# MOTOPLAT CV-307A

## Starters Guide


MOTOPLAT CV

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## IMPORTANT INFORMATION

### Safety warning

Electrical devices should be installed and operated in such a way that all applicable safety requirements are met. It is your responsibility as an installer to ensure that you identify the relevant safety standards and comply with them. Failure to do so may result in damage to equipment and personal injury. In particular, you should study the contents of this guide carefully before installing or operating the equipment.

Only qualified people should work with this equipment!

People who start using this product should review carefully this Starters Guide, or have had a training from a qualified person.

The use of electrical equipment is entirely at your own risk and Pos Service Holland is under no circumstances responsible for any incidental, consequential or special damages of any kind whatsoever, including but not limited to lost profits arising from or in any way connected with the use of the automated test equipment or this manual.

The tester should be connected to a properly grounded outlet.
If the power cable is damaged, you must have it be replaced by the supplier or by another qualified person in order to avoid dangerous situations.

In case the tester comes without batteries (non EU-countries) or in case you have to replace the batteries, please be aware to use qualified batteries (preferably deep cycle AGM) only, as non-qualified batteries can affect during testing or can even damage the tester.

### Environment

The tester should be installed in an weather protected area where heat, humidity or any other climate situation can not damage the tester.

The tester should be installed on a level surface that is clear of debris and obstructions.

*It is recommended that the box and packing materials be kept for possible reuse, should the tester be shipped again at a later time.*

**- Pos Service Holland -**

## Index

## Section 1 – General information

**1.0 General information about the Motoplat CV-307A alternator testbench:**
The Motoplat CV-307A test bench has a 380V 3 phase power supply and tests both 12 and 24 volt alternators.

To test modern alternators that have a high output at low RPM, the CV-307A is equipped with a modern high power 7,5KW motor, which makes less noise than most other test benches out there today.

The tester is equipped with the new API+ technology which will automatically detects the LIN and BSS protocol faster. The LIN and BSS signals will be displayed in 23 different protocols together with its ID code, which makes development in remanufacturing easier, cheaper and more clear.

The CV-307A also tests PWM, C and PD controlled alternators.

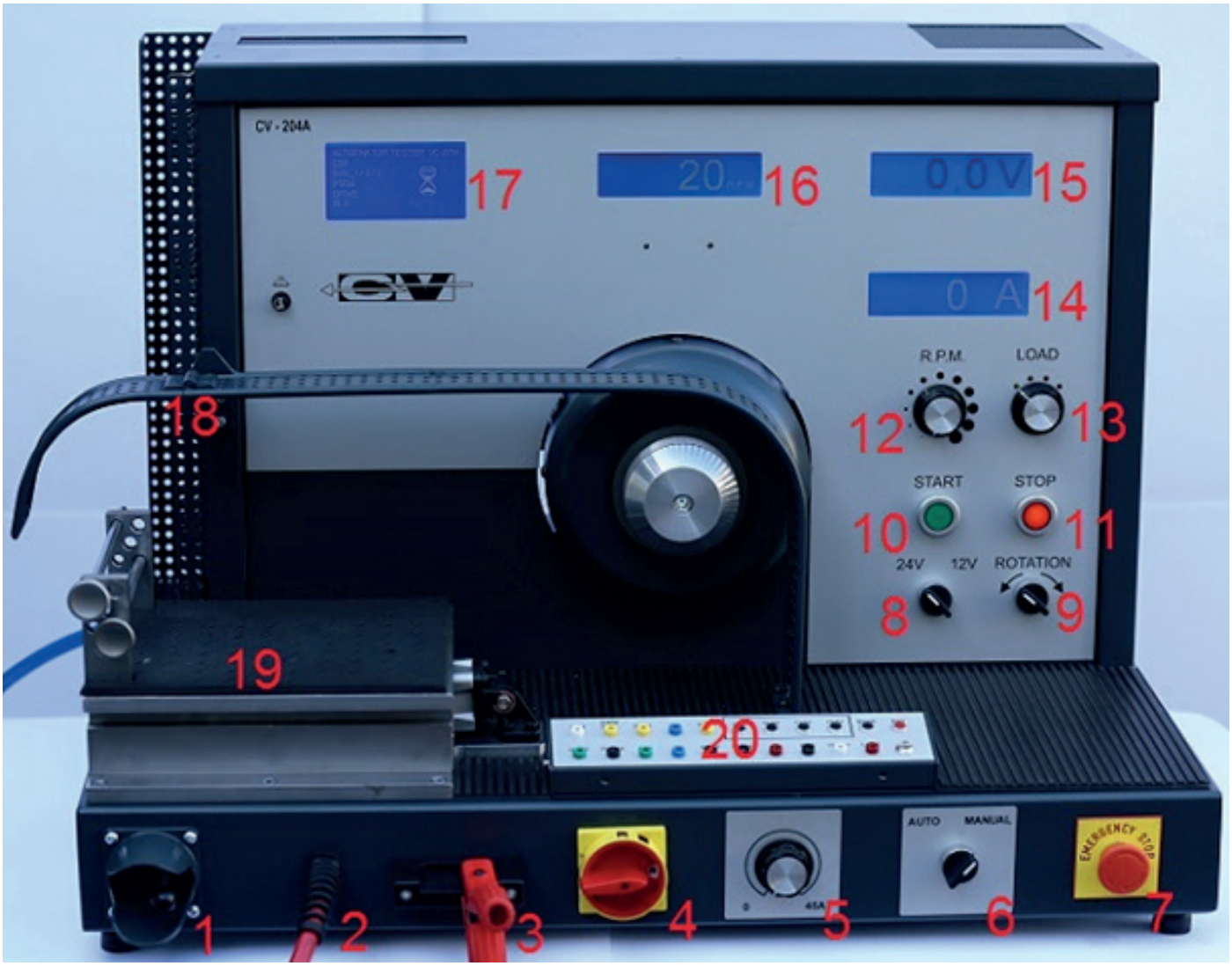
An in-depth DFM tester is also built in which shows the off-set of a DFM signal.

For sturdy and reliable testing, the alternator can be mounted pneumatic or servo motor.

A USB port is added on the front panel to connect the tester to a computer for an internet connection and to generate a modern and extensive report after the test is done.

The test bench is CE marked for use in any workshop or workplace that demand safe and reliable equipment.

**1.1 Front view:**

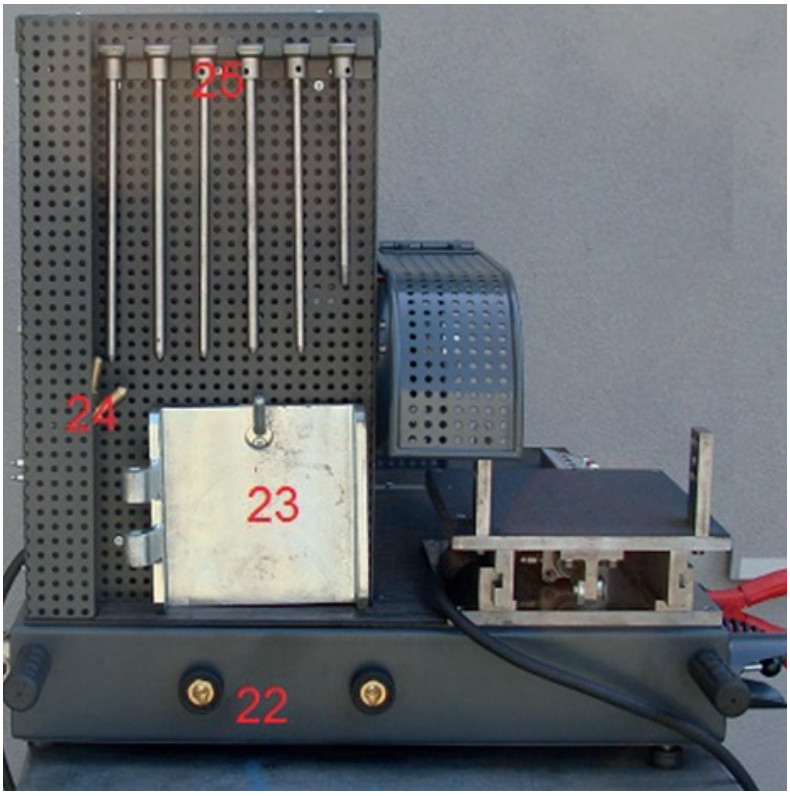



| | | | | | |
|---|---|---|---|---|---|
| 1 | Pneumatic belt tension valve | 9 | Changing the direction of motor revolutions, left and right, switch | 17 | COM display |
| 2 | Power lead (+) | 10 | START Push-Button | 18 | Cover switch |
| 3 | Wire catch (+) | 11 | STOP Push-Button | 19 | Platform to mount the alternator |
| 4 | Main circuit breaker switch | 12 | Motor speed regulator | 20 | connect and control panel |
| 5 | Step less resistor control in the range of 0 – 65 A | 13 | Resistor switch-button | | |
| 6 | Auto/Manual - mode selector switch | 14 | Amp meter | | |
| 7 | Emergency stop switch | 15 | Volt meter | | |
| 8 | 12 V/24 V switch | 16 | Tacho meter | | |

### 1.2 Right side view:


| | |
|---|---|
| 21 | USB connector |

### 1.3 Left side view:

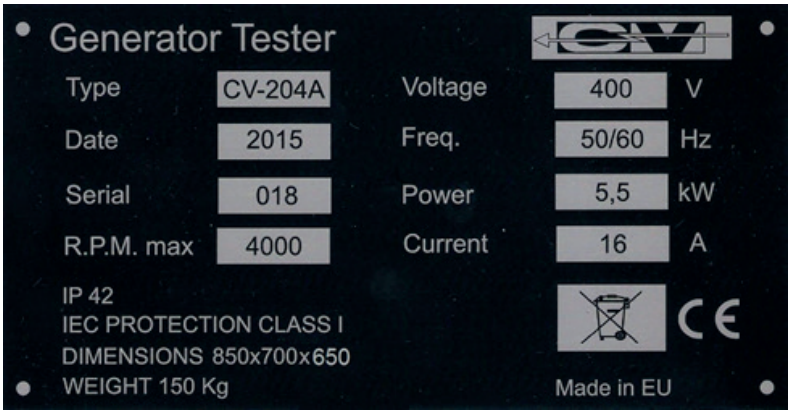



| | |
|---|---|
| 22 | Additional sockets for starter function test (+) |
| 23 | Support adapter |
| 24 | Contact terminals |
| 25 | Mounting spindles |

### 1.4 Back side view:


| | |
|---|---|
| 26 | Compressed air terminal |
| 27 | Main fuses |
| 28 | Inverter controller |
| 29 | Integrally fused circuit-breakers |

### 1.5 Data plate:




| | |
|---|---|
| **Type** | CV-307A |
| **Date** | 2017 (production year) |
| **Serial** | NNN |
| **R.P.M. max** | 4000 (motor max rotation speed) |
| **Voltage** | 400V (power supply) |
| **Freq.** | 50/60 Hz (power suply frequency speed) |
| **Power** | 7,5 kW (power consumption) |
| **Current** | 16A (maximum rated current) |

IP42
IEC PROTECTION CLASS I

CE
Made in EU

The Motoplat CV-307A fully complies with actual CE requirements.

### 1.6 Maintenance - key safety information:

Safety and protection elements MUST NOT BE MODIFIED.

- Main circuit breaker switch
- Emergency stop switch
- Safety cover lock protection switch
- Electric circuit  wires
- Metal safety cover

- The alternator test cannot be run while the metal safety cover is open.
- Do not block in any way the safety contact of the safety cover.
- Always make sure that the main socket is disconnected from the 400 V AC before any operations inside the tester.

### 1.7 Main Specifications:

| Measurements | |
|---|---|
| Width | 65 cm |
| Depth | 85 cm |
| Height | 70 cm |
| Weight | 150 kg (batteries included) |

| Electric equipment | |
|---|---|
| Motor | Three-phase, supply voltage 400 V, power 7,5 kW |
| Motor RPM | “left/right” switching, stepless speed control in the range of 0-4000 RPM. |
| Inverter | Winner V-60 7,5 kW/11,0 kW |
| Resistors | 4 units with total current capacity of 300 A, step by step load adjustment, including one with stepless adjustment from 0-65 A. |

| Tester-alternator communication | |
|---|---|
| A. | Load indicator lamp 12 V/24 V (conventional) |
| B. | Digital (based on 3 types of BSS signals and 19 types of LIN signals used in cars from 2000 to 2017). In the case of introducing new computer-alternator communication systems, the updates with the latest command signals data base will be available. |
| C. | Using information from the alternator about the actual value of the rotor current (DFM+ and DFM- ) – after pressing the DFM button, there will appear detailed frequency and offset data on the COM display. |
| D. | Using C  for Hyundai, Mitsubishi and Nissan and C1 signals characteristic for Honda. |

## Section 2 – Installation and system connection

**2.0 Requirements installation area:**

The tester must be placed on a flat and stable surface.
Please keep an extra square meter on the front and sides free to ensure a good and safe working environment.
The machine must not be held by only one person.

**2.1 Power supply**

- The tester must be connected to a 400 V three phase voltage supply.
- Each phase must be protected by a 25 A breaker.
- The tester is supplied with a standard CEE European socket. You can use a specific adapter for the kind of socket used in your country.
- The tester DC circuit is provide d with two 12 V batteries with capacity 14-18 ampere-hours (Ah) each. It is recommended to use batteries produced in AGM technology. They are designed to work with Start-Stop systems, as they are more resistant to temperature extremes and there is no chance they will evaporate!

***CAUTION!***

*The positive (+) and negative (-) poles must not be confused with each other. Otherwise, the alternator tester can be damaged. The poles are well marked on the batteries as well as on the wires. When the voltage is 24 V, the batteries are connected in series. Therefore, the batteries should be of the same name brand and condition (age and usage level). It is preferable to use batteries with capacity of 70 Ah. During every alternator test, the batteries are being charged and they should not become discharged. Nevertheless, the battery charge level should be checked periodically. If the need arises, the batteries should be charged by means of a rectifier. In the case of damaging the batteries, they have to be replaced with the new ones. Discharged or damaged batteries can have a significant influence on the test and test results.*
*Connect compressed air supply on the back of the alternator tester. The compressed air of 8-10 bar is crucial for the pneumatic system controlling the tensioning of the drive belt. When the compressed air pressure is 8-10 bar, the drive belt tension is about 700 N.*

**2.2 Printer + Test report**

Any desktop or laptop with a printer can be connected to the USB port on the right side of the alternator tester. Before this, the software accompanying the product has to be installed.
The alternator test printout is in the form of a table that includes, i.a., load value, voltage, rotational speed, and communication system, logo and company details.
Such information like the type of the alternator, identification number, time, and date of the test can be added to the table. According to the need, the result can be printed out at any time during the test. As the rotational speed and load value are set manually, one can print out the test result showing, for example, maximum load at minimum speed or the alternator's efficiency at 500, 1500 and 2500 RPM.
A side mount is mounted already for a PC screen or all-in-one PC.
PC and printer are options!

They can be customized in any way to meet the customers needs.
For more information feel free to contact us for the possibilities.
www.motoplat.nl I www.psh.nl

**2.3 Switch on/off the alternator tester:**

Once the machine is installed and correctly connected to the power supply, you can power it up by following the next steps:

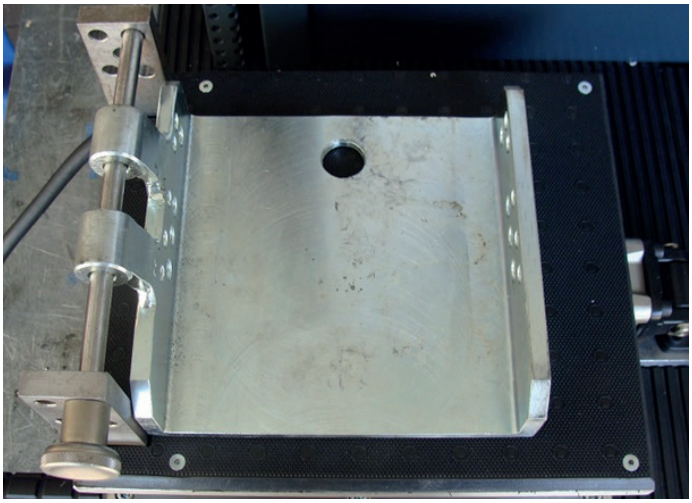
1. Switch the main circuit breaker switch (4*) from the “0” position to the “1” position (it will activate all displays and turn on the 12 V/24 V electrical system)
2. Press the“ON” button (10*) marked “POWER”.
3. Set the direction of motor revolutions (left or right) by means of the “ROTATION” switch (9*)
4. Close the safety cover
5. The motor speed regulator (12*) marked “RMP” must be in the “0” position i.e., turned maximum left. Otherwise, the motor will not start and an alarm will sound informing about the necessity to switch the motor speed regulator to the “0” position. After the motor speed regulator is in the “0” position and the safety cover is put down, the motor will start to slowly rotate at a speed of 10 RPM.
6. By turning the motor speed regulator to the right, one can increase the motor speed to 4000 RPM or decrease it by turning the motor speed regulator to the left.

***Caution!***
*If the alternator tester is being used, it does not have to be fully turned off (it is even not recommended to fully turn it off). It is preferable to use the “START” and “STOP” buttons (10*, 11*). That way, the alternator tester starts instantly without any delay. It can be connected to the power supply all the time, because in that state the power consumption of the alternator tester is minimum. It is not recommended to frequently turn off and on the alternator tester, as it contains a lot of advanced electronic measurement systems. In order to work properly, the advanced electronic measure systems should be connected to the power supply all the time rather than turned on and turned off in cycles.*

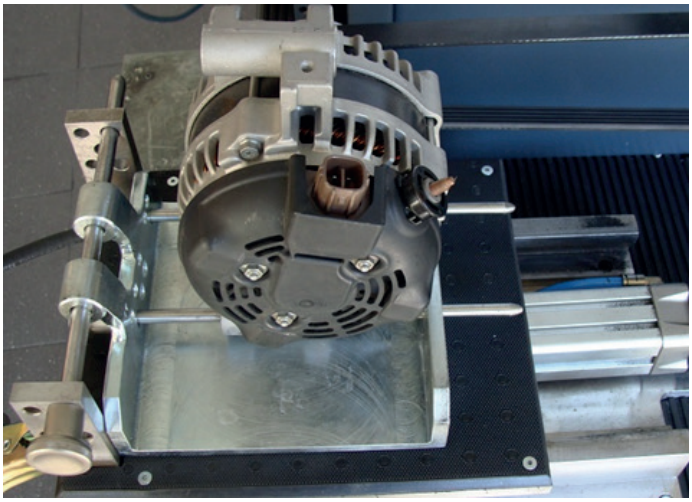
## Section 3 – Alternator – mounting and connecting

**3.0 Intro:**
All the elements needed to mount the alternator are included in the equipment accompanying the alternator tester. After mounting the alternator, connect it to the electric circuit of the alternator tester. All electrical connection cables are included in the equipment accompanying the alternator tester. Electrical connections are made with several kinds of test leads, depending on the alternator connectors and terminals.

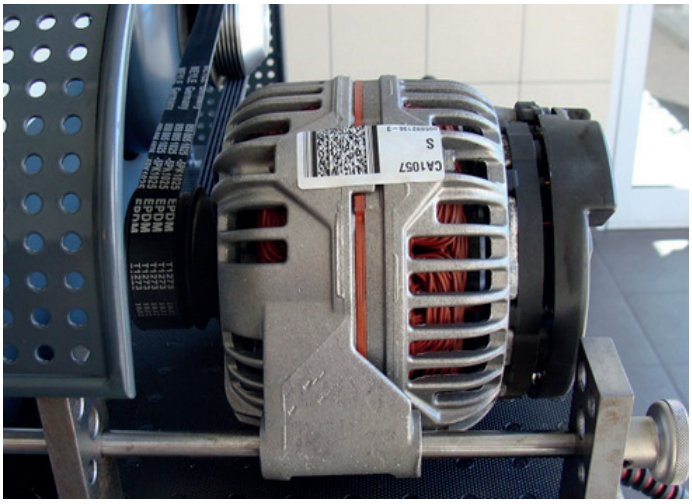
**3.1 Mounting the alternator:**
In order to mount the alternator, use a platform that is placed on the left side of the alternator tester. In the case of the alternators with a so called pad mounting solution, first attach a support that is placed on the side of the alternator tester with spindles that have a proper diameter. The spindles are also placed on the side of the alternator tester:



Next, mount the alternator by putting adequate spindles into the holes that are placed on both sides of the support:

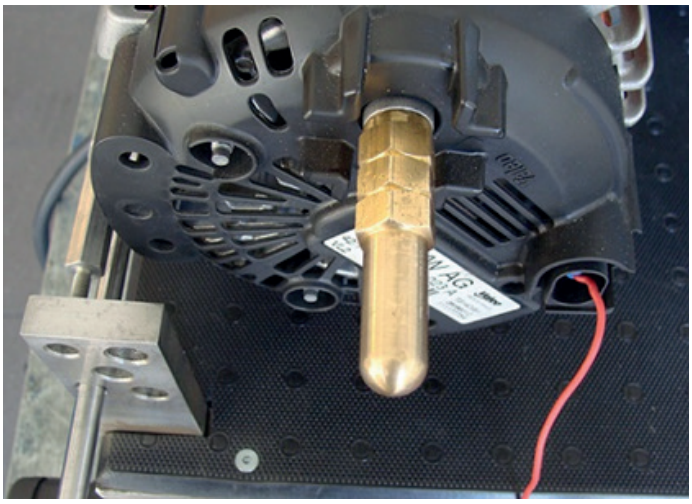


To mount alternators that are longitudinally mounted use only spindles (that have a proper diameter) without the support:



**3.2 Connecting the alternator:**

After mounting the alternator, connect it to the electric circuit of the alternator tester.
Connect the power lead to the positive clamp of the alternator stator winding (2, Figure 1.) In the absence of sufficient space for a proper connection, use one of two contact terminals (24, Figure 3) located on the left side of the alternator tester :



Then, depending whether it is a computer-controlled alternator or a conventional one, use the adequate test cables, connectors and buttons on the connect and control panel (20*).

### 3.3 Connect and control panel description:


| Connect and control panel description | |
|---|---|
| COM | Computer communication(API+)BSS/LIN(BSS-1,2,3/LIN-1 up to 21) |
| IDEN/DFM-; DFM+ | information from the alternator about the actual value of the rotor current in percentage depending on the type of the current control (current is transferred to the positive polarity brush (DFM+) or negative polarity brush (DFM-) |
| SIG | PWM computer control signal used on Ford, Landrover and Asian applications |
| FR / LI | Computer control signal used in Ford cars (both SIG and FRI/LI connectors are used to control the alternator on Ford/Landrover and Mondeo models) |
| OFF; 12,5; 13,5; 15,5 | Buttons used to control the voltage setpoint of the alternator with specified computer signals |
| OFF | "Off" command to the regulator to turn off the alternator |
| 12,5; 13,5; 15,5 | Voltage set points sent to the alternator during testing |
| MODE | Toggle through the diffent modes/functions displayed on the left screen |
| RST | Resets the CPU of the alternator control electronics(reverts to the default settings) |
| PHASE/DRIVE (PD) | Mazda control system (PHASE – output of the alternator phase) |
| DRIVE | Mazda alternator voltage control terminal |
| RLO | Toyota "Sense" PWM control system |
| C | PWM control system used on Nissan, Hyundai and Mitsubishi applications |
| STAT1 | Simulation of the alternator stator phase used to check the condition of the voltage regulator that uses one phase of the stator(Bosch regualtors) |
| STAT2 | Simulation of the alternator stator phase used to check the condition of the voltage regulator that uses two phases of the stator(Valeo Regualtors) |
| B+ | Positive connection(continuous supply) |
| GND | Ground connection |
| Vmeter | Voltmeter connection |
| LAMP | Lamp connection (conventional terminal) |

*For more information about alternator connections, please refer to our webshop.*
*www.psh.nl*

## Section 4 – Testing the alternator

**4.0 Intro**

After mounting the alternator, connecting it to the electric circuit of the alternator tester and turn on the alternator tester, you can start the alternator test.

**4.1. Load control**

The “LOAD” switch-key (13*) is used to load the alternator. The “LOAD” switch-button has a five positions, four of them are additionally marked luminous diodes (LED).
First, using the speed regulator (12*) make the alternator run more than 800 RPM. The “LOAD” switch-button must be in the “A” position, counting from the left to the right. Otherwise the diodes will flash.
The alternator load system has two safety locks:

1. When the rotational speed decreases to less than 800 RPM, the load will automatically turn off, which prevents batteries from discharging;
2. When the switch key is in other position than the “A” position, the load will not turn on in order to protect the alternator from damage.

***Caution!***

*The value of overload must not exceed the power rating value of the alternator. It can result in the alternator damage (burning out of its windings), faster battery discharge or even burning out of fuses in the battery circuit.*

Turning the ”LOAD” switch-key from the “B” position to the “E” position (inclusive) will make the red diodes light successively.
The “B” position means the load value of 65 A, which can be steplessly regulated in the range of 0-65 A by means of a potentiometer (5, Figure 1.).
Every step from the “C” position to the “E” position (inclusive) increases the load value by 65 A.
This means that at “C” position the load range is from 65A to 130A, at “D” position is from 130A to 195A and at “E” position is from 195A to 300 A.
If all resistors are turned on, the total load value is 300 A. Taking into account the resistance of wires, the maximum load value is 300 A. Thanks to the stepless control in the range of 0-65A, the load can be adjusted to every type of alternator with an accuracy of 1 A.

***CAUTION!***

*The load must not be turned on in the situation when the alternator is not driven by the motor.*

In the case of 24 V alternators, the safety requirements and the procedure of turning on the alternator tester is the same. However, when the voltage doubles its value, the load value of every resistors also doubles.
Thus, the “B” position provides a step less load control in the range of 0-150 A, the “C” position adds 150 A to the alternators load. The total load value is 300 A, a sufficient one to test 24 V alternators.
Moving the switch-key to the further positions on the right side will not make any of the red diodes light and the load of the alternator will not increase further.
In the case of a long-term loading of the alternator, cooling fans mounted in the casing of the resistors turn on. The cooling fans turn off automatically, when the temperature falls below 50 degrees Celsius.

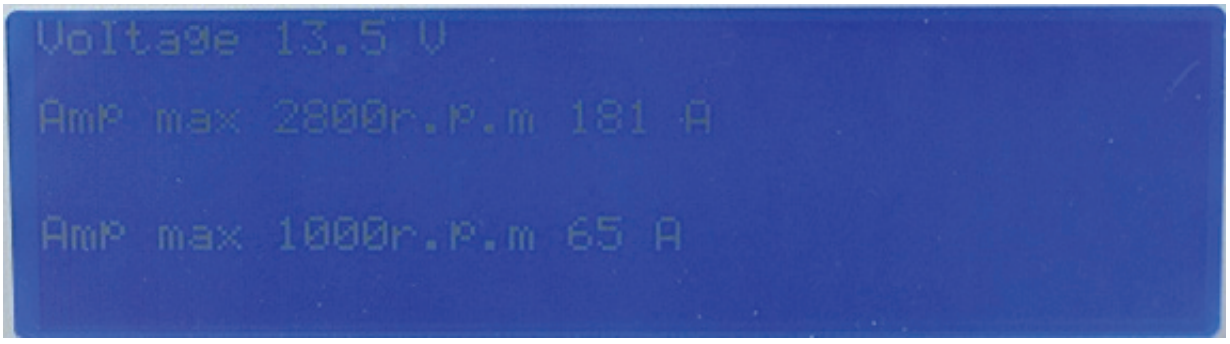
**4.2 Using the manual operating mode:**
The manual operating mode allows to change manually yarious parameters of the machine, and to control separately the alternator signals. With this operating mode, the user can make specific tests in order to characterize some failures. This mode doesn't give any interpretation of results.

**4.3 Testing the alternator controlled by the charging control lamp:**
After mounting and connecting the alternator (see section 4.1., 4.2. and 4.3.) set the mode selector switch (6, Figure 1) to position "MANUAL" and press the START push-button(10, Figure 1). Then use the speed regulator (12, Figure 1.) to increase the speed value above the idling speed value of an alternator mounted in a car. Next, increase the load value (see section 5.1.) and the speed of the alternator to achieve the maximum power and the charging voltage of 13,8-14,6 V. The charging voltage is registered by the voltmeter of the alternator tester (18, Figure 1.).

**4.4 Testing the computer controlled alternator:**
After mounting and connecting the alternator (see section 4.1., 4.2. and 4.3.) set the mode selector switch (6, Figure 1) to position "MANUAL" and press the START push-button(10, Figure 1).Then use the speed regulator (12, Figure 1.) to increase the speed value above the idling speed value of an alternator mounted in a car. Next, use the keys (OFF; 12,5; 13,5; 15,5) on the connect and control panel to choose the specified operation mode of the alternator and observe its reaction on the level of charging voltage provided to it at the moment. If the alternator tester software (API+ - Automatic Protocol Identification +) fails to recognize the command signal, after about 60 seconds the display will show an information about the failure of communication with the alternator.

**4.5 Using the automatic operating mode:**
The automatic operating mode allows to control alternators through an automatic and predefined sequence of tests, which depends on the terminals and signals of the alternator.

**4.6 Testing the alternator controlled by the charging control lamp:**
After mounting and connecting the alternator (see section 4.1., 4.2. and 4.3.) set the mode selector switch (6, Figure 1) to position "AUTO" and press the START push-button(10, Figure 1). During several minutes the machine carries out the test and the result in the form of load at given rotational speed will be shown on the screen ammeter:

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## Section 5 – Maintenance and Troubleshooting

**5.0 Maintenance recommendations**
Regularly clean the alternator tester.
Charge regularly the batteries in case of intense use.

**5.1 Quick troubleshooting guide:**
In case of a malfunction or a failure on the alternator tester, please verify these following points:

**The tester does not start:**
Verify the machine is connected to the power grid
Verify the main fuses on the rear side are still on.
Verify emergency STOP mushroom pushbutton is unlocked.

**The motor does not start:**
Verify the protection cover is closed and the safety switch is not defective.

**No alternator excitation:**
Verify the belt doesn’t slide: alternator speed can be not sufficient.

**Charging the batteries is impossible, there is always a big load current:**
Batteries should be replaced.

## Section 6 – Support

### 6.0 Contact Information:


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1244NV 's-Graveland
Holland

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