Accelev 6kW, 8kW

Dual-phase to Single-phase Charger/Converter

User Manual Accelev 6kW / 8 kW

Index:

Thank you for choosing our EVSE – Accelev v2.
We believe that our portable wall box is the best choice for your car.

1. Overview

Accelev v2 EVSE is a processor-controlled, advanced AC wall box with features not available in other chargers.

It is not an "ordinary" EVSE. Connected to 3-phase source it merges the power of two phases into one "super phase" to double your charging speed.

Along with the ability of speed reducing, when other load detected - your tripping breakers will be history.

Battery Balancing procedure may increase the usable capacity of your battery and state of health (SOH) - perfect for Nissan Leaf and Jaguar i-Pace battery SOH improvement.

This EVSE/charger/energy converter can be flexibly completed according to customer wishes (both cables are detachable/replaceable).

We believe that Accelev v2 is the most modern EVSE home station of our times.

2. Standard features

- Grid monitoring (immediate load reduction while grid overload detected – no more tripped off breakers)
- BatteryCare™ - unique full charging / no full charging modes with maximum life protection for your battery
- Current Boost - automatic current adjusting to find the maximum possible speed of charging.
- Voltage Boost - unique function, speeds up charging by 5-10% compared to any other charger with the same current.
- SOP - State of Power for monitoring of your home electric grid performance.
- AutoStart for quick starting of charge, just after car is detected.
- SoftStart for safe charging from unknown real amperage (for example - while travelling)
- Updateable - flash most recent firmware via micro USB extension port.
- Detachable cables - both input and output side. Use one charger in all situations.
- 2.8-inch touch screen - human interface with „geek mode” - you can monitor all parameters while loading.
- Safety first - RCD Type A protection (Type B as an option), advanced overload and overheat protection.

3. Precautions & Installation

Accelev v2 EVSE should be installed indoors or at least sheltered and should be protected from water. It has IP42 protection. To fix it at the wall, please install quick-click hanging system bar with 2 x 6mm x 50mm bolts or similar length screws (if installed on a wooden fence). Please remember that Accelev is a portable unit, but still, its weight is about 15 kg, so it needs accurate mounting of the quick-click bar and being screwed to the wall (bottom). It should not be connected to electricity when moving.

For your security, it is obligatory to install bottom wall screw while having Accelev wall-mounted. Do not connect power before finishing the installation. Do not detach, carry, move charger while charging. Protect from dust, water, direct sun exposition. If used as a portable charger Accelev should be positioned on its back. Do not wash with water, use notebook screen cleaning wipes.

Plug with a **green label** is an output to car or third phase extension, a **red label** side is for input (380-415V 3-phase). Same colours code can be found at the end of connecting wires. There is no risk to improperly connect plugs to sockets, as they are different.

Accelev, if used as a stationary unit, should be connected to 16A or 32A 3-phase EU connector (red). You can order Accelev with any of these: 16A/32A and 4pin/5pin. Phases can be changed directly in the plug (it has a unique, rotating connectors face-side). There is no need to have 32A 3-phase delivery at home, but 32A plugs can be used. For proper installation consult or call an electrician. Accelev EVSE can be used lying flat or hanging (preferred setup due to better cooling). Remember to avoid covering the inlet and outlets of the cooling system. Maintenance and cleaning can be done only if a power source is disconnected. It is not permitted to wash the unit with a direct stream of water. Use cleaning wipes for notebook/tv screens instead.

Secure Mounting (for using Accelev as a Wallbox)

At the bottom side, you'll find a **secure mounting**. While using this EVSE as a wallbox this security mounting must be installed to avoid serious injuries caused by charger drop. It should be installed by drilling fi=6 hole, install gold anchor (with an appropriate glue if needed, depending on surface).

Unlocking the cables

To unlock cables, please switch the power supply off first. Use a flat screwdriver to unlock latch (see picture).
Pull down the plug while keeping latch unlocked.
To plug in the cable again a screwdriver is not necessary.
Do not turn/rotate plugs like in Accelev v1.
Both connectors are waterproof.

Input phase switching

Factory configuration of input phases is L1, L2.
It means that Accelev will load these phases equally. L3 phase is unused.
Alternatively, you can change the input configuration to be L1, L3. To do that, please use a screwdriver and rotate pins inside the power plug. Gray disc inside input plug can be rotated and thus - phase L2 is replaced with L3.
Phase L1 is connected permanently. If you want to use L2, L3 configuration - please call an electrician to reconnect wires inside input power plug.

4. Do/Don’t

You can:
- Switch off a power source of Accelev while not charging, also by its input connector (you can use it also to reset counter – in such a situation, please switch off for at least 5 seconds).
- Disconnect your car at any moment.
- Press button at the delivery plug to restart charging
- Move or carry Accelev while not charging and not connected to the mains and all cables disconnected.
- Use Accelev as a portable charger while putting on the ground on the back, protecting it from rain, snow, direct sunlight and any situation, when water can penetrate vents.

You should not
- Use Accelev wall-mounted without securing it with bottom security hold
- Update Accelev with not fully charged notebook, so update procedure may stop
- Switch off a power source of Accelev while charging.
- Move or carry Acclev while charging, connected to the mains or cables connected.
- Open Accelev, modify or change its firmware
- Pour water, wash it with water, etc.

5. Charging speed

Accelev EVSE is capable of charging any electric car, that uses Type1 or Type2 input. Even if your car is not listed below, Accelev will charge it correctly.
Accelev EVSE tries to optimise your charging speed and load automatically, therefore, the following situations may occur:
- your AC network is not loaded, the car battery is not fully – charging speed is maximised
- your AC network is overloaded – charging speed is reduced by Accelev
- your car battery is almost full – charging speed is reduced by car.

Below you can find time estimates for some popular cars, which can be used to predict charging your car from 5% to 95% state of charge. Notice, that car may charge slower or faster due to battery temperature and power supply voltage & load. This table does not cover all car models and your car is compatible even if it is not listed. Estimated charging speed in hours is presented.
Notice: If the speed of charging is limited by low onboard charger amperage, Accelev still can be faster than other chargers due to higher voltage operation (voltage boost). This applies especially to cars with 3,3kW or weaker onboard charger. Notice, that „16A charger” may load your phase up to full 16A, but faster, fully loaded Accelev 6kW will load it with 13A per 230V phase (230V x 13A x 2 phases = 6kW), or with 7,5A per each 230V phase-only while doing exactly the same speed as 16A charger does.

Geek info: 7,5A x 2 = 15A, and not 16A, but the voltage at Accelev input will stay higher due to much lower load, so powers will be equal.

Estimated charging speeds (5-95% SOC)

Speed may depend on many circumstances. Accelev speeds are coloured yellow. If your car is not listed, it is still compatible with Accelev. In that case please contact us, so we can inform you about charging speed and gains you can have while replacing your old charger with Accelev.

Vehicle	Max rate (kW)	Battery size (kWh)	Charger included with car (h)	16A charger (h)	Accelev 6kW (h)	Accelev 8kW (h)
Audi A3 E-Tron	3.3	8.8	4.6	2.7	2.5	2.5
BMW 330e	3.6	7.6	3.9	2.2	2	2
BMW 530e	3.6	9.2	4.6	2.7	2.5	2.5
BMW 740e	3.6	9.2	4.6	2.7	2.5	2.5
BMW ActiveE	7	32	16.1	9.2	5.5	4.5
BMW i3 2014-2016	7.4	23	11.6	6.5	4	3
BMW i3 2017 (60 Ah battery)	7.4	23	11.6	6.5	4	3
BMW i3 2017 (90 Ah battery)	7.4	32	16.1	9.2	5.5	4.5
BMW i8	3.6	7.1	3.5	2.2	2	2
BMW X5 xDrive-40e	3.6	9	4.6	2.7	2.5	2.5
Cadillac CT6	3.6	18.4	9.1	4.9	4.5	4.5
Cadillac ELR	3.3	16.5	8.4	4.9	4.5	4.5
Chevy Bolt	7.2	60	30.1	17.4	10.5	8.5
Chevy Spark	3.3	23	11.6	7.6	7	7
Chevy Volt	3.3	16.5	8.4	4.3	4	4
Chevy Volt 2016-2018	3.6	18.4	9.1	4.9	4.5	4.5
Chevy Volt 2019 LT	3.6	18.4	9.1	4.9	4.5	4.5
Chevy Volt 2019 LT Upgrade	7.2	18.4	9.1	4.9	3	2.5
Chevy Volt 2019 Premier	7.2	18.4	9.1	4.9	3	2.5
Chrysler Pacifica	6.6	16	8.1	4.3	3	2.5
Coda	6.6	31	15.4	8.7	5.5	4.5
Fiat 500E	6.6	24	11.9	7.1	4	3.5
Fisker Karma	3.3	20	10.2	5.4	5	5
Ford C Max Energi	3.3	7.6	3.9	2.2	2	2
Ford Focus EV	6.6	23	11.6	6.5	4	3.5
Ford Focus EV 2017-2018	6.6	33.5	16.8	9.8	6	5
Ford Fusion Energi	3.3	7.6	3.9	2.2	2	2
Honda Accord	6.6	6.7	3.5	2.2	1.25	1
Honda Clarity EV	6.6	25.5	12.6	7.1	4.5	4
Honda Clarity Plug-In	6.6	17	8.4	4.9	3	2.5
Hyundai Ioniq	6.6	28	14.0	8.1	5	4
Hyundai Ioniq Plug-in	3.3	8.9	4.6	2.7	2.5	2.5
Hyundai Kona	7.2	64	31.9	18.5	11	9
Hyundai Sonata	3.3	9.8	4.9	3.3	3	3
Jaguar I-Pace	7.0	90	45.2	25.5	15.5	13
Karma Revero	6.6	21.4	10.9	6.0	3.5	3
Kia Niro	3.3	8.9	4.6	2.7	2.5	2.5
Kia Optima	3.3	9.8	4.9	3.3	3	3
Kia Soul	6.6	27	13.7	7.6	4.5	4
Mercedes B Class B250e	9.6	28	14.0	8.1	5	3.5
Mercedes C350 Hybrid	3.3	6.2	3.2	2.2	2	2
Mercedes GLC 350e	3.7	8.7	4.2	2.7	2.5	2.5
Mercedes GLE 550e	3.3	8.8	4.6	2.7	2.5	2.5
Mercedes S550 Hybrid	3.3	8.7	4.2	2.7	2.5	2.5
MINI Cooper SE Countryman ALL4	3.3	7.6	3.9	2.7	2.5	2.5
Mitsubishi i-MiEV	3.3	16	8.1	5.4	5	5
Mitsubishi Outlander	3.3	12	6.0	3.8	3.5	3.5
Nissan Leaf 2011-12	3.3	24	11.9	8.1	7.5	7.5
Nissan Leaf 2013-16 (3.3 onboard charger)	3.3	24	11.9	8.1	7.5	7.5

Nissan Leaf 2017 (3.3kW onboard charger)	3.3	30	15.1	9.8	9	9
Nissan Leaf 2017 (6.6kW onboard charger)	6.6	30	15.1	8.7	5	4.5
Nissan Leaf 2018	6.6	40	20.0	11.4	7	6
Nissan Leaf 2019	6.6	62	30.0	17.1	10.5	9
Nissan Leaf S 2013-15	6.6	24	11.9	7.1	4	3.5
Nissan Leaf S 2016	6.6	30	15.1	8.7	5	4.5
Nissan Leaf S 2016 (6.6kW onboard charger)	6.6	24	11.9	7.1	4	3.5
Porsche 918 Spyder	3.6	6.8	3.5	2.2	2	2
Porsche Cayenne S E-Hybrid	3.6	10.8	5.3	3.3	3	3
Porsche Cayenne S E-Hybrid (upgraded charger)	7.2	10.8	5.3	3.3	2	1.5
Porsche Panamera 4 E-Hybrid	3.6	14.1	7.0	4.3	4	4
Porsche Panamera 4 E-Hybrid (upgraded charger)	7.2	14.1	7.0	3.8	2.5	2
Porsche Panamera S E-Hybrid	3.6	9.4	4.6	2.7	2.5	2.5
Porsche Panamera S E-Hybrid (upgraded charger)	7.2	9.4	4.6	2.7	1.5	1.25
Range Rover P400e	7	13.1	6.7	3.8	2.25	2
Smart Car	3.3	17.6	8.8	6.0	5.5	5.5
Smart Fortwo ED 2017	7.2	17.6	8.8	4.9	3	2.5
Subaru Crosstrek PHEV	3.3	8.8	4.6	2.7	2.5	2.5
Tesla Model 3 Long Range	11.5	70	35.0	20.1	12	9
Tesla Model 3 Standard	7.7	50	24.9	14.1	8.5	6.5
Tesla Model S 100 & P100D	17.2	100	50.1	28.8	17	13
Tesla Model S 60 Dual (USA)	19.2	60	30.1	17.4	10.5	8
Tesla Model S 60 Single (USA)	9.6	60	30.1	17.4	10.5	8
Tesla Model S 70 Dual (USA)	19.2	70	35.0	20.1	12	9
Tesla Model S 70 Single (USA)	9.6	70	35.0	20.1	12	9
Tesla Model S 75 & 75D	11.5	75	37.5	21.2	13	9.5
Tesla Model S 85 Dual (USA)	19.2	85	42.4	24.4	14.5	11
Tesla Model S 85 Single (USA)	9.6	85	42.4	24.4	14.5	11
Tesla Model S 90 Dual (USA)	19.2	90	45.2	25.5	15.5	11.5
Tesla Model S 90 Single (USA)	9.6	90	45.2	25.5	15.5	11.5
Tesla Model X 100 & P100D	17.2	100	50.1	28.8	17	13
Tesla Model X 60 Dual (USA)	17.2	60	30.1	17.4	10.5	8
Tesla Model X 60 Single (USA)	11.5	60	30.1	17.4	10.5	8
Tesla Model X 75 Dual (USA)	17.2	75	37.5	21.2	13	9.5
Tesla Model X 75 Single (USA)	11.5	75	37.5	21.2	13	9.5
Tesla Model X 90 Dual (USA)	17.2	90	45.2	25.5	15.5	11.5
Tesla Model X 90 Single (USA)	11.5	90	45.2	25.5	15.5	11.5
Tesla Roadster	17.2	56	28.0	15.7	9.5	7.5
Toyota Prius EV	3.3	4.4	2.1	1.6	1.5	1.5
Toyota Prius Prime EV	3.3	8.8	4.6	2.7	2.5	2.5
Toyota Rav4	9.6	41.8	21.0	11.9	7	5.5
VIA Motors Truck	17.3	23	11.6	6.5	4	3
VIA Motors Van	17.3	23	11.6	6.5	4	3
Volvo S90 T8	3.6	10.4	5.3	3.3	3	3
Volvo V60	3.3	11.2	5.6	3.8	3.5	3.5
Volvo XC60 T8	3.6	10.4	5.3	3.3	3	3
Volvo XC90 T8	3.3	9.2	4.6	3.3	3	3
VW e-Golf (3.6kW onboard charger)	3.6	24	11.9	7.1	6.5	6.5
VW e-Golf (7.2kW onboard charger)	7.2	24	11.9	7.1	4	3.5
VW e-Golf 2017 (7.2kW onboard charger)	7.2	35.8	17.9	10.3	6	5

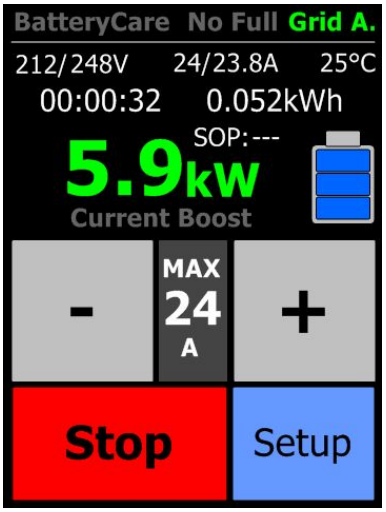
6. Main Screen

Below you see example screenshots of all screens of the charger. Values presented at these screens are just examples, and at your charger, these values would be different, but at the same location. For the main screen please notice that Geek Mode is on.

Values, Statuses (from top left):
(See “Usage and functions” chapter below to learn more about all options)

Status line (top)

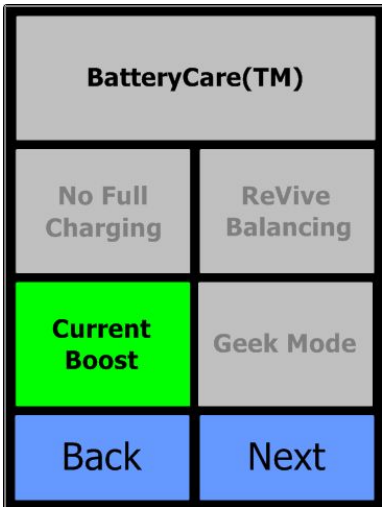
BatteryCare
– BatteryCare option status (Green - ON, Gray - Off)
No Full
– no full charge option status. (Green - ON, Orange - Triggered, Gray - Off)
Grid M./Grid A.
– grid monitoring status (Green - ON, Orange - Triggered, Gray - Off). If there is Grid A = Grid Monitoring is in automatic mode.
212/248V
– first value is a voltage of shedding (if green - autoset because Grid Monitoring is in automatic mode) / second value is the actual voltage at output.
24/23.8A
– actual maximum amperes set / second value is the actual amperage



25°C – the core of charger temperature. Charger may change a speed of cooling fan, if that temperature is too high.
00:00:32 – total charging time. It resets every time you connect the car or start charging by pressing the Start button.
0.052kWh – total kWh charged during the last charging session.
SOP - State of Power. Quality of your charging network, presented after 40 seconds of charing. Also, the long-time average is presented at the last screen of Setup
5.9kW – actual charging power (if displayed orange - Grid Monitoring reduced it)
Current Boost - if orange = Current Boost Active and negotiating faster speed of charging. Gray = Off, Green - current adjusted.
Battery symbol – shows the phase of charging and if BatteryCare is on or off. You can also click it to set the number of kWatts you want to charge (10, 20, 30 or no limit)
MAX 24A – max. amperes permitted. If you decide to limit the amount of kWats you want to charge (by pressing the battery symbol) - counter of kWats still to charge will be presented here.
[-] [+] - change max. amperes: 6, 9, 12, 15, 18, 21, 24 (27, 30, 32 - for 8kW)
Start – starts charging or idle, resets counters. If “Auto” or “Soft” visible at button surface - it means they are active.

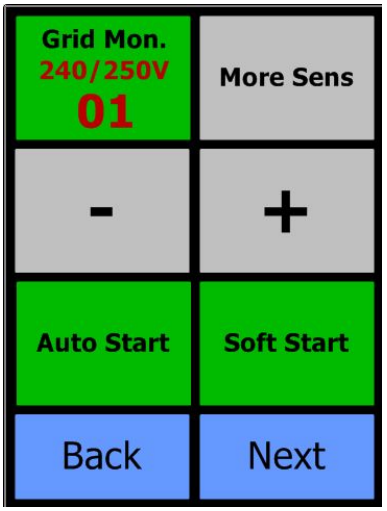
Setup button (blue) – opens Setup screens:

BatteryCare(TM)
– enables and disables BatteryCare routines and functions. More technical explanation for these functions is at par.10.



No Full Charging
– self-described, perfect for battery life.
ReVive Balancing
– a special pulse balancing of battery to cure and recover lost capacity.
Current Boost
- charger adapts charging current to be maximum possible by adjusting control signal to the car
Geek Mode
- if off, the main screen is simplified.
Next
- switches to the screen described below

Grid Mon
– enables and disables grid monitoring (shedding)
More Sensitive/Auto Sensitive/Less Sensitive – Grid Monitoring mode - a standard is Auto Sensitive and it will work in most situations optimally.
[-] [+]
- sets the level of grid monitoring in More/Less Sensitive mode



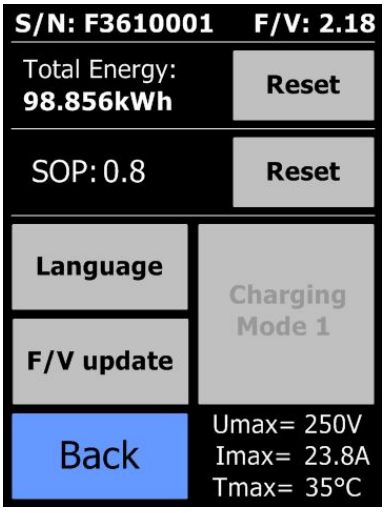
240/250V
– actual prediction for power shedding start/actual voltage
01
– tolerance of grid monitoring (01 = smallest gap, quickest reaction, 20-highest gap)

Grid monitoring depends on actual voltage in your electric grid. It is suggested to use **Auto Sensitive** mode, which learns a capabilities of your grid, along with using SOP parameter to find the best setup for your charger location, but if you want to do that manually in More/Less Sensitive mode, it is a good idea to set it more conservative. 08 is a typical setting, good for most situations, but you ought to set the trigger (left number) to be about 2-3V lower than unloaded grid voltage (right number on the Grid Monitoring button surface). Please remember to do manual settings while the network is unloaded with other loads except your car. Your car must be charging with full speed

In the case of electric breakers tripped off please decrease tolerance first. If you notice that charger reacts to load and reduces the speed of charging, but this amperage reduction is not enough (too small) for your fuse system - please switch “More Sens” on to increase the amount of amperage reduction by twice.

Auto Start - If enabled, forces charger to stay ready to charge even if not plugged, unplugged from car, stopped from the car. No need to start charging every time. **It must be off for firmware update.**

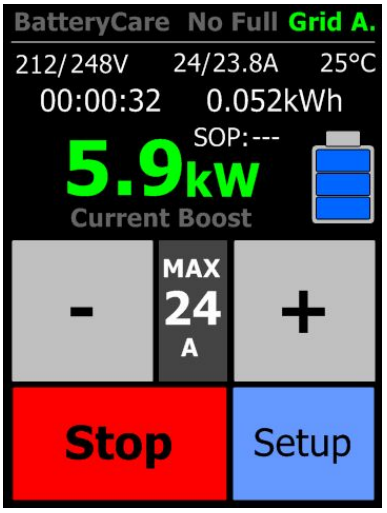
Soft Start - enables low current start with step-by-step load increase and grid monitoring, to find the maximum possible current from an unknown power source. Analysis of source capabilities may take up to 8 minutes.



S/N: xxxx
– serial number of charger. We may ask you for it, as it codes some information about your hardware inside
F/V: 2.18
– firmware version installed. Here you can check after an update, that a new firmware is properly installed and working for you.
Total Energy
– global energy counter. Please notice that we do stress tests for any charger we deliver, so this counter will not show zero while first start of your charger. If you want to reset it to zero - please contact us for a code for a reset button. We need your serial number to provide you a code.
Reset
– it resets global energy counter (code needed as described above).
SOP: 0.8
- Average SOP. More information about SOP parameter is in par.10. Average SOP will stabilize after about 20-40 charges.
Language
- choose language here. If your language is not yet added, you may help us to translate buttons and display info. Please contact us, any help appreciated.
F/V Update
– switches to boot mode, waits for an update via USB port. Screen becomes black and our Updater will enable Update Button, if any DFU file is loaded.
Charging Mode 1 - special mode for old Mitsubishi i-Miev. As it is illegal to use Mode 1 now for other cars than the first 5 months of production of i-Miev, please contact us for a special code, after you prove that you own i-Miev (car without communication to charger)
Umax – highest voltage ever measured
Imax – highest amperage ever measured
Tmax – highest temperature ever measured

7. Usage and functions

The status line shows the actual status of three main functions:



BatteryCare:

BatteryCare – off, the charger is a standard Mode2 charger
BatteryCare – enabled and idle
BatteryCare – enabled and in action

BatteryCare, once switched on, focuses on start charging speeds and finalising of charging, with constant voltage phase, to reduce the risk of single battery cell over-voltage to a minimum. It seamlessly reduces the speed of charging before the battery voltage reaches the maximum - and thus it protects cells much better than any OEM EVSE, still permitting full charge. SOH (State Of Health) of your car battery will drop slower. BatteryCare enables No Full Charging button. See more explanation in chapter 9.

No Full Charging

Battery symbol stays green if BatteryCare is enabled. Otherwise – it is blue.

No Full – off, the charger is a standard Mode2 charger
No Full – enabled and idle
No Full – enabled and almost full battery detected

No Full Charging can be switched on via the Setup menu, while BatteryCare is enabled. This function is preventing your battery to be fully charged. Once finalising (constant voltage) phase is detected, the car charge stops. For your information status “No Full” stays orange until reset with Start button.

We highly suggest to use BatteryCare on with No Full Charging on for everyday use and commuting, and BatteryCare on with No Full Charging off for occasional, long trip occurrences.
Charging battery full, along with its high temperature may reduce faster your battery’s usable capacity and the State Of Health.

Maximum amperage setting/display:

User can set and change maximum amperage at any moment of charge or idle.

Please notice, that maximum amperage set by USER and ACTUAL maximum amperage (presented below status bar, along with actual current) may differ (be reduced) if BatteryCare is on or Grid Monitoring is on.

Update
Please remember to load your notebook fully and use USB cable provided with your charger.
If you encounter any problems with starting Updater, please install drivers and C++ Runtime libraries (download from https://evtun.com/chargers.html) prior to next steps.
For update please disconnect your Accelev from the power source. Connect micro-USB cable between your Accelev and Windows PC. MicroUSB (covered with plastic plug) port is on the right side of Accelev. Go to Setup, **switch off Autostart (if it is on)** and then press **Firmware Update** button. Install Accelev Updater on your PC and start it with **Administrator privileges**. Choose proper update file and wait till Update Accelev button will be enabled (verification of data occurs). After the update is finished, disconnect USB and re-connect Accelev to power. Update program and new firmware versions are available at EVTUN.COM page or your distributor/shop page, once published.
If there is no update possible (the device is not detected) - this means your PC has no drivers installed (it should work automatically with Windows 8, 8.1, 10, but for older versions, or when no internet available - you can use our drivers instead of letting Windows to download them automatically.
If you see any errors of missing libraries, DLLs - this means you have forgotten to install C++ Runtime libraries.

8. FAQ – Frequently Asked Questions

1. What is a typical setup of charger you suggest?

We highly suggest to use BatteryCare with No Full Charging for everyday use and commuting, and BatteryCare without No Full Charging for occasional, long trip occurrences. Charging battery full, along with it's high temperature reduces usable capacity and State Of Health of your battery.

2. Can I restart ReVive balancing again after it finished to balance and cure my battery even more?

Yes, this is ok and it will work for you.

3. Can I use Accelev with 230V 3-phase network (like in some parts of Norway).

No. It won't work. Or better to answer – it will work with a reduced speed to 4 kWh and show an error.

4. Can I use Accelev outdoors?

No, it was designed to use indoor, sheltered. You can use it as a portable charger, but restrictions apply – see paragraph "3. Precautions & Installation.

5**. Can I charge Type1/Type2/Tesla US cars with one charger?**

Yes. You need just cables we provide. Tesla US connector, Mennekes (Type 2) and J1772 (Type 1) are available. Your charger is delivered with one of these types. If you want more – ask us.

6**. Can I have longer/shorter cables for supply/car connection?**

Of course. Just tell us what you need and we will produce that.

7. Do you plan to expand this charger to be 3-phase? Why don't you offer a 3-phase chargers?

Yes, we plan to add third phase extension as a separate module, but without oblige.
Charger is ready to have an extension module to 3-phase.
3-phase charger with such power in single housing will be heavy or inefficient.

8. DO I need to install current meter at the house power input to use grid monitoring?

No. Grid monitoring in Accelev uses voltage drop algorithm, based on a rule, that voltage drop is proportional to the current load. You can use grid monitoring and Soft Start (special for unknown capability power sources) at any time and place. This simplifies the usage of grid monitoring.

More Questions? News? Updates? Extensions? Other charger types? Ideas for updates?
Go to http://www.evtun.com

9. Specifications & Technical Data

Parameter	Accelev v2/6kW	Accelev v2/8kW
Dimensions (in mm)	330 x 240 x 130	380 x 270 x 130
Weight (net, in kg)	15	18
Human interface	2.8 inch colour TFT screen with touchscreen	
Update/extension port	USB micro B (USB 2.0 or higher)	
BatteryCare™	Installed, factory disabled (refer to manual)	
Housing	PC + GFS, steel	
Installation method	Indoor wall mounted	
Application allowance	Indoor or sheltered place, min. 1m over the ground, no direct sun.	
Portability	Yes, restrictions apply. Refer to the manual.	
Input plug type	IEC 60309, 3P+N+E (red plug, 5 pins). Contact if you need another standard. Replaceable.	
Input voltage range	200 ~ 240 V (AC) per phase	
Input cable length (in m)	2 (other options available)	
Typical power	6,0 kW	8,0 kW
Rated max. power	6,25 kW	8,40 kW
Rated max. current (release ver)	24 A	32 A
Output plug type	Type2 (IEC 62196) or Type1 (J1772). Replaceable.	
Output cable length in m	5 (other options available)	
Output voltage range	210 ~ 250 V (AC) single phase	
Charging standards/modes	Mode 3 (with power shedding), Mode 2.	
Protection	Overvoltage, under-voltage, overload, grounding, over temp.RCB Type A or Type B installed internally	
Efficiency	≥95%	
Power factor	≥0.99	
Working temperature	-30 ° C ~ +50 ° C	
Working humidity	5% ~ 95% (no condensation)	
Housing protection level	IP42	
Cooling, sound level	Active, fan, processor controlled, 49dB from 1 m (wall mounted)	
Measuring accuracy (power)	1%	
Standards met	CE, IP42, RCB-B/A, other vary between countries/markets.	
Branding	Possible, contact us for MOQ	

10. More technical explanation:

10.1 BatteryCare

One of the main problems while charging till 100% is a battery ageing, caused with a full charge. It seems that (depending on chemistry) single complete charging causes about four times more damage than discharging a battery to 0% capacity (maintaining "safe" voltage of 2,5V or higher.

Also, charging is controlled via a battery controller, with a passive (resistive) balancer. Such balancer cannot monitor every single cell or pouch inside a battery. Cells are stacked in groups of parallel-serial modules. Such complete modules consisting of few cells are controlled via balancer as a single energy storage units.

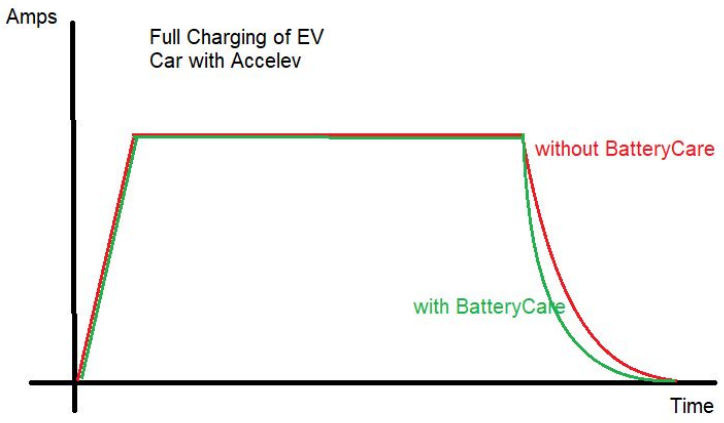
Different cell temperatures, state of their health or even accidental damages or production differences between them may cause different internal resistance of them and finally cause to overvoltage a single cell, while the whole module, that consists of such cell look appropriately powered. It is almost impossible to avoid that during battery life without adding monitoring and balancing units to every single cell.

Car manufacturers solve this via charging during final phase with constant voltage, that is set below 4,2 V (like 4,12V or so) to decrease the chance of overvoltage occurrences.

What to do?

First, the simple answer is: do not charge fully! Some cars (like Tesla) can be configured to stop charging at 90% or lower state of charge (Tesla highly suggest this to users to avoid battery depleting). You can also try to monitor your state of charge and switch off charging at a proper level.

Alternatively, you may use Accelev v2 and switch on BatteryCare group of functions. One of them is "No full charging". When the charger detects near-full state, it stops charging (usually at a level of 90-95%). This manner will be excellent for the longevity of your battery, primarily as a charging mode for daily commuting.



Sometimes we need to have a full available capacity (for example - before a long trip). In such a case, we can start charging without button "no full charging" pressed. A charger will charge till near-full state, and then - it will control current with steps down, to keep lower voltage than the typical one. Last charging phase may be more

extended (slightly), but the battery will stay at about 4V per cell (not 4,12V). A charger will learn proper finalising characteristics so that the next full charges can be even smoother and shorter.

We believe that BatteryCare can help with prolonging your battery life.

BatteryCare focuses on finalising of battery charging. This phase starts when the voltage reaches the maximum permitted (usually 4,12 V per cell). During that phase, when imbalance, different cell temperatures along with a group of cells controlled by single BMS node, or just partial cell failure occurs, it is quite possible to cause overvoltage at some individual cells, and through that - cause ageing and breakdown of whole battery (after some time).

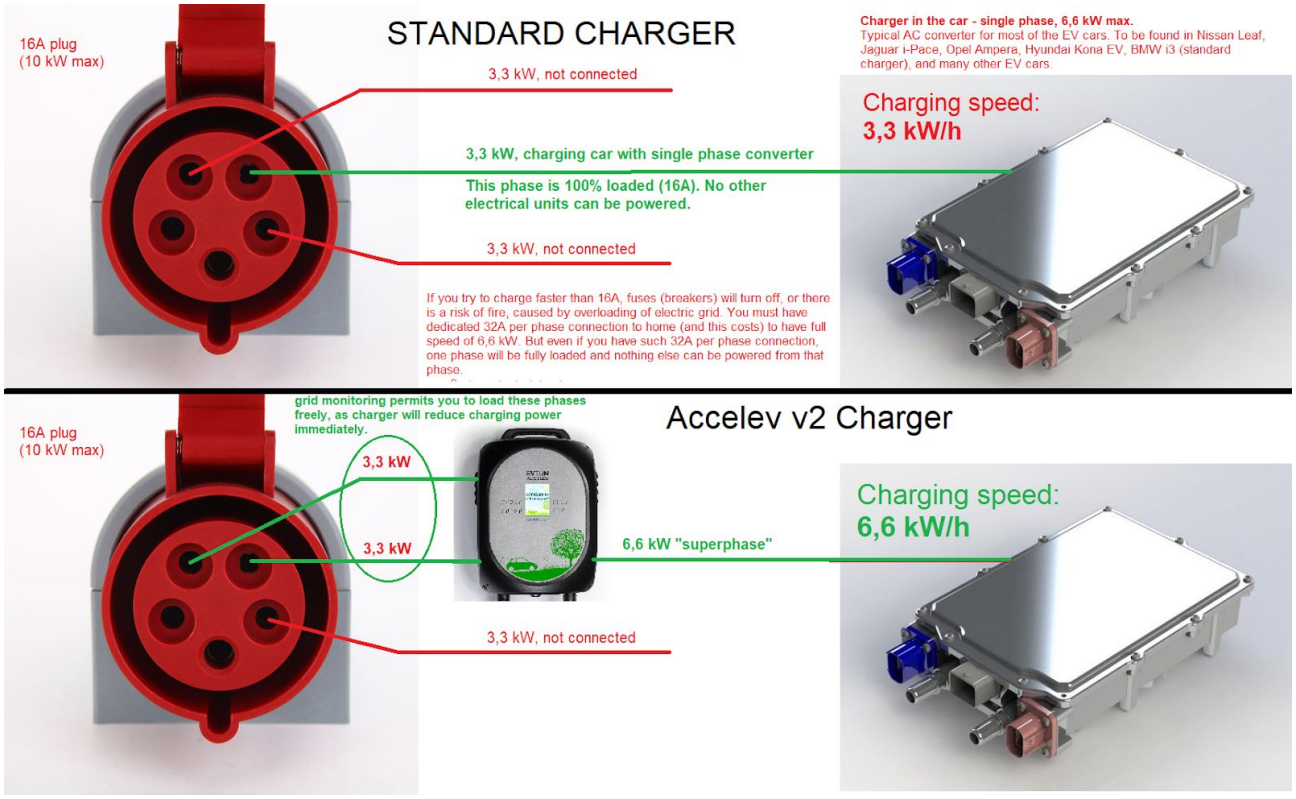
BatteryCare during the first pass (first full charge) tries to learn car charging characteristics, and memorise it. Also, it reduces charging amps to minimise the time of being at full voltage to about 15% of the original time. Such finalising stage can be up to 15% longer than conventional charging.

When learning is done, BatteryCare charges the car till full with current adapted to keep not more than 4,0V during finalizing. This adaptive method reduces time loss at the finalising stage to 5-10% while the battery will be less than 5% of finalising time in "danger zone".

When we compare factory BMS behaviour, it would be focused on a maximum speed of charge within a safe zone (4,12V or so). This safe zone is calculated as an optimal balance between speed of charging and risk of damage - for all cells staying in the exact same condition. As it is impossible to measure internal resistance and temperature of every single cell (most of the batteries have 2-4 thermosensors), such manner is good within laboratory conditions.

Car manufacturers want to advertise faster charging. Reducing the max. voltage per cell to 4,0V (with BatteryCare) delays charging during last phase (finalizing) but highly increases safety (especially when the car is intensively used, it is warm, or very cold). It may not help, when the battery is new (first 5000 - 10000 km), but it starts to be positively influential later, when cells are not as equal, as they were at the start of their life.

As we have received dozens of questions about how Accelev compares to typical 16A or 32A single-phase charger (EVSE), there is a simple graphic explanation.



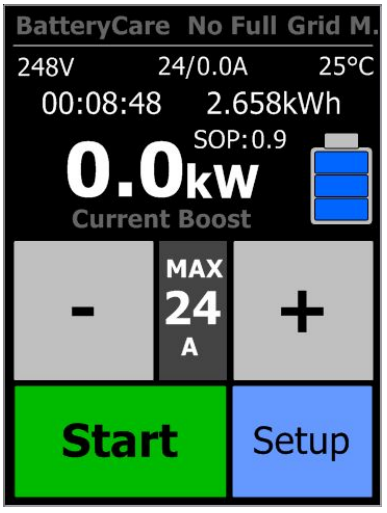
Typical 16A charger connected to 16A x 3 phase home grid (10 kW max capability, standard in Europe), drains one phase totally. Charging speed is about 3,3 - 3,5 kW. Nothing else can be connected to that phase (breaker will turn off the power). Also, no 3-phase tool can be used while charging an EV car.
With Accelev two phases are equally loaded. So with 3,3 kW charging speed, each phase will be loaded with half of its capability (about 8A)
But you can load two phases fully and charge 6,6-7,0 kW because Accelev includes Grid Monitoring. If any additional load is detected, charger reduces charging speed (or stops charging) for a period of the additional load operation. It gives you the fastest possible home charging for cars with single-phase onboard charger. Among these cars, we can find Nissan Leaf, Jaguar I-Pace, Opel Ampera, Hyundai Kona EV and many many others.
32A charging from a single phase with a conventional charger is possible when you own a dedicated 32A per phase home supply. It costs.

10.2 ReVive balancing

This function is intended to balance battery and revive missing capacity. Such curing based on pulse charging algorithm and slow balancing and may take up to 10 hours to finish. It can be interrupted at any moment, but the battery will be not entirely balanced. A car may not be fully charged after the end of ReVive.
A car should be discharged till <10% state of charge before using ReVive (you can discharge your car stationary, using a heating system and setting it to a max. temp.).
During charging with this function enabled, grid monitoring can be activated, but BatteryCare is off.

BMS (Battery Management System), which is installed in every electric or PHEV car (sometimes called alternatively by the producer of a vehicle) beside of controlling critical parameters, like the maximal voltage, or current, spends some time on balancing of cells. Basically, it is simple. The most common method uses passive energy reducement via resistive load. Most powerful cell (qualified mainly via highest voltage) or usually - a group of such cells are connected to small resistors to reduce their total energy stored and thus - to reduce voltage to be similar (more or less equal) to most of the cells.
This process is not continuous, and also it uses quite low energy consuming resistors to avoid generating heat.
The most crucial problem is that it is not entirely sure (but most probable) that the cell with the highest voltage has the highest capacity. As this may change while the voltage of the whole battery (and state of charge, SOC) would be lower, BMS tries to store some information about the behaviour of cells at various SOC levels to be better prepared and predict future needs of balancing. In simple words - a cell with the highest voltage at SOC=100% may be the weakest one at SOC = 10% - so it would be nonsense to discharge it (balance it), when BMS knows that this cell will lose that high voltage, along with SOC going down.
As all this information stored in BMS is used to predict the total capacity of the battery, it may start to be inaccurate. Sometimes it is just caused by an error (bug) in the software of BMS (like Nissan Leaf 30kWh before the update, that corrected that mistake). In most cases, it is just because the car is not fully loaded or discharged to help BMS to collect more data and predict real capacity better.
ReVive Balancing uses a semi-random "Pulse-Relax" algorithm, well known from modern 12V battery chargers with reconditioning of battery. The car should be discharged to <10% of SOC (shown at car dashboard). Then - charger pumps battery for a short period, then - relax it with slowest charging speed possible. It repeats with some time variations.
With this schema of charging, all weak cells show their behaviour at various SOC and BMS learns quickly and accurate, how to balance them in the future. We may say it "resets" but to be honest - it just updates all the info about cells behaviour at various SOC.
Last period (usually after 8-10 hours) is just slow charging of the car.
In most cases, usable capacity will be improved, and SOH (State of Health) may go up.
Please use that function overnight, at least twice a year, and you will recondition your battery and keep better usable capacity.

10.3 SOP



The SOP is State of Power (similar to SOC - state of charge, SOH - state of health).
It is displayed at the main screen of Accelev EVSE electric car charger. It represents the quality and capability of your power source (home grid).
It will alarm you when your grid may fail or connection is bad (not only at the charger, just whole electric network in house or garage).

The SOP uses an electric car as a load to test the grid under stress and is calculated as:
- (voltage drop per kilowatt charge power)*(250/voltage at the start)
Smaller values = better energy source.
It will change slowly intentionally. But charger will detect an unexpected increase in SOP as potential damage/failure of a network. So chargers will be able to detect ageing of cables, sockets, plugs, bad contact, water penetration in home grid etc.
Values:
0-1 perfect
1-2 typical
2-3 bad
3-4 very bad, consult your electrician
4+ do not use this grid for car charging, consult your electrician

10.4 Grid Monitoring

Bored of charging with a limited speed or tripped of breakers? Grid Monitoring is a crucial function that enables you to charge with a full load at your grid (with maximum amperage possible) without risk of breakers tripped off. It uses actual and historical grid voltage, along with learned average SOP (learn more about SOP at par.10.3) to react immediately (within single tenths of a second) to reduce charging speed of your car. Then - it monitors the grid and resumes full charging speed after some time.
We use self-learning AI algorithms (basing on neural networks) for that, so after some time your grid Monitoring (only if Auto Mode) will protect you from such situations when you charge your car with full speed and your Wife switches on a 3-phase induction plate.
No more tripped off breakers. We have solved that. Period.

Deep learning of your local grid behaviour, including voltage waving caused by your neighbours, is now a piece of cake. Just let your charger to charge your car fast, but react

to network and local grid needs. It will start immediately to solve breakers tripped off, but after a few days it should learn your network behaviour to eliminate such situations at all. The picture above shows a reaction of Grid Monitoring of Accelev while charging 3,6A car (16A max). Yellow/orange line shows a real monitored speed of charge.
First risk of breakers being switched off occurred, when an electric water heater started (the owner cannot control this as it is a mechanism of water heater and it can switch on randomly). As the period of water heater work (heating) was short, and a total power needed being not so huge, Grid Monitoring decided to resume charging quickly.
Later you can see the reaction for 3-phase induction cooking plate. Depending on the load detected (as an induction plate may use various load to cook), a car charging is "throttled" and later - resumes full speed.

11. Errors and Troubleshooting

Errors are presented as a separate red screen with the error code and an explanation. There is a button “Dismiss” visible. It can be used for a technician, to bypass the error. Following errors may occur:

01 - Input voltage too high.
It means that your grid voltage is above 240V at the input. Standard voltage is 220-230V per single phase. Please contact us if you see this error.
02 - Input voltage too low.
Your grid voltage is below 200V per phase. It is an unusual situation, as a standard voltage is around 230V while the grid is not loaded. Contact your local electrician or energy delivery company to solve this problem.
03 - Current too high.
It means that your car sinks more energy than is permitted by the charger. It must be a shortcut or energy leak somewhere at the battery. Please contact your car dealer to solve the problem.
For cars, that start heating immediately after waking from sleep being charged with a full-speed a problem of overcurrent (thus finally - error 03) may occur in winter. Please install software v2.18 or newer to solve that problem. Notice, that this is not a fault of a charger, but improper energy handling procedure in the car.
04 - Temperature too high.
The core of your charger has a too high temperature. Let it cool down, cover from direct sun. Contact us if all seems ok, but the error occurs.
05 - Temperature too low.
It seems that ambient temperature is below -30C. Please use your charger in a sheltered area, or at least, let it warm up somewhere at home, inside of your car etc. Electronics dislike working in the excessive cold.
06 - PE/RCBA/RCBB protection.
PE line error/grounding error detected or your PE/grounding in power socket is not correct. Contact your electrician.

As our chargers have real Residual Current Breakers built inside (Type B or Type A - depending on local governmental rules), it is possible that Error 06 is triggered when: (1) your connection to the charger has no proper PE line, or (2) a voltage is detected between PE and N line (even microvolts).
This protection is forced by governmental rules for electric cars chargers and EVSE, for security reasons and applied by us for your safety. Of course, you might argue that other chargers are working. Yes, it is possible. They do not perform any (OBLIGATORY!) tests on connections, and in our opinion, life is too important to be not adequately protected. This is why we have invented SOP (State of Power) to help you find out whether your home grid is performing well, and this way we can seriously cover all the obligations related to electrical safety and protection of users.

The most common causes of Error 06 are:
there is no PE line at all (it is enough to connect the PE with the N)
some junctions, where thePE and the N are not entirely isolated, are wet, working in colossal humidity, etc., thus allowing some energy to flow between them.
Please contact us if you encounter such a problem.
We also plan to display continuously measured value and type (DC, AC, both) of energy leakage and the existence of the PE line at the error screen to help your electrician to solve the problem in your home energy grid in the future.

12. Standard delivery and warranty

Standard delivery includes Type 2 EVSE-to-car cable. If you need Tesla USA plug or Type 1 plug, please inform us or your distributor. You can also order two or all three types of plugs, with an additional fee.
Warranty is 2-years long and covers all occurrences of production errors, fails and unusual behaviour except broken/stopped update problems. We also do not promise success with full tripping breakers occurrences. All errors (especially error 06 - problem with energy line safety) are not our fault and Owners should solve problems with their energy delivery networks by themselves. Dear Owner - please understand that Error 06 means that your home energy grid is illegal according to actual EU rules (usually - no PE, PE voltage leakage to N or any Lx phase etc). We, as producers, MUST produce chargers/EVSE/Wallboxes that accomplish EU rules and obligations.

IF YOU HAVE A 3-PHASE 16A AND SINGLE-PHASE CAR

(KONA, I-PACE, LEAF, TESLA USA, BOLT AMPERA-E)

Type 2 or Type 1 single phase car