

Technical documentation  
Last changed on: 07.10.2019

# ECH 54A / 55A / 56A

10 Slot 19" Crate for MMS – Low and High Voltage Power Supply Modules

- Up to 10 MMS-HV or MMS-LV Power Supply Modules
- Up to 3,000 W power
- wide range of HV- and LV-modules
- compatible to CC24 / CC23 Controller boards with integrated ICS Linux Server or Wiener Mpod Controller
- optional UPS
- robust mechanics, module front and back reversible



## Document history

Version	Date	Major changes
1.1	07.10.2019	Improved documentation
1.0	27.02.2019	Initial version

## Disclaimer / Copyright

Copyright © 2019 by iseg Spezialelektronik GmbH / Germany. All Rights Reserved.

This document is under copyright of iseg Spezialelektronik GmbH, Germany. It is forbidden to copy, extract parts, duplicate for any kind of publication without a written permission of iseg Spezialelektronik GmbH. This information has been prepared for assisting operation and maintenance personnel to enable efficient use.

**The information in this manual is subject to change without notice. We take no responsibility for any mistake in the document. We reserve the right to make changes in the product design without reservation and without notification to the users. We decline all responsibility for damages and injuries caused by an improper use of the device.**

## Important security information

It is strongly recommended to read the operator's manual before operation. To avoid injury of users it is not allowed to open the unit.

There are no parts which can be maintained by users inside of the unit. Opening the unit will void the warranty.

We decline all responsibility for damages and injuries caused by an improper use of the module. It is strongly recommended to read the operators manual before operation.

### WARNING!



WARNING!

The non-observance of the advices marked as "Warning!" could lead to possible injury or death.

### CAUTION!



CAUTION!

Advices marked as "Caution!" describe actions to avoid possible damages to property.

### INFORMATION



INFORMATION

Advices marked as "Information" give important information.

## Note

The information in this manual is subject to change without notice. We take no responsibility for any errors in the document. We reserve the right to make changes in the product design without notification to the users.

## Table of contents

Document history.....	2
Disclaimer / Copyright.....	2
Important security information.....	2
Note.....	2
1 General information.....	4
2 Technical data.....	5
3 Order options.....	5
4 Operation and maintenance.....	6
4.1 Replacing the power supply.....	7
4.2 Forced air cooling.....	8
4.3 Replacing the fan tray or airfilter mat.....	9
4.4 UPS maintenance and security advice.....	10
4.5 Storage and transport.....	11
4.6 Replacing the battery fuse.....	12
5 Compatibility lists.....	12
6 Dimensional drawing.....	13
7 Accesories.....	15
8 Appendix.....	15
9 Warranty & service.....	16
10 Disposal.....	16
11 Manufacturer´s contact.....	16

# 1 General information

This crate device is used operating iseg High Voltage power supply modules in a 19" rack compatible case. Depending on version it provides module slots for up to 10 MMS LV compatible Low Voltage and also HV compatible High Voltage modules or mixed setups. Each module is connected to a backplane of the crate by a vendor specific connector, which delivers module power supply and CAN based digital interface connection.

Depending on module's features further digital and analog signals are provided by the connector (safety loop, thermal sensors etc.). For control and network communication of the MMS modules a crate controller needs to be plugged into a special Crate Controller Slot. The ECH 5xA is compatible with iseg CC24 Master, CC23 Slave Controller and Wiener MPOD controller. The CC24 Master controller is equipped with integrated Linux server, hardware running iseg iCS System, ethernet and optional WiFi connectivity. Up to eight CC23 Slave controller can extend a CC24 system by using galvanically isolated CAN connections and auto addressing.

## CAUTION!



CAUTION!

It is not allowed to use the unit if the covers have been removed!

ISEG declines all responsibility for damages and injuries caused by an improper use of the module. It is highly recommended to read the manual before any kind of operation.

## 2 Technical data

SPECIFICATIONS	ECH 54A	ECH 55A	ECH 56A
Slots	10 x MMS modules and 1 x MMS controller		
High / Low Voltage Boards	MMS HV only	MMS LV only	MMS HV and LV Boards
Rated AC mains input	100-240 VAC with PFC		
AC power connector	Hirschman Schuko 1x16A		
HV module supply voltages	+24 V	Not installed	+24 V
DC output power HV module supply	1,200 W (on request from 600W up to 3,000 W)		
Cooling	Vertical, integrated fans , bottom air intake		
Operation temperature	0 ... 50°C ambient without derating		
Storage temperature	-30 °C ... +85 °C (+55°C with UPS option)		
Stability	10 mV or 0.1% / 24 hours, 25 mV or 0,3 % / 6 month under constant conditions		
Floating DC Power Supply	± 50V		± 50V
M.F.O.T. Maintenance Free Operation Time	Internal fans: 40°C ambient : > 65,000 h, 25°C ambient : 100,000 h electronics: 40°C ambient : > 100,000 h		
Dimensions (L/W/H)	463mm / 19" / 8U		
Weight	31,5kg, (+ 10 kg with UPS option)		

Table 1: Technical data

## 3 Order options

OPTION	ORDER CODE
Uninterruptible power supply 1200W	-UPS
Module cage reversed, module insertion from rear	-HVR

## 4 Operation and maintenance

### CAUTION!



CAUTION!

There is no mains fuse inside the crate!  
A circuit breaker for overcurrent protection 16A, type B or C (EN / IEC 60898, VDE 0641), has to be installed externally!

### WARNING!



WARNING!

When connected to mains, the unit is powered permanently! All on- / off-signals or power switches only operate as secondary DC on / off only and not as a mains breaker!

### WARNING!



WARNING!

When connected to the mains, the LV-backplane is powered with potentially lethal voltage of 385V DC. Do not touch the backplane or its connectors! For safe operation of crates equipped with a LV-backplane it is recommended to cover unused module slots with blind front panels ([Z514569](#)).

### CAUTION!



CAUTION!

For UPS option only:  
Before operating the first time, please make sure the battery fuse is inserted into the power supply!

Before operation and connecting to mains please make sure, that all cables are connected and airflow is not impeded. The case must not be covered and installed properly. The crate controller and modules must be plugged in, depending on module hotplugging is possible or not.

By connecting the crate to the mains, the controller will start up in standby mode and now is able to switch and monitor the power supply for the inserted modules. During this start up, the internal fans will begin spinning, the crate now is ready for operation.

## 4.1 Replacing the power supply

### WARNING!



When connected to mains, the unit is powered permanently! All on- / off-signals or power switches only operate as secondary DC on / off only and not as a mains breaker!  
Before starting any kind of work inside the crate, disconnect it from mains and wait a couple of minutes with your activities.

### WARNING!

The power supply is designed to be user replaceable. A Phillips- and a slotted-head screwdriver, a side cutter and a replacement cable tie are needed. Begin with setting the crate into standby mode, disconnect it from mains and wait a few minutes. Now remove the blue sticker at the bottom of the back cover (arrow at Figure 1) and proceed with unscrewing the four Phillips screws and carefully detach the lid beginning from the top side. Before completely removing the back cover it is necessary to disconnect the ribbon cable of the attached switch-circuitboard. Continue by cutting the cable tie on the handle and unplugging the internal mains wire. The back cover now may be removed completely.



Figure 1: remove blue sticker , undo 4 screws

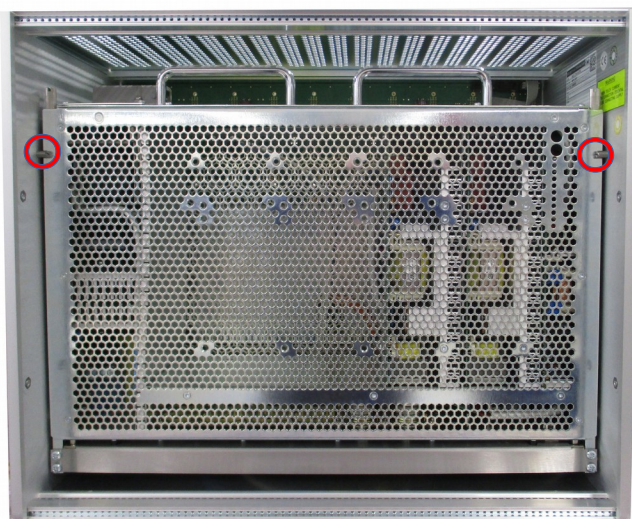


Figure 2: remove screws at the side panel

To remove the power supply, take the slotted-head screwdriver and unscrew the two retainers located at the side (Figure 2). By pulling on the handles towards you the power supply will swing out on its support frame. Make sure to pull carefully and with a firm grip, as the power supply is heavy, especially when equipped with UPS-option. Now unscrew the two slotted-knurled screws in an alternating manor to avoid tilting the power supply inside the frame (Figure 3). Sometimes a firm pull is needed to completely remove the power supply from its support frame.



Figure 3: remove wire tie and loosen screws

Now replace the power supply and reassemble in reverse order, tie down the internal mains cable on the handle.

## 4.2 Forced air cooling

The crate offers an internal forced air cooling with temperature dependent speed regulation by the crate controller. The fresh air intake is on the bottom, for proper ventilation it needs to be sure that the airflow is not blocked. Further it is recommended to cover unused module slots with blind front panels to provide optimal airflow and cooling performance.



### 4.3 Replacing the fan tray or airfilter mat

Before replacing the fan tray, set the power supply into standby-mode, disconnect from mains and wait a few minutes. Needed tool is a Phillips-screw driver. Begin with removing the blue sticker on the module side of the crate, unscrew the four Phillips-head screws and detach the lid. Now the airfilter mat is accessible for service. To remove just turn the retainers to the side and pull out the sheet metal holder.

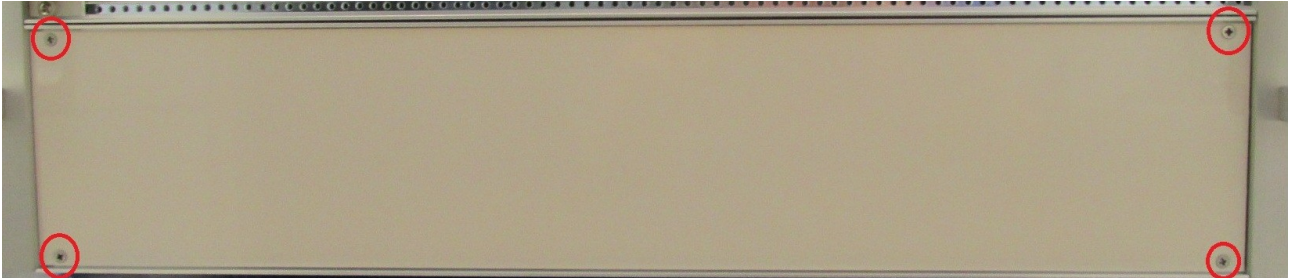


Figure 4: remove cover to replace fan tray

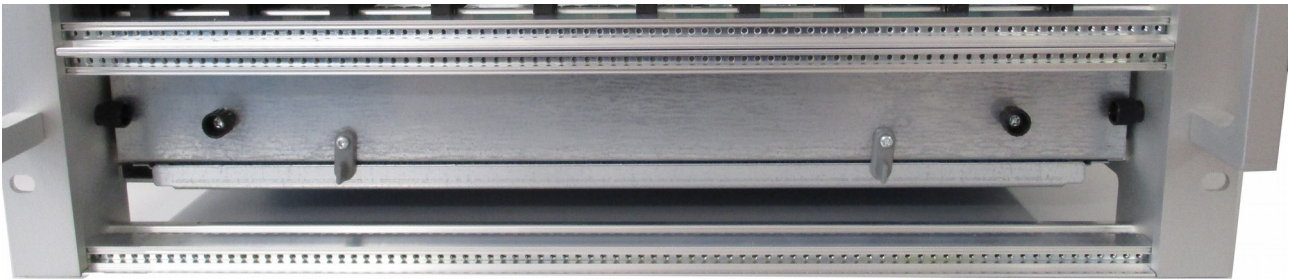


Figure 5: remove fan tray



Figure 6: pull out tray

After removing the case lid, use the Allen-head screw driver to unscrew the two tray retainers and pull out the fan tray assembly. Reassemble in reverse order. UPS – uninterruptible power supply (optional)

The ECH 5XA can be optionally equipped with a battery driven uninterruptible power supply (UPS) for the HV-module power rail. Its purpose is to provide emergency power to the HV-modules and CC24 / CC23 controller boards in case the mains power is failing. The battery backup is intended to securely shut the running system down, to prevent damage on the high voltage source- and load-side.

## 4.4 UPS maintenance and security advice

The valve regulated lead acid batteries used inside the UPS-option power supply are free from any maintenance during their operational lifespan of 5 years. After this time the batteries need to be replaced, in this case, please contact the iseg support for further information.

### WARNING!



WARNING!

The electrolyte inside the batteries is highly corrosive! At normal working condition a contact with the electrolyte is impossible. If the batteries get damaged do not touch any exposed electrolyte!

### WARNING!



WARNING!

When changing the UPS-option power supply:  
The batteries inside are heavy, handle with care as they are sensitive to mechanical damage!

### CAUTION!



CAUTION!

Do not dispose a UPS-option power supply in the normal household wastes, as the contained batteries have to be collected and recycled separately!  
Please contact iseg or a local and authorized waste management company for recollection.

## 4.5 Storage and transport

To store or decommission a UPS-option power supply for a longer period of time the batteries inside should be fully charged, for that connect the power supply for at least 8h to mains. Store in upright position inside a dry and frost-free room.

### WARNING!



WARNING!

It is not allowed to transport the crate with the battery fuse installed. Make sure the fuse is removed to guarantee a safe handling of the product.

### CAUTION!



CAUTION!

If the crate is not in use for more than 6 months, it needs to be connected to mains for at least 8 hours to make sure, the batteries are charged to full capacity again.

### INFORMATION



INFORMATION

There are no restrictions for rail, road, sea and air transportation (IATA, DGR clause A67).

## 4.6 Replacing the battery fuse

The batteries inside the power supply are fused to prevent damage in case of failure as they can deliver very high currents. The fuse needs to be inserted by the user, if you operate the crate for the first time. **Also it is mandatory to remove the fuse for transportation, to comply with the safety regulations!** The fuse is accessible on the back of the power supply unit, follow the steps described in 4.1 for detaching the case lid. Insert the fuse firmly in the slot next to the mains connector labeled „ACCU-Fuse“.

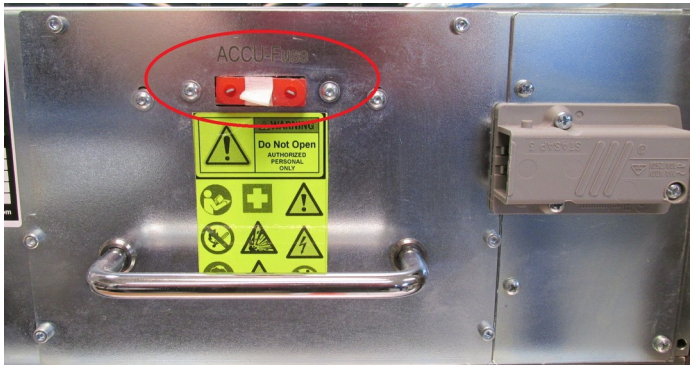


Figure 7: replace battery fuse

### Fuse specification

Automotive blade fuse, size MAXI, rated 32VDC, 50A, time delay

## 5 Compatibility lists

MMS CRATE CONTROLLERS	NOTES
<b>CC24 – Master controller</b> with Linux and iCS2, Ethernet and WiFi, 2 Slave CAN Lines	All series
<b>CC23 – Slave controller</b> Slave controller for use with CC24 system	All series
<b>Wiener MPOD Controller</b>	MPOD Controller built since 2016
MMS HIGH VOLTAGE MODULES	NOTES
<b>EHS series</b> Standard and High precision, CG / CFG / FG Floating, unipolar	All series please refer controller manual for firmware requirements
<b>EDS series</b> Cost effective distributor module. CFG, unipolar	
<b>EBS series</b> Bipolar 4 quadrant module, CFG, bipolar,	
<b>ESS series</b> High power 2 quadrant module, sink and source, FG, unipolar	

## 6 Dimensional drawing

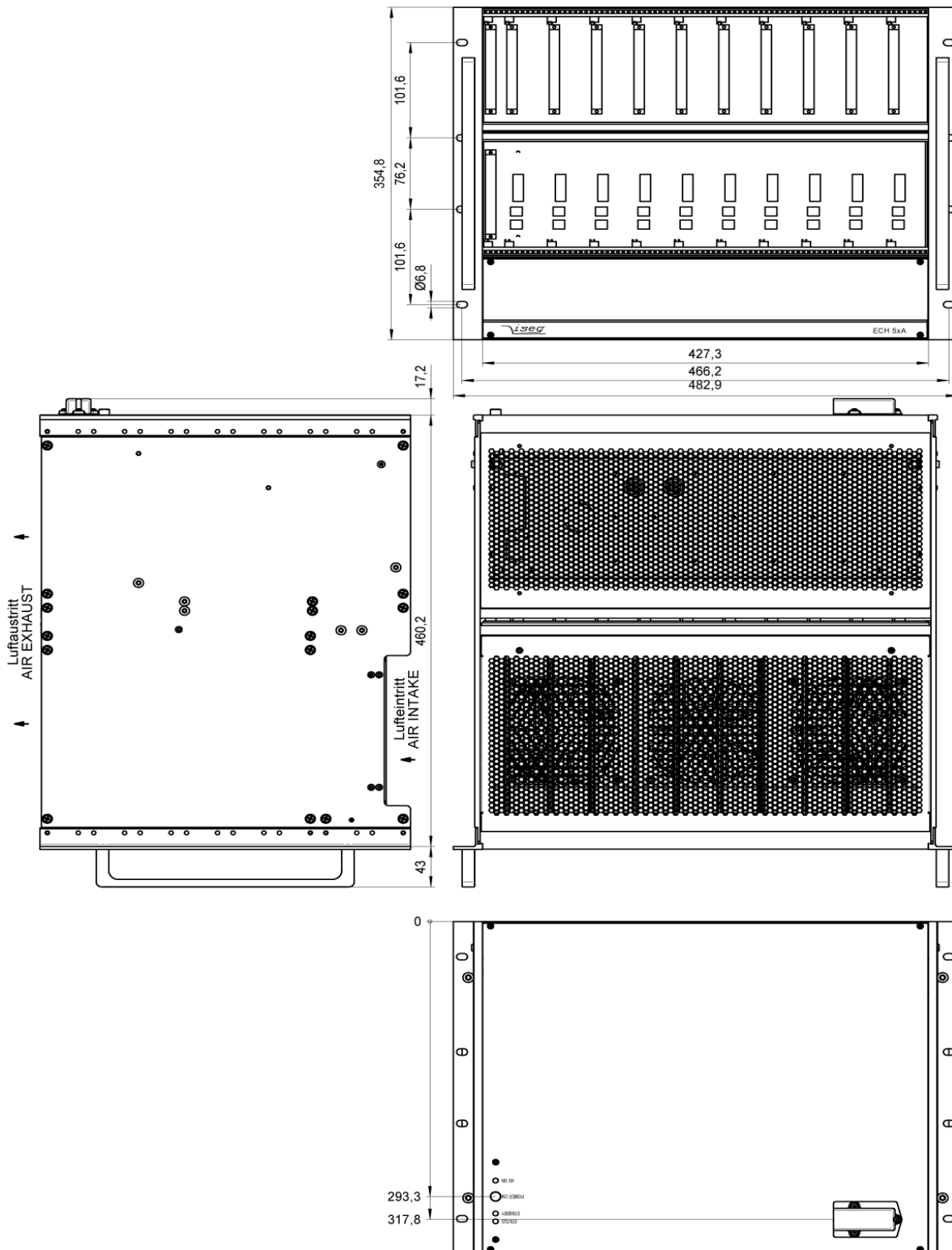


Figure 8: ECH 5xA

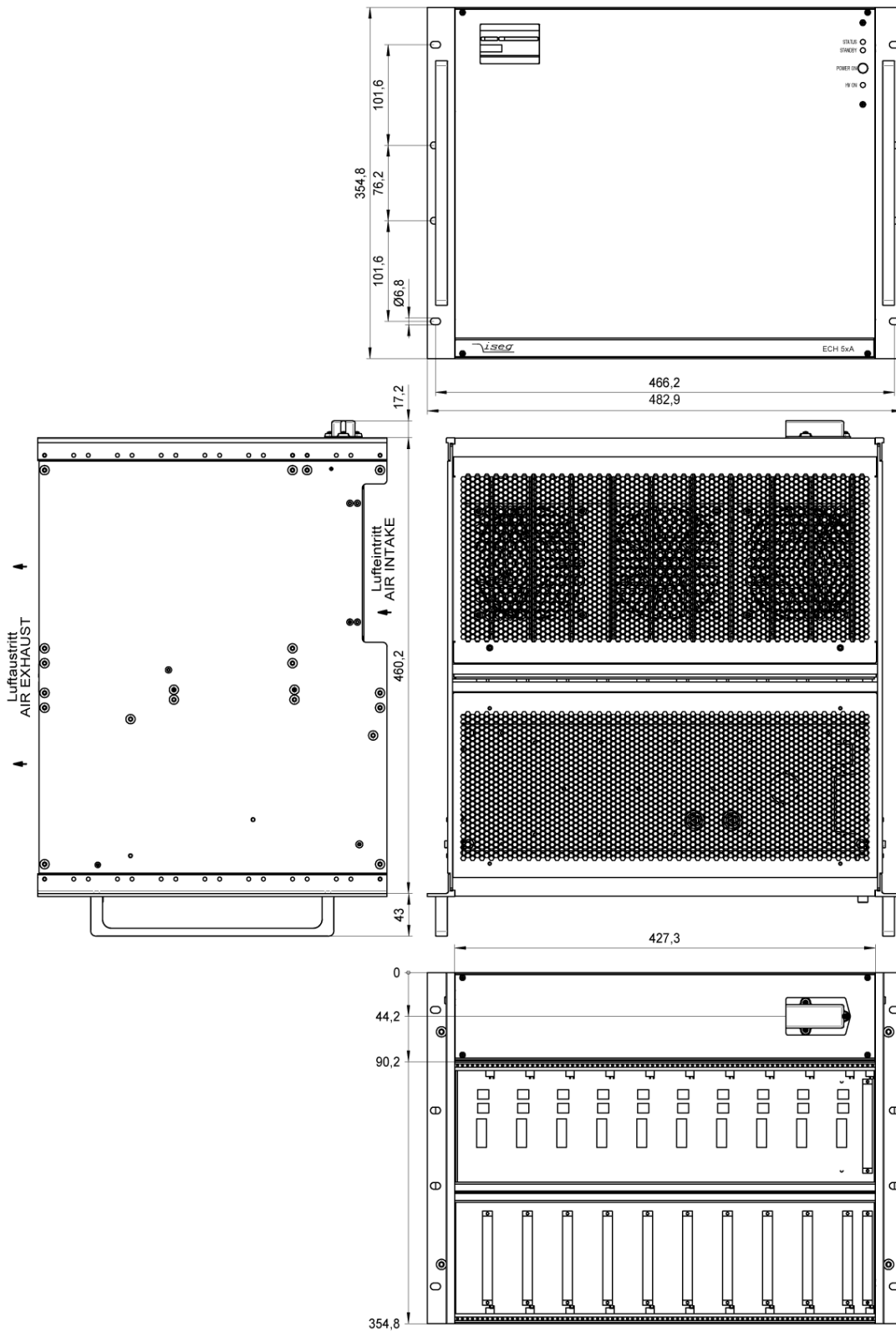


Figure 9: ECH 5xAHVR

## 7 Accessories

### CAUTION!



CAUTION!

Only use genuine iseg parts like power cables, CAN cables and terminators for stable and safe operation.

ACCESSORY ITEM	ORDER ITEM CODE
CAN cable RJ45-RJ45 1m, shielded	Z592637
CAN cable RJ45-RJ45 3m, shielded	Z592636
CAN cable RJ45-RJ45 10m, shielded	Z592610
CAN cable RJ45-SUB-D-9 5m, shielded	Z570060
CANbus-Adapter RJ45 to SUB-D-9 male	Z583382
CANbus-Adapter RJ45 to SUB-D-9 female	Z583401
Genuine power cable – EU Plug	Z201447
Front panel (blind) RAL9001 6U/8HP	Z514569
Spare fan-tray	Z520167
Spare power supply 1200W	Z520170
Spare uninterruptible power supply 1200W	Z520168
Front panels	Z514569

## 8 Appendix

For more information please use the following download links:

<b>This document</b>
<a href="http://download.iseg-hv.com/SYSTEMS/MMS/ECH/iseq_manual_ECH5xA_en.pdf">http://download.iseg-hv.com/SYSTEMS/MMS/ECH/iseq_manual_ECH5xA_en.pdf</a>
<b>Crate Controller CC24/23 manual</b>
<a href="http://download.iseg-hv.com/SYSTEMS/MMS/CC/iseq_manual_CC2x_en.pdf">http://download.iseg-hv.com/SYSTEMS/MMS/CC/iseq_manual_CC2x_en.pdf</a>

## 9 Warranty & service

This device is made with high care and quality assurance methods. The standard factory warranty is 36 months. Please contact the iseg sales department if you wish to extend the warranty.

### ATTENTION!



ATTENTION!

Repair and maintenance may only be performed by trained and authorized personnel.

For repair please follow the RMA instructions on our website: [www.iseg-hv.com/en/support/rma](http://www.iseg-hv.com/en/support/rma)

## 10 Disposal

### INFORMATION



All high-voltage equipment and integrated components are largely made of recyclable materials. Do not dispose the device with regular residual waste. Please use the recycling and disposal facilities for electrical and electronic equipment available in your country.

## 11 Manufacturer's contact

### iseg Spezialelektronik GmbH

Bautzner Landstr. 23

01454 Radeberg / OT Rossendorf

GERMANY

FON: +49 351 26996-0 | FAX: +49 351 26996-21

[www.iseg-hv.com](http://www.iseg-hv.com) | [info@iseg-hv.de](mailto:info@iseg-hv.de) | [sales@iseg-hv.de](mailto:sales@iseg-hv.de)