SECTION 12 24 13
ROLLER WINDOW SHADES

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PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Controlled motorized roller shade system for interior installation.

B. Related Requirements:

1. Section 06 10 00 - Rough Carpentry
2. Section 07 90 00 - Joint Protection
3. Section 09 20 00 - Plaster and Gypsum Board
4. Section 09 51 23 - Acoustical Tile Ceilings
5. Section 25 13 16 - Integrated Automation Control and Monitoring Network Integration Panels
6. Section 25 14 00 - Integrated Automation Local Control Units
7. Section 25 14 16 - Integrated Automation Application-Specific Control Panels
8. Section 25 15 16 - Integrated Automation Software for Control and Monitoring Networks
9. Section 25 30 00 - Integrated Automation Instrumentation and Terminal Devices
10. Section 25 50 00 - Integrated Automation Facility Controls
11. Section 26 05 00 - Common Work Results for Electrical
12. Section 26 09 23 - Lighting Control Devices
13. Section 26 09 36 - Modular Dimming Controls
14. Section 26 09 43 - Network Lighting Controls
15. Section 27 15 00 - Communications Horizontal Cabling
16. Section 27 41 16 - Integrated Audio-Video Systems and Equipment

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. Nm: newton-meter, unit of torque.

2. VAC: alternating current voltage.
3. VDC: direct current voltage.
4. AV: audio-visual.
5. RF: radio frequency.
6. TCP/IP: transmission control protocol/internet protocol.

B. Definitions

1. Control: Effecting a change in state by one PC program onto a microprocessor or device.
2. Daylight Harvesting: The dimming of electric lighting sources when natural daylight is available.
3. Load Shedding: Intentional reduction of power consumption to avoid total power disruption due to overloading the circuits or reduction of power consumption to avoid crossing an agreed on threshold of power usage. Load shedding lighting ballasts reduce the light level in response to a signal on the power line.
4. Monitor: Acquisition and presentation of status or operating condition of microprocessors or electrical devices in the network of the monitoring device or program.
5. Scene: Predetermined position of shades and light levels.
6. Scene Selection: Grouping of lighting and window shade controls into groups that will respond to a single scene command.
7. Shading Groups: Grouping rooms for common control of window shades.
8. Transmission Control Protocol/Internet Protocol (TCP/IP): Networking protocols for exchanging data over the World Wide Web and Local Area Networks.

1.3 ACTION SUBMITTALS

A. Shop Drawings - Indicate the following:

1. Schematic diagram showing complete motorized shade system and integrated control equipment and accessories.

B. Window Treatment Schedule:

1. List each roller shade, location, options, size and special requirements.

1.4 QUALITY ASSURANCE

A. Source Requirements: Provide motorized roller shade system, [lighting control system, and AV system] with integrated control, automation and monitoring capability from single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver product in unopened factory packaging to predetermined location.

B. Store products in unopened factory packaging in a controlled environment:

1. Ambient Temperature: 32 to 104 degrees Fahrenheit.

2. Humidity: 0 to 85 percent.

1.6 SITE CONDITIONS

A. Environmental Conditions Range:

1. Temperature: 32 – 104 degrees F (0 - 40 degrees C).
2. Relative Humidity: 10 – 90 percent, noncondensing.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of motorized roller shades and control system that fail in materials or workmanship within the specified warranty period following substantial completion.

PART 2 PRODUCTS

2.1 ROLLER WINDOW SHADE SYSTEM

A. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products of **Crestron Electronics, Inc., Rockleigh, NJ 07647**, Phone (800)237-2041, Fax: (201)767-1903, www.crestron.com

B. Description: Motorized roller window shade system shall be composed of the following integrated components:

1. Motorized Roller Shades:
    a. Internal 24 VDC shade motor.
    b. Mounting brackets.
    c. Shade Fabric.
2. Shade Motor Power Supplies.
3. Control Processors.
4. Automation Control Sequences .
5. Control User Interfaces.

C. Method of Control Communication:

1. Wired Control.
2. Wireless RF Control.

2.2 MOTORIZED ROLLER SHADES TYPE 1

A. Basis of Design Product: **Crestron** custom motorized roller shades.

B. Roller Shade shall be available in the following mounting types:

1. Inside mount.
2. Outside mount.
3. Coupled mount.

4. Pocket mount.

5. Dual mount.

C. Motorized Roller Shade Motors: Motorized Roller Shade units shall be equipped with roller drive motors based on shade fabric weight and size and control and power requirements.

D. Shade Motor Type 1

1. Basis of Design Product: **Crestron, QMT50** DC motor.

2. Tubular, 24 VDC motor.

3. Shade width support: 37 5/8 inch – 15 feet.

4. Maximum current draw: 50 Watts.

5. Concealed within shade motor tube.

6. Torque: 6 Nm.

7. Provide wired real-time activity and status feedback to processor.

8. Connections:

a. Wired Control:

SPECIFIER: The QMT50 connects via Cresnet and ships with cable mounted Cresnet connector and mating Cresnet connector to be connected to installed Cresnet cable.

1) System connection: Provide power and control via multi-conductor Class 2 cable connected directly to power panel motor terminal.

E. Shade Motor Type 2:

1. Basis of Design Product: **Crestron, QMT30** DC motor.

2. Tubular, 24 VDC motor.

3. Minimum shade width: 18 1/2 inch.

4. Concealed within shade motor tube.

5. Torque: 2 Nm.

6. Provide wireless real-time activity and status feedback to processor.

7. Connections – Shade motor shall be available with the following control options:

SPECIFIER: The QMT30 will ship with one of two interfaces. Wired control utilizes the CSC-DCCN motor interface (Cresnet cable required for control and 24 VDC power). Wireless control utilizes the CSC-DCEX motor interface (Class 2 cable required for 24 VDC power).

a. Wired Control: Provide power and communication via multi-conductor Class 2 cable connected from motor interface to power panel motor terminal.

b. Wireless Control: Provide power via Class 2 cable connected from motor interface to power panel motor terminal or plug-in transformer.

2.3 SHADE FABRIC

A. Roller shades shall be available with the following fabric options:

B. Openness factor:

1. Translucent.
2. Blackout.
3. Transparent 1 percent.
4. Transparent 3 percent.
5. Transparent 5 percent.
6. Transparent 7 percent.
7. Transparent 10 percent.
8. Transparent 17 percent.

C. Fabric design:

1. Roller Shade fabric shall be available in multiple design types.

D. Fabric color:

1. Roller Shade fabric shall be available in multiple color groups:
    a. Black.
    b. Black blends.
    c. Dark tone.
    d. Mid tone.
    e. Neutral.
    f. White.

2.4 SHADE MOTOR POWER SUPPLIES

A. Power Supply Type 1

1. Basis of Design Product: **Crestron, CSA-PWS225** panel mounted roller shade power supply and communication hub.
2. Power supply rating and compliance:
    a. UL Listed.
    b. FCC Part 15 Class B Digital Device.
3. Motor connection port:
    a. Three power segments, each segment includes two motors connections.
    b. Power Segment:
        1) Each power segment shall supports two 24 VDC motors.
        2) Motors segment power: 75 W Continuous; 100 W Peak.
        3) Over current protection: self-resetting thermal fuse.
        4) Short circuit protection: replaceable 4A fuse.
4. Communication connection port:
    a. Two data ports provide connectivity to control network.

5. Operation and status Indicator LEDs:
    a. Main Power.
    b. Segment Power.
    c. Data activity and short circuit.

B. Power Supply Type 2
1. Basis of Design Product: **Crestron, CSA-PWS450** panel mounted roller shade power supply and communication hub.
2. Power supply rating and compliance:
    a. UL Listed.
    b. FCC Part 15 Class B Digital Device
3. Motor connection port:
    a. Six power segments, each segment includes two motors connections.
    b. Power Segment.
        1) Each power segment shall supports two 24 VDC motors.
        2) Motors segment power: 75 W Continuous; 100 W Peak.
        3) Over current protection: self-resetting thermal fuse.
        4) Short circuit protection: replaceable 4A fuse.
4. Communication connection port:
    a. Two data ports provide connectivity to control network.
5. Operation and status Indicator LEDs:
    a. Main Power.
    b. Segment Power.
    c. Data activity and short circuit.

C. Power Supply Type 3
1. Basis of Design Product: **Crestron, CSA-PWS40** single motor roller shade power supply.
2. Power supply rating and compliance:
    a. UL Listed.
    b. FCC Part 15 Class B Digital Device.
3. Motor interface connection:
    a. 24 VDC flying leads.
        1) Support for one 24 VDC motor.
        2) Power: 40 W.
        3) Over current protection: internal self-resetting thermal fuse.

D. Power Supply Type 4

1. Basis of Design Product: **Crestron, CSA-PWS300-CAEN** integrated enclosure and power.
2. Power supply rating and compliance:
    a. UL Listed.
    b. FCC Part 15 Class B Digital Device.
3. Power and Motor interface connection:
    a. Power supply:
        1) Support for up to eight 24 VDC motors.
        2) Power: 300 Watts.
        3) Short circuit protection: replaceable 4A fuse.
    b. Power Segment
        1) Each power segment shall supports one 24 VDC motor.
        2) Motor segment power: 75 W Continuous; 100 W maximum.
        3) Over current protection: electronic circuit breaker.
4. Communication connection port:
    a. One data port provides connectivity to control network.
5. Power indicator LEDs:
    a. Main power.
    b. Segment Power.
6. Overload indicator LEDs:
    a. Main Power.
    b. Segment Power.
7. Data network activity LED.
    a. Main network.
8. Integrated steal enclosure:
    a. Surface or flush mount.
    b. UL and C-UL listed.

E. Power Supply Type 5

1. Basis of Design Product: **Crestron, CSA-PWS600-CAEN** integrated enclosure and power.
2. Power supply rating and compliance:
    a. UL Listed.
    b. FCC Part 15 Class B Digital Device.
3. Power and Motor interface connection:
    a. Power supply:

1) Support for up to sixteen 24 VDC motors.
2) Power: two 300 W units.
3) Short circuit protection: replaceable 4A fuse per unit.

b. Power Segment:
1) Each power segment shall supports one 24 VDC motor.
2) Motor segment power: 75 W Continuous; 100 W maximum.
3) Over current protection: electronic circuit breaker.

4. Communication connection port:
a. One data port provides connectivity to control network.

5. Power indicator LEDs:
a. Main power.
b. Segment Power.

6. Overload indicator LEDs:
a. Main Power.
b. Segment Power.

7. Data network activity LED.
a. Main network.

8. Integrated steal enclosure:
a. Surface or flush mount.
b. UL and C-UL listed.

2.5 CONTROL PROCESSORS

A. As specified in Section 25 50 00.

2.6 AUTOMATION CONTROL SEQUENCES

A. Motorized Roller Shade System capabilities:
1. Individual shade control.
2. Grouped shade control.
3. Unlimited grouping capability.
4. Control of individual shade motor or shade group shall not be limited by shade location, shade type, or location of power supply or control unit.
5. Grouping of shade motors shall not be limited by shade location, shade type, or location of power supply or control unit.
6. Actions for individual shades and shade groups:
a. Automatically aligned preset stop positions at any user-defined shade height level, measured in percentage of total opening height.
b. Automatic, all shades open and all shades closed presets.

c. Raise and lower to any position within total range of shade movement.

7. Automated Control:

a. All control capabilities shall be accessible by automated event actions.

8. Automated Event Actions:

a. System shall dynamically execute any controlled shade action, group of actions, or sequence of actions initiated by events composed of fulfilled conditions and criteria.

9. Automation Event Criteria:

a. System states.

b. Time-clock register.

c. Scheduled occurrences.

d. Dynamic conditions.

e. Pre-programmed composite of criteria.

2.7 SYSTEM INTEGRATION

A. Shade system processor shall support native control network protocol of lighting control system, and AV control system.

B. The following integrated systems shall allow unlimited access of sensor data between control processors and systems interfaces.

1. Lighting systems.

2. BMS systems.

3. AV systems.

4. HVAC systems.

C. All integrated systems shall communicate via a single unified control protocol.

1. The single control communication protocol shall be the protocol native to user interfaces and control processors.

2. Unified control protocol adaptors and interfaces for the following systems shall be acceptable upon approval by A/E:

a. BMS

b. HVAC

2.8 CONTROL USER INTERFACES

A. As specified in Division 25.

PART 3 EXECUTION

3.1 EXAMINATION

A. Prior to installation, examine work area to verify measurements, and that commencing installation complies with manufacturer's requirements.

3.2 INSTALLATION

A. Comply with requirements of Section 12 05 00 - Common Work Results for Furnishings.

B. Do not install roller shade or control devices until space is enclosed, HVAC systems are running, and overhead and wet work in roller shade work space are complete.

C. Install roller shades, power supplies and control devices in accordance with manufacturer's instructions.

D. Install user interfaces in accordance with manufacturer's instructions.

E. Grounding: Provide electrical grounding in accordance with NFPA 70.

F. Perform setup for each roller shade component.

3.3 PREINSTALLATION MEETING

A. Installer of roller shade system to coordinate a meeting of the mechanical and electrical engineer, mechanical and electrical contractor, lighting, and HVAC equipment manufacturers. Include any designers and contractors for any other direct digital control system designed to interact with product of this Section.

1. Discuss interoperability of integrated systems and overall integrated system management and control.

3.4 OPERATING SOFTWARE INSTALLATION

A. Install and program software in accordance with this Section to meet the Owner's requirements. Provide current system control and user interface programs and backup copies for the Owner's use.

3.5 SYSTEM STARTUP

A. Provide system startup and adjustment to occupied conditions in accordance with manufacturer's recommendations.

3.6 ADJUSTING

A. Within 2 months of the date of Substantial Completion provide onsite service to adjust the system to account for actual occupied conditions.

3.7 DEMONSTRATION

A. Schedule roller shade system demonstration with Owner to allow verification that shade system controls function as required.

B. Instruct owner's staff to adjust, operate and maintain roller shade system.

3.8 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Qualified manufacturer's field representative to perform on-site system inspection, startup, and owner demonstration and training.

1. Participation in Pre-installation Conference and pre-wire inspection.
2. Installation inspection.
3. Owner programming conference.
4. Installation of system software and system startup.
5. Owner demonstration and training.

3.9 CLOSEOUT ACTIVITIES

A. Demonstration: Schedule roller shade system demonstration with Owner to allow verification that shade system controls function as required.

B. Instruct owner's staff to adjust, operate and maintain roller shade system.

C. Furnish set of approved submittals and record drawings of actual installation for Owner's personnel in attendance at training session.

END OF SECTION 12 24 13