

OPEN SYSTEMS



Common Rail Injectors Inspection and Testing Equipment DT-FM measurement unit

Measuring unit technical description

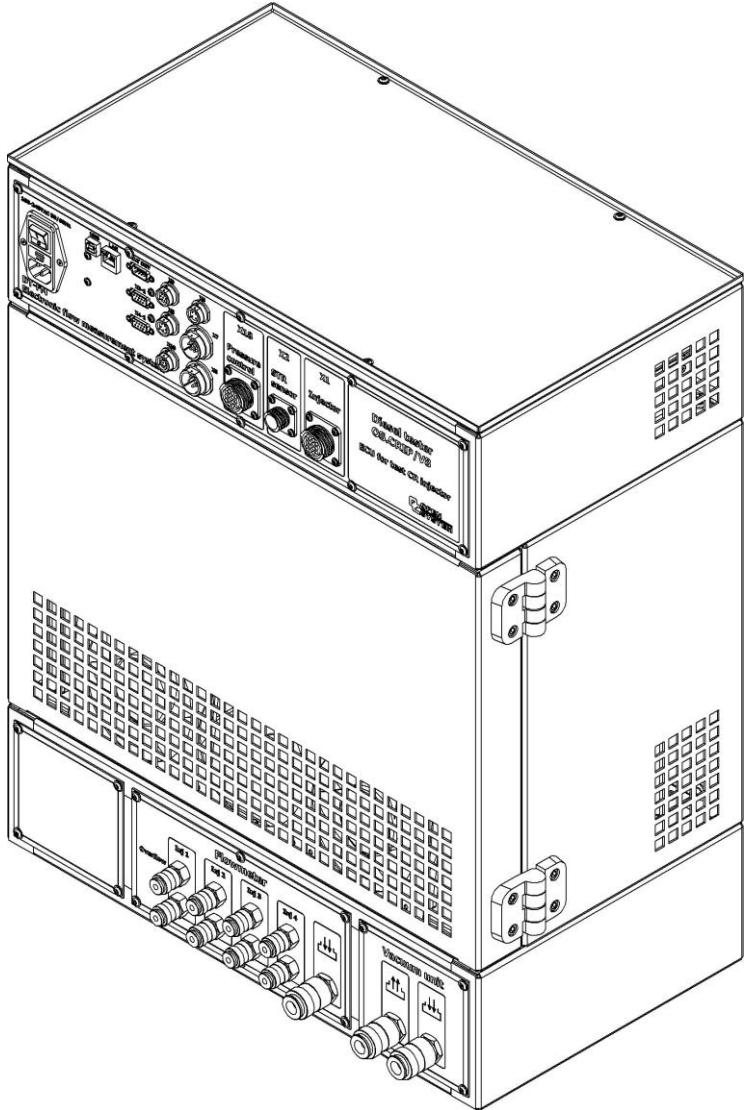
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1. Measuring unit DT-FM



Short description

The "Diesel tester OS.CRIP / V8" measuring unit is an electronic unit that controls the electrical elements of the Common rail fuel system, measures the injector volumetric flow and the injector backflow rate. It is used as part of the test bench equipment.

Depending on the modification, the "Diesel tester OS.CRIP / V8" measuring unit can simultaneously control and measure up to one or four injectors.

Modification "Diesel tester OS.CRIP / V8" 1 injector:

Number of delivery measurement channels..... 1 channel;

Number of channels for measuring backflow 1 channel;

Modification "Diesel tester OS.CRIP / V8" 4 injectors:

Number of delivery measurement channels..... 4 channels;

Number of channels for measuring backflow 4 channels.

General characteristics:

Supply voltage 230V AC 50 Hz;

Rated current 3 A;

Measuring range of the measuring unit0,01-400 mm³/ injection;

Measurement error in the range of 0.01-100mm³..... 1 %;

Measurement error in the range of 0.01-400mm³..... 1,5 %;

Resolution.....0,01 mm³/injection;

Overall dimensions HxWxD.....520x650x290 mm;

Net weight (excluding liquids and installation kit) 65 kg;

Minimum volume of test liquid in the tank of the system 20 L;

Test fluid flow when creating vacuum 8 L/min;

Maximum discharge..... -0.8 bar;

Used liquids:

Test liquid..... Calibration oil ISO 4113.

2. «Diesel tester OS.CRIP/V8» 4 injectors

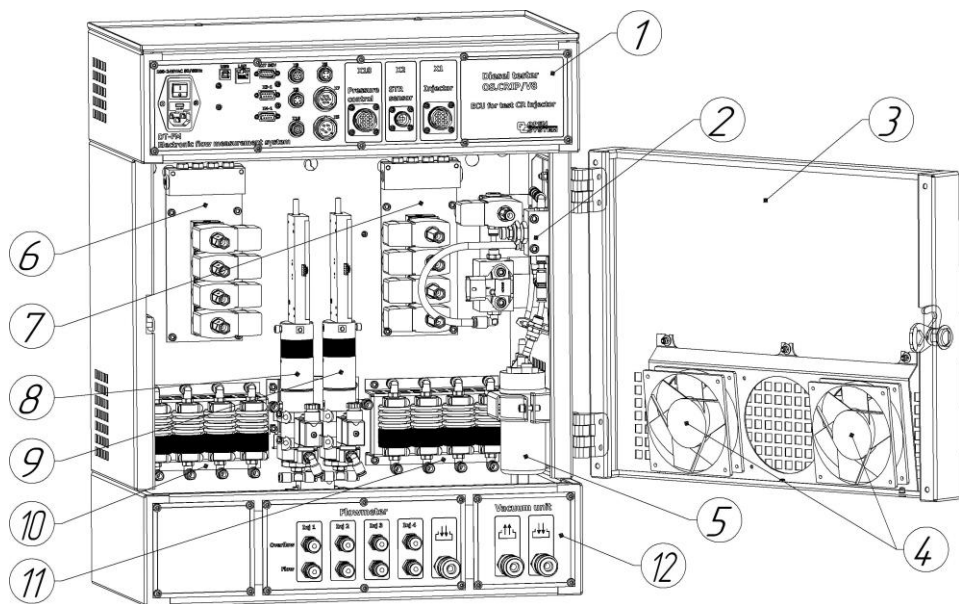


Figure 2. Modification "Diesel tester OS.CRIP / V8" 4 injectors

Position	Description
1	Electrical panel;
2	Vacuum unit;
3	Door;
4	Cooling fans for filters and meters;
5	Vacuum pump;
6	Injector flow metering valve block;
7	Valve block for measuring injector backflow;
8	Measuring module for injector supply;
9	Injector backflow measuring module;
10	Filter unit for measuring injector delivery;
11	Filter unit for injector backflow measurement;
12	Hydraulic panel.

3. «Diesel tester OS.CRIP/V8» 1 injector

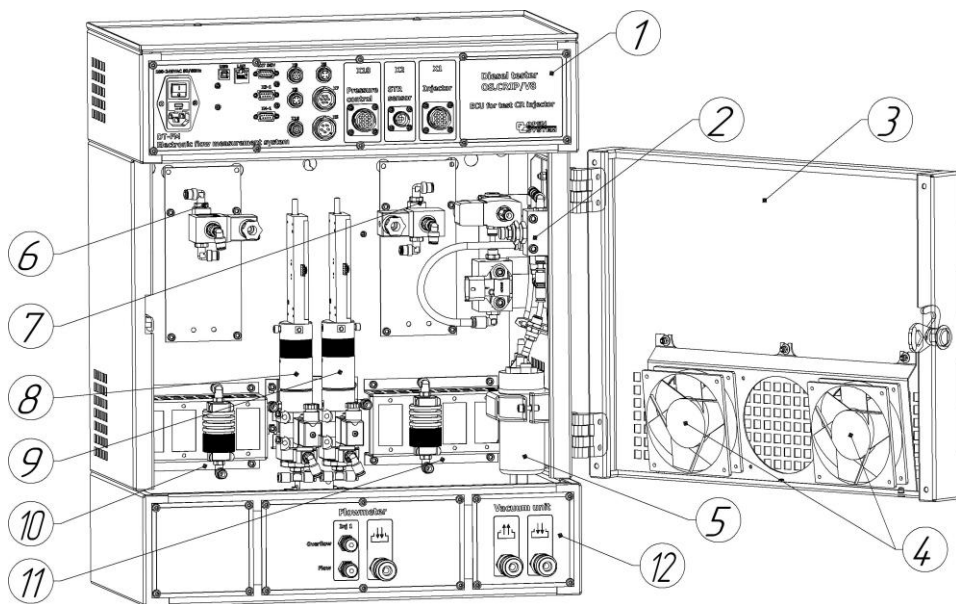


Figure 3. Modification "Diesel tester OS.CRIP / V8" 1 injector

Position	Description
1	Electrical panel;
2	Vacuum unit;
3	Door;
4	Cooling fans for filters and meters;
5	Vacuum pump;
6	Injector flow metering valve block;
7	Valve block for measuring injector backflow;
8	Measuring module for injector supply;
9	Injector backflow measuring module;
10	Filter unit for measuring injector delivery;
11	Filter unit for injector backflow measurement;
12	Hydraulic panel.

4. Hydraulic panel

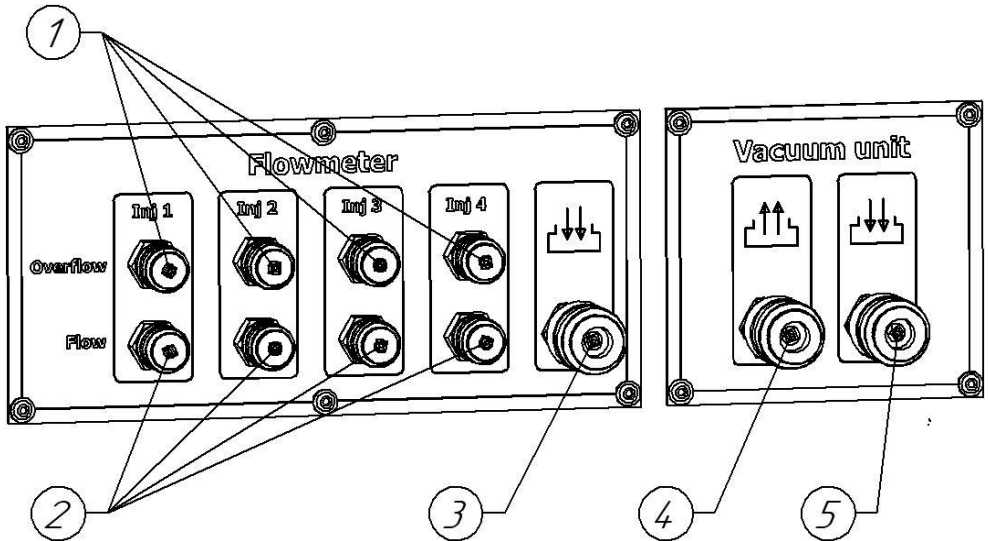


Figure 4. "Diesel tester OS.CRIP / V8" hydraulic panel 4 injectors

Position	Description
1	"Overflow" - inputs for injector backflow measurement;
2	"FLOW" - inputs for injector flow measurement;
3	Backflow of the measured liquid into the tank;
4	Inlet of the pump of the system for creating a vacuum from the tank;
5	Backflow of the system for creating a vacuum into the tank;

Hydraulic panel "Diesel tester OS.CRIP / V8" 4 injectors and 1 injector are identical and differ only in the number of inputs for measuring the supply and backflow of the injector.

Checking and coding of Delphi injectors is performed only on one channel, number 1. The required vacuum in the Delphi injector backflow system is created only at the input of the first channel. The Delphi injector supply should be connected to the measuring unit only through the injection chamber with a sensor.

5. Hydraulic connection of the injector to the block

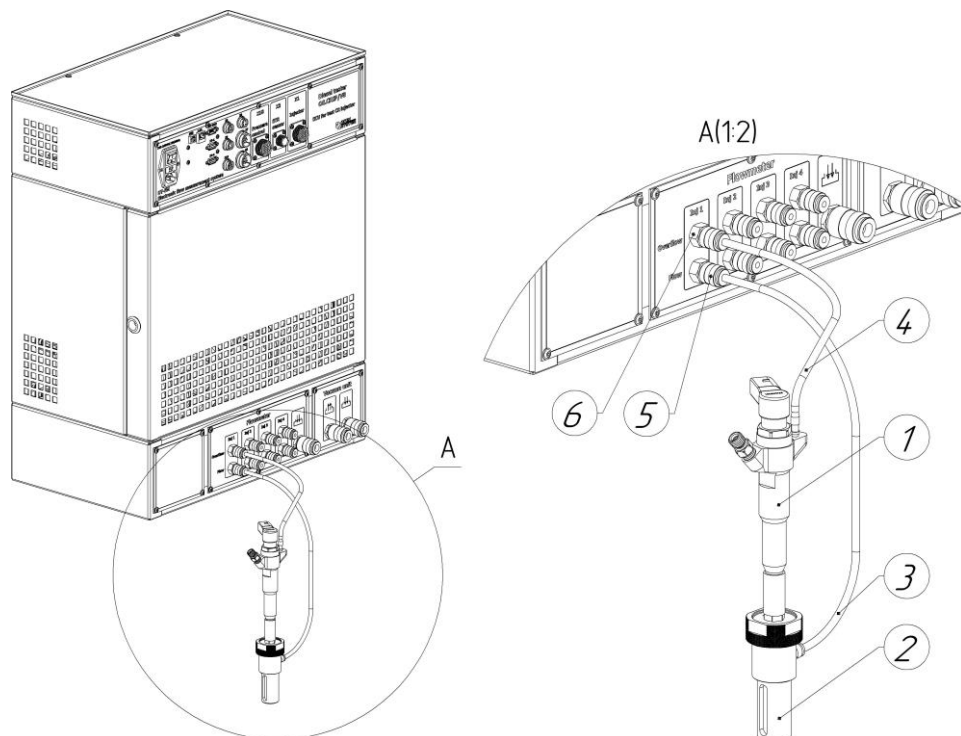


Figure 5: Hydraulic connection of the injector to the block

Position	Description
1	Injector;
2	Injection chamber;
3	Injector delivery line;
4	Injector backflow line;
5	"FLOW" - input for measuring injector delivery;
6	"Overflow" - injector backflow measurement input.

6. Hydraulic connection of the unit to the test bench

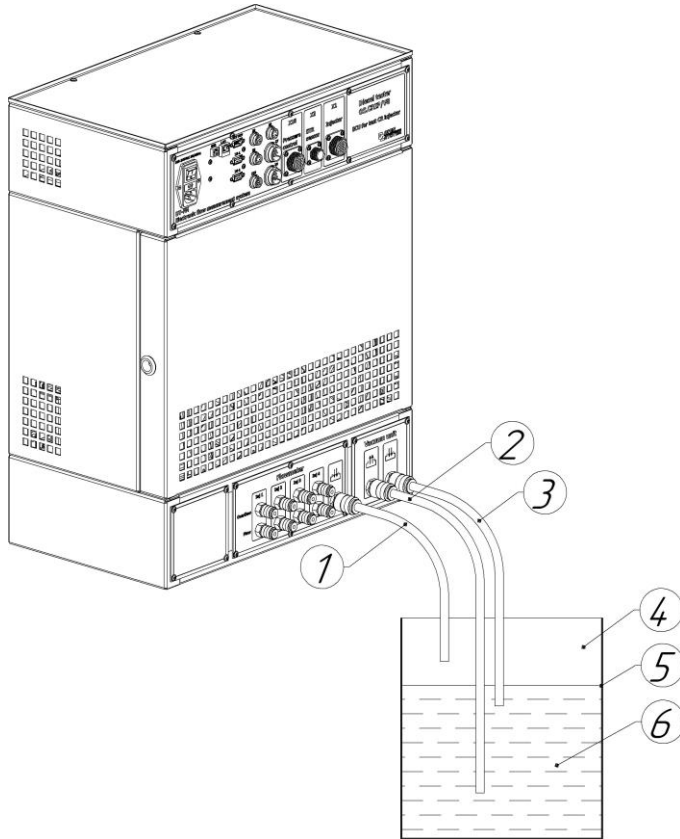


Figure 6: Hydraulic connection of the unit to the test bench

Position	Description
1	Backflow of the measured liquid into the tank;
2	Pump inlet of the system for creating vacuum from the tank;
3	Backflow of the system for creating a vacuum into the tank;
4	Test bench tank for test liquid;
5	Maximum test liquid level;
6	Test fluid ISO 4113.

7. Restrictions on the measured liquid backflow connection

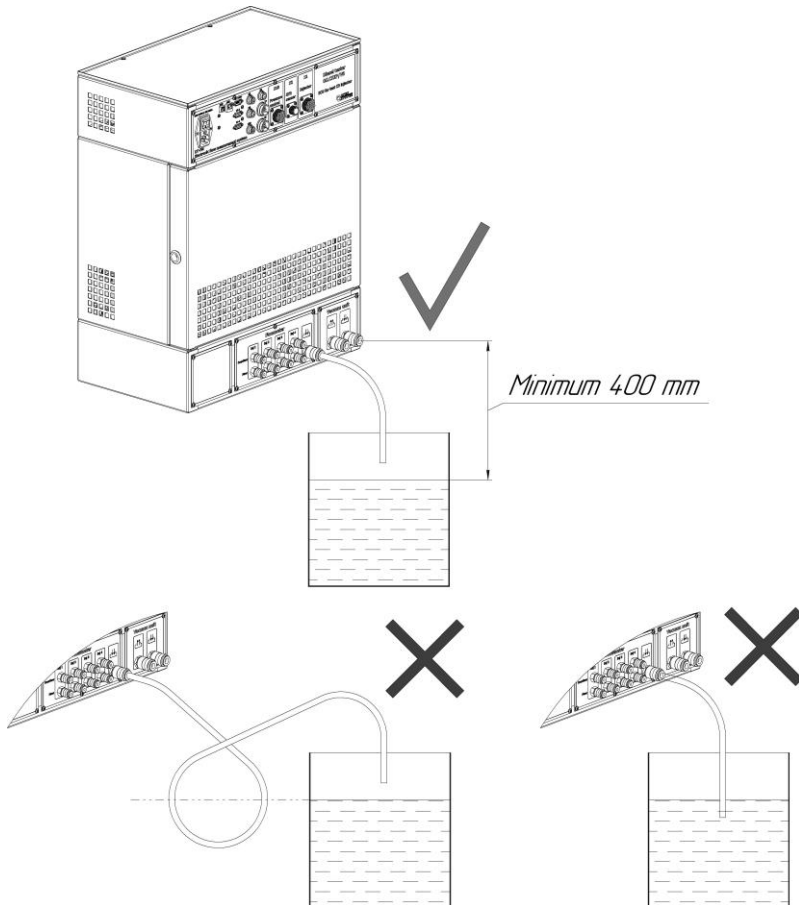


Figure 7: Limitations of the measured liquid backflow connection

To ensure the correct operation of the liquid measuring system, it is necessary to provide a free backflow of the measured liquid into the test bench tank.

The gauge block must be above the tank. The measured liquid must enter the tank above the liquid level in the tank. Do not bend the drain hose or immerse the drain hose in the test liquid.

8. Connection of high pressure system and injector

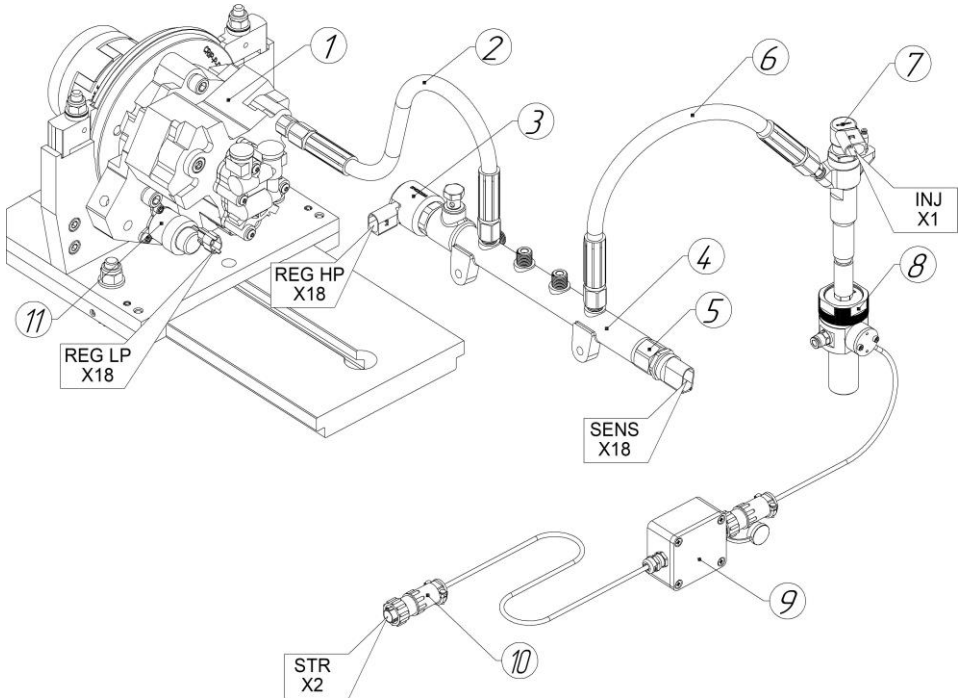


Figure 8: Connecting the high pressure system and the injector

Position	Description
1	High pressure test bench pump (high pressure fuel pump);
2	High pressure pipe from pump to rack;
3	High pressure regulator;
4	High pressure rail;
5	Rail pressure sensor;
6	High pressure pipe from the rail to the injector;
7	Injector;
8	Injection chamber with sensor (only for Delphi injector) .;
9	Injection sensor amplifier.
10	X2 electrical connector in the measuring unit;
11	Low pressure valve for high pressure fuel pump.

9. Injection chamber

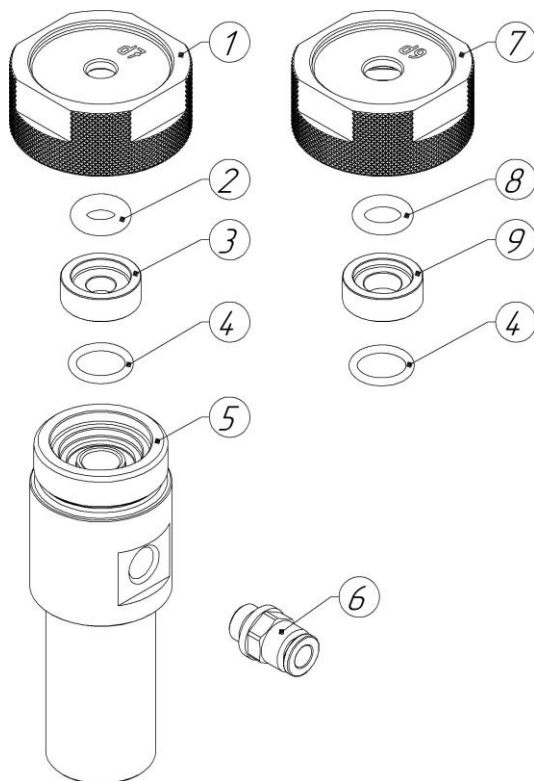


Figure 9. Injection chamber

Position	Description
1	Clamping nut for the nuzzle 7mm;
2	O-ring 7 * 4 NBR-70;
3	Guide sleeve 7 mm;
4	O-ring 12 * 2 NBR-70;
5	Injection chamber;
6	Fitting for connecting the injector supply line;
7	Clamping nut for the nuzzle 9mm;
8	O-ring 9 * 3 NBR-70;
9	Guide bush 9 mm.

10. Injection chamber with sensor

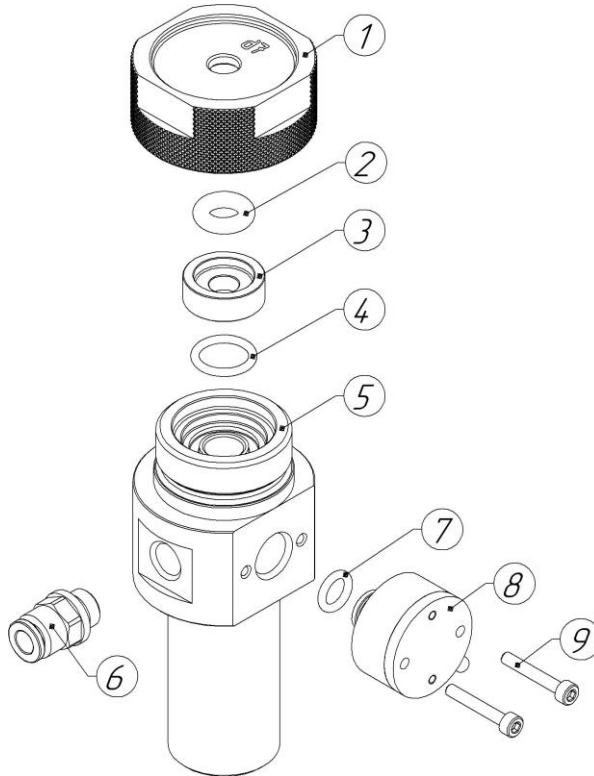


Figure 10. Injection chamber with sensor

Position	Description
1	Clamping nut for the nozzle 7mm;
2	O-ring 7 * 4 NBR-70;
3	Guide sleeve 7 mm;
4	O-ring 12 * 2 NBR-70;
5	Injection chamber with sensor;
6	Fitting for connecting the injector supply line;
7	O-ring 7 * 2.5 NBR-70;
8	Injection sensor;
9	Sensor mounting screws.

11. Measuring system filter

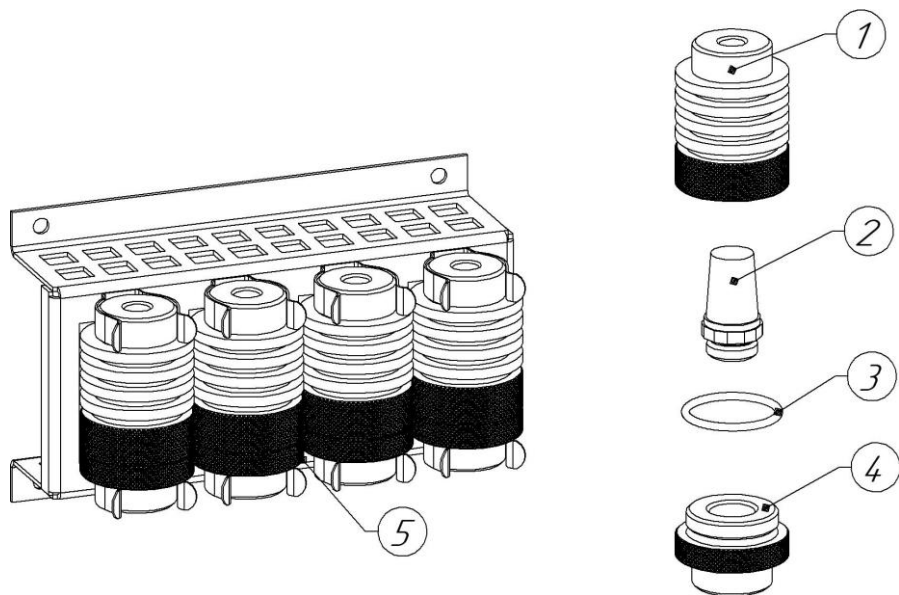


Figure 11. Measuring system filter

Position	Description
1	Top of the filter;
2	Filter element;
3	O-ring 26 * 2.5 NBR-70;
4	The bottom of the filter;
5	Filter block for one or four filters.

The filters of the measuring system are subject to periodic control and maintenance.

The frequency depends on the intensity of use, but at least once a month, carry out a visual check of the condition of the filter element. In case of contamination, blow back with compressed air and rinse in an ultrasonic bath. If it is impossible to clean, the element REPLACE !!!.

!!! ATTENTION, DO NOT CHANGE THE DIRECTION OF INSTALLATION OF THE FILTER ELEMENT, DANGER OF DISCONNECTING THE MEASURING MODULE !!!

12. Measuring module

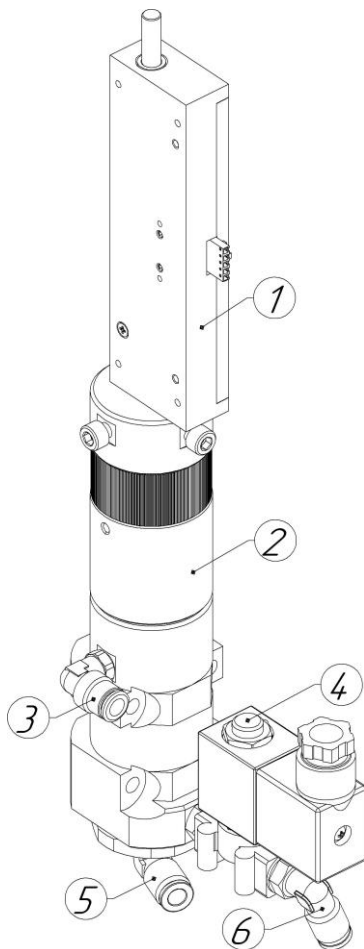


Figure 12. Measuring module

Position	Description
1	Linear displacement sensor (encoder);
2	Meter body;
3	Emergency overflow channel;
4	Drain valve;
5	Measured liquid supply channel;
6	The channel for draining the measured liquid.

13. Meter body

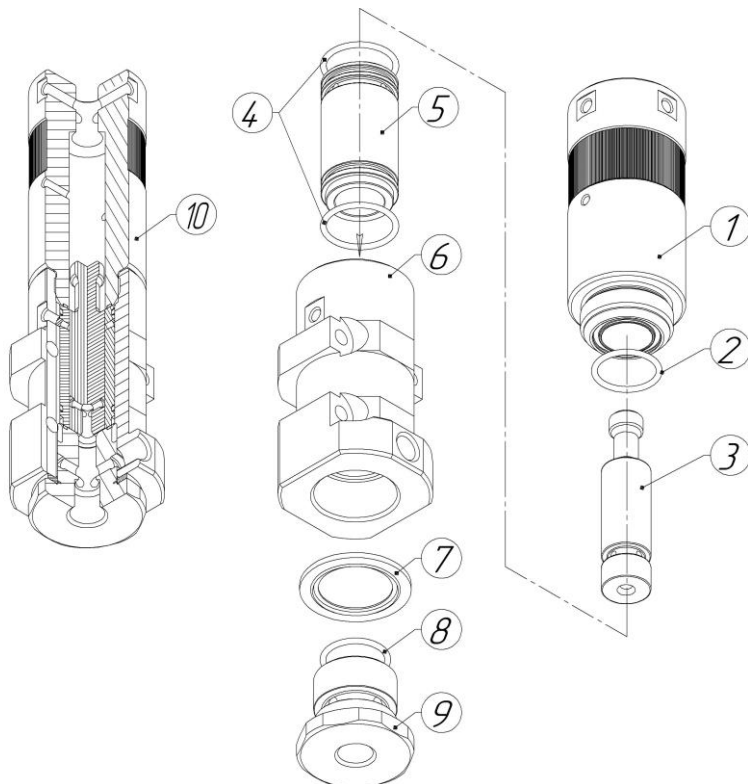


Figure 13.The set Delphi E1

Position	Description
1	The upper part of the case;
2	O-ring 19 * 1.5 NBR-70;
3	Plunger;
4	O-ring 21.95 * 1.78 NBR-70;
5	Plunger sleeve;
6	The lower part of the case;
7	Rubber-metal washer;
8	O-ring 17 * 1.5 NBR-70;
9	Union;
10	Meter body assembly.

14. Overall dimensions

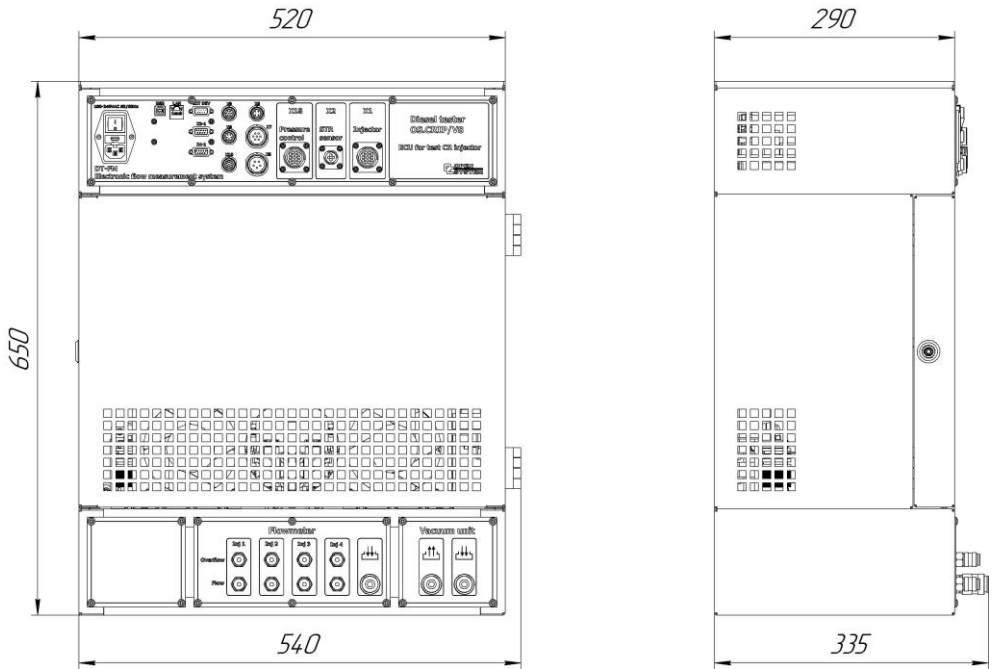


Figure 14. Overall dimensions

15. Mounting dimensions

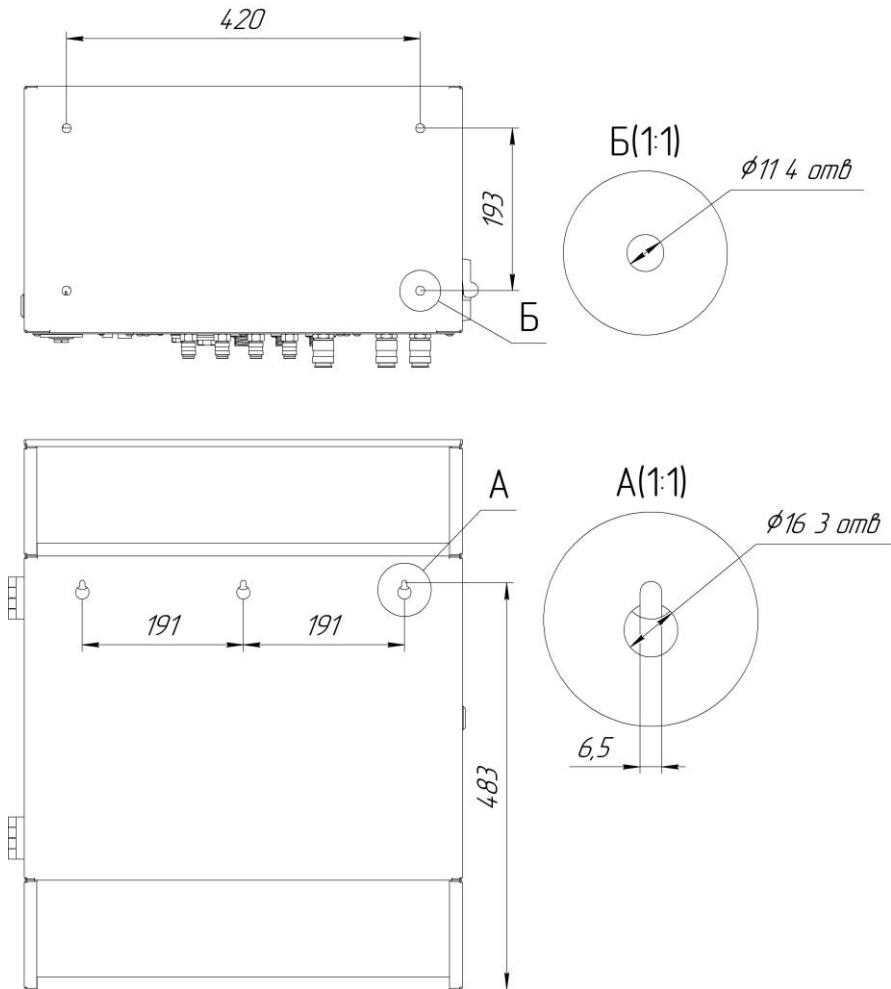


Figure 15. Mounting dimensions

Installation of the measuring unit on a horizontal or vertical surface is allowed. For this, there are mounting holes in the bottom of the case and on the rear wall.

During operation, the unit must be securely fixed and protected from vibration generated by the work of the test bench equipment.