

Equipment for inspecting and testing common rail injectors DT-FM measuring unit

Technical description of the measuring unit

Rev. 1-01
2021

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1. DT-FM measuring unit

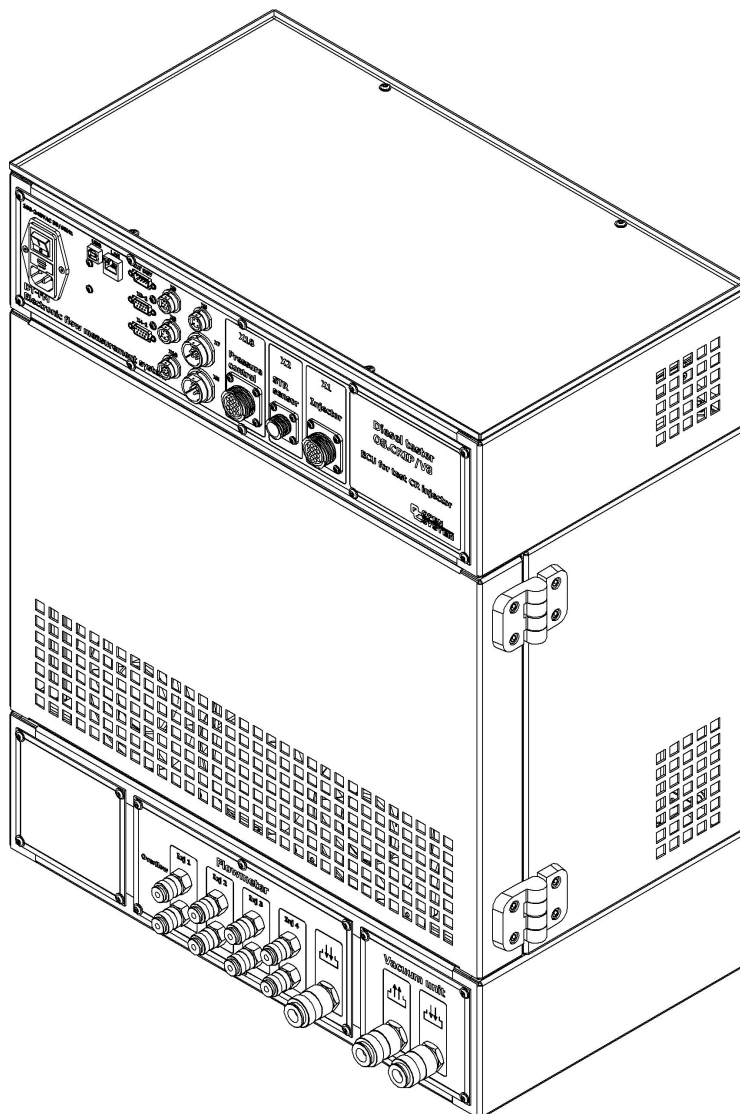


Figure 1 Exterior view of the DT-FM uni

Brief information

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

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

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

Number of feed measurement channels 1 Channel;

Number of return flow measurement channels 1 Channel;

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

Number of feed measurement channels 4 Channel;

Number of return flow measurement channels4 Channel.

General characteristics:

Supply voltage.....230B AC 50 Hz;

Rated current3 A;

Measuring range of the measuring unit.....0,01-400 mm³/ injection;

Accuracy of measurement within the range 0,01-100mm³ 1 %;

Accuracy of measurement within the range 0,01-400mm³ 1,5 %;

Resolution capacity 0,01 mm³/ injection;

Overall dimensions HxWxD520x650x290 mm;

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

Minimum volume of test liquid in the system tank.....20 l;

Flow of test liquid when creating a vacuum..... 8 l/min;

Maximum vacuum -0.8 bar;

Fluids to be used:

Test liquid Calibration oil ISO 4113.

2. "Diesel tester OS.CRIP/V8" 4 Injectors

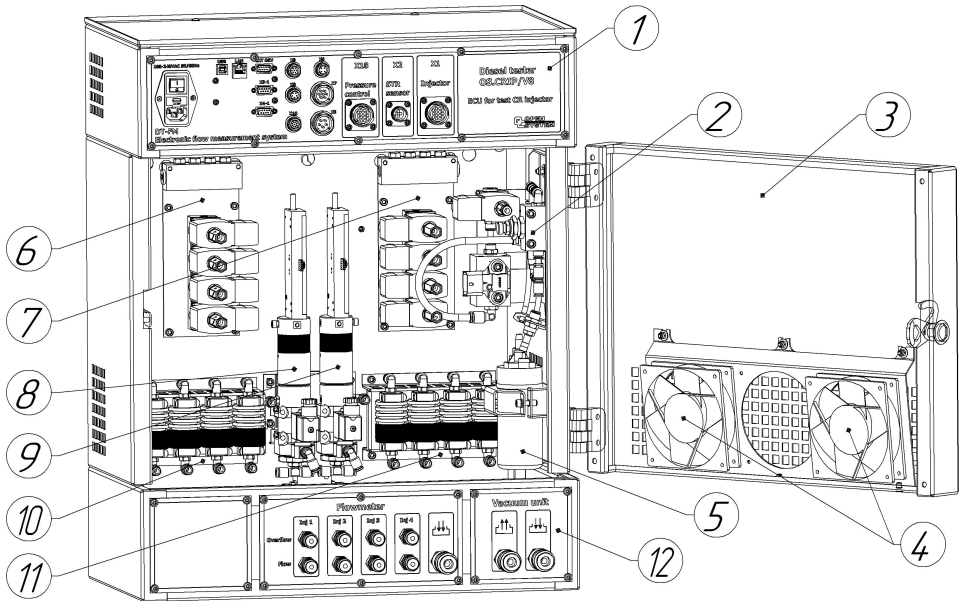


Figure 2 Modification "Diesel tester OS.CRIP/V8" 4 injectors

Pos.	Description
1	Electrical panel;
2	Vacuum unit;
3	Door;
4	Filter and gauge cooling fans;
5	Vacuum generation system pump;
6	Injector feed metering valve block;
7	Injector return measurement valve block;
8	Injector feed metering module;
9	Injector return flow measurement module;
10	Injector feed measurement filter unit;
11	Injector return flow measurement filter module;
12	Hydraulic panel.

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

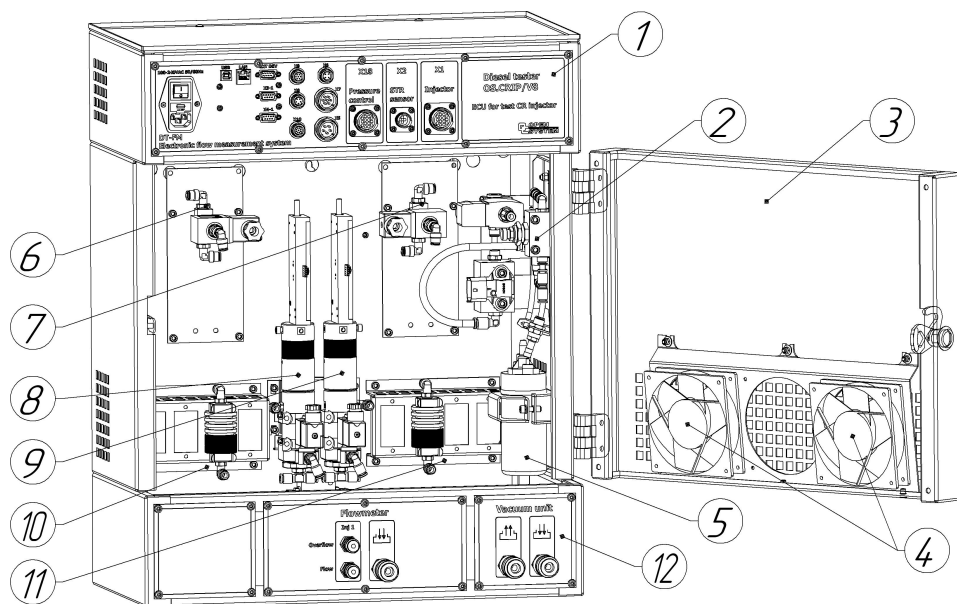


Figure 3 Modification "Diesel tester OS.CRIP/V8" 1 injectors

Pos.	Description
1	Electrical panel;
2	Vacuum unit;
3	Door;
4	Filter and gauge cooling fans;
5	Vacuum generation system pump;
6	Injector feed metering valve;
7	Injector return flow measuring valve;
8	Injector feed meter;
9	Injector return flow meter;
10	Injector feed measurement filter;
11	Injector return flow measurement filter;
12	Hydraulic panel.

4. Hydraulic panel

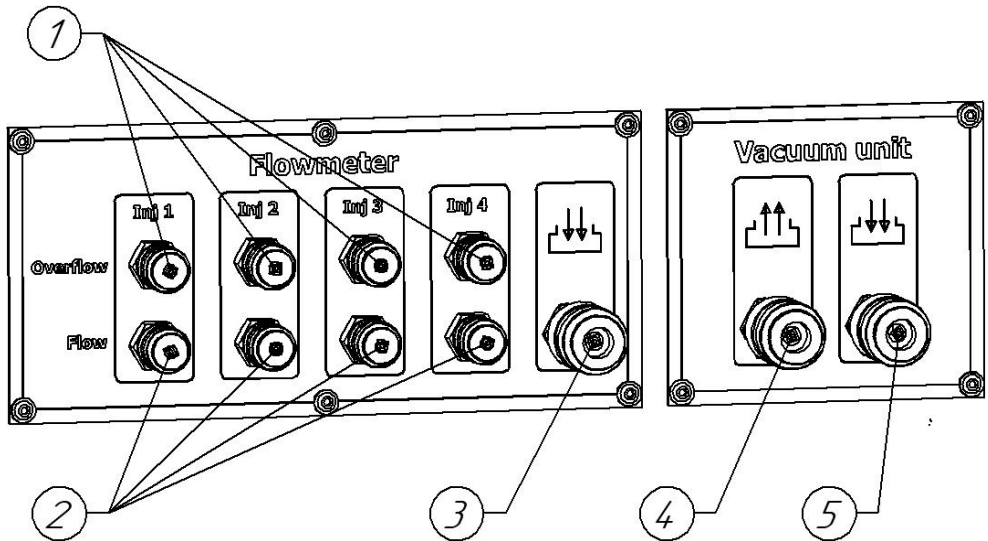


Figure 4 Diesel tester OS.CRIP/V8" hydraulic panel 4 injectors

Pos.	Description
1	"Overflow" - injector backflow measurement inputs;
2	"FLOW" - injector supply measurement inputs;
3	Backflow of the measured liquid into the tank;
4	Inlet of the pump of the vacuum generation system from the tank;
5	Backflow of the discharge system into the tank.

Diesel tester OS.CRIP/V8" hydraulic panel 4 injectors and 1 injector are identical and differ only in the number of injector feed and return flow measurement inputs.

Delphi injectors are checked and coded on only one channel, number 1. The necessary vacuum in the Delphi Injector Backflow System, is only created at the inlet of channel 1. The Delphi Injector Supply should only be connected to the measuring unit via the injection chamber with a sensor.

5. Hydraulic connection injector to the unit

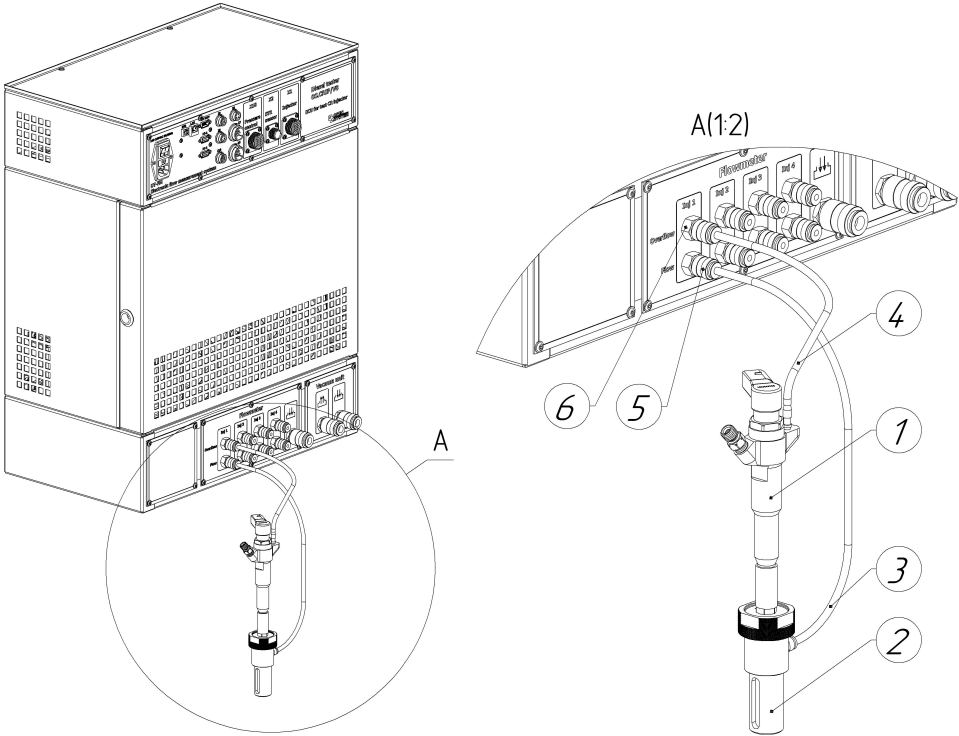


Figure 5 Hydraulic connection injector to the unit

Pos.	Description
1	Injector;
2	Injection chamber;
3	Injector feed line;
4	Injector return flow line;
5	"FLOW" - Injector flow measurement input;
6	"Overflow" - injector return flow measurement input.

6. Hydraulic connection of the unit to the stand

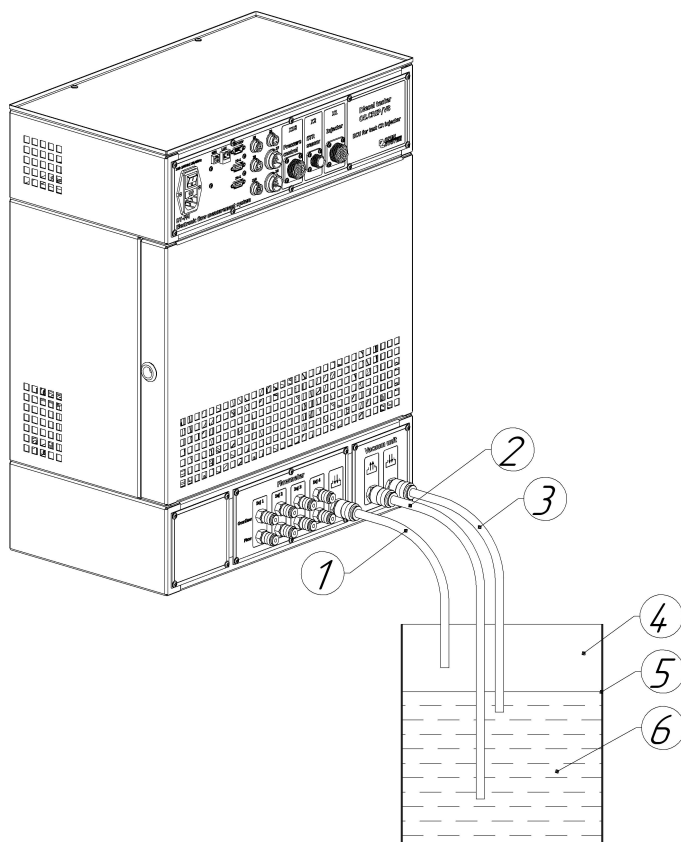


Figure 6 Hydraulic connection of the unit to the stand

Pos.	Description
1	Backflow of measured liquid into the tank;
2	"Inlet of suction system pump from tank;
3	Backflow of the vacuum generation system into the tank;
4	Bench tank for test liquid;
5	Maximum level of test fluid;
	Test fluid ISO 4113.

7. Limitations in the connection of the measured liquid return

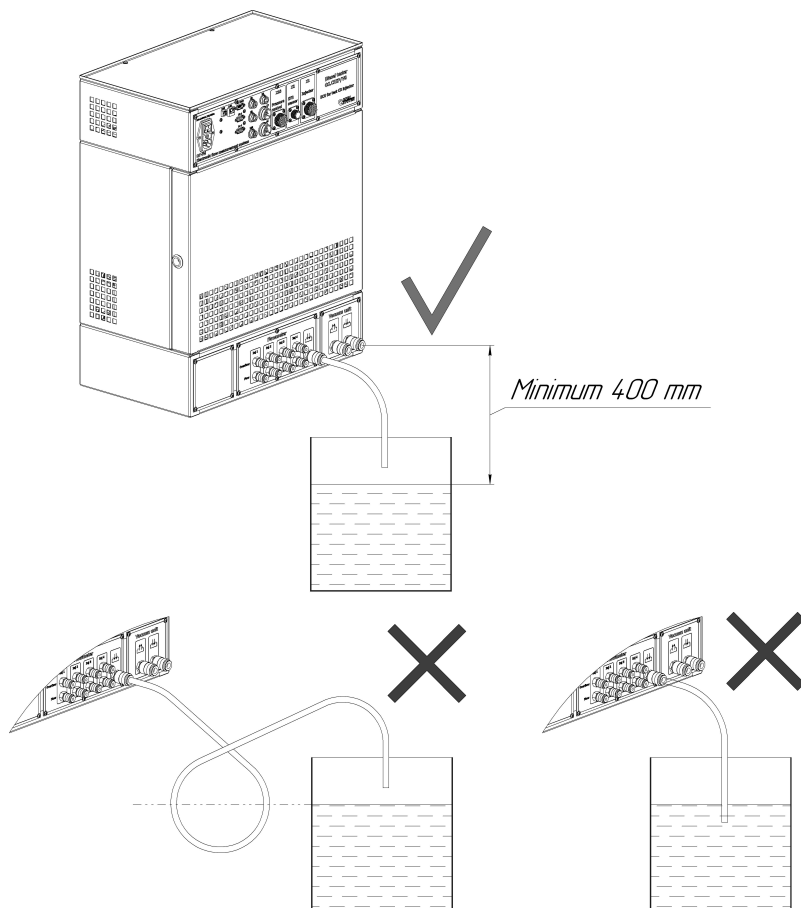


Figure 7 Limitations in the connection of the measured liquid return

To ensure the correct operation of the liquid measurement system, it must be ensured that the measured liquid is drained back into the test bench tank freely.

The measuring unit must be positioned above the tank. The measured liquid must flow into the tank above the liquid level in the tank. The drain hose must not be kinked and the drain hose must not be submerged in the test liquid layer.

8. Connection of the high pressure system and injector

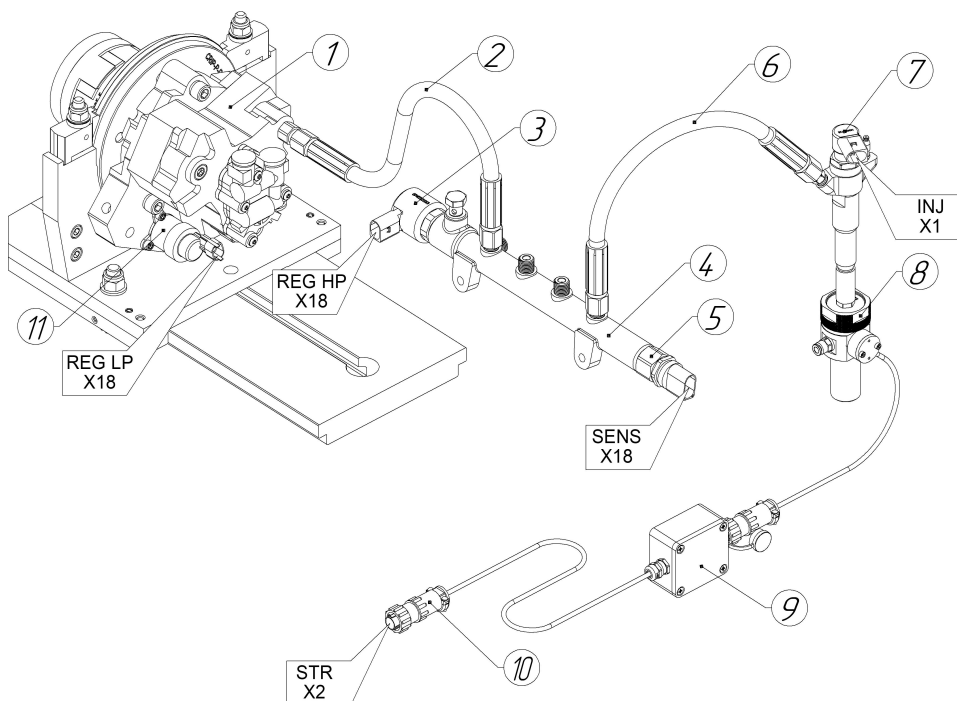


Figure 8 Connection of the high pressure system and injector

Pos.	Description
1	Bench mounted high pressure pump (HPP);
2	High pressure hose from the pump to the rail;
3	High pressure regulator;
4	High pressure rail;
5	Pressure sensor in the rail;
6	High pressure tube from the rail to the injector;
7	Injector;
8	Injection chamber with sensor (Delphi injector only);
9	Injection sensor booster;
10	Electrical connector X2 in the measuring unit;
11	HPV low pressure valve.

9. Injection chamber

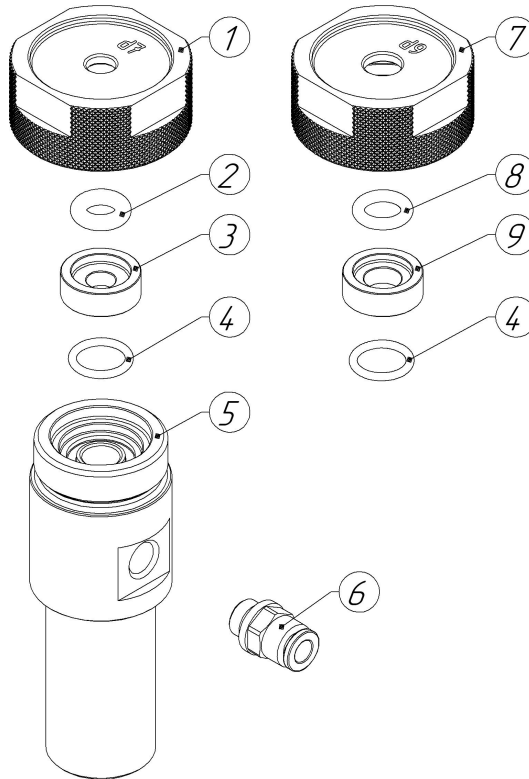


Figure 9 Injection chamber

Pos.	Description
1	Clamping nut for sprayer 7 mm;
2	O-ring 7*4 NBR-70;
3	Guide sleeve 7mm;
4	O-ring 12*2 NBR-70;
5	Injection chamber;
6	Injector line connection fitting;
7	Clamping nut for sprayer 9mm;
8	O-ring 9*3 NBR-70;
9	Guide sleeve 9 mm.

10. Injection chamber with sensor

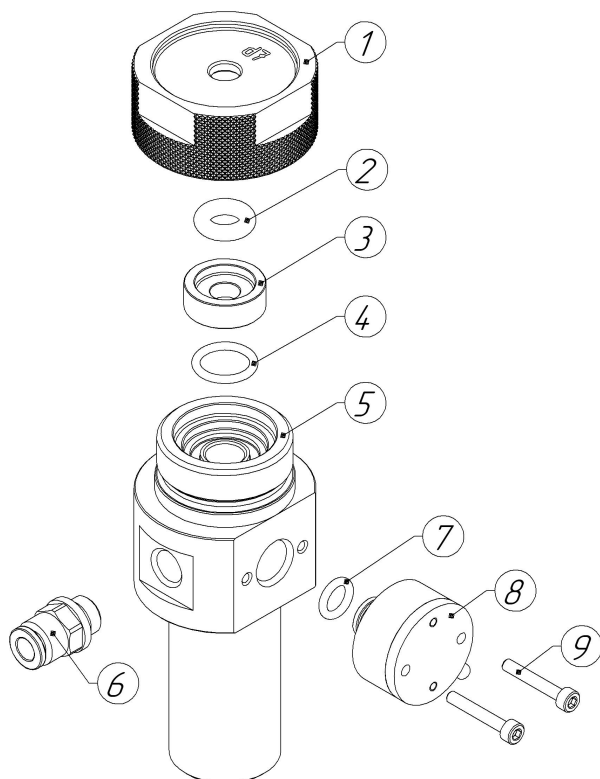


Figure 10 Injection chamber with sensor

Pos.	Description
1	Clamping nut for sprayer 7 mm;
2	O-ring 7*4 NBR-70;
3	Guide sleeve 7mm;
4	O-ring 12*2 NBR-70;
5	Injection chamber with sensor;
6	Injector line connection fitting;
7	O-ring 7*2,5 NBR-70;
8	Injection sensor;
9	Screws for mounting the sensor.

11. Filter of the measuring system

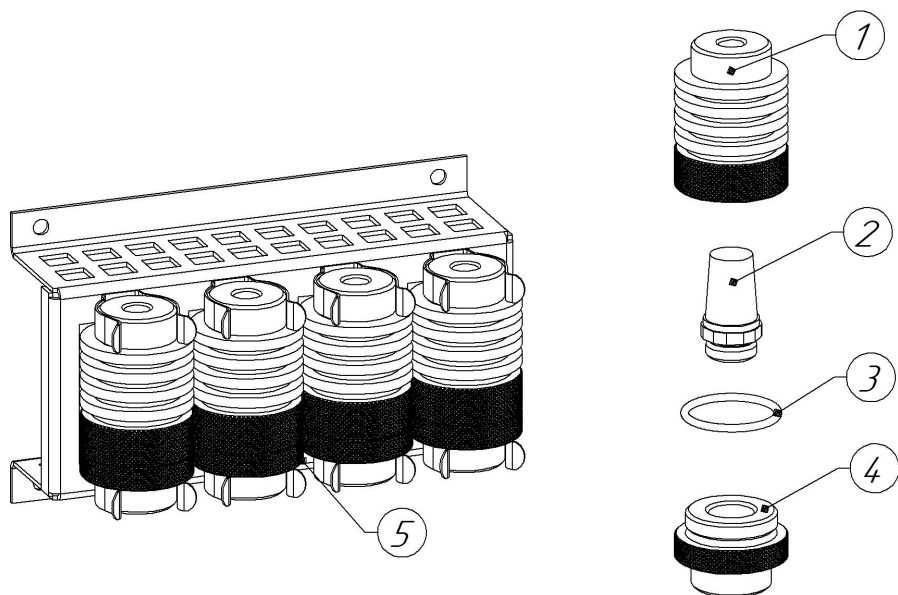


Figure 11 Filter of the measuring system

Pos.	Description
1	Upper part of the filter;
2	Filter element;
3	O-ring 26*2,5 NBR-70;
4	Lower part of filter;
5	Filter unit for one or four filters.

The filters of the measuring system must be inspected and maintained periodically.

The frequency depends on the intensity of use, but at least once a month carry out a visual inspection of the filter element. If it is dirty, blow it out with compressed air in reverse and rinse it in an ultrasonic bath. If the element cannot be cleaned, REPLACE it!!!

!!!ATTENTION, DO NOT CHANGE THE DIRECTION OF INSTALLATION OF THE FILTER ELEMENT, DANGER OF DAMAGING THE MEASURING UNIT!!!

12. measuring unit

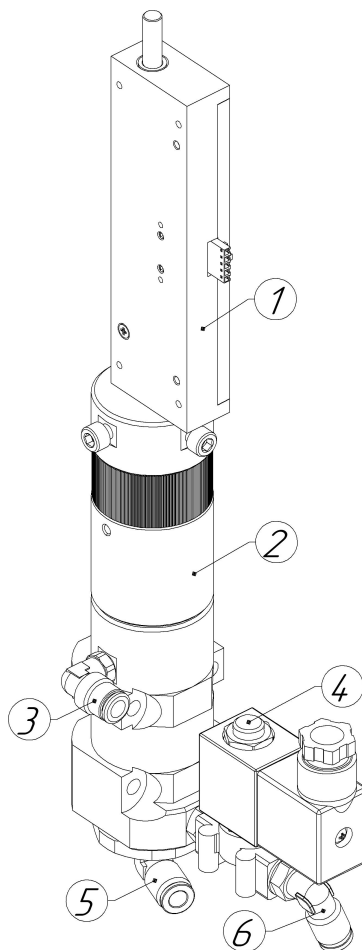


Figure 12 measuring unit

Pos.	Description
1	Linear encoder;
2	Housing;
3	Emergency overflow channel;
4	Drain valve;
5	The measuring liquid inlet;
6	Overflow channel for the measured liquid.

13. Meter housing

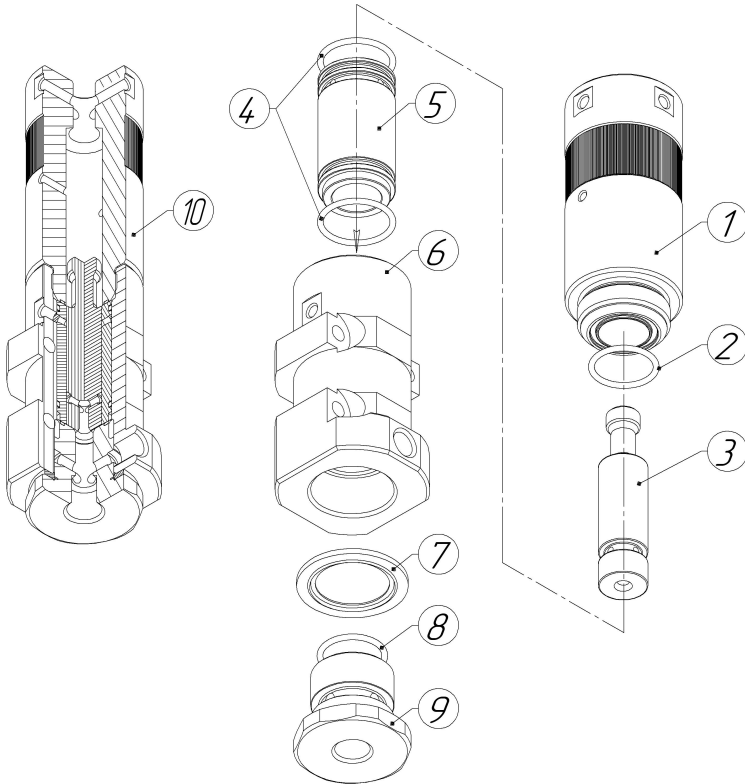


Figure 13 Meter housing

Pos.	Description
1	Upper part of the enclosure;
2	O-ring 19*1,5 NBR-70;
3	Plunger;
4	21,95*1,78 NBR-70 O-ring;
5	Plug sleeve;
6	Lower part of the body;
7	Rubber-metal washer;
8	O-ring 17*1,5 NBR-70;
9	Plug;
10	Meter body assembly.

14. Overall dimensions

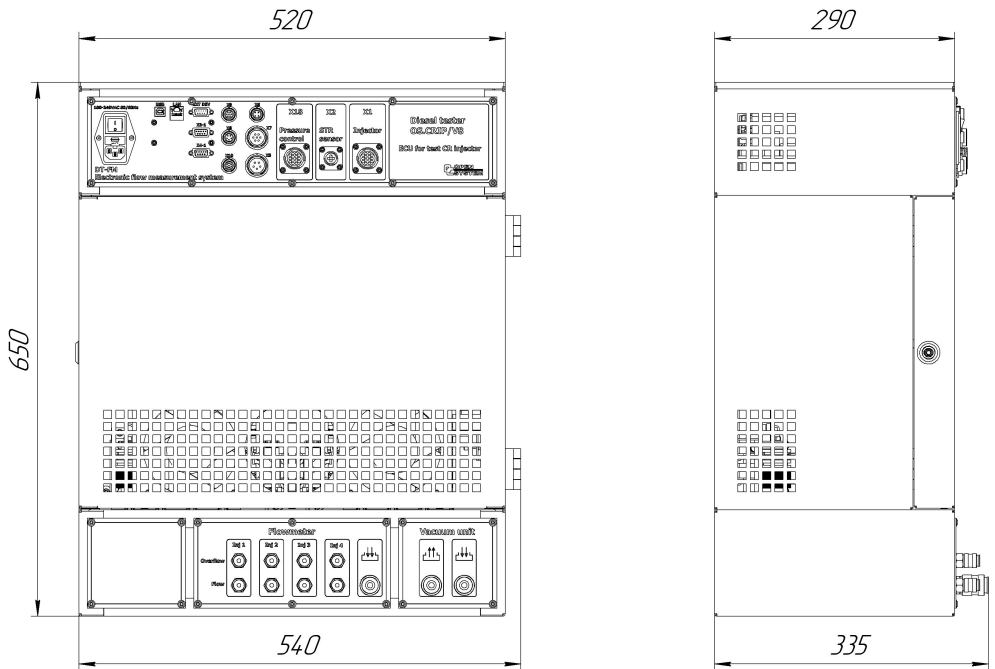


Figure 14 Overall dimensions

15. Mounting dimensions

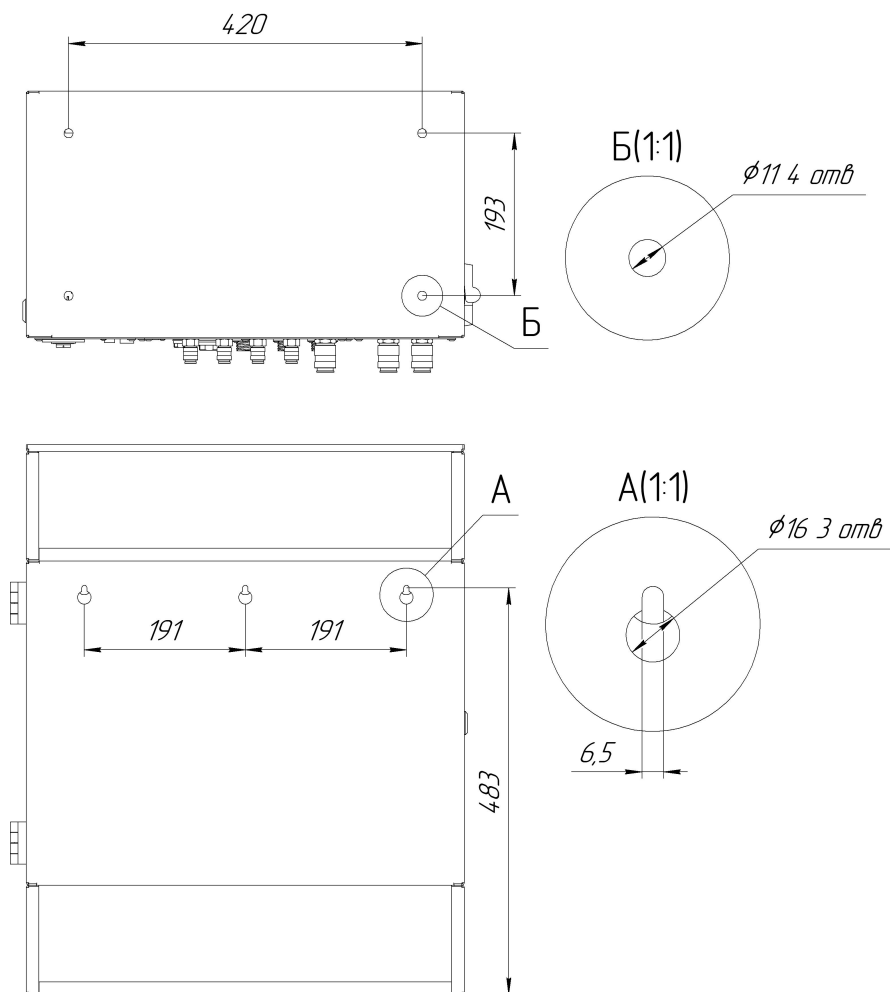


Figure 15 Mounting dimensions

The measuring unit can be mounted on a horizontal or vertical surface. There are mounting holes in the bottom of the enclosure and on the rear wall for this purpose.

During operation the unit must be securely fastened and protected from vibration caused by the operation of the test bench equipment.