

SCEPTER® JBOX™ Hinged Cover Junction Box

This bulletin dictates the technical data for the Scepter® Hinged Cover JBox™ for industrial automation use.

The Scepter Hinged Cover Junction Box is ideal for use whenever PVC conduit and fittings are employed. Scepter Hinged Cover JBoxes have no metallic parts or hardware to be of concern, making these boxes ideal for indoor, outdoor, wet locations and challenging corrosive environments. They are well suited for a wide range of applications such as corrosive environments, agricultural, wash down, water and waste-water treatment facilities, marine and car washes.

Why Select PVC for an Enclosure?

Nonmetallic PVC boxes/enclosures are lightweight, easily installed and modified, ideal for outdoor exposure to weather applications. They are also corrosion resistant and offer a high degree of resistance to chemical elements. PVC is a cost-effective option for enclosures with a proven long life indoor and outdoor applications. PVC does not support combustion, is self-extinguishing and non-conductive, eliminating the danger of shock. Boxes/enclosures can be cut and drilled on-site without risk of airborne fiber inhalation associated with fiberglass filled materials.



Performance Ratings

Max. Temp. Range	50°C (122°F)
Rec. Operating Temp.	-40°C to 50°C / (-40°F to 122°F)
UV and Water Exposure	UL 746C
Flame & Smoke	UL 94V-O / (UL94 Vertical Flame Test)
NEMA	JBX: 1,2,3R,4,4X,6,6P,12,13
	JBXH: 1,2,3R,4,4X,12,13
Industrial Control Panels	UL 508A
Conductors	Suitable for 90°C rated conductors

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Physical Properties

Sunlight Resistance (UV) & Weathering

The performance of an enclosure during its service life will be impacted by environmental conditions. Selecting the correct material for the application will ensure a long, trouble-free installation. Adverse conditions such as continuous direct exposure to sunlight, extreme temperatures and aggressive elements like wind-blown sand will have an impact on the enclosure. Steel enclosures are prone to corrosion when exposed to moisture and chemical atmospheres; the unprotected finish surfaces of Fiberglass enclosures can be adversely affected by direct exposure to sunlight (a condition known as fiber bloom).

PVC provides an excellent balance between material strength and environmental performance. The surface appearance of Scepter Hinged Cover Junction Boxes are not adversely affected by exposure to UV, can withstand years of weather exposure and are particularly well suited for marine areas and saltwater spray.

Maximum Temperature Range

Scepter Hinged Cover JBoxes are acceptable for use in ambient temperatures as permitted by the CEC. The CEC limits the use of PVC in ambient temperatures to 75°C (167°F).

Recommended Operating Temperature

The maximum recommended continuous use temperature for the Scepter Hinged Cover JBox is 50°C (122°F).

Enclosures/boxes are designed to provide protection and enclose electrical/electronic controls, instruments, components and wiring for indoor and outdoor applications. Ambient temperature may pose a concern for the enclosure and the products enclosed. The nature of the materials used to manufacture non-metallic enclosures provide a range of operating use temperatures, but what is most important is the temperature rating of the products contained within. For example, if the control equipment within an enclosure has a maximum operating temperature of 50°C (122°F), having a box that can withstand 130°C (266°F) is extraneous.

Declared Operating Temperatures of Nonmetallic Enclosures

JBX / JBXH	-40°C to 50°C	-40°F to 122°F
ABS	-18°C to 52°C	0°F to 125°F
Polycarbonate 'A'	-40°C to 85°C	-40°F to 185°F
Polycarbonate 'B'	-35°C to 82°C	-31°F to 180°F
Polyester 'A'	-40°C to 130°C	-40°F to 266°F
Polyester 'B'	-40°C to 120°C	-40°F to 248°F
Fiberglass 'A'	-40°C to 120°C	-40°F to 250°F
Fiberglass 'B'	-35°C to 130°C	-31°F to 266°F

Enclosure Temperature Rise

The difference between the air temperature inside the enclosure resulting from heat generated by components installed within the air temperature outside the enclosure is the temperature rise.

It is common for enclosures to be unventilated to provide maximum protection for the internal components from environment effects and allow internal heat to be transferred by conduction through the walls of the enclosure. Metallic enclosures will dissipate heat better than non-metallic products; however, they also absorb heat whereas non-metallic enclosures have an insulating effect. Unpainted metallic enclosures directly exposed to the sun often become too hot to touch. Painted metallic enclosures and non-metallic enclosures have similar heat transfer characteristics.

Temperature rise may be important as increased heat can reduce the life of electrical and electronic components and the temperature within the enclosure may impact the operating parameters (i.e. AMR or Absolute Maximum Rating) of the installed components. As an example, most manufacturers' variable speed

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drives are designed for full load Scepter JBX continuous operation at 40C (104F) maximum ambient. Operating above the rated temperature reduces the life.

To appreciate the temperature rise and whether or not it is a concern for a specific application, the following information is provided as a guide. To determine the heat rise, the enclosure surface area and the total internal heat load are required.

The table provides the total surface area exposed at air for specific Scepter Hinged Cover JBox sizes and assumes the box is surface mounted against a wall/surface – the back wall of the box is not included in the surface area calculation.

The heat load is the total watts generated by the components within the enclosure.

Temperature Rise (watts/ft²) = total input watts / total surface area in square feet.

Example: A JBX12126 box has a total internal heat load of 30 watts. The calculation is total watts / surface area (30/3.90) or 7.7 watts/ft²; using the graph, the estimated temperature rise is approximately 35°F.

The calculation and graph is an estimation of temperature rise. Internal component layout, external air movement and other factors can create variations in the actual temperature rise. If in doubt, we recommend applying a safety factor of 25%.

There are options to address an unfavourable temperature rise and its effect on equipment:

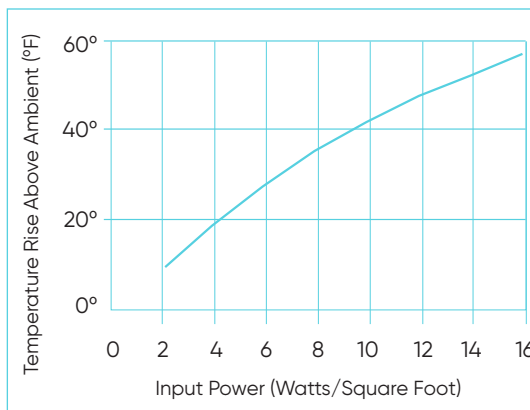
- 1) Increasing the enclosure box size will result in a lower temperature rise
- 2) Add venting, a fan or other air cooling options (note: this can impact the rating of the enclosure)
- 3) Heat rises; position equipment within the box accordingly. Equipment that can handle higher heat should be situated at the top.

Note: This information is a guideline only and provided to assist the user in determining the suitability of the product for the application.

Scepter Hinged Cover JBoxes can be used in ambient temperature of 50C (122F) maximum. The maximum heat rise tolerated in an enclosed, gasketed and sealed enclosure with no venting would be dependent upon the rating of the components installed and the size of the enclosure.

Scepter JBX box	Total Surface Area (sq ft) 5 sides
JBX/H 884	2
JBX/H 887	2.3
JBX/H 12106	3.6
JBX/H 12124	3.6
JBX/H 12126	3.9
JBX/H 12128	4.25
JBX/H 14148	5.6
JBX/H 141410	6.4
JBX/H 161610	7.6

Sealed Enclosure Temperature Rise



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Flame Resistance

The Scepter Hinged Cover JBox is manufactured of a specific PVC formulation and the material has been evaluated by UL for flammability in accordance with UL 94. The flame classification is 94V-0.

Impact Resistance

The Scepter Hinged Cover JBox has been designed and manufactured to exceed the impacting testing requirements of the product standard. Steel ball impact tests were conducted at ambient room temperature and at -35°C (-31°F). The Scepter JBox meets the same impact testing requirements as all non-metallic enclosures (fiberglass, polycarbonate etc.) listed to UL50/50E.

EMI/RFI Shielding

Electromagnetic Interference and Radio Frequency Interference Shielding is not a standard physical feature of non-metallic boxes/enclosures. For non-metallic products, a special coating must be applied to provide shielding protection. The customization option is not provided by IPEX on the Scepter JBox, however, shielding products are commercially available for the user/installer to apply a spray-on or painted shielding.

Relative Thermal Index

This PVC material used in the manufacture of the Scepter Hinged Cover JBox has been evaluated for Relative Thermal Index (RTI) ratings as noted below.

Relative Thermal Index, °C (°F)		
Electrical	Mechanical	
	w/Impact	w/o Impact
95 (200)	85 (185)	95 (200)

Chemical Resistance

Environmental resistance ratings are based upon tests where the material specimens were subjected to complete immersion in the reagent. This is severe and is not typical of actual installation use. Where there is a question of suitability for the enclosure in a specific environment, physical product samples should be tested under actual conditions. Any information provided on chemical resistance is intended as a guideline only, actual testing in the application environment is always recommended.

The user must determine the suitability of the product in an environment based upon individual characteristics. In many applications, several corrosive agents are present and reactions among them are not always documented. Application environments can be unique, necessitating the identification of all possible corrosive elements that may affect the intended enclosure application.

The ability for an enclosure to perform in specific environments is affected by the various materials that comprise the functional elements of the enclosure. To ensure the long-term performance of the enclosure, the hardware and components must also be suitable for use in the environment.

Scepter Hinged Cover JBoxes are well suited for more environments and offer very good chemical resistance to dilute acids, dilute alkalis, oils, greases and alcohols.

The green proprietary gasket has been formulated to provide low temperature flexibility, tear resistance and tensile strength to provide performance in a wide range of environmental conditions.

Similar to our PVC boxes, gaskets offer good chemical resistance to dilute acids, dilute alkalis, oils, some alcohols and water.

To confirm suitability for a given environment, samples should be tested under actual conditions.