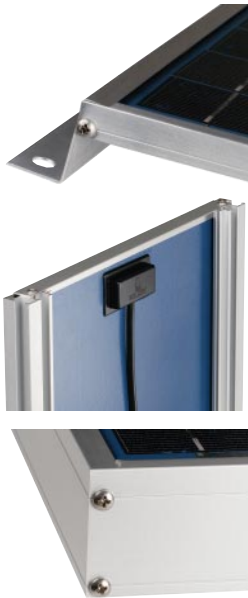




SX-40 SX-50

Photovoltaic Modules

SX-40 and SX-50 photovoltaic modules are part of Solarex's new SX™ module series, providing cost-effective photovoltaic power for DC loads with many energy requirements. With 36 polycrystalline cells in series, they charge batteries efficiently in virtually any climate. Their materials, design and construction reflect Solarex's quarter-century of experience.



Top:
DirectMount™ frame.
Center:
MultiMount™ frame.
Bottom:
Universal frame.

Typical commercial applications of these modules, which generate peak power of 40 watts and 50 watts respectively, include remote telemetry, instrumentation systems, security sensors, and land-based navigation aids. They are also well-suited to providing subsistence power to homes in remote areas without utility (mains) service. They are available in three configurations: the **M** configuration, which includes the versatile MultiMount™ frame and a 15-foot output cable; the **D** configuration, which mounts directly to many surfaces without additional hardware; and the **U** configuration, which includes the heavy-duty Universal frame and a high-volume junction box with dual-voltage output.

The SX-40M and SX-50M

The SX-40M and -50M are general-purpose PV modules suitable for applications compatible with the MultiMount™ frame and the modules' electrical characteristics. They are for use in single-module applications with DC system voltage not exceeding 30 volts.

MultiMount™ Frame

The MultiMount™ frame of the SX-40M and -50M provides tremendous flexibility in mounting approach. Oriented parallel to the edge and back of the module, its dual channels accept the heads of 5/16" or 8mm hex bolts, allowing the module to be mounted from the side or back. Bolts may be located anywhere along the channels (shown at left with end caps removed), a configuration which prevents them from turning during tightening and allows installation with just one wrench.

Complete, Factory-Wired

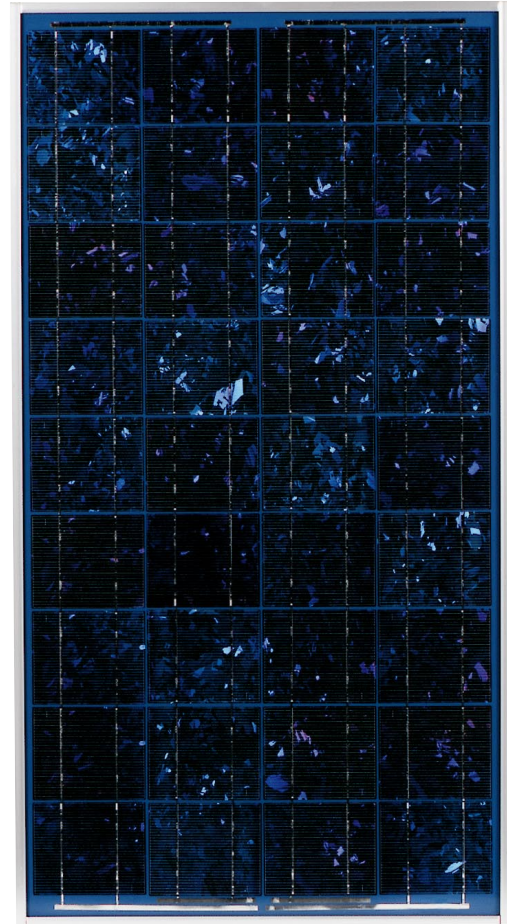
Output of the **M** configuration is via a 15-foot (4.6m) PVC-jacketed AWG 14-2 cable which terminates in a low-profile junction box on the module back. Epoxy-potted in the box, module electrical connections are sealed against corrosion and effectively strain-relieved. Output voltage is compatible with 12VDC systems.

Phone:
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Specifications subject to
change without notice

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SX-50U

The Natural Source for Electricity™

Solarex SX-40 and SX-50 modules are ideally suited for modest power requirements in remote areas such as this home lighting system in Nepal.



The SX-40D and SX-50D

The DirectMount™ frame of the SX-40D and -50D enables these modules to be mounted on many surfaces (roofs, walls, etc.) with no need for mounting hardware beyond four fasteners appropriate for the surface and material. They are easily and inexpensively installed on remote dwellings to provide limited electric power. Their electrical output circuitry and limitations are identical to the **M** configuration modules.

The SX-40U and SX-50U

The SX-40U and -50U are designed primarily for industrial use and other particularly demanding applications. Their rugged Universal frame is suitable for severe duty, exceeds the requirements of all certifying agencies, and is fully supported by Solarex's IntegraSystem™ system integration concept, which ensures full compatibility with other Solarex subsystems (support hardware, regulators, etc.). These modules are suitable for single- or multiple-module applications with DC system voltage not exceeding 600 volts.

Dual Voltage Capability

All SX-40 and -50 modules consist of 36 polycrystalline silicon solar cells, electrically configured as two series strings of 18 cells each. In the SX-40U and -50U junction box, the strings may be field-wired in series (providing 12V nominal output) or in parallel (providing 6V nominal output.)

High-Capacity Versatile Junction Box

The large (25 cubic inches, 411cc) junction box is raintight (IP54 rated) and accepts 1/2" nominal or PG13.5 conduit or cable fittings. With its six-terminal connection block, it enables most system array connections (putting modules in series or parallel) to be made right in the junction box. Optionally, this junction box can be fitted with:

- blocking and bypass diodes;
- an oversize terminal block which accepts conductors up to AWG #4 (25mm²); standard terminals accept up to AWG #10 (6mm²);
- a Solarstate™ charge regulator.

The SX-40U and -50U are certified by TÜV Rheinland as Class II equipment and for use in systems with voltage up to 1000VDC. They are approved by Factory Mutual Research for application in NEC Class 1, Division 2, Groups C & D hazardous locations.



Performance and Workmanship Warranted

The materials, workmanship and performance of every SX-40 and SX-50 module are covered by Solarex's limited twenty-year warranty. Contact Solarex's Marketing Department for full terms and limitations of the warranty.

Polycrystalline Solar Cells

With square corners, Solarex's polycrystalline solar cells fill the module surface with active photovoltaic area for high power density. Mega™ cells are efficient, stable, and attractive; their cut crystal facets provide a sparkling visual texture that shifts with the viewer's perspective.

Proven Materials and Construction

Solarex's quarter-century of field experience shows in every aspect of these modules' construction and materials:

- Cell strings laminated between sheets of ethylene vinyl acetate (EVA) and tempered glass, a rugged weatherproof package;
- Tempered glass superstrate is highly transmissive (low iron content), impact-resistant;
- Clear anodized frames are strong, corrosion-resistant, compatible with Solarex mounting hardware and other mounting structures, and durably attractive.

Safety Approved

These modules are listed by Underwriter's Laboratories for electrical and fire safety (Class C fire rating).



Quality Certified

SX-40 and -50 modules are manufactured in our ISO 9001-certified factories to demanding specifications, and comply with the requirements of IEC 61215 and IEEE 1262, including:

- repetitive cycling between -40°C and 85°C at 85% relative humidity;
- simulated impact of one-inch (25mm) hail at terminal velocity;
- a "damp heat" test, consisting of 1000 hours of exposure to 85°C and 85% relative humidity;
- a "hot-spot" test, which determines a module's ability to tolerate localized shadowing (which can cause reverse-biased operation and localized heating);
- static loading, front and back, of 50 psf (2400 Pa); front loading (e.g. snow) of 113 psf (5400 Pa).

Typical Electrical Characteristics⁽¹⁾

	SX-40	SX-50
Maximum power (P_{max})	40W	50W
Voltage at P_{max} (V_{mp})	16.8V	16.8V
Current at P_{max} (I_{mp})	2.37A	2.97A
Guaranteed minimum P_{max}	36W	45W
Short-circuit current (I_{sc})	2.58A	3.23A
Open-circuit voltage (V_{oc})	21.0V	21.0V
Temperature coefficient of I_{sc}	$(0.065 \pm 0.015)\%/^{\circ}\text{C}$	
Temperature coefficient of V_{oc}	$-(80 \pm 10)\text{mV}/^{\circ}\text{C}$	
Temperature coefficient of power	$-(0.5 \pm 0.05)\%/^{\circ}\text{C}$	
NOCT ²	$47 \pm 2^{\circ}\text{C}$	

Notes

1. These specifications represent the performance of typical 12V modules as measured at their output terminals (or cable termination), and do not include the effect of such additional equipment as diodes. The specifications are based on measurements made in accordance with ASTM E1036-85 corrected to SRC (Standard Reporting Conditions, also known as STC or Standard Test Conditions), which are:

- illumination of $1 \text{ kW}/\text{m}^2$ (1 sun) at spectral distribution of AM 1.5 (ASTM E892-87 global spectral irradiance);
- cell temperature of 25°C .

For characteristics of modules in 6V configuration, divide the 12V voltage characteristics by 2 and multiply current characteristics by 2. Power values are unchanged.

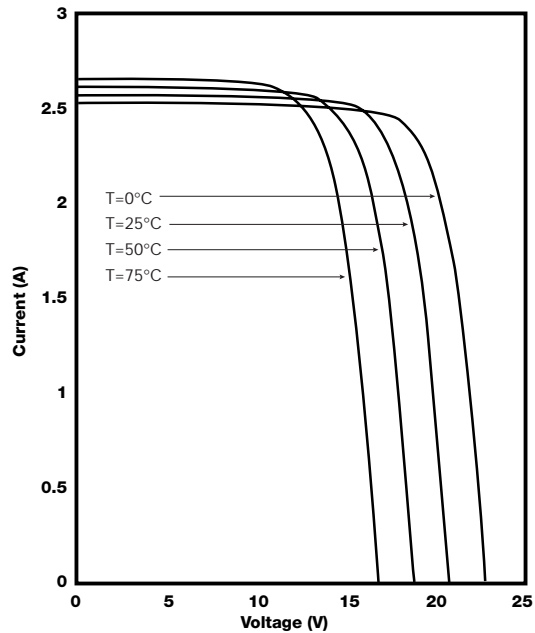
2. When illuminated, the cells in a module operate hotter than the ambient temperature. NOCT (Nominal Operating Cell Temperature) is an indicator of this temperature differential, and is the cell temperature under Standard Operating Conditions: ambient temperature of 20°C , solar irradiation of $0.8 \text{ kW}/\text{m}^2$, and wind speed of $1 \text{ m}/\text{s}$.
3. These specifications do not include the effect of light-induced degradation, which can result in approximately a 3% reduction in power output after exposure to sunlight.

Mechanical Characteristics

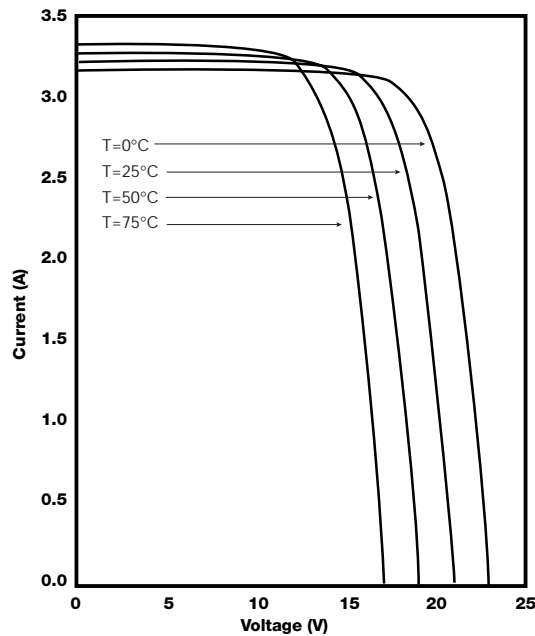
Weight

SX-40M, SX-40D	10.6 pounds (4.9 kg)
SX-40U	11.8 pounds (5.4 kg)
SX-50M, SX-50D	12.5 pounds (5.7 kg)
SX-50U	13.9 pounds (6.3 kg)

SX-40 I-V Curves

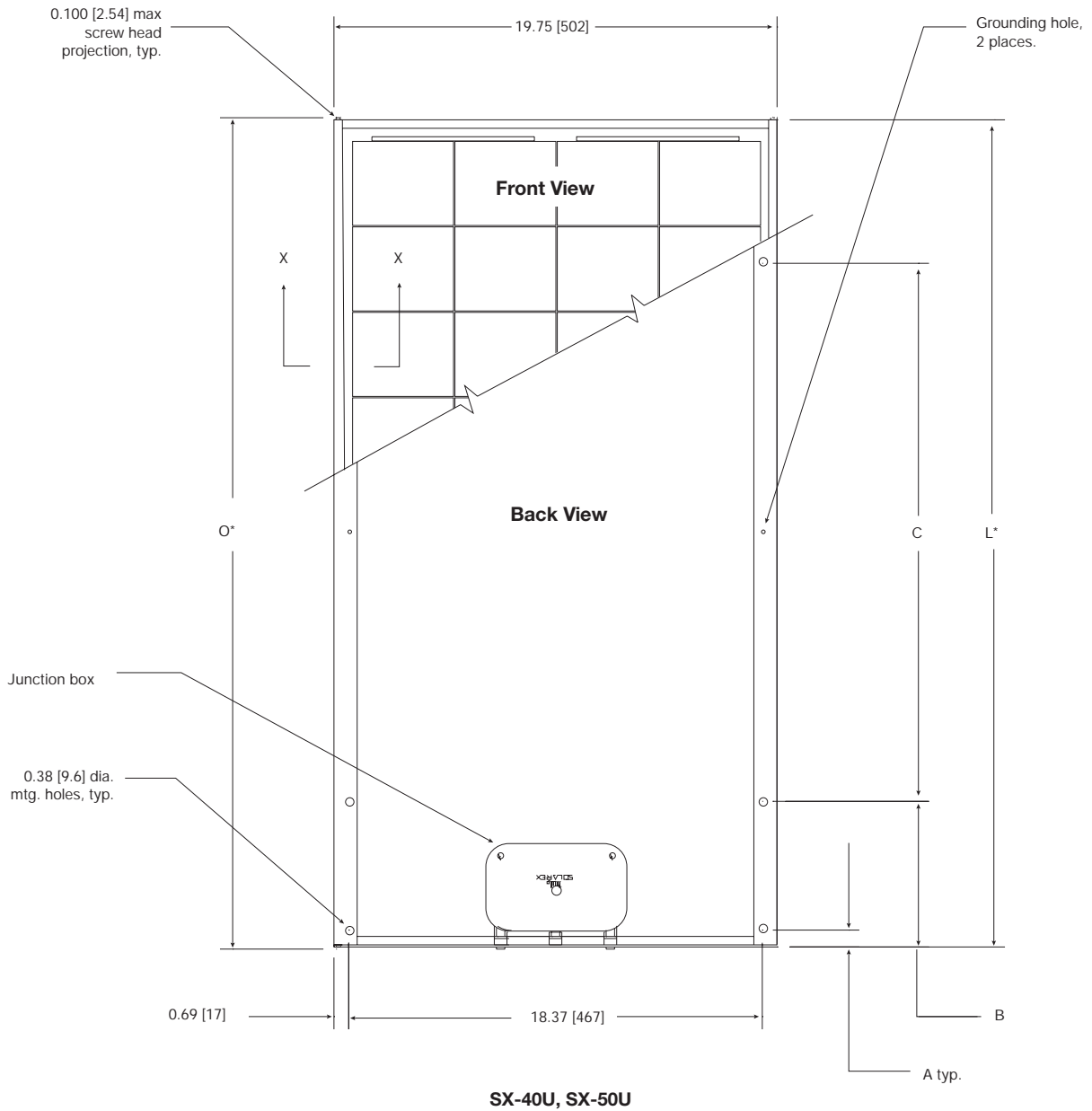


SX-50 I-V Curves



Dimensions

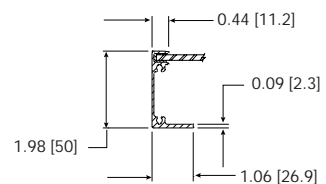
Dimensions in brackets are in millimeters. Unbracketed dimensions are in inches. Overall tolerances $\pm 1/8"$ (3mm)



	O*	L*	A	B	C
SX-40U	$\frac{30.20^*}{[767]}$	$\frac{30.00^*}{[762]}$	$\frac{7.00}{[178]}$	$\frac{15.00}{[381]}$	—
SX-50U	$\frac{36.97^*}{[939]}$	$\frac{36.77^*}{[934]}$	$\frac{0.69}{[17]}$	$\frac{6.39}{[162]}$	$\frac{24.00}{[610]}$

Note:

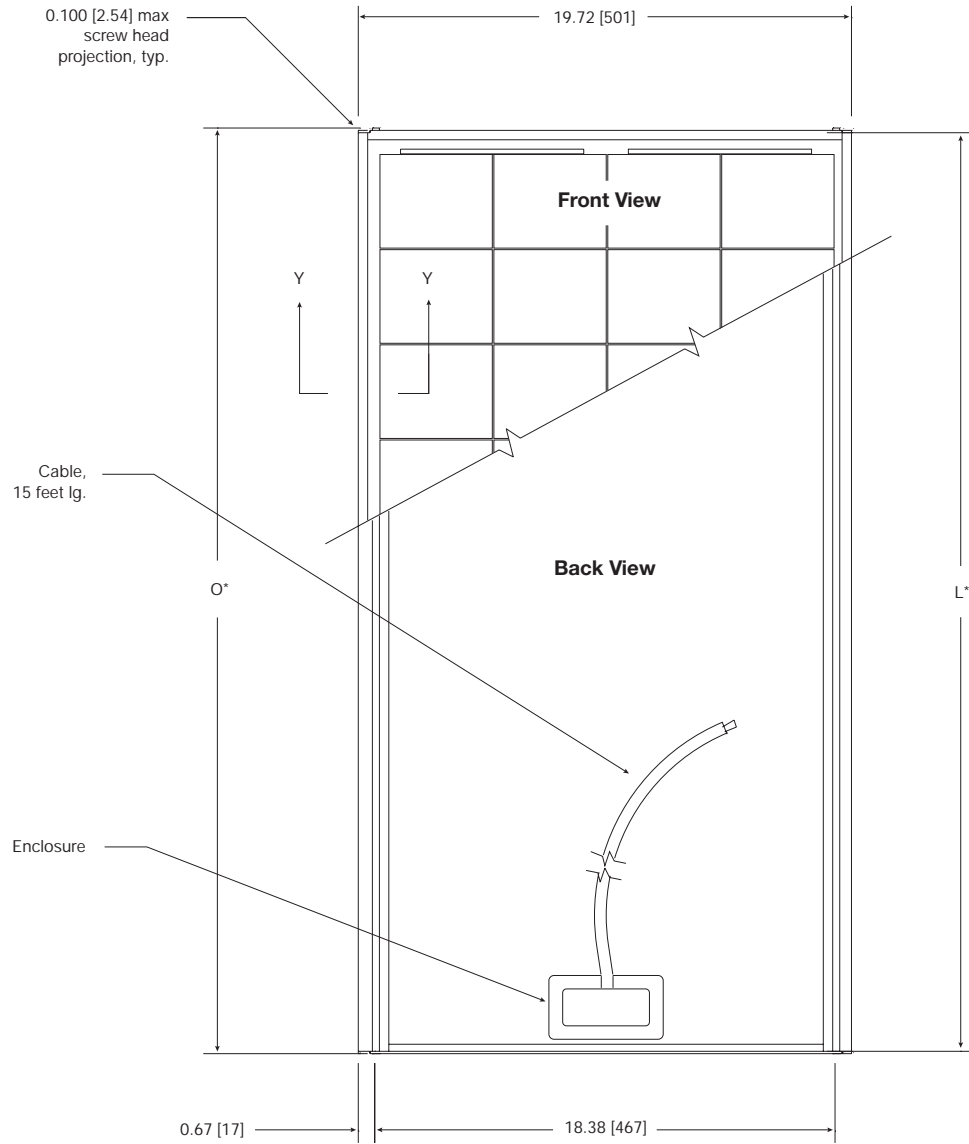
* "O" dimensions include 0.100 [2.54] max. screw head projection on each end.
 "L" dimensions do not include screw head projection.



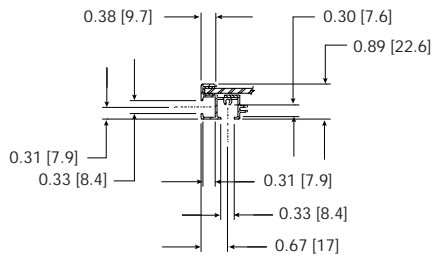
Section X-X

Dimensions

Dimensions in brackets are in millimeters. Unbracketed dimensions are in inches.
Overall tolerances $\pm 1/8"$ (3mm)



SX-40M, SX-50M

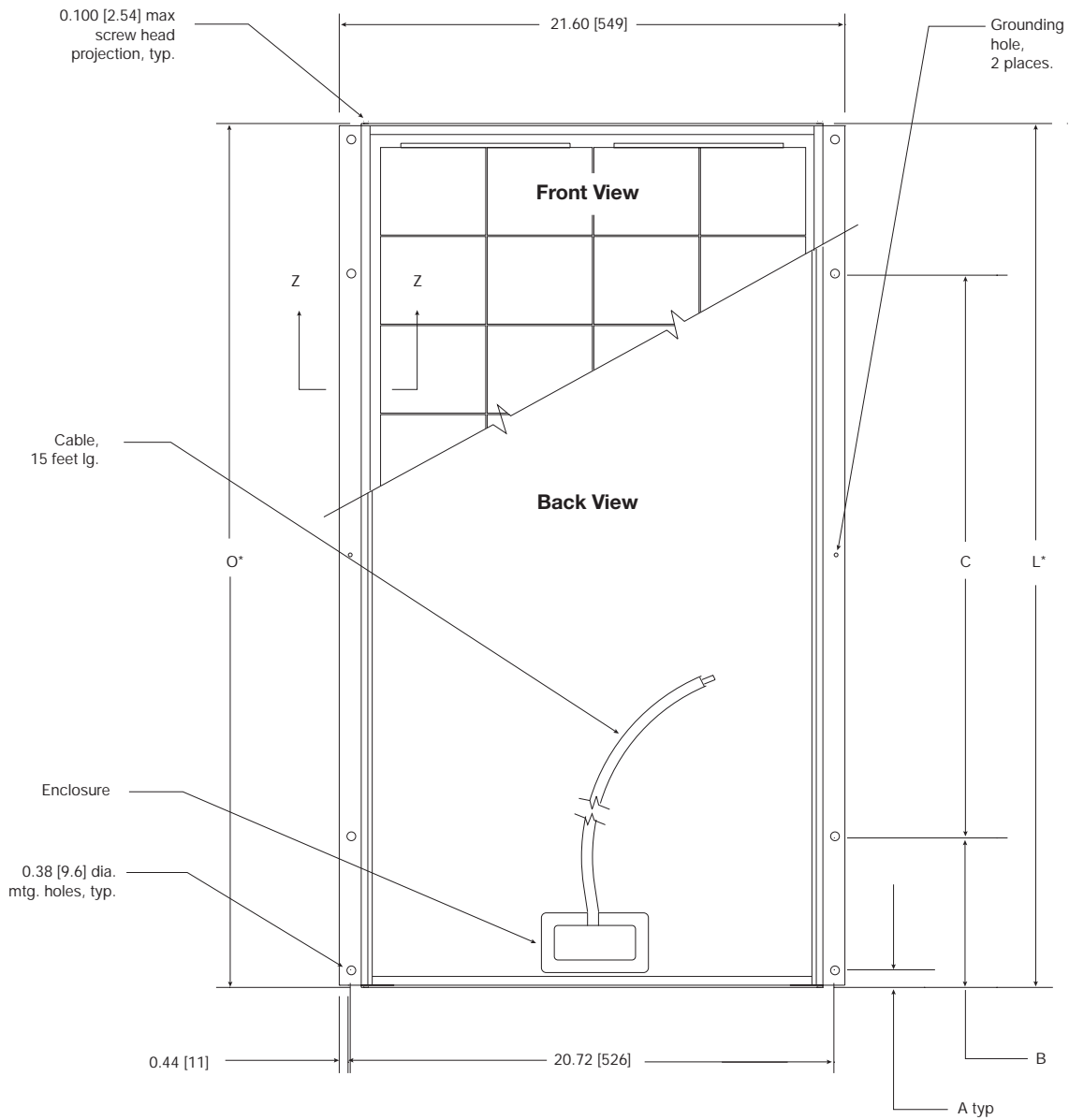


Section Y-Y

	O*	L*
SX-40M	$\frac{30.08^*}{[764]}$	$\frac{29.88^*}{[759]}$
SX-50M	$\frac{36.93^*}{[938]}$	$\frac{36.73^*}{[933]}$

Note:

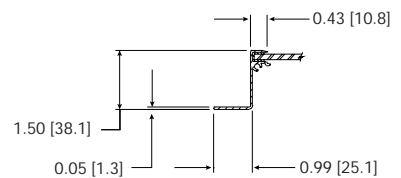
* "O" dimensions include 0.100 [2.54] max. screw head projection on each end. "L" dimensions do not include screw head projection.



SX-40D, SX-50D

	O*	L*	A	B	C
SX-40D	$\frac{30.11^*}{[765]}$	$\frac{29.91^*}{[760]}$	$\frac{6.96}{[177]}$	$\frac{14.96}{[380]}$	—
SX-50D	$\frac{36.95^*}{[938]}$	$\frac{36.75^*}{[934]}$	$\frac{0.68}{[17]}$	$\frac{6.38}{[162]}$	$\frac{24.00}{[610]}$

Note:
 * "O" dimensions include 0.100 [2.54] max. screw head projection on each end.
 "L" dimensions do not include screw head projection.



Section Z-Z