

About FFI

Functional Fenestration Inc. (FFI) of Los Angeles, CA is a wholesale distributor of architectural hardware and components for doors, windows and skylights. Each of our products is carefully selected for high quality, aesthetics, and variety. FFI's inventory includes custom products of our own design, and many from numerous manufacturers around the world, including European hardware lines from AGB, Olivari, and Tiger. FFI has been an official distributor for Truth Hardware since 1987, including window operators and motors, Anderberg 4-bar hinges, and patio door rollers.

FFI excels in systems for lift slide, interior and exterior sliding doors—with many components in stainless steel and architectural bronze, and in-demand finishes like kynar and oil-rubbed bronze.

FFI also specializes in **motorized actuators for windows and skylights** for projects ranging from heavy commercial to premium residential. We carry products from Truth Hardware and UltraFlex Control Systems, including chain- and linear-type electric actuators and remote manual operators. A complete list of FFI motor products appears on page 6. Our sales and technical support team can assist in motor selection and system configuration.

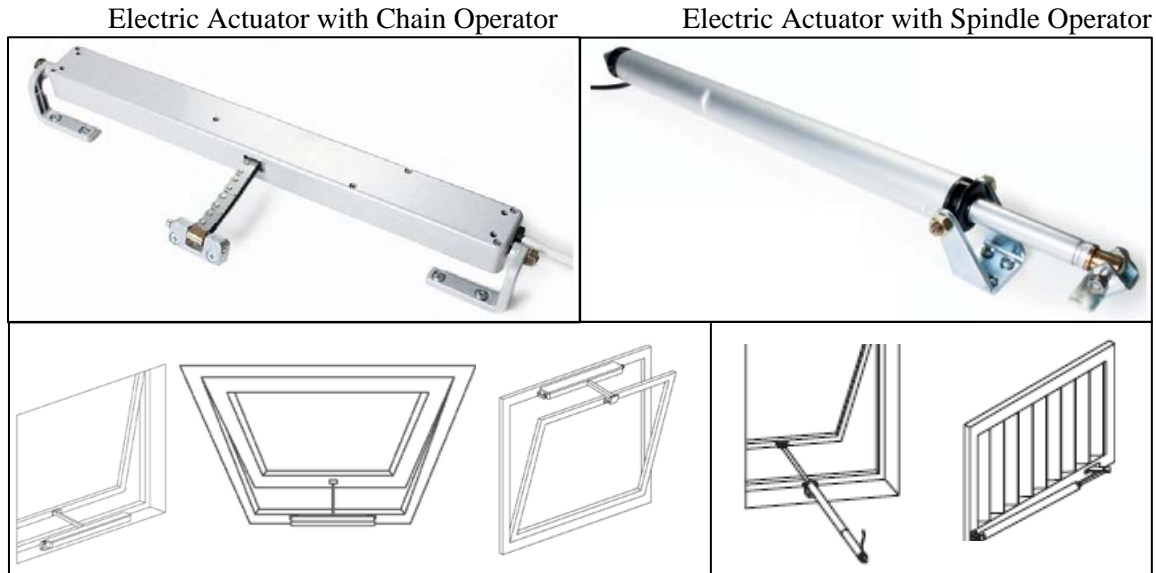
FFI's customers rely on our uncompromising quality, on-hand inventory, superior technical support and customer service. We believe that our success results from our ability to contribute to our customers' success. We welcome inquiries from architects, window and door manufacturers, custom millworks, glazing contractors, skylight manufacturers, and consulting specialists.

For more information please visit our website at www.fenestration.net. Please email your inquiries to service@fenestration.net or call us at (800) 677-0228.

Architectural Specification

Section 087516 – WINDOW OPERATORS

Motorized Actuators for Windows and Skylights



Chain-type electric operators for motorized windows should be suited for awning, casement and hopper type windows, roof windows, and skylights constructed of metal, wood or PVC materials. **Spindle-type electric operators** for motorized windows should be suited for awning and hopper type windows, roof windows, and skylights constructed of metal, wood or PVC materials. These actuators should be housed in an aluminum case with either an anodized or painted finish. Their operating temperature range should be 14 to 140 degrees F (-5 to 60 degrees C) with 60% maximum relative humidity.

The **chain operator** should be a corrosion-resistant, double link chain with stainless steel pins. It should connect to the window sash by means of a metal sash connector and a removable sash connector pin. The length of the chain operator should be between 5 and 40 inches (typically 12, 15 18 or 24 inches). Metal mounting brackets should be available for attaching the actuator to a horizontal or vertical surface, or within a curtain wall mullion. For windows wider than 48" a **dual chain actuator** or **multiple synchronized actuators** should be available.

The **spindle operator** should be a corrosion-resistant, steel spindle. It should connect to the window sash by means of a metal sash connector and a removable sash connector pin. The length of the spindle operator should be between 7 and 40 inches (typically 7, 12, 20, 30 and 40 inches).

The actuators should operate with line voltage power (110 Vac, 60 Hz) or low voltage power (24 Vdc). It should be possible to control multiple actuators via a switched power circuit. It should be possible to include an actuator control system with optional accessories, such as a basic switch, a 4-zone switch, handheld remote control, and environmental sensors (rain detector, wind detector and thermostat). It should be possible to control the actuator control system via a building automation system (BAS).

The actuators and **actuator control system** shall be manufactured by Ultraflex Control Systems S.r.l. (Genoa, Italy) and distributed in North America by Functional Fenestration Inc., Hawthorne, CA (www.fenestration.net). They should meet the technical and safety specifications shown below in Table 1.

Table 1: Technical Specifications for UCS Actuators

	Line Voltage Actuators	Low Voltage Actuators
supply voltage	110 Vac \pm 10%, 60 Hz	24 Vdc
power cord	4 conductors (2 load, common, ground)	2 conductors (control by polarity inversion)
electrical connections	Multiple actuators connect in parallel on 1 switched circuit.	
operating environment	14° to 140 ° F(-10 ° to 60 ° C)	
actuator housing	aluminum case	
chain stroke	varies by model (5 to 40 inches)	
push/pull force	varies by model (20 to 154 lbs)	
limit stop	electronic or microswitches	
safety stop	electronic or thermal	
enviromental sensors	rain detector, wind detector, thermostat	
switching options	basic switch, 4-station keypad, remote control	
Interface to external controller (building automation system)	dry contact switch terminals: Open, Common, Close.	
safety standards	any of the following marks: UL, UR, ETL, CE	

Notes on Safety Standards

As indicated by the presence of the UL, UR, ETL or CE marks, UCS actuators for windows and skylights conform to the safety standards established by Underwriters Laboratories (UL), European Testing Lab (ETL) or CENELEC (CE).



CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving the European Standard the status of a National Standard without any alteration. CENELEC members are the national electrotechnical committees of: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Poland, Slovakia, Slovenia, Spain, Sweden, Switzerland, and United Kingdom.

UL 325 is the relevant UL standard for door, drapery, gate, louver and window operators and systems.

The CE mark indicates conformance with the following standards:

- (1) Household and Similar Electrical Appliances—Safety Part 1: Gen’l Req’ts CEI EN 60335-1, April 04
- (2) Low Voltage Directive: 2006/95/CE (Dec 2006)
- (3) Electromagnetic Compatibility Directive: 89/336/CEE (Jan 1992)

List of Motor Division Services

- 1) Full product line of motorized window and skylight actuators for commercial and residential use
- 2) Two Brands of Electric and Remote Manual Window Actuators
 - a) **UltraFlex Control Systems** (chain, linear and remote manual actuators)
 - b) **Truth Hardware** (rotary and chain motors)
 - c) Product data sheets, CAD drawings, installation instructions, power and control wiring diagrams
- 3) On-hand Inventory of Standard Products
- 4) Technical Support
 - a) Customized Motor Features via Special Order
 - b) Assistance in Motor Selection, Configurations, Cut Sheets, Wiring Diagrams
- 5) Customer Service
 - a) Order Intake and Status
 - b) Replacement Parts
 - c) Product Warranty Claims

MANUFACTURER'S LIMITED WARRANTY

UCS (Ultraflex Control Systems S.r.l.) products are guaranteed against defects in material and workmanship for a period of two years from the date of manufacture. Alleged defective products returned, freight prepaid, within the warranty period will be repaired or replaced free of charge, at UCS's option, if found effectively below our quality standards. This guarantee does not cover other claims for direct or indirect damages. In particular, UCS declines liability and exclude guarantee (except for what stated above) if improper installation or misuse should result in a failure of our products.

The manufacturer's limited warranty does not cover

- (1) actuators whose casing or chain operator has been dis-assembled.
- (2) actuators whose internal circuitry has burned due to incorrect wiring to the power circuit.

Reference Projects For UCS Actuators

AIRPORTS

COPENHAGEN (Denmark)	Bi-Quasar
VENICE (Italy)	Twinmaster
ALGIERS (Algeria)	Rack
BEIJING (China)	Force

CONVENTION CENTRES

HANOVER (Germany) Pavillion for EXPO 2000	Twinmaster
MILAN (Italy)	Master
MUNICH (Germany)	Master
GENOA (Italy)	Linear Actuators

UNIVERSITIES

FLAGSTAFF (Arizona) No. Ariz. Univ. Applied R&D Facility	Twinmaster
STANFORD (California) Y2E2 Environment and Energy Building	Supermaster, Remote Manual Operators (MEC)
SAN DIEGO (California) School of Medicine	Supermaster
CHICAGO (Illinois) CM Harper Center, Univ Chicago	Master
BEIRUT (Lebanon) Lebanese University	Ulysses, Sintesi, Remote Manual Operators (MEC)
MILAN (Italy)	Remote Manual Operators (MEC)
MELBOURNE (Australia)	Compact
OTAGO (New Zealand)	
AMSTERDAM (Netherlands)	
UTRECHT (Netherlands)	
GRONINGEN (Netherlands)	

HOSPITALS

BENGHASI (Libya) Central Hospital	Remote Manual Operators (MEC)
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BUILDINGS

SAN MATEO (California) Public Library	Supermaster
LOS ANGELES (California) Children's Museum	
LA JOLLA ((California) YMCA	Vega
OXNARD (California) Advanced Water Purification Facility	Vega
SANTA FE (New Mexico) Public Works Building	Quasar
PHILADELPHIA (Pennsylvania) Kimmel Center for Performing Arts	Twinmaster
CHINA China Science Department, Physics Research	
PEKING (China) Agricultural Bank of China	Sintesi 2000
SHENZHEN (China) Shenzhen Metro	
TAIYUAN (China) Taiyuan Dongda Shengshi Building	
HONG KONG (China) Disneyland	CAT
ZAGREB (Croatia) Hypo Centre	Quasar
GENEVA (Switzerland) Horizon Sero	Quasar
DUBLIN (Ireland) Riverside One Building	Quasar
LONDON (England)New Street Square Building	Quasar
THE HAGUE (Netherlands) Houses of Parliament	
APELDOORN (Netherlands) Internal Revenue Service	
AMSTERDAM (Netherlands) Lloyds Hotel	
ADELAIDE (Australia) Commonwealth Law Courts	Rack
AUCKLAND (New Zealand) Vector Arena	Supermaster

FFI List of UCS Chain and Spindle Actuators

	Model	Voltage	Operator Length	Push Pull Force	Window Status Signal	Length	Width	Height	Safety Marks
Chain Motors for Outward Opening Windows									
1	UCS Vega AC	110 Vac, 60 Hz	12"	55 lbs	No	17 3/4	1 3/4	1 1/4	CE
2	UCS Vega DC	24 Vdc	12"	55 lbs	No	17 3/4	1 3/4	1 1/4	CE, UL
3	UCS Vega RF	110 Vac, 60 Hz	12"	55 lbs	No	17 3/4	1 3/4	1 1/4	CE
4	UCS Vega RF Rain	110 Vac, 60 Hz	12"	55 lbs	No	17 3/4	1 3/4	1 1/4	CE
5	UCS Quasar AC	110 Vac, 60 Hz	15", 20"	66 lbs	No	26 3/4	2 3/8	1 1/4	CE
6	UCS Quasar DC	24 Vdc	15", 20"	66 lbs	No	26 3/4	2 3/8	1 1/4	CE, UL
7	UCS Quasar-L AC 24	110 Vac, 60 Hz	24"	66 lbs	No	29 5/8	2 7/8	1 1/2	CE
8	UCS Quasar-L AC 31.5	110 Vac, 60 Hz	32"	44 lbs	No	33 1/2	2 7/8	1 1/2	CE
9	UCS Quasar-L AC 37.39	110 Vac, 60 Hz	39"	22/44 lbs	No	37 1/2	2 7/8	1 1/2	CE
10	UCS Quasar-L DC 24	24 Vdc	24"	66 lbs	No	29 5/8	2 7/8	1 1/2	CE
11	UCS Quasar-L DC 31.5	24 Vdc	32"	44 lbs	No	33 1/2	2 7/8	1 1/2	CE
12	UCS Quasar-L DC 39.37	24 Vdc	39"	22/44 lbs	No	37 1/2	2 7/8	1 1/2	CE
13	UCS Twin Quasar-Sync AC	110 Vac, 60 Hz	15", 20"	135 lbs	No	56 1/2	2 7/8	1 1/2	CE
14	UCS Twin Quasar-Sync DC	24 Vdc	15", 20"	135 lbs	No	56 1/2	2 7/8	1 1/2	CE, UL
15	UCS Master AC ‡	110 Vac, 60 Hz	15"	79 lbs	No	23 1/2	2 3/4	1 7/8	CE
16	UCS Master DC	24 Vdc	15"	79 lbs	No	17 3/8	2 3/4	1 7/8	CE, UL
17	UCS Twinmaster DC	24 Vdc	15"	154 lbs	No	48 1/2	2 3/4	1 7/8	CE, UL
18	UCS Supermaster AC ‡	110 Vac, 60 Hz	18"	88 lbs	No	22 5/8	3 1/4	2	CE
19	UCS Supermaster AC ‡	110 Vac, 60 Hz	24"	88 lbs	No	25 5/8	3 1/4	2	CE
20	UCS Supermaster DC	24 Vdc	18"	88 lbs	Yes	22 5/8	3 1/4	2	CE
21	UCS Supermaster DC	24 Vdc	24"	88 lbs	Yes	25 5/8	3 1/4	2	CE
22	UCS Supermaster DC	24 Vdc	32"	66 lbs	Yes	30 1/8	3 1/4	2	CE
23	UCS Supermaster-S AC	110 Vac, 60 Hz	18"	88 lbs	Yes	22 5/8	3 1/4	2	CE, UL IF
24	UCS Supermaster-S AC	110 Vac, 60 Hz	24"	88 lbs	Yes	25 5/8	3 1/4	2	CE, UL IF
Chain Motors for Inward Opening Windows									
25	UCS Sintesi 2000 AC	110 Vac, 60 Hz	10"	40/67 lbs	No	11 1/4	3 1/4	1 7/8	CE
26	UCS Sintesi 2000 AC	110 Vac, 60 Hz	15"	20/67 lbs	No	11 1/4	3 1/4	1 7/8	CE
27	UCS Sintesi 24 DC	24 Vdc	10"	40/45 lbs	No	11 1/4	3 1/4	1 7/8	CE
28	UCS Sintesi 24 DC	24 Vdc	15"	20/45 lbs	No	11 1/4	3 1/4	1 7/8	CE
Spindle Motors for Outward Opening Windows									
29	UCS Ulysses DC 7	24 Vdc	7"	145 lbs	No	20 1/4	1 3/4	1 3/4	CE
30	UCS Ulysses DC 12	24 Vdc	12"	145 lbs	No	25	1 3/4	1 3/4	CE
31	UCS Force DC 19	24 Vdc	19.7"	225 lbs	No	31 1/2	1 7/8	1 7/8	CE
32	UCS Force DC 29	24 Vdc	29.5"	225 lbs	No	41 3/8	1 7/8	1 7/8	CE
33	UCS Force DC 39	24 Vdc	39.3"	225 lbs	No	51 1/4	1 7/8	1 7/8	CE
34	UCS Rack (master) DC 21	24 Vdc	21.5"	168/145	No	30 1/4	2 1/4	2 3/8	CE
35	UCS Rack (master) DC 29	24 Vdc	29.5"	168/145	No	38 1/4	2 1/4	2 3/8	CE
36	UCS Rack (master) DC 39	24 Vdc	39.3"	168/145	No	48	2 1/4	2 3/8	CE
37	UCS Rack (slave) DC 21	24 Vdc	21.5"	168/145	No	30 1/4	2 1/4	2 3/8	CE
38	UCS Rack (slave) DC 29	24 Vdc	29.5"	168/145	No	38 1/4	2 1/4	2 3/8	CE
39	UCS Rack (slave) DC 39	24 Vdc	39.3"	168/145	No	48	2 1/4	2 3/8	CE
‡ Available only in minimum quantities of 100 units.									

(1) UL means UL 325-certified. "UL IF" means UL field approvable.

(2) UCS motors' operating temperature range: 14 to 140 degrees F (-10 to 60 degrees C). Maximum relative humidity: 60%.

(3) UCS motors are fitted with a factory-installed, 5-foot, unterminated power cable (not field replaceable).

Custom lengths are available by special order.