

System 71 02 599 00

=> [€/€](#)

solid state racing ignition for Yamaha RD and TZ250 fitting 1976 RD250C & RD400C 1977 RD250D & RD400D. The rotor on these models is retained with a 7mm bolt



Please make sure you order the correct version fitting your particular RD! [\(detail here\)](#)!



Highspeed (up to 22.000rpm) magnet based solid state ignition for vintage bike racing applications. At 18.000rpm (i.e. 36.000 sparks/min) still 25 Kilovolts output. (3.000-8.000rpm = 40kV, see [diagram](#)). Diameter of rotor is 59mm, rotor weight is 180 gramms.

Replaces such systems as [Motoplant](#), [Hitachi](#), [Fensatronic](#) and Kröber.

#### Note:

- no facility for lighting provided!!
- does not drive Kroeber Tachometer. For [tacho solutions see here](#)

#### advantages over old systems

- all parts are new
- very stable ignition with high energy spark
- better starting and fuel burning, increases engine performance
- no problem with points anymore
- very lightweight, rotor at 180gr, total system at 850gr

#### documentation

- [assembly instructions RD](#)
- [wiring diagram](#)
- [parts in the pack \(photo\)](#)
- [output diagram](#)
- [timing in function of engine speed](#)
- [dimensions of double ignition coil](#)
- [dimensions of stator and rotor](#)

#### Photos

- [view at installed system](#)
- [view at a TZ with the system](#)
- [photo ignition coil](#)
- [photo backside stator](#)



**If you can install and time a stock ignition and possess basic mechanical skills, you can install a VAPE system!**

**If you never have worked on your ignition, better have it done by someone who knows.**

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.



### **IMPORTANT:**

**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).

### **Designated use**

This system is designated to replace stock 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 road safety by offering increased reliability compared with the aging stock systems. As our systems do not tamper with engine characteristics they do not increase emission of gaseous pollutants and noise. In most cases emission of pollutants should be even reduced due to better combustion.

If used as designated the system therefore will not normally infringe the existing legal status of the motorcycle (this statement is valid for Germany, as this situation might be different in other countries, please consult your local road licencing regulations).

This system is not suitable for use in competition events. If used other than designated warranty is voided and it might well be that you do not obtain the desired results. In worst cases use not in accordance with designated use might entail legal roadunworthiness.

	<p><b>During assembly imperatively start with assy of engine based parts</b> to see that those really fit before you start fitting the external parts. In many cases customers assemble those first and thereby often <u><a href="#">modify them in breach of warranty</a></u> which renders them unfit for renewed sale. <u><a href="#">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.</a></u></p> <p>Our systems are <u><b>NOT</b></u> tested for use with other electronic devices (such as GPS, mobile phones, other 3rd party material.) 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> <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.</p>
 <b>Internet</b>	<p>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 <u><a href="http://www.powerdynamo.biz">http://www.powerdynamo.biz</a></u></p>



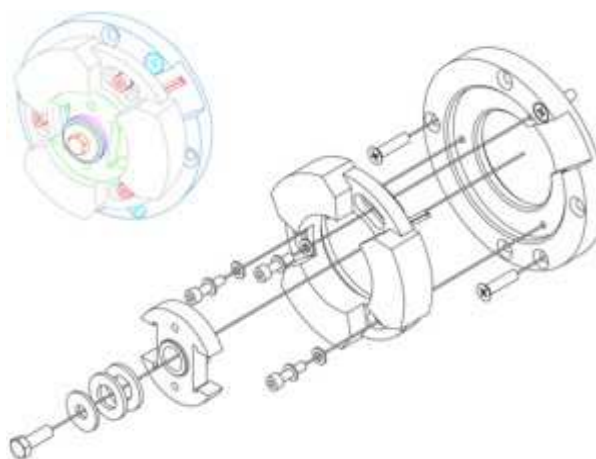
**First, check that you have received all parts:**

- pre-assembled stator unit
- rotor with 2 magnets
- rotor screw M7 and washer
- twin ignition coil
- high tension cable
- holder/puller tool

Take the old ignition system (including ignition coils) off. Take the woodruff key or arresting pin from the crankpin (so you have there).

Picture shows one type of stock system, there have been various.

Check again that your crankshaft is really a shaft which takes a screw to fasten the rotor.



Please ensure that all parts supplied are installed. It is important that the 3 large washers are placed onto the rotor, as otherwise fastening of the rotor is not possible.



Place the adapter onto the engine. The wire opening of the adapter will show to about 2 o'clock. Screw the adapter down with the 3 countersunk screws M6x25.

Put the stator onto the adapter. The wire has to be in the adapter opening. Screw the stator down with the 3 hex screws M5, not forgetting a washer each.

Place the rotor onto the shaft without tightening yet.

It is correct that the top surface of the rotor is about 5mm below the top surface of the stator



To be able to make use of the long holes to modify timing, set the screws into the middle position of those oblong holes.



Set one (no matter which one) of the 2 pistons into ignition position. (Any, as the system will fire both cylinders at the same time, which means you get a so called wasted spark into exhaust something not uncommon and effectively harmless.)

Whilst the crank remains in ignition position, carefully place the rotor onto it, in such a way that the small red marking on the rotor aligns with the red line on the inside of the stator. Take care not to change this position of the crank during that operation.

In this position the engine should run, but probably will not be set to accurate and safe values. Use a stroboscope to finally time. Not suitable settings may damage the engine and possibly even harm your health. Have settings controlled by a specialist mechanics shop. Take extra care at first starts.



To help turning the rotor and to stabilize it during fastening, use the supplied tool as shown here in the picture.

The rotor has 2 holes M6 for the arresting screws.





The same tool can be used to pull the rotor off again.

If the crank pin does not reach over the rotor to get pressed off, use some spacer, best a larger steel ball.

Screw the high tension wires into the wire outlets of the new [twin ignition coil](#) and set the 2 rubber grommets over the entries. Then fasten the new ignition coil on the frame of the motorcycle.

You will need to fit a ground wire securely connecting the metal core (holder frame) of the coil to ground. Do not rely on the fastening screws for the coil, lead an extra wire to good ground, preferably at the engine.

Then connect the 2 plugs from the stator wire to the coils terminals. Those plugs have different dimensions to prevent a mix up - which would be deadly to the coil. The coil does not only contain the transformer, but electronics for the ignition (as does the stator ring). So never mix those wires up and never connect the coil to something else.



The wider, 6,3mm pin shall connect to the red/white wire that brings the ignition voltage.

The narrower, 4,2mm pin gets the impulse from the black wire.

The red/white wire branches to a wire to be connected to the kill switch to cut off the system.

Connect the parts as shown here: [52sport](#)

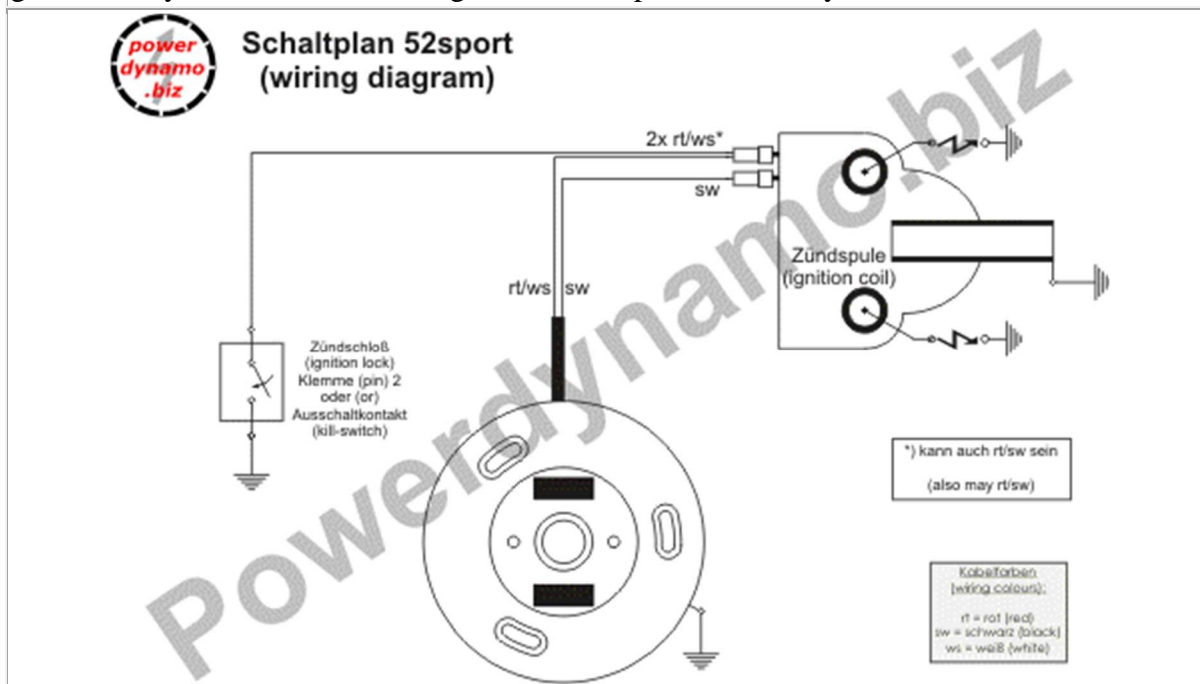
**This is very simple.** The cable from the stator has 2 plugs in different sizes. The ignition coil has 2 suitable terminals. Put the plugs onto the suitable terminals. Confusing the plugs will destroy the coil!

The free end of the small sideways connected wire is the wire for the kill switch. When that is connected to ground, ignition will stop. Here you connect your OFF-switch which closes against ground when activated.

**extremely important** is to fit a **ground wire** securely **connecting the metal core (holder frame) of the coil to engine ground** (not to frame as contact between engine and frame is never good!).

If you will be using a handlebar mounted kill switch **make sure that your handlabar has good ground** (powder coated frames prevent such!).

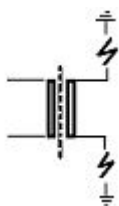
Otherwise, it may be that when you press the kill switch to stop the engine, you will be ground and you than feel the voltage from the capacitor in the system.



Screw the high tension cables into the ignition coil and place the rubber seals over the exits. It's more easier if you do that before mounting the coil. Please do use the cable arriving with the pack and not any old cables.

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.

**Do not use** spark plugs with an intern suppression resistor. NGK (e.g.) offered such spark plugs coded with an "R" (for resistor). Further, please do not use any spark amplifying cable, such as "Nology supercables" or "hot wires". This will disturb the system and possibly damage it.



In our twin outlet coils both ends of the secondary go to spark plugs.

Typical resistance between both exits is 6.2kOhm. Both exists fire at the same time (as many twin systems do). Sparks will be polarised however at a 180 degrees difference which might manifest [when you strobe](#) it and which can show with some amount of carbonisation at the spark plug getting the positive spark. This is however not a serious problem and, unfortunately, it can not be helped..

Ignition will only work correctly if both plug terminals are connected. You may not test one side with the other open (not sitting on the mounted spark plug). This is because (effectively) each exit uses ground from the other. That means also that both plugs are working in serial, adding resistances, so better use low resistance spark plug (resistor) sockets and make sure they are good (if in doubt, measure resistance on a **hot** socket (warm it up before measuring)).

Is the flow from ground of one side via spark plug there, via coil, to the other spark plug and its ground interrupted you get no spark - on neither side. If you really want to test only one side, put the HT wire of the other to ground (earth it) than it will work. The use of 2 individual ignition coils is not possible on this system.

Sometimes a coil deprived of its ground from the other side searches for a substitute - with some solid fireworks around it to the chassis.

Finally - **and before installing the battery and before the first kickstart** - please re-check carefully all connections and fitments against the wiring diagram. Please don't depend on the frame as *the* earth-connection. Varnish, oil and dirt prevent often a good contact!

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.

**Please note:** The crankshaft speed needed to get the system sparking is with about 500 revs/min quite high. If you simply turn the rear wheel of your lifted vehicle to check spark, you will not get any.

**You need fast kickstart action or better still push-starting the bike.**

### Important safety and operating information for sports systems of type 71 00

**The material has been exclusively made for sports purposes and is NOT destined for use on public roads!**

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 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 to earth the output.

# After installation, please check tightness of all screws. 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 is to apply changes to customize the firing point before running the system. Our parts have been checked before delivery to you. You will not be able to check much



	<p>anyway. <b>At any rate do refrain from measuring the electronic components (both stator and ignition coil). You risk severe damage to the inner electronics there. You will not get any tangible results from the operation anyway.</b> Bear in mind that also your carburetor and your spark plugs and spark plug sockets might be the reason for malfunction (even if absolutely new). 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 cut-off wire directly at the ignition coil (or in some cases advance unit) to eliminate any mistake in the cut-off circuitry. Check ground connections carefully, better put an additional wire between engine block and metal frame of the ignition coil.</p>
#	<p>The shaft speed needed to start ignition is relatively high with about 500revs/min. <b>Simply turning the lifted rear wheel will not produce a spark. You need rapid kick-starter movement or better still push-start.</b></p>
#	<p>There are systems destined for clockwise and there are systems destined for anticlockwise run of the crankshaft. Confusing the 2 senses will mean you have no spark. You may check for what sense your system has been made by the colour of its wires.</p> <ul style="list-style-type: none"> <li># a black/red wire: clockwise</li> <li># a white/red wire: anticlockwise</li> </ul>
#	<p>The spark of classic, points based ignition systems has with only about 10,000 Volts little energy and looks therefore yellow and bulky (hence well visible). The spark from our system is a high energy spark with up to 40,000 Volts and is therefore very sharp (needle thin focused) in form, and blue in colour, which makes it not well 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 on classic systems).</p>
#	<p>Systems using a <a href="#">twin outlet ignition coils</a> 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. Otherwise there will be no spark on either side.</p>
#	<p>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. <a href="#">Never use copper putty on spark plugs.</a></p>
#	<p>When connecting the ignition coil double check that you put the wires to the correct pins. (One is smaller). If you confuse them, the high tension for the condenser charge will kill the input switch</p>
#	<p>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", never use resistor spark plugs on this system, it will hamper starting.</p>
#	<p>It is a good idea to cover the rotor in a thin layer of oil to reduce the risk of corrosion.</p>
#	<p>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</p>

installed the system.

*Enjoy driving your bike with its new electric heart!*

# Schaltplan 52sport (wiring diagram)

# VAE

