

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SCHNEIDER ELECTRIC

ATV930C16N4

160 KW VARIABLE SPEED DRIVE

Used with the applicable Altivar Process ATV930 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Schneider Electric official documentation for ATV930C16N4

Altivar Process ATV930C11, C13N4, C16N4

Braking Module Installation Manual (supplied with the Product)

06/2019



Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Qualification Of Personnel

Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation are authorized to work on and with this product. In addition, these persons must have received safety training to recognize and avoid hazards involved. These persons must have sufficient technical training, knowledge and experience and be able to foresee and detect potential hazards that may be caused by using the product, by changing the settings and by the mechanical, electrical and electronic equipment of the entire system in which the product is used. All persons working on and with the product must be fully familiar with all applicable standards, directives, and accident prevention regulations when performing such work.



At a Glance

Document Scope

The purpose of this document is:

- to give you mechanical and electrical information related to the braking module option,
- to show you how to install and wire this option.

Validity Note

Original instructions and information given in the present document have been written in English (before optional translation).

NOTE: The products listed in the document are not all available at the time of publication of this document online. The data, illustrations and product specifications listed in the guide will be completed and updated as the product availabilities evolve. Updates to the guide will be available for download once products are released on the market.

This documentation is valid for the Altivar Process drive.

The technical characteristics of the devices described in the present document also appear online. To access the information online:

Step	Action
1	Go to the Schneider Electric home page www.schneider-electric.com .
2	In the Search box type the reference of a product or the name of a product range. • Do not include blank spaces in the reference or product range. • To get information on grouping similar modules, use asterisks (*).
3	If you entered a reference, go to the Product Datasheets search results and click on the reference that interests you. If you entered the name of a product range, go to the Product Ranges search results and click on the product range that interests you.
4	If more than one reference appears in the Products search results, click on the reference that interests you.
5	Depending on the size of your screen, you may need to scroll down to see the datasheet.
6	To save or print a datasheet as a .pdf file, click Download XXX product datasheet .

The characteristics that are presented in the present document should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the document and online information, use the online information as your reference.

Chapter 1

Introduction

What Is in This Chapter?

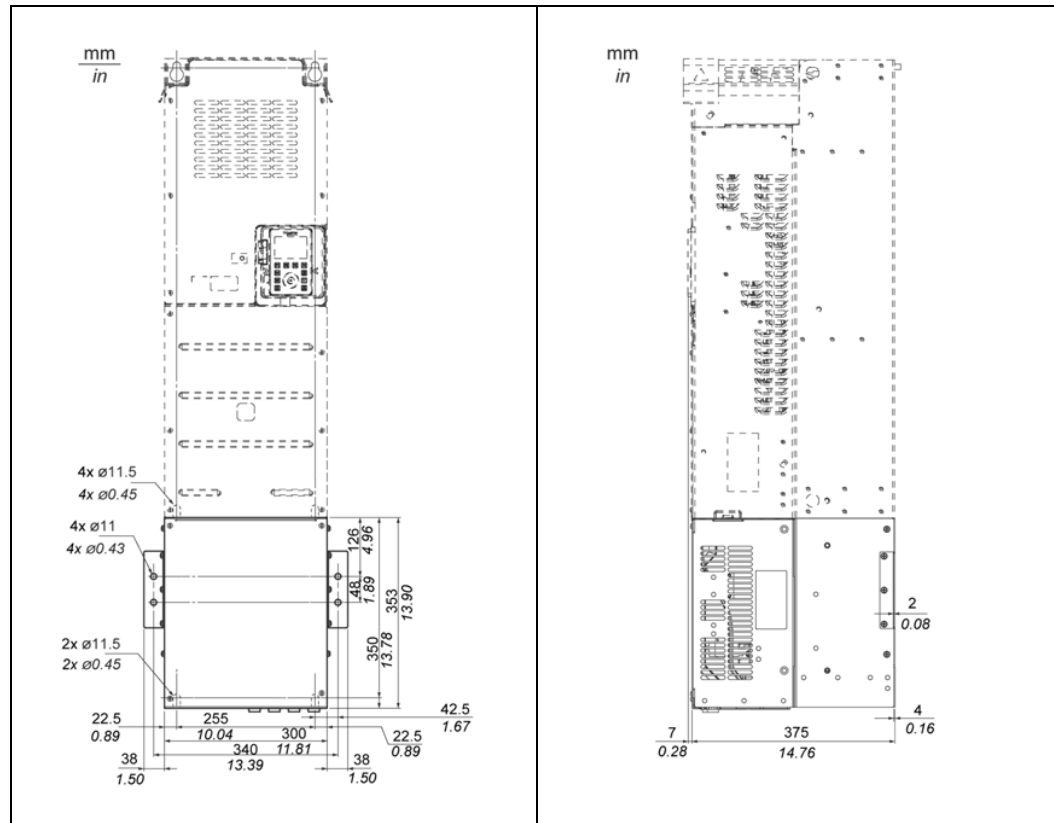
This chapter contains the following topics:

Topic	Page
Braking Module Overview	14
Preliminary Instructions	16

Braking Module Overview

Dimensions

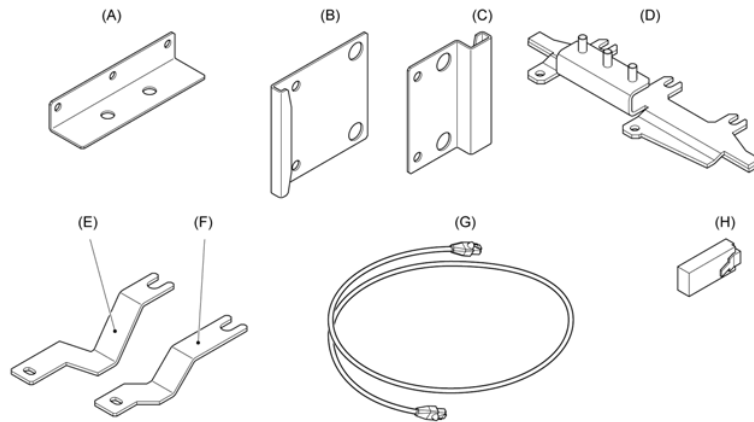
The figures below show the dimensions of the braking module delivered with the drive.



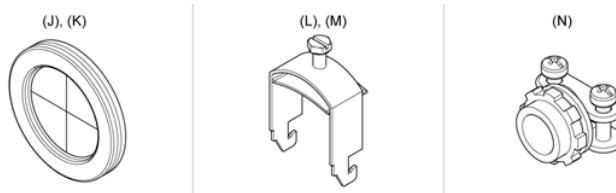
Accessories

Refer to the installation Instructions ([see page 21](#)).

This braking module is composed of the unit and following accessories. Unpack a parcel and check to make sure the contents.



- Part (A): Braking module support (x2)
- Part (B): Hanging metal drive (x2)
- Part (C): Hanging metal braking module (x2)
- Part (D): Grounding bar with gasket
- Part (E): DC bar for PA
- Part (F): DC bar for PC
- Part (G): Interconnection cable
- Part (H): Termination plug



- Part (J): Cable grommets Large (x4)
- Part (K): Cable grommets Small (x5)
- Part (L): Cable clamps Large (x4)
- Part (M): Cable clamps Small (x4)
- Part (N): Cable clamps ROMEX 6 (x4)
- Screw for connecting braking module: M8x16 bolt (x8), M8 nut (x5), and M6x14 screw (x8)

Preliminary Instructions

Inspecting the product

Damaged products or accessories may cause electric shock or unanticipated equipment operation.

 DANGER
ELECTRIC SHOCK OR UNANTICIPATED EQUIPMENT OPERATION
Do not use damaged products or accessories.
Failure to follow these instructions will result in death or serious injury.

Contact your local Schneider Electric sales office if you detect any damage whatsoever.

Step	Action
1	Verify that the catalog number printed on the nameplate (<i>see Altivar Process, Variable Speed Drives ATV930, ATV950, Installation Manual</i>) corresponds to the purchase order.
2	Before performing any installation work, inspect the product for visible damage.

To help protect the braking module option before installation, handle and store the device in its packaging. Ensure that the ambient conditions are acceptable.

Handling

 WARNING
INCORRECT HANDLING
• Handle the braking module by two people or more. • Handle and store the product in its original packaging. • Do not handle and store the product if the packaging is damaged or appears to be damaged. • Take all measures required to avoid damage to the product and other hazards when handling or opening the packaging.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Chapter 2

Technical Data

Main specifications

Type form	Braking Module
Delivered with drive	ATV930C11N4 ATV930C13N4 ATV930C16N4
Threshold voltage (default) ⁽¹⁾	780 V
Maximum DC bus voltage	820 V
Maximum braking power at threshold voltage (continuous power)	220 kW
Minimum allowable resistor	1.9 Ω
Calorific values	688 W
Cooling method	Forced air cooled
Monitoring functions	Overheat protection, short-circuit protection, overload protection
Degree of protection (IEC60529)	IP20
Enclosure rating (UL50)	Type1
Operation environment	Operating temperature: • Drive operating temperature should be restricted to -15 to 50° C when using the braking module option • In accordance with the drive for other environment
Storage temperature	-25 to 70° C
Mounting position	Lower side of drive (directly connected to drive)
Weight	Approx. 23 kg (50.71 lb)
NOTE: To brake using the braking module, refer to the programming manual (see page 10).	
⁽¹⁾ : Threshold voltage can be adjusted using the drive parameter [Braking level] Vbr .	

Chapter 3

Installation and wiring

This chapter explains installation of the braking module, how to remove the covers, how to connect with the drive and wire to braking resistor.

What Is in This Chapter?

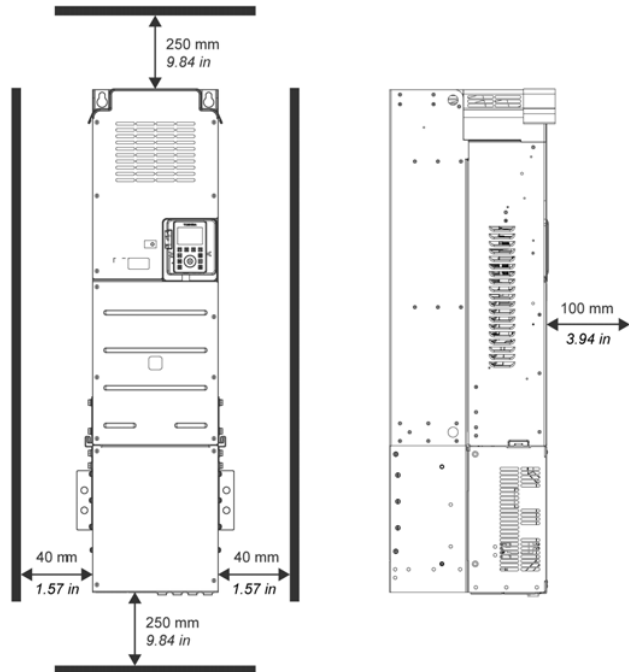
This chapter contains the following topics:

Topic	Page
Mounting Conditions	20
Braking Module Mounting	21
Wiring Instructions	27

Mounting Conditions

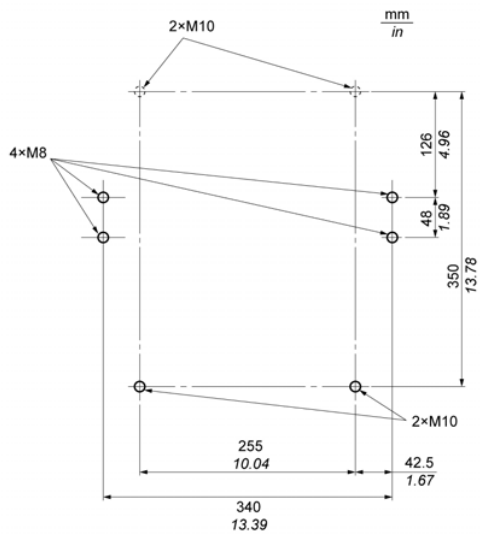
Clearances

Install the braking module on the drive in a well-ventilated indoor place and mount in vertical position. The following figure presents the minimum clearances for mounting.



Mounting Holes

The following figure presents the sizing of the holes and their positioning.



Braking Module Mounting

Preparation

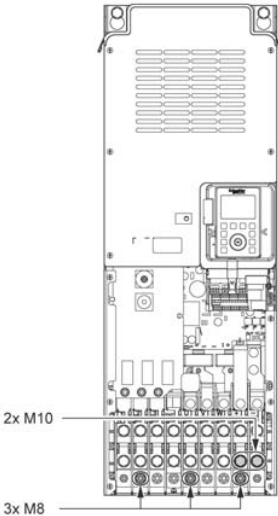
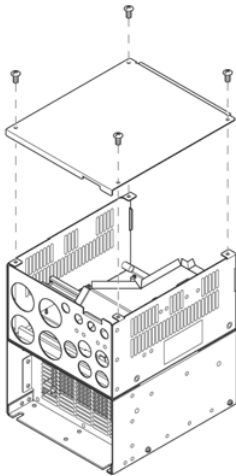
NOTICE

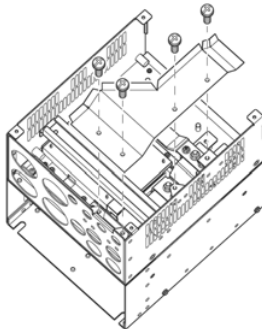
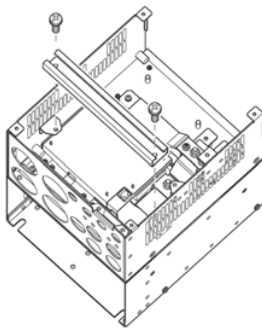
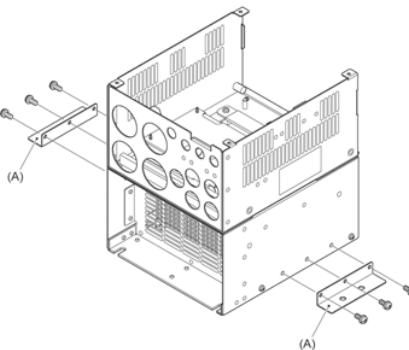
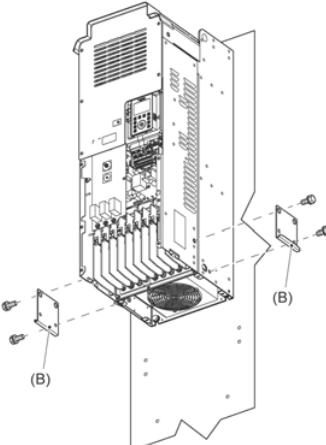
DESTRUCTION DUE TO INCORRECT MOUNTING

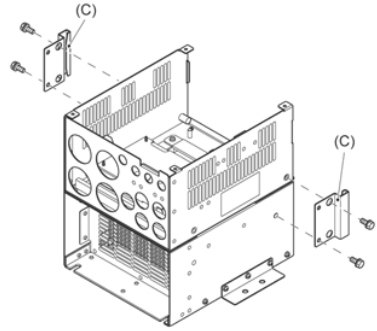
Strictly follow the procedures described below.

Failure to follow these instructions can result in equipment damage.

The table below describes the preliminary steps before mounting the braking module.

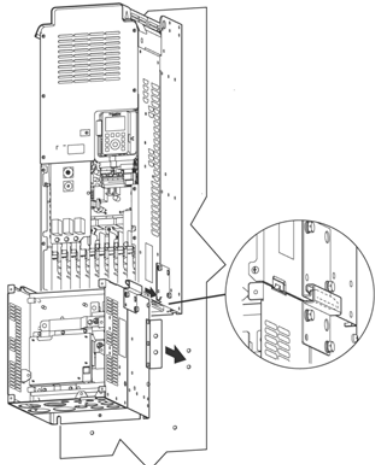
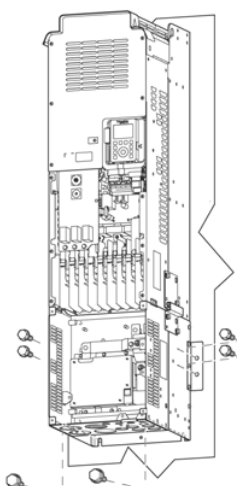
Step	Action	Figure
1	Install the drive according the drive manual (see <i>Altivar Process, Variable Speed Drives</i> <i>ATV930, ATV950, Installation Manual</i>).	–
2	Unscrew the 6 screws attaching the bottom cover of the drive and remove it.	–
3	Remove the terminal cover from the drive.	–
4	Remove the cable duct from the drive.	–
5	Remove the 3 nuts M8 from the bottom grounding bar.	
6	Remove the 2 bolts M10 from the power block.	
7	Remove the front cover from the braking module.	

Step	Action	Figure
8	Remove the cable duct from the braking module.	
9	Remove the upper cable rail from the braking module.	
10	Install the 2 braking module supports (A) on the braking module. Tighten the 6 screws M6 to 4.4 N·m (38.94 lbf.in).	
11	Install the 2 hanging metal brackets (B) on the drive. Tighten the 4 screws M8 to 7.3 N·m (64.61 lbf.in).	

Step	Action	Figure
12	Install the 2 hanging metal brackets (C) on the braking module. Tighten the 4 screws M8 to 7.3 N·m (64.61 lbf.in).	

Mounting on Wall

The procedure below describes the steps to mount the braking module on the wall.

Step	Action	Figure
1	Engage both pairs of hanging metal brackets. NOTE: Handle the braking module by two people or more.	
2	Install the 4 screws M8 and the 2 screws M10	

Connection to the Drive

Signal interference can cause unexpected responses of the drive.

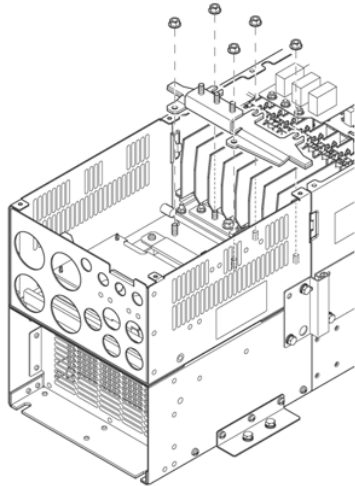
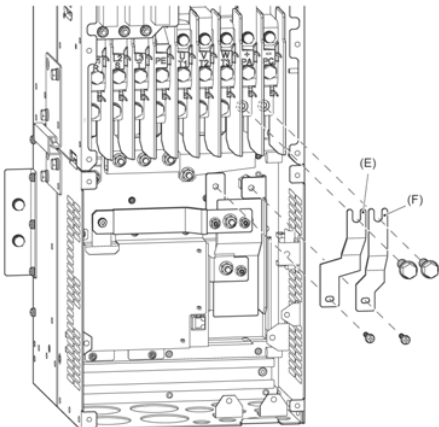
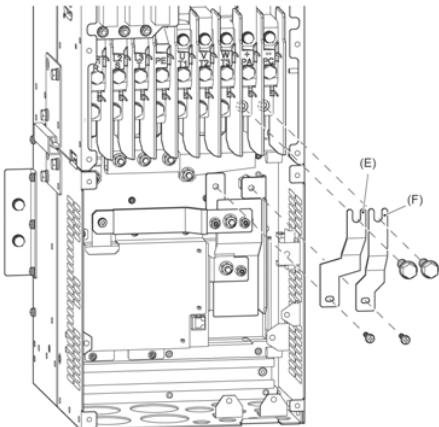
WARNING

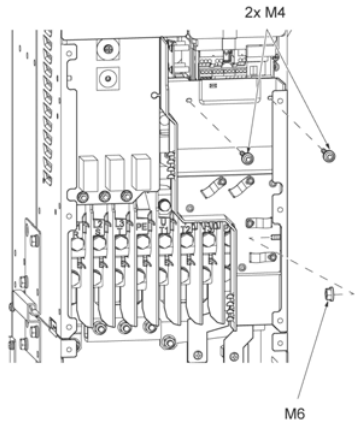
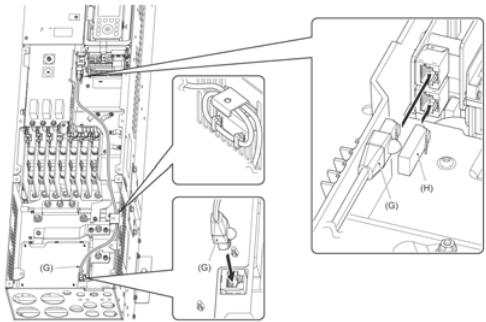
SIGNAL AND EQUIPMENT INTERFERENCE

Fix the interconnection cable in the unit according to the figure in the procedure below.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

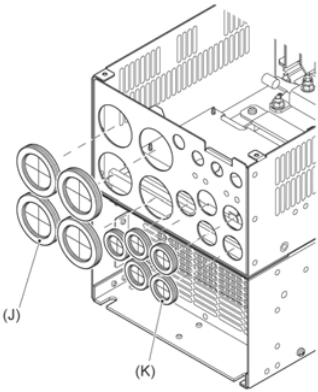
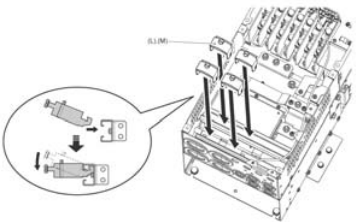
The procedure below describes the steps to connect the braking module to the drive.

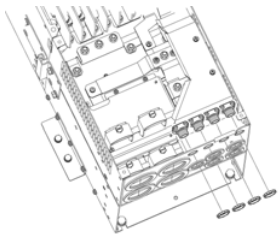
Step	Action	Figure
1	Install the grounding bar (D) in the braking module option. Tighten the 5 screws M8 to 11.8 N·m (104.44 lbf.in). NOTE: Reuse the 3 screws M8 that have been removed from the drive during the preparation procedure.	
2	Install the DC bar for PA (E) in the braking module. Tighten the screw M6 to 4.4 N·m (38.94 lbf.in). Tighten the screw M10 to 27 N·m (238.97 lbf.in). NOTE: Reuse the screw M10 that has been removed from the drive during the preparation procedure	
3	Install the DC bar for PC (F) in the braking module. Tighten the screw M6 to 4.4 N·m (38.94 lbf.in). Tighten the screw M10 to 27 N·m (238.97 lbf.in). NOTE: Reuse the screw M10 that has been removed from the drive during the preparation procedure	

Step	Action	Figure
4	Install the cable duct on the drive. Tighten the 2 screws M4 to 1.3 N·m (11.51 lbf.in). Tighten the nut M6 to 4.4 N·m (38.94 lbf.in).	
5	Connect the interconnection cable (G) to the braking module. Make a ring and hang the interconnection cable (G) on the collars.	
6	Connect the interconnection cable (G) to the drive. Connect the terminal plug (H) to the drive.	

Wiring Parts Mounting

The procedure below describes the steps to install the clamps and grommets onto the braking module.

Step	Action	Figure
1	Install the cable grommets (J) and (K) on the braking module.	
2	Install the cable clamps (L) or (M) in the braking module.	

Step	Action	Figure
3	Install the cable clamps ROMEX (N) on the braking module. Tighten the nuts to 1.5 N·m (13.28 lbf.in). Tighten the screws to 0.5 N·m (4.43 lbf.in).	
4	Refit the front cover on the braking module on completion of wiring. Tighten the 4 screws M5 to 2.6 N·m (23.01 lbf.in).	

NOTE: To brake using the braking module, refer to the programming manual ([see page 10](#)).

Wiring Instructions

General Instructions

The entire installation procedure must be performed without voltage present.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Read and understand the instructions in **Safety Information** chapter before performing any procedure in this chapter.

Failure to follow these instructions will result in death or serious injury.

Drive systems may perform unexpected movements because of incorrect wiring, incorrect settings, incorrect data or other errors.

WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Carefully install the wiring in accordance with the EMC requirements.
- Do not operate the product with unknown or unsuitable settings or data.
- Perform a comprehensive commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Unsuitable settings or unsuitable data or unsuitable wiring may trigger unintended movements, trigger signals, damage parts and disable monitoring functions.

WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Only start the system if there are no persons or obstructions in the zone of operation.
- Verify that a functioning emergency stop push-button is within reach of all persons involved in the operation.
- Do not operate the drive system with unknown settings or data.
- Verify that the wiring is appropriate for the settings.
- Never modify a parameter unless you fully understand the parameter and all effects of the modification.
- When commissioning, carefully run tests for all operating states, operating conditions and potential error situations.
- Anticipate movements in unintended directions or oscillation of the motor.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

DANGER

HAZARD OF FIRE OR ELECTRIC SHOCK

- Wire cross sections and tightening torques must comply with the specifications provided in this document
- If you use flexible multi-wire cables for a connection with a voltage higher than 25 Vac, you must use ring type cable lugs or wire ferrules, depending on the connection.

Failure to follow these instructions will result in death or serious injury.

Selection table

Following table shows the applicable drive, each minimum allowable resistance of a braking resistor and the wire size. Use the braking resistor with a resistance value greater than the minimum allowable resistance.

The table shows the applicable drive, each minimum allowable resistance of a braking resistor and the wire size. Use the braking resistor with a resistance value greater than the minimum allowable resistance.

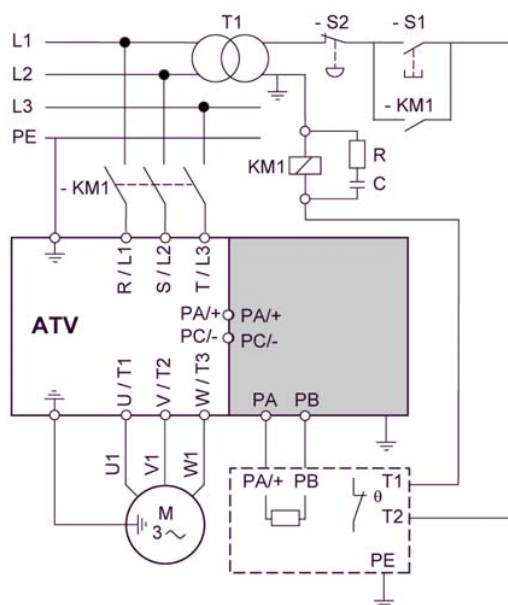
Applicable Drive Type	Minimum allowable resistance	Wire size			
		Heavy Duty		Normal Duty	
		AWG ⁽¹⁾	mm ² ⁽²⁾	AWG ⁽¹⁾	mm ² ⁽²⁾
ATV930C11N4	1.9Ω	1/0	35	1/0	35
ATV930C13N4		1/0	50	1/0	50
ATV930C16N4		4/0	70	4/0	70

⁽¹⁾ This cable size is in conformity with UL508C.
⁽²⁾ This cable size is in conformity with IEC60364-5-52.

NOTE: 600V HIV insulation wire (copper wire with the maximum allowable temperature 90° C of an insulator) must be connected to the drive for Input and Output cables when the braking module is mounted with 50° C ambient temperature.

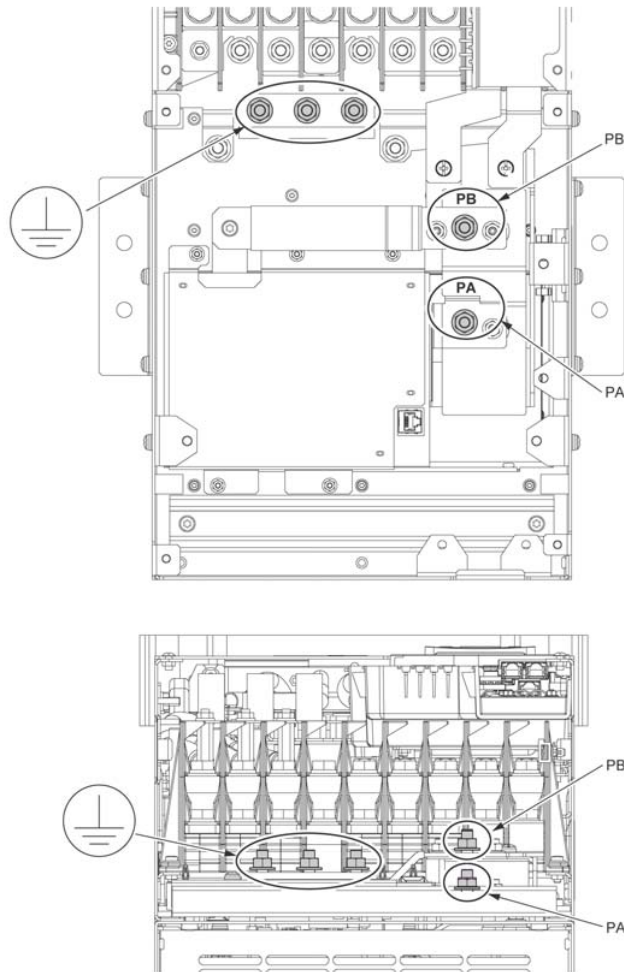
Standard Connection Diagram

The standard connection diagram is shown below.



Terminals

The connecting terminals are shown below.



NOTE: Tightening torque of the M8 screws is 11.8 N.m (104.44 lbf.in)
The width of the ring terminal should be 26 mm (1.02 in) or less.