

DT-UNI

**Device for testing high-pressure electronic fuel pumps
VE, PE, ZEXEL**

Manual.

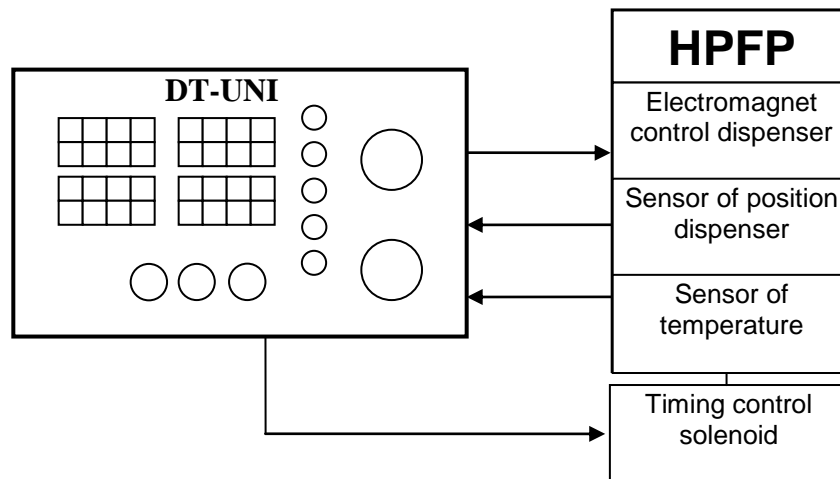
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Introduction

This manual (PS), combined with a technical description and instruction manual is a document certifying the main parameters and device specifications that are guaranteed by the manufacturer. This manual enable you to familiarize yourself with the device, the procedure and the rules of its operation, the adherence of which will ensure its working ability.

1. General information

Device for testing high-pressure electronic fuel injection pumps (HPFP) for the EDC series, HDK, oriented for use at a service stations which serve the diesel engine vehicles.



2. Purpose

The "DT-UNI" device is designed for testing and control of high-pressure fuel pumps with electronic control of the distribution type, as well as **in-line injection pumps**.

Distribution type VE - in particular Bosch HDK and EDC, as well as Japanese manufacturers of injection pumps ZEXEL in particular COVEC-F.

Series injection pump type: PE.

The device "DT-UNI" enable:

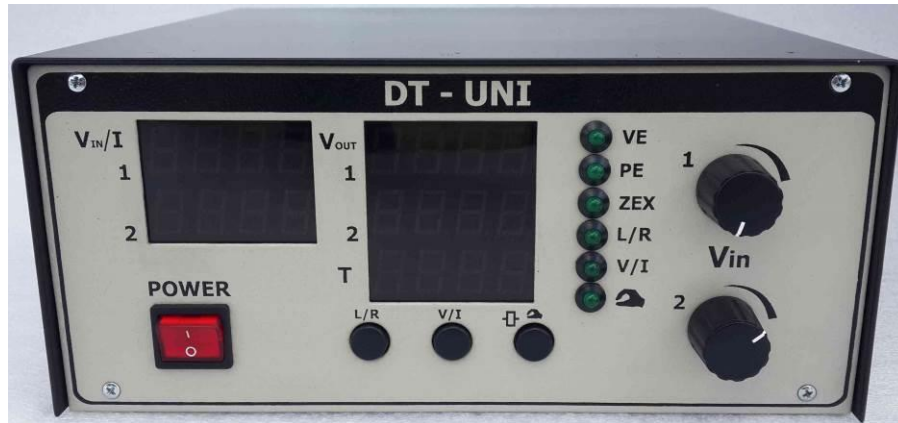
- operate fuel injection pump with electronic controls;
- set any possible position of the valve-spool (dispenser);
- operate pumps, with "inductive" or "potentiometric" position sensor;
- control the voltage (**checkback**) of the feedback from the sensor position of the dispenser on the indicator;
- monitor the preset voltage on the dispenser;
- monitor the current value through the coil of the dispenser;
- monitor the fuel temperature in the injection pump;
- operate the position of the fuel injection timing valve;
- display the voltage of the so-called "advance valve stroke" (TPS), only for ZEXEL-COVEC.
- start the engine directly using the "DT-UNI" device;
- control the operation of the fuel pump without removing it from the vehicle;

3. Main technical details and characteristics

1. Electric power supply voltage: $220V \pm 15\%$;
2. External electric power supply voltage: $+ 10 \dots + 16V$
3. The maximum permissible long-time current of the control circuit of the electromagnet of the dispenser: 10A;
4. The maximum permissible short-time current of the control circuit of the electromagnet of the dispenser: 12A;
5. Operating threshold of the operation current by a solenoid: $\sim 13A$;
6. Operating threshold of the operation current of the 2nd control channel (advanced): 4A (VE, ZEXEL) and 13A (PE);
7. Measurement error of the feedback voltage from the slide valve: no more than 2.5%;
8. TPS voltage measurement error: no more than 5%;
9. Temperature measurement error: 5%;
10. Current measurement error (at a current of more than 0.2 A): no more than 6%;
11. The mass of the device is not more than 5 Kg.
12. Dimensions (length x width x height): 230x220x150;
13. Power consumption: no more than 250 W.

4. Device design

The "DT-UNI" device is made as an attachment connected to the pump through of connectors-adapters.



the front panel of the device.

On the front panel of the device are: **power toggle switch**, indicators (voltage set and read, temperature), LED indicators of operation and conditions, control buttons, display voltage regulators.



the back panel of the device.

On the back panel of the device there are connectors for connection to the "centralization" of the pump, the connector for connecting the advance solenoid valve, the socket for connection of the external power supply +12 volts, the power connector 220 volts (combined with the fuse).

5. Operation guidelines

Requirements for environmental conditions:

- Operational temperature: +5 °C to +40 °C
- Temperature at the time of transportation -20 °C to +60 °C
- Relative humidity (without condensation): working 8% - 80%, storage 5% - 95%.
- Dustiness of air no more than 75 mkg / m³
- The air must be clean from corrosive gases.

Before the device has to be turned on. One has to be examined visually the integrity of the connectors-adapters, power cable 220 volts.

6. Setting-up procedures

Before the "DT-UNI" device has to be started one has carefully to read this manual.

When the device prepare for operation it is necessary to perform the following actions:

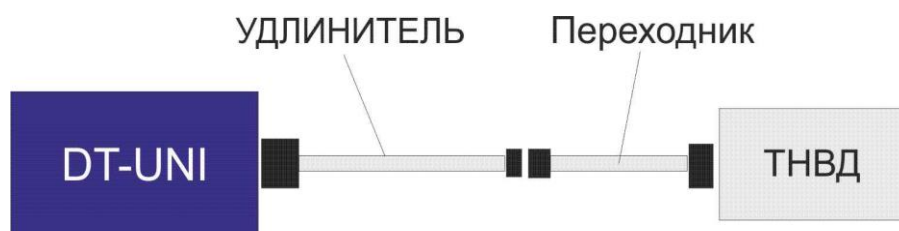
Do an external inspection of the device and the connecting cables. External inspection of the device and connecting cables is carried out with the power off and for this purpose one is to detect mechanical damage of the device and the connecting cables damage.

1. Procedure for connecting the controller to the injection pump.

You have to examine the appearance of the adapters. One can find it in the section "Adapter cables" of this manual.

Connection to the pump can be done in two ways.

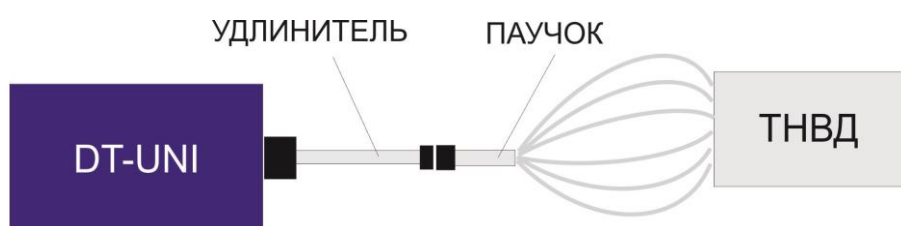
1. Using the "VE / ZEX" extension cable and the relative adapter from standard or additional set.



Connecting with an adapter cable

Using the universal adapter cable ("SPIDER") connect the terminals of the adapter cable to the relative terminals of the main wiring harness pump connector in compliance with the description on the pump.

2.



Connecting with manner of the spider.

1.1. Подключение универсальным переходником (паучок).

В таблице №1: указано соответствие цветной маркировки функциональному назначению линии универсального кабеля-переходника.

1.1. Connection with universal adapter (spider)

There is correspondence of the colour marking to the functional purpose of the universal adapter cable line indicated in table 1

Colour marking on the wire	L-sensor		R-sensor	
	Circuit name	Line service	Circuit name	Line service
GREEN	CONST	Coil terminal "backup"	R_IN	Potentiometer slider terminal
YELLOW	VAR	Coil terminal "position"	+5V	Farthest "high" terminal of the potentiometer*
RED	COM	Coil terminal "central"	GND	Farthest "bottom" terminal of the potentiometer*
BLUE	DT	Temperature sensor	DT	Temperature sensor
BLACK	DAW	Driving electromagnet of the dispenser	DAW	Driving electromagnet of the dispenser

Note:

* The "uppermost" one means a terminal to which the slider is supposed to move (central (**or medium**) terminal of the potentiometer) when opening the dispenser. The "lowest" one means the terminal to which the slider is supposed to move when the dispenser is in the "close" position.

If there is pump with an inductive position sensor, a conductor with location mark **GREEN** will indicate the need to connect it to the coil terminal of the "**backup**" if there is pump with a potentiometric sensor - **GREEN** will indicate the need to connect to the slider terminal of the potentiometer sensor slider. Similarly, conductors with color marks have a double meaning - **YELLOW, RED**.

Conductors with color location marks - **BLUE, BLACK** have the same purpose for both types of sensors. There are two conductors with color location marks - **BLUE, BLACK** and each of them has two conductors, the rotation of connection of which does not matter!

The description of the process of installing the pump on the test bench for diesel pumps, as well as the description of the test plan, is not included in these manual.

The relevant information is available in the testbeds operation manual, as well as in the technical documentation for the pump with potentiometric or inductive position sensors of the dispenser.

8. Connection of an unknown pump.

To do this, you need a device for measuring resistance, such as a multi-meter.

It is necessary to measure the resistance between the terminals, sorting out possible combinations. If the tester shows a resistance of 0.4-1 Ohm, between the two terminals, it means that the coil of the electromagnet of the dispenser drive is measured.

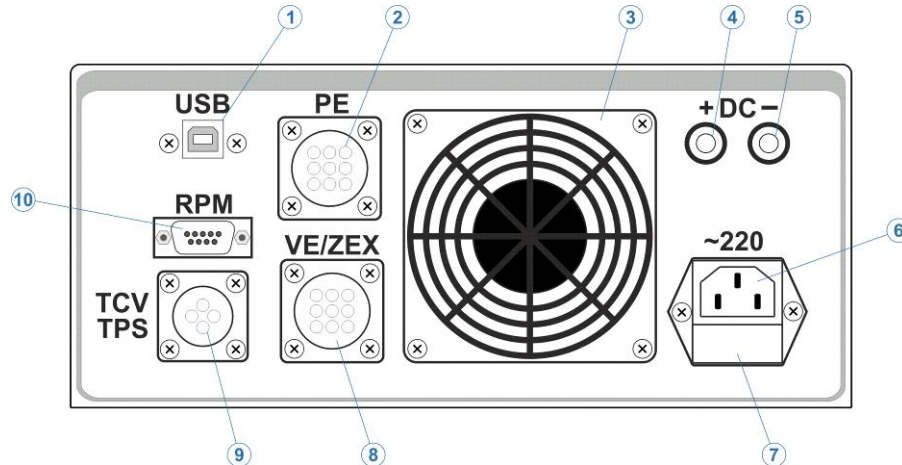
If the resistance is 4.9-7.5 Ohm - it means that one of the **coils** of the position sensor (inductive sensor) has been measured, should be two such coils there and, when one measure between the **farthest points** of the resistance should be about 10-15 Ohm. The definition of "**backup**" and "**variable**" is optional. In case of incorrect connection of the above mentioned coils (the central terminal should be connected to the NUL circuit), the device will display more than 4V, and with the opening of the slide valve the voltage decreases, as oppose to the voltage increase when it was connected correctly.

If 1 to 4 kΩ between two terminals is a temperature sensor (thermistor), then increasing temperature of the resistance decreases.

In case of a potentiometric sensor, it is necessary to find 3 terminals with 500-5000 Ohm resistance between them, while the resistance between two of them equals to the resistance between the other two pairs of terminals.

9. Operation with the device.

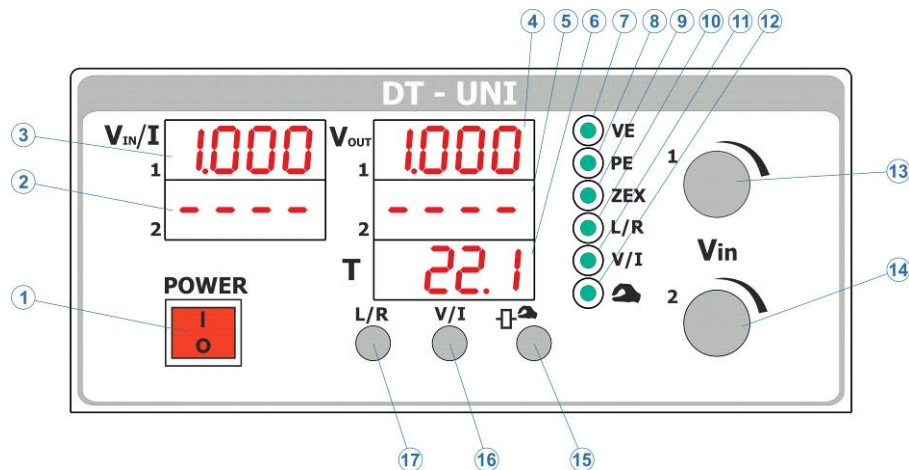
9.1 Connection.



Back panel of the device.

1	Connector USB-B. For connection with PC.
2	Connecting place of the adapter cable for pump-PE.
3	Fan.
4	+12B External power supply.
5	-12B External power supply.
6	Connecting socket power cable ~220V.
7	Fuse 5A.
8	Connecting place of the adapter cable for pump -VE или ZEXEL.
9	Connector of the testing cable "TIMING ADVANCE".
10	RPM – connecting place to the speed sensor (engine).

1.2. Controls.



Controls and indication

1	Toggle switcher to turn on the device.
2	2-Channel. Indicator of the preset voltage or current of the electromagnet.
3	1-Channel. Indicator of the preset voltage or current of the electromagnet
4	1-Channel. Indicator of the read voltage from the pump position sensor.
5	2-Channel Indicator of the read voltage from the position sensor of the control device "TIMING ADVANCE" (for ZEXEL only).
6	The fuel temperature indicator from the pump sensor
7	Operational status indicator TESTING - VE.
8	Operational status indicator TESTING - PE.
9	Operational status indicator TESTING - ZEXEL.
10	Selection indicator of the sensor type R – “resistive” (EDC).
11	Indicator for turning on of the current display of the electromagnet.
12	The indicator of the manual control regime activation
13	Operation handle for the 1st channel (DISPENSER).
14	Operation handle for the 2nd channel (TIMING ADVANCE).
15	Button for selecting of the hand operating or automatic control.
16	Button for selecting the display of the preset voltage or current.
17	Button for selecting of the sensor type o EDC - HDK.

9.3. Operating mode VE, PE, ZEXEL.

The operating mode switching namely a selection of the type of the tested pump VE, PE or ZEXEL is carried out by long pressing (about 2 seconds) of the button: [L / R].

The operating mode switching is cyclical namely

VE-HDK > VE-EDC > PE > ZEXEL > VE-HDK > and so on.

The selected operating mode is stored in the memory and remains the same after switching-off-switching-on.

9.4. Selection of the sensor type.

The type of HDL sensor (L- "inductive") or EDC (R- "resistive") is carried out by long pressing the [L / R] button in VE mode. **while** a return to the inductive sensor VE is possible after the operation mode switching PE, ZEXEL only.

9.5. Manual control.

Manual control is necessary to move the dispenser or rail, without maintaining its position, which is equivalent to controlling the electromagnet of the pump from the DC power supply.

Manual control is activated by pressing the relevant button 15, (picture Controls)



Manual control is selected simultaneously for both channels.

When manual control is selected, the LED 12 lights up (picture controls and indication) as well as on the indicators [VIN / I] are displayed only 3 labels (without a point). The range of values on them is from 0 to 100, which corresponds to the percentage of **PWM issued** to the electromagnet. The % PWM adjustment is set by the hand control **knobs**, each channel separately and with a relevant hand.

Instead of operation the **PWM**, you can select the operation in VOLTS (equivalent voltage). To do this, you need to press the manual control selection button for a long time. The device stores (with next switching-on) the selected **dimension in % -PWM** or VOLTS, which is accompanied by a short off of the indicators. Also on the indicators will appear a point and the range will become 0.0 - 14.0 (volts). Adjustment with **interval 0.1V**.

9.6. Current indication of the electromagnets.

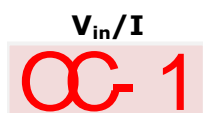
The [VIN / I] indicator, (for both the first and second channels) displays automatically the preset, so-called "**chackback**" voltage. When the [V / I] button is pressed, the indicators (for both channels simultaneously) will display the electromagnet current. Activating the current display signals the [V / I] LED's light.

9.7. Overcurrent.

The device has an electronic protection against overcurrent.

When the current threshold is exceeded in the electromagnet, the device is cut off of the current.

The device will sound a beep and one will be displayed on the overcurrent channel indicator, along the channels respectively:



Overcurrent threshold is different from types of the tested pumps is indicated below:

Pump types	Current protection threshold, A	
	1-chanel	2-chanel
VE	13	4
PE	13	13
ZEXEL	13	4

To "reset" the protection it is necessary to press the button briefly to activate the manual mode:

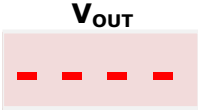


10. Indication of errors.

If the position sensor is faulty or the connection is incorrect (for example, the "SPIDER" connector), the device displays an error on the display. The error indication is also accompanied by a beep.

10.1. No connection to position sensor.

When there is no connection to the sensor (to the centralization bit), or to the break of both coils, the indicator displays:



10.2. When closed to a common (COM).

For the inductive sensor (HDK or ZEXEL), when a faulty connection is made (when one of the conductors is connected instead of the sensor to the coil of the driving dispenser electromagnet), the indicator displays:

Coil closure **CONCT**:



Coil closure **VAR**:



The closure for both coils, alternately blinks:



10.3. If there is no connection or breakage of the coil:

There is no coil CONCT:

V_{OUT}
L1 - -

Отсутствие катушки VAR:

There is no coils VAR

V_{OUT}
L2 - -

10.4 EDC.

For potentiometric sensor type (EDC).

In an unconnected state, values in the range can be displayed 0.000-0.050.

10.5. Temperature.

The [T] indicator displays the temperature measured by the sensor integrated in the pump. Dashes are displayed at breakage or closing of lines of the temperature sensor of the pump on the indicator:

T
- - - -

11 Software.

There is a software on the PC for the DT-UNI device (windows), which enables full control of the device from the PC, and it can also **make a diagram (chart) of dispenser motion** (the dependence of the position of the dispenser on the electromagnet current). It enables you to "see" the so-called "wedging" of the dispenser / rail movement. The software is available on the website:

<http://opensys.com.ua/novosti/new-dt-uni-tester>

The program on the PC enables you to control new versions of firmware for the device and update them.

12. Delivery set

Manual 1 pcs.

Controller DT-UNI 1 pcs.

Extension cable VE / ZEX 1 pcs.

Extension cable PE 1 pcs.

Cable TIMING ADVANCE VE / ZEX 1 pcs.

Cable-adapter "SPIDER-VE" 1 pcs.

Cable adapter VE-VOLKSWAGEN (0.986.612.439) 1 pcs.

Power cable 220V 1 pcs.

Banana plug 2 pcs.

Additionally you can purchase:

For pump testing of VE type **such Bosch** compatible cable-adapters:

- Cable adapter 0.986.612.430 (BMW)
- Cable adapter 0.986.612.434 (BMW)
- Cable adapter 0.986.612.444 (SHARAN)
- Cable adapter 0.986.612.445 (AUDI)
- Cable adapter 0.986.612.698 (SPRINTER)

2. For pumps testing of PE type **such Bosch** compatible adapter cables:

- Cable adapter 0.986.610. 104
- Cable adapter 0.986.610. 107
- Cable adapter 0.986.610.109
- Cable adapter 0.986.610.113
- Cable adapter 0.986.610.114
- Cable adapter 0.986.610.124

"Universal" adapter "Spider-PE", is supplied according to the agreement.

13. Warranty

The manufacturer guarantees the stable operation of the "DT-UNI" device if the device owner comply with the product storage regulations and operation rules which are set forth in this manual.

The warranty period is 18 months from the moment of purchase of the product, with the exception of cases when the buyer and seller agreed on other terms in writing.

The manufacturer indicates in the warranty card the year, month, day of sale, legal address, company phone which carries out the warranty repair (warranty card is in the appendix to the manual for "DT-UNI" devices).

During the warranty period, the device owner is entitled to free repair if one shows this manual and warranty card. After repairing, a list of repair works is included in the warranty card.

The manufacture does not consider a claim if there was violation of the integrity of the connecting wires (adapter cables).

The manufacturer does not take guarantee obligations for "DT-UNI" devices in cases of: opening the case of the device "DT-UNI", traces of damage on the case and the "DT-UNI" board, if the rules for storage and operation of the device are not comply with.

The guarantee repair does not do and manufacture does not consider a claim regarding the device quality if there is no a warranty card and if there is a stamp damage on the cover product.

During the warranty period repairs are carried out at the expense of the owner in the event if buyer does not operate this device in accordance with this manual.

The manufacturer provides further repair of the device "DT-UNI", after the end of the warranty period according to a new contract.

The manufacturer guarantees the information support.

14. Limitation of Liability

The manufacturer is not liable before buyer or before third party for damages and losses that Buyer and third party bear as a result of the wrong device use, including incompetent or erroneous actions of the buyer's staff, as well as for losses caused by the operations or no operations of this device.

Under no circumstances the manufacturer will be liable for missed profits, damages caused by an accident, or other subsequent economic losses, even if the company-manufacturer has been notified regarding the possibility of such damages.

The manufacturer is not liable for damages which buyer claimed on the basis of third party's claims or caused by failure to meet their obligations.

The manufacturer is not liable for any problems and damages as a result of the use of additional devices which are recommended for use with this device, as well as its modification, repair or modification in its design, not provided for this manual, including using a self-made connector-adapter.

:

15. Cable-adapters VE / ZEXEL.

for pump VE / ZEXEL type.

The list of cables-adapters included in the basic delivery set.



Extention cable VE / ZEX.



Cable "TIMING ADVANCE VE / ZEX".

Cable "TIMING ADVANCE VE/ZEX" is used for connection **valve** "TIMING ADVANCE" in VE и ZEXEL pumps, but in ZEXEL for read of the valve position "TIMING ADVANCE". Mark is specified in table:

COLOUR	VE	ZEXEL
BLACK	VALVE-TIMING ADVANCE	VALVE-TIMING ADVANCE
BLACK	VALVE- TIMING ADVANCE	VALVE- TIMING ADVANCE
YELLOW	-	POSITION SENSOR - VAR
RED	-	POSITION SENSOR - COM
GREEN	-	POSITION SENSOR - CONST



"SPIDER" (for VE / ZEXEL).



Cable-adaptor analogy VE-VOLKSWAGEN 0.986.612.439.

The list of cables-adapters not included in the basic delivery set.



VE-BMV 0.986.612.430



VE-BMV 0.986.612.434



VE-SPRINTER 0.986.612.698



VE-SHARAN 0.986.612.444



VE-AUDI 0.986.612.445

13.Cable-adapters PE.



PE 0.986.610.104



PE 0.986.610.107



PE 0.986.610.109



PE 0.986.610.113



PE 0.986.610.114



PE 0.986.610.124



“Spider” PE

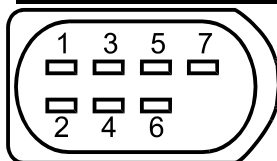
Appendix №1

The connection example of the control circuits of the **relevant contact points** (sensor type-inductive) of the «DT-UNI» device to pump

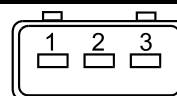
- AUDI A4 1,9D TDI 1995-2001. eng.. 1Z/AHU, AFF,AFN Bosch EDC
- AUDI Cabriolet 1,9D TDI 1995-2001. eng.1Z/AHU, Bosch EDC
- FORD Galaxy 1,9D TDI 1995-2001 eng. AFN, 1Z Bosch EDC 1.3/1.4
- SEAT Toledo, Ibiza, Cordoba 1,9D TDI 1995-1999. eng. 1Z, AHU, AFN Bosch EDC 1.3/1.4
- VW Polo Classic, Estatec 1,9D TDI 1997-2001 eng. AHU, AFN,ALE Bosch EDC 1.4
- VW Golf, Cabrio, Vento 1,9D TDI 1993-1998 eng.. 1Z/AHU Bosch EDC
- VW Passat 1,9D TDI 1994-2000 eng.. 1Z, AFN, AHU, AHH, AVG Bosch EDC, Bosch EDC15V
- VW Sharan 1,9D TDI 1995-1999 eng. 1Z, AFN, AHU, Bosch EDC
- VW Caddy 1,9D TDI 1996-2001 eng. ALE, AHU, Bosch EDC 1.4
- Volvo 850, S70, V70 1996-2000 eng.. D5252T, Bosch MSA 15.7

Table 2

Colour of the mark on the wire	Circuit name	№ Contact point on the pump connector	Conditions
YELLOW	VAR	3 (7-pin)	4,9-7,5[Ω]
RED	COM	2 (7-pin)	
GREEN	CONST	1 (7-pin)	4,9-7,5[Ω]
BLUE	DT	4 (7-pin)	см. табл.
BLUE	DT	7 (7-pin)	
BLACK	DAW	5 (7-pin)	0,4-1,1[Ω]
BLACK	DAW	6 (7-pin)	
TIMING ADVANCE	OPER	2 (3-pin)	12-20[Ω]
TIMING ADVANCE	OPER	3 (3-pin)	



Operation connector of the pump motion



Operation connector of the adjustment of the injector spray angle

Table 3

Correspondence of the resistance value and temperature

Temperature °C	0	20	40	60	80	100
Resistance [Ω]	5k-6k	2,25k-3k	900-1,4k	530-675	275-375	150-230

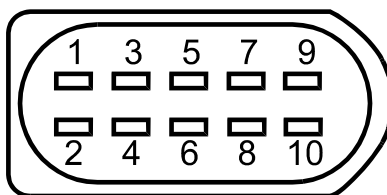
Appendix № 2(VE)

The connection example of the control circuits of the **relevant contact points** (sensor type-inductive) of the «DT-UNI» device to pump

- AUDI A4 1.9D TDI 1996-2001 eng.. AGR Bosch EDC
- VW Polo 1.7D, 1.9D 1996-2001 eng.. AHG, AKU, AGD Bosch EDC 15V
- VW Polo Classic 1.7D, 1.7D SDI 1997-2000 eng.. AKU, AKW Bosch EDC 15V
- VW Polo Estate 1.7D, 1.9D SDI 1997-2001 eng.. AKU, AEY Bosch EDC 15V
- VW Golf, Bora 1.9D SDI, 1.9D TDI 1997-2001 eng.. AGP, AQM,AGR,AHF,ALH Bosch EDC 15V
- VW Sharan, Passat 1.9D TDI 1994-1999 eng.. 1Z, AHU, AFN Bosch EDC
- VW Caddy 1.7D SDI, 1.9D SDI 1996-2001 eng.. AEY, AKW Bosch EDC 15V

Table - 4

Colour of the mark on the wire	Circuit name	№ Contact point on the pump connector	Conditions
YELLOW	VAR	3 (10-pin)	5-7[Ω]
RED	COM	2 (10-pin)	
GREEN	CONST	1 (10-pin)	5-7[Ω]
BLUE	DT	4 (10-pin)	см. табл.
BLUE	DT	7 (10-pin)	
BLACK	DAW	5 (10-pin)	0,4-1,1[Ω]
BLACK	DAW	6 (10-pin)	
TIMING ADVANCE	OPER	9 (10-pin)	12-20[Ω]
TIMING ADVANCE	OPER	10 (10-pin)	



Operation connector of the pump motion

Table – 5 Correspondence of the resistace value and temperature

Temperature °C	0	20	40	60	80	100
Resistance [Ω]	5k-6k	2,25k-3k	900-1,4k	530-675	275-375	150-230

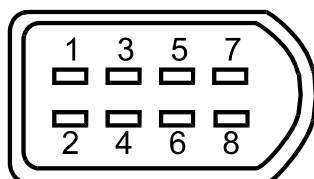
Appendix №3 (VE)

The connection example of the control circuits of the **relevant contact points** (sensor type-inductive) of the «DT-UNI» device to pump:

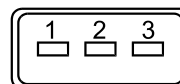
- SEAT Ibiza, Cordoba, Toledo 1.9D SDI 1996-1999 eng.. AEY Bosch EDC
- SEAT Alhambra, Inca 1.9D SDI, 1.9D TDI 1996-2001 eng.. AEY, 1Z Bosch EDC
- VW Polo, Polo Classic 1.9D SDI, 1.7D SDI 1996-2001 eng.. AEY, AHB, AEY Bosch EDC
- VW Polo Estate, Caddy 1.7D SDI 1996-2001 eng. AHB Bosch EDC
- VW Golf 1.9D 1995-1998 eng.. AEY/AEF Bosch EDC
- VW Transporter, LT 2.5D TDI 1995-2001eng.. ACV, AHD Bosch EDC

Table 6

Colour of the mark on the wire	Circuit name	№ Contact point on the pump connector	Conditions
YELLOW	VAR	3 (8-pin)	4,9-7,5[Ω]
RED	COM	2 (8-pin)	
GREEN	CONST	1 (8-pin)	4,9-7,5[Ω]
BLUE	DT	4 (8-pin)	см. табл.
BLUE	DT	7 (8-pin)	
BLACK	DAW	5 (8-pin)	0,5-2,5[Ω]
BLACK	DAW	6 (8-pin)	
TIMING ADVANCE	OPER	2 (3-pin)	12-20[Ω]
TIMING ADVANCE	OPER	3 (3-pin)	



Operation connector of the pump motion



Operation connector of the adjustment of the injector spray angle

Table 7

Correspondence of the resistance value and temperature

Temperature °C	0	20	40	60	80	100
Resistance [Ω]	5k-6k	2,25k-3k	900-1,4k	530-675	275-375	150-230

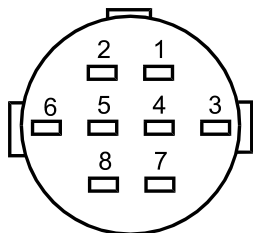
Appendix №4 (VE)

The connection example of the control circuits of the **relevant contact points** (sensor type-inductive) of the «DT-UNI» device to pump:

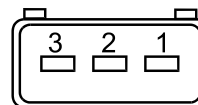
- Land Rover 2.0D T 1997-2000 eng. 20T Bosch MSA 11
- Rover 200, 400, 600 2.0D T 1995-1999 eng.20T2N Bosch MSA 11

Table 8

Colour of the mark on the wire	Circuit name	№ Contact point on the pump connector	Conditions
YELLOW	VAR	8 (8-pin)	5,6[Ω]
RED	COM	7 (8-pin)	
GREEN	CONST	6 (8-pin)	5,6[Ω]
BLUE	DT	2 (8-pin)	см. табл.
BLUE	DT	5 (8-pin)	
BLACK	DAW	3 (8-pin)	0,7[Ω]
BLACK	DAW	4 (8-pin)	
TIMING ADVANCE	OPER	2 (3-pin)	14,8[Ω]
TIMING ADVANCE	OPER	3 (3-pin)	



Operation connector of the pump motion



Operation connector of the adjustment of the injector spray angle

Table 9

Correspondence of the resistance value and temperature

Temperature °C	0	20	40	60	80	100
Resistance [Ω]	5k-6k	2,25k-3k	900-1,4k	530-675	275-375	150-230

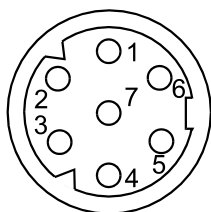
Appendix №5 (VE)

The connection example of the control circuits of the **relevant contact points** (sensor type-inductive) of the «DT-UNI» device to pump:

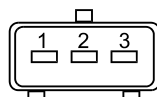
- Renault Megane, Scenic, Laguna, Espase 1.9D T 1997-2001 eng. F9Q730/734/736/710/716/720/722 Bosch MSA 15.5

Table 10

Colour of the mark on the wire	Circuit name	№ Contact point on the pump connector	Conditions
YELLOW	VAR	1 (7-pin)	4,9-6,5[Ω]
RED	COM	3 (7-pin)	
GREEN	CONST	2 (7-pin)	4,9-6,5[Ω]
BLUE	DT	5 (7-pin)	см. табл.
BLUE	DT	6 (7-pin)	
BLACK	DAW	7 (7-pin)	0,7[Ω]
BLACK	DAW	4 (7-pin)	
TIMING ADVANCE	OPER	1 (3-pin)	14,3-17,3[Ω]
TIMING ADVANCE	OPER	3 (3-pin)	



Operation connector of the pump motion



Operation connector of the adjustment of the injector spray angle

Table 11

Correspondence of the resistance value and temperature

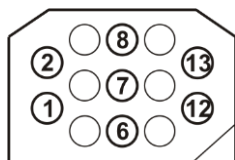
Temperature °C	0	20	40	60	80	100
Resistance [Ω]	5k-6k	2,25k-3k	900-1,4k	530-675	275-375	150-230

Appendix №6 (VE)

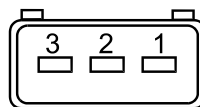
The connection example of the control circuits of the **relevant contact points** (sensor type-inductive) of the «DT-UNI» device to Мерседес «Sprinter» pump:

Table 12

Colour of the mark on the wire	Circuit name	№ Contact point on the pump connector	Conditions
YELLOW	VAR	8 (13-pin)	4,9-6,5[Ω]
RED	COM	7 (13-pin)	
GREEN	CONST	6 (13-pin)	4,9-6,5[Ω]
BUE	DT	1 (13-pin)	см. табл.
BLUE	DT	2 (13-pin)	
BLACK	DAW	12 (13-pin)	0,7[Ω]
BLACK	DAW	13 (13-pin)	
TIMING ADVANCE	OPER	1 (3-pin)	14,3-17,3[Ω]
TIMING ADVANCE	OPER	3 (3-pin)	



Operation connector of the pump motion



Operation connector of the adjustment of the injector spray angle

Table 13

Correspondence of the resistance value and temperature

Temperature °C	0	20	40	60	80	100
Resistance [Ω]	5k-6k	2,25k-3k	900-1,4k	530-675	275-375	150-230

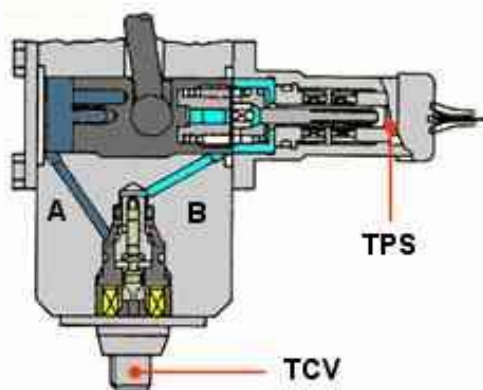
Appendix №7 (ZEXEL)

Connection to TCV valve (**timing advance operation**) and TPS (sensor of the timing advance position) in COVEC pump.

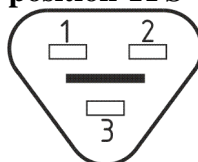
Connection to TCV TPS sensors is carried out with cable:

TIMING ADVANCE VE /ZEX

Conditional position of the sensors in the pump

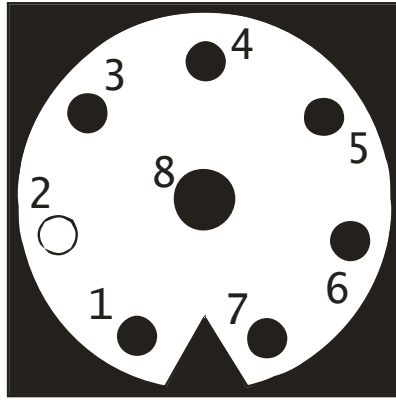


Sensor connector of the timing advance position TPS



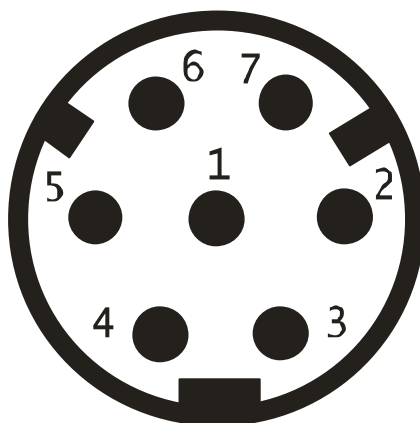
Colour of the mark on the wire	Circuit name	№ Contact point on the pump connector	Conditions
YELLOW	VAR (TPS)	2 (3-pin)	40 [Ω]
RED	COM (TPS)	3 (3-pin)	
GREEN	CONST (TPS)	1 (3-pin)	40 [Ω]
BLACK	ОПЕРЕЖ (TCV)	1 (2-pin)	8-12 [Ω]
BLACK	ОПЕРЕЖ (TCV)	2 (2-pin)	

Appendix №8 (PE)



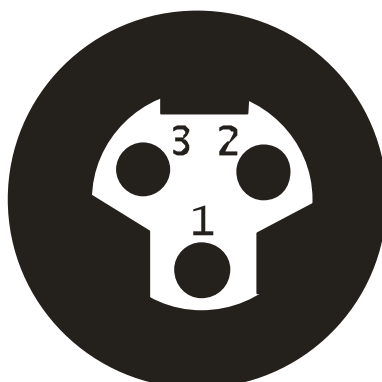
Contact point number	Line name	Colour
1	CONST	GREEN
2	Not use	-
3	Electromagnet coil of the timing advance	RED
4	Electromagnet coil of the timing advance	RED
5	VAR	BLUE
6	COM	YELLOW
7	Electromagnet coil of the control rod	BLACK
8	Electromagnet coil of the control rod	BLACK

Appendix №9 (PE)



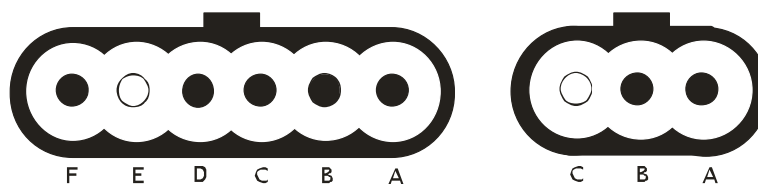
Contact point number	Line name	Colour
1	CONST	GREEN
2	Electromagnet coil of the control rod	BLACK
3	Electromagnet coil of the timing advance	RED
4	Electromagnet coil of the timing advance	RED
5	VAR	BLUE
6	COM	YELLOW
7	Electromagnet coil of the control rod	BLACK

Appendix №10 (PE)



Contact point number	Line name	Colour
1	COM	YELLOW
2	VAR	BLUE
3	CONST	GREEN

Appendix №11 (PE)



Contact point number	Line name	Colour
A (6 Contact points)	Electromagnet coil of the timing advance	RED
B(6 Contact points)	Electromagnet coil of the timing advance	RED
C(6 Contact points)	COM	YELLOW
D(6 Contact points)	VAR	BLUE
E(6 Contact points)	Not use	-
F(6 Contact points)	CONST	GREEN
A(3 Contact points)	Not use	-
B(3 Contact points)	Electromagnet coil of the control rod	BLACK
C(3 Contact points)	Electromagnet coil of the control rod	BLACK

13 Warranty

Warranty no. _____

The "DT-UNI" device for testing high-pressure electronic fuel pumps.

Guarantee repair and maintenance of the controller "DT-UNI" is carried out by the manufacturer.

tel./fax _____

Date of sale " ____ " _____

Signature _____ Manufacturer's stamp

