VOLTCRAFT®

GB Operating instructions

V-Charge Field 400 multifunctional charger

Item No. 1873415

CE

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GB

1. Introduction

Dear customer,

Thank you for purchasing this Voltcraft® product.

Voltcraft® produces high-quality measuring, charging and network devices that offer outstanding performance and innovation.

With Voltcraft®, you will be able to cope with even the most difficult tasks whether you are an ambitious hobby user or a professional user. Voltcraft® offers you reliable technology at an extraordinarily favourable cost-performance ratio.

We are confident that starting with Voltcraft® will be the beginning of a long, successful relationship.

We hope you enjoy your new Voltcraft® product!

If there are any technical questions, please contact:

www.conrad.com/contact

2. Explanation of symbols

The symbol with an exclamation mark in a triangle is used to highlight important information in these operating instructions. Always read this information carefully.

The arrow symbol indicates special information and advice on how to use the product.

3. Intended use

The processor-controlled charger is intended for charging and discharging NiCd/NiMH (1 – 16 cells), LiPo/Li-ion/LiFe/LiHV (1 – 6 cells) rechargeable batteries and lead-acid rechargeable batteries (1 – 12 cells, 2 V – 24 V). The charging current can be set between 0.1 A and 16.0 A. The maximum charging power is 400 W.

Furthermore, rechargeable batteries can also be discharged; the discharge current can be 0.1 - 3.0 A directly at the charger. The maximum discharge power is 8 W.

An optional, external charging adapter can increase the discharge capacity up to 200 W or a discharge current of up to 15 A. This significantly speeds up the discharge and maintenance of high capacity batteries.

A colour graphic display with menu and a dial with touch function make operating the device simple.

The charger may only be operated at 9 – 32 V/DC. The DC power source must supply sufficient current to reach the output data. The input power of the power source can be set from 50 to 450 W. The charger thus ensures reliable operation even with lower-performance power sources.

For lithium rechargeable batteries, a balancer is integrated in the charger. The balancer compensates for voltage differences in multi-cellular lithium rechargeable battery packs during charging/discharging. Non-uniformly charged cells reduce the capacity of the entire rechargeable battery pack. The balancer is suitable for lithium rechargeable battery packs with 1 to 6 cells. The charge level is displayed individually for each cell.

Do not connect non-rechargeable primary batteries (zinc-carbon, alkaline, etc.).

The polarity of the connection cables and the balancer must be observed!

Operation under adverse ambient conditions is not permitted.

Adverse conditions include:

- Damp or excess air humidity.
- Dust and flammable gases, vapours or solvent,
- Strong vibrations.

Any use other than that described above is not permitted and may damage the product. Furthermore, there are dangers such as short circuit, fire, electric shock etc.

The product must not be modified or reassembled!

The safety instructions, the operating instructions of the rechargeable battery pack used and the charging instructions of the respective rechargeable battery manufacturer must be strictly observed!

4. Delivery content

- Charger
- Quick start guide
- CD with detailed operating instructions

Up-to-date operating instructions

Download the latest operating instructions via the link www.conrad.com/downloads or scan the QR code. Follow the instructions on the website.

5. Safety instructions

These instructions contain important information on how to use the multimeter correctly. Please read them carefully before using the multimeter for the first time.

Damage caused due to failure to observe these instructions will void the warranty. We shall not be liable for any consequential damage.

We shall not be liable for damage to property or personal injury caused by improper handling or failure to observe the safety instructions! Such cases will void the warranty/guarantee.

- For safety and licensing reasons, the unauthorised conversion and/or modification of electrical devices is not allowed.
- Do not leave the charger, and the rechargeable batteries that are connected to it, unattended while in operation.
- To ensure safe operation, the user must follow the safety instructions and warning notices that are included in these operating instructions.
- Chargers and accessories should be kept away from children! They are not toys.
- Always comply with the accident prevention regulations for electrical equipment when using the product in commercial facilities.
- In schools, training centres, hobby and self-help groups, the use of chargers and accessories must be supervised by trained personnel in a responsible manner.
- Improper use (too high charging current or incorrect polarity) can supercharge or damage the rechargeable battery. In the worst case, the rechargeable battery can explode and thereby cause serious damage.
- Never connect the device to the rechargeable battery pack immediately after it has been brought from a cold environment to a warm one. The condensation which forms can damage the device. Allow the device to reach ambient temperature before connecting it.
- If you suspect that safe operation is no longer possible, discontinue the device immediately and prevent unauthorized use.

- Safe operation can no longer be assumed if:
  - There are signs of damage
  - The device does not function properly
  - The device was stored under unfavourable conditions for a long period of time
  - The device was subjected to rough handling during transport.
- Make sure that you always have these instructions at hand to ensure safe operation. Keep these operating instructions in a safe place and give them to any subsequent owners. When connecting and operating the charger, a set of safety instructions must be observed.
- The charger contains various safety measures. Despite these precautions, the user is solely responsible for configurations made and their accuracy. Furthermore, the user must ensure that all charging safety measures have been taken. In addition, please observe the following notes.
- Place the device in a secure place so that it is absolutely secure and cannot fall down! Otherwise, this could cause injuries. Never place the charger and the rechargeable battery on a flammable surface (e.g. carpet). Always use a suitable, non-flammable, heatproof surface.
- Ensure that there is sufficient ventilation during operation. Never cover the charger and/or the connected rechargeable battery. Allow enough space (at least 20 cm) between the charger, the rechargeable battery and other objects.
- Never insert any objects in ventilation openings! This can cause a risk of contact with live parts and short circuits with serious consequences.
- For safety reasons, make sure you use the built-in balancer when charging or discharging lithium cells.
- Only charge cells of the same capacity and the same brand together.
- Do not charge rechargeable batteries that are almost or fully charged.
- Never charge rechargeable batteries with higher charging currents than those specified by the manufacturer.
- Always keep rechargeable batteries away from flammable materials, both during and after charging. Charge and store rechargeable batteries in a fireproof container.
- Never charge defective or damaged rechargeable batteries.
- Never charge rechargeable batteries connected to an electrical circuit.

6. Notes on rechargeable batteries

Despite the fact that both rechargeable and non-rechargeable batteries have become a normal, everyday item, there are still numerous dangers and problems associated with them. When using LiPo/Li-ion/LiFe rechargeable batteries with high energy content (compared to conventional NiCd or NiMH rechargeable batteries) in particular, different instructions must be followed in order to avoid explosion and fire hazards.

Always make sure that you have read and understood the following information and safety instructions before handling rechargeable batteries.

Also read and observe the notes provided with the rechargeable battery!

a) General information

- Rechargeable batteries are not toys. Keep rechargeable batteries away from children.
- Do not leave rechargeable batteries lying around unattended. Children or pets may swallow them. If rechargeable batteries have been swallowed, seek medical attention immediately!
- Rechargeable batteries must not be short-circuited, disassembled or thrown into a fire. This may cause a fire or explosion!
- Leaking or damaged rechargeable batteries can cause corrosive injuries in case of contact with the skin. Therefore you should use suitable protective gloves for this.
- Do not recharge normal, non-rechargeable batteries. This may cause a fire or explosion!
- Non-rechargeable batteries are only meant to be used once and must be disposed of properly when empty.
- Only charge rechargeable batteries that are suitable for this purpose and use a suitable battery charger.
- Rechargeable batteries must not be wet or damp.
- Do not leave rechargeable batteries unattended while charging/discharging.
- Pay attention to the correct polarity (positive/+ and negative/-). Both the device and the rechargeable battery will be damaged if rechargeable batteries are improperly installed. This may cause a fire or explosion!
- This charger has a mechanism to prevent the poles connecting incorrectly. It is nonetheless possible that improperly installed rechargeable batteries will cause damage under certain conditions.
- If the product will not be used for a long time (for example, during storage), disconnect all rechargeable batteries from the charger and disconnect the charger from the power supply.
- Do not charge/discharge rechargeable batteries that are still hot (for example, due to the high discharge current of this product). Before charging or discharging rechargeable batteries, allow them to cool down to room temperature.
- Do not charge/discharge damaged, leaking or deformed rechargeable batteries. This may cause a fire or explosion! Dispose of unusable rechargeable batteries in an environmentally friendly manner. Do not continue to use these rechargeable batteries.
- Do not use rechargeable battery packs that consist of different cell types.
- Charge rechargeable batteries approximately every 3 months; otherwise, there is a risk of the rechargeable battery becoming completely discharged due to self-discharge. In this case, the rechargeable batteries will no longer be usable.
- Remove fully charged rechargeable batteries from the charger.
- Do not damage the outer shell of rechargeable batteries. This may cause a fire or explosion!

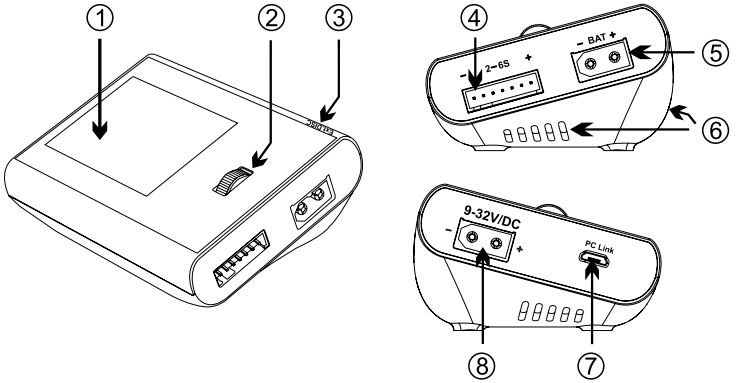
- Do not charge/discharge rechargeable batteries directly in the model. First, remove rechargeable batteries from the model.
- Place the charger and rechargeable battery on a non-flammable, heat-resistant surface (e.g. stone tiles). Maintain enough distance from flammable objects. Allow enough space between the charger and the rechargeable battery. Do not place the rechargeable battery on the charger.
- Ensure adequate ventilation because both the charger and rechargeable batteries will become hot during charging/discharging. Never cover the charger and rechargeable batteries!

b) Additional information on lithium rechargeable batteries

- Modern lithium rechargeable batteries not only have a notably higher capacity than NiMH or NiCd rechargeable battery packs, but they are also much lighter. So this rechargeable battery type is particularly useful for model making. The LiPo rechargeable batteries (lithium polymer) are used very often in model making.
- LiPo rechargeable batteries (as well as Li-ion, LiHV, and LiFe rechargeable batteries that can be charged with this charger) require special care during charging/discharging, as well as during operation and handling.
- So in the following chapters, you will find information about hazards and measures to prevent hazards in order to ensure that rechargeable batteries maintain their performance over a long period of time.
- The outer shell of LiPo rechargeable batteries normally consists only of a very thick film and is extremely sensitive.
- Never destroy or damage the rechargeable battery, do not drop it or puncture it with any objects. Protect the rechargeable battery from mechanical stresses and do not pull on its connection cables! This may cause a fire or explosion!
- These instructions must also be followed when inserting or removing the rechargeable battery from the model.
- Make sure that the rechargeable battery does not overheat during use, charging, discharging, transport and storage. Do not place the rechargeable battery near heat sources (e.g. model control, motor) and protect it from direct sunlight. This may cause the battery to overheat, which can cause a fire or explosion!
- The temperature of the rechargeable battery must not exceed +60 °C (also note all other manufacturer information!).
- Stop using the rechargeable battery if it is damaged (for example, after an aeroplane or helicopter model crash) or if its outer shell is bloated/swollen. Do not recharge it. This may cause a fire or explosion!
- Handle rechargeable batteries with care; use suitable protective gloves.
- Dispose of rechargeable batteries in an environmentally friendly manner.
- Use only a suitable charger to charge lithium rechargeable batteries and observe the correct charging method. Do not use conventional chargers for lithium rechargeable batteries in order to avoid fire and explosion hazards!
- When charging lithium rechargeable batteries with more than one cell, use a “balancer” (already integrated in this charger).
- Charge LiPo rechargeable batteries with a charging current of max. 1 C (unless otherwise stated by the battery manufacturer!). The charging current must not exceed the capacity printed on the rechargeable battery (for example, rechargeable battery capacity 1000 mAh, max. charging current 1000 mA = 1 A).
- For lithium rechargeable batteries, observe the manufacturer’s instructions.

- The discharge current must not exceed the value printed on the rechargeable battery. For example, when a value of “20 C” is printed on the rechargeable battery, the discharge current is 20 times the rechargeable battery capacity (for example, battery capacity 1000 mAh, max. discharge current 20 C = 20 × 1000 mA = 20 A). If these instructions are not followed, the rechargeable battery will overheat might become deformed or swell or cause explosions and fire!
- The printed value (for example, “20 C”) does not necessarily refer to the constant current, but to the maximum current that the rechargeable battery can generate in a short time. The constant current should not be higher than one half of the given value.
- Lithium rechargeable battery cells may only be discharged to a certain voltage; otherwise, the rechargeable battery will be destroyed. Standard values are listed in the tables below.
- If the model does not provide protection against total discharge or have a visual display indicating a low battery, remember to switch off the model in time.

7. Overview of parts



1 Graphic display

2 Setting knob with sensor function

3 Connection socket for optional “Ext-DISC” discharge adapter

4 Balancer terminal block

5 XT60 charge/discharge output connector

6 Integrated fan and vents

7 PC Link interface (not active!)

8 Input power supply XT60 (9 – 32 V/DC)

8. Setup

When connecting batteries, always observe the polarity and the charging instructions from the relevant battery manufacturer.

Always supply the charger with power before connecting the rechargeable battery. This also applies to the balancer connection.

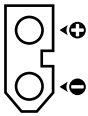
After use, disconnect the charger from the power source and unplug the rechargeable battery.

Setting up power supply

Power is supplied via the side XT60 connector (8) on the left. The rechargeable batteries to be charged are connected via the XT60 connection on the right side (5).

The polarity is specified by the connector geometry. The XT60 socket must show the polarity.

After a brief system test, the parameters will be shown on the display.



9. Operation

Supply the charger with power. The charger will start with a system test and fan test confirmed by a beep.

Some settings must be made before operating the charger.

To operate the charger, use the knob with press function (2). To select menu items, turn the knob. To confirm the selection, press the knob. This procedure applies to all settings (system and programme settings).

The setup menus are largely self-explanatory and can be easily set up using predetermined parameters.

Main display

The main display shows basic parameters of the currently connected rechargeable battery/rechargeable battery pack.

The main display colour also provides information about the current status:

Grey background colour = standby

Blue background colour = charging mode

Green background colour = rechargeable battery is charged

Orange background colour = discharge mode

Red background color = battery is discharged

A Rechargeable battery type

B Number of cells

C Charging programme

D Battery charge level in %

E Low battery charge level icon

F Charging/discharge current

G Charging/discharge time

H Display marker

I Display of cell voltages

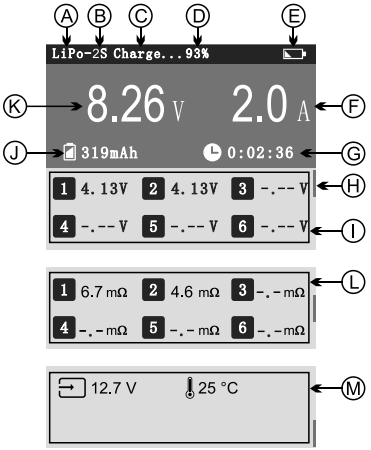
J Capacity (charging/discharge)

K Rechargeable battery voltage

Turn the knob down to display other parameters. The display marker (H) will show the current display field.

L Display of internal cell resistances

M Power supply and system temperature display



“System Setup” system settings

In the system menu, set general settings that the charger requires for operation. To enter the system menu, press and hold down the knob for approx. 2 seconds. The system menu will be displayed with a beep.

The “System Setup” menu contains the following settings:

Menu item	Meaning	Value
Language	System language	English
MAX Input Power	Set the maximum power of the voltage source to avoid overload. The formula is: P = U x I. Power in W (P) = voltage in V (U) x current in A (I).	450 W (50 – 450 W in 10 W increments)
MIN Input Voltage	Set a low voltage level. This is useful when rechargeable batteries are used as the power source. If the value is below the lower limit, the charging/discharging process will be interrupted. This prevents deep discharge of sensitive rechargeable battery types.	12.0 V (9.0 – 24.0 V in 0.1 V increments)
Capacity Cut	Set the maximum capacity. If the set value is exceeded, the charging/discharging process will be interrupted.	15000 mAh (OFF) 100 - 50000 mAh in 100 mAh increments)
Time Cut	Set the maximum charging/discharge time. The timer prevents infinite charging in case of defective rechargeable batteries.	180 min (OFF 1 – 720 min in 1 min increments)
Backlight	Adjust the display brightness.	Medium (Low Medium High)
Volume	Adjust the beep volume.	High (OFF Low Medium High)
About	Display the firmware and hardware version number.	
Factory Reset	Reset the device to factory settings.	No Yes
Back	Ends the system setup and returns to the main display.	

Turn the knob until the selection bar shows the menu item. Press the knob to confirm the selection. The menu item will open.

Proceed with the selection of parameters shown. Follow the menu selection.

To exit the system menu, select the last “Back” menu item and press the knob.

Programme settings

In the programme menu, you can pre-set all parameters for rechargeable battery care. To enter the programme menu, briefly press (for less than 1 second) the knob. The programme menu will be displayed with a beep (unless the beep has been disabled in the system menu).

The “Programme” menu contains the following settings.

The values without brackets are pre-set, and the valuesin brackets describe the possible adjustment range.

Menu item	Meaning	Value
Battery	Set the rechargeable battery type.	LiPo (LiPo, LiFe, Li-ion, LiHV, NiMH, NiCd, Pb)
Cells	Set the number of rechargeable battery cells (S = cells).	LiPo 6S (1 - 6S) LiFe 6S (1 - 6S) LiIo 6S (1 - 6S) LiHv 6S (1 - 6S) NiMH Auto NiCd Auto Pb 6S (1 - 12S)
Mode	Set the charging/discharge programme.	Charge (Charge Discharge Storage Ext DISC)
Current	Set the max. charge / discharge current.	2.0 A (0.1-16.0 A in 0.1 A increments, depending on the mode)
TVC	Set the end-of-charge voltage per cell.	LiPo 4.20 V (4.18 - 4.24 V) LiFe 3.60 V (3.58 - 3.65 V) LiIo 4.10 V (4.08 - 4.20 V) LiHv 4.35 V (4.25 - 4.35 V) NiMH 1.80 V NiCd 1.80 V Pb 2.40 (2.30 - 2.40 V)
Start	Start the selected programme.	
Back	Ends the programme setup and returns to the main display.	

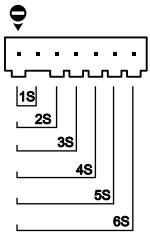
Follow the menu selection. Start with the first menu item and then select all other menu items.

Important! Make sure that the set parameters match the rechargeable battery before connecting it. The rechargeable battery and the charger may be damaged if the charger is not properly configured. Overcharging may cause an explosion or fire. Take extreme care when configuring. If there are no specific rechargeable battery parameters, please note the data in the table below.

	Rated voltage/ cell	Charging end voltage/cell	Storage voltage/ cell	Max. charge rate	Discharge voltage/cell
LiPo	3.70 V	4.20 V	3.80 V	≤ 1 C	3.00 – 3.30 V
Li-ion	3.60 V	4.10 V	3.70 V	≤ 1 C	2.90 – 3.20 V
LiFe	3.20 V	3.60 V	3.30 V	≤ 4 C	2.60 – 2.90 V
LiHV	3.80 V	4.35 V	3.90 V	≤ 1 C	3.10 – 3.40 V
NiCd	1.20 V	1.40 V	---	1C – 2C	0.5 – 1.10 V
NiMH	1.20 V	1.40 V	---	1C – 2C	0.5 – 1.10 V
Lead-acid (Pb)	2.00 V	2.40 V	---	≤ 0.4 C	1.80 – 2.00 V

10. Connecting the rechargeable battery and starting the programme

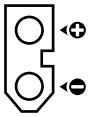
a) Balancer connection



When the charger is supplied with power, connect the XH balancer connector of the rechargeable battery pack to the balancer terminal block (4), observing the correct polarity. Always align the connector with the negative contact on the negative pole of the balancer terminal block. If necessary, use suitable adapters.

It is recommended that you always charge lithium rechargeable batteries with the balancer connector. However, you can also charge rechargeable batteries without a balancer.

b) Connecting the rechargeable battery



The rechargeable battery is connected via the side XT60 connector (5). The polarity is specified by the connector geometry. The XT60 socket should be connected as shown.

When all parameters are set correctly and the rechargeable battery is connected, start the selected programme using the “Start” menu item.

To exit the programme menu in advance, select the last “Back” menu item and press the knob.

11. Troubleshooting

The charger is very user-friendly thanks to the menu navigation and plain text displays. However, problems may occur, which are detailed below, together with possible remedies.

Make sure that all charger settings you have made exactly match the connected rechargeable battery!

Check the connection between the power supply and the charger for problems (cuts or other cable damages). Furthermore, you should check that the charging cable connectors are intact and not undersized. This can often be recognised by excessive heat. The charging cables should not be longer than 30 cm with a minimum conductor cross section of 2.5 mm².

When operating with a car battery, make sure that the connectors are properly connected to the battery poles. Many charger related problems are due to problems with connection cables and terminals.

Try charging another rechargeable battery; the rechargeable battery might be in poor condition and cause problems.

Try charging a different rechargeable battery type. For example, switch to a NiMH rechargeable battery if you have problems with lithium cells. If you also experience problems with the other rechargeable battery type, the charger could be defective. Check everything again very thoroughly.

Contact our service, provide full details and a description of the problem, including the type of power supply, rechargeable battery and number of cells.

If a connection problem is displayed, make sure that all rechargeable battery connections are properly set up. Specifically check the balancer connection. If everything is fine, clean the connector contacts to remove oxidation. Make sure you use a high-performance switched-mode power supply or a fully charged car battery with a high capacity value. Try charging another lithium rechargeable battery from another manufacturer, preferably with a different balancer connector system, to exclude any possible errors.

Never attempt to tamper with the device, as it is too dangerous and will automatically invalidate any warranty claims! Repairs should only be undertaken by qualified personnel. Improper repairs can cause fires and/or electric shocks. Send the charger to our service for repair.

12. Disposal

Electronic devices are recyclable waste and must not be placed in household waste. At the end of its service life, dispose of the product according to the relevant statutory regulations.

Disposal of Flat Accumulators

You are required by law to return all used batteries. They must not be placed in household waste.

Contaminated batteries/rechargeable batteries are labelled with symbols to indicate that disposal in domestic waste is forbidden. The designations for the heavy metals involved are: Cd=cadmium, Hg=mercury, Pb=lead (the marking can be seen on the battery, e.g., underneath the refuse bin symbol shown on the left). Used batteries can be returned to local collection points, our stores or battery retailers.

That way you fulfil your statutory obligations and contribute to the protection of the environment!

13. Technical data

Number of charging channels	1
Suitable rechargeable battery type	NiMH, NiCd, LiPo, Li-ion, LiFe, LiHV, lead-acid (Pb)
Suitable for LiPo/Li-ion/LiFe/LiHV	1 – 6 cells
Suitable for NiCd/NiMH	1 – 16 cells
Suitable for lead-acid rechargeable battery	2 – 24 V (1 – 12 cells)
Charging current	0.1 - 16 A
Max. charging power	400 W
Discharge current	0.1 – 3 A
Discharge current Ext-DISC (optional)	0.1 - 15 A
Discharge capacity max.	8 W (200 W optional)
Balancer current per cell	max. 1 A
Plug-in system	XT60
Plug-in balancer	XH
Colour LC display	6.1 cm (2.4”), 320 x 240 pixels
Operating Temperature	0 to +40 °C
Storage temperature	-20 to +60 °C
Power supply	9 - 32 V/DC
Product dimensions (L x W x H)	90 x 70 x 41 mm
Weight	130 g

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