

Saturn S Revolving Door

Division 8 – Door and Windows

Section 08 42 33 – Revolving Doors



PART I – General

1.01 SECTION INCLUDES

- A. This section covers the furnishing and installation of a complete Manual Revolving Door System. Provide complete system that has been fabricated and tested for proper operation. It includes curved sidewalls, canopy, ceiling, door wings, hardware, glass, speed control and emergency collapsing mechanism as required for installation.

1.02 RELATED SECTIONS

- A. Section 07915 - Sealants, Caulking and Seals
- B. Section 08400 - Entrances and Storefronts
- C. Section 08710 - Door Hardware
- D. Section 08810 - Glass and Glazing
- E. Section 09600 - Flooring
- F. Section 16123 - Electrical Supply and Termination

1.03 REFERENCES

- A. ANSI/BHMA A156.27 – American National Standard for Power and Manual Operated Revolving Pedestrian Doors.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials used in Buildings.
- C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum
- D. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- E. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- F. ASTM A 480/A 480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
- G. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- H. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- I. ASTM A 36 / A36 Standard Specification for Carbon Structural Steel.
- J. ASTM A 240 / A 240M Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

1.04 COORDINATION

- A. Recesses: Manufacturer shall coordinate size and location of recesses in floor construction for revolving door entrance components including anchorages for frames and supports.
- B. Anchorages: Manufacturer shall furnish drawings and directions for installing anchorages that are to be embedded into concrete.
- C. Layout Template (Optional): Manufacturer shall provide precision cut floor layout template.

1.05 QUALITY ASSURANCE

- A. Manufacturer shall be a company specializing in the supply of manual revolving doors with a minimum of ten (10) years of experience.
- B. Installer shall supply a factory-trained supervisor during installation of the door (Optional).
- C. All Revolving Doors must be pre-erected and tested in factory prior to shipment.

1.05 SUBMITTALS

- A. Manufacturer shall submit project specific shop drawings and finish samples as required.
- B. Manufacturer shall indicate pertinent dimensions, general construction, component connections and locations, anchorage methods and locations.
- C. Manufacturer shall provide sample of unexecuted manufacturer warranty.
- D. Manufacturer shall provide test reports proving that they have tested and met the requirements of "ASHRAE" air infiltration requirements "90A" and "90.1" per the "ASTM E-283" testing parameters.

1.06 CLOSEOUT SUBMITTALS

- A. Manufacturer shall submit appropriate operation and maintenance manual.
- B. Manufacturer shall submit copy of the revolving door "As-Built" shop drawings.
- C. Manufacturer shall submit copy of the executed revolving door warranties.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Manufacturer shall deliver materials to job site in manufacturer's packaging undamaged, complete with installation and operating manuals.
- B. Manufacturer shall store materials off ground, under cover, protected from weather and construction activities.

1.08 WARRANTY

- A. International Revolving Door warrants its doors against defects in material and workmanship for a period of twelve (12) months from the date of shipment of the product. This warranty excludes glass breakage, normal wear on finishes or damage that occurs due to abuse, misuse, or acts of God.
- B. International Revolving Door warrants its overhead speed control for a period of one-hundred and twenty (120) months from the date of shipment of the product. This warranty excludes normal wear on finishes or damage that occurs due to abuse, misuse, or acts of God. This warranty is void if work is performed on speed control by a non-factory authorized technician.
- C. International Revolving Door warrants its floor speed control for a period of sixty (60) months from the date of shipment of the product. This warranty excludes normal wear on finishes or damage that occurs due to abuse, misuse, or acts of God. This warranty is void if work is performed on speed control by a non-factory authorized technician.



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- D. International Revolving Door warrants its electronic components for a period of twelve (12) months. This warranty excludes damage that occurs due to abuse, misuse, water damage, or acts of God. This warranty is void if work is performed on electronic components by a non-factory authorized technician.
- E. Finish Warranty Period: Anodized finishes: Five (5) years, painted finishes: Five (5) years manufacturers' warranty **(Ten (10) and Twenty (20) year finish warranties available).**

PART 2 – Materials and Products

2.01 MANUFACTURER

- A. Saturn S Manual Revolving Door
Manufactured By: International Revolving Door
2138 N. Sixth Ave, Evansville, IN 47710.
(812) 425-3311 Homepage: <http://www.internationalrevolvingdoor.com/>
- B. Limitations: Obtain revolving door entrance components through one source from a single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

- A. Performance Standard: Comply with ANSI A156.27
- B. Opening Force, Maximum Turning Speed, Emergency Breakout, and Entrapment-Prevention Force: Comply with cited BHMA standard and requirements by authorities having jurisdiction
- C. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201.
- D. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 1.25 cfm/sq. ft. (6.4 L/s x sq. m) of fixed entrance-system area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 under UL 325.

2.03 DOOR CONSTRUCTION

- A. Basis of Design: International Revolving Door Saturn S Revolving Door
- B. Aluminum Curved Enclosure Walls: Shall have a standard inside diameter of 6'-6", 7'-0", 7'-6", 8'-0" and be manufactured from four (4) extruded aluminum posts, two (2) 4" extruded aluminum center mullions, and two (2) 4" extruded aluminum bottom rails.
 - 1. Enclosure walls shall be fastened and fit with tight hair line butt-joints.
 - 2. Enclosure wall shall be 1-5/8" thick.
 - 3. Enclosure walls shall have a 4" bottom sightline.
- C. Bronze and Stainless Steel Curved Enclosure Walls: Shall have a standard inside diameter of 6'-6", 7'-0", 7'-6", 8'-0" and be manufactured from four (4) bronze or stainless steel formed wall posts, two (2) 4"



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bronze or stainless steel formed center mullions, and two (2) 4" bronze or stainless steel bottom rails bottom rails.

1. Enclosure substructure shall be made and reinforced with stainless steel for corrosion resistance.
 2. Fabricate revolving door individual assemblies using reinforced and face welded surface joints, with all welds dressed flush and finish blended to match adjacent surfaces (Per American Welding Society standards).
 3. Where bends in steel forming are required, all stretch lines and die marks shall be refinished to blend with adjacent surfaces.
 4. Enclosure walls shall be 1-3/4" thick.
 5. Enclosure walls shall have a 4" sightline.
- D. Free-standing Design (Optional): Free-Standing Design doors have a 1-1/2" structural steel square bar running from the sub-floor to the canopy in each wall post and mullion.
- E. Canopy: The canopy and ceiling shall consist of one (1) structural piece, and shall have a formed and welded steel substructure (Available with a 3-1/8", 6" and 12" cornice).
1. Canopy shall have a formed steel joist with a minimum thickness of .105" steel.
 2. Cornice sheet minimum thickness shall be .090".
- F. Saturn S (Narrow Stile) Door Wings: Three (3) or four (4) door wings as designed and manufactured of narrow stile aluminum extrusions and reinforced with internal aluminum door corners for strength. Door wings must utilize removable rubber and felt weather stripping on two sides and rubber on one side. The inside stile shall be 1-3/4" x 1-3/4", the outside stile shall be 1-3/4" x 2-1/2", and the bottom and top rail shall be 1-3/4" x 3". Door wings must be capable of folding forward or backward allowing for emergency egress. Door wings are available in clad bronze or stainless steel.
1. Where bends in steel forming are required, all stretch lines and die marks shall be refinished to blend with adjacent surfaces.
 2. Door wings shall have a 4" sightline.
- G. Fasteners: No visible fasteners shall be used except those necessary for the application of manufacturer's hardware, and glass molding. Fasteners shall be corrosion-resistant, non-staining, non-bleeding, and compatible with adjacent materials.

2.04 EQUIPMENT

- A. Overhead Manual Speed Control: Attaches to the top of the center rotating shaft inside the canopy and limits the rotation speed of the door to a preset RPM not to exceed 12 revolutions per minute. Operating in an oil bath, the centrifugal braking unit can be adjusted for lower maximum speeds to meet NFPA, BOCA requirements.
1. The overhead speed control device shall engage at 10 rpm and limit the turning speed to 12 rpm.
 2. The speed control shall have a 100-1 gear ratio and must be designed to prevent rapid acceleration.
 3. The speed control housing shall be precision machined from cast iron.
 4. The speed control shall have a precision machined bronze brake shoe.
 5. The brake shoe housing shall be precision machined from cast iron.
- B. In-Floor Speed Control (Optional): Attaches to the bottom disc of the center rotating shaft with a stainless-steel speed control stub shaft plate and limits the rotational speed of the door to a preset RPM not



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to exceed 12 revolutions per minute. Operating in an oil bath, the centrifugal braking unit can be adjusted for lower maximum speeds to meet NFPA, BOCA requirements.

1. The overhead speed control device shall engage at 10 rpm and limit the turning speed to 12 rpm.
 2. The speed control shall have a 100:1 gear ratio and must be designed to prevent rapid acceleration.
 3. The speed control housing shall be cast iron.
 4. The speed control shall have a stainless-steel stub shaft plate that mounts to the speed control and bolts to the bottom disc of the center shaft.
- C. Automatic Drive System (Optional): A gearbox attaches to the top of the center rotating shaft inside the canopy and limits the rotation speed of the door to a preset RPM not to exceed 12 revolutions per minute. The door will have a motor attached to a gearbox to lower maximum speeds to meet NFPA, BOCA requirements (Requires a 12" minimum cornice height and 110-120 VAC power service from above, by others).
- D. Emergency Collapsing Mechanism: Precision-engineered door hangers and disks that allow the door wings to be collapsed or folded, and stored in a book-fold position. Collapsing mechanism shall permit the wings to fold to emergency exit position allowing a minimum aggregate width of 36 inches. Pressure setting shall be capable of being adjusted from 60 pounds to a maximum setting of 220 pounds. The adjusting device shall be accessible without removal of wings, center shaft or discs. Pressure setting shall be preset and tested in the factory and shall only be adjusted in the field to meet the specific needs of the building.
1. Wings are held in radial positions by means of self-lubricating plungers, engaging in the top and bottom disc of each wing. Excess pressure shall rotate plunger from disc "V-groove".
 2. The hangers will have two (2) replaceable bronze guide pins.
- E. IRD Carrier Arm Electric Shaft and Wing E-Lock (Optional): A fail-safe shaft and wing lock mechanism with a two (2) position post-mounted key switch to activate locking and/or a remotely located activation and de-activation switch. When engaged, the electromagnetic locking carrier arm will prevent the collapsing of the wing, and/ or will prevent rotation of the door wings. Electric locking is disengaged by loss of power or signal from building fire/smoke alarm (Requires a minimum 12" canopy and a 110-120 VAC power service from above, by others).
- F. IRD Carrier Arm Door Return and Push Assist (Optional): Automatically resets the door to its home (X) position after every use to provide an optimal weather seal while door is idle. The door will be equipped with a carrier arm with electromagnetic locks. The door will use infrared sensors to identify if any person(s) are in a compartment prior to door returning to home (X) position. The door will automatically assist operator in rotation of revolving door wings. Motor engages at roughly half the pushing pressure of a standard manual. Overhead sensors detect when all quadrants are vacant and automatically reset the door to its home (X) position (Requires a minimum 12" canopy and a 110-120 VAC power service from above, by others).
- G. Lights (Optional): Provide (up to 4) LED 9-1/4" diameter lights to be recessed into ceiling (110-120 VAC power service required from above by others).

2.05. HARDWARE

- A. Adjusting Screw: Bronze screw used to adjust the pressure required to book-fold rotating wings.



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- B. Bumpers: Rigid, architectural bronze and rubber-tipped bumpers are located on the top door rail of each door wing to prevent door wings from contacting one another when in the book fold position; one (1) per wing. Bumpers are available in the following finishes:
1. #4 Satin Brushed Bronze or Chrome
 2. #8 Polished Mirrored Bronze or Chrome
 3. #4 Statuary Bronze
 4. Painted to Match
- C. Center Shaft: Steel center shaft shall connect the speed control and floor pivot using a stainless-steel pivot pin.
- D. Center shaft Housing: Extruded center shaft housing shall be of aluminum alloy 6061-T6 per ASTM B-221 and shall cover the steel center shaft.
- E. Discs: Precision machined disc from bronze casting shall be mounted on center shaft that receives the hanger breakaway mechanism; two (2) per center shaft. The disc face shall be 1-1/2" thick and comes in the following finishes:
1. #4 Satin Brushed Bronze or Chrome
 2. #8 Highly Polished (mirror finish) Bronze or Chrome
 3. #4 Statuary Bronze
 4. Painted to Match
- F. Floor Grates (Optional): A stainless steel frame shall be embedded in the radius of the door, designed for recessed mats and to provide a smooth transition between flooring. If used, this ring is required to be installed in the floor prior to the installation of the door.
- G. Guide Pin: A bronze pin shall connect the hanger to the disc on the center shaft; two (2) per hanger.
- H. Hanger: Precision machined hanger from bronze casting that mounts the rotating wing to the disc on the center shaft; two (2) per rotating wing. The hangers shall be of 1/8" minimum thickness. Hangers are available in the following finishes:
1. #4 Satin Brushed Bronze or Chrome
 2. #8 Highly Polished (mirror finish) Bronze or Chrome
 3. #4 Statuary Bronze
 4. Painted to Match
- I. Pivot: Floor mounted under center shaft to provide smooth rotation. Must be of teflon filled acetyl or similar material, resilient, self-lubricating, and have a replaceable snap-in bushing. An overhead pivot is available with in-floor speed control.
- J. Push Bars: Provide 3/8" x 2" aluminum, architectural bronze, or stainless steel flat push bar; one (1) per door wing. 1" diameter round aluminum, stainless steel, or architectural bronze push bars are available as an option. Push bars are available in the following finishes:
1. #4 Satin Brushed Bronze or Stainless Steel
 2. #8 Highly Polished (mirror finish) Bronze or Stainless Steel #4 Statuary Bronze
 3. Anodized to Match
 4. Painted to Match



- K. Roof Sheet/Dust Cover: Made of aluminum, bronze, or stainless-steel sheet metal. The roof sheets sit on top of the canopy and is fastened and caulked in place. Roof sheets are available in the following finishes:
- 1) Mill Finish
 - 2) Finished to Match (Optional)
- L. Surface Applied Locks: Precision machined, architectural bronze 1-7/8" x 6-1/4" surface-mounted deadbolt locks with removable, keyed cylinders that lock into the ceiling or floor on the two interior door wings; two (2) per revolving door. Locks available in the following finishes:
1. #4 Satin Brushed Bronze or Chrome
 2. #8 Highly Polished (mirror finish) Bronze or Chrome
 3. #4 Statuary Bronze
 4. Painted to Match (Optional)

2.06 POWER REQUIREMENTS

- A. 110-120 volts, single phase 60 HZ

2.07 MATERIALS/FINISH

The following materials and finishes are available for the enclosure walls, rotating door wings and ceiling.

- A. Tempered Glass: All flat glass in door wings shall be 1/4" clear tempered safety glass. All glass shall meet ANSI standard Z 97.1.
1. Glass etching/printing per Architect (Optional)
 2. Tint color per Architect from Manufacturer's full line (Optional)
 3. Ultra-clear low-iron glass (Optional)
- B. Laminated Glass: All curved glass in door wall shall be 5/16" clear curved laminated safety glass; 7/16" clear curved laminated safety glass is available as an option. All glass shall meet ANSI standard Z 97.1.
1. Glass etching/printing per Architect (Optional)
 2. Tint Color per Architect from Manufacturer's full line (Optional)
 3. Ultra-clear low-iron glass (Optional)
- C. Weatherstripping: Weatherstrips shall be made of dual durometer extruded Santoprene and woven felt. Weatherstrip is to be installed in top rails, stiles and bottom rails, designed to properly engage the curved enclosure walls, revolving door ceiling, and floor. Special adjustment feature will allow for three-eighths inch adjustment.
- D. Glazing Sealants: Wall glazing shall be silicone, single component – Spectrem 1 (Tremco) or silicone, single component – 791 (Dow Corning).
- E. Metal Finishes: Shall Comply with NAAMMs "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- F. Aluminum Extrusions: All commercial grade extrusions shall be of aluminum alloy 6063-T6 per ASTM B-221 and be of .125 minimum thickness. Finishes available:



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1. AAMA 611 Architectural Class 1 Clear Anodized Type AA-M10C22 A41
 2. AAMA 611 Architectural Class 1 Anodized Type AA-M10C22 A44: Light, Medium and Dark Bronze, Black and Champagne
 3. Custom Anodized Finish by Architect
 4. AAMA 2605 Superior Performing Organic Coatings (e.g.: Duranar, Fluropon; 70% Kynar Fluoropolymers)
 5. AAMA 2604 High Performance Organic Coatings (e.g.: Powder Coating)
- G. Aluminum Sheet: All aluminum sheet metal shall meet ASTM B-209, be of H15 or H34 temper 5005 alloy and shall be of .063 minimum thicknesses. Finishes available:
1. AAMA 611 Architectural Class 1 Clear Anodized Type AA-M10C22 A41
 2. AAMA 611 Architectural Class 1 Anodized Type AA-M10C22 A44: Light, Medium and Dark Bronze, Black and Champagne
 3. AAMA 2605 Superior Performing Organic Coatings (e.g.: Duranar, Fluropon; 70% Kynar Fluoropolymers)
 4. AAMA 2604 High Performance Organic Coatings (e.g.: Powder Coating)
- H. Stainless Steel Sheet: All stainless-steel sheets shall meet ASTM 240/A 240M, shall be Type 304 and shall be of .060" minimum thickness; Type 316 is available as an option. Finishes available:
1. #4 Brushed Satin
 2. #6 Brushed Satin
 3. #8 Highly Polished (mirror finish)
 4. #8 Highly Polished Non-Directional (mirror finish)
- I. Steel Sections: ASTM A 36; shapes to suit mullion sections.
- J. Steel Sheet: ASTM A 653/A 653M; 0.105 inch (2.6 mm) minimum thickness.
- K. Bronze Sheet: All bronze sheets shall be alloy #280 (Muntz) and be of .062" minimum thickness; #220 (Commercial) and Nickel Silver are available as options. Finishes available:
1. #4 Brushed Satin; Lacquered
 2. #4 Statuary Bronze; Lacquered
 3. #6 Brushed Satin; Lacquered
 4. #8 Highly Polished (mirror finish); Lacquered

PART III – EXECUTION

3.01 Examination

- A. Inspection: Installer must examine the location and advise the Contractor of any site conditions unacceptable for proper installation of product. These conditions include but are not limited to the following:
1. Door must be installed on finished floor
 2. Finished floor must be completely level at any point within the footprint of the door
 3. Electrical power and control connections must be properly located and of correct characteristics.



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4. Recessed and supplemental framing must comply with requirements on approval shop drawings.
- B. Installer shall proceed with installation once conditions affecting installation and performance of revolving door entrance meet manufacturer's requirements.

3.02 REVOLVING DOOR INSTALLATION

- A. General: Comply with revolving door entrance manufacturer's written installation instruction and approved shop drawings
- B. Construction: Install revolving doors in accordance with manufacturer's printed instructions. Set units level, plumb, and with uniform hairline joints. Anchor securely into place. Use only factory-authorized installers. Revolving door to be installed after other finishing operations have been completed.
- C. Structural Connection: Secure revolving door entrance components to building structure and supports as indicated on approved shop drawings, utilizing approved fasteners and spacing (for doors without the free-standing option).
- D. Glass Installation: Install glass and enclosure panels in accordance with Section 088000 "Glazing".
- E. Electrical Power: Complete connections to electrical power, lighting and controls in accordance with requirements of respective Division 26 and Division 28 Sections (by others)
- F. Lubrication: Lubricate breakaway mechanism disc "V-groove", hanger guide pins, and floor pivot with lithium grease

3.03 REVOLVING DOOR ADJUSTMENT

- A. Hardware and Operating Components: Adjust to produce smoother operation, and tight, uniform fit
- B. Door Rotations per Minute: Adjust speed control to required timing and force
- C. IRD Carrier Arm Door Return and Push Assist (Optional): Test and adjust components for smooth operation and functionality
- D. Door Locks: Adjust latches and locks for smooth operations
- E. IRD Carrier Arm Electric Shaft and Wing E-Lock (Optional): Test and adjust components for smooth operations and functionality

3.04 REVOLVING DOOR MAINTENANCE

- A. Off-Site Instruction: A factory-trained technician shall remotely demonstrate to the owner's maintenance crew the proper operation of the door and the necessary service requirements such as lubrication, cleaning, and inspection of components upon completion of installation.
- B. On-Site Instruction (Optional): A factory-trained technician shall demonstrate to the owner's maintenance crew the proper operation of the door and the necessary service requirements such as lubrication, cleaning, and inspection of components upon completion of installation.



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- C. Cleaning: Installer shall clean metal and glass surfaces carefully after installation to remove excess caulk, dirt and labels.
- D. Routine Maintenance: Every three (3) months, manufacturer shall fold wings and check operation. Use a clean, dry paintbrush to remove any accumulation of dirt from areas around the hold plunger and V-recess. Wipe off guide pins and pilot pin on hangers and wipe out grooves in disc with a slightly oiled cloth to ensure trouble free operation.
- E. Technical Support: Manufacturer to provide twelve (12) months of over the phone technical support.

IRD Group, Inc. dba: International Revolving Door reserves the right to change this specification at any time without notice.



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