

LynTec Remote Power Control (RPC) Motorized Circuit Breaker Panel

1) General

- a) LynTec RPC panels incorporate required over-current circuit protection and remote on and off circuit control, utilizing motorized circuit breakers, in a single enclosure.
- b) The wall mount panel shall be the RPC Unit as manufactured by LynTec, or equal. RPC panels shall be ETL Listed, and shall be so labeled when delivered.
 - i) The RPC-383 panel shall consist of any quantity up to eighty-three positions of, 15, 20 or 30 ampere, single, double or triple pole motorized or non-motorized circuit breakers, 15 to 125 amps, as required, control electronics, power supply, isolated technical ground bar and enclosure.
 - ii) The RPC-365 panel shall consist of any quantity up to sixty-five positions of, 15, 20 or 30 ampere, single, double or triple pole motorized or non-motorized circuit breakers, 15 to 125 amps, as required, control electronics, power supply, isolated technical ground bar and enclosure.
 - iii) The RPC-341 panel shall consist of any quantity up to forty-one positions of, 15, 20 or 30 ampere, single, double or triple pole motorized or non-motorized circuit breakers, 15 to 125 amps, as required, control electronics, power supply, isolated technical ground bar and enclosure.
 - iv) The RPC-329 panel shall consist of any quantity up to twenty-nine positions of, 15, 20 or 30 ampere, single, double or triple pole motorized or 15 to 125 amps, non-motorized circuit breakers as required, control electronics, power supply, isolated technical ground bar and enclosure.
 - v) The RPS-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, optional isolated technical ground bar and enclosure.
 - vi) The RPS-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, optional isolated technical ground bar and enclosure.
 - vii) The RPS-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, optional isolated technical ground bar and enclosure.
 - viii) The RPS-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, optional isolated technical ground bar and enclosure.

2) Mechanical

- a) Panels shall be no larger than:
 - i) RPC-383 28" W x 86" H x 6" D
 - ii) RPS-384 28" W x 86" H x 6" D
 - iii) RPC-365 28" W x 86" H x 6" D
 - iv) RPS-366 28" W x 86" H x 6" D
 - v) RPC 348 28" W x 74" H x 6" D
 - vi) RPS 348 28" W x 74" H x 6" D
 - vii) RPC-341 28" W x 56" H x 6" D
 - viii) RPS-342 20" W x 56" H x 6" D
 - ix) RPC-329 36" W x 38" H x 6" D
 - x) RPS-330 20" W x 38" H x 6" D
 - xi) RPC 329N 17" W x 65" H x 6" D
 - xii) RPC 341N 17" W x 85" H x 6" D
 - xiii) RPS 330N 9" W x 65" H x 6" D
 - xiv) RPS 342N 9" W x 85" 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 removable knockout panels shall facilitate conduit entry and vertical mounting. The front panel shall be easily removable as well for full front access to input, output and data connections.
- d) The unit shall ship with covers allowing controlled access to the wiring. A separate cover is provided for access to the Type 2 wiring only.
- e) An Isolated Technical Ground Bar (ITG), if specified, shall be installed in a listed Type 1 space.
- f) 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 shall be allowed.
- 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), Isolated Technical Ground (ITG) and chassis ground 120/208 or 277/480 VAC 60 Hz supply.
- c) Main Circuit Breaker protection or Main Lug Only options shall be provided.
- d) Feed through Lug options shall be provided.

- e) The panel control electronics shall operate on single phase, 120-277V AC 60Hz fed from an included 15-amp circuit breaker. Fault current protection shall be 25,000 AIC @ 120 VAC.
 - f) 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 480VAC. Circuit loads must be derated as required by national and local electrical codes.
 - g) Each motorized circuit breaker shall have an integral manual override switch with on/off status indication.
 - h) 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.
 - i) All line, neutral and ground terminals shall accept up to 6 AWG wire.
 - j) Control wiring shall land on removable headers for easy contractor installation (On-board DMX, Serial, BACnet and I/O and Input terminations).
 - k) Ethernet connectivity shall be an RJ-45 jack.
 - l) A voltage barrier shall be provided to separate Type 1 and Type 2 sections of the panel.
- 5) Electronics
- a) The RPC controller shall have a power status LED indicator (Orange) and a DMX status LED indicators (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) AMX formatted control commands
 - (c) 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.
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- c) The motorized circuit breakers shall respond to control changes in less than 25 milliseconds. DMX512 update speed shall be 40Hz.
 - d) The RPS panels shall allow an optional power supply and buffer to be factory or field installed in installation where the control wire length from the RPC 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. 167 Motorized circuit breakers can be physically located in any of the four panels under the direct control of the Master RPC controller. Each zone can be associated with a discrete control protocol.
 - i) Selecting Sequenced operation shall allow the choice of order and delay time between motorized circuit breaker operations.
 - j) Selecting Grouped operation shall default to 25ms delay time between motorized circuit breaker operations.
 - k) 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.
 - l) 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 contacts output
 - (h) N-channel 100v, 20 amp rated Field Effect Transistor (FET) output
- m) The unit shall always power-up in the last used mode and settings and shall be ready for use without user intervention. The Power Restore behavior setting shall ensure the unit restores to its previous state (preset, sequence) when power is cycled.
- n) The unit shall always turn off those motorized circuit breakers that were added to the Brown Out protection group when the incoming voltage falls below the user defined threshold. When power is restored the controller will wait for the delay time entered in the GUI and then sequence those motorized circuit breakers in the predetermined order ready for use without user intervention. The Brown Out Behavior setting shall ensure the unit restores to its previous state (preset, sequence) when incoming power is restored. Reserve power for these operations shall be provided by a non-lead, non-acid, power buffer with adequate reserve power to complete the directed operations.
- o) 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 discrete addresses.
 - iii) E1.31 Universe and channel address.
 - iv) RS-232 baud rate.
 - v) BACnet address and baud rate.
 - vi) Individual settings for DMX "On" and DMX "Off" threshold level, per controllable circuit.
 - vii) Static or Dynamic IP address.
 - viii) Brown Out group inclusion.
 - ix) Emergency Off group inclusion.
 - x) Emergency Lighting group inclusion.
 - xi) Power Up Behavior.
 - xii) Restore Defaults (Recovery).
 - xiii) Astronomical Time of Day operation with separate "on" and "off" control.
- p) The controller shall be capable of switching up to 167 motorized circuit breakers on or off at once, or in a user-selectable delay period of 0.025 seconds to 999 seconds, per motorized circuit breaker.
- q) RPS panels shall be connected to RPC 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 RPC and RPS 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 Qualification 67 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.