VOLTAGE CONVERTERS

Questions which are frequently posed

Do voltage converters also convert the frequency?

-NO-

All voltage converters we supply do only convert the voltage and not the frequency.

Almost all appliances, like e.g. household devices, computer and electronic appliances are working faultless in spite of that.

You will find a general view under „**plug systems – worldwide**" in which countries which voltage and frequency is used.

Small problems may occur with appliances with built-in motors, for example:

- USA-appliances with 110 – 120 V, 60 Hz, are working in Germany with 220 – 240 V, 50 Hz, a little slower and German appliances are working a little quicker in the United States.

- At analog clocks and time switch circuits the precise time is no more indicated exactly.

There exist appliances which are converting the frequency, these cost, however, several thousand Euros.

We don't sell them.

Which voltage converter do I need for example for a television set?

If a watt number is indicated on the backside of your television, you should select in every case a voltage converter which has a 20 – 30 % higher capacity than the television.

The reason is: on switching on the television, it needs a much higher switching-on voltage than the capacity which is mentioned by the manufacturer, for example:

- If your television indicates a capacity of 500 Watt, you should use a voltge converter with a capacity of approx. 700 Watt (500 W + 30 % = 650 Watt). Our next available type has 800 Watt.

How do I select the appropriate voltage converter for me?

On the backside of the appliance which you want to use with a voltage converter, you will find normally the indication about the capacity of your appliance in Watt or Ampere.

For example: if the capacity of your appliance is indicated with 70 Watt, you will need a voltage converter with 100 Watt (70 Watt + approx. 30 % = 21 Watt = totally 91 Watt).

Can I use several electrical appliances with one voltage converter?

If you want to use several appliances with one voltage converter, just add the capacities in Watt of your appliances, for example:

One of your appliances has 150 Watt, the other 200 Watt = totally 350 Watt.

You require then a voltage converter with 500 Watt (350 Watt + approx. 30 % = 455 Watt).

The capacity of the voltage converter must be always much higher than the capacity in Watt of your appliances which you want to connect.

How do you find out the watt/capacity of your electrical device?

If the label of your electrical device doesn't indicate a watt capacity (W), but you know the Ampere (A), you may calculate the watt capacity by yourself:

Ampere (A) x Volt (V) = Watt =

For example

3 A x 220 V = 660 Watt or
3 A x 110 V = 330 Watt.

To this value please add 20 – 30 % as reserve for the voltage converter which you will then need, e.g.

330 Watt + 20 % = 396 Watt, so you will need a voltage converter of 400 Watt or more.

Information regarding our voltage converters:

Standardly our voltage converters are supplied with a protective contact plug with 2 earth wiring systems (plug type E + F), therefore also usable e.g. in France, Belgium, Czech Republic, Poland etc, without an adapter needed.

For other countries relating adapters can be obtained which are included in our delivery programme (please refer to – **converter plugs** -):

Of course you may buy the relating adapter also from your local dealer.

Our voltage converters from 100 Watt – 5000 Watt have the following functions which has not every voltage converter available on the market:

1.)
Our voltage converters are converting the voltage in both directions, e.g. from 230 V to 110 V and from 110 V to 230 V.

2.)
Our voltage converters are secured by 1 – 2 fuses depending on capacity.

3.)
A glass fuse is included free of charge.

4.)
On/off switch

5.)
Universal sockets for different plug types with earth.
When using a Schuko plug, the earth doesn't go through. Additionally an adapter has to be used, e.g. our no. 7351 254 W or an adapter cable.

6.)
Tripolar cable with Schuko plug which has 2 earth wires, so that the appliance can be also used in France, Belgium, Czech Republic, Poland etc. without adapter.

7.)
The voltage converters can be adjusted with a special plug to different voltages on the backside of the appliance, like

110 V
200 V
220 V
240 V.

230 V 50 Hz converting into 120 V 60 Hz

Alternating current which is produced by generators has a certain number of pole changes per second.

This frequency is stated in Hertz.

Mainly 2 frequencies are used.

50 Hz in Europe
60 Hz in the United States and a few countries in Central- and South America and Asia.

Transformers and motors are working with these frequencies, e.g. a transformator which is converting 230 V 50 Hz to 120 V is supplying this only with 50 Hz.

That means for a motor laid out for 120 V and 60 Hz, that this has approx.17 % less number of revolutions at 50 Hz.

The question is, is it possible to use my appliance 50 Hz also with 60 Hz or vice versa my appliance 60 Hz also with 50 Hz?

Actually not – what happens:

in transformatores – like the input transformators of several electrical appliances – the current intensity is increasing.

The current intensity is increasing also in motors and the number of revolutions which is depending on hertz directly – if this is changed in relation, e.g. if a motor 120 V 60 Hz is used with 50 Hz, the speed is only 830 U/min instead of 1000 U/min.

If you can oppose against the increase of the current intensity by reducing the voltage for approx. 20 %, the difference in speed remains in motors.

If a type 120 V 60 Hz shall be used with 230 V 50 Hz, you should use a transformer on own risk which is transforming down the input voltage from 230 V to 90 V.

Electrical appliances are laid out by the manufacturer only for a certain frequency and can't be used on another frequency!

In some cases – if the appliance can be used for both frequencies – on the type plate is mentioned: 50/60 Hz, e.g.

on a charging set for a laptop.
On the type plate is indicated 100 – 240 V and 50/60 Hz.

That means: every voltage between 100 V and 240 V can be either used on 50 or 60 Hz.

Why should we don't use an appliance – fitted with a frequency – with the second frequency?

The international current is increasing and this could cause a quicker deterioration of the insulation at the wiring. That may cause a short-circuit and a fire could arise.
What happens if the current rating is increasing in transformers (like in input transformers of an appliance)?

The self-heating is increasing!

In motors (like in cooling ventilators or compressors) the current is also increasing, the rotations of the motor depend on the frequency, what means that the rotations are 17 % higher if you go from 50 to 60 Hz and 17 % lower if you go from 60 to 50 Hz.

Can I do anything to use the appliance on another frequency?

Yes, but on your own risk. It is still not possible to change the efficiency of higher or lower rotations, but you can reduce the current:

reduce the voltage of the appliance for approx. 20 % - as indicated on the type plate – by using a transformer.

<u>1st example:</u>
European model 230 V 50 Hz should be used in the United States with 60 Hz:
connect it with a transformer of 120 V on the socket in the United States to 180 V for the appliance (instead of the indicated 230 V).

<u>2nd example:</u>
USA – model 120 V 60 Hz should be used in Europe with 50 Hz:

connect it with a transformer of 230 V on the socket in Europe to 90 V for the appliance (instead of the indicated 120 V).

3rd example:
is it possible that women are using their hair dryers on another frequency in vacation?

Only if 50/60 Hz is indicated on the type plate and if it can be adapted to the other voltage either of 120 V or 230 V. Don't believe being able to buy an universal adapter as this is only possible if the adapter is used with the wattage (approx. 1200 Watt or VA). An adapter like this is very heavy if based on a transformer, if it is based on electronics, it is not heavy but it may damage the appliance and it should be used only for a short time.

If 120/230 V 50/60 Hz is mentioned on the type plate, mostly a changing-over is possible as all is prepared by the manufacturer. A switch should be provided at the appliance.