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Irfora QDB-3A

Irfora QDB-3A Ignition Coil Tester User Manual

Model: QDB-3A

1. Introduction

The Irfora QDB-3A Ignition Coil Tester is a versatile diagnostic instrument designed for automotive maintenance. It offers a range of functions to quickly identify component problems in various vehicle systems. This manual provides detailed instructions for the proper use and operation of the device.
Key functions include PWM drive output, stepper motor drive, PWM signal output, and voltage/resistance measurement.

2. Key Features

- **Versatile Testing Capabilities:** Drives and tests ignition coils, fuel injectors, solenoid valves, fuel metering valves, idle stepping motors, instrument stepping motors, headlight follow-up steering stepping motors, and urea pump motors.
- **High-Precision Simulation:** Generates Hall signals with adjustable output frequency, amplitude, and duty ratio to simulate various duty cycle sensors (e.g., air conditioning pressure sensors, air flowmeters).
- **Enhanced Safety Features:** Operates with a power supply voltage range of 12V to 24V, incorporating reverse connection and overcurrent protections for equipment safety.
- **Wide Adjustment Ranges:** Electromagnetic coil driving current from 0 to 3.5A, output frequency from 1Hz to 100KHz, duty cycle adjustment from 1% to 100%, and adjustable voltage from 1.25V to 11.5V.
- **User-Friendly Operation:** Easy to operate with all parameters adjustable, making it accessible for users without extensive professional knowledge.

3. Package Contents

Upon unpacking, please verify that all the following items are included:

- 1 x Irfora QDB-3A Ignition Coil Tester Unit
- 1 x Power Cable
- 3 x Test Connection Cables
- 3 x Single Plugs

- 1 x Idle Speed Stepper Motor Plug
- 1 x Stepper Motor Welding Cable

Figure 3.1: Irfora QDB-3A Ignition Coil Tester with its accessories.

4. Product Overview and Specifications

4.1 Device Layout

The QDB-3A features a TFT color screen and clearly labeled controls for ease of use. Refer to the diagram below for an overview of the device's components and controls.

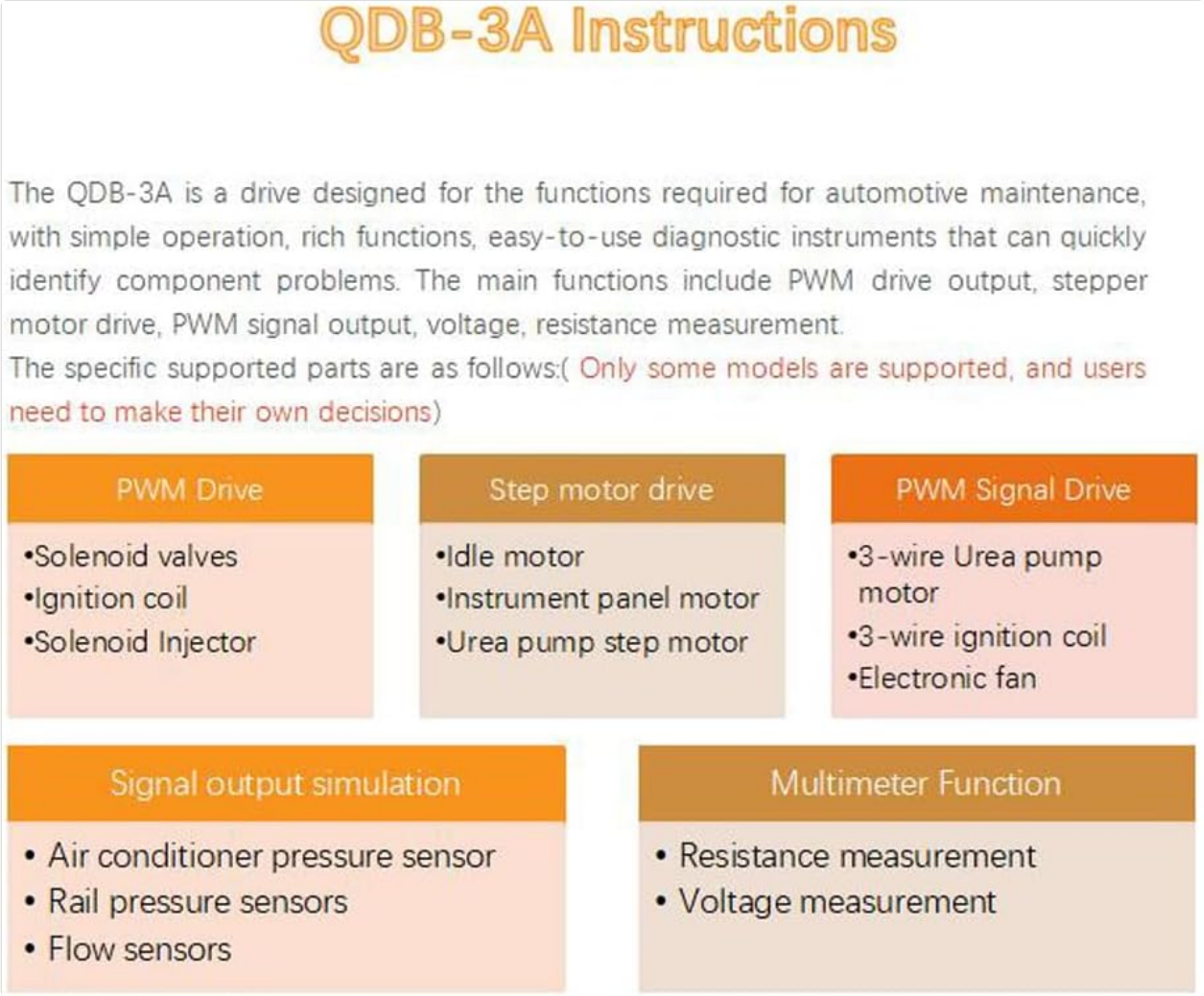

Figure 4.1: Front and bottom view of the QDB-3A tester with labeled controls and ports.

- **TFT Color Screen:** Displays operational parameters and measurement results.
- **Increase/Reduce Frequency Buttons:** Adjust the output frequency.
- **Increase/Reduce Duty Buttons:** Adjust the duty cycle.
- **Step Motor Run Left/Right Buttons:** Control the direction of stepper motor rotation.
- **Mode Switch:** Cycles through different operating modes.
- **Regulate Output Voltage Knob:** Adjusts the VADJ output voltage.
- **Voltage, Resistance Measurement Terminal:** Input for multimeter functions.
- **PWM Working Indicator:** LED indicating PWM operation.
- **Adjustable Power Output:** Variable voltage output.
- **PWM Signal Out:** Output for PWM signals.
- **Signal Out or DMM Measurement Ground:** Common ground for signal output and multimeter.
- **PWM Drive Negative Terminal:** Negative terminal for PWM drive.
- **Power Supply Voltage Output:** Output voltage equals the supply voltage.
- **Stepper Motor Connector:** Port for connecting stepper motors.
- **DC Power In:** Input for 9-26V DC power supply.

4.2 Technical Specifications

Num.	Item	Specification

Num.	Item	Specification
1	Power Input	DC 9-26V / 100W
2	Power Output	Current: Max 2.5A
3	VADJ Output	Voltage: 1.25V-14.5V, Current: Max 1.5A
4	DMM (Multimeter)	DCV: 0-30V, DCR: 0-1MΩ
5	PWM Signal	Frequency: 1-100KHz, Duty: 0-100%, VPP: 1.25V-14.5V
6	PWM Drive	Frequency: 1-100KHz, Duty: 0-100%, Current: Max 3A
7	Step Motor	Max 1.5A
8	OTR (Operating Temperature Range)	0-55°C

A. 3-wire signal drive mode

1. Connect the measured parts according to the diagram.
2. Power the QDB-3A according to the measured parts, 12V or 24V.
3. Adjust the VPP of the PWM signal, which can be adjusted between 5-12V for different parts.
4. Adjust the frequency of the PWM signal.
5. Adjust the duty cycle of the PWM signal.
6. Check the screen and confirm whether the setting parameters are within the set value.
7. Observe the working condition of the components at the same time to judge their quality.

2. Specification

Num.	Item	Specification
1	Power In	DC 9~26V /100W
2	Power Out	Current: Max 2.5A Voltage: ~Power In
3	VADJ Out	Voltage:1.25V~14.5V Current: Max 1.5A
4	DMM	DCV: 0~30V DCR: 0~1MΩ
5	PWM Signal	Frequency:1~100KHz Duty: 0.0~100% VPP: 1.25V~14.5V
6	PWM Drive	Frequency:1~100KHz Duty: 0.0~100% Current: Max 3A
7	Step Motor	Max 1.5A
8	OTR	0~55°C

Figure 4.2: Specifications table and connection diagram for 3-wire signal drive mode.

5. Setup and Basic Operation

5.1 Power Connection

1. Connect the provided power cable to the DC Power In port on the QDB-3A unit.
2. Connect the other end of the power cable to a 12V or 24V power source. Ensure the power source meets the device's requirements (9-26V / 100W).
3. The device will power on, and the TFT screen will display the main interface.

5.2 Navigating Modes

Use the 'Mode Switch' button to cycle through the different operating modes available on the QDB-3A. The current mode will be displayed on the TFT screen.

6. Operating Modes

6.1 PWM Drive Mode (2-wire Ignition Coil, Solenoid Valve, Injector, EGR)

This mode is used to drive and test 2-wire components such as ignition coils, solenoid valves, fuel injectors, and EGR valves.

1. Connect the component to be tested to the QDB-3A according to the diagram below. Ensure proper polarity.
2. Power the QDB-3A with a 12V or 24V supply.
3. Adjust the frequency of the PWM signal using the 'Increase/Reduce Frequency' buttons.
4. Adjust the duty cycle of the PWM signal using the 'Increase/Reduce Duty' buttons.
5. Check the screen to confirm that the set parameters are within the desired range.
6. Observe the working condition of the component to assess its quality.

PWM drive: Solenoid valves/Ignition coil/Solenoid Injector
Step motor drive: Idle motor nstrument panel motor/Urea pump step motor
PWM signal drive: 3-wire ignition coil/3-wire Urea pump motor/Electronic fan
Signal output simulation: Air conditioner pressure sensor/Rail pressure sensors/Flow sensors
Multimeter function: Resistance measurement/Voltage measurement
Power input: 9-26V/100W
Power output: Max 2.5A current
VADJ output: 1.25-14.5V, max 1.5A current
PWM drive: 1-100KHz frequency/0-100% duty/max 3A current
PWM signal: 1-100KHz frequency/0-100% duty/1.25-14.5V VPP
Step motor: Max 1.5A

Figure 6.1: Connection diagram for 2-wire power drive mode.

6.2 3-wire Signal Drive Mode

This mode is suitable for testing 3-wire components such as 3-wire ignition coils, 3-wire pump motors, and electronic fans.

1. Connect the component to be tested to the QDB-3A as shown in Figure 4.2.
2. Power the QDB-3A with a 12V or 24V supply.
3. Adjust the VPP (peak-to-peak voltage) of the PWM signal, which can be set between 5V and 12V for different components.
4. Adjust the frequency of the PWM signal.
5. Adjust the duty cycle of the PWM signal.
6. Verify the settings on the screen.
7. Observe the component's operation to determine its quality.

6.3 Step Motor Testing (Idle Motor, Instrument Motor, Headlight Motor)

Use this mode to test various stepper motors found in vehicles.

1. Connect the stepper motor to the QDB-3A using the stepper motor connector and appropriate cables, following the diagram below.
2. Power the QDB-3A with a 12V or 24V supply.
3. Click or long-press the 'Step Motor Run Left' or 'Step Motor Run Right' buttons to control the motor's rotation.
4. Observe the working condition of the stepper motor to judge its quality and functionality.

Figure 6.2: Connection diagram for step motor testing.

6.4 Signal Output Simulation

The QDB-3A can simulate Hall signals for various duty cycle sensors, including air conditioning pressure sensors, rail pressure sensors, and flow sensors. This function allows for testing ECU responses to sensor inputs.

- Connect the QDB-3A's PWM Signal Out to the ECU input for the sensor you wish to simulate.
- Adjust the frequency, amplitude, and duty ratio of the Hall signal using the corresponding controls on the device.
- Monitor the ECU's response to the simulated signal to diagnose sensor-related issues.

6.5 Multimeter Function (Resistance and Voltage Measurement)

The device includes a basic multimeter function for measuring resistance and voltage.

1. Power the QDB-3A with a 12V or 24V supply.
2. Connect the measuring probes to the Voltage, Resistance Measurement Terminal and the Signal Out/DMM Measurement Ground.

3. Connect the probes to the component or circuit you wish to measure. Ensure the voltage is not connected in reverse polarity.
4. Read the measurement value from the screen and interpret the results.

Figure 6.3: Connection diagram for resistance and voltage measurement.

7. Safety Information

To ensure safe operation and prevent damage to the device or connected components, please observe the following safety guidelines:

- Always ensure the power supply voltage is within the specified range of 9-26V.
- The device is equipped with reverse connection protection. However, always double-check polarity before connecting to avoid potential issues.
- Overcurrent protection is integrated. If an overcurrent condition occurs, disconnect the device immediately and investigate the cause.
- Do not expose the device to extreme temperatures, moisture, or corrosive environments.
- Only use the provided cables and accessories or compatible replacements.
- Keep the device away from children.

8. Maintenance

The Irfora QDB-3A Ignition Coil Tester requires minimal maintenance to ensure long-term performance:

- **Cleaning:** Wipe the device with a soft, dry cloth. Do not use abrasive cleaners or solvents.
- **Storage:** Store the device in a cool, dry place away from direct sunlight and extreme temperatures when not in use.
- **Cable Inspection:** Periodically inspect all cables for signs of wear, damage, or fraying. Replace damaged cables immediately.

9. Troubleshooting

If you encounter issues with your QDB-3A tester, consider the following basic troubleshooting steps:

- **Device Not Powering On:** Ensure the power cable is securely connected and the power source is providing the correct voltage (9-26V). Check the power source itself.
- **No Output Signal:** Verify that the correct operating mode is selected and all parameters (frequency, duty cycle, voltage) are set appropriately for the component being tested. Check all connections.
- **Incorrect Measurements:** For multimeter functions, ensure probes are correctly connected and making good contact. Verify the component being measured is functioning correctly.
- **Component Not Responding:** Double-check all connections to the component. Ensure the component itself is not faulty. Verify the QDB-3A's output parameters match the component's requirements.

If problems persist, consult the manufacturer's support resources or a qualified technician.

10. Warranty and Support

For information regarding product warranty, technical support, or service, please refer to the documentation provided with your purchase or contact Irfora customer service directly. Keep your purchase receipt as proof of purchase for warranty claims.

Related Documents - QDB-3A

	Kawish QDB-4A Automotive Actuator Detector: User Manual and Technical Specifications Comprehensive guide to the Kawish QDB-4A automotive actuator detector, detailing its functions, technical specifications, and usage instructions for testing vehicle components like ignition coils, fuel injectors, and stepper motors.
	Kawish QDB-4A Automobile Actuator Drive Detector - User Guide and Specifications Comprehensive guide to the Kawish QDB-4A Automobile Actuator Drive Detector, detailing its functions, panel layout, test parameters, connection instructions for various automotive components, and warranty information.

	[HWAUT QDB-5A: Automotive Actuator Drive Detector User Manual & Specifications] Comprehensive guide to the HWAUT QDB-5A automobile actuator drive detector. Learn about its functions, specifications, testing procedures for various automotive components, and warranty information.
	[Kawish QDB-4A: Manual de Usuario y Diagnóstico Automotriz] Guía completa del controlador de diagnóstico automotriz Kawish QDB-4A, cubriendo sus funciones, especificaciones y uso para el mantenimiento automotriz.
	[Cobra RAD 480i Quick Start Guide: Setup, Features, and Troubleshooting] Get started with your Cobra RAD 480i connected radar and laser detector. This guide covers dashboard mounting, smartphone connection via Bluetooth, and troubleshooting tips.
	[Napoleon Electric Fireplaces, Mantels & Log Sets Catalog] Explore the Napoleon collection of electric fireplaces, mantels, and log sets. Discover innovative designs, realistic flames, and features for every home. View models like Ascent, Cinema, Tranquille, and Woodland.