

MARVEL™ ELECTRONIC SKYLIGHT / WINDOW OPERATOR

Truth Hardware's new Marvel™ power operator system for windows and skylights proves that simpler can be better. Challenged by window and skylight manufacturers with providing a small and sleek motorized system that is simple to install, easy to operate and above all affordable – Truth is confident that the Marvel System is the answer.

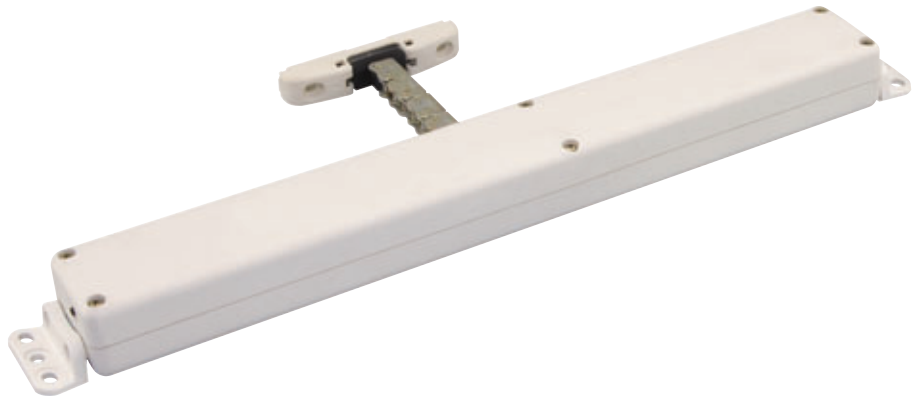
EASY TO INSTALL & OPERATE

With easy to install mounting brackets used to help secure the Marvel Operator in the center of your window or Skylight, this system can be installed in a matter of minutes.

- Three styles of mounting brackets accompany this product to allow for easy mounting the unit (see Fig. # for details).
- Can be face-mounted or mounted to applications with sills.
- No transformer required. Operates from 110 volt household current.
- Controlled using a standard, single pole / double throw, center off momentary contact switch (not supplied).
- Durable double link chain produces 9.5" of chain travel
- Electronic limit switch controls the opening position while the closing position is controlled through an internal current sensing feature.
- Users can operate multiple units from one control switch.

MARVEL OPERATOR CAPACITY & RATINGS

- With 45 lbs. of lifting load at the chain the Marvel System is rated to lift skylight sashes that weigh up to 90 lbs.
- When used on awning windows, the Marvel System is designed to work on awning windows with a properly sized counter-balance hinge (See Truth Tips) and operator. (Consult awning operator specifications).
- Marvel Operators are ANSI/UL 325 Certified and CAN/CSA C22.2 Certified.



WARRANTY: Truth Hardware's Marvel Motorized Operator System is warranted for one year against defects in materials and workmanship on all electronic and mechanical components.

PRODUCT APPLICATION ASSISTANCE:

If you need assistance with product configurations to meet your needs, please visit our website at www.truth.com. Under the "Technical Support" tab you will find all of the technical information needed to properly configure and specify all elements of an automated window installation, including installation instructions, pre-wiring and proper hardware requirements. You can also contact Truth's highly trained Technical Service Staff who can assist you with the selection of the appropriate hardware. These individuals are available during normal business hours (CST) at 800-324-4487.

ORDERING INFORMATION:

Ordering of the Marvel System is quite simple. All hardware necessary for mounting the system on either a window or skylight is now included in the same kit.

1. Order item number 42.90.XX.100
2. Specify color: .03 Bronze or .38 White

TRUTH TIPS:

1. Awning windows must be equipped with a properly sized counter balance hinge such as Truth Hardware's 13 series or 34 series 4-bar hinges. All hardware and motor system warranties

are void if these guidelines are not followed. (See Tech Notes).

2. Unless otherwise specified, the Marvel Motorized Window and Skylight System is designed to operate any properly sized window or skylight utilizing a hinge system manufactured by Truth Hardware. Use of the Marvel motor system on windows or skylights with hardware manufactured by companies other than Truth Hardware is at your own risk. For verification, look for the Truth logo/name stamped on the hinge or consult with the window manufacturer. If your hardware is not manufactured by Truth Hardware, contact Truth's Technical Service Department for available options at 800-324-4487.

3. The Truth Hardware Marvel Motorized Operator is rated for use in indoor applications only.

4. The Marvel Motorized Operator system is designed to be used on skylight operators that lift to open and pull to close in the center of the skylight. Therefore, the stiles of the skylight panel must be rigid enough in the closed position to ensure proper corner pull-in for a weather tight seal and rigid enough in the open position to provide proper skylight stability when supported at a single center point. The wider the skylight is the more significant this issue can become. For more assistance, contact Truth Hardware Technical Services.

5. For vinyl window applications, mounting screws should pass through two PVC walls, or one PVC wall and one insert wall. For this reason, it may be necessary to use a longer screw than is recommended.

MARVEL™ POWER WINDOW SYSTEM

INCLUDE TRUTH SPECS IN YOUR NEXT MOTORIZED WINDOW/SKYLIGHT PROJECT

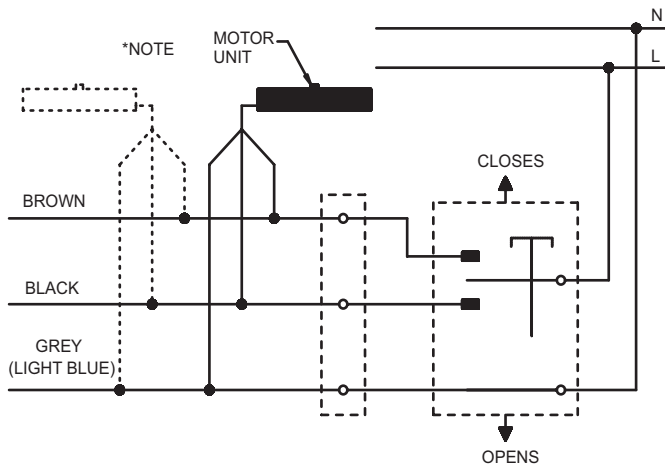
Motorized system for windows or skylights (not exceeding 45 lbs of weight measured at the chain). Motor uses a double link chain providing 9.5" of chain stroke. Mounting should accom-

modate wood, PVC or metal skylights and windows. Mounting hardware to be provided to accommodate a wide range of window profile shapes and materials. Motor system should run off of 110 volt current and utilize a standard single pole / double throw, center off momentary contact switch. Motor

system to be ANSI/UL 325 certified and CAN/CSA C22.2 certified. This motor system shall be "Marvel Electronic Window/Skylight" series as offered by Truth Hardware, Owatonna, MN.

Switch Installation & Wiring Diagram

- It is recommended that the Marvel unit be controlled with a single pole, double throw (SPDT) center off 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.
- The advantage of the center off 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) center off momentary contact switch.



*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.

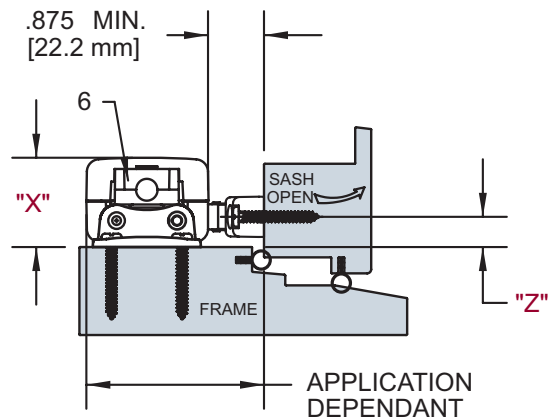
General Electrical Specification

- 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 at 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:
 - △ ANSI/UL 325 - 2003 which is the standard for Door, Drapery, Gate, Louver and Window Operators and Systems.
 - △ AN/CSA C22.2 No. 68-92 which is the standard for Motor Operated Appliances (Household and Commercial)

FIG. 1 SILL MOUNT APPLICATION
(MARVEL 42.90.XX.100 KIT)

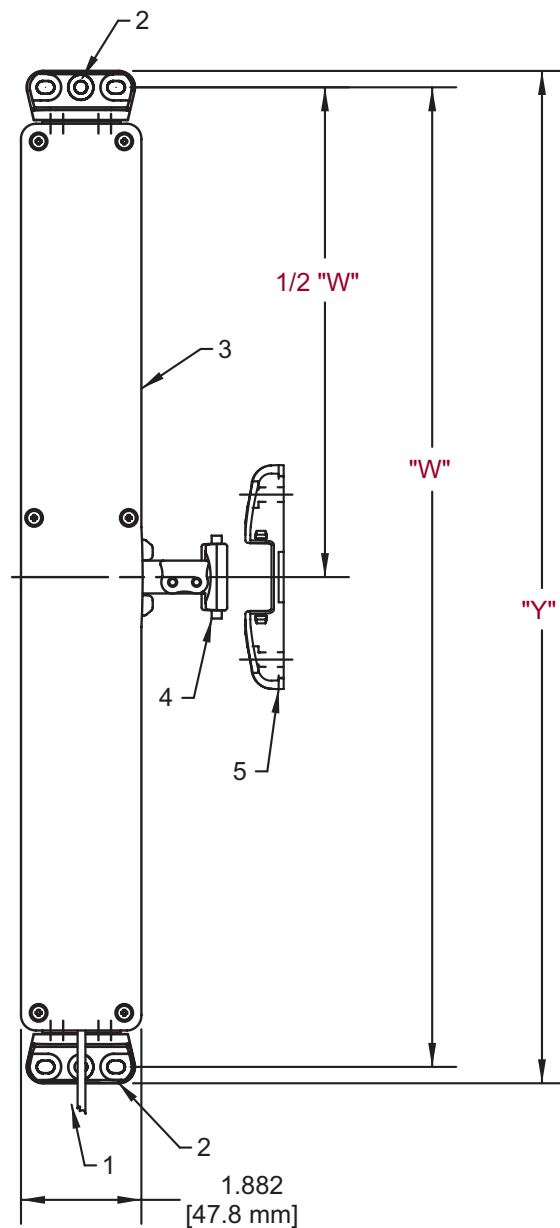


- 1) POWER SUPPLY CABLE
- 2) SILL MOUNT FRAME BRACKETS ("A" OR "B")
- 3) MOTOR UNIT
- 4) CHAIN CONNECTOR
- 5) SASH BRACKET
- 6) ELECTRIC CONNECTOR

RECOMMENDED SCREWS FOR BRACKETS:

(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

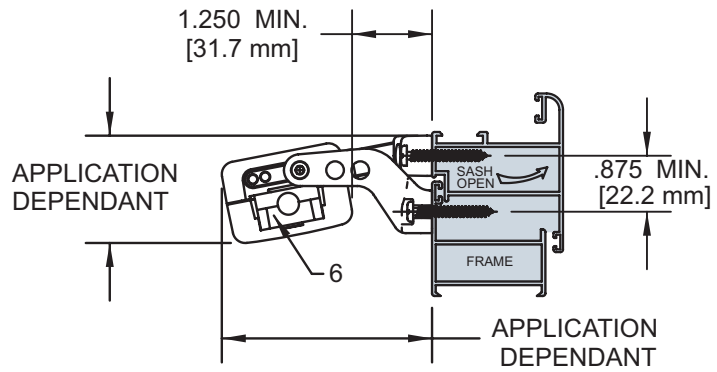
OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



FRAME BRACKET	"W"	"X"	"Y"	"Z"
"A"	15.31" [389mm]	1.38" [35mm]	15.82" [402mm]	.482" [12mm]
"B"	15.19" [386mm]	1.63" [41mm]	15.86" [403mm]	.728" [18.5mm]

**MARVEL™
POWER WINDOW
SYSTEM**
(Snap Bracket Kit)

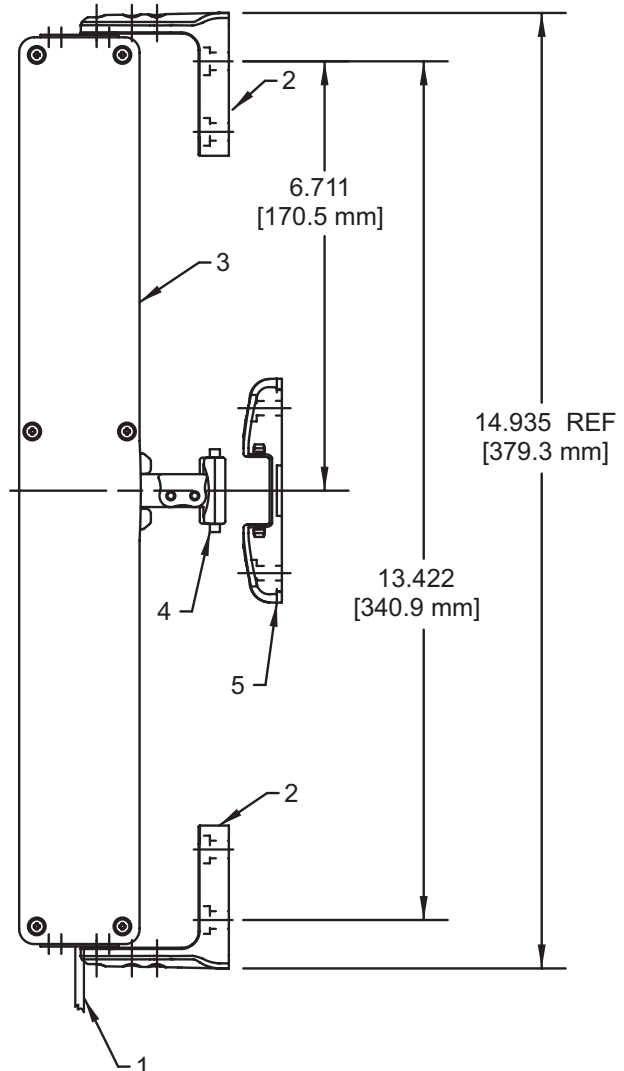
FIG. 2 FACE MOUNT APPLICATION
(MARVEL 42.92.XX.100 KIT)



- 1) POWER SUPPLY CABLE
- 2) FACE MOUNT FRAME BRACKETS "F"
- 3) MOTOR UNIT
- 4) CHAIN CONNECTOR
- 5) SASH BRACKET
- 6) ELECTRIC CONNECTOR

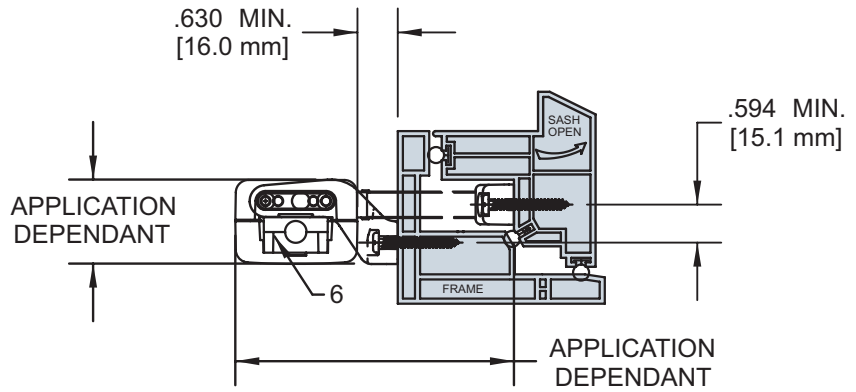
RECOMMENDED SCREWS FOR BRACKETS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



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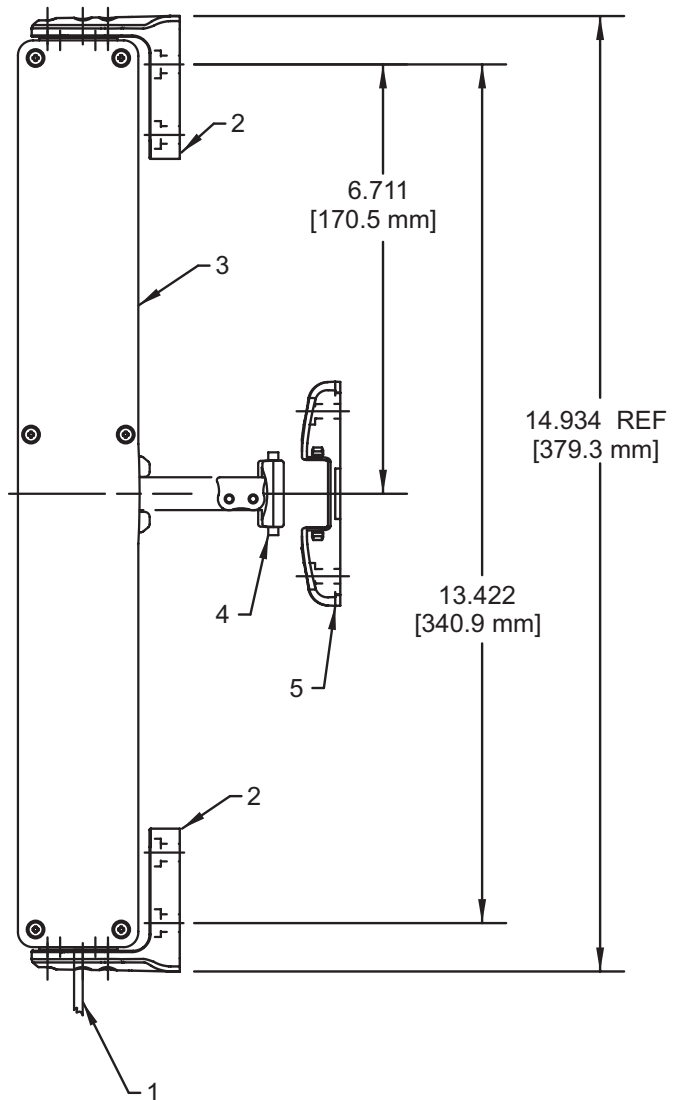
FIG. 3 FACE MOUNT APPLICATION
(MARVEL 42.90.XX.100 KIT)



- 1) POWER SUPPLY CABLE
- 2) FACE MOUNT FRAME BRACKETS "F"
- 3) MOTOR UNIT
- 4) CHAIN CONNECTOR
- 5) SASH BRACKET
- 6) ELECTRIC CONNECTOR

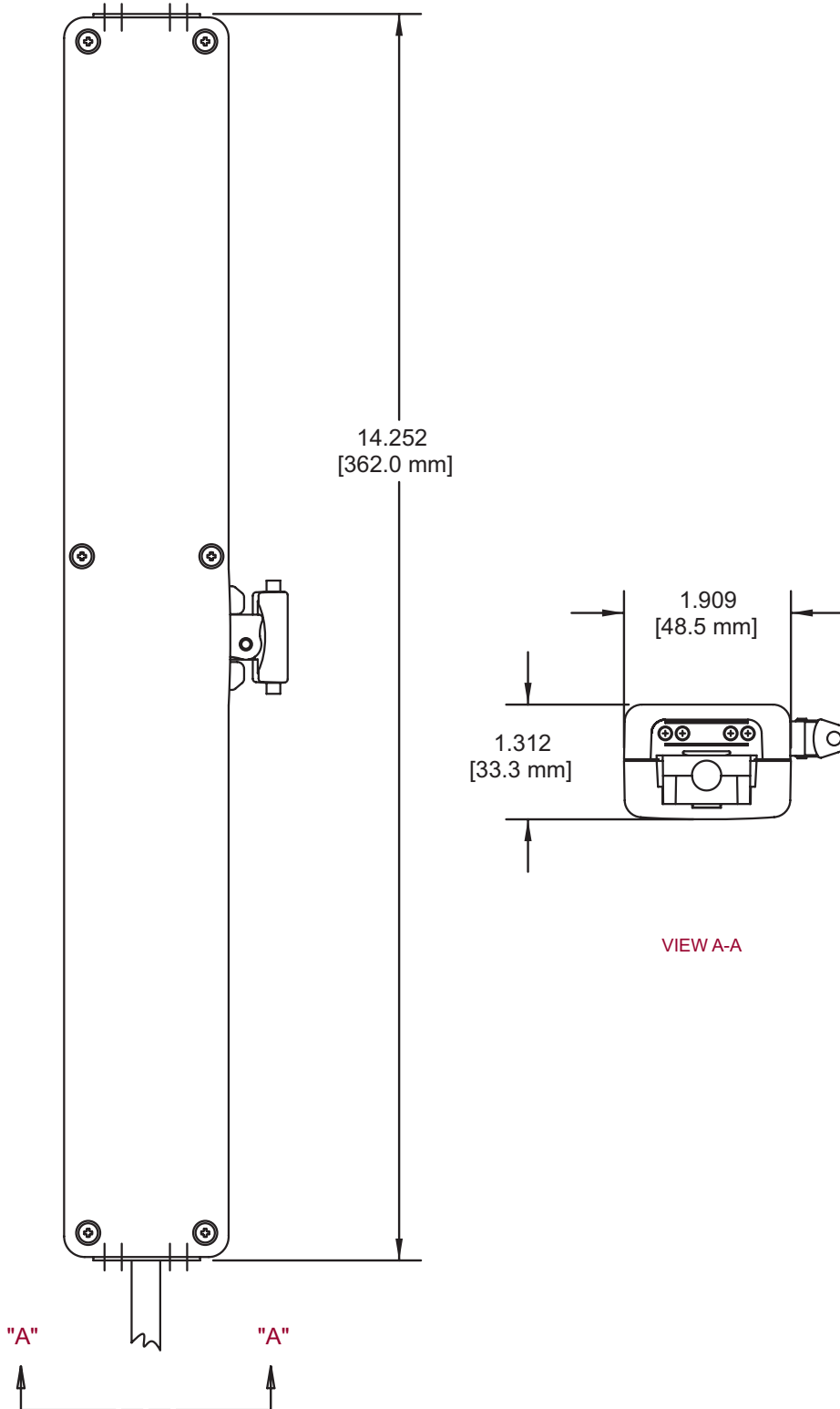
RECOMMENDED SCREWS FOR BRACKETS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



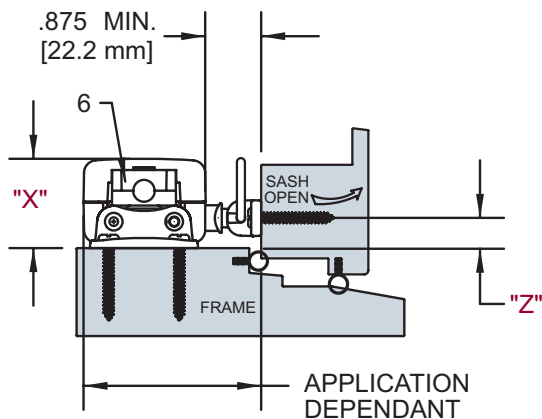
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FIG. 4 MOTOR UNIT OVERALL DIMENSIONS
(MARVEL 42.90.XX.100 KIT)



**MARVEL™
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(Pull Pin Bracket Kit)

FIG. 5 SILL MOUNT APPLICATION
(MARVEL 42.90.XX.101 KIT)

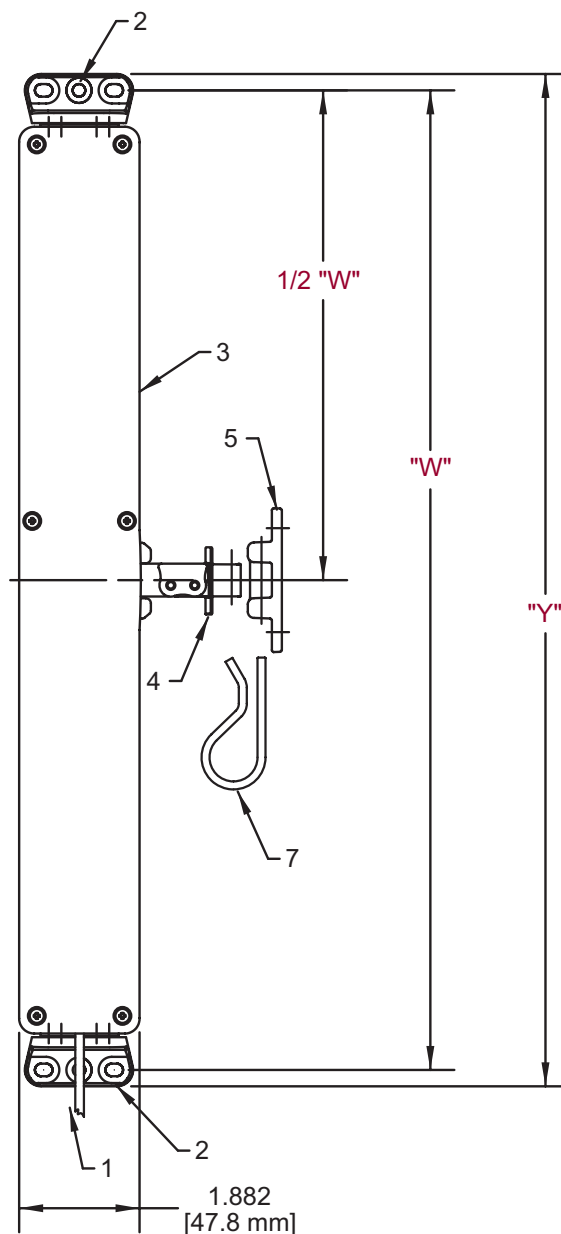


- 1) POWER SUPPLY CABLE
- 2) SILL MOUNT FRAME BRACKETS ("A" OR "B")
- 3) MOTOR UNIT
- 4) CHAIN CONNECTOR
- 5) SASH BRACKET
- 6) ELECTRIC CONNECTOR
- 7) PULL PIN

RECOMMENDED SCREWS FOR BRACKETS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

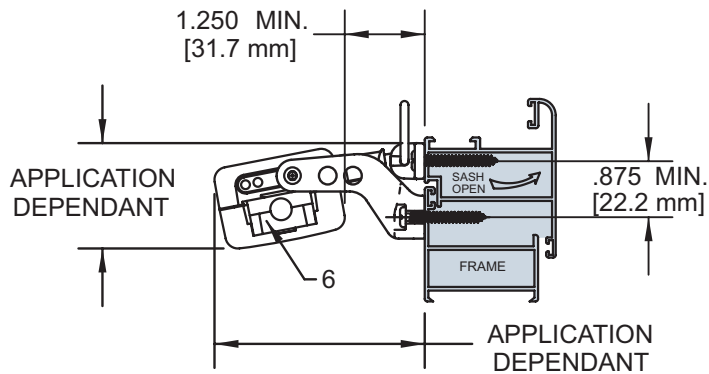
OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FRAME BRACKET	"W"	"X"	"Y"	"Z"
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"B"	15.19" [386mm]	1.63" [41mm]	15.86" [403mm]	.728" [18.5mm]



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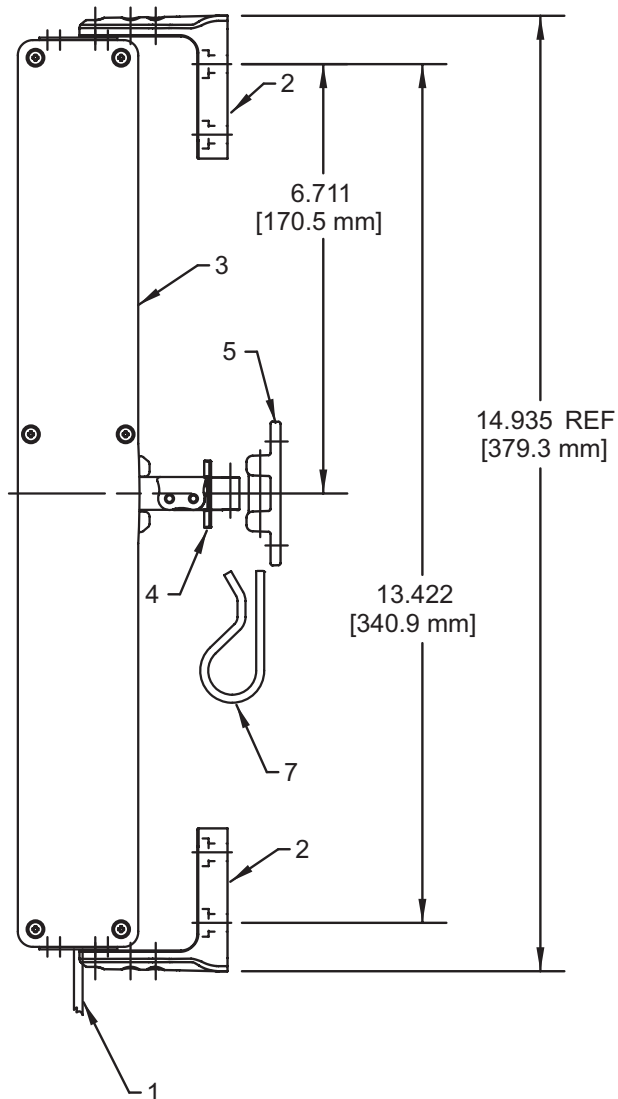
**FIG. 6 FACE MOUNT APPLICATION
(MARVEL 42.90.XX.101 KIT)**



- 1) POWER SUPPLY CABLE
- 2) FACE MOUNT FRAME BRACKETS "F"
- 3) MOTOR UNIT
- 4) CHAIN CONNECTOR
- 5) SASH BRACKET
- 6) ELECTRIC CONNECTOR
- 7) PULL PIN

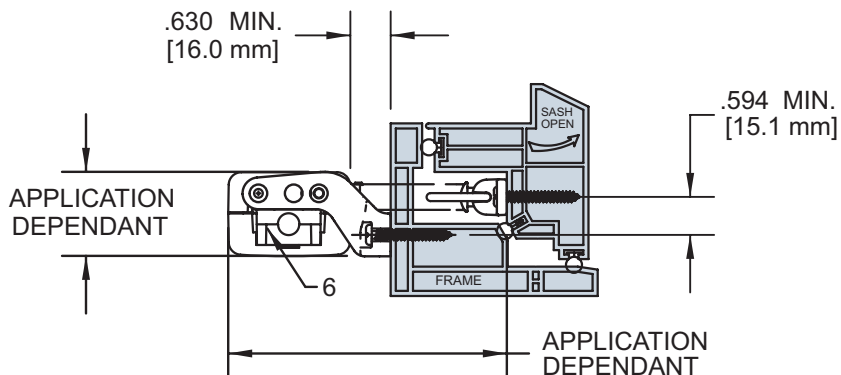
RECOMMENDED SCREWS FOR BRACKETS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



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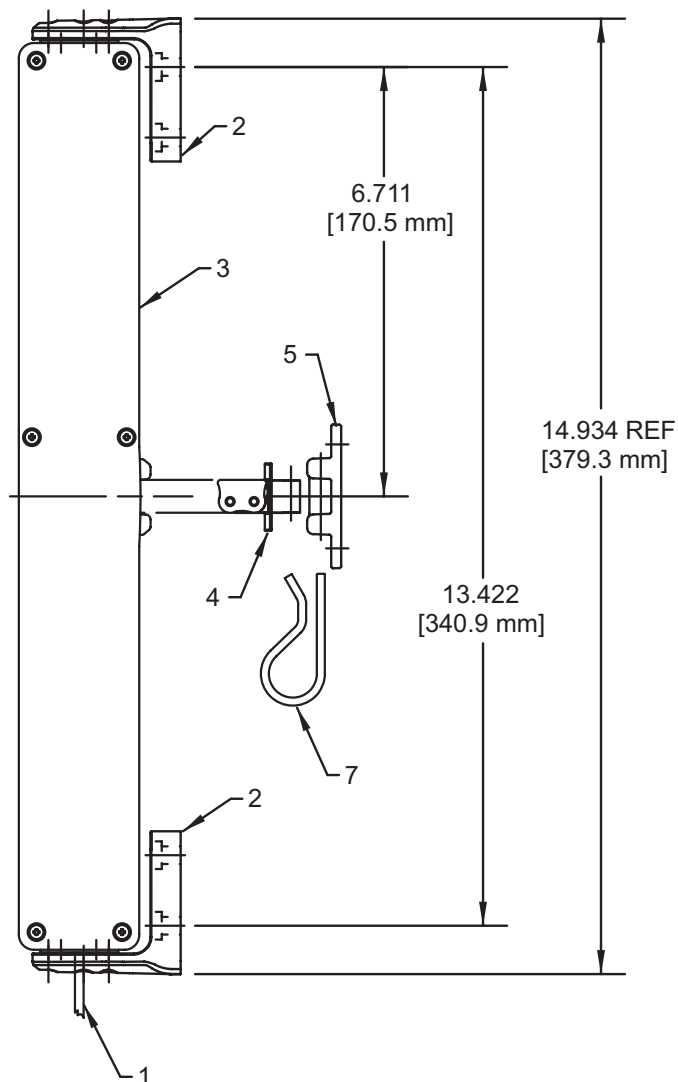
FIG. 7 FACE MOUNT APPLICATION
(MARVEL 42.90.XX.101 KIT)



- 1) POWER SUPPLY CABLE
- 2) FACE MOUNT FRAME BRACKETS "F"
- 3) MOTOR UNIT
- 4) CHAIN CONNECTOR
- 5) SASH BRACKET
- 6) ELECTRIC CONNECTOR
- 7) PULL PIN

RECOMMENDED SCREWS FOR BRACKETS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)



**MARVEL™
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FIG. 8 MOTOR UNIT OVERALL DIMENSIONS
(MARVEL 42.90.XX.101 KIT)

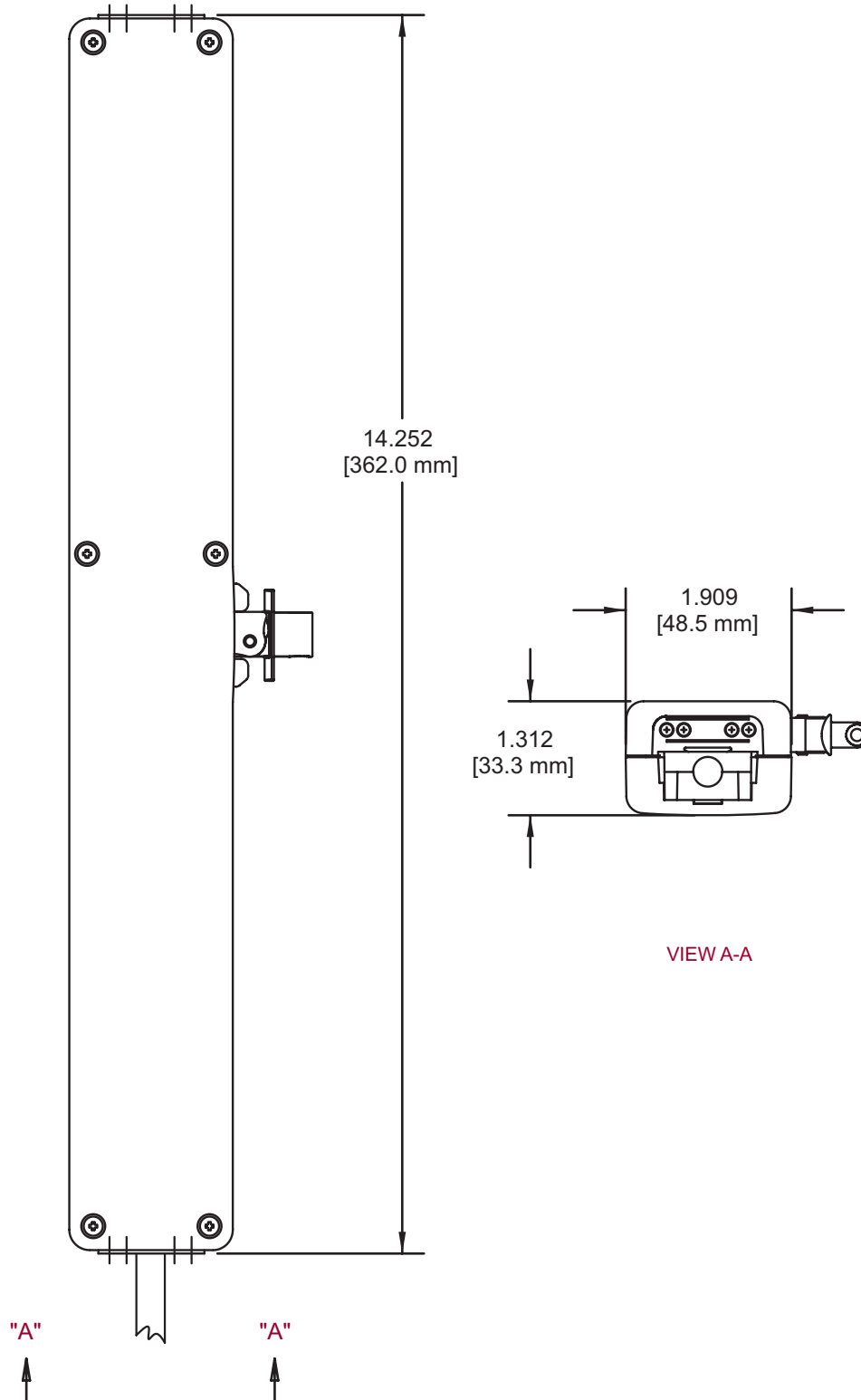


FIG. 9 SNAP SASH BRACKET 23166
(INCLUDED IN 42.90.XX.100 KIT)

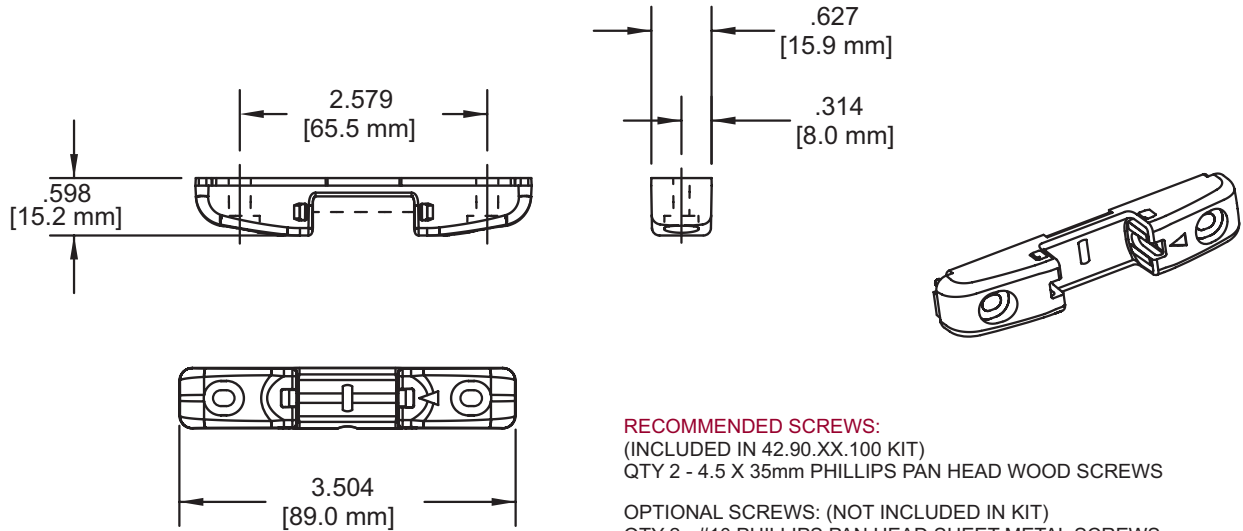
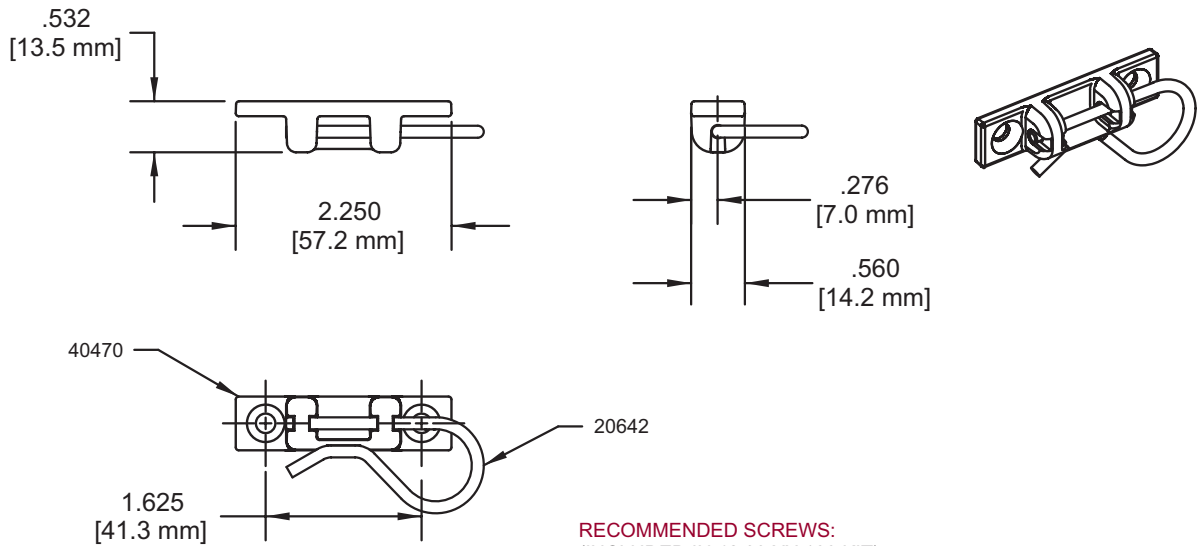
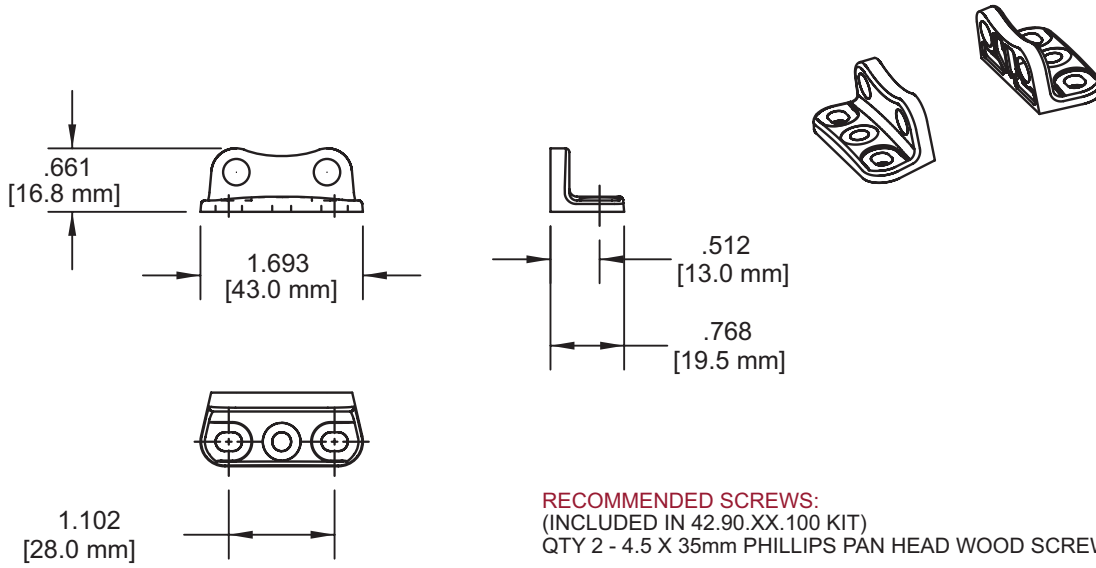


FIG. 10 SASH BRACKET 40470 AND DETACHABLE SASH PIN 20642
(INCLUDED IN 42.90.XX.101 KIT)



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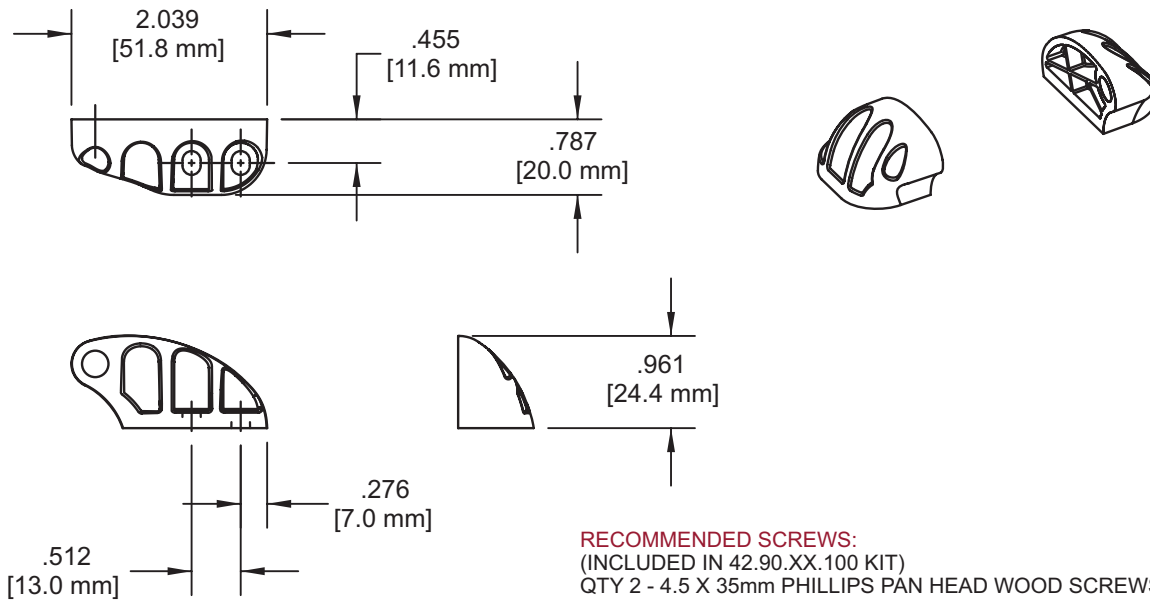
FIG. 11 NON-HANDED SILL MOUNT BRACKET "A" 23169.XX
(INCLUDED IN 42.90.XX.100 & 42.90.XX.101 KIT)



RECOMMENDED SCREWS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

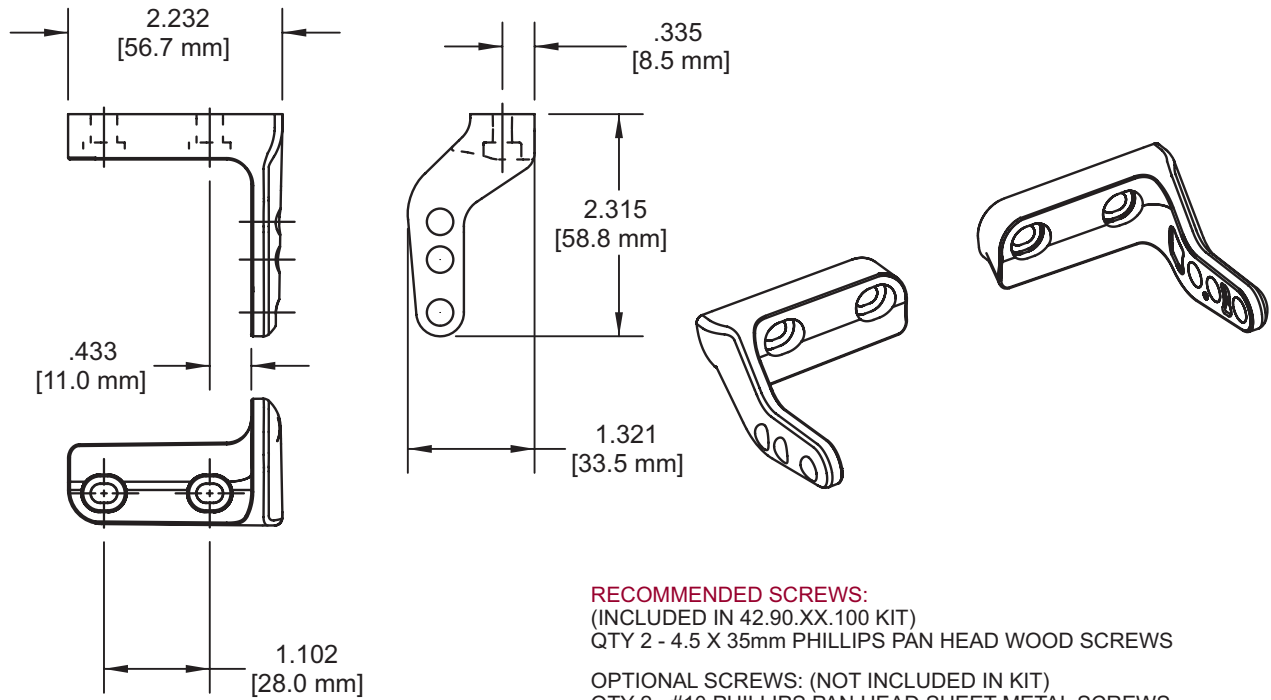
FIG. 12 HANDED SILL MOUNT BRACKET "B" 23167.XX (LH) 32168.XX (RH)
(INCLUDED IN 42.90.XX.100 & 42.90.XX.101 KIT)



RECOMMENDED SCREWS:
(INCLUDED IN 42.90.XX.100 KIT)
QTY 2 - 4.5 X 35mm PHILLIPS PAN HEAD WOOD SCREWS

OPTIONAL SCREWS: (NOT INCLUDED IN KIT)
QTY 2 - #10 PHILLIPS PAN HEAD SHEET METAL SCREWS
(LENGTH AND THREAD TYPE DETERMINED BY PROFILE)

FIG. 13 HANDED FACE MOUNT BRACKET "F" 23175.XX (LH) 32176.XX (RH)
(INCLUDED IN 42.90.XX.100 & 42.90.XX.101 KIT)



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