Installation and Operation Instructions for Remotely Controlled Sequential Loadcenter Systems

Models covered:

ACL-100-SQ (formerly ACLC-100-20-SC248-ASM)	Loadcenter, 1 ph, 20 space, 20 circuit, 100A main brkr, w/ control unit (loadcenter dim: 21" H, 14 5/16" W, 3 7/8" D)
ACL-200-SQ (formerly ACLC-200-30-SC248-ASM)	Loadcenter, 1 ph, 30 space, 40 circuit, 200A main brkr, w/ control unit (loadcenter dim: 34 1/8" H, 14 5/16" W, 3 7/8" D)
ACL-125-SQ3P (formerly ACLC-3P-125-30-SC248-ASM)	Loadcenter, 3 ph, 30 space, 42 circuit, 125A main brkr, w/ control unit (loadcenter dim: 40 1/8" H, 15 13/16" W, 5 1/8" D)
ACL-225-SQ3P (formerly ACLC-3P-225-42-SC248-ASM)	Loadcenter, 3 ph, 42 space, 42 circuit, 225A main brkr, w/ control unit (loadcenter dim: 47" H, 15 1/2" W, 5 1/4 " D)
ACSC-248-ASM	Sequential control unit only Dim: 14" H, 14 5/16" W, 3 7/8" D

ACRB-20-1	Circuit breaker 20A single pole, soleniod operated (control cable included)
ACRB-20-2	Circuit breaker 20A double pole, soleniod operated (control cable included)
ACRB-30-1	Circuit breaker 30A single pole, soleniod operated (control cable included)
ACRB-30-2	Circuit breaker 30A double pole, soleniod operated (control cable included)
ACB-20-1	Circuit breaker 20A single pole (standard)

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

ALWAYS FOLLOW ALL APPLICABLE NATIONAL AND LOCAL ELECTRICAL CODES.
OBSERVE APPROPRIATE SAFETY AND LOCKOUT / TAGOUT PROCEDURES

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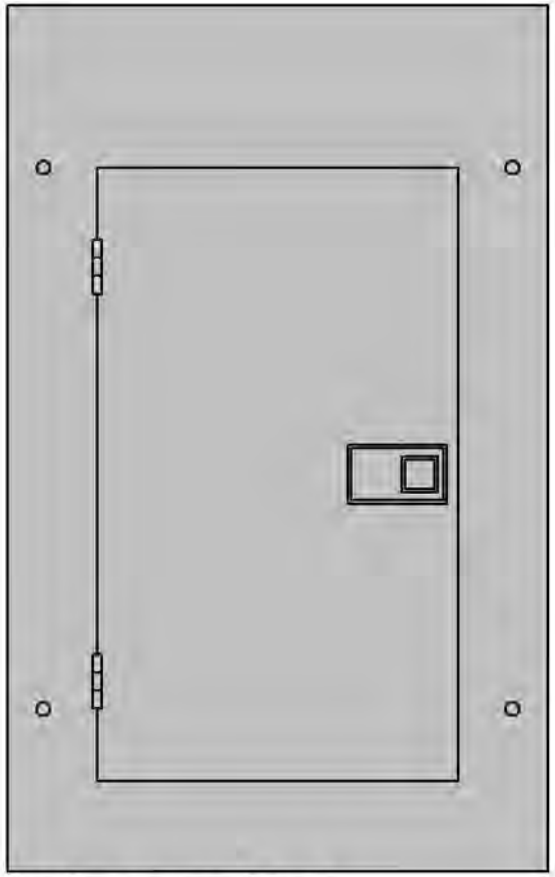
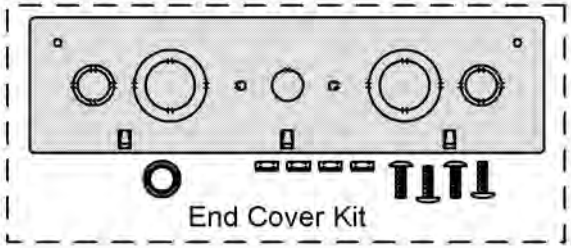
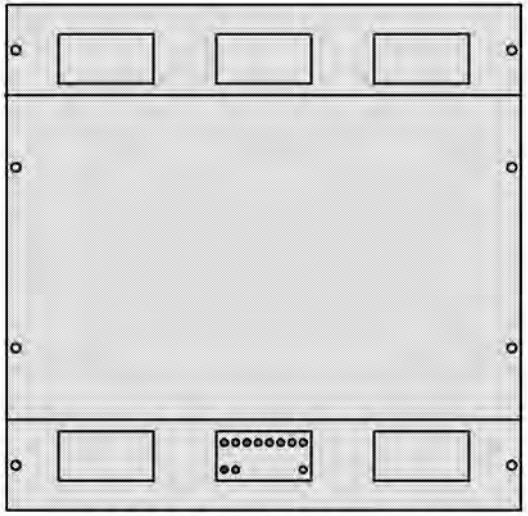
P/N 15025 E1442 8/6/07



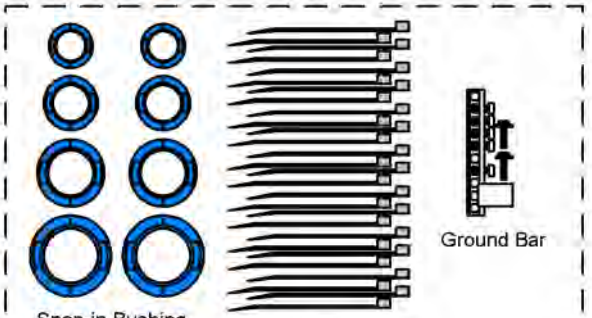
Loadcenter (one of four)
100A 1 phase
200A 1 phase
125A 3 phase
225A 3 phase



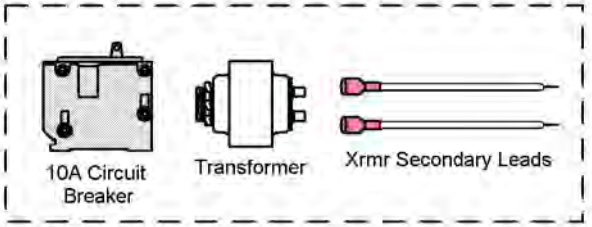
End Cover Kit



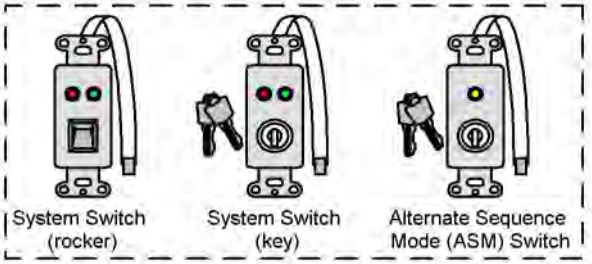
ACSC248-ASM Control Unit



Accessory Kit



Transformer Kit

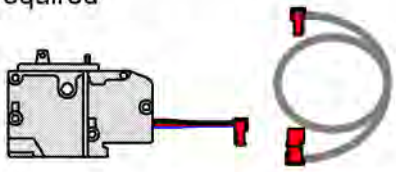


Switch Kit

ALL PARTS ABOVE INCLUDED WITH MODELS:
ACL-100-SQ (100A 1 ph)
ACL-200-SQ (200A 1 ph)
ACL-125-SQ3P (125A 3 ph)
ACL-225-SQ3P (225A 3 ph)

REMOTE CONTROLLED CIRCUIT BREAKERS
Order separately quantities required

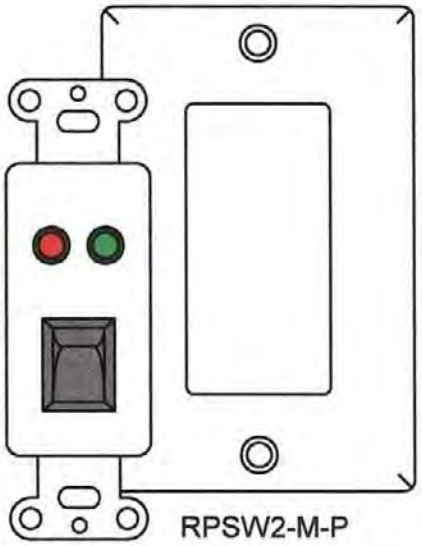
ACRB-20-1 (20A 1 pole)
ACRB-20-2 (20A 2 pole)
ACRB-30-1 (30A 1 pole)
ACRB-30-2 (30A 2 pole)



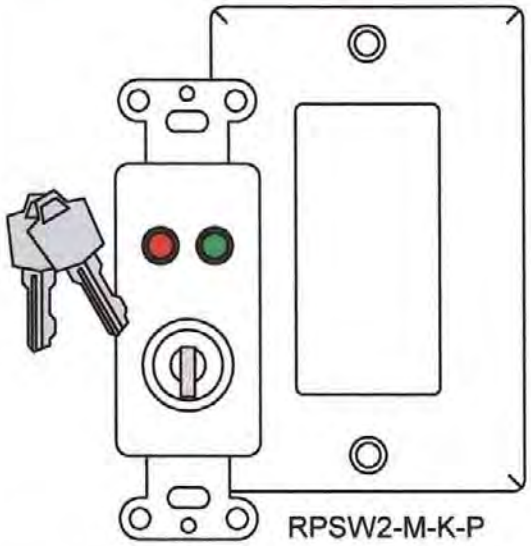
REGULAR CIRCUIT BREAKERS (non-controlled)
Order separately quantities required

ACB-20-1 (20A 1 pole)
Also available from local electrical distributer

Optional Accessories (order separately)

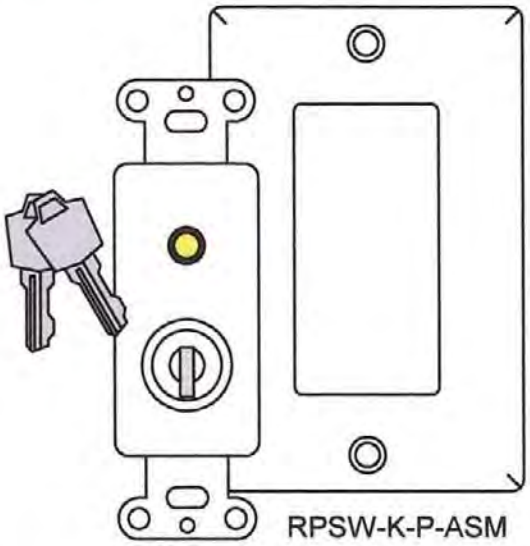


RPSW2-M-P



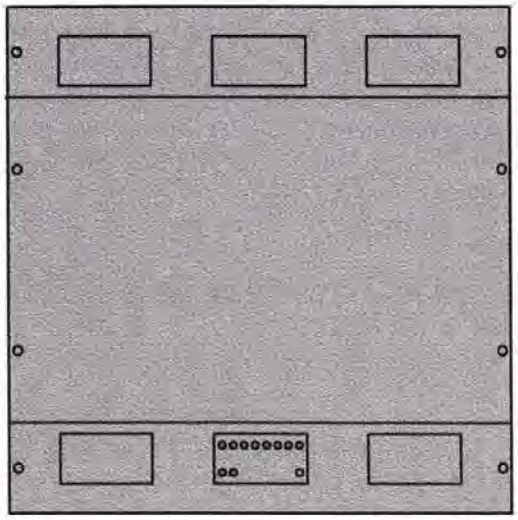
RPSW2-M-K-P

System Switches: Identical to switches provided with unit except white (wallplate included) and w/o flex cable. May be utilized in remote locations, connect per hook-up diagram.

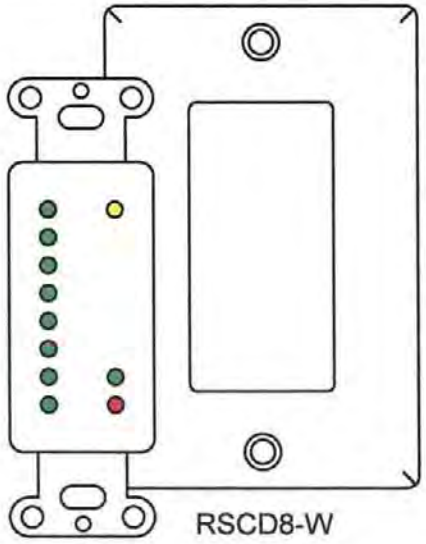


RPSW-K-P-ASM

Alternate Sequence Mode (ASM) activation switch. Identical to ASM switch provided except white (wallplate included) and w/o flex cable. May be utilized in remote location INSTEAD of ASM switch provided with unit.

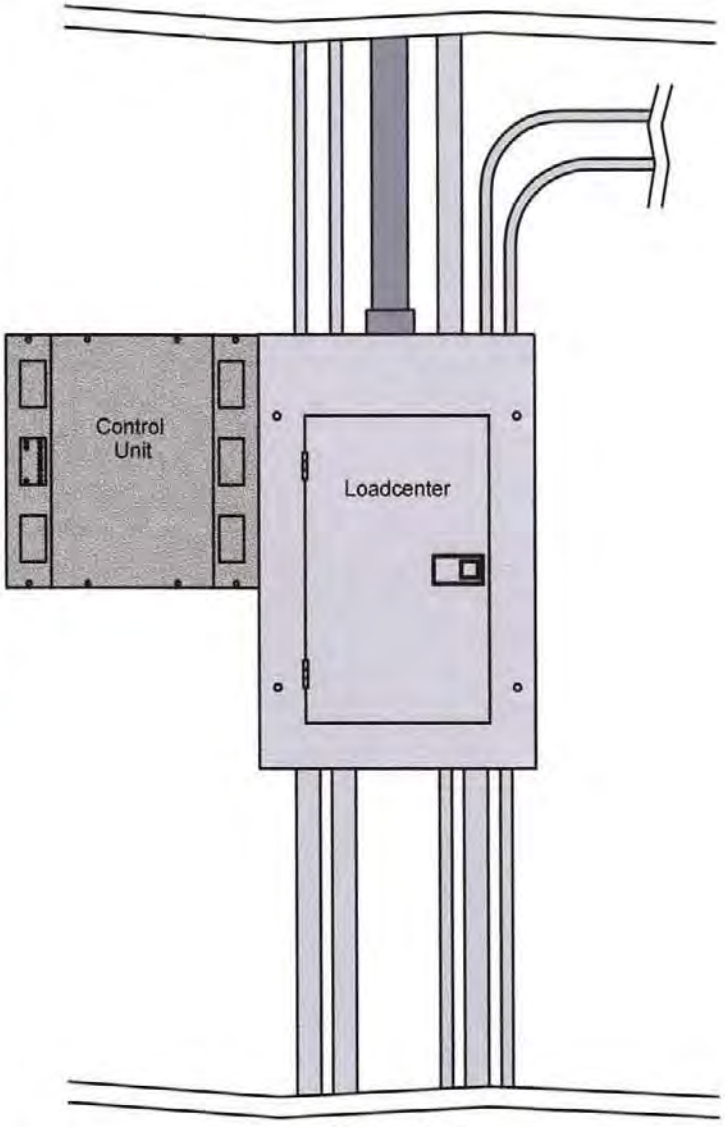


ACSC248-ASM Control Unit Additional control units may be added to create two or more independent systems originating from same loadcenter.

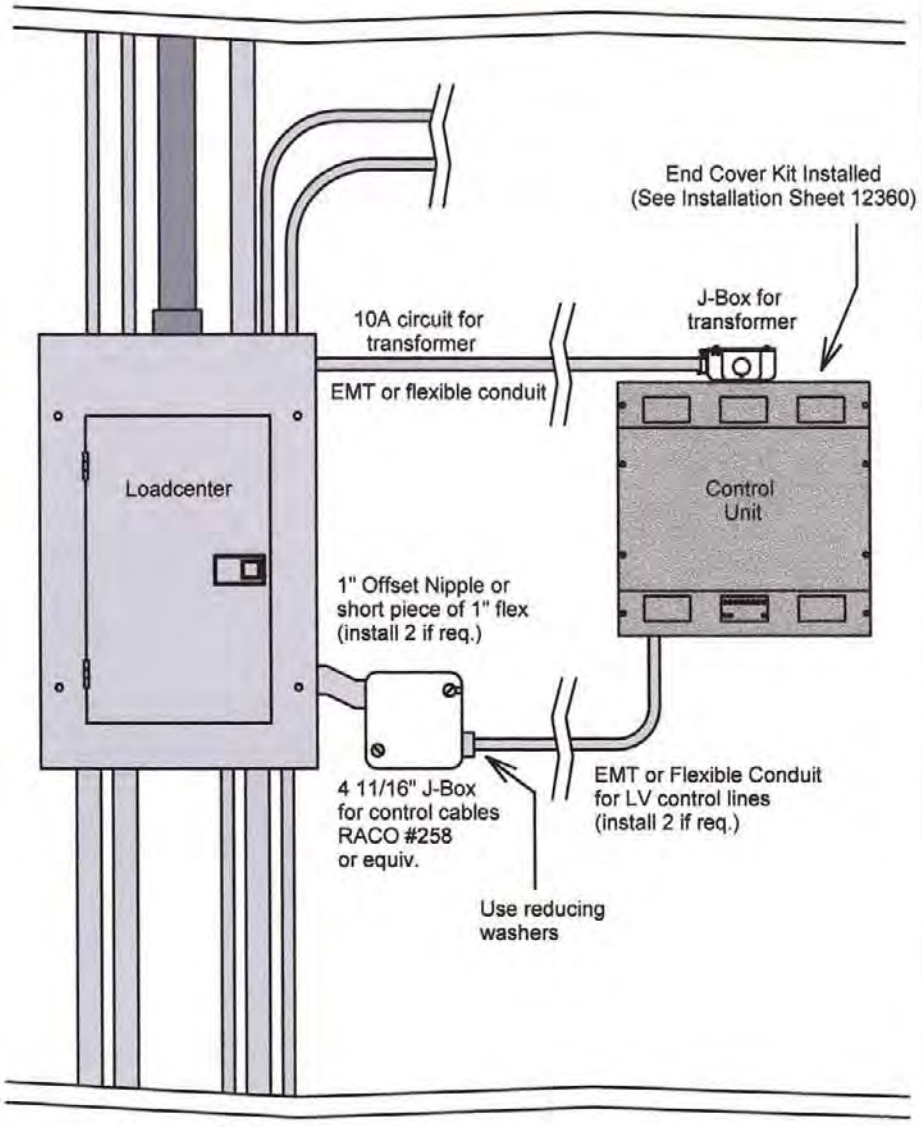


RSCD8-W

Remote display allows for system status indication at remote location. Identical to display on control unit except white (wallplate included) and w/o flex cable. Note: Requires 12 conductor cable from control unit.



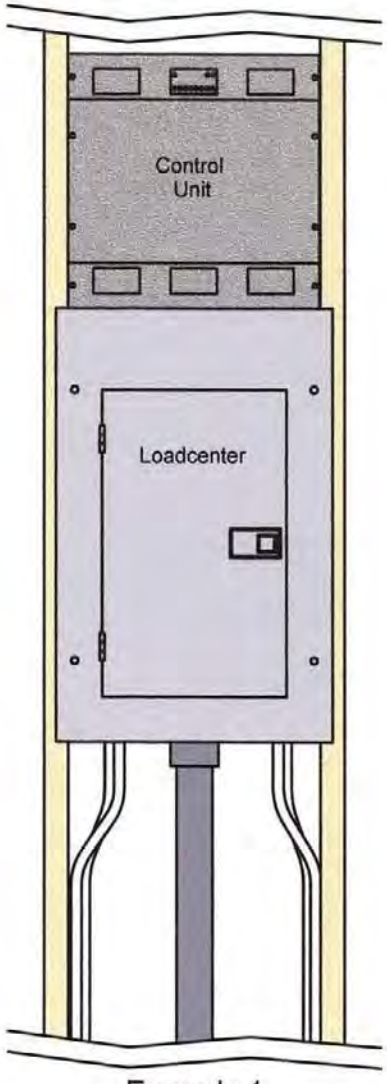
Example 1
Control Unit may be installed at upper or lower left, upper or lower right, top or bottom positions (upper left shown).



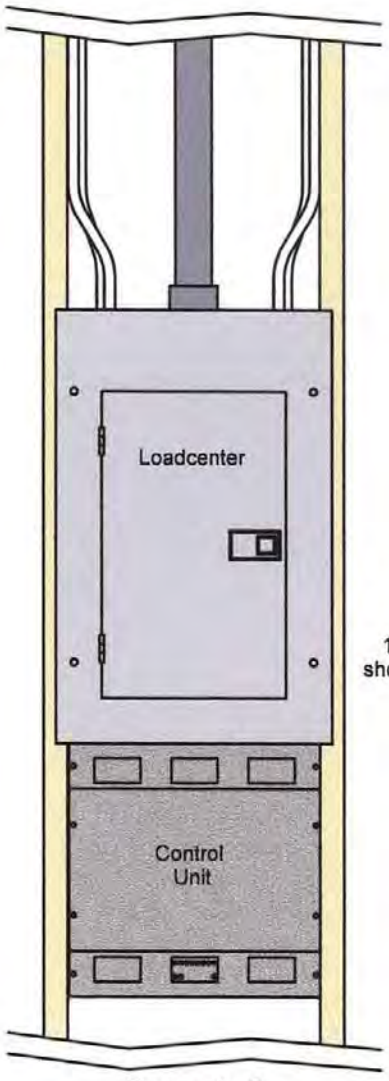
Example 2
Control Unit Installed In "Remote" Location

Surface Mount Installation Examples

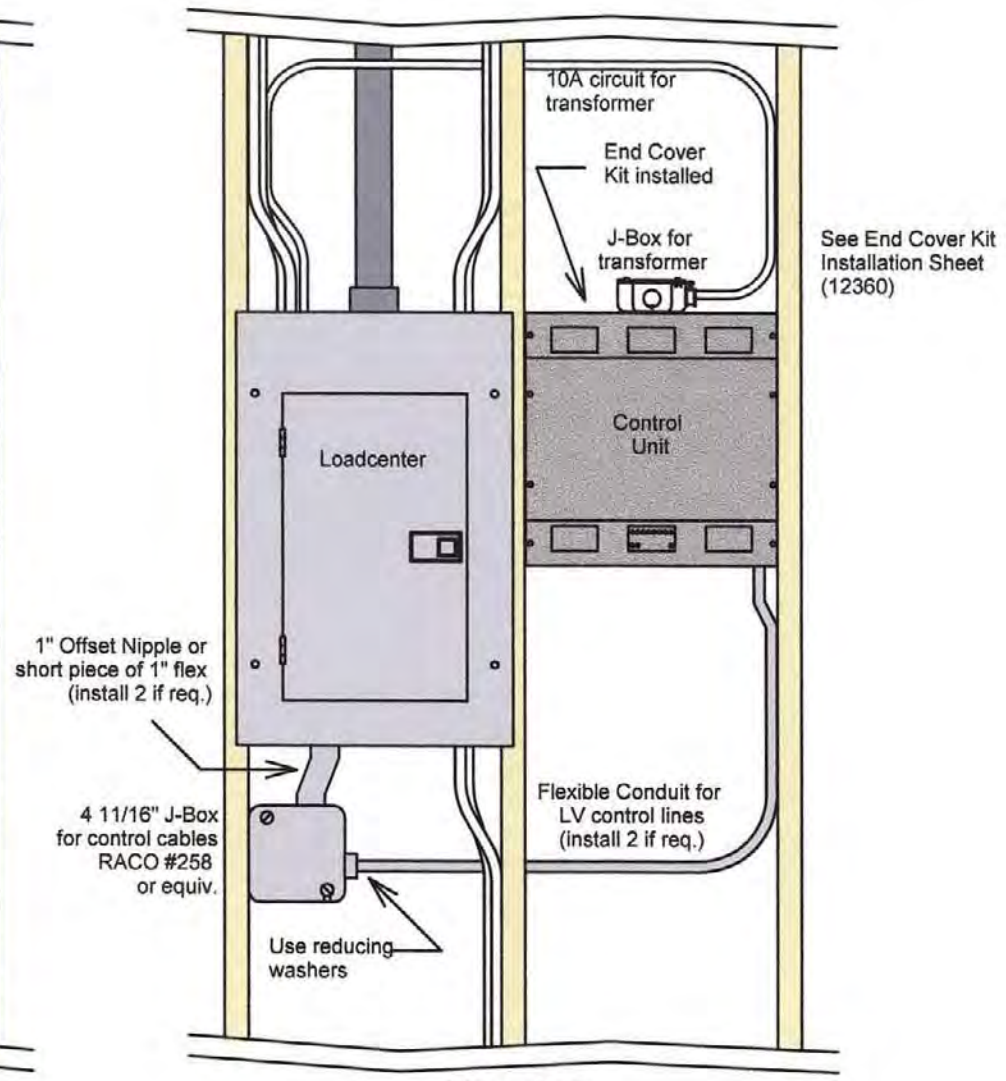
Note: Control cables supplied with circuit breakers will need to be extended with generic multi-conductor cable installed between J-box and Control Unit. (min. 22ga, 1000 ft max.)
1) Cut off female end (smaller connector) approx. 6" from connector. Splice onto new cable inside Control Unit and plug onto appropriate header.
2) Install cable with male connector between loadcenter and J-box, plug connector onto appropriate breaker. Splice onto multi-conductor cable inside J-box.



Example 1
Control Unit Installed
Above Loadcenter



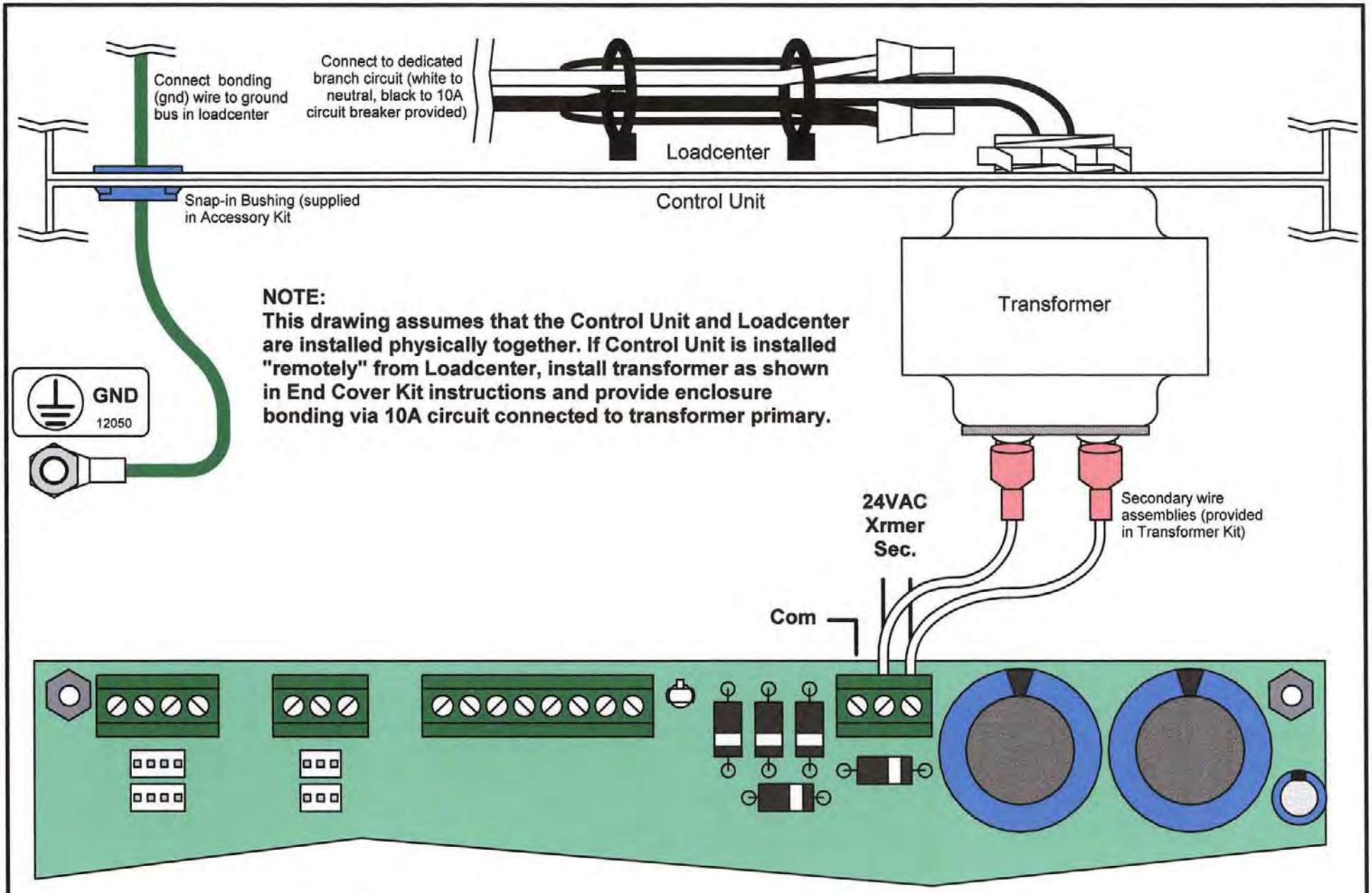
Example 2
Control Unit Installed
Below Loadcenter



Example 3
Control Unit Installed In "Remote"
Location From Loadcenter

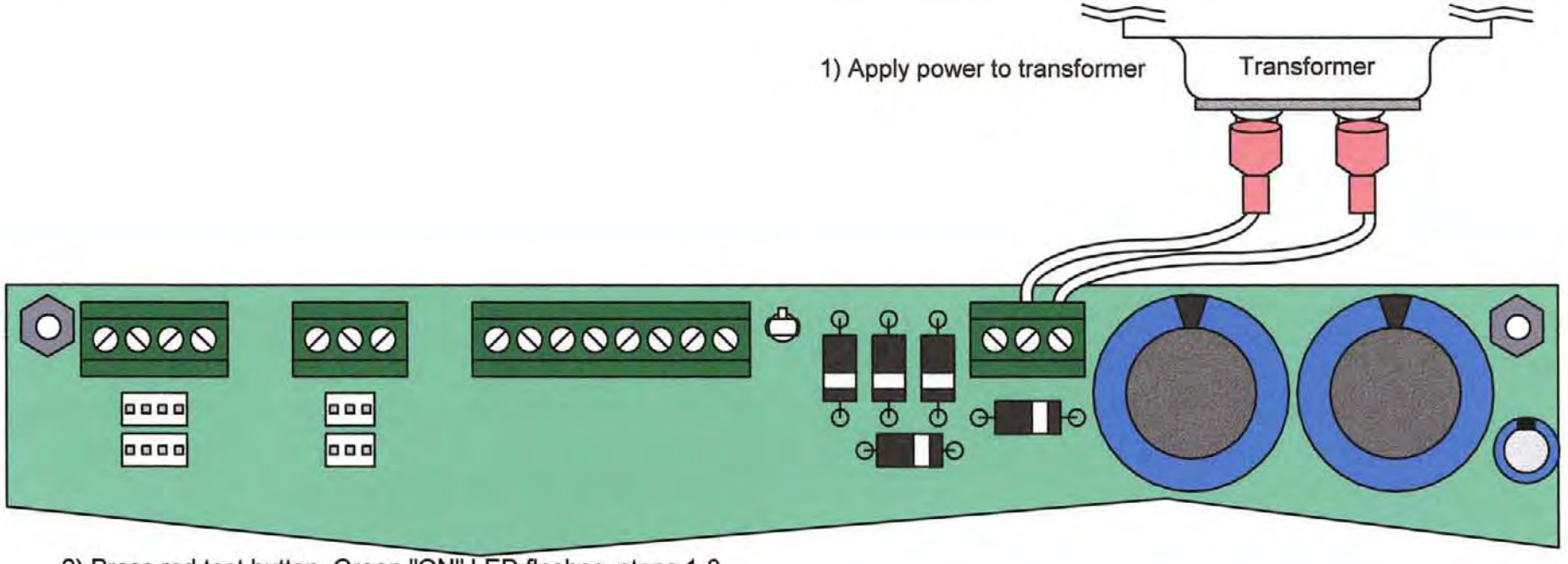
Between Stud Installation Examples (16" stud spacing)

Note: Control cables supplied with circuit breakers will need to be extended with generic multi-conductor cable installed between J-box and Control Unit. (min. 22ga, 1000 ft max.)
1) Cut off female end (smaller connector) approx. 6" from connector. Splice onto new cable inside Control Unit and plug onto appropriate header.
2) Install cable with male connector between loadcenter and J-box, plug connector onto appropriate breaker. Splice onto multi-conductor cable inside J-box.

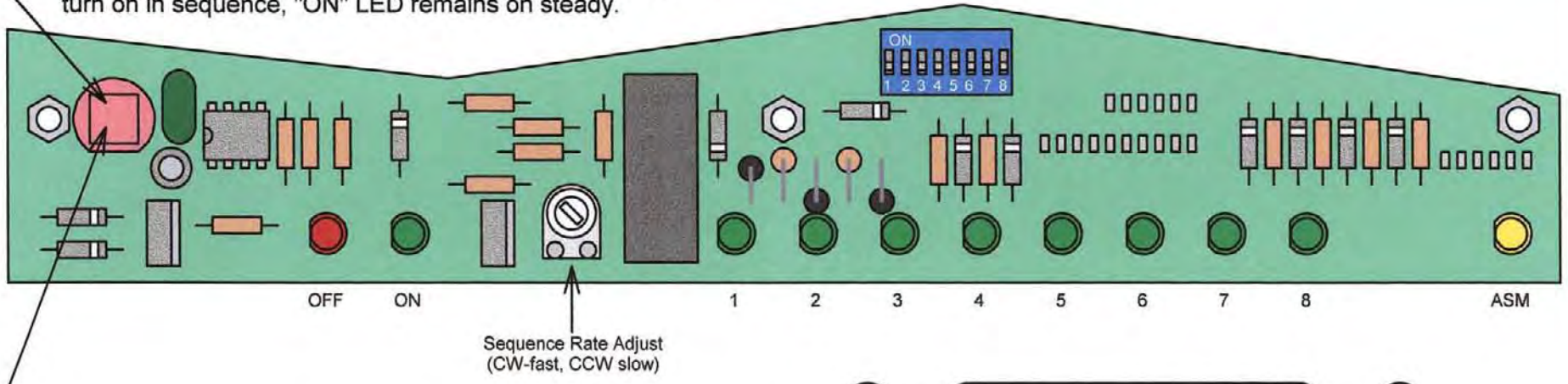


Transformer Connection

1) Apply power to transformer

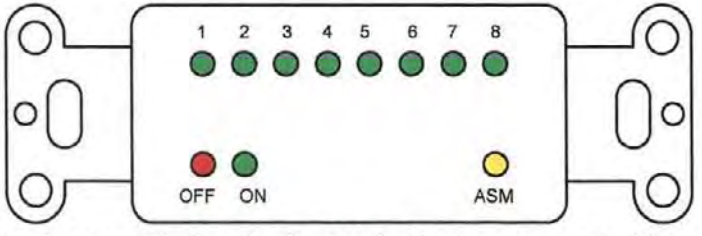


2) Press red test button. Green "ON" LED flashes, steps 1-8 turn on in sequence, "ON" LED remains on steady.

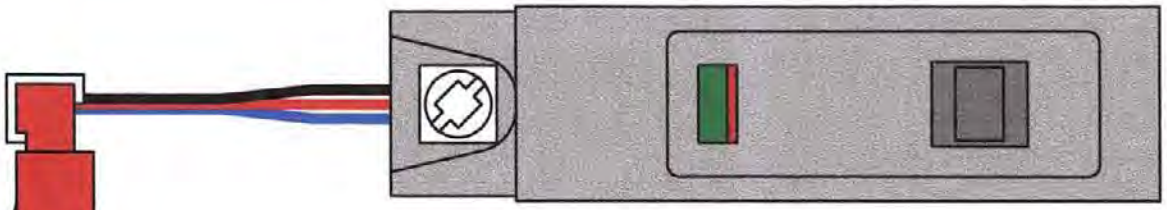


3) Press red test button again. Red "OFF" LED flashes, steps 1-8 turn off in sequence, "OFF" LED remains on steady.

Preliminary System Test



Front cover display duplicates indicators on control board



ACRB series circuit breaker

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 is 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.

TIP: Cables may be identified by marking with a fine point "Sharpie" or by labels attached to rear connector cover.

Control Cable (supplied with circuit breaker)

NOTE:
This drawing assumes that the Control Unit and Loadcenter are installed physically together. If Control Unit is installed "remotely" from Loadcenter, refer to control cable connection instructions on "Surface Mount Installation Examples" and "Between Stud Installation Examples".

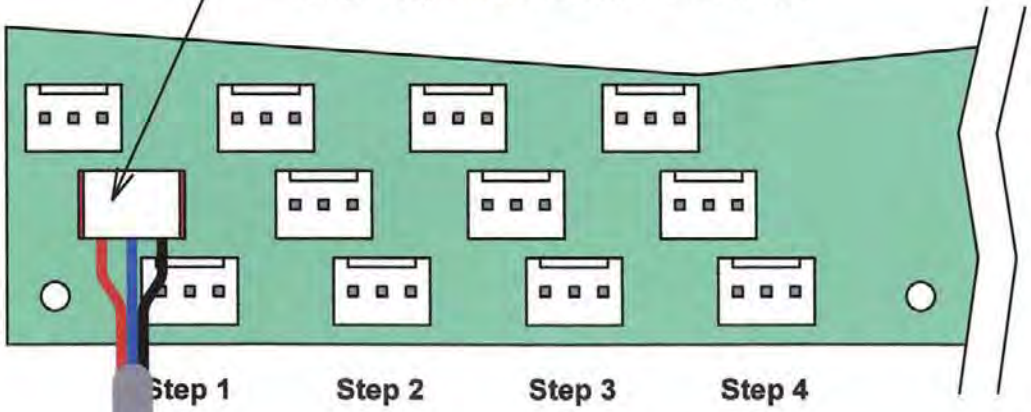
Loadcenter

Control Unit

Snap-in Knock-out Bushings (supplied in Accessory Kit)

TIP: Cables may be identified by marking with a fine point "Sharpie" or by labels attached to rear connector cover.

NOTE:
Use D-clamps to neatly dress excess cable length



Control Cables From Circuit Breakers (max 3 per step)

Circuit Breaker Control Cable Connection

REMOTE SWITCH
model #s:
(order separately)
RPSW2-M-P
RPSW2-M-K-P

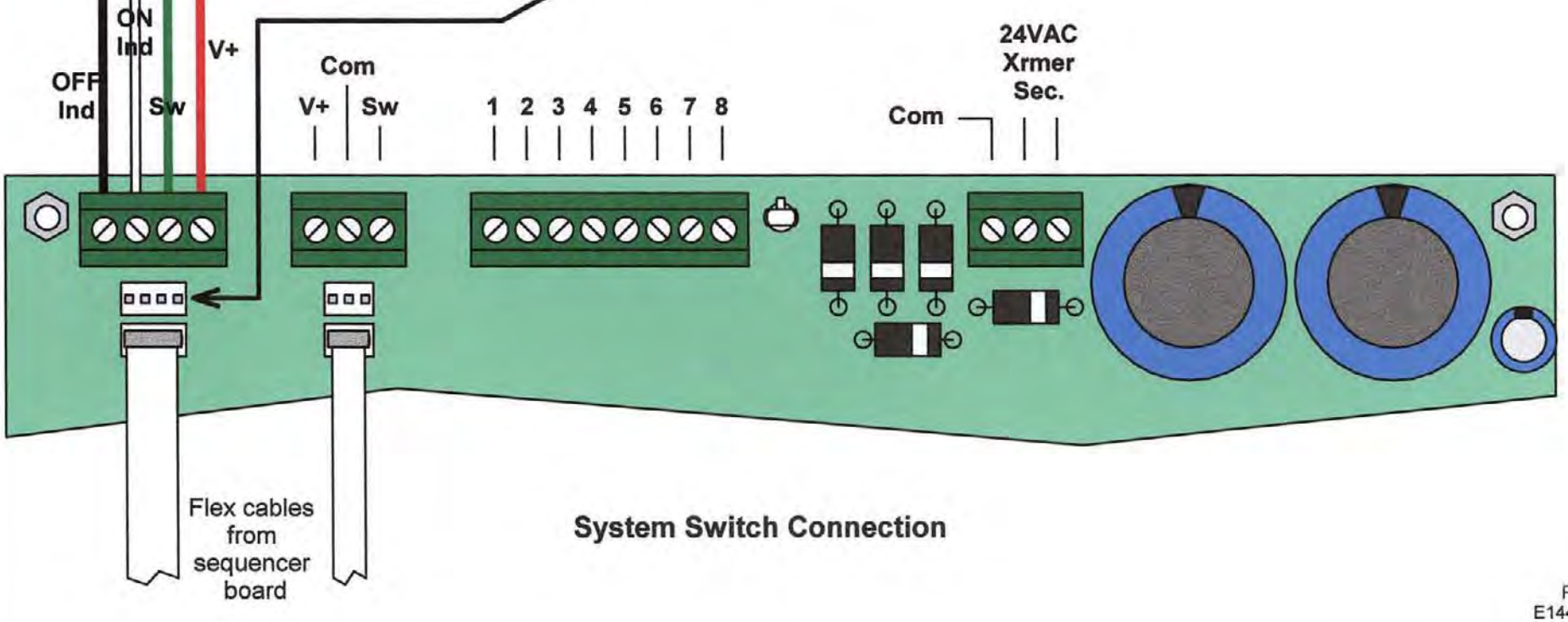
Cable requirements: Any generic 4 conductor cable. Max distance: 5000 ft

LOCAL SWITCH (installed in enclosure cover Decora cut-out)
One each rocker switch and key switch provided in Switch Kit

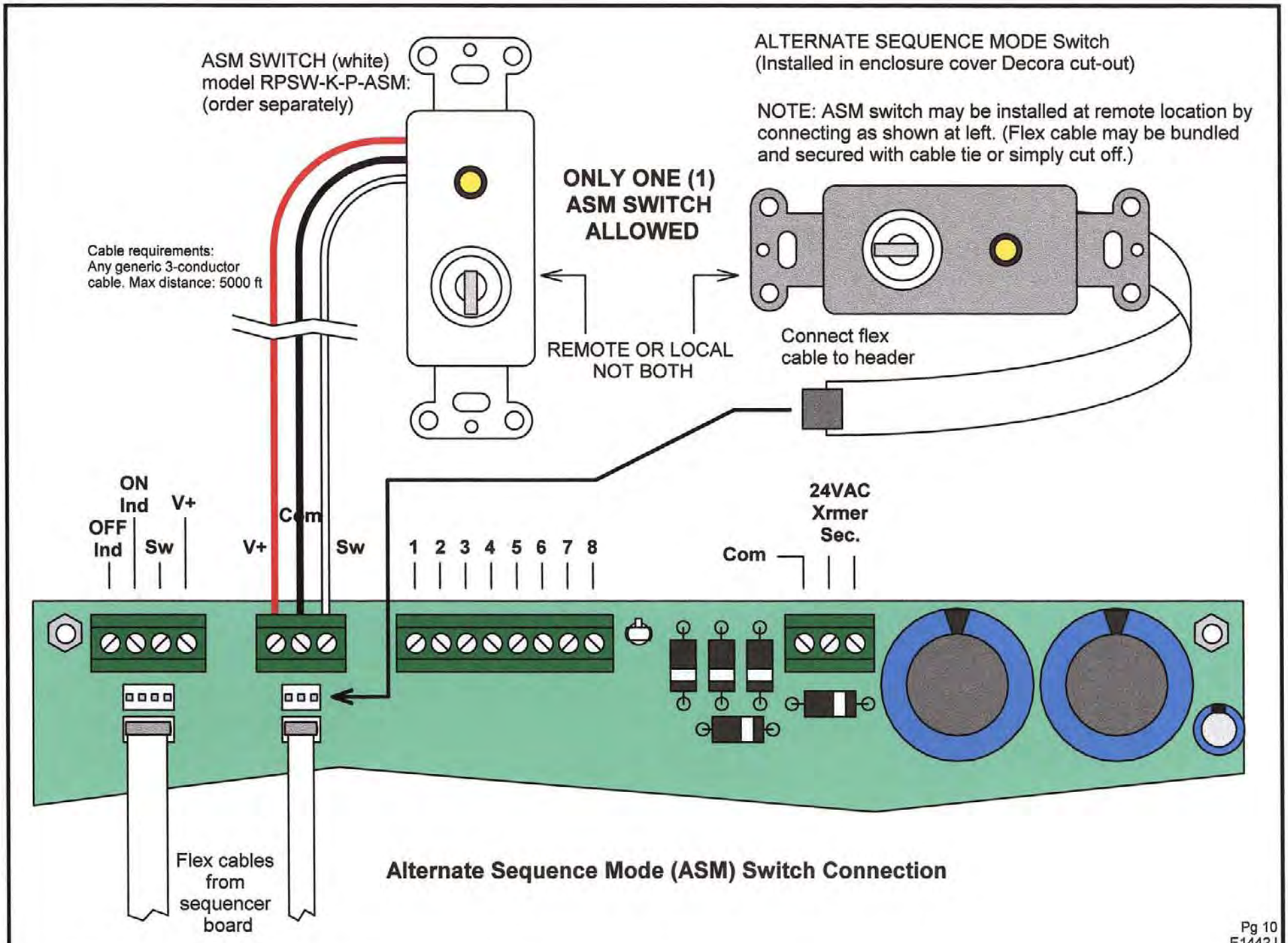
NOTE: One or both switches may be installed at remote location by connecting as shown at left. (Flex cable may be bundled and secured with wire tie or simply cut off.)

Recommended maximum number of system switches (remote and local): 10

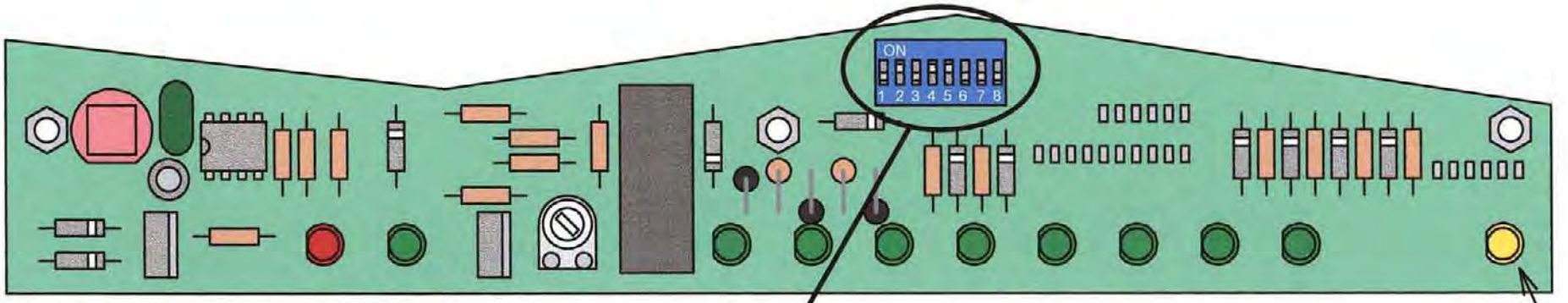
Connect flex cable to header



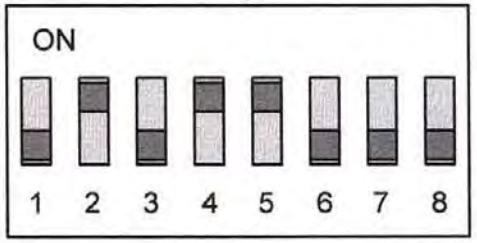
System Switch Connection



Alternate Sequence Mode (ASM) Switch Connection

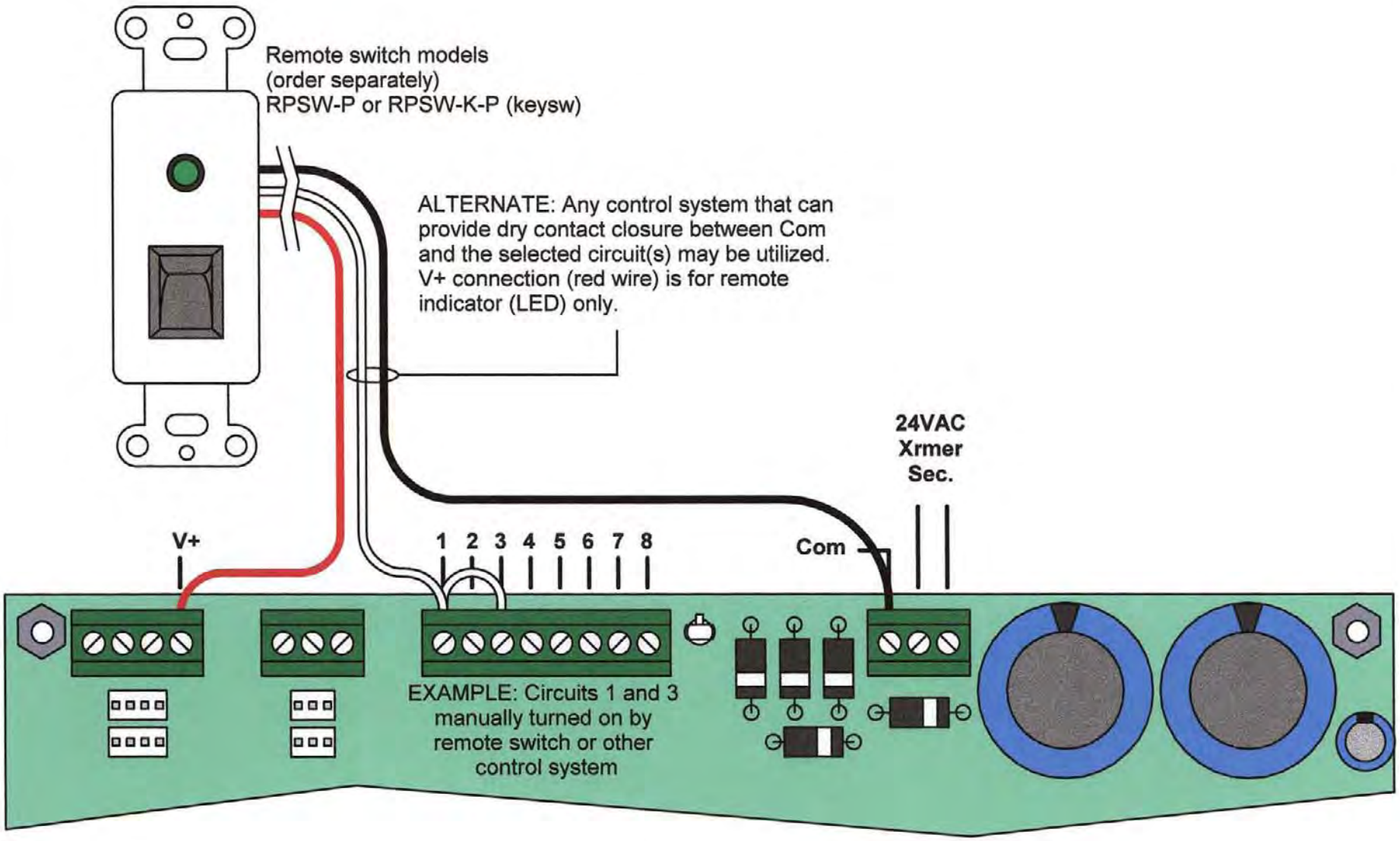


When Alternate Sequence Mode (ASM) is activated, yellow LED will be ON.



Select step(s) to be bypassed by setting corresponding DIP switch position to ON.
When remote ASM switch is closed selected circuits will NOT turn on.
(In example shown, steps 2, 4, and 5 will be bypassed.)

Alternate Sequence Mode (ASM) Programing



Independent Circuit Control Switch Connection

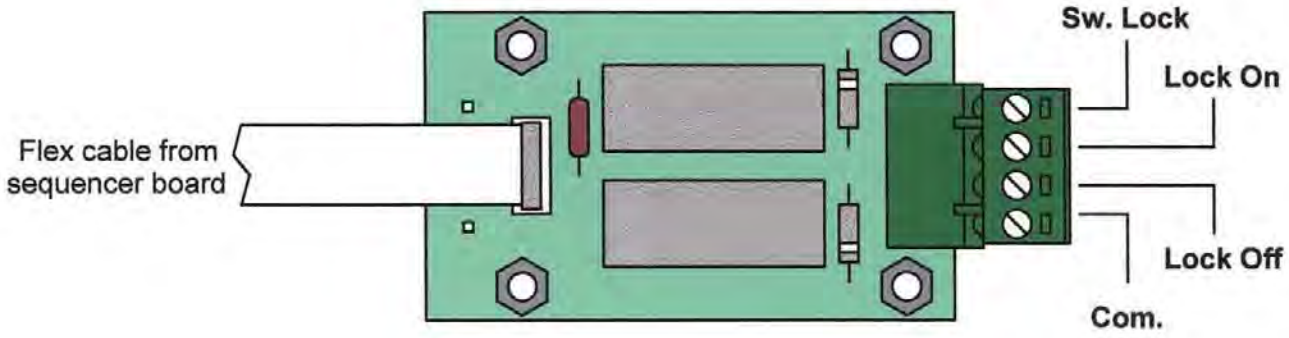
ALARM SYSTEM INTERFACE:
If required by local building code, faculty usage, or Fire Marshal, the system switches can be overridden and the system controlled by contact closures provided by the fire alarm panel or other similarly installed device. A maintained contact between the "com" terminal and any 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. Note: Independent Circuit Control Switches (if any) will still be active.

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.



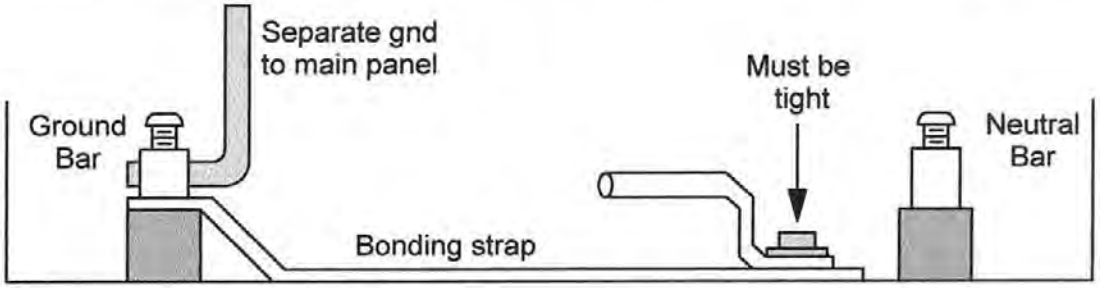
TIP: The "lock on" interface scheme can be used in place of the standard remote switches when only one set of external switches or one external control system is used to activate the sequencer.

Alarm Interface / Master Control Connections

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 intrance, 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.

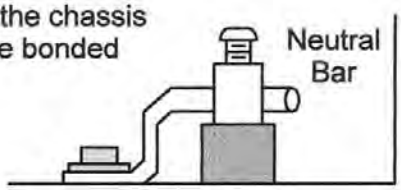
If this loadcenter is to be a SUB PANEL, fed from another main panel, the neutral to ground bonding jumper should be disconnected from the neutral bar. The green bonding screw MUST be tightened to maintain ground bar to box bonding. A separate ground conductor MUST be provided back to the main panel.



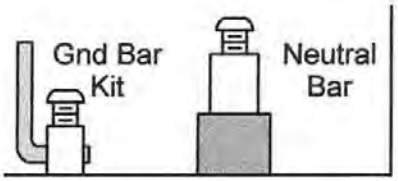
If an ISOLATED GROUND system is required, the bonding jumper, bonding screw, and bonding strap can be removed so that the ground bar and neutral bar are isolated from the box. However, the small ground bar kit (provided) MUST be installed and a separate bonding conductor MUST be installed to assure that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

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

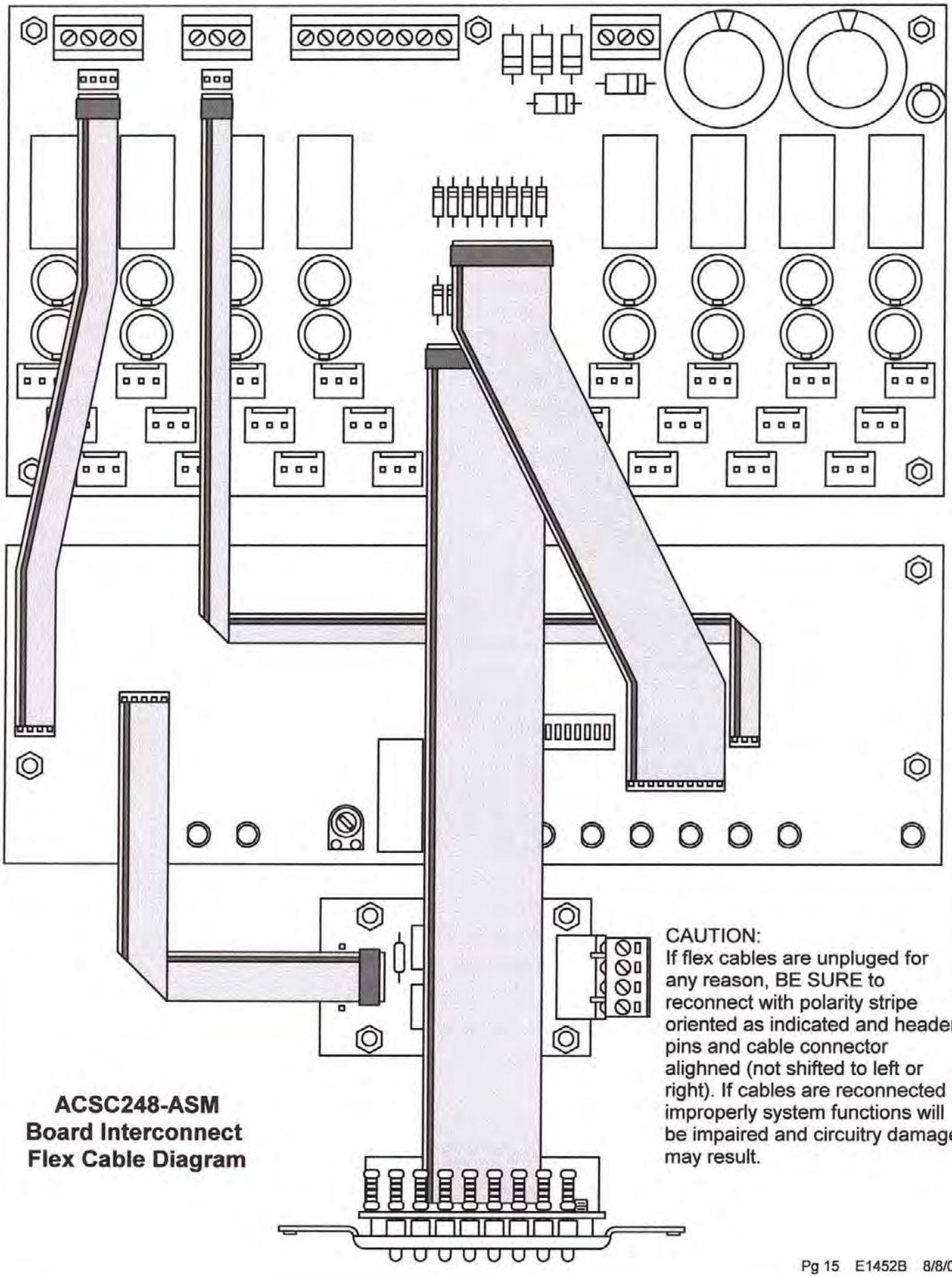
If this loadcenter is to be the MAIN PANEL, the bonding jumper between the chassis and the Neutral bar should be installed, so that the neutral and ground are bonded at the same potential.



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 distributer.



THIS INSTALLATION 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).

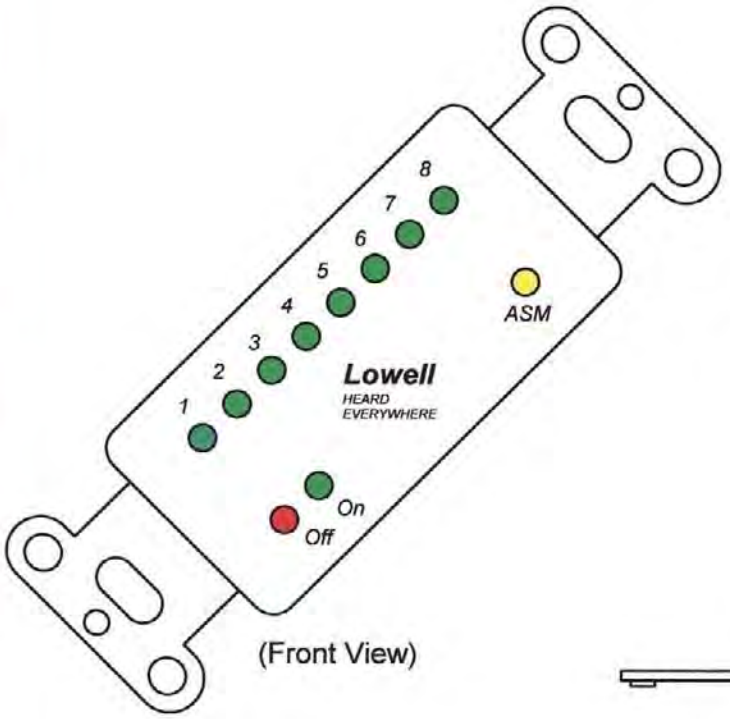


ACSC248-ASM
Board Interconnect
Flex Cable Diagram

CAUTION:
If flex cables are unpluged for any reason, BE SURE to reconnect with polarity stripe oriented as indicated and header pins and cable connector alighned (not shifted to left or right). If cables are reconnected improperly system functions will be impaired and circuitry damage may result.

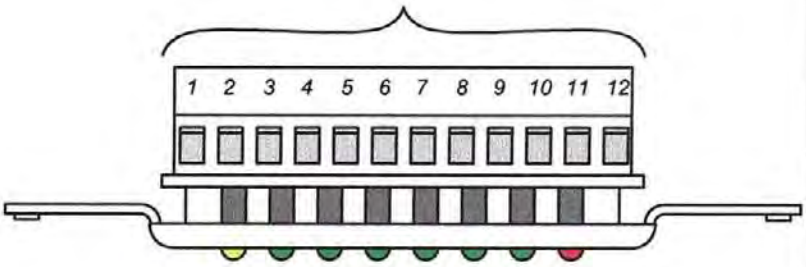
Remote Sequential Controller Display, 8-step
Model RSCD8-W

Provides visual indication of sequential loadcenter operation and status.
Green LEDs (1 through 8) show progress of sequencer cycle up or down.
Green "ON" LED flashing: Up cycle in progress
Green "ON" LED steady on: Up cycle complete, system ready for use.
Red "OFF" LED flashing: Down cycle in progress
Red "OFF" LED steady on: Down cycle complete, system shut down
Yellow "ASM" LED on: Alternate Sequence Mode enabled, selected steps programed at controller to be skipped. (See ACSC248-ASM installation instructions)



(Front View)

Connect IN EXACT ORDER to coresponding terminal block on RSCD8 unit located in ACSC248 control enclosure.
(Numbers shown for reference only)
Cable requirements: 12 conductors, 28 ga min.
Max. distance w/ 28 ga wire: 5000 ft.
Max. distance w/ 22 ga wire: 15,000 ft.



(Side View)

Note: Black Decora sub-plate included. To change plate, remove two nuts, circuit board assembly, spacers, and washers and reassemble onto other plate.
(Black plate typically utilized with Lowell Decora style rack panels; LD3-RMP, LD4 -RMP, LD8-RMP, LD9-RMP)

P/N 14968 E1426 7/07

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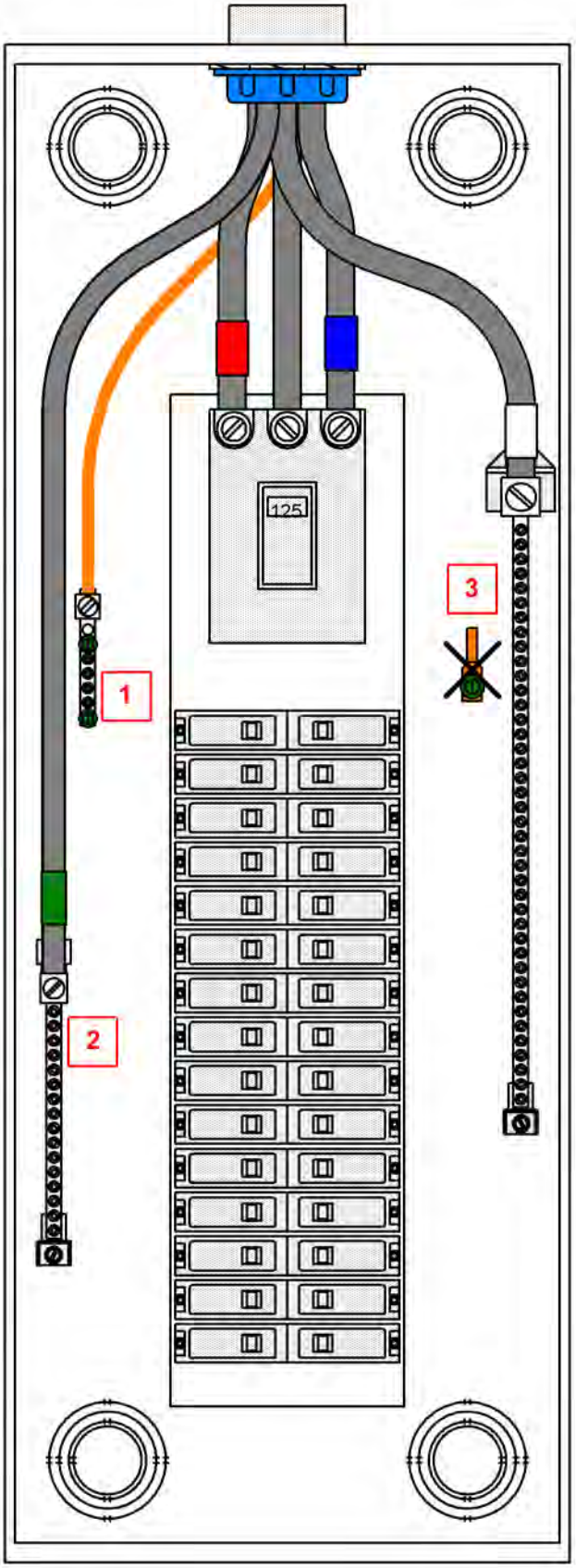
(636)257-3400 Fax (636)257-6606 www.lowellmfg.com

Insulated Ground Configuration for Cutler / Hammer BR Series 3-phase Loadcenters when used as a subpanel



1) Install Ground Bar (provided with sequential loadcenter accessory kit). Connect bonding conductor from service entrance. (For 125A panels: 6 ga min. For 225A panels: 4 ga min.)

2) Install Insulated Ground Bar P/N 18050 (C/H part # 17NEU125B) Connect insulated (isolated) ground conductor from service entrance.

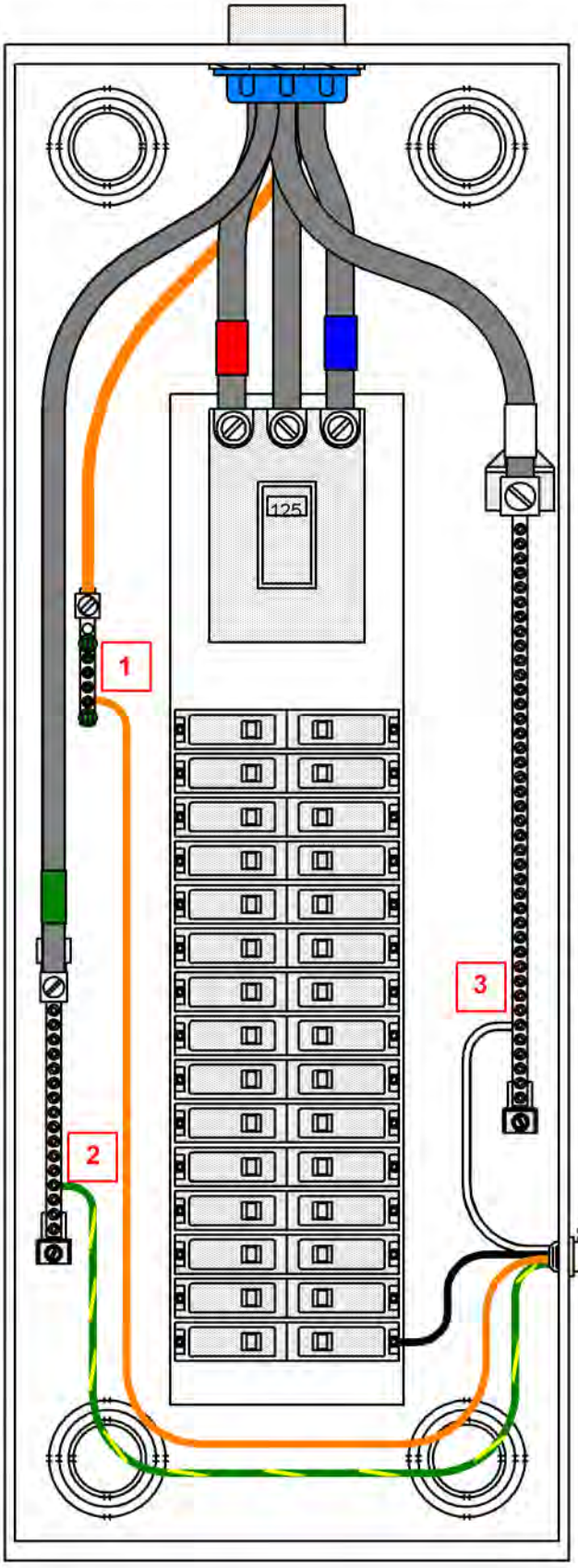
3) Make sure that neutral bonding jumper is NOT connected. Remove screw and jumper and discard to prevent future inadvertant connection.

E1720 9/1/09 TW
revised 7/6/11

Insulated Ground Branch Circuit Wiring for Cutler / Hammer BR Series 3-phase Loadcenters when used as a subpanel

1) Bonding conductor from branch circuit connects to ground bar. Wire can be bare or green insulated. More than one wire under each screw and/or pigtailing of wires is allowed.

2) Isolated ground conductor from branch circuit connects to isolated (non-bonded) ground bar. Traditional color of isolated ground wire is green with yellow stripe. More than one wire under each screw and/or pigtailing of wires is allowed.



3) Neutral conductor from branch circuit connects to non-bonded Neutral Bar. Wire color MUST be white. Per NEC 408.41 only ONE wire per screw terminal is allowed.

E1720A 9/1/09 TW

Ratings

- Main Circuit Breaker — BR
- 100 Amperes, 1-Phase, 3-Wire, 120/240V AC
- Tin-Plated Aluminum Bus Bar
- Interrupting Rating 10 kAIC
- Split: 20/20
- Split Neutral
- Enclosure Type: Indoor
- Trim Type: Combination
- Paint Type: ANSI 61 Light Gray Finish
- Incoming Wire Range: #4 – 1/0, Cu/Al 60 or 75°C

Notes

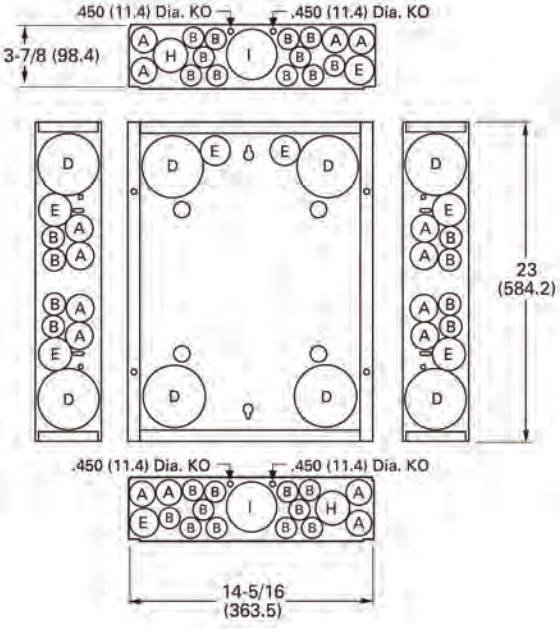
1. All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with a neutral bonding strap preattached. The maximum rating of the panel is the main circuit breaker rating when used as service entrance equipment.

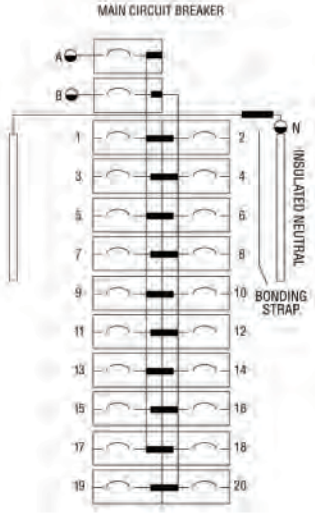
2. Ground bar kits priced separately.

3. Combination style covers may be used in surface or flush applications.

Knockouts

Code	Diameter in Inches					Diameter in mm				
A	1/2	3/4	—	—	—	12.7	19	—	—	—
B	1/2	—	—	—	—	12.7	—	—	—	—
C	1/2	1-1/4	1-1/2	2	2-1/2	12.7	31.7	38.1	50.8	63.5
D	1-1/4	1-1/2	2	2-1/2	—	31.7	38.1	50.8	63.5	—
E	1/2	3/4	1	—	—	12.7	19.0	25.4	—	—
F	1/2	3/4	1	1-1/2	2	12.7	19.0	25.4	38.1	50.8
G	1-1/4	1-1/2	2	—	—	31.7	38.1	50.8	—	—
H	1/2	3/4	1	1-1/4	1-1/2	12.7	19.0	25.4	31.7	38.1
I	1	1-1/4	1-1/2	2	2-1/2	25.4	31.7	38.1	50.8	63.5
J	1	1-1/4	1-1/2	—	—	25.4	31.7	38.1	—	—





Reference DWG # 96-4891

Used on Lowell Model No. ACLC-100-20-SC 248ASM

Dimensions in Inches (mm)

THE INFORMATION ON THIS DOCUMENT IS CREATED BY CUTLER-HAMMER. IT IS DISCLOSED IN CONFIDENCE AND IS ONLY TO BE USED FOR THE PURPOSE IN WHICH IT IS SUPPLIED.	PREPARED BY / DATE		**Cutler-Hammer**	PITTSBURGH, PA	
	APPROVED BY / DATE		JOB NAME / DESIGNATION		
	VERSION		TYPE: BR2020B100	DRAWING TYPE	
NEG-ALT NUMBER	REVISION	DWG SIZE	G.O.	ITEM	SHEET

Ratings

- Main Circuit Breaker — CC
- 125 Amperes, 3-Phase, 4-Wire, 120/208V AC or 240V AC
- Tin-Plated Aluminum Bus Bar
- Interrupting Rating 10 kAIC
- Spaces/Poles: 30/42
- Insulated/Bondable Neutral
- Enclosure Type: Indoor
- Trim Type: Combination
- Paint Type: ANSI 61 Light Gray Finish
- Incoming Wire Range: #1 – 2/0, Cu/Al 60 or 75°C

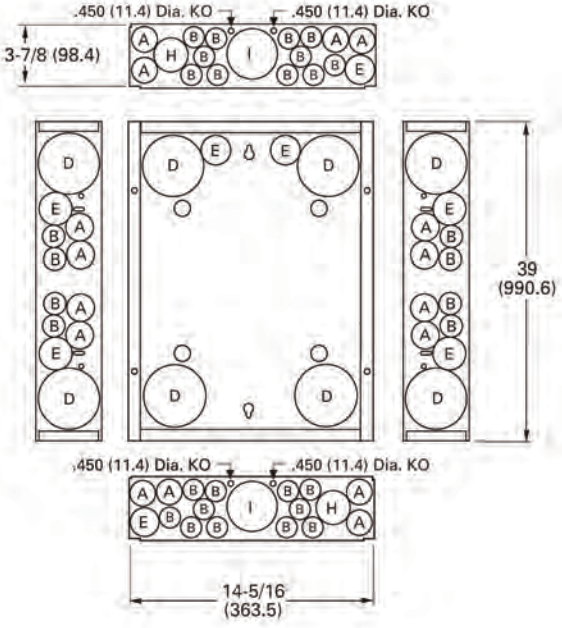
Notes

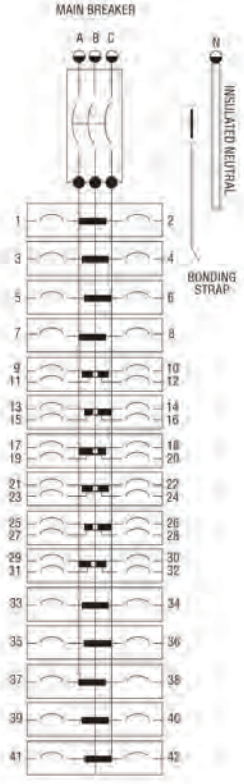
1. All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with a neutral bonding strap pre-attached (commercial loadcenters do not have a pre-attached bonding strip). The maximum main rating of the panel is the main circuit breaker rating when used as service entrance equipment.

2. Ground bar kits priced separately.

Knockouts

Code	Diameter in Inches					Diameter in mm				
A	1/2	3/4	—	—	—	12.7	19	—	—	—
B	1/2	—	—	—	—	12.7	—	—	—	—
C	1/2	1-1/4	1-1/2	2	2-1/2	12.7	31.7	38.1	50.8	63.5
D	1-1/4	1-1/2	2	2-1/2	—	31.7	38.1	50.8	63.5	—
E	1/2	3/4	1	—	—	12.7	19.0	25.4	—	—
F	1/2	3/4	1	1-1/2	2	12.7	19.0	25.4	38.1	50.8
G	1-1/4	1-1/2	2	—	—	31.7	38.1	50.8	—	—
H	1/2	3/4	1	1-1/4	1-1/2	12.7	19.0	25.4	31.7	38.1
I	1	1-1/4	1-1/2	2	2-1/2	25.4	31.7	38.1	50.8	63.5
J	1	1-1/4	1-1/2	—	—	25.4	31.7	38.1	—	—





Reference DWG # 96-4972

Used on Lowell Model No. ACLC-3P-125-30-SC248ASM

Dimensions in Inches (mm)

THE INFORMATION ON THIS DOCUMENT IS CREATED BY CUTLER-HAMMER. IT IS DISCLOSED IN CONFIDENCE AND IS ONLY TO BE USED FOR THE PURPOSE IN WHICH IT IS SUPPLIED.	PREPARED BY DATE	**Cutler-Hammer**		PITTSBURGH, PA	
	APPROVED BY DATE	JOB NAME DESIGNATION			
	VERSION	TYPE 3BR3042B125		DRAWING TYPE	
NEG-ALT NUMBER	REVISION / DWG SIZE	G.O.		ITEM	SHEET

Ratings

- Main Circuit Breaker — BW
- 200 Amperes, 1-Phase, 3-Wire, 120/240V AC
- Tin-Plated Aluminum Bus Bar
- Interrupting Rating 10 kAIC
- Spaces/Poles: 30/40
- Split Neutral
- Enclosure Type: Indoor
- Trim Type: Combination
- Paint Type: ANSI 61 Light Gray Finish
- Incoming Wire Range: #1 – 300 kcmil, Cu/Al 60 or 75°C

Notes

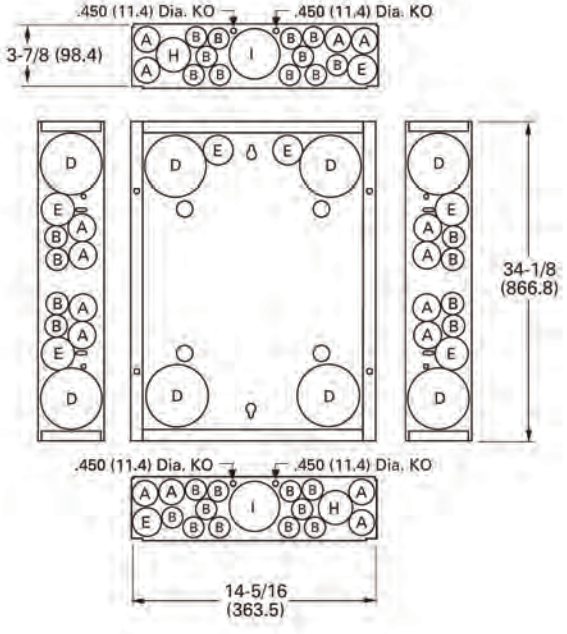
1. All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with a neutral bonding strap preattached. The maximum rating of the panel is the main circuit breaker rating when used as service entrance equipment.

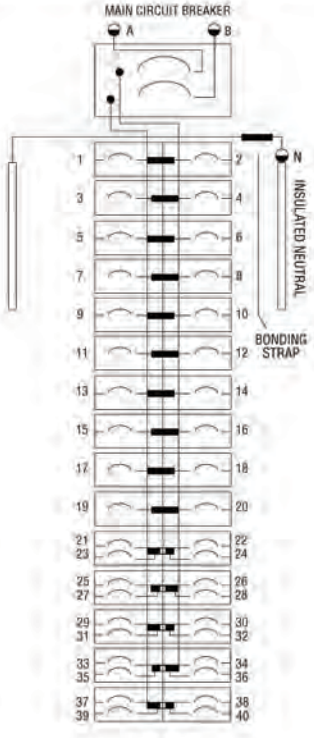
2. Ground bar kits priced separately.

3. Combination style covers may be used in surface or flush applications.

Knockouts

Code	Diameter in Inches					Diameter in mm				
A	1/2	3/4	—	—	—	12.7	19	—	—	—
B	1/2	—	—	—	—	12.7	—	—	—	—
C	1/2	1-1/4	1-1/2	2	2-1/2	12.7	31.7	38.1	50.8	63.5
D	1-1/4	1-1/2	2	2-1/2	—	31.7	38.1	50.8	63.5	—
E	1/2	3/4	1	—	—	12.7	19.0	25.4	—	—
F	1/2	3/4	1	1-1/2	2	12.7	19.0	25.4	38.1	50.8
G	1-1/4	1-1/2	2	—	—	31.7	38.1	50.8	—	—
H	1/2	3/4	1	1-1/4	1-1/2	12.7	19.0	25.4	31.7	38.1
I	1	1-1/4	1-1/2	2	2-1/2	25.4	31.7	38.1	50.8	63.5
J	1	1-1/4	1-1/2	—	—	25.4	31.7	38.1	—	—





Reference DWG # 96-4947

Used on Lowell Model No. ACLC-200-30-SC248ASM

Dimensions in Inches (mm)

THE INFORMATION ON THIS DOCUMENT IS CREATED BY CUTLER-HAMMER. IT IS DISCLOSED IN CONFIDENCE AND IS ONLY TO BE USED FOR THE PURPOSE IN WHICH IT IS SUPPLIED.	PREPARED BY / DATE		**Cutler-Hammer**	PITTSBURGH, PA	
	APPROVED BY / DATE		JOB NAME / DESIGNATION		
	VERSION		TYPE: BR3040B200	DRAWING TYPE	
NEG-ALT NUMBER	REVISION	DWG SIZE	G.O.	ITEM	SHEET

Ratings

- Main Circuit Breaker — CC
- 225 Amperes, 3-Phase, 4-Wire, 120/20V AC or 240V AC
- Tin-Plated Aluminum Bus Bar
- Interrupting Rating 10 kAIC
- Spaces/Poles: 42/42
- Insulated/Bondable Neutral
- Enclosure Type: Indoor
- Trim Type: Surface with Door
- Paint Type: ANSI 61 Light Gray Finish
- Incoming Wire Range: #1 – 300 kcmil, Cu/Al 60 or 75°C

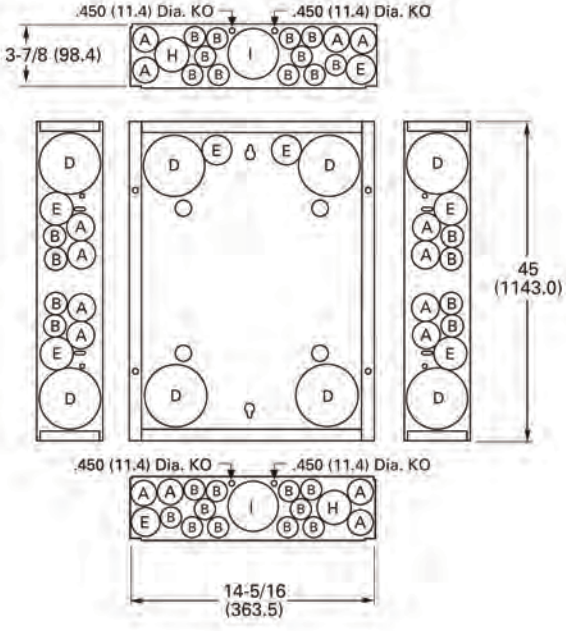
Notes

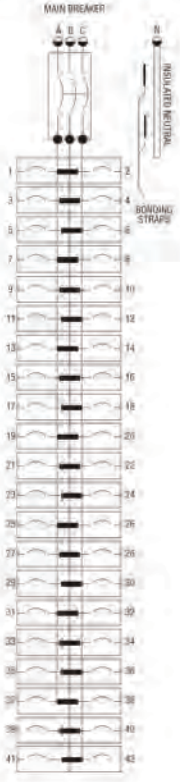
1. All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with a neutral bonding strap pre-attached (commercial loadcenters do not have a pre-attached bonding strip). The maximum main rating of the panel is the main circuit breaker rating when used as service entrance equipment.

2. Ground bar kits priced separately.

Knockouts

Code	Diameter in Inches					Diameter in mm				
A	1/2	3/4	—	—	—	12.7	19	—	—	—
B	1/2	—	—	—	—	12.7	—	—	—	—
C	1/2	1-1/4	1-1/2	2	2-1/2	12.7	31.7	38.1	50.8	63.5
D	1-1/4	1-1/2	2	2-1/2	—	31.7	38.1	50.8	63.5	—
E	1/2	3/4	1	—	—	12.7	19.0	25.4	—	—
F	1/2	3/4	1	1-1/2	2	12.7	19.0	25.4	38.1	50.8
G	1-1/4	1-1/2	2	—	—	31.7	38.1	50.8	—	—
H	1/2	3/4	1	1-1/4	1-1/2	12.7	19.0	25.4	31.7	38.1
I	1	1-1/4	1-1/2	2	2-1/2	25.4	31.7	38.1	50.8	63.5
J	1	1-1/4	1-1/2	—	—	25.4	31.7	38.1	—	—





Reference DWG # 96-4997

Used on Lowell Model No. ACLC-3P-225-42-SC248ASM

Dimensions in Inches (mm)

THE INFORMATION ON THIS DOCUMENT IS CREATED BY CUTLER-HAMMER. IT IS DISCLOSED IN CONFIDENCE AND IS ONLY TO BE USED FOR THE PURPOSE IN WHICH IT IS SUPPLIED.	PREPARED BY / DATE	**Cutler-Hammer**		PITTSBURGH, PA	
	APPROVED BY / DATE	JOB NAME / DESIGNATION			
	VERSION	TYPE: 3BR4242B225		DRAWING TYPE	
NEG-ALT NUMBER	REVISION / DWG SIZE	G.O.		ITEM	SHEET