SECTION 08 71 13

AUTOMATIC DOOR OPENERS

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\*\* NOTE TO SPECIFIER \*\* TORMAX USA Inc.; Automatic door opener products.
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This section is based on the products of TORMAX USA Inc., which is located at:12859 Wetmore Rd.San Antonio, TX 78247Toll Free Tel: 888-685-3707Tel: 210-494-3551Fax: 210-494-5930Email: [request info (info@tormaxusa.com)](https://arcat.com/rfi?action=email&company=TORMAX%252BUSA%252BInc.&message=RE%253A%2520Spec%2520Question%2520(08731tor)%253A%2520&coid=43969&spec=08731tor&rep=&fax=210-494-5930)
Web: <https://www.tormaxusa.com>
 [ [Click Here](https://arcat.com/company/tormax-usa-inc-43969) ] for additional information.
Welcome to one of the world's leading door system suppliers. As you read this, somewhere in the world a TORMAX automatic door system is being installed. Since 1951 the TORMAX name has stood for safety, reliability and superior functionality. Discover the beautiful and high tech door world of TORMAX found where ever people move. Owning a TORMAX door means owning the best.
Since it's founding in Switzerland by the Landert Motoren Group, TORMAX has set the global standard for entrance system automation. TORMAX USA Inc., headquartered with manufacturing in San Antonio, Texas, founded in 1997, is the TORMAX supplier for North America. We provide high quality, quick response, technically supported solutions for Swing Doors, Sliding Doors, Folding Doors, Doors for Extreme Conditions, Escape Route & Fire Doors, Industrial Doors, Semi-Circular Doors, Revolving Doors, Manual Doors-ICU, Controls, Accessories, and Door Management Systems.

1. GENERAL
	1. SECTION INCLUDES

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

* + 1. Automatic Door Openers
	1. RELATED SECTIONS

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

* + 1. Section 05 10 00 - Structural Metal Framing.
		2. Section 06 10 00 - Rough Carpentry.
		3. Section 08 12 00 - Metal Frames.
		4. Section 08 14 23 - Clad Wood Doors.
		5. Section 08 43 13 - Aluminum-Framed Storefronts.
		6. Section 08 42 29 - Automatic Entrances.
		7. Section 08 42 43 - ICU Automatic Entrance Doors
		8. Section 09 90 00 - Painting and Coating.
		9. Section 12 48 43 - Floor Mats.
		10. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
		11. Section 26 05 00 - Common Work Results for Electrical.
	1. REFERENCES

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

* + 1. ANSI A117.1 - American National Standard for Accessible and Useable Buildings and Facilities.
		2. ANSI A156.10 - Power Operated Pedestrian Doors.
		3. ANSI A156.19 - Power Assist and Low Energy Power Operated Doors.
		4. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
		5. Aluminum Association Standard AA DAF-45 - Designation System for Aluminum Finishes.
		6. NFPA 70 - National Electric Code.
		7. NFPA 101 - Life Safety Code.
		8. UL 228 - Door Closers-Holders, With or Without Integral Smoke Detectors.
		9. UL 325 - Door, Drapery, Gate, Louver, and Window Operators and Systems - (UL) listed.
		10. C-UL certified (equivalent to CSA certified)
	1. DESIGN / PERFORMANCE REQUIREMENTS
		1. Automatic swinging door system shall be certified by the manufacturer to meet performance design criteria according to the following test standards.
			1. ANSI A156.10 for power operated pedestrian doors.
			2. ANSI A156.19 for low energy power operated doors.
			3. NFPA 80.
			4. NFPA 101.
			5. Underwriter's Laboratories 228 (UL) listed.
			6. Underwriter's Laboratories 325 (UL) listed.
			7. C-UL equivalent to CSA.
		2. Accessibility Requirements: Comply with requirements of Local building code, and Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities.

\*\* NOTE TO SPECIFIER \*\* Coordinate with mechanical engineer to determine if artificially induced air pressure and suction loads in building interior will adversely affect requirements of the following paragraph.

* + 1. System Design: Operate, hold open, and close doors under design wind and suction loads calculated in accordance with applicable building code.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		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 instructions.
			4. Operation and maintenance data.
		3. Shop Drawings: Indicate layout and dimensions; head, jamb, and sill conditions; elevations; components, anchorage, adjacent construction interface, recesses, materials, and finishes, electrical characteristics and connection requirements.

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraphs if LEED is not applicable.

* + 1. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
			1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
			2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
		2. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
		3. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
		4. Contract Closeout: Submit
			1. As-Built Record Documents showing actual installation conditions and wiring.
			2. Manufacturer's Warranty.
			3. Parts lists and maintenance instructions including data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Manufacturer to have minimum five years documented experience in the fabrication of automatic doors of the type required for this project and be capable of providing field service representation during installation. Products shall be manufactured in an ISO 9001 registered manufacturing facility.
		2. Installer Qualifications: Installer to be AAADM certified in the work of this section who has specialized in the installation of work similar to that required for this project.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of installation techniques and application workmanship.
			1. Finish areas designated by Architect.
			2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
			3. Refinish mock-up area as required to produce acceptable work.
			4. Accepted mock-up may become part of the Work.
	1. DELIVERY, STORAGE, AND HANDLING
		1. Package hardware items individually with necessary fasteners and installation templates when necessary; label and identify each package with door opening code to match door schedule.
		2. Store products in manufacturer's unopened packaging until ready for installation.
		3. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
		4. Store materials in a dry, warm, ventilated weather tight location.
	2. SEQUENCING
		1. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
		2. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
	3. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
	4. MAINTENANCE MATERIALS
		1. Provide special wrenches and tools applicable to each different or special hardware component.
	5. COORDINATION
		1. Coordinate work with other directly affected components involving manufacture or fabrication of reinforcement for door hardware and recessed items.
		2. Coordinate work with other directly affected components involving electrical wiring and components.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: TORMAX USA Inc., which is located at:12859 Wetmore Rd.San Antonio, TX 78247Toll Free Tel: 888-685-3707Tel: 210-494-3551Fax: 210-494-5930Email: [request info (info@tormaxusa.com)](https://arcat.com/rfi?action=email&company=TORMAX%252BUSA%252BInc.&message=RE%253A%2520Spec%2520Question%2520(08731tor)%253A%2520&coid=43969&spec=08731tor&rep=&fax=210-494-5930);Web: <https://www.tormaxusa.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 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required for project requirements. iMotion® 1301 Swing Door Operator (High and Low Energy) is suitable for single, pair, dual independent and double egress applications. Coordinate with doors and hardware specified in other sections. Use the schedule at the end of this section to identify the locations of the equipment required for each opening.

* 1. HEAVY DUTY DUAL PURPOSE SWING DOOR OPERATORS - SURFACE MOUNT (High and Low Energy)
		1. TORMAX iMotion 1301 Swing Door Operator - Side Load Application.
			1. Operator is capable of swinging interior or exterior doors weighing up to 550 pounds (250 kg) up to 48 inches wide (1219 mm). System consists of a non-handed electro-mechanical power open spring close swing door operator with heavy duty mechanics, self-learning iMotion microprocessor programmable control unit, aluminum header, door connecting hardware, operate controls and on/off/hold open switch. Mechanical switches and or cams to determine door position shall not be permitted. iMotion 1301 swing door operator, control unit and header shall be factory assembled as a unit, adjusted and tested. All bearings shall be ball or roller type and no bushings are used.
			2. Power Supply Requirements: Provide 115VAC 60 HZ, 5 Amp, single-phase power supply. For multiple operators provide service to each operator from junction box.
			3. Power Open Operation: Operator uses a 1/3 HP AC Synchronous wear free motor driving a rack and pinion transmission coupled with the self-learning fully programmable iMotion microprocessor control. AC motor has a built-in protection circuit that interrupts current to the motor if the door is blocked open. Door arm and linkage assembly is attached to a conical/hexagonal shaped stainless steel output shaft. Provide door opening speed as required by ASNI Standard. Drive train shall have positive, constant engagement. Operator shall stop the door in the open position, stall against an internal adjustable end stop and remain in the full open position as required by ANSI Standard. Provide operation as follows:

\*\* NOTE TO SPECIFIER \*\* Select one of the following Full Power or Low Energy paragraphs as required for the project and delete the one not required.

* + - * 1. Power Operated Pedestrian Door per ANSI A156.10.
				2. Low Energy Power Operated Door per ANSI A156.19.
			1. Spring Closing Operation: Operator shall close the door by spring energy. Closing speed is controlled by employing the motor as a dynamic break. Closing spring shall be field adjustable and pre-loaded for positive closing action at a low material stress level. Provide door closing speed as required by ANSI Standard.
			2. Manual Operation: Operator shall function as a manual door closer in the direction of swing with or without electric power.
			3. Entrapment protection: Door forces and speeds generated during power opening and manual opening and spring closing shall conform to the requirements of ANSI.
			4. Header Case: Side load, lintel mounted unit measuring 4-9/16 inches high by 5-9/16 inches wide by 31-1/2 inches long (116 mm high by 141 mm wide by 800 mm long). Header case consists of an extruded aluminum back plate and cover with finished steel end caps. Access to the operator shall be from the header face. Operator/controller mechanism is sealed against dust, dirt and corrosion within the header case.

\*\* NOTE TO SPECIFIER \*\* Select full width headers if required. Delete if not required.

* + - * 1. Provide full width header.
				2. Side Load mounting back plate with a minimum of .156 (4 mm) wall thickness.
				3. Aluminum Extrusion Finish: Standard anodized finish shall be: [select one:

\*\* NOTE TO SPECIFIER \*\* Select the finish required from the following paragraphs as required for the project and delete the ones not required. Special anodized, painted and metal clad finishes are available upon request. Specify finish, type and color.

AA-M12-C21-A41 Clear Architectural Class 1 anodized.

AA-M12-C22-A44 Dark Bronze Architectural Class 1 anodized.

AA-M12-C22-A44 Black Architectural Class 1 anodized.

Custom Anodized Color: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* + - 1. Linkage Assembly: Assembly shall provide positive control of door through the entire swing; and permit use on outswing and inswing doors with butt hinges, offset pivots and center pivots.
			2. Controls: Provide with the following control functions.

\*\* NOTE TO SPECIFIER \*\* Select the controls required for ANSI A 156.10 full power operators only from following paragraphs and delete those not required.

* + - * 1. Eagle motion sensor
				2. OA-Edge2 approach and swing side door mounted presence sensors.
				3. Active and safety mats with molding.
				4. Guide rails

\*\* NOTE TO SPECIFIER \*\* Select the controls required for ANSI A 156.19 low power operators only from following paragraphs and delete those not required.

* + - * 1. Hardwire push plates
				2. Wireless push plates
				3. Hand held transmitter
				4. OA-Edge1 approach and swing side door mounted presence sensors.
				5. Battery back-up
				6. I/O module
				7. Sequencing module
				8. Interlocking module
				9. Other \_\_\_\_\_
			1. Mode of Operation: Provide with three-position on/off/hold open switch with the following modes of operation.
				1. OFF - Door activators are inhibited. Key switch input remains enabled for access control integration.
				2. ON - Normal operation (open/time out/close)
				3. HOLD OPEN - Door will open and stay open.

\*\* NOTE TO SPECIFIER \*\* Select the optional control panel and system configuration if required from following paragraphs and delete if not required.

* + - 1. Control Panel: Provide with Illuminated control panel for operating modes as follows:
				1. Off/Automatic 1.
				2. Automatic 2.
				3. Exit/Open/Manual.
				4. Auto-diagnostics.
				5. System Configuration
		1. Self-Learning iMotion microprocessor control shall utilize the following: An encoder fastened to the motor shaft shall monitor motor revolutions and send signals to the controller. Signals from the encoder shall define door position without the use of door position magnets or mechanical switches. Includes the following features:
			1. Control shall utilize a teach-in program for the initial door set-up for both "Push and Pull" and "Automatic Door Operation" initiated through an automatic reference run. Door opening speed, door opening angle and hold open time (0-60s) shall be programmed to meet application requirements.
			2. Features: Microprocessor control provides the following functions:
				1. Mode of Operation: Power Operated Pedestrian Door or Low Energy Power Operated Door as defined by ANSI Standard A156.10 or A156.19.
				2. Respond to activation controls such as hardwired push plates, wireless push plates, operate sensors and/or "Push or Pull" activation
				3. Respond to floor, overhead or door mounted safety sensors - Programmable
				4. Power open and hold - Programmable (smoke evacuation doors)
				5. Auto-diagnostics for quick and simple troubleshooting
				6. Integrated access code to inhibit unauthorized door adjustments
				7. Electronic reversing for door obstruction in the opening and closing direction - Programmable
				8. Reversing sensitivity adjustment - Programmable
				9. Motor power boost close - Programmable
				10. Motor hold close - Programmable
				11. Adjustable opening and closing speeds - Programmable.
				12. Adjustable opening angle - Programmable
				13. Adjustable hold open time for door actuators (0-60s) - Programmable
				14. Selectable (on/off) "Push and Pull" activation - Programmable
				15. Manual door movement required for "Push and Pull" activation - Programmable
				16. Adjustable latch check positioning - Programmable
				17. Adjustable latch check speed - Programmable
				18. Sequential operation (push to open/push to close) - Programmable
				19. On-board 24VDC .75A max power supply output with overload protection for sensors and activators
				20. On-board lock output power supply (24VDC 1A max.) for electric strike with (.2-4S) delay - Programmable
				21. On-board lock output power supply (24VDC 1A max) for magnetic lock - Programmable
				22. Two on-board outputs (24VDC) for door position status, alarm, etc. - Programmable
				23. On-board input for key switch - remains enabled in off mode for access control integration
				24. Four on-board inputs for safety sensors - Programmable
				25. Self-configuring swing side door mounted safety sensors - no cut off switch or manual adjustment required
				26. Four on-board inputs for activators, mode of operation, key switch - Programmable
				27. Factory reset - Programmable
				28. Built-in safety circuit with stall / safety slow /reactivation / Carpet - Programmable.
				29. Global power supply - Selectable 115-230 VAC 50-60 HZ
		2. Operating Conditions:
			1. Climatic Conditions: System components shall operate between minus 30 and plus 130 degrees F (minus 34 and plus 54 degrees C) in all climatic conditions.
			2. Equivalent Continuous Sound Level: Less than 70 DB

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required for project requirements. TORMAX 1201 Swing Door Operator (High and Low Energy) is suitable for single, pair, dual independent and double egress applications. Coordinate with doors and hardware specified in other sections. Use the schedule at the end of this section to identify the locations of the equipment required for each opening.

* 1. HEAVY DUTY DUAL PURPOSE SWING DOOR OPERATORS - SURFACE MOUNT (High and Low Energy)
		1. TORMAX 1201 Swing Door Operator - Side Load design:
			1. Operator is capable of swinging interior or exterior doors weighing up to 550 pounds (250 kg) up to 55 inches wide (1400 mm) and consists of a non-handed electro-mechanical power open spring close modular operator and supporting heavy duty mechanics, self-learning programmable microprocessor control unit, aluminum header, door connecting hardware, operate controls, safety controls and on/off/hold open switch. The use of mechanical switches and or cams to determine door position shall not be permitted. Tormax 1201 swing door operator shall be factory assembled as a unit, adjusted and tested. All bearings shall be ball or roller type. No bushings shall be used.
			2. Power Supply Requirements: Provide 115V 60HZ, 5 amps, single-phase power supply. For multiple operators provide service to each operator from junction box.
			3. Power Open Operation: Operator uses a 1/3HP DC motor driving a forged rack and pinion compression spring assemble through a patented re-circulating ball screw mechanism. DC motor has a built-in protection circuit that interrupts current to the motor if the door is blocked open. Door arm and linkage assembly attaches to a conical/hexagonal shaped stainless steel output shaft. Door opening speed as required by ANSI Standard. Drive train has positive, constant engagement. Operator shall stop the door in the open position and shall stall against an internal adjustable end stop. Door shall remain in the full open position as required by ANSI Standard. Provide operation as follows:

\*\* NOTE TO SPECIFIER \*\* Select one of the following Full Power or Low Energy paragraphs as required for the project and delete the one not required.

* + - * 1. Power Operated Pedestrian Door per ANSI A156.10.
				2. Low Energy Power Operated Door per ANSI A156.19.
			1. Spring Closing Operation: Operator shall close the door by spring energy. Closing speed is controlled by employing the motor as a dynamic brake. Closing spring is field adjustable and pre-loaded for positive closing action at a low material stress level. Door closing speed as required by ANSI Standard.
			2. Manual Operation: Operator shall function as a manual door closer in the direction of swing with or without electric power.
			3. Entrapment protection: Door forces and speeds generated during power opening and manual opening and spring closing shall conform to the requirements of ANSI Standard.

\*\* NOTE TO SPECIFIER \*\* Select one of the following Header Case or Low Profile Slim Line Cover option and delete the one not required.

* + - 1. Header Case: Operator/controller mechanism is isolated with rubber pads and sealed against dust, dirt, and corrosion within the header case. Case is a side load, lintel mounted unit, 4 9/16 inches high by 5 inches wide by 31.5 inches long (116 mm high by 127 mm wide by 800 mm long) aluminum extrusion back plate and cover with steel end caps. Access to operator is provided from the header face. Cover shall be flush with bottom of header.

\*\* NOTE TO SPECIFIER \*\* Select full width headers if required. Delete if not required.

* + - * 1. Provide Full Width Header
				2. Aluminum Header Extrusion: Minimum wall thickness of .156 (4 mm).
				3. Aluminum Extrusion Finish: Standard anodized finish shall be:

\*\* NOTE TO SPECIFIER \*\* Select the finish required from the following paragraphs as required for the project and delete the ones not required. Special anodized, painted and metal clad finishes are available upon request. Specify finish, type and color.

AA-M12-C21-A41 Clear Architectural Class 1 anodized.

AA-M12-C22-A44 Dark Bronze Architectural Class 1 anodized.

AA-M12-C22-A44 Dark Black Architectural Class 1 anodized.

Custom Finish \_\_\_\_\_\_\_\_.

* + - 1. Low Profile Slim Line Cover: Operator/controller mechanism fastens directly above the door to a solid non-transparent surface or direct to an optional back plate. Low profile slim line cover is snapped into place concealing the operator/controller mechanism to the wall or back plate. Cover is finished with decorative end plates. Low profile slim line cover measures 3-3/8 inches high by 5 inches wide by 31-1/2 inches long (86 mm high by 127 mm wide by 800 mm long). Access to operator/controller mechanism is provided from the cover face. Cover shall be flush with bottom of optional back plate.

\*\* NOTE TO SPECIFIER \*\* Select optional back plate if required. Delete if not required.

* + - * 1. Aluminum back plate measuring 3-3/8 inches high by 3/16 inch wide by 31-1/2 inches long (86 mm high by 5 mm wide by 800 mm long).

\*\* NOTE TO SPECIFIER \*\* Select full width cover and optional back plate if required. Delete if not required.

* + - * 1. Provide Full Width cover
				2. Provide Full Width optional back plate.
				3. Aluminum Extrusion Finish: Standard anodized finish shall be:

\*\* NOTE TO SPECIFIER \*\* Select the finish required from the following paragraphs as required for the project and delete the ones not required. Special anodized, painted and metal clad finishes are available upon request. Specify finish, type and color.

AA-M12-C21-A41 Clear Architectural Class 1 anodized.

AA-M12-C22-A44 Dark Bronze Architectural Class 1 anodized.

AA-M12-C22-A44 Black Architectural Class 1 anodized.

Custom Anodized Color: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* + - 1. Linkage Assembly: Provide positive control of the door through the entire swing and permit use on outswing and inswing doors with butt hinges, offset pivots and center pivots.
			2. Controls: Provide with the following control functions.

\*\* NOTE TO SPECIFIER \*\* Select the controls required for ANSI A 156.10 full power operators only from following paragraphs and delete those not required.

* + - * 1. Eagle motion sensor
				2. OA-Edge2 approach and swing side door mounted presence sensors.
				3. Active and safety mats with molding.
				4. Guide rails

\*\* NOTE TO SPECIFIER \*\* Select the controls required for ANSI A 156.19 low power operators only from following paragraphs and delete those not required.

* + - * 1. Hardwire push plates
				2. Wireless push plates
				3. Hand held transmitter
				4. OA-Edge1 approach and swing side door mounted presence sensors.
				5. Battery back-up
				6. Sequencing module
				7. Interlocking module
				8. Other \_\_\_\_\_
			1. Mode of Operation: Provide three-position on/off/hold open switch with the following modes of operation.
				1. OFF - Door activators are inhibited (key switch input remains enabled for access control integration).
				2. ON - Normal operation (open/time out/close)
				3. HOLD OPEN - Door will open and stay open.
		1. Self-Learning microprocessor control shall utilize the following: An electronic encoder shall monitor motor revolutions and send signals to the controller. Signals from the encoder shall define door position without the use of door position magnets or mechanical switches. Includes the following features:
			1. Control shall utilize a teach-in program for the initial door set-up for both "Push and Pull" and "Automatic Door Operation" initiated through an automatic reference run. Door opening speed, door opening angle and hold open time (0-60s) shall be programmed to meet application requirements.
			2. Features: Microprocessor control provides the following functions:
				1. Mode of Operation: Power Operated Pedestrian Door or Low Energy Power Operated Door as defined by ANSI Standard A156.10 or A156.19.
				2. Respond to activation controls such as hardwired push plates, wireless push plates, operate sensors and/or "Push or Pull" activation
				3. Respond to floor, overhead or door mounted safety sensors - Programmable
				4. Power open and hold - Programmable (smoke evacuation doors)
				5. Auto-diagnostics for quick and simple troubleshooting
				6. Integrated access code to inhibit unauthorized door adjustments
				7. Electronic reversing for door obstruction in the opening and closing direction - Programmable
				8. Motor power boost close - Programmable
				9. Motor hold close - Programmable
				10. Fine-tune door motion elements after "Teach-In" - Programmable
				11. Adjustable opening force limitation - Programmable
				12. Adjustable opening and closing speeds - Programmable.
				13. Adjustable opening angle - Programmable
				14. Adjustable hold open time for door actuators (0-60s) - Programmable
				15. Selectable (on/off) "Push and Pull" activation - Programmable
				16. Manual door movement required for "Push and Pull" activation - Programmable
				17. Sequential operation (push to open/push to close) - Programmable
				18. On-board power supply output with overload protection (24VDC 1.5A Max.) as standard for activation, electric strikes, magnetic locks, and safety sensors - No auxiliary transformer required
				19. One on-board output (24VDC) for door position status, alarm, etc. - Programmable
				20. One on-board input for safety sensor - Programmable
				21. Self-configuring swing side door mounted safety sensors - no cut off switch or manual adjustment required
				22. One on-board input for activators
				23. Factory reset - Programmable
				24. Built-in safety circuit with stall/carpet/safety slow/reactivation - Programmable
				25. Standard power supply - 115 VAC 60 HZ single phase, 5 amp circuit
				26. Tormax 1201 Operator is Modular in Design. Allows for additional functionality via EDM and PDM modules.

Locking sequence with activators: Exterior Door Module (EDM) provides on-board 24VDC output @ 1AMP for 24VDC electric strike or magnetic lock as standard with 0.2-4.0s delay or NO /NC dry output contact, programmable. Provides on-board input for key switch. Remains enabled in "Off" mode for access control integration. Provides one activation input as standard. Provides interface for function control programmer and skipper for FW updates.

High Energy/Full Power Pedestrian Door Applications. Power Door Module (PDM). Provides for three safety inputs. Programmable one inhibit input. Smoke or fire door applications. Allows for 60 percent additional motor torque to be applied to operator, programmable.

* + 1. Operating Conditions:
			1. Climatic Conditions: Operator shall be fully lubricated to minimize wear and friction of moving parts, and shall operate in an ambient temperature range plus 5 and plus 125 degrees F (minus15 and plus 50 degrees C) in all climatic conditions.
			2. Equivalent Continuous Sound Level: Less than 70 DB

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required for project requirements. TORMAX TTX 1102 Low Energy Swing Door Operator is suitable for single, pair, dual independent and double egress applications. Coordinate with doors and hardware specified in other sections. Use the schedule at the end of this section to identify the locations of the equipment required for each opening.

* 1. LOW ENERGY SWING DOOR OPERATORS - SURFACE MOUNT
		1. TORMAX TTX 1102 Low Energy Swing Door Operator - Side Load design:
			1. Operator is capable of swinging interior or exterior doors weighing up to 275 pounds (125 kg) up to 48 inches wide (1219 mm) and consists of a non-handed electro-mechanical power open spring close modular operator and mechanics, self-learning programmable microprocessor control unit, aluminum header, door connecting hardware, operate controls, safety controls and on/off/hold open switch. The use of mechanical switches and or cams to determine door position shall not be permitted. Tormax TTX 1102 swing door operator shall be factory assembled as a unit, adjusted and tested. All bearings shall be ball or roller type. No bushings shall be used.
			2. Power Supply Requirements: Provide 115V 60HZ, 5 amps, single-phase power supply. For multiple operators provide service to each operator from junction box.
			3. Power Open Operation: Operator uses a 1/4 plus HP DC motor driving a forged rack and pinion compression spring assemble through a patented re-circulating ball screw mechanism. DC motor has a built-in protection circuit that interrupts current to the motor if the door is blocked open. Door arm and linkage assembly attaches to a conical/hexagonal shaped stainless steel output shaft. Door opening speed as required by ANSI Standard. Drive train has positive, constant engagement. Operator shall stop the door in the open position and shall stall against an internal adjustable end stop. Door shall remain in the full open position for a minimum of 5 seconds or a minimum of 3 seconds if push/pull activation is used.
			4. Spring Closing Operation: Operator shall close the door by spring energy. Closing speed is controlled by employing the motor as a dynamic brake. Closing spring is pre-loaded for positive closing action at a low material stress level. Door closing speed as required by ANSI Standard.
			5. Manual Operation: Operator shall function as a manual door closer in the direction of swing with or without electric power.
			6. Entrapment protection: Door forces and speeds generated during power opening and manual opening and spring closing shall conform to the requirements of ANSI Standard.

\*\* NOTE TO SPECIFIER \*\* Select one of the following Header Case or Low Profile Slim Line Cover option and delete the one not required.

* + - 1. Header Case: Operator/controller mechanism is isolated with rubber pads and sealed against dust, dirt, and corrosion within the header case. Case is a side load, lintel mounted unit, 4-9/16 inches high by 5 inches wide by 31.5 inches long (116 mm high by 127 mm wide by 800 mm long) aluminum extrusion back plate and cover with steel end caps. Access to operator is provided from the header face. Cover shall be flush with bottom of header.

\*\* NOTE TO SPECIFIER \*\* Select full width headers if required. Delete if not required.

* + - * 1. Provide Full Width Header
				2. Aluminum Header Extrusion: Minimum wall thickness of .156 (4 mm).
				3. Aluminum Extrusion Finish: Standard anodized finish shall be:

\*\* NOTE TO SPECIFIER \*\* Select the finish required from the following paragraphs as required for the project and delete the ones not required. Special anodized, painted and metal clad finishes are available upon request. Specify finish, type and color.

AA-M12-C21-A41 Clear Architectural Class 1 anodized.

AA-M12-C22-A44 Dark Bronze Architectural Class 1 anodized.

AA-M12-C22-A44 Black Architectural Class 1 anodized.

Custom Anodized Color: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* + - 1. Low Profile Slim Line Cover: Operator/controller mechanism fastens directly above the door to a solid non-transparent surface or direct to an optional back plate. Low profile slim line cover is snapped into place concealing the operator/controller mechanism to the wall or back plate. Cover is finished with decorative end plates. Low profile slim line cover measures 3-3/8 inches high by 5 inches wide by 31-1/2 inches long (86 mm high by 127 mm wide by 800 mm long). Access to operator/controller mechanism is provided from the cover face. Cover shall be flush with bottom of optional back plate.

\*\* NOTE TO SPECIFIER \*\* Select optional back plate if required. Delete if not required.

* + - * 1. Aluminum back plate measuring 3-3/8 inches high by 3/16 inch wide by 31-1/2 inches long (86 mm high by 5 mm wide by 800 mm long).

\*\* NOTE TO SPECIFIER \*\* Select full width cover and optional back plate if required. Delete if not required.

* + - * 1. Provide Full Width cover
				2. Provide Full Width optional back plate.
				3. Aluminum Extrusion Finish: Standard anodized finish shall be:

\*\* NOTE TO SPECIFIER \*\* Select the finish required from the following paragraphs as required for the project and delete the ones not required. Special anodized, painted and metal clad finishes are available upon request. Specify finish, type and color.

AA-M12-C21-A41 Clear Architectural Class 1 anodized.

AA-M12-C22-A44 Dark Bronze Architectural Class 1 anodized.

AA-M12-C22-A44 Black Architectural Class 1 anodized.

Custom Anodized Color: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* + - 1. Linkage Assembly: Provide positive control of the door through the entire swing and permit use on outswing and inswing doors with butt hinges, offset pivots and center pivots.
			2. Controls: Provide with the following control functions.

\*\* NOTE TO SPECIFIER \*\* Select the controls required from following paragraphs and delete those not required.

* + - * 1. Hardwire push plates
				2. Wireless push plates
				3. Hand held transmitter
				4. OA-Edge1 approach and swing side door mounted presence sensors
				5. Battery Backup
				6. Sequencing module
				7. Interlocking module
				8. Other \_\_\_\_\_
			1. Mode of Operation: Provide with three-position on/off/hold open switch with the following modes of operation.
				1. OFF - Door activators are inhibited (key switch input remains enabled for access control integration).
				2. ON - Normal operation (open/time out/close)
				3. HOLD OPEN - Door will open and stay open.
		1. Self-Learning microprocessor control shall utilize the following: An electronic encoder shall monitor motor revolutions and send signals to the controller. Signals from the encoder shall define door position without the use of door position magnets or mechanical switches. Includes the following features:
			1. Control shall utilize a teach-in program for the initial door set-up for both "Push and Pull" and "Automatic Door Operation" initiated through an automatic reference run. Door opening speed, door opening angle and hold open time (0-60s) shall be programmed to meet application requirements.
			2. Features: Microprocessor control provides the following functions:
				1. Mode of Operation: Low Energy Power Operated Door as defined by ANSI Standard A156.19.
				2. Respond to activation controls such as hardwired push plates, wireless push plates, operate sensors and/or "Push or Pull" activation
				3. Respond to overhead or door mounted safety sensors - Programmable
				4. Power open and hold - Programmable (smoke evacuation doors)
				5. Auto-diagnostics for quick and simple troubleshooting
				6. Integrated access code to inhibit unauthorized door adjustments
				7. Electronic reversing for door obstruction in the opening and closing direction - Programmable
				8. Motor power boost close - Programmable
				9. Motor hold close - Programmable
				10. Fine-tune door motion elements after "Teach-In" - Programmable
				11. Adjustable opening force limitation - Programmable
				12. Adjustable opening and closing speeds - Programmable.
				13. Adjustable opening angle - Programmable
				14. Adjustable hold open time for door actuators (0-60s) - Programmable
				15. Selectable (on/off) "Push and Pull" activation - Programmable
				16. Manual door movement required for "Push and Pull" activation - Programmable
				17. Sequential operation (push to open/push to close) - Programmable
				18. On-board power supply output with overload protection (24VDC 1.5A Max.) as standard for activation, electric strikes, magnetic locks, and safety sensors - No auxiliary transformer required
				19. One on-board output (24VDC) for door position status, alarm, etc. - Programmable
				20. One on-board input for safety sensor - Programmable
				21. Self-configuring swing side door mounted safety sensors - no cut off switch or manual adjustment required
				22. One on-board input for activators
				23. Factory reset - Programmable
				24. Built-in safety circuit with stall/carpet/safety slow/reactivation - Programmable
				25. Standard power supply - 115 VAC 60 HZ single phase, 5 amp circuit
				26. TTX 1102 Low Energy Swing Door Operator is modular in design. (Allows for additional functionality via EDM and PDM modules)

Locking sequence with activators: Exterior Door Module (EDM) provides on-board 24VDC output @ 1AMP for 24VDC electric strike or magnetic lock as standard with 0.2-4.0s delay or NO /NC dry output contact, programmable. Provides on-board input for key switch. Remains enabled in "Off" mode for access control integration. Provides one activation input as standard. Provides interface for function control programmer and skipper for FW updates.

Power Door Module (PDM), provides three programmable safety inputs.

* + 1. Operating Conditions:
			1. Climatic Conditions: Operator shall be fully lubricated to minimize wear and friction of moving parts, and shall operate in an ambient temperature range plus 5 and plus 125 degrees F (minus15 and plus 50 degrees C) in all climatic conditions.
			2. Equivalent Continuous Sound Level: Less than 70 DB

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required for project requirements. TTX II Bottom Load Design (Low Energy) is suitable for single, pair, dual independent and double egress applications. Coordinate with doors and hardware specified in other sections. Use the schedule at the end of this section to identify the locations of the equipment required for each opening.

* 1. LOW ENERGY SWING DOOR OPERATORS - SURFACE MOUNT
		1. TTX II Low Energy Swing Door Operator - Bottom Load Design:
			1. Operator is capable of swinging interior or exterior doors weighing up to 220 pounds (100 kgs) up to 48 inches wide (1219 mm). System consists of a handed electro-mechanical power open spring close swing door operator, self-learning microprocessor digital programmable control unit, aluminum header, door connecting hardware, operate controls, safety controls and on/off/hold open switch. Mechanical switches and or cams to determine door position are not permitted. Operator, control unit and header shall be factory assembled as a unit, adjusted and tested. All bearings shall be ball or roller type and no bushings are used.
			2. Power Supply Requirements: Provide 115VAC 60 HZ, 5 Amp, single-phase power supply. For multiple operators provide service to each operator from junction box.
			3. Power Open Operation: Operator uses a fractional HP DC electric motor driving a forged rack and pinion and compression spring assembly through a patented re-circulating ball screw mechanism. DC motor includes built-in protection circuit that interrupts current to the motor if the door is blocked open. Door arm and linkage assembly attaches to a conical/hexagonal shaped stainless steel output shaft. Provide door opening speed as required by ANSI Standard. Drive train shall have positive, constant engagement. Operator shall stop the door in the open position and shall stall against an integral built-in spring loaded adjustable end stop. Door shall remain in the full open position as required by ANSI Standard.
			4. Spring Closing Operation: Operator shall close the door by spring energy. Closing speed is controlled by employing the motor as a dynamic break. Closing spring shall be pre-loaded for positive closing action at a low material stress level. Provide door closing speed as required by ANSI Standard.
			5. Manual Operation: Operator shall function as a manual door closer in the direction of swing with or without electric power.
			6. Entrapment protection: Door forces and speeds generated during power opening and manual opening and spring closing shall conform to the requirements of ANSI Standard.
			7. Header Case: Operator/controller mechanism is sealed against dust, dirt and corrosion within the header case.
				1. Bottom load, lintel mounted unit measuring 5-3/4 inches high by 5-1/2 inches wide by 31-1/2 inches long (146 mm high by 140 mm wide by 800 mm long). Header case consists of an extruded aluminum header and cover plate, encased within aluminum "L" end cap mounting brackets. Access to operator shall from the underside of header.
				2. Mounting brackets provided with a minimum of .156 (4 mm) wall thickness.

\*\* NOTE TO SPECIFIER \*\* Select full width header if required from the following paragraphs and delete the ones not required

* + - * 1. Provide full width header.
				2. Aluminum Extrusion Finish: Standard anodized finish shall be: [select one:

\*\* NOTE TO SPECIFIER \*\* Select the finish required from the following paragraphs as required for the project and delete the ones not required. Special anodized, painted and metal clad finishes are available upon request. Specify finish, type and color.

AA-M12-C21-A41 Clear Architectural Class 1 anodized.

AA-M12-C22-A44 Dark Bronze Architectural Class 1 anodized.

AA-M12-C22-A44 Black Architectural Class 1 anodized.

Custom Anodized Color: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* + - 1. Linkage Assembly: Assembly shall provide positive control of door through the entire swing; and permit use on outswing and inswing doors with butt hinges, offset pivots and center pivots.
			2. Controls: Provide with the following control functions.

\*\* NOTE TO SPECIFIER \*\* Select the controls required from following paragraphs and delete those not required.

* + - * 1. Hardwire push plates
				2. Wireless push plates
				3. Hand held transmitter
				4. OA-Edge1 approach and swing side door mounted presence sensors
				5. Sequencing module
				6. Interlocking module
				7. Other
			1. Mode of Operation: Provide with three-position on/off/hold open switch with the following modes of operation.
				1. OFF - Door activators are inhibited (key switch input remains enabled for access control integration).
				2. ON - Normal operation (open/time out/close)
				3. HOLD OPEN - Door will open and stay open.
		1. Self-Learning Microprocessor Digital Programmable Control: Microprocessor control shall incorporate the following: Registration of door position back to the controller shall be determined via a linear potentiometer and signals from the linear potentiometer shall define door position without the use of door position magnets or mechanical switches.
			1. Control shall utilize a primary self-learning "teach-in" general program for the initial door set-up for both "Push and Pull" and Automatic door operation. Door opening speed, opening angle (0-110 degrees for outswing; 0 - 95 degrees for inswing), hold open time (0-6000 seconds) and closing speed shall be determined by manually walking the door through the initial door cycle.
			2. Features: Programmable controller provides the following features:
				1. Mode of Operation: "Low Energy Operator" as defined by ANSI Standard A156.19.
				2. Respond to activation controls such as hardwired push plates, wireless push plates, operate sensors and/or "Push or Pull" activation
				3. Respond to safety controls such as Quadscan door mounted presence sensors
				4. Electronic reversing for door obstruction in the opening and closing direction
				5. Adjustable opening and closing speeds - Programmable.
				6. Adjustable opening angle - Programmable
				7. Adjustable hold open time for door actuators - Programmable
				8. Adjustable hold open time for "Push and Pull" activation - Programmable
				9. Selectable (on/off) "Push and Pull" activation - Programmable
				10. Manual door movement required for "Push and Pull" activation - Programmable
				11. Adjustable latch check positioning - Programmable
				12. Adjustable latch check speed - Programmable
				13. Adjustable opening force limitation - Programmable
				14. Adjustable opening and closing speed limitation - Programmable
				15. Sequential operation (push to open/push to close) - Programmable
				16. On-board 24VDC .75A max power supply output with overload protection for wireless receiver
				17. On-board output for 24VDC electric strike with (.2-3.6S) delay - Programmable
				18. On-board output 24VDC for door open or door closed position status - Programmable
				19. On-board input for key switch - remains enabled in off mode for access control integration
				20. On-board input for swing side door mounted presence sensor - standard non programmable
				21. On-board input for approach side door mounted presence sensor - Programmable
				22. On-board input for swing side overhead mounted presence sensor - Programmable. (Controller shall only function with door mounted presence sensors on each side of the door or a door mounted presence sensor and an overhead presence sensor and lockout relay located on the swing side of door.)
				23. Factory reset - Programmable
				24. Built-in safety circuit with safety slow /stall / carpet / Reactivation - Programmable.
				25. Global power supply - Selectable 115-230 VAC 50-60 HZ
		2. Operating Conditions:
			1. Operator shall be fully lubricated to minimize wear and friction of moving parts, and shall operate in an ambient temperature range plus 5 and plus 125 degrees F (minus 15 and plus 50 degrees C) in all climatic conditions
			2. Equivalent Continuous Sound Level: Less than 70 DB

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required for project requirements. iMotion®TN 110 In-Floor Swing Door Operator (High and Low Energy) is suitable for single, pair, dual independent and double egress applications. Coordinate with doors and hardware specified in other sections. Use the schedule at the end of this section to identify the locations of the equipment required for each opening.

* 1. SWINGING DOOR OPERATOR - IN-FLOOR MOUNT (High and Low Energy)
		1. TORMAX iMotion TN 110 In-Floor Swing Door Operator.
			1. Operator is capable of swinging interior or exterior doors weighing up to 1000 pounds (454 kg). System consists of a non-handed electro-mechanical power open spring close swing door operator with heavy duty mechanics, galvanized floor box, self-learning iMotion microprocessor programmable controller, door connecting hardware, seven-segmented function control panel and operate controls. Mechanical converter to support the door and an overhead commercial/pedestrian rated overhead swing door operator to power the door open and close are not permitted. Mechanical switches and or cams to determine door position are not permitted. iMotion TN 110 In-Floor swing door operator and iMotion microprocessor control unit shall be factory assembled as a unit, adjusted and tested. Drive shall be recessed into the floor and contained within a galvanized floor box. All bearings shall be ball or roller type and no bushings are used.
			2. Power Supply Requirements: Provide 115VAC 60 HZ, 15 Amp, single-phase power supply to remote microprocessor control unit and low voltage shielded cables from remote microprocessor control unit to In-Floor operator motor and encoder.
			3. Power Open Operation: Operator uses a 1/3 HP AC Synchronous wear free motor driving a rack and pinion transmission coupled with the self-learning fully programmable iMotion microprocessor control. AC motor has a built-in protection circuit that interrupts current to the motor if the door is blocked open. Door opening speed provided and required by ANSI Standard. Drive train shall have positive, constant engagement. Operator shall stop the door in the open position, stall against an internal adjustable end stop and remain in the full open position as required by ANSI Standard. Provide operation as follows:

\*\* NOTE TO SPECIFIER \*\* Select one of the following Full Power or Low Energy paragraphs as required for the project and delete the one not required.

* + - * 1. Power Operated Pedestrian Door per ANSI A156.10.
				2. Low Energy Power Operated Door per ANSI A156.19.
			1. Spring Closing Operation: Operator shall close the door by spring energy. Closing speed is controlled by employing the motor as a dynamic break. Operator shall stop door in the closed position and stall against an internal adjustable end stop. Closing spring shall be pre-loaded for positive closing action at a low material stress level. Provide door closing speed as required by ANSI Standard.
			2. Manual Operation: Operator shall function as a manual door closer in the direction of swing with or without electric power.
			3. Entrapment protection: Door forces and speeds generated during power opening and manual opening and spring closing shall conform to the requirements of ANSI Standard.
			4. Floor Box:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required for the project and delete the one not required. Note that galvanized floor box requires a weep drain provided by others to eliminate any fluids from building up inside the box.

* + - * 1. Surface Box with satin stainless steel cover.
				2. Flush Mount Box with pan type cover for floor covering up to 3/4 inch (19 mm) maximum.
			1. Door Shoe: TN door shoe assembly encased with rubber sound isolators, securely fastened and concealed to the inside of the bottom door rail. Provide with cast iron door shoe splined to the operator drive spindle for maximum holding and strength. Shoe shall provide positive control of door through entire swing. Provide for the following type installation.

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs as required for the project and delete the ones not required.

* + - * 1. Center pivot without breakout.
				2. Center pivot with breakout.
				3. Offset Pivot.
				4. Butt Hung.

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs for doors with breakout feature. Delete if not applicable.

* + - 1. Emergency Release: Provide for center pivot in-swing doors requiring breakout. Equip doors with panic device assembly to provide emergency egress. While the door is in the emergency release mode the door shall be prevented from power operation. Door shall be manually reset to resume power operation. Not more than 50 pounds at the lock stile shall be required for emergency use per ANSI Standard.
			2. Controls: Provide with the following control functions.

\*\* NOTE TO SPECIFIER \*\* Select the controls required for ANSI A 156.10 full power operators only from following paragraphs and delete those not required.

* + - * 1. Eagle motion sensor
				2. OA-Edge2 approach and swing side door mounted presence sensors.
				3. Active and safety mats with molding.
				4. Guide rails

\*\* NOTE TO SPECIFIER \*\* Select the controls required for ANSI A 156.19 low power operators only from following paragraphs and delete those not required.

* + - * 1. Hardwire push plates
				2. Wireless push plates
				3. Hand held transmitter
				4. OA-Edge1 approach and swing side door mounted presence sensors.
				5. Battery back-up
				6. I/O module
				7. Sequencing module
				8. Interlocking module
				9. Other \_\_\_\_\_
			1. Control Panel: Provide with Illuminated control panel for operating modes as follows:
				1. Off/Automatic 1.
				2. Automatic 2.
				3. Exit/Open/Manual.
				4. Auto-diagnostics.
				5. System Configuration.
		1. Self-Learning iMotion microprocessor control shall utilize the following: An encoder fastened to the motor shaft shall monitor motor revolutions and send signals to the controller. Signals from the encoder shall define door position without the use of door position magnets or mechanical switches. Includes the following features:
			1. Control shall utilize a teach-in program for the initial door set-up for both "Push and Pull" and "Automatic Door Operation" initiated through an automatic reference run. Door opening speed, door opening angle and hold open time (0-60s) shall be programmed to meet application requirements.
			2. Features: Microprocessor control provides the following functions:
				1. Mode of Operation: Power Operated Pedestrian Door or Low Energy Power Operated Door as defined by ANSI Standard A156.10 or A156.19.
				2. Respond to activation controls such as hardwired push plates, wireless push plates, operate sensors and/or "Push or Pull" activation
				3. Respond to floor, overhead or door mounted safety sensors - Programmable
				4. Power open and hold - Programmable (smoke evacuation doors)
				5. Auto-diagnostics for quick and simple troubleshooting
				6. Integrated access code to inhibit unauthorized door adjustments
				7. Electronic reversing for door obstruction in the opening and closing direction - Programmable
				8. Reversing sensitivity adjustment - Programmable
				9. Motor power boost close - Programmable
				10. Motor hold close - Programmable
				11. Adjustable opening and closing speeds - Programmable.
				12. Adjustable opening angle - Programmable
				13. Adjustable hold open time for door actuators (0-60s) - Programmable
				14. Selectable (on/off) "Push and Pull" activation - Programmable
				15. Manual door movement required for "Push and Pull" activation - Programmable
				16. Adjustable latch check positioning - Programmable
				17. Adjustable latch check speed - Programmable
				18. Sequential operation (push to open/push to close) - Programmable
				19. On-board 24VDC .75A max power supply output with overload protection for sensors and activators
				20. On-board lock output power supply (24VDC 1A max.) for electric strike with (.2-4S) delay - Programmable
				21. On-board lock output power supply (24VDC 1A max) for magnetic lock - Programmable
				22. Two on-board outputs (24VDC) for door position status, alarm, etc. - Programmable
				23. On-board input for key switch - remains enabled in off mode for access control integration
				24. Four on-board inputs for safety sensors - Programmable
				25. Self-configuring swing side door mounted safety sensors - no cut off switch or manual adjustment required
				26. Four on-board inputs for activators, mode of operation, key switch - Programmable
				27. Factory reset - Programmable
				28. Built-in safety circuit with stall / Safety Slow /reactivation / carpet - Programmable.
				29. Global power supply - Selectable 115-230 VAC 50-60 HZ
		2. Operating Conditions:
			1. Climatic Conditions: System components shall operate between minus 30 and plus 130 degrees F (minus 34 and plus 54 degrees C) in all climatic conditions.
			2. Equivalent Continuous Sound Level: Less than 70 DB

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required for project requirements. TORMAX iMotion 1302 OHC Overhead Concealed Swing Door Operator (High and Low Energy) is suitable for single, pair, dual independent and double egress applications. Coordinate with doors and hardware specified in other sections. Use the schedule at the end of this section to identify the locations of the equipment required for each opening.

* 1. OVERHEAD CONCEALED MOUNT - SWINGING DOOR OPERATOR (High and Low Energy)
		1. TORMAX iMotion 1302 OHC Overhead Concealed Swing Door Operator - Bottom Load:
			1. System consists of the iMotion 1302 OHC electro-mechanical swing door operator and self-learning programmable microprocessor control unit, aluminum header, door connecting hardware, segmented function control panel, operate controls, safety controls and guide rails.
			2. System consists of a non handed electro-mechanical power open spring close swing door operator with heavy duty mechanics, self-learning programmable iMotion microprocessor control unit, aluminum header. iMotion 1302 swing door operator, control unit and header shall be factory assembled as a unit, adjusted and tested. All bearings shall be ball or roller type with no bushings.
			3. Power Supply Requirements: Provide 115V 60HZ, 5 amps, single-phase power supply. For multiple operators provide service to each operator from junction box.
			4. Door Operation:

\*\* NOTE TO SPECIFIER \*\* Select the operation required from following paragraphs and delete those not required.

* + - * 1. Single outswing
				2. Single inswing
				3. Pair, outswing
				4. Pair, inswing
				5. Operation(s) indicated on the Drawings.
			1. Power Open Operation: Operator uses a 1/5 HP AC synchronous wear free motor driving a transmission assembly that is coupled with the self-learning iMotion microprocessor programmable controller. Provide door opening speed as required by ANSI Standard. Drive train shall have positive, constant engagement. Operator shall stop the door in the open position by electrically reducing the motor voltage and stalling against a mechanical stop and remain in the full open position as required by ANSI Standard. Provide operation as follows:

\*\* NOTE TO SPECIFIER \*\* Select one of the following Full Power or Low Energy paragraphs as required for the project and delete the one not required.

* + - * 1. Power Operated Pedestrian Door per ANSI A156.10.
				2. Low Energy Power Operated Door per ANSI A156.19.
			1. Spring Closing Operation: Operator shall close the door by spring energy. Closing speed is controlled by employing the motor as a dynamic brake. Door closing speed as required by ANSI Standard. Closing spring shall be a clock type torsion spring, pre-loaded for positive closing action at a low material stress level for long spring life.
			2. Emergency Release: Center Pivot inswing doors equipped with a panic device assembly to provide emergency egress. While in the emergency release mode door shall be prevented from power operation. Door must be manually reset to resume normal operation. Not more than 50 pounds at the lock stile shall be required for emergency use per ANSI Standard.
			3. Header Case Bottom Load: Case is 5.90 inches wide by 5.90 inches high (150 mm wide by 500 mm high) aluminum extrusions with structurally integrated end caps. Operator is sealed against dust, dirt, and corrosion within the header case. Access to operator and microprocessor control box is provided by a full-length bottom load cover. Cover shall be flush with bottom of header.
				1. Aluminum Header Extrusion: Minimum wall thickness of .118 (3 mm).
				2. Aluminum Extrusion Finish: Standard anodized finish shall be:

\*\* NOTE TO SPECIFIER \*\* Select the finish required from the following paragraphs as required for the project and delete the ones not required. Special anodized, painted and metal clad finishes are available upon request. Specify finish, type and color.

AA-M12-C21-A41 Clear Architectural Class 1 anodized.

AA-M12-C22-A44 Dark Bronze Architectural Class 1 anodized.

AA-M12-C22-A44 Black Architectural Class 1 anodized.

Custom Anodized Color: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* + - 1. Door Arm Assembly: Top door arm shall be the OHC center pivot end load door arm assembly consisting of a forged steel arm and shim plate. Arm assembly shall be fastened and concealed to the inside web of the top door arm. Door arm shall be splined to the operator drive for maximum holding and strength. Door arm assembly shall provide for lateral door adjustment and shall have no moving parts.
			2. Floor and Bottom Door Pivot: Provide end load bottom door and floor pivot assembly as follows:

\*\* NOTE TO SPECIFIER \*\* Select the assembly required from the following paragraphs and delete the one not required.

* + - * 1. Surface mount pivot with tapered threshold plate.
				2. Flush mount pivot.
				3. Matching tapered threshold to finish off the opening.
			1. Control Panel: Provide with illuminated control panel for operating modes as follows:
				1. Off/Automatic 1.
				2. Automatic 2.
				3. Exit/Open/Manual.
				4. Auto-diagnostics.
				5. System Configuration
			2. Manual Use: Operator shall function as a manual door closer in the direction of swing with or without electrical power.
			3. Entrapment Protection: Door forces and speeds generated during power opening and manual opening and spring closing shall conform to the requirements of ANSI Standard.
			4. Controls: Provide with the following control functions.

\*\* NOTE TO SPECIFIER \*\* Select the controls required for ANSI A 156.10 full power operators only from following paragraphs and delete those not required.

* + - * 1. Eagle motion sensor.
				2. OA-Edge2 approach and swing side door mounted presence sensors.
				3. Active and safety mats with molding.
				4. Guide rails

\*\* NOTE TO SPECIFIER \*\* Select the controls required for ANSI A 156.19 low power operators only from following paragraphs and delete those not required.

* + - * 1. Hardwire push plates
				2. Wireless push plates
				3. Hand held transmitter
				4. OA-Edge1 approach and swing side door mounted presence sensors.
				5. I/O module
				6. Sequencing module
				7. Interlocking module
				8. Other \_\_\_\_\_
		1. Self-Learning iMotion microprocessor control shall utilize the following: An encoder fastened to the motor shaft shall monitor motor revolutions and send signals to the controller. Signals from the encoder shall define door position without the use of door position magnets or mechanical switches. Includes the following features:
			1. Control shall utilize a teach-in program for the initial door set-up for both "Push and Pull" and "Automatic Door Operation" initiated through an automatic reference run. Door opening speed, door opening angle and hold open time (0-60s) shall be programmed to meet application requirements.
			2. Features: Microprocessor control provides the following functions:
				1. Mode of Operation: Power Operated Pedestrian Door or Low Energy Power Operated Door as defined by ANSI Standard A156.10 or A156.19.
				2. Respond to activation controls such as hardwired push plates, wireless push plates, operate sensors and/or "Push or Pull" activation
				3. Respond to floor, overhead or door mounted safety sensors - Programmable
				4. Power open and hold - Programmable (smoke evacuation doors)
				5. Auto-diagnostics for quick and simple troubleshooting
				6. Integrated access code to inhibit unauthorized door adjustments
				7. Electronic reversing for door obstruction in the opening and closing direction - Programmable
				8. Reversing sensitivity adjustment - Programmable
				9. Motor power boost close - Programmable
				10. Motor hold close - Programmable
				11. Adjustable opening and closing speeds - Programmable.
				12. Adjustable opening angle - Programmable
				13. Adjustable hold open time for door actuators (0-60s) - Programmable
				14. Selectable (on/off) "Push and Pull" activation - Programmable
				15. Manual door movement required for "Push and Pull" activation - Programmable
				16. Adjustable latch check positioning - Programmable
				17. Adjustable latch check speed - Programmable
				18. Sequential operation (push to open/push to close) - Programmable
				19. On-board 24VDC .75A max power supply output with overload protection for sensors and activators
				20. On-board lock output power supply (24VDC 1A max.) for electric strike with (.2-4S) delay - Programmable
				21. On-board lock output power supply (24VDC 1A max) for magnetic lock - Programmable
				22. Two on-board outputs (24VDC) for door position status, alarm, etc. - Programmable
				23. On-board input for key switch - remains enabled in off mode for access control integration
				24. Four on-board inputs for safety sensors - Programmable
				25. Self-configuring swing side door mounted safety sensors - no cut off switch or manual adjustment required
				26. Four on-board inputs for activators, mode of operation, key switch - Programmable
				27. Factory reset - Programmable
				28. Built-in safety circuit with stall / safety slow / reactivation / Carpet - Programmable.
				29. Global power supply - Selectable 115-230 VAC 50-60 HZ
		2. Operating Conditions:
			1. Climatic Conditions: Operator shall be fully lubricated to minimize wear and friction of moving parts, and shall operate in an ambient temperature range minus 30 and plus 130 degrees F (minus 34 and plus 54 degrees C) in all climatic conditions.
			2. Equivalent Continuous Sound Level: Less than 70 DB
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly prepared.
		2. Verify that other trades are complete with their required work before installing the automatic swing door operating system.
		3. Mounting surfaces shall be plumb, straight and secure; substrates shall be of proper dimension and material; material which door is anchored to shall be capable of supporting the automatic door system and associated loads.
		4. Verify electric power is available and has correct characteristics.
		5. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions.
		2. Set all units plumb, level and secure.
		3. Provide all fasteners required for installation of the automatic sliding door system.
		4. After repeated operation of the completed installation, inspect door operators and controls for optimum operating condition and safety.
		5. Adjust door equipment for correct function and smooth operation.
		6. Clean all metal surfaces promptly after installation.
		7. Remove temporary protection, clean exposed surfaces.
	4. FIELD QUALITY CONTROL
		1. Manufacturers representative to verify that installation of doors and controls are in conformance to the manufacturer's recommendations.
	5. PROTECTION
		1. Protect installed products until completion of project.
		2. Touch-up, repair or replace damaged products before Substantial Completion.
	6. SCHEDULES

\*\* NOTE TO SPECIFIER \*\* Retain Paragraph below if required to suit project requirements. Identify products by name on the Drawings or use this paragraph to define the location of each type of material to be used. The following are some examples of schedule references. Edit as required to suit project or delete and identify products on the Drawings.

* + 1. :
		2. :

END OF SECTION