

SECTION 087113 – AUTOMATIC SWING DOOR OPERATORS

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(Consultant shall edit specifications and blue text in header to meet project requirements. This includes but is not limited to updating Equipment and/or Material Model Numbers indicated in the specifications and adding any additional specifications that may be required by the project. Also turn off all “Underlines”)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Low-energy automatic door operators with power-assist, for swinging doors.

- B. Related Requirements

- 1. Division 8 Section “Aluminum-Framed Entrances and Storefronts” for entrances furnished separately in Division 8 Section.
 - 2. Division 8 Section “Door Hardware” for hardware to the extent not specified in this Section.
 - 3. Division 26 and 28 Sections for electrical connections including conduit and wiring for automatic entrance door operators and access control devices.

1.3 DEFINITIONS

- A. AAADM: American Association of Automatic Door Manufacturers.
- B. Activation Device: A control that, when actuated, sends an electrical signal to the door operator to open the door.

1.4 REFERENCES

- A. References: Refer to the version year adopted by Authority Having Jurisdiction.

- 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.

- B. American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA).°

- 1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.

2. ANSI/BHMA A156.19 Standards for Power Assist and Low Energy Power Operated Doors.

C. Underwriters Laboratories (UL).

1. UL Listed R-9469 Fire Door Operator with Automatic Closer.
2. UL 325 Standard for Safety for Door, Drapery, Gate, Louver and Window Operators and Systems.
3. UL991 Listed - Tests for Safety-Related Controls Employing Solid-State Device.
4. UL244A – Solid – State Controls for Appliances.
5. UL1998 – Software in Programmable Components.
6. UL1310 – Class 2 Power Units.

1.5 COORDINATION

- A. Coordinate door operators with doors, frames and related work to ensure proper size, thickness, hand, function and finish.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for automatic door operators.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

- B. Shop Drawings: For automatic door operators.

1. Include plans, elevations, sections, hardware mounting heights, and attachment details.
2. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Indicate locations of activation and safety devices (reuse existing).
4. Include diagrams for power, signal, and control wiring.

- C. Samples: Submit manufacturer's samples of a finished closure.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and Certified Inspector.

- B. Product Certificates: For each type of automatic door operator. [For each operator for fire-rated door assemblies, certify that operator is listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for use on types and sizes of labeled fire doors required.]

- C. Manufactures Field Reports. Submit manufacturer's field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA after completion of installation.

1.8 CLOSEOUT SUBMITTALS

- A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the work of this section. The manual to include the name, address, and contact information of the manufacturers providing the operators and their nearest service representatives. The final copies delivered after completion of the installation test to include spare parts list.
- B. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.9 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 10 years of documented experience in manufacturing of doors and equipment of similar to that indicated for this Project and that have a proven record of successful in-service performance. Manufacturer to have a company certificate issued by AAADM.
- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing and maintenance of units similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Certified Inspector Qualifications: Certified by AAADM.
- D. Certifications: Operators shall be certified by the manufacturer to meet performance design criteria in accordance with the following standards.
 - 1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
 - 2. ANSI/BHMA A156.19 American National Standard for Power Assist and Low Energy Operated Doors.
 - 3. NFPA 101 - Life Safety Code.
- E. Emergency Exit Door Requirements: Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of automatic door operators that fail in materials or workmanship for a period of two (2) years from date of substantial completion.
 - 1. Failures include, but are not limited to, the following:
 - a. Faulty or sporadic operation of automatic door operator, including controls.
 - 2. Deterioration of metals, metal finishes, and other materials beyond normal weathering or use.
- B. During the warranty period a factory-trained technician shall perform service and affect repairs. An inspection shall be performed after each adjustment or repair.

- C. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal business hours.
- D. Manufacturer shall have in place a dispatch procedure that shall be available 24 hours a Day, 7 Days a week for emergency call back service.

PART 2 - PRODUCTS

2.1 SWING DOOR OPERATORS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Besam Entrance Solutions; an ASSA ABLOY Group Company, 1900 Airport Road, Monroe, NC 28110.
 - a. Model: Besam SW200i.
- B. Substitutions: Requests for substitution and product approval in compliance with the specifications must be submitted in writing. Approval of requests is at the discretion of the University.

2.2 AUTOMATIC DOOR OPERATORS, GENERAL

- A. General: Provide operators for long-term, maintenance-free operation under normal traffic load for occupancy type indicated; and in accordance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation and safety devices.

Include one or both paragraphs below per project requirements.

- 1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.
- 2. Wind Load: Provide door operators on exterior doors that will open and close doors and maintain them in fully closed position when subjected to wind load of **<Insert windload>**.
- B. Electromechanical Operating System: Unit is non-handed operator, powered by 24 volt, ¼ hp motor. Operator shall be adjustable to compensate for different manual push forces as required.
- C. Housing for Overhead Concealed Operators: Overhead Concealed Operators are not allowed.
- D. Surface Mounted:
 - 1. Cover for Surface-Mounted Operators: Fabricated from 0.125-inch-thick, extruded or formed aluminum[,with enclosed end caps, provision for maintenance with side access, and fasteners concealed when door is in closed position.
 - 2. Brackets and Reinforcements: Fabricated from aluminum with non-staining, nonferrous shims for aligning system components.
 - 3. Connecting Hardware: Surface mounted operators to have a steel arm from the operator, mounted to the top face of the swing door.
 - 4. UL Listed R-9469 Fire Door Operator with Automatic Closer (surface mounted operator).
- E. Exposed Finish:

Choose one or both of finishes listed below.

1. Class I, clear anodic finish.
2. Finish matching existing door and frame at the exterior doors.

F. Fire-Door Package (interior fire rated partitions): Consisting of UL-listed latch mechanism, power-reset box, and caution signage for fire-rated doors. Latch mechanism shall allow door to swing free during automatic operation; when fire is detected, latch actuator shall cause exit hardware to latch when door closes. Provide latch actuators with fail-secure design.

G. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 SWING DOOR OPERATORS

A. Reference Standard: BHMA A156.19.

B. Performance Requirements:

1. Opening Force if Power Fails: Not more than 15 lbf required to release latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
 - a. Accessible Interior Doors (does not apply to fire-rated doors): Not more than 5 lbf to push or pull door to fully open position.
2. Entrapment-Prevention Force: Not more than 15 lbf required to prevent stopped door from closing or opening.
3. Automatic operator shall be capable of operating and controlling up to a 700 pound door, 48 inches in width.

C. Configuration: Operator to control single swinging door.

1. Traffic Pattern: Two way.
2. Operator Mounting: Surface.

D. Operation: Power opening and power-assisted spring closing. Provide time delay for door to remain open before initiating closing cycle as required by BHMA A156.19. When not in automatic mode, door operator shall function as manual door closer, with or without electrical power.

E. Closing Time:

1. Doors shall be field adjustable to close from 90 degrees to 10 degrees in 2 seconds or longer as applicable per ANSI/BHMA A156.10 standards.
2. Doors shall be field adjustable to close from 90 degrees to 10 degrees in 3 seconds or longer as applicable per ANSI/BHMA A156.19 standards.
3. Doors shall be field adjusted to close from 10 degrees to fully closed in not less than 1.5 seconds.

F. Operating System: Electromechanical.

- G. Operator shall be field switchable between an ANSI/BHMA A156.19 and an ANSI/BHMA A156.10 compliant operator and vice versa. Addition of the required safety sensors, activation devices and guard rails may be required to comply with the applicable standard.
- H. Operator Temperature Range: Capable of operating within temperature ranges of -31°F to 160°F (-35°C to 71°C).
- I. Electrical Characteristics: Maximum power consumption is 300 watts (2.5 amps at 120 VAC), 50/60hz, built-in thermal overload protection.

Battery Convenience Mode is an option that must be specified, and is acceptable when door operator is not connected to emergency power. Confer with UMB Project Manager if required.

- J. Battery Convenience Mode: Operator to maintain continuous operation by battery power during power failure. Battery is continuously monitored and provides a warning signal if the battery is not working properly.

Digital Cycle Counter is an option that must be specified, and is acceptable when door operator is not connected to emergency power. Confer with UMB Project Manager if required.

- K. Digital Cycle Counter: Battery powered, 7 digit LCD cycle counter with a reset feature to track door usage cycles.
- L. Microprocessor Control Unit: Solid-state controller.
- M. Features:
 - 1. Adjustable opening and closing speed.
 - 2. Adjustable opening and closing force.
 - 3. Adjustable backcheck.
 - 4. Adjustable hold-open time from zero to 30 seconds.
 - 5. Adjustable time delay.
 - 6. Adjustable acceleration.
 - 7. Obstruction recycle.
 - 8. On-off/hold-open switch to control electric power to operator.
- N. Activation Device: Push-plate switch (existing) on each side of door to activate door operator.

2.4 DOOR OPERATION

- A. Opening Cycle The adjustable speed operator mechanically powers the drive shaft and the torque control maintains constant speed throughout the opening cycle regardless of stack pressures or wind speed. Operator shall allow manual door operation with operational forces as indicated to fully open the door applied at 1" (25 mm) from the latch edge of the door.
- B. Hold Open: The operator shall stop and hold the door open at the selected door opening angle for an adjustable period of time (1.5 seconds to 30 seconds).
- C. Closing Cycle: Spring close with speed controlled power assist.

1. Upon loss of power, dynamic braking will control the door insuring controlled closing.
 2. Selectable Torque Control: Automatically adjusts torque without changing the closing speed of the operator.
 - a. When the torque control is activated, the closing speed shall remain constant regardless of stack pressures or wind speed.
 - b. Torque Cancellation: The torque control is deactivated whenever there is a signal received from door mounted sensors.
 - c. The torque control is disabled during manual use of the door.
- D. Wind Force Dampening: The operator electromechanically counteracts wind forces, slowing down the door movement to safely open or close the door.
- E. Stack Pressure Compensation: Operator shall counteract positive stack pressures, negative stack pressures, and sudden changes of stack pressures. The operator never allows the door to open or close faster than the speed control settings, regardless of pressures.
- F. Obstruction Control: The operator will stop and reverse the door movement.
- G. Electric Lock Management:
1. Internal module for electrified locking integration.
 2. Electric Lock Output: Selectable 12 VDC, maximum 1200 mA / 24 VDC, maximum 600 mA.
 3. Lock monitoring prevents operator(s) from opening door(s) until release of electrified lock.
 4. Operator pulls door closed before opening, automatically unjamming electric latch hardware.
 5. Sequenced operation between operators for pairs of doors allowing lock release and astragal coordination.
- H. Lock Retry Circuit: If attempt to fully close the door is unsuccessful, the operator will automatically reverse open 10 degrees and reclose in an attempt to successfully close the door.
- I. Selectable Alarm Reset: The operator can be field set so that after receiving an alarm signal, the operator will not accept any activation impulses and will operate only as a manual door closer until manually reset.
- J. Electronic Controls: Solid state integrated circuit controls the operation and switching of the swing power operator. The electronic control provides low voltage power supply for all means of actuation. The controls include time delay (1 to 30 seconds) for normal cycle.
- K. Control Switch: Automatic door operators shall be equipped with the following type of multi-position function switch:
1. Three position rocker switch mounted on end cap (On-Off-Hold).
- L. Operator Interface:
1. Safety Sensor Integration for overhead presence safety device and door mounted reactivation safety sensors.

2.5 CONTROLS

- A. General: Provide controls, including activation and safety devices, in accordance with BHMA standards; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for occupancy type indicated. Coordinate activation and safety devices with door operation and door operator mechanisms.

2.6 ACTIVATION BY SMOKE EVACUATION SYSTEM

Retain paragraphs below if door operators are part of a smoke evacuation system.

- A. General: Provide activation by the smoke evacuation system and/or fire detection system. Coordinate other required activation devices and safety devices with door operation and door operator mechanisms.
- B. Activation: Smoke evacuation system and/or fire detection system shall provide activation of the operator by means of a normally open maintained contact to control the opening and closing of the door systems in the event of an alarm condition. Doors are to be held open until the smoke evacuation/fire detection system is reset.

2.7 ACTIVATION DEVICES

- A. General: Provide activation devices in accordance with ANSI/BHMA standards, for condition of exposure and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated. Coordinate activation and safety devices with door operation and door operator mechanisms.
- B. Knowing Act Activation Device:
 - 1. Push-Plate Switch: Momentary-contact door control switch with flat push-plate actuator with contrasting-colored, engraved message.
 - 2. Configuration: Round push plate with 4-by4-inch junction box.
 - 3. Mounting: Recessed mounted in wall.
 - 4. Configuration: Rectangular push plate with 2-by-4inch junction box.
 - 5. Mounting: **<Recess mounted in wall ><Recess mounted in door jamb ><Surface mounted on guide rail>**.
 - 6. Push-Plate Material: Stainless steel as selected by Architect from manufacturer's full range.
 - 7. Message: **<"Push to Open."><International symbol of accessibility.>**
- C. Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.
- D. Manual Operation:
 - 1. Operator shall allow manual door operation with operational forces adjustable from 5 lbf to 15 lbf maximum.
 - 2. Operator shall allow manual door operation with operational forces to 15 lbf maximum.

Retain paragraph below for large exterior doors that are unable to be adjusted to ADA standard 5lbs. of force to open.

3. Operator shall provide power assist function to the doors to provide ease of manual operational forces, where applicable.

E. Card Reader Activation:

Edit as required. Typically at exterior doors, card reader does not activate the door operator unless the knowing activation device is subsequently activated.

1. Card reader to provide signal for activation of automatic entrance when entrance is locked.
2. Access control systems, including card readers, shall be provided by others.

2.8 FABRICATION

- A. Factory fabricate automatic door operators to comply with indicated standards.
- B. Form aluminum shapes before finishing.
- C. Fabricate exterior components to drain condensation and water-passing joints within operator enclosure to the exterior.
- D. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws, finished to match operator.
- E. Provide metal cladding, completely covering visible surfaces before shipment to Project site. Fabricate cladding with concealed fasteners and connection devices, with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion, and with allowance for thermal expansion at exterior doors.

2.9 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary, protective covering before shipping.
- B. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.

2.10 ALUMINUM FINISHES

Edit below for project. If retaining more than one finish for a project, indication location of each on door schedule. Surface mounted housings are the UMB standard, with clear anodic finish.

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

If needed per project, insert requirements for high-performance organic finish (fluoropolymer) to match doors and frames, or powder-coat finish to match high-performance organic finishes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, door and frame preparation and reinforcements, and other conditions affecting performance of automatic door operators.
- B. Examine roughing-in for electrical systems to verify actual locations of power connections before automatic door operator installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install automatic door operators in accordance with manufacturer's written instructions and cited BHMA standard for type of door operation and direction of pedestrian travel, including signage, controls, wiring, remote power units if any, and connection to building's power supply.
 - 1. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion.
 - 2. Install operators true in alignment with established lines and door geometry without warp or rack. Anchor securely in place.
- B. Controls: Install activation and safety devices in accordance with manufacturer's written instructions and cited BHMA standard for operator type and direction of pedestrian travel. Connect control wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- C. Access-Control System: Connect operators to existing access-control system.
- D. Signage: Apply on both sides of each door as required by cited BHMA standard for type of door operator and direction of pedestrian travel.

3.3 FIELD QUALITY CONTROL

- A. Certified Inspector: Engage a Certified Inspector to test and inspect components, assemblies, and installations, including connections.
- B. Perform the following tests and inspections:
 - 1. Test and inspect each automatic door operator installation, using AAADM inspection forms, to determine compliance of installed systems with applicable BHMA standards.
- C. Automatic door operators will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports, deliver to the University.

3.4 ADJUSTING

- A. Adjust automatic door operators to function smoothly, and lubricate as recommended by manufacturer; comply with requirements of applicable BHMA standards.
 - 1. Adjust operators on exterior doors for tight closure.
- B. After completing installation of automatic door operators, inspect exposed finishes on doors and operators. Repair damaged finish to match original finish.
- C. Readjust automatic door operators and controls after repeated operation of completed installation equivalent to three days' use by normal traffic (100 to 300 cycles).
- D. Occupancy Adjustment: Within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project Site for this purpose.

3.5 MAINTENANCE SERVICE

Verify with Owner that maintenance service is required for the Project, it is highly recommended and helps ensure excellent initial installations.

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 24 months' full maintenance by skilled employees of automatic door operator Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 - 1. Engage a Certified Inspector to perform safety inspection after each adjustment or repair and at end of maintenance period. Furnish completed inspection reports to Owner.
 - 2. Perform maintenance, including emergency callback service, during normal working hours.

3.6 DEMONSTRATION AND TRAINING

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic door operators.
- B. Provide a video of the demonstration, and a sign-in sheet for all University attendees, to the Owner upon completion of the Demonstration and Training,

END OF SECTION 087113