SECTION 12491 - INTERIOR ROLLER SHADES – ELECTRONIC

PART 1 GENERAL

1.1 SUMMARY

A. SCOPE

1.) The following specifications detail the minimum performance and related criteria for an electronic shade control system proposed for this project. Any deviations from this specification must be submitted in the format defined in section 2.1.

2.) Provide all electronic shading systems, controls, and materials as specified in locations indicated on architectural plans including:

a.) AC Motorized Shade Drive

b.) Shade Fabric

c.) Mounting Conditions

d.) Control Options (Operator)

e.) Top Treatments and Extruded Aluminum or Steel Accessories

3.) Furnish and install all window shades, accessories, controls, and attaching hardware.

B. PRODUCTS TO BE SUPPLIED BUT NOT INSTALLED UNDER THIS SECTION

1.) Class 2 electrical control components such as control keypads and sensors necessary to provide control characteristics as specified elsewhere in this section.

2.) Line-voltage control components such as group controllers and switches as necessary to provide control characteristics as specified elsewhere in this section.

C. RELATED SECTIONS AND DOCUMENTS

1.) Section 06100-- Rough Carpentry; blocking for support of window shade brackets or pocket assemblies.

2.) Section 09256-- Substrate for window shade systems and installation of shade pockets, pocket closure, and/ or accessories supplied only under this section.

3.) Section 09511-- Acoustical Ceilings; installations of shade pockets, pocket closure, and/or accessories supplied only under this section.

4.) DIVISION 16 - Electrical; installation of and connections to electrical motor control system and lighting control system components supplied only by this section as required to accomplish control requirements specified elsewhere and as indicated in the drawings.

5.) Drawings and general provision of the Contract, including General Conditions apply to this Section.

1.2 REFERENCES

A. MANUFACTURER

1.) Underwriters Laboratories Inc.

2.) Canadian Standards Association

3.) NOM Certification Mark

4.) American National Standards Institute

5.) Institute of Electrical and Electronic Engineers

B. FABRICS

1.) Flame-retardant fabrics must meet or exceed requirements of NFPA test #701.

2.) Fire – Provide shade fabrics tested in accordance with:

a.) 1989 NFPA 701 small scale Vertical Burn Test and rated "PASS."

b.) 1996 NFPA 701 small scale Vertical Burn (telephone booth test) and rated "PASS."

C. Electrical: All line voltage components of the system shall be either UL Listed or UL recognized. All low voltage components within the system shall be powered by UL listed or UL recognized class 2 transformers or power supplies and wired as NEC® Class 2 circuits.

D. Electronic components within the system shall meet IEC801-2, tested to withstand a 15kV electrostatic discharge without damage or loss of memory.

E. RESPONSIBILITY FOR WINDOW-TREATMENT SYSTEM

1.) The responsibility for the design, engineering, installation, and performance of motorized window shade systems, motors, controls, low-voltage control electrical wiring specified in this Section shall be assigned to a single manufacturer and their authorized dealers/installers.

2.) Unless specifically requested, the Architect will not need to produce a set of electrical drawings for the installation or control wiring of the motors or controllers for the window shades.

3.) The General Contractor shall coordinate installation of the following items with the Window Shade Installer for all window treatment systems:

a.) Metal shade pockets or housings recessed into ceiling system or assembly.

b.) Extruded aluminum ceiling pocket trim (closure) assemblies.

4.) The General Contractor, electrical contractor, mechanical engineer, and electrical engineer shall provide the following materials and services to the window shade contractor for electrically powered window treatments:

a.) Power wiring in accordance with requirements provided by the Window Shade Installer.

b.) Power and panel boxes of sufficient size to accommodate window shade manufacturer's requirements, as indicated on the Electrical Drawings.

c.) Power (junction box) within 5’ (1516 mm) of each motor where required and connect power to shade motor. (Window Shade Installer shall specify power needs to Electrical Contractor).

d.) Low-voltage wiring as necessary for operation of shade control system. All above-ceiling and concealed wiring shall be installed in conduit. (Window Shade Installer shall specify power needs to Electrical Contractor)

e.) All conduits as required for window shade electrical wiring; coordinate requirements with window shade manufacturer before inaccessible areas are constructed.

f.) Conduit in all areas that might not be accessible to the Window Shade Installer due to the building design or equipment location.

g.) Any electrical wiring, connectors, relays, or electrical devices required to complete installation of system that are not specified in this section.

1.3 SYSTEM DESCRIPTION

A. AC Motor Shade system shall provide control of motorized window treatments with limit setting from the motors, grouping and subgrouping of shade with group control boxes, and trim hardware as specified for the project.

1.4 SUBMITTALS

A. PRODUCT DATA

1.) Submit manufacturer’s descriptive literature for each product type specified. Details shall include product brochures and technical documents indicating materials, finishes, construction, and mounting requirements. Also include installation, wiring, and operating instructions.

B. SHOP DRAWINGS

1.) Indicate structural mounting requirements and installation methods as well as relevant dimensions for each product type and mounting condition. Typical wiring diagrams shall also be provided for each product type showing seamless control of lighting and shading where applicable.

2.) Provide shade schedule coordinating room number, opening size(s), quantities and key to details.

3.) Provide the following project-specific information:

a.) System one-line wiring diagrams including connection details and overall arrangement of all shades and control locations supplied by this section for installation and connection by division 16.

b.) Drawings indicating seam/ batten locations to aid Base Building contractor to coordinate work.

c.) Head, jamb, and sill details to aid Base Building contractor to coordinate work.

C. SAMPLES

1.) Selection Samples:

a.) 8” X 10” (200 mm x 252mm) shade fabric swatches for initial fabric color selection from manufacturer’s full range of available fabrics.

b.) Material samples for color and finish selection of controls.

2.) Verification samples:

a.) One fully operational window shade sample of each type required complete with selected shade fabric including sample of seam / batten when applicable. Location of sample to be as directed by Architect. Disassemble window shade sample to assure compliance with PART 2 of specification.

b.) One complete set of all shade components demonstrating compliance with PART 2 of specification.

D. TEST REPORTS, CERTIFICATES, AND DEMONSTRATION

1.) Current reports demonstrating compliance with references listed in Section 1.2 (References) are available upon request to verify specification requirements.

2.) Manufacturer shall make available to project design team and project owner a tour of manufacturing operations to evaluate manufacturing processes as identified in Source Quality Control Section of Part 2.

3.) For projects where onsite demonstration of verification samples and custom designs is impractical due to building construction schedule or shade fabric size, manufacturer shall make available requested verification samples at the manufacturing facility.

E. MANUFACTURER'S INSTRUCTIONS

1.) Installation, Programming, and Maintenance instructions to be included in product packaging.

2.) Installation, Programming, and Maintenance Instructions must be available on manufacturer's website.

3.) 24-Hour / 7-Day Technical support shall be available to aid with unforeseen installation difficulties.

1.5 QUALITY ASSURANCE

A. QUALIFICATIONS

1.) Manufacturer shall have component quality program in place to reduce defective levels to less than 100 PPM and provide documentation on request.

2.) Manufacturer shall have 15 years minimum experience manufacturing products comparable to those specified in this section.

3.) Manufacturer shall furnish all shading systems and electrical control equipment for a complete installation and single source responsibility of shading and lighting control where applicable.

4.) The manufacturer, subsidiary, or licensed agent shall be approved to supply the products specified and to honor any claims against the product presented in accordance with the warranty.

5.) Installer shall be qualified to install the specified products by prior experience, demonstrated performance, and acceptance of any requirement of the manufacturer, subsidiary of the manufacturer, or licensed agent.

6.) 24-Hour / 7-Day Technical support shall be available to troubleshoot system wiring and aid in system programming.

B. FIELD SAMPLES

1.) Install large size sample of selected fabric for final verification of color, weave, and density in window opening as directed by design professional.

1.6 DELIVERY, STORAGE, AND HANDLING

A. STORAGE AND PROTECTION

1.) Do not deliver items to the project until all concrete, masonry, plaster, painting and other wet work has been completed and is dry.

2.) Deliver shades to project in protective packaging, uniquely labeled to identify each shade for each opening. Schedule delivery to prevent delays to completion of work, but to minimize on-site storage time.

3.) Store materials in a dry, secure place. Protect from weather, surface contaminants, corrosion, construction traffic, and all other potential damage.

B. PROJECT / SITE CONDITIONS

1.) Electronic components shall operate in an ambient temperature range of 0°C (32°F) to 40°C (104°F) and 90% non-condensing relative humidity.

1.7 SCHEDULING

A. Do not fabricate shades without obtaining field dimensions for each opening.

B. Coordinate construction of surrounding conditions to allow for timely field dimension verification.

C. Manufacturer's standard lead times apply. Reference submittal and schedule accordingly for project timeline.

D. If required, manufacturer's field services require 10 business-days notice. The contractor shall provide the manufacturer with 10 business-days notice of the scheduled commissioning date.

E. Pre-installation Meetings:

1.) Before starting installation, conduct conference at project Site, comply with requirements in General Conditions.

1.8 WARRANTY

A. Manufacturer to provide written limited warranty of not less than 8 years.

1.) The limited warranty shall cover 100% of the parts and manufacturer's labor costs required over the first two years.

2.) The limited warranty shall also entitle the end user to a credit against the purchase price upon return of defective goods for 8 years.

a.) 100% for years 1 and 2

b.) 50% for years 3, 4, and 5

c.) 25% for years 6, 7, and 8

B. Warranty coverage shall begin on the date of substantial completion.

C. In the event of a warranted product failure, the shade contractor will facilitate acquisition and delivery of all necessary components and services to the owner.

1.9 MAINTENANCE

A. EXTRA MATERIALS

1.) The manufacturer shall make available to the end user a method of ordering new equipment for expansions, replacement, or parts to be used as spares twenty-four hours a day, seven days a week.

2.) The manufacturer must make available new or remanufactured parts for a minimum period of ten years from the final date of substantial completion.

B. MAINTENANCE SERVICE

1.) The manufacturer shall offer to make available to the end user a method of ordering factory service, new or remanufactured replacement parts, and a service contract that extends the factory-limited warranty from two years to five years.

2.) Manufacturer shall allow end user to purchase extended warranty services on an annual basis for a minimum period of ten years from the date of final commissioning.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. To establish the standard of quality, design, and function desired, drawings and specifications are based on products by:

Lutron Shading Solutions by VIMCO or approved equal.
11520 Sun Shade Lane
Ashland, Virginia 23005
United States of America

Telephone 1:	1 (800) 446-1503
Telephone 2:	1 (804) 752-3300
Fax:	1 (804) 752-3366
24/7 Technical Support:	1 (800) 523-9466
Website:	http://www.vimco.com

2.2 AC MOTOR SHADE EQUIPMENT

A. SYSTEM SPECIFICATIONS

1.) Motor allows full open, full close, and infinite stop positions in between.

2.) Shade roller will be supplied to site with motor and idler bearings installed.

3.) The system will provide a maximum fabric gap of 1.5” per side (1.25” per side is typical).

B. MOTOR DRIVE SYSTEM

1.) GENERAL

a.) Motor shall operate at 110-127 VAC, 50-60 Hz with a maximum current draw of 1.6A. Rotation speed of motor shall be determined by manufacturer, depending on shade size and torque requirements.

2.) POWER SUPPLY

a.) Electrical connection to shade motor shall have a 6-foot pigtail containing 4 electrical conductors (Hot, Hot, Neutral, and Ground). Motors shall not be parallel wired (only 1 driver per shade).

i. Provide quick disconnect plug.

3.) BRACKETS AND MOUNTING

a.) Mounting brackets will accommodate a ceiling-, wall- or end-mount and will be mounted to substrate with 1/4” diameter minimum steel fasteners.

b.) Intermediate Brackets or Couplers (available for 2" and 2.5" motorized shades only) allow one motor to lift up to three shade panels dependent upon application and panel size.

c.) Mounting brackets will support and properly operate weight of 400 pounds.

d.) 5.5” Aluminum Tubes Only: The idler end assembly will consist of a steel axle that is supported by steel roller bearings for smooth operation. The axle will be keyed to provide a mating surface for the idler end bracket.

4.) SHADE TUBE

a.) Manufacturer shall identify appropriate shade tube based on shade size, fabric type, and application requirements.

i. Window Shade Contractor shall coordinate with Base Building Contractor regarding mounting, space requirements, and shade pocket housing details based on tube size required.

b.) For 5.5” Aluminum Tube:

a. Entire enclosure shall fit in a 9”x9” Enclosure.

b. Roller tube will have clamp bar that mechanically holds the fabric. Fabric clamp bar will fit within the diameter of the roller tube, so that it does not cause bumps or wrinkles in the fabric.

C. SYSTEM CONTROLS

1.) AC motor controlled through Grafik Eye Lighting Control System

a.) Digital Group Controller (Lutron P/N GRX-4M-GC)

i. General

a. The Group Controller shall provide open, close, and stop operation of up to four AC motorized window treatments.

b. The Group controller shall be UL Listed.

c. The Group Controller shall be directly controlled from the Lighting Control System communication link with no external interfaces. The Group Controller shall provide means to wire directly to the Lighting Control System communication link.

d. The operation of the Group Controller shall be incorporated into the scenes of the Lighting Control System or operated independently. The independent control of each shade zone shall be available at the keypad, at the GRAFIK Eye control unit, or at the group controller.

e. The position of each zone of the Group Controller shall be capable of being set to open, close, or unaffected in each scene, including the “OFF” scene.

f. The Group Controller shall be configurable from an IBM-compatible PC as to which zone on the GRAFIK Eye control unit it is controlled from.

g. The Group Controller shall be capable of receiving either momentary or maintained dry contact closure inputs. This function shall be configurable by a switch.

h. The Group Controller shall be capable of individual channel control and/or master control from the contact closure inputs.

i. Stopping the motor shall be accomplished either by providing a dry contact closure to the “Stop” terminal or by applying contact closures to the “Open” and “Close” terminals simultaneously.

j. The Group Controller shall provide means for reversing motor direction for a given input in the event of a miswire without removing power from the unit. The motor direction shall be configurable by a switch.

k. The Group Controller shall provide LED indication as to the last state of the window treatment.

ii. MECHANICAL

a. The Group Controller shall be housed in a metal enclosure capable of being surface-mounted in any orientation.

b. The enclosure shall have separate, isolated wiring compartments for line-voltage wiring and Class 2 wiring.

c. The Group Controller shall provide individual terminals for each wiring connection of the mains inputs, neutrals, and the motors.

d. The Group Controller shall provide a grounding bar to land each ground of mains input and each motor.

e. The Group Controller shall provide keyed mounting features so that mounting screws do not need to be removed.

iii. ELECTRICAL

a. The Group Controller shall operate between 110 and 127 VAC or between 220 and 240 VAC, 50 Hz or 60 Hz for international applications. Voltages are referenced to Neutral.

b. Each channel on the Group Controller shall be rated for 5 amperes, ¼ hp motor load at 120 VAC with a lifetime greater than or equal to 10,000 cycles.

c. Each channel on the Group Controller shall be rated for 5 amperes, 1/2 hp motor load at 240 VAC with a lifetime greater than or equal to 10,000 cycles.

d. The Group Controller shall be capable of providing power for up to three accessory controls or GRX-4000 preset control units.

e. The Group Controller shall contain non-volatile memory that prevents system programming to be lost in the event of power failure.

f. The Group Controller shall meet IEC 801-2, tested to withstand 15kV electrostatic discharge without damage or loss of memory.

g. The Group Controller shall meet ANSI/IEEE Std. C62.41-1980, tested to withstand voltage surges of up to 6000V and current surges of up to 200A without damage or loss of memory.

iv. MANUAL OVERRIDE

a. The Group Controller shall provide local override buttons that activate the window treatments for wiring verification.

b. Each channel on the Group Controller shall occupy no more than one zone on the preset control unit. A single zone on the preset control unit shall be capable of controlling any or all AC window treatment zones in the system.

c. The Group Controller shall also be capable of being controlled via dry contact closure inputs simultaneously with the Lighting Control System.

b.) SEETOUCH STYLE CONTROLS

i. General:

a. Control shall be capable of controlling Lutron Sivoia QED shades or Motorized AC shades.

b. Control shall be capable of simultaneously controlling one or more shades, up to the maximum number of shades in the system without affecting the lights.

c. Keypads shall be engraved with standard descriptions unless otherwise specified in advance of project bid.

i. Custom engraving, if specified for project, shall be furnished to the manufacturer prior to fabrication. Size and style of engraving type shall be determined by the Design Professional.

ii. Any engraved artwork specified for controls, such as borders and logos, shall be applied in a method designed to resist removal by scratching, cleaning, etc.

ii. Controls Shall Be of Type:

a. Three-Button with Raise/Lower Shade Control Wallstation (Lutron P/N SG-3WRL or SO-3WRL)

i. Wallstation will provide buttons for selecting the following for one group of shades: full-open, full-close, stop, and raise/lower.

D. FABRICS

1.) GENERAL

a.) Where applicable, shade fabric will be ultrasonically cut and friction sealed to minimize fraying.

b.) Woven yarn fabrics will be interlocking and heat-treated so that all material is securely bonded.

c.) All material options to be offered in a variety of colors.

2.) Basis of Design Product: the design for the fabric is based on the product named on the Drawings.

E. TRIM

1.) GENERAL

a.) Upon complete installation, there shall be no fasteners visible along the trim.

2.) TOP TREATMENTS

a.) Standard Shade Pocket only

i. Standard Shade Pocket dimensions shall be 5"x4.75" and made of .100” extruded aluminum U-shaped enclosure with a 3" wide .061” aluminum access flap.

3.) SIDE TREATMENTS

a.) Side Channels shall be one piece, each 2.5" deep by 1.0” wide, and .060” extruded aluminum with “T” slots to receive wool-pile light seal on both leading edges.

4.) BOTTOM TREATMENTS

a.) Hem Bar

i. Standard Hem Bar shall be a 1" wide by .1875" thick extruded aluminum bar enclosed in a thermally-sealed pocket across the bottom of the shading fabric.

2.3 FABRICATION

A. Critical shade measurements shall be accurate to within ±1/16” of specified measurements.

2.4 FINISHES

A. METAL FINISHES

1.) Colors and Finishes: Custom colors as selected by Architect.

2.) Aluminum extrusions are of 6063T5 alloy available in custom colors as selected by Architect.

2.5 SOURCE QUALITY CONTROL

A. Shade Fabric panels shall be 100% visually inspected for defects using a light box integrated into the manufacturing line.

B. 100% visual inspections shall be performed on each shade seam and hem bar welds and compared to strict aesthetic standards.

C. Shade seam weld strength process shall be tested on a daily basis to ensure controlled consistency of weld quality.

D. Shade panels shall be 100% checked for square (±1/16”)

E. Shade panels shall be 100% visually inspected to ensure there are no frayed edges or defects in the cut.

F. Finished products shall be 100% End of Line tested to ensure quality and performance of finished product.

G. All lineals shall be 100% visually inspected and measure checked after the cutting operation.

H. 100% outgoing audits shall be performed to ensure:

1.) All shade hardware kits contain correct content.

2.) Each shade is manufactured with correct components.

3.) The system is packaged properly.

PART 3 EXECUTION

3.1 EXAMINATION

A. Refuse delivery of any damaged packaging.

B. Ensure all parts match specified bill of materials and purchase order.

3.2 INSTALLATION

A. Install shades in windows level and plumb to provide smooth operation.

B. Install in accordance with manufacturer’s product data and approved shop drawings.

C. Field measurement and installation shall be performed by a Factory-Trained technician.

3.3 FIELD QUALITY CONTROL

A. SITE TESTS / INSPECTION

1.) Examine substrate and conditions for installation. Do not commence installation until conditions are satisfactory. Commencement of installation indicates acceptance of site conditions by Contractor. Notify the Design Professional upon inspection when the project conditions are unacceptable for shade installation. "Beginning of installation" means acceptance of substrate and project conditions.

B. MANUFACTURERS' TECHNICAL SUPPORT SERVICES

1.) Manufacturer shall maintain a 24-hour, 7 days a week technical support center.

2.) Manufacturer's website shall contain product data sheets, installation, programming, and maintenance instructions.

3.4 ADJUSTING

A. Adjust fabric on tube using shims to prevent telescoping of fabric over time.

3.5 CLEANING

A. Touch up damaged finishes and repair minor damage in order to eliminate evidence of repair. Remove and replace work that cannot be satisfactorily repaired.

B. Clean exposed surfaces, including metal and shade fabric, using non-abrasive materials and methods recommended by the Shade Fabric Manufacturer. Remove and replace work that cannot be satisfactorily cleaned.

3.6 DEMONSTRATION

A. Demonstrate operation method and instruct Owner's personnel in the proper operation and maintenance of the window shade systems.

3.7 SCHEDULES

A. As indicated on the Drawings.

END OF SECTION 12491