

ACS800

Cabinet Installation

ACS800-04 and ACS800-04M Drive Modules (45 to 560 kW)

ACS800-U4 Drive Modules (60 to 600 HP)



ACS800 Single Drive Manuals

HARDWARE MANUALS (appropriate manual is included in the delivery)

ACS800-01/U1 Hardware Manual 0.55 to 160 kW (0.75 to 200 HP)
3AFE64382101 (English)

ACS800-01/U1/04 Marine Supplement 0.55 to 160 kW (0.75 to 200 HP)
3AFE64291275 (English)

ACS800-11/U11 Hardware Manual 5.5 to 110 kW (7.5 to 125 HP)
3AFE68367883 (English)

ACS800-31/U31 Hardware Manual 5.5 to 110 kW (7.5 to 125 HP)
3AFE68599954 (English)

ACS800-02/U2 Hardware Manual 90 to 500 kW (125 to 600 HP)
3AFE64567373 (English)

ACS800-04/U4 Hardware Manual 0.55 to 160 kW (0.75 to 200 HP)
3AFE68372984 (English)

ACS800-04/04M/U4 Hardware Manual 45 to 560 kW (60 to 600 HP)
3AFE64671006 (English)

ACS800-04/04M/U4 Cabinet Installation 45 to 560 kW (60 to 600 HP)
3AFE68360323 (English)

ACS800-07/U7 Hardware Manual 45 to 560 kW (50 to 600 HP)
3AFE64702165 (English)

ACS800-07/U7 Dimensional Drawings 45 to 560 kW (50 to 600 HP)
3AFE64775421

ACS800-07 Hardware Manual 500 to 2800 kW
3AFE64731165 (English)

ACS800-17 Hardware Manual 55 to 2500 kW (75 to 2800 HP)
3AFE68397260 (English)

ACS800-37 Hardware Manual 55 to 2700 kW (75 to 3000 HP)
3AFE68557925 (English)

- Safety instructions
- Electrical installation planning
- Mechanical and electrical installation
- Motor control and I/O board (RMIO)
- Maintenance
- Technical data
- Dimensional drawings
- Resistor braking

FIRMWARE MANUALS, SUPPLEMENTS AND GUIDES

(appropriate documents are included in the delivery)

Standard Control Program Firmware Manual
3AFE64527592 (English)

System Control Program Firmware Manual
3AFE64670646 (English)

Control Program Template Firmware Manual
3AFE64616340 (English)

Master/Follower 3AFE64590430 (English)

Pump Control Program Firmware Manual
3AFE68478952 (English)

Extruder Control Program Supplement 3AFE64648543 (English)

Centrifuge Control Program Supplement 3AFE64667246 (English)

Traverse Control Program Supplement 3AFE64618334 (English)

Crane Control Program Firmware Manual 3BSE11179 (English)

Adaptive Programming Application Guide
3AFE64527274 (English)

OPTION MANUALS (delivered with optional equipment)

Fieldbus Adapters, I/O Extension Modules etc.

ACS800-04 and ACS800-04M Drive Modules
45 to 560 kW
ACS800-U4 Drive Modules
60 to 600 HP

Cabinet Installation

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About this manual

What this chapter contains

This chapter describes the intended audience and contents of the manual. It contains a flowchart of steps in checking the delivery, installing and commissioning the drive. The flowchart refers to chapters/sections in this manual and other manuals.

Target audience

This manual is intended for people who plan the installation, and install the drive module into a user-defined cabinet. Read the manual before the installation work. The reader is expected to know the fundamentals of electricity, wiring, electrical components and electrical schematic symbols.

The manual is written for readers worldwide. Both SI and imperial units are shown. Special US instructions for installations within the United States that must be installed per the National Electrical Code and local codes are marked with (US).

Safety



WARNING! Follow the safety instructions given in *ACS800-04/04M/U4 Hardware Manual* [3AFE64671006 (English)] when installing, operating and servicing the drive. If ignored, physical injury or death may follow, or damage may occur to the drive, the motor or driven equipment. Read the safety instructions before you work on the unit.

Other related manuals

See *ACS800-04/04M/U4 Hardware Manual* [3AFE64671006 (English)] for information concerning the drive module such as

- safety
- planning the electrical installation
- electrical installation
- motor control and I/O board (RMIO)
- maintenance
- technical data
- resistor braking.

For installation instructions of optional equipment, see their manuals.

For example installations in Rittal TS 8 cabinet, refer to *ACS800-04/U4 Rittal TS 8 Cabinet Installation* [3AFE68372330 (English)].

Categorization according to the frame size

The instructions, technical data and dimensional drawings which concern only certain frame sizes are marked with the symbol of the frame size R7 or R8. The frame size is not marked on the drive designation label. To identify the frame size of your drive, see the rating tables in chapter *Technical data* in *ACS800-04/04M/U4 Hardware Manual* [3AFE64671006 (English)].

Categorization according to the plus code

The instructions, technical data and dimensional drawings which concern only certain optional selections are marked with plus codes, e.g. +E210 or +H354. The options included in the drive can be identified from the plus codes visible on the type designation label of the drive. The plus code selections are listed in chapter *The ACS800-04/U4 and ACS800-04M* under *Type code*.

Contents

The chapters of this manual are briefly described below.

About this manual introduces this manual.

The ACS800-04/U4 and ACS800-04M describes the drive module.

Planning the cabinet installation instructs on general cabinet design, gives layout examples, free space requirements around the drive module for cooling and cabinet cooling data.

Mechanical installation of pre-assembled units (ACS800-04/U4) instructs how to mount a pre-assembled drive module into a cabinet.

Mechanical installation of non-pre-assembled units (ACS800-04M) instructs how to assemble the drive from the assembly kits.

Checking the installation helps in checking the mechanical and electrical installation of the drive.

Dimensional drawings contains the dimensional drawings of the drive modules.

Circuit diagrams shows an example circuit diagram for employing the Prevention of Unexpected Start function (+Q950).

Assembly drawings contains a few step-by-step assembly drawings.

Installation, commissioning and operating flowchart

Task	Chapters in this manual	Chapters in ACS800-04/04M/U4 Hardware Manual [3AFE64671006 (English)]
Identify the frame size of your drive, R7 or R8.	-	<i>Technical data / IEC ratings or NEMA ratings</i>
Plan the installation. Check the ambient conditions, ratings, required cooling air flow, input power connection, compatibility of the motor, motor connection, and other technical data.	<i>Planning the cabinet installation</i> If optional equipment is included, see its manuals.	<i>Technical data</i> <i>Planning the electrical installation</i>
Unpack and check the units. Check that all necessary optional modules and equipment are present and correct. Only intact units may be started up.	<i>Mechanical installation of pre-assembled units (ACS800-04/U4) or Mechanical installation of non-pre-assembled units (ACS800-04M)</i> If the converter has been non-operational for more than one year, the converter DC link capacitors need to be reformed. Ask ABB for instructions.	-
Assemble and install the drive module into the cabinet.	<i>Mechanical installation of pre-assembled units (ACS800-04/U4) or Mechanical installation of non-pre-assembled units (ACS800-04M)</i>	
Install the RDCU drive control unit.	-	See <i>RDCU Drive Control Unit Hardware Manual</i> [3AFE64636324 (English)]
Check the installation.	<i>Checking the installation</i>	-
Electrical installation	-	<i>Safety, Planning the electrical installation, Electrical installation, Maintenance, Technical Data, Resistor braking</i>
Commissioning and operating the drive	-	See the appropriate firmware manual.

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type code and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/drives and selecting *Drives – World wide service contacts* on the right pane.

Product training

For information on ABB product training, navigate to www.abb.com/drives and select *Drives – Training courses* on the right pane.

Providing feedback on ABB Drives manuals

Your comments on our manuals are welcome. Go to www.abb.com/drives, then select successively *Drives – Document Library – Manuals feedback form* on the right pane.

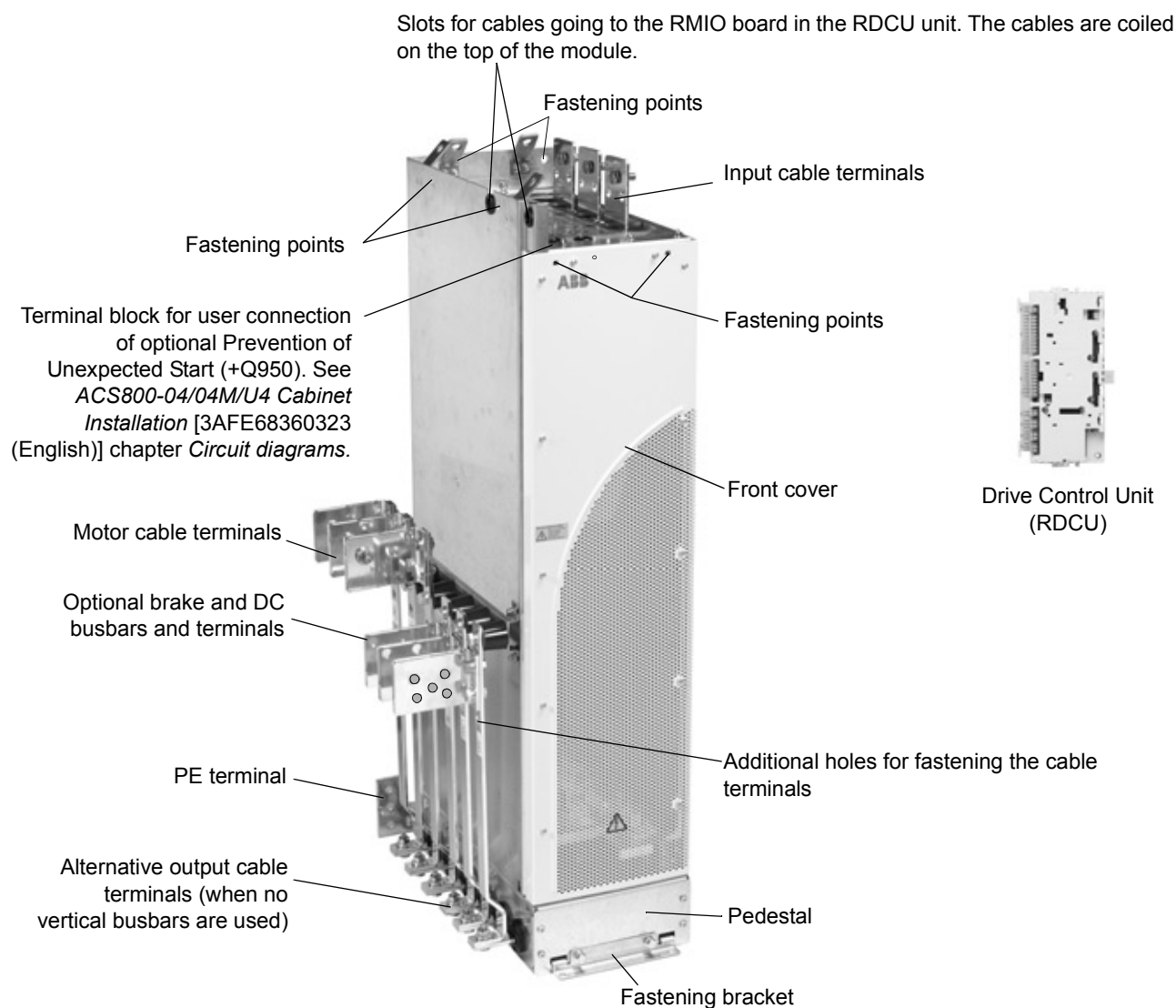
The ACS800-04/U4 and ACS800-04M

What this chapter contains

This chapter describes the construction and operating principle of the drive in short.

The ACS800-04/U4

The ACS800-04/U4 is an IP 00 drive module for controlling AC motors. It is to be installed into a cabinet by the customer with base or wall fastening. The input cable terminals are located at the top of the unit whereas the motor cable terminals are located at the left- or right-hand side of the unit. The unit is delivered pre-assembled with mounting pedestal and output busbars.

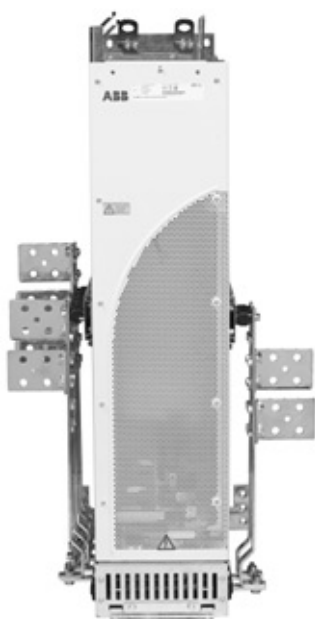


The ACS800-04M

The ACS800-04M is delivered as non-pre-assembled kits, which provide more alternatives in assembling the units than the basic ACS800-04.

Example configurations

Frame size R7



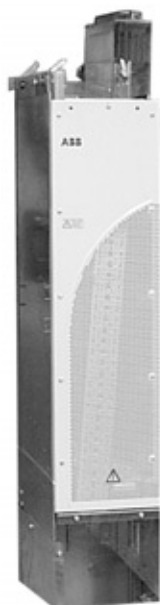
Motor and brake busbars on the left-hand long side of the module and DC busbars on the right-hand side



Motor and brake busbars on the right-hand long side of the module and DC busbars on the left-hand side



Output busbars on the short side of the module



Frame size R7 with bottom exit (optional top entry busbar shroud and bottom exit shroud included). Output busbars are located at the base of the module.



Drive Control Unit (RDCU)

Frame size R8

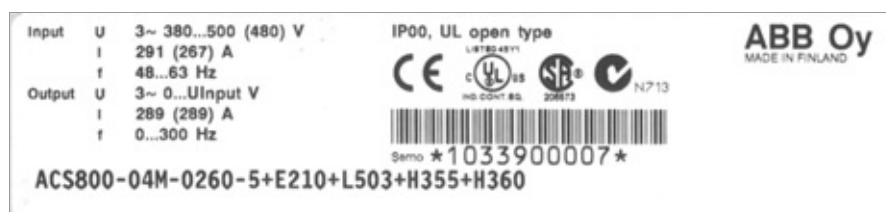
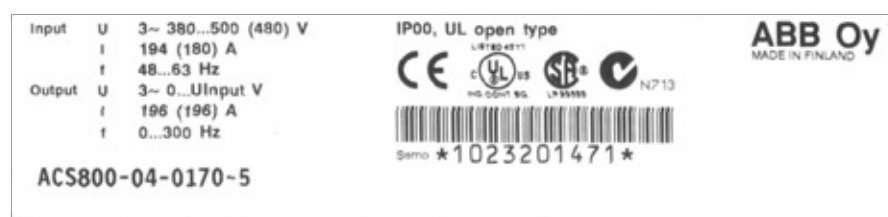


Output busbars on the short side of the module

Type designation label

The type designation label includes an IEC and NEMA rating, C-UL US, and CSA markings, a type code and a serial number, which allow individual recognition of each unit. The first digit of the serial number refers to the manufacturing plant. The next four digits refer to the unit's manufacturing year and week respectively. The remaining digits complete the serial number so that there are no two units with the same serial number.

The type designation label is located on the front cover and the serial number label inside the unit. Example labels are shown below.



Type code

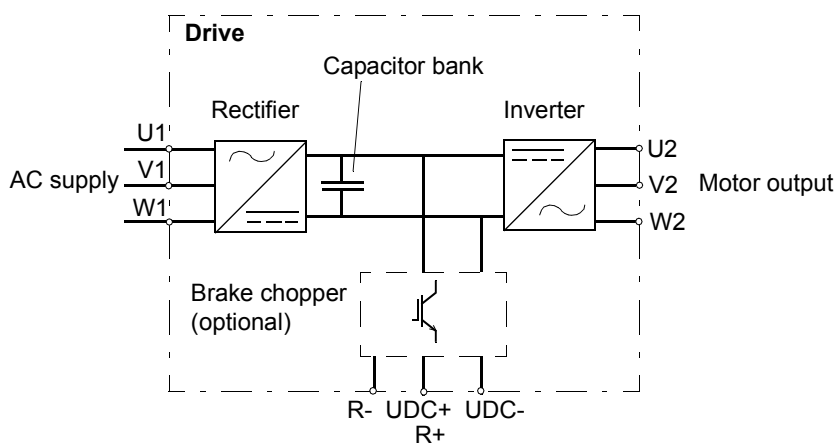
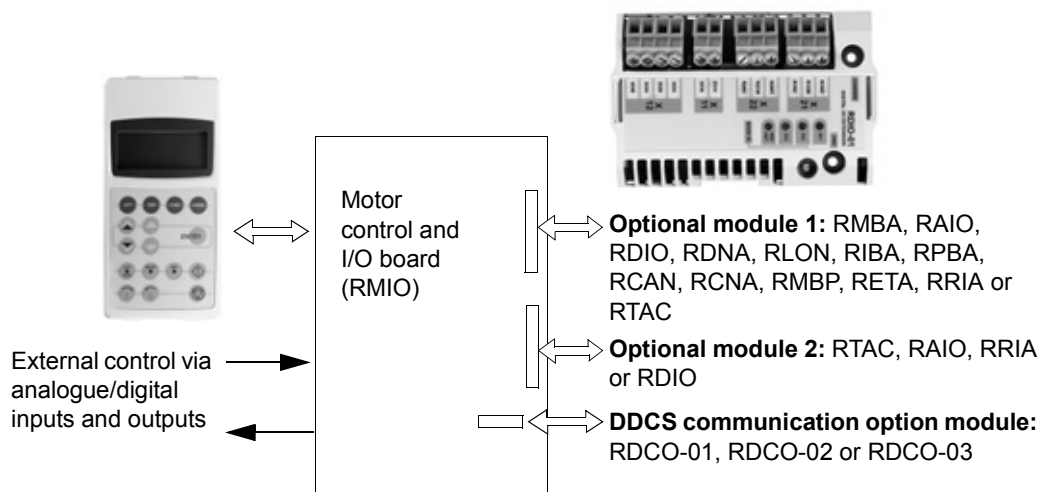
The type code contains information on the specifications and configuration of the drive. The first digits from left express the basic configuration (e.g. ACS800-04-0170-5). The optional selections are given thereafter, separated by plus signs (e.g. +E202). The main selections are described below. Not all selections are available for all types. For more information, refer to *ACS800 Ordering Information* (EN code: 64556568, available on request).

Type code for ACS800-04 and ACS800-U4 pre-assembled units		
Selection	Alternatives	
Product series	ACS800 product series	
Type	04	Drive module. When no options are selected: 6-pulse diode input bridge, IP 00, top entry, side exit, RDCU drive control unit, no control panel, no EMC filter, Standard Control Program, boards without coating, pedestal with output on the long side, output busbar set for motor, base and wall mounting brackets, one set of manuals. Pre-assembled unit.
	U4	Drive module (USA). When no options are selected: 6-pulse diode bridge, open chassis, top entry, side exit, no control panel, no EMC filter, US version of the Standard Control Program (three-wire start/stop as default setting), common mode filter in frame size R8, boards without coating, pedestal with output on the long side, output busbar set for motor, base and wall mounting brackets, one set of manuals. Pre-assembled unit.
Size	Refer to <i>Technical data: IEC ratings or NEMA ratings in Hardware Manual</i> [3AFE64671006 (English)].	
Voltage range (nominal rating in bold)	2	208/220/ 230 /240 VAC
	3	380/ 400 /415 VAC
	5	380/400/415/440/460/480/ 500 VAC
	7	525/575/600/ 690 VAC
+ options		
Resistor braking	D150	brake chopper and busbars for brake resistor and DC connection
Filter	E210	EMC/RFI filter for second environment TN/IT (grounded/ungrounded) system
	E208	common mode filter
Pedestal and output busbars	0H354	no pedestal
Control panel	J400	control panel including a 3-metre panel connection cable
	J410	RPMP-11 control panel mounting platform kit including a 3-metre panel connection cable but no control panel
	J413	RPMP-21 control panel holder
Fieldbus	K...	Refer to <i>ACS800 Ordering Information</i> (EN code: 64556568).
I/O	L...	
Control program	N...	
Language of manual	R...	
Specialities	P901	coated boards
Safety features	Q950	Prevention of Unexpected Start, 500 mm (19.68 in.) cable outside the drive module in frame size R7, 600 mm (23.62 in.) cable outside the drive module in frame size R8.

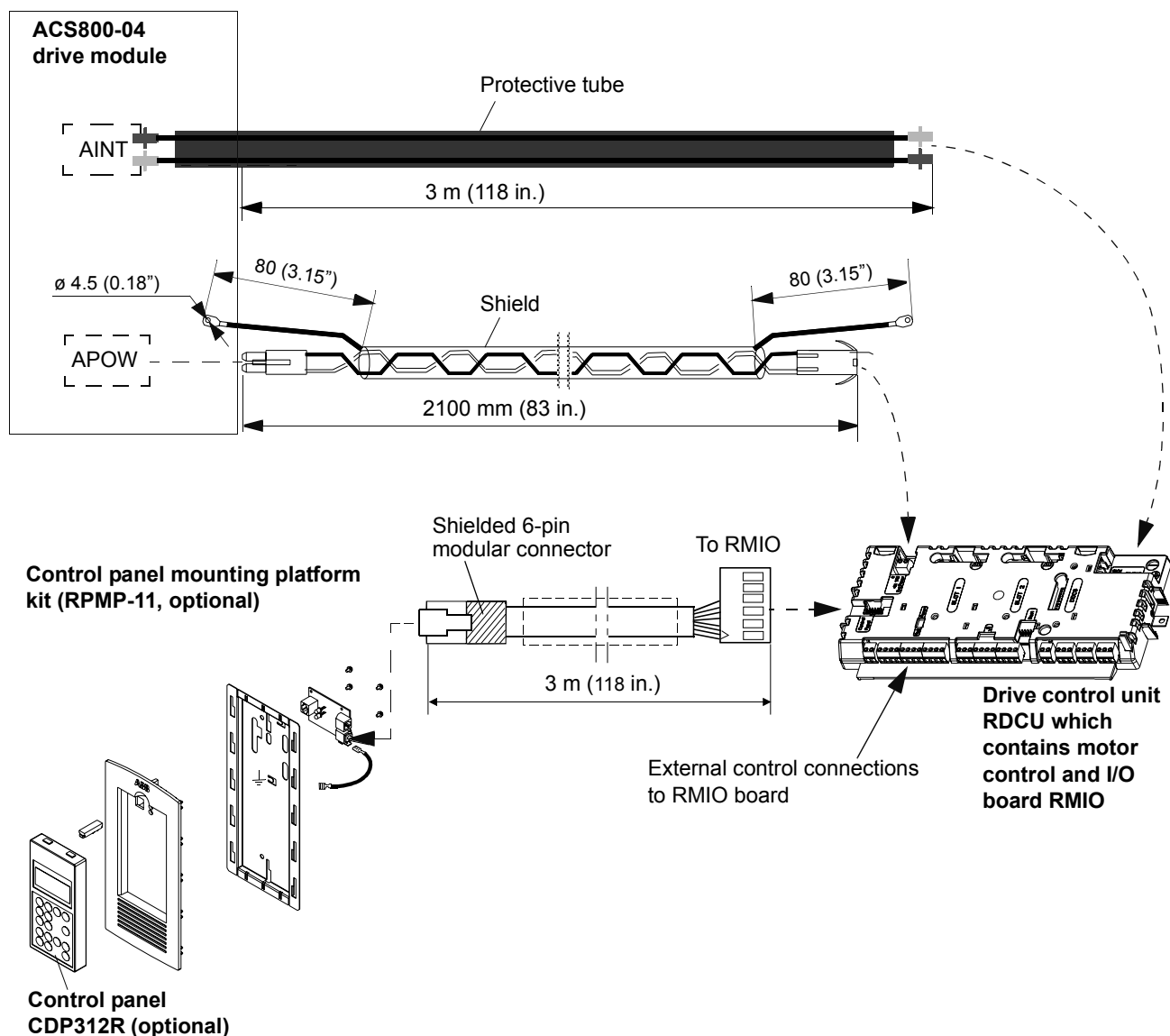
Type code for ACS800-04M non-pre-assembled units (delivered as kits)		
Selection	Alternatives	
Product series	ACS800 product series	
Type	04M	Drive module. When no options are selected: 6-pulse diode input bridge, IP 00, top entry, RDCU drive control unit, Standard Control Program, boards without coating, one set of manuals. No pedestal, no output busbars, no control panel, no EMC filter. Delivered as kits.
Size	Refer to <i>Technical data: IEC ratings in Hardware Manual</i> [3AFE64671006 (English)].	
Voltage range (nominal rating in bold)	2	208/220/ 230 /240 VAC
	3	380/ 400 /415 VAC
	5	380/400/415/440/460/480/ 500 VAC
	7	525/575/600/ 690 VAC
+ options		
Shrouds	B060	<u>Frame size R7</u> : clear plastic shrouds for bottom exit kit (+H352) and input terminals. <u>Frame size R8</u> : clear plastic shrouds for vertical busbars and input terminals in bookshelf mounting (+H354)
Resistor braking	D150	brake chopper
Filter	E202	EMC/RFI filter for first environment TN (grounded) system, restricted (the A limits)
	E210	EMC/RFI filter for second environment TN/IT (grounded/ungrounded) system
	E208	common mode filter
Pedestal and output busbars	H352	bottom exit kit for frame size R7
	H354	pedestal with output on the long side (bookshelf)
	H355	vertical busbars and support brackets for AC output connection
	H356	pedestal (and adapter with +H360) busbar kit for brake resistor and DC connection
	H360	pedestal with output on the short side (flat)
	H362	vertical busbars (and support brackets with +H360) for DC output connection
	H363	busbar kit for DC and brake outputs on different long sides of the pedestal (+H356 required, not available for +H360)
Control panel	J400	control panel including a 3-metre panel connection cable
	J410	RPMP-11 control panel mounting platform kit including a 3-metre panel connection cable but no control panel
	J413	RPMP-21 control panel holder
Fieldbus	K...	Refer to <i>ACS800 Ordering Information</i> (EN code: 64556568).
I/O	L...	
Control program	N...	
Language of manual	R...	
Specialities	P901	coated boards
Safety features	Q950	Prevention of Unexpected Start, 500 mm (19.68 in.) cable outside the drive module in frame size R7, 600 mm (23.62 in.) cable outside the drive module in frame size R8.

Main circuit and control interfaces

This diagram shows the control interfaces and the main circuit of the drive.



Connections of the Drive Control Unit (RDCU) in frame sizes R7 and R8



Operation

This table describes the operation of the main circuit in short.

Component	Description
six-pulse rectifier	converts the three-phase AC voltage to DC voltage
capacitor bank	energy storage which stabilizes the intermediate circuit DC voltage
six-pulse IGBT inverter	converts the DC voltage to AC voltage and vice versa. The motor operation is controlled by switching the IGBTs.

Printed circuit boards

The drive contains the following printed circuit boards as standard:

- main circuit board (AINT)
- motor control and I/O board (RMIO) with a fibre optic link to the AINT board
- input bridge control board (AINP)
- input bridge protection board (AIBP) which includes snubbers for the thyristors and varistors
- power supply board (APOW)
- gate driver control board (AGDR)
- diagnostics and panel interface board (ADPI)
- brake chopper control board (ABRC) with option +D150

Motor control

The motor control is based on the Direct Torque Control (DTC) method. Two phase currents and DC link voltage are measured and used for the control. The third phase current is measured for earth fault protection.

Planning the cabinet installation

What this chapter contains

This chapter guides in planning the installation of a converter module into a user-defined cabinet. The chapter gives free space requirements around the module for cooling, cabinet cooling data and layout examples. The issues discussed are essential for the safe and trouble-free use of the drive system.

Note: The installation must always be designed and made according to applicable local laws and regulations. ABB does not assume any liability whatsoever for any installation which breaches the local laws and/or other regulations.

Cabinet construction

The cabinet frame must be sturdy enough to carry the weight of the drive components, control circuitry and other equipment installed in it.

The cabinet must protect the converter module against contact and meet the requirements for dust and humidity, see chapter *Technical data* in *ACS800-04/04M/U4 Hardware Manual* [3AFE64671006 (English)].

Disposition of the devices

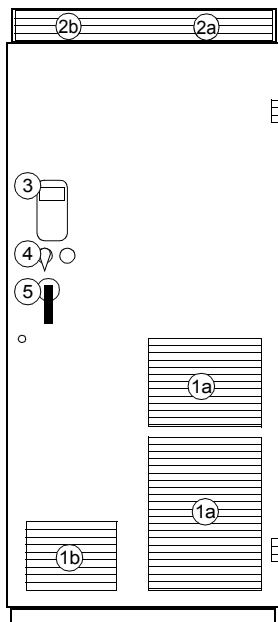
For easy installation and maintenance, a spacious layout is recommended. Sufficient cooling air flow, obligatory clearances, cables and cable support structures all require space.

The control boards must not be installed near main circuits or hot parts.

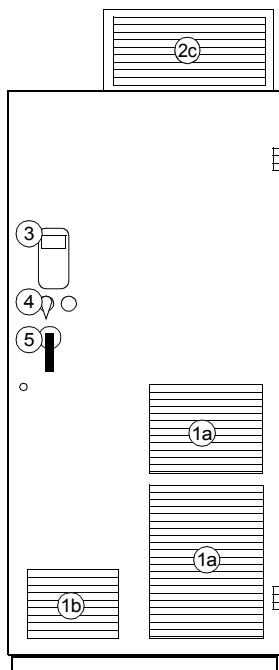
The following sections show a few layout examples. For example layouts in Rittal TS 8 cabinet, refer to *ACS800-04/U4 Rittal TS 8 Cabinet Installation* [3AFE68372330 (English)].

Layout examples, door closed

IP 22

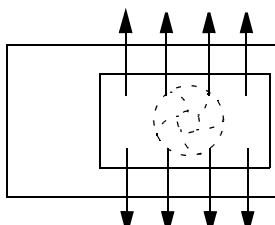
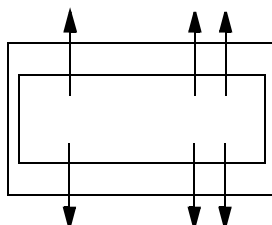


IP 54

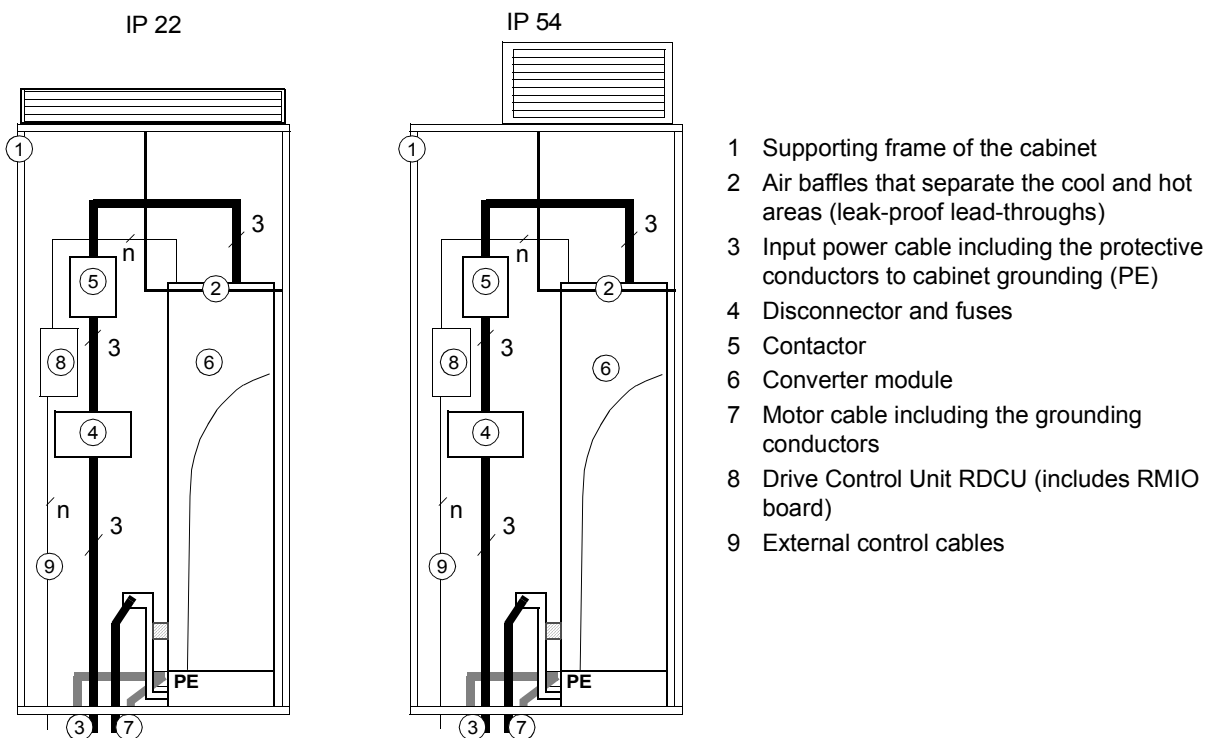


- 1a Air inlet for the converter module
- 1b Air inlet for the other equipment
- 2a Air outlet for the converter module
- 2b Air outlet for the other equipment
- 2c Air outlet for the converter module and the other equipment, an extra exhaust fan
- 3 Converter control panel (connected to the RMIO board in the RDCU unit inside the cabinet)
- 4 Contactor control switch and emergency stop switch (connected to the contactor control circuit inside the cabinet)
- 5 Operating handle of the disconnect

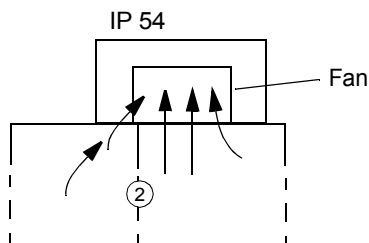
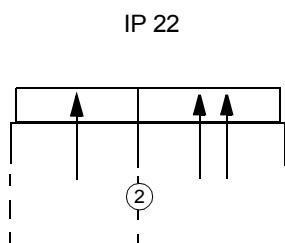
Roof air flow viewed from top



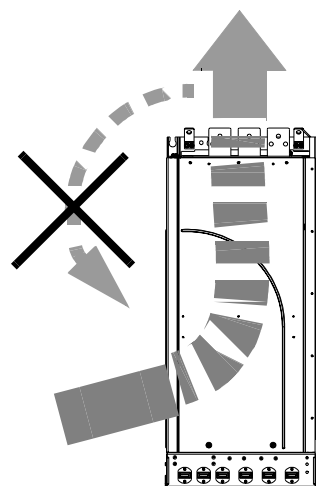
Layout examples, door open



Air flow to the roof



Air flow through the module



See also section *Required free space around the drive module for cooling*.



WARNING! For units without bottom exit kit (+H352), it is not allowed to connect the cables directly to the drive module terminals without the pedestal as the lead-through insulation material is not strong enough to carry the mechanical stress exerted by the cables.

Grounding of mounting structures

Make sure any cross-members or shelves on which components are mounted are properly grounded and the connecting surfaces left unpainted. The drive module will be grounded to the cabinet frame via its fastening screws.

Busbar material and joints

Tin-plated copper is recommended but aluminium can also be used.

Before joining aluminium busbars, remove the oxide layer and apply suitable anti-oxidant joint compound.

Tightening torques

The following table applies to grade 8.8 screws (with or without joint compound).

Screw size	Torque
M5	3.5 N·m (2.6 lbf·ft)
M6	9 N·m (6.6 lbf·ft)
M8	20 N·m (14.8 lbf·ft)
M10	40 N·m (29.5 lbf·ft)
M12	70 N·m (52 lbf·ft)
M16	180 N·m (133 lbf·ft)

Cabinet cooling

The installation site must be sufficiently ventilated.

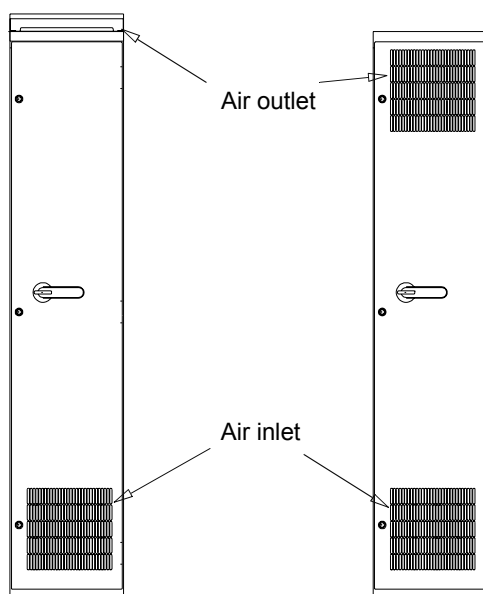
The cabinet must have enough free space for the components to ensure sufficient cooling. Observe the minimum clearances given for each component.

The heat dissipated by cables and other additional equipment must also be ventilated.

The air inlets and outlets must be equipped with gratings that

- guide the air flow
- protect against contact
- prevent water splashes from entering the cabinet.

The drawing below shows two typical cabinet cooling solutions. The air inlet is at the bottom of the cabinet, while the outlet is at the top, either on the upper part of the door or on the roof.



The internal cooling fans of the converter modules and reactors/chokes are usually sufficient to keep the component temperatures low enough in IP 22 cabinets.

In IP 54 cabinets, thick filter mats are used to prevent water splashes from entering the cabinet. This entails the installation of additional cooling equipment, such as a hot air exhaust fan.

Arrange the cooling air flow through the converter module so that the requirements given in chapter *Technical data in ACS800-04/04M/U4 Hardware Manual* [3AFE64671006 (English)] are met:

- cooling air flow
Note: The figures apply to continuous nominal load. If the load is cyclic or less than nominal, less cooling air is required.
- allowed ambient temperature.

See section *Cabinet cooling data* for:

- allowed temperature rise inside the cabinet
- allowed pressure drop over the cabinet that the module fan can overcome
- air inlet and outlet sizes required for the module cooling and recommended filter material (if used).

Cabinet cooling data

IP 22 cabinet with no extra fan

The table below shows the data the IP 22 cabinet should meet to ensure efficient cooling of the converter module. No extra fan is used. The pressure drop over the cabinet is the additional counterpressure that the module fan is capable of overcoming while still maintaining the required air flow through the module.

Frame size	Temp. rise Over module °C	Pressure drop		Cabinet air inlet		Min. cabinet air outlet size* mm
		Over module Pa	Over cabinet Pa	Min. size mm	Filter by Luftfilter	
R7	30	300	30	288×292+688×521	airTex G150	398×312 (2 pcs)
R8	30	300	45	288×292+688×521	airTex G150	398×312 (2 pcs)

00096931

* size when the outlet is located on the cabinet roof

IP 54 cabinet with an extra fan

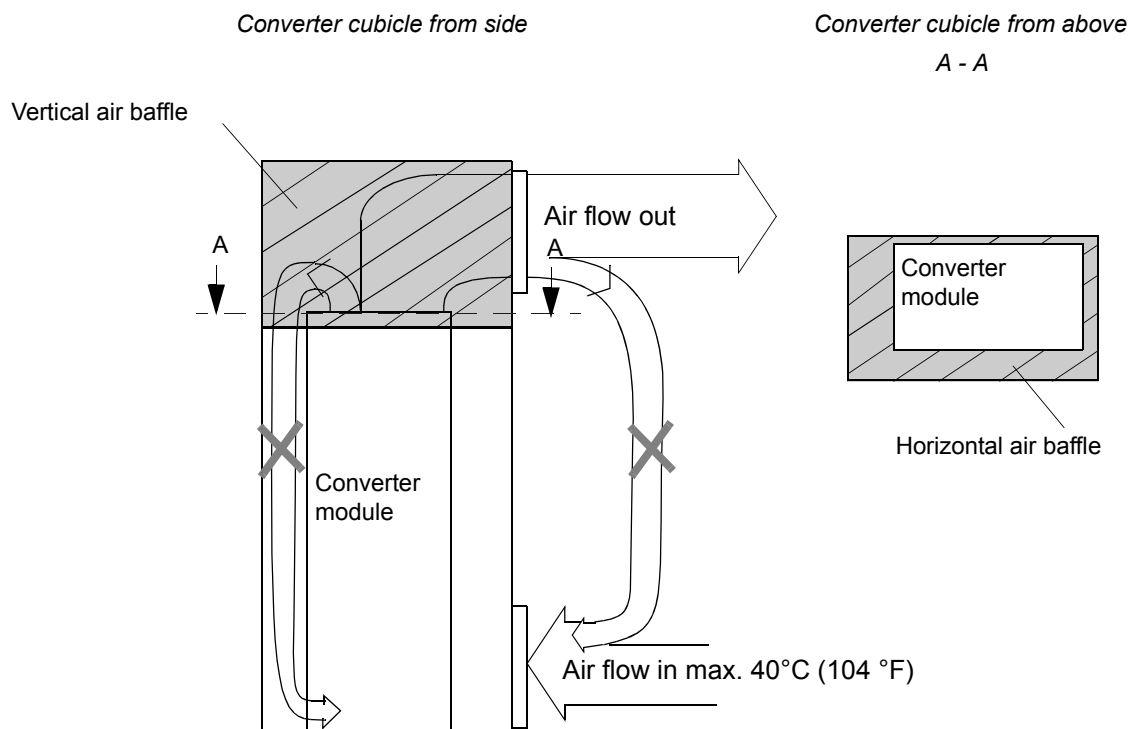
The table below shows the data the IP 54 cabinet should meet to ensure efficient cooling of the converter module. An extra fan is used. The pressure drop over the cabinet is the counterpressure the extra fan must overcome. The given fan types and filter materials are examples. Corresponding products by another manufacturer may be used as well. See the manufacturer's Internet site for the detailed specification.

Frame Size	Temp. rise Over module °C	Pressure drop Over cabinet Pa	Extra fan type	Air inlet and outlet filter by Luftfilter	
				Min. inlet (door) mm	Min. outlet (roof) mm
R7	30	250*	RB2C-225/088 K093 or R2E225-AU64 by ebm	airComp 300-50 288×292 + 688×521	airTex G150 398×312 (2 pcs)
R8	30	250*	RH35M-4EK.2F.1R by Ziehl-Abegg or RB4T- 355/170 by ebm	airComp 300-50 288×292 + 688×521	airTex G150 398×312 (2 pcs)

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* inlet filter 50 % unclean

Preventing the recirculation of hot air



Outside the cabinet

Prevent hot air circulation outside the cabinet by leading the outcoming hot air away from the area where the inlet air to the cabinet is taken. Possible solutions are listed below:

- gratings that guide air flow at the air inlet and outlet
- air inlet and outlet at different sides of the cabinet
- cool air inlet in the lower part of the front door, and an extra exhaust fan on the roof of the cabinet.

Inside the cabinet

Prevent hot air circulation inside the cabinet with e.g. leak-proof air baffles at the positions shown in the diagrams in section *Required free space around the drive module for cooling*. No gaskets are usually required.

Cubicle heaters

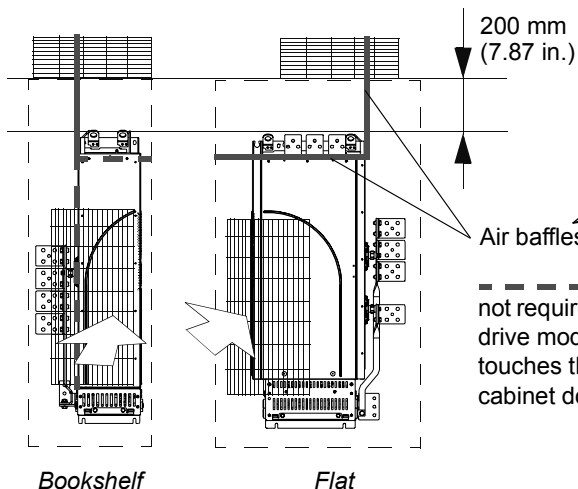
Use a cubicle heater if there is a risk of condensation in the cabinet. Although the primary function of the heater is to keep the air dry, it may also be required for heating at low temperatures. When placing the heater, follow the instructions provided by its manufacturer.

Required free space around the drive module for cooling

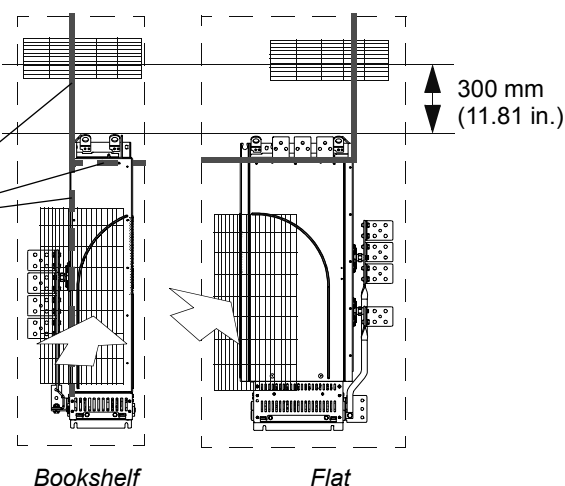
Free space at the top of the drive module

Required free space at the top of the module for frame sizes R7 and R8 is shown below (views of frame size R7). **Note:** Air inlet gratings only at the lower part of the cabinet door are not recommended without an extra fan. The air baffles are examples.

Air outlet on the cabinet roof and high air inlet gratings in the cabinet door

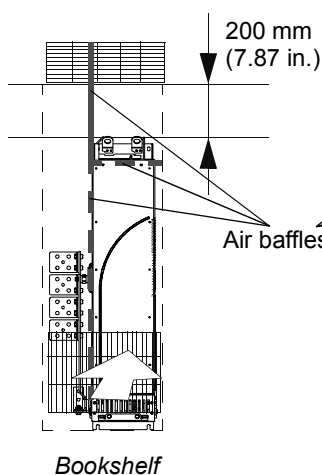


Air outlet and high air inlet gratings in the cabinet door

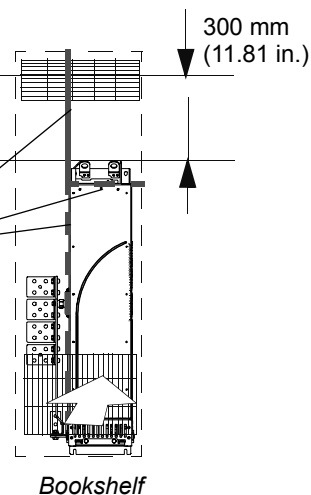


See also pages 31 and 32.

Air outlet on the cabinet roof and low air inlet gratings in the cabinet door



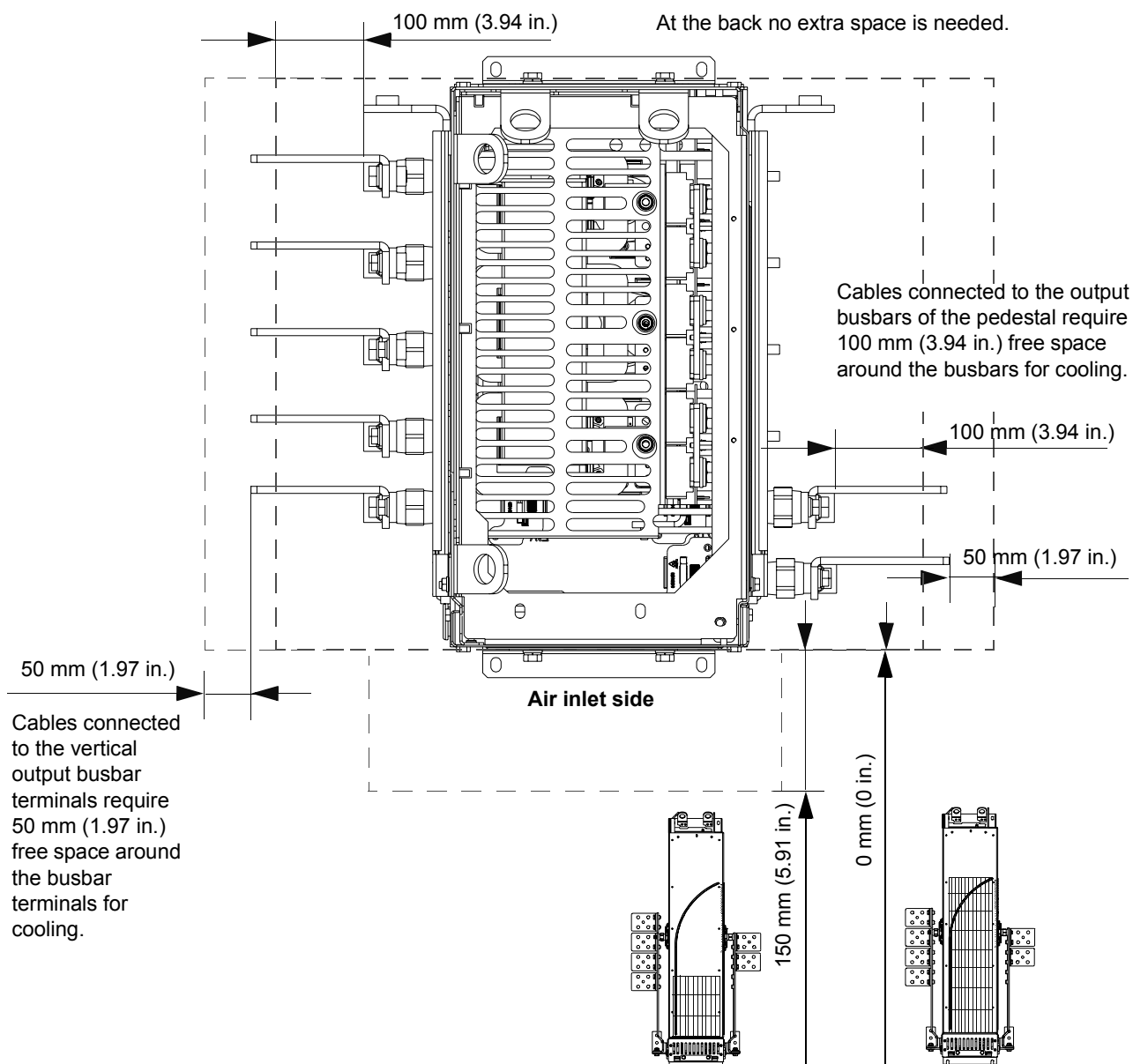
Air outlet and low air inlet gratings in the cabinet door



See also pages 31 and 32.

Free space around units with busbars on the long side (bookshelf mounting +H354)

The figure below shows the required free space in a unit with motor and brake busbars connected to the left-hand side and DC busbars to the right-hand side of the module (+H354+H356+H362+H363). The required free space when no vertical busbars are used is also shown.



The required free space in front of the unit depends on the gratings in the cabinet door:

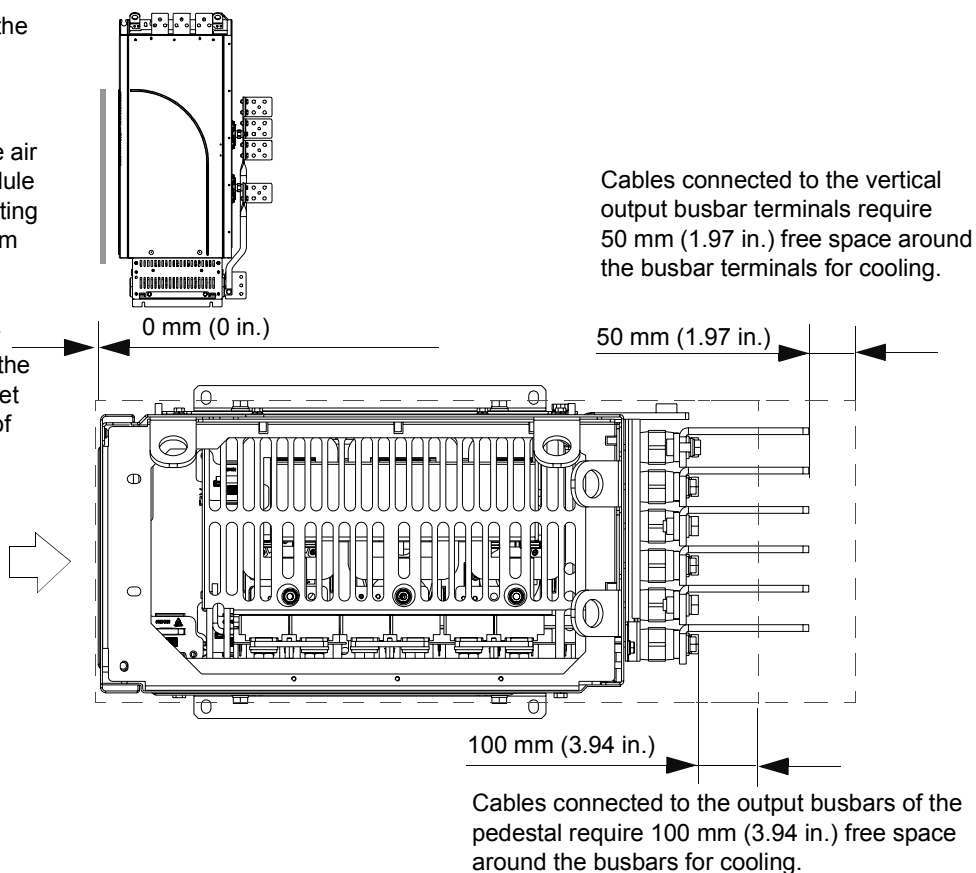
- 0 mm (0 in.) with air inlets as high as the grating in the module [R7: 675 mm (27 in.), R8: 1120 mm (44 in.)]
- 150 mm (5.91 in.) with air inlets at the lower part of the cabinet only.

Free space around units with busbars on the short side (flat mounting +H360)

The required free space at the air inlet side of the drive module:

- 0 mm (0 in.) if cabinet gratings are located at the air inlet side of the drive module and are as high as the grating in the module [R7: 675 mm (27 in.), R8: 1120 mm (44 in.)]
- 150 mm (5.91 in.) with air inlets at the lower part of the cabinet only or with cabinet gratings at the long side of the drive module only.

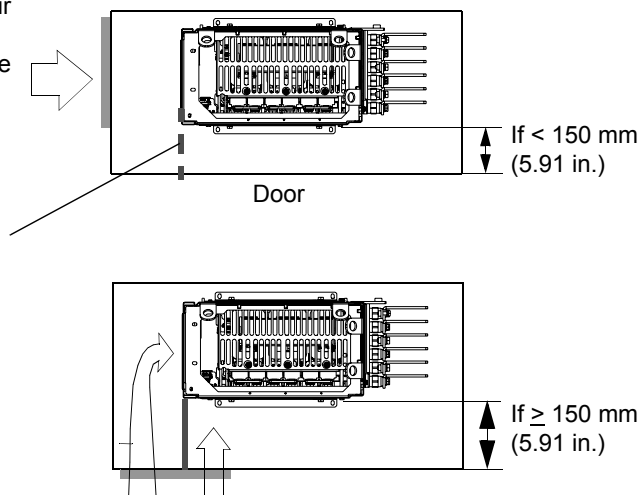
Air inlet side of the drive module



Location of air inlet gratings

Air inlet gratings in the cabinet are recommended at the air inlet side of the drive module if free space in front of the long side of the module is less than 150 mm (5.91 in.). The required area of the gratings is approximately 3 × 300 mm × 300 mm (3 × 11.81 in. × 11.81 in.), the minimum area is given on page 28.

Air baffle. Not needed if the drive module touches the cabinet door or the module air inlet touches the air inlet grating of the cabinet.

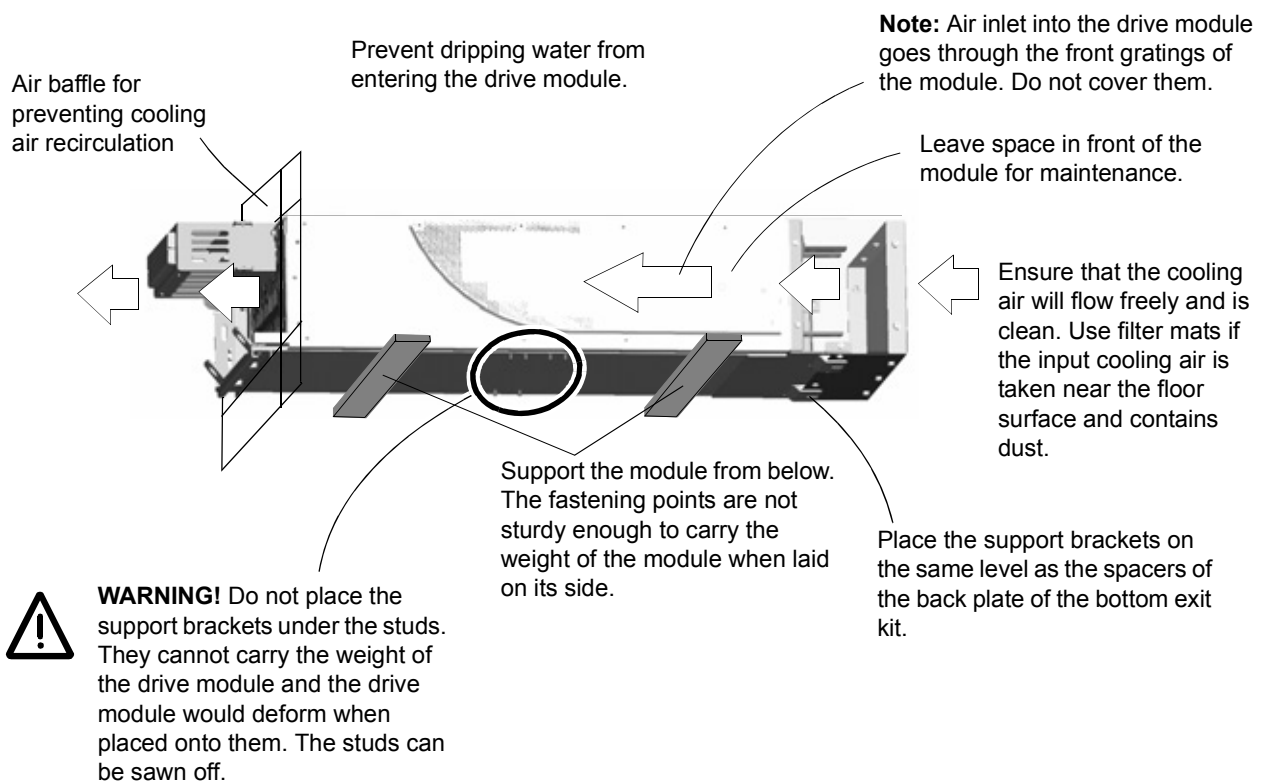


Required area of air inlet gratings is approximately 3 × 300 mm × 300 mm (3 × 11.81 in. × 11.81 in.)

When the drive module is installed in another position than vertically

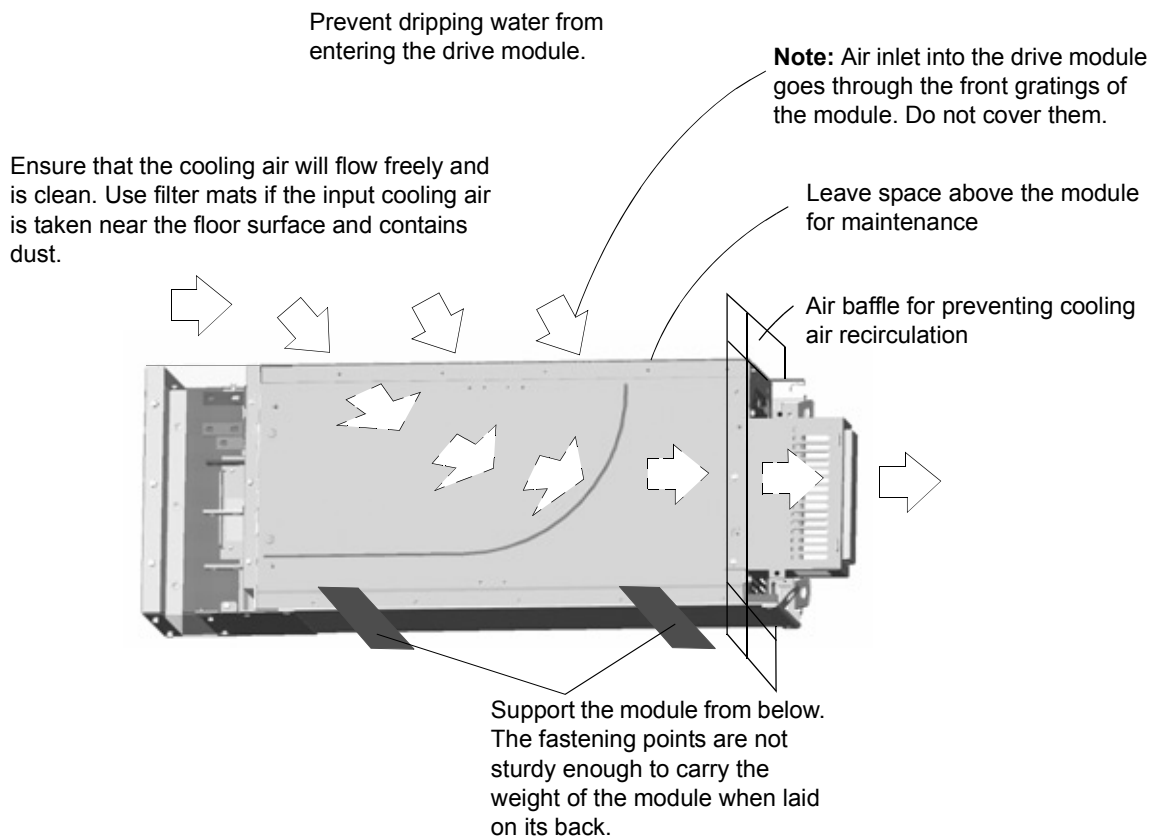
- Fasten the drive module by the fastening points.
- Lay support brackets below the module to carry the module weight.
- Ensure that hot air flows freely out of the cabinet and does not build up pressure.
- Reserve enough space for the cabling.
- In case of a short-circuit inside the drive module, hot ionized gases may escape sideways/upwards from the module through its ventilation holes. Ensure that the cabinet is constructed so that this will not cause any danger.
- The outlet cooling air is 25...30 °C (77...86 °F) hotter than the inlet air and flows sideways. Ensure that this does not cause danger.
- Ensure that the front panel, and preferably also the profiled side panel, can be removed and the cooling fan and capacitor pack changed.
- Ensure that the module can be changed, e.g. by sliding out of the cabinet on rails.

Drive module of frame size R7 on its side



64796003_bottom_exit_copy<64796003>.asm

Drive module of frame size R7 on its back



64796003_bottom_exit_copy<64796003>.asm

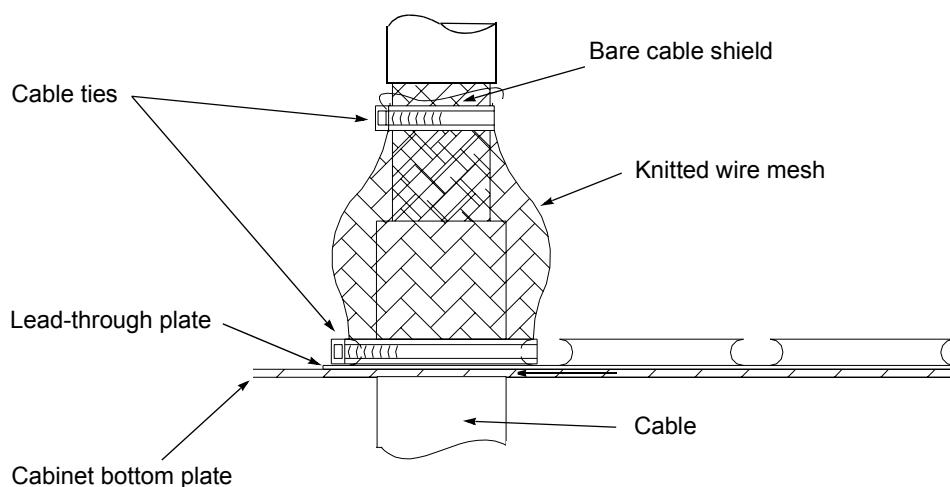
EMC requirements

Generally, the fewer and smaller the holes in the cabinet, the better the interference attenuation. The maximum recommended diameter of a hole in galvanic metal contact in the covering cabinet structure is 100 mm. Special attention must be paid to the cooling air inlet and outlet gratings.

The best galvanic connection between the steel panels is achieved by welding them together as no holes are necessary. If welding is not possible, the seams between the panels **are recommended to be left unpainted** and equipped with special conductive EMC strips to provide adequate galvanic connection. Usually, reliable strips are made of flexible silicon mass covered with a metal mesh. The non-tightened touch-contact of the metal surfaces is not sufficient, so a conductive gasket between the surfaces is required. The maximum recommended distance between assembly screws is 100 mm.

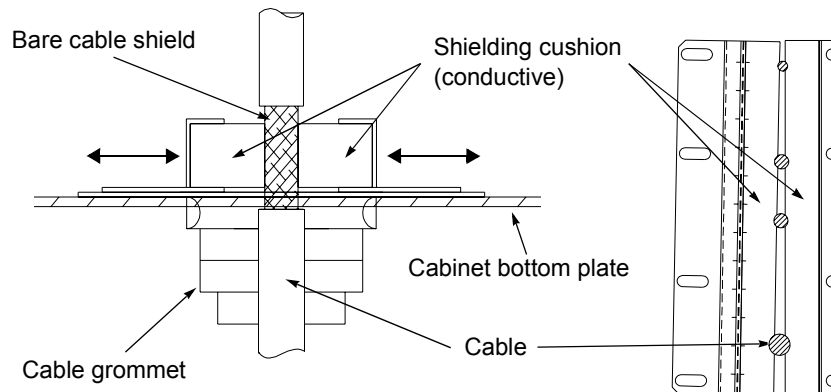
Sufficient high-frequency grounding network must be constructed in the cabinet to avoid voltage differences and forming of high-impedance radiator structures. A good high-frequency grounding is made with short flat copper braids for low inductance. One-point high-frequency grounding cannot be used due to the long distances inside the cabinet.

First environment EMC compliance ^{*)} of the drive requires 360° high frequency grounding of the motor cable shields at their entries. The grounding can be implemented by a knitted wire mesh screening as shown below.

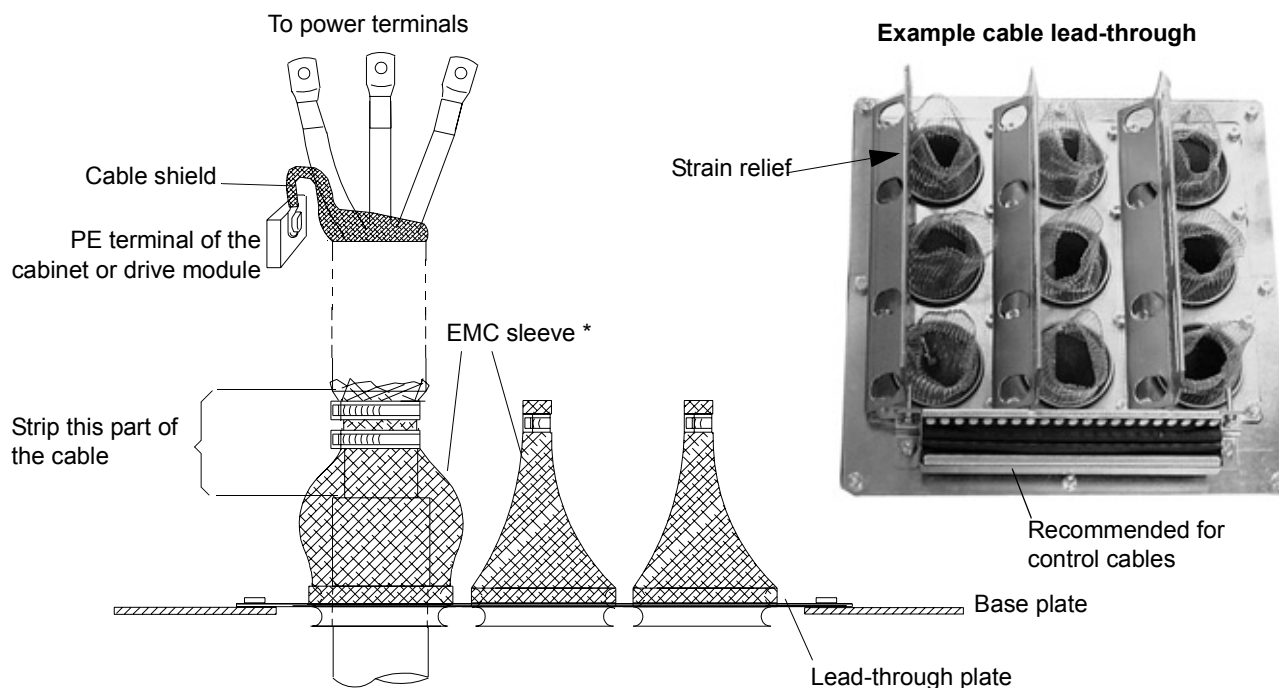


^{*)} First environment EMC compliance is defined in chapter *Technical data / CE marking* in ACS800-04/04M/U4 Hardware Manual [64671006 (English)].

360° high frequency grounding of the control cable shields is recommended at their entries. The shields can be grounded by means of conductive shielding cushions pressed against the cable shield from both directions:



Grounding of cable shields



* required for motor cables in first environment installations. First environment EMC compliance is defined in chapter *Technical data / CE marking* in *ACS800-04/04M/U4 Hardware Manual* [64671006 (English)].

Installing the Drive Control Unit (RDCU)

See *RDCU Drive Control Unit Hardware Manual* [3AFE64636324 (English)].

Fastening of the control panel (CDP312R)

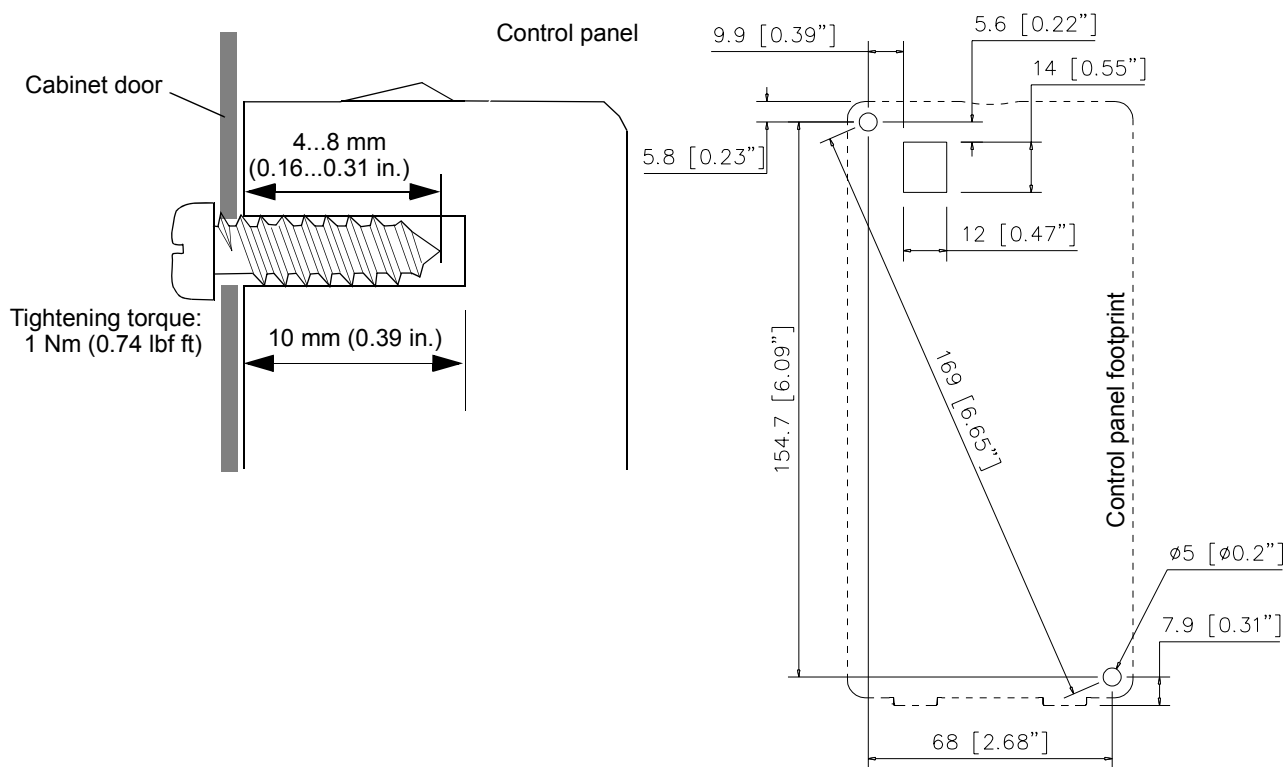
The control panel can be fastened directly to the cabinet door, or a mounting platform or control panel holder (+J413) can be used.

Installing the control panel directly on the cabinet door

Fasten the control panel from the back side with two screws of one of the following types:

- standard screw with nominal diameter of 4 mm (0.16 in.)
- tapping screw with nominal diameter of 4.2 mm (0.17 in.) DIN 7981 C, DIN 7982 C, DIN 7983 C or DIN 7976 C
- PT screw for thermoplastics with nominal diameter of 4 mm (0.16 in.).

View from outside the cabinet door

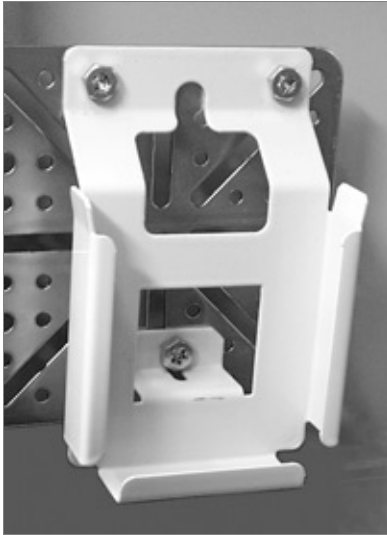


Control Panel Mounting Platform RPMP-11/13 (+J410)

For installation of the mounting platform, see *RPMP-11/13 Control Panel Mounting Platform Kit Installation Guide* [3AFE68400643 (English)].

Control Panel Holder RPMP-21 (+J413)

Fasten the control panel holder to the cabinet frame or wall with three screws. Do not fasten the panel holder to the drive module.



Mechanical installation of pre-assembled units (ACS800-04/U4)

What this chapter contains

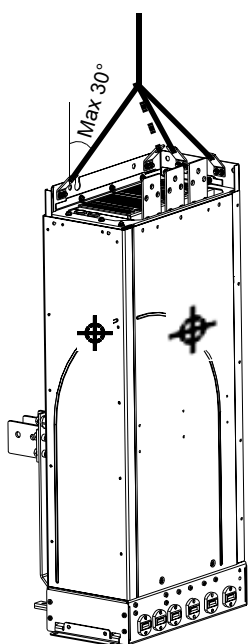
This chapter describes how to install a pre-assembled drive module into a cabinet. First, before-installation information is given, such as required tools, moving the unit and checking the delivery. Then, the mechanical installation procedure is described.

Moving and unpacking the unit

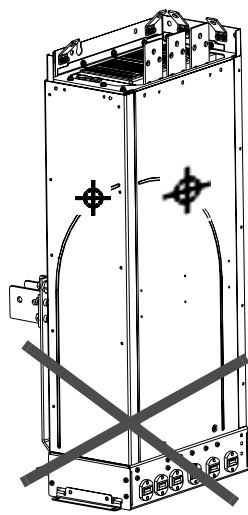


WARNING! The drive is heavy [frame size R7: 100 kg (220 lb), frame size R8: 200 kg (441 lb)]. Lift the drive by the upper part only using the lifting lugs attached to the top of the unit. The lower part will be deformed from lifting. Do not remove the pedestal before lifting.

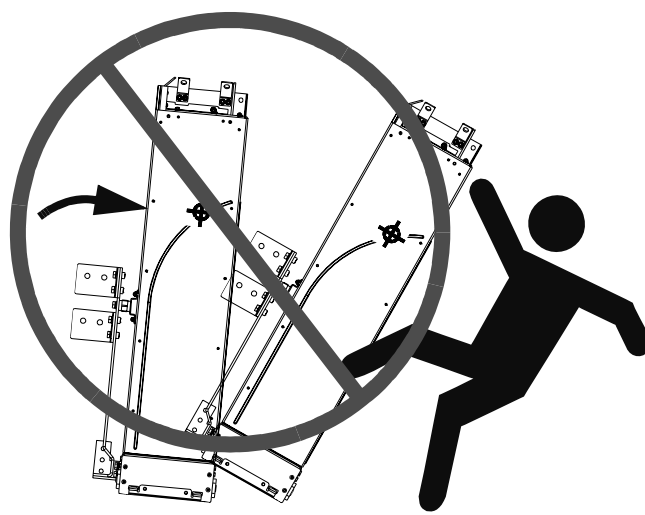
Do not tilt the drive. **The centre of gravity of the unit is high.** The unit will overturn from a tilt of about 6 degrees. **An overturning unit can cause physical injury.**



Views of frame size R7



Do not lift by the lower part of the frame.

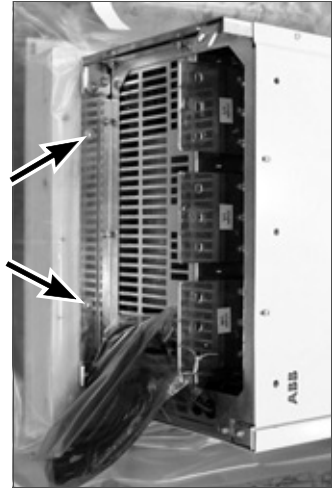


Do not tilt!

Move the transport package by pallet truck to the installation site. Unpack the package as shown below.



Undo the fastening screws.



The following items are located below the drive module:

Drive Control Unit (RDCU)

Note: Optional modules (if ordered) are factory installed onto the RMIO board in the RDCU unit. The fibre optic cables and power supply cable to be connected to the RMIO board are coiled on the top of the drive module.

Base and wall fastening brackets, terminals for output cable connection and PE grounding. Screws are included in a plastic bag.

Manuals (hardware, appropriate firmware, optional module), delivery documents, residual voltage warning stickers



Control panel with a 3 m (98 in.) cable and RPMP control panel mounting kit (if ordered)

The following items are fastened to the drive module:

- pedestal
- output busbars U2, V2 and W2
- busbars for brake resistor connection if brake chopper is included.
- DC busbars if ordered

Delivery check

Check that there are no signs of damage. Before attempting installation and operation, check the information on the type designation label of the drive to verify that the unit is of the correct type.

Required tools

- set of screw drivers
- torque wrench with a 500 mm (20 in.) or 2 × 250 mm (2 × 10 in.) long extension bar
- 19 mm (3/4 in.) socket
for frame size R7: 13 mm (1/2 in.) magnetic-end socket
for frame size R8: 17 mm (11/16 in.) magnetic-end socket.

Installation procedure

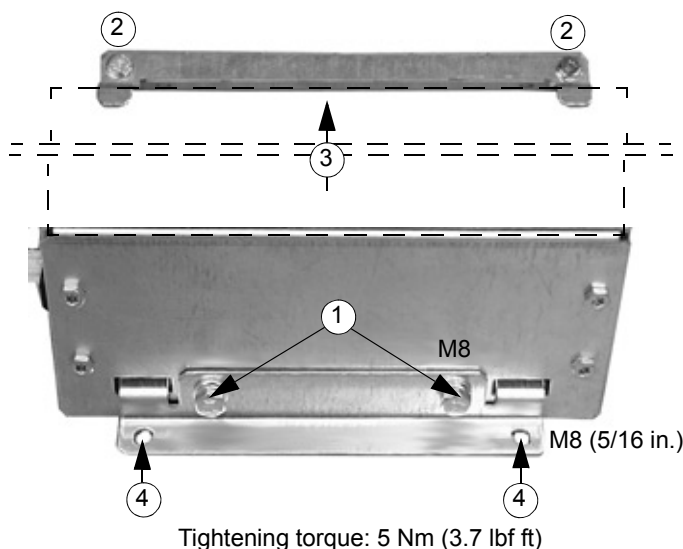
Fasten the module to the cabinet

Fasten the module to the base of the cabinet with the outside fastening brackets as described below. For instructions in alternative fastening methods, refer to *Mechanical installation of non-pre-assembled units (ACS800-04M)*.

It is recommended to fasten the module also from the fastening points at the top of the unit. Refer to *Dimensional drawings* for the horizontal and vertical fastening points.

Clamping the pedestal with the outside brackets

1. Fasten the front bracket to the pedestal with two screws.
2. Fasten the back fastening bracket onto the cabinet floor with two screws.
3. Place the pedestal on the cabinet floor and push it so that the tabs of the fastening bracket enter the slots in the pedestal.
4. Fasten the front bracket to the base with two screws.



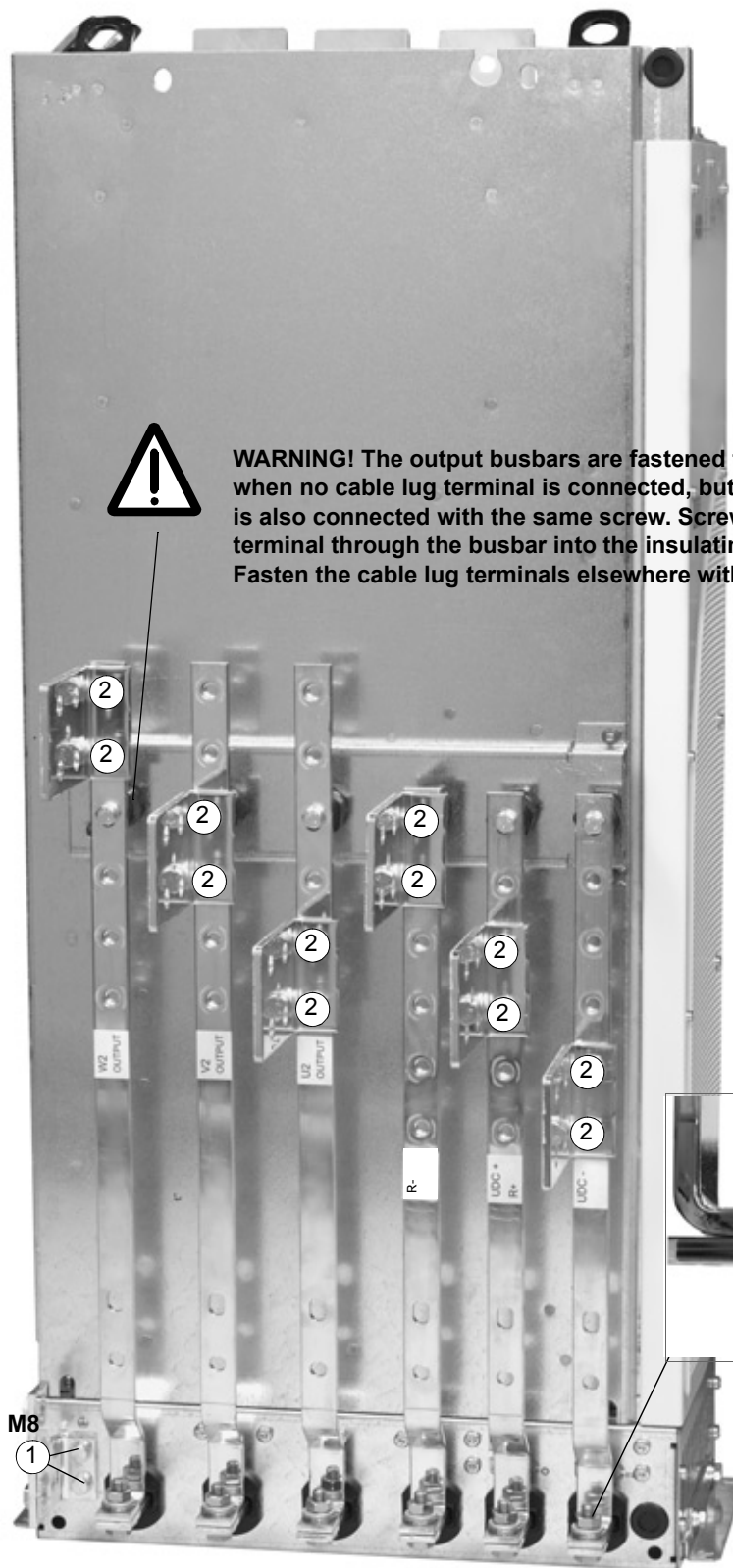
Note: Place the module on a solid base. The fastening brackets are not strong enough to carry the weight of the module on their own.

Fasten the terminals to the busbars

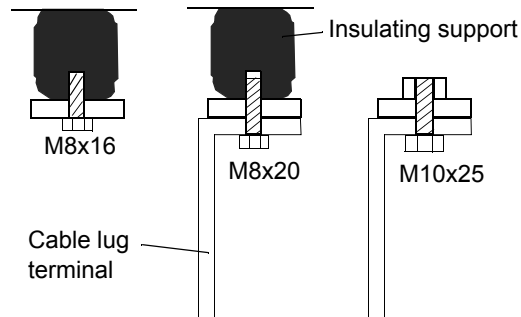
1. Connect the PE terminal to the long side plate of the pedestal with screws.
2. Connect the output cable terminals to the busbars with screws.

Note 1: The output cable terminals and PE terminal need not necessarily be used. The output cables can be also connected directly to the vertical output busbar holes with cable lugs. The PE conductors can be connected to the PE terminal screws. Busbars for output cables can be connected to the pedestal busbars.

View of output busbar connections of frame size R7 (DC and brake busbars included)



Top view of insulating support and cable lug terminal connections

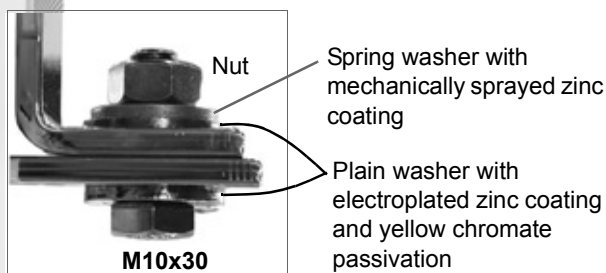


WARNING! The output busbars are fastened to the insulating supports with **M8x16** screws when no cable lug terminal is connected, but with **M8x20** screws when a cable lug terminal is also connected with the same screw. Screwing an **M8x20** screw without a cable lug terminal through the busbar into the insulating support will break the insulating support. Fasten the cable lug terminals elsewhere with **M10x25** screws.

Tightening torques

M8: 15...22 Nm (3.7 lbf ft)

M10: 30...44 Nm (22...32 lbf ft)

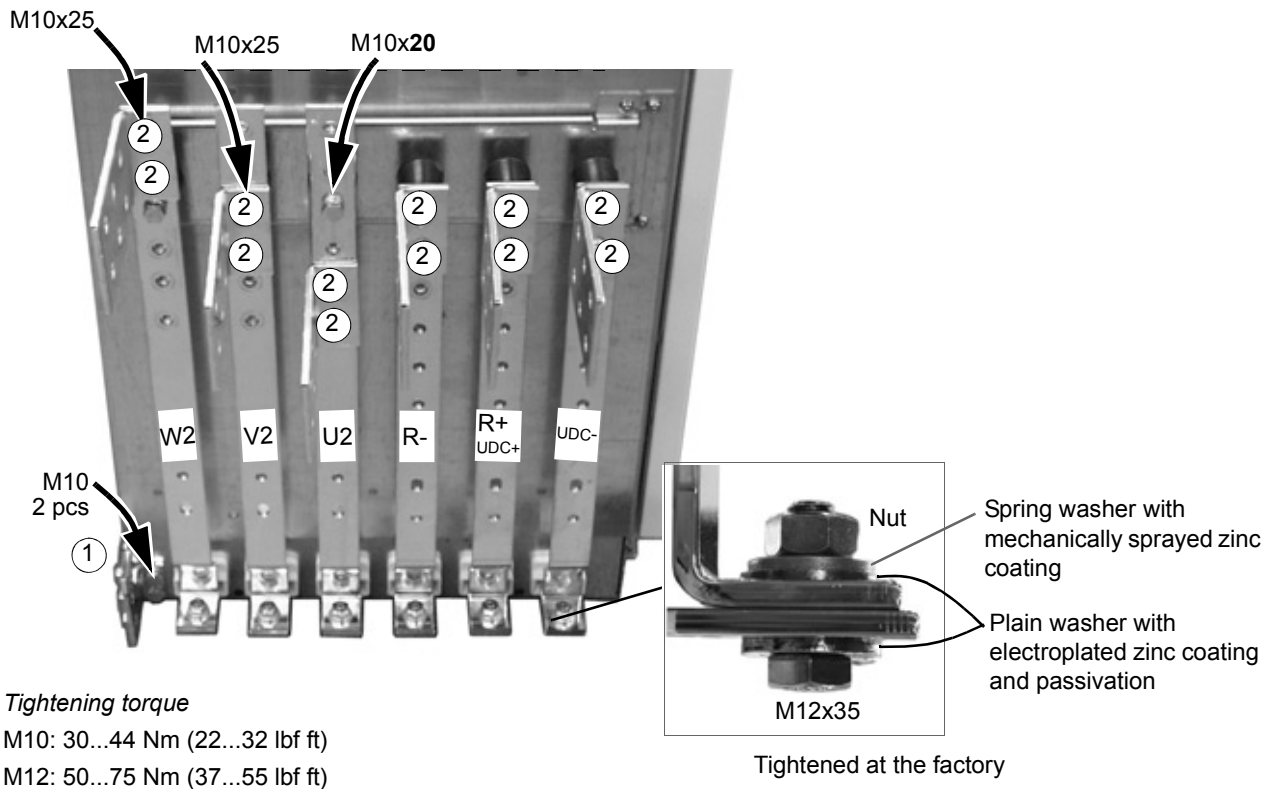


Tightened at the factory

View of output busbar connections of frame size R8 (DC and brake busbars included)



WARNING! Fasten the output busbars to the insulating supports with M10x20 screws when no cable lug terminal is connected, but with M10x25 screws when a cable lug terminal is connected as well. Screwing an M10x25 screw without a cable lug terminal through the busbar into the insulating support will break the insulating support.



User connections of Prevention of Unexpected Start (+Q950)

See pages 72 and 97.

Mechanical installation of non-pre-assembled units (ACS800-04M)

What this chapter contains

This chapter describes how to assemble the drive from the assembly kits. First, before-installation information is given, such as required tools, moving the unit and checking the delivery. Then, the working order of the mechanical installation is described. Thereafter, particular assembling instructions follow.

How to read this chapter

Units with bottom exit

1. Read sections *Required tools and tightening torques* and *Moving and unpacking the unit*.
2. Go to section *Frame size R7 units with bottom exit (+H352)* on page 49.

Units with pedestal and busbars on the long side (+H354, bookshelf mounting)

1. Read sections *Required tools and tightening torques* and *Moving and unpacking the unit*.
2. Identify your unit by its type code with the help of section *Units with pedestal and busbars on the long side (+H354, bookshelf mounting)* on page 57.
3. Choose the applying instructions in section *Assembling procedure for units with busbars on the long side (+H354)* on page 73.

Units with pedestal and busbars on the short side (+H360, flat mounting)

1. Read sections *Required tools and tightening torques* and *Moving and unpacking the unit*.
2. Identify your unit by its type code with the help of section *Units with pedestal and busbars on the short side (+H360, flat mounting)* on page 91.
3. Choose the applying instructions in section *Assembling procedure for units with busbars on the short side (+H360)* on page 104.

Required tools and tightening torques

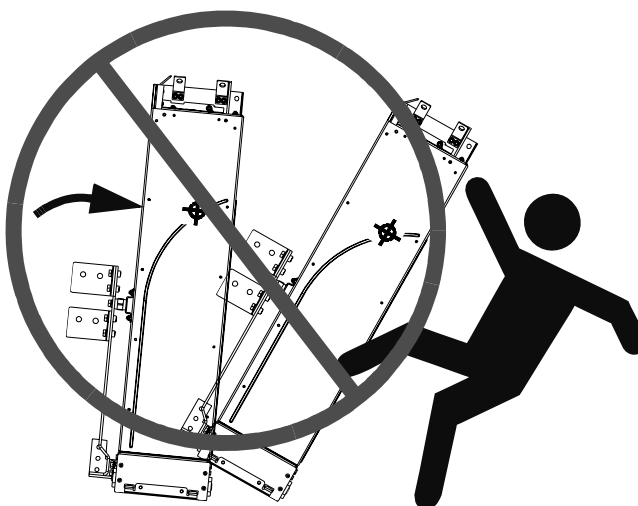
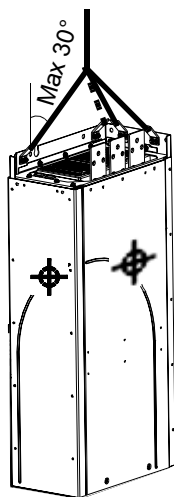
- set of screw drivers
- torque wrench with a 500 mm (20 in.) or 2 x 250 mm (2 x 10 in.) long extension bar
- 19 mm (3/4 in.) socket
for frame size R7: 13 mm (1/2 in.) magnetic-end socket
for frame size R8: 17 mm (11/16 in.) magnetic-end socket.

Screw	Grade	Tool		Tightening torque	
		mm	in.	Nm	lbf ft
M4	8.8	7		2	1.46
M5	8.8	8		4	
M6	8.8	10		6...9	3.7
M8	8.8	13	5/16	15...22	3.7
M10	8.8	17	3/8	30...44	22...32
M12	8.8	19	1/2	50...75	37...55

Moving and unpacking the unit



WARNING! The drive is heavy [frame size R7: 100 kg (220 lb), frame size R8: 200 kg (441 lb)]. Lift the drive using the lifting lugs attached to the top of the unit. Do not tilt the drive. **The centre of gravity of the unit is high.** The unit will overturn from a tilt of about 6 degrees. **An overturning unit can cause physical injury.**



Do not tilt!

The module is delivered in a two-level package. Unpack the package as shown below.



Move the transport package by pallet truck to the installation site. Lift up the top cover. The following items are located in the upper package (1):

- pedestal
- output busbars U2, V2 and W2
- supports, screws and terminals for the output busbars and PE grounding
- fastening brackets for base and wall mounting
- busbars for brake resistor connection (if brake chopper is ordered)
- adapter (if output busbars on the short side of the module)
- DC busbars (if ordered)
- control panel and a 3 m (98 in.) cable (if ordered)
- control panel mounting platform (if ordered).



In the lower package (2):

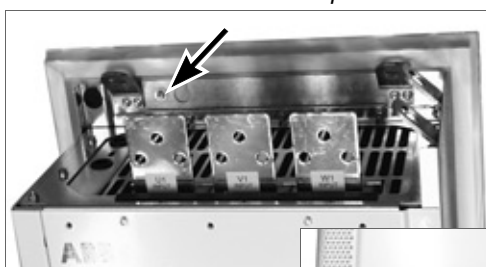
- drive module.

Below the drive module (3):

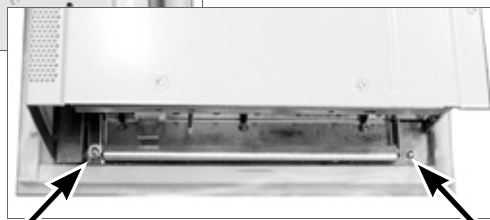
- **Drive Control Unit (RDCU).** **Note:** The fibre optic cables and power supply cable to be connected to the RMIO board inside the RDCU unit are wound on the top of the drive module.
- optional modules (if ordered) factory installed onto the RMIO board in the RDCU unit
- residual voltage warning and output busbar stickers
- hardware manual
- appropriate firmware manuals and guides
- delivery documents
- optional module manuals.



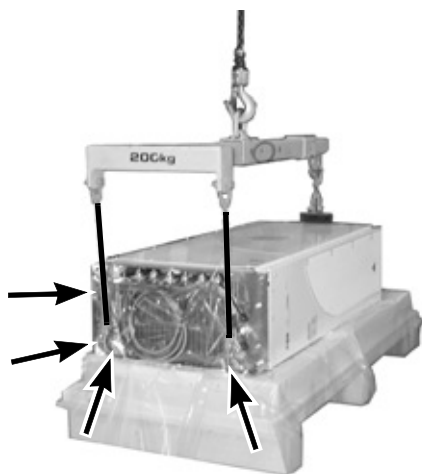
Top view



Bottom view



Undo the fastening screws.




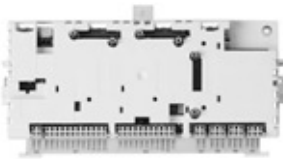
Fasten the lifting hooks to the lifting lugs of the drive module. A hook can be fastened to the base bracket also. Use at least three fastening points because the module is turns over easily.

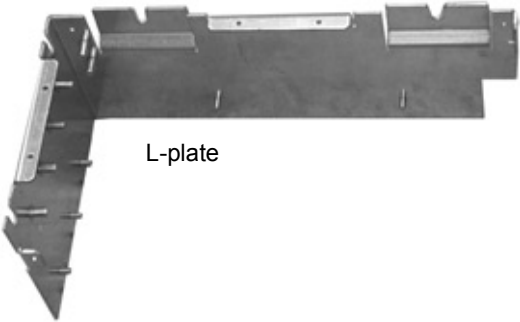


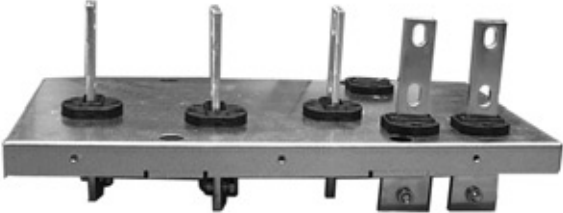
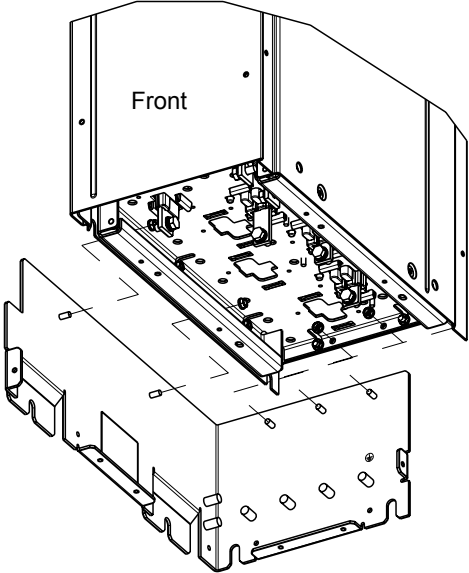
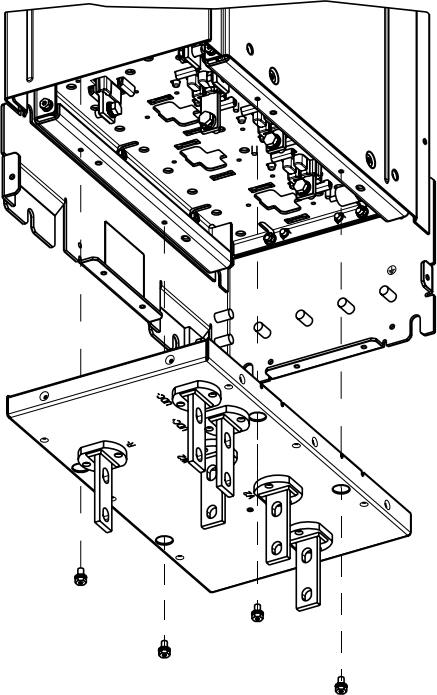


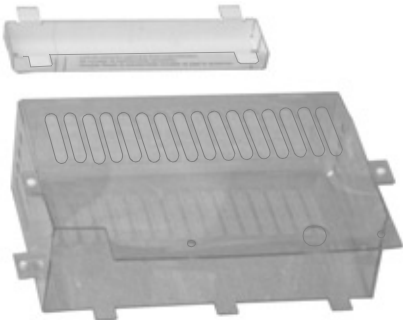
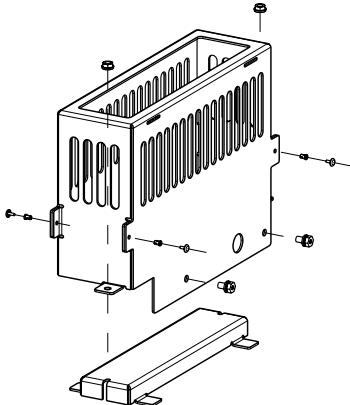

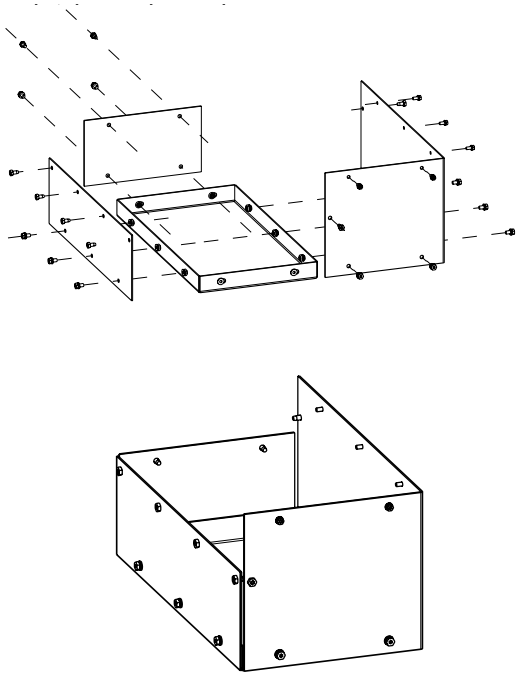
Frame size R7 units with bottom exit (+H352)

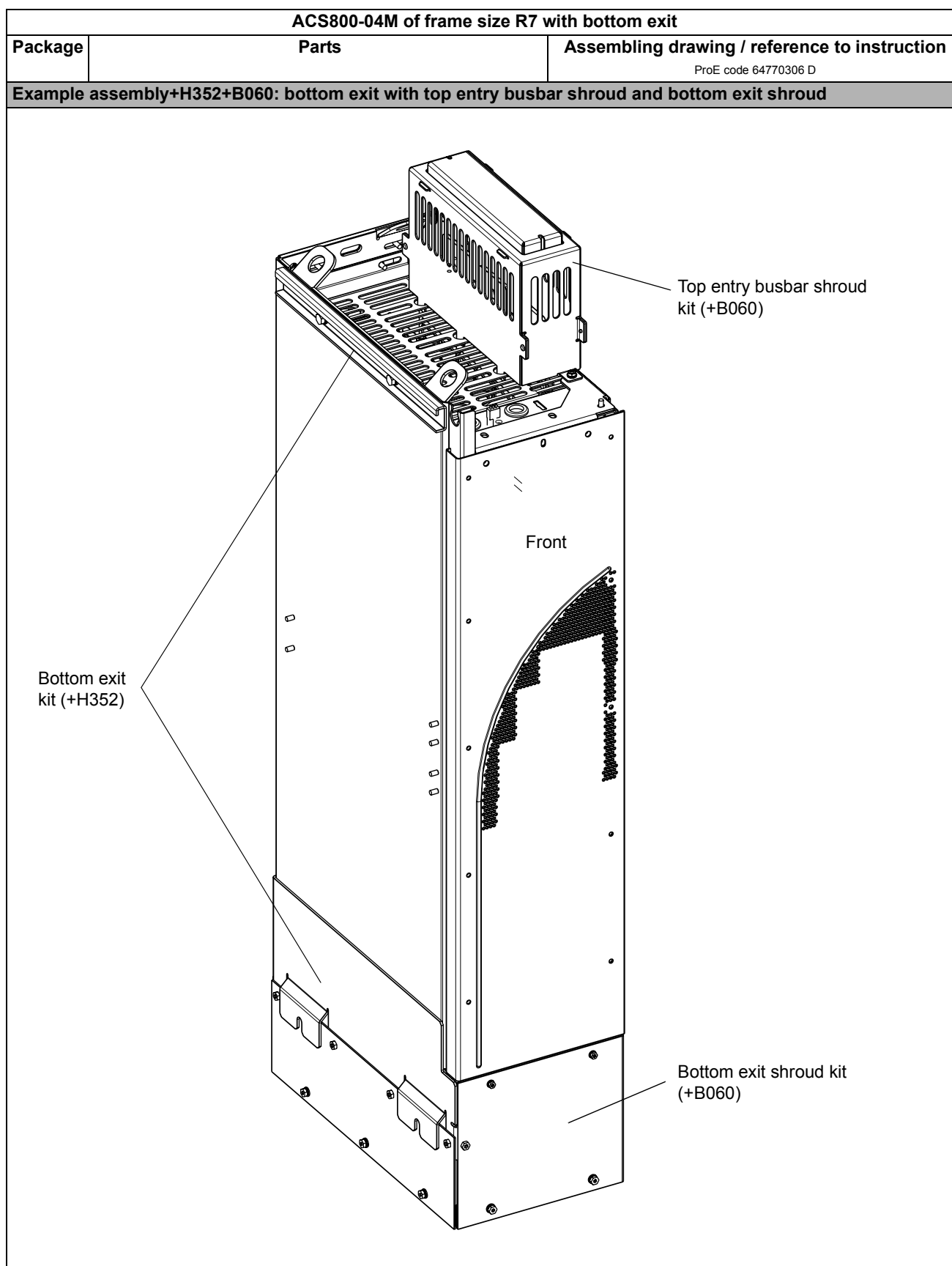
Delivery check

Check that there are no signs of damage. Before attempting installation and operation, check the information on the type designation label of the drive to verify that the unit is of the correct type.

ACS800-04M of frame size R7 with bottom exit		
Package	Parts	Assembling drawing / reference to instruction ProE code 64770306 D
Basic unit (type code ACS800-0M4-XXXX-X+H352)		
	 <p>Drive module</p>	Refer to section <i>Assembling procedure</i> on page 53.
Drive control unit (RDCU)	 <p>RDCU drive control unit</p>	See <i>RDCU Drive Control Unit Hardware Manual</i> [3AFE64636324 (English)].

ACS800-04M of frame size R7 with bottom exit		
Package	Parts	Assembling drawing / reference to instruction
	68324963	ProE code 64770306 D
Bottom exit kit R7 +H352	<div><p>L-plate</p></div> <div><p>Spacers for wall mounting</p></div> <div><p>R-busbar with fastening pin</p></div> <div><p>Bottom plate</p></div>	<div><p>Front</p></div> <div></div>

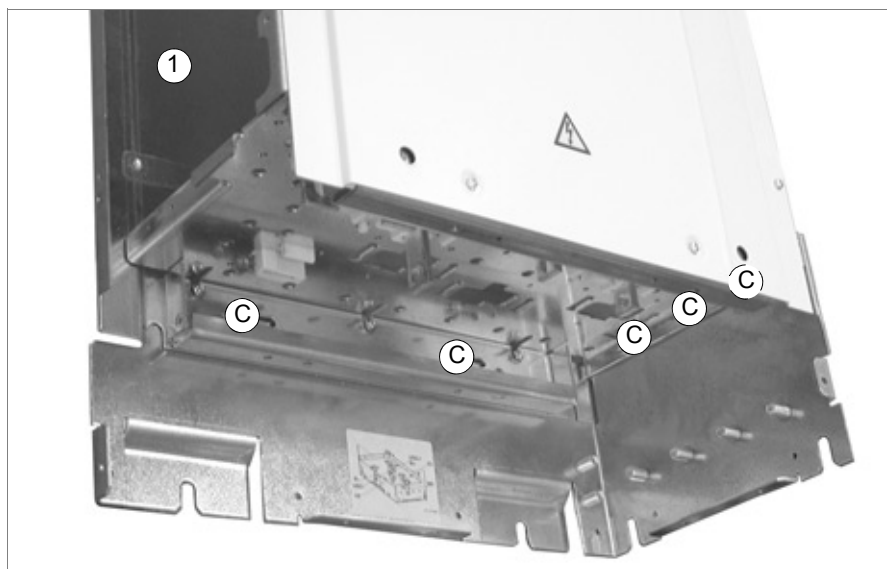
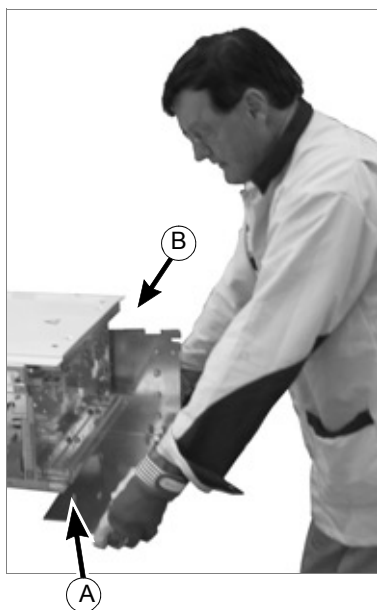
ACS800-04M of frame size R7 with bottom exit		
Package	Parts	Assembling drawing / reference to instruction ProE code 64770306 D
Optional selection +H352+B060: top entry busbar shroud and bottom exit shroud		
Top entry busbar shroud kit R7 +B060	<p>68363977</p> 	
Bottom exit shroud kit R7 +B060	<p>68339545</p>  <p>Screws</p>	



Assembling procedure

Assemble the units with bottom exit (+H352) as follows:

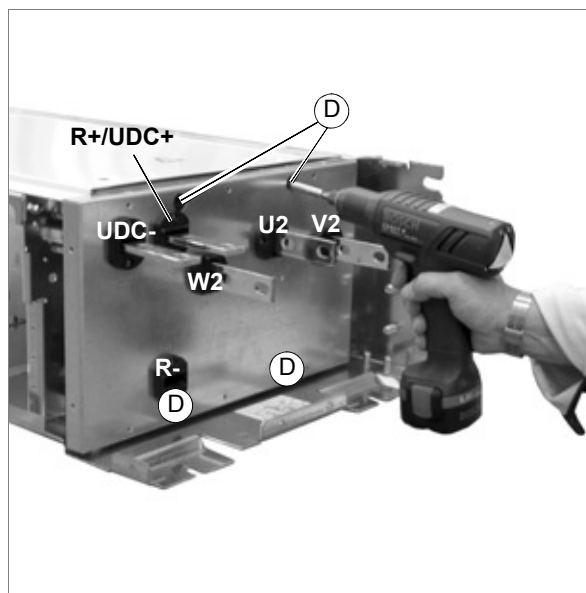
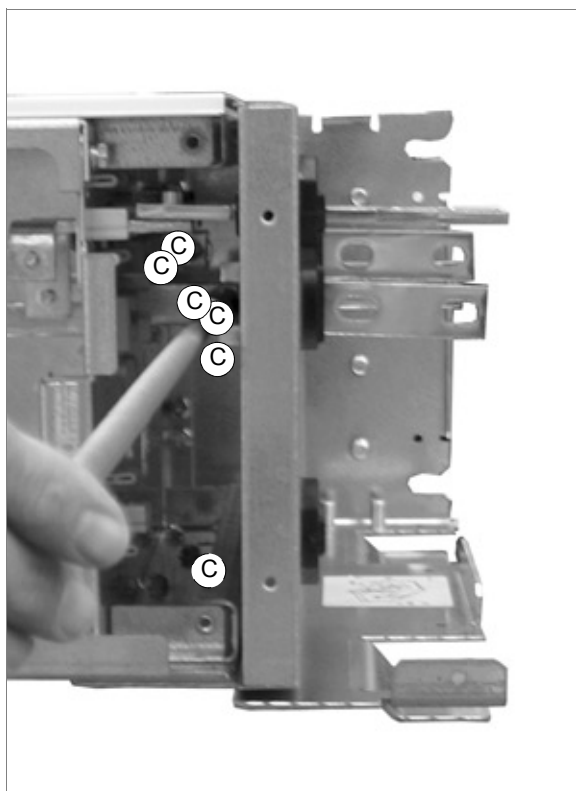
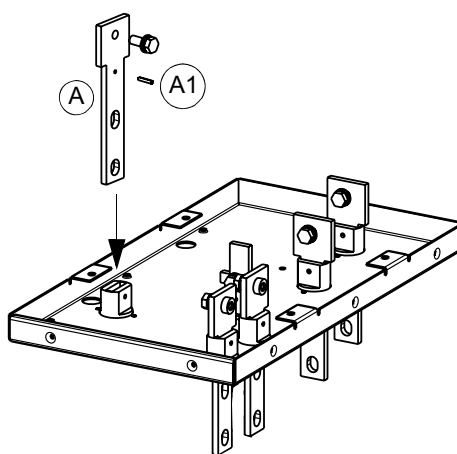
1. Remove the front cover of the drive module.
2. Fasten the L-plate to the base of the module.
 - A. Insert the two pins of the longer side of the L-plate to the counter holes in the side plate of the drive module.
 - B. Slide the L-plate horizontally to match the three pins in its shorter side with the counter holes in the drive module.
 - C. Fasten the L-plate with 5 screws.



3. Fasten the bottom plate to the base of the drive module.



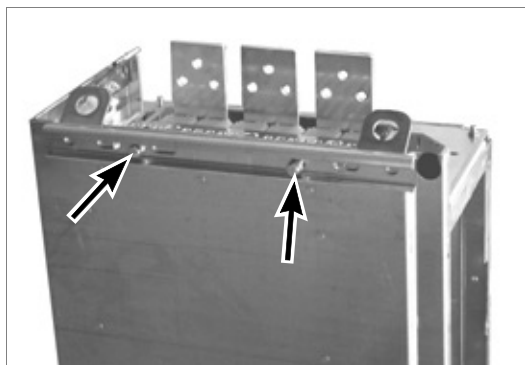
- A. With brake chopper option (+D150), fasten R- busbar to the bottom plate with pin A1.
- B. Insert the bottom plate onto its place.
- C. Connect the busbars of the bottom plate to the busbars of the drive module with M8x25 combi screws using a torque wrench with an extension bar. Tightening torque: 15...22 Nm (11...16 lbf ft).
- D. Fasten the bottom plate to the drive module with four M6 screws. Tightening torque: 6...9 Nm (3.7 lbf ft).



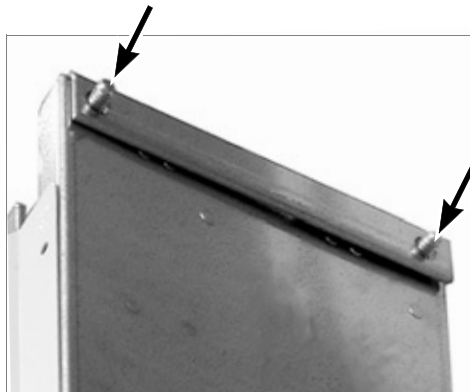
4. Fasten the front cover.

Fastening the spacer

Fasten the the drive module to the cabinet or wall using a spacer at the top of the module on the fastening side.



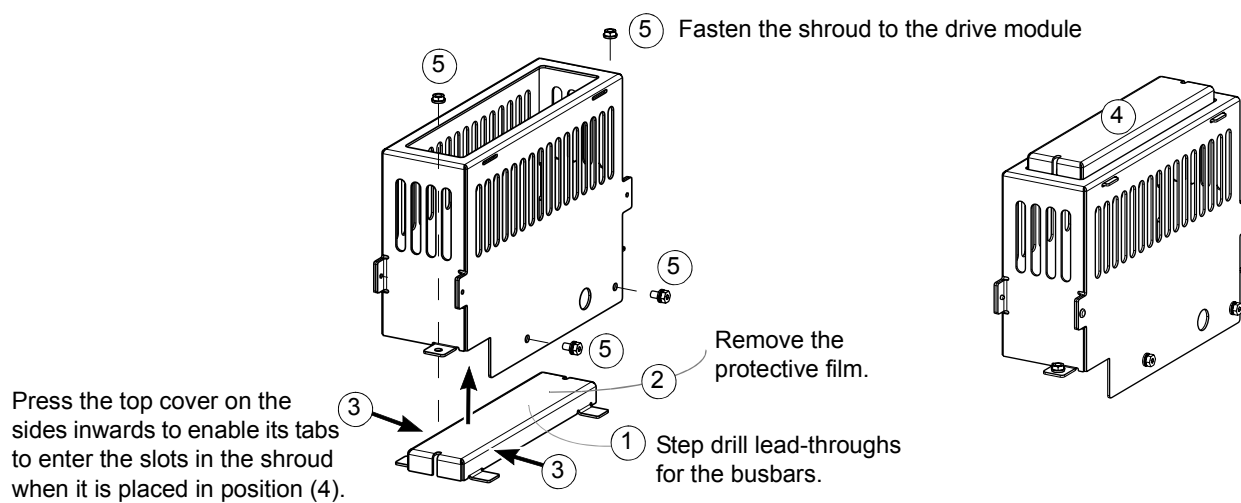
Fastening the spacer to the long side of the module (flat mounting)



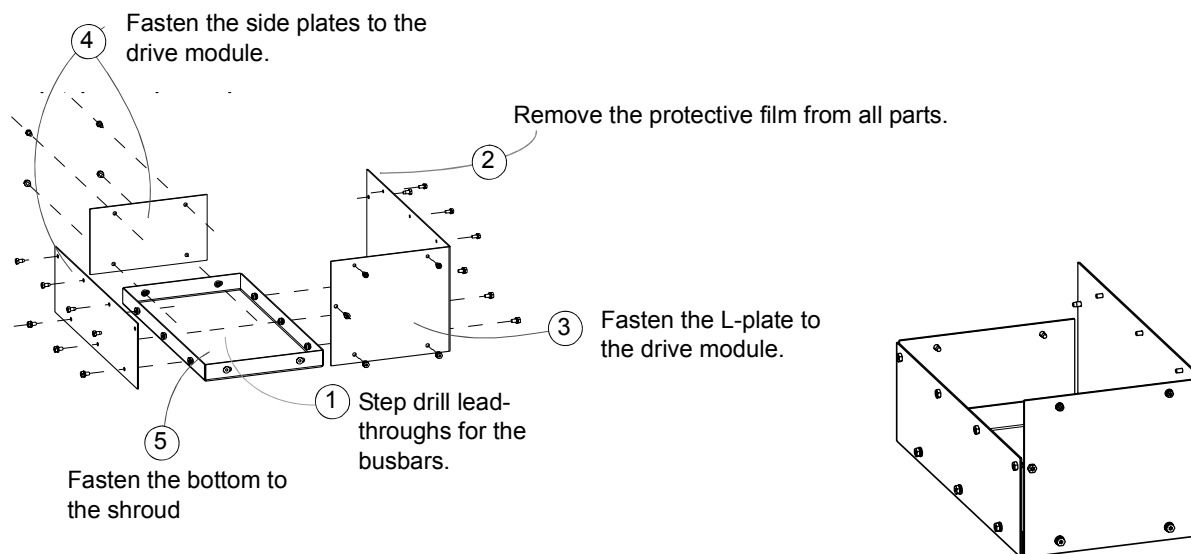
Fastening the spacer to the short side of the module (bookshelf mounting)

Fastening the top entry busbar and bottom exit shrouds (+B060)

Top entry busbar shroud



Bottom exit shroud



Units with pedestal and busbars on the long side (+H354, bookshelf mounting)

Delivery check

Check that there are no signs of damage. Before attempting installation and operation, check the information on the type designation label of the drive to verify that the unit is of the correct type.

Item packages

The following tables show what each item package contains:


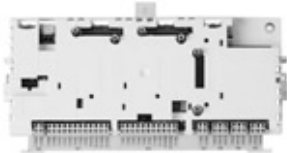
- parts
- part list code
- plus code
- assembling instruction.


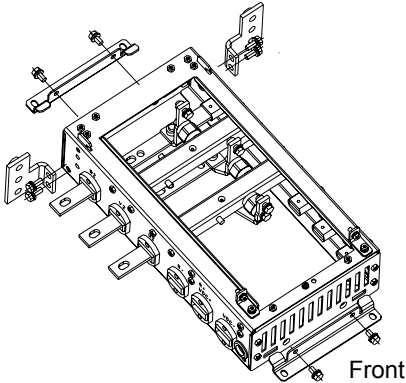

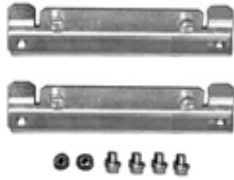


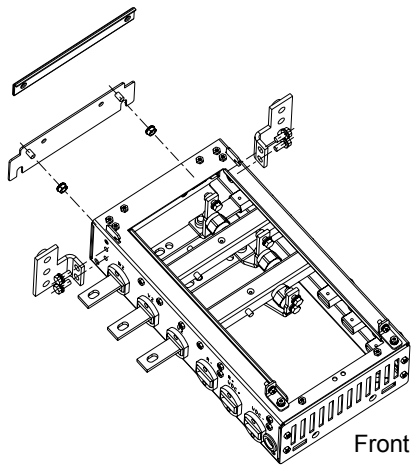
In the tables, the basic unit is described first, then the possible optional parts are listed. Choose the table and options of your delivery in the following sections:

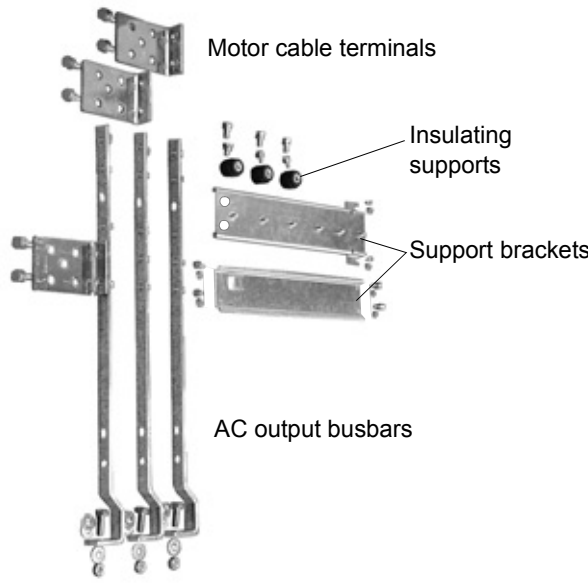
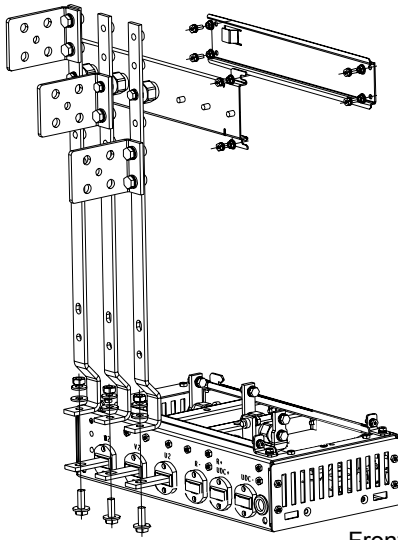

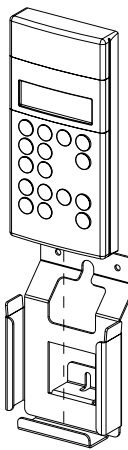
- *Item packages of frame size R7 with busbars on the long side* on page 58.
- *Item packages of frame size R8 with busbars on the long side* on page 64.


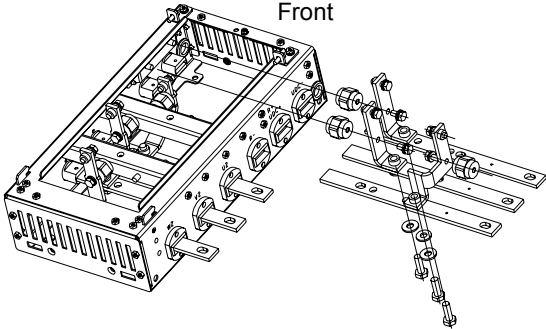
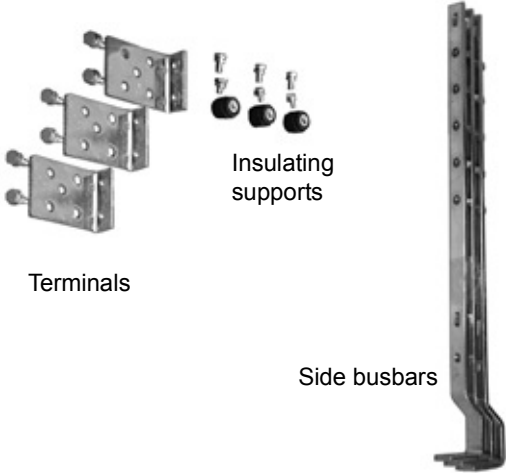
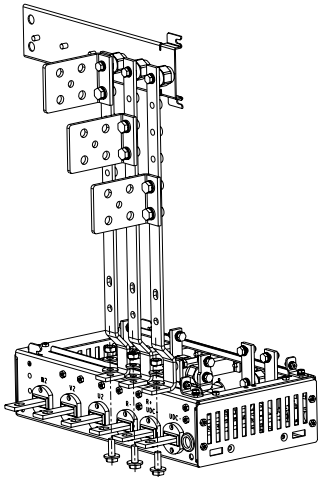
Note: The complete assembling instructions are represented under *Assembling procedure for units with busbars on the long side (+H354)* on page 73.

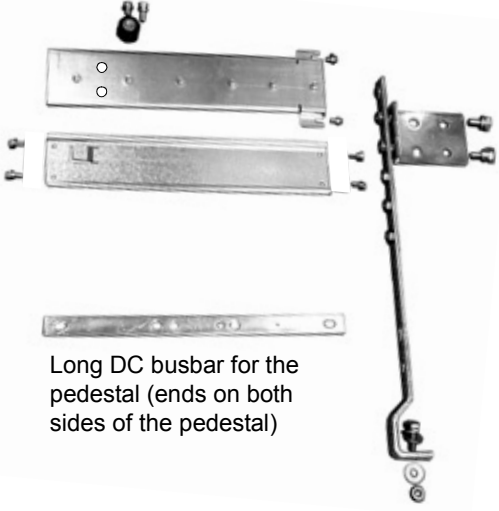
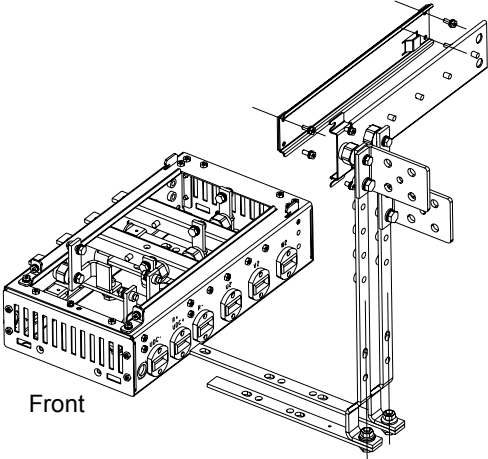
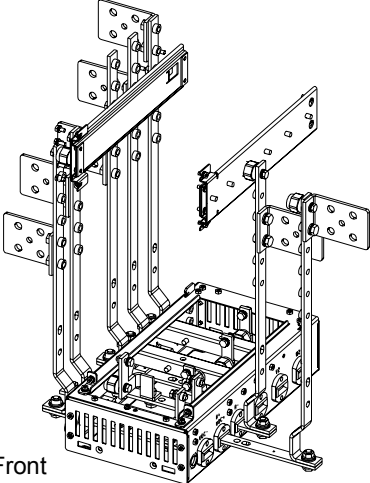
Item packages of frame size R7 with busbars on the long side

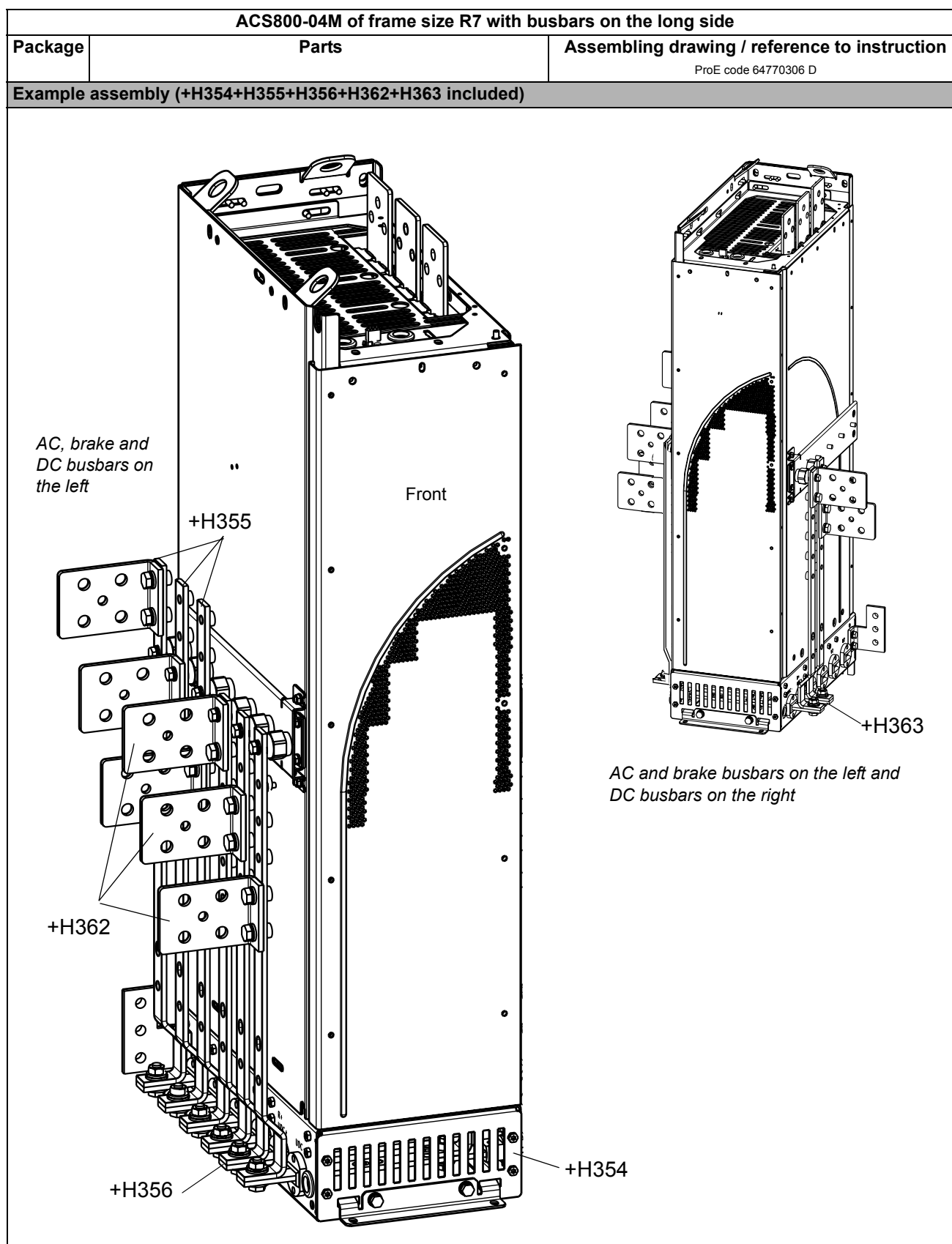
ACS800-04M of frame size R7 with busbars on the long side		
Package	Parts	Assembling drawing / reference to instruction ProE code 64770306 D
Basic unit (type code ACS800-0M4-XXXX-X+H354+H355)		
-	 <p>Drive module</p>	Refer to section <i>Assembling procedure for units with busbars on the long side (+H354)</i> on page 73.
Drive control unit (RDCU)	 <p>RDCU drive control unit</p>	See <i>RDCU Drive Control Unit Hardware Manual</i> [3AFE64636324 (English)].

ACS800-04M of frame size R7 with busbars on the long side		
Package	Parts	Assembling drawing / reference to instruction ProE code 64770306 D
Pedestal R7 +H354	<p>64754416</p>  <p>Pedestal</p>	<p>Base mounting from outside:</p> 
Mounting bracket and grounding terminal kit R7 +H354	<p>64743309</p>  <p>PE terminals left right</p>  <p>Base mounting brackets</p>  <p>Wall mounting bracket</p>  <p>Spacer for wall mounting</p>	<p>Wall mounting:</p> 

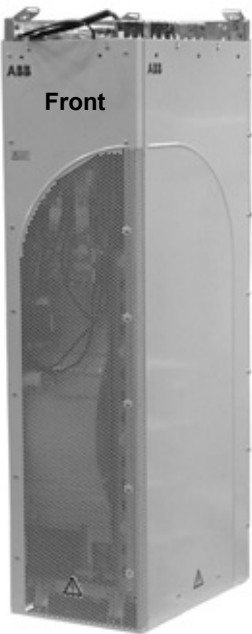
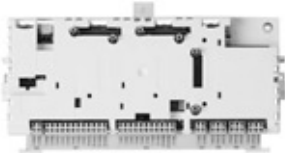
ACS800-04M of frame size R7 with busbars on the long side		
Package	Parts	Assembling drawing / reference to instruction ProE code 64770306 D
Motor output busbar kit R7 +H355	<p>64743180</p>  <p>Motor cable terminals</p> <p>Insulating supports</p> <p>Support brackets</p> <p>AC output busbars</p>	 <p>Front</p>
Optional selection +J413: Control Panel Holder RPMP-21		
Control panel holder +J413	<p>68394961</p>  <p>Control panel holder</p>	

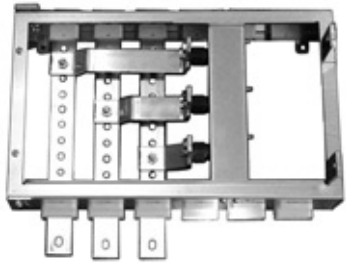
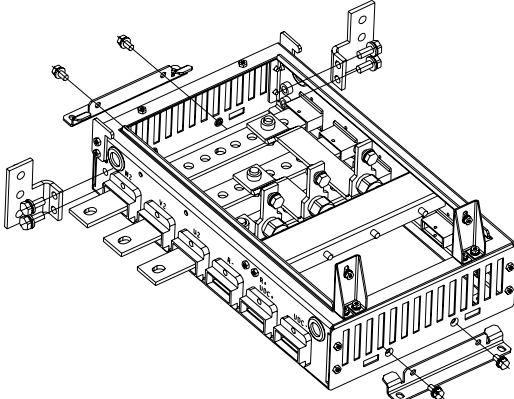
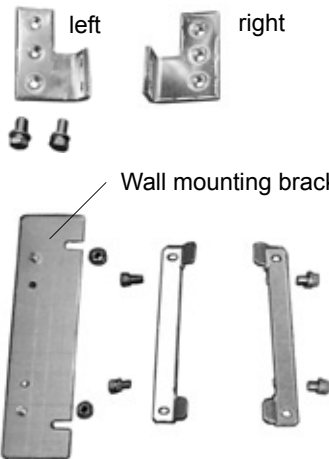
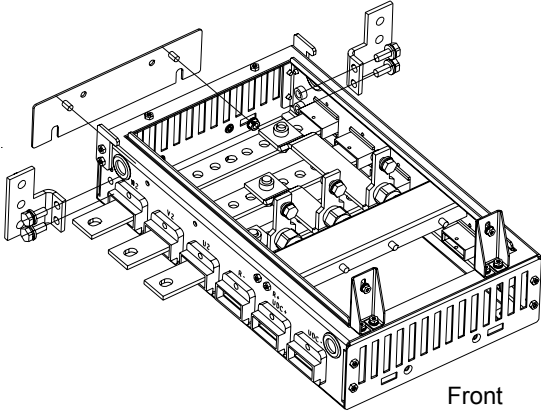
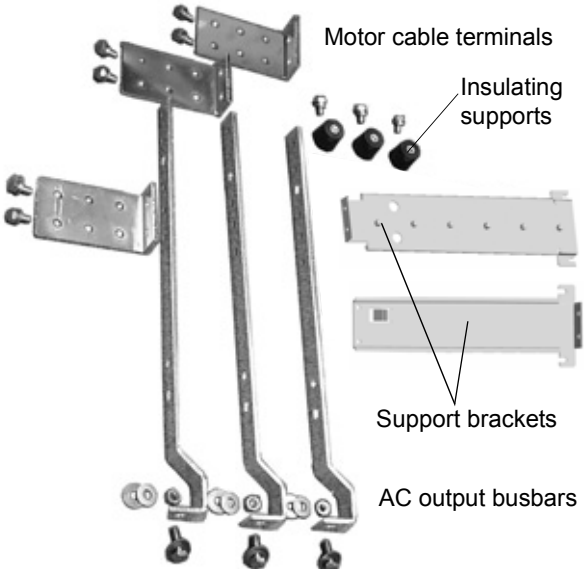
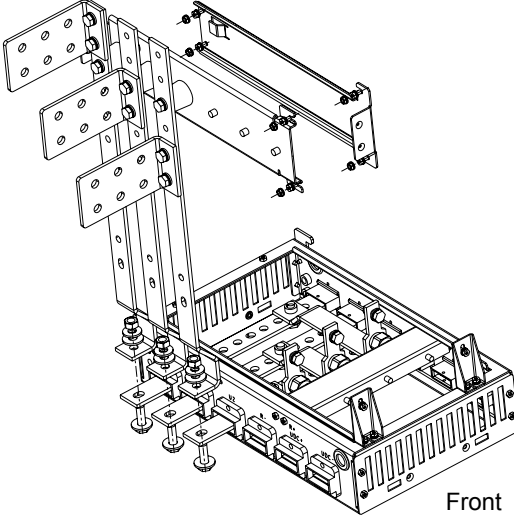
ACS800-04M of frame size R7 with busbars on the long side		
Package	Parts	Assembling drawing / reference to instruction ProE code 64770306 D
Optional selection +H354+H356+H362: DC/brake busbars		
Pedestal DC busbar kit R7 +H356	64769341  <p>Pedestal busbars</p>	 <p>Front</p>
DC output busbar kit R7 +H362	64744747  <p>Terminals</p> <p>Insulating supports</p> <p>Side busbars</p>	 <p>Front</p>



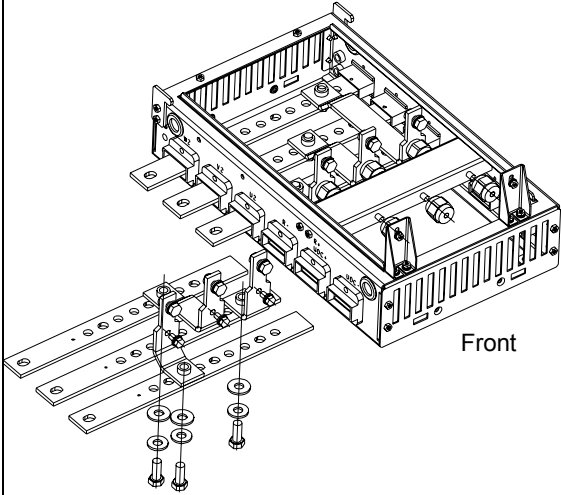
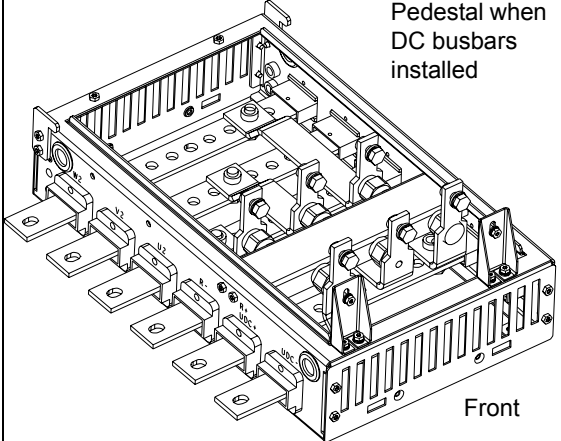
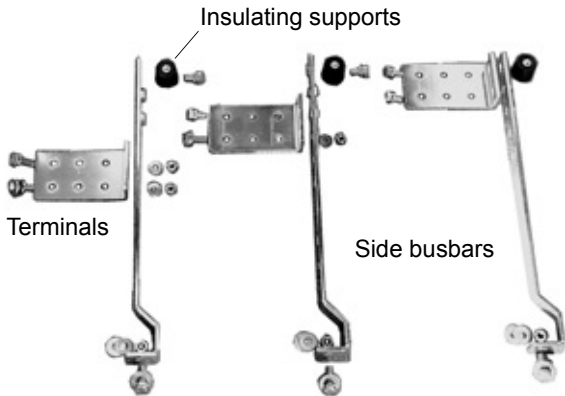
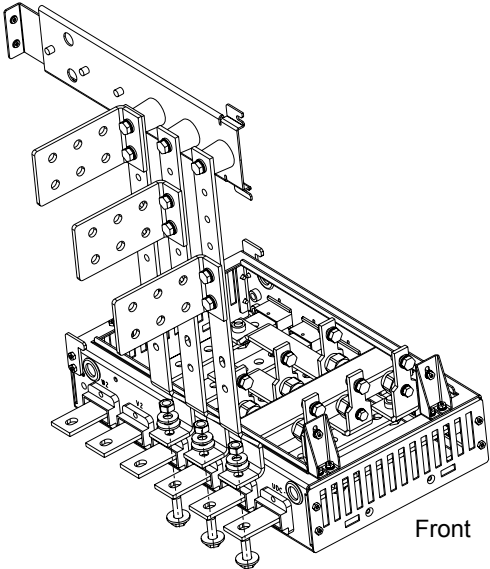
ACS800-04M of frame size R7 with busbars on the long side		
Package	Parts	Assembling drawing / reference to instruction
ProE code 64770306 D		
Optional selection +H354+H356+H362+H363: DC and brake busbars on opposite sides		
Bilateral DC output busbar kit R7 +H363	<div>64744895</div> <div></div> <div>Long DC busbar for the pedestal (ends on both sides of the pedestal)</div>	<div>DC busbars on the right side:</div> <div></div> <div>Front</div> <div>DC busbars on the left side and brake busbars on the right side:</div> <div></div> <div>Front</div>

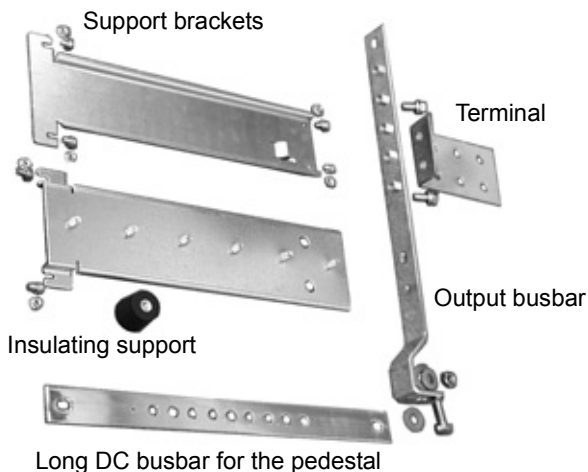
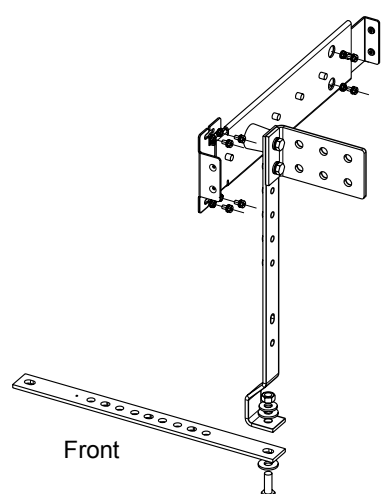
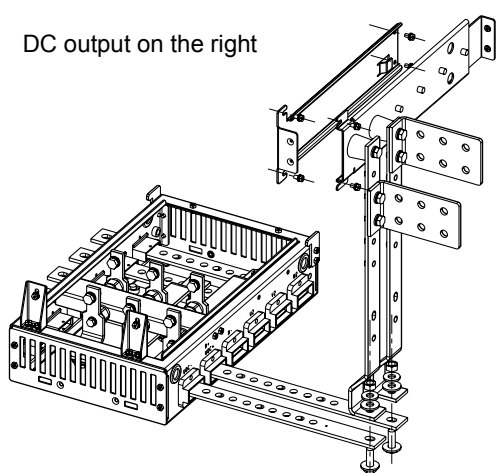
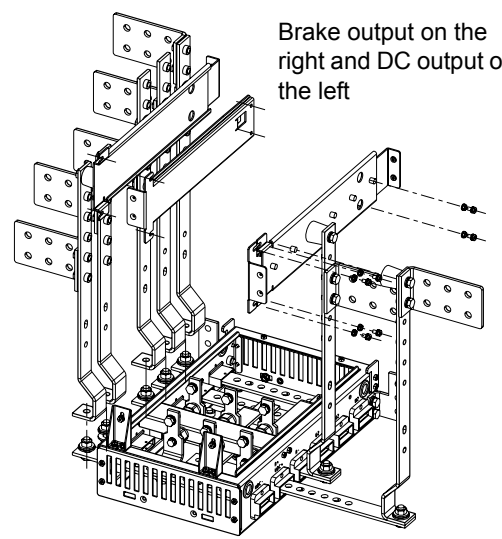



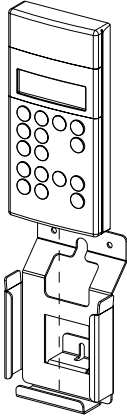
Item packages of frame size R8 with busbars on the long side

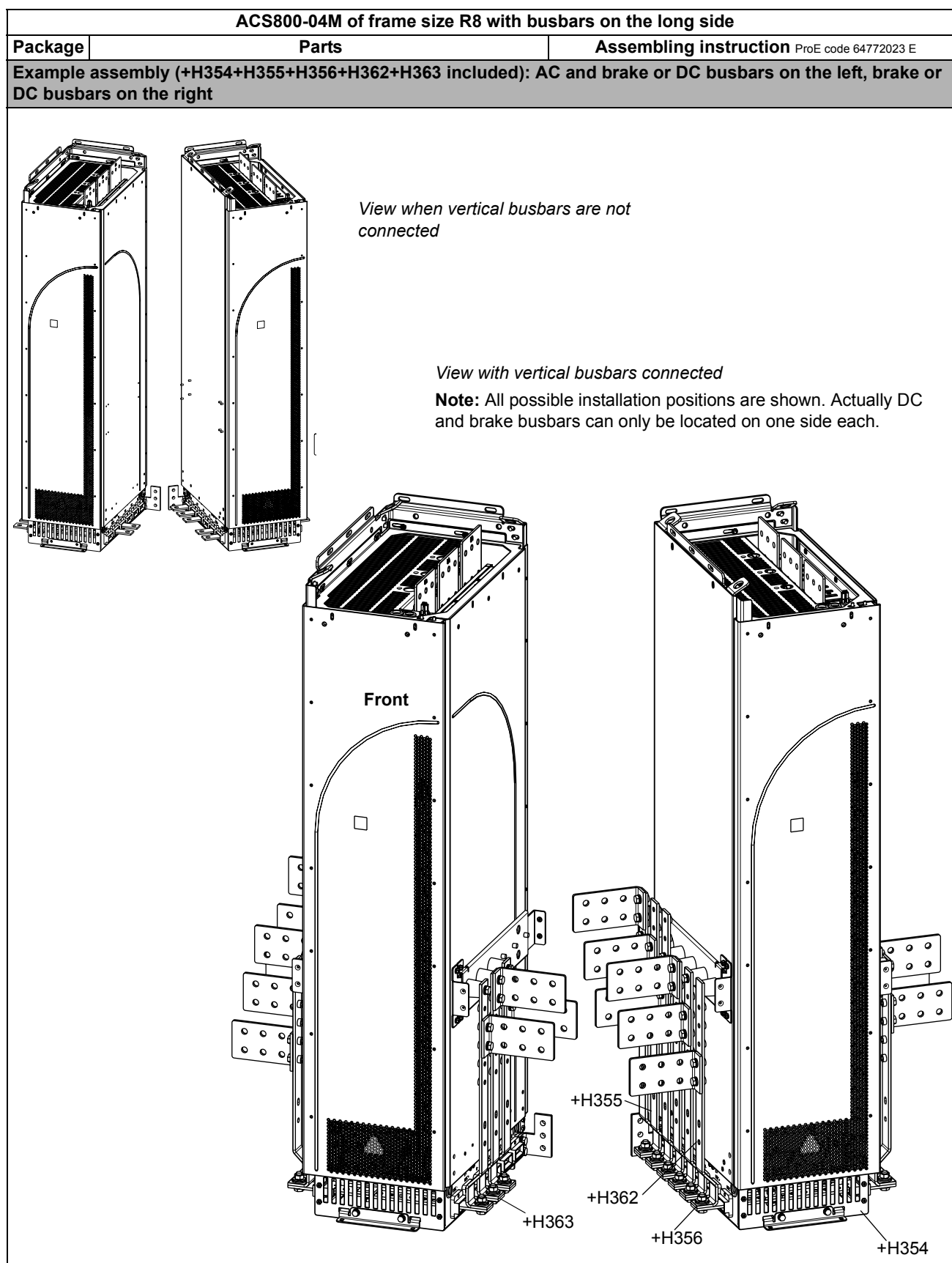
ACS800-04M of frame size R8 with busbars on the long side		
Package	Parts	Assembling instruction ProE code 64772023 E
Basic unit (type code ACS800-04M-xxxx-x+H354+H355)		
-	 <p>Drive module</p>	Refer to section <i>Assembling procedure for units with busbars on the long side (+H354)</i> on page 73.
Drive control unit (RDCU)	 <p>RDCU drive control unit</p>	See <i>RDCU Drive Control Unit Hardware Manual</i> [3AFE64636324 (English)].


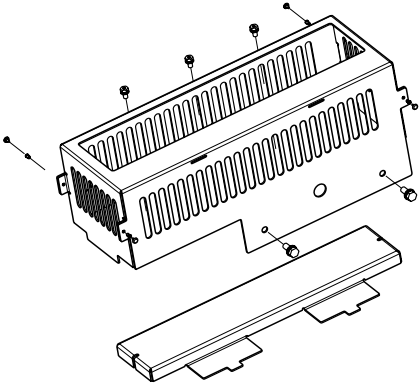
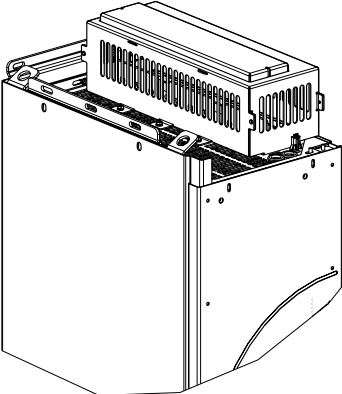
ACS800-04M of frame size R8 with busbars on the long side		
Package	Parts	Assembling instruction <small>ProE code 64772023 E</small>
Pedestal R8 +H354	<p>64754424</p>  <p>Pedestal</p>	<p>Base mounting from outside:</p>  <p>Front</p>
Mounting bracket and grounding terminal kit R8 (+H354)	<p>64744330</p>  <p>left right PE terminals</p> <p>Wall mounting bracket</p> <p>Base mounting brackets</p>	<p>Wall mounting:</p>  <p>Front</p>
Motor output busbar kit R8 +H355	<p>64743295</p>  <p>Motor cable terminals</p> <p>Insulating supports</p> <p>Support brackets</p> <p>AC output busbars</p>	 <p>Front</p>

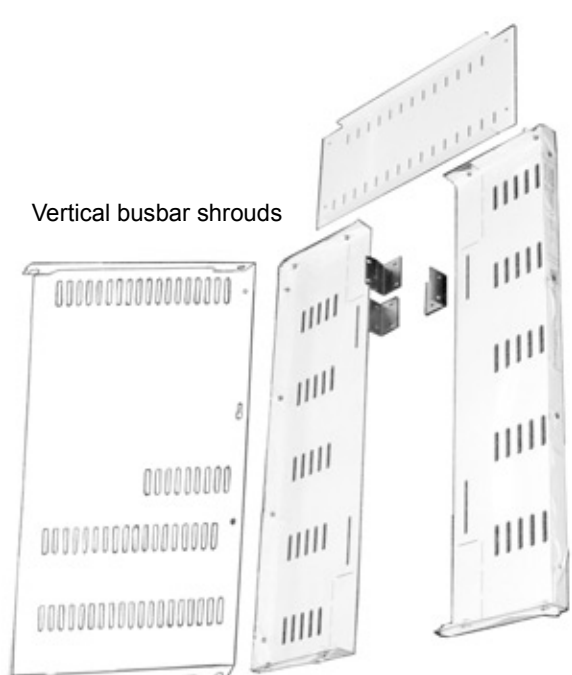
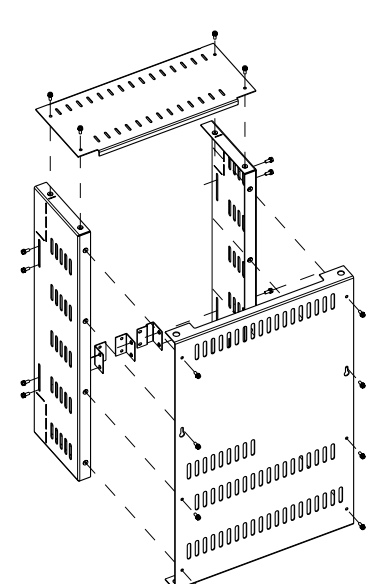
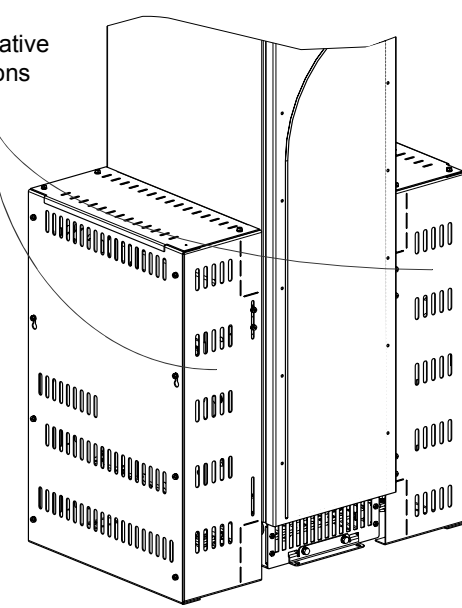
ACS800-04M of frame size R8 with busbars on the long side		
Package	Parts	Assembling instruction <small>ProE code 64772023 E</small>
Optional selection +H354+H356+H362: DC/brake busbars		
Pedestal DC busbar kit R8 H356	<div>64769359</div> <div></div> <div>Insulating supports and connecting busbars</div> <div></div> <div>Pedestal DC busbars</div>	<div></div> <div>Front</div> <div></div> <div>Pedestal when DC busbars installed</div> <div>Front</div>
DC output busbar kit R8 H362	<div>64744755</div> <div></div> <div>Terminals</div> <div>Insulating supports</div> <div>Side busbars</div>	<div></div> <div>Front</div>

ACS800-04M of frame size R8 with busbars on the long side		
Package	Parts	Assembling instruction ProE code 64772023 E
Optional selection +H354+H356+H363: DC and brake busbars on opposite sides		
Bilateral DC output busbar kit R8 +H363	<p>64744798</p>  <p>Support brackets</p> <p>Terminal</p> <p>Output busbar</p> <p>Insulating support</p> <p>Long DC busbar for the pedestal</p>	<p>DC output on the right side:</p>  <p>Front</p> <p>DC output on the right</p>  <p>Brake output on the right and DC output on the left</p> 

ACS800-04M of frame size R8 with busbars on the long side		
Package	Parts	Assembling instruction <small>ProE code 64772023 E</small>
Optional selection +J413: Control Panel Holder RPMP-21		
Control panel holder +J413	<div>68394961</div> <div></div> <div>Control panel holder</div>	



ACS800-04M of frame size R8 with busbars on the long side		
Package	Parts	Assembling instruction <small>ProE code 64772023 E</small>
Optional selection +B060: shrouds for vertical busbars and input terminals		
Top entry busbar shroud kit +B060	68341493	
	<div></div> <div>Top entry busbar shroud</div> <div>Fastening screws included</div>	<div></div> <div></div>

ACS800-04M of frame size R8 with busbars on the long side		
Package	Parts	Assembling instruction <small>ProE code 64772023 E</small>
Vertical busbar shroud kit +B060	<p>68329639</p> <p>Vertical busbar shrouds</p>  <p>Fastening screws included</p>	 <p>Alternative positions</p> 

ACS800-04M of frame size R8 with busbars on the long side		
Package	Parts	Assembling instruction ProE code 64772023 E

Example assembly (+H354+H355+H356+H362+B060+Q950 included): top entry busbar shroud, vertical busbar shroud and Prevention of Unexpected Start

The diagram illustrates the mechanical installation of the ACS800-04M unit. It shows two views: a top view and a front view. The top view shows the unit with a top entry busbar shroud (+B060) and a vertical busbar shroud (+B060). A cable (600 mm / 23.62 in.) connects the shroud to a terminal block. The terminal block has three terminals: 1 (GND), 2 (N), and 3 (L). The front view shows the unit with a front panel and a vertical busbar shroud (+B060). The +Q950 Prevention of Unexpected Start board is located at the bottom of the unit, near the AGPS board.

Note: The protective films on the shrouds must be removed before installing.

Terminal block for user connection of Prevention of Unexpected Start (+Q950).
The other end of the cable is connected to AGPS board terminal X1. The terminal block can be fastened to the cabinet frame or wall with screws.

1 ≙ GND
2 ≙ N
3 ≙ L

600 mm (23.62 in.)

Front

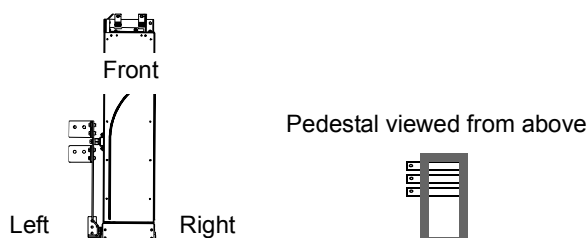
+B060

+Q950 Prevention of Unexpected Start. Location of AGPS board.

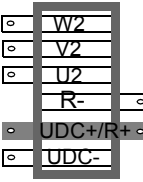
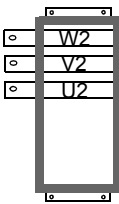
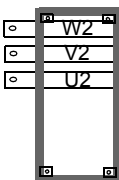
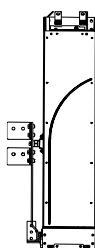
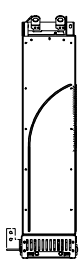
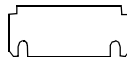
Assembling procedure for units with busbars on the long side (+H354)

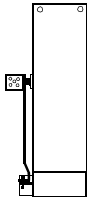
Working order

References to instructions in this chapter are printed in *italic* in the table below. The pictures represent frame size R7 with the following orientations.



Step	If	Instruction
1 Preparing the pedestal		AC busbars on the left side Go to step 2.
		AC busbars on the right side 1. See <i>Swapping the busbars of the pedestal to the other side</i> on page 78. 2. Go to step 2.
		AC busbars, R-, R+/UDC+ and UDC- busbars on the left side (+H356 required) 1. See <i>Connecting the DC busbars to the pedestal (+H356 and +H363 only)</i> on page 76. 2. Go to step 2.
		AC busbars, R-, R+/UDC+ and UDC- busbars on the right side (+H356 required) 1. See <i>Swapping the busbars of the pedestal to the other side</i> on page 78. 2. See <i>Connecting the DC busbars to the pedestal (+H356 and +H363 only)</i> on page 76. 3. Go to step 2.
		AC busbars and R-, R+/UDC+ busbars on the left side and UDC+ and UDC- busbars on the right side (+H356 and +H363 required) 1. See <i>Swapping the busbars of the pedestal to the other side</i> on page 78 and <i>Optional selection +H363</i> on page 79. 2. See <i>Connecting the DC busbars to the pedestal (+H356 and +H363 only)</i> on page 76. 3. Go to step 2.

Step		If	Instruction
		AC busbars and UDC+ and UDC- busbars on the left side and R-, R+/UDC+ busbars on the right side (+H356 and +H363 required)	<ol style="list-style-type: none"> 1. See <i>Swapping the busbars of the pedestal to the other side</i> on page 78 and <i>Optional selection +H363</i> on page 79. 2. See <i>Connecting the DC busbars to the pedestal (+H356 and +H363 only)</i> on page 76. 3. Go to step 2.
2 Fastening the pedestal by the base (not performed for wall-mounted units)		Base mounting from outside	<ol style="list-style-type: none"> 1. See <i>Clamping the pedestal with the outside brackets</i> on page 80. 2. Go to step 3.
		Base mounting from inside	<ol style="list-style-type: none"> 1. See <i>Fastening the pedestal through the holes inside the pedestal</i> on page 80. 2. Go to step 3.
3 Fastening the busbars and module to the pedestal		Units with vertical busbars	<ol style="list-style-type: none"> 1. See <i>Fastening the output busbars and PE terminal and sliding the module in</i> on page 86. 2. See <i>Fastening the drive module to the pedestal</i> on page 89. 3. Go to step 4.
		Units with no vertical busbars	<ol style="list-style-type: none"> 1. See <i>Fastening the drive module to the pedestal</i> on page 89. 2. Go to step 4 (wall-mounted units) or 5 (base-mounted units).
4 Wall mounting		wall-mounted unit	See <i>Fastening the drive module to wall (wall-mounted units only, not for base-mounted units)</i> on page 81.

Step		If	Instruction
5 Fastening by top		base-mounted unit	See <i>Fastening the drive module by top to the cabinet frame</i> on page 81.
6 Fastening shrouds		if included	<u>Frame size R7</u> See <i>Top entry busbar shroud</i> in section <i>Fastening the top entry busbar and bottom exit shrouds (+B060)</i> on page 55. <u>Frame size R8</u> See <i>Fastening the shrouds in frame size R8</i> on page 90.

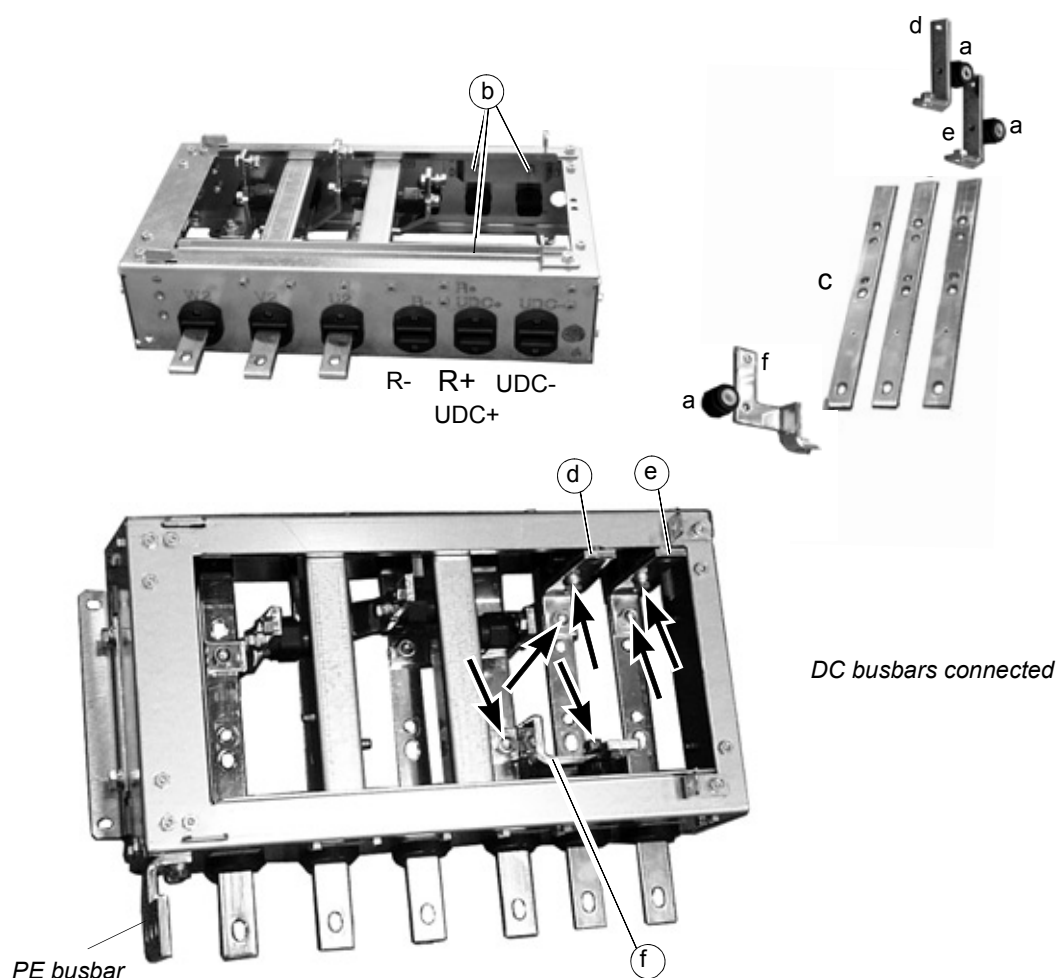
Connecting the DC busbars to the pedestal (+H356 and +H363 only)

Procedure

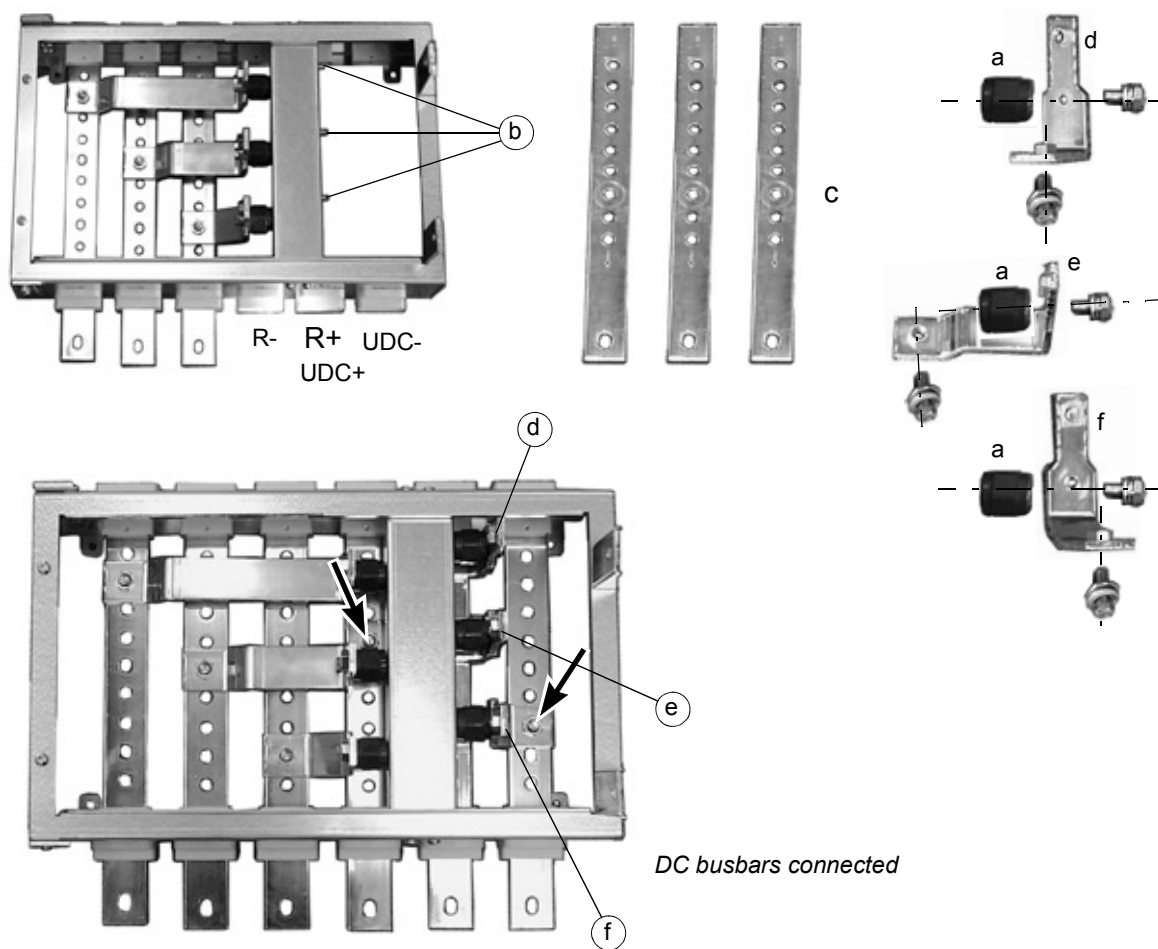
1. Screw insulating supports ("a" below) onto the free pins ("b" below) on the inner sides of the pedestal.
2. Push busbars (c) through the R-, R+/UDC+ and UDC- lead-through insulators as the W2, V2 and U2 busbars.
3. Connect the connecting busbars (d, e, f) to the insulating supports and to the R-, R+/UDC+ and UDC busbars as shown below.

For +H363, see also *Optional selection +H363* on page 79.

Photos of frame size R7



Photos of frame size R8



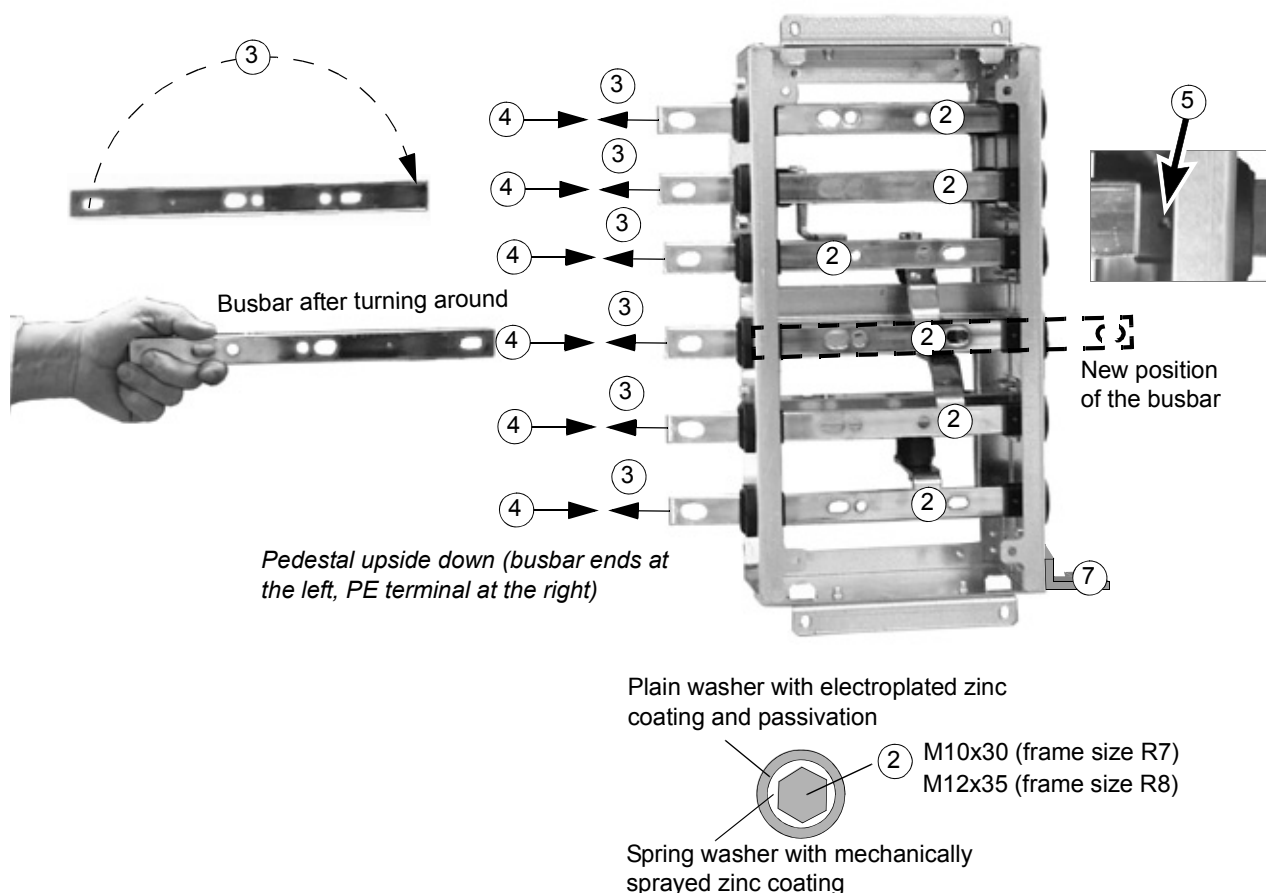
Busbars to the left- or right-hand side of the module?

The pedestal is delivered from the factory ready for left-hand side busbar connections. When required, the internal busbars of the pedestal can be swapped to the right side.

Swapping the busbars of the pedestal to the other side

When swapping the busbars from left to right, proceed as follows:

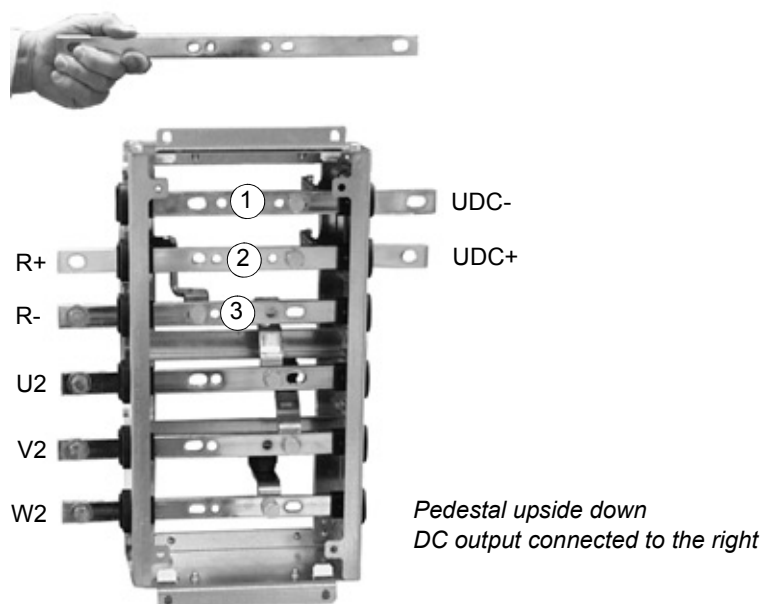
1. Turn the pedestal over to access the bolts which connect the pedestal power connections to the horizontal busbars.
2. Undo the connections.
3. Pull out the busbars and rotate them 180 degrees.
4. Reinsert the busbars so that the busbar ends with the hole protrude on the right-hand side of the pedestal.
5. Position the busbars so that the small hole in the busbar is aligned with the hole in the insulator.
6. Tighten the connections (2).
7. Connect the right-hand side PE terminal.



Optional selection +H363

This selection enables the connection of the DC output and the brake resistor output to the opposite sides of the pedestal. The installation below requires also optional selection +H356. The UDC- busbar and R- busbar are taken from the +H356 parts, the R+/UDC+ busbar from the +H363 parts. For instruction on how to connect the busbars to the pedestal frame, see *Connecting the DC busbars to the pedestal (+H356 and +H363 only) on page 76*.

1. Connect the UDC- busbar.
2. Connect the R+/UDC+ busbar.
3. Connect the R- busbar.



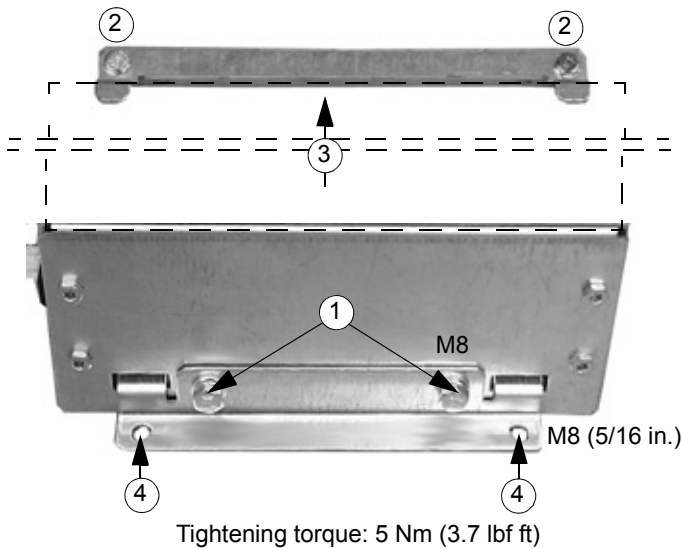
Fastening the pedestal to the cabinet base (not for wall-mounted units)

Fasten the pedestal to the base of the cabinet either with the outside fastening brackets or by using the fastening holes inside the pedestal.

Note: Place the module on a solid base. The fastening brackets are not strong enough to carry the weight of the module on their own.

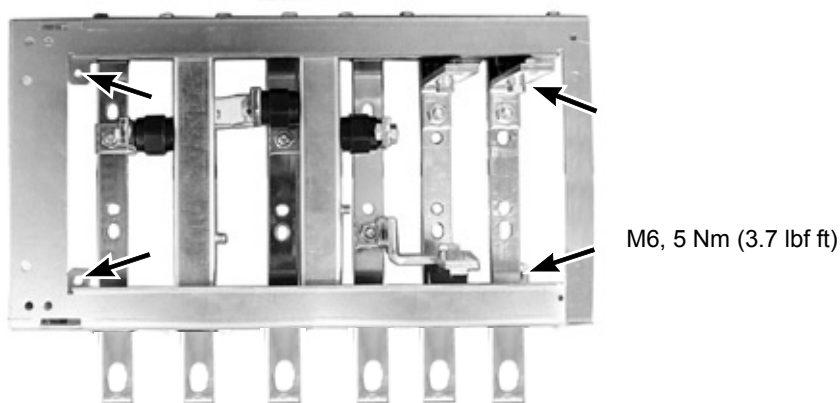
Clamping the pedestal with the outside brackets

1. Fasten the front bracket to the pedestal with two screws.
2. Fasten the back fastening bracket onto the cabinet floor with two screws.
3. Place the pedestal on the cabinet floor and push it so that the tabs of the fastening bracket enter the slots in the pedestal.
4. Fasten the front bracket to the base with two screws.



Fastening the pedestal through the holes inside the pedestal

Fasten the pedestal to the base of the cabinet with four screws through the inside fastening points.



Fastening the drive module by top to the cabinet frame

In addition to the base fastening, it is recommended to fasten the module to the cabinet also from the fastening points at the top. Refer to *Dimensional drawings* for the vertical fastening points.

If the module is not fastened from the back top to the cabinet frame, it must be fastened from the front top fastening points during transportation or in case of vibration.

Fastening the drive module to wall (wall-mounted units only, not for base-mounted units)*Requirements for protection*

The drive module must be protected against contact, dust and humidity (see chapter *Technical data* in *ACS800-04/04M/U4 Hardware Manual* [64671006 (English)]).

Requirements for the wall

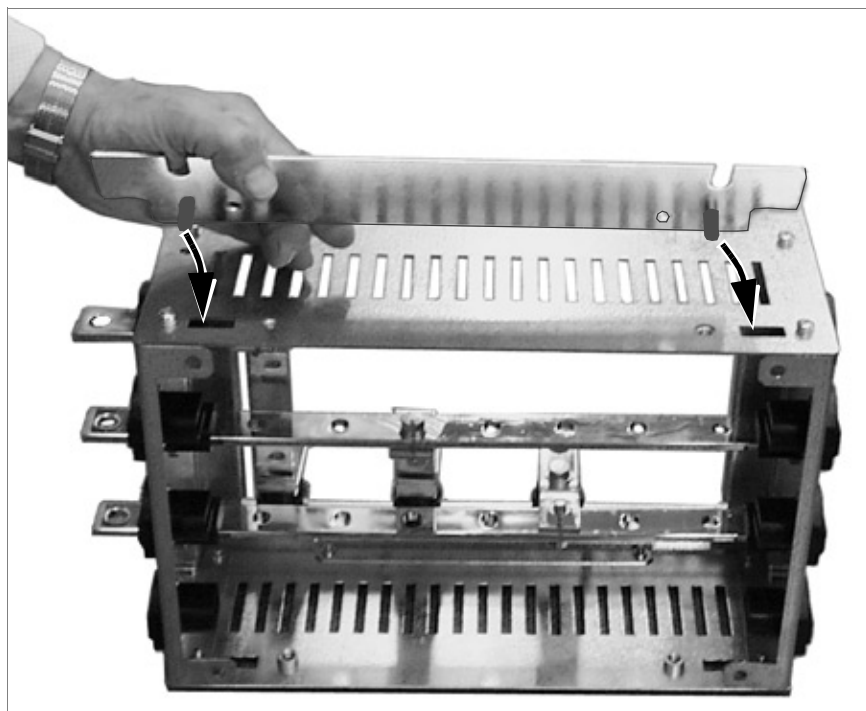
The wall must be as close to vertical as possible, of non-flammable material and strong enough to carry the weight of the unit. Check that there is nothing on the wall to inhibit the installation.

Floor

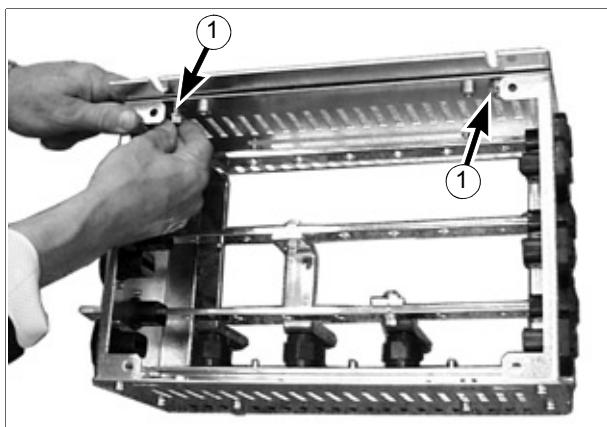
The floor/material below the installation must be non-flammable.

Procedure

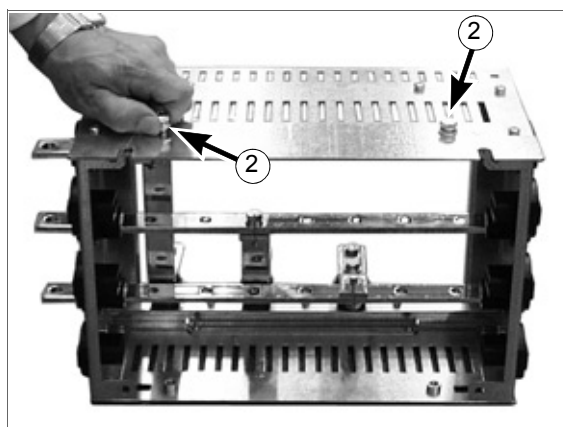
- Place the wall mounting bracket onto the pedestal so that its pins enter the slots of the pedestal.
- Fasten the pins with nuts (1) from inside or fasten the bracket with screws from outside (2). The nuts and screws are included in the mounting bracket package.



Inserting the wall mounting bracket into the slots in the pedestal



The pins of the wall mounting bracket are fastened with nuts from inside



Fastening the wall mounting bracket with screws from outside (alternative to pin fastening from inside)

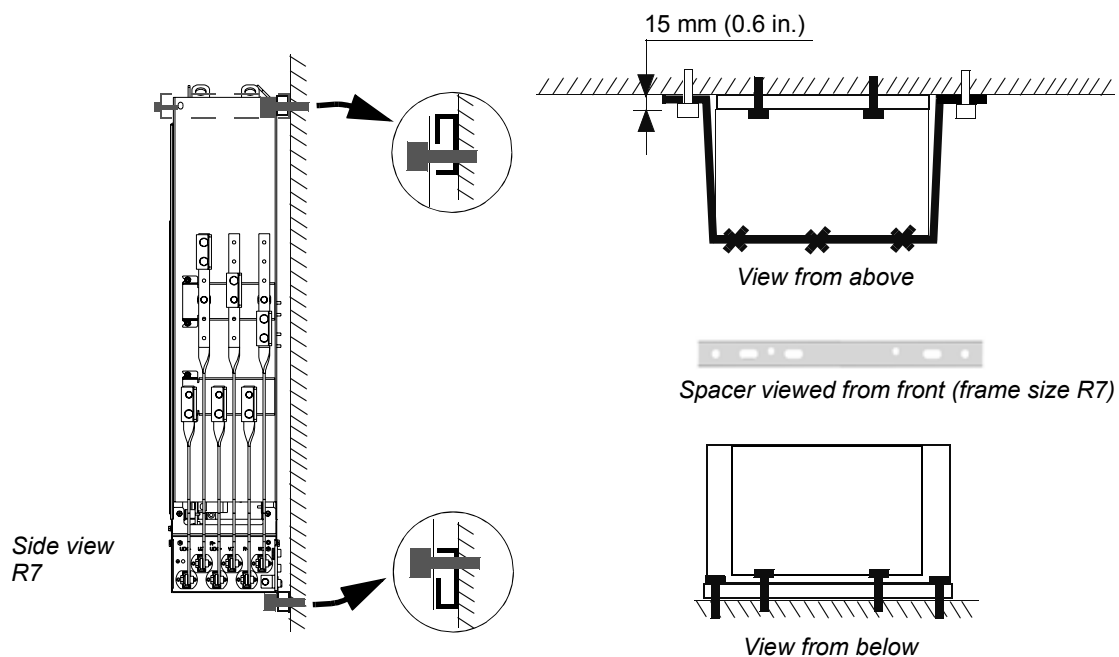
- See *Dimensional drawings* for locations of the fastening points at the top of the module.
- Use a pallet truck or a lifter to move the unit to the final mounting place.



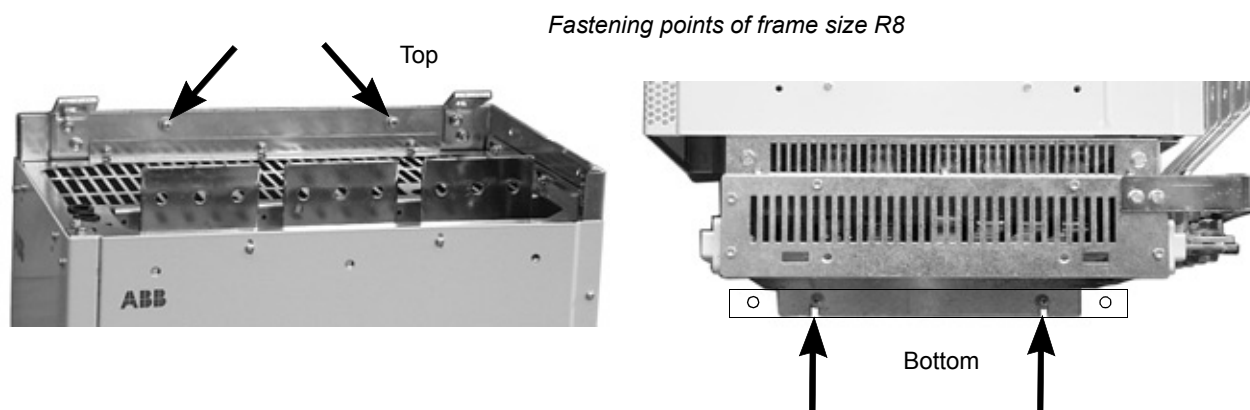
WARNING! Secure the unit to eliminate the danger of overturning and falling during the fastening procedure.

- Fasten the module through the slots in the wall mounting bracket and the fastening holes at the top of the module using spacers between the module and the wall.
Note: In flat mounting, the spacers (at the top and bottom) provide a clearance of 15 mm (0.6 in.) between the drive module and the wall so that the protruding studs of the module will not press against the wall. In bookshelf mounting, the spacer removes a 4 mm (0.16 in.) gap between the drive module top and the wall so that the module will hang in an upright position.
- Fasten the module also by top front with a wall-fastened support bracket.

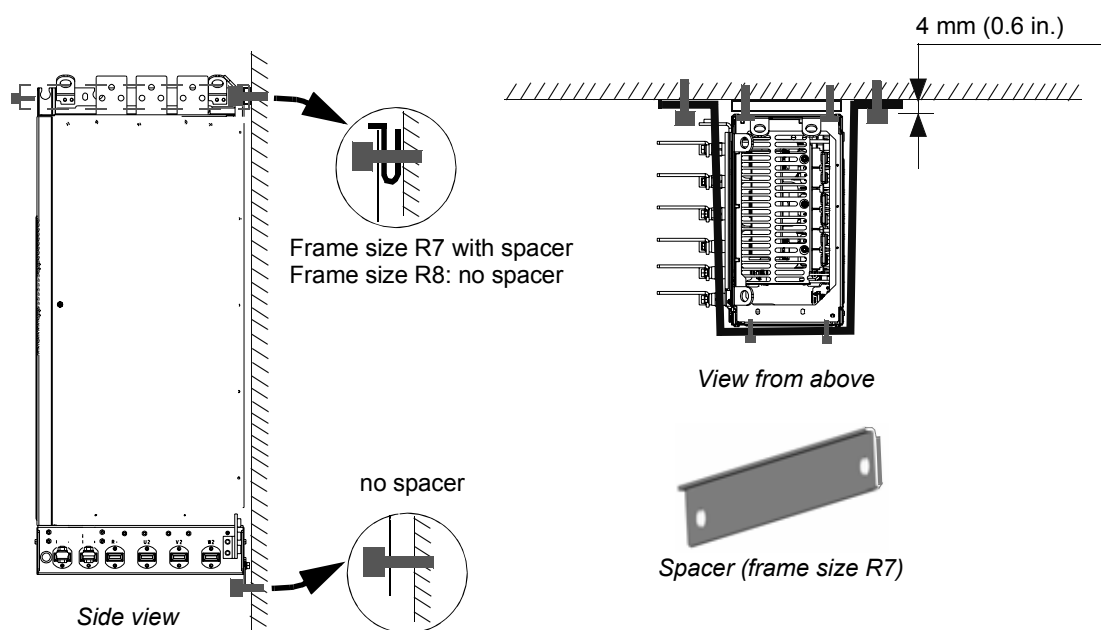
Units with busbars on the short sides (flat mounting, frame sizes R7 and R8)



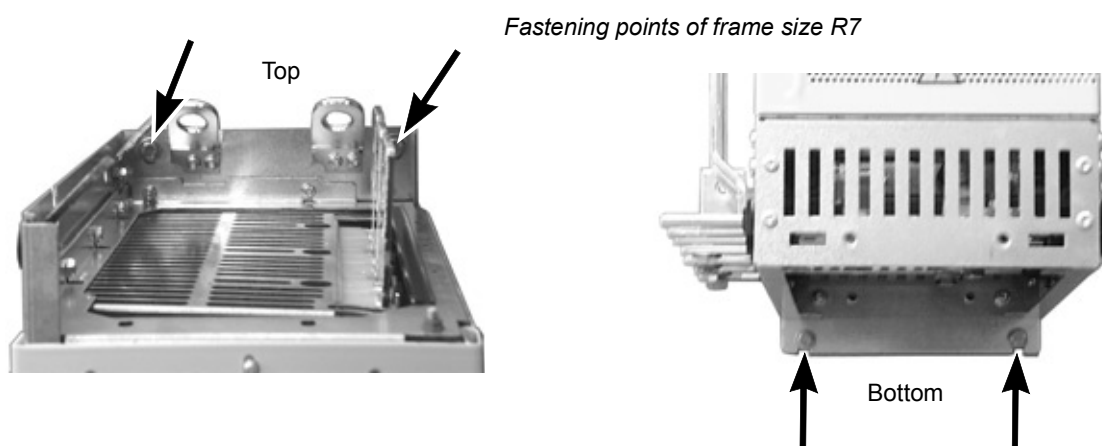
Screw size: M10 for frame sizes R7 and R8



Units with busbars on the long side (bookshelf mounting, frame sizes R7 and R8)



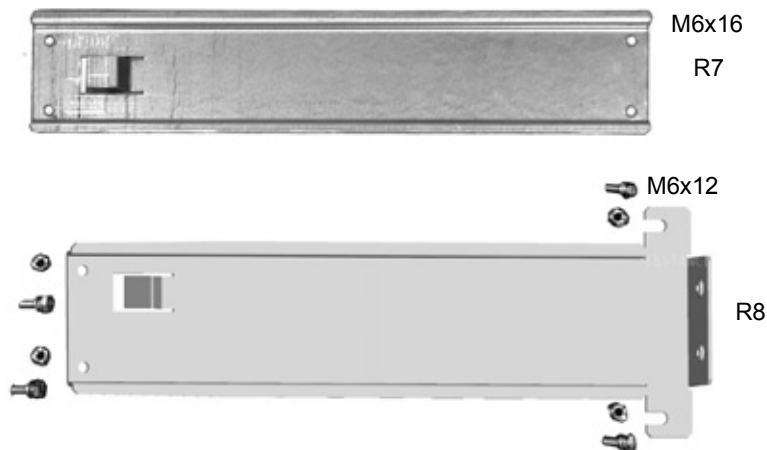
Screw size: M10 for frame sizes R7 and R8



Fastening the output busbars and PE terminal and sliding the module in

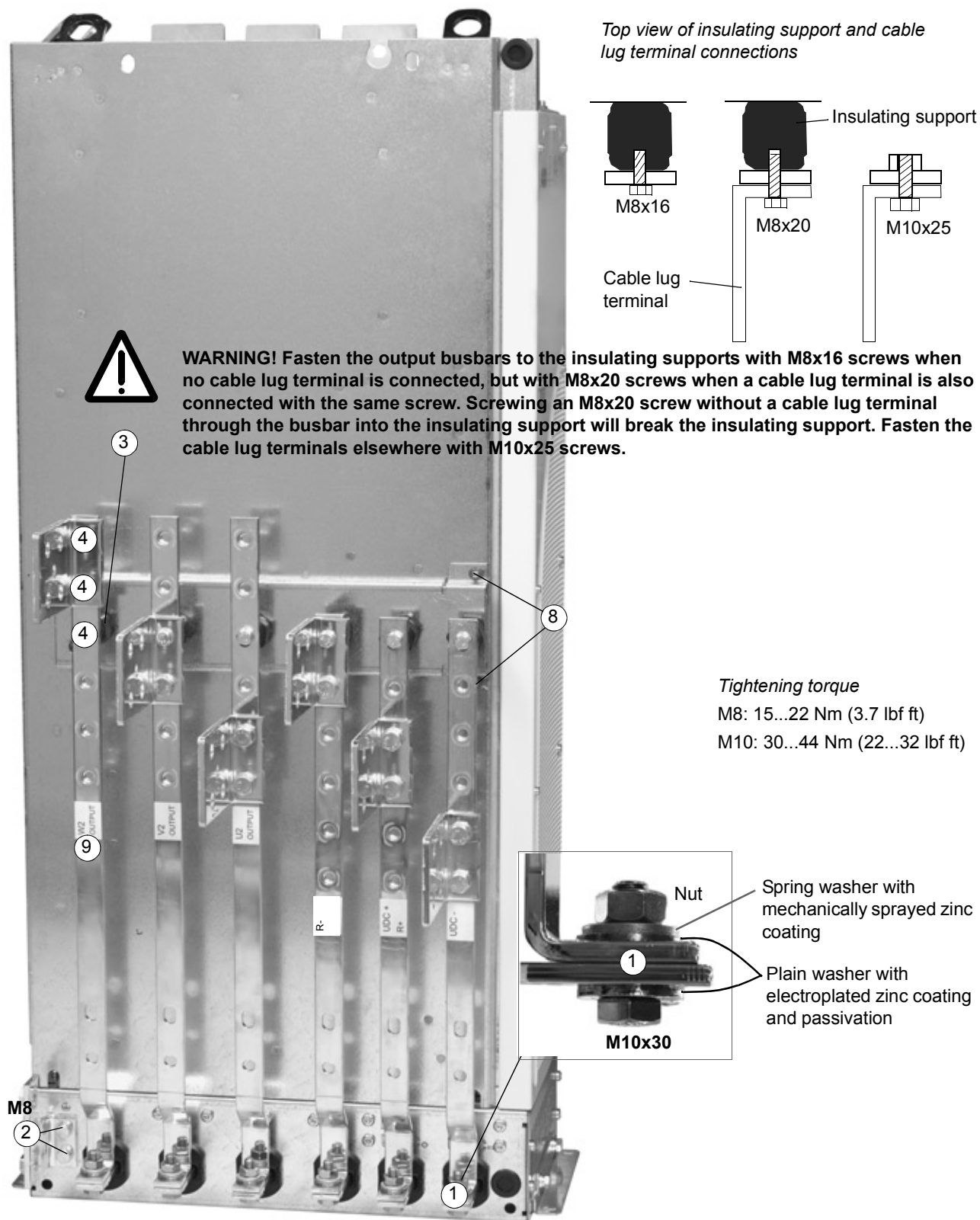
The steps of this installation procedure are shown in the photos on the next pages.

1. Connect the output busbars to the pedestal.
2. Fasten the PE terminal.
3. Screw the insulating supports onto the pins on the outer support bracket.
4. Fasten the output busbars and terminals to the insulating supports on the outer support bracket.
5. Fasten the inner support bracket to the drive module.



6. Remove the fastening brackets (screws “b” on photos under *Fastening the drive module to the pedestal* on page 89) from the pedestal.
7. Slide the module onto the pedestal so that the inner support bracket enters inside the outer support bracket.
8. Fasten the outer support bracket to the drive module.
9. Fasten the stickers to the output busbars.

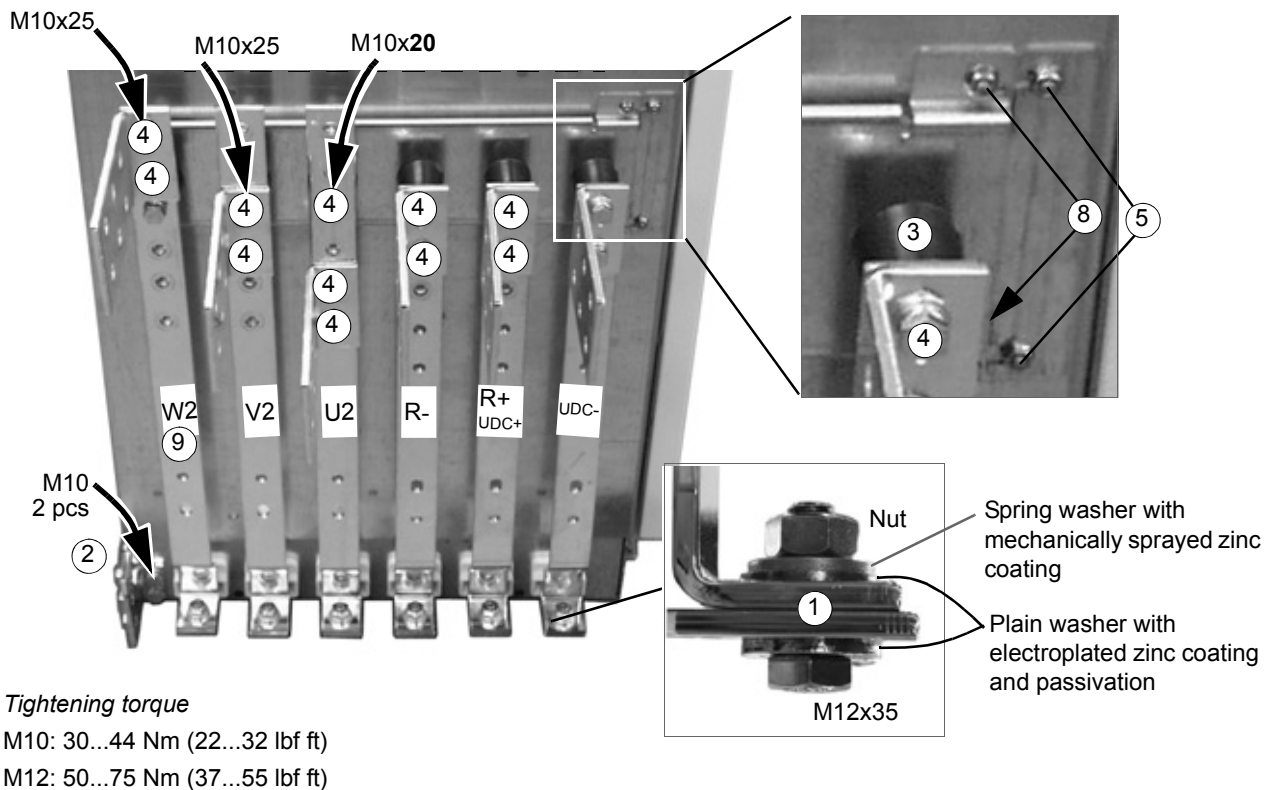
View of output busbar connections of frame size R7 (DC and brake busbars included)



View of output busbar connections of frame size R8 (DC and brake busbars included)



WARNING! Fasten the output busbars to the insulating supports with M10x20 screws when no cable lug terminal is connected, but with M10x25 screws when a cable lug terminal is connected as well. Screwing an M10x25 screw without a cable lug terminal through the busbar into the insulating support will break the insulating support.

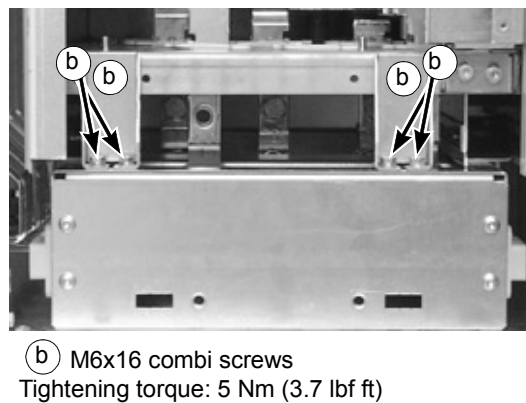
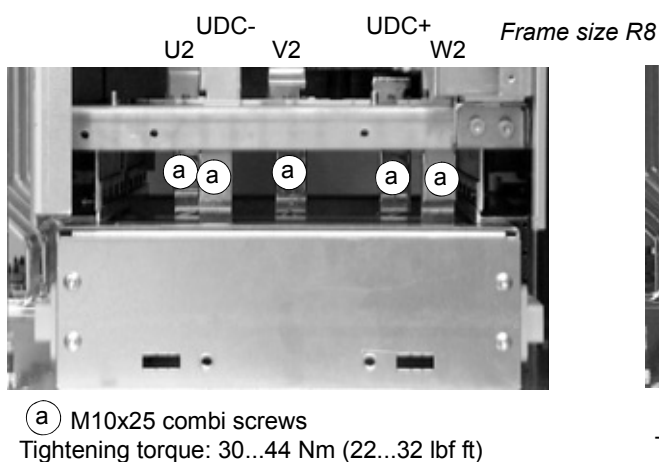
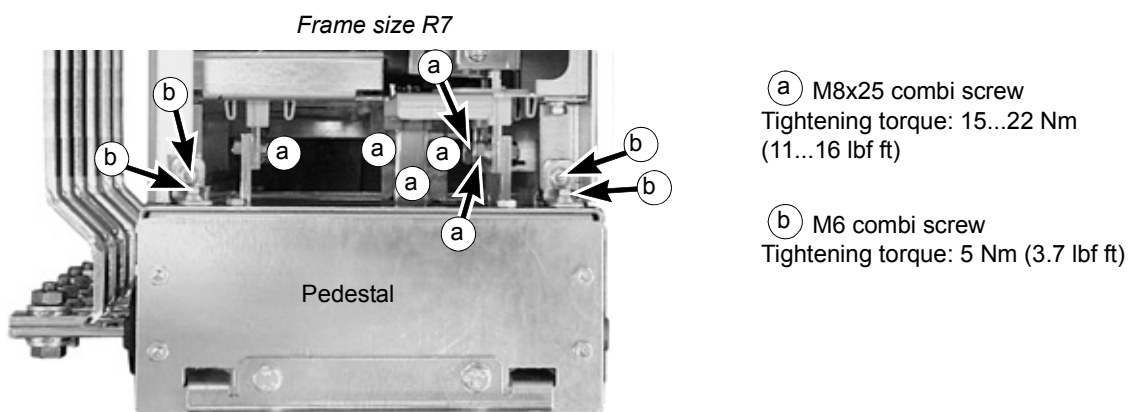


Fastening the drive module to the pedestal

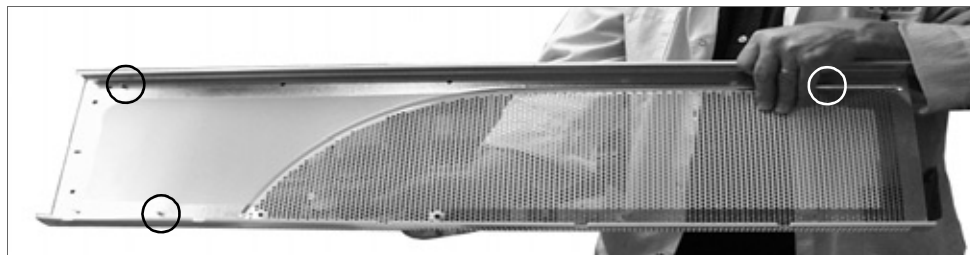
- Remove the front cover of the module.
- Connect the busbars with screws [3 to 6 pcs (a)] using a torque wrench with an extension bar.
- Fasten the module to the pedestal with screws (b).



WARNING! Fastening of screws (b) is important because the screws are required for the grounding of the drive.

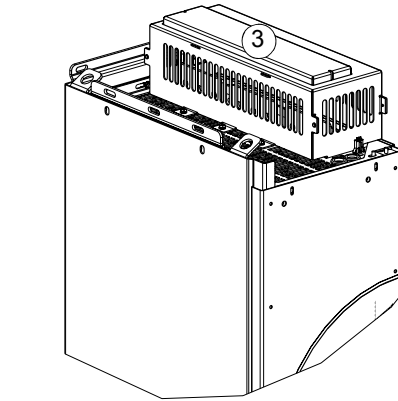
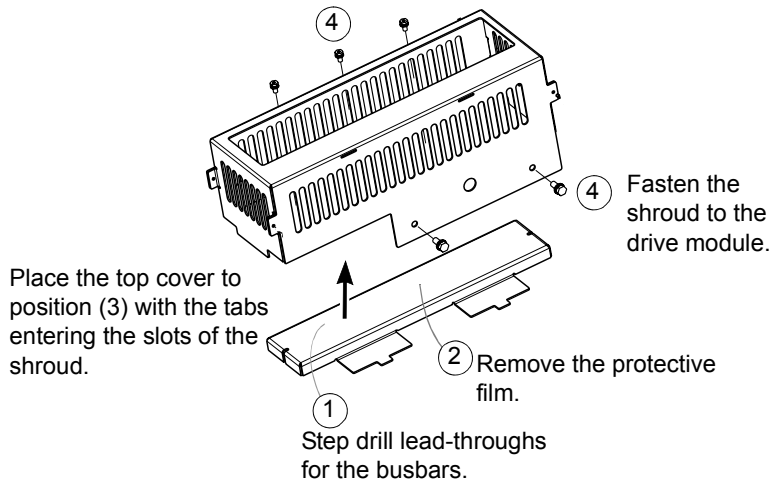


- Match the three guide pins on the cover with the counter holes. Fasten the front cover to the module with screws.



Fastening the shrouds in frame size R8

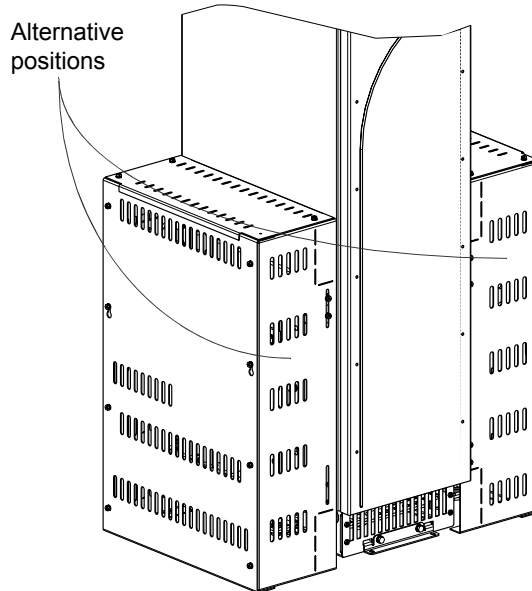
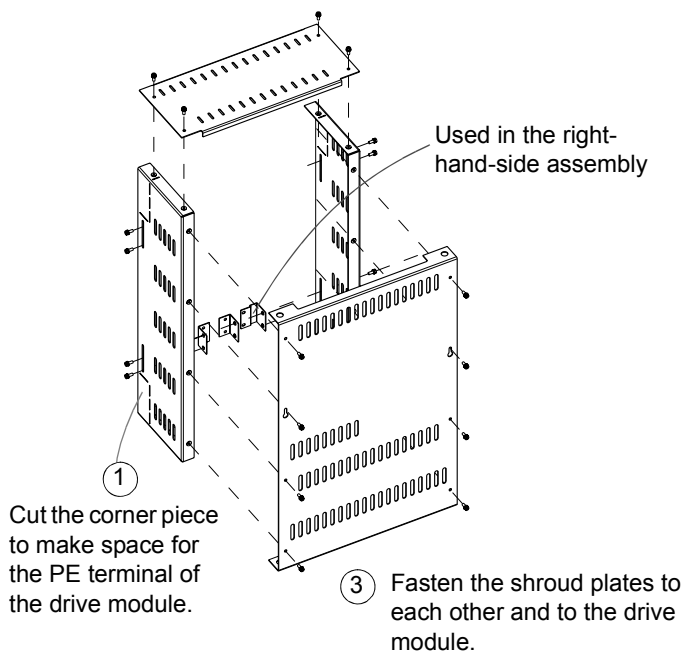
Top entry busbar shroud



Top entry busbar shroud fastened

Vertical busbar shroud

- ② Remove the protective film from the shroud surfaces.



Vertical busbar shroud fastened

Note: When connecting the power cables, remove the front (and top and side) shroud by undoing the fastening screws.

Units with pedestal and busbars on the short side (+H360, flat mounting)

Delivery check

Check that there are no signs of damage. Before attempting installation and operation, check the information on the type designation label of the drive to verify that the unit is of the correct type.

Item packages

The following tables show what each item package contains:


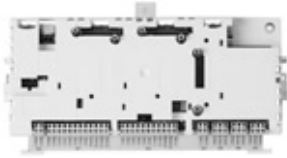
- parts
- part list code
- plus code
- assembling instruction.

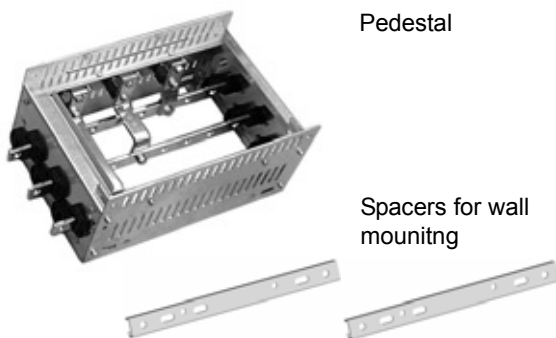
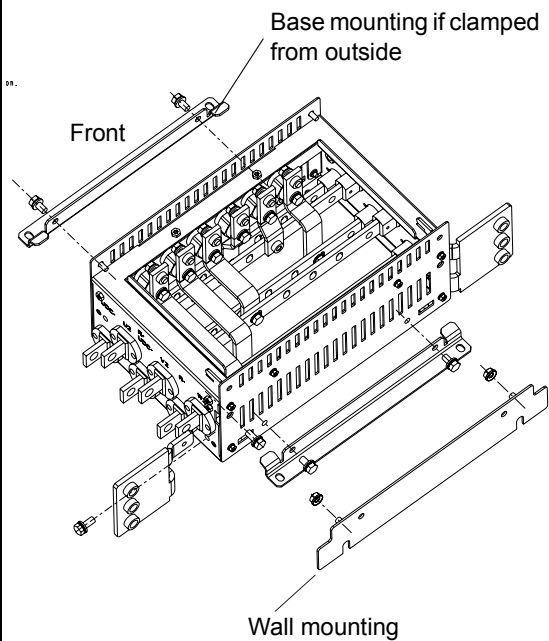
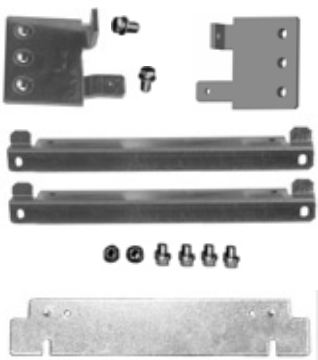
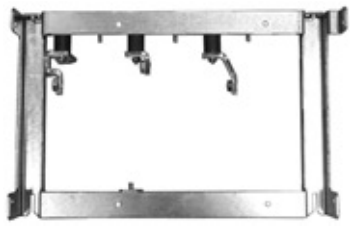
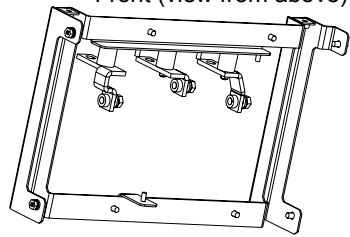
In the tables, the basic unit is described first, then the possible optional parts are listed. Choose the table and options of your delivery in the following sections:

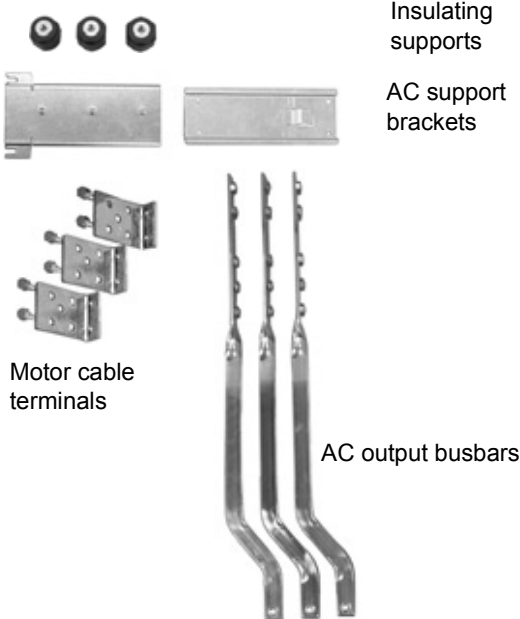
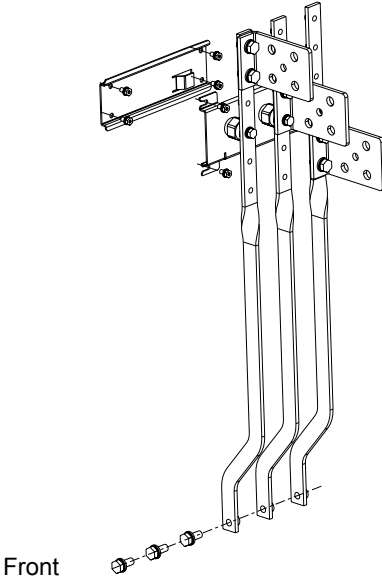

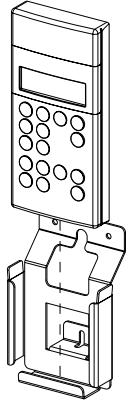
- *Item packages of frame size R7 with busbars on the short side* on page 92.
- *Item packages of frame size R8 with busbars on the short side* on page 98.

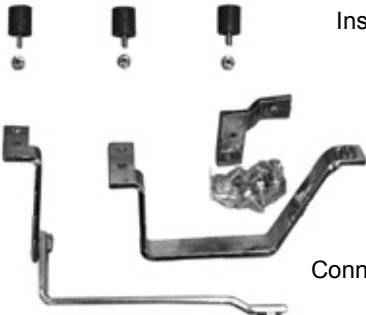
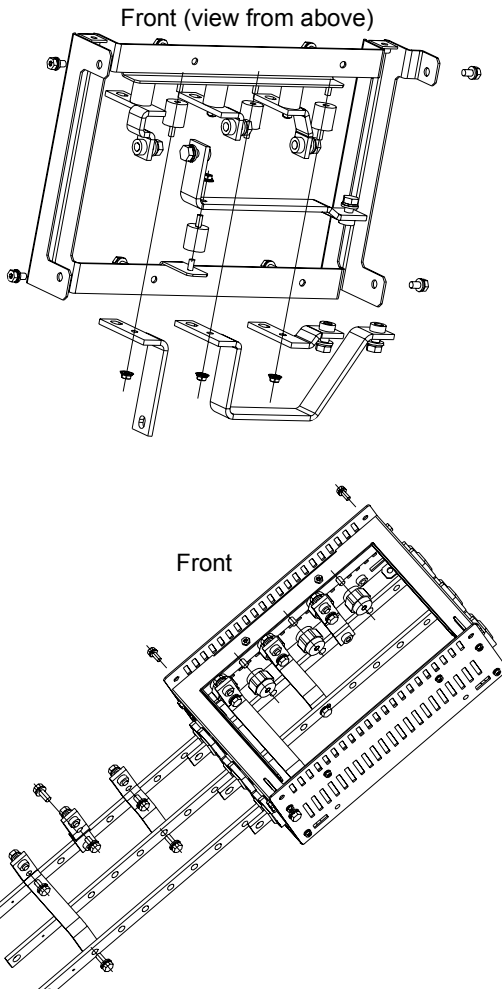
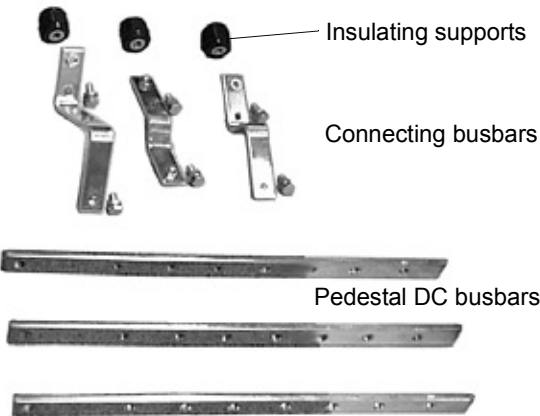
Note: The complete assembling instructions are represented under *Assembling procedure for units with busbars on the short side (+H360)* on page 104.





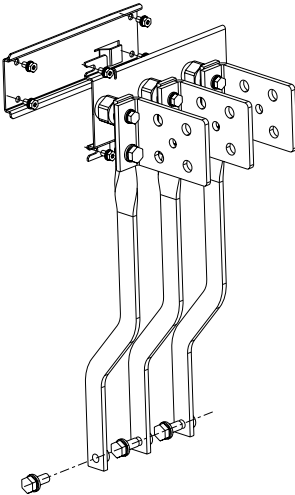
Item packages of frame size R7 with busbars on the short side

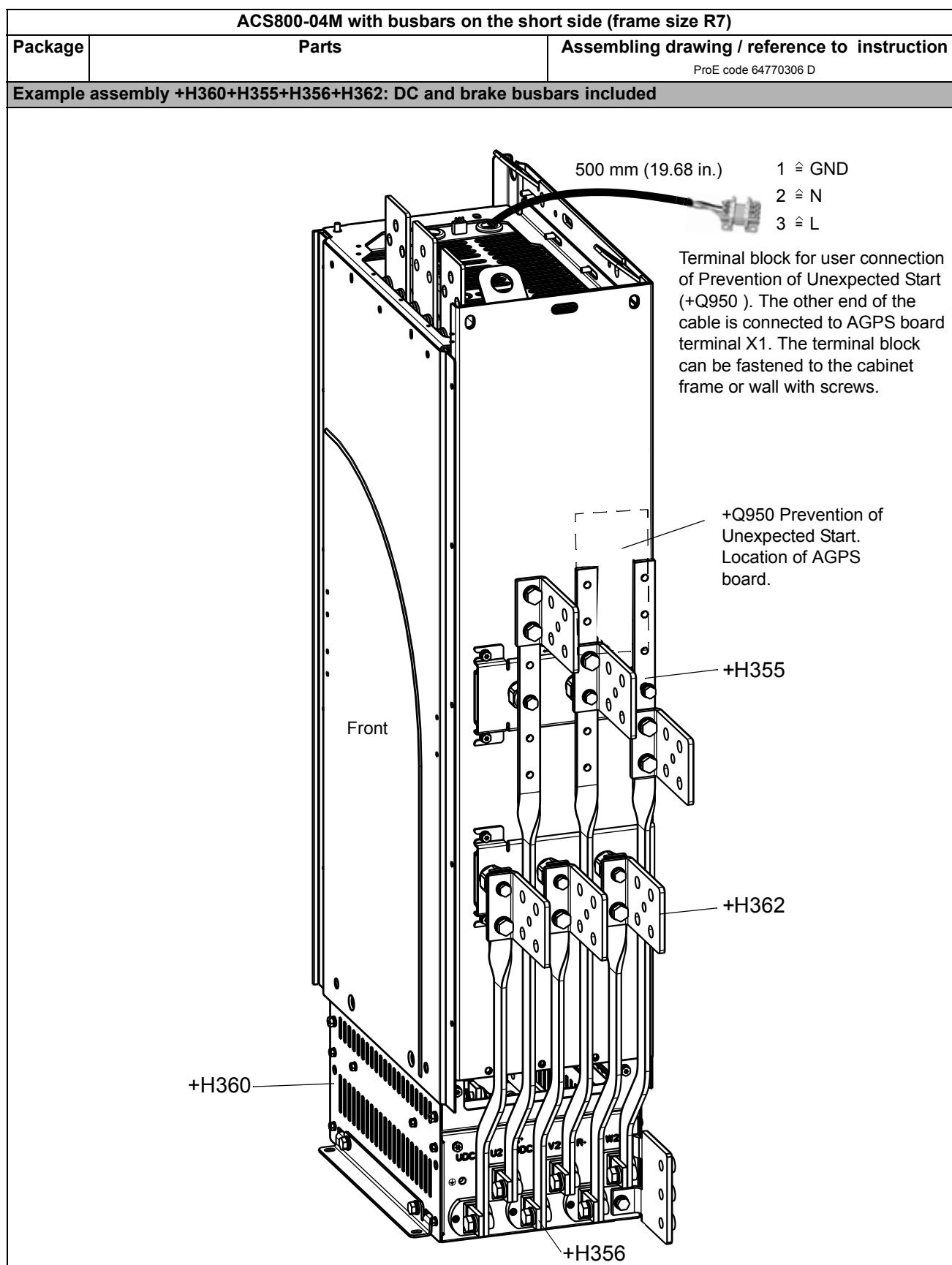
ACS800-04M with busbars on the short side (frame size R7)		
Package	Parts	Assembling drawing / reference to instruction ProE code 64770306 D
Basic unit (type code ACS800-04M-xxxx-x+H355+H360)		
-	 <p>Drive module</p> <p>Front</p>	Refer to section <i>Assembling procedure for units with busbars on the short side (+H360)</i> on page 104.
Drive control unit (RDCU)	 <p>RDCU drive control unit</p>	See <i>RDCU Drive Control Unit Hardware Manual</i> [3AFE64636324 (English)].

ACS800-04M with busbars on the short side (frame size R7)		
Package	Parts	Assembling drawing / reference to instruction ProE code 64770306 D
Pedestal R7 +H360	<p>64749404</p>  <p>Pedestal</p> <p>Spacers for wall mounting</p>	 <p>Base mounting if clamped from outside</p> <p>Front</p> <p>Wall mounting</p> <p>Note: DC and brake busbars (+H356) are included in the drawing</p>
Mounting bracket and grounding terminal kit R7 +H360	<p>64745808</p>  <p>PE terminals</p> <p>Base mounting brackets</p> <p>Wall mounting bracket</p>	
Adapter R7 +H360	<p>64749391</p>  <p>Adapter (viewed from the side that will mate with the drive module)</p>	<p>Front (view from above)</p> 

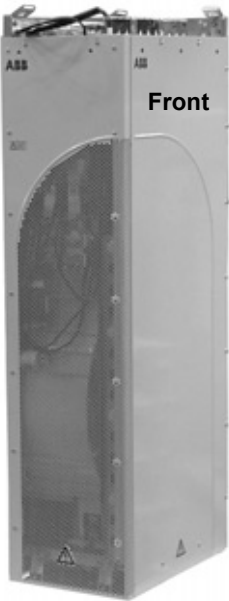
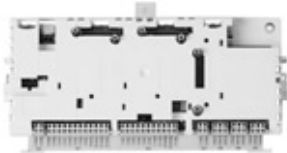
ACS800-04M with busbars on the short side (frame size R7)		
Package	Parts	Assembling drawing / reference to instruction ProE code 64770306 D
Motor output busbar kit R7 + H355	<p>64744402</p>  <p>Insulating supports</p> <p>AC support brackets</p> <p>Motor cable terminals</p> <p>AC output busbars</p>	 <p>Front</p>
Optional selection +J413: Control Panel Holder RPMP-21		
Control panel holder +J413	<p>68394961</p>  <p>Control panel holder</p>	

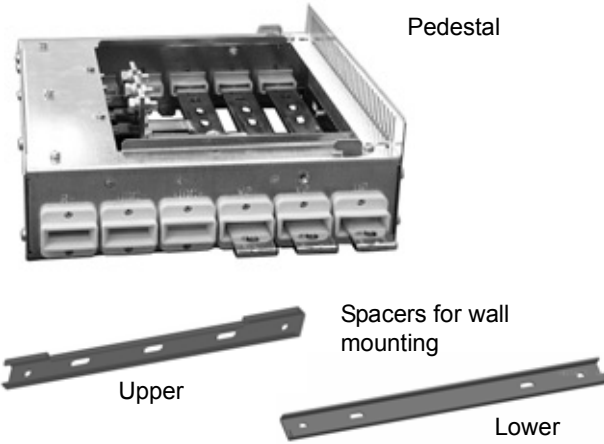
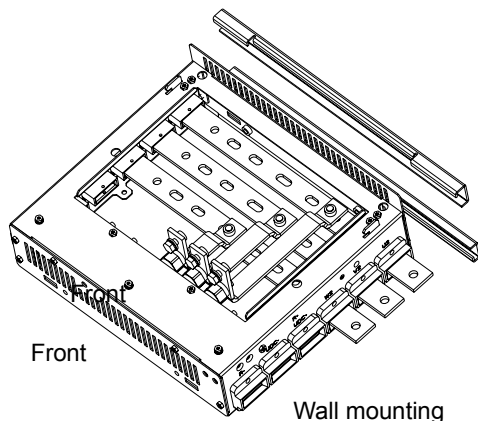
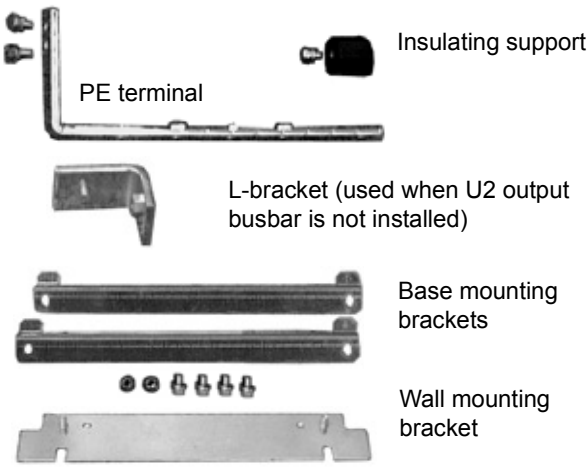
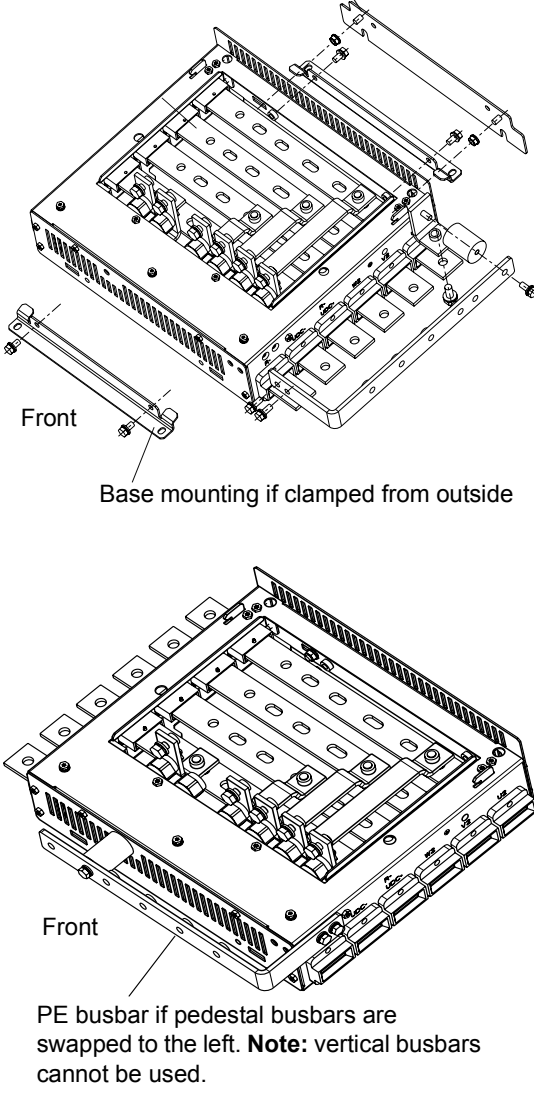
ACS800-04M with busbars on the short side (frame size R7)		
Package	Parts	Assembling drawing / reference to instruction ProE code 64770306 D
Optional selection +H360+H356+H362: DC/brake busbars		
Adapter DC busbar kit R7 +H356 (+H360 required)	64769375  <p>Insulating supports</p> <p>Connecting busbars</p>	 <p>Front (view from above)</p> <p>Front</p>
	 <p>Insulating supports</p> <p>Connecting busbars</p> <p>Pedestal DC busbars</p>	

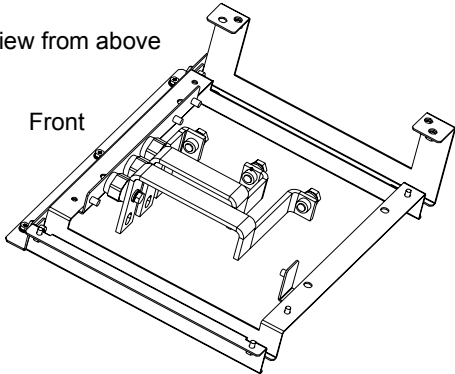
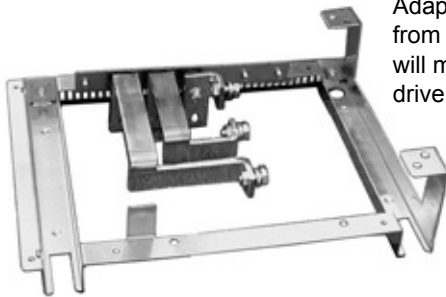
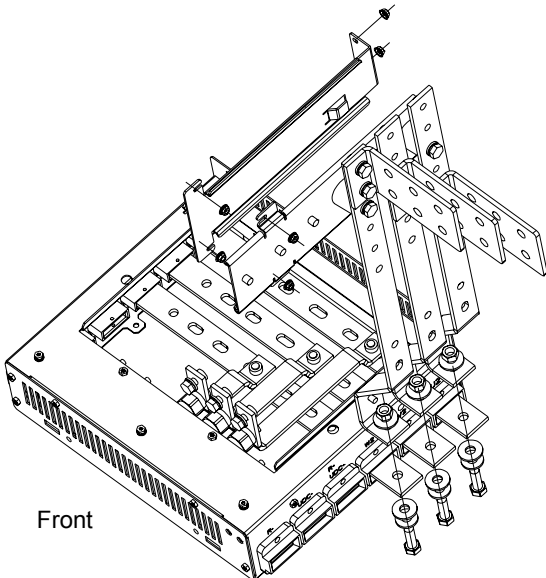
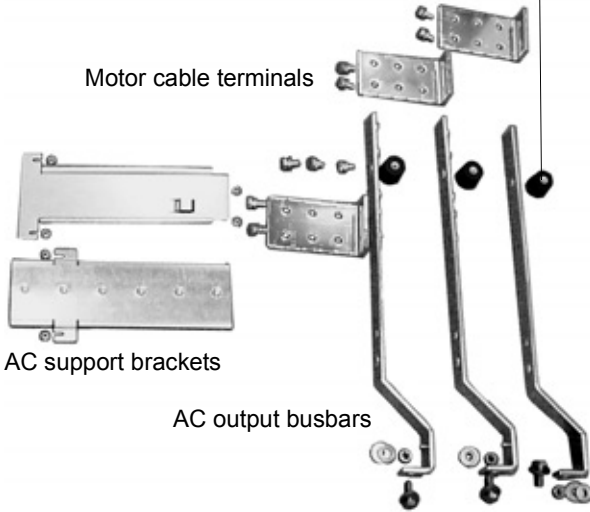
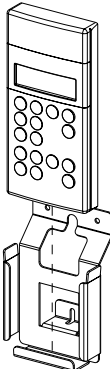

ACS800-04M with busbars on the short side (frame size R7)		
Package	Parts	Assembling drawing / reference to instruction
		ProE code 64770306 D
DC output busbar kit R7 +H362 (+H360 required)	<div>64744763</div> <div> Insulating supports</div> <div> DC support brackets</div> <div> Terminals</div> <div> Side busbars</div>	<div> Front</div>

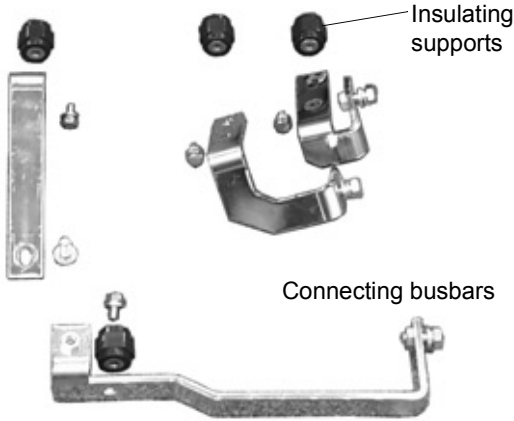
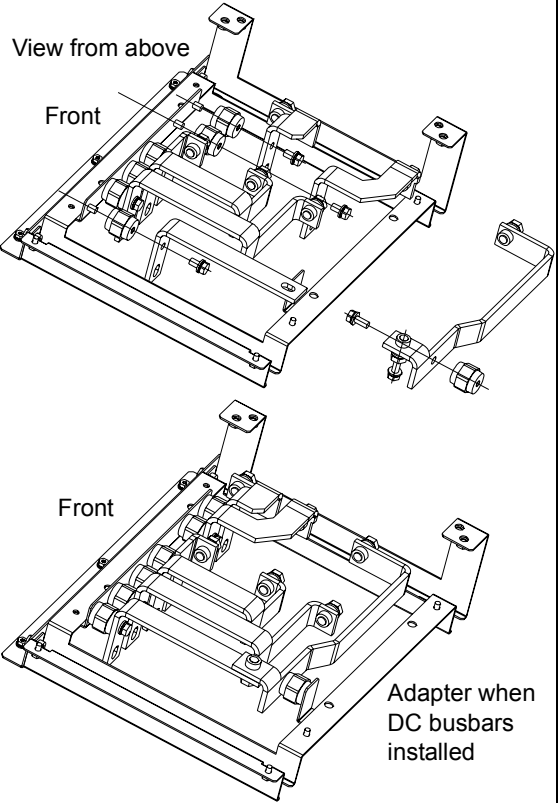


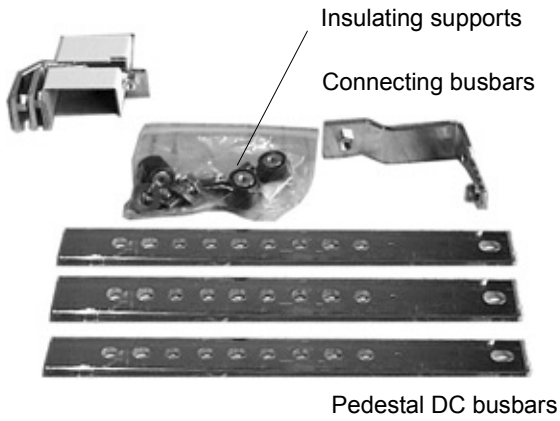
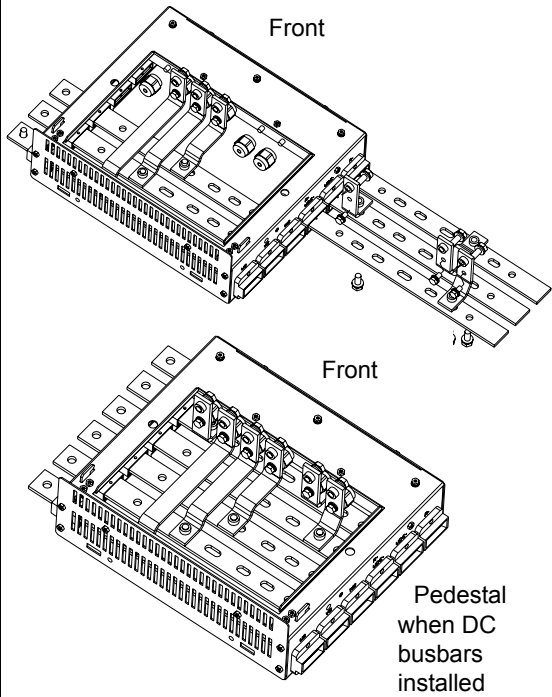
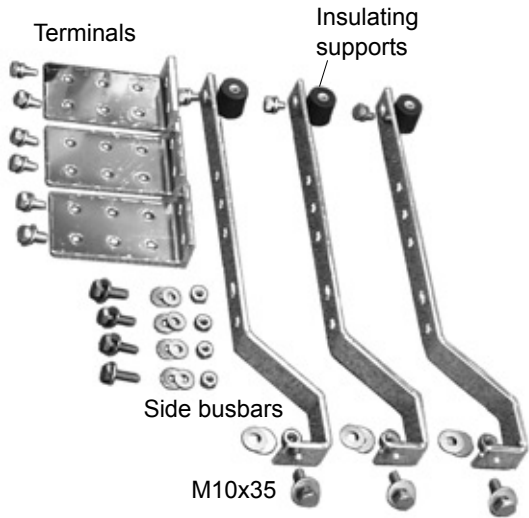
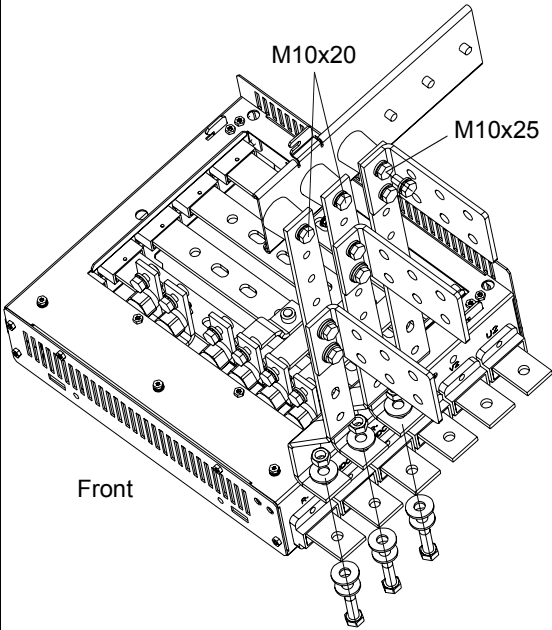
Item packages of frame size R8 with busbars on the short side

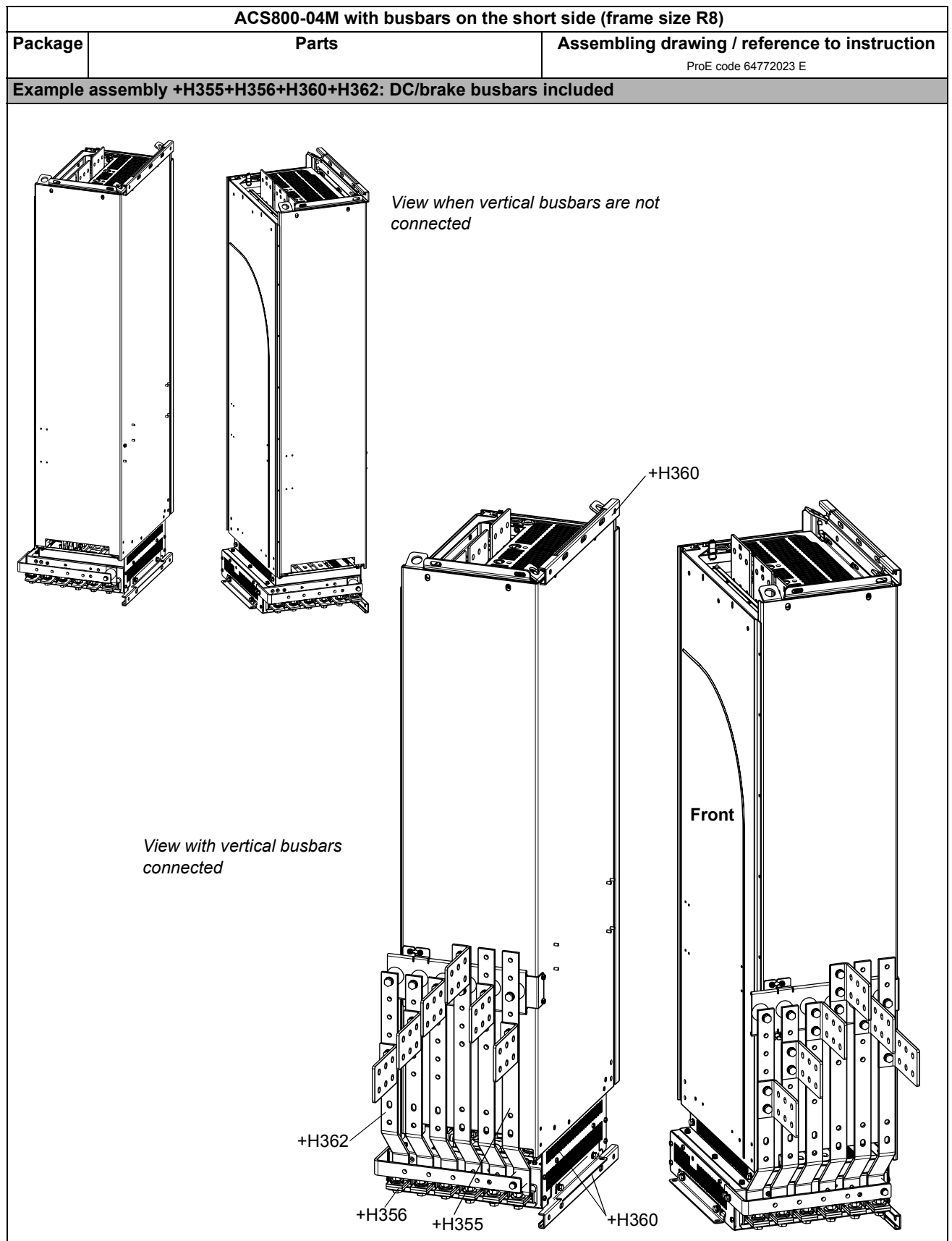
ACS800-04M with busbars on the short side (frame size R8)		
Package	Parts	Assembling drawing / reference to instruction ProE code 64772023 E
Basic unit (type code ACS800-04M-XXXX-X+H355+H360)		
-	 <p>Drive module</p>	Refer to section <i>Assembling procedure for units with busbars on the short side (+H360)</i> on page 104.
Drive control unit (RDCU)	 <p>RDCU drive control unit</p>	See <i>RDCU Drive Control Unit Hardware Manual</i> [3AFE64636324 (English)].

ACS800-04M with busbars on the short side (frame size R8)		
Package	Parts	Assembling drawing / reference to instruction ProE code 64772023 E
Pedestal R8 +H360	<p>64749978</p>  <p>Pedestal</p> <p>Upper</p> <p>Lower</p> <p>Spacers for wall mounting</p>	 <p>Front</p> <p>Wall mounting</p>
	<p>64745794</p>  <p>PE terminal</p> <p>Insulating support</p> <p>L-bracket (used when U2 output busbar is not installed)</p> <p>Base mounting brackets</p> <p>Wall mounting bracket</p>	 <p>Front</p> <p>Base mounting if clamped from outside</p> <p>Front</p> <p>PE busbar if pedestal busbars are swapped to the left. Note: vertical busbars cannot be used.</p>

ACS800-04M with busbars on the short side (frame size R8)		
Package	Parts	Assembling drawing / reference to instruction
ProE code 64772023 E		
Adapter R8 +H360	64749871	
	 <p>Adapter (viewed from the side that will mate with the drive module)</p>	
Motor output busbar kit R8 + H355	64744453	
	 <p>Motor cable terminals</p> <p>Insulating supports</p> <p>AC support brackets</p> <p>AC output busbars</p>	
Optional selection +J413: Control Panel Holder RPMP-21		
Control panel holder +J413	68394961	
	 <p>Control panel holder</p>	

ACS800-04M with busbars on the short side (frame size R8)		
Package	Parts	Assembling drawing / reference to instruction ProE code 64772023 E
Optional selection +H356+H362+H360: DC/brake busbars		
<p>Adapter DC busbar kit R8 +H356 (+H360 required)</p>	<p>64769456</p> 	

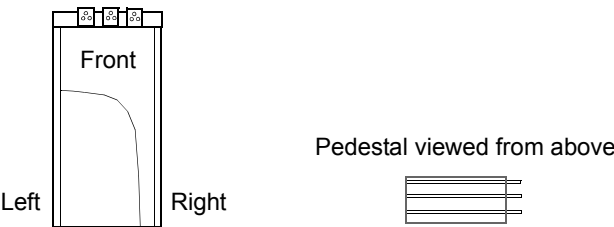
ACS800-04M with busbars on the short side (frame size R8)		
Package	Parts	Assembling drawing / reference to instruction
ProE code 64772023 E		
Pedestal DC busbar kit R8 +H356 (+H360 required)	 <p>Insulating supports</p> <p>Connecting busbars</p> <p>Pedestal DC busbars</p>	 <p>Front</p> <p>Front</p> <p>Pedestal when DC busbars installed</p>
DC output busbar kit R8 +H362 (+H360 required)	64744771  <p>Terminals</p> <p>Insulating supports</p> <p>Side busbars</p> <p>M10x35</p>	 <p>M10x20</p> <p>M10x25</p> <p>Front</p>

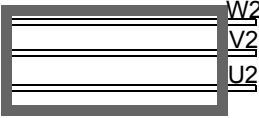
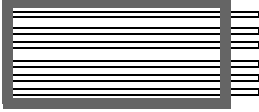
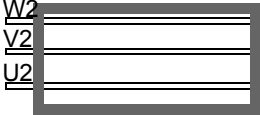
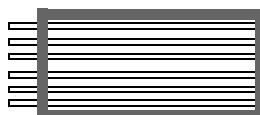
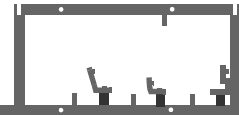



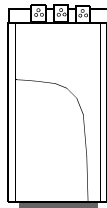
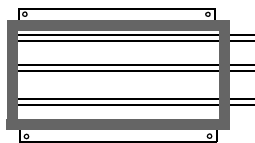
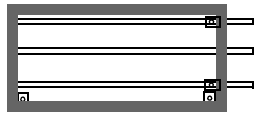
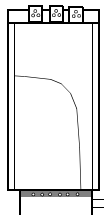
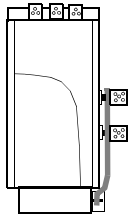
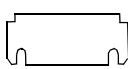
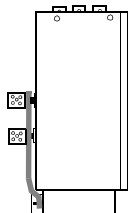
Assembling procedure for units with busbars on the short side (+H360)

Working order

References to instructions in this chapter are printed in *italic* in the table below. The pictures represent frame size R7 with the following orientations.



Step	If		Instruction
1 Preparing the pedestal		AC busbars on the right side	Go to step 2.
		AC busbars, R-, R+/UDC+ and UDC- busbars on the right side (+H356 required)	1. See <i>Connecting the DC busbars to the pedestal (+H360 +H356 only)</i> on page 107. 2. Go to step 2.
		AC busbars on the left side	1. See <i>Swapping the pedestal output busbars to the left-hand side</i> on page 106. 2. Go to step 2.
		AC busbars, R-, R+/UDC+ and UDC- busbars on the left side (+H356 required)	1. See <i>Swapping the pedestal output busbars to the left-hand side</i> on page 106. 2. See <i>Connecting the DC busbars to the pedestal (+H360 +H356 only)</i> on page 107. 3. Go to step 2.
2 Preparing the adapter		AC busbars on the right or left side	Go to step 3.
		AC busbars, R-, R+/UDC+ and UDC- busbars on the right or left side (+H356 required)	1. See <i>Preparing the adapter (+H360 +H356 only)</i> on page 108. 2. Go to step 3.

Step	If		Instruction
3 Fastening the adapter to the drive module		-	1. See <i>Fastening the adapter to the drive module</i> on page 109. 2. Go to step 4.
4 Fastening the pedestal by the base (not performed for wall-mounted units)		Base mounting from outside	1. See <i>Clamping the pedestal with the outside brackets</i> on page 80. 2. Go to step 5.
		Base mounting from inside	1. See <i>Fastening the pedestal through the holes inside the pedestal</i> on page 80. 2. Go to step 5.
5 Fastening the adapter to the pedestal		-	1. See <i>Fastening the drive module to the pedestal via the adapter</i> on page 110. 2. Go to step 6.
6 Connecting the output busbars		Units with vertical busbars	1. See <i>Connecting the output busbars on the short side of the module</i> on page 111. 2. Go to step 7.
7 Wall mounting (not performed for base-mounted units)		wall-mounted unit	1. See <i>Fastening the drive module to wall (wall-mounted units only, not for base-mounted units)</i> on page 81.
8 Fastening by top		base-mounted unit	1. See <i>Fastening the drive module by top to the cabinet frame</i> on page 81.

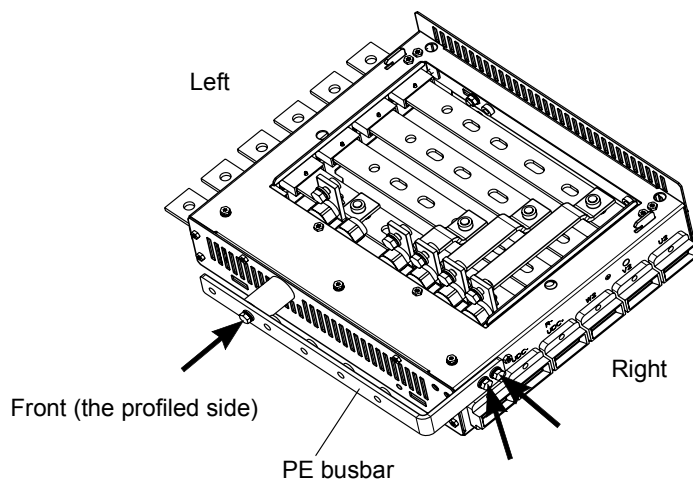
Swapping the pedestal output busbars to the left-hand side

- Disconnect the horizontal pedestal busbars from the busbars that connect them to the adapter.
- Push the horizontal busbars to the left.
- Reconnect the horizontal busbars to the adapter connecting busbars.

Note:

When the pedestal busbars are swapped to the left:

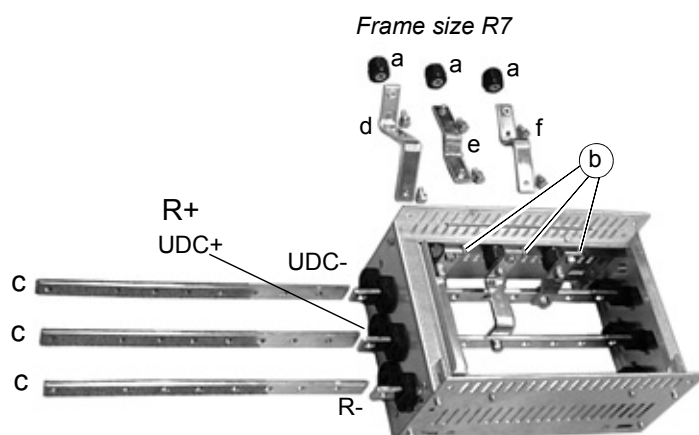
- vertical output busbars cannot be installed.
- the unit cannot be mounted on a wall with the wall mounting bracket included in the delivery.
- ensure that the required clearance between the cabinet base or floor and the cable lugs or busbars used in the cabling is at least 13 mm (1/2 in.). Otherwise, insulating material must be used below the drive module.
- fasten the left-hand side PE terminal in frame size R7. In frame size R8, fasten the PE busbar as follows.



Fastening of the PE busbar in frame size R8

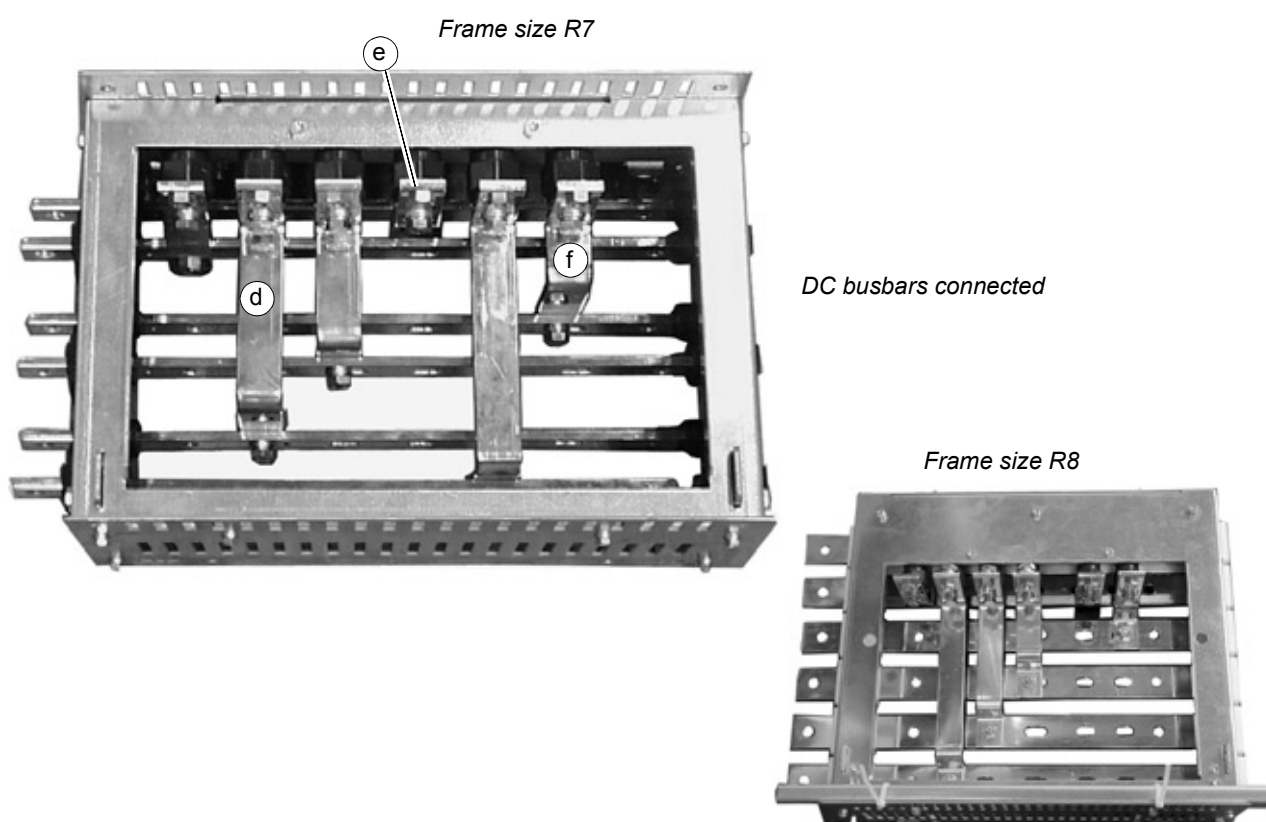
Connecting the DC busbars to the pedestal (+H360 +H356 only)

Required parts



Procedure

1. Screw insulating supports ("a" above) onto the free pins ("b" above) on the inner sides of the pedestal.
2. Push busbars (c) through the R-, R+/UDC+ and UDC- lead-through insulators.
3. Connect the connecting busbars (d, e, f) to the insulating supports and to the R-, R+/UDC+ and UDC busbars as shown below.

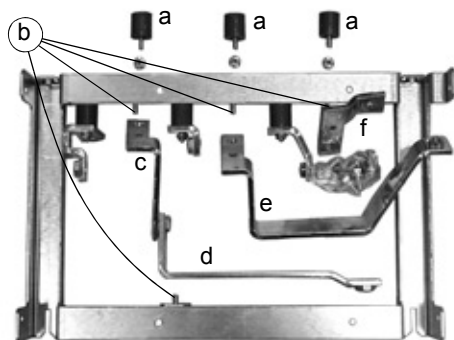


See also chapter *Assembly drawings*.

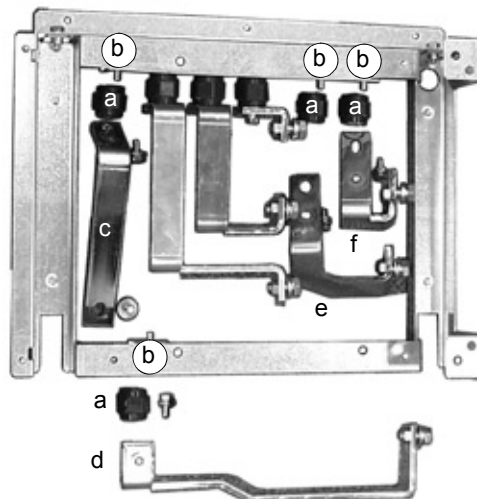
Preparing the adapter (+H360 +H356 only)

Required parts

Frame size R7



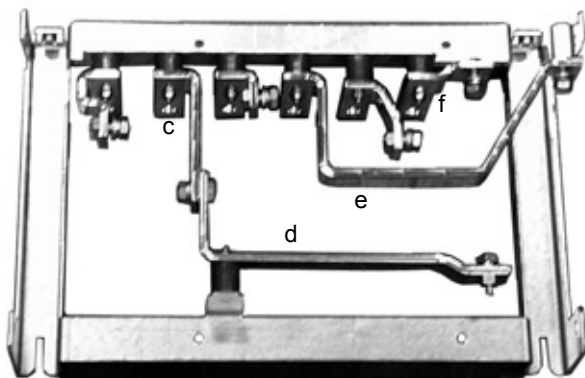
Frame size R8



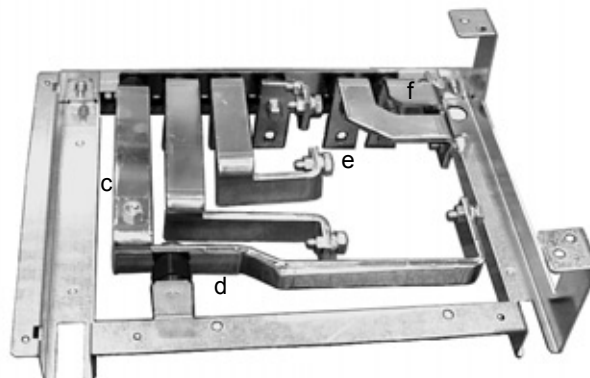
Procedure

1. Screw insulating supports ("a" above) onto the free pins ("b" above).
2. Connect the connecting busbars to the insulating supports as shown below. Connect busbar c to busbar d.

Frame size R7



Frame size R8



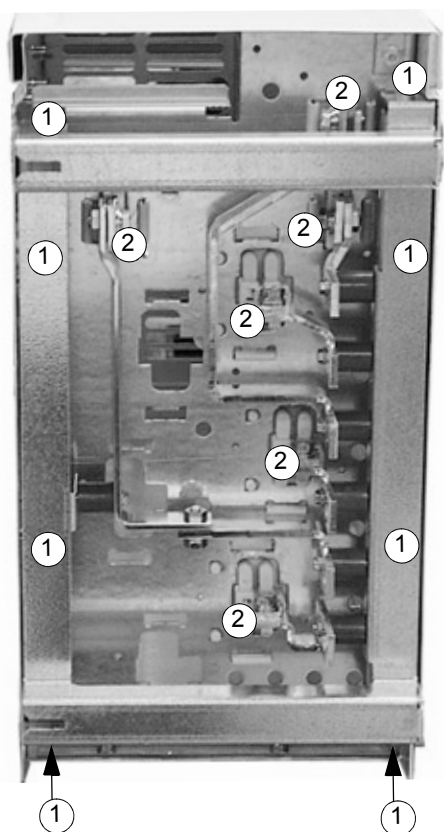
See also chapter *Assembly drawings*.

Fastening the adapter to the drive module

The DC busbars (+H356) are included in the installation examples below.

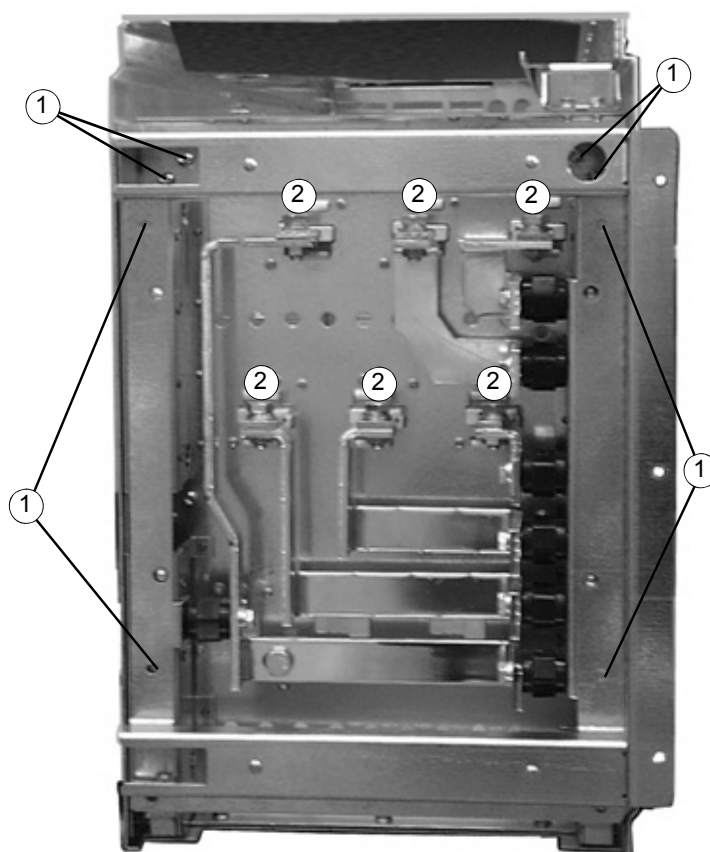
1. Fasten the screws.
2. Connect the busbars.

Frame size R7



- ② *Tightening torque*
M8: 15...22 Nm (3.7 lbf ft)

Frame size R8



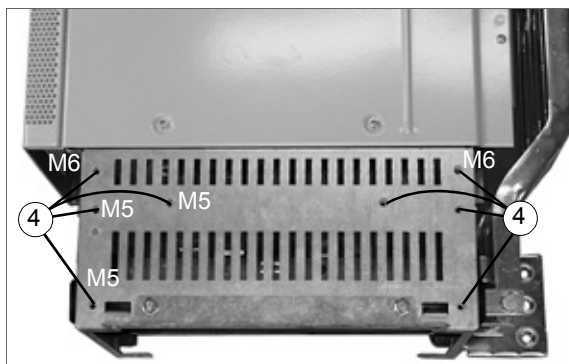
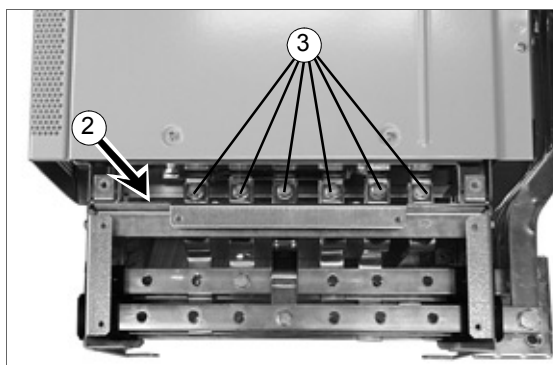
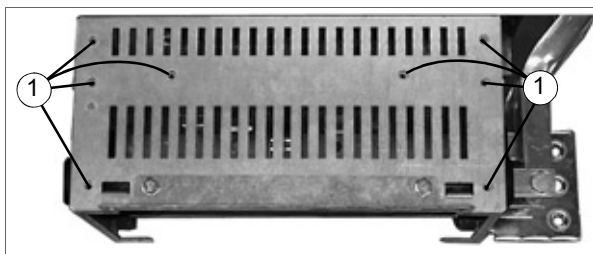
- ② *Tightening torque*
M10: 30...44 Nm (22...32 lbf ft)

Fastening the drive module to the pedestal via the adapter

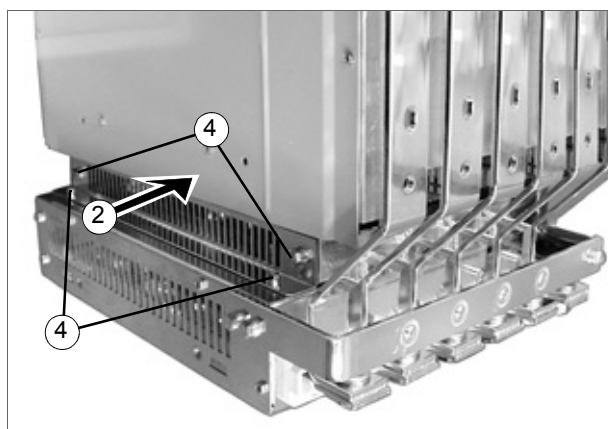
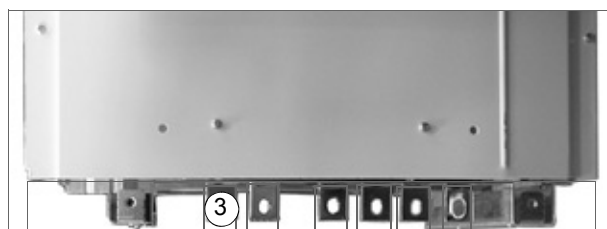
The DC busbars (+H356) are included in the installation examples below. The adapter has been connected to the drive module.

1. Frame size R7: Remove the “long front” side plate of the pedestal.
Frame size R8: Remove the “long front” side plate of the adapter.
2. Slide the drive module with the adapter fastened onto the pedestal.
3. Connect the busbars.
4. Frame size R7: Fasten the side plate of the pedestal.
Frame size R8: Fasten the side plate to the adapter and the pedestal.

Frame size R7



Frame size R8

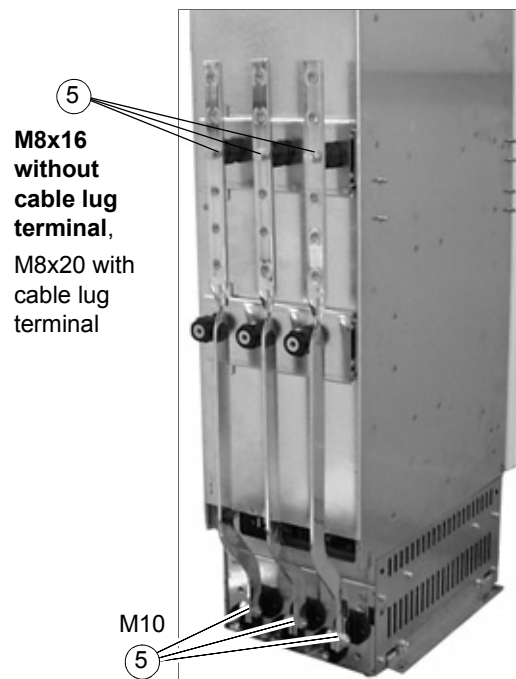
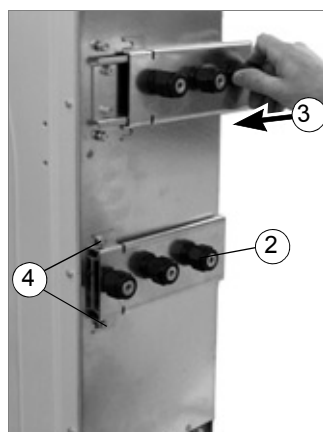
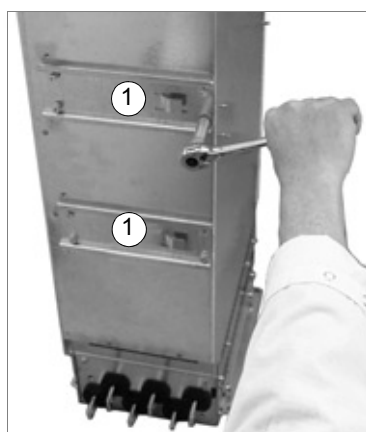


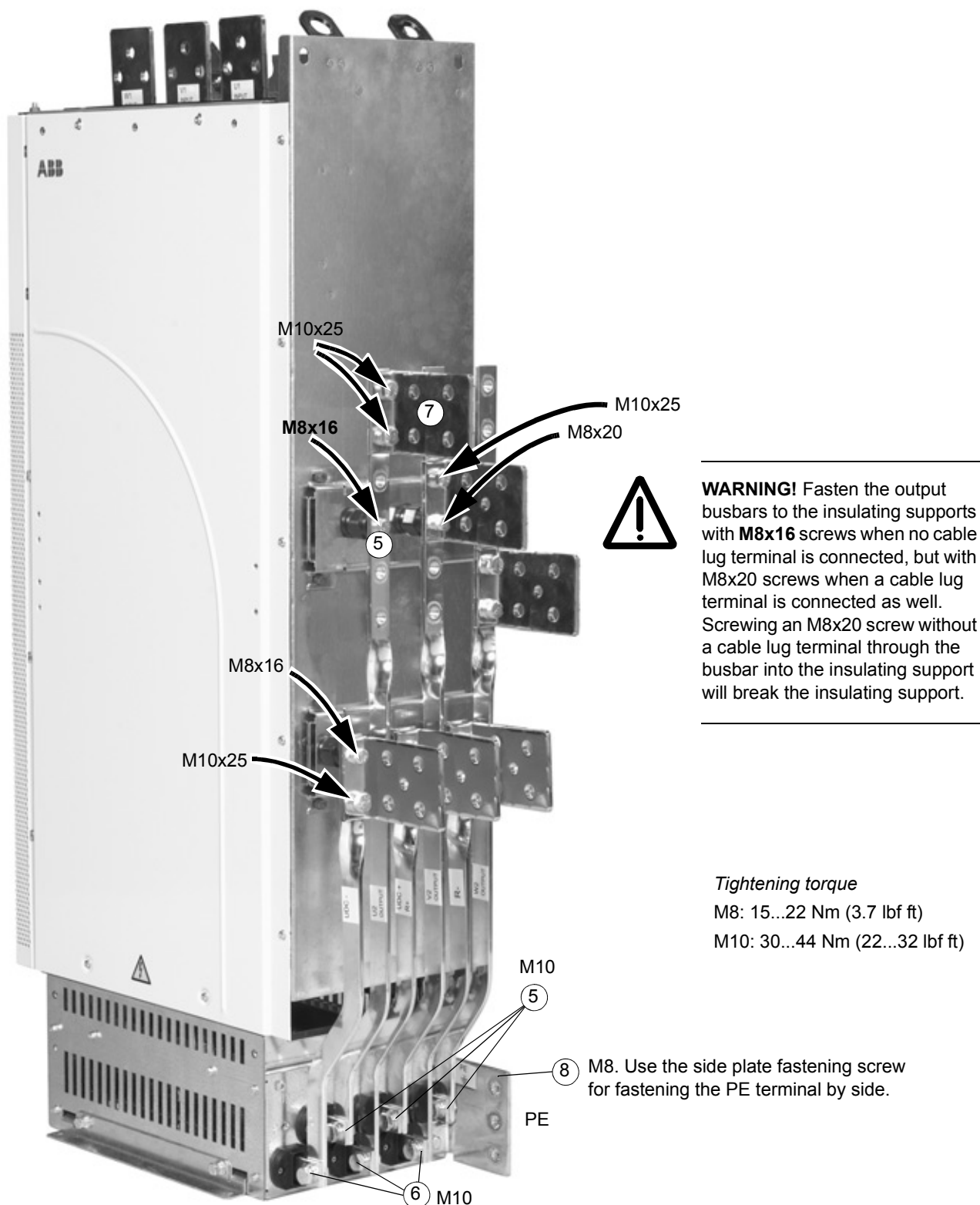
Connecting the output busbars on the short side of the module

Procedure for frame size R7

The steps of this installation procedure are shown in the photos below and on the next page.

1. Fasten the inner support bracket (brackets if DC busbars ordered) to the drive module with four M6 screws.
2. Screw the insulating supports onto the pins on the outer support bracket (s).
3. Slide the outer support bracket(s) on the inner bracket(s).
4. Fasten the outer support bracket(s) with two M6 screws.
5. Connect the AC busbars.
6. Connect the DC busbars (if ordered).
7. Connect the cable lug terminals. Use a M8x20 screw when the terminal is placed on an insulating support and M10x25 screws elsewhere.
8. Connect the PE busbar.





Frame size R7 +H360: AC, DC and brake busbars connected (+H356 included)

Procedure frame size R8

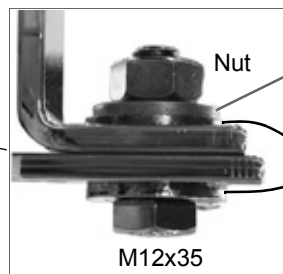
The steps of this installation procedure are shown in the photo on the next page.

1. Fasten the inner support bracket to the drive module.
2. Screw the insulating supports onto the pins on the outer support bracket.
3. Slide the outer support bracket on the inner bracket.
4. Fasten the outer support bracket to the drive module.
5. Connect the AC busbars.
6. Connect the DC busbars (if ordered).
7. Connect the PE busbar.



Tightening torque

M12: 50...75 Nm (37...55 lbf ft)



- Plain washer with electroplated zinc coating and passivation

Frame size R8 +H360: AC, DC and brake busbars connected (+H356 included)

Checking the installation

What this chapter contains

This chapter contains checklists according to which the assembly of converter modules into a cabinet is inspected at ABB factory.

Visual inspection

Inspect the mechanical and electrical installation of the converter module visually to ensure safe testing and use of the drive.

Cabinet construction

Checks for cabinet construction are listed below.

Step	Check item
1	Cabinet construction
1.1	Frame, wall, floor and roof structures, busbar enclosures and cable entries are correct and completely assembled.
1.2	Mechanical joints are tightened and not broken.
1.3	Parts are clean and painted surfaces not scratched. The cabinet frame and parts which are in metal to metal contact with the frame (e.g. seams, component fixing points on assembly plates, back of control panel mounting plate) are not finished with non-conducting paint or material.
1.4	IP enclosure class
1.5	There is a sufficient number of supports, bolts and nuts for cables.

Instrumentation, busbars and cabling

Checks for instrumentation, busbars, cabling, clearances and creepage distances are listed below. For more information, refer to *ACS800-04/04M/U4 Hardware Manual* [3AFE64671006 (English)]: *Planning the electrical installation*.

Step	Check item
2	Instrumentation
2.1	Type and number of option modules and other equipment is correct. Option modules and other equipment are not damaged.
2.2	Option modules and terminals are labelled correctly.
2.3	The placement of option modules and other equipment inside the cabinet and on the cabinet door is correct.
2.4	The mounting of option modules and other equipment is correct.

Step	Check item
3	Busbars
3.1	The types (Al/Cu) and cross-sections of busbars are correct.
3.2	Busbars are intact and joint surfaces are clean. There are no metal scraps on the busbars that could cause a short-circuit.
3.3	The placement and mounting of busbars is correct.
3.4	The electrical connection of busbars. Check that the surfaces in electrical connections of aluminium and uncoated busbars are rubbed. Check that anti-oxidant joint compound is used in electrical connections of aluminium busbars. Check that the number of washers and the sizes of bolts are correct.
3.5	Busbar supports and lead-in insulators are visually intact and degreased, and placed and mounted correctly.
3.6	The electrical connections on the main circuit are tightened to required torque and marked with a green marking.
4	Cabling and wiring
4.1	Wiring of the main circuit. Check <ul style="list-style-type: none"> • AC supply input • AC output • supply for brake resistor (if used).
4.2	Wiring of the 230 VAC circuit. Check <ul style="list-style-type: none"> • terminal strips and relays • supply of cabinet fans (if used) • 24 VDC auxiliary voltage circuit (optional module supply) • supply for cooling fan of the braking resistor(s) (if used).
4.3	Wiring of the converter module circuit. Check <ul style="list-style-type: none"> • RDCU module (RMIO board) connections • control cable connections • control panel cable connections.
4.4	Cable types, cross-sections, colours and optional markings are correct.
4.5	Check the cabling for circuits susceptible to interference. Check the twisting of cables and cable routes.
4.6	Check that cables without short-circuit protection <ul style="list-style-type: none"> • can carry the load current • are shorter than 3 m (10 ft) • are assembled separate to other cables • are protected by an enclosure or duct.
4.7	Cable connectors and fibre optic cables are intact and according to instructions. Check the termination of cables (e.g. AMP connectors), the crimping of cable lugs and ferrules. Check that the connectors are suitable for the cables and the correct crimping tool has been used. Check that <ul style="list-style-type: none"> • insulation of the cable is not underneath the connector • all strands of the cable are inside the connector • connector is not broken • cable is deep enough in its connector.

Step	Check item
4.8	Connection of cables to devices and terminal blocks. Check that <ul style="list-style-type: none"> • cables are connected to terminals tight enough by pulling the cable • cable termination on terminals chaining is done correctly • bare conductors are not too far outside the terminal causing an insufficient clearance or loss of shielding against contact.
4.9	Cables are not lying against sharp edges or bare live parts. Bending radius of fibre optic cables at least 3.5 cm (1.38 in.).
4.10	The type, markings, insulation plates and cross connections of terminal blocks are correct.
5.	Clearances and creepage distances
5.1	Clearances outside the modules are at least 12.7 mm (0.5 in.).
5.2	Creepage distances outside the modules are at least 12.7 mm (0.5 in.).




Groundings and protection

Checks for groundings and protections are listed below. Tips for installations where EMC emissions must be minimised are given in column *Extra requirements for EMC*.

Step	Check item	Extra requirements for EMC
6	Groundings and protection	
6.1	The grounding colours, cross-section and grounding points of modules and other equipment match the circuit diagrams.	No long routes for pigtails
6.2	Connections of PE cables and busbars are tight enough. Pull the cable to test that it does not loosen.	No long routes for pigtails
6.3	Doors equipped with electrical equipment are grounded.	No long grounding routes. From EMC standpoint best result is achieved with a flat copper braid.
6.4	Fans that can be touched are shrouded.	
6.5	Live parts inside the doors are protected against direct contact to at least IP 2x (if required).	

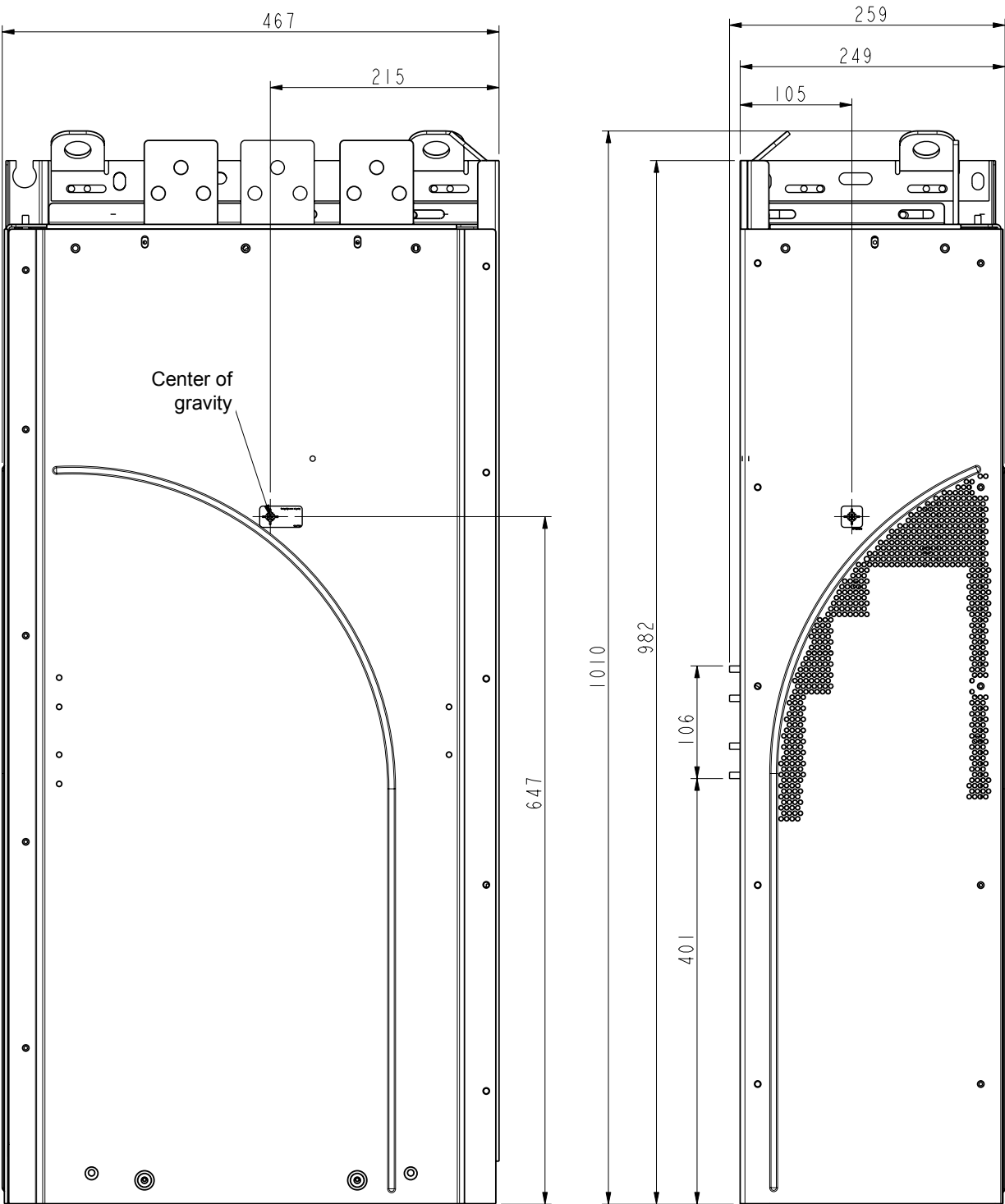
Labels, switches, fuses and doors

Checks for labels, switches, fuses and doors are listed below.

Step	Check item
7	Labels
7.1	<p>The name plates are correct. The name plates are located correctly. Check the name plates for</p> <ul style="list-style-type: none"> • cabinet • main circuit fuses • settings of the circuit-breakers • safety switches of the main circuit.
7.2	<p>The warning and instruction stickers are located correctly.</p> <p><i>Stickers required inside the cabinet:</i></p> <ul style="list-style-type: none"> •  near all grounding connections • inside the cabinet door main fuse specification label, fuse installation (centring) note •  on contact covers • warning of live terminals of a blown fuse on contact cover on the main fuses • warning about apparatus not disconnected from the supply network by the main switch on contact covers of these busbars and apparatus • warning sticker for residual voltages of the converter capacitor banks placed on the converter module. <p><i>Stickers required on the cabinet door:</i></p> <ul style="list-style-type: none"> • five-minute warning of residual voltage •  • sticker on the control panel mounting platform (if used) • emergency stop and start switch label (if applicable) • main switch label.
8.	Switches, fuses and doors
8.1	Check the functioning of mechanical switches by closing and opening them.
8.2	Check that fuses can be changed with a fuse handle. Check that fuse disconnectors and sockets match each other.
8.3	<p>Check the appropriate length and fastening of the operation rod of the main disconnecting switch.</p> <p>When switch fuses or disconnecting switches are closed, the corresponding cabinet doors cannot be opened:</p> <ol style="list-style-type: none"> 1. Lock the cabinet door with the main switch in OPEN position (0). 2. Close the main switch (position 1). 3. Unlock the door. It must not be possible to open the door by pulling the handle.

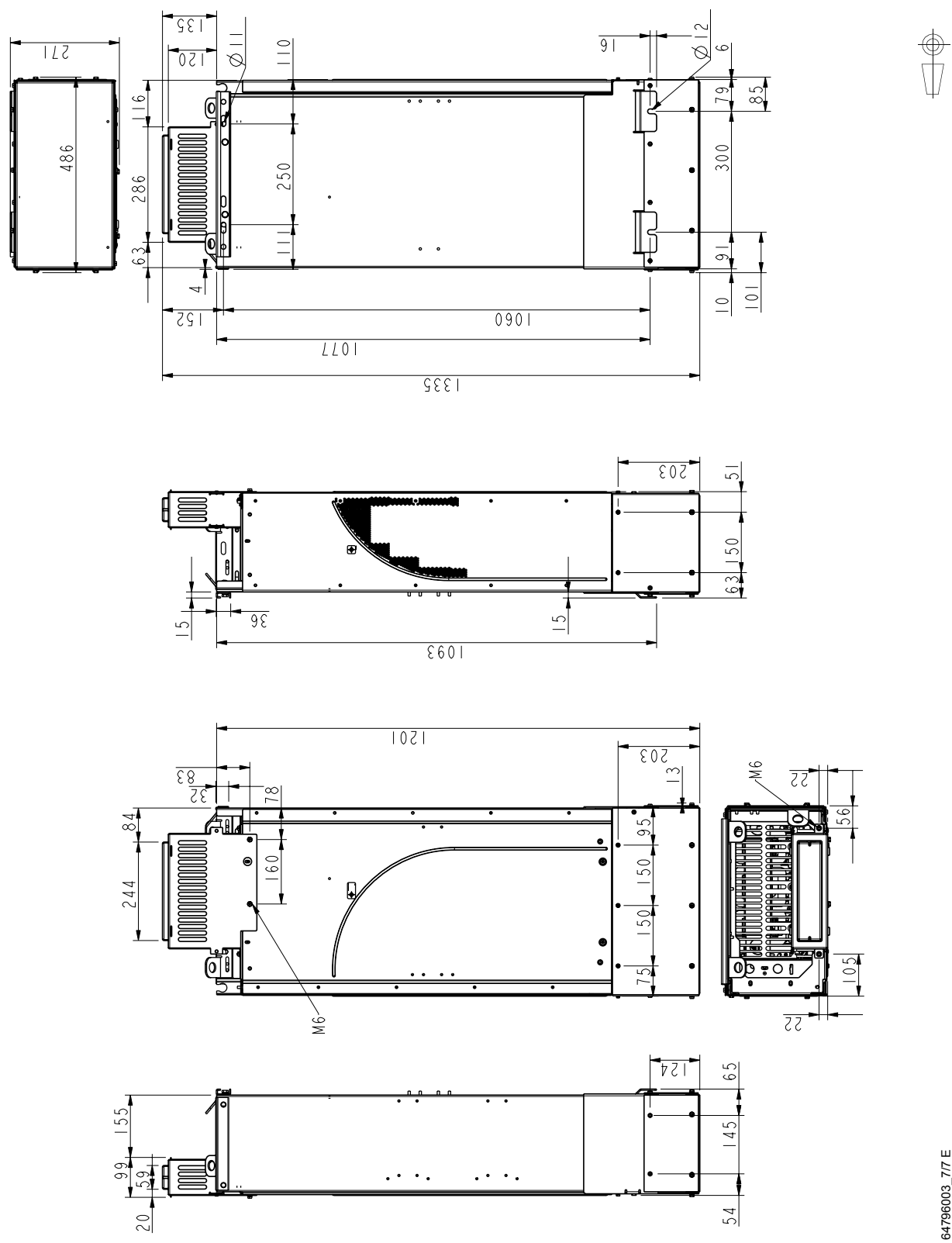
Dimensional drawings

Frame size R7 without pedestal (mm)

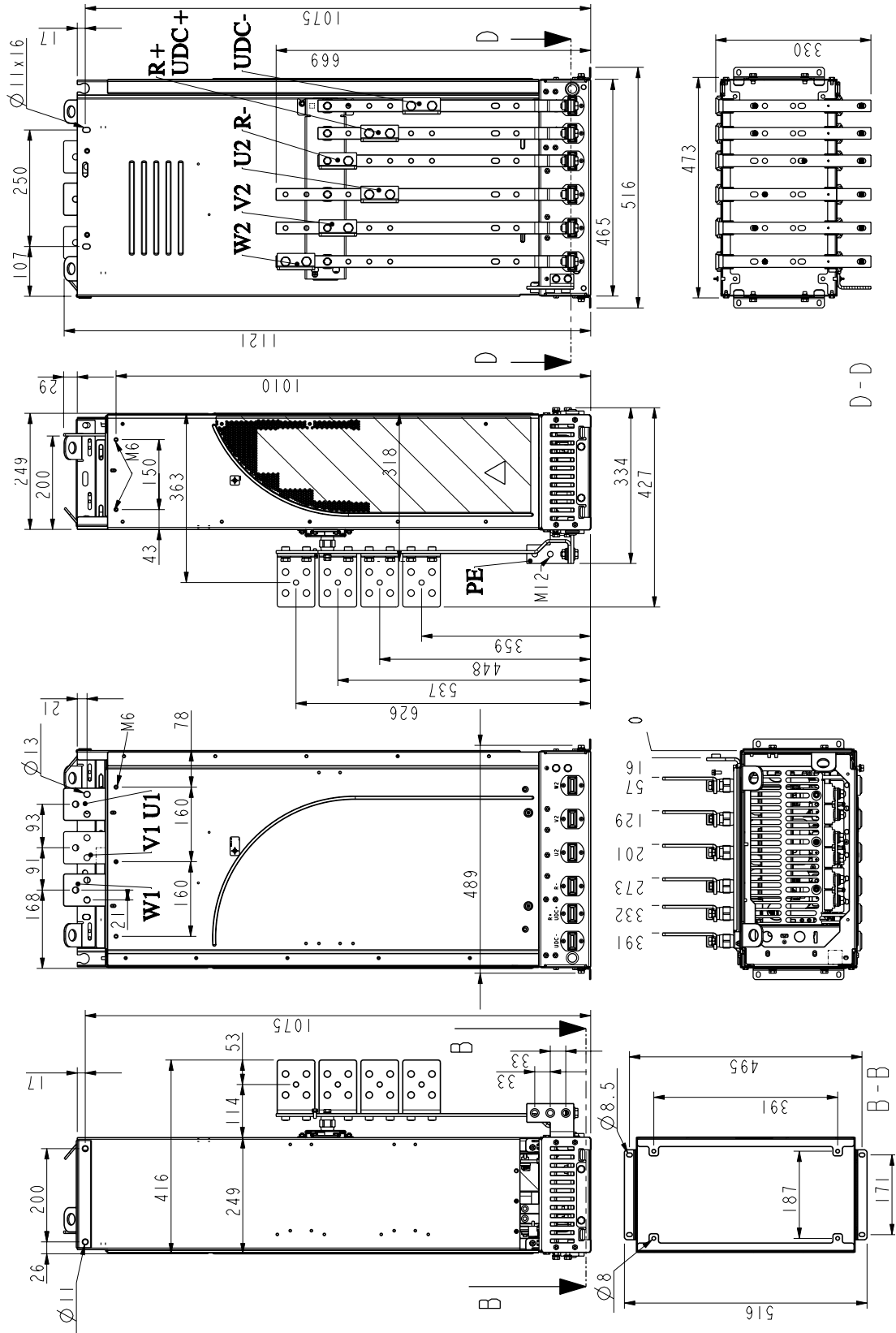


64796003_3/7 E

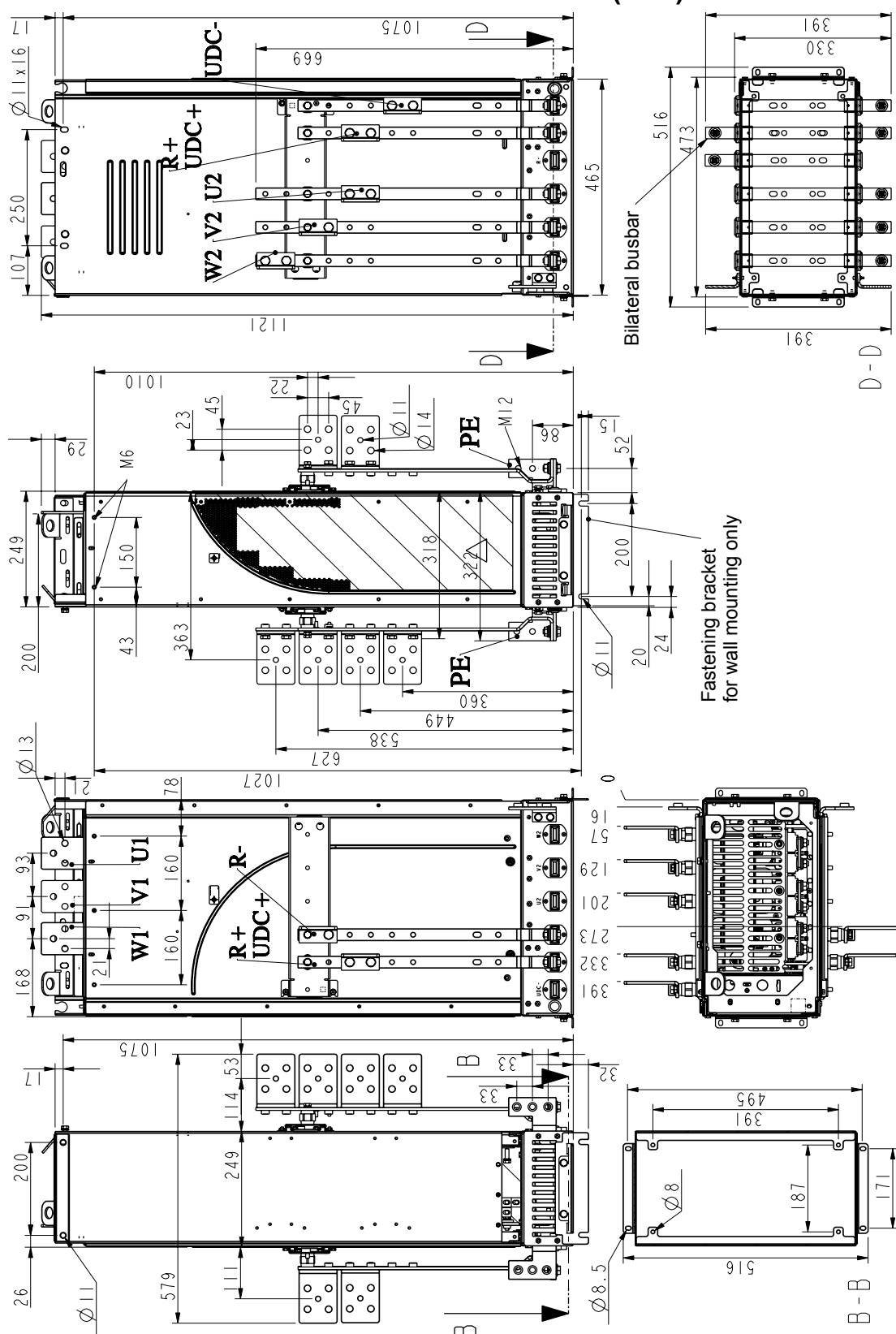
Frame size R7 with bottom exit and top entry and bottom exit shrouds (mm)



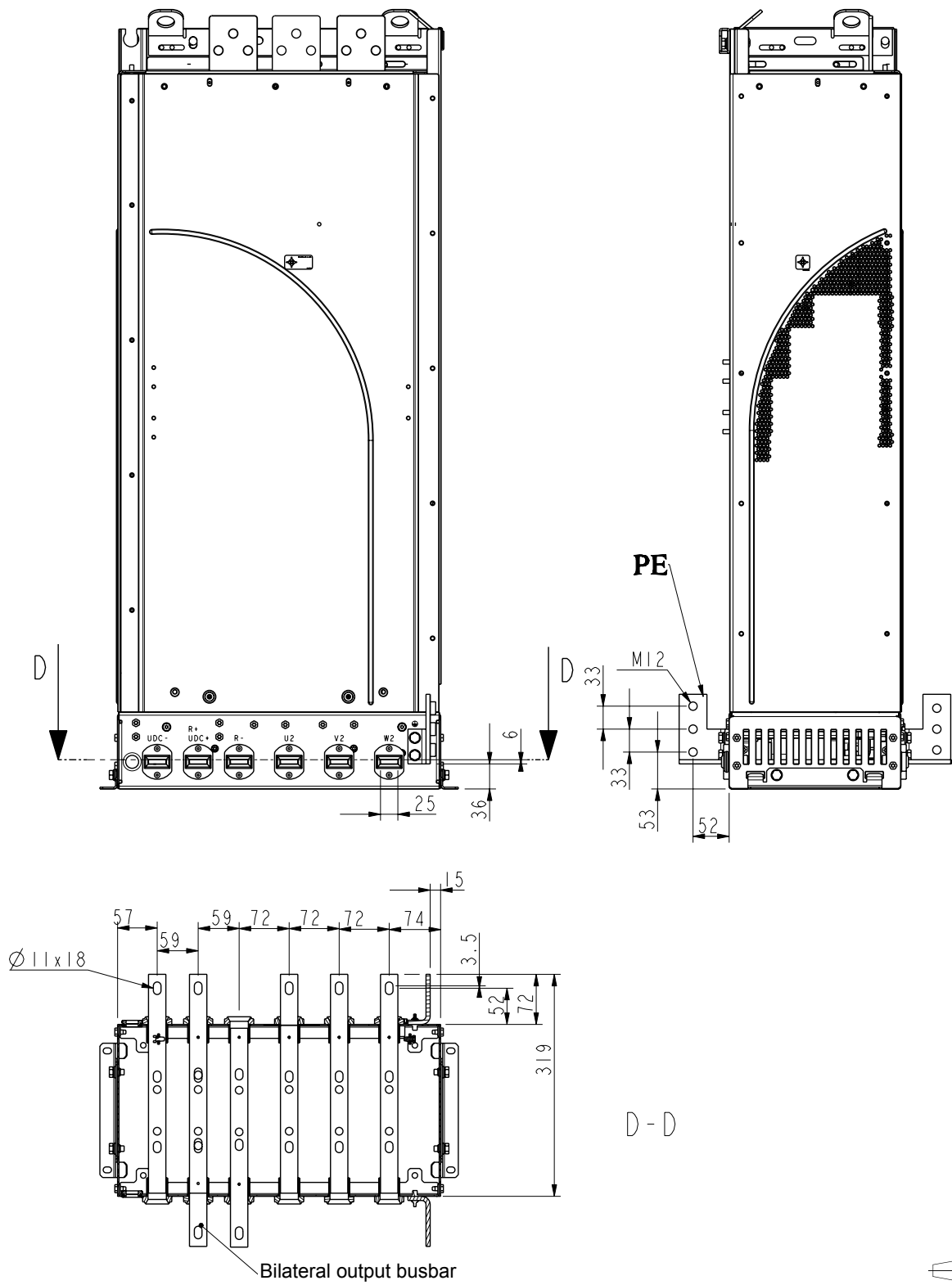
Frame size R7 with busbars on the left side (mm)

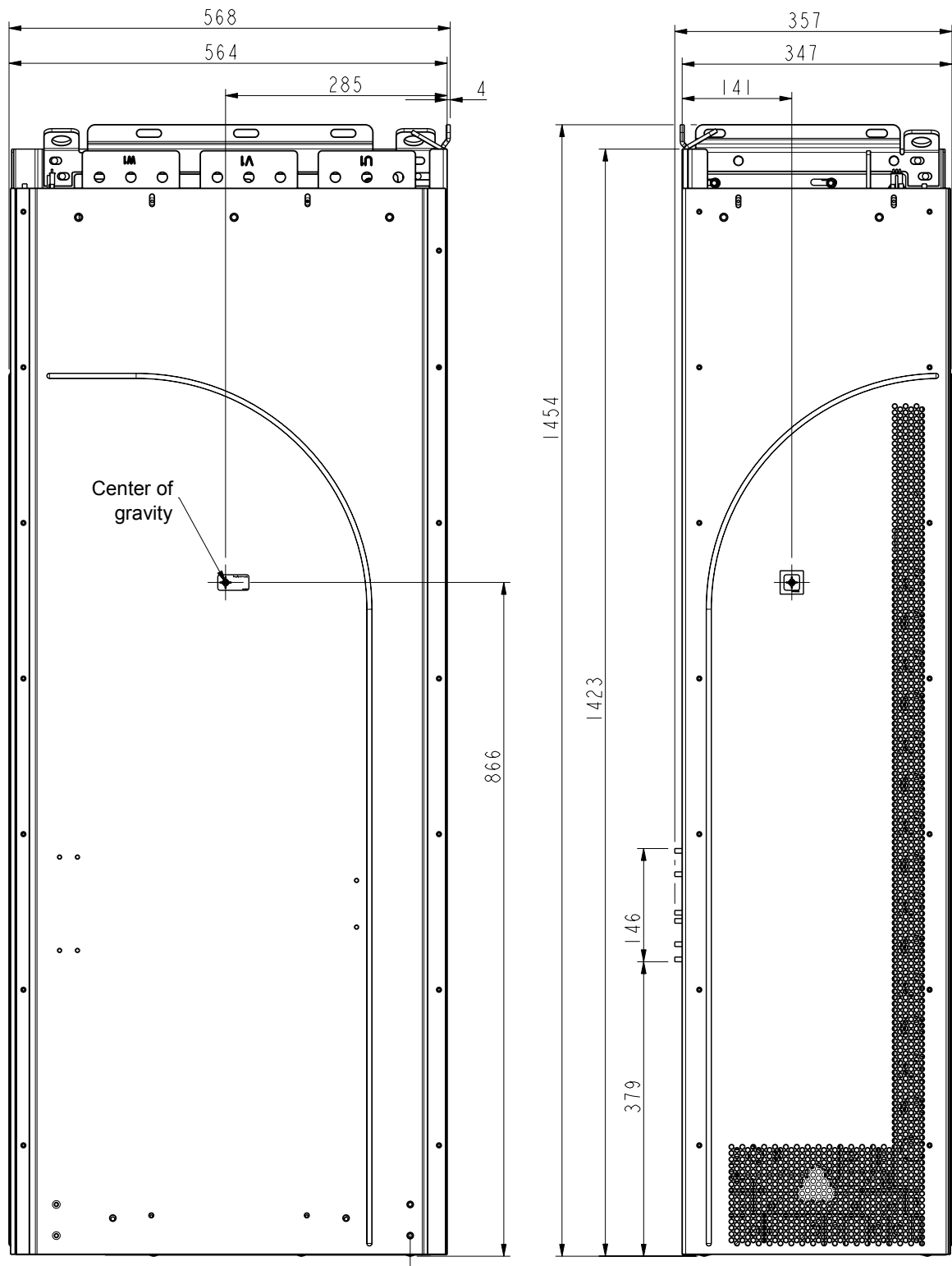


64796003_2/7 G

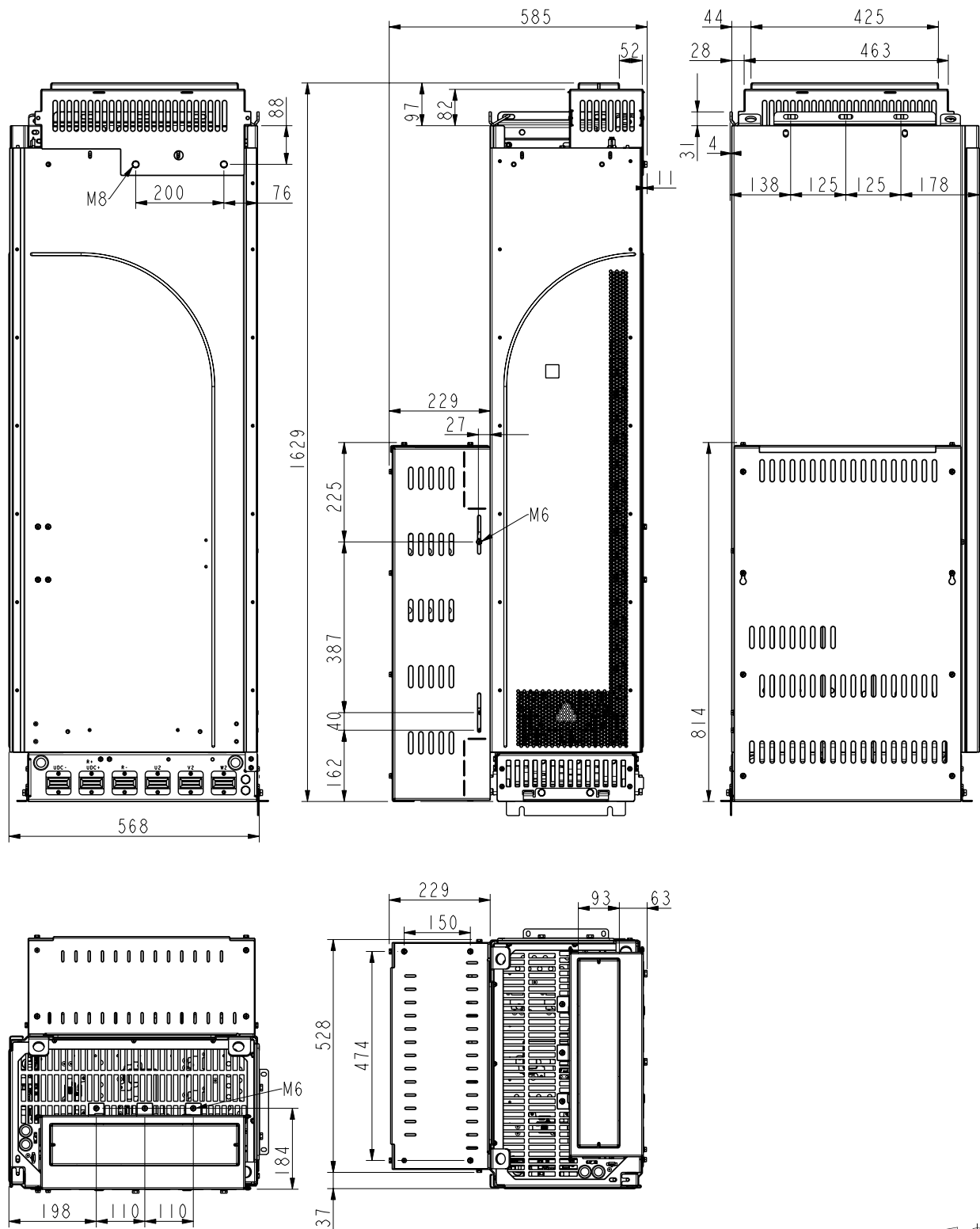


Frame size R7 pedestal busbars on the long side (mm)

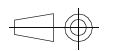
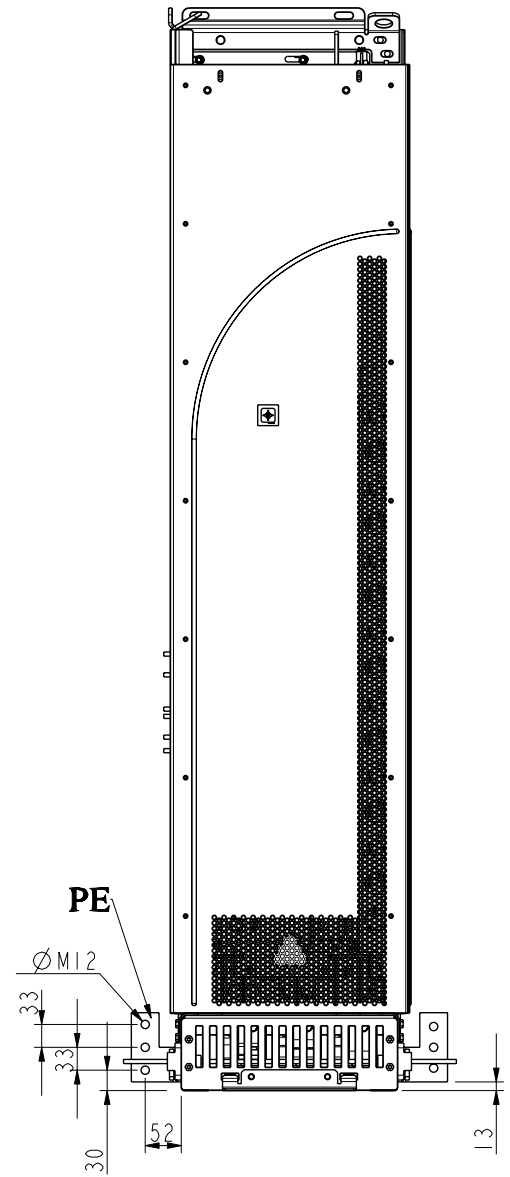
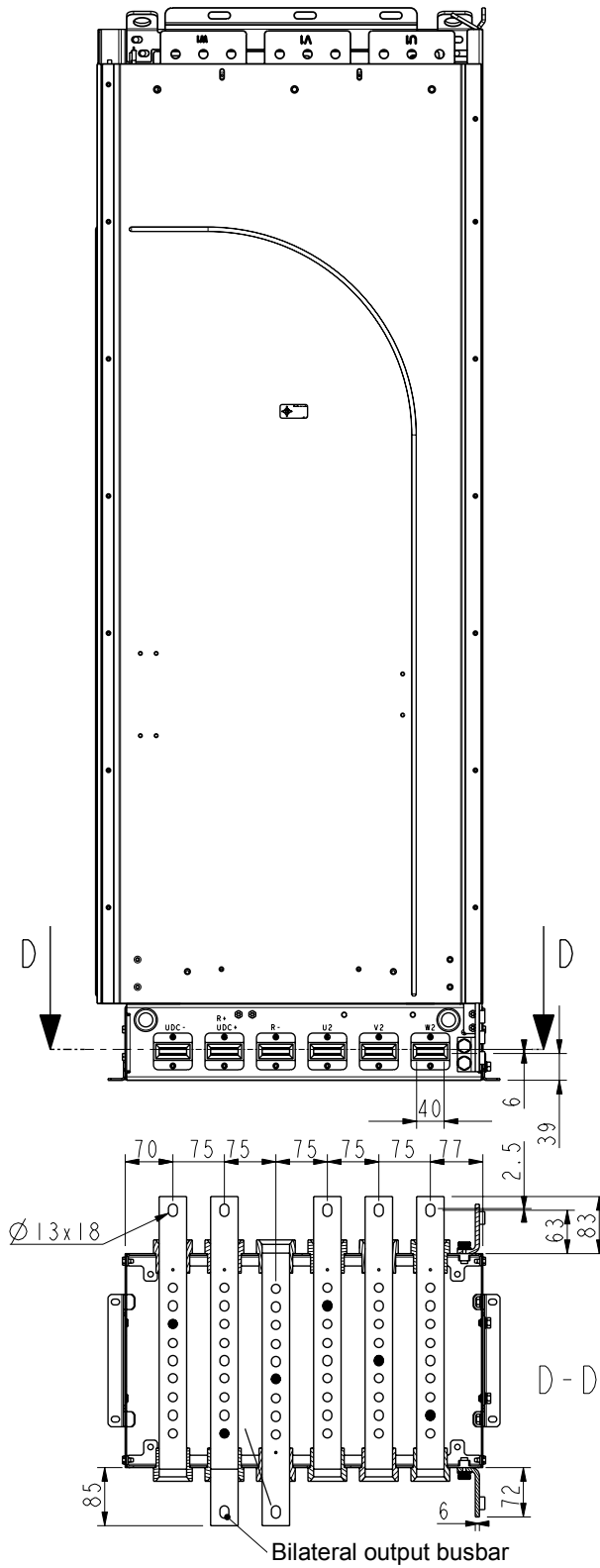


Frame size R8 without pedestal (mm)

Frame size R8 with top entry and vertical busbar shrouds (mm)

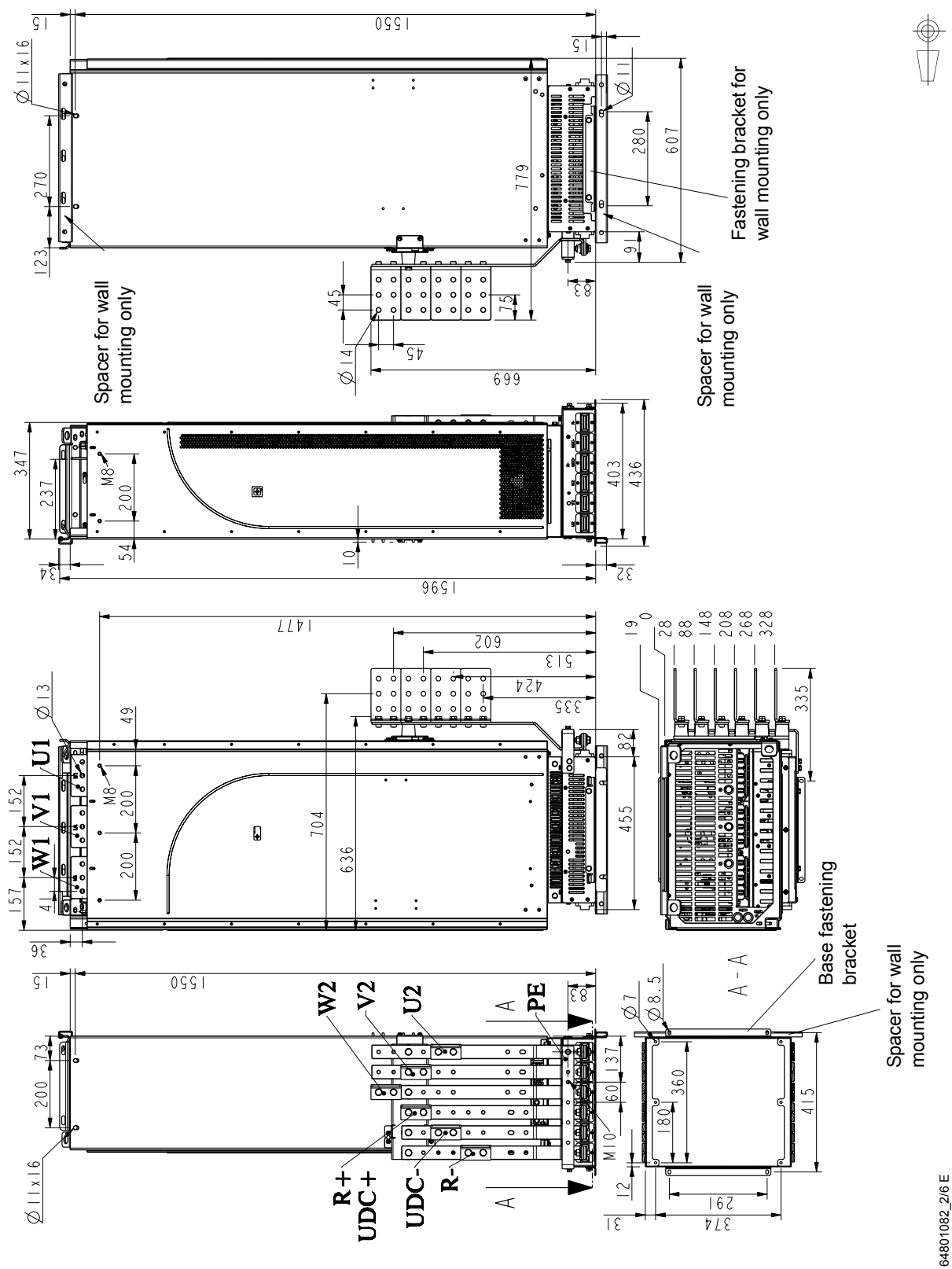


Frame size R8 pedestal busbars on the long side (mm)

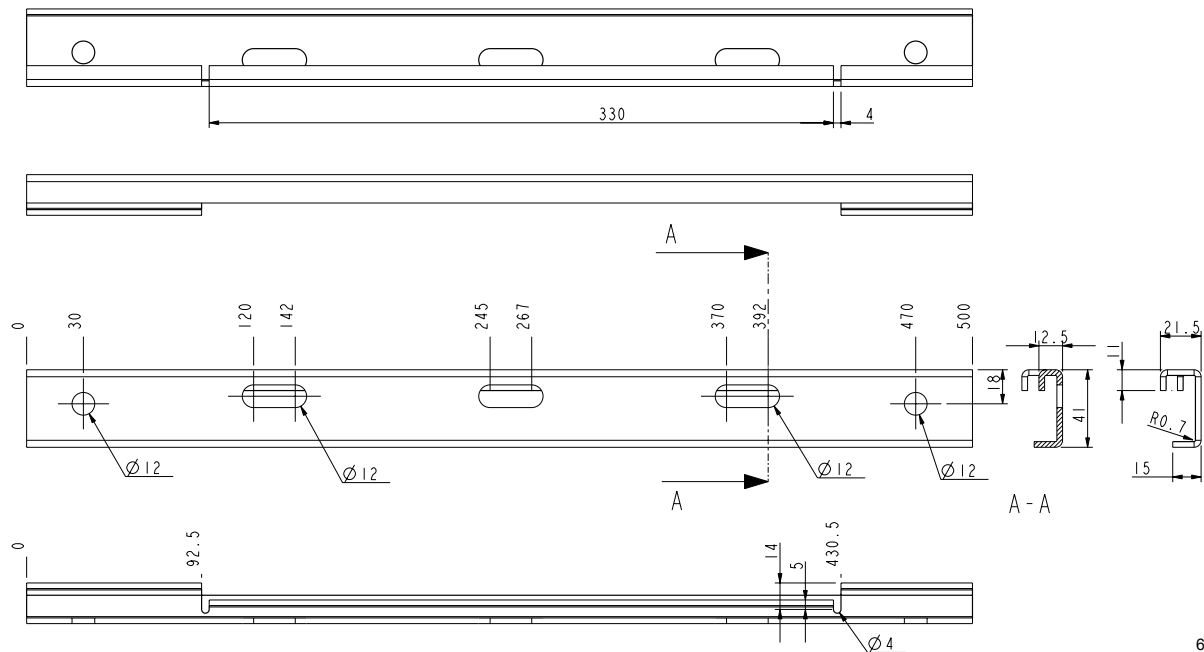


64801082_4/6 E

Frame size R8 with busbars on the short side (mm)

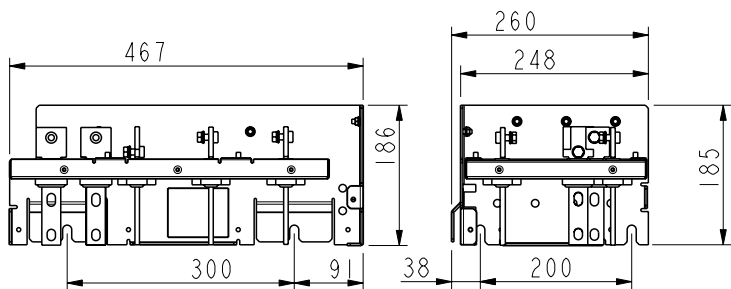


Frame size R8: short side against wall

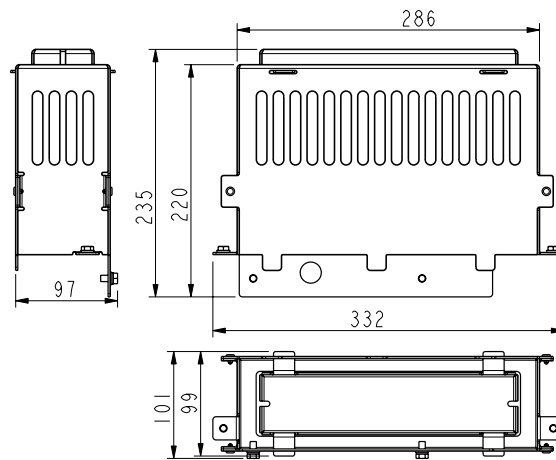


68377927 A

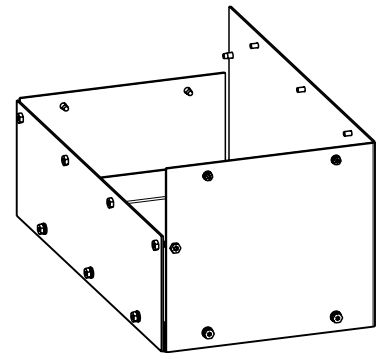
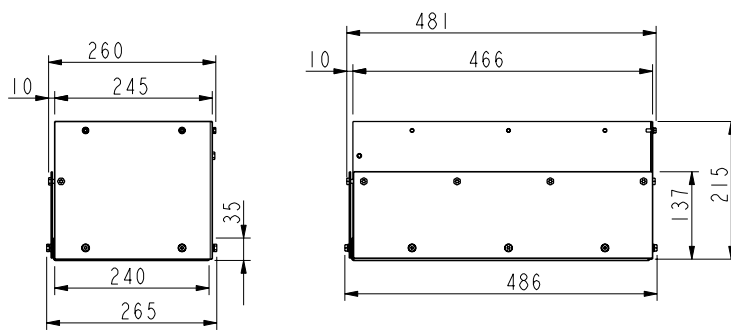
Frame size R7 bottom exit kit (+H352)



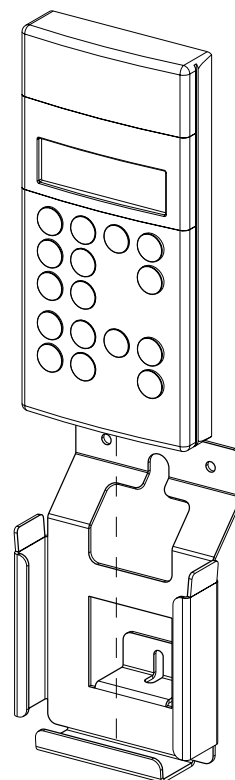
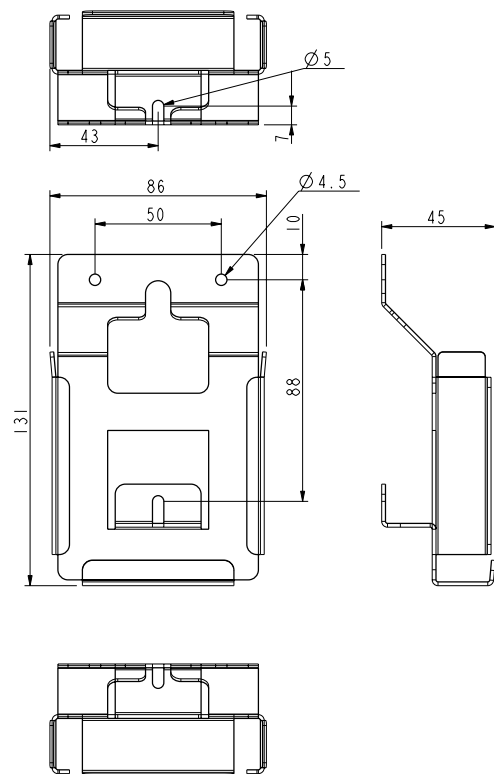
64770306_16/20 E

Frame size R7 top entry busbar shroud and bottom exit shroud (+B060)

64770306_18/20 E



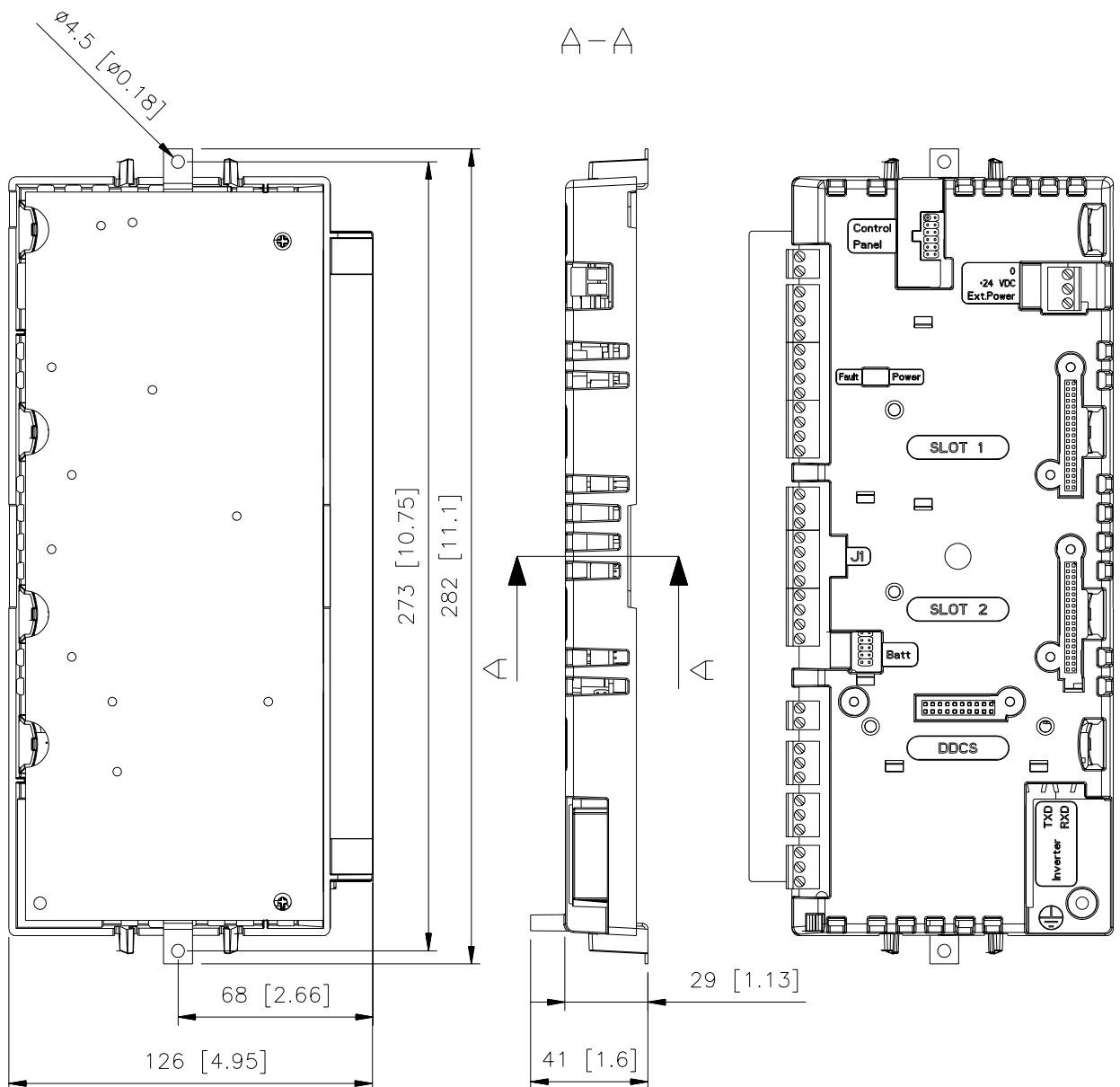
64770306_17/20 E

Control Panel Holder RPMP-21 (+J413)

64770306_20/20 E

Drive Control Unit (RDCU-02)

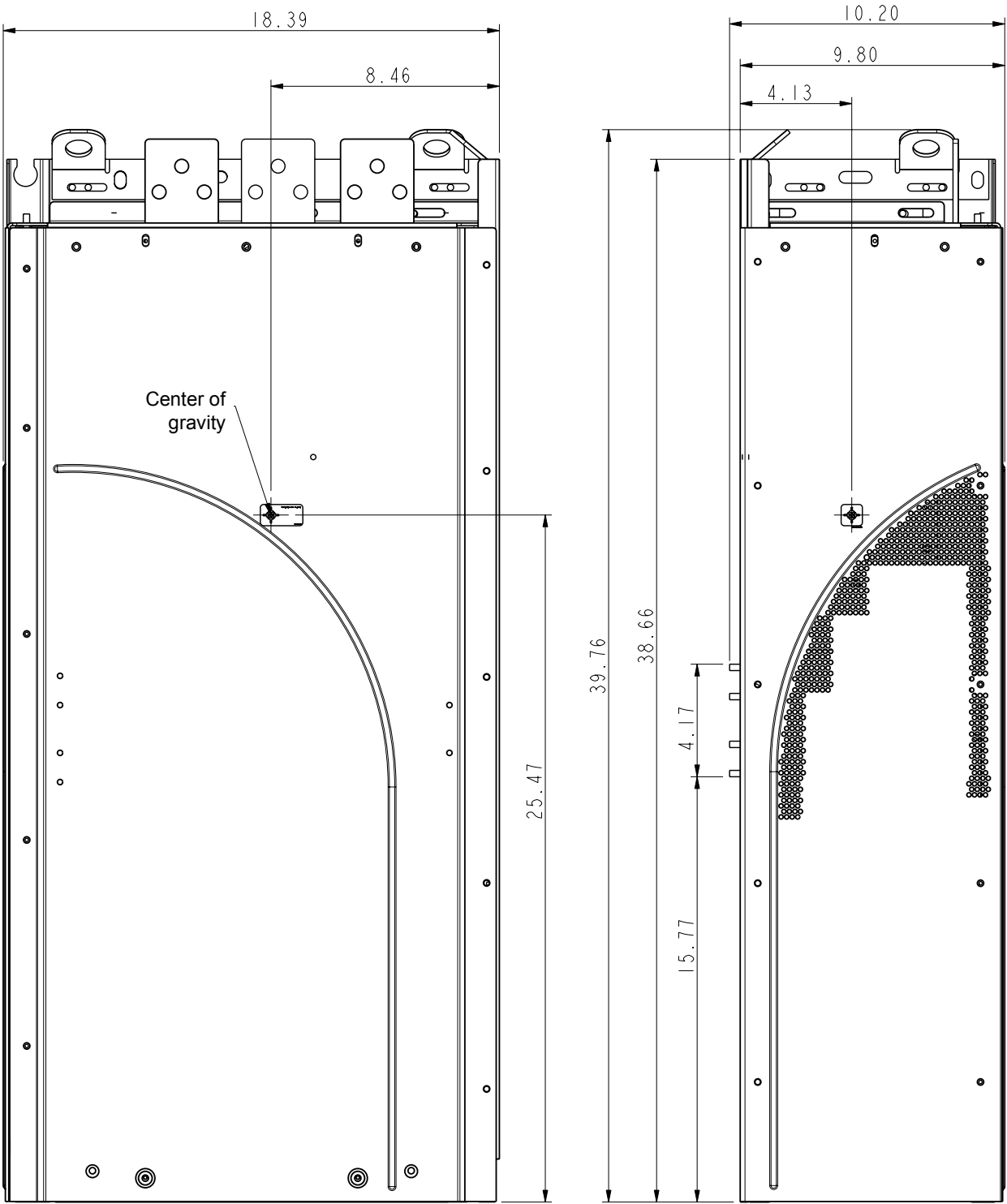
Can be mounted on a DIN rail
(EN 50022, 35 mm x 7.5 mm)

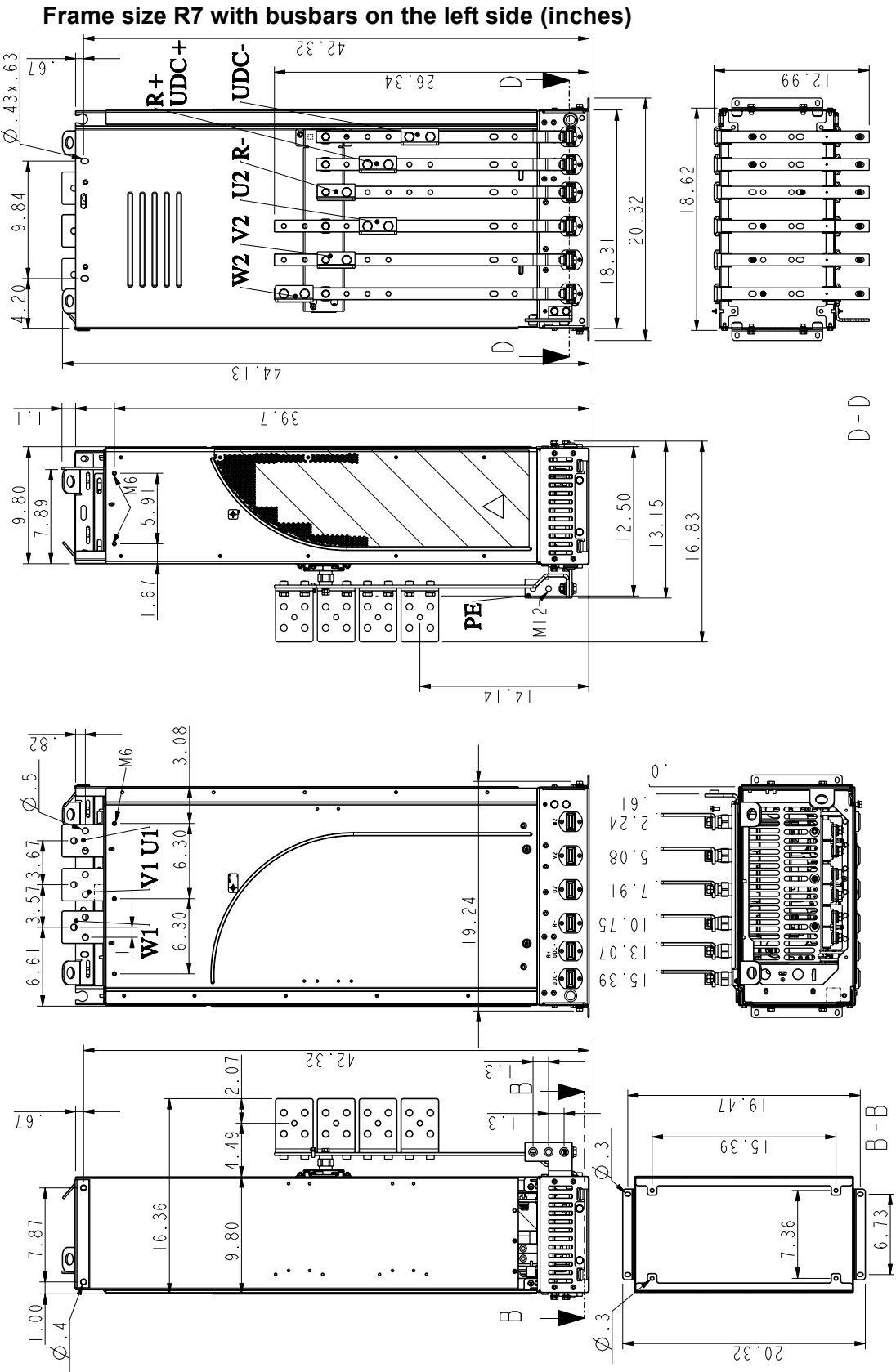


64675214-B

Dimensional drawings (USA)

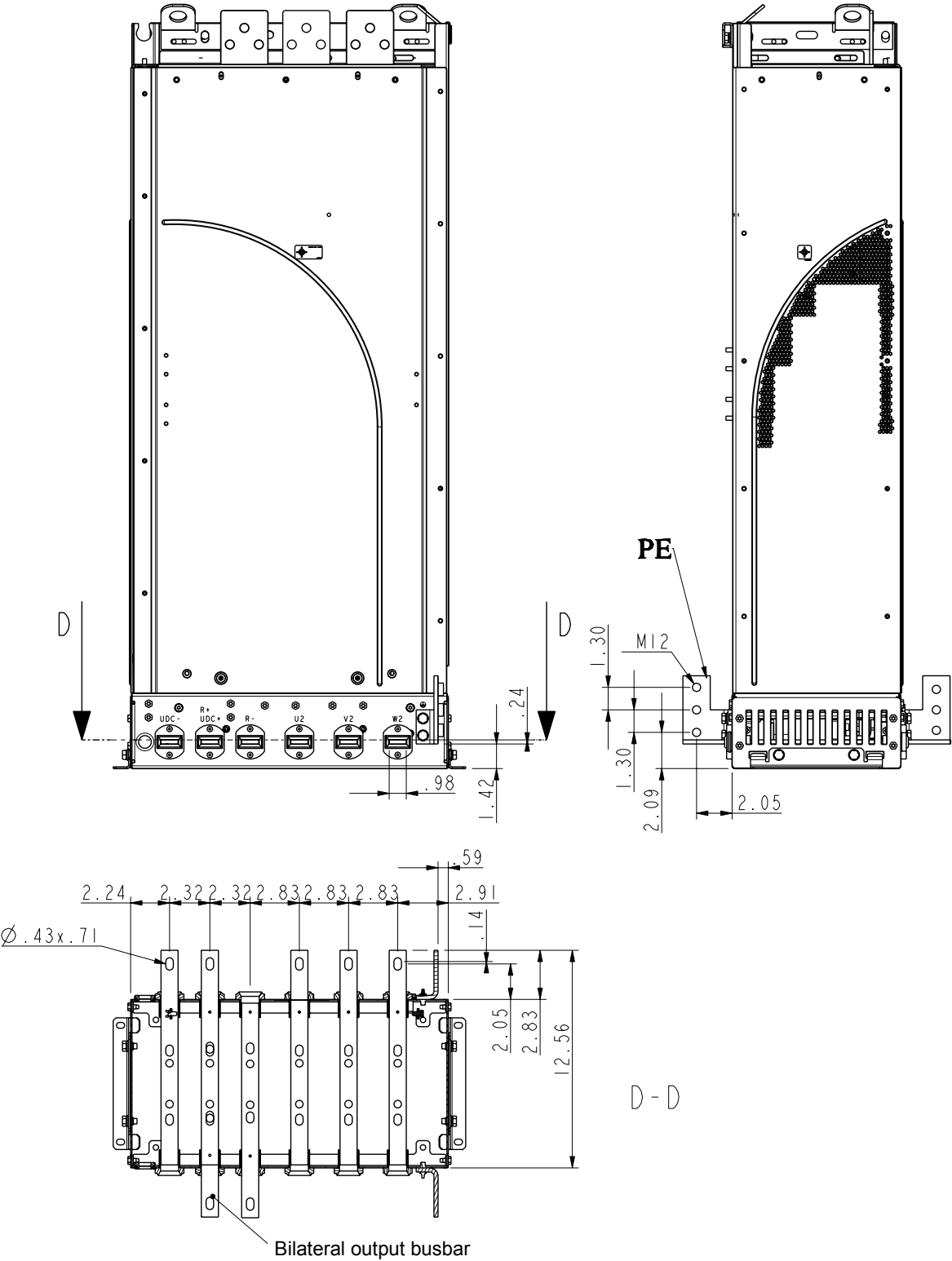
Frame size R7 without pedestal (inches)





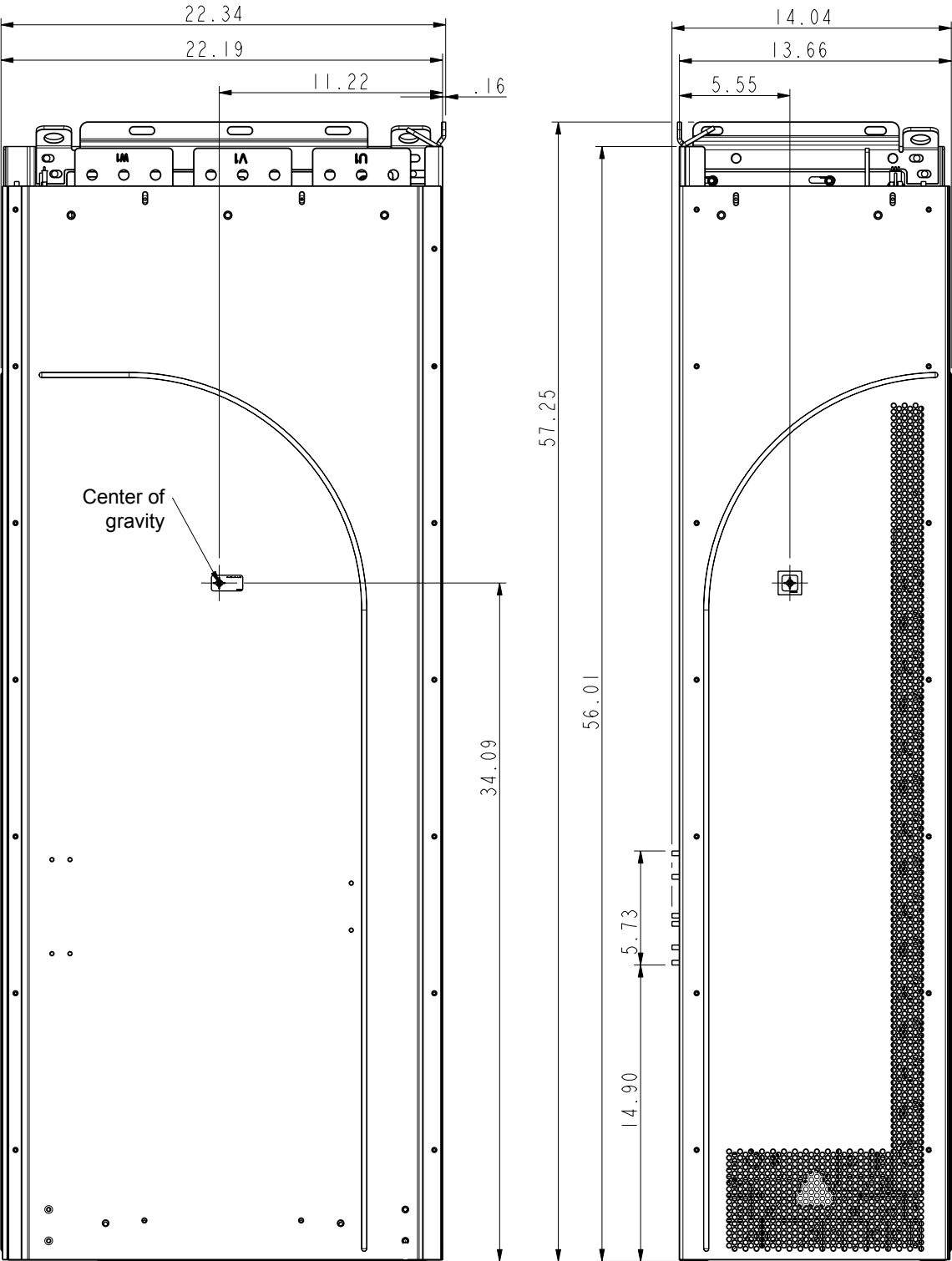
68439221_5/7 F

Frame size R7 pedestal busbars on the long side (inches)



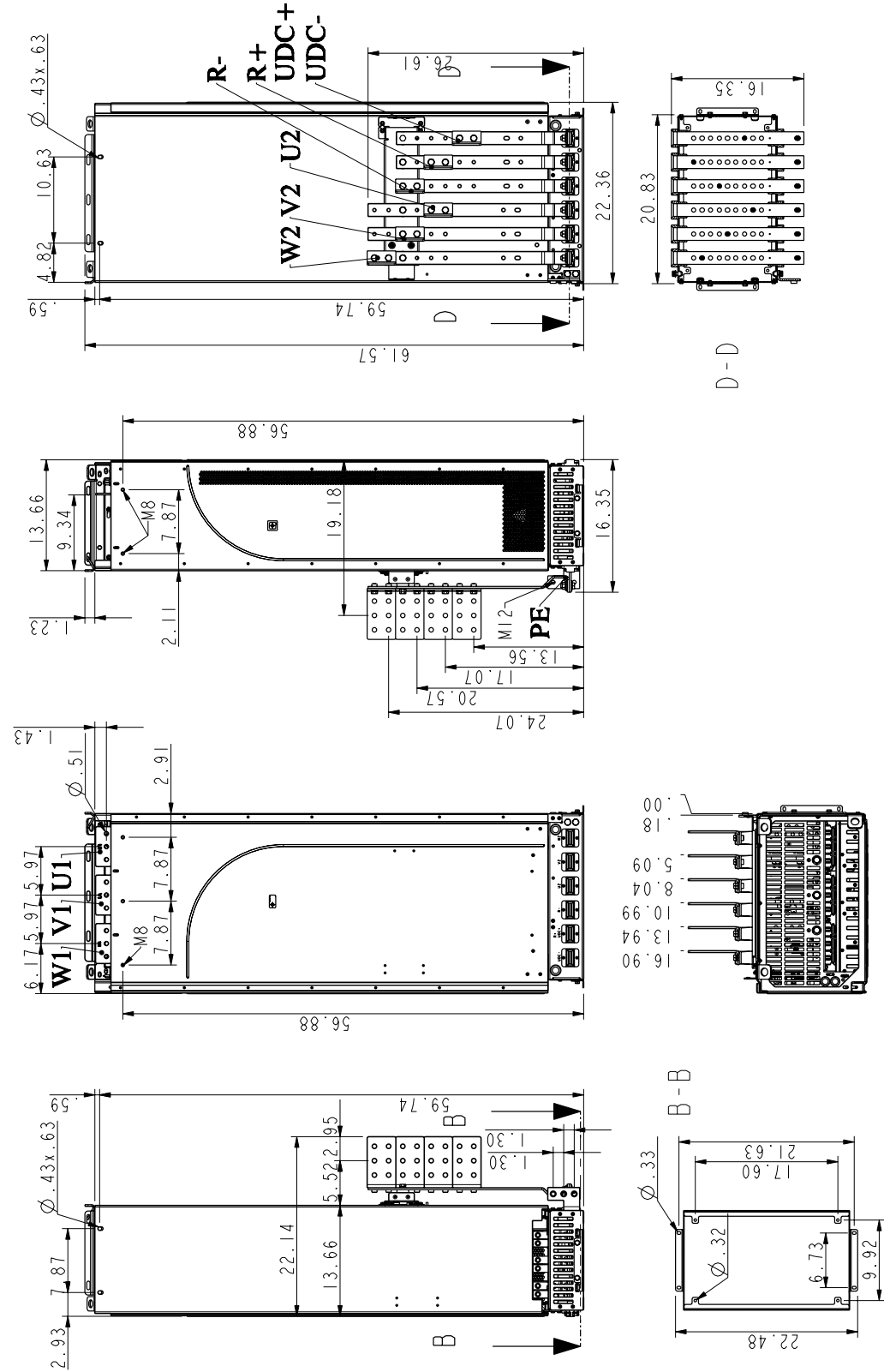
68439221_4/7 A (64796003.asm E)

Frame size R8 without pedestal (inches)



68440513_3/6 A (64801082.asm E)

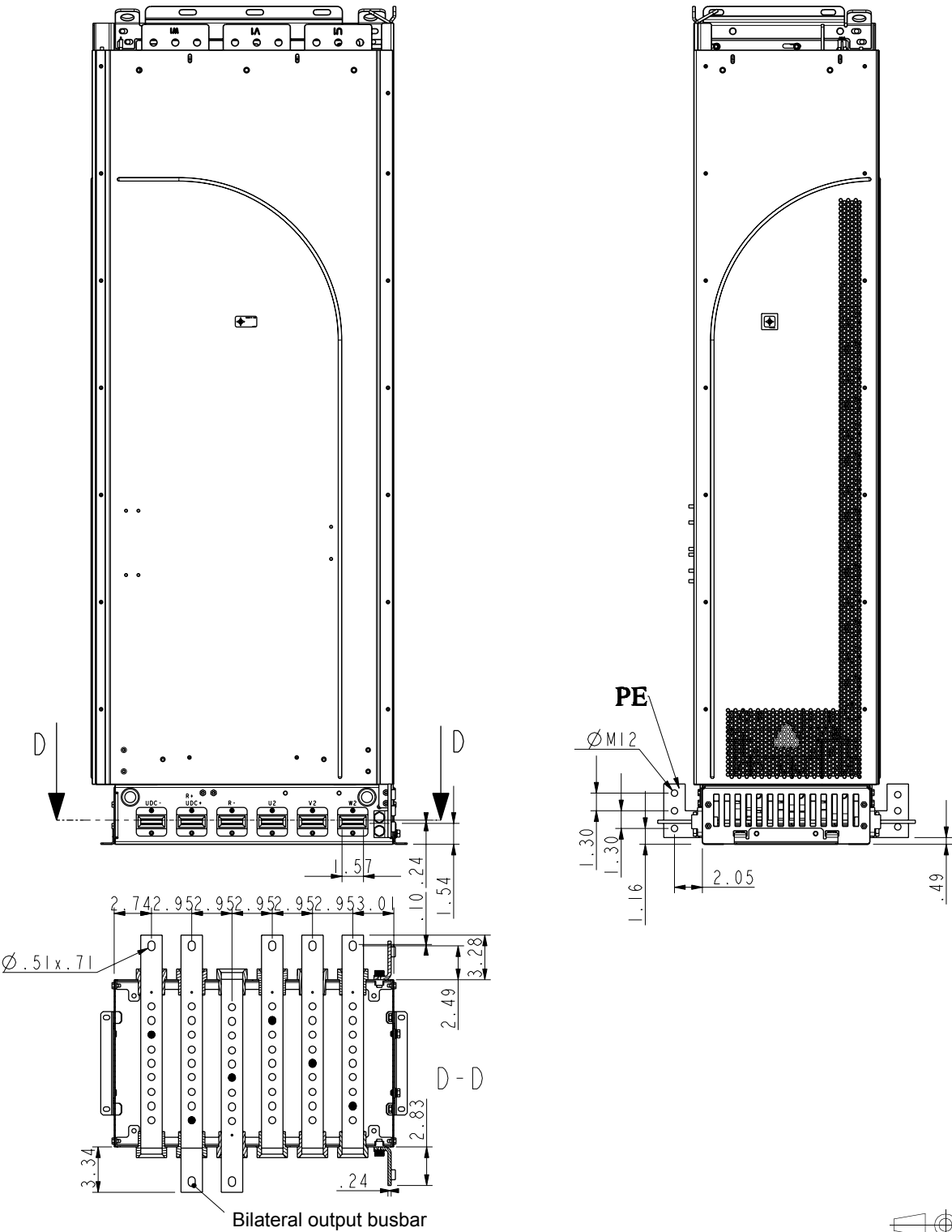
Frame size R8 with busbars on the left side (inches)





68440513_6/6 A (64801082.asm E)

Frame size R8 pedestal busbars on the long side (inches)



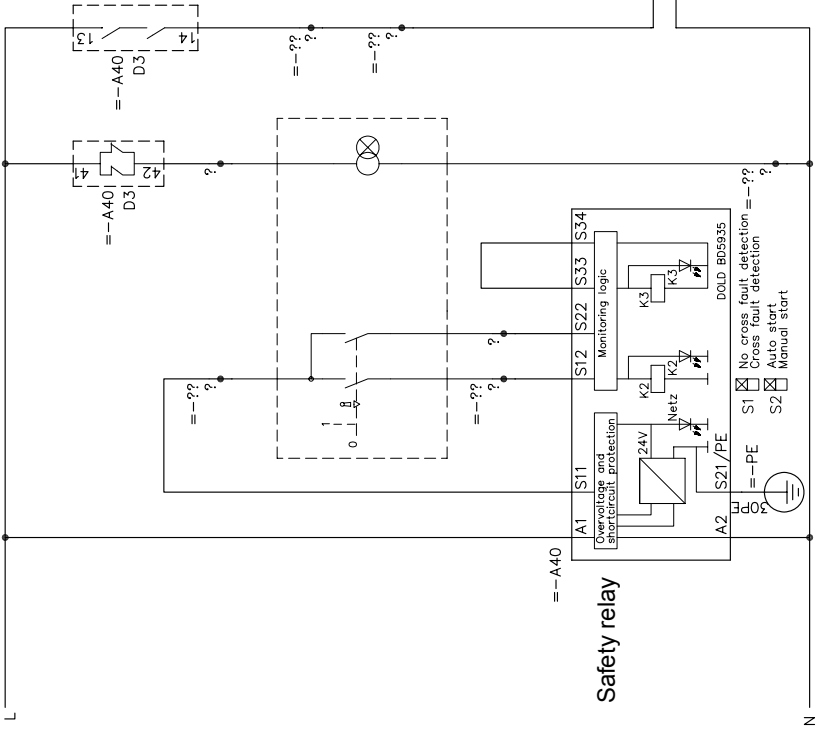
68440513_4/6 A (64801082.asm E)

Circuit diagrams

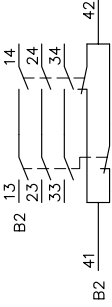
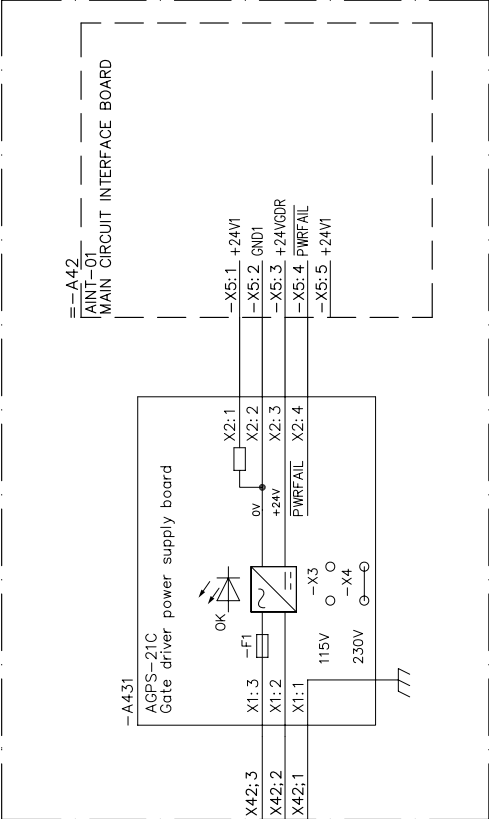
What this chapter contains

This chapter shows an example circuit diagram for employing the Prevention of Unexpected Start function (+Q950).

Components to be provided and wired by the user



ACS800-04/04M drive module

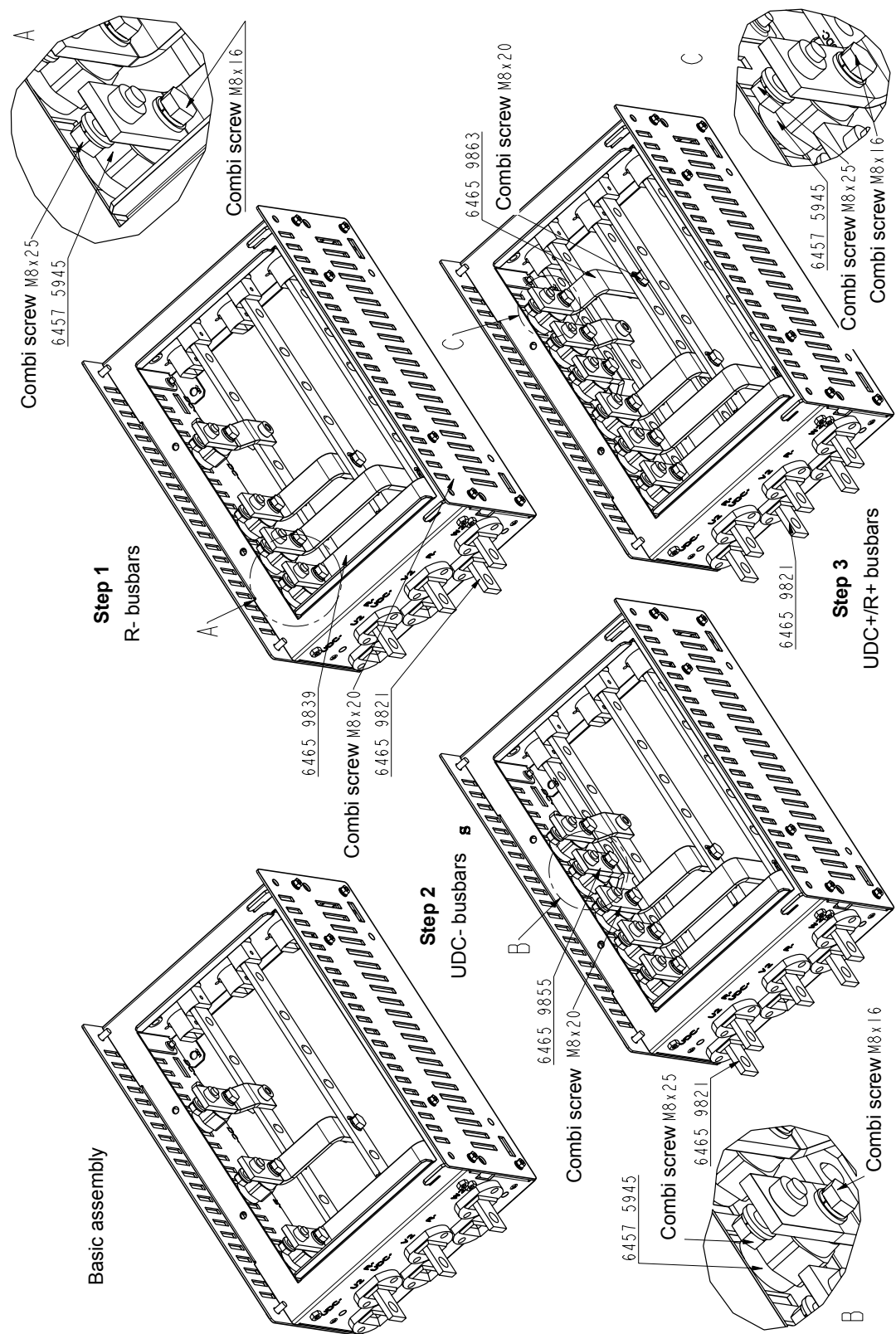


Assembly drawings

What this chapter contains

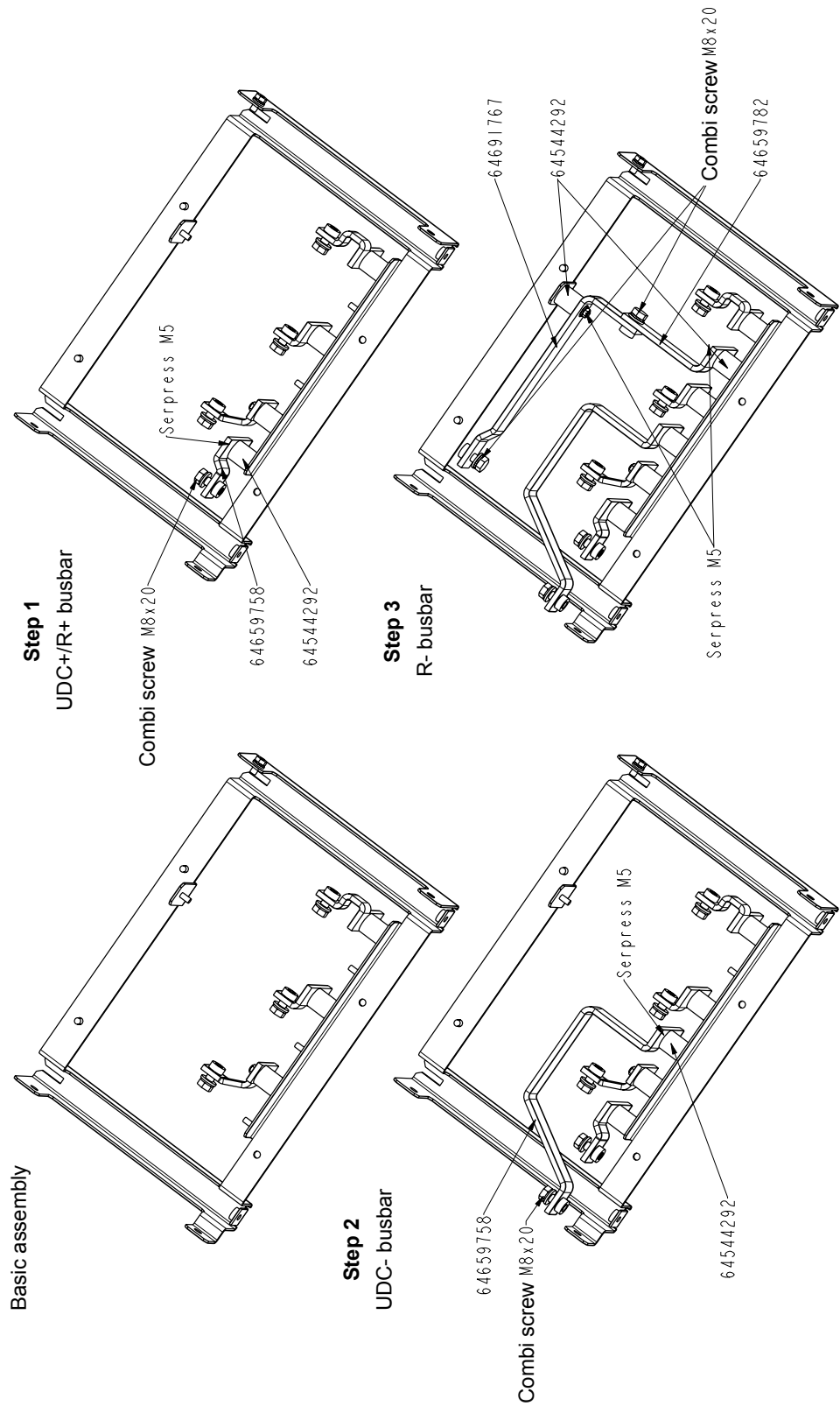
This chapter shows a few step-by-step assembly drawings.

Adding UDC+/R+, UDC- and R- busbars to the pedestal (frame size R7, +H356+H360)

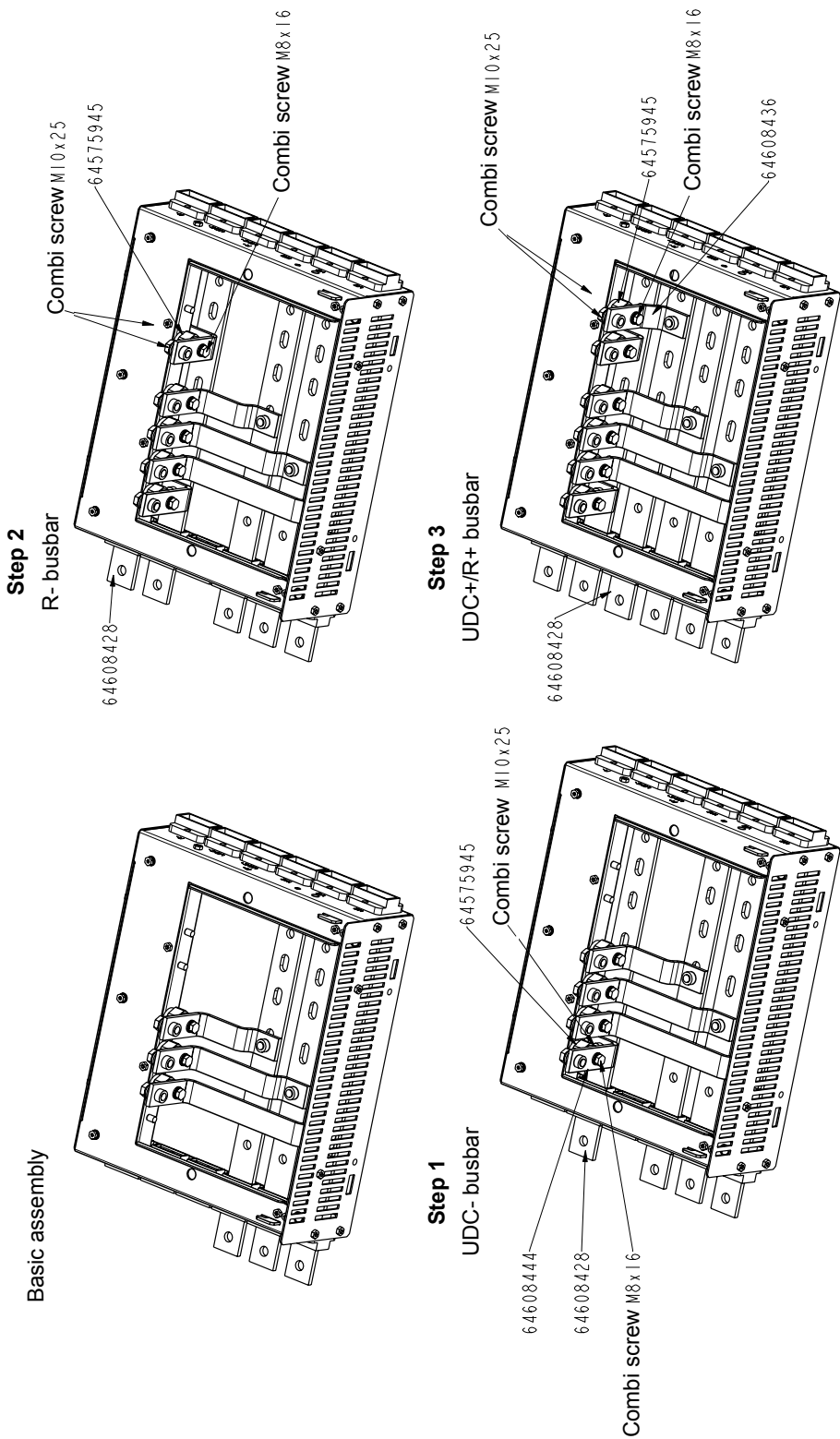


6844855 A

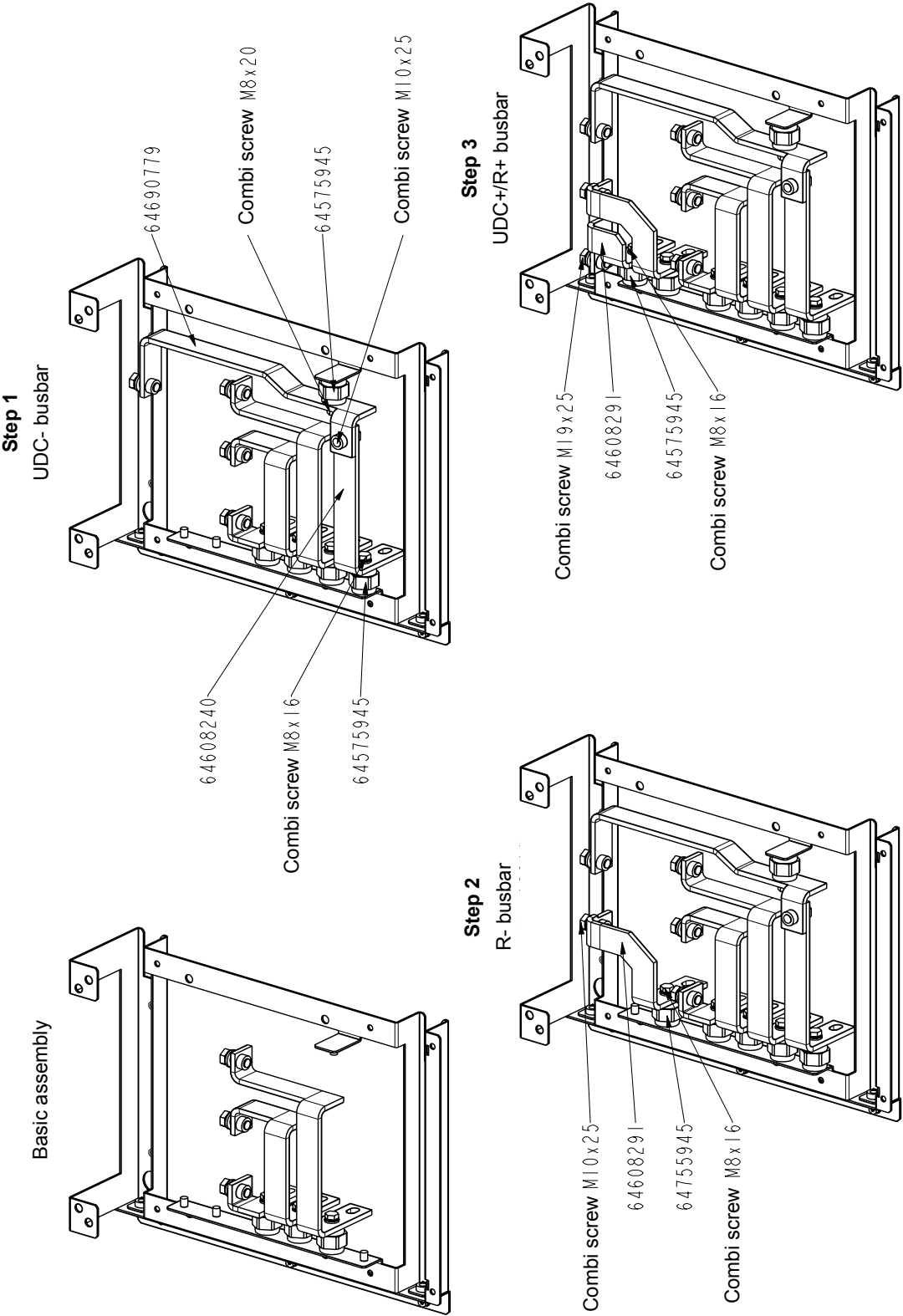
Adding UDC+/R+, UDC- and R- busbars to the adapter (frame size R7, +H356+H360)



Adding UDC+/R+, UDC- and R- busbars to the pedestal (frame size R8, +H356+H360)



Adding UDC+/R+, UDC- and R- busbars to the adapter (frame size R8, +H356+H360)



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