

Systems include choice of 4 loadcenters (single-phase 100A or 200A, 3-phase 125A or 225A)

+ Sequencer Model ACSC-248 bundled with accessories shown

Sequentially Controlled AC Loadcenter System (Model ACLC-100-20-SC248 shown wired)

Features

- One switch remote power control system provides time sequenced AC power to system components.
- Systems include sequencer bundled with 2 remote switches, transformer, snap-in bushings, cable ties and loadcenter.
- Sequencer Model ACSC-248 is UL508A Listed and controls up to 24 circuits with 8-steps and up to 3 circuits per step.
- Loadcenters are offered with single-phase (100A or 200A) or 3-phase (125A or 225A) main breaker.
- Remote switches can be installed on the sequencer or at a remote location (1 key switch, 1 rocker switch provided)
- Automatic shut-down provides protection from power failure.
- Interface for alarm systems or master control allows 'lock-on', 'lock-off' or 'switch-locked' functions.
- Set & change sequence operation with plug-in cables.
- Adjust sequence delay from 0.5 to 10 seconds.

ACSC-248 sequencer (bundled with two remote switches, transformer, assorted bushings and cable ties) and a Cutler Hammer loadcenter (choose single-phase 100A or 200A; or 3-phase 125A or 225A main breaker). Lowell also offers individual 20A and 30A breakers (single or dual) with control cable that simply plugs in to the sequencer to set and change sequence operation - no wires to strip. Sequence delay is easily set from 0.5 to 10 seconds using a flat blade screwdriver. Sequencer housing is galvanized steel with knockouts and a coverplate painted grey to match Cutler Hammer loadcenters.

To configure a loadcenter with more than one sequencer or to retrofit an existing Cutler Hammer or compatible loadcenter; sequencer Model ACSC-248 (with bundled accessories) may be ordered separately. Additionally, Lowell's multi 20A circuit surge suppressor Series ACSP20 and ACSP20-GTF with ground transient filter and up to six 20A circuits per assembly may be used in conjunction with the sequenced loadcenter system to protect sensitive equipment from surges and ground transients. Visit the www.lowellmfg.com for more information on these and other Lowell Power products.

Description

Lowell's ACLC Series sequenced AC loadcenter systems provide one switch remote control of circuit breakers for time sequenced AC power distribution to sound system components. UL Listed ACLC Series is engineered to provide easy ordering and simple installation. Packaged systems include Model

SYSTEM ASSEMBLIES - AC LOADCENTER WITH SEQUENCER

| System Model | loadcenter (included) | Sequencer (included) | Switches (2 included) | Accessories (order separately) |
|----------------------|---|-----------------------------|-----------------------|---------------------------------|
| ACLC-100-20-SC248 | 100A main breaker 1-phase 20space 20circuit | ACSC-248 24 circuit, 8-step | 1 keylock, 1 rocker | Individual breakers (see below) |
| ACLC-200-30-SC248 | 200A main breaker 1-phase 30space 40circuit | ACSC-248 24 circuit, 8-step | 1 keylock, 1 rocker | Individual breakers (see below) |
| ACLC-3P-125-30-SC248 | 125A main breaker 3-phase 30space 42circuit | ACSC-248 24 circuit, 8-step | 1 keylock, 1 rocker | Individual breakers (see below) |
| ACLC-3P-225-42-SC248 | 225A main breaker 3-phase 42space 42circuit | ACSC-248 24 circuit, 8-step | 1 keylock, 1 rocker | Individual breakers (see below) |

SYSTEM ACCESSORIES

Individual Breakers (order separately)

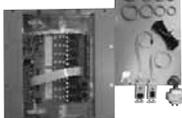
| | |
|-----------|---|
| ACRB-20-1 | Remote breaker 20A circuit single pole, pulse solenoid operated |
| ACRB-20-2 | Remote breaker 20A circuit two pole, pulse solenoid operated |
| ACRB-30-1 | Remote breaker 30A circuit single pole, pulse solenoid operated |
| ACRB-30-2 | Remote breaker 30A circuit two pole, pulse solenoid operated |
| ACB-20-1 | Standard breaker 20A circuit, single pole |

Sequencer (included with system - order if adding a second sequencer or retrofitting an existing Cutler Hammer or compatible loadcenter)

| | |
|----------|--|
| ACSC-248 | Sequencer control unit for ACLC Series, 24 circuits, 8 step adj time delay |
|----------|--|



Individual breakers



Extra sequencer - ACSC-248

1c-104 P/N 12091

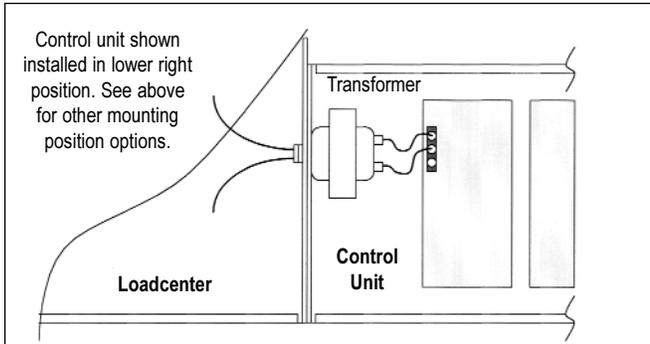
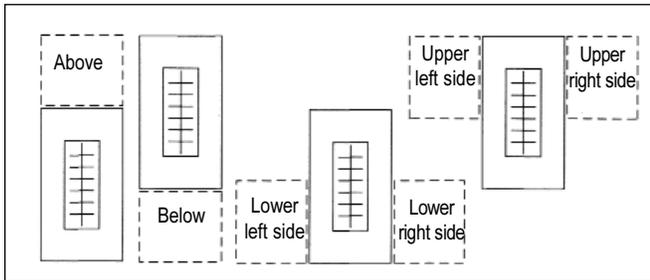
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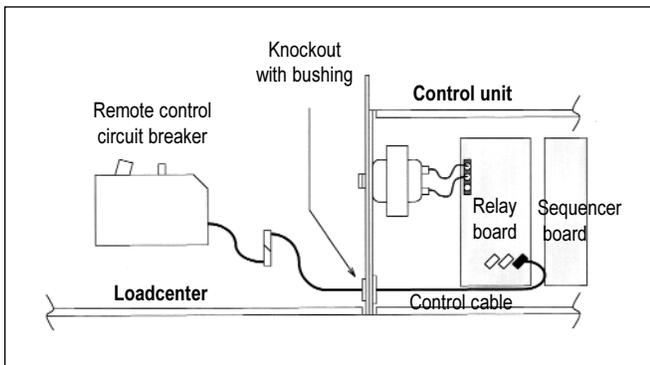
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Download and print this spec from www.lowellmfg.com to insure that you have the most current information



TEST PROCEDURE:

- 1) Apply power to transformer. (turn on 10A breaker) Red LED on sequencer board should be on.
- 2) Press red button on sequencer board Red LED will turn off, Green LED will begin flashing. Sequencer will cycle up, each step indicated by Green LED turning on and by "click" of relay on other board. When "on" cycle is complete, Green flashing LED will stay on steady.
- 3) Press red button again. Green LED will turn off, Red LED will begin flashing. System will cycle off in reverse order. When "off" cycle is complete, Red LED will stay on steady. Cycle rate can be adjusted with trimpot.



After all control cables are connected, dressed, and bundled NEATLY, the system is ready for testing.

Installation Instructions

BEFORE BEGINNING, PLEASE NOTE: Depending upon the local construction trade situation, some or all of the following installation may have to be performed by a "qualified electrician". Please consult with the AHJ (Authority Having Jurisdiction) and /or the General Contractor if there are any questions.

- Step 1) Install load center in desired location. Follow guidelines found in NEC 404.B (A) as to placement height. (Center of highest breaker to be no higher than 6' 7" [2.0m] from floor).
- Step 2) Install sequencer unit (ACSC-248) in desired location. End with obround opening must be against load center. See diagram below for placement options.
- Step 3) Connect bonding wire (green) to load center ground bar.

CAUTION: If main and neutral feeders are connected to load center, make sure main breaker is OFF and follow all appropriate safety procedures for working with live equipment.

- Step 4) Install 10A circuit breaker (packed with ACSC-248) into load center in a location close to control unit.
- Step 5) Install control transformer (packed with ACSC-248) into a 1/2" KO in load center such that the body of the transformer (24vac output side) is inside the control unit and the bushing (125vac input) is inside the load center. See diagram. Connect transformer primary (input) leads to 10A breaker (black) and neutral bus (white). Trim lead length as required. Using lead wires with push-on connectors provided with transformer, connect secondary (output) to terminals on circuit marked "24vac". Trim lead length as required.

NOTE: If power is available in the load center, this is a good point in the installation to test the control unit.

CAUTION: LOADCENTER MUST BE DE-ENERGIZED BEFORE PROCEEDING WITH INSTALLATION. FOLLOW ALL APPROPRIATE SAFETY AND LOCKOUT / TAGOUT PROCEDURES

- Step 6) Install Remote Control Breakers in loadcenter at desired locations, typically close to the control unit to minimize length of control cables inside loadcenter.
- Step 7) Remove appropriate larger knock-out(s) between loadcenter and control unit. Install proper snap-in protective bushings (provided with ACSC-248 control unit).
- Step 8) Install one control cable through KO between loadcenter and control unit, male end (larger) in loadcenter, female (smaller) end in control unit. Connect cable to breaker desired to sequence "on" first. Connect other end of cable to one of the "step one" 3-pin headers on the relay board. (Each sequence step can control up to three circuit breakers.) Extra cable length can be dressed around and through nylon D-clamps.

NOTE: It is advisable to mark or otherwise identify each control cable as it is installed. This will make any future system reconfiguration much easier. On method of identification is to use a permanent marker, or "sharpie" on the back of the connector shell at each end of the cable.

- Step 9) Repeat step 8 for each additional remote controlled breaker, connecting control cables in desired order on relay board. Be sure to mark them as you go. Cables in loadcenter should be dressed and bundled below breakers so as not to interfere with load circuit wiring. UL and NEC require Class 2 wiring (the control cables) to be routed and secured at least 1/4" away from Class 1 wiring (AC load wiring). A package of small cable ties is provided for this purpose.

NOTE: Unused breaker spaces in load center may be filled with standard breakers for non-remotely operated circuits. Order model ACB-20-1 (20A breaker, Cutler/Hammer BR120) or appropriate size breakers available from a local Cutler/Hammer distributor.



ACLC Series

AC Loadcenter System - Sequentially Controlled (page 3)

-CAUTION- Observe all Appropriate Safety Precautions when Working with Live Equipment

Test Procedure:

- 1) Make sure ALL breaker handles are in the "off" position.
- 2) Energize load center
- 3) Turn on main breaker and 10A breaker connected to control transformer (see step 4). Leave other breakers off.
- 4) Verify that Red Led on sequence board is on.
- 5) Press red test button on sequencer board. System will cycle up. The green indicator on each remote control breaker will move to show red as each circuit turns on. Note: This function is independent of the circuit breaker operation.
- 6) Press red test button on sequencer board again. System will cycle down and green indicators on circuit breaker will return to original position.
- 7) If a "live" test of the system is desired, all of the circuit breaker handles can be turned on and the above procedure repeated.

NOTE ON REMOTELY OPERATED CIRCUIT BREAKERS: The green indicator can be used to manually energize its respective circuit by pushing it in the direction away from the breaker handle. However, if this done, the circuit can then only be de-energized by turning the breaker handle to "off". It will be necessary to cycle the entire system up and then down to reset the breaker remote control function. Therefore, manual switching of circuits in this manner is not recommended except in emergency situations.

Simulated Power Outage Test:

- 1) Press red test button and allow system to cycle up completely.
- 2) Turn off main breaker. All remotely operated breakers will turn off after approximately one second.
- 3) Turn on main breaker. System "remembers" that it was on and will cycle up again. If system is off when power outage occurs, it will "remember" that it was off and stay off until activated by test switch or remote switch.

Local and Remote Switch Installation:

Two switch assemblies (one keyswitch and one rocker) are included with the control unit. If a system switch is desired at the control unit location, remove the blank decor filler plate from the smaller cover and replace it with the desired switch assembly. Plug ribbon cable into relay board next to 3-conductor ribbon cable from sequencer board. Observe same polarity. The remaining switch assembly may be utilized at a remote location. Ribbon cable may be cut off and discarded or simply wrapped up inside the E.O. box.

Remote switch wire requirements: 3 conductor (22ga min. recommended). Shielded cable may be used but is not required. Max. recommended distance: 6000 feet. Multiple switches may be parallel connected at remote junction locations; home runs are not necessary. If additional switches are required, order momentary (normally open) Model RPSW-M-P (rocker on wallplate), RPSW-M-K-P (keylock on wallplate), RPSB-M-R (rocker on 1RU panel), or RPSB-M-K-R (keylock on 1RU panel).

ALARM SYSTEM INTERFACE:

If required by local building code, faculty usage, or Fire Marshal, the system switches can be overridden and the system controlled by contact closures provided by the fire alarm panel or other similarly installed device. A maintained contact between the "com" terminal and any of the terminals shown below will provide the following functions.

Lock Off: A maintained contact between the "com" terminal and the "lock off" terminal will turn the system off and keep it off regardless of any other switch activations. If the system is already off, it will be kept off.

Lock On: A maintained contact between the "com" terminal and the "lock on" terminal will turn the system on and keep it on regardless of any other switch activations. If the system is already on, it will be kept on.

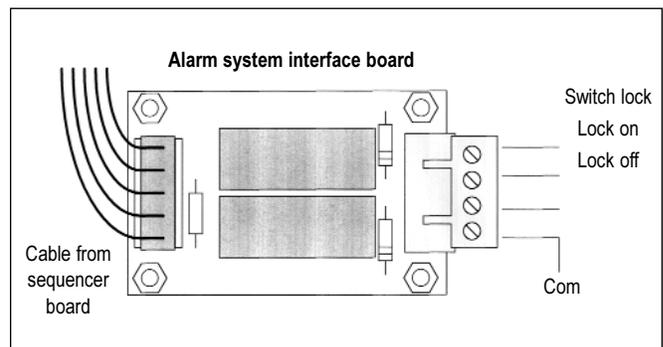
Switch Lock: A maintained contact between the "com" terminal and the "switch lock" terminal will lock the system in its current state, either on or off, regardless of any other switch activations.

Caution: Do not allow alarm system to make more than one of the above described contacts at the same time. Sequencer board damage may result.

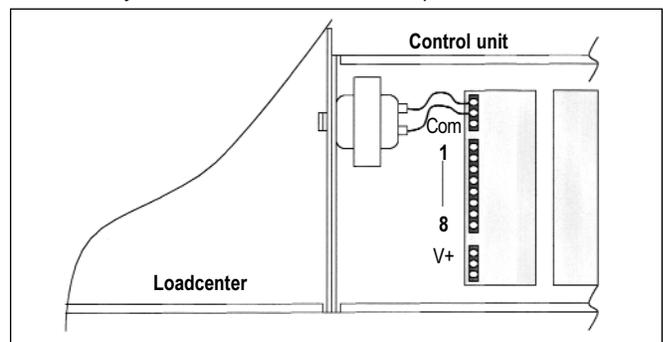
INDEPENDENT CIRCUIT ACTIVATION:

Individual remotely operated circuit breakers may be activated without sequencing the entire system. An independent switch may be connected between the "com" terminal on the relay board and the numbered terminal (1 through 8) corresponding to the desired circuit breaker (s). When switch is closed, only that circuit will turn on, all others will remain off. Note: If switch is left closed (on) that circuit will stay on regardless of system sequencing.

Application Example: A theater or auditorium may need to use the mixing console and stage monitors without turning on the entire sound system.



TIP: This interface scheme can be used in place of the standard remote switches when only one set of external switches or one external control system is used to activate the sequencer.



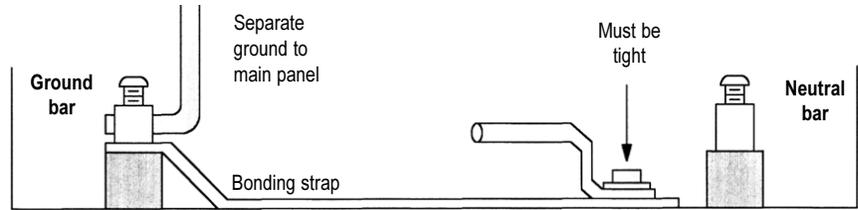
TIP: The RPSB Series momentary (normally open) independent switches from Lowell work nicely for this application. Connect "V+" to V+ terminal for remote switches, connect "Com" to Com terminal next to transformer connections, and connect "Switch" to chosen circuit terminal (1 through 8).

Notes on Grounding and Bonding for Cutler Hammer BR series Single Phase Loadcenters

If this loadcenter is to be the MAIN PANEL, located at the service entrance, the bonding jumper between the Neutral bar and the Ground bar should be left in place, so that the neutral and ground are bonded at the same potential.



If this loadcenter is to a SUB PANEL, fed from another main panel, the neutral to ground bonding jumper should be disconnected from the neutral bar. The green bonding screw MUST be tightened to maintain ground bar to box bonding. A separate ground conductor MUST be provided back to the main panel.

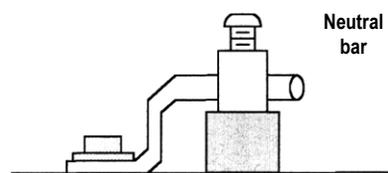


If an ISOLATED GROUND system is required, the bonding jumper, bonding screw, and bonding strap can be removed so that the ground bar and neutral bar are isolated from the box. However, the small ground bar kit (provided) MUST be installed and a separate bonding conductor MUST be installed to assure that the loadcenter box is bonded to ground at the main panel.

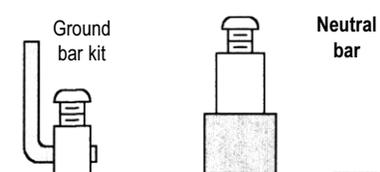


Notes on Grounding and Bonding for Cutler Hammer BR series Three Phase Loadcenters

If this loadcenter is to be the MAIN PANEL, the bonding jumper between the chassis and the Neutral bar should be installed, so that the neutral and ground are bonded at the same potential.



If this loadcenter is to be a SUB PANEL, the bonding jumper should be left disconnected or removed, the ground bar kit should be installed and a grounding conductor provided back to the main panel. If the ground bar kit provided is not adequate, obtain a larger GBK series ground bar kit from a local Cutler Hammer distributor.



ALL INSTALLATIONS MUST COMPLY WITH ALL APPLICABLE NATIONAL ELECTRIC CODE REQUIREMENTS AS WELL AS ALL LOCAL BUILDING CODES. IF QUESTIONS ARISE, CONSULT WITH THE LOCAL BUILDING INSPECTOR OR THE APPROPRIATE A.H.J. (AUTHORITY HAVING JURISDICTION).