

System 952279900

**12 Volts generator/electronic ignition for MZ ETZ250/251/301**

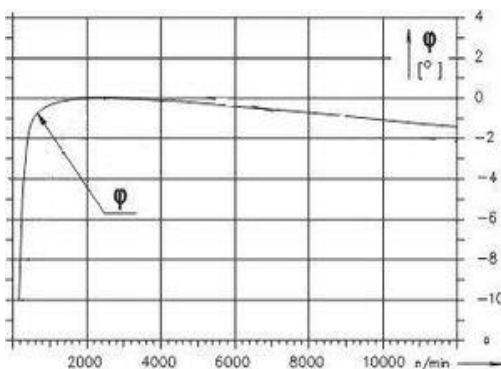
- For ETZ 125/150 see system 95 23 799 00

- Magnet based generator with integrated fully electronic ignition. Output 12V/180W DC. Solid state ignition with own power supply from within the system. Replaces stock alternator, points (or whatever electronic ignition system you had), condenser, ignition coil.

- You may drive without a battery, if you want, but you need to check local regulations for this.

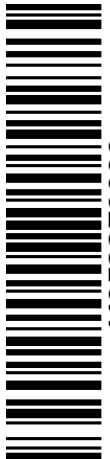
Advantage over original system

- all parts are new
 - more light output
 - very stable ignition with solid spark
 - better starting, better fuel burning
 - no trouble anymore with setting points
- **The VAPE system does not support the stock electronic tachometer of the ETZ, not even through use of the module offered by us.**
 - **during engine run the system may bring some wheeling noise which seems to be due to special air circulation conditions. This is however harmless**




- This system does not have an advance unit. It works with fixed timing, as the stock ignition does. It has to be added that there is some minimal technologically caused change which we indicate here in the graph.

- The zero line shows the setting achieved as by instructions (rotor/stator alignment) and corresponds to the 2.5/2.7 mm BTDC. The negative values show that in this spectrum, that is at start up ignition happens nearer to TDC (starting with about 10° less advance, but than rapidly shifting to normal. Beyond 4000 revs advance is taken back by about 1 degree (till max revs of ETZ)



M952279900

Assembly instructions for system 952279900 and 952379900	7.12.2020
<p>- If you can install and time a stock ignition and possess basic mechanical skills, you can install a VAPE! If you never have worked on your ignition, better have it done by someone who knows.</p>	
<p>- VAPE can not monitor the compliance to those instructions, nor the conditions and methods of installation, operation, usage and maintenance of the system. Improper installation may result in damage to property and possibly even bodily injury. Therefore we assume no responsibility for loss, damage or cost which result from, or are in any way related to, incorrect installation, improper operation, or incorrect use and maintenance. We reserve the right to make changes to the product, technical data or assembly and operating instructions without prior notice</p>	
<p style="text-align: center;"><u>IMPORTANT</u></p>	
<p>- Please read these instructions fully and carefully before starting work on your motorcycle Please bear in mind that any modification of the material as well as own repair attempts which have not been agreed with VAPE may result in a loss of warranty. Do not cut off wires. This leads to a loss of reverse polarity protection and often results in damage to electronics. Also, please take note of the information provided on the information page for this system. Check that what you have bought really corresponds to the motorcycle you have. Wrong ignition settings may damage your engine and even hurt you during kickstart (violent kickbacks). Be careful during the first test runs. If needed change settings to safer values (less advance). During assembly check carefully that the rotor (flywheel) does not touch the stator coils or anything else, which may happen due to various circumstances and lead to severe damage.</p>	
<p>Designated use - This system is designated to replace stock dynamo/alternator & ignition systems in vintage and classic motorcycles whose engine characteristics have not been modified aftermarket. This system is not a tuning system and it will not bring significant increases in engine output. It does however significantly enhance roadworthiness and comfort by offering better lighting, better function of side indicators and horn and, compared with the aging stock systems, increased reliability. As our system does not tamper with engine characteristics it does not increase emission of gaseous pollutants and noise. In most cases emission of pollutants should even be reduced due to better combustion. If used as designated the system therefore will not normally infringe the existing legal status of the motorcycle. (Please check your local legal regulations!) This system is not suitable for use in competition events. If used other than the designated way, your warranty will be voided and it might well be that you do not obtain the desired results or, worst you loose legal roadworthiness.</p>	
<p> - VAPE guarantees homologated products marked with the "E" mark in the ring (E8 specifically for the Czech Republic), thereby ensuring a consistent conformity of the product properties with the relevant ECE homologation regulations (especially ECE R10.05). Inspection is regularly carried out by the competent authority.</p>	
<p>- The charging system is only suitable for use with rechargeable 12V (6V systems 6V) lead-acid batteries with liquide electrolyte or sealed lead-acid batteries, AGM, Gel. It is not suitable for use with nickel-cadmium, nickel-metal-hydride, lithium-ion or any other types of rechargeable or non rechargeable batteries.</p>	
<p>- This is a replacement system and not a copy of the stock material. The parts in this system therefore look different and might fit differently (notably ignition coil and regulator) requiring some adaptation by you.</p>	
<p>- During assembly imperatively start with assy of engine based parts to see that those really fit before you start fitting the external parts. In many cases customers assemble those first and thereby often modify them in breach of warranty which renders them unfit for renewed sale. Replacing old ignition systems is not a matter of taking something from a supermarket shelf as there have been very many types, versions and possibly unknown aftermarket modifications which harbour plenty of room for error.</p>	
<p>- Our systems are NOT tested for use with third party electronic devices (such as GPS, mobile phones, LED lighting etc) and may cause damage to such parts. Possibly existing electronic tachometers will not work with the new system. Possibly existing safety switches and electronic valve controls are not supported. It might be that your motorcycle was originally equipped with an ignition that did limit top speed for legal reasons. The new system does not have such a facility, so check your legal situation beforehand.</p>	

- If you have no expertise for the installation have it done by an expert or at a specialist's workshop. Improper installation may damage the new system and your motorcycle, possibly even lead to bodily harm.

- Before you order a system, please check whether a puller tool for the new rotor is included in the kit. If not, better order it at the same time. Never use anything other than the recommended puller tool to pull the new rotor again. Damage to the rotor as a result of use of other tools or methods is not covered by your warranty.

- The rotor is sensible to blows (including during transport). Before assembly, please always check for damage (on rotor without magnet plastification try to push the magnets aside with your fingers). After impact the glued in magnets might have broken loose, sticking to the rotor solely by magnetic force, so that one does not notice right away. During engine run the damage would be considerable. Before placing the rotor onto the engine, please make sure that its magnets have not collected any metal objects such as small screws, nuts and washers. That equally would lead to severe damage.

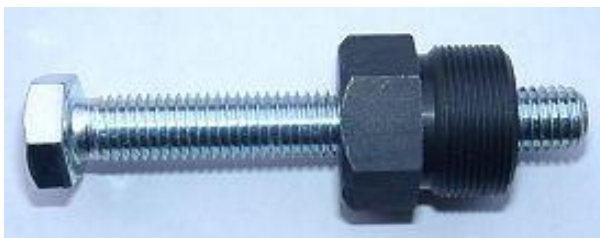
- **If you have access to the Internet, best view those instructions online.** You get larger and better pictures by clicking onto them and possibly updated information. System list at <http://www.powerdynamo.biz>



You should have received those parts:

- base plate with fitted stator coil (no need to remove stator from plate during assembly)
- rotor
- CDI ignition coil
- regulator/rectifier
- switch off relay
- high tension cable, fastening screws, 3 holder clamps

- Info: the single blue wire inside the stator harness is not for ignition but for the neutral gear contact which might get lost when removing the stock alternator setup. If you do not need it, just leave it idle, cut it or pull it out.



- To disengage your new rotor again, you will need a puller M27x1,25 (part-no.: 999979900 - **Not provided!**).

- **Note:** Never use a claw puller, a hammer or any other device, that will shake the magnets off.



- To disengage your old rotor, you will need a puller screw M10x90 (part-no.: 899902600 - **Not provided!**).

- Notes on wiring:

- Experience shows that in the course of time nearly every motorcycle undergoes changes to its wiring. As a result, wire colours and wires themselves on your bike might differ to those we describe. In case of doubt, please consult the original wiring diagrams for MZ.

- Make sure your MZ rests securely on her stand, preferably on an elevated work bench and that you have good access to the generator side of the engine.

- Disconnect your battery and take it out of the motorcycle. Note that you will have a 12 volts system further on, so you will either need a 12 volt battery or you use the option of driving without. For driving without battery, please observe our information on driving without battery.
- You have to decide which method of ignition cut-off you will use. There are different ways, every one with pros and cons. We have pre-assembled the relay option.

Relay method (supplied as standard):

advantage: This option will allow you to use your ignition switch as before. Nothing changes.

disadvantage: You cannot ride without a working battery (unless, in an emergency you pull the blue wire between relay and ignition coil).

Kill switch method:

advantage: You may drive without battery, a plus for historic bikes driven only occasionally.

disadvantage: You have to buy the switch and you need to install it on the handlebar. We offer such a switch.

Tip: You may re-function the flashlight switch to do the job.



- **Note:** When you make use of the non-battery options you will either have to

- use our alternative regulator 73 00 799 50 (in picture left at bottom) in place of the standard one (top left). Or
- install a high capacity condenser (22.000µF) in place of the battery to smoothen the pulsing voltage (top right).

- Otherwise your flasher unit will not work correctly. the better option is the alternative regulator

Disconnect the 2 red/black wires (which join in one ring terminal) from pin 15 of your old ignition coil and insulate the terminal carefully, so that it can not accidentally connect to ground or other wires. Do not cut the 2 joint wires, otherwise some of the lighting facilities at the rear of the bike will not function anymore.

Relay option:

Take note of the red/black wires just disconnected from the ignition coil. You will have to add to them a further wire later.

Kill switch option:

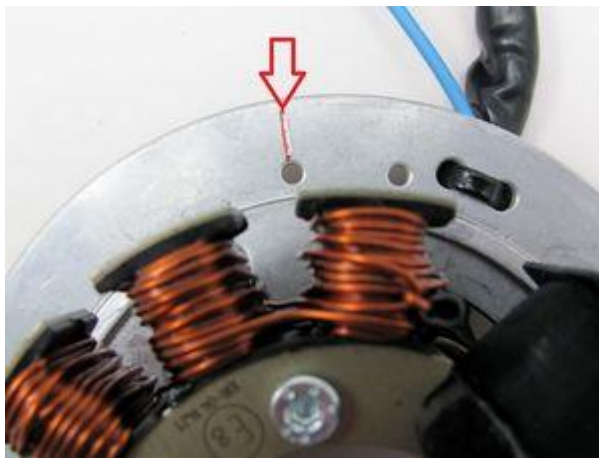
Check that you did insulate the terminal of the red/black wires, formerly running to the ignition coil. You will not need to connect to them. The relay will not be fixed.

Disconnect all wires at your old generator, regulator/rectifier (may be one unit with generator or regulator) as well as the green wire from the ignition coil and take those parts and all wiring between them off (except the above mentioned red/black wire, running from the main switch, pin 15, formerly to the ignition coil). As the blue wire for the neutral gear switch equally runs through the generator harness, you have to disconnect it from the switch. (The new system brings a new blue wires with it.)



- Should the arresting pin on the top right corner of the alternator seat still be in place, please - **imperatively** - take it off (pull oder cut it). It will otherwise prevent the new system from being installed.

- There is no harm in that, as the pin had only the task of preventing wrong setting of the old generator.



- Take a look at the new stator plate.

- You will find there, somewhat left to the exiting cable an engraves radial line, highlighted in red (in picture arrow pointing to it).
This is a timing mark. Spark happens when this marking aligns with the marking on the rotor.

- Should you not really find this marking any more after some time, know that it is in the middle of the left hole there.

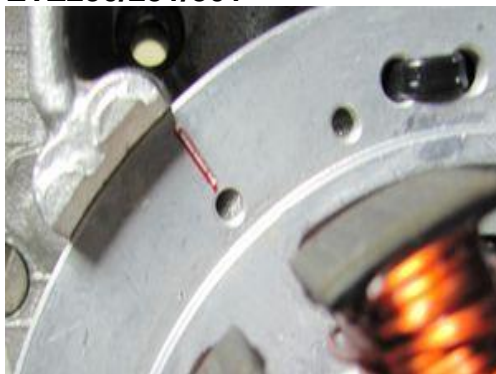


- Take a look at the new rotor.

- You will find there, somewhat left to the exiting cable an engraves radial line, highlighted in red (in picture arrow pointing to it).
This is a timing mark. Spark happens when this marking aligns with the marking on the rotor.

- Should you not really find this marking any more after some time, know that it is in the middle of the left hole there.

ETZ250/251/301



ETZ125/150



Put the pre-assembled stator plate into the place of your old generator.

- **in ETZ 251/301**
the marking on the plate (see above) should be set at the righthand edge of the left top boss as shown in picture above left.
- **in ETZ 125/150**
as the housing differs a little to the one of the larger engine, a little to the right of the rib as shown above right picture

- **With this, ignition is set to a workable situation. You may finetune later as described below.**

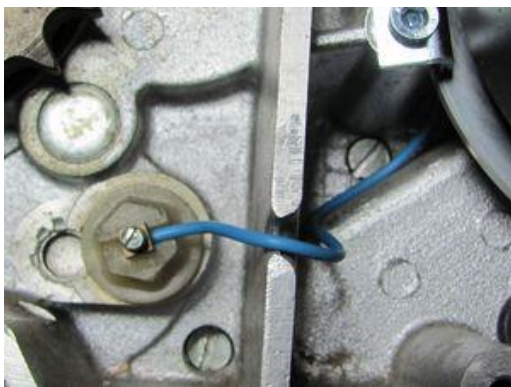


- Fasten the stator plate with the 3 small L-holders and screws M5. The clamps have different lengths between ETZ 125/150 and the bigger engines.



- The wiring harness of the stator will be led out of the engine casing as before.

- You will need to cut the rubber grommet to needed size.



- There is a blue wire inside the harness at the new stator. This is not for ignition but for the neutral gear contact.

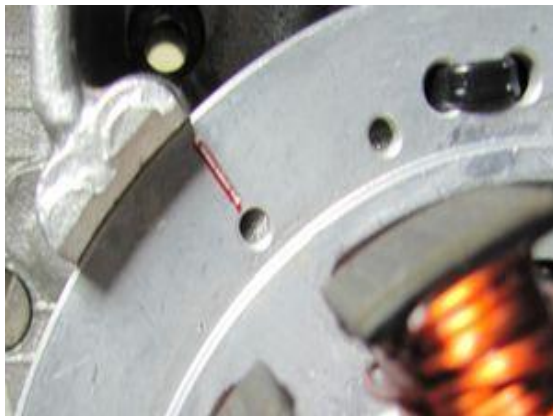
- Connect it to the terminal of the neutral gear switch as shown here.

- Put the rotor onto the crankshaft. Make sure that it slots over the crank shaft's arresting pin. Make sure that the rotor really sits on the crank taper. Sometimes the roller pin on the crank is too high up and prevents correct seating of the rotor.

- Fasten the rotor with the help of the screw M7x50. Do not forget the washer. To loosen the rotor again, use a puller M27x1,12.



- Now on finetuning. As mentioned the engine should run well with the above described setting.
- To improve this, you need a clock dial or an other timing gauge.

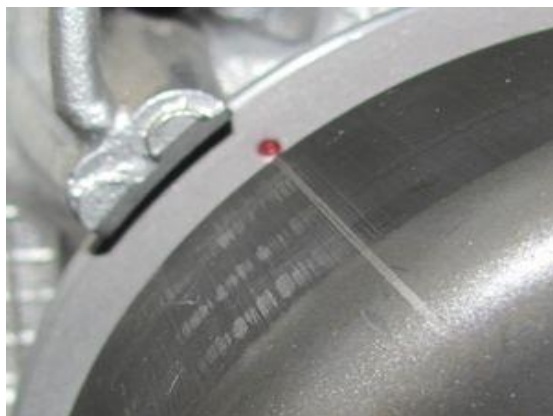


- You had set the base plate as shown above and you have placed the rotor onto the shaft with the crank pin arresting it in its position.

- You may now change the shafts position by using the new rotor as a turning handle (take spark plug out to ease compression).

- Place the piston with the help of the mentioned tools into

- ETZ 251/301: 2.7mm BTDC
- ETZ 125/150: 2.5mm BTDC



- Now, check what your markings do.

- If all is correct, both rotor and stator markings should align as shown here.

picture whows older version with dot and not line as marking

- If both do not match, than - **without changing the position of the rotor which is important** - loosen the 3 screws fixing the holder clamps a little and carefully turn the stator plate in such a way that the markings align. Than refasten the clamps (do not forget this!)
- Should you - whyever - need a setting different to what is normally the case, please know that turning the stator plate anticlockwise brings more advance (away from TDC) and turning clockwise more retard (nearer to TDC)

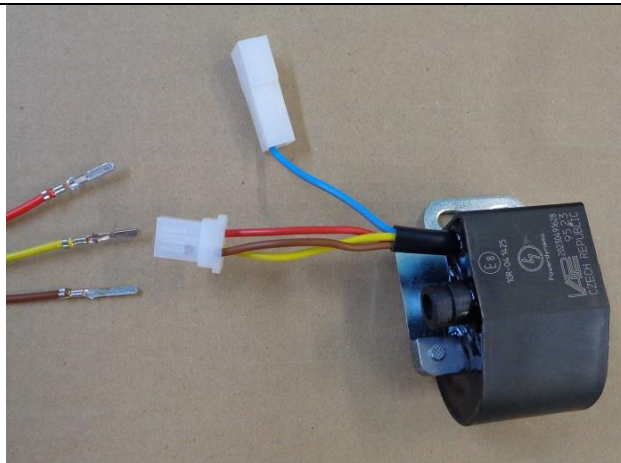


- Work at engine level is now finished.
Fix your new ignition coil and the new regulator in an convenient place

Connect the parts as shown in the respective wiring diagram!

- For our standard DC regulator (95 22 699 06), use the wiring diagram **73mz**:
For our DC regulator with built in smooting condenser (73 00 799 50), use additional the wiring diagram **reg_102**:

- To facilitate wire exit through the often small openings in the engine casing, the plastic plug of the generator's wiring that leads to the ignition coil have not been put onto the wire terminal. You should place the plug there only once all has been properly installed on the engine side.



- Look for the ignition coil with its female plug and the three wires (red, brown and yellow).

- Put the provided 4-position plug housing onto this plug and insert the three wires (red, brown and white) from the generator. Make sure that the terminals engage securely in the housing and that you connect:

- red to red
- brown to brown
- yellow to yellow
- the blue wire could be used for neutral (idle) switch

- Should you need (or want) to get the terminals out of the plug housing again, enter a paper clip from front next to the terminals and push the little barb aside. Than pull the wire out.

Connecting VAPE alternator to lighting circuit (via regulator):

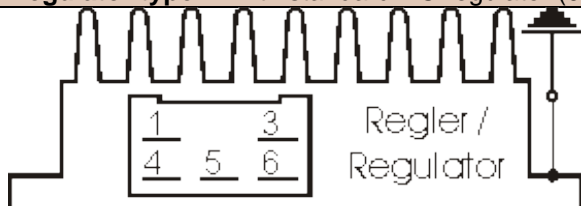


- The 2 black wires running from the stator coil carry the voltage for lights, horn, flashers etc. They have nothing to do with ignition.

- This voltage (something between 10 and 50 volts AC) has however to be stabilized (regulated) and for most uses rectified into direct current (DC) as it primarily is alternating current (AC).

- **For this we offer 2 different regulators:**

Attention: Any **confusion between plus and minus** (with the DC versions) leads to **immediate destruction of the regulator**. This will not constitute a warranty case as it is negligence! One can recognize a burnt regulator mostly by its sharp smell.

Regulator type 1: with standard DC regulator (95 22 699 06), use the wiring diagram 73mz:


-The new regulator/rectifier has a compact plug with 6 positions, of which *one* is not used. A female plug cover fitting to this plug is delivered. Into this female plug you have to insert the following wires (which have terminals that snap into the plug):

The two black cables leading from the generator ...

... connect to pins 1/4 of the new regulator (from there equally black wires lead inside the unit). It does not matter which wire connects to which of the both terminals (1/4) as they carry alternating current.

The new brown cable with the round eye terminal.

... connects pin 3 of the regulator unit (from there equally a brown wire goes inside the unit) with the negative pole of the battery or (in case you drive without battery) to ground (chassis).

The new red cable with the round eye terminal ...

Take care:
Wrong polarity will damage the electronics!

... connects to pin 5 of the new regulator (from there equally a red wire goes inside the unit). This wire is a major integration point between the old and the new system. Here your regulated positive voltage comes out to connect to battery plus, or (in case you drive without battery) to the voltage input terminal of the main switch (ignition lock, German bikes: pin 51/30).

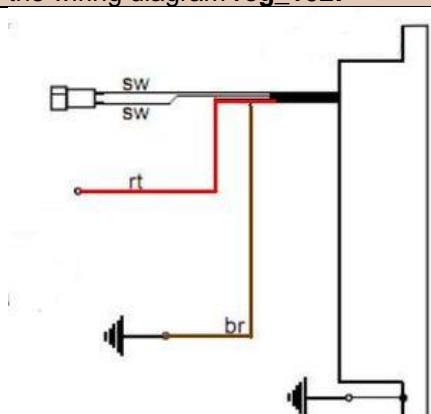
Make sure that you have a **15A-fuse** between battery and vehicle circuitry.

The green/red wire at pin 6 of the new regulator ...

... is for the charge control light. You connect there the wire that formerly did run from the control light to the original regulator.

- Sure that this control only functions with a battery present. Should you drive without battery but still connect the wire, you will see that the light glows even as the generator generates voltage. So without battery, do not connect it.

- The charge light control function is based on a transistor switch and is an additional function. Even if that should fail, the regulator might still be in ok working condition. Simple check: have the engine running, turn lights on, disconnect the battery. If you have bright lights the unit is ok.

Regulator type 2: with DC regulator with built in smoothing condenser (73 00 799 50), use additional the wiring diagram reg_102:


- the 2 black (sw) wires are the AC input from the alternator (as it is AC it does not matter which black to which black)
- the red (rt) wire is the 12V DC output plus
- the brown (br) wire is ground, internally connected to housing

<p>- Remains the blue (sometimes blue/white) wire at the ignition coil. This is the kill (cut-off) wire.</p> <p>- Connected to ground - it will stop ignition!</p> <p><u>Note:</u></p> <p>- Should you experience ignition failures, disconnect as a first measure this blue wire. In many cases that will permit you to get mobile again</p>	<p>- <u>Switch off via separate kill switch</u> (when driving without battery): The relay will not be fitted. The blue(/white) cable of the ignition coil will be connected to a kill switch, closing against ground (a button at the handlebars). Or you mount an ignition lock that has a facility to connect against ground when in OFF position.</p> <p>- <u>Battery method:</u> Connect the brown relay wire to good ground. Lead the longer black wire from the relay to the wire that did run previously to a pin carrying voltage when the switch is on (in German bikes: pin 15) and connect it there. Connect the blue wire from pin 30 of the relay to the blue(/white) wire at the new ignition coil. Should your battery fail on the road, just disconnect that blue wire and your bike will run again (it will now only not stop by switching off).</p>
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<p><u>Relay wiring</u> (if used):</p>	<p>- The brown wire with the ring terminal from pins 87a und 86 goes to ground.</p> <p>- The black wire from pin 85 goes to a main switch terminal carrying voltage if switched on.</p>
<p>Screw the high tension (ignition) cable ...</p> <p>- Please do not use any spark amplifying cables, such as "Nology supercables" or "hot wire". This will disturb the system and possibly damage it.</p>	<p>... into the ignition coil and pull over the rubber seal before mounting the coil (it will be easier).</p> <p>- Please do use the cable arriving with the pack and not any old cable.</p>
<p>- You will do yourself a favour to treat your bike to new spark plugs and spark plug sockets (preferably some between 0-2kOhm). Plenty of problems are to be traced back to "apparently good" (even completely "brand-new") sparks plugs, terminals and cables.</p> <p>- <u>Do not use</u> spark plugs with an intern suppression resistor. NGK (e.g.) offered such spark plugs coded with an "R" (for resistor).</p>	
<p>- Finally - and before installing the battery and before the first kickstart - please re-check carefully all connections and fitments against the wiring diagram. Do check battery and light bulbs for correct voltage (12V).</p> <p>- Should something not work, please consult our trouble-shooting guide on our homepage. As a first step disconnect the blue wire from the coil and re-test.</p>	
<p>- <u>IMPORTANT:</u> During crank shaft repair the dynamo shaft is often machined and gets shorter. The result is a rotor sitting lower, possibly touching now with its rivets the stator coil. The result is a destroyed stator and ignition failure.</p>	

Important safety and operating information
<p>- Safety first! Please observe the general health and safety regulations motor vehicle repair (MVR) as well as the safety information and obligations indicated by the manufacturer of your motorcycle. The timing marks on the material are for general guidance only during first installation. Please</p>

check after assembly by suitable means (stroboscope) that settings are correct to prevent damage to the engine or possibly even your health. You alone are responsible for the installation and the correctness of settings.

- Ignition systems generate high tension! With our material right up to 40,000 Volts! This may, if handled carelessly, not only be painful, but outrightly dangerous. Please do keep a safe distance to the electrode of your spark plug and open high tension cables. Should you need to test spark firing, hold the spark plug socket securely with some well insulating material and push it firmly to solid ground of the engine block.

Never pull sparkplug caps when engine is running. Wash your vehicle only with engine at standstill and ignition off.

- You should have received the HT Cable with the fixed rubber cap (*which does not contain a resistor*) as a part of the kit, you should have to use a spark plug with an inbuilt resistor (*or replace the cap with the one containing a resistor*) to comply with your local laws (*Electromagnetic compatibility requirements*).

- Do not use a spark plug cap(s) containing a resistor **WITH** a spark plug(s) containing a resistor at the same time. It would cause problems, especially difficult engine starting. The total resistance of cap and spark plug combined should not exceed 5kOhm.

- Remember that candle plugs age, increasing resistance. If an engine only starts when it is cold, it is very likely that a defective spark plug connector or faulty spark plug is the cause. Do not use so-called ignition-reinforcing cables (e.g. Nology).

- After installation, please check tightness of all screws, even those preinstalled. If parts get loose during run, there will be inevitably damage to the material. We pre-assemble screws only loosely.

- Give the newly installed system a chance to work, before you start to check and test values, or what is worse apply changes to it.

Our parts have been checked before delivery to you. You will not be able to check much anyway. **At any rate do refrain from measuring the electronic components (such as ignition coil, regulator and advance unit). You risk severe damage to the inner electronics there. You will not get any tangible results from the operation anyway.** Bear in mind that also your carburetor, your spark plugs and spark plug sockets (even if completely new) might be the reason for malfunction. The general experience with our systems is that the carburetor will have to be re-adjusted to lower settings. Should the system not start after assembly, first disconnect the blue (or blue/white) cut-off wire directly at the ignition coil (or in some cases advance unit) to eliminate any malfunction in the cut-off circuitry. Check ground connections carefully, make sure there is a good electrical connection between frame and engine block.

In case of troubles, please consult our Knowledge Base first before you send off the material to us for checking.

- The spark of classic, points based ignition systems has with about 10,000 Volts comparatively little energy and looks therefore yellow and fat (which however makes it highly visible). The spark from our system is a high energy spark with up to 40,000 Volts and therefore is needle thin focused in form, and blue in colour, which makes it not so visible. Furthermore you get spark only at kick-start operated speeds and not by pushing the kick-lever down slowly with your hand (as you might get with battery based ignitions).

- Systems using a twin outlet ignition coils have a few peculiarities. Please observe that during tests on one side, the other has either to be connected to an fitted spark plug or securely earthed/grounded. Otherwise there will be no spark on either side. Also with such open exits long and dangerous sparks may fly all over the coil.

- Never do electric arc welding on the bike without completely disconnecting all parts containing semiconductors (ignition coil, regulator, advance) stator and rotor need not be taken off. The same is true for soldering. Before touching electronics disconnect the soldering iron from mains! Never use copper putty on spark plugs.

- Electronics are very sensitive to wrong polarity. After work on the system, do check correct polarity of the battery and the regulator. Wrong polarity creates short circuits and will destroy the regulator, the ignition coil and the advance unit. As a rule, wiring will always be colour to colour. Instances, where colour jumps between wires are expressly mentioned in our instructions.

- When you handle the new rotor, take care not to damage its magnets. Refrain from direct blows to the circumference of the rotor. **When transporting never put the rotor over the stator.** Observe our information relative to transport of the material.

- Do not use spark plug sockets with a resistance of more than 5kOhm. Better use 1 or 2kOhm ones. Bear in mind that spark plug sockets do age and thereby increase their internal resistance. Should an engine start up only when cold, a defective spark plug socket and/or spark plug is very probably the cause. In case of problems check high tension cables too. Never use carbon fibre HT-cables, never use so called "hot wires" which promise to increase spark.

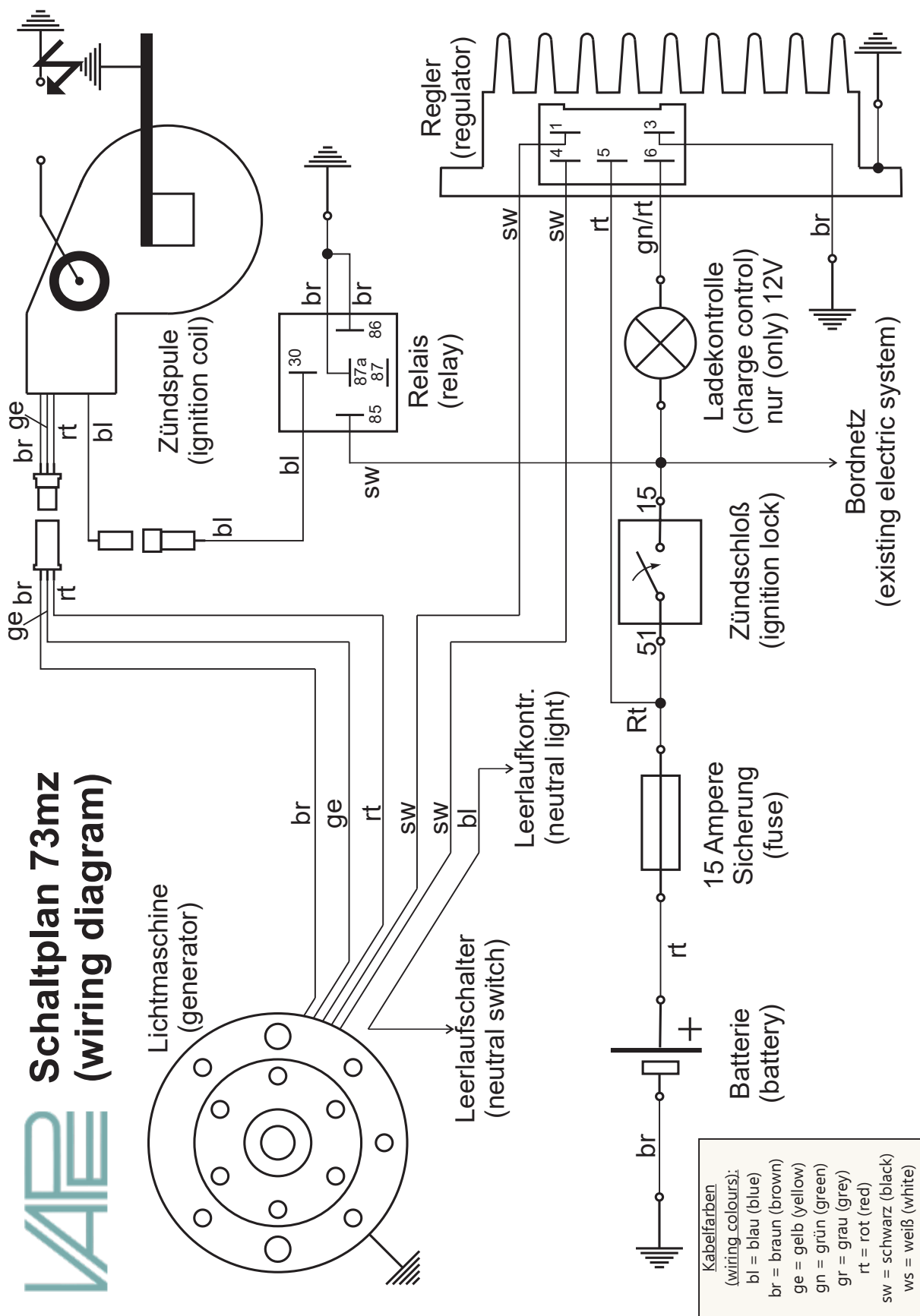
- It is a good idea to cover the rotor in a thin layer of oil to reduce the risk of corrosion.

- Never use a claw puller or a hammer to disengage the rotor. Its magnets might become loose in the event. We offer a special puller for disengaging the new rotor again (see assembly instruction)!

- Should the motorcycle not be in use for some longer period, please disconnect the battery (so existing) to prevent current bleeding through the diodes of the regulator. Though, even a disconnected battery will empty itself after a while.

- Please do observe these remarks, but at the same time, don't be afraid of the installation process. Remember, that before you, thousands of other customers have successfully installed the system.

Enjoy driving your bike with its new electric heart!



Schaltplan Regler 102 (wiring diagram regulator)

