

# FM 194-401

## SmartMotion DC chain actuators



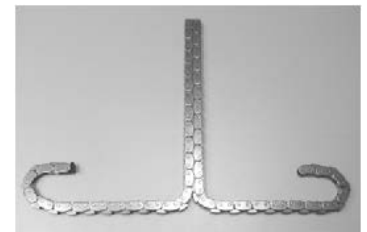
Functional Fenestration Inc (FFI) is an expert and leader in the American motorized actuator market, with a broad range of motors for windows, vents, and skylights. FFI has been providing motorized operators for natural ventilation since 1987, for institutional, commercial and residential applications.

### Benefits of motorized actuators

- Automated operation of multiple awning windows, hopper windows, casement windows, curtain wall vents, and skylights.
- Ideal for smart buildings; integrate with building and home automation systems.
- FM actuators are certified for Smoke and Heat Extraction (SHE).
- Natural ventilation enables lower energy consumption, lets in fresh air and daylight, enables LEED credit.
- Low voltage DC motors are energy efficient.

### Features

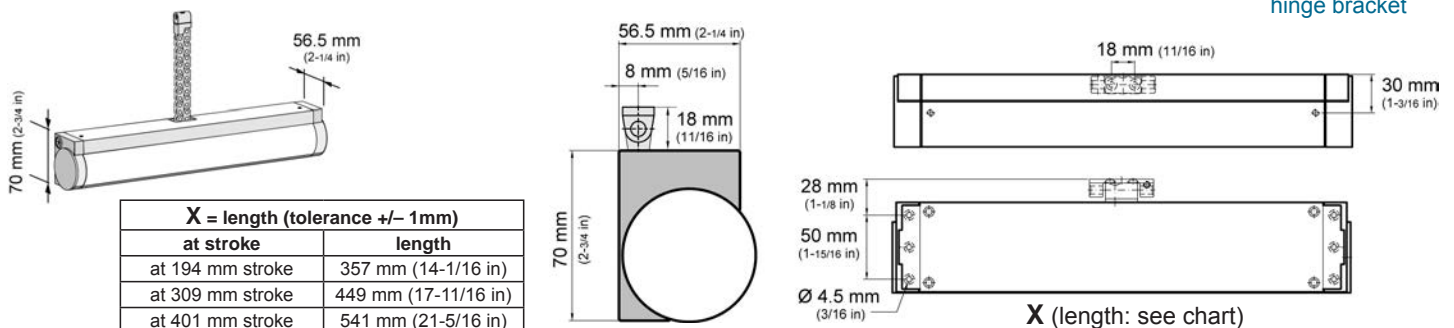
- FM series is the strongest chain drive actuator offered in North America.
- Push/Pull Force up to 450 N (101 lb), to operate “450N” versions.
- Opening distance ranges from 194 mm to 401 mm approx., according to version.
- Multiple actuators may be linked for simultaneous operation of multiple windows.
- Has stainless steel double zipper chain for rigidity and durability.
- Low-noise operation.
- Tight vent closure using electronic power cut-off.
- Chain must be manually adjusted at installation.
- This product is not UL Recognized or labeled. FM 501-800 is UL Recognized.
- Sash connector/hinge bracket for FM is included with the actuator. Mounting brackets are optional; FM actuators can be mounted direct to frame or sill without mounting bracket kit, depending on the application. See FM Brackets & Accessories DataSheet for optional bracket kits.
- Actuators are available in standard grey, white, or black color.
- UL cable 1 meter included, black color.
- Tested to 10,000 cycles.
- 3-year manufacturer’s warranty; requires use according to Installation Guide recommendations.



double zipper SST chain



sash connector/hinge bracket



# FM 194-401

## Applications

### On Wall or Frame



### Awning



### Hopper



### Skylight



## Specifications

|                                       |  |
|---------------------------------------|--|
| Supply voltage:                       | 24 V DC (-20 % / +30 %)  |
| Normal current amp draw*:             | 300 N (68 lbf +/- 3%) = approx. 0.7 amp<br>450 N (101 lbf +/- 3%) = approx. 1.0 amp  |
| Limit stop:                           | integrated limit switch (Open and Closed), with additional overload protection   |
| Chain stroke length (approx):         | 194 mm (7-5/8 inch)<br>309 mm (12-3/16 inch)<br>401 mm (15-3/4 inch)   |
| Chain installation adjustment:        | manual adjustment  |
| Push/pull force (max):                | 300 N (68 lbf +/- 3%) for 300N versions<br>450 N (101 lbf +/- 3%) for 450N versions  |
| Nominal clamping force (max):         | 3000 N (675 lbf +/- 3%) force needed to rip chain out of actuator case   |
| Min. sash height at stroke length* *: | chain stroke    without bracket                      with bracket SBFM5<br>194 mm        300mm (11-13/16 in) sash ht        200mm (7-7/8 in) sash ht<br>309 mm        600mm (23-5/8 in) sash ht                500mm (19-11/16 in) sash ht<br>401 mm        800mm (31-1/2 in) sash ht                600mm (23-5/8 in) sash ht |
| Chain speed:                          | approx. 10 mm/sec (0.393 in/sec) at rating load and nominal load   |
| Actuator Dimensions (l x h x d):      | 194 mm chain = 357 x 70 x 56.5 mm (14-1/16 x 2-3/4 x 2-1/4 in)<br>309 mm chain = 449 x 70 x 56.5 mm (17-11/16 x 2-3/4 x 2-1/4 in)<br>401 mm chain = 541 x 70 x 56.5 mm (21-5/16 x 2-3/4 x 2-1/4 in)  |
| Power cable:                          | UL cable 1 meter included, black color   |
| Run/Rest cycle:                       | For every 60 seconds running (ON), must then rest (OFF) for 120 seconds.   |
| Ambient operating temperature:        | -10 °C to +60 °C (14 °F to 140 °F)   |
| Safety marks:                         | CE   |
| Protection class:                     | IP 20  |
| Case:                                 | aluminum profile   |
| Colors (standard):                    | powder-coated: silver grey (RAL 9006), white (RAL 9016), or black (RAL 9005)   |
| Special colors:                       | other RAL colors on request, see accessory data sheet  |
| Opening mechanism:                    | stainless steel double zipper-type chain, chain is centered in case  |

\* Calculate power supplies and control boxes needed based on peak draw of 2 times normal amp draw.

\* \* If sash height is very low, order an SBFM swivel bracket.

## FFI FM 194-401 Actuators

| Stroke (and push/pull Force)                      | Part Numbers |         |         |
|---|--------------|---------|---------|
|   | Silver Grey  | White   | Black   |
| <b>194 mm (300 N)</b> 7-5/8 in (68 lbf +/- 3%)    | 2103083      | 2103042 | ask FFI |
| <b>194 mm (450 N)</b> 7-5/8 in (101 lbf +/- 3%)   | 2103570      | 2103539 | ask FFI |
| <b>309 mm (300 N)</b> 12-3/16 in (68 lbf +/- 3%)  | 2101301      | 2101285 | ask FFI |
| <b>309 mm (450 N)</b> 12-3/16 in (101 lbf +/- 3%) | 2103240      | 2103208 | ask FFI |
| <b>401 mm (300 N)</b> 15-3/4 in (68 lbf +/- 3%)   | 2103562      | 2103521 | ask FFI |
| <b>401 mm (450 N)</b> 15-3/4 in (101 lbf +/- 3%)  | 2101343      | 2101327 | ask FFI |

## FM Accessory Parts



|  |   |
|--|---|
| FM Status Signal closed (added at factory) | part # 50000824                         |
| FM brackets                                | see FM Brackets & Accessories DataSheet |

Recommendations for FFI Actuators & Controls: FFI only recommends UL compliant systems. FFI is a UL registered firm. Read FFI data sheets & installation guides before specifying project details. Project-specific needs vary depending on the number of actuators, electrical layouts, building management systems, distance between power supplies & actuators, and other details. Project specifications to comply with electric & building codes—for wire gauge, wire connections and run distance, conduits, junction boxes—must be arranged by the project electrical contractors. Distribute this guide to all project parties, including electrical contractors, architects, and building management personnel.