

## LynTec Lighting Control Panelboard (LCP) Motorized Circuit Breaker Panel

### 1) General

- a) LynTec LCP panels incorporate required over-current circuit protection and remote on and off circuit control, utilizing motorized circuit breakers.
- b) The wall mount panel shall be the LCP Unit as manufactured by LynTec, or equal. LCP panels shall be ETL Listed and shall be so labeled when delivered.
- i) The LCP 378 panel shall consist of any quantity up to seventy-eight positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized or non-motorized circuit breakers, 15 to 125 amps, as required, power supply, and enclosure. Control electronics shall be included in a separate LCP Control Module enclosure.
- ii) The LCP 348 panel shall consist of any quantity up to forty-eight positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized or up to fifty non-motorized circuit breakers, 15 to 125 amps, as required, power supply, and enclosure. Control electronics shall be included in a separate LCP Control Module enclosure.
- iii) The LCP 342 panel shall consist of any quantity up to forty-two positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized or non-motorized circuit breakers, 15 to 125 amps, as required, power supply, and enclosure. Control electronics shall be included in a separate LCP Control Module enclosure.
- iv) The LCP 330 panel shall consist of any quantity up to thirty positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized or 15 to 125 amps, non-motorized circuit breakers as required, power supply, and enclosure. Control electronics shall be included in a separate LCP Control Module enclosure.
- v) The LCS 384 panel shall consist of any quantity up to eighty-four positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized or 15 to 125 amps, non-motorized circuit breakers as required.
- vi) The LCS 366 panel shall consist of any quantity up to sixty-six positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized or 15 to 125 amps, non-motorized circuit breakers as required.
- vii) The LCS 348 panel shall consist of any quantity up to forty-eight positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized or up to fifty-four non-motorized circuit breakers, 15 to 125 amps, as required.
- viii) The LCS 342 panel shall consist of any quantity up to forty-two positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized or 15 to 125 amps, non-motorized circuit breakers as required.
- ix) The LCS 330 panel shall consist of any quantity up to thirty positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized, or non-motorized circuit breakers as required.
- x) The LCP 336N panel shall consist of any quantity up to thirty-six of, 15, 20 or 30 ampere, single, double, or triple pole motorized or up to thirty-nine non-motorized circuit breakers, 15 to 60 amps, as required, power supply, and narrow profile enclosure. Control electronics shall be included in a separate LCP Control Module enclosure.

- xi) The LCP 324N panel shall consist of any quantity up to twenty-four positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized or up to twenty-seven 15 to 60 amps, non-motorized circuit breakers as required, power supply, and narrow profile enclosure. Control electronics shall be included in a separate LCP Control Module enclosure.
- xii) The LCS 342N narrow profile secondary panel shall consist of any quantity up to forty-two positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized or 15 to 60 amps, non-motorized circuit breakers as required.
- xiii) The LCS 330N narrow profile secondary panel shall consist of any quantity up to thirty positions of, 15, 20 or 30 ampere, single, double, or triple pole motorized, or 15 to 60 amps, non-motorized circuit breakers as required.

## 2) Mechanical

- a) Panels shall be no larger than:
  - i) LCP 378: 20" W x 86" H x 6" D
  - ii) LCS 384: 20" W x 86" H x 6" D
  - iii) LCS 366: 20" W x 86" H x 6" D
  - iv) LCP 348: 20" W x 62" H x 6" D
  - v) LCS 348: 20" W x 62" H x 6" D
  - vi) LCP 342: 20" W x 62" H x 6" D
  - vii) LCS 342: 20" W x 56" H x 6" D
  - viii) LCP 330: 20" W x 38" H x 6" D
  - ix) LCS 330: 20" W x 38" H x 6" D
  - x) LCP 324N 9" W x 65" H x 6" D
  - xi) LCP 336N 9" W x 85" H x 6" D
  - xii) LCS 330N 9" W x 65" H x 6" D
  - xiii) LCS 342N 9" W x 85" H x 6" D
  - xiv) LCP Control Module: 12" W x 12" H x 6" D
- b) Panel shall be constructed of 16-gauge steel. All panel components shall be properly treated; primed and finished in fine-textured, scratch resistant paint or rust resistant galvanized coating. The entire unit shall surface mount.
- c) Equally sized top and bottom blank end panels shall facilitate conduit entry and vertical mounting. The front panel shall be easily removable as well for full front access to input and output connections.
- d) Each LCP Control Module shall ship with a hinged cover, allowing controlled access to the wiring.
- e) Circuit breakers and supporting interior may be removed to facilitate installation of the enclosure.

## 3) Thermal

- a) The panel shall be convection cooled. No fans or other powered ventilation are required.

- b) The panel shall operate safely in an environment having an ambient temperature between 32°F (0°C) and 104°F (40°C), and humidity between 10-90% (non-condensing).

#### 4) Electrical

- a) All Type 1 components shall be Schneider Electric NF-G3 series panel board devices or equivalent.
- b) The panel shall be fed by 3-Phase 5-wire (3-Phase conductors, 200% Neutral), and chassis ground 120/208 or 277/480 VAC 60 Hz supply. Narrow profile panels are fed by 3-Phase 4-wire (3-Phase conductors, 100% Neutral).
- c) Main Circuit Breaker protection, except 84 space panels, or Main Lug Only options shall be provided.
- d) Feed through Lug options shall be provided.
- e) Sub-feed lugs options shall be provided.
- f) The panel control electronics shall operate on single phase, 120-277V AC 60Hz fed from an included bus mounted power supply. Device fault current protection shall be minimum 25,000 AIC @ 120 VAC.
- g) The individual remote-controlled circuit breakers shall contain motor driven, mechanically held contacts with ampacity ratings of 15, 20 or 30 amps at up to 277VAC line to neutral.
- h) Each motorized circuit breaker shall have an integral manual override switch with on/off or tripped status indication.
- i) The motorized circuit breaker shall be Schneider Electric ECB-G3 circuit breakers with the following minimum ratings:
  - i) Bolt on interface to bus bar
  - ii) HACR UL Rated
  - iii) SWD (Switching Duty) UL Rated
  - iv) HID (High Energy Lighting) UL listed
  - v) Single pole 65kAIR @ 120 VAC, 14kAIR @ 277 VAC
  - vi) Two-pole 65kAIR @ 120 VAC, 14kAIR @ 277/480 VAC
  - vii) Three-pole 42kAIR @ 240 VAC, 14kAIR @ 277/480
  - viii) 200,000 mechanical operations at full load current and 0.8 Power Factor.
- j) All line, neutral and ground terminals shall accept up to # 6 AWG wire.
- k) Control wiring shall land on removable headers for easy contractor installation (On-board DMX, Serial, BACnet and I/O and Input terminations).
- l) Ethernet connectivity shall be a female RJ45 jack.
- m) Low voltage connections are in a separate enclosure.

#### 5) Electronics

- a) The LCP controller shall have a power status LED indicator (Orange) and a DMX status LED indicator (Green) or BACnet indicator (Yellow). Two yellow navigation buttons and a two line by 16-character backlit LCD shall be provided for system monitoring and control status. Green and red test buttons are provided for local control and diagnostics.

- b) The panel shall receive:
  - i) ESTA DMX512-A control protocol. Addressing shall be set via internal web page.
  - ii) EIA RS-232 serial control protocol. Baud rate shall be set via internal web page.
    - (a) Crestron formatted control commands
    - (b) Extron formatted control commands
    - (c) AMX formatted control commands
    - (d) Properly formatted commands by others
  - iii) PLASA E1.31 (sACN) streaming ACN control protocol. Universe and address shall be set via internal web page.
  - iv) TCP/IP
    - (a) HTTP Graphical User Interface (GUI) via a commercially available web browser (Provided by others).
    - (b) HTTP Get commands to direct the operation and receive status of individual motorized breakers or zones.
    - (c) Telnet commands to direct the operation and receive status of individual motorized breakers or zones.
- c) The motorized circuit breakers shall respond to control changes in less than 25 milliseconds. DMX512 update speed shall be 40Hz.
- d) The LCS panels shall allow an optional power supply and buffer to be factory or field installed in installation where the control wire length from the LCP panel is greater than 400 feet. One circuit breaker position will be reserved to provide electrical power to this circuit.
- e) 2,500V optical isolation shall be provided between the DMX512 inputs and the control electronics as well as between control and power components.
- f) The panel shall have a UL 924-compliant contact input for use in Emergency Lighting systems. The panel shall respond to the contact input by switching selecting motorized circuit breakers on, while switching other motorized circuit breakers off. The emergency lighting status shall be maintained for the duration of the contact closure and will not be modified by any other input during the emergency lighting duration. Each motorized circuit breaker can be selected for activation upon contact input.
- g) An internal astronomical clock shall provide up to 84 events to be automatically adjusted for Sunrise and Sunset times based on the physical location of the panel and calendar date. The internal schedule feature shall allow an offset of up to 3 hours, by 30-minute steps, before or after local Sunrise or Sunset times. Access to the internal schedule and selecting the physical location of the panel shall be through the internal web page.
- h) It shall be possible to define up to 12 zones using the GUI. Zones shall be programmable by manually selecting one or more motorized circuit breaker to be included in the zone. 168 Motorized circuit breakers can be physically located in any of the four panels under the direct control of the Primary LCP controller. Each zone can be associated with a discrete control protocol.

- i) Grouped operation shall be a fixed 100ms delay time between motorized circuit breaker operations.
- j) Each zone sequence shall be controlled by up to six remote switch sets or other low voltage contact closures within 5,000 feet of the controller.
- k) Status indication of the zone shall be displayed by the illumination of the "ON" button illumination circuit.
  - i. Steady green shall indicate all breakers in the zone are on
  - ii. Slow flashing (1 Hz) shall indicate breakers have been directed to change state
  - iii. Fast flashing (4 Hz) shall indicate a fault or tripped circuit breaker within the zone
  - iv. Asymmetrical flashing, once per 4 seconds, indicates a mechanically bypassed circuit breaker in the controlled zone.
  - v. Thirty-eight (38) 3-wire input/output terminals for connection to external low voltage control devices may be provided. Each may be configured as:
    - (a) Normally Open (NO) 2-wire maintained input
    - (b) Normally Closed (NC) 2-wire maintained input
    - (c) Normally Open (NO) 2-wire momentary "toggle on" input
    - (d) Normally Open (NO) 2-wire momentary "toggle off" input
    - (e) Three-wire momentary input operation
    - (f) 100-milliamp, 50-volt, Open Collector (OC) output
    - (g) Dry Contact 1-amp relay Type C contact output
    - (h) P-channel, 55v, 31 amp, rated Field Effect Transistor (FET) output
- l) In the event of power loss, breakers will maintain their state. Any commands sent to the controller during the period of loss shall be ignored.
- m) Panel setup shall be user programmable utilizing the graphical user interface. The control panel shall provide the following setup features:
  - i) Selection of desired control protocol per zone.
  - ii) DMX Address. Motorized circuit breakers are user defined as sequential addresses per Zone or a single address per Zone or "All Available".
  - iii) E1.31 (sACN) Universe and starting channel address.
  - iv) RS-232, eight-bit word, one stop bit, no parity bit and selectable baud rate.
  - v) Individual settings for DMX, sACN, "On" and DMX "Off" threshold level.
  - vi) Static or Dynamic IP address.
  - vii) Emergency Off group inclusion.
  - viii) Emergency Lighting group inclusion.
  - ix) Power Up Behavior.
  - x) Restore Defaults (Recovery).
  - xi) Astronomical Time of Day operation with separate "on" and "off" control.
- n) The controller shall be capable of switching up to 168 motorized circuit breakers on or off at once, 100-millisecond rate, per motorized circuit breaker.
- o) LCS panels shall be connected to LCP panels with RS-485 communications links provided by others not to exceed a total of 168 circuit breaker positions or eight control bus strip addresses, whichever is greater.

## 6) UL Listing

- a) All LynTec LCP and LCS panels shall meet the following standards:
  - i) UL 67—Standard for Panelboards
  - ii) UL 50—Enclosures for Electrical Equipment
  - iii) UL Listed Class CTL panelboard
  - iv) CSA C22.2, No. 29-M1989—Panelboards and Enclosed Panelboards
  - v) CSA C22.2, No. 94-M91—Special Purpose Enclosures
  - vi) NEMA PB 1—Panelboards
  - vii) NFPA 70—National Electrical Code® (NEC®)
  - viii) Federal Specification W-P-115C Type I Class 1—Circuit Breaker Panelboards
  - ix) 2003 IBC, NFPA 5000, ASCE/SE17—Seismic Qualification67 for Panelboards
  - x) UL 50 Enclosures for Electrical Equipment
  - xi) UL 489 Molded Case Circuit Breakers
  - xii) UL 508A Industrial Control Panel
  - xiii) UL 924 Emergency Lighting Auxiliary Equipment

## 7) Warranty

- a) Manufacture shall warrant specified equipment to be free from defects in materials and workmanship for five (5) years from the date of purchase for control electronics and a period of fifteen (15) months for devices manufactured by Schneider Electric.