SECTION 08731

AUTOMATIC DOOR OPERATORS - COMMERCIAL

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\*\* NOTE TO SPECIFIER \*\* LiftMaster; Commercial Automatic Door Operators.  
This section is based on the products of LiftMaster, which is located at:  
300 Windsor Dr.  
Oak Brook, IL 60523  
Toll Free Tel: 800-282-6225  
Fax: 630-516-8412  
Email: [specs@LiftMaster.com](mailto:specs@LiftMaster.com?subject=RE:ARCAT%20Spec%20Question%20(08731cha):%20%20)  
Web: <http://LiftMaster.com>   
  
 {[click Here](http://www.arcat.com/arcatcos/cos42/arc42485.html?src=spec)} for additional information.  
  
LiftMaster's full commercial and residential garage door operator/gate operator/access control product lines meet the needs of Architects, Designers, Engineers, and Specifiers in any design or conceptual plan, while offering 100 percent compliance with UL 325 safety and construction codes. Our entire product line also contributes to energy-efficiency credits for LEED green building certification from the U.S. Green Building Council. LiftMaster is a registered presenter of the American Institute of Architects and is approved to present any of our AIA CEUs at your firm's location. For learning objectives and to schedule a Lunch and Learn for your firm, please send a request to [specs@LiftMaster.com](mailto:specs@LiftMaster.com). To find a complete library of architectural specifications, shop drawings, CSI format 3-part specs, CAD, and BIM product renderings, visit LiftMaster.com.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Trolley-Type Door Operators:
       1. Trolley-type door operators for apartment/condominium applications. (LiftMaster Model APT)
       2. Trolley-type continuous-duty door operators for standard lift sectional doors. (LiftMaster Model GT)
       3. Trolley-type door operators for standard lift sectional doors. (LiftMaster Models ATSW, MT, BMT, T)
    2. Hoist-Type Door Operators:
       1. Hoist-type door operators for rolling doors, shutters, and grilles. (LiftMaster Models DHJ, BDHJ, H, BH)
       2. Hoist-type continuous-duty door operators for rolling doors, grilles, and industrial sectional doors with vertical or high lift. (LiftMaster Model GH)
       3. Hoist-type door operators for high or vertical lift sectional doors and small rolling doors or grilles. (LiftMaster Model MH)
       4. Hoist-type slow-speed door operators for rolling sheet doors. (LiftMaster Model MHS)
    3. Jackshaft-Type Door Operators:
       1. Jackshaft-type door operators for high or vertical lift sectional doors and limited rolling door and grille applications. (LiftMaster Models DJ, BDJ, J, BJ)
       2. Jackshaft-type door operators for high or vertical lift sectional doors and small rolling doors or grilles. (LiftMaster Models MGJ, MJ)
       3. Jackshaft-type door operators for light-duty commercial standard and high lift; 5 feet (1524 mm) high lift maximum, sectional doors. (LiftMaster Model LJ8900W)
       4. Jackshaft-type door operators for commercial rolling sheet door applications. (LiftMaster Model LJ8950W)
       5. Jackshaft-type door operators for light-duty commercial high lift; 5 feet (1524 mm) high lift maximum, and vertical lift sectional doors. (LiftMaster Model DDO8900W)
    4. Industrial-duty single and bi-parting door operators for sliding doors. (LiftMaster Models GSD, SD)
    5. Commercial overhead door and gate operators. (LiftMaster Model HCT Series)
       1. Overhead door and gate operators. (LiftMaster Model HCTDCPKGUL08)
       2. Overhead door and gate operators. (LiftMaster Model HCTDCPKGUL10)
       3. Overhead door and gate operators. (LiftMaster Model HCTDCPKGUL12)
       4. Overhead door and gate operators. (LiftMaster Model HCTDCPKGUL14)
       5. Overhead door and gate operators. (LiftMaster Model HCTDCPKGUL16)
    6. Central Motor Door Operators:
       1. Central motor type door operators for dead shaft type, balanced rolling door. (LiftMaster Models LM-1600, LM-2000)
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 06100 - Rough Carpentry: Installation and requirements for blocking and nailers.
    2. Section 16050 - Basic Electrical Materials and Methods: Installation and requirements for electrical connections.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. International Electrotechnical Commission (IEC).
    2. National Electrical Manufacturers Association (NEMA): NEMA ICS 6 - Industrial Control and Systems: Enclosures.
    3. Underwriters Laboratories (UL): UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.
  1. SUBMITTALS
     1. Submit under provisions of Section 01300.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Preparation instructions and recommendations.
        2. Storage and handling requirements and recommendations.
        3. Installation methods.
        4. Cleaning methods.
     3. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including anchorage, edge conditions, and accessories.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Store products in manufacturer's unopened packaging with labels intact until ready for installation.
     2. Schedule delivery of door operator so that spaces are sufficiently complete that door operators can be installed immediately upon delivery.
  3. WARRANTY
     1. Manufacturer's standard limited 2-year warranty against material and manufacturing defects with the exception of LiftMaster Model ATSW, which carries a limited 1-year warranty.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: LiftMaster, which is located at: 300 Windsor Dr.; Oak Brook, IL 60523; Toll Free Tel: 800-282-6225; Fax: 630-516-8412; Email: [specs@LiftMaster.com](mailto:specs@LiftMaster.com?subject=RE:ARCAT%20Spec%20Question%20(08731cha):%20%20); Web: <http://LiftMaster.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01600.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. TROLLEY-TYPE DOOR OPERATORS
     1. Low-Profile Apartment House Operator: LiftMaster APT Low-Profile Apartment House Operator, resilient mount motor with overload protection and emergency disconnect with auto-reconnect trolley assembly for manual door operation.
        1. Electric Operator: Low-profile assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; operator shall drive the door at a speed of approximately 6 inches (152 mm) per second. Operator vertical profile shall not exceed 11 inches (279 mm).
           1. Drive Reduction: Heavy-duty 5L V-belt and chain/sprocket secondary; all reduction sprockets and pulleys shall be drilled and pinned to steel shafts plated for resistance to corrosion; operator shall be equipped with permanently lubricated ball bearings on output shaft, adjustable friction clutch and quick-disconnect door arm to facilitate manual operation.
           2. Brake: Standard solenoid brake to stop and hold a door at any position.
           3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
           4. Electric Motor: High-starting torque, continuous-duty, industrial-type protected against overload by current sensing and thermal overload devices. For single-phase applications, incoming voltage field-selectable between 115V and 230V, 60 Hz by properly positioning connector.
           5. Solid-State Motor Control and Enclosure: LiftMaster Logic 5.0 motor control shall be UL-approved microprocessor solid-state type and shall include the capability to select one of 7 wiring types; additional features shall include a maintenance alert diagnostic system, programmable Timer-to-Close with timer defeat input, mid-stop programming capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster Logic 5.0 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ 2.0 Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory up to (30) 3-button remote controls (or 90 single-button remote controls) plus 30 wireless keypads, or an unlimited number of trinary DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.

Internet Connectivity: MyQ Technology.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop functionality shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
        2. Door Drive: Full No. 48 roller chain with emergency disconnect for manual door operation.
        3. Track: Heavy-duty, double-angle, 11-gauge galvanized steel.
        4. Trolley Assembly: 2 inches H x 2 inches W (51 mm H x 51 mm W) galvanized steel angle rails with automatic reconnect trolley including plated steel rail spacers with a nylon chain-guide assembly.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-Approved and Listed Monitored Entrapment Protection Devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored reversing sensing edgesystem; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored reversing sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMasterCPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross-beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes: non-monitored, non-contact, infrared beam photo sensor with polarized reflector
        7. NEMA 6 Monitored Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.
      1. Trolley Track: 2 inches H x 2 inches W (51 mm H x 51 W mm) galvanized steel angle rails with automatic reconnecting trolley and shall include plated steel rail spacers with nylon chain-guide assembly; nylon inserts will be provided on trolley mechanism and rail spacers to reduce vibration and chain noise.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Heavy Industrial-Duty Operator: LiftMaster GT Heavy Industrial-Duty Trolley Operator, continuous-duty, high-starting torque motor with overload protection and emergency disconnect for manual door operation.
       1. Electric Operator: Heavy industrial-duty assembly, cULus listed and cULus labeled, complete with electric motor and factory-prewired motor controls, wormgear reduction unit, electric solenoid-actuated brake, 3-button open/close/stop control station along with conduit-encased wiring from control circuit to motor, and accessories required for proper operation; operator shall be capable of driving door at a speed of approximately 11 to 12 inches (279 to 304 mm) per second.
          1. Primary Drive Reduction: Wormgear-in-oil-bath gear reducer with synthetic "All Climate" oil with 20:1 speed reduction; adjustable torque limiter and quick- disconnect door arm to facilitate manual operation; permanently lubricated ball bearings on output shaft and output and door driven sprockets.
          2. Brake: Electric solenoid-actuated brake that is capable of stopping and holding a door at any position.
          3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on treaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
          4. Electric Motor: High-starting torque, continuous-duty, industrial-type protected against overload by current sensing and thermal overload devices. For single-phase applications, incoming voltage field-selectable between 115V and 230V, 60 Hz by properly positioning connector. For 3-phase applications, incoming voltage field-selectable between 208V, 230V and 460V, 60 Hz by properly positioning connector.

Motor Specification:

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specifications not required.

115/230V 60 Hz, single phase, 1/2 HP.

115/230V 60 Hz, single phase, 3/4 HP.

115/230V 60 Hz, single phase, 1 HP.

115/230V 60 Hz, single phase, 1-1/2 HP.

208/230/460V 60 Hz, 3-phase, 1/2 HP.

208/230/460V 60 Hz, 3-phase, 3/4 HP.

208/230/460V 60 Hz, 3-phase, 1 HP.

208/230/460V 60 Hz, 3-phase, 1-1/2 HP.

575V 60 Hz, 3-phase, 1/2 HP.

575V 60 Hz, 3-phase, 3/4 HP.

575V 60 Hz, 3-phase, 1 HP.

575V 60 Hz, 3-phase, 1-1/2 HP.

* + - * 1. Motor Control and Enclosure: LiftMaster Logic 5.0 motor control shall be UL-approved microprocessor solid-state type and shall include the capability to select one of 7 wiring types; additional features shall include a maintenance alert diagnostic system, programmable Timer-to-Close with timer defeat input, mid-stop programming capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster Logic 5.0 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ 2.0 Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory up to (30) 3-button remote controls (or 90 single-button remote controls) plus 30 wireless keypads, or an unlimited number of trinary DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.

Internet Connectivity: MyQ Technology.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop functionality shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
        2. Door Drive: Full No. 41 roller chain with emergency disconnect for manual door operation.
        3. Track: Heavy-duty, double-angle, 11-gauge galvanized steel.
        4. Trolley Assembly: 2 inches H x 2 inches W (51 mm H x 51 mm W) galvanized steel angle rails with cast aluminum trolley including plated steel rail spacers with nylon chain-guide assembly.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored reversing sensing edge system; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored reversing sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross-beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.
      1. Trolley Track: 2 inches H x 2 inches W (51 mm H x 51 mm W) galvanized steel angle rails with automatic reconnecting trolley and shall include plated steel rail spacers with nylon chain-guide assembly; nylon inserts will be provided on trolley mechanism and rail spacers to reduce vibration and chain noise.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Light-Duty Operator: LiftMaster ATSW Light-Duty Trolley Operator with Wi-Fi on board enabling access to myQ or myQ Business, dual-rated for residential and commercial doors for up to full 14' door openings, with anti-burglary coding radio receiver. Delivers Commercial Duty-Cycle Rating of 8 cycles/hour. Suitable for sale and installation for Commercial applications in California per SB-969.
       1. Electric Operator: Light-duty assembly, cULus listed and cULus labeled, complete with electric motor and factory-prewired motor controls; single button open/close/stop control station; dual-sided lighting with light lenses; UL and CSA listed self-monitoring infrared sensing device integral to operator system, and accessories required for proper operation; operator shall be capable of driving the door at a speed of approximately 8 to 9 inches (203 to 229 mm) per second.
          1. Limit Switches: Fully adjustable, electronic limit mechanism synchronizing operator with door with auto force adjustment.
          2. Electric Motor: High-starting torque, 120 VAC, single-phase, 60 Hz permanently lubricated motor with automatic safety reverse with automatic stop function, motor overload thermal protection, and POSILOCK. Motor starter shall be of solid-state circuitry, and enclosed in a NEMA 1 enclosure. MVIS (Motor Vibration Isolation System) to reduce vibration noise. Delivers 600 in-lbs/sec (67.8 nm) Rated Load and 6 A (max.) current rating.
          3. Travel Rate: 10-Tooth Sprocket moves the door 8 to 9 inches (203 to 229 mm) per second (faster than similar Residential operator that have 6-8 tooth sprockets).
          4. Radio Receiver: LiftMaster Security+ 2.0 Receiver on-board, Tri-band Frequency (agile on 310/315/390 MHz) and equipped to accept Rolling Code Technology remote controls and trinary DIP switch remote controls. Receiver memory shall accept up to (40) Security+ 2.0 remote control pushbuttons plus (4) Security+ 2.0 wireless keypads plus (16) myQ devices, or an unlimited number of trinary DIP switch remote controls.
          5. Security+ 2.0 Remote Controls: Operating range of 200 feet (61 m) (approximately), operating temperate range of -31 degrees F (-35 degrees C) to 149 F (65 degrees C). Security+ 2.0 anti-burglary coding.
          6. myQ Powered Radio: 902 to 928 MHz. 50-channel FHSS (Frequency Hopping Spread Spectrum). Provides two-way communication from commercial/residential door operator and myQ accessories. Enables remote closing of garage door with key myQ accessories. Enables monitoring and control of commercial/residential door operators and lighting controls via Wi-Fi enabled smartphone, tablet, or computer.
          7. Security+ 2.0 Encrypted Controls: Timer-to-Close (when optional Smart control panel is used - 880LMW). Light Controls: Turns operator lights on/off.
          8. Single-Button Control Station: 1-button station providing open/close/stop/reverse operation shall be NEMA Type 1.
       2. Self-Monitoring Safety Operation Application: Operator shall include inherent automatic safety reversal of door (on close)/automatic stop of door (on open) upon encountering an obstruction and shall be provided with fully monitored, non-contact, infrared beam photo sensors to be mounted 6 inches (152 mm) maximum and no lower than 4 inches (102 mm) minimum above the floor that reverse a closing door to the full open position when an obstruction is sensed.
       3. Track: Heavy-duty steel "I" beam configuration with automatic reconnect trolley in case of manual operation.

\*\* NOTE TO SPECIFIER \*\* Delete rail length options not required.

* + - * 1. Rail Lengths: 8 ft (2438 mm). CD1008.
        2. Rail Lengths: 10 ft (3048 mm). CD1010.
        3. Rail Lengths: 12 ft (3658 mm). CD1012.
        4. Rail Lengths: 14 ft (4267 mm). CD1014.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Medium-Duty Operator: LiftMaster Medium-Duty Logic Trolley Operators, limited-duty (recommended duty of 12 cycles per hour), high-starting torque motor with overload protection and emergency disconnect for manual door operation.

\*\* NOTE TO SPECIFIER \*\* Delete model not required.

* + - 1. Model: LiftMaster MT.
      2. Model: LiftMaster BMT.
      3. Electric Operator: Medium-duty assembly, cULus listed and cULus labeled, complete with electric motor and factory-prewired motor controls, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; operator shall provide a door speed of approximately 8 to 10 inches (203 to 229 mm) per second.
         1. Primary Speed Reduction: Heavy-duty 4L V-belt and No. 41 chain and sprocket with sprocket reduced secondary; operator shall be equipped with adjustable friction clutch, quick-disconnect door arm for manual door operation, oil-tight bushings on output shaft and output and door driven sprockets.
         2. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
         3. Electric Motor: High-starting torque, 115V, single-phase, 1/2 HP motor with an internal automatic reset thermal overload device to protect against overload.
         4. Motor Control and Enclosure: LiftMaster medium-duty Logic motor control shall be a microprocessor solid-state type PCB; the control board shall provide the capability to select one of 2 wiring types, diagnostic LEDs for operator status and troubleshooting, programmable Timer-to-Close with timer defeat capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster medium-duty Logic on-board, 3-channel receiver with external antenna; equipped to accept Security+ Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory for up to 20 Security+ remote controls or an unlimited number of trinary DIP switch remote controls.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop within a NEMA 1 Type enclosure.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Operator Modifications: Electric solenoid-actuated brake capable of stopping and holding a door at any position.
        2. Door Drive: Full No. 48 roller chain and emergency disconnect for manual door operation.
        3. Track: Heavy-duty, double-angle, 11-gauge galvanized steel.
        4. Trolley Assembly: 2 inches H x 2 inches W (51 mm H x 51 mm W) galvanized steel angle rails with cast aluminum trolley including plated steel rail spacers with nylon chain-guide assembly.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross-beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Industrial-Duty Operator: LiftMaster T Low-Profile Industrial-Duty Trolley Operator, continuous-duty, high-starting torque motor with overload protection and emergency disconnect for manual door operation.
       1. Electric Operator: Industrial-duty assembly, cULus listed and cULus labeled, complete with electric motor and factory-prewired motor controls, internal auxiliary reversal circuit, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; operator shall be capable of driving door at a speed of approximately 8 to 12 inches (203 to 279 mm) per second. Vertical operator profile shall not exceed 12 inches (279 mm).
          1. Drive Reduction: Heavy-duty 5L V-belt and chain/sprocket secondary; all reduction sprockets and pulleys shall be drilled and pinned to steel shafts plated for resistance to corrosion; operator shall be equipped with permanently lubricated ball bearings on output shaft, adjustable friction clutch and quick-disconnect door arm to facilitate manual operation.

\*\* NOTE TO SPECIFIER \*\* Brake is standard on 3/4 HP and 1 HP models; brake is optional on 1/3 HP and 1/2 HP models and must be specified if desired. Delete if not required.

* + - * 1. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position. Optional on 1/3 HP and 1/2 HP. Standard on 3/4 HP and 1 HP.
        2. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
        3. Electric Motor: High-starting torque, continuous-duty, industrial-type protected against overload by current sensing and thermal overload devices. For single-phase applications, incoming voltage field-selectable between 115V and 230V, 60 Hz by properly positioning connector. For 3-phase applications, incoming voltage field-selectable between 208V, 230V and 460V, 60 Hz by properly positioning connector.

Motor Specification:

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

115/230V 60 Hz, single phase, 1/3 HP.

115/230V 60 Hz, single phase, 1/2 HP.

115/230V 60 Hz, single phase, 3/4 HP.

115/230V 60 Hz, single phase, 1 HP.

208/230/460V 60 Hz, 3-phase, 1/3 HP.

208/230/460V 60 Hz, 3-phase, 1/2 HP.

208/230/460V 60 Hz, 3-phase, 3/4 HP.

208/230/460V 60 Hz, 3-phase, 1 HP

575V 60 Hz, 3-phase, 1/2 HP.

575V 60 Hz, 3-phase, 3/4 HP.

575V 60 Hz, 3-phase, 1 HP.

* + - * 1. Motor Control and Enclosure: LiftMaster Logic 5.0 motor control shall be UL-approved microprocessor solid-state type and shall include the capability to select one of 7 wiring types; additional features shall include a maintenance alert diagnostic system, programmable Timer-to-Close with timer defeat input, mid-stop programming capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster Logic 5.0 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ 2.0 Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory up to (30) 3-button remote controls (or 90 single-button remote controls) plus 30 wireless keypads, or an unlimited number of trinary DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.

Internet Connectivity: MyQ Technology.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop functionality shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
        2. Door Drive: Full No. 48 (1/3 HP and 1/2 HP models) or No. 41 (3/4 HP and 1 HP models) roller chain with emergency disconnect for manual door operation.
        3. Track: Heavy-duty, double-angle, 11-gauge galvanized steel.
        4. Trolley Assembly: 2 inches H x 2 inches W (51 mm H x 51 mm W) galvanized steel angle rails with cast aluminum trolley including plated steel rail spacers with a nylon chain-guide assembly.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored reversing sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross-beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. HOIST-TYPE DOOR OPERATORS
     1. Industrial-Duty Operator with Internal Door Lock Sensor: LiftMaster Industrial-Duty Operators with internal door lock sensor, continuous-duty, high-starting torque motor with overload protection, internal door lock sensor to prevent accidental operation of a locked door and an emergency chain hoist with electric interlock.

\*\* NOTE TO SPECIFIER \*\* Delete model not required.

* + - 1. Model: LiftMaster DHJ.
      2. Model: LiftMaster BDHJ.
      3. Electric Operator: Industrial-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, internal door lock sensor, positive locking mechanical system acting as a holding brake, manually operated chain hoist, conduit-encased wiring from control to motor, and accessories required for proper operation; door speed of approximately 8 to 9 inches (203 to 229 mm) per second.
         1. Drive Reduction: Heavy-duty 5L V-belt primary reduction and chain/sprocket secondary and third stage reduction; all reduction sprockets and pulleys shall be drilled and pinned to steel shafts plated for resistance to corrosion; operator shall be equipped with permanently lubricated ball bearings on output shaft, adjustable friction clutch and output and door driven sprockets.
         2. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position. Optional on 1/2 HP. Standard on 3/4 HP.
         3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
         4. Electric Motor: High-starting torque, continuous-duty, industrial-type protected against overload by current sensing and thermal overload devices. For single-phase applications, incoming voltage field-selectable between 115V and 230V, 60 Hz by properly positioning connector. For 3-phase applications, incoming voltage field-selectable between 208V, 230V and 460V, 60 Hz by properly positioning connector.

Motor Specification:

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

115/230V 60 Hz, single phase, 1/2 HP.

115/230V 60 Hz, single phase, 3/4 HP.

208/230/460V 60 Hz, 3-phase, 1/2 HP.

208/230/460V 60 Hz, 3-phase, 3/4 HP.

575V 60 Hz, 3-phase, 1/2 HP.

575V 60 Hz, 3-phase, 3/4 HP.

* + - * 1. Motor Control and Enclosure: LiftMaster Logic 5.0 motor control shall be UL- approved microprocessor solid-state type and shall include the capability to select one of 7 wiring types; additional features shall include a maintenance alert diagnostic system, programmable Timer-to-Close with timer defeat input, mid-stop programming capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster Logic 5.0 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ 2.0 Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory up to (30) 3-button remote controls (or 90 single-button remote controls) plus 30 wireless keypads, or an unlimited number of trinary DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.

Internet Connectivity: MyQ Technology.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - * 1. Internal Door Lock Sensor: Sensing circuit to stop operator when door is locked.
        2. Floor level disconnect and chain hoist with electrical interlock for emergency manual door operation.
        3. Door Drive: Full No. 50 roller chain; operator shall be equipped with an electrically interlocked, floor level disconnect and chain hoist for manual operation.
        4. Control Station sold separately due to door lock. (Control Station is typically key lock or push-button.)
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes, reversing photo sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately and can be field-cut to required length.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored reversing sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross-beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Industrial-Duty Operator: LiftMaster Industrial-Duty Hoist Operators, continuous-duty, high-starting torque motor with overload protection and an emergency chain hoist with electric interlock.

\*\* NOTE TO SPECIFIER \*\* Delete model not required.

* + - 1. Model: LiftMaster H.
      2. Model: LiftMaster BH.
      3. Electric Operator: Industrial-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, manually operated chain hoist, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, positive locking mechanical system acting as a holding brake, and accessories required for proper operation; door speed of approximately 8 to 9 inches (203 to 229 mm) per second.
         1. Drive Reduction: Heavy-duty 5L V-belt primary reduction and chain/sprocket secondary and third stage reduction; all reduction sprockets and pulleys shall be drilled and pinned to steel shafts plated for resistance to corrosion; operator shall be equipped with permanently lubricated ball bearings on output shaft, adjustable friction clutch and output and door driven sprockets.
         2. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position. Optional on 1/3 HP and 1/2 HP. Standard on 3/4 HP and 1 HP.
         3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
         4. Electric Motor: High-starting torque, continuous-duty, industrial-type protected against overload by current sensing and thermal overload devices. For single-phase applications, incoming voltage field-selectable between 115V and 230V, 60 Hz by properly positioning connector. For 3-phase applications, incoming voltage field-selectable between 208V, 230V and 460V, 60 Hz by properly positioning connector.

Motor Specification:

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specifications not required.

115/230V 60 Hz, single phase, 1/3 HP.

115/230V 60 Hz, single phase, 1/2 HP.

115/230V 60 Hz, single phase, 3/4 HP.

115/230V 60 Hz, single phase, 1 HP.

208/230/460V 60 Hz, 3-phase, 1/3 HP

208/230/460V 60 Hz, 3-phase, 1/2 HP.

208/230/460V 60 Hz, 3-phase, 3/4 HP.

208/230/460V 60 Hz, 3-phase, 1 HP.

575V 60 Hz, 3-phase, 1/2 HP.

575V 60 Hz, 3-phase, 3/4 HP.

575V 60 Hz, 3-phase, 1 HP.

* + - * 1. Motor Control and Enclosure: LiftMaster Logic 5.0 motor control shall be UL- approved microprocessor solid-state type and shall include the capability to select one of 7 wiring types; additional features shall include a maintenance alert diagnostic system, programmable Timer-to-Close with timer defeat input, mid-stop programming capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster Logic 5.0 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ 2.0 Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory up to (30) 3-button remote controls (or 90 single-button remote controls) plus 30 wireless keypads, or an unlimited number of trinary DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.

Internet Connectivity: MyQ Technology.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop functionality shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
        2. Door Drive: Full No. 50 roller chain; operator shall be equipped with an electrically interlocked, floor level disconnect and chain hoist for manual operation.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes, sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: connects a 2-wire monitored sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross-beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        2. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        3. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        4. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        5. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Heavy Industrial-Duty Gear-Reduced Operator: LiftMaster GH Heavy Industrial-Duty Gear-Reduced Operator, continuous-duty high-starting torque motor with overload protection and emergency chain hoist with electric interlock.
       1. Electric Operator: Industrial-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, wormgear reduction unit, electric solenoid-actuated brake, manually operated chain hoist, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; operator shall be capable of driving door at a speed of approximately 8 to 9 inches (203 to 229 mm) per second.
          1. Primary Speed Reduction Device: Wormgear-in-oil-bath gear reducer with synthetic "All Climate" oil with 43:1 to 45:1 speed reduction; permanently lubricated ball bearings on output shaft and output and door driven sprockets.
          2. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position.
          3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
          4. Electric Motor: High-starting torque, continuous-duty, industrial-type motor protected against overload by current sensing and thermal overload devices. For single-phase applications, incoming voltage field-selectable between 115V and 230V, 60 Hz by properly positioning connector. For 3-phase applications, incoming voltage field-selectable between 208V, 230V and 460V, 60 Hz by properly positioning connector.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

Motor Specification:

115/230V 60 Hz, single phase, 1/2 HP.

115/230V 60 Hz, single phase, 3/4 HP.

115/230V 60 Hz, single phase, 1 HP.

115/230V 60 Hz, single phase, 1-1/2 HP.

208/230/460V 60 Hz, 3-phase, 1/2 HP.

208/230/460V 60 Hz, 3-phase, 3/4 HP.

208/230/460V 60 Hz, 3-phase, 1 HP.

208/230/460V 60 Hz, 3-phase, 1-1/2 HP.

208/230/460V 60 Hz, 3-phase, 2 HP.

208/230/460V 60 Hz, 3-phase, 3 HP.

208/230V 60 Hz, 3-phase, 5 HP.

460V 60 Hz, 3-phase, 5 HP.

575V 60 Hz, 3-phase, 1/2 HP.

575V 60 Hz, 3-phase, 3/4 HP.

575V 60 Hz, 3-phase, 1 HP.

575V 60 Hz, 3-phase, 1-1/2 HP.

575V 60 Hz, 3-phase, 2 HP.

575V 60 Hz, 3-phase, 3 HP.

575V 60 Hz, 3-phase, 5 HP.

* + - * 1. Motor Control and Enclosure: LiftMaster Logic 5.0 motor control shall be UL- approved microprocessor solid-state type and shall include the capability to select one of 7 wiring types; additional features shall include a maintenance alert diagnostic system, programmable Timer-to-Close with timer defeat input, mid-stop programming capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6. (5 HP motor does not have Logic control features.)

Radio Receiver: LiftMaster Logic 5.0 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ 2.0 Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory up to (30) 3-button remote controls (or 90 single-button remote controls) plus 30 wireless keypads, or an unlimited number of trinary DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference. (Standard Security+ Radio Receiver for 5 HP operator.)

Internet Connectivity: MyQ Technology.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

5 HP operator does not have standard Internet connectivity.

Contactor-Style (Mechanical) Motor Starter, Control and Enclosure: Motor starter shall be an across-the-line, mechanically interlocked, magnetic-reversing contactor; motor control shall be housed in a NEMA 1 enclosure integral to the operator; control enclosures shall conform to ANSI/NEMA ICS 6. 5 HP operator offered in contactor-style (mechanical) only.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop functionality shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
        2. Door Drive: Operator shall be equipped with roller chain and sprockets as specified below, an electrically interlocked, floor level disconnect, a chain hoist for manual operation and an electric solenoid-actuated brake to stop motor and hold the door in any position:

\*\* NOTE TO SPECIFIER \*\* Delete option not required.

Roller Chain and Sprocket: 50B40 door sprocket and No. 50 drive chain, motor rated up to 1 HP.

Roller Chain and Sprockets: 50B60 door sprocket and No. 50 drive chain, motor rated from 1-1/2 HP to 2 HP.

Roller Chain and Sprockets: 80B60 door sprocket and No. 80 drive chain, motor rated at 3 HP.

Roller Chain and Sprockets: As required for 5HP based upon door specification.

* + - 1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes, sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross-beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Medium-Duty Operator: LiftMaster MH Medium-Duty Logic Hoist Operator, limited-duty (recommended duty of 12 cycles per hour), high-starting torque motor with overload protection and emergency chain hoist with electric interlock.
       1. Electric Operator: Medium-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, emergency floor-level manual chain hoist mechanism with electrical interlock, electric solenoid-actuated brake, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; operator shall provide a door speed of approximately 8 to 9 inches (203 to 229 mm) per second.
          1. Primary Speed Reduction: Heavy-duty 4L V-belt and No. 41 chain and sprocket with sprocket reduced secondary; operator shall be equipped with adjustable friction clutch and output and door driven sprockets.
          2. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position.
          3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
          4. Electric Motor: High-starting torque, 115V, single-phase, 1/2 HP motor with an internal automatic reset thermal overload device to protect against overload.
          5. Motor Control and Enclosure: LiftMaster medium-duty Logic motor control shall be a microprocessor solid-state type PCB; the control board shall provide the capability to select one of 2 wiring types, diagnostic LEDs for operator status and troubleshooting, programmable Timer-to-Close with timer defeat capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster medium-duty Logic on-board, 3-channel 315 MHz receiver external antenna; equipped to accept Security+ Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory for up to 20 Security+ remote controls or an unlimited number of trinary DIP switch remote controls.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop within a NEMA 1 Type enclosure.
        2. Door Drive: Full No. 41 roller chain; operator shall be equipped with an electrically interlocked, floor level disconnect and chain hoist for manual operation.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes, sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface Connects a 2-wire monitored sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross-beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge shall reverse a closing door to the full open position when an obstruction is sensed.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Medium-Duty Operator: LiftMaster MHS Medium-Duty Logic Slow-Speed Hoist Operator for Rolling Sheet Doors, limited-duty (recommended duty of 12 cycles per hour), high-starting torque motor with overload protection and emergency chain hoist with electric interlock.
       1. Electric Operator: Medium-duty assembly, UL listed and UL labeled, with electric motor and factory-prewired motor controls, emergency floor-level manual chain hoist mechanism with electrical interlock, electric solenoid-actuated brake, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; operator shall provide a door speed of approximately 4 to 5 inches (203 to 229 mm) per second.
          1. Primary Speed Reduction: Heavy-duty 4L V-belt and No. 41 chain and sprocket with sprocket reduced secondary; operator shall be equipped with adjustable friction clutch and output and door driven sprockets.
          2. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position.
          3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
          4. Electric Motor: High-starting torque, 115V, single-phase, 1/2 HP motor with an internal automatic reset thermal overload device to protect against overload.
          5. Motor Control and Enclosure: LiftMaster medium-duty Logic motor control shall be a microprocessor solid-state type PCB; the control board shall provide the capability to select one of 2 wiring types, diagnostic LEDs for operator status and troubleshooting, programmable Timer-to-Close with timer defeat capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster medium-duty Logic on-board, 3-channel 315 MHz receiver external antenna; equipped to accept Security+ Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory for up to 20 Security+ remote controls or an unlimited number of trinary DIP switch remote controls.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop within a NEMA 1 Type enclosure.
        2. Door Drive: Full No. 41 roller chain; operator shall be equipped with an electrically interlocked, floor-level disconnect and chain hoist for manual operation.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross- beam infrared detection Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. JACKSHAFT-TYPE DOOR OPERATORS
     1. Industrial-Duty Operator with Internal Door Lock Sensor: LiftMaster Industrial-Duty Operators with internal door lock sensor, continuous-duty, high-starting torque motor with overload protection, internal door lock sensor to prevent accidental operation of a locked door and emergency disconnect for manual door operation.

\*\* NOTE TO SPECIFIER \*\* Delete model not required.

* + - 1. Model: LiftMaster DJ.
      2. Model: LiftMaster BDJ.
      3. Electric Operator: Industrial-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, internal door lock sensor, positive locking mechanical system acting as a holding brake, an emergency disconnect for manual operation of the door, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; provides door speed of approximately 8 to 9 inches (203 to 229 mm) per second.
         1. Drive Reduction: Heavy-duty 5L V-belt primary reduction and chain/sprocket secondary and third stage reduction; all reduction sprockets and pulleys shall be drilled and pinned to steel shafts plated for resistance to corrosion; operator shall be equipped with permanently lubricated ball bearings on output shaft, adjustable friction clutch, floor-level disconnect and output and door driven sprockets.
         2. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position. Optional on 1/2 HP. Standard on 3/4 HP.
         3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
         4. Electric Motor: High-starting torque, continuous-duty, industrial-type motor protected against overload by current sensing and thermal overload devices. For single-phase applications, incoming voltage field-selectable between 115V and 230V, 60 Hz by properly positioning connector. For 3-phase applications, incoming voltage field-selectable between 208V, 230V and 460V, 60 Hz by properly positioning connector.

Motor Specification:

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

115/230V 60 Hz, single phase, 1/2 HP.

115/230V 60 Hz, single phase, 3/4 HP.

208/230/460V 60 Hz, 3-phase, 1/2 HP.

208/230/460V 60 Hz, 3-phase, 3/4 HP.

575V 60 Hz, 3-phase, 1/2 HP.

575V 60 Hz, 3-phase, 3/4 HP.

* + - * 1. Motor Control and Enclosure: LiftMaster Logic 5.0 motor control shall be UL-approved microprocessor solid-state type and shall include the capability to select one of 7 wiring types; additional features shall include a maintenance alert diagnostic system, programmable Timer-to-Close with timer defeat input, mid-stop programming capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster Logic 5.0 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ 2.0 Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory for up to (30) 3-button remote controls (or 90 single-button remote controls) plus 30 wireless keypads, or an unlimited number of trinary DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.

Internet Connectivity: MyQ Technology.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - * 1. Internal Door Lock Sensor: Sensing circuit to stop operator when door is locked.
        2. Door Drive: Full No. 50 roller chain; operator shall be equipped with a floor-level disconnect for manual operation of the door.
        3. Control Station sold separately due to door lock. (Control Station is typically key lock or push button.)
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Connects a 2-wire monitored sensing edge; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross- beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Industrial-Duty Operator: LiftMaster Industrial-Duty Wall-Mount Operators, continuous-duty, high-starting torque motor with overload protection and emergency disconnect for manual door operation.

\*\* NOTE TO SPECIFIER \*\* Delete model not required.

* + - 1. Model: LiftMaster J.
      2. Model: LiftMaster BJ.
      3. Electric Operator: Industrial-duty assembly, cULus listed and cULus labeled, complete with electric motor and factory-prewired motor controls, positive locking mechanical system acting as a holding brake, emergency disconnect for manual operation of the door, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; operator shall be capable of driving door at a speed of approximately 8 to 9 inches (203 to 229 mm) per second.
         1. Drive Reduction: Heavy-duty 5L V-belt primary reduction and chain/sprocket secondary and third stage reduction; all reduction sprockets and pulleys shall be drilled and pinned to steel shafts plated for resistance to corrosion; operator shall be equipped with permanently lubricated ball bearings on output shaft, adjustable friction clutch and output and door driven sprockets.
         2. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position. Optional on 1/3 HP and 1/2 HP. Standard on 3/4 HP and 1 HP.
         3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
         4. Electric Motor: High-starting torque, continuous-duty, industrial-type motor protected against overload by current sensing and thermal overload devices. For single-phase applications, incoming voltage field-selectable between 115V and 230V, 60 Hz by properly positioning connector. For 3-phase applications, incoming voltage field-selectable between 208V, 230V and 460V, 60 Hz by properly positioning connector.

Motor Specification:

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

115/230V 60 Hz, single phase, 1/3 HP.

115/230V 60 Hz, single phase, 1/2 HP.

115/230V 60 Hz, single phase, 3/4 HP.

115/230V 60 Hz, single phase, 1 HP.

208/230/460V 60 Hz, 3-phase, 1/3 HP

208/230/460V 60 Hz, 3-phase, 1/2 HP.

208/230/460V 60 Hz, 3-phase, 3/4 HP.

208/230/460V 60 Hz, 3-phase, 1 HP.

575V 60 Hz, 3-phase, 1/2 HP.

575V 60 Hz, 3-phase, 3/4 HP.

575V 60 Hz, 3-phase, 1 HP.

* + - * 1. Motor Control and Enclosure: LiftMaster Logic 5.0 motor control shall be UL-approved microprocessor solid-state type and shall include the capability to select one of seven wiring types; additional features shall include a maintenance alert diagnostic system, programmable Timer-to-Close with timer defeat input, mid-stop programming capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster Logic 5.0 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ 2.0 Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory for up to (30) 3-button remote controls (or 90 single-button remote controls) plus 30 wireless keypads, or an unlimited number of trinary DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.

Internet Connectivity: MyQ Technology.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop functionality shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
        2. Door Drive: Full No. 50 roller chain; operator shall be equipped with a floor-level disconnect for manual operation of the door.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode other than basic constant contact on the "Close" button of the 3-button station to lower the door, one of the following UL-approved and UL-listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Connects a 2-wire monitored sensing edge; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface; connects a 2-wire monitored sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface, connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross- beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Medium-Duty Operator: LiftMaster MGJ Medium-Duty Logic Gear-Reduced Operator, limited-duty (recommended duty of 12 cycles per hour), high-starting torque motor with overload protection and emergency disconnect for manual door operation.
       1. Electric Operator: Medium-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, emergency floor-level disconnect for manual operation, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; operator shall provide a door speed of approximately 8 to 9 inches (203 to 229 mm) per second.
          1. Primary Speed Reduction: Wormgear-in-oil-bath reducer; operator equipped with floor-level disconnect and output and door driven sprockets.
          2. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
          3. Electric Motor: High-starting torque, 115V, single-phase, 1/2 HP motor with an internal automatic reset thermal overload device to protect against overload.
          4. Motor Control and Enclosure: LiftMaster medium-duty Logic motor control shall be a microprocessor solid-state type PCB; the control board shall provide the capability to select one of 2 wiring types, diagnostic LEDs for operator status and troubleshooting, programmable Timer-to-Close with timer defeat capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster medium-duty Logic on-board, 3-channel 315 MHz receiver external antenna; equipped to accept Security+ Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory for up to 20 Security+ remote controls or an unlimited number of trinary DIP switch remote controls.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop within a NEMA 1 Type enclosure.
        2. Door Drive: Full No. 41 roller chain; operator shall be equipped with an electrically interlocked, floor-level disconnect for manual operation.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode other than basic constant contact on the "Close" button of the 3-button station to lower the door, one of the following UL-approved and UL-listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored sensing edge.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored sensing edge.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross- beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Medium-Duty Operator: LiftMaster MJ Medium-Duty Logic Wall-Mount Operator, limited-duty (recommended duty of 12 cycles per hour), high-starting torque motor with overload protection and emergency disconnect for manual door operation.
       1. Electric Operator: Medium-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, emergency floor-level manual chain hoist mechanism with electrical interlock, electric solenoid-actuated brake, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; operator shall provide a door speed of approximately 8 to 9 inches (203 to 229 mm) per second.
          1. Primary Speed Reduction: Heavy-duty 4L V-belt and No. 41 chain and sprocket with sprocket reduced secondary; operator shall be equipped with adjustable friction clutch and output and door driven sprockets.
          2. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position.
          3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
          4. Electric Motor: High-starting torque, 115V, single-phase, 1/2 HP motor with an internal automatic reset thermal overload device to protect against overload.
          5. Motor Control and Enclosure: LiftMaster medium-duty Logic motor control shall be a microprocessor solid-state type PCB; the control board shall provide the capability to select one of 2 wiring types, diagnostic LEDs for operator status and troubleshooting, programmable Timer-to-Close with timer defeat capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster medium-duty Logic on-board, 3-channel 315 MHz receiver external antenna; equipped to accept Security+ Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory for up to 20 Security+ remote controls or an unlimited number of trinary DIP switch remote controls.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop within a NEMA 1 Type enclosure.
        2. Door Drive: Full No. 41 roller chain; operator shall be equipped with a floor-level disconnect for manual operation of the door.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode other than basic constant contact on the  
"Close" button of the 3-button station to lower the door, one of the following UL-approved and UL-listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately and can be field-cut to required length.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross- beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Light-Duty Jackshaft Operator: LiftMaster LJ8900W Light-Duty Wall-Mount Operator, limited-duty (recommended duty of 10 cycles per hour maximum).
       1. Standard and high-lift (maximum 5 feet [1524 mm] high-lift) sectional doors with torsion assemblies, measuring up to 14 feet (4267 mm) high and up to 18 feet (5486 mm) wide, but not exceeding 180 square feet (16.7 sq. m) or 650 pounds (295 kg).
       2. Electric Operator: Light-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, emergency release handle, 1-button control station and accessories required for proper operation. UL 325 compliant operation.
          1. Electric Motor: Heavy-duty 12V DC motor provides ultra-quiet operation, along with variable-speed smooth start and stop. Quick-connect terminals and 6-foot (1829 mm) power cord. 120V AC, 60 Hz input voltage.
          2. Cable Tension Monitor: Door shall reverse when excessive cable slack is detected.

\*\* NOTE TO SPECIFIER \*\* Controls with 2 and 3 buttons are available.

* + - * 1. 1-button station for open and close functions with type B2 control wiring (standard for all operators).
      1. Radio Receiver: LiftMaster Security Plus 2.0 on-board equipped to accept Security Plus 2.0 Rolling Code Technology remote controls and Encrypted DIP switch remote controls, with memory for up to (13) 3-button remote controls (or 40 single-button remote controls) plus 4 wireless keypads, or an unlimited number of DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.
         1. Internet Connectivity: MyQ Technology and/or WIFI 802.11.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - 1. Primary Entrapment Protection Devices:
         1. The Protector System Safety Reversing Sensors: A "non-contact" photo safety sensor designed to sense an obstruction and signal the door operator to reverse to open.
      2. Accessories: Provide the following.

\*\* NOTE TO SPECIFIER \*\* Delete accessories not required.

* + - * 1. LiftMaster 841LM Automatic Power Door Lock: Prevents the door from being manually forced open once fully closed.
        2. LiftMaster 485LM Battery Backup System: Operates the door operator for up to 20 full cycles within a 24-hour period.
        3. LiftMaster 480LMB Alternate Mounting Kit: Allows operator to be mounted below the torsion bar.
        4. LiftMaster 827LM MyQ Remote LED Light: Adds 1500 lumens of light with adjustable light time delay; maximum number of 10 lights can be added.
        5. LiftMaster KPW5 Wireless Key Pad: Wireless access controlled keypad with up to 5 access codes and 10 unique temporary PINs.
        6. KPW250 Wireless Key Pad: Wireless access controlled keypad with 250 access codes and 10 unique temporary PINs.
        7. LiftMaster LC-36A Light Curtain: Provides 36 inches of cross-bean infrared detection. When beams are interrupted, door will stop, and reverse. Must be used with a primary monitored entrapment device. Can be used in pairs and separate along the plane of the door for maximum vertical coverage. Can be powered off the operator's A/C accessory power supply or with an optional 100MAPS External DC Power Supply, as applicable.
        8. LiftMaster 811LM 1-button Encrypted DIP Remote Control.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Light-Duty Jackshaft Operator: LiftMaster LJ8950W Light-Duty Wall-Mount Operator, limited-duty (recommended duty of 10 cycles per hour maximum).
       1. Commercial rolling sheet doors with live or dead shaft measuring up to 12 feet (3658 mm) high and up to 14 feet (4267 mm) wide, but not exceeding 168 sq. feet (15.6 sq. m) or 650 pounds (295 kg).
       2. Electric Operator: Light-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, emergency release, 1-button control station and accessories required for proper operation. UL 325 compliant operation. Live and dead shaft sprocketing standard.
          1. Electric Motor: Heavy-duty 12V DC motor provides ultra-quiet operation, along with variable-speed smooth start and stop. Quick-connect terminals and 6-foot (1829 mm) power cord. 120V AC, 60 Hz input voltage.

\*\* NOTE TO SPECIFIER \*\* Controls with 2 and 3 buttons are available.

* + - * 1. 1-button station for open and close functions with type B2 control wiring (standard for all operators).
      1. Radio Receiver: LiftMaster Security+2.0 on-board equipped to accept Security+ 2.0 Rolling Code Technology remote controls and Encrypted DIP switch remote controls, with memory for up to (13) 3-button remote controls (or 40 single-button remote controls) plus 4 wireless keypads, or an unlimited number of DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.
         1. Internet Connectivity: MyQ Technology and/or WIFI 802.11.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - 1. Primary Entrapment Protection Devices:
         1. The Protector System Safety Sensors: A "non-contact" photo safety sensor designed to sense an obstruction and signal the door operator to reverse to open.
      2. Accessories: Provide the following.

\*\* NOTE TO SPECIFIER \*\* Delete accessories not required.

* + - * 1. LiftMaster 3950CGJ Chain Guard with Mounting Clip: Required for applications where the LJ8950W is mounted less than 8 feet from the floor.
        2. LiftMaster 485LM Battery Backup System: Operates the door operator for up to 20 full cycles within a 24-hour period
        3. LiftMaster 3950-41-dS: For door applications without a live shaft such as self-storage facility requiring a heavier No. 41 chain, in place of No. 48 chain.
        4. LiftMaster 827LM MyQ Remote LED Light: Adds 1500 lumens of light with adjustable light time delay; unlimited number of lights can be added.
        5. LiftMaster KPW5 Wireless Key Pad: Wireless access controlled keypad with up to 5 access codes and 10 unique temporary PINs.
        6. LiftMaster KPW250 Wireless Key Pad: Wireless access controlled keypad with 250 access codes and 10 unique temporary PINs.
        7. LiftMaster LC-36A: Provides 36 inches of cross-bean infrared detection. When beams are interrupted, door will stop, and reverse. Must be used with a primary monitored entrapment device. Can be used in pairs and separate along the plane of the door for maximum vertical coverage. Can be powered off the operator's A/C accessory power supply or with an optional 100MAPS External DC Power Supply, as applicable.
        8. LiftMaster 811LM 1-button Encrypted DIP Remote Control.
    1. Light-Duty Jackshaft Operator: LiftMaster DDO8900W Light-Duty Wall-Mount Operator, limited-duty (recommended duty of 10 cycles per hour maximum).
       1. High-lift (maximum 54 inch (1372 mm) high-lift) and full vertical lift sectional doors with torsion assemblies, measuring up to 14 feet (4267 mm) high and up to 18 feet (5486 mm) wide, but not exceeding 180 square feet (16.7 sq. m) or 300 pounds (136 kg).
       2. Electric Operator: Light-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, emergency release handle, 3-button control station and accessories required for proper operation. UL 325 compliant operation.
          1. Electric Motor: Heavy-duty 12V DC motor provides ultra-quiet operation, along with variable-speed smooth start and stop. Quick-connect terminals and 6-foot (1829 mm) power cord. 120V AC, 60 Hz input voltage.
          2. Cable Tension Monitor: Door shall reverse when excessive cable slack is detected.

\*\* NOTE TO SPECIFIER \*\* Controls with 2 and 3 buttons are available.

* + - * 1. 3-button station for open/close/stop functions with type B2 control wiring (standard for all operators).
      1. Radio Receiver: LiftMaster Security+2.0 on-board equipped to accept Security+ 2.0 Rolling Code Technology remote controls and Encrypted DIP switch remote controls, with memory for up to (13) 3-button remote controls (or 40 single-button remote controls) plus 4 wireless keypads, or an unlimited number of DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.
         1. Internet Connectivity: MyQ Technology and/or WIFI 802.11.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - 1. LMi5: LiftMaster interface device: When operator is connected via the internet to the MyQ Business Facility platform, this device enables Dock Door Session feature to monitor up to 5 dry contact sensors around the dock door (i.e., dock leveler, truck restraint, trailer presence, and more) that provides productivity at the dock door when a truck is present and loading/unloading).
      2. Primary Entrapment Protection Devices:
         1. The Protector System Safety Reversing Sensors: A "non-contact" photo safety sensor designed to sense an obstruction and signal the door operator to reverse to open.
      3. Accessories: Provide the following.

\*\* NOTE TO SPECIFIER \*\* Delete accessories not required.

* + - * 1. LiftMaster 841LM Automatic Power Door Lock: Prevents the door from being manually forced open once fully closed (Qty 2 capable)
        2. LiftMaster 485LM Battery Backup System: Operates the door operator for up to 20 full cycles within a 24-hour period.
        3. LiftMaster 480LMB Alternate Mounting Kit: Allows operator to be mounted below the torsion bar.
        4. LiftMaster 827LM MyQ Remote LED Light: Adds 1500 lumens of light with adjustable light time delay; maximum 10 number of lights can be added.
        5. LiftMaster KPW5 Wireless Key Pad: Wireless access controlled keypad with up to 5 access codes and 10 unique temporary PINs.
        6. KPW250 Wireless Key Pad: Wireless access controlled keypad with 250 access codes and 10 unique temporary PINs.
        7. LiftMaster LC-36A Light Curtain: Provides 36 inches of cross-bean infrared detection. When beams are interrupted, door will stop, and reverse. Must be used with a primary monitored entrapment device. Can be used in pairs and separate along the plane of the door for maximum vertical coverage. Can be powered off the operator's A/C accessory power supply or with an optional 100MAPS External DC Power Supply, as applicable.
        8. LiftMaster 811LM 1-button Encrypted DIP Remote Control.
        9. LiftMaster 813LM 3-button Encrypted DIP Remote Control for open/close/stop functionality.External Sensor Options (for use with the LMi5 interface device to monitor status of equipment around the dock door space - All devices requiring power must be powered by an external power supply and cannot be powered by the LMi5 device - see 100MAPS External DC Power Supply:

PRE-SENSOR: Trailer Presence Sensor - mounts externally over the dock door to detect when a trailer is present.

WS-SENSOR: Mechanical limit switch to monitor status of dock leveler (stored or deployed) or truck restraint (engaged or disengaged)

WS-SENSOR-E: photoelectric switch to monitor status of dock leveler (stored or deployed) or truck restraint (engaged or disengaged)

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. INDUSTRIAL-DUTY DOOR OPERATORS FOR SLIDING DOORS
     1. Heavy Industrial-Duty Operators: LiftMaster GSD Heavy Industrial-Duty Slide Door Operator, continuous-duty high-starting torque motor with overload protection and emergency disconnect for manual operation.
        1. Electric Operator: Heavy industrial-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; door speed of approximately 11 to 12 inches (279 to 304 mm) per second.
           1. Primary Speed Reduction Device: Wormgear-in-oil-bath gear reducer with synthetic "All Climate" oil with 45:1 speed reduction; sprockets and pulleys shall be drilled and pinned to steel shafts and all shafts shall be plated for resistance to corrosion; operator shall be equipped with adjustable friction clutch, quick-disconnect door arm for manual door operation and permanently lubricated ball bearings on output shaft.
           2. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position.
           3. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
           4. Electric Motor: High-starting torque, continuous-duty, industrial-type motor protected against overload by current sensing and thermal overload devices. For single-phase applications, incoming voltage field-selectable between 115V and 230V, 60 Hz by properly positioning connector. For 3-phase applications, incoming voltage field-selectable between 208V, 230V and 460V, 60 Hz by properly positioning connector.

Motor Specification:

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specifications not required.

115/230V 60 Hz, single phase, 1/2 HP.

115/230V 60 Hz, single phase, 3/4 HP.

115/230V 60 Hz, single phase, 1 HP.

115/230V 60 Hz, single phase, 1-1/2 HP.

208/230/460V 60 Hz, 3-phase, 1/2 HP.

208/230/460V 60 Hz, 3-phase, 3/4 HP.

208/230/460V 60 Hz, 3-phase, 1 HP.

208/230/460V 60 Hz, 3-phase, 1-1/2 HP.

575V 60 Hz, 3-phase, 1/2 HP.

575V 60 Hz, 3-phase, 3/4 HP.

575V 60 Hz, 3-phase, 1 HP.

575V 60 Hz, 3-phase, 1-1/2 HP.

* + - * 1. Motor Control and Enclosure: LiftMaster Logic 5.0 motor control shall be UL- approved microprocessor solid-state type and shall include the capability to select one of 7 wiring types; additional features shall include a maintenance alert diagnostic system, programmable Timer-to-Close with timer defeat input, mid-stop programming capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster Logic 5.0 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ 2.0 Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory for up to (30) 3-button remote controls (or 90 single-button remote controls) plus 30 wireless keypads, or an unlimited number of trinary DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.

Internet Connectivity: MyQ Technology.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop functionality shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
        2. Track: Heavy-duty, double-angle, 11-gauge galvanized steel.
        3. Door Drive: No. 41 roller chain with emergency disconnect for manual door operation.
        4. Trolley Assembly: 2 inches H x 2 inches W (51 mm H x 51 mm W) galvanized steel rails with cast aluminum trolley along with plated steel rail spacers on nylon chain guide assembly; angle brackets provided for wall-mounting.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - * 1. Operator Modifications:

\*\* NOTE TO SPECIFIER \*\* Delete options not required.

Provide damp environment operator modification for applications where severe moisture, but not direct spray, is present.

Provide NEMA 4 operator modification for applications where operator is subjected to direct water spray and/or water-tight/oil-tight/dust-tight protection is required.

Provide NEMA 4X operator modification for applications where operator is subjected to direct water spray, water-tight/oil-tight/dust-tight protection is required and/or corrosion resistance is required.

* + - 1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately and can be field-cut to required length.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Interface: Connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, Primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross-beam infrared detection.Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Industrial-Duty Operators: LiftMaster SD Industrial-Duty Slide Door Operator, continuous-duty high-starting torque motor with overload protection and emergency disconnect for manual door operation.
       1. Electric Operator: Industrial-duty assembly, cULus listed and cULus labeled, with electric motor and factory-prewired motor controls, internal auxiliary reversal circuit, 3-button open/close/stop control station, conduit-encased wiring from control circuit to motor, and accessories required for proper operation; door speed of approximately 11 inches (279 mm) per second.
          1. Drive Reduction: Heavy-duty 5L V-belt and chain/sprocket secondary; all reduction sprockets and pulleys shall be drilled and pinned to steel shafts plated for resistance to corrosion; operator shall be equipped with permanently lubricated ball bearings on output shaft, adjustable friction clutch and door disconnect mechanism to facilitate manual operation.

\*\* NOTE TO SPECIFIER \*\* Brake is standard on 3/4 HP and 1 HP models; brake is optional on 1/3 HP and 1/2 HP models and must be specified if desired. Delete if not required.

* + - * 1. Brake: Electric solenoid-actuated brake capable of stopping and holding a door at any position
        2. Limit Switches: Fully adjustable, linear-driven limit mechanism synchronizing operator with door; low-friction nylon limit nuts fitted on threaded steel shaft that rotates on oil-tight self-lubricating bronze bushings; motor shall be removable without affecting limit switch settings.
        3. Electric Motor: High-starting torque, continuous-duty, industrial-type motor protected against overload by current sensing and thermal overload devices. For single-phase applications, incoming voltage field-selectable between 115V and 230V, 60 Hz by properly positioning connector. For 3-phase applications, incoming voltage field-selectable between 208V, 230V and 460V, 60 Hz by properly positioning connector.

Motor Specification:

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

115/230V 60 Hz, single phase, 1/2 HP.

115/230V 60 Hz, single phase, 3/4 HP.

115/230V 60 Hz, single phase, 1 HP.

208/230/460V 60 Hz, 3-phase, 1/2 HP.

208/230/460V 60 Hz, 3-phase, 3/4 HP.

208/230/460V 60 Hz, 3-phase, 1 HP.

575V 60 Hz, 3-phase, 1/2 HP.

575V 60 Hz, 3-phase, 3/4 HP.

575V 60 Hz, 3-phase, 1 HP.

* + - * 1. Motor Control and Enclosure: LiftMaster Logic 5.0 motor control shall be UL- approved microprocessor solid-state type and shall include the capability to select one of 7 wiring types; additional features shall include a maintenance alert diagnostic system, programmable Timer-to-Close with timer defeat input, mid-stop programming capabilities and a maximum run timer to provide motor overrun protection; motor control shall be housed in a NEMA 1 enclosure integral to the operator and shall conform to ANSI/NEMA ICS 6.

Radio Receiver: LiftMaster Logic 5.0 on-board, 3-channel receiver with standard external antenna; equipped to accept Security+ 2.0 Rolling Code Technology remote controls and trinary DIP switch remote controls, with memory for up to (30) 3-button remote controls (or 90 single-button remote controls) plus 30 wireless keypads, or an unlimited number of trinary DIP switch remote controls. Tri-band frequency (310/315/390 MHz) sends multiple radio signals to bypass radio interference.

Internet Connectivity: MyQ Technology.

902 to 928 MHz.

50-channel FHSS (Frequency Hopping Spread Spectrum).

LiftMaster 828LM Internet Gateway enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.

Provides two-way communication between commercial door operator and MyQ Accessories to enable remote open, close and monitoring of commercial door.

* + - * 1. 3-Button Control Station: 3-button station providing open/close/stop functionality shall be NEMA Type 1 with maintenance alert indicator to signal intervals for routine door and operator maintenance.
        2. Track: Heavy-duty, double-angle, 11-gauge galvanized steel.
        3. Door Drive: No. 41 roller chain drive with emergency disconnect for manual door operation.
        4. Trolley Assembly: 2 inches H x 2 inches W (51 mm H x 51 mm W) galvanized steel rails with cast aluminum trolley along with plated steel rail spacers on a nylon chain guide assembly; angle brackets provided for wall mounting.
      1. Primary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* For any type of operating mode or features beyond basic constant contact on the 3-button station "Close" button to lower the door, one of the following UL-approved and listed monitored entrapment protection devices must be connected directly to the LiftMaster Logic 5.0 Operator. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective Photo Eyes sensor system.

\*\* NOTE TO SPECIFIER \*\* Delete options for motor specification not required.

* + - * 1. NEMA 6 Monitored Optical Edge System (OES): Shall reverse a closing door to the full open position when an obstruction is sensed; sensing edge ordered separately and can be field-cut to required length.
        2. Monitored Sensing Edge Interface:

LiftMaster CPS-MEI Monitored Sensing Edge Interface: Connects a 2-wire monitored sensing edge; sensing edge ordered separately.

LiftMaster CPS-EI Monitored Sensing Edge Connects a 4-wire monitored sensing edge; sensing edge ordered separately.

* + - * 1. Additional monitored primary entrapment protection devices may be added with the appropriate interface device or plug-in accessory card.
      1. Ancillary Entrapment Protection Devices:

\*\* NOTE TO SPECIFIER \*\* Ancillary entrapment protection devices are optional and can be used to supplement, but not replace, primary entrapment protection devices. Select one of the following and delete options not required.

* + - * 1. NEMA 1 Monitored Photo Sensors: LiftMaster CPS-U Monitored Photo Eyes, non-contact, infrared beam photo sensor system.
        2. NEMA 4 Monitored Photo Sensors: LiftMaster CPS-UN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        3. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-OPEN4 Monitored Photo Eyes, non-contact, photo beam reversing photo sensor system.
        4. NEMA 4X Monitored Photo Sensors: LiftMaster CPS-RPEN4 Monitored Retro-reflective photo eyes sensor system.
        5. Light Curtains: LiftMaster LC-36A light curtains to provide 36 inches of cross- beam infrared detection. Powered by the operator's A/C accessory power supply or via an optional 100MAPS External DC Power Supply as applicable.
        6. Retro-reflective Photo Sensors: LiftMaster CPS-RN4 Retro-reflective Photo Eyes non-monitored, non-contact, infrared beam photo sensor with polarized reflector for use in conjunction with the LiftMaster CPS-EI Monitored Sensing Edge and monitored 4-wire sensing edge.
        7. NEMA 6 Optical Edge System (OES): 2-wire non-monitored electric edge.
        8. Non-Monitored Electric Sensing Edge: 2-wire non-monitored electric edge.
        9. Pneumatic Sensing Edge: Pneumatic (air hose) sensing edge.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. COMMERCIAL OVERHEAD OPERATORS
     1. Commercial Overhead Operators: LiftMaster HCTDCU Series Heavy-Duty, High-Cycle Trolley Overhead Door/Gate Operators.
        1. LiftMaster HCTDCU Overhead Door and Gate Operator:

\*\* NOTE TO SPECIFIER \*\* Delete models not required.

* + - * 1. HCTDCPKGUL08 - 8 feet (2438 mm) tall door/gate.
        2. HCTDCPKGUL10 - 10 feet (3048 mm) tall door/gate.
        3. HCTDCPKGUL12 - 12 feet (3658 mm) tall door/gate.
        4. HCTDCPKGUL14 - 14 feet (4267 mm) tall door/gate.
        5. HCTDCPKGUL16 - 16 feet (4877 mm) tall door/gate.

\*\* NOTE TO SPECIFIER \*\* To be UL 325 Compliant for commercial/industrial applications while allowing momentary contact on a control to close, a minimum of one external monitored safety entrapment protection device must be installed to protect in the closing direction (the inherent reversing system in this operator does not replace this requirement). Alternatively, for commercial/industrial door applications, constant contact on a hard-wired control to close may be employed. To enable the use of momentary contact on a control to close, including portable transmitters and automatic actuation accessories, devices such as monitored photo eyes or edge sensors are required to be installed with this operator.

* + - 1. Compliance: UL Listed. Compliant to the UL 325, UL 991 and CSA C22.2 No. 247 standards.
         1. This model is intended for use in commercial and industrial door applications.
      2. Monitored Safety Inputs: 3 inputs per board (main board and expansion board) totaling 6 inputs with any combination of up to:
         1. Main Board:

1 Monitored Close Photo Eye input.

1 Monitored Open Photo Eye input.

1 Monitored Open Safety Edge or Open Photo Eye input.

* + - * 1. Expansion Board:

2 Monitored Safety Edge or Photo Eye inputs (selectable for Open or Close).

1 Monitored Photo Eye input (selectable for Open or Close).

* + - * 1. 8 Monitored edges available when Transceiver is added.
      1. Electrical Power Requirements:

\*\* NOTE TO SPECIFIER \*\* Delete power option not required.

* + - * 1. 115V AC, single phase.
        2. 230V AC, single phase.
      1. Motor: 24 DC, with soft start/stop operation.
         1. Duty cycle: Continuous.
      2. Capacity:
         1. HCTDCPKGUL08 - 8 feet (2438 mm) tall overhead door or gate up to 700 pounds (318 kg).
         2. HCTDCPKGUL10 - 10 feet (3048 mm) tall overhead door or gate up to 700 pounds (318 kg).
         3. HCTDCPKGUL12 - 12 feet (3658 mm) tall overhead door or gate up to 700 pounds (318 kg).
         4. HCTDCPKGUL14 - 14 feet (4267 mm) tall overhead door or gate up to 700 pounds (318 kg).
         5. HCTDCPKGUL16 - 16 feet (4877 mm) tall overhead door or gate up to 700 pounds (318 kg).
      3. Recommended Cycles per Day: Continuous
      4. Gate/Door Travel Speed: Selectable; Standard Open - up to 8 inches (305 mm) per second; Fast Open - up to 11 inches (279 mm) per second; Fast Close - up to 8 inches (305 mm) per second.
      5. Warranty: 5 years for commercial applications,
      6. Wormgear Reduction: Commercial oil bath gearbox with 28:1 ratio wormgear reduction running in synthetic oil bath.
      7. Battery Backup: Power Management system draws 14.8 mA when gate or door is idle with remote controls programmed. Provides 112 cycles on Battery Backup with two 7Ah batteries.
      8. Standby Time: Proves up to 24 days of standby power in the event of a power loss with two 7Ah batteries (excluding accessories).
      9. Accessory Electrical Power Requirements: 24V DC 500 mA output, switched and unswitched power.
      10. Dynamic Braking System: Adds substantial gate position control at all points in travel. The brake system also prevents the gate or door from being back-driven.
      11. Chassis: Constructed with 1/4 inch (6mm) gold zinc-plated steel for rust prevention.
      12. Trolley Assembly: Heavy-duty 12-gauge steel track with 6 UHMW rollers.
      13. Noise Isolators: Designed for exceptionally quiet performance.
      14. Internet Connectivity: MyQ Technology.
          1. 902 to 928 MHz.
          2. 50-channel FHSS (Frequency Hopping Spread Spectrum).
          3. LiftMaster 828LM Internet Gateway enables monitoring and control of gate operators via internet-enabled smartphone, tablet or computer.
          4. LiftMaster 819LMB MyQ Home Bridge enables monitoring and control of door operators and lighting controls via Internet-enabled smartphone, tablet or computer.
          5. Provides two-way communication between gate operator and MyQ accessories to enable remote open, close and monitoring of gate.
      15. Receiver:
          1. Security+ 2.0 3-channel on-board receiver, holds up to 50 remote controls, HomeLink compatible
          2. HomeLink compatible, version 4 and higher
          3. Transmits 310 MHz, 315 MHz, 390 MHz.
      16. Electronic limits: Maintains accurate limit position throughout travel, even after using the manual release handle.
      17. Soft Stop and Start during mid-travel reversal extends operator life under high-cycle, heavy gate use.
      18. LED Diagnostic Display: Simplifies installation and troubleshooting.
      19. Colored Terminal Blocks: Provides easy identification of safety and fire department inputs.
      20. Programmable Auxiliary Relays: 2 programmable relays with 6 settings each
          1. Pre-warning or gate-in-motion sounder.
          2. Switch on/off devices at open or Close Limits or while gate is in motion.
          3. Tamper detection if gate is pushed off Close Limit.
          4. Cycle quantity feedback.
          5. Red/Green light to control door and gate traffic.
      21. Quick Close, Anti-Tailgate: Closes the door or gate immediately after a vehicle pulls off of interrupt loop.
      22. Sequenced Access Management: Capable of sequentially controlling the operator in tandem with barrier gate.
      23. Plug-in Loop Detector Inputs: Programmed inputs for shadow, interrupt and exit.
      24. Alarm Reset Button: Instantly resets the built-in safety alarm siren.
      25. Fire Department Compliant: Selectable settings allow gate or door to auto open and power failure or battery depletion.
      26. Surge Suppression: Industrial strength on high and low voltage outputs.
      27. Keyed Manual Disconnect: Simple-to-use disconnect allows gate or door to be operated manually and maintain limit position once re-engaged.
      28. Operating Temperature Range: Minus 4 to 140 degrees F (minus 20 to 60 degrees C).
      29. MyQ enabled Accessories:
          1. LiftMaster 828LM Internet Gateway: Allows remote monitoring from internet-enabled computer or smartphone.
          2. LiftMaster 819LMB MyQ Home Bridge: Allows remote monitoring and control from Internet-enabled smartphone, tablet or computer.
          3. LiftMaster 829LM Door and Gate Monitor: Allows remote monitoring and operation.
          4. LiftMaster 823LM Remote Light Switch: Controls light remotely.
          5. LiftMaster 825LM Remote Light Control: Allows remote monitoring and operation.

\*\* NOTE TO SPECIFIER \*\* Delete optional accessories if not required.

* + - 1. Accessories: Safety Monitoring Devices:
         1. Monitored Photo Eyes and Wireless Edge Kits:

LiftMaster LMRRU Reflective Photo Eyes.

LiftMaster CPSUN4G Thru-Bean Photo Eyes.

LiftMaster LMTBU Thru-Beam Photo Eyes.

LiftMaster CPS-OPEN4 Monitored Dual Sided Photo Eye.

LiftMaster LMWEKITU Wireless Edge Kith with Transmitter and Receiver.

LiftMaster LMWETXU Wireless Edge Transceiver.

* + - * 1. Wired Monitored Edges: Can be used with LMWEKITU.

LiftMaster S50 Small Profile Monitored Edge:

LiftMaster S504AL Small Profile Edge, 4 foot (1219 mm) aluminum channel.

LiftMaster S505AL Small Profile Edge, 5 foot (1524 mm) aluminum channel.

LiftMaster S506AL Small Profile Edge, 6 foot (1829 mm) aluminum channel.

LiftMaster L50 Large Profile Monitored Edge:

LiftMaster L504AL Large Profile Edge, 4 foot (1219 mm aluminum channel.

LiftMaster L505AL Large Profile Edge, 5 foot (1521 mm) aluminum channel.

LiftMaster L506AL Large Profile Edge, 6 foot (1829 mm) aluminum channel.

LiftMaster WS4 Wrap-Around 4 foot (1219 mm) square monitored edge.

LiftMaster WS5 Wrap-Around 5 foot (1524 mm) square monitored edge.

LiftMaster WS6 Wrap-Around 6 foot (1829 mm) square monitored edge.

LiftMaster WR4 Wrap-Around 4 foot (1219 mm) round monitored edge.

LiftMaster WR5 Wrap-Around 5 foot (1524 mm) round monitored edge.

LiftMaster WR6 Wrap-Around 6 foot (1829 mm) round monitored edge.

* + - * 1. Optical Edges for Overhead Doors:

LiftMaster OES-SD16; 16 ft (4877 mm) Sectional Door Edge Kit.

LiftMaster OES-SD24; 24 ft (7315 mm) Sectional Door Edge Kit.

LiftMaster OES-5104; 16 ft (4877 mm) 2 x 2 inch (50 x 50 mm) PVC Channel.

* + - 1. Accessories: Provide the optional accessories listed below.
         1. LiftMaster LOOPDETLM Plug-in Loop Detector.
         2. LiftMaster KPW250 Wireless Commercial Keypad.
         3. LiftMaster RGL24LY Red/Green Traffic Light.
         4. LiftMaster 892LT 2-Button Security+ 2.0 Learning Remote Control.
         5. LiftMaster 894LT 4-Button Security+ 2.0 Learning Remote Control.
         6. LiftMaster 811LM 1-button Encrypted DIP Remote Control.
         7. LiftMaster 813LM 3-Button Encrypted DIP Remote Control.
         8. LiftMaster IPAC Internet Protocol Access Control Entry System.
         9. LiftMaster IPACIPDCC IPAC 2 Door IPDC - Cloud.
         10. LiftMaster EL2000SS Stainless Steel Commercial and Gated Community Telephone Entry System.
         11. LiftMaster Star1000 Commercial Access Control Receiver.
         12. LiftMaster PPWR Passport Receiver with Security+ 2.0 Technology.
         13. LiftMaster PPV1 Passport 1-Button Remote.
         14. LiftMaster PPK1 Passport 1-Button Mini Remote.
         15. LiftMaster KPR2000 Single Access Remote Control Keypad and Proximity Reader.
  1. CENTRAL MOTOR DOOR OPERATORS FOR DEAD SHAFT BALANCED ROLLING DOORS.
     1. Operator: A single electric motor secured to the dead shaft of a rolling door. The geared armature rotates a circular crown around the stationary motor and dead shaft, wrapping or unwrapping the door around the crown. Drums the diameter of the crown support the door ends. Limit switches, engaged the brake stopping the motor.
        1. Model: LM-1600; Rated load, 330 lbs (150 kg).
        2. Model: LM-2000, Rated load, 396 lbs (180 kg).
        3. Compliance: IEC, UL 325.
        4. Maximum Door Height: (3.5 m)
        5. Max Shutter Size; Door Area: (16 sq m)
        6. Dead Shaft Diameter: 1.65 to 1.89 inches (42 to 60 mm).
        7. Cycles per Day: 10 maximum.
        8. Lifting Capacity:

\*\* NOTE TO SPECIFIER \*\* Model LM-1600. Delete if not required.

* + - * 1. 330 lbs (150 kg).

\*\* NOTE TO SPECIFIER \*\* Model LM-2000. Delete if not required.

* + - * 1. 396 lbs (180 kg).
      1. Motor Crown: Two-piece die cast aluminum housing.
         1. Crown adapters: Matches crown diameter to shutter mounted door end drums.
         2. Crown and drum diameter: 7-7/8 to 8-11/16 inch (200 to 220 mm).
      2. Electric Motor:
         1. Power supply voltage: 120 VAC; 50 to 60 Hz.
         2. Amps: 5 A (590 W)-(LM-1600; 5.5A (635W (LM-2000)
         3. Drive torque (range):

\*\* NOTE TO SPECIFIER \*\* Model LM-1600. Delete if not required.

110.6 ft-lbs (150 Nm).

\*\* NOTE TO SPECIFIER \*\* Model LM-2000. Delete if not required.

132.7 ft-lbs (180 Nm).

* + - * 1. Winding flange speed: 12 rpm.
        2. Overload protection: 4 minutes with reset.
        3. Thermal Protection: 311 degrees F (155 degrees C)
        4. Insulation class: F
        5. Operation temperature range: 23 to 95 degrees F (minus 5 to 35 degrees C)
      1. Brake: Electric, with manual override release.
      2. Limit switches: Electro mechanical, cam actuated, internal to door operator.
      3. Motor Control and Enclosure Station: Key lock box, water resistant, constant pressure operating switch and manual brake release.

1. EXECUTION
   1. EXAMINATION AND PREPARATION
      1. Do not proceed with installation until substrates have been properly prepared and deviations from manufacturer's recommended tolerances are corrected.
      2. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions. Commencement of installation constitutes acceptance of conditions.
   2. INSTALLATION
      1. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction. Test for proper operation and adjust until satisfactory results are obtained. Demonstrate operation to owner's personnel.
   3. PROTECTION
      1. Protect installed products until completion of project.
      2. Touch up, repair or replace damaged products before Substantial Completion.

END OF SECTION