF Control and Daisy-Chain Wiring



^{139-0252-12.2}B-W SS-2/SS-2PL Insert 8/13/08 See http://www.lyntec.com/139-0252.pdf for latest version.

A typical LynTec three panel, daisy-chained system with two locking control locations.

For Timing Diagram and Logic levels See http://www.lyntec.com/139-0266_Seq_Timing.pdf Wire Requirements for Remote Controls

Basic system	ON/OFF Control from one p	anel only4 conductors
Basic + Kill	Add Kill function	6 conductors
2 conductors to	Kill control location	

Remote control at both ends9 conductors

Kill, Remote control both ends, full power verification11 conductors Low voltage control wire: 24 gauge minimum, 5,000 ft. loop max.



139-0252-11.3 Daisy Chain Hookup 4/12/05

LynTec MSLC or MSP Modular series Power Sequencing System A five panel, series-parallel system with two locking control locations. Advantage: Faster cycling time for large systems. On cycle time of this system at 1/8 sec. per step is 6 seconds plus any user set Time Delay. Off cycle time is 6 seconds. + ON ON LED LED NO Lock Lock Low voltage control wire: 24 gauge minimum, 5,000 ft. loop max. ٢I ON ON NOF TOP BOTTOM Each board's BOARD BOARD BOTTOM TOP expansion outputs FIRST BOARD BOARD LAST can drive up to OFF 4 boards in parallel. Borrow and Pilot Com Com Com Com are taken from the V+ Pilot V-Pilot first board of the V– Borrow OFF Borrow parallel system ON Carry ON which takes the Hold Hold Busy longest time to Kill Kill Kill sequence off. Connect

Cabinet B1

Sequencer

boards 3, 4 & 5.

Cabinet C1

Sequencer

boards 9, 10 & 11.

0

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800-724-4047

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NOTE The quantity of Power Vouchers illustrated in this series-string is *NOT* typical. A typical string has one PV-110 for each breaker-fed circuit in the audio system to verify all circuits are hot.

BOTTOM

BOARD

Com

V-

OFF

Carry

Busy

Kill

Ð

G

Daisy-chain

connections

within a

cabinet are

made via

Cascade

Connector

jumper plug.

TOP BOARD

FIRST

Com

Pilot

Borrow

ON

Hold

Kill

€

Θ

www.LynTec.com

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V+ to V-

on LAST

sequencer

if Power

Vouchers

are not used.

> 1N4002 Isolation diodes required in each OFF ine to prever

interaction.

BOTTOM BOARD

DFF

Com

V+

V-

This optional

V+ to V- jumper helps

troubleshoot the

C1-C2 panels by

providing local

on-board ON

LED indication.

ÐG

Cabinet B2

Sequencer boards 6,7 & 8.

TOP

BOARD

Com

Pilot

Borrow

ON

Hold

Kill

VER VOUCHE

Θ

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Cabinet C2

Sequencer

boards 12 & 13.

Latest revision: HTTP://www.lyntec.com/139-0277_Series-Parallel.pdf

Power Vouchers, if

connected to V+ and

V- of the last board

of the same system.

TOP BOARD

ON

Com

Pilot

+5v

Logic

Com

Kill

• G

139-0277-03 Series-Parallel Hookup 3/31/06

To touch panel.

(mimics Pilot output)

Fire Alarm

N.O. contact.

Closure kills all

sequenced power.

Opening resumes

ON sequence.

BOTTOM

BOARD

Com

V-

OFF

Carry

Busy

Kill

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Cabinet A

Sequencer

boards 1 & 2.

1N4002

Isolation

diodes required in each ON line

to prevent OFF

interaction

used, should be

Built-in Kill, Hurry-Off and **ZipOff** (PANIC) switch option for MSLC and MSP and PDS-10 series AC SEQUENCING SYSTEMS

What the functions do

Kill — EMERGENCY SHUTDOWN

Provides an IMMEDIATE shut down method for the sound system at the command of a fire alarm, emergency announcement system, or ZipOff switch.

Optional **ZipOff** switch, **ZOS-5K**

Provides a full AC Power shutdown within 200 milliseconds after the **ZipOff** button is pushed.

In case of a runaway oscillation or other unexpected signal which could damage the loudspeakers if sustained...

Lift the protective cover and press the ZipOff button... it latches down and lights red. The AC power sequencing system immediately zips off.

Press again to unlatch... the light goes out and the sequencer restarts to repower the system.

or

Use the new Hurry-Off function at any OFF switch.

MULTI-BOARD SHUNT R

The Kill line is an 11 ma. current source from each MS-12 Modular Sequencer or PDS-10 board

A voltage sensor on the Kill line determines the Kill threshold.

The Kill line has an open circuit voltage of 28 volts which must be pulled down to less than 10.5 volts to generate a Kill function. Grounding the Kill line to Common will always kill the system instantly. This current source may also be used to light the Zip-Off switch's, red LED.

The red ZipOff LED only requires 10 ma. For systems where multiple-board system's Kill lines are paralleled, a 9 v. voltage regulator chip is installed in the ZOS-5K which will automatically shunt the excess source current of up to 5 boards. For more than 5 boards an additional resistor must be used in parallel with the ZipOff switch LED. To prevent damage due to overheating the voltage regulator chip, the resistor should be installed as shown with full length leads to get the heat source away from the switch.

Total Number of boards	Shunt Resistor required		
1-5	none		
6	820Ω, 1/4w	16	75Ω, 2w
7	430Ω, 1/4w	17	68Ω, 2w
8	270Ω, 1/2w	18	62Ω, 2w
9	200Ω, 1/2w	19	56Ω, 2w
10	150Ω, 1/2w	20	56Ω, 2w
11	150Ω, 1w	21	51Ω, 2w
12	120Ω, 1w	22	47Ω, 2w
13	100Ω, 1w	23	47Ω, 2w
14	92Ω, 1w	24	43Ω, 2w
15	82Ω, 1w	25	39Ω, 2w

What to specify or order

Delivery: Stock.

ZOS-5K Contractor C.O.D. price: \$34.

Hurry-Off

The MS-12 Modular & PDS-10 Sequencing boards have a new Hurry-Off function. If you hold down any OFF switch for two seconds, a "Kill without restore" function is triggered. The system shuts down within 200 milliseconds and doesn't restart until you give it a new ON command.

How they work

All LynTec sequencing systems have the ZipOff load shedding feature. The older SLC, SP and PDS-8's implemented it by interrupting 24v ac power.

The newer Modular sequencers, the MSLC and MSP series and the PDS-10, load shed when power fails, but also have a Kill function that is triggered by arounding the Kill line.

The red Kill LED, adjacent to the Kill terminal on the board, lights and Zip-Off is immediate. The kill line is a low current line. Long control wiring may be used without concern for loop resistances up to 32Ω . (22 gauge, up to a 1,000 ft. run [2,000 ft. loop] or a 680 ft. run of 24 ga).

The microprocessor remembers that the sequencer was ON. When the Kill line is opened, the ON sequence repeats, bringing the AC power back on.

For the Modular series control boards the **ZipOff** switch connects the Kill line to common, through the Zip-Off switch's LED, initiating the Kill function.



139-0256-07 8/11/08 See http://www.lyntec.com/139-0256_ZOS-5K.pdf for latest version.

LynTec

for Modular A.C. Sequencing Systems, models **MSLC**, **MSP & PDS-10**.



stainless steel wall plate)

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(Max. loop resistance: 32 ohms)

COM <

NOT for new designs - Discontinued 5/05 - No replacement

POWER VOUCHERTM.....from LynTec

- Used to verify the presence of power at all AC circuits of a sound system
- A safe, solid-state AC power sensor
- Replaces labor-intensive relay assembly
 Cost effective
 Optically isolated from AC line
- Visual indication on rack power strips, green LED when power is on.

When used with any LynTec power sequencer, the PV-110's complete a closed loop system. The operator is assured of a fully powered sound system when his AC control switch ON light *stays on* at the end of the turn-on sequence. If any circuit is un-powered due to breaker trip or unauthorized shut-off, that PV-110's LED will extinguish and signal the sequencer to extinguish the sound system AC ON light, warning the operator that the system is not *all* ON.



NOT for new designs - Discontinued 5/05 - No replacement

LynTec PDS-10 series Power Delay Sequencer

Relay based power sequencer for sound systems — Turns on front-end gear first, power amplifiers last Protects expensive loudspeaker systems from damaging power-on or power-off click & pop transients

- Tested, complete package low labor mount next to any circuit breaker panel to sequence AC power "hot" lines
- Time proven, reliable, G-E RR7P3 latching relays snap in and have low voltage plug-in connectors
- Low power consumption no continuous relay coil current — runs cool for long life
- Diagnostic LEDs and internal ON OFF test switches speed installation for testing and troubleshooting
- Cabinet and all components connected to high voltage are UL listed — low voltage electronics are isolated.
- 4, 8 or 10 20/30 A circuits 120 or 240 volt models available
- Up to 6 One Touch remote control locations possible
- Kill function uses external contact for instantaneous shutdown.
- HurryOff function shuts down immediately if you hold down any OFF button for 2 seconds. Great for Ohh.... no...... situations.
- Daisy-chains for unlimited circuit count. Interfaces with LynTec MSLC, MSP, SLC, SP or multiple PDS sequencing systems.

New Features

- Multiple delay options.
- Variable step rate
- Completion contact option on last step can be used for additional indicators or to trigger more equipment.



Green LED illuminated

SS-2 Sequencer Switch Set One SS-2 switch set is supplied with each panel.

Red



How they work

Applies AC to low level, frontend electronics... waits for them to stabilize... (clicks and pops are ignored by un-powered power amplifiers)...

AC is then sequenced to power amplifiers spreading high inrush currents over time.

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

PDS-10 series INTERIOR and WIRING



PDS-10 series **MECHANICAL**



OTHER LynTec SEQUENCING PRODUCTS

Ideal for new construction that requires a breaker panel anyway.

• MSLC series Modular Sequencing Load Centers

• MSP series Modular Sequencing Panelboards

One-panel solution combines a circuit breaker panel with up to 5 AC power sequencers. ONE TOUCH controls - wide range of field-selected time delays and sequence step rates Utilize Square D panels and motorized, remotely operated, circuit breakers

12, 24, 36 or 41 circuits — cascade (daisy chain) for more circuits

Unlimited circuit design flexibility — One, two or three pole motorized (QOPL) or un-motorized (QO) circuits —15, 20 or 30 Amps per circuit

Available in Single Phase, 3 wire, 120/240v., 3 Phase, 4 wire, 208Y/120v., or 60v—0—60v Balanced Power.

Interface with PDS-8EK sequencer and earlier LynTec sequencers

MRTS Modular Rain Tight Sequencer

Add **One Touch** sequential control of motorized breakers to any Square D QO series panel.

 LynTec also makes DMX and Ethernet controlled panels for individualized control of non-dimmed lighting circuits.

Switch Set OPTIONS

SS-2PL or SS-32PL Locking Switch Set



SS-2PL is an SS-2 Switch Set and a KS-2L mounted on a single gang stainless steel PLate. The SS-2 switches are momentary SPDT. The KS-2L Key Switch is SPDT.

SS-32PL is an SS-32 Switch Set and a KS-2L mounted on a single gang stainless steel PLate. The SS-32 switches are momentary DPDT with a spare set of contacts for control of other equipment.

SS-2LRP or SS-32LRP Locking Switch Set





Page **3** of 4

SPECIFICATIONS - LOW VOLTAGE SECTION - Class 2

RELAY CONTROL CIRCUITS

10 ON and 10 OFF RR7P3 relay coil drivers.

RELAY DRIVER CHARACTERISTICS

Each 3 pin header is connected to ON and OFF open collector NPN transistors. Built-in reverse EMF snubber diodes connect from the collector to the sequencer's built-in +35 volt supply. Relay drive capacity: One RR7 coil (530 mA. max.) NEVER parallel relay coils! Relay ON/OFF pulse width and spacing: Variable

RELAY SOURCE — ZIP-OFF LOAD SHEDDING

The +35 volt internal dc relay supply has a PULSE CURRENT indicator for visual as well as aural troubleshooting. Each time the LED flashes a relay should click.

All latched-on relays are zipped-off 2 seconds after power fails, shedding the load. **ZIP-OFF** minimizes the surge load when power resumes.

The sequencer remembers if the system was ON and automatically re-sequences when power resumes. No manual reset is required. Short protection: A 0.75A Fuse protects in the event of a short.

REMOTE CONTROL CHARACTERISTICS

A momentary contact from **ON** or **OFF** to COMmon is required to tactivate the ON or OFF function in the sequencer.

The **SS-2** Sequencer Switch Set (one set supplied, up to 6 supported) provides easy-to-mount switches, with built-in film legends, to remote control the AC power. Switches are IDEC AL6 series.

Mount in 5/8" diameter round holes on \geq 1" centers.

Typical remote switch current: 9 milliamperes.

Minimum closure time to initiate sequence: 25 milliseconds.

Open circuit voltage appearing at ON and OFF terminals: +30 to +35 volts.

REMOTE PILOT LED OUTPUT

Pulsed 12 volts DC will drive remote pilot ON LEDs up to 200 ma. or 6 - SS-2's.

All pilot LEDs flash once per second during the sequence cycle.

All pilot LEDs glow continuously at the end of the ON cycle if

the POWER VERIFICATION terminals are bridged by a resistance lower than 100K Ω . Output protection: Short circuit protected, automatically resets after fault clears.

LOW VOLTAGE CONNECTIONS

Relays: 3 position, .156" center male headers to mate with GE RR7P3 relays. 5 position, .156" center male headers to mate with GE RR9P5 relays for CR option.

Remote Control Wiring: 4 conductor, 22-26 gauge wire, solder to SS-2 Switch Set and connect to spring-lever actuated, cage-clamp terminals in the sequencer.

LOCATING RR7 RELAYS REMOTELY

In some instances it is desirable to locate one or two RR7 relays at a location other than the PDS-10 cabinet. Example: Control room electronics need to be sequenced but they are located several hundred feet from the power amplifier racks. The PDS-10 is located near the power amp racks. RR7's may be driven remotely via a 3 wire, low voltage cable for one or a 5 wire cable for two relays.

Wire sizing minimums: \leq 75 ft. run, use 22 ga., \leq 125 ft. run, use 20 ga., \leq 200 ft., use 18 ga., \leq 300 ft. run, use 16 ga. RULE: Keep loop resistance \leq 2.5 Ω .

Connect to PDS-10 board mounted plugs with AMP or Molex 3 pin housing: Digi-Key WM2123-ND & 3 crimp pins per relay: Digi-Key WM2300-ND. Five pin connector for CR option is Digi-Key part # WM2103-ND.

Digi-Key: 800-344-4539. Independent control of these remote relays is also possible. Example: Turn on control room only. Call LynTec for details.

PDS-10 POWER SOURCE REQUIREMENT

24 volts AC, 50/60 Hz, \leq 6 watts.

SPECIFICATIONS - HIGH VOLTAGE SECTION - Class 1

AC POWER CONTROL

GE RR7 and RR9 Relay ratings — see page 2

NOTE Tungsten lamps have high inrush currents similar to power amplifiers.

SEQUENCER POWER TRANSFORMER

INPUT VOLTAGE FREQUENCY OUTPUT VOLTAGE UL Listed CUL Listed (Canadian)

overseas PDS-10: 240 volts ±15% 50/60 Hz 24 volts @ 40 VA., 27 volts, No Load. 428L, Class 2 B6 428L, Class 2 B6 120 volt: (Dormeyer # DCT-40-120) 240 volt: (Dormeyer # DCT-40-240)

Standard PDS-10: 120 volts ±15%

The sequencer power transformer should be connected to a separate 10 Amp circuit breaker and labelled SEQUENCER POWER.

CABINET

GE RBS2 REMOTE CONTROL CABINET — surface mount

Type 1 Enclosure "INDOOR USE ONLY" — UL Listing: 508G Industrial Control Equipment **MECHANICAL**

Size: 12.4" square x 3.5" high max. Cover attached with 4 — 10-32 screws. Mounting: Cabinet has 4 raised mounting dimples with 1/4" holes on 10" vertical and horizontal centers for surface mounting.

Orientation: Any position. Weight: 15 lb.

Shipping Weight: 17 lb. Shipping size: 15.5" x 15.5" x 6.5", .9 cu. ft. G-E & General Electric are registered trademarks of the General Electric Company.

SPECIFYING & ORDERING DETAILS

Any number of LynTec sequencers may be daisy-chain cascaded; PDS-8EK's, MSLC & SLC series Sequencing Load Centers or MSP & SP series Sequencing Panelboards.

PDS-10 Power Sequencing System Includes: Cabinet and cover with the following installed: 120 v, 50/60 Hz power transformer, sequencer, and 10 ea. GE RR7P3 relays. One SS-2 switch set is supplied. PDS-10-4

Same as above but only loaded with 4 RR7P3 relays for four circuits.

PDS-10-8

Same as above but loaded with ${\bf 8}$ RR7P3 relays for eight circuits.

PDS-10**OV**, PDS-10-8K**OV** PDS10-4**OV** overseas part number suffix for 240v, 50/60 Hz operation.

A GE RR9 relay can be added in the #10 position to provide completion contact capability. Please indicate the **CC option** when specifying. (ex. PDS-10**CC**)

SS-2 Switch Set.

OFF and illuminated ON switches with built-in film legends. One set included with each PDS-10 system, Up to 6 total supported for multiple location remote control.

SS-2PL Locking Switch Plate (photo on page 3)

A locking key switch to restrict access installed with a SS-2 switch set in a single gang stainless steel wall plate. **ON** and **OFF** switches may be field rotated for horizontal mounting. All locks are keyed alike.

SS-2LRP Locking Rack Plate (photo on page 3)

A locking key switch to restrict access installed with a SS-2 switch set in a single rack plate. All locks are keyed alike.

RR7P3 Latching relay. (P3 = 3 pin, .156" Plug). (photo on page 2)

For more than 10 circuits, 208 v. circuits or 30A circuits see

MSLC series Sequencing Load Centers or MSP series Sequencing Panelboards (photo on page 3).

In the interest of product improvement, specifications are subject to change without notice — see web site for the most current data.

www.**LynTec**.com

Voice 800-724-4047 • 913-529-2233 - Fax 888-722-4157 • 913-529-4157

All sound systems need a power panel - why not have ONE TOUCH AC power control? Motorized circuit breakers sequence sound system AC power!

MSP 341-xx Modular Sequencing Panelboard - The Electrician's choice Low voltage cabinets house sequencer circuit boards MSLC 341-xx Modular Sequencing Load Center Separate ISOLATED TECHNICAL GROUND cabinet 2]] MSLC 326-xx Modular Sequencing Load Center AR V1d

LynTec

Modular Sequencing series Power Panels

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.
- Multiple sequencing panels may be daisy-chained for larger systems.

Reduced installation labor

• One wall-mounted, sequenced power panel feeds AC power to all rack and console receptacles.

Low power consumption

- **BMB** (Bolt-on) and **MB** (Clip-on) series motorized circuit breakers require no holding current (like DC relays) or heat sinks (like solid state relays).
- Runs cool lasts long.

LynTec Modular Sequencing series panels add branch circuit sequencing to the main and branch circuit breaker functions normally found in a Load Center or Panelboard.

How they work

Applies AC to low level, front-end electronics... waits for them to stabilize... (clicks and pops are ignored by un-powered power amplifiers)...

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.

ONE TOUCH

REMOTE POWER CONTROL

SHOWN ACTUAL SIZE



Green LED illuminated

SS-2 Sequencer Switch Set One SS-2 switch set is supplied with each panel.

Automatic load shedding and *BROWNOUT* protection

- A voltage sensing system automatically sheds the load when AC mains voltage drops below 95 volts for 2 seconds.
- Capacitor-stored energy zips-off all circuits 2 seconds after power fails.
- The system automatically re-sequences without operator intervention when stable voltage (above 105 volts for 5 seconds) resumes.
- Reduces the start-up load for auxiliary power units.
- Smart wake-up is ideal for unattended systems.

🖊 Kill

- Emergency instant shutdown may be triggered by an external contact closure.
- System automatically re-sequences when contact opens.
- HurryOff Ohh..... no..... switch Kill without restart
 - By holding *any* OFF switch down for 2 seconds, the operator can trigger an instant shutdown with no automatic restart.



BOUARE D www.SquareD.com For the most up-to-date information

Thermal-magnetic Molded Case Circuit Breakers

250 Ampere Frame Class 734



QDL & QGL 2 and 3-pole 70–250 Amperes

POWERPACT Q-frame ▲ ---250 A, Thermal-magnetic (240 Vac)

	Current	AC Ma	agnetic ettings	D Interrupting	G Interrupting
	@ 40°C	Hold	Trip	Catalog Number	Catalog Number
	2-pole, 240 V	/ac			
LynTec MSP 139	70 80 90 100 110	1000 1000 1000 1200 1200	1800 1800 1800 2400 2400	QDL22070 QDL22080 QDL22090 QDL22100 QDL22110	QGL22070 ++ QGL22080 ++ QGL22090 ++ QGL22100 ++ QGL22110 ++
Main breaker, rated at 100 AMPS or less. QO2xxxVH Series 22kAIR	125 150 175 200 225 250	1200 1200 1200 1200 1200 1200	2400 2400 2400 2400 2400 2400	QDL22125 QDL22150 QDL22175 QDL22200 QDL22225	QGL22125++ QGL22150++ QGL22175++ QGL22200++ QGL22225++
	230	1200	2400		
					LynTec MSP 119 MSP 141
					++ All models 70-225A Special order, NCNR Non Cancelable Non Returnable
	Current	AC Magnetic Trip Settings		D Interrupting	G Interrupting
	@ 40°C	Hold	Trip	Catalog Number	Catalog Number
LynTec	3-pole, 240 V	ac			
LCLC 326 MSLC 326 MSLC 338 MSP 338	70 80 90 100 110	1000 1000 1000 1200 1200	1800 1800 1800 2400 2400		QGL32070 QGL32080 QGL32090 QGL32100 QGL32110
Use a 3 pole, back-fed main breaker, rated at 100 AMPS or less. QQ3xxxVH Series	125 150 175 200 225	1200 1200 1200 1200 1200	2400 2400 2400 2400 2400	QDL32150 + QDL32175 QDL32200 + QDL32225 >	QGL32125 QGL32150 QGL32175 + QGL32200 QGL32225 +
22kAIR	250	1200	2400		
				LynTec LCLC 341 MSLC 341 >Standard	LynTec MSLCH 341 + Optional from stock
			+ (Optional from stock	

▲ Replacement lugs are not available for POWERPACT Q-frame circuit breakers. Lugs for the POWERPACT Q-frame circuit breakers accept (1) #4–300 kcmil.

Interrupting Ratings (kA)

QD	QG
25	65
	QD 25

Accessories	pages 6-36-6-38
Optional Lugs	pages 6-43, 6-44
Dimensions	pages 6-49, 6-50
Enclosures	pages 6-51-6-54

For Branch Breaker Series Ratings

see http://www.lyntec.com/139-0407_Series_Ratings.pdf

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LynTec 139-0343-03 Q Frame Mains 10/31/06 Derived from Digest 173 — page 6-21

Selection Information



For the most up-to-date information



H- and J- frame Thermal-magnetic Molded Case 150 and 250 Ampere Frame — Class 611

			150 A I	H-frame		250 A J-frame			
		the All		Li LC MSI Main -MHG3 -MHG3 Special Non	pnTec P341-xx P 341-xx breaker suffix 110 = 110 A 125 = 125 A Order Option NCNR Cancellable			LC M The stan a JGP36 st Main b -MJG -MJG -MJG -MJG	LynTec CP 341-xx SP 341-xx dard main breaker is 225 and requires no uffix number. reaker suffix options 3150 = 150 A 3175 = 175 A 3200 = 200 A 3225 = 225 A
Circuit Brea	ker Type	HD	HG	HJ	HL	JD	JG	JJ	JL
Number of F	Poles	2,3	2,3	2,3∎	2,3	2,3	2,3∎	2,3	2,3∎
Current Ran	ige	15–150 A	15–150 A	15–150 A	15–150 A	150–250 A	150–250 A	150–250 A	150–250 A
Interruptin	a Ratinas			•	•	•			
	240 V	25	65	100	125	25	65	100	125
1117	480Y/277 Vac	18	35	65	100	18	35	65	100
CSA/	480 Vac	18	35	65	100	18	35	65	100
NOM 50/60 Hz	600Y/347 Vac	14	18	25	50	14	18	25	50
	600 Vac	14	18	25	50	14	18	25	50
	125/250 Vdc	20	20	20	20	20	20	20	20
Ratings	500 Vdc	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	220/240 Vac	25/25	65/65	100/100	125/125	25/25	65/65	100/100	125/125
IEC 947-2	380/415 Vac	18/18	35/35	65/65	100/100	18/18	35/35	65/65	100/100
ICU/ICS	500/525 Vac	14/14	18/18	25/25	50/50	14/14	18/18	25/25	50/50
Special Ba	atings		•	1	1	1			I
End Spor	w/C-275B/GEN	/					1	1	
HACB (2	3-nole)	· ·		-	-	· ·	· ·		· ·
		v	, v	, v	, v	, v	, v	v	•
Connectio	ns/Terminations								
Unit Mour	nt	/						/	
I-Line®		<i>,</i>						/	
Rear Con	nection					1	1	/	
Drawout									
Optional L	Lugs	V						1	
Unit Mour	1t	1	~	<i>,</i>	<i>,</i>	<i>v</i>	1	7	<i>,</i>
Accessorie	es and Modification	S							
Shunt Trip)	1	1	1	1	1	1	1	1
Undervolt	age Trip	1	1	1	1	1	1	1	1
Auxiliary S	Switches	1	1	1	1	1	1	1	1
Alarm Sw	itch	1	1	1	1	1	1	1	/
Motor Ope	erator	✓▲		1	1	1	1	/	/
Handle O	perators	✓▲						/	
Handle Pa	adlock Attachment						<i>✓</i>	/	<i></i>
Handle M	echanical Interlocks	✓▲					7	7	
Optional	JF Protection								
Trip Syster	т Туре		1						
Thermal-r	nagnetic	1	1	1	1	1	1	1	<i>✓</i>
Instantaneous-only (MCP)									
Molded C	ase Switch (Automatic)	1	1				1	1	
Electronic	:								
Dimension	IS								
Dimensions	Height IN (mm)		6.4	(163)			7.5 (191)	
(3P Unit	Width IN (mm)		4.1	(104)			4.1 (104)	
wounty	Depth IN (mm)		3.4	(86)		3.4 (86)			

▲ Not available in HD and HG two-pole rating (2-pole module) ■ 2-pole in a 3-pole module. 12/01/05

For Branch Breaker Series Ratings

see http://www.lyntec.com/139-0407_Series_Ratings.pdf

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Series Ratings

For NQOD and NF Panelboards Class 1630, 1670



This page contains UL Tested and Certified series combination ratings for panelboards. These ratings apply to either an integral main located in the same enclosure or a remote main located in a separate enclosure. NOOD Series Patings

		5 361	ies naungs				
		ent		Bran	nch Circuit E	Breaker Des	ignations
		n⊊		a		ab	langeo
m System AC c		rica Lica	Integral or				
		ircu	Remote Main Circuit				
			Breakers				
		es s	and Remote	Туре	1-pole	2-pole	3-pole
	E A	E E	Main Fuses		-	-	-
	tage	ing i					
	Volta	Rat					
		22k	MG	QO (B)	15–30 A		
	120/	42k	HD, JD	QO (B) PL	15–30 A	15–60 A	15–30 A
	240 1Ø	65k	HG, JG	QO (B) PL	15–30 A	15–60 A	15–30 A
		100k	HJ, JJ	QO (B) PL	15–30 A	15–60 A	15–30 A
		125k	HL, JL	QO (B) PL	15-30 A	15-60 A	15–30 A
			D.I 400 A	QO (B) QO (B) GFI	15–70 A 15–30 A	40–60 A	
	120/		20 10071	QO (B) VH QO (B) AFI	15–20 A	150 A 	15–150 A
	1Ø	100k		QO (B)	15–70 A	15–125 A	15–30 A
	208Y/		01	QO (B) AS QO (B) GFI	15–30 A 15–30 A	15–30 A 15–60 A	15–30 A
	120		QJ	QO (B) PL	15–30 A	15–60 A 150 A	15–30 A 35–150 A
				QO (B) AFI	15–20 A		
	208Y/		LA/LH (L) 34200MC				
Imme	120	18k	LA/LH (L) 34250MC	QO (B)	15–30 A	15–30 A	15–30 A
models	`			00 (B)	15-70 ^	15-125 ^	15-100 4
LCLC 3	26	001-		QO (B) AS	15-30 A	15-30 A	15–30 A
MSLC 3	26	22K	MB-xx	QO (B) GFI QO (B) PL	15-30 A 15-30 A	15-60 A 15-30 A	
MSLC 3	38			QO (B) AFI	15-20 A		
MSP13	9 J	22k	Q2-Hf	QO (B) QO (B) GFI	15-30 A	15–100 A 15–30 A	15–30 A
_					15-20 A		
LynTe	ີ່			QO (B) AS	15-30 A	15-30 A	15–30 A
LCLC 3	841	25k	QD MB-xx	QO (B) PL	15–30 A	15-60 A	15-30 Å
MSLC 3	341 J			QO (B) VH QO (B) AFI	15–20 A	150 A 	35–150 A
				QO (B)	15–70 A	15–125 A	15–100 A
mode	els	25K	ED, FDf	QO (B) GFI QO (B) AFI	15–30 A 15–20 A	15–60 A 	
MSLC	113			QO (B)	15-70 A	15–125 A	15-100 A
MSLC	127	25k	KDf	QO (B) AS QO (B) GFI	15–30 A 15–30 A	15–30 A 15–60 A	15–30 A
are se	ries			QO (B) AFI	15-20 A		
rated	22k			QO (B) VH	15-70 A	15-125 A	35–150 A
AIF	ł.	25k	HD, JD	QO (B) GFI QO (B) AFI	15–30 A 15–20 A	15-60 A	
See	e Myy			QO (B) H QOB2150VH		15–100 A 150 A	
on pa	1-3		LA, MA	Q2L-Hf		110-225 A	110-225 A
of Dig	jest	42k	MG		 15–30 A	15-30 A	15-30 A
			HD, JD	QO (B) PL	15–30 A	15-60 A	15–30 A
		42k		QO (B)	15–70 Ad		
			42k		QO (B) VH	15–30 A	15–125 A
			10	QO (B) GFI	15–30 Ae	15–60 A	
Ś	240		600 A Maximum		15-20 A		 15–100 A (3P
ĝ		65k		QO (B) VH	15–30 A	15–125 A	208 V Max.)
OA				QO (B) GFI QO (B) AFI	15–30 Ae 15–20 A		
LB				QO (B)	15–70 A	15–125 A	
N		65k	DJ 400 A	QO (B) VH QO (B) H		150 A 15–100 A	15–150 A
PZ		CEI-			15-70 A	15–125 A	15–100 A
ŝ		ОЭК	LG, FGT , KGT	QO (B) GFI QO (B) AFI	15–30 A 15–20 A	13-60 A	
			06		15-70 A	15-125 A	15-30 A
		654		QO (B) VH			35–150 A
				QO (B) GFI QO (B) PI	15-30 A	15-60 A	15-30 A
		\square		QO (B) AFI	15–30 A		
LynTe	C	651	BUMB-XX	QO (B) QO (B) VH	15–70 A 	15–125 A 	15–100 A 35–150 A
ISLCH 3	341)	UDK	110, JU	QO (B) H QOB2150VH	 	15–100 A 150 A	
MSP 11	9 🏱	$\forall 7$	FCL22	QO (B)	15–70 A	15–100 A	15–100 A
MSP 14	11 J /	65k	KCL22 FCL32	QO (B) AS QO (B) GFI	15–30 A 15–30 A	15–30 A 15–30 A	15–30 A
LCP 34	1-/		KCL32	QO (B) AFI	15–20 A		
MSP 34	1/	65k	400 A Max. Class J or T6 Fuses	QO (B) VH QOB-VH	15–30 A	15–125 A 150 A	15–100 A
	/		ECI 04	QO (B) AFI	15-20 A		
		100k	KCL24	QO (B) QO (B) AS	15-70 A 15-30 A	15-100 A 15-30 A	15–100 A 15–30 A
			KCL34	QO (B) GFI QO (B) AFI	15–30 A 15–20 A	15–30 A 	
/		100k	200 A Max. Class T3	QO (B) AFI	15–20 A		
		-	1 4363	QQ (B)	15–70 A	15–125 A	15–100 A
		100k	EJ, FJf	QO (B) GFI QO (B) AFI	15–30 A 15–20 A	15–60 A	
	-						
	- (QOE -XXX	xxx (B) = BUM = poles. x xx = tri	B series E	solt-on, U	nMotoriz	ed Breaker
1		[1 pc	le] BUMB-15. B	SUMB-20.	BUMB-3	0	
\ \		[2 pc	le] BUMB-215 ,	BUMB-22	O, BUMB	-230	
		[3 pc	le] BUMB-315 ,	BUMB-32	0, BUMB	-330	
	~	QOx	xx = UMB serie	s clip-on,	U n M otori	zed B rea	ker
	_						
		- A ^^	e] UMB-15. UM	1B-20. UM	B-30		

[3 pole] UMB-315, UMB-320, UMB-330

All 15 & 20 A breakers are HM (High Magnetic)

NOOD Series Batings (Continued)

	Current al)		Branch Circuit Breaker Designations and Allowable Ampere Ranges ab				
Maximum System Voltage AC c	Maximum Short Circuit (Rating (RMS Symmetric	Integral or Remote Main Circuit Breakers and Remote Main Fuses	Туре	1-pole	2-pole	3-pole	
240	100k	HJ, JJ	QO (B) QO (B) VH	15–70 A	15–125 A	15–100 A 35–150 A	
	125k	HL. JL	QO (B) PL QO (B) PL QO (B) AFI QO (B) H QOB2150VH	15–30 A 15–30 A 15–20 A 	15–60 A 15–60 A 15–100 A 150 A	15–30 Å 	
	200k	FI, KI	QO (B) QO (B) AS QO (B) GFI QO (B) AFI	15–70 A 15–30 A 15–30 A 15–20 A	15–125 A 15–30 A 15–60 A 	15–100 A 15–30 A 	
	200k	Maximum Fuses 200 A Class J or T6 400 A Class T3	QO (B) QO (B) AS QO (B) GFI	15–70 A 15–30 A 15–30 A	15–125 A 15–30 A 15–60 A	15–100 A 15–30 A	

Suffixes HID, SWD and SWN may also be applied to the applicable branch circuit breakers shown above, except suffix SWN may NOT be applied in combination with LC main circuit breakers

Solinkes in Covid and Several Suffix SWN may NOT be applied to the applicable branch or additional breakers shown above, except suffix SWN may NOT be applied in combination with LC main circuit breakers.
 Where QO (B) circuit breakers are shown above, QO (B) H, QO (B) VH, and QH (B) circuit breakers may also be used.
 For shown circuit breakers rated less than this maximum voltage, the indicated short circuit current rating also applies, but at the voltage rating of the circuit breaker.
 Only 15–30 A circuit breakers may be used when the LC circuit breaker.
 Only 15–30 A circuit breakers may be used when the LC circuit breaker is rated 450, 500 or 600 A.
 Obsolescent. Contact your nearest Square D/Schneider Electric sales office for replacement circuit breakers are shown above, QO(B), EPD circuit breakers may also be used.

Return to Table of Contents NF Series Ratings

Maximum System Voltage AC	Maximum Short Circuit Current Rating (RMS Symmetrical)	Main Type	Branch Type	Poles	
	05 000	EG, FH, FGf, KH, LH, MH, MX, HG, JG	EDB, EDB-EPD		
	65,000	EG	ECB-G3		
240	100,000	EJ, FC, FJf , KC, LC, LX, HJ, JJ	EDB, EDB-EPD, EGB		
		EJ, FC, KC, HJ, JJ	ECB-G3	1.2&3	
	125,000	HL, JL	EDB, EDB-EPD, EGB, ECB-G3	.,	
	200,000	FI, KI, LI, LXI	EDB, EDB-EPD, EGB, EJB		
		FI, KI	ECB-G3		
480Y/277	35,000	EG, FGf , KH, LH, HG, JG	EDB, EDB-EPD		
	55,000	EG, HG, JG	ECB-G3		
	65,000	EJ, FC, FJf , KC, LC, LX, HJ, JJ	EDB, EDB-EPD, EGB		
		EJ, FC, KC, HJ, JJ	ECB-G3	1,2&3	
	100,000	HL,JL	EDB, EDB-EPD, EGB		
	200,000	FI, KI, LI, LXI	EDB, EDB-EPD, EGB, EJB		
		FI, KI	ECB-G3		
	18,000	HG, JG, MG	EDB, EDB-EPD		
	25,000	EJ, FI, KH, KL, LC,. LE, LX, LI, LXI, HJ, JJ	EDB, EDB-EPD, EGB		
		LH	EDB(15-70 A), EGB		
600Y/347	35,000	LC, LE	EDB, EDB-EPD, EGB, EJB	1, 2, 3	
	50,000	HL, JL	EDB, EDB-EPD, EGB		
	65.000	FI, KI	EDB, EDB-EPD, EGB, EJB		
	,	LI, XI	EJB		
		Remote Main Fuse			
240	200,000	200 Ampere Maximum Class J or T (600V)	ECB-G3	1,2&3	
	100,000	400 Ampere Maximum Class J or T (600V)	EDB, EDB-EPD, EGB, EJB		
480Y/277	200,000	200 Ampere Maximum Class J or T (600V)	EDB, EDB-EPD, EGB, EJB	1,2&3	
	200,000	200 Ampere Maximum Class J or T (600V)	ECB-G3		
600Y/347	200,000	200 Ampere Maximum Class J or T (600V)	EDB, EDB-EPD, EGB, EJB	1,2&3	

QOBPLxxx-5393 = BMB series Bolt-on, Motorized. (REMOTELY OPERATED) -xxx = poles. xxx = trip current. -5393 suffix denotes special 60" control wires.

[1 pole] BMB-15, BMB-20, BMB-30

[2 pole] BMB-215, BMB-220, BMB-230, BMB-240, BMB-250, BMB-260 [3 pole] BMB-315, BMB-320, BMB-330

QOPLxxx-5393 = MB series clip-on, **M**otorized. (REMOTELY OPERATED) -**x**xx = poles. x**xx** = trip current. **-5393** suffix denotes special 60" control wires.

[1 pole] MB-15, MB-20, MB-30 [2 pole] MB-215, MB-220, MB-230, MB-240, MB-250, MB-260 [3 pole] MB-315, MB-320, MB-330

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LynTec overprint: 139-0407-02 Series Ratings 10/31/06 For most current version see http://www.lyntec.com/139-0407_Series_Ratings.pdf © 2006 Schneider Electric All Rights Reserved 8/24/06



LynTec MSP 341 series

SEQUENCING



PANELBOARD MSP 341 series

LynTec

139-0357-05.7

Page 7 of 8

SPECIFICATIONS SEQUENCING SYSTEM SPECIFICATIONS

Circuits controlled by one or more MS-12 Modular Sequencer boards

Each MS-12 board has 6 drivers capable of simultaneously driving two each of the 1, 2 or 3 pole **MB** series motorized circuit breakers. Step 1 drives breakers 1a and 1b. Step 2 drives breakers 2a and 2b and so on through step 6. The motorized breakers may be located in any open slot in the panel.

Sequence timing is field programmed by installing push-on jumpers.

STEP RATES

Default, with no program jumpers, is one second per step with no delays. One jumper selects 1/2 or 1/4 second per step.

Two jumpers in the 1/2 and 1/4 sec. positions set the step rate at 1/8 second. **DELAY TIME and DELAY POSITION jumpers and timing**

Low level or front-end 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.

Normally, the low level equipment such as preamps, mixing consoles, tuners, CD players, tape decks and EQ's are powered from the first few A.C. circuits.

Bold face type = legends printed on MS-12 boards.

One (First) or two (Second) programmable DELAY TIMEs provide stabilization time for the computers to boot or DSPs to settle.

DELAY TIMEs

1 sec, (no jumper), 2, 4, 8, 16 or 30 seconds or 2, 4, or 8 minutes.

Programmable **DELAY POSITION** settings allow selection of a sufficient number of steps to sequence the breakers required. The **First** delay may be positioned before or between any of the 6 steps depending on the first **DELAY POSITION** jumper.

The **Second** delay position is determined by, you guessed it, the second **DELAY POSITION** jumper. Additional delays may be added between higher steps, but their delay times will all be the same as the **Second**.

Energy Storage — Brownout protection — ZipOff Load Shedding

A distributed power supply stores sufficient energy to ZipOff 12 motorized circuit breakers 2 seconds after power falls below 95 volts. This load shedding ZipOff is delayed 2 seconds to prevent power-glitch induced sequencing.

Automatic Restart after power failure or Kill command.

Five seconds after power stabilizes above 105 volts, the on sequence resumes the orderly turn on. A *fast* flashing ON LED indicates the power hasn't been above 105 volts for the last 5 seconds and the sequencer is waiting for the power to stabilize before restarting the on sequence.

Kill

A Kill terminal on each MS-12 board provides an instant shutdown (within 100 milliseconds) when connected to common.

Opening the connection restarts the on sequence as described above.

HurryOff — the Ohh switch

When you *REALLY* want to shut the system down in a hurry, due to system oscillation or other problem, a HurryOff command may be invoked by holding *any* OFF button down for at least 2 seconds. HurryOff shuts the system off completely in 2.1 seconds. To provide the operator time to isolate and correct the problem, there is no automatic restart after a HurryOff command. The system must be manually restarted by pressing the ON switch.

Indicator LEDs

Power to each MS-12 circuit board is indicated by the amber **POWER** LED.

Green cylinder 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

To begin the ON or OFF sequence, a momentary contact to common of at least 30 milliseconds is required to initiate an ON or OFF function of the sequencer. Momentary contacts are necessary when more than one control location is required. ON and OFF line characteristics: +35 volts DC fed through 6900Ω (ON) and 4700Ω (OFF)

ON/OFF Switch Set Supplied

The one supplied **SS-2** Sequencer ON and OFF Switch set provides switches with built-in film legends. The ON switch is backlit by an internal 12v @ 10 ma. green LED. The SS-2 switches mount in 5/8" round holes on 1" centers.

Additional switch sets may be parallel wired for up to 5 remote control locations. See Page 7 for other switch options.

Remote Pilot LED Output

60 Hz Half-wave pulsed +18 volts (7.5v rms) flashed at a 50%, 1 Hz rate, will drive remote pilot \mathbf{ON} LEDs up to 200 milliamperes. Incandescent indicator lamps are not recommended.

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 <u>if</u> the *last* board in a daisy-chained system has its VOUCHER SUPPLY [V+] and VOUCHER SENSE [V–] terminals bridged by a resistance of less than 100 K Ω .

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 power 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 circuit that must be powered for proper system operation.

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

The POWER VOUCHER output terminals are all connected in series and then back to the *last* LynTec sequencer's VOUCHER SUPPLY [V+] and VOUCHER SENSE [V-] terminals.

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

Jumper the V+ and V- terminals on the *last* board if power verification is not used.

+5v Logic Output

A clean logic level output that mimics the **ON** LED for touch screen drive. Pulses during sequencing, high at end of on sequence. Source: +3.3 K Ω from +5v.

For detailed Timing Diagram see http://www.lyntec.com/139-0266_Seq_Timing.pdf

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 by a 3 wire low voltage field connection to the screw terminal strips on sequencer circuit board/s.

Control Wire Requirements

From ON/OFF switch location to **one** LynTec sequencing panel: 4 conductors, 24 gauge, 5,000 ft. maximum

Between multiple MSLCs, MSPs, SLCs, SPs or PDS-8s when daisy chained:

7 conductors, 24 gauge, 5,000 ft. maximum

- 9 conductors if ON/OFF switches are required at each sequencer location.
- 11 conductors if POWER VOUCHERs are used.

SEQUENCER POWER

The SEQUENCER POWER circuit breaker, mounted in the lower right position in the high voltage section of the panel, 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 as an approved, switchable connection method to the high voltage. The, **UL** & **UL**_c listed, transformer is impedance protected with an internal thermal fuse.

Each sequencer board is protected by an on-board AGC 1/2 amp fuse.

Power required: 50/60 Hz, 4 watts per board with one external ON LED load. 20 watts maximum per panel.

ARCHITECTS & ENGINEERS SPECIFICATIONS for PDF and Word file links

see http://www.lyntec.com/139-0354_A&E_Specs.pdf

In the interest of product improvement, specifications are subject to change without notice — see web site for the most current data.

www.**LynTec**.com

LynTec, Inc. • 8401 Melrose Drive • Lenexa, KS 66214 (a Kansas City suburb) Voice 800-724-4047 • 913-529-2233 • Fax 888-722-4157 • 913-529-4157

ARCHITECT'S and ENGINEER'S SPECIFICATIONS Sound system A.C. power Sequencing Load Center

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

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

Time between sequence steps shall be adjustable from 1/8 second to 1 second. Sequencing shall have a time delay adjustable between the low-level equipment circuits and the power amplifier circuits. The delay time shall have a field adjustable range from 1 second to 8 minutes.

The sequencing system shall be capable of shedding the load within 3 seconds after a power failure and automatically re-sequencing when power resumes and remains above 105 volts for more than 5 seconds without operator intervention.

The sequencing system shall have brownout protection; monitoring the line voltage and triggering an automatic shutdown if the line voltage drops below 95 volts for more than 2 seconds.

The sequencing system shall have emergency shutdown capability triggered by external contacts or the sound system operator.

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.

All Sequencing Load Centers shall have an isolated technical ground bar.

The sound system power sequencing shall be the LynTec model MSLC xxx series Sequencing Load Center

LynTec — 800-724-4047 — www.lyntec.com

Models:

Single Phase, 22k AIR: MSLC 129-12, MSLC 129-24, MSLC 129-36

Balanced Power, 60v — 0 — 60v, 22k AIR: MSLC 119-12, MSLC 119-24

Three Phase, 22k AIR: MSLC 326-12, MSLC 326-24, MSLC 326-36

Three Phase, 25k AIR: MSLC 341-12, MSLC 341-24, MSLC 341-36, MSLC 341-48

Three Phase, 65k AIR: MSLCH 341-12, MSLCH 341-24, MSLCH 341-36, MSLCH 341-48

This document available in Word format: http://www.lyntec.com/139-0345_LdCntr_A&E_Spec.doc

Most recent version pdf http://www.lyntec.com/139-0345_LdCntr_A&E_Spec.pdf

139-0345-02_LdCntr_A&E _Spec 12/23/06

ARCHITECT'S and ENGINEER'S SPECIFICATIONS Sound system A.C. power Sequencing Panelboard

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

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.

Time between sequence steps shall be adjustable from 1/8 second to 1 second. Sequencing shall have a time delay adjustable between the low-level equipment circuits and the power amplifier circuits. The delay time shall have a field adjustable range from 1 second to 8 minutes.

The sequencing system shall be capable of shedding the load within 3 seconds after a power failure and automatically re-sequencing when power resumes and remains above 105 volts for more than 5 seconds without operator intervention.

The sequencing system shall have brownout protection; monitoring the line voltage and triggering an automatic shutdown if the line voltage drops below 95 volts for more than 2 seconds.

The sequencing system shall have emergency shutdown capability triggered by external contacts or the sound system operator.

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.

Three phase sequenced panelboards shall have 200% neutrals.

Single phase sequenced panelboards shall have a single neutral.

All sequenced panelboards shall have a separate and attached isolated technical ground section.

All branch circuit breakers shall be bolt-on.

The sound system power sequencing shall be the LynTec model MSP xxx or MSPH xxx series Sequencing Panelboard.

LynTec — 800-724-4047 — www.lyntec.com

Models:

Single Phase, 65k AIR: MSP 141-12, MSP 141-24, MSP 141-36, MSP 141-48, MSP 141-60

Balanced Power, 60v-0-60v, 65k AIR: MSP 119-12, MSP 119-24

Three Phase, 65k AIR: MSP 341-12, MSP 341-24, MSP 341-36, MSP 341-48, MSP 341-60

This document available in Word format: http://www.lyntec.com/139-0339_PnlBrd_A&E_Spec.doc

Most recent version pdf: http://www.lyntec.com/139-0339_PnlBrd_A&E_Spec.pdf

139-0339-05_PnlBrd_A&E _Spec 10/31/06

LynTec MRTS-12 and MRTS-24 Modular Rain Tight Sequencers

Sound system AC Power Sequencer for Square D QO Load Centers & Panelboards Using the new flexible MS-12 Modular Sequencer control boards

The MRTS sequencer provides a solution for contractors needing sound system sequencing using any Square D cabinet that accepts **QO** circuit breakers.

Consists of a lockable, rain tight, Hoffman UL & CSA listed cabinet with the proven LynTec MS-12 Modular sequencer boards and power transformer mounted on an iridited aluminum subchassis.

The subchassis allows the interior to be easily removed for rough-in. Just loosen 4 nuts and lift the subchassis to clear the keyhole slots.

The smooth walled cabinet provides full flexibility of field mounting and piping options.

Click green box for board tour 18.25" High — 12.5" Wide — 6.5" Deep

AVAILABLE MODELS

MRTS-12 Drives up to 12 motorized breakers

MRTS-24 Drives up to 24 motorized breakers

What is included

The **MRTS-12** or **-24** includes the UL/CSA listed cabinet, a 10 amp unmotorized breaker (UMB-10) to feed SEQUENCER POWER to the 24v transformer powering the sequencer board/s. A SEQUENCER POWER label is supplied. One 27 position isolated ground bar is supplied for the

audio technical ground system. (Typically located in the Square D panel supplied by others). One **SS-2** Switch Set.

The SS-2PL Locking Switch Plate is optional.

Additional LynTec components required

MB-15, MB-20 or MB-30 Branch Motorized circuit Breakers — one per sequenced circuit. (Square D GOPL1XX-5339) For Bolt-on breakers order BMB-15, BMB-20 or BMB-30.

139-0312-01 MRTS Brochure 3/17/04 — See http://www.lyntec.com/139-0312.pdf for latest revision.

Overlay	Download jpeg	TI	MING and LOG	IC LEVEL DI	AGRAM			
images and	button images	Lyn	Tec MS-12 seri	es Modular S	Sequencer			
+5v Logic	Timing Diagram	n is shown for a one board	I system with only or	ne jumper in the	First 2 sec. pos	sition. Step rates de	fault at 1 sec.	
SOUND SYSTEM	All boa	rds within each panel are f	factory daisy-chain c	connected with 4	pin board-to-bo	pard cascade conne	ctors.	
ON	_	Remove c	ascade connectors	to separate into	multiple system	S. SOUND SYSTEM		
	Press	ON switch LED Flashes during sequencing for	operator feedback	Sequence	Press	_ OFF		Sequence finished.
AC POWER	button	ON LED flashes at 1 second integration	erval regardless of step rate	All ON	button			All OFF
Alabert and a substantion				ON				
Sequence	er							
Step	1 Motor	zed Breakers 1a and 1b ON						
number	2	Motorized Breakers 2a and 2b OI	N;		;			
	3	Adjustable up to 8 min.	Motorized Breakers 3a and	3b ON		on turn off.		
	4	May be set before or between any step.	Motorized Breakers	4a and 4b ON			v. 14 up boards >8/03.	
	5		Motorized	Breakers 5a and 5b O	DN /			
			Motori	zed Breakers 6a and 6	6b ON			
						130-0266-08 MS-1	2 Timing Diagram 2/23/0	[!] 5
	+35v Contro	l line TIMING, FUNCTIONS a	Ind LEVELS			133-0200-00 103-		,
Swite	ch. → 30 msec. minimu 500 msec. maxin	m Source resistance is 3720 to 6900 Ohms o	depending on model.					
For o	laisy-chain, connect to only the <i>first</i> ON swite	previous board's CARRY. h in daisv-chained systems - turn ON	first board - turn OFF last b	oard.				
OF	=				+35v			
Swite Use	ch. For daisy-chain, co only the <i>last</i> OFF swit	nnect to <i>next</i> board's BORROW. ch in daisy-chained systems - turn ON	I <i>first</i> board - turn OFF <i>last</i> I	ooard. ca	ommon 30 msec. minimu 1500 msec. max	Im Source resistance is 3720 to 470	10 Ohms depending on model.	
	-				+12v		i)	
BUSY (An or	itput. Connected to <i>ne</i>	xt board's HOLD. Low holds next segu	uencer until this board's on se	n equence is complete).				
(7.11.00								
	+16v 60 Hz pulses.	ana annan annan an	ann annan hannan		nanana nanan	nnnnn nnnnn	AAAAAA AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	
PILOT (An ou	Com	ternal ON switch LEDs).						
For da Power	isy-chained systems a Verification and seque	III ON LEDs + connect to the <i>first</i> boa	rd's PILOT. ent board's PILOT output.					Sequence finished
The la	st sequencer uses a V	+ to V— jumper or series connected F	Power Vouchers to light the	N LED at end of sequ	ience.			All OFF
+5v Log (Clean (CMOS 5v logic for touc	ch panel interface. 3.3 kOhm source in	npedance).	n				
CARRY		F			+35v supplied from <i>next</i> ON. Sou	rce resistance is 3720 to 6900 Ohms depe	nding on model.	
(An ope current	n collector, NPN darlin limiting resistor. Conne	gton with a 1N4004 diode and a 200 (act to next ON. Toggles next board on)	Ohm transient -> 56	msec.				
POPPO	N		Comn	CARKY IOW STATE VOITAGE IS +2.5V	aue to series 200 ohm resistor, dia +35v supplied from p	oue and VCEsat of darlington transistor. (or previous OFF. Source resistance is 3720	e daisy-chain load) to 4700 ohms depending on model.	
(An open	collector NPN output	with an 82 Ohm transient current limit	ing resistor			low state voltage: +0.75v due to series 92.	Ohm (one daisy-chain load)	→ → 56 mse
Connect	ess ON button	jies previous board off).	finished. All ON		DFF button	Return to Tab	le of Conten	Commo Its

Instruction Bulletin

ECN N353

QO-PL (Plug-on), QOB-PL (Bolt-on) Powerlink[®] Remotely Operated Circuit Breakers

(Use in Type QO Load Centers and Type NQO, NQOB, and NQOD Panelboards)

Retain for future use.

REQUIREMENTS

Remotely Operated Circuit Requirements

A DANGER

HAZARD OF ELECTRIC SHOCK, BURN, OR EXPLOSION.

When servicing a branch circuit fed by a remotely operated circuit breaker, move handle of remotely operated circuit breaker to OFF position. Do not rely on remote operation to open circuit breaker.

Failure to follow these instructions will result in personal injury or death.

CIRCUIT BREAKER

🛕 DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must be installed and serviced only by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death, or serious injury.

POWERLINK[®] QO(B)-PL Remotely Operated Circuit Breakers require a power supply capable of delivering at least two amperes at 24 Vdc for a minimum of 50 milliseconds. One-, two-, and three-pole circuit breakers all have one internal motor, and power requirements are the same regardless of the number of poles and ampere ratings.

The required power supply ampacity and control device contact rating are determined by the number of circuit breakers to be switched simultaneously (i.e., four circuit breakers switched simultaneously require a power supply and a control device contact rated 8 amperes minimum). The control device may be either a normally-open (NO)/ normally-closed (NC) contact; a single-pole, double-throw switch (SPDT); or other three-wire control device.

- 1. Turn off all power supplying this equipment before working on or inside equipment. All LynTec
- Before installing circuit breaker turn circuit breaker handle to OFF position.

supplied breakers have special 60" control wires. (Square D standards

Remove panelboard cover and deadfront. Verify power is off with voltage meter before proceeding.

Installation of circuit breaker into panelboard/load center (refer to standards figure below) are 18".)

 Except for remotely operated connections, QO(B)-PL remotely operated circuit breakers are installed in a panelboard/load center the same as conventional QO(B) circuit breakers.

Connection of remotely operated circuit (refer to the figure on next page)

5. Assure that power supply and control device meet requirements listed under "Remotely Operated Circuit Requirements."

CIRCUIT BREAKER INSTALLATION

CAUTION

HAZARD OF CIRCUIT BREAKER DAMAGE.

Connect the 24 Vdc remote control wiring as shown on this page.

Failure to follow these instructions can permanently damage the remotely operated circuit breaker.

LynTec

part numbers MB series motorized circuit breakers (Snap-On)

May be used in LCLC, LCP, MSLC, MSP, SLC or SP series panels.

BMB series motorized circuit breakers (Bolt-On) Use only in LCP, MSP or SP Panelboards

All **BMB & MB** series breakers have Square D part number suffix of -5393 indicating a special 60 inch lead length for remote control wires required to connect to LynTec control boards in low voltage cabinet.

** = Stocked items

****MB-15** = 15 Amp. square D QO-115PL-5393 ****BMB-15** = 15 Amp. square D QOB-115PL-5393

****MB-20** = 20 Amp. Square D QO-120PL-5393 ****BMB-20** = 20 Amp. Square D QOB-120PL-5393

****MB-30** = 30 Amp. square D QO-130PL-5393 ****BMB-30** = 30 Amp. square D QOB-130PL-5393 Two pole motorized - call for pricing & delivery

MB-215 = 15 Amp. Square D QO-215PL-5393 BMB-215 = 15 Amp. Square D QOB-215PL-5393

****MB-220** = 20 Amp. Square D QO-220PL-5393 ****BMB-220** = 20 Amp. Square D QOB-220PL-5393

MB-230 = 30 Amp. Square D QO-230PL-5393 BMB-230 = 30 Amp. Square D QOB-230PL-5393

40A, 50A or 60A, Two pole also available on Special Order

Three pole motorized - call for pricing & delivery **MB-315** = 15 Amp. Square D QO-315PL-5393 **BMB-315** = 15 Amp. Square D QOB-315PL-5393

MB-320 = 20 Amp. Square D QO-320PL-5393 **BMB-320** = 20 Amp. Square D QOB-320PL-5393

MB-330 = 30 Amp. square D 00-330PL-5393 BMB-330 = 30 Amp. square D 00B-330PL-5393 LynTec also stocks UMB & BUMB (un-motorized) QO series circuit breakers including HM (High Magnetic). Recommended for eliminating nuisance trips in high inrush applications. [AlI BMB & MB-315 and BMB & MB-3205 are HM breakers.]

800-724-4047

LynTec • www.LynTec.com 8401 Melrose Dr., Lenexa, KS 66214, USA Voice 913-529-2233 • Fax **888-722-4157** or 913-529-4157

LynTec overprint 139-0216-08.2 9/23/06

Square D Company 3700 Sixth Street SW Cedar Rapids IA 52404 USA 1-888-SquareD (1-888-778-2733) www.SquareD.com

- 6. All wiring and splicing must comply with applicable code requirements for Class 1 circuits. Refer to paragraph 373-8 and article 725 of the National Electrical Code.
- 7. Three #18 AWG control wires are attached to the remotely operated circuit breaker for connection to the power supply and remote control device and should be cut to the required length to reach the splice connections. Use #18 AWG or larger conductors with 600 V insulation and approved wire connectors for splices.
- 8. Connect the black lead of the remotely operated circuit breaker to the negative (-) terminal of the 24 Vdc power supply. Connect the red lead of the remotely operated circuit breaker to the positive (+) terminal of the 24 Vdc power supply. Connect the white lead of the remote control device. The remote control device provides connections between either positive or negative potential of the power supply and the white wire of the remotely operated circuit breaker, as appropriate.
- 9. Applying the positive potential of the power supply to the white wire (contact closure between the red wire and white wire) will operate the remote mechanism of the circuit breaker to the OFF position. Applying the negative potential of the power supply to the white wire (contact closure between the black wire and the white wire) will operate the remote mechanism of the circuit breaker to the ON position. A control circuit utilizing a normally open (NO)/normally closed (NC) contact is illustrated below.

NOTE: The remote mechanism will not move the circuit breaker handle. Also, the remote mechanism cannot turn power ON when the circuit breaker is tripped (VISI-TRIP[®] flag indicator showing) or when the circuit breaker handle is in the OFF position.

Installation of the trim and operational checks

- 10. Remove corresponding twist-out from panelboard trim and replace trim.
- 11. Turn power to panelboard on.
- 12. Turn remotely operated circuit breaker handle to the ON position.
- 13. Turn power to the remotely operated circuit on and test this circuit, turning remotely operated circuit breaker off remotely, then on remotely. If power to remote controlled circuit breaker load does not switch off and on, turn off power to remotely operated circuit and panelboard and check wiring.

NOTE: A power supply is available from Square D Company, Cat. No. QOPLPS (plug-on) or QOBPLPS (bolt-on).

Splice not normally required with

Return to Table of Content²

Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

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SQUARE D

Emergency circuit breaker activation

for MSLC or MSP systems using motorized circuit breakers.

LynTec 800-724-4047

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CIRCUIT

BREAKER

Emergency RR7 relay activation for LCRP or PDS-8 series

139-0286-02 Emergency activate 1/25/06

LIMITED WARRANTY

All LynTec manufactured products are warranted to be free from defects in workmanship and materials for a period of 5 years from the original invoice date. This warranty shall be limited to the repair, adjustment and/or replacement of defective parts.

LynTec will repair or replace defective LynTec products only at the factory at 8401 Melrose, Lenexa, KS 66214, U.S.A. 800-724-4047. All returns are to be prepaid. LynTec will pay return UPS surface freight charges within the continental United States on warranty repairs. All customs expenses and excess transportation charges will be borne by the customer.

All Square D and General Electric products that are resold as part of a LynTec equipment package are warranted to be free from defects in workmanship and materials for a period of 15 months from the original invoice date. This warranty shall be limited to the repair, adjustment and/or replacement of defective parts.

LynTec will not be responsible for inconveniences or consequential damages occasioned by LynTec equipment, or by breach of any express or implied warranty with respect thereto.

Implied warranties on this product shall be in effect only for the duration of the express warranty set forth above. After the warranty expiration date shown on the serial number label, there shall be no warranties, express or implied on the product.

This warranty becomes void if the product shows evidence of mishandling, tampering, battery or chemical corrosion, fire, water or lightning damage or other acts of nature, use contrary to the applicable instruction manual, shipping damage or repair performed by others.

Job List

A partial list of users and their applications of the LynTec AC power sequencing systems

Supplying reliable sequencing solutions to mission-critical venues since 1989

LDS Assembly Hall — Salt Lake City, Utah — Full sound system AC control of 21,000 seat auditorium. National Cathedral — Washington, D.C. — Full sound system AC control. Autzen Stadium — Home of Oregon Ducks — Eugene Oregon — 54,000 seat football stadium - Full sound system AC control. NCAA Hall of Champions — Indianapolis, Indiana — Full AV system AC control. Kentucky Speedway — Sparta, Kentucky — Full sound system AC control. Gillette Stadium — Foxborough, MA— Home of the New England Patriots — Full sound system AC control. Madison Square Garden — New York, New York — Full sound system AC control. Kennedy Center — Washington, D.C. — AC control of Opera House and Concert Hall sound systems. **PNC Park** — Home of the Pittsburgh Pirates — Full sound system AC control. Sun Theater — Anaheim, California — Full sound system AC control. Breslin Center Arena & Spartan Stadium — Michigan State — East Lansing, Michigan — Full sound system AC control. Benaroya Concert Hall — Seattle, Washington — Full sound system AC control, balanced power system. Tennessee Titans Stadium - Nashville, Tennessee - Full sound system AC control War Memorial Opera House — San Francisco, California — Full sound system AC control. SBC Center— Home of San Antonio Spurs— San Antonio, TX —18,500 seat arena — Full sound system AC control. Jordan Hare Stadium — Auburn University, Alabama — 85,214 seat football stadium — Full sound system AC control. Lookingglass Theatre & Millenium Park — Chicago, Illinois — Full sound system AC control. Alltel Stadium — Home of Jacksonville Jaguars — Jacksonville, Florida — Full sound system AC control. Memorial Stadium — Home of Nebraska Cornhuskers — Lincoln, Nebraska — Full sound system AC control. Quad Discovery Center, Smithsonian — Washington, D.C. — Sound system AC control. Dale Halton Arena — University of North Carolina, Charlotte — Charlotte, North Carolina — Full sound system AC control. New England Conservatory of Music — Boston, Massachusetts — Full sound system AC control. Galveston Convention Center — Galveston, TX — Full sound system AC control. Ralph Wilson Stadium — Home of the Buffalo Bills — Buffalo, New York — Sound system AC control. Creative & Performing Arts High School — Philadelphia, Pennsylvania — Full sound system AC control. University of Georgia Coliseum — Athens, Georgia — 10,000 seat multipurpose arena — Full sound system AC control. Fremont Street Experience — Las Vegas, Nevada — Sequential control of 80 — 6,000 watt power amplifiers. Popejoy Hall Performing Arts Facility — University of New Mexico — Full sound system AC control. Shakespeare Theatre — Chicago, Illinois — Full sound system AC power control. Conte Forum Arena, Boston College — Boston, Massachusetts — Full sound system AC control. Vivian Beaumont Theater - Lincoln Center - New York, New York - Full sound system AC control. Network Associates Coliseum — Home of Oakland Raiders — Oakland, California — Full sound system AC control. Dollywood — Pigeon Forge, Tennessee — Full sound system AC control. Texas Instruments Boardroom — Dallas, Texas — Full sound system AC control. Circle Center Mall at Artsgarden — Indianapolis, Indiana — Full sound system AC control. Baum Stadium at George Cole Field — University of Arkansas — Fayetteville, Arkansas — Full sound system AC control. Westlake Ohio City Hall - Westlake, Ohio - Full sound system AC control. High Street Baptist Church — Springfield, Missouri — Full sound system AC control. Hugh Hodgson Concert Hall —University of Georgia — Athens, Georgia — Full sound system AC control. Schubert Theater — Boston, Massachusetts — Full sound system AC control. World Changers Church — Atlanta, Georgia — Full sound system AC control. Germain Ampitheater — Columbus, Ohio — Full sound system AC control. Madam Tussauds Wax Museum — Las Vegas, Nevada — Full sound system AC control. Roxy Roller Disco — New York, New York — Full sound system AC control. Qualcom Stadium — Home of San Diego Chargers — San Diego, California — Full sound system AC control. "The Groove" Dance Club — Universal City Walk, Orlando, Florida — Full sound system AC control. St. James Church — Madison Avenue, New York City — Full sound system AC control. Lancaster Municipal Stadium — Home of the Lancaster Jethawks — Lancaster, California — Full sound system AC control. Mission Planning Center — MacDill AFB — Tampa, FL — Full sound system AC control. Starlight Theater — 12,000 seat ampitheater — Kansas City, Missouri — Full sound system AC control. Cleveland Browns Stadium & Gund Arena, Home of Cleveland Cavaliers — Cleveland, Ohio — Full sound system AC control.

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