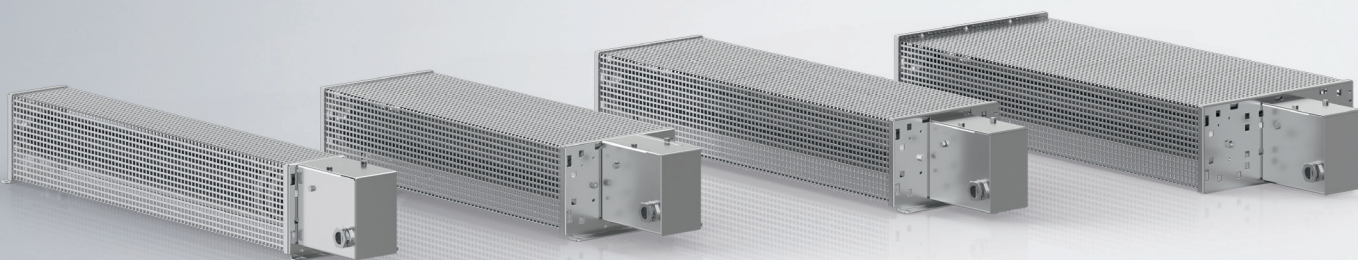


Operating instructions | EN

# AX2090-BW80

External brake resistor





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- EP1590927
- EP1789857
- EP1456722
- EP2137893
- DE102015105702



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## Limitation of liability

All components in this product as described in the operating instructions are delivered in a specific configuration of hardware and software, depending on the application regulations. Modifications and changes to the hardware or software configuration that go beyond the documented options are prohibited and nullify the liability of Beckhoff Automation GmbH & Co. KG.

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- Failure to observe these operating instructions
- Improper use
- Use of untrained personnel
- Use of unauthorized spare parts

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## Version numbers



### **Provision of revision levels**

On request, you can obtain a list of revision levels for changes in the operating instructions.

Send your request to: [info@beckhoff.de](mailto:info@beckhoff.de)

### **Origin of the document**

These operating instructions were originally written in German. All other languages are derived from the German original.

### **Product properties**

Only the product properties specified in the current operating instructions are valid. Further information given on the product pages of the Beckhoff homepage, in emails or in other publications is not authoritative.

## Staff qualification

These operating instructions are intended for trained control and automation specialists with knowledge of the applicable and required standards and directives.

Specialists must have knowledge of drive technology and electrical equipment as well as knowledge of safe working on electrical systems and machines. This includes knowledge of proper setup and preparation of the workplace as well as securing the working environment for other persons.

The operating instructions published at the respective time of each installation and commissioning is to be used. The products must be used in compliance with all safety requirements, including all applicable laws, regulations, provisions and standards.

### **Instructed person**

Instructed persons have a clearly defined task area and have been informed about the work to be carried out. Instructed persons are familiar with:

- the necessary protective measures and protective devices
- the intended use and risks that can arise from use other than for the intended purpose

### **Trained person**

Trained persons meet the requirements for instructed persons. Trained persons have additionally received training from the machine builder or vendor:

- machine-specific or
- plant-specific

### **Trained specialists**

Trained specialists have received specific technical training and have specific technical knowledge and experience. Trained specialists can:

- apply relevant standards and directives
- assess tasks that they have been assigned
- recognize possible hazards
- prepare and set up workplaces

## **Qualified electricians**

Qualified electricians have comprehensive technical knowledge gained from a course of study, an apprenticeship or technical training. They have an understanding of control technology and automation. They are familiar with relevant standards and directives. Qualified electricians can:

- independently recognize, avoid and eliminate sources of danger
- implement specifications from the accident prevention regulations
- assess the work environment
- independently optimize and carry out their work

## Safety and instruction

Read the contents that refer to the activities you have to perform with the product. Always read the chapter For your safety in the operating instructions. Observe the warnings in the chapters so that you can handle and work with the product as intended and safely.

## Explanation of symbols

Various symbols are used for a clear arrangement:

- ▶ The triangle indicates instructions that you should execute
- The bullet point indicates an enumeration
- [...] The square parentheses indicate cross-references to other text passages in the document
- [+] The plus sign in square brackets indicates ordering options and accessories

## Pictograms

In order to make it easier for you to find text passages, pictograms and signal words are used in warning notices:

### **DANGER**

Failure to observe will result in serious or fatal injuries.

### **WARNING**

Failure to observe may result in serious or fatal injuries.

### **CAUTION**

Failure to observe may result in minor or moderate injuries.



## Notes

Notes are used for important information on the product. The possible consequences of failure to observe these include:

- Malfunctions of the product
- Damage to the product
- Damage to the environment



## Information

This sign indicates information, tips and notes for dealing with the product or the software.



## Examples

This symbol shows examples of how to use the product or software.



## QR-Codes

This symbol shows a QR code, via which you can watch videos, animations or other documents. Internet access is required in order to use it.

You can read the QR code, for example, with the camera of your smartphone or tablet. If your camera doesn't support this function you can download a free QR code reader app for your smartphone. Use the Appstore for Apple operating systems or the Google Play Store for Android operating systems.

*If you cannot read the QR code on paper, make sure that the lighting is adequate and reduce the distance between the reading device and the paper. In the case of documentation on a monitor screen, use the zoom function to enlarge the QR code and reduce the distance.*

## Beckhoff Services

Beckhoff and the worldwide partner companies offer comprehensive support and service.

## Support

The Beckhoff Support offers technical advice on the use of individual Beckhoff products and system planning. The employees support you in the programming and commissioning of complex automation systems.

Hotline: +49(0)5246/963-157  
Fax: +49(0)5246/963-199  
e-mail: [support@beckhoff.com](mailto:support@beckhoff.com)  
Web: [www.beckhoff.de/support](http://www.beckhoff.de/support)

## Training

Training in Germany takes place in our training center at the Beckhoff headquarters in Verl, at branch offices or, by arrangement, at the customer's premises.

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Web: [www.beckhoff.de/service](http://www.beckhoff.de/service)

## Download area

In the download area you can obtain product information, software updates, the TwinCAT automation software, documentation and much more.

Web: [www.beckhoff.de/download](http://www.beckhoff.de/download)

## Headquarters

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Web: [www.beckhoff.de](http://www.beckhoff.de)

The addresses of the international Beckhoff branch offices can be found on the Beckhoff website: <http://www.beckhoff.de>

Read this chapter containing general safety information. The chapters in these operating instructions also contain warning notices. Always observe the safety instructions for your own safety, the safety of other persons and the safety of the product.

When working with control and automation products, many dangers can result from careless or incorrect use. Work particularly thoroughly, not under time pressure and responsibly towards other people.

## Safety pictograms



### Warning of hot surface

The surface of the housing can reach a temperature of 200 °C. Do not touch the hot surface. The housing must have cooled to below 40 °C before you touch the surface.

Beckhoff products feature safety pictograms, either on stickers or printed, which vary depending on the product. They serve to protect people and to prevent damage to the products. Safety pictograms must not be removed and must be legible for the user.



## General safety instructions

This chapter provides you with instructions on safety when handling the product. This product is not capable of stand-alone operation and is therefore categorized as an incomplete machine. The product must be installed in a machine or plant by the machine manufacturer. Read the documentation prepared by the machine manufacturer.

## Before operation

### **Protective equipment**

Do not remove or bypass any protective devices. Check all protective devices before operation. Make sure that all emergency switches are present at all times and can be reached by you and other people. People could be seriously or fatally injured by unprotected machine parts.

### **Shut down and secure the machine or plant**

Shut down the machine or plant. Secure the machine or plant against being inadvertently started up.

### **Correctly ground electrical components or modules**

Avoid electric shocks due to improper grounding of electrical components or modules. Ground all conductive components according to the specifications in the chapters "Electrical Installation" and "Mechanical Installation".

### **Keep the immediate environment clean**

Keep your workplace and the surrounding area clean. Ensure safe working.

### **Check safety pictograms**

Check whether the designated pictograms are on the product. Replace missing or illegible stickers.

### **Observe tightening torques**

Mount and repeatedly check connections and components, complying with the prescribed tightening torques.

### **Use the original packaging only**

When shipping, transporting, storing and packing, use the original packaging or non-conductive materials.

## During operation

### **Do not work on live electrical parts**

Do not open the multi-axis servo system while it is live. Measure the voltage on the DC link test contacts DC+ und DC-. Only work on the multi-axis servo system when the voltage has dropped to < 50 V. Ensure that the protective conductor is connected properly. Never loosen electrical connections when live. Disconnect all components from the mains and secure them against being switched on again.

### **Do not touch hot surfaces**

Check the cooling of the surfaces with a thermometer. Do not touch the components during and immediately after operation. Allow the components to cool sufficiently after switching off.

### **Avoid overheating**

Operate the components according to the technical specifications. Refer here to the chapter: "Technical data". Provide for sufficient cooling. Switch the components off immediately if the temperature is too high.

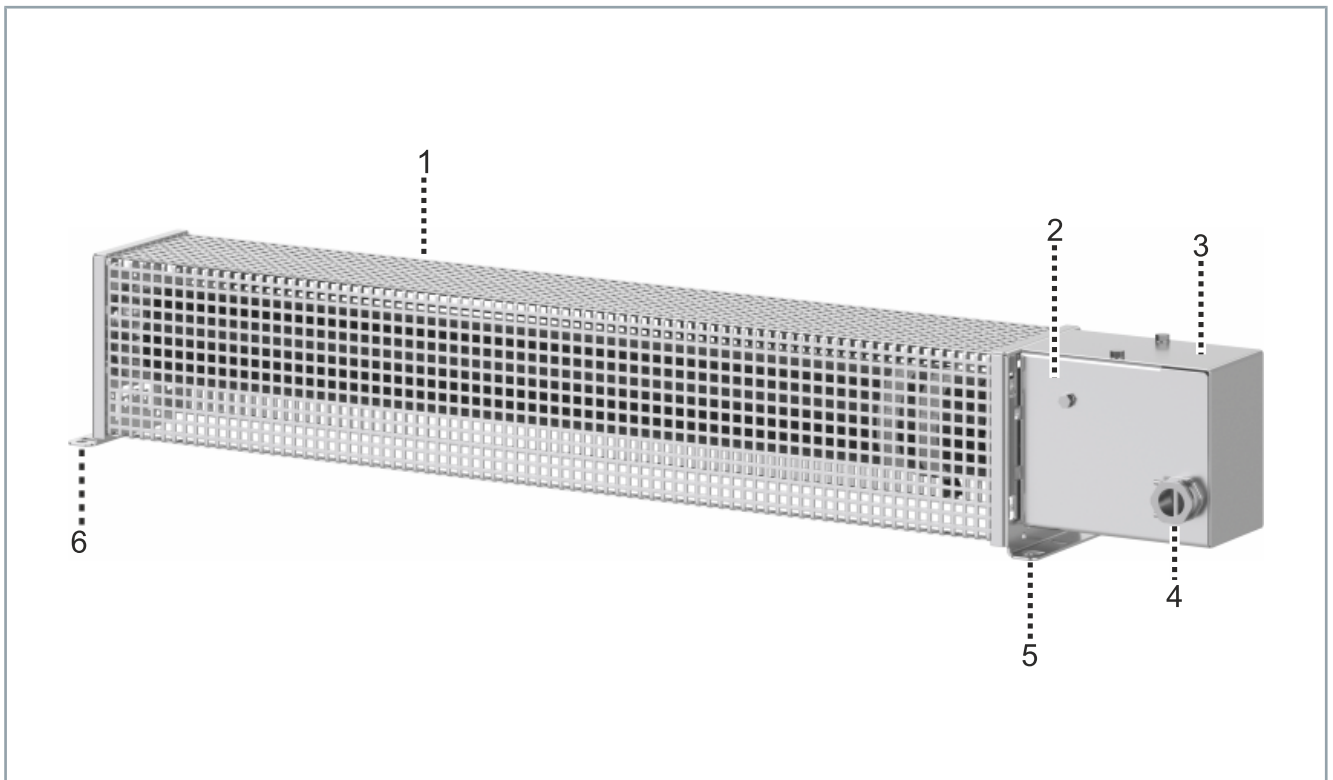
### **Do not touch any moving or rotating components**

Do not touch any moving or rotating components. Fasten all parts or components on the machine or plant.

## After operation

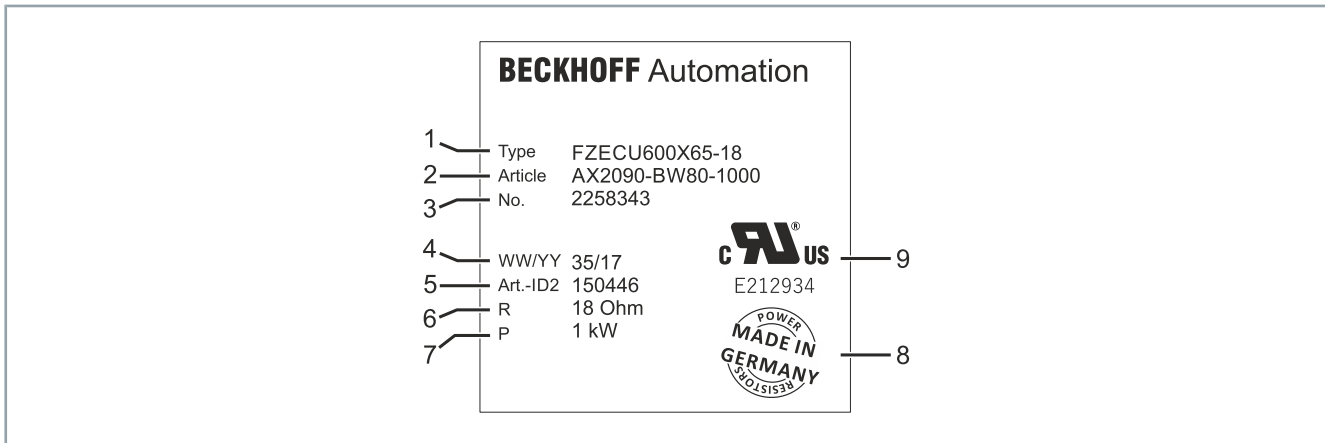
### **De-energize and switch off components before working on them**

Check the functionality of all safety-relevant devices. Secure the working environment. Secure the machine or plant against being inadvertently started up. Observe the chapter: "Decommissioning".



Number	Explanation
1	Housing
2	Name plate
3	Terminal box
4	Connection
5	Fastening to the mounting surface
6	Fastening to the mounting surface

## Name plate



Number	Explanation
1	Article name/product type
2	Order number/order identifier
3	Serial number
4	Date of manufacture
5	Identification number
6	Resistance value
7	Power rating
8	Country of manufacture
9	UR certification with specification of the E-number

## Type key

AX2090 – BW80 – xxxx	Explanation
AX2090	Product line Drive Technology Accessories
BW	Brake energy management Brake resistor
80	Series AX8000
xxxx	Execution 1000 = 1.0 kW, 18 Ω for use on AX8640-0000 1600 = 1.6 kW, 33 Ω for use on AX8620-0000 2000 = 2.0 kW, 18 Ω for use on AX8640-0000 3200 = 3.2 kW, 18 Ω for use on AX8640-0000 6000 = 6.0 kW, 10 Ω for use on AX85xx

## Product characteristics

### **External brake resistor**

The AX8000 multi-axis servo system offers the option of destroying arising braking energy through the internal brake resistor. If the internal brake resistor is not sufficient, you can connect an external brake resistor to the AX8620 power supply module at the terminal X01 and to the AX8640 power supply module at the terminal X02.

### **UL and CSA marking**

The brake resistors from the Ax2090-BW80-xxxx series are marked with "UL Recognized Component" in accordance with the applicable UL and CSA safety requirements. You may therefore use the brake resistors in products, plants or systems bearing the UL test mark.

### **Heat conversion**

Regenerative energy is converted into heat via the external brake resistors from the AX2090-BW80 series when braking a servomotor.

## Intended use

The brake resistors from the AX2090-BW80-xxxx series may only be connected to an AX8620 power supply module at the terminal X1 or to the AX8640 power supply module at the terminal X02.

Together with the AX86xx power supply module on a multi-axis servo system, the brake resistors must be installed in electrical systems or machines and can only be put into operation as integrated components of the system or machine.



### **Read the entire drive system documentation:**

- This translation of the original instructions
- Original operating instructions for the AX8000 multi-axis servo system
- Complete machine documentation provided by the machine manufacturer

## Improper use

Any use exceeding the permissible values specified in the Technical data is considered improper and therefore prohibited.

The brake resistors from the AX2090-BW80-xxxx series are not suitable for use in the following areas:

- ATEX zones without suitable housing
- Areas with aggressive environments, for example aggressive gases or chemicals

The relevant standards and directives for EMC interference emissions must be complied with in residential areas. The brake resistors may only be installed in housings and control cabinets with appropriate shielding attenuation.

## Data for operation and environment

Beckhoff products are designed for operation under certain environmental conditions, which vary according to the product. The following specifications must be observed for operation and environment in order to achieve the optimum service life of the products.



### Operate the brake resistor only under the specified environmental conditions

Operate the brake resistor only in accordance with the specifications for operation and the environment listed in this chapter. This ensures a long service life and proper operation.

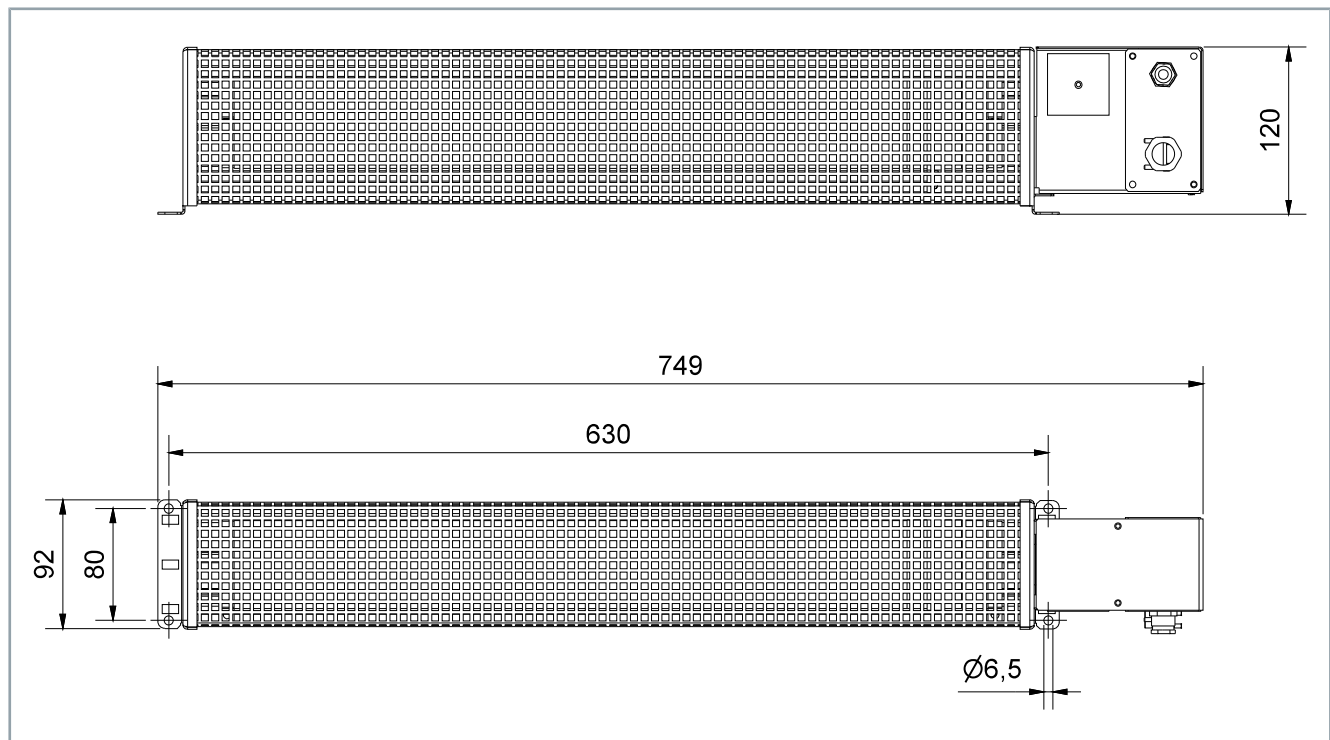
*The lifetime of the brake resistor may be shortened at temperatures above +40 °C and with encapsulated installation.*

Environmental requirements	
Climate category - operation	3K3 according to EN 60721
Ambient temperature during operation	-30 °C to +40 °C Extended temperature range up to +60 °C with power derating of 4 % / 10 K
Ambient temperature during transport	-40 °C to +80 °C, maximum fluctuation 20 K per hour
Ambient temperature during storage	-40 °C to +80 °C, maximum fluctuation 20 K per hour
Permissible humidity in operation	85 % relative humidity, no condensation
Permissible humidity during transport and storage	85 % relative humidity, no condensation
Corrosion protection	Strip-galvanized housing Special measures are to be taken in consultation with the vendor if the environmental conditions are extreme or if they differ from those described in this chapter.
Level of contamination	3 according to EN 60204 and EN 50178
Specifications for intended use	
Ventilation	Free convection
Insulation material class	N according to IEC 60085
Protection class	Devices IP 20 Terminals IP 00
Installation position	Vertical or horizontal according to chapter "Installation position", [Page 28]
Vibration resistance	3M2
Shock resistance	3M2
Approvals	cURus See chapter: Guidelines and Standards

## AX2090-BW80-1000

Electrical data	AX2090-BW80-1000
Type power at 40 °C [W] 4% power derating per 10 K temperature difference	1000
Resistance [ $\Omega$ ]	18
Mechanical data	
Weight [kg]	4

## Dimensional drawing

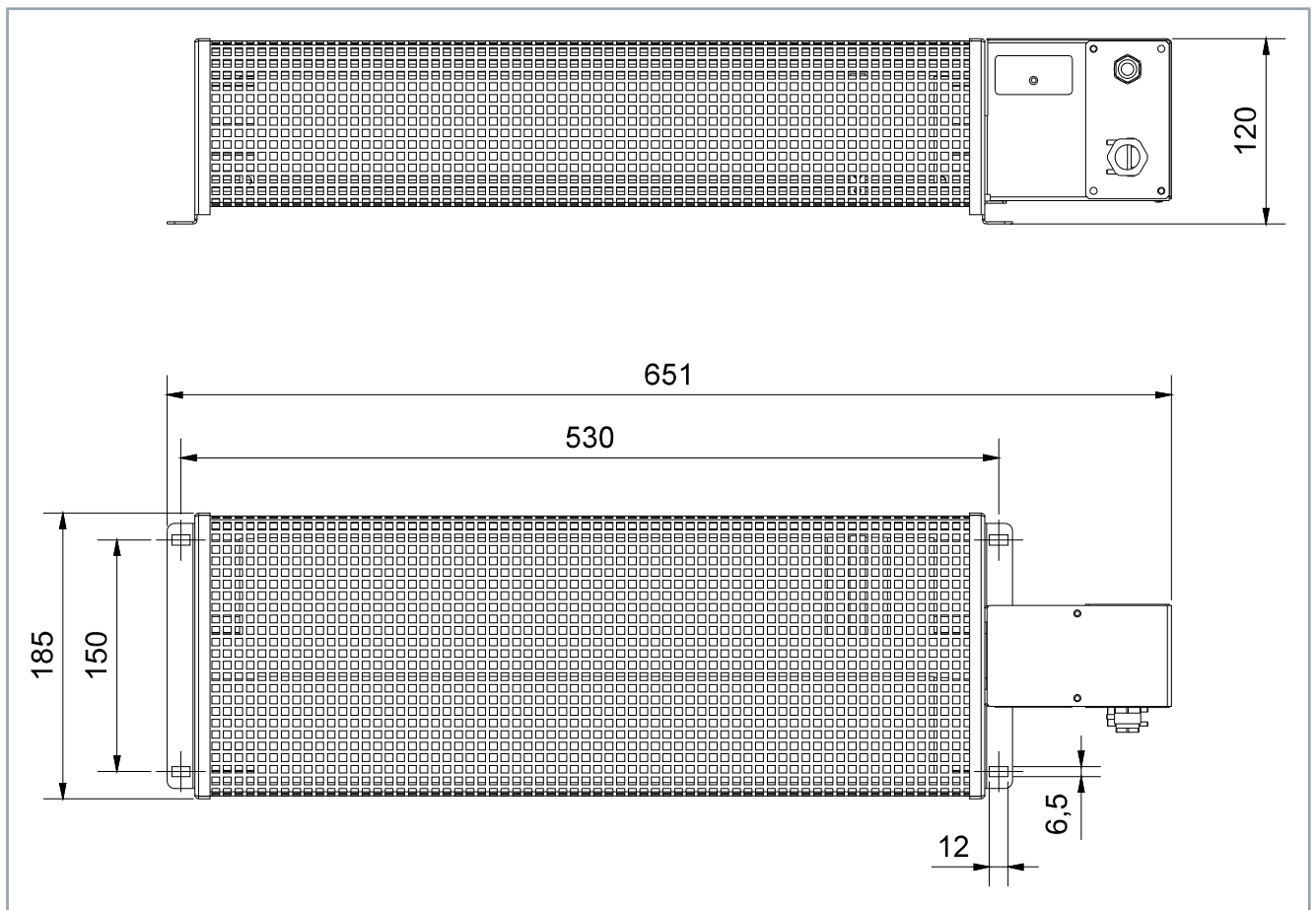




## AX2090-BW80-1600

Electrical data	AX2090-BW80-1600
Type power at 40 °C [W] 4% power derating per 10 K temperature difference	1600
Resistance [ $\Omega$ ]	33
Mechanical data	
Weight [kg]	5.8

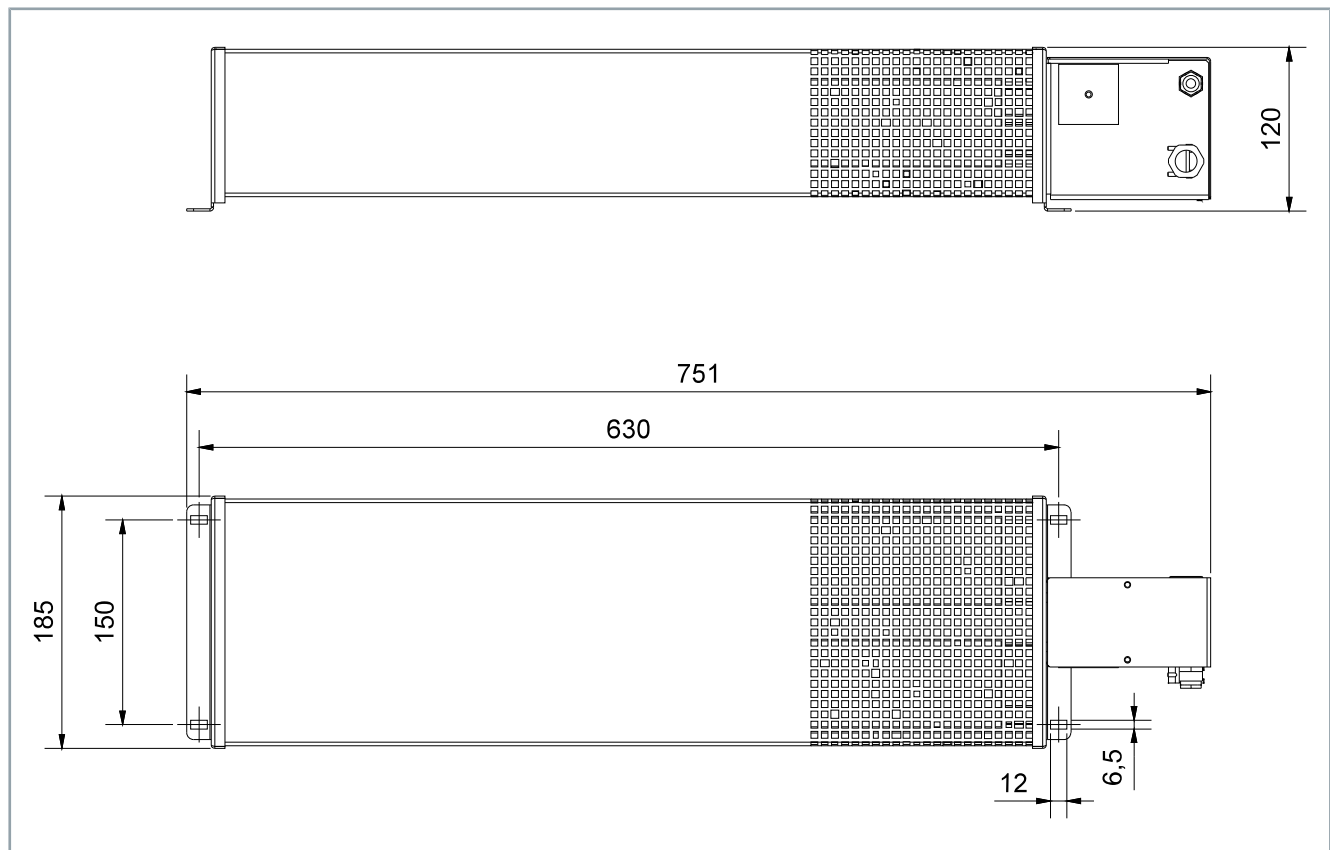
## Dimensional drawing



## AX2090-BW80-2000

Electrical data	AX2090-BW80-2000
Type power at 40 °C [W] 4% power derating per 10 K temperature difference	2000
Resistance [ $\Omega$ ]	18
Mechanical data	
Weight [kg]	6.7

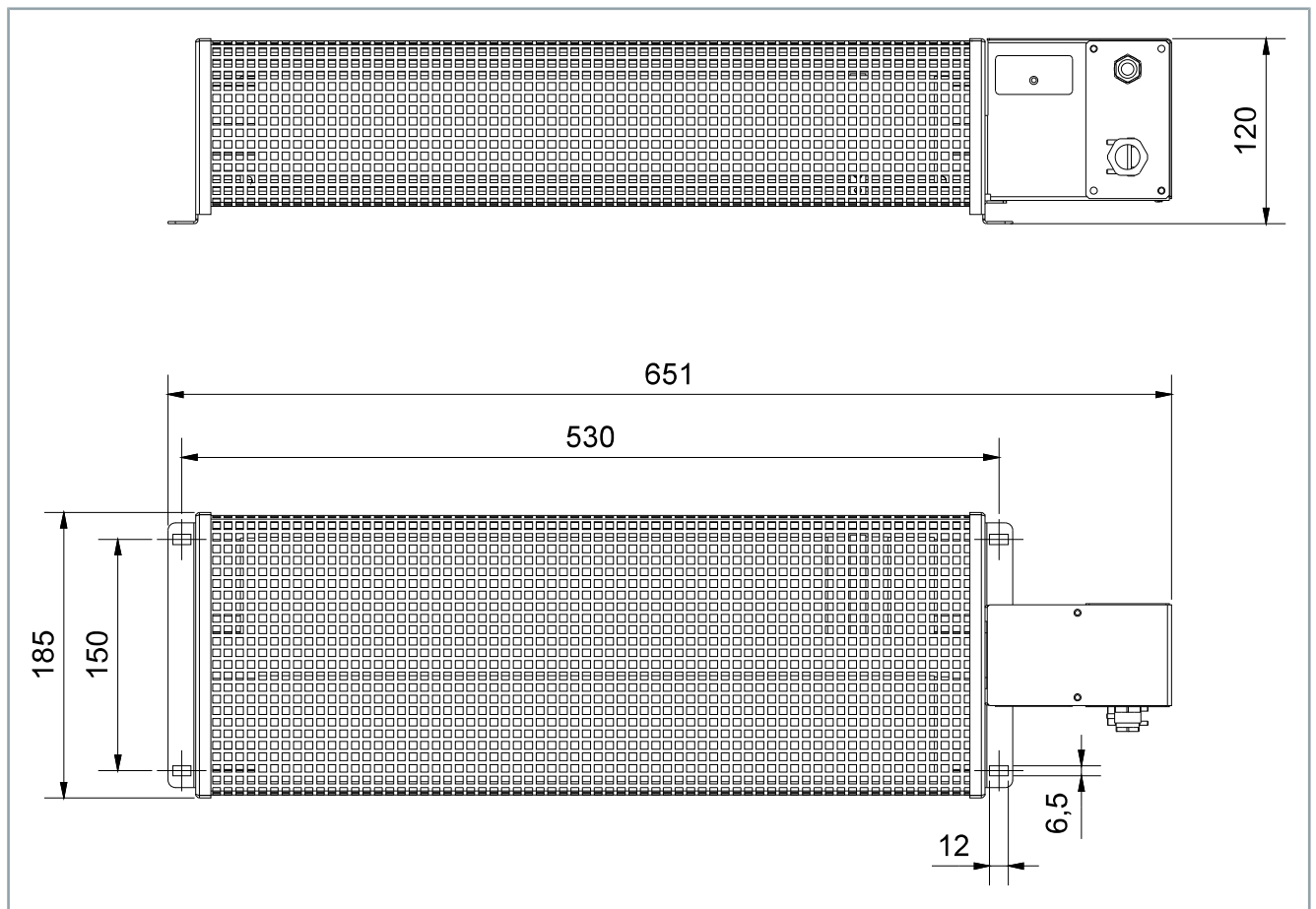
## Dimensional drawing



## AX2090-BW80-3200

Electrical data	AX2090-BW80-3200
Type power at 40 °C [W] 4% power derating per 10 K temperature difference	3200
Resistance [ $\Omega$ ]	18
Mechanical data	
Weight [kg]	10.3

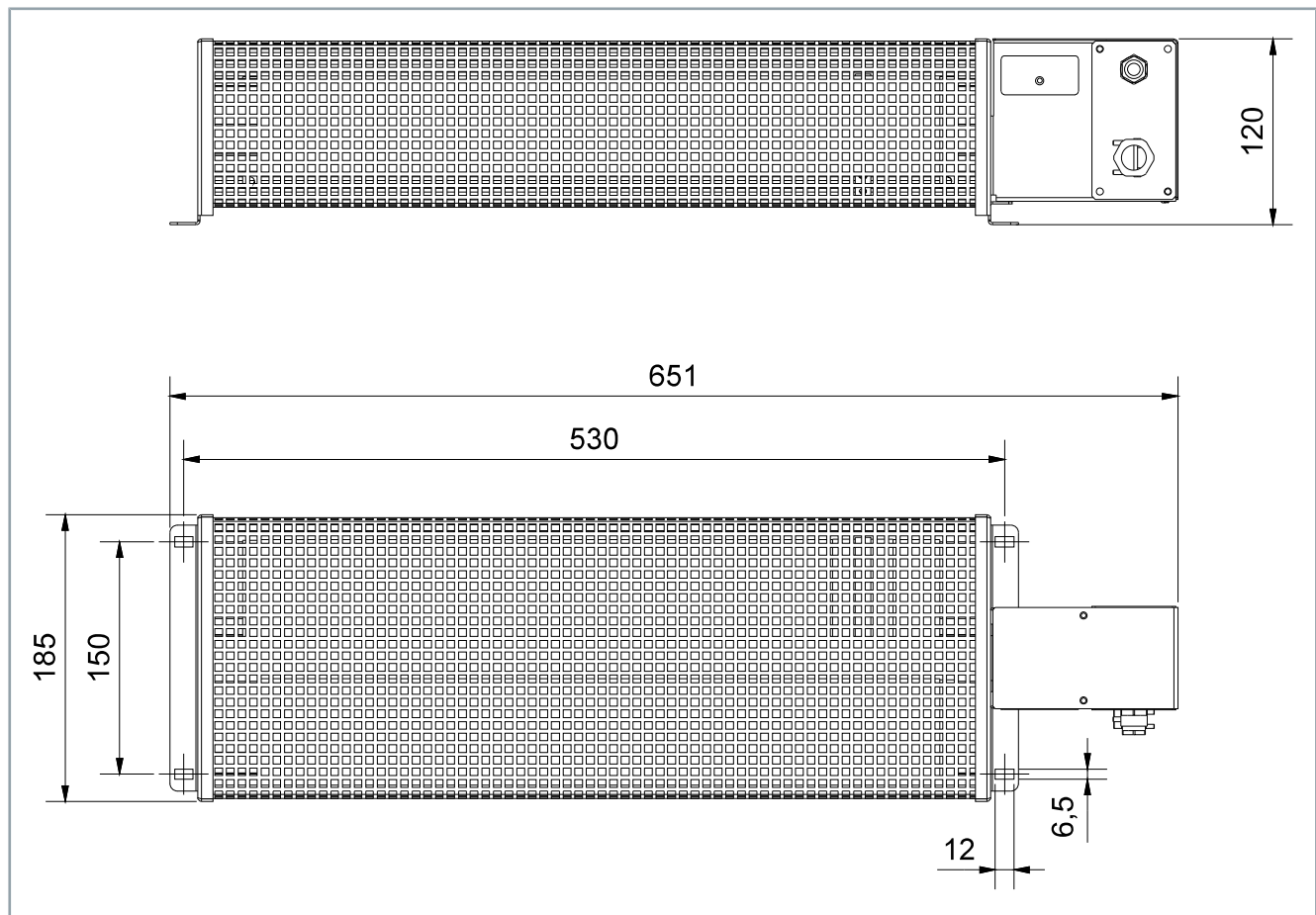
## Dimensional drawing



## AX2090-BW80-6000

Electrical data	AX2090-BW80-6000
Type power at 40 °C [W] 4% power derating per 10 K temperature difference	6000
Resistance [ $\Omega$ ]	10
Mechanical data	
Weight [kg]	13

## Dimensional drawing



**Check the scope of supply for missing or damaged parts**




Check your delivery for completeness. If any parts are missing or became damaged during transport, contact the carrier, vendor or our service department immediately.

Please check that the delivery includes the following items:

- AX2090-BW80-xxxx brake resistor

## Packaging

If the brake resistor is shipped in a collective order, instructions for handling are printed on the packaging of the collective order:

Symbol	Explanation
	This is the correct position for the packaging.
	The packaging must be protected from moisture.
	The contents are fragile.

## ⚠ WARNING

### Protecting the brake resistor against damage

Protect the brake resistor against damage during transport and storage and adhere to the conditions.

*Damage may result in hazardous voltages being present on the housing or exposed components and can lead to serious or even fatal injuries.*



### Avoiding damage to the brake resistor and loss of the warranty

Observe the conditions and the following chapters on transport and storage.

*Disregarding the conditions can lead to damage to the brake resistor and invalidation of the warranty.*

### Avoid short-circuit due to moisture

Condensed water can form during transport in cold weather or in case of extreme temperature differences. Make sure that no moisture collects in the brake resistor. Slowly adjust the temperature to room temperature. Switch the brake resistor on only when it is dry.

*If the brake resistor is not fully dry, condensed water can lead to a short-circuit and damage to the brake resistor when switching on.*

## Conditions

Care must be taken that the brake resistor and individual components are not damaged during transport and storage. Observe the specifications in the following chapters and comply with the following conditions:

- Avoid electrostatic charging
- Avoid contact with highly insulating materials
- Temperature: -40 °C to +55 °C, maximum fluctuation 20 K/hour
- Air humidity: Max. relative humidity 95 %, non-condensing
- Use of suitable means of transport
- Use of the vendor's original packaging

The table shows the maximum stacking height in which you may store and transport the brake resistors in their original packaging on a pallet:

Brake resistor type	Stacking height [qty]
AX2090-BW80	7

## Transport



### **Avoid high mechanical stresses**

Use a suitable means of transport and secure the brake resistor against high mechanical stress.

*High mechanical stresses will damage the brake resistor and individual components.*

All brake resistor models from the AX2090-BW80-xxxx series can be transported without any aids.

## Long-term storage



### **Observe the maximum storage time**

Do not exceed a maximum storage time of five years.

*Exceeding the specified maximum storage time can lead to a change in the properties of the brake resistor used and may damage it in operation.*

You have the option to store the brake resistor over a short or longer period. For storage we always recommend the original packaging. Adhere to the conditions specified in the chapter: "Transport and storage", [Page 26].

Ensure the storage space is vibration-free.

## Installation position

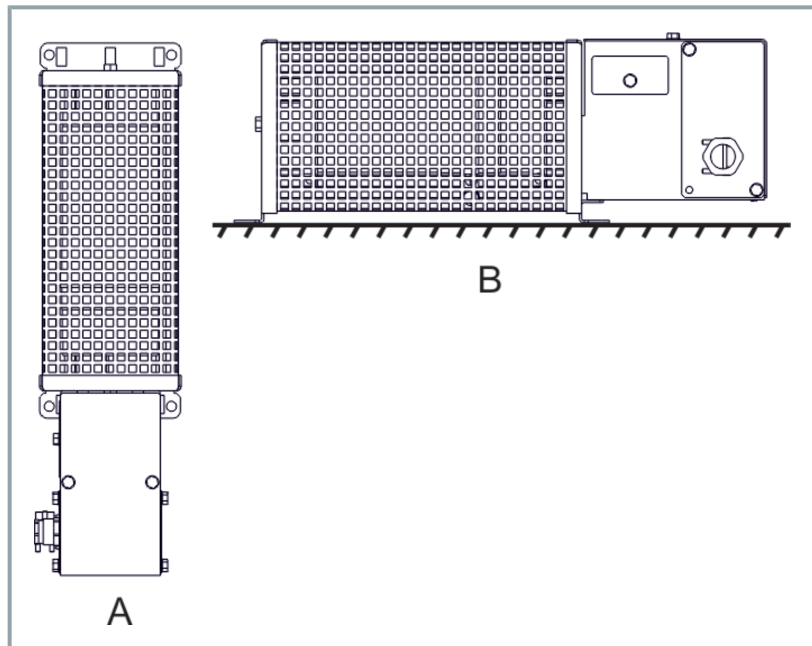
The permitted installation position of the brake resistors is the vertical installation position A or horizontal installation position B. In vertical mounting position, the terminal box must face downwards..



### Observe mounting position

Due to the temperature development, the vertical installation position A is only permitted if the terminal box points downwards.

*Failure to observe this may result in damage to the connecting cable and malfunctions.*



## Distances

You must maintain minimum distances, depending on the installation position.

### In all installation positions:

- 200 mm to adjacent components or walls
- 300 mm upwards to components or roofs

### In vertical installation position:

- 200 mm downwards to components or floor



**▲ WARNING****Avoid contact with DC link DC+ and DC-**

Measure the voltage on the DC link test contacts DC+ und DC-. Keep to the waiting times after disconnection from the supply network:

- 30 minutes for AX8620 and AX8640
- 30 minutes for AX8108, AX8118 and AX8206
- 30 minutes for AX8525 and AX8540

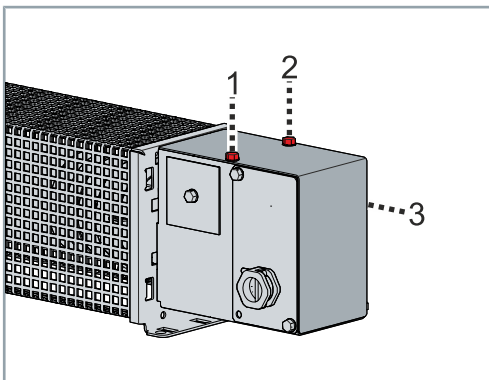
*There is still a life-threatening voltage of  $> 875 V_{DC}$  on the capacitors after disconnection from the supply network. Serious or even fatal injuries may result if this is ignored.*

**Electromagnetic compatibility**

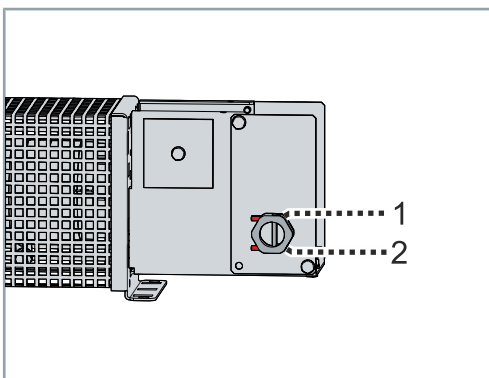
Connect all components and use only shielded cables. Earth the shields of the assembled cables via the mounting plate and place the star point centrally on the unpainted mounting plate.

In the case of larger applications, implement the potential equalization via PE rails.

*Improper earthing or faulty contacting can lead to damage to the multi-axis servo system or to EMC interference emissions. The minimum cross-sections of separate protective conductors can be found in EN 61439-1.*

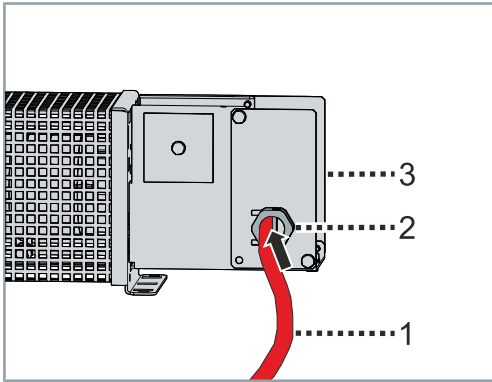


- ▶ Loosen and remove screws 1 and 2
- ▶ Remove cover 3

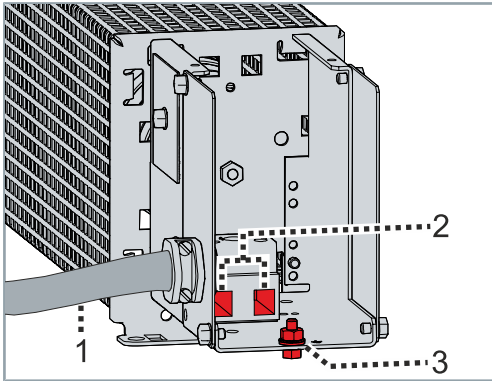


- ▶ Loosen screws 1 and 2, but do not remove them

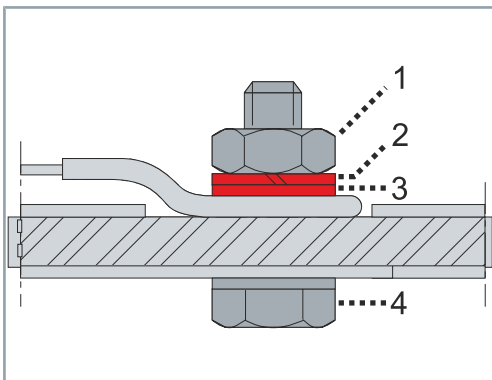
# Electrical installation



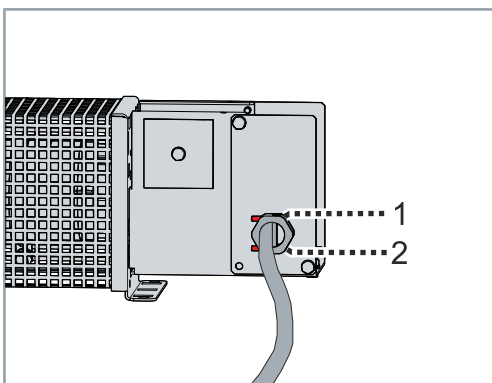
- ▶ Feed a sufficiently dimensioned cable 1 through the clamping device 2 into the terminal box 3



- ▶ Connect the cable 1 to the connections 2 and the earthing point 3



- ▶ Earth the surface as shown in the illustration with nut 1, spring washer 2, washer 3 and bolt 4



- ▶ Tighten screws 1 and 2 again
- ▶ Connect the other end of the cable to the terminal of the power supply module:

Power supply module	Terminal
AX8620	X01
AX8640	X02
AX85xx	X02

- ▶ Fit the cover again

## Cables

Beckhoff offers pre-assembled cables for faster and flawless installation of the motors. These cables are tested with regard to the material used, shielding and connection type. Perfect functioning and compliance with legal regulations, such as EMC and UL, are guaranteed. The use of other cables can cause unexpected malfunctions and result in exclusion of warranty.

## Cross-sections

Model	Brake resistor	
	[mm <sup>2</sup> ]	[AWG]
AX2090-BW80-1000	1.5	16
AX2090-BW80-1600	1.5	16
AX2090-BW80-2000	2.5	12
AX2090-BW80-3200	2.5	12
AX2090-BW80-6000	4	11

### Recommended Beckhoff connection cables:

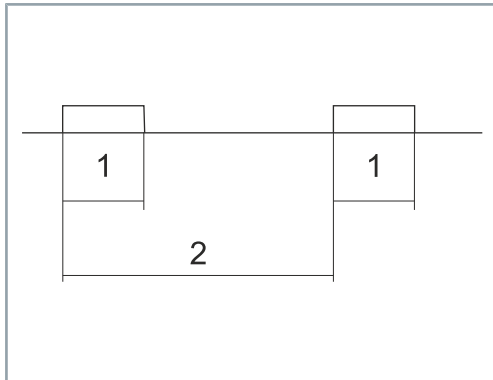
- With cross-section 1.5 mm<sup>2</sup>: ZK4000-2101-2xxx
- With cross-section 2.5 mm<sup>2</sup>: ZK4000-2102-2xxx
- With cross section 4 mm<sup>2</sup>: ZK4000-210x-2xxx

## Short-term power

Brake resistors are usually not operated continuously, but only exposed to short-time duty. In the following chapter, the short-term power will be calculated from the following factors:

- Continuous power
- Overload factor
- Duty cycle

## Duty cycle



Position	Explanation
1	Switch-on time $t_{on}$
2	Cycle time

The duty cycle is a relative value and depends on the switch-on time  $t_{on}$  and the cycle time. A cycle time of up to 120 seconds is incorporated directly into the calculation. If the cycle time exceeds 120 seconds, you must use the maximum relevant cycle time of 120 seconds.

### Calculation equation

- Duty cycle =  $t_{on} / \text{Cycle time} \times 100 \%$



### Example

$T_{on} = 60 \text{ s}$

Cycle time = 120 s

$60 \text{ s} / 120 \text{ s} \times 100 \% = 50 \% \text{ duty cycle}$

$T_{on} = 40 \text{ s}$

Cycle time = 100 s

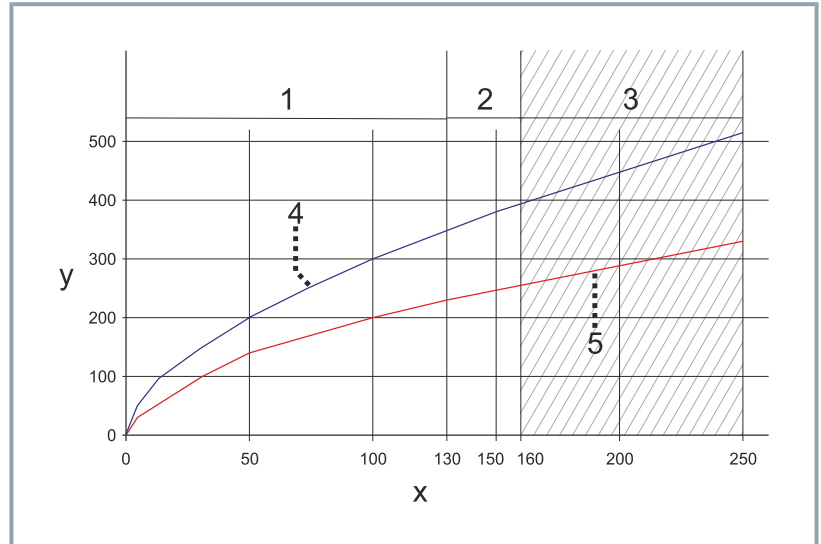
$40 \text{ s} / 100 \text{ s} \times 100 \% = 40 \% \text{ duty cycle}$

## Overtemperature



### Ensure adequate ventilation

The housing surface may reach a temperature of over 200 °C. Always make sure that the brake resistor is adequately ventilated. *If this is ignored, the brake resistor and surrounding components may be destroyed.*



Position	Explanation
x	Continuous power in % of the type power
y	Overtemperature in K
1	Normal operating range
2	Permitted operating range
3	Inadmissible operating range
4	At resistor element
5	At the housing surface

An application may require a higher continuous power than the specified type power. You can implement this state if a higher temperature of the brake resistor is permissible.

## Operating ranges

The following table provides information on the development of overtemperature with continuous power:

Operating range	Explanation
Normal: Maximum 130 %	Recommended operating range for maximum lifetime with error-free operation
Permissible: Maximum 160 %	Still permissible operation with short service life and high failure probability
Impermissible: Over 160%	Risk of destruction of the brake resistor due to overheating and endangerment of the surrounding components due to high temperature

## Fuse protection



### **Observe cable protection and requirements**

The cable protection is performed internally electronically. The prerequisite is the activation of the thermal model for the selected resistor and the use of the correct braking resistor cable.

*The system may be damaged if this is ignored.*

## **WARNING**

### **Ensure safe condition for cleaning work**

Basically, electronic devices are not fail-safe. The condition is always safe when the unit is switched off and not energized. For cleaning work, place the connected brake resistors and the machine in a safe state.

*Carrying cleaning work during operation can lead to serious or fatal injuries.*

### **Do not touch hot surfaces**

The surface of the housing can reach a temperature of 200 °C. Allow the brake resistor to cool to below 40 °C after switching off. *Ignoring this can lead to burns being sustained.*



### **Do not immerse or hose down the brake resistor**

Only wipe the brake resistor with a cloth.

*Cleaning by immersion will destroy the brake resistor. Impermissible solutions will damage the brake resistors and surfaces.*

Contamination, dust or chips can have a negative effect on the function of the components. In the worst case, contamination can lead to failure. Beckhoff recommends regular cleaning and maintenance of the components in a system at regular and required intervals.

No special maintenance and cleaning measures are usually foreseen for brake resistors from the AX2090-BW80-xxxx series. A brake resistor must be replaced in the event of malfunctions or faults.

Disassembly may only be carried out by qualified and trained personnel.

When disposing of electronic waste, make sure that you dispose of it in accordance with the regulations applicable in your country. Read and follow the instructions for proper disposal.

## Disassembly

### **WARNING**

#### **Avoid contact with DC link DC+ and DC-**

Measure the voltage on the DC link test contacts DC+ und DC-. Keep to the waiting times after disconnection from the supply network:

- 30 minutes for AX8620 and AX8640
- 30 minutes for AX8108, AX8118 and AX8206
- 30 minutes for AX8525 and AX8540

*There is still a life-threatening voltage of  $> 875 V_{DC}$  on the capacitors after disconnection from the supply network. Serious or even fatal injuries may result if this is ignored.*



#### **Do not remove components from the products**

Only Beckhoff Automation GmbH & Co. KG is permitted to remove components.

Contact Beckhoff Service if you have any questions.

#### **Removing the brake resistor from the machine**

- Remove cables and electrical connections
- Loosen and remove the brake resistor fixing screws
- Transport the brake resistor to the workplace or put it into storage



## Disposal

Depending on your application and the products used, ensure the professional disposal of the respective components:

### Cast iron and metal

Dispose of cast and metal parts as scrap metal for recycling.

### Cardboard, wood and foam polystyrene

Dispose of packaging materials made of cardboard, wood or foam polystyrene in accordance with the regulations.

### Plastics and hard plastics

You can recycle parts made of plastic and hard plastic via the recycling depot or re-use them depending on the component designations and markings.

### Oils and lubricants

Dispose of oils and lubricants in separate containers. Hand over the containers at the used oil collection station.

### Batteries and rechargeable batteries

Batteries and rechargeable batteries may also be marked with the crossed-out trash can symbol. You must separate these components from the waste and are legally obliged to return used batteries and rechargeable batteries within the EU. Observe the relevant provisions outside the area of validity of the EU Directive 2006/66/EC.



### Electronic components

Products marked with a crossed-out waste bin must not be disposed of with general waste. Electronic components and equipment must be disposed of properly. The national regulations for the disposal of electrical and electronic equipment must be observed.

## Returning to the vendor

In accordance with the WEEE-2012/19/EU directives, you can return used devices and accessories for professional disposal. The transport costs are borne by the sender.

Send the used devices with the note "For disposal" to:

Beckhoff Automation GmbH & Co. KG  
 "Service" Building  
 Stahlstrasse 31  
 D-33415 Verl

In addition, you have the option to contact a local certified specialist company for the disposal of used electrical and electronic appliances. Dispose of the old components in accordance with the regulations applicable in your country.

## Standards

### **EN 61000-6-2:2005**

*"Electromagnetic compatibility (EMC). Generic standards. Immunity for industrial environments"*

### **EN 61000-6-4:2007+A1:2011**

*"Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments"*

### **Product standard EN 61800-3:2004+A1:2012**

*"Adjustable speed electrical power drive systems. EMC requirements and specific test methods"*

### **Product standard EN 61800-5-1:2007+A1:2017**

*"Adjustable speed electrical power drive systems. Safety requirements"*

### **RoHS: EN 50581:2012**

*"Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances"*

### **IEC / EN 61800-5-2:2017**

*"Adjustable speed electrical power drive systems - Part 5-2: Safety requirements - Functional"*

## Guidelines

### **2014/35/EU**

Low Voltage Directive




### **2011/65/EU**

RoHS Directive

### **2014/30/EU**

EMC Directive

## Test centers

	<p>The AX8000 multi-axis servo system does not fall within the area of applicability of the Machinery Directive.</p> <p>However, Beckhoff products are designed and evaluated in full compliance with all relevant regulations for personal safety and use in a machine or system.</p>
	<p>The AX8000 multi-axis servo system meets all requirements of the Eurasian Economic Union. These include Russia, Belarus, Armenia, Kazakhstan and Kyrgyzstan.</p> <p>The EAC logo can be found on the name plate.</p>
	<p>The multi-axis servo system meets the requirements according to UL and is certified as a cURus component for the USA and Canadian markets in accordance with the standards applicable in the USA and Canada.</p> <p>The cURus logo can be found on the name plate.</p>

## EU conformity



### Placing at disposal

Beckhoff Automation GmbH & Co KG will be pleased to provide you with EU declarations of conformity and manufacturer's declarations for all products on request.

Send your request to: [info@beckhoff.com](mailto:info@beckhoff.com)

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More Information:  
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