

SECTION 08 71 13
AUTOMATIC DOOR OPERATORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Low energy door operators for swinging doors.

1.2 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.
- C. Double-Egress (Doors): A pair of doors that simultaneously swing, with the two doors moving in opposite directions with no mullion between them.
- D. Double-Swing (Doors): A pair of doors that swing, with the two doors moving in opposite directions with a mullion between them; each door functioning as a single-swing door.
- E. Safety Device: A control that, to avoid injury, prevents a door from opening or closing.
- F. For automatic door terminology, see BHMA A156.10 and BHMA A156.19 for definitions of terms.

1.3 ACTION SUBMITTALS

- A. Product Data: Technical data including material descriptions and compliance with cited standards, and finishes.
 - 1. Include 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.
 - 3. Include in final hardware schedule reflecting changes made during construction.
- B. Shop Drawings: Submit plans, elevations, sections, hardware mounting heights, and attachment details.
 - 1. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Indicate locations of activation and safety devices.
 - 3. Wiring Diagrams: Submit wiring diagrams for power, signal, and control wiring.
 - 4. Include plans, elevations, sections, and attachment details for guide rails.

5. Include operational descriptions detailing where only magnetic hold-opens are indicated.
 6. Provide a copy with each hardware schedule submitted after approval.
 7. Submit a copy with delivery of hardware to jobsite and another copy to Owner at time of job completion.
- C. Operational Descriptions: Submit operational descriptions of electrical components listed by opening.
1. Submit operational descriptions detailing each electrical component function with the opening incorporating conditions of ingress and egress.
 2. Submit a copy with each hardware schedule and revision submitted. Attach a copy with delivery of hardware to jobsite. Submit a copy to Owner at time of job completion.
- D. Samples: Submit for each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Submit for Installer Certified Inspector.
- B. Product Certificates: Submit for each type of automatic door operator.
1. 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. Field quality control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Submit for automatic door operators, safety devices, and control systems to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative having minimum 10 years documented experience who is trained and approved by manufacturer for installation and maintenance of units required and who employs a Certified Inspector.
1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
- B. Certified Inspector Qualifications: Entity having minimum 5 years documented experience who is certified by AAADM.
- C. Source Limitations: Obtain each type of automatic door hardware from single manufacturer.
- D. Preinstallation Conference: Conduct conference at project site.

1.7 COORDINATION

- A. Coordinate sizes and locations of recesses in concrete floors for recessed control mats that control automatic door operators. Concrete, reinforcement, and formwork requirements are specified elsewhere.
- B. Templates: Distribute for doors, frames, and other work specified to be factory prepared and reinforced for installing automatic door operators.
- C. Coordinate hardware for doors with operators to ensure proper size, thickness, hand, function, and finish.
- D. Electrical System Roughing in: Coordinate layout and installation of automatic door operators with connections to the following:
 - 1. Power supplies.
 - 2. Access control system.
 - 3. Remote activation devices.
 - 4. Remote monitoring systems.
- E. Pneumatic System Roughing-in: Coordinate layout and installation of automatic door operators and power units with compressed-air piping.

1.8 WARRANTY

- A. Written warranty signed by Manufacturer in which Manufacturer agrees to repair or replace components of automatic door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Faulty or sporadic operation of automatic door operator, including controls.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering or use.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Provide operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and 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.
 - 1. Emergency Breakaway: Where indicated for center pivoted doors, provide emergency breakaway feature for reverse swing of doors. Equip system to discontinue power to automatic door operator when door is in emergency

breakaway position, to return door to closed position after breakaway, and to automatically reset.

2. 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.
3. 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 loading of the project as indicated on the Drawings .

B. Low Energy Operators:

1. Opening Force if Power Fails: Not more than 15 lbf (67 N) required to release latch if provided, not more than 30 lbf (133 N) required to manually set door in motion, and not more than 15 lbf (67 N) required to fully open door.
2. Entrapment Prevention Force: Not more than 15 lbf (67 N) required to prevent stopped door from closing or opening.

2.2 AUTOMATIC DOOR OPERATORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Besam Entrance Solutions.
2. DORMA USA, Inc.
3. Hager Companies.
4. Horton Automatics; a division of Overhead Door Corporation.
5. LCN; an Allegion brand.
6. SARGENT Manufacturing Company.
7. Stanley Access Technologies.

B. Electromechanical Operating System: Self contained unit powered by permanent magnet dc motor; with closing speed controlled mechanically by gear train and dynamically by braking action of electric motor, connections for power and activation and safety device wiring, and manual operation, including spring closing when power is off.

C. Hinges: Refer to Section 08 71 00 for hinge type for each door that door operator shall accommodate.

D. Housing for Overhead Concealed Operators: Fabricated from minimum 0.125 inch (3.2 mm) thick, extruded or formed aluminum and extending full width of door opening, including door jambs, to conceal door operators and controls. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.

E. Cover for Surface Mounted Operators: Fabricated from 0.125 inch (3.2 mm) thick, extruded or formed aluminum; continuous over full width of operator controlled door opening; with enclosed end caps, provision for maintenance access, and fasteners concealed when door is in closed position.

- F. Brackets and Reinforcements: Fabricated from aluminum with nonstaining, nonferrous shims for aligning system components.
- G. Fire Door Package: 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.
- H. 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 LOW ENERGY DOOR OPERATORS FOR SWINGING DOORS

- A. Standard: BHMA A156.19.
- B. Configuration: Operator to control single swinging door.
 - 1. Traffic Pattern: One or Two way as indicated.
 - 2. Operator Mounting: Surface unless Overhead concealed is indicated in door hardware sets or in Drawings.
- C. Configuration: Operator to control pair of swinging doors.
 - 1. Traffic Pattern: One way, Two way, Double egress, or Double swing as indicated.
 - 2. Operator Mounting: Surface unless Overhead concealed is indicated in door hardware sets or in Drawings.
- D. Operation: Power opening and 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. Operating System: Electromechanical.
- F. Microprocessor Control Unit: Solid-state controller.
- G. 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; key operated.
- H. Activation Device: Push plate switch on each side of door to activate door operator.

- I. Exposed Finish: Class I, clear anodic finish with intent of Finish matching door hardware.
 1. Color: Selected by Architect.
 2. Metal Cladding: No. 4, directional satin finish stainless steel.

2.4 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 1. Extrusions: ASTM B221 (ASTM B221M).
 2. Sheet: ASTM B209 (ASTM B209M).
- B. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher leveled standard of flatness, in manufacturer's standard thickness.
- C. Brass Sheet: ASTM B36/B36M, Alloy UNS No. C26000 (cartridge brass, 70 percent copper), in thickness.
- D. Bronze Sheet: ASTM B36/B36M, Alloy UNS No. C28000 (muntz metal, 60 percent copper) or Alloy UNS No. C23000 (red brass, 85 percent copper), in manufacturer's standard thickness.
- E. Expanded Aluminum Mesh: Expanded and flattened aluminum sheet in accordance with the geometry of ASTM F1267.
- F. Polycarbonate Sheet: ASTM C1349, Appendix X1, Type II, coated, mar resistant, UV stabilized polycarbonate with coating on both surfaces.
- G. Fasteners and Accessories: Corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

2.5 CONTROLS

- A. 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.
- B. Motion Sensors: Self contained, K band frequency, microwave scanner units; fully enclosed in plastic housing; adjustable to provide detection field sizes and functions required by BHMA A156.10.
 1. Provide capability for switching between bidirectional and unidirectional detection.
 2. For one way traffic, sensor on egress side shall not be active when doors are fully closed.
- C. Presence Sensors: Self contained, active infrared scanner units; adjustable to provide detection field sizes and functions required by BHMA A156.10. Sensors shall remain active.

- D. Photoelectric Beams: Pulsed infrared, sender receiver assembly for recessed mounting. Beams shall not be active when doors are fully closed.
- E. Push Plate Switch: Momentary contact door control switch with flat push plate actuator with contrasting colored, engraved message.
 - 1. Configuration: Round push plate with 4 inch by 4 inch (100 mm by 100 mm) junction box.
 - a. Mounting: Recess mounted, semiflush in wall unless otherwise indicated.
- F. 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.

2.6 ACCESSORIES

- A. Signage: Required by cited BHMA standard for type of door and its operation.
 - 1. Application Process: Standard process.
 - 2. Provide sign materials with instructions for field application when operators are installed.

2.7 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.

2.8 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.

- D. Aluminum Finishes:
- E. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- F. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
- G. Baked Enamel or Powder Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions 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. Examine roughing in for compressed air piping systems to verify actual locations of piping connections before automatic door operator installation.
- D. Verify that full height finger guards are installed at each door with pivot hinges, where door has a clearance at hinge side greater than 1/4 inch (6 mm) and less than 3/4 inch (19 mm) with door in any position.
- E. Proceed with installation after correcting unsatisfactory conditions.

3.2 INSTALLATION

- 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 electrical specifications.
- C. Access Control System: Connect operators to 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.

- E. Guide Rails: Install in accordance with BHMA A156.10, including Appendix A and manufacturer's written instructions unless otherwise indicated.

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 with the assistance of a factory authorized service representative:
 - 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.

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: When requested within 12 months of date of Substantial Completion, provide onsite assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other than normal occupancy hours for this purpose.

3.5 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 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. Include 24 hour per day, seven day per week, emergency callback service.

3.6 DEMONSTRATION

- A. Engage a factory authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic door operators.

END OF SECTION