Rail Pressure Tester

RPT-5

User manual

Please read carefully before using the device. Ignorance of this manual may result in damage to the device or components operated by it.

DeltaTech® Electronics

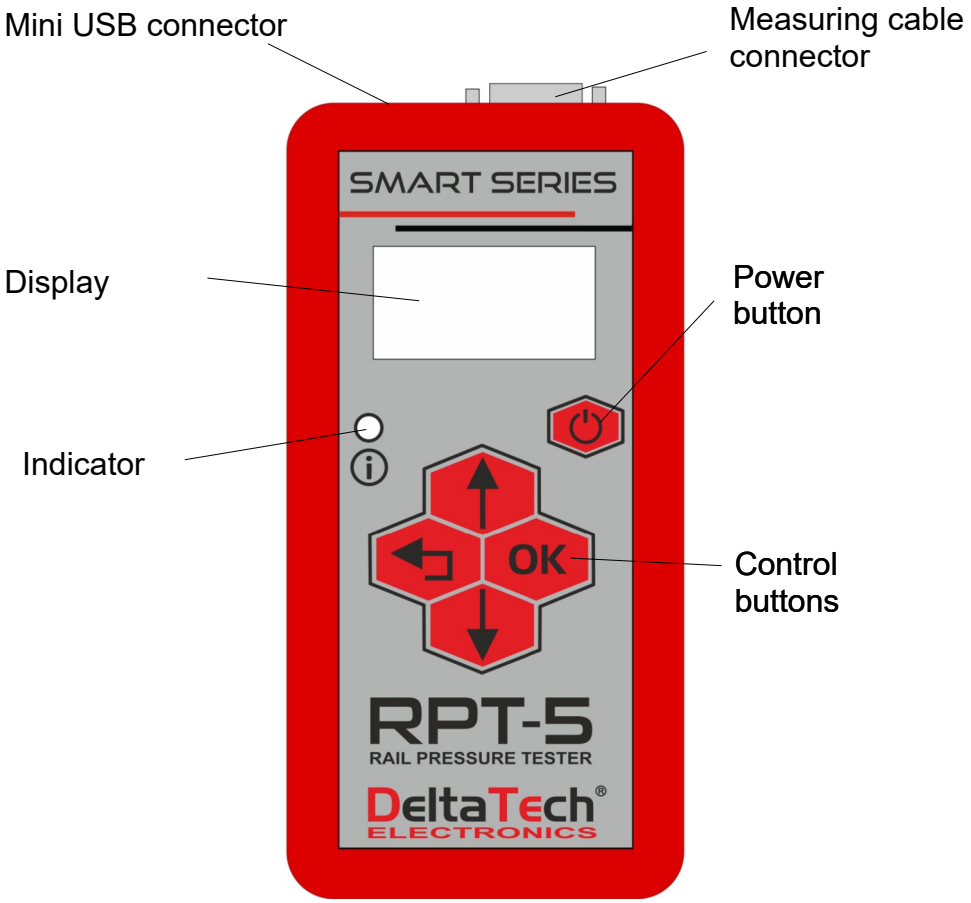
Table of contents

1. Device parameters

Power supply:	built-in Li-ion battery
Operating time	approx. 8 hours when fully charged
Charging connector:	5V, 500mA
Operating conditions:	temp. 0 – 40°C
Voltage measurement:	0..7V
External sensor power supply:	5V, max 50mA

Do not connect the tester outputs to any voltage sources other than the circuits of the tested sensors.

2. Appearance and connection



Measuring cable connector – it is used to connect the measuring cable.

Mini USB connector – it is used to charge the device's battery and also allows connection to a computer to update the software.

[⏻] – turns the device off and on.

[OK] Confirming menu or function selection, moving to the next stage of the test.

[⮌] Return from the selected function to the menu, return from the sub-menu to the main menu, cancel the selection.

[▲] – selects the previous option from the list, increases the modified value, switches additional options during the measurement.

[▼] – selects the next item from the list, reduces the modified value, switches additional options during the measurement.

Indicator – using various colors it signals operation of the device or in the case of connected charger or computer it shows the battery charge status (red - "charging", green - "charged").

2.1 Charging the device

The device is powered by a built-in battery. Charging is done by connecting an external 5V charger (min. 500mA) connected to the mini USB connector, you can also use the computer's USB port. Charging the built-in battery takes, depending on the degree of discharge, to approx. 2,5 h. During charging, the device's indicator lights up in red and turns green when completed.

Do not allow the battery to discharge for a long time, as this may damage it. If you leave the device unused for a long time, you must charge the battery first.

3. Using the device

The device can be used in the following cases:

- Parallel pressure measurement from a sensor placed in the vehicle.
- Pressure measurement using an additional external sensor*
- Simultaneous pressure measurement from two sensors (in vehicle and external sensor).

The device can be used both in Common Rail systems in vehicles / machines as well as for testing pressure in test bench systems.

The internal battery charge level is displayed in the upper right corner of the display with the

* Functionality available as an option. Contact the manufacturer or distributor to purchase the appropriate connection cable.

battery symbol ( ). If the symbol is visible next to it, it means that the Bluetooth module is active and it is possible to communicate with a compatible device mobile.

After starting, the device will go to the main menu. Use [▲] and [▼] buttons to select a chosen function and[OK] to confirm.

The list of available menu items is discussed in the following paragraphs.

3.1 Sensor test

1. Connect in parallel to the pressure sensor circuit using an adapter with a sensor connector or with a needle probe. Connect the device with the adapter attached to the sensor.

2. Choose the type of system:
   - CR (Common Rail) – direct diesel injection in diesel engines.
   - GDI (Gasoline Direct Injection) – direct gasoline injection (FSI, SIDI) in spark-ignition engines.

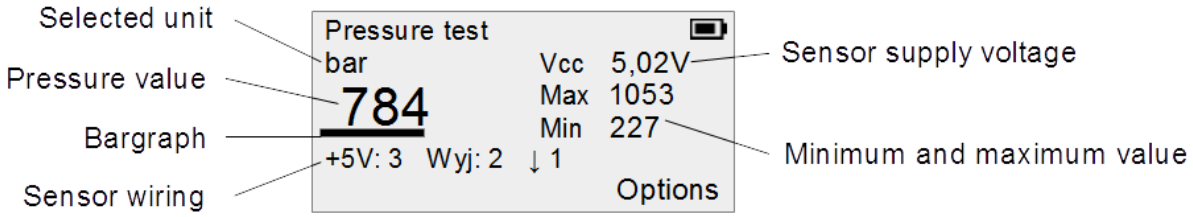
3. Select the system variant (for the Common Rail system):
   - Bosch/Denso – sensor with a scaled output in the range: 0,5 – 4,5V
   - Denso – sensor with a scaled output in the range: 1 – 4,2V

4. Select the range of the sensor - the options available vary depending on the selected system.

   After selecting the *Other* option, you can manually set the sensor range using the [▲] and [▼] buttons.

5. Turn on the sensor supply (ignition). After the signal is detected, the tester will automatically recognize the pinout and start displaying pressure.

Pressure test screen:



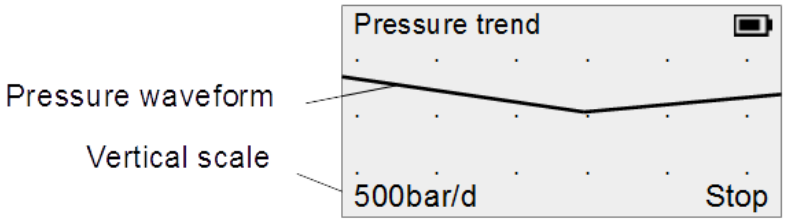
The numbering of signals in the pinout system is consistent with the pin numbers in the connector or with the numbers of the probes for connecting the needle probes.

Press [OK] to display the option menu:

Pressure trend

Choose Pressure trend to display the low-speed sampling pressure waveform.

Pressure trend screen:



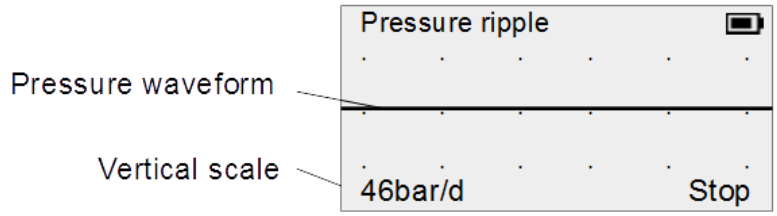
The vertical scale of the graph can be changed using the [▲] and [▼] buttons.
The scale of the time axis is fixed and amounts to 2s/division.
By pressing [**OK**] you can stop or resume recording the waveform.
The measurement is done in a continuous time - when the screen is full, the data is overwritten.

To obtain the waveform in higher resolution and the possibility of recording the obtained data, you can use the application for Android (details in the further part of the User manual).

Pressure ripple

Allows you to display a high-speed sampling pressure waveform

Pressure ripple display



The vertical scale of the graph can be changed using the [▲] and [▼] buttons.
The scale of the time axis is fixed and amounts to 25ms/division.
By pressing [**OK**] you can stop or resume recording the waveform.
The running measurement is triggered several times per second.

To obtain the waveform in higher resolution and the possibility of recording the obtained data, you can use the application for Android (details in the further part of the User manual).

Comparison mode

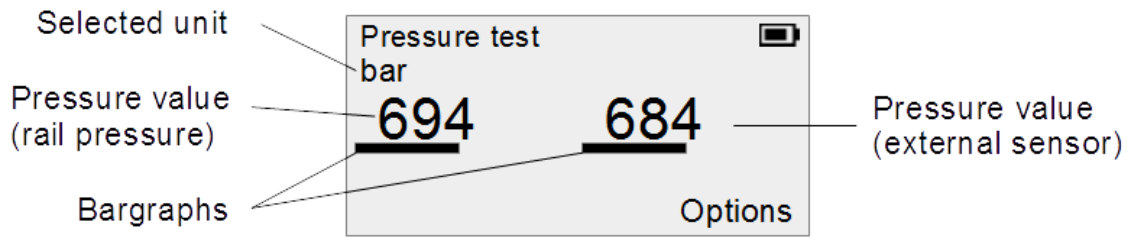
It allows to run simultaneous measurement with an additional sensor (option), details about

connecting the additional sensor under *3.2 External sensor* .

During the measurement, the sensor on the rail is connected in parallel to the tester and the tested system (motor controller, test bench), while the additional sensor (external) is connected only to the tester.

Thanks to a comparative measurement using a valid external sensor, an objective evaluation of the sensor's performance is possible.

Measurement screen in comparison mode:



The screen contains two pressure values - the value on the left applies to the sensor on the rail in the system (powered by the controller), the value on the right of the additional external sensor connected to the system (powered by RPT-5).

Reset max/min

Selecting the option resets the displayed maximum and minimum values.

3.2 External sensor (option)

Optionally, it is possible to connect an additional sensor (connected and powered by the RPT-5 device). Contact the manufacturer or distributor for information and to purchase an additional sensor cable.

In the external sensor mode, it is possible to perform all measurements (also waveform recording) using a sensor connected to the system by the user. The sensor is powered with 5V voltage directly from the tester.

Do not connect the output intended for an external sensor to any other devices or voltage sources.

To use this functionality, in addition to having a suitable cable, it is necessary to set the type of sensor used. These parameters are saved and it is not necessary to give them before each

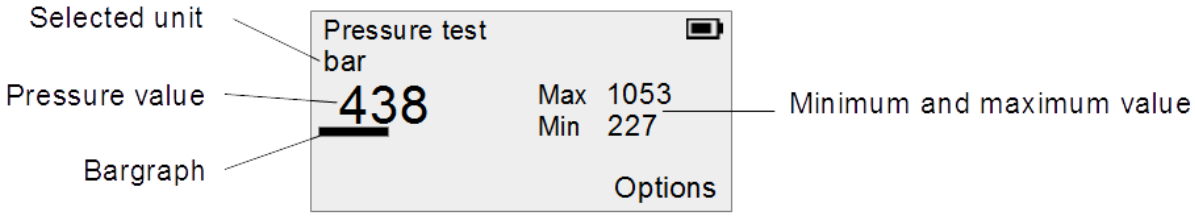
test. The setting of new parameters is only necessary when changing the used external sensor.

To set the sensor parameters (before the first use) :

1. Select *Menu* → *Settings* → *External sensor*
2. Specify the type of system: CR - Common Rail (Diesel), GDI - Gasoline (also FSI).
3. Select the sensor variant for Common Rail (Bosch / Delphi or Denso).
4. Specify the sensor range in megapascals [MPa].

After configuring the sensor, you can take measurements with it.

Measurement screen in external sensor mode:



The test screen using an additional (external) sensor does not contain information about the sensor supply voltage, because in this case the voltage is supplied by the tester and has a constant level of 5V.

Other functionalities work normally except that from the measurement in the external sensor mode it is not possible to go directly to the comparative test. To do this, go back to the main menu and after selecting *Pressure test* first determine the sensor to be tested on the rail.

Language

The menu allows you to choose the device's interface language. Use [▲] and [▼] to change item. Button [OK] confirms choice, [⮌] returns to the previous setting.

Bluetooth

Use [▲] and [▼] to select *Turn on* and *Turn off*. At the bottom of the screen, a PIN number is displayed for pairing with the device to use the included application. Button [OK] confirms choice, [⮌] returns to the previous setting.

Turning off Bluetooth when not required will extend the battery life.

Version

It displays the device software version. To go back to the previous menu press [⮌].

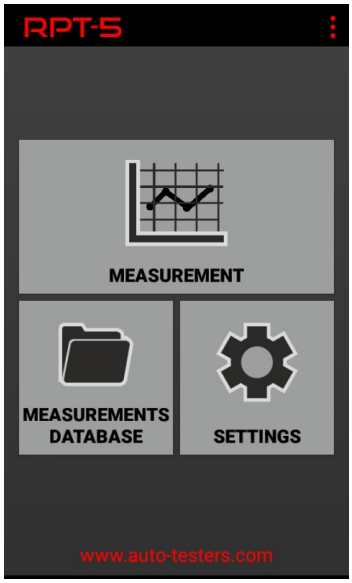
4. Android app

It is possible to extend the capabilities of the device through cooperation with a dedicated application. To download the application, use the link:

http://auto-testers.com/download/rpt/

To download the program it is necessary to provide the serial number of the device. It is located under the silicone case of the cover.

App window:



Measurement screen - allows remote reading of measurement parameters. The function is available only if the appropriate sensor test screen is displayed on the device.

Measurements database - allows you to view results that was previously stored in the device.

Settings - allows you to set up a Bluetooth connection, change the program language and display version information.

To connect to the application:

- Turn on Bluetooth in RPT-5 and on your mobile device.
- Start the RPT-5 application.

First connection:

- Select a Bluetooth device by selecting *Settings → Bluetooth.*
- When pairing devices, enter the PIN number 7785 (shown in the device menu).

All program data is saved in the device's main memory in the *RPT5_DATA* folder. To back up the database, you must make a copy of this folder. To transfer data to another device, all you need to do is move the contents of the mentioned directory.

6. Troubleshooting

Problem	*Solution*
The device does not turn on. After connecting to the charger, no indicator lights up.	Check if the charger is operational. Make sure that the battery is charged by long-term connection to the charger. If it does not help, the battery may be worn or damaged.
The device works very shortly after charging and / or charging will end shortly after being connected to the charger.	The battery is worn out and needs to be replaced. Contact the manufacturer.
The device is not detected from the Android application.	1. Make sure the device has Bluetooth enabled; 2. Search for devices nearby, device *RPT-5* should be detected; 3. Connect to the device using the *7785* pin.
The device does not detect or incorrectly detect the sensor output when the ignition is turned on.	Check the measurement cables. Try switching on the ignition before selecting *Sensor test* . Diagnose the sensor's power supply.
The sensor readings are significantly different from those read from the diagnostic tester.	An incorrect variant or range of the sensor has been provided.

If the list of suggested solutions is exhausted or if a problem not mentioned in the table above appears, please contact the manufacturer of the device.

Warning !!!

The device is covered by a 24-month warranty. Detailed conditions of the warranty are in the warranty card included.

DeltaTech Electronics company has made great effort to write this manual to the best of its ability, but it cannot guarantee that it does not contain any mistakes. While

conducting any workshop activities always conform to vehicle service manuals, applicable laws, regulations, provisions, as well as industrial safety and fire protection rules.

The DeltaTech Electronics company shall not be liable for possible damage caused by improper use of the RPT-5 tester.