

INJECTOR CLEANER & DETECTOR



Please read carefully and understand the operation manual Instruction before operation.
Operators must obey all safety procedures & instructions.

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I. Function and Characteristics

This product is applicable to diagnose and clean fuel injectors of various cars manufactured worldwide, improving stability, reliability and reducing pollution. It can perform automatic detecting, analyzing and cleaning.

Main functions:

- Can do reverse flushing, flush-back cleaning, ultrasonic flushing, and disaffiliation-free flushing to one or more fuel injectors
- Automatically simulate the overall process under various pulse width and engine speed. The operation status of the fuel injectors can also be observed whether at acceleration and deceleration.
- Can manually set time, pulse width and rotation speed of the fuel injector, and observe the performance under varied parameters. Ease and convenience of operation.
- Can determine the shortest on-off cycle and the quality of the injector.
- Can do oil circuit testing, and disaffiliation-free flushing to the engine.
- Ultrasonic cleaning: ultrasonic cleaning for the single or multiple injector, can thoroughly remove carbon deposition of injector.
- Uniformity test: test the uniformity of spray nozzle of oil.
- Atomization observation: using the background light, can comprehensive and careful observation of nozzle jet atomization.
- Leak test: injector can be detected under the high pressure of sealing and dripping.
- Fuel injection quantity detect: can detect nozzle under certain operating conditions (such as the same time, same timer) of fuel injection quantity.
- Automatic cleaning detection: under certain operating conditions, the actual simulation nozzle test under various conditions.

Main features:

- Strength of ultrasonic cleaning technology, cleaning ability.
- Use the electronic voltage regulator control technology, hydraulic stability, wide adjustable range.
- Using high-definition digital tube display, the operation is clear, easy to learn.
- Tank liquid level visual display, test agent can be recycled.
- Background light LED bright, clear view of nozzle work situations
- Patents and applicable to a variety of models of replaceable compound accidentally.
- Within the scope allowed adjustment can be arbitrary adjust the nozzle test time.

Working frequency. The number of injection. The shortest switch pulse width and so on.

Technical Parameter

Dimension: 630mm*610mm*740mm

Weight: 50kgs

Voltage: AC220V , 50 Hz , 250W

Operation Temperature:-10C°~40° c

Tank Capacity: 4L

Test Tube Capacity: 120CC

Ultrasonic Frequency: 28KHZ±0.5 KHZ

Rotation Speed: 0~15000r/min

Step: 100r/min

Time Counting Range: 0~9900 sec

Step: 50 sec (adjustable)

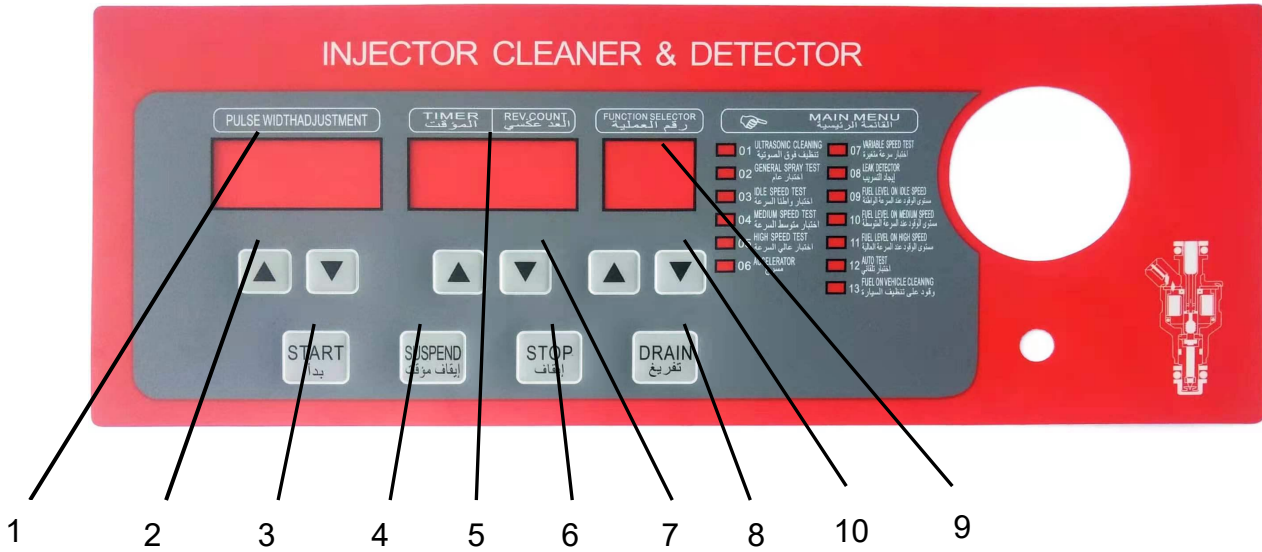
Oil Pump Pressure: 1.8kg/cm²----10kg/cm²

Fuel Flow: 4.5 L/min

II. Introduction about different parts of Injector Cleaner & Detector

1. High-pressure tube
2. Fixed screw and bolt
3. Oil Circuit / Fuel distributor oil rail
4. Test tube
5. Oil pressure gauge
6. Digital display window
7. Detecting oil outlet
8. Pressure regulating valve

III. Instruction on function keys of the control panel



- 1、 Pulse width widows: Show the injector working pulse width
- 2、 Pulse width adjustment button: Adjust the injector working pulse width
Press ▲ key, increase the injector pulse width while cleaning.
Press ▼ key, reduce the injector pulse width while cleaning.
- 3、 Start: After the execution of the selected function.
- 4、 Suspend: Press to pause the selected function.
- 5、 Timer/REV.Count: How long the injection lasts and How many times the injection takes place.
- 6、 Stop: stop the selected function.
- 7、 Injection time adjustment button:
Press ▲ key, increase the injector working time and injection times.
Press ▼ key, reduce the injector working time and injection times.
- 8、 Darin: Drain back liquid to tank.
- 9、 Function Selector

10、 Function Selection button:

Press ▲ key,

Press ▼ key,

11、 Main Menu

IV. Operation process

1. Ready to work

1) Remove the nozzle from the car, check whether the rubber sealing ring is damaged, if damaged, should be replaced in time before washing test, in order to avoid leaking test. Then nozzle into gasoline or detergent, carefully remove after the external pollution with a soft cloth to wipe clean.

2) Switch on power supply (note: this equipment is a long time after power restart, will delay for a few seconds).

3) From the parts cleaning bracket out of box, put into the ultrasound groove, and wipe clean the nozzle in the ultrasonic tank cleaning bracket positioning hole.

2. Ultrasonic cleaning

Ultrasonic cleaning is the use of ultrasonic wave propagation in a medium which is caused by shock wave penetrating and cavitation, and will be with complex shape. Inner cavity and the object of pores powerful cleaning function to thoroughly remove stubborn carbon deposition on the nozzle.

Link fuel injectors to pulse signal circuit, and place the injectors into the ultrasonic rinse tank. Add cleaning liquid into the tank (Normally two thirds of the tank), and switch on ultrasonic.

Press the key projects to choose the selected "01" ultrasonic cleaning, and then

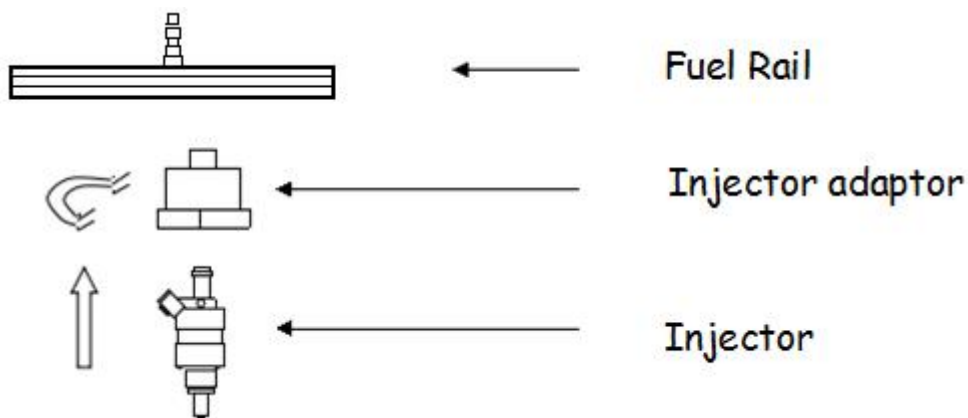
press work time up and down keys to set the time. (the system default for 10 minutes, if you want to modify the time can be up and down keys to change).

In ultrasonic cleaning at the same time, open the heating switch on the right side of the cleaning agent for heating can be heated to 50 degrees Celsius (15 minutes), without heating function, please pay attention to keep the heating switch closed.

3. Add the test liquid.

Add test liquid from the liquid into the mouth. (about 1500 ml, filling liquid surface height is not less than 1000 ml at ordinary times).

4. Install the injector



A. plug injector connector into the hydraulic oil circuit board panels.

B. positive nozzle installation (the nozzle painted a little grease on the "O" shape circle)

C. the oil plate and the nozzle is installed on the upper seat, and fixed with fixed the self-contained stick the self-contained set of screw fixation. Ready to test.

5. Operating Methods and steps

●02 General spray test

- 1) connected the black flow line quick connector to the oil pipe joint on the board, plug injector pulse cable.
- 2) according to the key projects to choose the selected item "02 General spray test".
- 3) according to the working time up and down keys to set the time. (set to 2 minutes)
- 4) press "start" began to work.
- 5) rotating pressure adjusting knob, make the pressure switch to 2-5 kg. (in the electronic injection system, the general hydraulic work in 2-5 kg)
- 6) press up and down keys to choose the appropriate pulse width. (the system default is 3 ms, general adjustment for the 3 ms).
- 7) gradually reduce the work time, when is zero, the system automatically stop.

●03 Idle speed test

- 1) according to the key projects to choose the selected item "03 Idle speed test".
- 2) press "start" began to work.
- 3) the rest of the operation steps same as 02.

●04 Medium speed test

- 1) according to the key projects to choose the selected item "04 Medium speed test".
- 2) press "start" began to work.
- 3) the rest of the operation steps same as 02.

●05 High speed test

- 1) according to the key projects to choose the selected item "05 High speed test".
- 2) press "start" began to work.

3) the rest of the operation steps same as 02.

●06 Accelerator

1) according to the key projects to choose the selected item "06 Accelerator".

2) press "start" began to work.

3) the rest of the operation steps same as 02.

PS:

A. The fuel pressure, Work time and pulse width be setted automatically, the system default 10 s for a cycle, the user can be set up.

B. The system will automatically turn continuous loop simulation engine three times in 1500-5000 turned uniformly accelerated the working condition of nozzle and the fuel injection quantity.

●07 Variable speed test

1) according to the key projects to choose the selected item "07 Variable speed test".

2) press "start" began to work.

PS: A. The fuel pressure, work time and pulse width be setted automatically, the system default is 10 s in a cycle time, the user needn't to set again.

B. System will automatically continuous cycle three times simulation engine at idle speed (1500 RPM), medium speed (3000 RPM). High speed (5000 RPM) at the time of the nozzle work condition and fuel injection quantity.

●08 Leak detector

1) according to the key projects to choose the selected item "08 Leak detector".

2) press "start" began to work.

3) the rest of the operation steps same as 02.

PS: A. Pulse width system default is 3 ms, no need to set.

B. The simulation of vehicle oil pressure is 0.3 Mpa when nozzle are dripping phenomenon.

●09 Fuel level on idle speed

1) according to the key projects to choose the selected item "09 Fuel level on idle speed".

2) according to the set number of injection times up and down keys. (generally set at 2000 times)

3) the rest of the operation steps same as 02.

PS: Simulation engine at idle fuel injectors work when a certain number of working conditions and the fuel injection quantity.

●10 Fuel level on medium speed

1) according to the key projects to choose the selected item "10 Fuel level on medium speed"

2) the rest of the operation steps same as 09.

●11 Fuel level on high speed

1) according to the key projects to choose the selected item "11 Fuel level on high speed"

2) the rest of the operation steps same as 09.

PS:

A. Flow balance: at different speeds for traffic balancing test, when the test tube in the test tube liquid reagent beta 2/3, pause or stop working, observing the balance of the fuel injection quantity. For a car all injector fuel injection quantity deviation should not exceed 2%. Or reference to the relevant technical manual injector to determine the nozzle flow balance.

B. injection observed: in a variety of shapes observed under the same car speed all injection nozzle shape angle is uniform. Nozzle opening width can be adjusted simultaneously, check the minimum nozzle opening width are the same.

C. Leak test leak test: is to detect injector nozzle needle in the system under high pressure sealing. (Observation injector seal, generally there should be no leakage within one minute).

●12 Auto test

1) according to the key projects to choose the selected item "12 Auto test".

2) The system will automatically run 02,03,04,05,08,09,10,11projects, including system settings when the project ends 08,09,10 delayed, so that the test tube in the test agent is drained.

●13 Fuel on-vehicle cleaning.(optional)

※ **Disaffiliation-free flushing**

First, cut off the oil inlet pipe from the joint of the fuel filter of the car yet to be cleaned and switch off the safety device of the oil pump. Connect the suitable plug to one end of the oil inlet pipe of $\phi 10$, and connect the other end of the pipe to the quick acting joint of disaffiliation-free flushing and then insert the joint into the cleaning liquid outlet.

Second, Cut off the oil return pipe of the engine, and connect it to an $\phi 10$ oil pipe tightened with a pipe fixture. Connect the $\phi 10$ oil pipe to an $\phi 8$ oil pipe. Connect the $\phi 8$ oil pipe to the quick acting joint of the machine and finally insert the joint to the cleaning liquid outlet on the upper right side of the machine.

Third, tune the oil pressure to the assigned system value. Start the engine and clean it for 15 minutes (The ratio of fuel to cleaning liquid is 10:1). Step on the car accelerator

continuously to drain the dirt.

※ **How to detect dribbling?**

Select the right joint according to the model of the fuel injector and connect them together. Check the “O” ring to make sure if it is OK. If not, change it. Place the injectors onto the test stand and press “START” key to tune the pressure to the designated pressure, 10% higher is better, and then observe whether the injector is oil leaking. If the fuel drains more than one drop within one minute or beyond the technically allowed volume, change the .

※ **How to diagnose the injecting angle and atomization?**

Chosse “05 High speed test” and observe to make sure that the injecting angle. The injecting angle must be identical or be up to the manufacture’s specification, and atomization must be coefficient without efflux. Otherwise change injectors.

injectors

※ **How to diagnose the distributive value of the fuel injectors?**

Switch off “DRAIN” , and press “START”. Select “02 function”. See if the distributive value is within the range of 34-38ml (or up to specific volume). Otherwise change injectors.

※ **How to diagnose the uniformity of distributive value?**

Set the rotation speed to 650 rpm, pulse width 3ms and times counting 4000. Press “START” and tune the pressure to the assigned pressure. Press “START”. After times counting is finished (the digital display is “0000”), observe the oil quantity each injector

injects into the test tube. If the dispersion is within 9% or matches technical specification, the injectors are still up to standard. Otherwise the injectors must be changed.

※How to change testing liquid

The testing liquid may become foul after repeated usages, when it is time for replacement. Change the liquid as follows:

1. Insert the plug end of the oil pumping pipe to the quick acting coupler at top of the device, the other plug end to the oil drum for receiving the foul liquid.
2. Press "DRAIN" key and the foul liquid in the oil tank will be pumped out automatically. Switch off pumping at the emptiness of the tank. Or loosen the screw beneath the tank to release the foul liquid.

V. Tidy up and maintenance

1. Tidy up

- 1) Turn off the power, unplug the power cord.
- 2) Replace all fittings accessories box to save.
- 3) Replace the ultrasonic cleaner bottle sealed and equipment with a soft dry cloth to wipe clean.
- 4) If long-time haven't use, please open the tank valve test let test liquid back in the bottle sealed.

2. Maintenance

- 1) Replace the test liquid

When the test liquid is used for a period of time, will accumulate a lot of impurities, dirt containing test liquid can not be used, or easily clogged fuel injectors. So should replace the test liquid. First, open the Oil drain outlet, and then use a net to clean up the waste oil , use the cleaned oil to clean it again. After cleaning, re-close the test liquid valve, pour new test liquid.

2) Fuse Replacement

The left side of the device there is a power outlet at the square box labeled fuse, opened the box-you can see the fuse. If blown, replace with the new one (5A).

3) Dust proof

A. Cover the device after usage to prevent dust entering into the glass test tube and to avoid blockage of the oil return DRAIN.

B. Clean the control panel after usage.

4) Oil pump maintenance

A. After disaffiliation-free flushing, draw the dirty cleaning liquid out from the oil tank, or release it from the joint at the base of the oil tank to avoid corrosion to the oil pump.

B. Use this device often, at least every 7 days. That means fill cleaning liquid into the oil tank until the high level indicator light is on at lease every 7 days, and press “Pumping” key, stop it in 10 minutes.

C. Replace the foul cleaning liquid in the oil tank in time.

5) Option of cleaning liquid

The liquid must be innocuous, non-corrosive, unflammable, and contains no water.

The cleaning liquid produced by factory.

VI. Cautions

1. Must operate in line with the instruction.
2. This machine must work under AV 220V OR 110V, and must be grounded.
3. Keep away from smoke and fire.
4. Energized without digital display (there may be a few seconds delay), check the power has power; If yes, please check if the plug is securely connected, or check the fuse is blown. If not broken, and the intermittent pressing the switch several times does not work, please contact your local distributor, must not disassemble.
5. When ultrasound groove not add cleaning liquid, it is forbidden to open the ultrasonic cleaning project, in order to avoid damage of empty into the ultrasonic system.
6. Every time change the test liquid , must be all empty, and then add 1500 ml test liquid.
7. Using unqualified test liquid will cause pump. Oil pipeline corrosion and pressure gauge failed.
8. Use of other cleaning liquid and test liquid will cause equipment surface coating spalling.
9. It is forbidden to use kerosene. Gasoline. Water and other test liquid and cleaning liquid and so on as the unit test liquid and cleaning liquid is used. Otherwise it will make the "O" type circle inside the equipment. Rubber parts such as damage to the pipeline, causing leakage.
10. Cleaning liquid and test liquid cannot be used in confusion.
11. Inspection without reference is prohibited within maintenance period. Any problem, contact the local distributor.
12. Special testing liquid and cleaning liquid are requested.

Parameters for the pressure of the fuel systems worldwide

| | Brand | Model | System pressure(kg/cm ²) |
|-----------------------------------|----------|---------------------------------------|--------------------------------------|
| EURO CAR | AUDI | 200/200 Quattro 2.2L Turbo | 4.8~5.5 |
| | | 90/80/90 Quattro 100/100 Quattro 2.3L | 6.2~6.6 |
| | | 80 2.0L | 6.3~6.6 |
| | BMW | 528 | 2.7~2.9 |
| | | Others | 2.8~3.2 |
| | JAGUAR | All models | 2.4~3.2 |
| | BENZ | W140/W124/W129 | 3.3~3.7 |
| | | 190E 2.6L/260E/300 | 5.4~5.6 |
| | | 420/560 | 6.2~6.4 |
| | PEUGEOT | 505 2.2i /505 Turbo | 2.5~2.7 |
| | PORSCHE | 911 Carrera 3.6L | 3.2~3.6 |
| | | 911 Carrera 3.2L | 2.3~2.7 |
| | SAAB | 900/900S | 2.5~3.1 |
| | | 900 Turbo | 2.5 |
| | | 9000 | 2.0~2.5 |
| | VW | Cabriolet / Fox | 2.7/4.8~5.5 (Idle speed) |
| | | Golf/Golf GT/Jetta/Passat | 2.0~2.5/ 5.3~5.8(Idle speed) |
| | | Vanagon | 2.0~2.5 |
| | VOLVO | All Models | 3.0 |
| | | 2000 | 2.2~2.7 |
| | HONDA | ACCORD 2.0、2.2 | 2.9 |
| | | 1.5L | 2.6~2.9 |
| | | 3.2L | 2.7~3.0 |
| Accord2.0L/Civic 1.6L/CRX/Prelude | | 2.5~2.9 | |
| SUZUKI | Sidekick | 2.4~2.8 | |
| | Swift | 1.8~2.1 | |
| DAEWOO | | 2.8~3.0 | |

| | | | |
|------------------|-------------------|--|---------------------------------|
| EURO CAR | HYUNDAI | | 2.7~2.8 |
| | MITSUBISHI | V63000 | 3.5 |
| | | Conquest/Starion/Montero/ Raider(2.6L/2.6L Turbo) | 0.2~0.3 |
| | | Others | 2.7 |
| | DAHAITSU | 4 Cylinder Charade | 1.9~3.2 |
| | | Rochy | 2.3~2.8 |
| | | 3 Cylinder | 2.3~2.8/ 1.5~2.0(Idle speed) |
| | ISUZU | Amigo/Impulse-Turbo/Pick Up/Trooper II 2.6L/Rodeo | 2.5~3.0 |
| | | I – Mark/Impulse/stylus | 2.0~2.5 |
| | MAZDA | B2200/Miata/B 2600i/ MPV/MX-6/323/626/929/RX 7 | 4.6~6.0 |
| | | RX 7 Turbo | 5.0~6.5 |
| | NISSAN | BLUEBIRD | 2.5 |
| | | | 2.5 |
| 300EX | | 20.6~2.55 | |
| SUBARU | | 2.5~3.5 | |
| Asian Car | TOYOTA | Cressida/Supra Camry/Celica 3S-FE | 2.7~3.1 |
| | | Camry/Celica 3S-GE、 3S-GTE、MR-2 | 2.3~2.7 |
| | | Corolla/Van/Pick Up/ 22R-E/4Runner | 2.7~3.1 |
| | | Toyota3.0 | 2.8 |
| | | Previa | 2.7~3.3 |
| | | 300、400 | 2.7~3.0 |
| | | Camry3.0 | 2.7~3.0 |
| | | LAND CRUISER | 3.0 |
| Asian Car | TOYOTA | COROLLA | 2.7~3.1 |
| | LEXUS | ES250/LS400 | 2.7~3.1 |
| | ACURA | All models | 2.5~2.6 |
| | | Jetta | 2.7~2.9 |
| American | GM | | 2.9~3.3 |

| | | | |
|-------------|-----------------|--------------|---------|
| Cars | | PARK AVENUE | 2.9~3.3 |
| | | CADILLAC 5.7 | 2.9~3.3 |
| | | CHEVROLET | 2.3~3.0 |
| | | CHEVROLET | 2.5~3.0 |
| | FORD | 2.3L | 2.8 |
| | | | 2.1~3.1 |
| | CHRYSLER | 213 | 2.7 |
| | | 3.3L | 3.4 |
| | | Others | 3.4~3.9 |