

PORTAWATTZ™

300
DC to AC
POWER INVERTER

Owner's Manual

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1.0 Introduction

Thank you for purchasing the PORTAWATTZ 300 Power Inverter. The PORTAWATTZ 300 is part of an advanced family of high performance power inverters from Xantrex, the leader in the field of high frequency inverter design. From the 12 Volt outlet in your vehicle or boat, or directly from a 12 Volt battery, the PORTAWATTZ 300 will efficiently and reliably power a wide variety of household AC products, such as most TVs, computers, fluorescent lights, soldering irons, etc. The PORTAWATTZ 300 employs reliable solid state power electronics for years of safe, trouble free operation and includes a built-in cooling fan and automatic safety monitoring circuitry to protect it, and your battery, from inadvertent overload conditions.

Read this manual before installing or using the PORTAWATTZ 300 and save it for future reference.

The following main topics are covered in this manual:

- Important safety information
- Installation and operating instructions
- General principles of operation
- Warranty and service information

2.0 Safety First ... Before You Use the PORTAWATTZ 300

Incorrect installation or misuse of the PORTAWATTZ 300 may result in danger to the user or hazardous conditions. We urge you to pay special attention to all **CAUTION** and **WARNING** statements. **CAUTION** statements identify conditions or practices that may result in damage to the PORTAWATTZ 300 or to other equipment. **WARNING** statements identify conditions that may result in personal injury or loss of life.

WARNING! Shock hazard. Keep away from children.

- The PORTAWATTZ 300 generates the same potentially lethal AC power as a normal household wall outlet. Treat it with the same respect that you would any AC outlet.
- Do not insert foreign objects into the PORTAWATTZ 300's AC outlets.
- Do not expose the PORTAWATTZ 300 to water, rain, snow or spray.
- Do not, under any circumstances, connect the PORTAWATTZ 300 to power utility AC distribution wiring.
- Failure to follow the above safety instructions may result in personal injury and/or damage to the PORTAWATTZ 300.

WARNING! Heated surface.

- The PORTAWATTZ 300's housing may become uncomfortably warm, reaching 140°F (60°C) under extended high power operation. Ensure at least 2 in. (5 cm) air space is maintained on all sides of the PORTAWATTZ 300. During operation, keep away from materials that may be affected by high temperatures.

CAUTION!

- Do not connect any AC product to the PORTAWATTZ 300, whose neutral conductor is connected to ground.
- Do not expose the PORTAWATTZ 300 to temperatures in excess of 100°F (40°C).

3.0 Quick Start Guide

3.1 Overview

These basic instructions are intended to provide a brief overview of the PORTAWATTZ 300's key features. For complete information about the PORTAWATTZ 300, it is important to read this manual fully. The diagram below shows the PORTAWATTZ 300's key features.

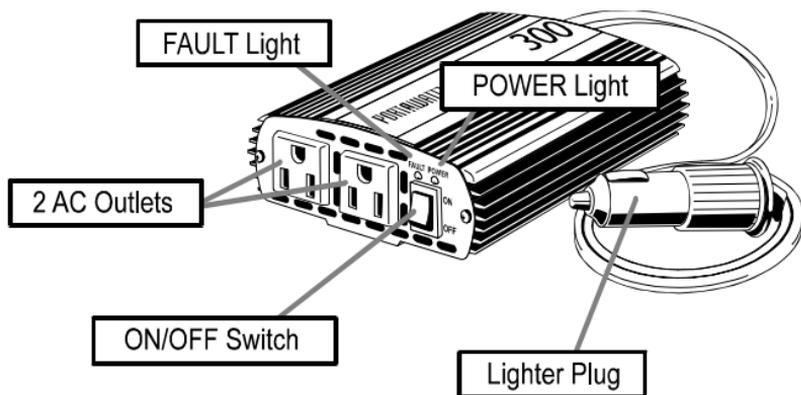


Figure 1. Key Features

3.2 Operating 115 V AC Products

1. For products rated at 150 Watts or less, plug the PORTAWATTZ 300 DC lighter plug into a vehicle's cigarette lighter or 12 Volt outlet. For products rated between 150 and 300 Watts, connect directly to a 12 Volt battery (See section 6.2).
2. Turn the PORTAWATTZ 300 ON/OFF switch ON. The green POWER light indicates AC power is available at the AC outlets.
3. Plug the AC products you wish to operate into the AC outlet(s) and switch them on, one at a time.
4. In the event of an overload, low battery voltage or overheating, the PORTAWATTZ 300 will automatically shut down. (See section 7.0)

4.0 Design Features

4.1 Switchmode Power Conversion Technology

The PORTAWATTZ 300 employs advanced high frequency switchmode power conversion circuitry. This results in a smaller, lighter, more efficient and quieter inverter.

4.2 High Surge Power Capability

High performance Power FETs (Field Effect Transistors) are employed for high surge power capability.

4.3 Safety Features

These advanced safety features are built into the PORTAWATTZ 300.

- Electronic overload protection with automatic shutdown.
- Built-in internal backup DC fuse provides added safety.
- Low battery voltage warning followed by automatic shutdown.
- Overheat shutdown protection.
- High input voltage protection.
- Manual reset eliminates unexpected restarting.

5.0 Placement Guidelines

For optimum operation, the PORTAWATTZ 300 should be placed on a flat surface such as the floor or seat of a vehicle. The location should be...

- ...dry. Do not expose to water drip or spray.
- ...cool. Operate only in ambient temperatures between 32°F (0°C) and 100°F (40°C). Keep away from heating vents.
- ...well ventilated. Allow at least 2 inches (5 cm) clearance above and on all sides of the PORTAWATTZ 300 for proper cooling.

6.0 Operating 115 Volt AC Products and Equipment

6.1 General Information

The PORTAWATTZ 300 is capable of powering most 115 Volt AC products that use 300 Watts or less. Its AC output waveform, called “modified-sine wave” is designed to function similarly to the sine wave shape of utility power. Most AC products rated for 300 Watts or less will operate normally with the PORTAWATTZ 300.

CAUTION: Do not use the PORTAWATTZ 300 with the following:

- Small battery operated appliances such as rechargeable flashlights, some rechargeable shavers and night lights that are plugged directly into an AC receptacle to recharge.
- Battery chargers used with certain power tool battery packs. These chargers will have a warning label stating that dangerous voltages are present at the charger’s battery terminals.

The power, or “wattage”, rating of AC products is the average power they use. When many AC products are first switched on, they initially consume more power than their power rating. TVs, monitors, and electric motors are examples of products that have

high “surge” requirements at start up. Although the PORTAWATTZ 300 can supply momentary surge power as high as 500 Watts, occasionally some products rated less than 300 Watts may exceed its surge capabilities and trigger its safety overload shutdown feature. If this problem occurs when attempting to operate several AC products at the same time, try first switching on the inverter with all AC products switched off, then one by one switch each on, starting with the high surge product first.

6.2 Powering AC Products Rated above 150 Watts

Cigarette lighter or 12 Volt outlets are limited in the power they can safely deliver. When continuously powering loads rated higher than 150 Watts, connect the PORTAWATTZ 300 directly to a 12 Volt battery.

CAUTION: Connect the PORTAWATTZ 300 directly to a 12 Volt battery when powering loads above 150 Watts. Connect only to a 12 Volt battery; do not connect to a battery of any other voltage.

WARNING: Batteries contain corrosive materials and present an Energy Hazard. To prevent irritation and burns, wear protective eyewear and clothing, and take special care to ensure no metal tools or personal objects contact the battery terminals.

To make a direct battery connection, carefully follow these steps:

1. Cut the lighter plug off the PORTAWATTZ 300 power cord.
2. IMPORTANT! One of the two wires in the power cord is identified with a red or white stripe. **Note that this is the positive wire.**
3. The power cord may be extended if required, to a maximum total length of 6 feet (2 meters) including the existing PORTAWATTZ 300 power cord length. Insulated 12 AWG wire or heavier must be used, and all connections must be soldered and properly insulated using electrical tape or heat shrinkable tubing.
4. Install a 30 Amp fuse, and a switch rated at 25 Amps in line with the positive wire, as close as possible to the end that attaches to the battery. The switch is a necessary requirement to ensure no sparking occurs when connections are made to the battery. Solder and insulate the connection as detailed in step 3 above. Set the switch to the OFF position. See Figure 2 for full details.
5. Solder heavy duty ring tongue terminals to the end of the positive and negative wires. Select these terminals to mate properly with the battery terminals or existing battery cable clamps.
6. Fasten the positive ring tongue terminal to the positive battery post, then fasten the negative ring tongue terminal to the negative battery post.

WARNING: Risk of explosive gases. Failure to turn the in-line switch OFF before connecting or disconnecting the battery, may result in a spark and ignition of explosive battery gasses.

CAUTION: Reverse polarity will damage inverter. Do not proceed until you are sure wire polarity (identified in step 2) is correct. Damage to the inverter caused by reverse polarity is not covered under the PORTAWATTZ 300 warranty.

7. Double check wiring polarity, then turn the in-line switch ON. The PORTAWATTZ 300 is now ready for operation.
8. When disconnecting the battery, first turn the in-line switch OFF.

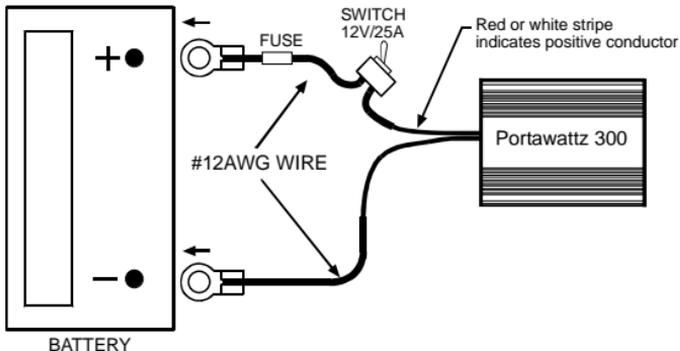


Figure 2. Direct Connection to Battery

6.3 Interference with Electronic Equipment

Generally, most AC products operate with the PORTAWATTZ 300 just as they would with household AC power. Below is information concerning two possible exceptions.

6.3.1 Buzzing Sound in Audio Systems.

Some inexpensive stereo systems and “boom boxes” have inadequate internal power supply filtering and “buzz” slightly when powered by the PORTAWATTZ 300. Generally, the only solution is an audio system with a higher quality filter.

6.3.2 Television Interference.

The PORTAWATTZ 300 is shielded to minimize interference with TV signals. However, with weak TV signals interference may be visible in the form of lines scrolling across the screen. The following should minimize or eliminate the problem:

- Use an extension cord to increase the distance between the PORTAWATTZ 300 and the TV, antenna and cables.
- Adjust the orientation of the PORTAWATTZ 300, television, antenna and cables.
- Maximize TV signal strength by using a better antenna and use shielded antenna cable where possible.
- Try a different TV. Different models of televisions vary considerably in their susceptibility to interference.

7.0 Using the PORTAWATTZ 300

Refer to Figure 1 in section 3.1 for location of the items identified below.

7.1 Indicators, Controls and Connectors

- Two AC outlets are provided on one end of the PORTAWATTZ 300. Any combination of 115 Volt AC products with a total power consumption of 150 Watts or less, when operated from a vehicle cigarette lighter or 12 Volt outlet, or 300 Watts or less when wired directly to a battery, may be plugged in.
- The PORTAWATTZ 300 is equipped with a heavy duty DC lighter plug that fits standard vehicle cigarette lighter and DC power outlets. With this lighter plug, the PORTAWATTZ 300 can power loads up to 150 Watts. See section 6.2 for important instructions on powering higher loads.
- The ON/OFF switch enables output AC power at the AC outlets when switched ON. It also acts as a manual reset for overload, low battery voltage and overheat fault conditions. Reset occurs by switching OFF for 5 seconds, then back ON again.
- The green POWER light indicates AC power is present at the two AC outlets and the PORTAWATTZ 300 is operating normally.
- The red FAULT light indicates inverter shutdown caused by low voltage, overload or excessive temperature.

- An internal audible alarm sounds when low battery voltage is approaching, prior to low voltage shutdown.

7.2 Inverter Operation

1. When connected to a 12 Volt battery, turning the ON/OFF switch ON, will illuminate the green POWER light, activate the cooling fan, and AC power will be delivered to the two AC outlets.
2. As the battery charge is used up, battery voltage begins to fall. When the PORTAWATTZ 300 senses the voltage at its DC input has dropped to 10.7 Volts, an audible alarm sounds. This allows time for computers or other sensitive devices to be shut down.
3. If the audible alarm is ignored, the PORTAWATTZ 300 will shut down a short time later when the battery voltage drops to 10.0 Volts, to prevent battery damage. The green POWER light is switched off, and the red FAULT light illuminates.
4. If an AC product rated higher than 300 Watts (or which draws excessive surge power) is connected, the PORTAWATTZ 300 will shut down. The green POWER light will turn off and the red FAULT light will turn on.
5. If the PORTAWATTZ 300 exceeds a safe operating temperature, due to insufficient ventilation or a high temperature environment, it will automatically shut down. The green POWER light will turn off and the red FAULT light will turn on.

6. To reset the PORTAWATTZ 300 after automatic shutdown, the OFF/ON switch must be switched OFF for 5 seconds, then ON again. This manual reset feature prevents unexpected or hazardous restarting of connected AC loads.
7. Should a defective battery charging system cause the battery voltage to rise to dangerously high levels, the PORTAWATTZ 300 automatically shuts down. Reset occurs once battery voltage falls to normal levels.
8. The cooling fan is designed to operate continuously to ensure optimal internal temperature control of the PORTAWATTZ 300.

7.3 Battery Operating Time

When using the PORTAWATTZ 300, operating time will vary depending on the charge level of the battery, its capacity and the power level drawn by the particular AC load. With a typical vehicle battery and a 300 Watt load, an operating time of 1 hour or more can be expected. With a 100 to 150 Watt load (such as a typical 19 inch color TV), two to three hours can be expected.

Vehicle batteries are designed to provide brief periods of very high current needed for engine starting. They are not intended for constant deep discharge. Regularly operating the PORTAWATTZ 300 from a vehicle battery until the low voltage alarm sounds will shorten the battery's life. When using a vehicle battery as a power source, it is strongly recommended to start the vehicle

every hour or two to recharge the battery before its capacity drops too low. The PORTAWATTZ 300 can operate while the engine is running, but the normal voltage drop that occurs during starting may trigger the PORTAWATTZ 300's low voltage shutdown feature.

For longer operating times, the use of a deep discharge battery is strongly advised. Its capacity should be selected based on the desired operating time. As a guide for deep discharge batteries, the battery operating time can be roughly estimated as follows:

$$\frac{10 \times \text{battery capacity (Amp-Hours)}}{\text{Load Power in Watts}} = \text{Run Time in Hours}$$

For maximum battery life, do not regularly discharge deep discharge batteries below 50% capacity. Because the PORTAWATTZ 300 draws less than 0.2 Amps with the ON/OFF switch in the ON position and with no AC products connected, operating with no AC loads connected has minimal impact on battery run time.

8.0 Troubleshooting

Problem: AC product will not operate, red FAULT light ON.

<u>Possible Cause</u>	<u>Suggested Remedy</u>
<i>AC product(s) connected are rated at more than 300 Watts; overload shutdown has occurred.</i>	<i>Use product(s) with a total power rating less than 300 Watts (or 120 Volts/2.5 Amps).</i>
<i>AC Product is rated less than 300 Watts; high starting surge has caused overload shutdown.</i>	<i>Product exceeds inverter's surge capability. Use a product with starting surge power within the PORTAWATTZ 300's capability.</i>
<i>Battery is discharged (alarm is also sounding).</i>	<i>Recharge battery.</i>
<i>PORTAWATTZ 300 has overheated due to poor ventilation</i>	<i>Switch PORTAWATTZ 300 OFF and allow to cool for 15 minutes. Clear blocked fan or remove objects covering unit, then restart.</i>

Problem: AC product will not operate, no inverter lights are on.

<u>Possible Cause</u>	<u>Suggested Remedy</u>
<i>Poor contact with lighter socket or 12 Volt outlet.</i>	<i>Press plug firmly into socket. Clean plug or socket if necessary.</i>
<i>Lighter socket or 12 Volt outlet may require ignition to be switched on.</i>	<i>Turn key to accessory position.</i>
<i>Cigarette lighter or 12 Volt outlet fuse is blown.</i>	<i>Check vehicle fuses and replace blown fuse with correct value.</i>
<i>Inverter has been connected with reverse DC input polarity.</i>	<i>Probable inverter damage has occurred. Have unit repaired.</i>

Problem: Measured inverter output is too low.

<u>Possible Cause</u>	<u>Suggested Remedy</u>
<i>Standard “average-reading” AC voltmeter used to measure output voltage, resulting in an apparent reading 5 to 15 Volts too low.</i>	<i>Inverter’s “modified sine wave” output requires “true RMS” voltmeter, such as Fluke 87 series multimeter, for accurate measurement.</i>
<i>Battery voltage is too low.</i>	<i>Recharge battery.</i>

Problem: Battery run time is less than expected.

Possible Cause

Suggested Remedy

AC product power consumption is higher than rated.

Use a larger battery to make up for increased power requirement.

Battery is old or defective.

Replace battery.

Battery is not being properly charged.

Many simple chargers are unable to charge a battery fully. Replace charger with better model such as a TRUECHARGE™ smart charger.

9.0 Limited Warranty and Performance Guarantee (USA and Canada Only), and Out-of-Warranty Service Information

What Does This Warranty Cover? Xantrex manufactures its products from parts and components that are new or equivalent to new, in accordance with industry standard practices. This warranty covers any defects in workmanship or materials.

How Long Does The Coverage Last? This warranty lasts for 6 months from the date of purchase. Implied warranties of merchantability and fitness for a particular purpose are limited to six months from date of purchase. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

What Does This Warranty Not Cover? This warranty will not apply where the product has been misused, neglected, improperly installed, physically damaged or altered, either internally or externally, or damaged from improper use or use in an unsuitable environment. Xantrex does not warrant uninterrupted operations of its products. Xantrex shall not be liable for damages, whether direct, incidental, special, or consequential, or economic loss even though caused by the negligence or fault of Xantrex. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

What Will Xantrex Do? At its option, Xantrex will repair or replace the defective product free of charge. Xantrex will, also at its option, use new and/or reconditioned parts made by various manufacturers in performing warranty repair and building replacement products. If Xantrex repairs or replaces a product, its warranty term is not extended. Xantrex owns all parts removed from repaired products.

Service During Warranty. In order to qualify for the warranty, dated proof of purchase must be provided and the product must not be disassembled or modified without prior authorization by Xantrex. If your product requires warranty service, please return it to the place of purchase along with a copy of your dated proof of purchase. If you are unable to contact your merchant, or the merchant is unable to provide service, contact Xantrex directly:

- BY PHONE: (604) 420-1585
(toll free) 1-800-670-0707
- BY FAX: (604) 420-1591
(toll free) 1-800-994-7828
- BY EMAIL: support.portawattz@xantrex.com

You must obtain a Return Material Authorization (RMA) number from Xantrex before returning a product directly to Xantrex. Do not return a product to Xantrex without first obtaining an RMA number. When you contact Xantrex to obtain service, be prepared to supply the serial number of your product and its date of purchase as well as information about the installation or use of the unit.

If you are returning a product from the USA or Canada, follow this procedure:

1. Obtain an RMA number and a shipping address from Xantrex. *Product(s) returned without an RMA number or shipped collect, will be refused.*
2. Package the unit safely, preferably using the original packing materials. Include the RMA number, a copy of your dated proof of purchase, a return address where the repaired unit can be shipped, a contact telephone number, and a brief description of the problem.
3. Ship the unit to the address provided in Step 1, freight prepaid. Obtaining proof of delivery is recommended.

The Performance Guarantee. Xantrex guarantees the PORTAWATTZ 300 will run any 27 inch television or Xantrex will replace your unit with another inverter (selected at Xantrex's option) that will run your particular television model. This performance guarantee is offered because we are confident you will find the PORTAWATTZ 300's performance superior to any other brand with similar power ratings.

Conditions That Apply To The Performance Guarantee. This guarantee is valid only if your PORTAWATTZ 300 is installed to a properly functioning power source and according to guidelines in this manual. For certain television models it may be necessary to wire the inverter directly to a 12-volt battery source. Your PORTAWATTZ 300 must be within the warranty period and all conditions that apply to the

Warranty also apply to the Performance Guarantee. In addition, the television must be an AC powered consumer model designed for use in the USA or Canada, in proper working condition, and have a screen size of 27 inches or less as specified by the television's manufacturer, and may not be altered in any way or used in an unsuitable environment.

Submitting Performance Guarantee Claims. If your PORTAWATTZ 300 fails to run any television up to 27 inches and all conditions stated above apply, contact Xantrex Customer Service directly at the telephone number listed above. Do not return your unit for upgrade to the retailer where purchased.

In order to process your claim, you will need to provide dated proof of purchase confirming your PORTAWATTZ 300 is within the warranty period and the model, size, manufacturer and serial number of the television that the inverter will not run. In most cases you will receive a Return Material Authorization (RMA) number and return shipping instructions from Customer Service, which allows you to return your PORTAWATTZ 300 for an upgraded model. However, Xantrex reserves the right to conduct an independent test to verify whether or not the PORTAWATTZ 300 will operate your particular television model.

How Other Laws Apply: This warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction.

For Our Canadian Customers: When used herein “implied warranties of merchantability and fitness for a particular purpose” includes all warranties and conditions, express or implied, statutory or otherwise, including without limitation implied warranties and conditions of merchantability and fitness for a particular purpose.

Service Out Of Warranty: If the warranty period for your PORTAWATTZ 300 has expired, if the unit was damaged due to misuse, incorrect installation or if other conditions of the warranty have not been met, or if no dated proof of purchase is available, your unit may be serviced/replaced for a minimum flat fee of \$40.00 US (\$60.00 CDN). To return your PORTAWATTZ 300 for out of warranty service, contact Xantrex customer service for a Return Material Authorization (RMA) number and follow the other steps outlined in the section “Service During Warranty” above. Options for payment (e.g. credit card or money order) will be explained by the customer service representative. In cases where the minimum flat fee does not apply (e.g. incomplete units or units with excessive damage), and additional fee will be charged. If applicable, you will be contacted by customer service once your unit is received. The minimum flat fee is subject to change without notice.

10.0 Specifications

AC output voltage (nominal)	115 Volts AC
DC input voltage range	10 – 15 Volts DC
Maximum Continuous AC output power	300 Watts
Maximum AC output surge power	500 Watts
AC output frequency	60 ± 4 Hz
AC output waveform	modified sine wave
Battery drain with no AC load (at 12V input)	0.18 Amps
Efficiency (maximum)	90%
Ambient operating temperature range	0°C - 40°C 32°F- 100°F
Low battery alarm trigger point (nominal)	10.7 Volts
Low battery shut down point (nominal)	10.0 Volts
High battery shut down point (nominal)	15 Volts
Dimensions (L x W x H)	165mm x 120mm x 45mm 6 ½ " x 4 ¾ " x 1 ¾ "
Weight	825 grams / 1lb 13oz

SPECIFICATIONS subject to change without notice.

11.0 Other Products from Xantrex

The PORTAWATTZ 300 is part of the PORTAWATTZ family of DC to AC power inverters. Other members of this family are:

PORTAWATTZ 150 Inverter A compact, versatile inverter that provides 150 Watts of AC power for running everything from compact TVs and VCRs to laptop computers to recharging camcorders and cellular phones.

PORTAWATTZ 600 Inverter Designed for recreational and industrial applications, the PORTAWATTZ 600 produces 600 Watts of AC power, and can run loads ranging from power tools to bread makers to computers.

PORTAWATTZ 1000 Inverter A 1000 Watt inverter designed for installation in trucks, vans, boats and RV's. This inverter can operate more powerful tools and equipment, and even many smaller microwave ovens.

PORTAWATTZ 1750 Inverter A 1750 Watt inverter designed for installation in a boat, vehicle, or remote home for operating power tools, kitchen appliances, and a wide range of other equipment.

PORTAWATTZ 3000 Inverter A heavy duty 3000 Watt inverter perfect for running multiple higher power loads simultaneously, or for starting tough motor-driven loads.

Xantrex also designs and manufactures the **PROsine** line of high tech, high performance sine wave inverters and inverter-chargers, and the **TRUECHARGE** line of “smart” battery chargers.

Contact your Xantrex retailer for more information or visit our web site at <http://www.xantrex.com>.

