

# Marvel™

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## **Motorization System Installation Instructions**



**Did you find what you're looking for?**

The Truth Hardware Web site  
is a great resource for the latest product  
and installation information.

It's available at **[www.truth.com](http://www.truth.com)**



An FKI Industries Company  
700 West Bridge Street  
Owatonna, MN 55060  
[www.truth.com](http://www.truth.com)  
[techserv@truth.com](mailto:techserv@truth.com)  
Form 90219 R1



## **Danger**

To help prevent  
severe  
personal injury  
or death

- Read and understand instructions completely before beginning installation.
- Wiring must be installed according to local and National Electrical Codes (N.E.C.)
- Disconnect main power before beginning installation! Verify that power is OFF at the main breaker or fuse panel by testing with a voltage meter that you know is working correctly.
- Connect power only after electrical connections are verified.
- This equipment should be connected to a circuit capable of providing 1 Amp at 120 VAC of power per motorized unit.
- Do not allow children to operate unit.
- The **Marvel Power System** must not be used on windows intended to meet egress codes.
- The **Marvel Power System** is intended for indoor use only.
- Save ALL instructions. Additional copies can be downloaded off of our web site at: **[www.truth.com\technical support](http://www.truth.com/technical support)**
- **Installer** – please be sure to give ALL instructions to the homeowner once installation is complete.
- Unless a screen is locked into place to avoid a person reaching into the window during operation, it is advised that the Marvel System not be installed in applications where the motor unit is less than eight feet above the floor.

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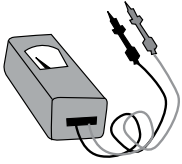
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## What You Should Know Before Starting



### Supply Voltage Note

The voltage range for the **Marvel Power System** is very flexible, it can accommodate voltages available from many different countries. The input (supply) voltage range is 80 to 260 VAC at a frequency range of 50 to 60 Hz. For practical purposes, the supply voltage referenced in this document is 120 volts at 60 Hz commonly used in North America.

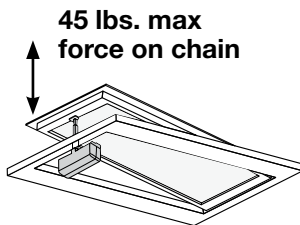
### Operating Environment

- The control unit must be located in a dry environment which includes protection from condensation. The operating temperature range must be maintained between 140° F (60° C) to -5° F (-20° C).
- The **Marvel Power System** is intended to fit onto hinged windows or skylights.
- Any use of the **Marvel Power System** not approved by Truth Hardware is at the user's own risk.

### Be sure the motor system is compatible with your application:

It is important to understand that a successful application of the **Marvel Power System** is dependent on a properly functioning manual window or skylight system. This will include the following:

- Δ **Correct hinges** installed on the window unit to ensure a counter-balanced operation.
  - It is the responsibility of the window manufacturer and/or the window specifier to insure that the properly selected hinges are used on the window. Selection of hinges is based on the window size and weight.
- Δ In any application, the force at the chain (**pulling or pushing**) should not exceed **45 pounds**.
  - Please note that on hinged skylight applications the weight on the chain is typically about half the total weight of the sash.
- Δ Ability to connect to the power cord in accordance with local electrical codes.



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## Required for Installation

### Marvel Power System

- Motor unit w/ power cord
- Two styles of sill mount brackets
- Screw pack
- One set of face mount brackets
- Sash bracket
- Templates
- Installation Instructions

### Single pole double throw momentary wall switch (not included)

- Select amperage rating of switch based on your application and local electrical codes.
- Electrical circuit capable of supplying 1 amp per motor.

### Tools required for installation

- Screw driver
- 1/8" Drill bit (For pilot holes)
- 7/64" [3mm] Hex wrench

#### Note:

- See wiring diagram on page 12 for wiring requirements.
- For replacement parts, please go to [www.truth.com/technicalsupport](http://www.truth.com/technicalsupport)

## Planning



*Talk to the homeowner*

### Important

*If you are not the homeowner, it is important to contact the homeowner and discuss how they want to control a group of windows and/or skylights. It may be very difficult to change the installation to meet the homeowner's desires once installation is complete.*

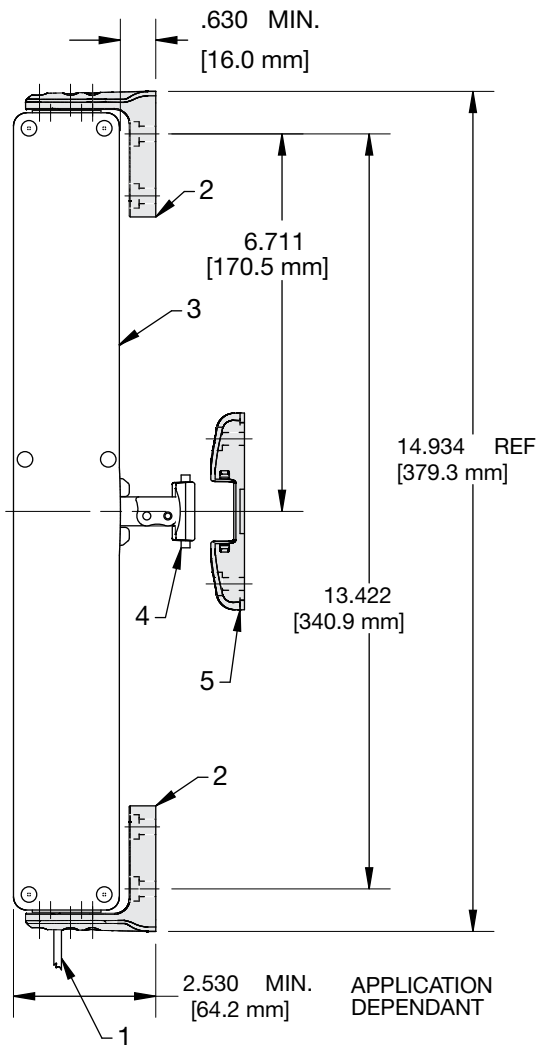
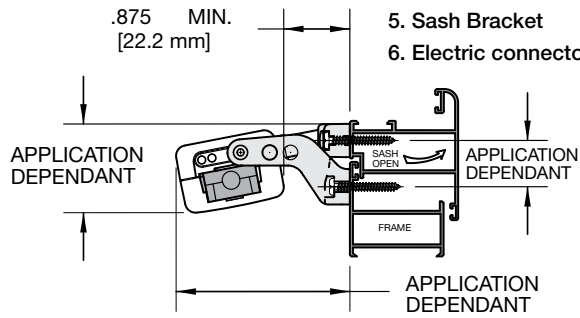
### Please consider

- Only one Marvel power unit per window or skylight application.
- Multiple, independent Marvel Power Units can be controlled by one switch, or have their own individual control switch.
  - **Switch must have proper amperage rating for your application.**
- Depending on the mounting brackets used, approximately a 16"(406mm) long x 1.5"(38mm) tall and 3"(76mm) deep space is required to mount the Marvel Unit.
- If you are installing the motor system onto a window that has manual locks we recommend that the keepers on the locks be removed.
- For more advanced methods of controlling the Marvel Power System please contact Truth's Technical Services.
- The windows and/or skylights must operate correctly and smoothly. Lubrication or cleaning of hardware may be required. This motor system will not operate correctly if the manual hardware is not functioning properly.

# Mounting Instructions for Marvel Power System

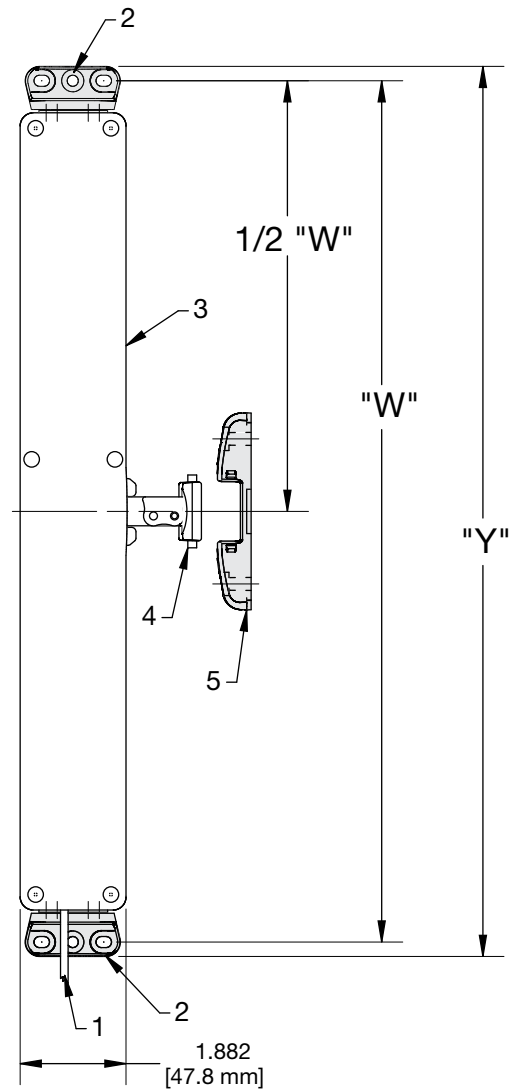
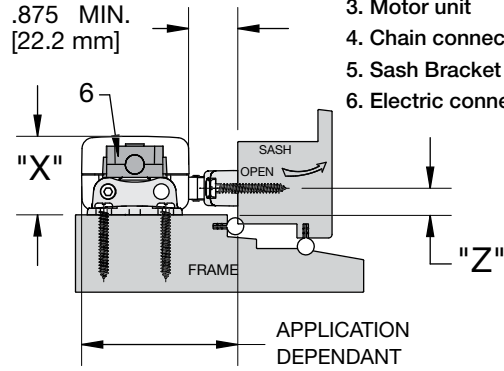
## FACE MOUNT

1. Power supply cable
2. Face mount frame brackets
3. Motor unit
4. Chain connector
5. Sash Bracket
6. Electric connector



## SILL MOUNT

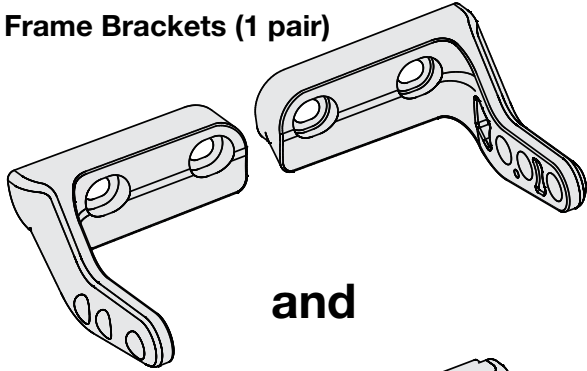
1. Power supply cable
2. Sill mount frame brackets
3. Motor unit
4. Chain connector
5. Sash Bracket
6. Electric connector



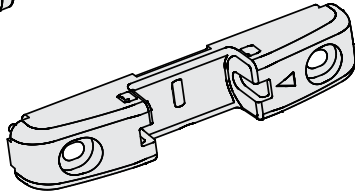
**Brackets Required  
For Face Mount**

On a Face Mount application you will need one set of Frame Face Mount Brackets and one Sash Bracket for your window or skylight.

Frame Brackets (1 pair)



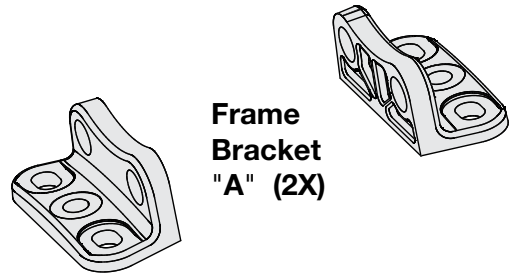
and



Sash Bracket

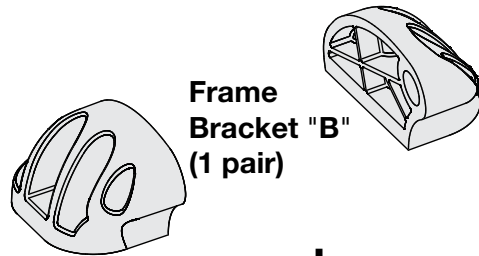
**Brackets Required  
For Sill Mount**

On a Sill Mount application determine which set of brackets you will need for your window or skylight.



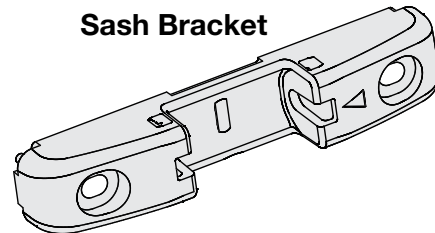
Frame Bracket "A" (2X)

or



Frame Bracket "B" (1 pair)

and

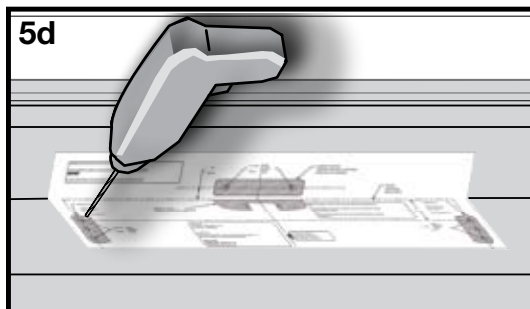
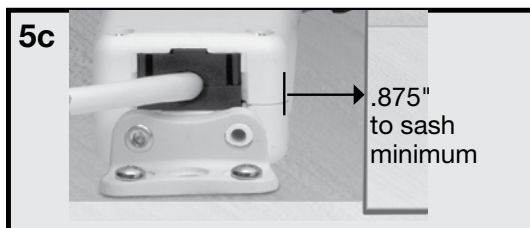
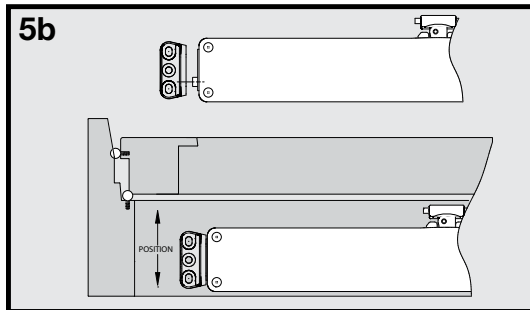
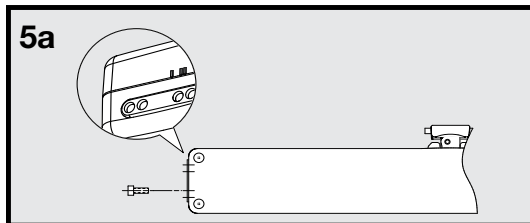
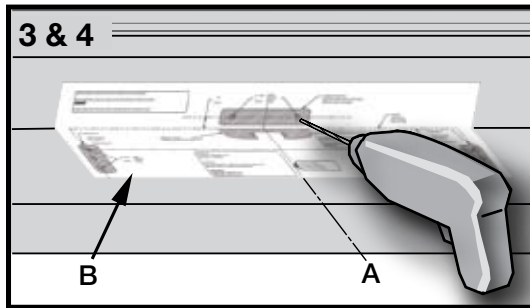
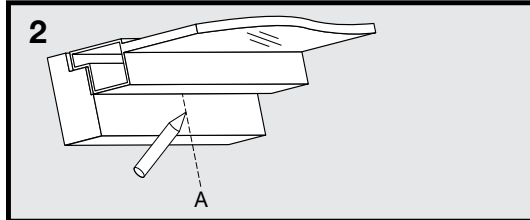


Sash Bracket

Sill Mount Drawing Page 6

Frame Bracket	"W"	"X"	"Y"	"Z"
"A"	15.31" (389mm)	1.38" (35mm)	15.82" (402mm)	.482" (12mm)
"B"	15.191" (386mm)	1.63" (41mm)	15.86" (403mm)	.728" (18.5mm)

## Motor Installation for Sill Mount Brackets

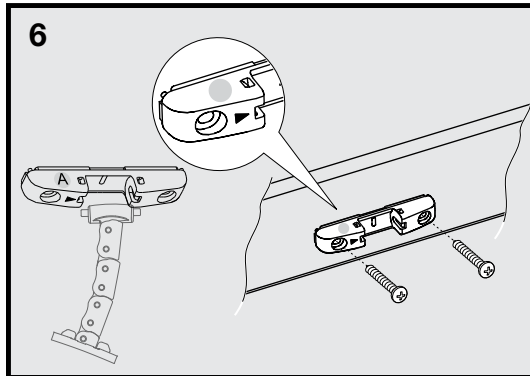


*Graphics show bracket "A" but instructions are for both brackets "A" and "B".*

1. Plan wire exit location on window or skylight
2. Locate centerline (A) of window or skylight
3. Align appropriate template (B) with centerline (A)
4. Drill pilot holes for sash bracket.
5. Determine the distance the motor unit will sit from the sash. (Make sure sash is fully closed before aligning motor unit.) The Marvel motor unit shuts off in the closing direction based off of amperage draw being monitored in the control circuitry. This feature allows great flexibility in the mounting position of the motor unit. For mounting suggestions and minimum conditions refer to Truth's web site at [www.truth.com/technical](http://www.truth.com/technical) service.
  - a) Choose which set of pivot holes in the motor unit that will be used with the selected frame mounting bracket to position the motor correctly. Insert cap screws into the selected pivot holes in the motor unit. (1 cap screw per side)
  - b) Slide frame bracket "A" onto cap screws and position on sill using the template markings as a starting location.
  - c) Align the frame bracket screw holes with the pre-drill center lines on the template. Moving motor unit closer or farther from the sash until it is in the correct position. Mark screw locations. Distance between sash and motor unit must be greater than .875 [22.2mm]
  - d) Drill pilot holes (2 for each bracket) into frame. Pilot holes should be centered in bracket screw holes.

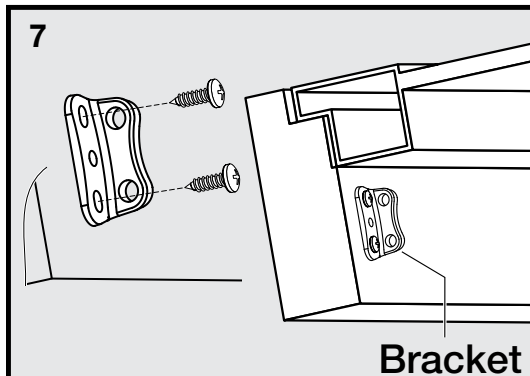


## Motor Installation for Sill Mount Brackets



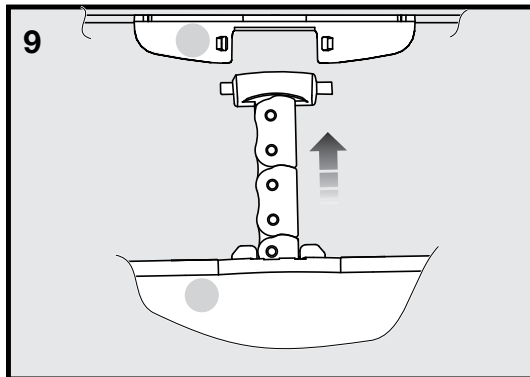
6. Install sash bracket with screws provided.

a) It is necessary to properly orient the sash bracket with respect to the motor unit in order for the quick disconnect feature to work. The graphic at left shows the proper orientation. The arrow on the sash bracket is to show how the bracket is to be oriented with respect to how the chain bends. In addition to the arrow on the sash bracket showing orientation, colored stickers have also been included on the sash bracket and motor unit to help orient the bracket with respect to the motor unit. Ex: If the green sticker is on top of the motor unit the sash bracket should be oriented so the green sticker on the bracket is also on top



7. Attach the motor unit with frame brackets to the window or skylight frame with the screws provide.

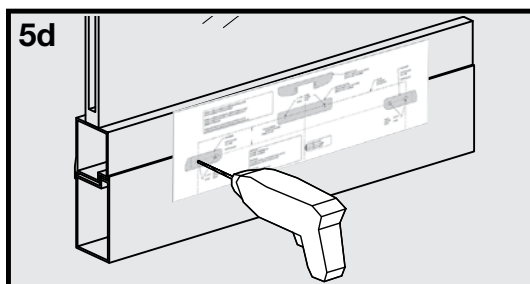
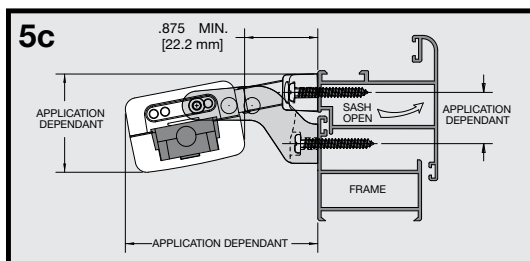
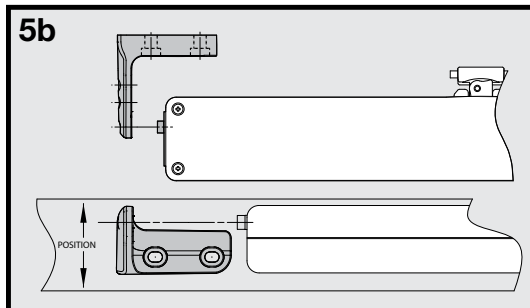
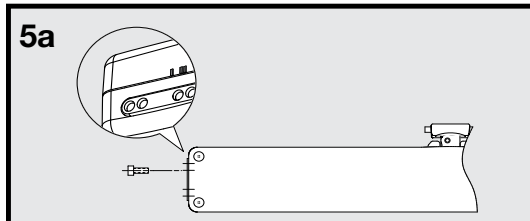
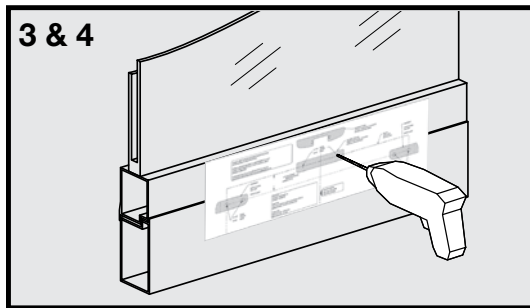
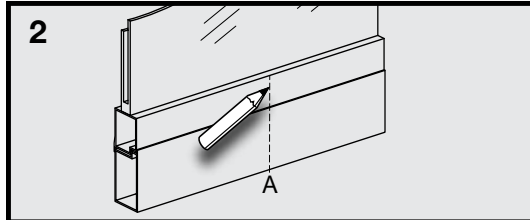
8. Complete electrical wiring and run test to assure function. (refer to page 12 for wiring diagram)



9. Cycle motor unit in order to advance chain enough to snap chain into sash bracket.

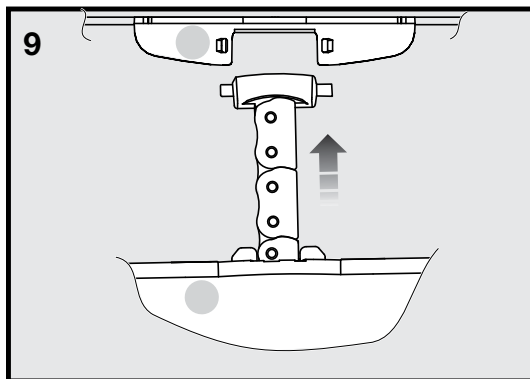
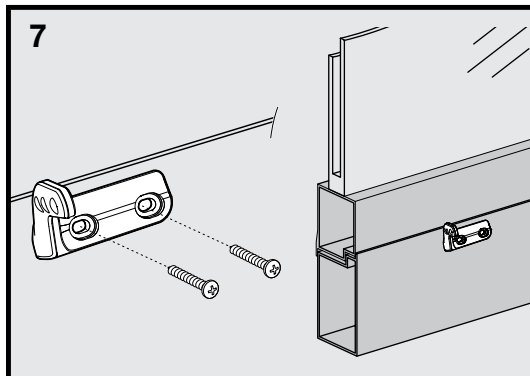
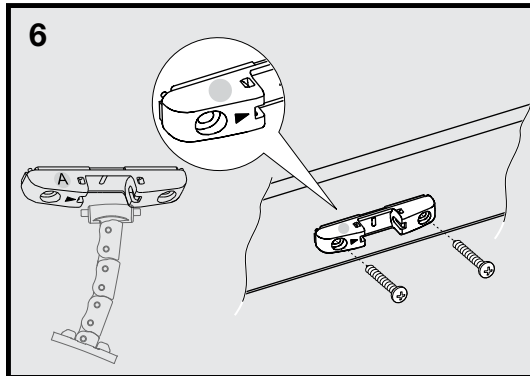
10. Cycle unit fully open and fully closed to check function.

## Motor Installation for Face Mount Brackets



1. Plan wire exit location on window or skylight
2. Locate centerline (A) of window or skylight
3. Align appropriate template (B) with centerline (A)
4. Drill pilot holes for sash bracket.
5. Determine the distance the motor unit will sit from the sash. (Make sure sash is fully closed before aligning motor unit.) The Marvel motor unit shuts off in the closing direction based off of amperage draw being monitored in the control circuitry. This feature allows great flexibility in the mounting position of the motor unit. For mounting suggestions and minimum conditions refer to Truth's web site at [www.truth.com/technical-service](http://www.truth.com/technical-service).
  - a) Choose which set of pivot holes in the motor unit that will be used with the selected frame mounting bracket to position the motor correctly. Insert cap screws into the selected pivot holes in the motor unit. (1 cap screw per side)
  - b) Slide frame bracket "A" onto cap screws and position on sill using the template markings as a starting location.
  - c) Align the frame bracket screw holes with the pre-drill center lines on the template. Moving motor unit closer or farther from the sash until it is in the correct position. Mark screw locations. Distance between sash and motor unit must be greater than 1.250 [31.7mm]
  - d) Drill pilot holes (2 for each bracket) into frame. Pilot holes should be centered in bracket screw holes.

## Motor Installation for Face Mount Brackets



6. Install sash bracket with screws provided.

a) It is necessary to properly orient the sash bracket with respect to the motor unit in order for the quick disconnect feature to work. The graphic at left shows the proper orientation. The arrow on the sash bracket is to show how the bracket is to be oriented with respect to how the chain bends. In addition to the arrow on the sash bracket showing orientation, colored stickers have also been included on the sash bracket and motor unit to help orient the bracket with respect to the motor unit. Ex: If the green sticker is on top of the motor unit the sash bracket should be oriented so the green sticker on the bracket is also on top

7. Attach the motor unit with frame brackets to the window or skylight frame with the screws provide.

8. Complete electrical wiring and run test to assure function. (refer to page 12 for wiring diagram)

9. Cycle motor unit in order to advance chain enough to snap chain into sash bracket.

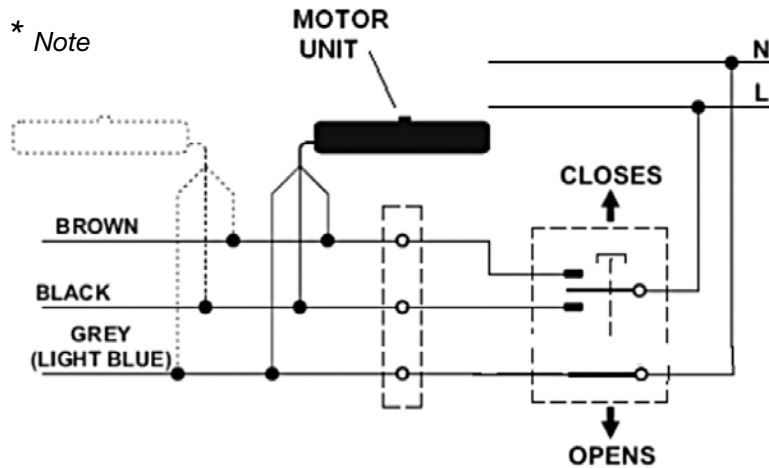
10. Cycle unit fully open and fully closed to check function.

## Switch Installation & Wiring Diagram

- It is recommended that the Marvel unit be controlled with a single pole, double throw (SPDT) momentary contact switch. These switches are typically available through local electrical supply stores. Please see the diagram below for how the unit is to be connected.

*\*Additional Marvel units can be controlled by one SPDT momentary contact switch.*

- Check that the switch is properly rated for the total amperage draw of all the units combined.
- Marvel does not support synchronous operation where more than one Marvel unit is installed on a single sash.



- The advantage of the momentary contact switch is that as soon as your finger is removed from the switch the switch will return to the center, off position and the motor unit will stop at the desired position.
- Please contact Truth's Technical Support Department for application help when it is desired to control the Marvel with something other than a single pole, double throw (SPDT) momentary contact switch.

### General Electrical Specification

- The Marvel has double electrical insulation.
- An internal electronic limit switch controls the opening position.
- The closing position is controlled by current sensing.
- The amperage draw of a single Marvel unit at 120 V – 60 HZ is .12 amps at a 45 pound load. The amperage draw at no load is .040 amps.
- It is recommended that the circuit be capable of providing 1 amp @120 VAC of power per window.
- The input voltage for the unit can range from 80 V to 260 V for both 50 Hz and 60 Hz.

### Product Certification

- The Marvel has been certified to the following standards
  - Δ ANSI / UL 325 – 2003 which is the standard for Door, Drapery, Gate Louver and Window Operators and Systems
  - Δ AN / CSA C22,2 No. 68-92 which is the standard for Motor Operated Appliances (Household and Commercial)

## Apply Power & Test Application

### Common Problems

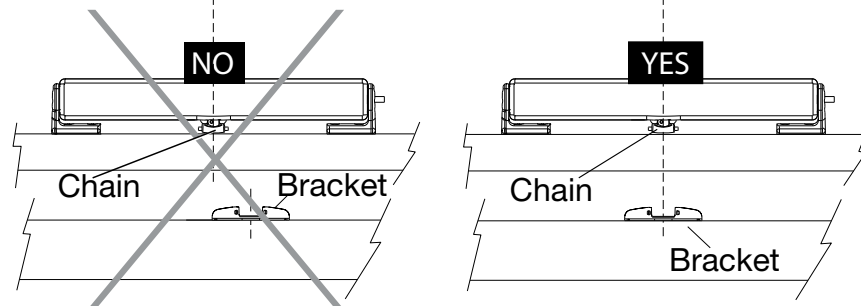
Note: Additional Technical assistance can be found by logging onto:  
[www.truth.com/technicalsupport](http://www.truth.com/technicalsupport)

#### Motor does not run...

- Check to make sure power is on and fuses at the electrical panel are good.
- Check to make sure the power cord connector is fully engaged with Marvel unit.

#### Motor is not straight on my window...

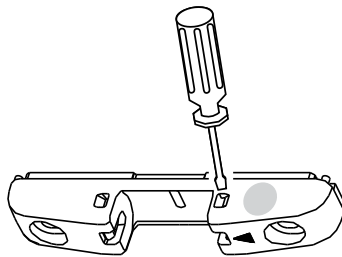
- Check to be sure the correct mounting holes are used in the mounting brackets and that all hardware is mounted level and on center.



#### Window or Skylight does not fully close or open...

- Check for obstructions between sash and frame.

## Emergency Procedures



- Should it be necessary to close the window manually, due to power supply failure or mechanism block, follow these instructions:

1. Disconnect power form unit.
2. Block sash open
3. Disconnect sash bracket ...

To disconnect the sash bracket from the chain, insert a small, flat blade screwdriver into the access hole on the side of the bracket with the arrow. Then push the metal tab toward the closest mounting hole and separate the bracket from the chain. To attach the chain again, simply align the end of the chain with respect to the center line of the bracket clips and snap the pieces together.

4. Move Marvel chain out of the way
5. While supporting the weight of the sash, remove block and close window or skylight

## **Service**

Truth Hardware has made every effort to make all pertinent information available to you through this instruction manual and our web site. However, if you encounter a problem or question you cannot resolve to please call 1-800-324-4487 to speak to one of our hardware technicians or send an email to: **techserv@truth.com**

### **Before contacting Truth Hardware please be aware that:**

- Complete product and troubleshooting information is available on our web site at: **www.truth.com/technicalsupport**
- A qualified electrician is required to resolve most electrical issues
- Contact a qualified window service technician through your window dealer to resolve window or hardware related issues.
- Truth Hardware is a window and patio door hardware manufacturer. *Truth Hardware is not the manufacturer of your windows.*
- Truth Hardware does not have field service technicians. If you encounter a problem or question you cannot resolve to please call 1-800-324-4487 to speak to one of our hardware technicians or send an email describing the problem to: **techserv@truth.com**.
- Replacement window hardware is available through the window manufacturer or through one of our authorized distributors. Consult the Truth Hardware web site at **www.truth.com** for the nearest distributor.