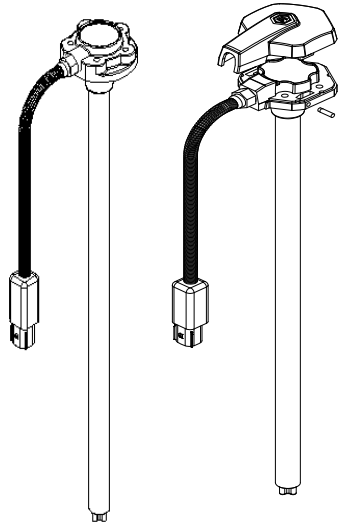


Capacitive level sensor TD-150

DATASHEET

Serial number S

Date D

1 GENERAL PRODUCT INFORMATION

1.1 The sensor ESCORT TD-150 determines the fill level of light oils in reservoirs (storage tanks). It is used as a fuel sensor in the automotive engineering, as a level sensor for any light oils in the industry.

1.2 The sensor converts the calculated fuel level into a digital code, frequency or analog signals.

1.3 The sensor is a complete, finished solution. To ensure explosion protection, it is necessary to connect a resistor of the appropriate rating to the power supply circuit, the presence of a resistor depends on the scope of delivery.

1.4 Information about certification: Certificate of type approval of measuring instruments No. 82228-21 dated July 21, 2021 valid until July 12, 2026.

1.4 DO NOT USE THE SENSOR FOR MEASUREMENT OF ELECTRICALLY CONDUCTIVE LIQUID (E.G. WATER, DAIRY PRODUCTS) LEVEL.

1.5 DO NOT DISASSEMBLE THE SENSOR!

1.6 DO NOT EXCEED THE OPERATING CHARACTERISTICS SPECIFIED IN THE CERTIFICATE!

1.7 PREVENT MECHANICAL DAMAGE OF THE SENSOR COMPONENTS, CONNECTING WIRES AND CABLES DURING INSTALLATION AND OPERATION.

2 SPECIFICATIONS

Table 1 – Technical characteristics ESCORT TD-150

Parameter	Value / units
Power supply voltage	7 ... 80 V[1)]
Current, no more	30 mA
Reduced measurement error in the effective range	up to 1% UML2[2)]
Operating modes	digital, frequency, analog
1) Digital mode: a) wired: - interface - communications protocol - data communication rate - output signal range LLS b) Wireless (TD-150-BLE[3]): - interface - the communication protocol 2) Frequency mode: - output signal range 3) Analog mode: - output signal range	 RS-485 LLS 19200 bps 1 ... 4095 un. Bluetooth LE (BLE[3)] Escort BLE[3)] 300 ... 4395 Hz 0,2 ... 9 V
The sensitivity of the receiver / transmitter power	-96 dBm[3)] / 4 dBm[3)]
Operating frequency range (BLE)	from 2,402 to 2,480 GHz[3)]

1) the maximum permissible voltage value for intrinsically safe electrical equipment installed in an explosive zone is 40 V;

2) UML - upper limit of measurement;

3) It is used for TD-150-BLE option.

Continuation of the table 1

Parameter	Value / units
Ingress protection rating	IP69S
Electric shock protection	class III
Type of explosion protection	intrinsically safe electrical circuit ("ia" level of protection)
Explosion proof mark	0Ex ia IIB T6 Ga X (0Ex ia IIB T6 X)
Categories of explosive mixtures	categories IIA, IIB
Explosion hazardous areas	0; 1 and 2
Operating conditions: - ambient temperature - extreme ambient temperature - air pressure	 - 45 ... + 50 °C - 60 ... +85 °C 84 ... 106.7 kPa
Dimensions,no more mm	80x80x(L+21), where L is the sensor length in mm
Nominal sensor length	indicated on the label (pasted in the Certificate)
Weight, no more kg	0,35 + 0,4xL, where L – the sensor length in meters

Table 2 - Parameters of intrinsically safe circuits

Parameter	**Value / units**		
Terminals	x3-x4 +Uпит и GND	x12-x13 A и B	x5-x4 Аналоговый выход
Maximum input voltage Ui, V	40	12,5	10
Maximum input current Ii, mA	30	2,5	50
Maximum input power Pi, W	1,2	0,08	0,01
Maximum internal capacity Ci	0,27 ICF	0,01 sf	0,01 sf
Maximum internal inductance Li, MH	0,01	0,01	0,01
Specific inductance of the cable Lc, nGn/m	7		
Specific capacity of the cable Sc, pF/m	1,4		
Maximum cable length, m	7		

3 SCOPE

Table 3 – Scope ESCORT TD-150

Name	Quantity	Ser.number	Notes
Ver.1[1)]			
Sensor ESCORT TD-150	1		
Installation kit	1		
Datasheet	1		in electronic form
Ver.2			
Sensor ESCORT TD-150	1		
Installation kit	1		
Datasheet	1		in electronic form

1) - the appearance of the product version 1 can be presented in two housings that do not affect the performance of the capacitive level meter

4 SAFETY PRECAUTIONS

Observe general safety instructions for works with electrical devices during the sensor installation, operation and maintenance.

5 LIFE CYCLES, SERVICE AND SHELF LIFE, WARRANTY

5.1 Guaranteed service life is 5 years from the date of shipping from the factory.

5.2 Service life - 10 years.

5.3 The manufacturer guarantees compliance of the meter with specification requirements, provided that the operation, transportation and storage conditions are observed by the Customer.

5.4 In case of any failure detection, contact the manufacturer.

5.5 Products with defects caused by the Customer's fault due to failure to observe the operation, transportation and storage conditions are not covered by the warranty.

5.6 The manufacturer reserves the right to make changes in design and complete set product without prior notice to the customer.

6 ACCEPTANCE CERTIFICATE

Sensor ESCORT TD-150 is manufactured in Ser. №_____S_____ accordance with the current technical documentation and qualified for operation.

7 PACKING CERTIFICATE

Sensor ESCORT TD-150 is packed in Ser. №_____S_____ accordance with the current technical documentation

8 INSTALLATION CERTIFICATE

Sensor ESCORT TD-150 ser. No. _____S_____ is installed in accordance with the current technical documentation on the equipment:

name	identification number / state number

signature	/ Full Name /	day, month, year

remarks

9 VERIFICATION INFORMATION

9.1 Initial verification

Date	Conclusion	Verification officer signature	Verification officer seal

9.2. Periodic verification

Date	Conclusion	Verification officer signature	Verification officer seal

10 TRANSPORTATION AND STORAGE

10.1 The sensor is transported factory-packaged by enclosed transport. To be stored in dry rooms with humidity not more than 75 % at a temperature of -20 to +30°C. Storage rooms should not contain current-conducting dust, aggressive substances and their vapors that cause corrosion of parts and destruction of electrical insulation of the sensors.

11 DISPOSAL

11.1 The instrument does not include environmentally hazardous components.

11.2 The instrument does not contain precious metals in the amounts to be recorded.

12 CONSIDERATIONS RELATING TO INSTALLATION ON AUTOMOTIVE EQUIPMENT (see Technical Description or Operating Manual for details)

12.1 Sensor length should be specified when ordering.

12.2 If necessary, cut measuring tubes with a hacksaw, avoiding chips in the measuring part. Minimal residual length of the measuring part should be at least 150 mm.

12.3 Install the centralizer from the installation kit, see the Appendices 7.

12.4 Set the upper and lower limit levels using a USB-RS485 interface converter or via Bluetooth ** (for version TD-150-BLE) and the configuration software. For details, see the Instruction Manual.

12.5 Install the sensor using sealing gasket between the sensor flange and the tank surface.

12.6 If there is no additional insulation (corrugated tube) of the sensor cable and connecting cable, lay them in additional insulation (corrugated tube), avoiding contact with hot parts of the units of automotive equipment.

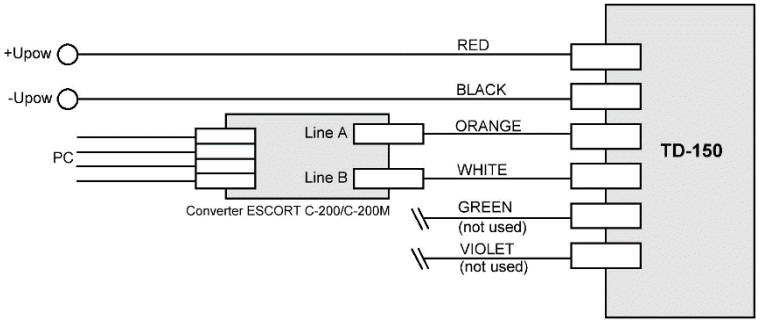
12.7 When installing the sensor not in the proper location, perform mounting, see details in Appendices 6.

12.8 The connection diagrams of the sensors are given in Appendices 1-5.

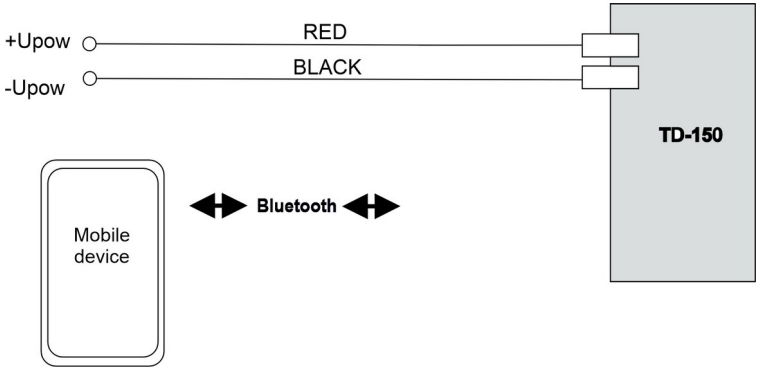
ATTENTION! The upper level of the sensor should be calibrated from the drain hole (10 mm from the sensor cell).

ATTENTION! The sensor longer than 2 m must be installed with a bottom detent included in the installation kit, see the Appendices 7.

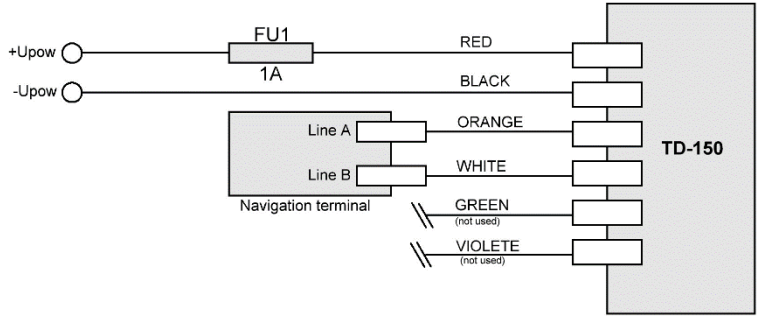
APPENDIX 1. Sensor connection diagram in program mode

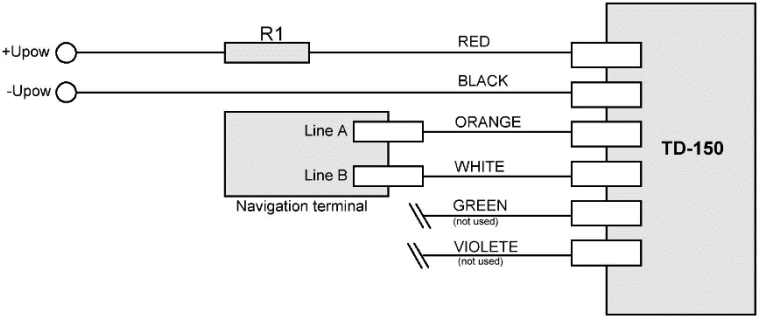


For execution (TD-150-BLE)

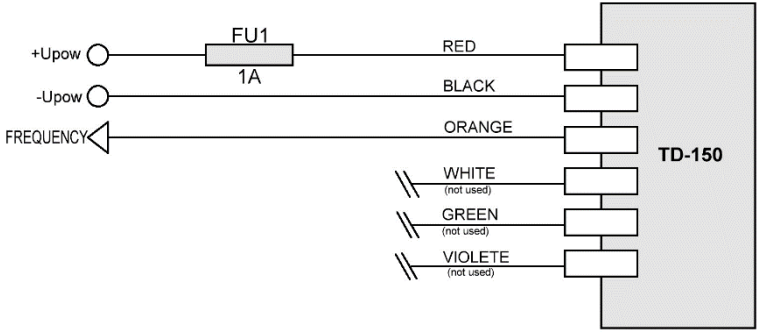


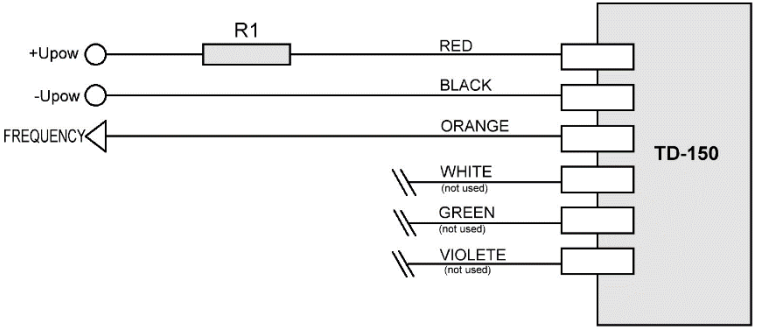
APPENDIX 2. Sensor connection diagram in RS-485 mode



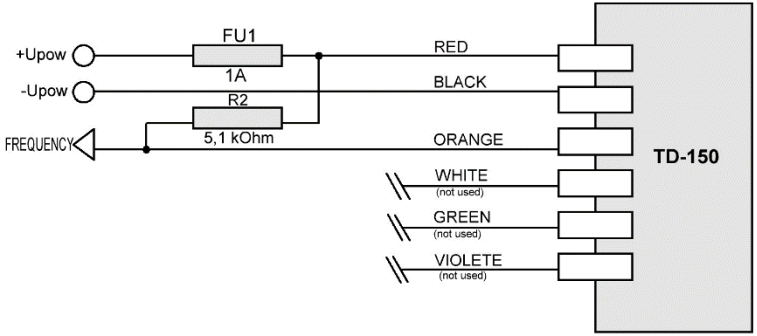


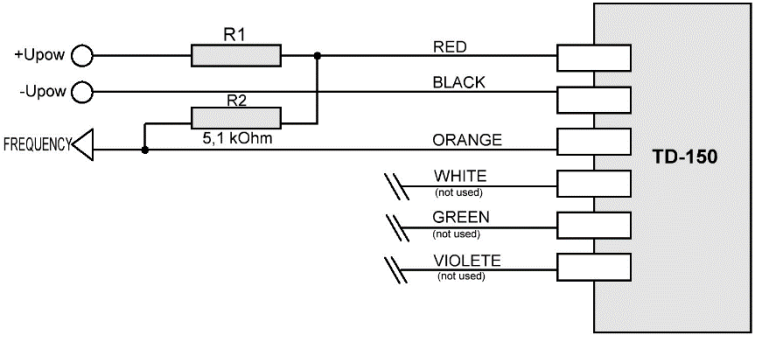
APPENDIX 3. Sensor connection diagram in frequency mode



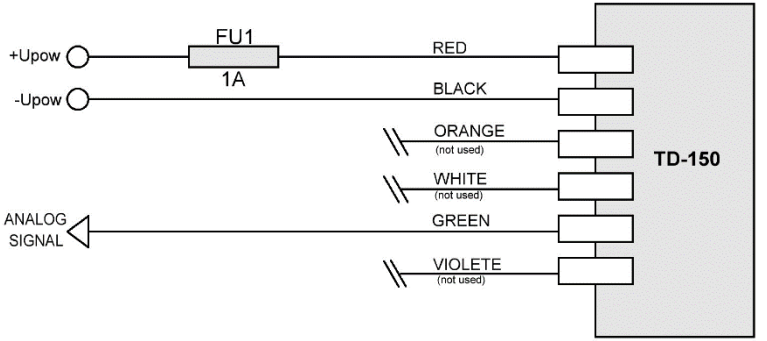


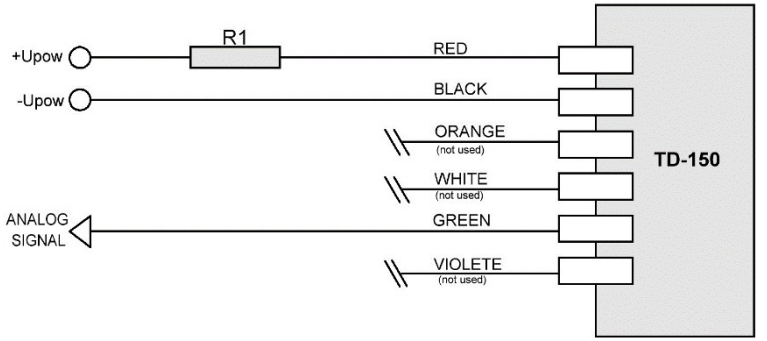
APPENDIX 4. Sensor connection diagram in frequency mode with pulling-up by resistor



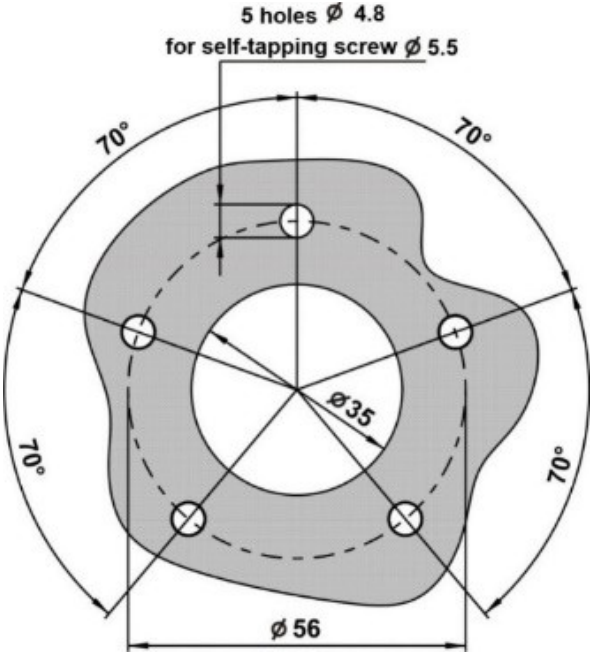


APPENDIX 5. Sensor connection diagram in analog mode

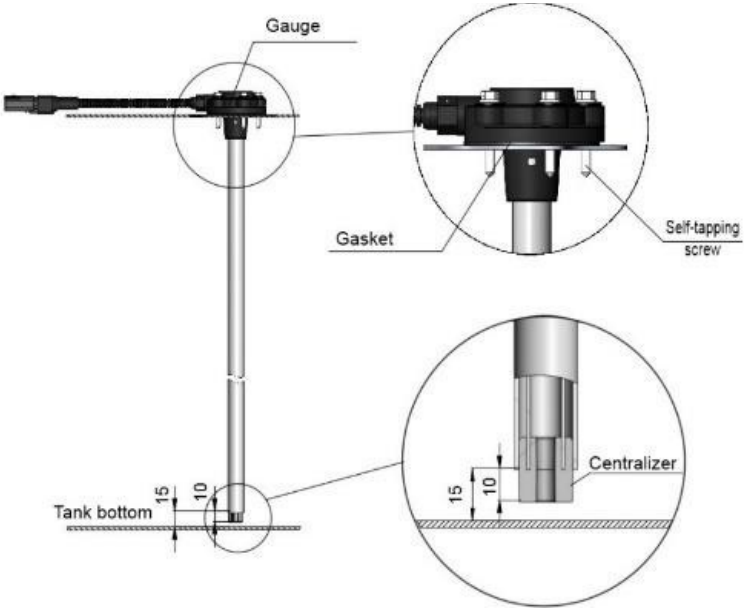


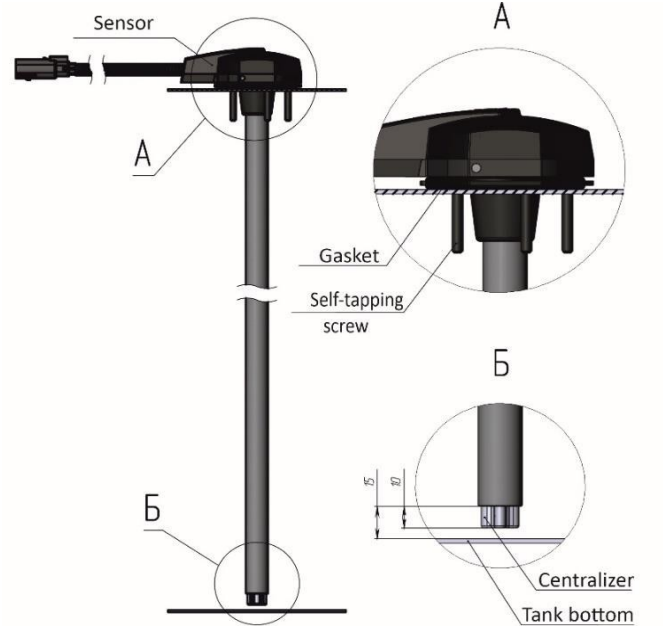


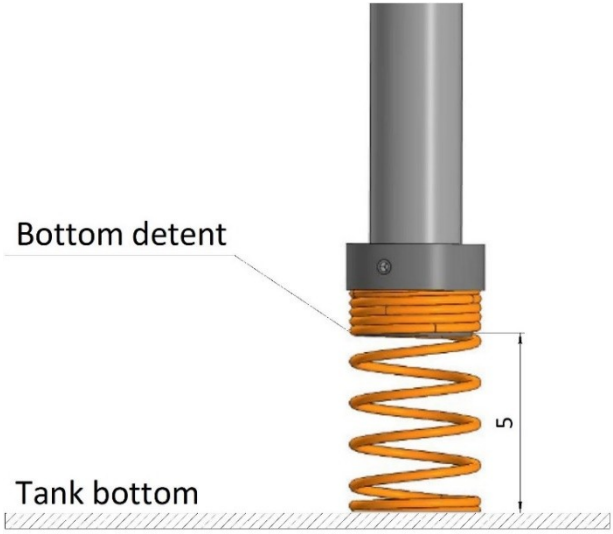
APPENDIX 6. Sensor installation dimensions beyond the proper location



APPENDIX 7. Sensor installation on the tank

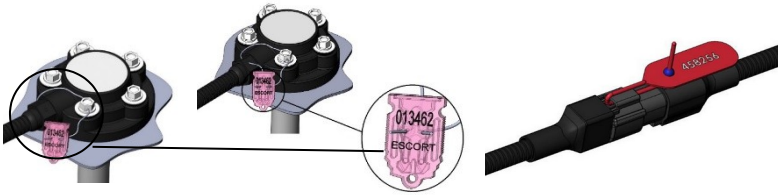



Sensor
А
А
Gasket
Self-tapping
screw
Б
Б
15
17
Centralizer
Tank bottom



Bottom detent installation

APPENDIX 8. Sensor head and cable connection sealing methods



For execution TD-150-BLE

1)

2)

3)

4)

5)

6)

FOR NOTES