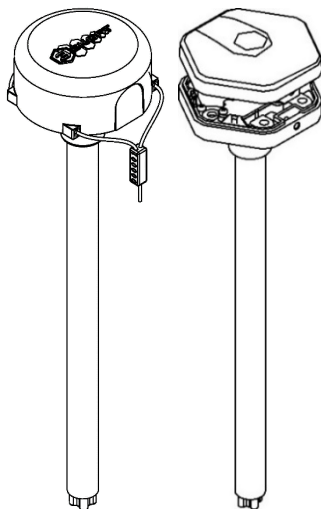




ESCORT
fmeter.ru



电容式 ESCORT TD-BLE
TD.BLE012.000 DS
液位计

说明书

LEVEL METER
CAPACITIVE ESCORT TD-
BLE
TD.BLE012.000 DS

DATASHEET

(ОКПД-2) 26.51

REG 2024-10-18 CH-EN



1 产品概述

1.1 电容式 ESCORT TD-BLE 液位计（以下简称“液位计”或“传感器”）用于测定储罐（存储容器）中轻质石油产品的填充液位。该液位计可应用于汽车拖拉机等机械中，作为燃油液位测量工具，在工业领域则可用于测量任何轻质石油产品的液位。

1.2 液位计将计算出的燃油液位转换为数字代码，并通过 ESCORT BLE 协议，经由蓝牙 LE（低功耗蓝牙）无线传输这些数值。

1.3 液位计采用可拆卸、免维护的锂硫酰氯电池进行自主供电。其应用领域包括根据 GOST IEC 60079-10-1-2011 标准划定的 0、1 和 2 类爆炸危险区域，以及根据 GOST 31610.10-1-2022 标准划定，防爆标志为 IIA、IIB 类爆炸性混合物区域。

1.4 认证信息：测量设备类型批准证书编号为 82229-21，颁发日期为 2021 年 7 月 21 日，有效期至 2026 年 7 月 12 日。

1.5 特殊使用条件

防爆标志后的“X”标志表示，在使用时需遵守以下特殊条件：

- 电池更换必须在非爆炸危险区域进行；
- 液位计的安裝位置、安裝方式和操作方式必须排除测量部分因摩擦或撞击而产生摩擦火花的可能性；
- 为避免产生静电放电的风险，液位计外壳的外部表面应仅使用湿布进行清洁。

1.6 禁止将液位计用于测量导电液体（如水、乳制品）的储罐填充液位。

1.7 禁止拆卸液位计！

1.8 禁止超出本产品说明书中所列明的使用特性范围进行操作！

1.9 在安装和使用过程中，不得对液位计的部件造成任何机械损伤。

2 技术参数

表 1 - Escort TD-BLE 液位计的技术参数

参数名称	数值
工作区域内的测量折合误差，不大于	1% MPI*
工作模式	数字模式
数字模式： - 接口 - 数据交换协议	Bluetooth LE (BLE) Escort BLE
与基站通信的有效距离（在无干扰和障碍物的正常使用条件下），米，不小于	10
与基站数据交换间隔，秒	10
接收器灵敏度/发射器功率，dBm	-96 / 4
外壳防护等级（根据GOST 14254-2015）	IP69S
防电击保护（根据GOST 12.2.007.0-75）	III类
防爆类型	“ia”级本安电路
防爆标志	0Ex ia IIB T6 X
GOST 31610.20-1-2020易爆混合物	IIA、IIB类别
GOST IEC 60079-10-1-2013易爆危险区域	0、1和2
*MPI - 测量上限	

表 1 续

参数名称	数值
使用环境： - 工作温度范围, °C - 极限工作温度范围, °C - 工作大气压力, kPa - 极限大气压力, kPa	-45至+50 -60至+85 84至106.7 57至110
供电电压, V, 不大于	3,6
工作频率范围, GHz	2,402-2,480
尺寸, mm, 不大于： 型号1 型号2	 87x87x(L*+39) 97x88x(L*+33)
液位计假定长度, mm, 不大于	标签上标明 (粘贴在说明书内) : - 轮式运输工具: 150÷2500; - стационарные ёмкости: 150÷6000 - 固定容器: 150÷6000
质量, kg, 不大于	0,5+0,4xL*
*L - 测量部分的长度, 以mm为单位	

3 装箱套装

表 2 - Escort TD-BLE 液位计完整配套

名称	数量	出厂编号	备注
型号 1:			
TD-BLE电容式液位计 TDBL1.407529.001	1		
安装部件套件 TEMG.407911.009	1		
TD.BLE012.000 DS 说明书	1		
型号 2:			
TD-BLE E电容式液位计 TDBL1.407529.001-01	1		
安装部件套件 TEMG.407961.004	1		
TD.BLE012.000 DS 说明书	1		

4 安全使用须知

4.1 在安装、操作和维护液位计时，需遵守与电器相关的一般安全技术操作规范。

4.2 更换电源元件时，务必佩戴具备防静电性能的手套！

4.3 应使用锂-硫酰氯（LI-SOCL₂）电源元件 LS 14500。

4.4 若处于易爆环境，切勿打开！

5 寿命、使用及储存期限、保修

5.1 保修期及储存期为自液位计出厂之日起 3 年，其中保修储存期不超过 12 个月。

5.2 使用寿命为 7 年。

5.3 制造商保证，在用户遵守使用、运输及储存条件的前提下，液位计符合技术规范的要求。

5.4 如发现故障，请联系制造商。

5.5 对于因用户违反使用、储存及运输条件而导致故障的缺陷产品，不享受保修服务。

5.6 制造商有权在不事先通知用户的情况下，对产品结构和配置进行更改。

5.7 电源元件不享受保修期和使用寿命的保障。

6 验收合格证书

电容式TD-BLE 液位计，序列号：_____，根据
现行技术规范制造，出场检查合格，可供使用。

出厂日期_____

技术检查处负责人

签字处

签名 签名解释（名字完整写法）_____
年、月、日_____
出口供货裁剪线

企业负责人

供货所依据的文件标识

签字处

签名 签名解释_____
年、月、日

客户(如有)

签字处

8 安装证明

电容式液位计 TD-BLE，序列号：_____ 已根据
技术设备的相关现行技术文件安装于：

_____	_____	
名称	识别号/ 国家编 号	
_____	_____	_____
签名	姓名（全称）	年、月、日

备注		

9 校验信息

9.1 初次校验

日期	结论	校验员签名	校验员印章

9.2 定期校验

日期	结论	校验员签名	校验员印章

10 运输与储存

10.1 产品应在原厂包装下，使用封闭式运输工具进行运输。储存时，应置于湿度不超过 **80%**、温度在**+5 至+40°C** 之间的干燥室内。储存室内不得有导电尘埃、腐蚀性物质及其蒸汽，以免腐蚀部件或破坏液位计的电气绝缘。

11 废弃处理

11.1 产品的废弃处理由使用单位负责，并需遵守当地的相关规范和标准。

11.2 ESCORT TD-BLE 电容式液位计含有对环境有害的部件（如带有无线电元件的印刷电路板、塑料外壳），需进行专门废弃处理。

11.3 产品中不含有需核算数量的贵金属。

12 安装在汽车拖拉机设备上的特殊说明

12.1 液位计的长度应在订购时确定。

12.2 如有必要，可使用金属锯切割测量管，但需避免金属屑进入测量部分。测量部分的最小剩余长度应不少于 150mm。

12.3 根据附录 5 安装装配套件中的找中器。

12.4 对液位计进行设置（利用已连接的数据库和 ESCORT 程序的 USB-RS485 接口转换器，或安装在 Android 系统手机上的配置器来设定上下液位）。详细操作指南请参阅使用手册。

12.5 若在非标准位置安装液位计，请参照附录 1-6 进行装配和连接。

12.6 安装液位计时，应在传感器安装边与油箱表面之间使用密封垫片。如有必要，可额外使用汽车耐油密封胶以确保密封性。

12.7 在驾驶室内连接并安装传感器无线电信号接收器（BLE-BASE 基座）。关于在汽车拖拉机设备上的更详细安装条件，请参阅技术描述和使用手册。

注意！传感器上液位的校准应从排水孔处进行（距离传感器外壳 10mm）。

重要提示！安装长度 2 米及以上的液位计时，必须使用装配套件中的底部支撑，具体操作请参照附录 7。

13 联系方式

Techavtomatika 有限责任公司

俄罗斯，喀山，杰缅季耶娃街 2B 号，4 栋

8 800 777 16 03

销售部转 1

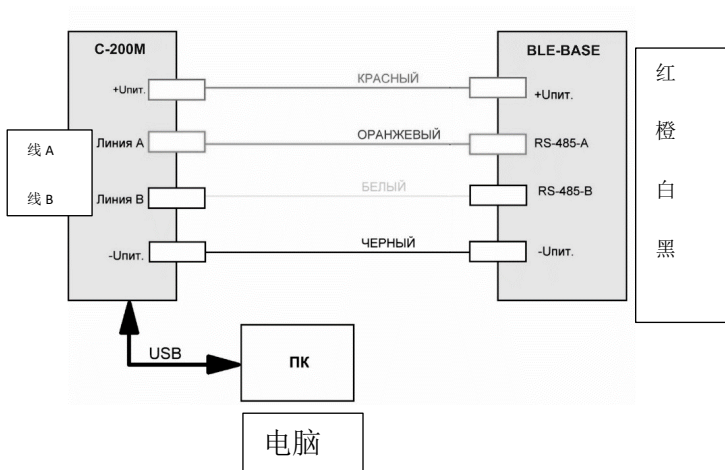
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8 960 046 46 65（消息服务）

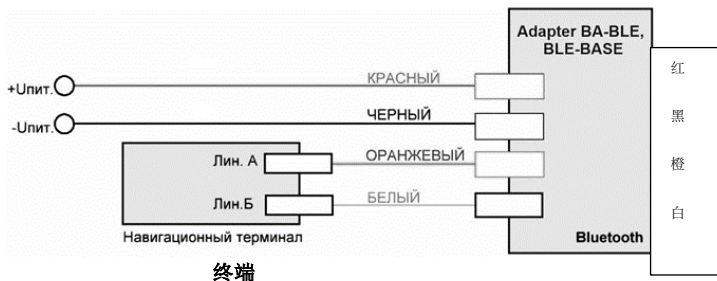
WhatsApp（24 小时）

help@escortsensors.com

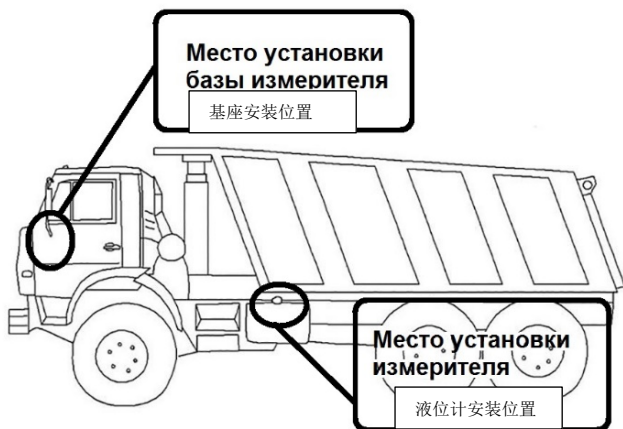
附录 1 液位计基座在编程模式下的连接示意图



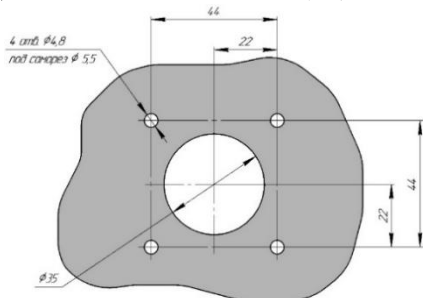
附录 2 液位计基座在 RS-485 模式下的连接示意图



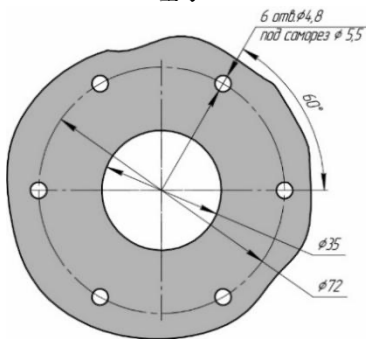
附录 3 液位计基座与液位计在汽车拖拉机上的大致布局图



附录 4 非标准安装位置的液位计安装尺寸



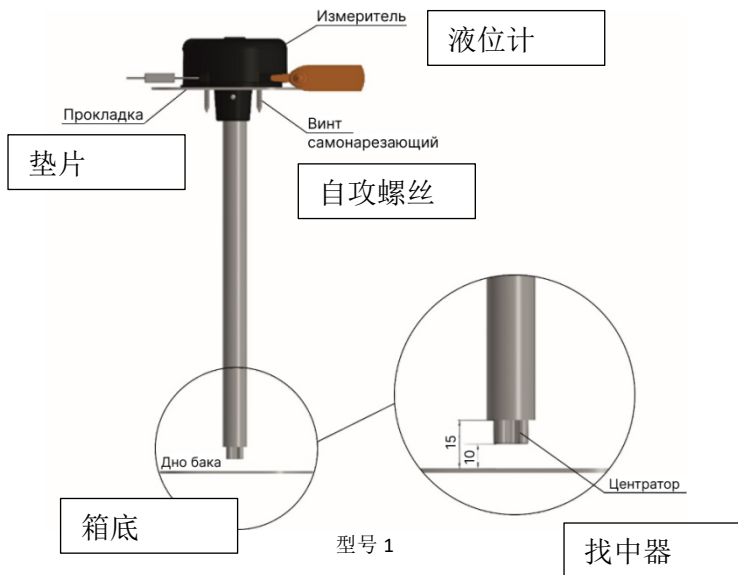
型号 1

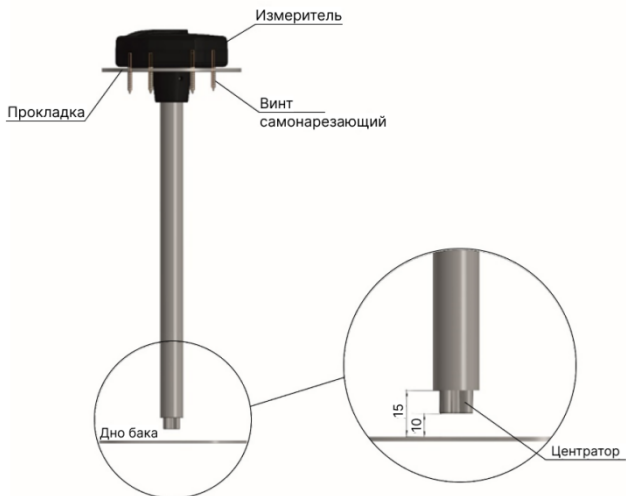


型号 2

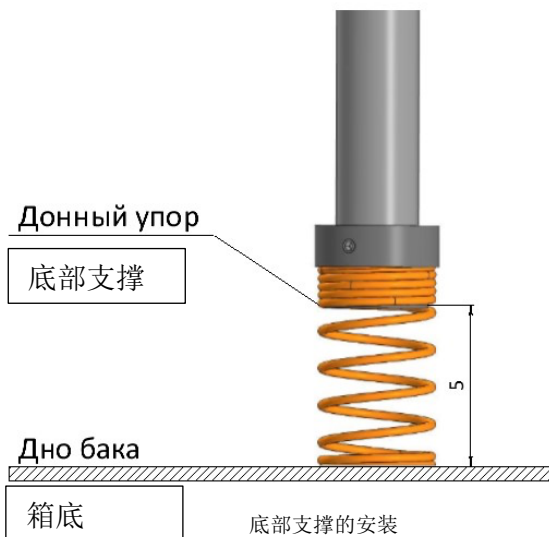
注意：图中所示为自攻螺丝孔的直径，如需使用其他固定方式，请根据图中所示孔的中心位置进行标记。

附录 5 液位计在油箱上的安装方法

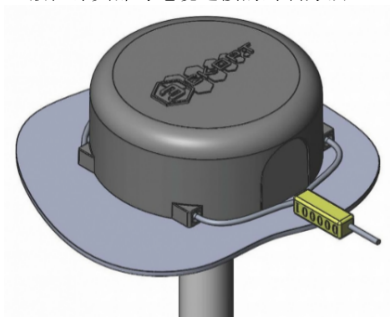




型号 2



附录 6 液位计头部与电缆连接的封装方法



型号 1



型号 2

1 PRODUCT OVERVIEW

1.1 Level meter capacitive Escort TD BLE determines the fill level of light oil in reservoirs (storage tanks). It is used as a fuel level sensor in tractor type vehicles, as a level sensor for any light oil in the industry.

1.2 The sensor converts the calculated fuel level in the digital code. Sensor transmits the obtained values by Escort BLE protocol via Bluetooth LE radio channel - (Bluetooth low energy).

1.3 Sensor is battery-powered device with a removable, yet maintenance free, lithium battery. Application area - Explosion hazardous areas of classes 0, 1 and 2 according to GOST IEC 60079-10-1-2011 categories of explosive mixtures IIA, IIB according to GOST R IEC 60079-20-1-2011, according to the explosion protection marking.

1.4 Information about certification: The certificate of type approval of measuring instruments No. 82229-21 dated July 21, 2021 is valid until July 12, 2026.

1.5 SPECIAL CONDITIONS OF USE.

THE X SIGN AFTER THE EX-MARKING MEANS THAT THE FOLLOWING SPECIAL CONDITIONS MUST BE OBSERVED DURING OPERATION:

- REPLACE THE BATTERY OUTSIDE THE EXPLOSIVE ZONE;**
- THE PLACEMENT, INSTALLATION AND OPERATION METHODS OF THE METERS SHOULD EXCLUDE THE POSSIBILITY OF THE FORMATION OF FRICTION SPARKS FORMED BY FRICTION OR COLLISION OF THE MEASURING PART;**

- TO AVOID THE RISK OF ELECTROSTATIC DISCHARGE, CLEAN THE OUTER SURFACE OF THE METER HOUSING ONLY WITH A DAMP CLOTH**

1.6 DO NOT USE THE SENSOR FOR MEASURING OF CONDUCTIVE LIQUIDS (WATER, DAIRY PRODUCTS).

1.7 DO NOT DISASSEMBLE THE SENSOR!

1.8 DO NOT EXCEED THE PERFORMANCE CHARACTERISTICS SPECIFIED IN THE PASSPORT!

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

2 TECHNICAL CHARACTERISTICS

Table 1 – Technical characteristics Escort TD BLE

Parameter / units	Value
Reduced measurement error in the effective range, up to	1% UML ¹
Modes of operation	digital
Digital Mode: - interface - the communication protocol	Bluetooth LE (BLE) Escort BLE
Range (under normal operating conditions in the absence of interference and obstacles when working with the base), meters, not less than	10
The period of data exchange with the base, sec.	10
The sensitivity of the receiver / transmitter power, dBm	-96 / 4
The degree of protection according to GOST 14254-2015	IP69S
Protection against electrocution by GOST 12.2.007.0-75	class III
Type of explosion protection	intrinsically safe electrical circuit ("ia" level of protection)
Explosion proof mark	OEx ia IIB T6 X
Categories of explosive mixtures according to GOST 31610.20-1-2020	categories IIA, IIB
Explosion hazardous areas according to GOST IEC 60079-10-1-2011	0; 1 and 2

Continuation of the table 1

Parameter / units	Value
Operating conditions: - temperature, °C - ambient temperature, °C - Atmosphere pressure, kPa - ambient atmosphere pressure, kPa	- 45 ... + 50 - 60 ... + 85 84 ... 106.7 57 ... 110
Dimensions, mm, no more Generation 1 Generation 2	87x87x(L + 39), 97x88x(L + 33), where L - length of the measuring part in mm
Conditional sensor length	Indicated on the label (pasted in the passport)
Weight, no more	0,35+0,4xL, where L - length of the measuring part in mm
Supply voltage, V, no more	3,6
Operating frequency range, GHz	from 2,402 to 2,480
UML ¹ - upper limit of measurement	

3 SCOPE

Table 2 – Scope Escort TD BLE

Name	Quantity	Ser. number	Notes
Ver.1:			
Sensor TD BLE TDBL1.407529.001	1		
Installation kit TEMG. 407911.009	1		
Datasheet TD.BLE012.000 DS	1		
Ver.2:			
Sensor TD BLE TDBL1.407529.001-01	1		
Installation kit TEMG.407961.004	1		
Datasheet TD.BLE012.000 DS	1		

4 PRECAUTIONS

4.1 The installation, operation and maintenance of the sensor comply with the general safety rules for working with electrical appliances.

4.2 THE BATTERY MUST BE REPLACED WITH GLOVES WITH ANTISTATIC PROPERTIES!

4.3 LITHIUM-THIONYL CHLORIDE (LI-SOCL₂) LS 14500 BATTERIES MUST BE USED.

4.4 DO NOT OPEN IF AN EXPLOSIVE ENVIRONMENT IS PRESENT.

5 RESOURCES, SERVICE AND SHELF LIFE, GUARANTY

5.1 Warranty service life - 3 years from the date of shipment from the manufacturer's company.

5.2 Life time- 7 years.

5.3 The manufacturer guarantees the sensor specifications if used in compliance with the prescribed operating, transport and storage conditions.

5.4 If damage is found request the manufacturer.

5.5 The product with defects caused by the fault of the consumer as a result of violation of conditions of operation, storage or transportation is not covered by warranty.

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

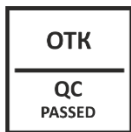
5.7 The warranty period and service life does not apply to the battery.

6 ACCEPTANCE REPORT

Level meter capacitive Escort TD BLE is made in Ser. № _____
_____ accordance with the current technical documentation and is fit for
use.

7 CERTIFICATE OF PACKING

Level meter capacitive Escort TD BLE is packaged in Ser. № _____
_____ accordance with the current technical documentation.



8 INSTALLATION CERTIFICATE

Level meter capacitive Escort TD BLE Ser. № _____
is installed in accordance with the current technical documentation on the
equipment:

name_____
identificaton 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 product is transported in the original packaging in closed vehicles. Stored in dry conditions with a humidity of not more than 75% at a temperature from -20 to + 30 °C. Presence of conductive dust, corrosive substances and their pairs causing corrosive destruction of parts and electrical insulation of sensor.

11 DISPOSAL

11.1 Disposal of the product is produced by the operator and carried out according to the rules and regulations applicable in the territory of the Russian Federation.

11.2 This instrument does not include environmentally harmful elements.

11.3 The device does not contain precious metals in an amount to be counted.

12 INSTALLATION GUIDE (For further details see Manual)

12.1 Sensor Length specified when ordering.

12.2 If necessary, the measuring tube is cut with a hacksaw trim for metal, avoiding shaving to get inside. Minimal residual length of measuring tube should be at least 150 mm.

12.3 Install the centralizer from the installation kit (see Appendix).

12.4 Perform sensor settings: by setting the upper and lower level via USB-RS485 interface converter connected to the base and the ESCORT software or using the configurator, installed on a mobile phone with Android OS. For details see the manual.

12.5 For the installation out of the conventional installation place, see details in Appendix.

12.6 Mount a sensor putting a sealing gasket between the flange of the sensor and the surface of the tank. If necessary, use oil and gasoline resistant automobile sealant.

12.7 Plug and install the radio receiver (Escort TD BLE-B base) inside the cabin.

12.8 Additional information can be found in the Appendix.

ATTENTION! Upper level calibration should be carried out from the drain hole (10 mm from the sensor housing).

ATTENTION! The sensor with a length of 2 m or longer must be installed with a bottom detent included in the installation kit, see the Appendix 7.

13 CONTACTS

Techautomatica LLC

Russia, Kazan Dementieva str. 2B, building 4

8 800 777 16 03

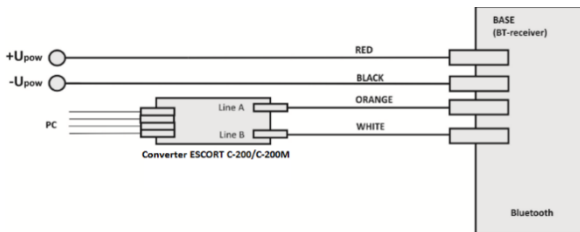
Sales department: internal number '1'

Tech support: internal number '2' (6 am to 12 am MSC)

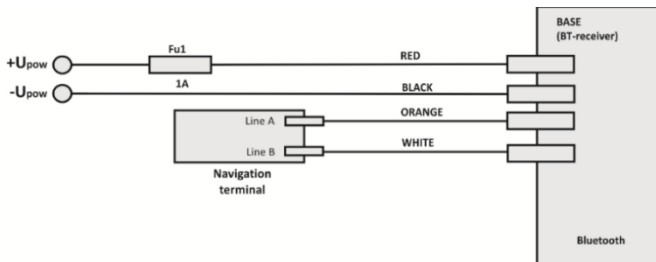
8 960 046 46 65 - WhatsApp (24/7)

help@escortsensors.com

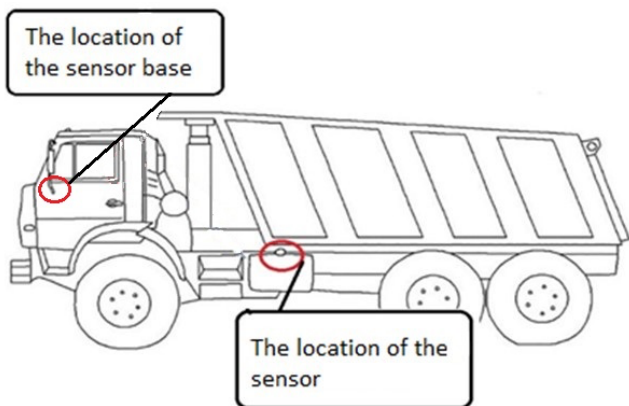
ANNEX 1 Wiring diagram of sensor base connection in the programming mode



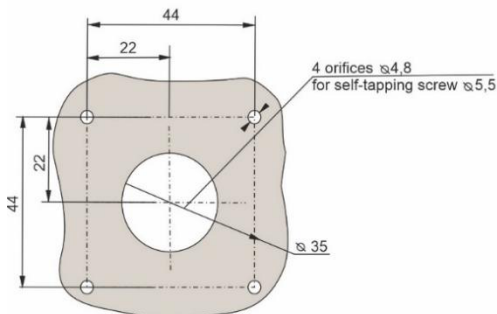
ANNEX 2 Wiring diagram of sensor base connection in RS-485 mode



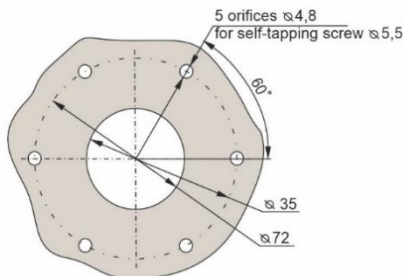
ANNEX 3 Approximate scheme of placing the sensor and the base in an automobile.



ANNEX 4 Dimensions for mounting the sensor out of nominal installation site



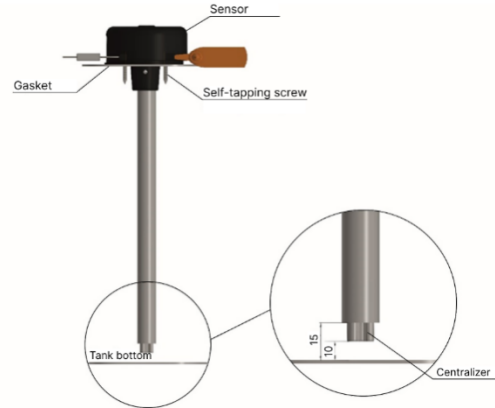
Generation 1



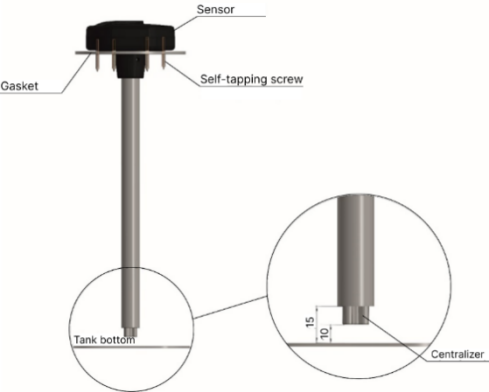
Generation 2

Note - The diameters of the holes are given for self-tapping screws, if necessary, mark places for another fastening according to the centers of specified holes.

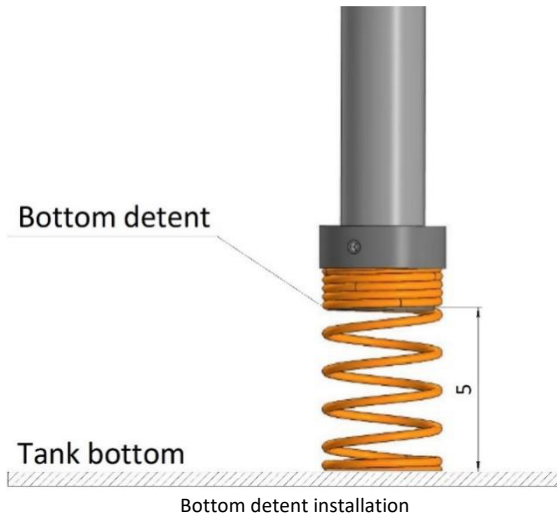
ANNEX 5 Installing the sensor on the tank



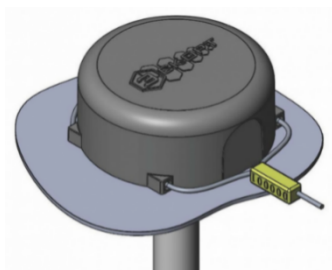
Generation 1



Generation 2



ANNEX 6 Methods of sealing of sensor head and cable connection



Generation 1



Generation 2

Identification sticker

Идентификационный стикер



记录处 / FOR NOTES

