OPEN SYSTEMS

“ValveTester OS.111”

Injector’s solenoid inspection device

Passport.
Technical description.
User manual.
Warranty card.

2024 г.

v1.4

Content

Content 2
Introduction 3
1. General information 3
2. The purpose 3
3. The basic technical data and specifications 4
4. The design of device 4
5. Instructions for use 5
6. Limitations of liability 6
7. Preparation for work 7
8. Work with the device 8
9. The firmware update 21
10. The set of delivery 22
11. Warranty 23
Appendix №5 Warranty 24
Notes 25
Notes 26

Introduction

This passport is a document certifying the basic parameters and technical characteristics of the ValveTester OS.111 controller guaranteed by the manufacturer for testing and verifying the performance of common rail diesel injectors. This passport allows you to get acquainted with the device, the procedure and rules for its operation, compliance with which will ensure the correct operation of the controller.

1. General information

The ValveTester OS.111 controller is an electronic device that measures the electrical parameters of a solenoid of a electrically controlled injector (any type (CommonRail, UIS, HEUI and other) and any manufacturer).

2. The purpose

The device is designed to diagnose and measure the operating parameters of the solenoid valves for controlling fuel equipment (for example, CommonRail injectors, unit injectors and sections). The device allows you to adjust the control solenoid valve to ensure the same operating parameters of the control solenoid valve for all engine cylinders (to ensure uniform engine operation). The parameters of the control solenoid valve are among the basic parameters (along with the hydraulic parameters of the dosing device and the compression value in the cylinders) and directly affect the uniformity of fuel delivery and the uniformity of engine rotation.

At the moment, the device allows working with the following types of solenoid control valves:

- 799xxx;
- 755xxx;
- 720xxx;
- 701xxx;
- CRI1;
- CRI2-18;
- CRI2-20;
- CRI 2.2;
- CRI 1-14;
- DENSO 3;
- DENSO 0.5;
- 120288 SCV;
- 120288 NCV;
- Delphi SmartInj&Pump;
- Delphi E1;
- Delphi E3;
- Delphi CR;
- Cummins XPI;
- custom.

The device provides:

- measurement of solenoid's operate current;
- measurement of solenoid's release current;
- indirect measurement of the air gap of the solenoid valve;
- measuring the inductance of solenoid;
- measuring the active resistance of solenoid;
- measuring the resistance of isolation of solenoid (V2 version);

3. The basic technical data and specifications

- Supply voltage, V - ~ 220 V ± 15%;
- Power consumption, W, no more - 350 W.
- Mass of the device: 2 kg;
- Dimensions (length x width x height) - 240x287x70;

4. The design of device



Figure 1. Front view

On the front panel of the device are: display, control buttons, a connector for connecting to the injector (X17), a power toggle switch.



Figure 2. Back view

On the back of the device are the connectors:

• USB - for connecting to a personal computer;

• "Power" for connecting mains power ~ 220 V.

The "Power" connector is structurally made in one housing with a fuse.

5. Instructions for use

Environmental Requirements:

• Operating temperature: +5 ºC to +40 ºC

• Temperature during transportation: -20 ºC to +60 ºC

• Relative humidity (non-condensing): working 8% - 80%, storage 5% - 95%.

• Dustiness of air: no more than 75 mcg / m3

Before turning on the device, it is necessary to check visually or with the help of devices, the condition of the connectors-adapters, the power cable 220 volts.

If the device was transferred from a cold to a warm room, it is strictly forbidden to turn it on within 1-1.5 hours.

After switching on, let the device run for 2-4 minutes, then proceed to work.

Strongly forbidden:

• turn on the device with faulty power cables;

• connect the device to a AC network that does not have a grounding loop;

• connect the device to the AC network with a cable that does not have a grounding contact;

• use the device in conjunction with electrical equipment not connected to the ground loop.

Failure to comply with the last three points may result in electric shock.

6. Limitations of liability

The manufacturer is not liable to the buyer of this product or a third party for damage or loss suffered by customers or a third party as a result of improper use of the product, including inept or erroneous actions of personnel, as well as for losses caused by the action or inaction of this device.

Under no circumstances will the Manufacturer Company be liable for loss of profits, lost savings, losses caused by an accident, or other subsequent economic losses, even if the company was notified of the possibility of such losses. The manufacturer is not liable for losses incurred by you on the basis of claims of a third party, or caused by failure to fulfill your obligations.

The manufacturer is not responsible for any malfunctions and losses resulting from the use of additional devices recommended for use with this device, as well as its modification, repair or modification to its design, not provided for by the operating instructions, including when using a self-made adapter connector.

7. Preparation for work

Before using the device, carefully read the operating instructions.

When preparing the device for operation, the following steps must be taken:

Perform an external inspection of the device and connecting cables. External inspection of the device and connecting cables is carried out with the power off and consists in identifying mechanical damage to the device and connecting cables.

8. Work with the device

Description of control elements of the device



Figure 3. Control elements of device on front panel

- MENU / CANCEL button switches the display between the main operating modes of the device (the mode of measuring the active resistance and inductance of the control solenoid valve; the mode for determining the value of the opening and closing currents, as well as the gap of the control solenoid valve) and the settings menu (separate for every operating mode) or global settings menu (by long press);

- UP and DOWN buttons switch between the main operating modes of the device (measuring the resistance and inductance of the control solenoid valve; determining the value of the opening and closing currents, as well as the gap of the control solenoid valve), or navigate the device parameters menu;

- control knob allows you to change the parameters of the device in the menu; - the START / STOP button starts the measurement mode;

- POWER button to turn on / off the device;

Start work with device

- Switch on the power supply of the device;

- Connect the control solenoid valve to the device using the supplied cable;

- Using the menu, select the required type of control solenoid valve;

- If necessary, measure the active resistance and inductance of the control solenoid valve;

- switch to the mode of determining the value of the opening and closing currents, as well as the gap of the control solenoid valve and start the measurement with the START / STOP button.

Operating modes:



Figure 4. Type selection mode - **Pulse**

- Operating mode of injector type selection and "tapping" of the injector solenoid valve (to eliminate gaps in the process of tightening the solenoid valve). In this mode you can select injector's type and run "tapping" by "Start" button. Also user can change mode (by pressing the knob) from **Pulse**("tapping") to **VStest** and **BIPtest**;



Figure 5. Type selection mode - **VStest**



Figure 6. Type selection mode - **BIPtest**



Figure 7. Type selection mode settings menu - **Pulse**

Settings available in type selection mode – Pulse (access by MENU/CANCEL button):

- **Pulse qty** - setting the number of pulses for "tapping" the injector solenoid valve (to eliminate gaps between parts when adjusting the air gap).



Figure 8. Type selection mode settings menu - **VStest**

Settings available in type selection mode – VStest (access by MENU/CANCEL button):

- **VScurrent** - setting the value of holding current to provide stroke test on injector;

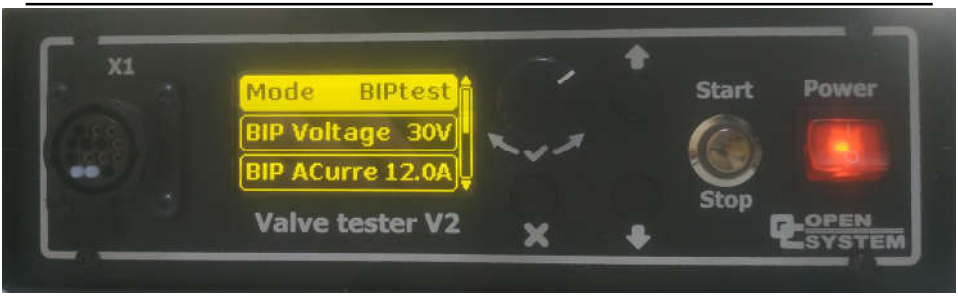


Figure 9. Type selection mode settings menu - **BIPtest**

Settings available in type selection mode – BIPtest (access by MENU/CANCEL button):

- **BIP Voltage** - setting the value of voltage of signal applied in BIPtest to injector.
- **BIP ACurrent** - setting the value of current of signal applied in BIPtest to injector.

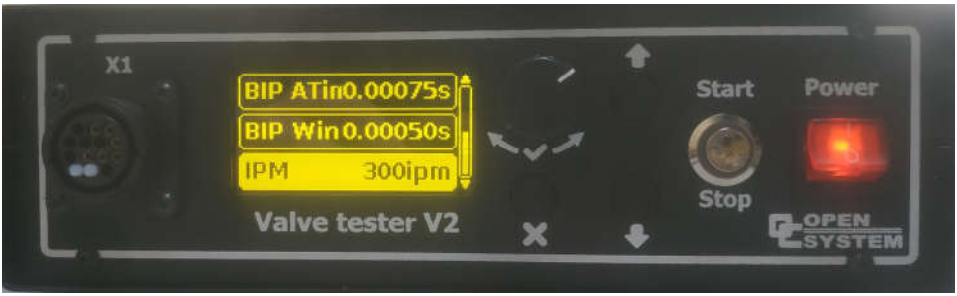


Figure 10. Type selection mode settings menu - **BIPtest**

- **BIP ATime** - setting the value of time of signal applied in BIPtest to injector.
- **BIP Window**- setting the value of time of BIP detection of signal applied in BIPtest to injector.
- **IPM** - setting the value of frequency of BIP measuring signal.



Figure 11. LR measurement mode

- Operating mode of measuring the active resistance and inductance of the electromagnetic control valve. In this mode you can measure a LR parameters by “Start” button;



Figure 12. Gap measurement mode

- Operating mode of determining the value of the opening and closing currents, as well as the gap of the electromagnetic control valve. In this mode you can start a measuring of a closing and release current and gap by “Start” button. In this mode you can switch (by pressing of rotating knob) to Detail view (it is suitable only for experienced users). Also in left side of screen is displayed setup and measured value of max value of current in measuring signal. In this mode user can adjust setup value by rotating knob.



Figure 13. Gap measurement mode with Detail view enabled

In Detail view device is displayed extended info about current values detecting.

In Detail view device is displaying all (up to 4) detected points (current value, relative amplitude (in percents, relative to the max amplitude))for closing and release currents.

When Detail view is disabled device displaying only one point (for closing and release currents) with max amplitude.

Settings available in Gap measurement mode (access by MENU/CANCEL button):

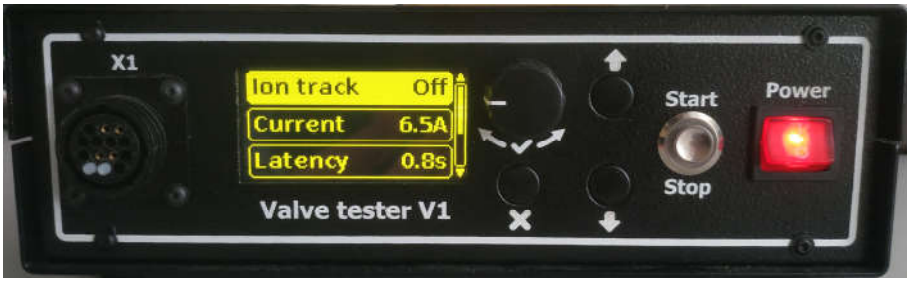


Figure 14. Gap measurement mode settings menu

Ion track – "tracking" mode of the Ion detecting (Ion will be detected only in +-0.3A range from last detected value of Ion).

Current –setting the maximum value of the current of the measuring signal that is applied to solenoid.

Latency – setting the latency of measuring signal to increase the value of measured signal.

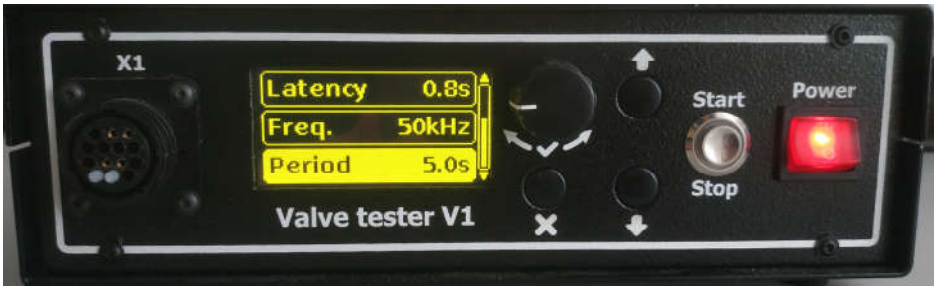


Figure 15. Gap measurement mode settings menu

Freq. – setting the frequency of PWM of measuring signal to increase the value of measured signal .

Period - setting a period of measuring signal (measured parameters refresh rate).



Figure 16. Gap measurement mode settings menu

Auto+ – enabling/disabling automatic increment (if device produce required level of current, but cant measure gap and ON/OFF currents) of maximum value of the current of the measuring signal .

Auto+ Max – setting the max percentage of automatic increment of maximum value of the current of the measuring signal .

Auto+ Max – setting the step of automatic increment of maximum value of the current of the measuring signal .



Figure 17. Manual PWM control mode

- Operating mode of manual PWM control (ON/OFF by "Start" button, PWM value changed by rotating knob);



Figure 18. Manual PWM control mode settings menu

Settings available in manual PWM control mode (access by MENU/CANCEL button):

- **Freq.** - frequency of PWM in manual PWM control mode.
- **PWM** – value of the PWM in manual PWM control mode.



Figure 19. Insulation measurement (base mode) operation mode (in V2 version only)



Figure 20. Insulation measurement (advanced mode) operation mode (in V2 version only)

- Insulation measurement (in V2 version only) operationg mode(ON/OFF by “Start” button, base/advansed view changed by rotating knob);



Figure 21. Insulation measurement mode settings menu (in V2 version only)

Settings available in insulation measurement (in V2 version only) mode (access by MENU/CANCEL button):

- **Current** – value of current in solenoid to heat up the solenoid in insulation measurement mode.
- **`Time`** – time to heat up the solenoid in insulation measurement mode.



Figure 22. Global settings menu

Global settings menu (access by long press MENU/CANCEL button):

Language – language selection.
PWM – enable/disable manual PWM mode control menu.
Unit – enable/disable displaying measuring units in Gap mode.
Key volume –.value of volume level at key processing.
Knob volume –.value of volume level at knob processing.
HWconfig – displaying device's internal config.
pwrON – displaying device's internal counter.
Run – displaying device's internal counter.
Time – displaying device's internal counter.
SCC – displaying device's internal counter.
SN – displaying device's serial number.

9. The firmware update

To update the device firmware, do the following:

1. Connect the USB communication cable to the device connector and connect it to the USB port of the PC.
2. Connect the network cable to the power connector and to the AC 220V / 50Hz.
3. Turn on the device with the power toggle switch on front panel.
4. Start the PC and run update software to update the firmware of the device.
5. Click the “Update Firmware!” Button.
6. Wait for the update process to complete.
7. Close the updater window.

10. The set of delivery

Passport (Technical description, instruction manual) - 1 pc.
Device “ValveTester OS.111" - 1 pc.
Connecting cable for injectors - 2 pc.
Connecting adapter for 720XXX injectors - 1 pcs.
Power cable 220V - 1 pc.
Fuse 5A - 1 pc.

11. Warranty

The manufacturer guarantees the stable operation of the ValveTester OS.111 device, subject to the owner observing the storage and operation rules set forth in this passport.

The warranty period is established by the manufacturer - 18 months from the date of receipt of the product, unless otherwise specified by the manufacturer and the buyer by an additional contract.

The manufacturer notes in the warranty card the year, month, day of sale, legal address, telephone number of the company performing the warranty repair (the warranty card is in the appendix to the passport for the ValveTester OS.111 device).

During the warranty period, the owner is entitled to free repair upon presentation of this passport and warranty card. After repairs are carried out, a list of troubleshooting steps is entered in the warranty card.

Not a ground for complaint: violation of the integrity of the connecting wires (adapter cables).

The manufacturer has the right to refuse warranty repair of the ValveTester OS.111 device in the following cases:

• presence of traces of opening the device case;

• the presence of traces of mechanical damage on the body or electronic circuit board of the device;

• the presence of foreign objects and liquids in the housing or on the electronic board of the device;

• in case of non-observance of the rules of storage and operation of the device.

Without presenting a warranty card and in case of violation of the safety of seals on the product, claims to the quality of work and warranty repairs are not made.

During the warranty period of operation installed on the product, repairs are carried out at the expense of the owner if he does not use it in accordance with these operating instructions.

The manufacturer provides further repair of the ValveTester OS.111 device, after the end of the warranty period under a separate contract.

Appendix №5 Warranty

Warranty card №_____

Device ValveTester OS.111 for testing and verifying the performance of diesel injectors of the Common Rail system.

Warranty repair and maintenance of the ValveTester OS.111 controller is carried out by the enterprise _____.

Address _____

Phone. _____

Date of sale "____"_____ _____

Notes

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