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# U 100-230 U 100-48 Base units



## Operating Manual

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## Before starting operation of the device

**HINWEIS:** Read this operating manual attentively! It contains important information about installation, ambient conditions and maintenance of the device. Keep this operating manual for future use and for handover in the event of a change of owner. A PDF version of this manual is available to download on the ASTRO website (there may be a more recent version).

The ASTRO company confirms that the information in this manual was correct at the time of printing, but it reserves the right to make changes, without prior notice, to the specifications, the operation of the device and the operating manual.

## Symbols and conventions used

### Symbols used in these instructions

Pictograms are visual symbols with specific meanings. You will encounter the following pictograms in this installation and operating manual:

Warning about situations in which electrical voltage and non-observance of the instructions in this manual pose a risk of fatal injuries.



Warning about various dangers to health, the environment and material.



Warning about thermal dangers (risk of burns).



Recycling symbol: indicates components or packaging materials which can be recycled (cardboard, inserts, plastic film and bags). Used batteries must be disposed of at approved recycling points. Batteries must be completely discharged before being disposed of.



This symbol indicates components which must not be disposed of with household rubbish.



### Copyright information

Parts of the software used with this product originate from third-party vendors and were developed under a variety of licensing conditions. Detailed information on the licences can be found on the device's web user interface. If you select the menu item "Licensing" on the web browser interface of the device, you will find a link to a page with detailed information.

You can obtain the source code for licence-free parts of the software upon request and against payment of a processing fee.

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## Proper use

The U 100-230 and u 100-48 base units can only be used for power supply of modules of the U 100 series. Modification of the devices or use for any other purpose is not permitted, and will immediately void any guarantee provided by the manufacturer.

## Target group of this manual

### Installation and starting operation

The target group for installation and starting operation of the ASTRO headend technology are qualified experts who have training enabling them to perform the work required in accordance with EN 60728-11 and EN 62368-1. Unqualified person are not allowed to install and start operation of the device.

### Device configuration

Target group for the configuration of the ASTRO headend are persons who have received instructions and have training enabling them to perform a configuration. Knowledge of EN 60728-11 and EN 62368-1 is not necessary for configuration.

## Device description

The delivery consists of the following parts:

- ☐ U 100-230 or U 100-48 base unit
- ☐ Operating manual

Figure I, top:  
Base unit U 100, front  
[1] Status messages  
Slots:  
L: left  
M: middle  
R: right  
Power supply unit:  
P: Power supply

Figure I, middle:  
U 100, rear  
[2] Power supply I  
[3] Earth connection  
[4] Power supply II

Figure I, bottom:  
optional version with 48 V power supply unit  
[5] Fuses  
[6] Earth connection  
[7] Mains supply

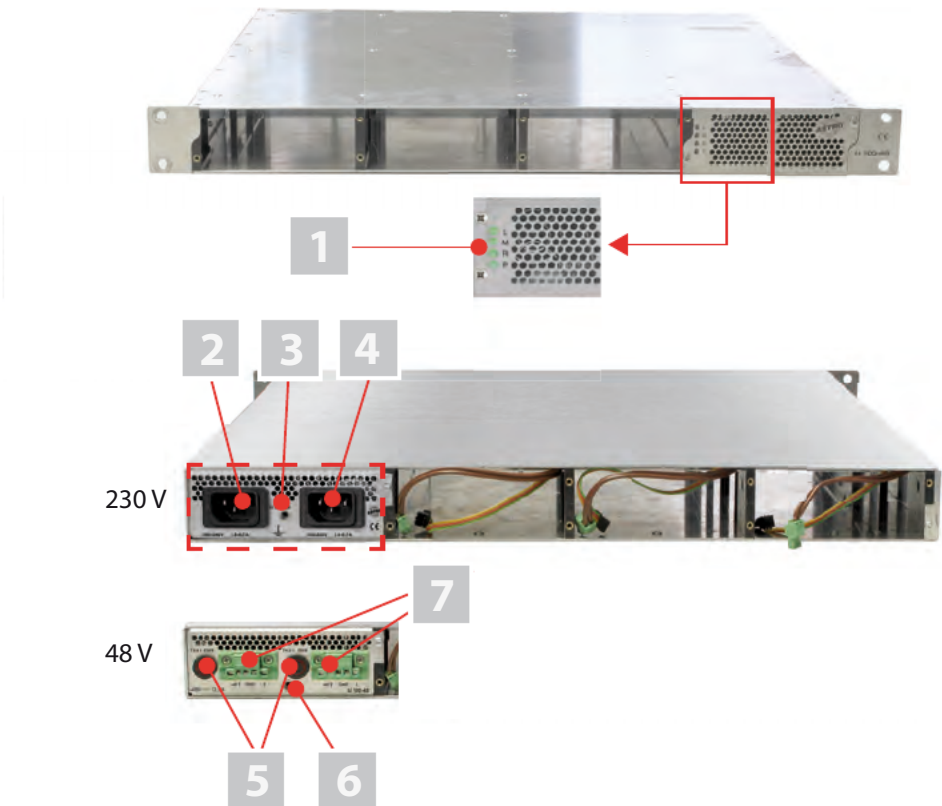


Figure 1: U 100 - base unit

The base units U 100-230 and U 100-48 feature a CE marking. This confirms that the products conform to the relevant EC directives and adheres to the requirements specified therein.





## Important safety information

To avoid any potential risks to the greatest extent possible, you must adhere to the following safety information:

**ACHTUNG:** *Failure to observe this safety information may result in personal injury due to electrical and thermal dangers!*

### Proper use

- ☐ Only use the device at the approved operating sites and in the ambient conditions allowed (as described in the following), and only for the purpose described in the section "Proper use".

### Before starting operation of the device

**HINWEIS:** *Read this operating manual attentively! It contains important information about installation, ambient conditions and maintenance of the device. Keep this operating manual for future use and for handover in the event of a change of owner or operator. A PDF version of this manual is available to download on the ASTRO website (there may be a more recent version).*

- ☐ Check the packaging and the device for transport damage immediately. Do not start operation of a device that has been damaged.
- ☐ Transporting the device by the power cable may damage the mains cable or the strain relief, and is therefore not permitted.

### Installation and operation

- ☐ The device may only be installed and operated by qualified persons (in accordance with EN 62368-1) or by persons who have been instructed by qualified persons. Maintenance work may only be carried out by qualified service personnel.
- ☐ The installation site must be planned in a way that prevents children from playing with the device and its connections.
- ☐ In order to prevent inadmissible operating statuses from occurring, only the components described in this manual, or components approved by the manufacturer for the base unit, may be used.
- ☐ In order to operate the U 100-230 unit (protection class I), it must be connected to mains sockets with a protective earth conductor.
- ☐ The U 100 base unit may only be installed using guide rails! If the device is only affixed by the screws in the front panel, this will damage the base unit.
- ☐ The electrical connection conditions must correspond to the specifications on the device type plate.
- ☐ To avoid damage due to overheating, the device may only be installed on horizontal surfaces. The device is primarily designed for operation in metallically conductive 19" racks with sufficient air convection. The installation surface should be non-flammable.
- ☐ The ambient temperatures specified in the technical data must be complied with, even when climatic conditions change (e.g. due to sunlight). If the device overheats, the insulation used to isolate the mains voltage may be damaged.
- ☐ The device and its cable may only be operated away from radiant heat and other sources of heat.
- ☐ To avoid trapped heat, ensure there is good ventilation on all sides (minimum interval of 20 cm to other objects). Installing the device in a niche or covering the ventilation openings is not permitted.
- ☐ No objects may be placed on the device.
- ☐ Do not insert any objects through the ventilation holes.
- ☐ Caution, dangerous voltage: To disconnect the device from the mains voltage, you must disconnect all connections that may carry mains voltage.





- ☐ The subscriber network must be earthed in accordance with EN 60728-11, and must remain earthed even when the device is removed. Furthermore, the earth connection on the device can be used. Devices within hand's reach must be integrated into the potential equalisation together. Operating the device without an earth conductor, without earthing the device or without using device potential equalisation is not permitted.
- ☐ The device does not feature protection against water and may therefore only be operated and connected in dry rooms. It must not be exposed to splash water or drip water, condensation or similar effects of water, as this may impair the isolation from the mains voltage.
- ☐ The electrical system supplying current to the device, e.g. a house installation, must incorporate safety devices against excessive current, earth leakages and short-circuiting in accordance with EN 60950-1.
- ☐ All adhere to all applicable national safety regulations and standards.
- ☐ Both mains plugs are used as a mains voltage disconnect unit in the event of servicing and in the event of danger, and must therefore be accessible and be able to be operated at any time. The device is operational as soon as one mains plug is connected to the mains voltage.
- ☐ Do not install the unit in locations with excessive dust formation, as this may impair the isolation from the mains voltage.
- ☐ Excess mechanical loads (e.g. falling, impacts, vibrations) may damage the insulation used to provide protection from mains voltage.
- ☐ High excess currents (lightning strike, surges in the power utility grid) may damage the insulation used to provide protection from mains voltage.
- ☐ If there is no information about intended use (e.g. operating site, ambient conditions), or the operating manual does not include the corresponding information, then you must consult the manufacturer of this device to ensure that the device may be installed. If you do not receive any information on this from the manufacturer, do not start operating the device.
- ☐ Disconnect devices with damaged power cables from the mains power (unplug the power supply plug).

#### Electromagnetic compatibility (EMC)

In order to avoid malfunctions from occurring when operating radio and telecommunications equipment, as well as other operating units or broadcasting services, the following points must be observed:

- ☐ Before installation, the device must be checked for mechanical damage. Damaged or bent covers or housings may not be used.
- ☐ During operation, the device must always be covered by the components provided for this purpose. Operation with an opened cover is not permitted.
- ☐ The braided line or the contact springs may not be damaged or removed.

#### Maintenance

- ☐ The operating display only shows whether the DC current, which supplies the device components, has been disconnected. However, operating displays (on the power supply unit or the device) that are not lit up in no way indicate that the device is completely disconnected from the mains. There may still be voltages in the device that are dangerous to touch. You may therefore not open the device.
- ☐ Read carefully: EN 60728-11 – Part 1, Safety requirements / No service tasks during electrical storms!

#### Repair

- ☐ Repairs may only be performed by the manufacturer. Improperly performed repairs may result in considerable dangers for the user.
- ☐ Do not start operating devices with a damaged power cable, and instead have them repaired by the manufacturer.
- ☐ If malfunctions occur, the device must be disconnected from the mains and authorised experts must be consulted. The device may need to be sent to the manufacturer.

#### General information

- ☐ Store or use the device in a safe location, well out of reach of small children. It may contain small parts that can be swallowed or inhaled. Dispose of any small parts that are not needed.



- ☐ Plastic bags may have been used for packaging the device. Keep these plastic bags away from babies and children in order to avoid any danger of suffocation. Plastic bags are not toys.
- ☐ Do not store the device near chemicals or in places in which a leakage of chemicals may occur. Organic solvents or fluids in particular may cause the housing and/or cables to melt or disintegrate, presenting a danger of fire or electric shock. They may also cause device malfunctions.
- ☐ Do not connect the mains adapter provided to any other products.

## Warranty conditions

The general terms and conditions of ASTRO Bit GmbH apply. You will find these in the current catalogue or on the Internet under “[www.astro-kom.de](http://www.astro-kom.de)”.

## Disposal

All of our packaging material (cardboard boxes, inserts, plastic film and bags) is completely recyclable. Electronic devices must not be disposed of with household waste, but rather – according to DIRECTIVE 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL from 27 January 2003, on waste electrical and electronic equipment – must be properly disposed of. When it is no longer of use, please bring the device for disposal to one of the public collection points for this purpose.

ASTRO Bit is a member of the Elektro system solution for the disposal of packaging materials. Our contract number is 80395.





## Connecting and installing modules

Observe the instructions on installation and connection described in the section "Important!"

Ensure that the mains voltage, signal sources etc. are properly connected to the device using the corresponding connections. The local mains voltage must be the same as the supply voltage required to operate the device (see section "Technical data").

### Installing the signal converter in the base unit

Start by removing the dummy plates on the front of the U 100 base unit by removing the two fastening screws from the dummy plate.

Then push the plug-in module through the opening on the front side of the U 100 until the front plate of the plug-in module is flush with the U 100 housing.

Now use the two fastening screws to connect the plug-in module to the base unit.

### Coding and installing the backplane

**HINWEIS:** A detailed description of how to install a module in the base unit you will find in the operation manual of each of the available modules. Consecutively the installation is explained in short for one of the backplane types as an example.

A backplane is included with every U 1xx signal converter. This is used to establish a mechanical connection between the signal converter and the base unit. Both the mains HF connections and the network connections are connected to this backplane. There is usually a temperature-controlled fan for cooling the signal converter on the backplane. This can be replaced while the device is operating.

To ensure the position of the backplane, and therefore the position of the respective signal converter in the U 100 base unit, is correct, you must plug a corresponding jumper into the circuit board on the backplane. Proceed as described in the following.

- [1] Left slot
- [2] Middle slot
- [3] Right slot

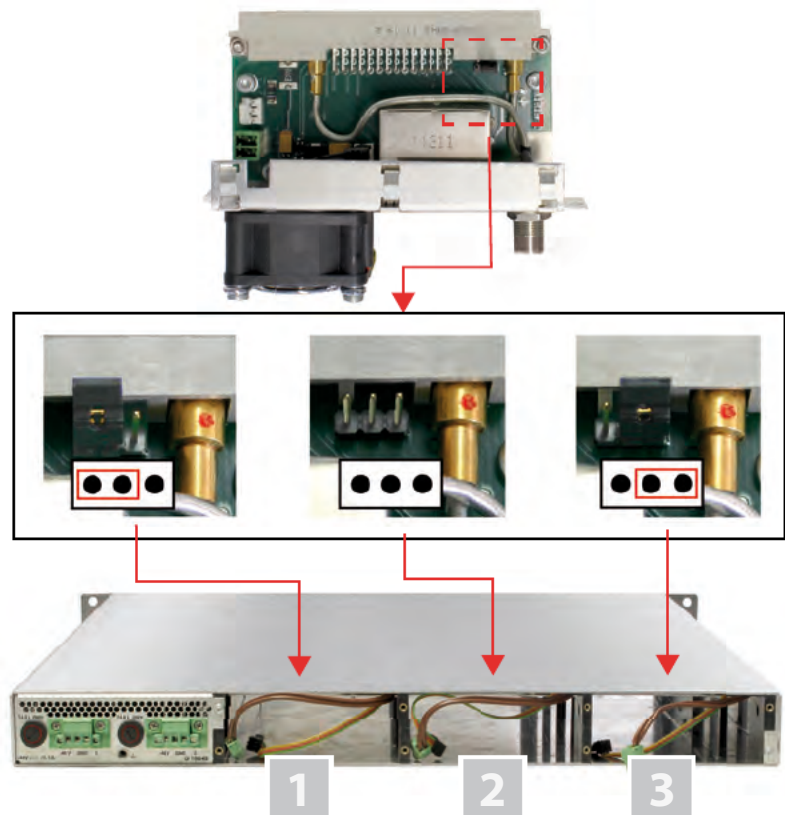


Figure 2: Coding the backplane by plugging in the bridge



To prepare the backplane for installation, proceed as follows:

Plug the bridge into the installation position provided in accordance with figure 3 (page 8).

**HINWEIS:** A bridge which has not been correctly plugged into the corresponding installation position will result in incorrect LED displays on the front of the U 100 base unit (see section "Device description"). Furthermore, the correct position cannot be displayed on the web browser user interface.

You can now install the backplane in the base unit. To do so, proceed as follows:

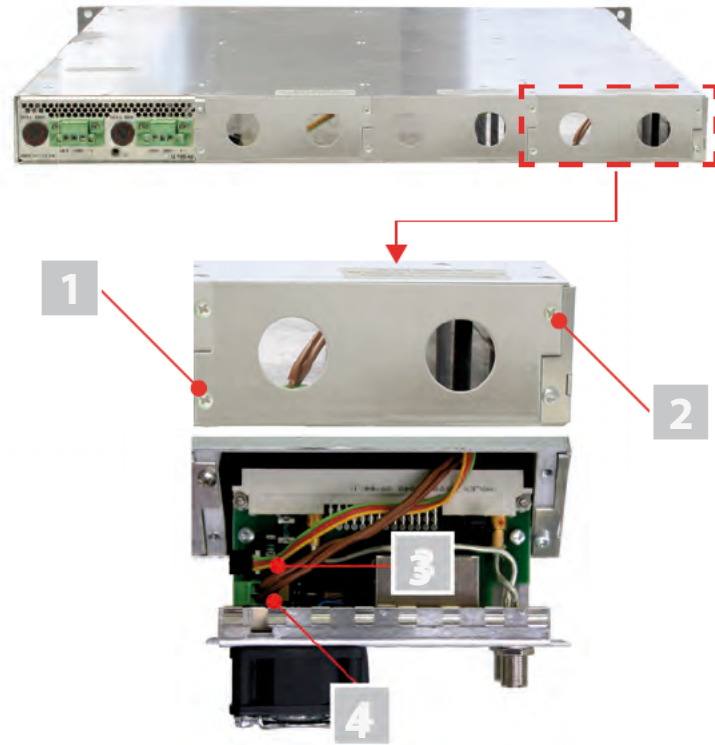


Figure 3: Installing the backplane in the base unit

#### AUFGABE

1. When the U 100 base unit is in its delivery state, the three installation slots for the backplanes are covered by dummy plates (see figure 3, above). Start by removing the Phillips-head screws [1] and [2] from the dummy plate at the required installation position (left, middle or right) and remove the dummy plate.
2. You can now see the two connection cables for the selected slot (power supply and signal cable). Connect the cables to the backplane as shown in figure 3 (above).
3. Now carefully insert the backplane into the slot of the U 100. Make sure the cables are not jammed. You can push the backplane into the housing by applying light pressure.

#### ERGEBNIS:

The backplane is now connected and installed. Once installed, it should correspond to the figure at the left.

**HINWEIS:** You can learn how to connect a plug-in module to your PC or laptop by reading the operating manual for the respective signal converter.



## Troubleshooting

If the device is not functioning correctly, please perform the following checks:

- ☐ Check whether the device is connected to the required grid voltage (230 V~, 50 Hz for the U 100 base unit, and 48 V for the U 100-48 base unit).
- ☐ Check whether the signal cable is connected correctly, and that there are no breaks or short circuits in the connectors.

If the problem cannot be resolved, please contact the ASTRO customer service.

## Maintenance and repair

**ACHTUNG:** The following safety information must be observed when performing maintenance and repair work. Failure to observe this safety information may result in personal injury due to electrical and thermal dangers!

- ☐ The operating display only shows whether the DC current, which supplies the device components, has been disconnected from the mains voltage. If the operating display (for the power supply unit or the device) does not light up, this does not mean that the device has been fully disconnected from the mains voltage. There may still be voltages in the device that are dangerous to touch. You may therefore not open the device.
- ☐ The cover for the power supply unit is designed to prevent accidental contact with voltages that are dangerous to touch, and must not be removed.
- ☐ Housing components near the cooling fins at the rear, or actual the cooling fins, may become very hot.
- ☐ Read carefully: EN 60728-11 Safety requirements: No service work during thunderstorms.
- ☐ A defective device may only be repaired by the manufacturer to ensure that components with the original specification are used (e.g. power cable, fuse). Improperly performed repairs may result in considerable dangers for the user or installer. If malfunctions occur, the device must therefore be disconnected from the mains and authorised experts must be consulted. The device may need to be sent to the manufacturer.

## Service tasks

The following tasks, which involve the removal of screw connections, can be performed by appropriately instructed service personnel: Removal and installation of signal converters and power supply units, even when the U 100 is operating.

### Replacing power supply units

After removing the screws from the cover of the power supply chamber (ASTRO logo), the power supply unit can be pulled forwards by hand using the mounting tab. When installing power supply units, do not touch the fan or fan grille and only use the mounting tab affixed to the power supply unit. When the tasks are complete, the cover of the power unit chamber must be replaced. Continuous operation of the device is not permitted without this cover.

**ACHTUNG:** Do not put your hand or any objects into the power unit chamber!

**HINWEIS:** The U 100-230 base unit must only be operated with the original power unit(s)!

### Replacing converter modules

Converter modules can be pulled out to the front after removing the safety screw in the front covers (see section "Connecting and installing the module")



Type		U 100 - 48	U 100 - 230
Order number		380 100	380 101
EAN-Code		4026187611064	4026187611149
Common data			
Voltage supply	[V]	- 48 [-40,5 .... -57 (-60)*]	110...240
Voltage supply tolerance	[%]	10	
Supply frequency		DC	50 - 60
Effective power consumption	[W]	depends on number of modules assembled (see operating manual, chapter: "Calculation of effective and apparent power consumption at mains")	
Apparent power consumption	[VA]		
Maximum permissible current draw: at mains	[A]		1,6
complete current of all converter modules at the internal intermediate voltage		3,1 [4*]	3,1
complete current of all converter modules at the internal intermediate voltage	[A]	3	3
Internal intermediate voltage (I48)		Input voltage -1.4	47
Dimensions		19" / 1 RU	
Ambient temperature	[°C]	0...+45	

\* considering the voltage tolerance

**HINWEIS:** Even when using redundant power supply, the current draw values in the table above must not be exceeded at the internal intermediate voltage. Especially when using modules with remote supply option, this must be taken into consideration.

The maximum permissible summed up current at the internal intermediate voltage (I<sub>48</sub>) must be less than 3 A for U 100-230 and less than 4 A for U 100-48.

The intermediate voltage must be calculated as follows:

$$\frac{P_{Module1} + P_{Module2} + P_{Module3} + 1W + \text{number of remote powering recipients} * 10W}{\text{internal intermediate voltage}} < I_{48}$$

Hint for simplifying the calculation:

If there is no remote powering afforded, the above stated supposition is fulfilled for modules with a power consumption of less than:

- ☐ 50 W for U 100-48 base units
- ☐ 49 W for U 100-230 base units

You will find more notes concerning power consumption in the operating manuals of the modules.

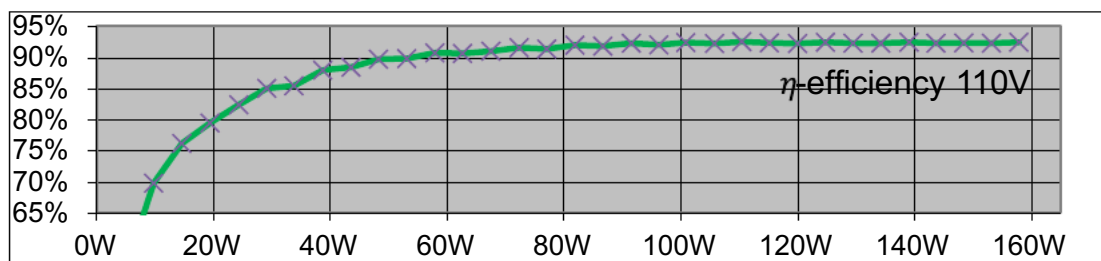
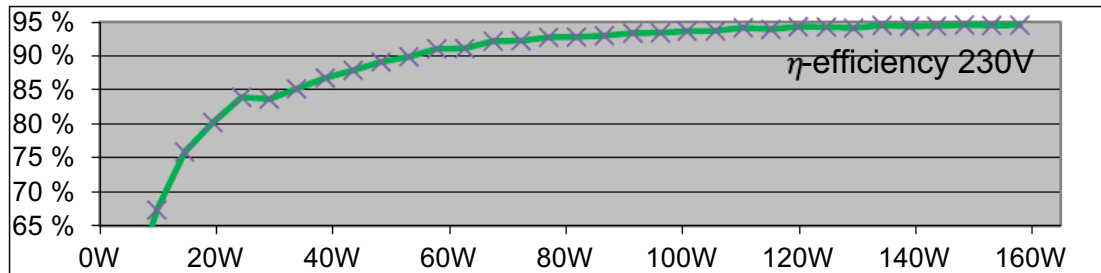
Hints for calculation of effective and apparent power consumption of the U100-230 you will find in the following chapter or on request at the ASTRO client service.

## Calculating effective and apparent power consumption at mains when using U 100 SNT ECO switching power supplies

The (230V or 110V) power consumption at mains ( $P_{Net}$ ) must be calculated as follows:  $P_{Net} = \frac{P_{48}}{\eta}$

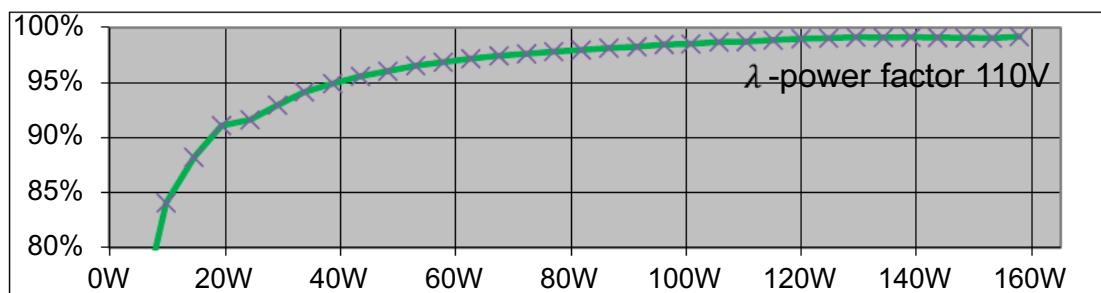
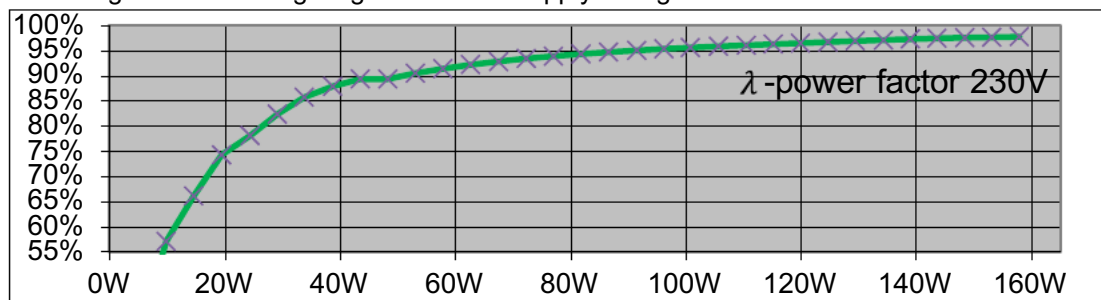
The efficiency ( $\eta$ ) must be calculated in total ( $P_{48}$ ) at intermediate voltage by using the following diagrams for supply voltage 110V or 230V.

*Note: At redundant supply via 2 power supply units, the summed up power ( $P_{48}$ ) is splitted up to 50% for each supply unit. It must be ensured, that the maximum permissible current draws of the base units are not exceeded.*



The (230V or 110V) apparent power ( $S_{Net}$ ) at mains must be calculated as follows:  $S_{Net} = \frac{P_{Net}}{\lambda}$

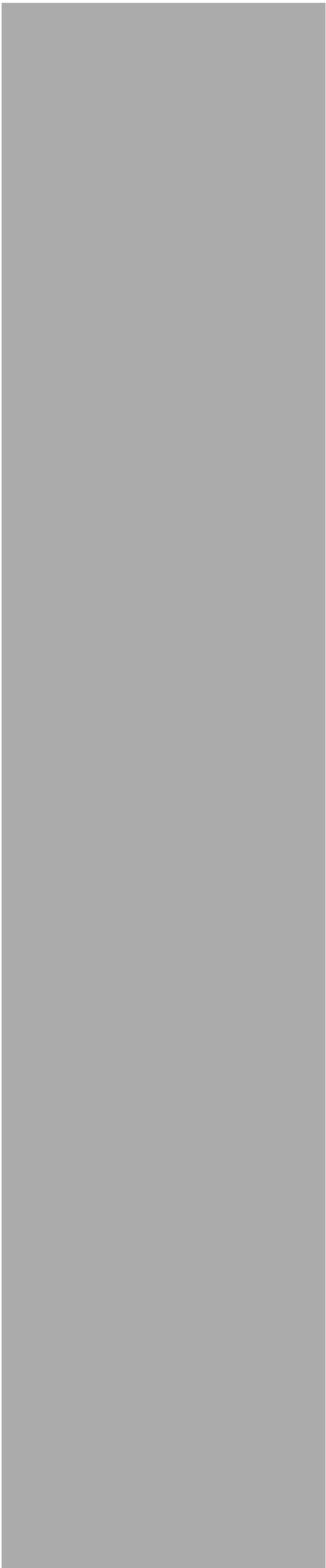
The power factor ( $\lambda$ ) must be calculated at summed up power ( $P_{48}$ ) at the internal intermediate voltage according to the following diagrams for the supply voltage 110V or 230V.



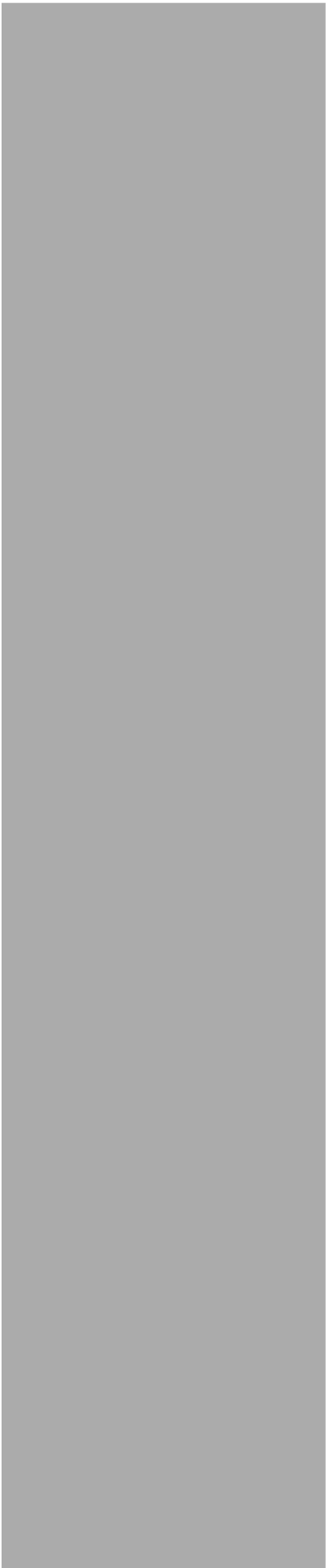
The (230V or 110V) current draw ( $I_{Net}$ ) at mains must be calculated as follows:  $I_{Net} = \frac{S_{Net}}{U_{Net}}$

### Examples:

**3 units U114 and one U100SNT ECO:**  $P_{48}$ : 88W ;  $P_{Net230}$ : 94,62W ;  $S_{Net230}$ : 99,92VA ;  $\eta_{230}$ : 93% ;  $\lambda_{230}$ : 94,7%











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