

SECTION 08 71 13 AUTOMATIC DOOR OPERATORS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies equipment, controls and accessories for automatic operation of swing and sliding doors.
- B. This section includes the following types of automatic door operators:
 - 1. Exterior and interior, automatic door operators, low energy, with visible mounting.
 - 2. Automatic door operators shall be configured for doors as follows:
 - a. Simultaneous pairs, out swing.
 - b. Single door, out swing.

1.2 RELATED WORK

- A. Door hardware; Section 08 71 00, DOOR HARDWARE.
- B. Section 09 91 00 PAINTING.
- C. Electric general wiring, connections and equipment requirements; Division 26, ELECTRICAL.

1.3 QUALITY ASSURANCE

- A. Automatic door operators, controls and other equipment shall be products of a manufacturer regularly engaged in manufacturing such equipment for a minimum of three years, certified under ISO9001.
- B. Source Limitations: Obtain automatic door operators through one source from a single manufacturer.
- C. Installer Qualification: Manufacturer's authorized representative, with certificate issued by AAADM, who is trained for installation and maintenance of units required for this Project.
- D. Manufacturer shall have in place a national service dispatch center providing 24 hours a day, 7 days a week, emergency call back service.

1.4 WARRANTY

- A. Automatic door operators shall be free of defects in material and workmanship and terms of the "Warranty of Construction" FAR clause 52.246-21 for a period of two (2) years from the date of substantial completion in lieu of one year.
- B. During the warranty period the Owner shall engage a factory-trained technician to perform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form shall be submitted to the Owner.
- C. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal working hours.

1.5 MAINTENANCE MANUALS

- A. In accordance with Section 01 00 00, GENERAL REQUIREMENTS Article titled "INSTRUCTIONS", furnish maintenance manuals and instructions on automatic door operators.

1.6 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's literature and data describing operators, power units, controls, door hardware and safety devices.
- C. Shop Drawings:
 - 1. Showing location of controls and safety devices in relationship to each automatically operated door.
 - 2. Showing layout, profiles, product components, including anchorage, accessories, as applicable.
 - 3. Submit templates, wiring diagrams, fabrication details and other information to coordinate the proper installation of the automatic door operators.
- D. Submit in writing to Contracting Officer Representative "COR" that items listed in Article 1.3 are in compliance.

1.7 DESIGN CRITERIA

- A. General: As a minimum automatic door equipment shall comply with the requirements of BHMA 156.10. Except as otherwise noted on drawings, provide operators which will move the doors from the fully closed to fully opened position in three seconds maximum time interval, when speed adjustment is at maximum setting.

- B. Equipment: Conforming to UL 325. Provide key operated power disconnect wall switch for each door installation. Key switch shall be able to accept 7-pin Best core.
- C. Provide a momentary, spring return, switch to control door opening at nurse station.
- D. Electrical Wiring, Connections and Equipment: Provide all motor, starter, controls, associated devices, and interconnecting wiring required for the installation. Equipment and wiring shall be as specified in Division 26, ELECTRICAL.
- E. Provide automatic door operators capable of withstanding loads and thermal movements based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.
- F. Operating Range: Minus 30 deg F (Minus 34 deg C) to 130 deg F (54 deg C).
- G. Opening- Force Requirements for Egress Doors: In the event power failure to the operator, swinging automatic entrance doors shall open with a manual force, not to exceed 30lbf (133 N) applied at 1" (25mm) from the latch edge of the door.
- H. Break Away Requirements: Automatic door operators shall breakaway with no more than 30 lbf (133N) applied at 1" (25mm) from the latch edge of the door.
- I. Provide necessary hardware and software to allow electrical interface capability for future activation of automatic door operators by card readers and "Wonderguard Patient System".

1.8 APPLICABLE DOCUMENTS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
 - 1. Underwriters Laboratories (UL)
 - a. UL325 – Standard for Door, Drapery, Gate Louver, and Window Operators and Systems.
 - b. UL 10C – Positive Pressure Fire Tests of Door Assemblies
 - 2. American National Standards Institute (ANSI)/ Builders' Hardware Manufacturers(BHMA):
 - a. ANSI/BHMA A156.10: Standard for Power Operated Pedestrian Doors.
 - b. ANSI/BHMA A156.19: Standard for Power Assist and Low Energy Power Operated Doors.
 - 3. American Society for Testing and Materials (ASTM)

- a. ASTM B221 – Standard Specification for Aluminum and Aluminum- Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- b. ASTM B209 – Standard Specification for Aluminum and Aluminum- Alloy Sheet and Plate.

4. American Association of Automatic Door Manufacturers (AAADM):
5. National Fire Protection Association (NFPA):
 - a. NFPA 101 – Life Safety Code
 - b. NFPA 70 – National Electric Code.
6. International Code Council (ICC):
 - a. IBC: International Building Code
7. Building Officials and Code Administrators International (BOCA), 1999:
8. California Department of Forestry and Fire Protection, Office of the State Fire Marshall (CSFM)
9. International Standards Organization (ISO):
 - a. ISO 9001 – Standard for Manufacturing Quality Management Systems
10. National Association of Architectural Metal Manufacturers (NAAMM):
 - a. Metal Finishes Manual for Architectural and Metal Products.
11. American Architectural Manufacturers Association (AAMA):
 - a. AAMA 607.1 – Clear Anodic Finishes for Architectural Aluminum
 - b. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.

1.9 DELIVERY AND STORAGE

- A. Delivery shall be in factory's original, unopened, undamaged container with identification labels attached.

1.10 COORDINATION

- A. Templates: Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing automatic door operators to comply with indicated requirements.
- B. Electrical System Roughing-in: Coordinate layout and installation of automatic door operators with connections to, power supplies, remote activation devices, electric door latching hardware, and security access control system.

See Division 28 [13] Section "Electronic Safety and Security" for systems not provided under this section.

- C. System Integration: Integrate automatic door operators with other systems as required for a complete working installation.
 - 1. Provide electrical interface control capability for activation of automatic door operators by secure activation system on doors with electric locking.
 - 2. Where indicated to install both push plates and secure activation system, automatic door operators shall be configured to operate; by secure activation system when secured; by push plate when not secured.
 - 3. Where required for proper operation, provide a time delay relay to signal automatic door operator to activate only after electric lock system is released.

PART 2 - PRODUCTS

2.1 SWING DOOR OPERATORS

- A. General: Swing door operators shall be of institutional type, door panel size 600 mm to 1250 mm (2'-0" to 5'-0") width and, weight not to exceed for 300 kg (600 pounds). Operator shall be furnished with electric operated for overhead mounting within the header or transom shall be metal mounting supports, brackets and other accessories necessary for the installation of operators at the head of the door frames. The motor, on automatic door operation shall be provided with an interlock so that the motor will not operate when doors are electrically locked from opening.
- B. Operators shall have checking mechanism providing cushioning action at last part of door travel, in both opening and closing cycle. Operators shall be capable of recycling doors instantaneously to full open position from any point in the closing cycle when control switch is activated. Operators shall, when automatic power is interrupted or shut-off, permit doors to easily open manually without damage to automatic operator system.
- C. Operator, enclosed in housing, shall open door by energizing motor and shall stop by electrically reducing voltage and stalling motor against mechanical stop. Door shall close by means of spring energy, and close force shall be controlled by gear system and motor being used as dynamic break without power, or controlled by hydraulic closer in electro-hydraulic operators. System shall operate as manual door control in event of power failure. Opening and closing speeds shall be adjustable:
 - 1. Operator Housing: Housing shall be a minimum of 112 mm (4-1/2 inches) wide by 140 mm (5.5 inches) high aluminum extrusions with enclosed end caps for application to 100 mm (4 inches) and larger frame systems. All structural sections shall have a minimum thickness of 3.2 mm (0.125 inch) and be fabricated of a minimum of 6063-T5 aluminum alloy.

2. Power Operator: Completely assembled and sealed unit which shall include gear drive transmission, mechanical spring and bearings, all located in aluminum case and filled with special lubricant for extreme temperature conditions. Complete unit shall be rubber mounted with provisions for easy maintenance and replacement, without removing door from pivots or frame.
3. Connecting hardware shall have drive arm attached to door with a pin linkage rotating in a self-lubricating bearing. Door shall not pivot on shaft of operator.
4. Electrical Control: Operator shall have a self contained electrical control unit, including necessary transformers, relays, rectifiers, and other electronic components for proper operation and switching of power operator. All connecting harnesses shall have interlocking plugs.

2.2 MICROPROCESSOR CONTROLS

- A. The system shall include a multi-function microprocessor control providing adjustable hold open time (1–30 seconds), LED indications for sensor input signals and operator status and power assist close options. Control shall be capable of receiving activation signals from any device with normally open dry contact output. All activation modes shall provide fully adjustable opening speed:
- B. The door shall be held open by low voltage applied to the continuous duty motor. The control shall include an adjustable safety circuit that monitors door operation and stops the opening direction of the door if an obstruction is sensed. The motor shall include a recycle feature that reopens the door if an obstruction is sensed at any point during the closing cycle. The control shall include a standard three position key switch with functions for ON, OFF, and HOLD OPEN, mounted on operator enclosure, door frame, or wall.
- C. The control system shall include a momentary contact mushroom type push button at the nurse station to allow for remote opening of the doors.

2.3 AUTOMATIC DOOR OPERATORS ADDITIONAL REQUIREMENTS

- A. In addition to the requirements in the above paragraphs, automatic door operators shall include the following features as described below.
 1. Header Case: Header case shall not exceed 6" (152 mm) square in section and shall be fabricated from extruded aluminum with structurally integrated end caps, designed to conceal door operators and controls. The operator shall be sealed against dust, dirt, and corrosion within the header case. Access to the operator and electronic control box shall be provided by a full-length removable cover, edge rabbetted to the header to ensure a flush fit. Removable cover shall be secured to prevent unauthorized access.

2. Door Arms: A combination of door arms and linkage shall provide positive control of door through entire swing; units shall permit use of butt hung, center pivot, and offset pivot-hung doors.
3. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.
4. Signage: Provide signage in accordance with ANSI/BHMA A156.19.
5. Field Adjustable Spring Closing Operation: The operator shall close the door by spring energy employing the motor, as a dynamic brake to provide closing speed control. The closing spring shall be a helical compression spring, adjustable for positive closing action. The spring shall be adjustable, without removing the operator from the header, to accommodate a wide range of field conditions.
6. Independent Adjustable Closing and Latching Speed Control: The operator shall employ a rheostat module to allow for independent field adjustment of closing and latching speeds using the motor as a dynamic brake.
7. Field Adjustable Open Stop: The operator shall provide a field adjustable open stop to accommodate opening angles from 80 to 135 degrees without the need for additional components.
8. Consistent Cycle: The operator shall deliver an even, consistent open force across the entire transition from door fully closed to door fully open. Additionally, the range of the force shall be field adjustable to accommodate a wide range of on-site conditions.
9. Quiet Performance: The operator shall be designed to output audible noise ratios less than or equal to 50db.
10. Manual Use: The operator shall function as a manual door closer in the direction of swing with or without electrical power. The operator shall deliver an even, consistent open force across the entire transition from door fully closed to door fully open.
11. Electrical service to door operators shall be provided under Division 26 Electrical. Minimum service to be 120 VAC, 10 amps for doors with operators in pairs, 5 amps for single doors.

2.4 ELECTRICAL CONTROLS

- A. Electrical Control System: Electrical control system shall include a microprocessor controller and position encoder. The encoder shall monitor revolutions of the operator shaft and send signals to microprocessor controller to define door position. Systems utilizing external magnets and magnetic switches are not acceptable.

- B. Life Cycle Data Counter: The microprocessor control shall incorporate a non-re-settable counter to track door operation cycles.
- C. Controller Protection: The microprocessor controller shall incorporate the following features to ensure trouble free operation:
 - 1. Automatic Reset Upon Power Up.
 - 2. Main Fuse Protection.
 - 3. Electronic Surge Protection.
 - 4. Internal Power Supply Protection.
 - 5. Resettable sensor supply fuse protection.
 - 6. Motor Protection, over-current protection.
- D. Push Button Interface: The controller shall have push button switches with two digit LED readout to allow for selection or change of the following parameters: single or dual door, activation options, normal back check or large back check, push-to-open assist on/off.
- E. Soft Start/Stop: A "soft-start" "soft-stop" motor driving circuit shall be provided for smooth normal opening and recycling.
- F. Obstruction Recycle: Provide system to recycle the swinging panels when an obstruction is encountered during the closing cycle.
- G. Programmable Controller: Microprocessor controller shall be programmable and shall be designed for connection to a local configuration tool. Local configuration tool shall be software driven and shall be utilized using handheld interface. The following parameters may be adjusted via the configuration tool.
 - 1. Operating speeds and forces as required to meet ANSI/BHMA A156.19.
 - 2. Adjustable and variable features as specified in 2.4, B.
 - 3. Firmware update.
 - 4. Trouble Shooting to include I/O Status and Electrical component monitoring including parameter summary.
 - 5. Software for local configuration tool shall be available as a free download from the automatic door operator manufacturer's internet site.
- H. Emergency Breakout Switch: A cam actuated emergency breakout switch shall be provided to disconnect power to the motor when an in-swinging door is manually pushed in the emergency out direction. The operator will then automatically reset and power will be resumed.

- I. Control Switch: Automatic door operators shall be equipped with a three position function switch to control the operation of the door. Control switch shall provide three modes of operation, Automatic, Off, and Hold-Open.
- J. Power Switch: Automatic door operators shall be equipped with a two position On/Off switch to control power to the door.
- K. Power Units: Each power unit shall be self-contained, electric operated and independent of the door operator. Capacity and size of power circuits shall be in accordance with automatic door operator manufacturer's specifications and Division 26 – ELECTRICAL.
- L. Manufacturer: Stanley Access Technologies; Magic-Force™ Series automatic door operator or approved equal. The specified system is used to establish standard of quality, utility, appearance and basis of design.

2.5 ACTIVATION AND SAFETY DEVICES

- A. Opening and closing actions of doors shall be actuated by controls and safety devices specified, and conform to ANSI 156.10. Controls shall cause doors to open instantly when control device is actuated; hold doors in open positions; then, cause doors to close, unless safety device or reactivated control interrupts operation.
- B. High-Low Push Plate: Provide low profile, hi-low, push plate with SPST switches. Push plate shall provide activation from any point on the face plate with less than 2 lb (9 N) of force. Vertical edges shall be tapered, with friction-fit, to be weather resistant. Face plates and mounting studs shall be stainless steel. Face plates shall be engraved with the international symbol for accessibility, top and bottom, and "Push To Open".
 - 1. Controls shall be programmed to cause the High-Low Push Plates outside the buildings to be operable only at settable times of the day, so that the plates will not operate at night.
 - 2. Push plates shall be wall mounted over single or double gang electrical boxes and hardwired to door operator controls.
 - 3. Dimensions:
 - a. Activation Area: 36 inch by 6 inch (914 mm by 152 mm) minimum.
 - b. Depth: 1 inch (25 mm) maximum.
 - c. Top End Cap: 1 ¾ inch (44 mm) high.
 - 4. Materials and Finish:
 - a. Stainless Steel, type 304, 25 gauge, powder coat finish.
 - b. Top and Bottom End Cap: Black ABS Plastic

- c. Sides: Brushed aluminum with friction fit.
- 5. High-Low push plates shall be equal to or better than BEA LPR36.
- 6. Replace all existing push plates.

- C. Presence Detection: Provide presence detection system designed to sense people and objects in the swing zone when the swinging automatic entrance door is fully open, fully closed or in motion. System provided shall consist of door mounted safety sensors and accessories required for a complete working system as follows:
1. Door Mounted Presence Detection Sensors: The motion detector shall provide a signal to actuate the door operator, and monitor the immediate zone, to detect intrusion by persons, carts or similar objects. The zone which the detector monitors shall be 1500 mm (five feet) deep and 1500 mm (five feet) across, plus or minus 150 mm (six inches) on all dimensions. The maximum response time shall be no less than 25 milliseconds. Unit shall be designed to operate on 24 volts AC. The control shall not be affected by cleaning material, solvents, dust, dirt and outdoor weather conditions. Door mounted presence detection sensors shall be reflective active infrared type designed specifically to sense moving or stationary objects in the swing zone on each side of a moving door leaf. Sensor housings shall be high impact shock resistant with tinted lenses suitable for door mounting. Door mounted presence detection sensors shall not be affected by ultrasonic, ambient light or radio frequencies, within the vicinity of the swing door.
 2. Secondary Activation: Presence detection system shall satisfy the requirements for secondary activation; no additional sensors shall be required unless required for safety :
 - a. Area over which doors swing or slide shall be a safety section and anyone standing in path of door's movement shall be protected by a safety device.
 - b. Each swing door shall have installed on the pull side a presence sensor to detect any person standing in the door swing path and prevent the door from opening.
 - c. Time delay switches shall be installed adjustable between 3 to 60 seconds and shall control closing cycle of doors.
 - d. Decals with sign "In" or "Do Not Enter" shall be installed on both faces of each door. Prior to installation, coordinate with COR.
 3. Supporting relays and controllers shall be provided for a complete working system.
 4. Door mounted presence detection sensors shall be equal to or better than Stanley Access Technologies Swing-Guard.
- D. Activation Control Module: Provide microprocessor controlled module as required for timed activation of door operators integrated with electric locking. Module shall comply with the following:

1. Power Supply: 12-24 VAC/VDC.
2. Inputs: 4 Dry Contacts, 1 Wet @ 5-24 VAC/VDC.
3. Outputs: 2 Dry Relays @ 3 A, 1 Dry Relay @ 1 A, 1 Wet Relay @ 1 A
4. Unit shall be suitable for mounting in automatic door operators headers.
5. Provide contacts for future control using VA card reader system
6. Sequencing module shall be equal to or better than BEA Br3.

2.6 ALUMINUM FINISHES

- A. General: Comply with NAAMM Metal Finishes Manual for Architectural and Metal Products for recommendations for applying and designing finishes. Finish designations prefixed by AA comply with system established by Aluminum Association for designing finishes.
- B. Class II, Clear Anodic Finish: AA-M12C22A31 Mechanical Finish: as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.40 mils minimum complying with AAMA 611-98, and the following:
 1. AAMA 607.1
 2. Applicator must be fully compliant with all applicable environmental regulations and permits, including wastewater and heavy metal discharge.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of swinging automatic entrance doors. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Coordinate installation of equipment with other related work. Manual controls and power disconnect switches shall be recessed or semi-flush mounted in partitions. Secure operator components to adjacent construction with suitable fastenings. Conceal conduits, piping, and electric equipment, in finish work. All equipment, including time delay switches, shall be accessible for maintenance and adjustment.
- B. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.
- C. Mounting: Install automatic door operators/headers plumb and true in alignment with established lines and grades. Anchor securely in place.

1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
 2. Set headers, arms and linkages level and true to location with anchorage for permanent support.
 3. Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections. Operators shall be adjusted to function properly for the type of traffic (pedestrians, carts, stretchers and wheelchairs) expected to pass through doors. Each door leaf of pairs of doors shall open and close in synchronization. On pairs of doors, operators shall allow either door to be opened manually without the other door opening.
- D. Sealants: Comply with requirements specified in Division 7 Section "Joint Sealants" to provide weather tight installation.

3.3 FIELD QUALITY CONTROL

- A. Testing Services: Factory Trained Installer shall test and inspect each swinging automatic entrance door to determine compliance of installed systems with applicable ANSI standards.

3.4 ADJUSTING

- A. Adjust door operators, controls, and hardware for smooth and safe operation, for weather-tight closure, and complying with requirements in ANSI/BHMA A156.19 by AAADM Certified Technician.

3.5 INSTRUCTIONS

- A. Following the installation and final adjustments of the door operators, the installer shall fully instruct VA personnel for 2 hours on the operating, servicing and safety requirements for the swing and sliding automatic door operators.

3.6 CLEANING AND PROTECTION

- A. Clean surfaces promptly after installation. Remove excess sealant compounds, dirt, and other substances. Repair damaged finish to match original finish.

END OF SECTION 08 71 13