**PART 1 - GENERAL**

1.01 SECTION INCLUDES

1. Motorized window actuator control system for windows.
2. Hardware and accessories.
3. Related Sections:
4. Division 08 for windows and doors.

1.02 SUBMITTALS

1. Product Data: For each window actuator and controls type required. Include manufacturer's standard details, fabrication methods, and mounting and installation recommendations for each component of the window operating system required, and the following:
2. Installation instructions.
3. Parts included.
4. Maintenance Data: include in the maintenance and installation manual.

1.03 QUALITY ASSURANCE

1. Installer Qualifications: Engage an experienced electrical installer who is an authorized representative for both installation and maintenance of units required for this Project.
2. UL Standard: Provide actuators and controls that are UL certified.

1.04 WARRANTY

1. General Warranty: WindowMaster window actuators must only be connected to genuine WindowMaster WCC 310/320 UL power supplies. If power supplies other than WindowMaster are used for connection to WindowMaster 24v window actuators, then this will invalidate in full any warranty or guarantee for WindowMaster window actuators. WindowMaster take no responsibility for the performance of WindowMaster products or third-party products in this instance.
2. Warranty Period: 3 year from date of substantial completion, unless otherwise agreed upon with window manufacturer or project manager. This special warranty must be a submitted written and signed warranty between the window manufacturer and WindowMaster Clearline Inc.

**PART 2 - PRODUCTS**

2.01 MANUFACTURE

Motorized Window Actuators and Controls Basis of Design

WindowMaster Industries GmbH. [www.windowmaster.com](http://www.windowmaster.com)

2.02 WINDOW ACTUATOR REQUIREMENTS

1. Capacity: Provide window actuators recommended by manufacturer for window dimensions, weight, glass thickness, opening direction and movement; for long-term maintenance-free operation.

1. Products to be Provided By:

WindowMaster Clearline Inc.

1. Concar Dr, Floor 4, San Mateo | CA 94402 P: +1 650 360 5414

Contact: Mia Brondum mbr.us@windowmaster.com

1. 24vdc motorized window actuators by WindowMaster WMX/WMU/WMB/WMS series. Actuators will be delivered in WindowMaster’s standard color, unless otherwise specified.
2. Power supplies Motor Controller WCC 310/320 P UL.
3. WSK or WWS 100 keypads for occupant override.
4. 1.9 Meter 3-Core Cable, unless otherwise specified in actuator product cut sheet.
5. All brackets and mounting parts.
6. Installation manuals, detailed drawings and product sheets.

2.03 MOTORIZED WINDOW ACTUATORS

1. Manufacturer: WindowMaster Industries GmbH delivered by WindowMaster Clearline Inc.
2. Motorized Window Actuators: shall be WMX, WMU, WMB, WMS actuator by WindowMaster Clearline Inc., and shall be mounted with WindowMaster brackets.
3. At least one motorized actuator is required per operable window. The number of actuators will be based on the window size, weight, glass thickness and window movement.
4. 24v DC window actuators shall be used. Motors and all low voltage system components shall be Underwriter Laboratory (UL) recognized or listed.
5. Electrical installer shall provide voltage drop calculation for wire runs to actuators to insure adequate power for synchronized operation of motors in each room.
6. Electrical installer to supply wiring (sized correctly for voltage drop), conduit, connectors, j boxes, electrical enclosures and required fuses.
7. WindowMaster Clearline Inc. will supply installation manuals and mounting details for the specific project. Locational and wiring diagrams can be ordered by WindowMaster, upon request.
8. Technical specifications
	1. Voltage Supply: 24V DC (max. 10% ripple)
	2. Open Circuit Voltage: max. 36 VDC
	3. Actuator Max Stroke: from 50 - 600 mm
	4. Traction Force: 100-1500 N
	5. Locking Force: 3000 N
	6. Power: Max 24W
	7. Current consumption: range of 0.5 Amp - 5 Amp per actuator

2.04 MOTORLINK ACTUATORS

1. Programmable 24v DC window actuators with MotorLink technology must be used throughout the project. The MotorLink actuator range must be suitable for surface and/or for concealed installation in comfort ventilation applications. The actuator must have a reverse function to prolong the life of the weather seal and must be programmable for modification of tractive force and pressure for closing forces (subject to factors such as hinges, window type, application etc.).
2. The MotorLink actuators must be used in conjunction with an intelligent MotorLink control panel for programmed to benefit from:

# Actuator Position feedback. The actuator must provide two-way communication with the control panel to enable feedback to the control software on the exact position, for precision of opening (mm x mm) and control, as well as a security indicator for open windows.

# Three Speed Operation. The actuator must provide two-way communication with the control panel to enable it to operate at a very slow speed when in the automatic mode, which can reduce any potential impact or disturbance to the occupants. It can also enable the motors to operate at a faster speed when activated by the manual keypads, for example, in order to provide an immediate visual response to the user, and at full speed in the event of an alarm signal for rain, snow or/and wind situations.

# Pressure Safety Function. The MotorLink actuator must have the ability to monitor for entrapment on specified windows by communication via the microprocessors installed within the actuator and by monitoring in real-time the amount of electrical current being drawn and the precise position of the window to an accuracy of less than a millimetre. The MotorLink actuator will detect if an object becomes trapped in the leading edge of the window and prevent it from closing by monitoring the amount of current being drawn and then reversing the actuator to release the obstruction. The sensitivity of the pressure safety must be adjustable, as the pressure safety function is a factor of the closing force of the actuator combined with the size and weight of the window, as well as the configuration of the window, its hinges and the rigidity of the profile itself. Therefore, the overall performance and sensitivity of the system is dependent upon all these factors combined and needs to be monitored and adjusted as the required forces can change during the life of the building.

# Fault Indication. The actuator must provide two-way communication with the control panel to enable feedback to the control software on the window status and an early indication of any errors with the actuator operation or the wiring.

# Synchronization Function. The MotorLink actuators must run fully synchronized – without an external synchronization module. Up to four actuators can work together on one window with a tolerance of less than 0.08 inches (2 mm). The actuators communicate with each other directly and adjust their speed so that they are always operating fully synchronized.

**PART 3 - EXECUTION**

3.01 PREPARATION

1. Templates and Diagrams: Completed diagrams, and other data to fabricators and installers of related work as necessary for coordinating window actuator and controls installation.
	1. INSTALLATION
2. General: Install complete manual and motorized window operating system according to manufacturer's written installation manuals, including controls, control wiring units and cables.
3. Location: refer to drawings for location and installation manuals.

3.03 ADJUSTING, CLEANING & MAINTENANCE

1. Follow instructions from manufacturer installation manual.

**END OF SECTION**