

SECTION 12 25 09
WINDOW TREATMENT MOTORS, CONTROLS, AND NETWORKED AUTOMATION SYSTEMS

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Motor Operators and Controls for Roller Shades:
 - 1. Wired technology.
 - 2. Wireless technology.
 - 3. Digital network technology.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry. For wood blocking and grounds for mounting motors, controls, and accessories.
- B. Section 09 22 00 - Support Systems for Gypsum Board; for mounting motors, controls, and other system accessories.
- C. Section 12 24 13 - Roller Window Shades. For window shades.
- D. Section 26 05 00 - Common Work Results for Electrical. For Low-voltage and line voltage electrical power when scope of work to be by others. For identification of products and requirements. For wiring devices, and motorized shade wall switches.
- E. Section 26 09 43 - Network Lighting Controls. For lighting control system for control of motorized window shades via 0-10v technology.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. PRE-INSTALLATION CONFERENCE
 - 1. Preinstallation Conference: Conduct conference at Project site to review the following:
 - a. Low voltage wiring requirements and responsibilities.
 - b. Separation of power and low voltage / data wiring.
 - c. Wire labeling.
 - d. Control locations.
 - e. Connections to other equipment.
 - f. Installer responsibilities.
 - g. Pocket and/or mounting conditions.

1.4 ACTION SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and mounting details.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Description of Operations pertaining to automation schedule.

4. Motor-Operator and Control Systems:
 - a. Include details for power, signal, wiring, and:
 - 1) Line-voltage 120 Vac.
 - 2) Low-voltage 24 Vdc.
 - 3) Wired technology motors.
 - 4) Wireless technology motors.
 - 5) Digital network technology motors.
 - b. Installation instructions.
 - c. System riser diagrams.
 - d. Sensor positioning diagrams.
 - e. Include requirements for interfacing with other systems.
 - f. Include wiring detail for interconnection between components; gauge of wiring, wire limitations, connection to building electrical to follow local electrical code.
 - g. Include final document package reflecting all changes to infrastructure, equipment type, locations, and other changes from original documentation.
 - h. Include floor plan drawings to meet designated requirements of the building infrastructure and locations of all system components.
 - i. Provide completed operation and maintenance manual including list of components and part numbers, and operation and maintenance instructions.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
- B. Product Data: For each type of product.
 1. Include component assembly details, material descriptions, dimensions of individual components and profiles, features, finishes, operating equipment, control systems, power, and signal types, electrical and communications requirements and connections, wiring diagrams, and installation instructions.
- C. Sustainability Submittals refer to Division 01.
- D. Product Schedule: For each motor-operator unit and network controls, and controllers. Use the same designations indicated on Drawings.
- E. Operation and Maintenance Data: For motor operators and control systems to include in operation and maintenance manuals.
- F. Warranty: Manufacturer's executed warranty documentation.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Motor operators, controls, and controllers certified by a Nationally Recognized Testing Laboratory to provide CE Compliant, UL-listed and/or cURus certified wired ac and dc powered motors.
 1. ISO 9001 certified including in-house engineering and product design activities.
 2. Motor manufacturer capable of supplying a full range of low-voltage (24 Vdc), main or line-voltage (120 Vac) motor and control products.
- B. Installer Qualifications: Trained by manufacturer of motor-operator and control system products.
- C. Controls manufacturer capable of supplying commissioning services for control systems.
- D. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
- E. Mock-Up: Construct a mock-up with actual materials in sufficient time for Consultant's review

and to not delay construction progress. Locate mock-up as acceptable to consultant and provide temporary foundations and support.

1. The intent of mock-up is to demonstrate quality of workmanship and visual appearance.
2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
3. Retain mock-up during construction as a standard for comparison with completed work.
4. Do not alter or remove mock-up until work is completed or removal is authorized.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver complete motorized roller shade and control systems and accessories in factory packages, marked with manufacturer, product name, unique motor identification code, and location of installation using same designations indicated on Drawings.
- B. Store equipment indoors in clean, dry space with uniform temperature to prevent condensation. Protect from exposure to dirt, fumes, water, corrosive substances, and physical damage.

1.8 PROJECT CONDITIONS

- A. Ambient Limitations: Do not install motor operators and control systems until spaces are dry with ambient temperature and humidity conditions maintained at levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where motor operators and control systems are indicated to fit to other construction, verify dimensions of other construction by field measurements and indicate measurements on Shop Drawings.
 1. Allow clearances for operating hardware through entire operating range.
 2. Notify Consultant of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.9 WARRANTY

- A. Manufacturer's Special Non-Prorated Warranty for Motor Operators and Control Systems: Manufacturer agrees to repair or replace motor and control system products not free from defects in material and workmanship under normal and proper use within specified warranty period.
 1. Warranty Period: Five years from date of manufacture.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Somfy Systems, Inc., which is located at: 121 Herrod Blvd.; Dayton, NJ 08810; Toll Free Tel: 800-64-SOMFY; Tel: 609-395-1300; Fax: 609-395-1776; Email: [request info \(commercial_solutions_na@somfy.com\)](mailto:request_info_commercial_solutions_na@somfy.com); Web: <https://www.somfysystems.com/commercial> Email: commercial_solutions_na@somfy.com; Web: <https://www.somfysystems.com/commercial>
- B. Acceptable Manufacturer: Somfy Systems Inc., which is located at: 6411 Edwards Blvd, Mississauga, ON L5T 2P7; Phone: 800-66-SOMFY; 905-564-6446; Email: request info (commercial_solutions_na@somfy.com); Web: <https://www.somfysystems.com/commercial>
- C. Basis of Design Manufacturer: Subject to compliance with requirements, provide Somfy Systems; named motor operators and control systems.
- D. Substitutions: Not permitted.

- E. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00 - Product Requirements.

2.2 WIRED MOTOR OPERATORS AND CONTROLS - ROLLER SHADES

- A. Electric Low Voltage Motor: cULus listed tubular, enclosed in roller.
1. Basis of Design Product: Somfy Systems; Sonesse 30 DCT.
 2. Control Interface: Wired; local control and group control via dry contact switching.
 3. Electrical Characteristics: 24 Vdc, 0.8 Amps.
 - a. Sound Level: 42 dBA or less.
 4. Low Voltage Power and Data Cable: Two Cables; Two-wire for power, Four-wire for dry contact control; non-removable, 6 ft (1.8 m).
 5. Low Voltage Power Distribution: cULus Listed.
 - a. Basis of Design: Somfy Systems; Power Distribution Enclosure Kit; for up to twenty 24v DC motors per kit.
 - b. Electrical Characteristics: 120 Vac 2.8 A - 11A; coordinate with Division 26.
- B. Electric Motor: cURus certified tubular, enclosed in roller.
1. Basis of Design Product: Somfy Systems; Sonesse 50 RA.
 2. Control Type: Wired; local control via 120 Vac Momentary or Maintained Single Pole Double Throw Decora Switch.
 3. Control Type: Wired; group control, 120 Vac Momentary or Maintained Double Pole Double Throw Decora Switch.
 4. Control Type: Wired; local control and group control, low voltage dry contact switch, low voltage Momentary or Maintained Decora Switch via Motor Controller.
 5. Electrical Characteristics: 120 Vac, 60 Hz, 1.2 - 1.67 Amps.
 - a. Torque: 53.1 in-lbsf (6 N/m) - 88.5 in-lbsf (10 N/m).
 - b. Sound Level: 47 dBA or less.
 6. Power Cable: Four-wire SJTW cable. 6.5 ft (1.98 m) hardwired with quick disconnect plug.
 7. Power Cable: Four-wire SJTW cable on Motor with Fast Connector; 1.6 ft (480 mm).
 - a. Extension cable to be supplied by roller shade contractor.
 - b. Four-wire Fast Connector Extension Cable with Open Leads:
 - 1) Length: 4.4 ft (1.3 m) - 22.4 ft (6.8 m).
 8. Product Environmental Profile Type III EPD Certified.
- C. Electric Motor: cURus certified tubular, enclosed in roller.
1. Basis of Design Product: Somfy Systems; Sonesse ULTRA 50 RA.
 2. Control Type: Wired; local control via 120 Vac Momentary or Maintained Single Pole Double Throw Decora Switch.
 3. Control Type: Wired; group control, 120 Vac Momentary or Maintained Double Pole Double Throw Decora Switch.
 4. Control Type: Wired; local control and group control, low voltage dry contact switch, low voltage Momentary or Maintained Decora Switch via Motor Controller.
 5. Electrical Characteristics: 120, 60 Hz, 0.95 Amps.
 - a. Sound Level: 38 dBA ultra-quiet.
 6. Power Cable: Four-wire SJTW cable. 6.5 ft (1.98 m) hardwired with quick disconnect plug.
 7. Power Cable: Four-wire SJTW cable on Motor with Fast Connector; 1.6 ft (480 mm).
 - a. Extension cable to be supplied by roller shade contractor.
 - b. Four-wire Fast Connector Extension Cable with Open Leads:
 - 1) Length: 4.4 ft (1.3 m) - 22.4 ft (6.8 m).
- D. Motor Control Key Switch: Three-position, key switch-operated control station with open, close, and center off (stop) function.
1. Contact: Maintained.
 2. Contact: Momentary.

3. Basis of Design Product: Somfy Systems; Indoor key switch.
 4. Switch Type: Single Pole Double Throw.
 5. Switch Type: Double Pole Double Throw.
 6. Electrical Characteristics: 120Vac, 60Hz.
- E. Motor Control Wired Decora Switch: Three-position, switch-operated control station with open, close, and center off (stop) functions.
1. Contact: Maintained.
 2. Contact: Momentary.
 3. Basis of Design Product: Somfy Systems.
 - a. Decorator: AC.
 - b. Decorator: DC.
 - c. Switch Style: Paddle.
 - d. Switch Style: Toggle.
 - e. Switch Style: Rocker.
 - f. Switch Type: Single Pole Double Throw.
 - g. Switch Type: Double Pole Double Throw.
 - h. Electrical Characteristics: 120 Vac, 60 Hz.
 - i. Electrical Characteristics: 24Vdc.
 - j. Electrical Characteristics: Dry Contact.
 - k. Finish: White.
 - l. Finish: Ivory.
- F. Motor Control Dry Contact Individual/Group Button/Keypad: Momentary-contact, wall-switch-operated control station with open, close, and stop functions.
1. Basis of Design Product: Somfy Systems; DecoFlex Dry Contact Keypad
 2. Basis of Design Product: Somfy Systems; Dry Contact Open, Close, Stop Wall Switch.
 3. Finish: White.
- G. Motor Control Wired Individual/Group Motor Controller: Programmable microprocessor controller with open, stop, close, and preset intermediate position functions.
1. Basis of Design Product: Somfy Systems; IGC 4n1 Motor Controller.
 2. Motor Connections: Four or less per Motor Controller.
 3. Control Device Types: Key Switch
 4. Control Device Types: Keypad.
 5. Control Device Types: Radio receiver.
 6. cULus Rated - UL certified E160923.
 7. Plenum Rated NEMA Enclosure.
 8. Accessories:
 - a. IGC 4n1 RTS Radio Receiver to be used with Somfy RF transmitters, providing wireless open, stop, close functions.
 - b. Decoflex Dry Contact Keypad for IGC 4n1 provides three intermediate shade positions, open, stop, and close functions.
 - c. Momentary Indoor Key or Momentary Decorator Paddle Switch providing open, or close functions.
 9. Operating Features:
 - a. Configurable individual or group control of roller shades.
 - b. Capable of accepting input from third-party automation control system via momentary Dry Contact signal.
- H. Factory-assembled, electric motor and factory-prewired motor controls with connector that disconnects motor from power.
- I. Enclosures protecting controls and operating parts.
- J. Accessories necessary for complete installation.

- K. Coordinate operator wiring requirements and electrical characteristics with building electrical system and contractor.
- L. Electrical Components: Listed and labeled as defined in NFPA 70.
- M. Electric motor tested for standards CAN/UL 325, and CSA-C22.2 No. 247 by a qualified testing agency and marked for intended location and application.

2.3 WIRELESS CONTROLLED MOTOR OPERATORS AND CONTROLS - ROLLER SHADES

- A. Electric motor tested for standards CAN/UL 325, and CSA-C22.2 No. 247 by a qualified testing agency and marked for intended location and application.
- B. Electric Low Voltage Motor: cULus listed tubular, enclosed in roller.
 - 1. Basis of Design Product: Somfy Systems; Sonesse 30 RTS.
 - 2. Control Type; Radio: Local control and group control via Switches.
 - 3. Electrical Characteristics: 24 Vdc, 0.8 Amps.
 - a. Sound Level: 42 dBA or less.
 - 4. Low Voltage Power Cable: Two-wire with weidmuller; 10 in. (250 mm).
 - 5. Low Voltage Power Distribution: cULus Listed.
 - a. Basis of Design: Somfy Systems; Power Distribution Enclosure Kit; for up to twenty 24v DC motors per kit.
 - b. Electrical Characteristics: 120 Vac 2.8 A - 11A; coordinate with Division 26.
- C. Electric Low Voltage Motor: cULus listed tubular, enclosed in roller.
 - 1. Basis of Design Product: Somfy Systems; Sonesse ULTRA 50 DC RTS.
 - 2. Control Type; Radio: Local control and group control via Switches.
 - 3. Electrical Characteristics: 24 Vdc, 1.5 Amps.
 - a. Sound Level: 38 dBA ultra-quiet.
 - 4. Low Voltage Power Cable: Two-wire with weidmuller; 10 inches (250 mm).
 - 5. Low Voltage Power Distribution: cULus Listed.
 - a. Basis of Design: Somfy Systems; Power Distribution Enclosure Kit; for up to twenty 24v DC motors per kit.
 - b. Electrical Characteristics: 120 Vac 2.8 A - 11A; coordinate with Division 26.
- D. Electric Motor: cURus certified tubular, enclosed in roller.
 - 1. Basis of Design Product: Somfy Systems; Sonesse 50 RTS.
 - 2. Control Type; Radio: Local control and group control via Switches.
 - 3. Electrical Characteristics: 120 Vac, 60 Hz 1.2 - 1.67 Amps.
 - a. Torque: 53.1 in lbf (6 N/m) - 88.5 in lbf (10 N/m).
 - b. Sound Level: 47 dBA or less.
 - 4. Power Cable: Three-wire SJTW cable. 9.8 ft (3 m) hardwired with quick disconnect.
 - 5. Power Cable: Three-wire cable with molded three prong plug. 9.8 ft (3 m).
 - 6. Power Cable: Three-wire SJTW cable on Motor with Fast Connector; 1.6 ft (480 mm).
 - a. Extension cable to be supplied by roller shade contractor.
 - b. Three-wire Fast Connector Extension Cable with Open Leads:
 - 1) Length: 4.4 ft (1.3 m). - 22.4 ft (6.8 m).
 - 7. Product Environmental Profile Type III EPD Certified.
- E. Electric Motor: cURus certified tubular, enclosed in roller.
 - 1. Basis of Design Product: Somfy Systems; Sonesse ULTRA 50 RTS.
 - 2. Control Type; Radio: Local control and group control via Switches.
 - 3. Electrical Characteristics: 120 Vac. 60 Hz, 0.95 Amps.
 - a. Sound Level: 38 dBA ultra-quiet.
 - 4. Power Cable: Three-wire SJTW cable. 9.8 ft (3 m) hardwired with quick disconnect.
 - 5. Power Cable: Three-wire cable with molded three prong plug. 9.8 ft (3 m).
 - 6. Power Cable: Three-wire SJTW cable on Motor with Fast Connector; 1.6 ft (480 mm).

- a. Extension cable to be supplied by roller shade contractor.
 - b. Three-wire Fast Connector Extension Cable with Open Leads:
 - 1) Length: 4.4 ft (1.3 m). - 22.4 ft (6.8 m).
- F. Wireless Remote Control: Electric controls with NEMA ICS 6, Type 1 enclosure for handheld remote-control activation of shades:
- 1. Basis of Design Product: Somfy Systems; Telis 16 has an LCD display for channel selection; Sixteen channel.
 - 2. Basis of Design Product: Somfy Systems; Situo 1; Single channel.
 - 3. Basis of Design Product: Somfy Systems; Situo 5; Five channel.
 - 4. Finish: Pure.
 - 5. Electrical Characteristics: Battery operated.
 - 6. Optimal RF Range: 65 ft (20 m) radius under optimal conditions, FCC Approval Part 15, Class B.
 - 7. Control Functions: Open, Close, My (stop).
 - 8. Accessories:
 - a. Wall mount holder with screw cover and screw kit.
- G. Wireless Control Wall Switch: Button-operated keypad station, fitting standard decora style wall switches.
- 1. Basis of Design Product: Somfy Systems; DecoFlex WireFree RTS Switch.
 - 2. Mounting: Surface.
 - 3. Mounting: Recessed.
 - 4. Mounting: Flushed.
 - 5. Wall Switch Finish: White.
 - 6. Wall Switch Finish: Black.
 - 7. Wall Switch Finish: Ivory.
 - 8. Custom Engraved Buttons: Yes.
 - 9. Custom Engraved Buttons: No.
 - 10. Wireless Transmitter: Up to five channels of individual or group control of roller shades, consultant to select channel options during shop drawings.
 - 11. Electrical Characteristics: Battery operated.
 - 12. Optimal RF Range: 65 ft (20 m) radius under optimal conditions, FCC Approval Part 15, Class B.
 - 13. Control Functions: Open, Close, My (stop).
- H. Wireless Control Surface-Mounted Wall Switch: Button-operated keypad station.
- 1. Basis of Design Product: Somfy Systems; Smoove RTS.
 - 2. Wall Switch Finish: Pure.
 - 3. Wall Switch Finish: Black.
 - 4. Wall Switch Finish: Silver matte.
 - 5. Wall Switch Finish: Light Bamboo.
 - 6. Wall Switch Finish: Walnut.
 - 7. Wall Switch Finish: Cherry.
 - 8. Wall Switch Finish: Amber bamboo.
 - 9. Custom Engraved Buttons: Yes.
 - 10. Custom Engraved Buttons: No.
 - 11. Wireless Transmitter: Up to four channels of individual or group control of roller shades, consultant to select channel options during shop drawings.
 - 12. Electrical Characteristics: Battery operated.
 - 13. Optimal RF Range: 65-ft (20-m) radius under optimal conditions, FCC Approval Part 15, Class B.
 - 14. Control Functions: Up, Down, My (stop).
- I. App Control: Wireless Control Interface: RTS 433.42 MHz, 2.4 GHz WiFi, or direct wired network connection with WEP, WPA2, TKIP, open and mixed mode encryption; multiple

single-zone units may be joined to create a multi-zone system; capable of serving as an Internet protocol (IP) to radio bridge for third-party control systems.

1. Basis of Design Product: Somfy Systems; TaHoma.
 2. Integration to third-party systems; App Control and Voice Control
 3. Control Functions: Open, Close, My (stop), Timers, and Scenes.
 4. Channels: 40 RTS Channels available.
 5. Enclosure: ABS; cULus listed; UL 94 V-0 flame rating; RoHS compliant.
 6. Electrical Characteristics: 120 Vac; 60 Hz; wall-mounted power supply.
 7. Timer Control: Clock timer based on astronomic timeclock with 60-minute sunrise and sunset offset.
 8. Ethernet Adaptor for direct wired network connection.
- J. Third Party Integration Universal RTS Interface: Allow third-party automation systems to control RTS motorized solutions.
1. Basis of Design Product: Somfy Systems; Universal RTS Interface II (URTSI II).
 2. Channels: 16; RTS controls per URTSI.
 3. Power Input: 9 Vdc, 200 mA; UL approved, electrical outlet required.
 4. RF Range: 65 ft (20 m) radius under optimal conditions, FCC Approval Part 15, Class B.
 5. Serial Inputs: RS232, RS485, or IR.
- K. Factory-assembled, of size and capacity and with features, characteristics, and accessories suitable for conditions indicated.
- L. Enclosures protecting controls and operating parts.
- M. Accessories required for reliable operation without malfunction.
- N. Coordinate operator wiring requirements, radio control requirements, and electrical characteristics with building electrical system and contractor.
- O. Electrical Components: Listed and labeled as defined in NFPA 70.
- P. Electric motor tested for standards CAN/UL 325, and CSA-C22.2 No. 247 by a qualified testing agency and marked for intended location and application.

2.4 DIGITAL NETWORK MOTOR OPERATORS AND CONTROLS - ROLLER SHADES

- A. Electric Motor: cULus listed tubular, enclosed in roller.
1. Basis of Design Product: Somfy Systems; Sonesse 30 DC RS485.
 2. Control Type Network: Automated control or Standalone window treatment control system.
 3. Control Type Network: Control via lighting control system.
 4. Control Type Network: Control via audio-visual system.
 5. Control Type Network: Control via BMS.
 6. Communication Network: Bus connected SDN PowerConnect Power Panel.
 7. Electrical Characteristics: 24 Vdc, 0.8 Amp.
 - a. Sound Level: 42 dBA or less.
 8. Low Voltage Power and Data Cable: Five-wire with weidmuller; 10 inches (250 mm).
- B. Electric Motor: cULus listed tubular, enclosed in roller.
1. Basis of Design Product: Somfy Systems; Sonesse ULTRA 50 DC RS485.
 2. Control Type Network: Automated control or Standalone window treatment control system.
 3. Control Type Network: Control via lighting control system.
 4. Control Type Network: Control via audio-visual system.
 5. Control Type Network: Control via BMS.

6. Communication Network: Bus connected SDN PowerConnect Power Panel.
 7. Electrical Characteristics: 24 Vdc, 1.5 Amps.
 - a. Sound Level: 38 dBA ultra-quiet.
 8. Low Voltage Power and Data Cable: Five-conductor pigtail with inline detachable terminal block; 10 inches (250 mm).
- C. Electric Motor: cURus certified tubular, enclosed in roller.
1. Basis of Design Product: Somfy Systems; Sonesse ULTRA 50 RS485.
 2. Control Type Network: Automated control or Standalone window treatment control system.
 3. Control Type Network: Control via lighting control system.
 4. Control Type Network: Control via audio-visual system.
 5. Control Type Network: Control via BMS.
 6. Electrical Characteristics: 120 Vac, 60 Hz, 0.95 Amps.
 - a. Sound Level: 38 dBA ultra-quiet.
 7. Power Cable: Three-wire SJTW cable. 9.8 ft (3 m) hardwired with quick disconnect.
 8. Power Cable: Three-wire cable with molded three prong plug. 9.8 ft (3 m).
 9. Power Cable: Three-wire SJTW cable on Motor with Fast Connector; 1.6 ft (480 mm).
 - a. Extension cable to be supplied by roller shade contractor.
 - b. Three-wire Fast Connector Extension Cable with Open Leads:
 - 1) Length: 4.4 ft (1.3 m).
 - 2) Length: 22.4 ft (6.8 m).
 10. Data Cable: RJ9/RJ45. Black.
 - a. Length: 2.5 ft (0.76 m).
 - b. Length: 24 ft (7.32 m).
- D. Electric Motor: cURus certified tubular, enclosed in roller.
1. Basis of Design Product: Somfy Systems; Sonesse 50 RS485.
 2. Control Type Network: Automated control or Standalone window treatment control system.
 3. Control Type Network: Control via lighting control system.
 4. Control Type Network: Control via audio-visual system.
 5. Control Type Network: Control via BMS.
 6. Electrical Characteristics: 120 Vac, 60 Hz 1.2 - 1.67 Amps.
 - a. Torque: 53.1 in lbsf (6 N/m) to 88.5 in lbsf (10 N/m).
 - b. Sound Level: 47 dBA or less.
 7. Power Cable: Three-wire SJTW cable. 9.8 ft (3 m) hardwired with quick disconnect.
 8. Power Cable: Three-wire cable with molded three prong plug. 9.8 ft (3 m).
 9. Power Cable: Three-wire SJTW cable on Motor with Fast Connector; 1.6 ft (480 mm).
 - a. Extension cable to be supplied by roller shade contractor.
 - b. Three-wire Fast Connector Extension Cable with Open Leads:
 - 1) Length: 4.4 ft (1.3 m).
 - 2) Length: 22.4 ft (6.8 m).
 10. Data Cable: RJ9/RJ45. Black.
 - a. Length: 2.5 ft (0.76 m).
 - b. Length: 24 ft (7.32 m).
- E. Electric Motor: cURus certified tubular, enclosed in roller.
1. Basis of Design Product: Somfy; LT50 RS485.
 2. Control Type Network: Automated control or Standalone window treatment control system.
 3. Control Type Network: Control via lighting control system.
 4. Control Type Network: Control via audio-visual system.
 5. Control Type Network: Control via BMS.
 6. Electrical Characteristics: 120 Vac, 60 Hz, 1.8 - 2.1 Amps.
 - a. Torque: 132 in-lbsf (15 N/m) - 308 in lbsf (35 N/m).

- b. Sound Level: 55 dBA or less.
 - c. Speed: Depending on motor torque, roller shade contractor to use same motor torque for all roller shades.
 - 7. Power Cable: Three-wire SJTW cable. 9.8 ft (3 m) hardwired with quick disconnect.
 - 8. Power Cable: Three-wire cable with molded three prong plug. 9.8 ft (3 m).
 - 9. Power Cable: Three-wire SJTW cable on Motor with Fast Connector; 1.6 ft (480 mm).
 - a. Extension cable to be supplied by roller shade contractor.
 - b. Three-wire Fast Connector Extension Cable with Open Leads:
 - 1) Length: 4.4 ft (1.3 m).
 - 2) Length: 22.4 ft (6.8 m).
 - 10. Data Cable: RJ9/RJ45. Black.
 - a. Length: 2.5 ft (0.76 m).
 - b. Length: 24 ft (7.32 m).
- F. Balanced multi-point digital intelligent motors integrated into the following:
- 1. System: Standalone.
 - 2. System: Building Management.
 - 3. System: Audio/Video.
 - 4. System: Low Voltage Lighting Control.
- G. Basis of Design Product: Somfy Systems; Somfy Digital Network (SDN) RS485.
- 1. Linear Bus Wiring: ANSI/TIA/EIA RS-485 standard, capacitance controlled, unshielded twisted pair cable.
 - 2. Bus Distribution Components:
 - a. SDN Data Hub.
 - b. Data Hub Mini.
 - c. SDN Data Panel.
 - d. SDN PowerConnect Power Panel.
 - 3. Electrical Characteristics: Bus-connected control devices for SDN data such as keypads, sensors and receivers powered directly from bus line using a 24 Vdc NEC Class 2 power supply.
 - 4. Wire and Connectors: Category 5e balanced twisted pair cable, ethernet patch cables, RJ45 connectors and Weidmuller connectors.
- H. Solar Management System: Digital network system integrating solar tracking, timed events, digital keypads, and weather sensors to operate motorized window coverings. Microprocessor controller for setting, changing, and adjusting control features of motorized window coverings.
- 1. Basis of Design Product: Somfy Systems; animeo IP.
 - 2. Electrical Characteristics: 120 Vac, 1.25 Amps.
 - 3. Motor Technology: Somfy Digital Network RS485 Networked Motors.
 - 4. Network Characteristics:
 - a. Manage individually addressed intelligent motors and controls.
 - b. Allow intelligent keypads, schedules, motor grouping and virtual switches to be configurable and managed from its own internal IP network, building internal network, or remotely over the internet.
 - c. Up to 200 motors on Building Controller, system expansion using animeo IP Sub Controllers.
 - d. Dedicated Motor Bus Segment and Sensor Bus Segment.
 - 5. Interface Controls: Personal computer.
 - 6. Interface Controls: Virtual Keypad.
 - 7. Interface Controls: Low voltage lighting control system integration.
 - 8. Interface Controls: Dry Contact to Audio Video system integration.
 - 9. Interface Controls: Building Management System Integration.
 - 10. Sensors: Outside Sensor Box, all mounting installation brackets, and Sun Sensors.
 - 11. Sensors: Outside Sensor Box, Outside Sensor Box Extension, all mounting

- installation brackets, and Sun Sensors.
 - 12. PC Software: animeo IP Visual Configuration graphical user interface.
 - 13. Certifications: UL Listed.

- I. Digital Keypad: Digital button-operated wall station, fitting standard decora style wall switches.
 - 1. Basis of Design Product: Somfy Systems; DecoFlex digital keypad animeo IP.
 - 2. Basis of Design Product: DecoFlex digital keypad for SDN.
 - 3. Basis of Design Product: SDN DecoFlex digital keypad for group control.
 - 4. Electrical Characteristics: Cable and connector to SDN bus power.
 - a. Power: 24 Vdc, supplied by SDN Bus with LED status indicators.
 - b. Wire and Connectors: Category 5e balanced twisted pair cable, Ethernet patch cables, and RJ45 connectors.
 - 5. Control Functions: Up, Down, Stop, three presets.
 - a. Button Configurations: Six button digital keypad.
 - 6. Control Functions: Up, Down, Stop, five presets.
 - a. Button Configurations: Eight button digital keypad.
 - 7. Control Functions: Up, Down, Stop, ECO-MODE.
 - a. Button Configurations: Six button digital keypad.
 - b. Button Configurations: Eight button digital keypad.
 - 8. Control Functions: Up, Down, Stop, groups.
 - a. Button Configurations: Six button digital keypad for 3 groups.
 - b. Button Configurations: Eight button digital keypad for 5 groups.
 - 9. Face Plate: Lexan 945U material in standard Decora-style with color to match switch.
 - a. Color: Black.
 - b. Color: Ivory.
 - c. Color: White.
 - 10. Temperature Range: Ambient temperature; indoor use only.

- J. Bus Power Supply for Digital Network: Provides power to the digital network and sensor bus.
 - 1. Basis of Design Product: Somfy Systems; Bus and Sensor Station Power Supply.
 - 2. Electrical Characteristics: Input 120 Vac; plugs into outlet; Output: 24 Vdc 1 Amps.
 - 3. Power Cord: 26 inches (660 mm) line-voltage, ac (IEC-320 C6).
 - 4. UL listed and CE approved.

- K. Power Panel: provides power and data to a maximum of 10 Motors.
 - 1. Basis of Design Product: Somfy Systems; SDN PowerConnect Power Panel.
 - 2. Electrical Characteristics: Input 120 Vac 7.2A; Output 24Vdc fused 2A per motor.
 - a. Power and Data wiring up to 240 ft (73 m) from motor to power panel using Somfy SDN Low-Voltage Motor Cable.
 - b. Two isolated device ports up to 200 ft (20 m).
 - 3. Listed: cULus.

- L. Data Panel: Creates head-end and riser bus distribution network.
 - 1. Basis of Design Product: Somfy Systems; Data Panel.
 - 2. Electrical Characteristics: Input 120 Vac 3.35 A; Output 24 Vdc 1 Amp per segment.
 - 3. Provides four isolated digital network bus segments to the SDN system.
 - 4. Built-in override Decoflex Digital Keypad.

- M. Third Party Integration Building Management System (BMS) Interface: Provide communication between BMS and network intelligent motors, operating either individual motors, or groups via Standalone SDN or animeo IP. Additional features of retrieving sensor data from animeo IP sensor bus.
 - 1. Basis of Design Product: Somfy Systems; Somfy Connect BMS Interface V2.
 - 2. Power Input: 9 to 24 Vdc power supply plugs into an ac outlet.
 - 3. Data Point Capacity: 4500 maximum.
 - 4. Integration Capabilities: Modbus, BACnet MS/TP, BACnet IP, Metasys N2 by JCI.

5. Certifications: CE, FCC, IC Canada, RoHS3 and REACH complaint.
- N. Third Party Integration Universal Digital Automation Interface: Allows third-party automation systems to control network intelligent motors; one interface per motorized system for up to 250 motors per interface.
 1. Basis of Design Product: Somfy Systems; Somfy Connect Universal Automation Interface (UAI) Plus.
 2. Power Input: 24 Vdc, powered via Bus and Sensor Station Power Supply.
 3. Communication Input: RS232 protocol or IP Ethernet protocol.
 4. Communication Output: Somfy's "SDN RS485" protocol.
 5. Integration: Third-party drivers utilizing Somfy Synergy API.
 6. UL listed and CE approved.
 7. Operating Characteristics: Indoor conditioned space use only.
 - O. Third Party Integration Building Control Systems 0-10 V Integration Interface: Provides integration between low voltage lighting control systems 0-10 V analog output and network intelligent motors, operating either individual or groups via Standalone SDN or animeo IP.
 1. Basis of Design Product: Somfy Systems; SDN 0-10 V Interface V2.
 2. Electrical Characteristics: 120C AC 60Hz 20mAmps.
 3. Power and Data Output: 24 Vdc SDN bus output.
 4. Integration Capabilities: Industry standard 0-10 V analog input.
 5. Mounting: Junction box mounted plenum rated enclosure.
 6. UL Listed.
 7. Operating Characteristics: Indoor conditioned space use only.
 8. Factory-assembled, of size and capacity and with features, characteristics, and accessories suitable for conditions indicated.
 - P. Enclosures protecting controls and operating parts.
 - Q. Accessories required for reliable operation without malfunction.
 - R. Low voltage wiring from motor controls to motors through digital network communication supplied by roller shade contractor.
 - S. Low voltage wiring from motor controls to motors supplied by Division 26.
 - T. Coordinate operator wiring requirements and electrical characteristics with building electrical system and contractor.
 - U. Electrical Components: Listed and labeled as defined in NFPA 70.
 - V. Electric motor tested for standards CAN/UL 325, and CSA-C22.2 No. 247 by a qualified testing agency and marked for intended location and application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, blocking, accurate locations of connections to building electrical system, lighting, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.

- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 MOTOR CONTROLLER INSTALLATION

- A. Comply with reviewed Shop Drawings for system equipment placement in accordance with Somfy guidelines and instructions.
- B. Comply with NFPA 70, Article 400, for flexible cords and cables.
- C. Comply with NECA 1 and NECA 130.
- D. Comply with FCC guidelines.
- E. Install window treatment motor operators and stationary control systems level, plumb, and aligned with adjacent units in accordance with manufacturer's written instructions.
- F. Electrical Connections: Connect wired motor operators and stationary control systems to building electrical system in accordance with NEC requirements.
 - 1. Grounding: Provide electrical grounding in accordance with NFPA 70.
- G. Networked BMS: Connect networked automation controls for motorized equipment to BMS.
- H. Sun, Rain, and Wind Sensor Locations: Mount on exterior in accordance with manufacturer's written instructions.

3.4 ADJUSTING

- A. Adjust motorized equipment to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
 - 1. Adjust motor-limit settings in accordance with manufacturer's written instructions for specific locations and placements.
 - 2. Program each motor-operator control system to manufacturer's standard settings or Owner-provided program settings.
- B. Commissioning Control Systems: Perform commissioning of integrated automation control systems and connection to BMS in accordance with Division 01.
 - 1. Managed by shade manufacturer/supplier.
 - 2. Managed by motor and control manufacturer.
 - 3. Managed by digital network integrator.
 - 4. Managed by _____ aka, The Commissioning Agency.

3.5 CLOSEOUT ACTIVITIES

- A. Demonstration and Training: Engage Somfy factory-authorized service representative to demonstrate and train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION