Click the button and download
our free wBox app:

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User Manual

tankSensor PRO TANK FILL LEVEL SENSOR

SAFETY RULES

Connect only in accordance with the diagram presented in the manual. Improper connections may be dangerous, it can damage the controller, and loss of the warranty.

DANGER! Risk of electric shock! Even with the device turned off, the outputs may be live. All assembly work should be ALWAYS performed with the disconnected power circuit.

Connecting the device to a power supply that does not meet the quality requirements specified in EN 50081-1, EN 50082-1, UL508, EN 60950 will invalidate the warranty.

1 INSTALLATION - BASICS

The connection diagrams can be found at the end of the manual

- Before proceeding with the controller installation, disconnect power from the circuit. Always ensure that all mounting work is carried out with the power disconnected (turning off the main circuit breaker or unplugging the power supply unit from the mains socket).
- Mount the controller in a location protected from accidental damage. Metal objects near the controller or antenna (such as wiring and large mounting elements) can degrade the wireless range. Ensure the device is securely fixed in a stable position with the antenna positioned vertically. For installations exposed to moisture, ensure proper sealing of the rubber grommets in accordance with the device's IP rating.
- Review the schematics prior to installing the controller. Pay close attention to the connector markings. Connect the +12–48 V DC power wire (red or black with a white dashed line) and the ground wire (black) first, observing correct polarity.
- Next, connect the tankProbe500 probe. Route the sensor cable through the entry grommet in the housing and connect it as shown in the schematic, paying strict attention to polarity. When using another hydrostatic level sensor with a 4–20 mA output, check its rated supply voltage - you may need to use an alternative wiring method according to the remaining schematics.
- The sensor cable contains a capillary tube used for atmospheric pressure compensation. The cable termination at the controller side, where the capillary is located, must remain in a dry place and be protected from water, condensation, and other contaminants. **Protect the capillary from liquid ingress, debris and clogging.** The ingress of liquid or contaminants into the capillary tube or its blockage may cause incorrect readings or permanent damage.
- **The probe cable should be routed freely and protected against mechanical damage - avoid excessive bending, crushing, twisting, and contact with sharp edges.** If the cable is also used to suspend the probe, appropriate strain relief, a dedicated mounting clamp or a cable gland designed for this purpose must be used. Transferring the weight of the probe to the electrical connector in the controller is prohibited.
- The probe should be placed in the tank in a location that enables accurate measurement of the expected liquid level changes, away from pumps, agitators, inlets, outlets and other sources of turbulence. In wastewater tanks, suspended mounting above the bottom of the tank is recommended to prevent the probe from being covered by solid deposits, sludge, or other debris.
- After ensuring that the device has been connected in accordance with the wiring and mounting diagrams and that there are no nearby metal components that could reduce the wireless communication range, power on the device by applying the supply (switching on the mains circuit breaker for the power supply circuit or plugging the power adapter into the socket).

2 FIRST START-UP

- Download the free wBox app. If you have an Android device, you can find the app on the Play Store. For iOS devices, the app is available on the App Store.
- Using your mobile phone or tablet, connect directly to the device's access point. Follow these steps:

  - Disable mobile data: To avoid communication issues, temporarily turn off cellular data in your device settings.

  - Connect to the device: Go to the Wi-Fi settings on your smartphone or computer, then find and connect to the network named ""tankSensor_PRO-xxxxxxxxxx"" (where "xxxxxxxxxx" is the unique serial number of your device).

  - Maintain WiFi connection: Your operating system (Android/iOS) may notify you that the network provides no Internet access. In this case, select "Keep connection", "Use anyway", or "Stay connected". This is essential to proceed with the device configuration."
- Open the wBox app. The device will be visible on the main screen. To add it to your account in the app, select "Add device to account." If you are an installer and do not want to assign the device to your account, choose "Use once only".

3 WIFI CONNECTION AND SERVICE (AP) SETTINGS

QUICK INSTALLATION GUIDE
first configuration of the BleBox controller

Scan the QR code or click the link below
to access the quick installation guide.

https://blebox.eu/start

- Go to the WiFi settings ("gear" icon in the top right corner of the screen, under the "Connection" section), where you can connect the device to your home WiFi network to control the controller locally or from anywhere in the world. To do this, select the network name from the list of available networks and tap "Connect". If required, enter the WiFi password. While the device is connecting to the home network, your phone or tablet may temporarily disconnect from the device's network.
- You can also configure the network settings using a web browser. After connecting to the controller's wireless network, open a browser and go to www.blebox.eu.
- After reconnecting your phone to the controller's WiFi network, check the "WiFi Client Status" and "Remote Access Status" fields. The controller is equipped with a network connection monitoring system, which will report any issues with the WiFi or Internet connection and their possible causes. If the network is functioning correctly, both fields will display "Connected".
- To communicate with the device from outside your local WiFi network, from anywhere in the world, via the wBox app, the device automatically connects by default to the BleBox cloud service The remote access system is fully encrypted and secure, with data transmitted through European servers of reputable companies. It is possible to disable remote access – click the

- “Configure” button and toggle the switch for “Remote Access”. Note that disabling “Remote Access”” will prevent using the controller outside the local network and will also result in loss of access to historical data (including charts) and push notifications to your smartphone. We recommend keeping this feature enabled (it is the default setting).

- Enabling the “Event Log” option allows for the automatic recording of device activity in the BleBox cloud. The system logs events such as notifications defined in the “Actions” section, as well as the history of the controller’s connections and disconnections from the network. This feature provides access to the full operational history of the device at any time, even when the controller is currently offline.

- After completing the WiFi network configuration, you can disconnect from the device’s network and connect your phone or tablet directly to your home WiFi network. Control via the wBox app will work the same as when your phone or tablet is connected to the device’s network. If you leave the local network, for example by leaving home or switching your phone to mobile data, the wBox app will indicate this as “Remote Mode”. In this case, you will have access to the device’s data, but for security reasons, the settings options will be unavailable.

- In the “Service Connection (AP)” section you can change the name and set a password for the WiFi network broadcast by the device. Keep in mind that changing the network name or password may cause an immediate disconnection from the device after clicking the “Save” button, so you will need to reconnect to the WiFi network.

- It is also possible to completely disable the access point broadcast by the device. To do this, move the “Access Point” slider to the off position and confirm your choice by clicking the “Save” button.

- Warning! If the controller does not have a stable connection to the WiFi network (“WiFi Client Status: CONNECTED”, with no error warnings), it will not be possible to re-enable the access point – in this case, the only solution is to reset the controller to factory settings. Disabling the access point is recommended only after the controller has been fully configured and you have confirmed that the entire system is functioning correctly.

4 DEVICE SETTINGS

- On the main control screen, which displays imported, exported, and instantaneous active power measurements, go to the device settings (click the “gear” icon in the upper right corner).

- In the “Name and icon” section, you can change the default device name displayed in the wBox application. This allows you to assign a custom, more descriptive name, for example: “Rainwater tank”, “Septic tank”, or “Technical tank”. You can also select a different icon for the sensor. This makes it easier to adapt the user interface to the specific application.

- In the “Device Settings” section, in addition to the option to disable the LED, four configuration tabs are available.

- The first tab, “Sensor 1 - Pressure”, allows you to select the type of connected probe: tankProbe500 or another custom probe. This tab also includes the “Calibrate zero point” function.

- In the “Sensor 2 - Liquid Height” tab, you can enable or disable the liquid height display on the main screen of the device. There is also an option to configure the density of the liquid in which the probe is located.

- The “Sensor 3 - Fill Level” tab allows you to specify the height of the tank in centimeters. Based on this value, the tank fill level is calculated. Displaying this value on the main screen of the device can be enabled or disabled.

- The last tab, “Sensor 4 - Volume”, allows you to enter the total tank volume, based on which the current liquid volume is calculated. Displaying this value can also be disabled. This tab also features a volume calculator to help calculate the tank capacity.

5 MEASUREMENT DATA AND CHARTS

- The main screen of the controller displays the current tank fill level as a percentage, along with a graphic whose fill level changes according to the liquid level.

  Depending on the selected settings, additional values are displayed below:

  - Liquid height - shows the height of the liquid in the tank in centimeters.

  - Volume - indicates the current amount of liquid in the tank.

- Charts and historical measurement data are accessible by clicking the chart icon in the upper right corner of the screen. The “History” section displays a chart for a selected time range, which can be freely modified. Additionally, users can choose the “Chart type” (bar, point, line, or line with points) and the “Interval” (hourly or daily). Please note that the availability of intervals depends on the selected time range.

- In the “Sensor” section, you can select the values displayed on the chart. Two options are available: “Liquid height” and “Fill level”.

- Measurement data is stored on the BleBox server and is available only when the “Remote access” option is set to “Yes”. Data is accessible for 12 months with 1-hour aggregation, while results from the last 7 days feature a detailed 5-minute aggregation.

- Historical measurement data can be exported for further processing, comparison, and archiving in external systems and analytical tools. To do this, click the “three dots” icon in the upper right corner of the screen and then select the “Export” option. You can choose between the “.csv” and “.xlsx” (Excel) formats.

6 CONTROLLING OTHER DEVICES

- The controller can send control commands to other BleBox devices via Wi-Fi using the local API. Actions are triggered based on selected trigger types, such as “Fill level greater than”, “Fill level lower than”, “Liquid height greater than” or “Liquid height lower than”. This makes it possible to create practical automation scenarios, for example controlling a pump depending on the water level.

- Go to settings by clicking the gear icon in the top right corner, then select the “Actions” tab. This section is initially empty - to add a new function, click the “Add action” button.

- When adding an action, in the “When” tab select a “Trigger type” such as “Fill level greater/lower than” or “Liquid height lower/greater than”. A field will appear in which you enter the fill level (%) or liquid height (cm) value at which the action is to be triggered.

- “In the “Execute” tab, select “Control another device” in the “Result” field, and then confirm your selection. Then click the “Select device” button. The controller will scan the network for compatible devices and display them in a list. Select the device you want to control. If the device does not appear in the list, use the general API control method described below or update the firmware in the target controller.

  Note: All controllers must be on the same local network, and the “Wireless client isolation” option must be disabled in the AP/router settings.

- Next, in the “Call API” field, enter the API command that will trigger the controller.

- The most popular /s/ API control commands for the switchBoxDC and switchBox controllers are listed below:

  Turn on the pump / open the valve via switchBox/switchBoxDC: 1

  Turn off the pump / close the valve via switchBox/switchBoxDC: 0

- By default, the configured action is executed once when the set threshold is exceeded. In order for it to be triggered again, the value must first drop below the defined limit. There is also an option for cyclic execution of the action after exceeding the threshold, which enables monitoring of a specific state in another controller and prevents the state from changing as long as the value remains above the threshold. In this case, the appropriate repeat option must be selected and a time interval defined.”

- If the device was not on the list of discovered compatible devices or you want to control another device on the network, select “Call URL” as the “Action Type”.

- In the “URL” field, enter the API command preceded by the http protocol prefix and the IP address of the controller you want to control. The IP address can be found in the settings of the respective device.

  Warning! All controllers must be on the same local network, and the “Wireless Client Isolation” option in the AP/router must be disabled.

- Below are the most commonly used API commands for the switchBox controller. It is assumed that the IP address of the remote controller is: 192.168.1.123

  Caution! In the router settings (DHCP), a static IP address must be assigned to the controller.

  Turn on the pump via switchBox: http://192.168.1.123/s/1

  Turn off the pump via switchBox: http://192.168.1.123/s/0

- The “Send URL” action can also be used to transmit measurements to an external server. While creating the action, the “Action Symbols” button is available. It displays a list of available placeholders along with short descriptions. To add a action placeholder, click the “plus button”.
- The most suitable trigger type for this kind of application is the “cyclical” trigger. It allows sending information at various time intervals (minimum every 15 seconds). Below are examples using placeholders, also called action symbols:
- Sending the current tank fill level to an external server:

  http://177.120.11.5/state/{fillLvl_pct.2}
- Sending the current tank fill level to an external server using the “query string”:

  http://177.120.11.5/meter?meter_reading={fillLvl_pct.2}
- Sending the current tank fill level and device status to an external server using a “query string”:

  http://177.120.11.5/sensor1?fill_level={fillLvl_pct.2}&state={s_state.2}
- In the “Summary” tab, name the action, check its correctness, and confirm by clicking the “Save” button.
- A detailed description of control and examples of integrating other controllers using the local, open API can be found on our website https://blebox.eu in the FAQ section, while the complete technical API documentation for BleBox devices is available at: https://technical.blebox.eu
- The added action will appear in the list. Expanding its details allows you to view, among other things, the status of its last execution.

7 NOTIFICATIONS

- The controller can display system notifications on a phone with the wBox app installed, depending on the selected trigger type, for example when the “Fill level is greater than” or “Liquid height is higher than” condition is met.
- Notifications work only when the controller has a stable Internet connection and the “Remote Access” option is enabled (default setting).
- Notifications are added in a similar way to “Actions” - fill in the form fields, and in the “Do” tab, select “Notification” as the “Result.” Confirm by clicking the “Save” button.
- Additionally, you can create “Custom notifications” with your own message text.
- While creating a “Custom Notification” action, the “Action Symbols” button is available. It displays a list of available placeholders along with short descriptions. To add a placeholder, click the “plus” button.

  Examples of custom notification text:

  - “Septic tank 80% full.”
  - “Septic tank almost full. Schedule emptying.”
  - “Warning! Risk of tank overflow.”
  - “Liquid level in the tank has exceeded 150 cm.”
  - “Water level in the pond has dropped below 30 cm.”
  - “Low water level in the tank.”
- Custom notification text with the current tank fill level:

  The septic tank level at my cottage is: {fillLvl_pct.2}
- To have a notification appear on your phone, you must allow notifications from the specific BleBox device. This can be done in two ways:

  1. Go to the controller settings, select the “Notifications” tab, and check the option “Action Notifications.”

  2. On the wBox app home screen, open the menu (by tapping the “”three lines” icon in the top left corner), then select “Notifications.” Go to the notification settings, find the controller in the device list, and from the dropdown next to it, select “Action Notifications.”

  In both cases, you can also enable other types of notifications. Confirm the changes by tapping the “”Save” button in the top right corner of the screen.”
- If notifications do not appear despite being configured, check your phone’s system settings (Android/iOS) to ensure that the wBox app has permission to display system notifications.

8 DEVICE TIME AND LOCATION

- Go to the settings, to the “Time and Location” section. In the “Device Time” tab, select your region and location from the list and confirm the changes by clicking “Save.” The device will synchronize its time with an NTP server (if the controller is on a WiFi network with Internet access) or retrieve the time from your phone/tablet. Since the controller does not have battery backup for its clock, the time resets when the power is disconnected. Therefore, it is recommended to keep the controller connected to a WiFi network with Internet access so it can automatically synchronize its clock. This is especially important for controllers that use scheduled operations.
- You can set the controller’s location using your smartphone or tablet. In the “Device Location” tab, click the “Set Location” button. The app will ask if you want to share your location – allow it. The “Coordinates” field should display approximate coordinates of your location. If the “Set Location” button flashes red with the message “Error,” or if the “Coordinates” field does not change from “Not set” to numerical values, the location could not be retrieved. In this case, make sure your phone/tablet has a GPS module and that location sharing is enabled for the wBox app. Setting the location is especially important for controllers that use schedules based on sunrise and sunset times.

TECHNICAL SPECIFICATIONS

supply voltage	12 - 48 V DC
energy consumption	< 1W
protection	inverted polarization, ESD, overcurrent
supported probe type	pressure measurement probe
measurement range	4-20 mA
measurement resolution	0.5 µA @ 4-10mA 1.0 µA @ 10-20 mA
measured parameters and resolution	**Tank fill level:** - 0.1% **Liquid column height:** - 0.1 cm **Liquid volume:** - below 1000 l: 0.1 l - above 1000 l: 0.001 m^3 Actual resolution depends on the measuring probe used.
measurement accuracy	depends on the probe used
dimensions	50 x 92 x 28 mm (without antenna), 85 x 230 x 28 mm (with the antenna located vertically), antenna length 197 mm
housing	made of polyurethane composition not containing halogens, self-extinguishing for thermal class B (130 °C)

probe included	not included - "blebox tankProbe500" is available as an optional accessory
maximum number of connected probes	1
mounting method	two oval mounting holes with dimensions of 18 mm x 3.5 mm (width x height) or self-adhesive element (tape)
protection level	IP54 according to PN-EN 60529
controller operating temperature	from -20°C to +50°C
antenna output	yes
antenna connector type	RP-SMA
antenna	omnidirectional, 5 dBi gain - included in the kit
API	open https://technical.blebox.eu/
communication standard	µWiFi, compatible with WiFi, 802.11g
transmission type	bi-directional, encrypted
radio frequency	2.4 GHz
mode	direct connection (as Access Point), Wi-Fi connection via a stan- dard router, connection with access from any location in the world (requires only access to the Internet)
encryption	WPA2-PSK and authenticated encryption with associated data (AEAD)
compatible devices and systems	iOS (e.g. iPhone, iPad), Android, Windows, macOS (ARM processors labeled M1 or newer)

ADDITIONAL INFORMATION

FIRMWARE UPDATE

To update the controller's firmware, connect it to your home WiFi network (see the "WiFi Connection Settings" section) with Internet access. Then go to the settings, to the "Details, Update, and Help" section, and click the "Check for Update" button. If a newer version is available, the button will change to "Download New Firmware." Click it and wait approximately 1 minute, without closing the interface or performing any other actions. The device will download the latest firmware and then restart. The device ID, hardware version, and firmware version can be viewed in the device details.

HELP

The latest versions of manuals, additional information, and product materials are available on our website: blebox.eu

General inquiries: info@blebox.eu Service and technical support: support@blebox.eu

Before contacting our support, if possible, prepare the "Service Key" of the controller, available in its settings under the "Details, Update, and Help" tab. By clicking the icon, the key will be copied to your phone's clipboard. Also prepare the "Installation Key" of the wBox app, available in the app's main menu under the "Settings" tab.

The instructions for restoring the controller to factory settings are available at: http://blebox.eu/start/reset

The instructions for reconfiguring the controller are available at: http://blebox.eu/start

Warning! Restoring factory settings resets the controller's configuration but does not remove it from the user accounts it is assigned to. Removing the controller by the owner (the first user who added the device to their account) will also remove it from all other users.

To remove the controller from an account, open the wBox app, go to the main menu and the "Manage Devices" tab, select the controller, and click "Remove Device." Alternatively, you can log in to https://portal.blebox.eu , go to the "Devices" tab, select the controller, and in the "Actions" menu (top right corner), click "Remove Device."

for more information visit our website

www.blebox.eu

or send us an email to: info@blebox.eu

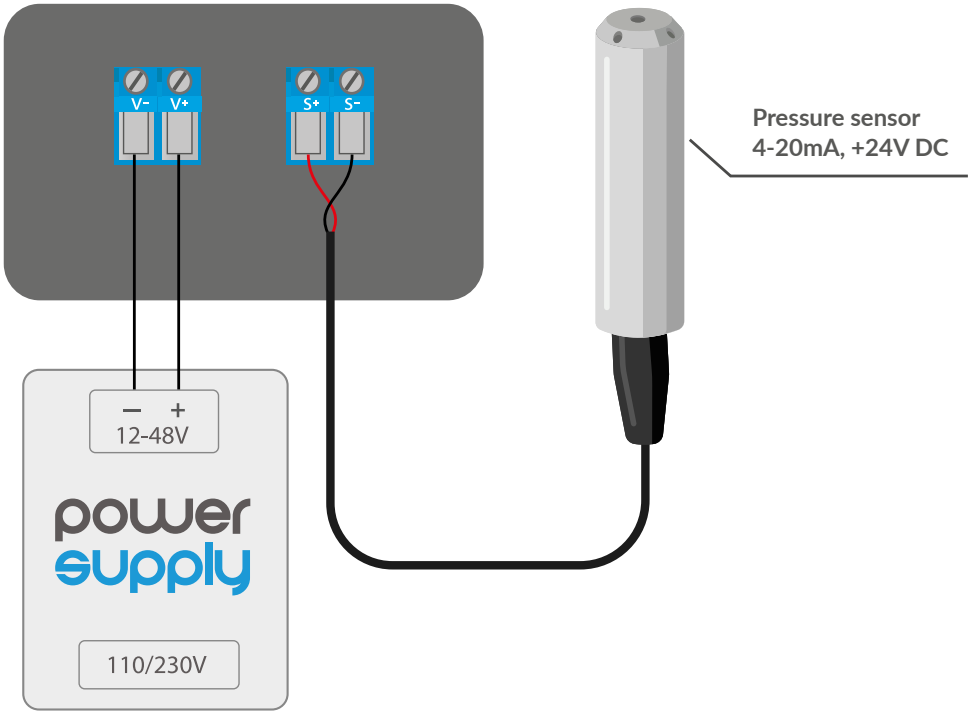
support is available at support@blebox.eu

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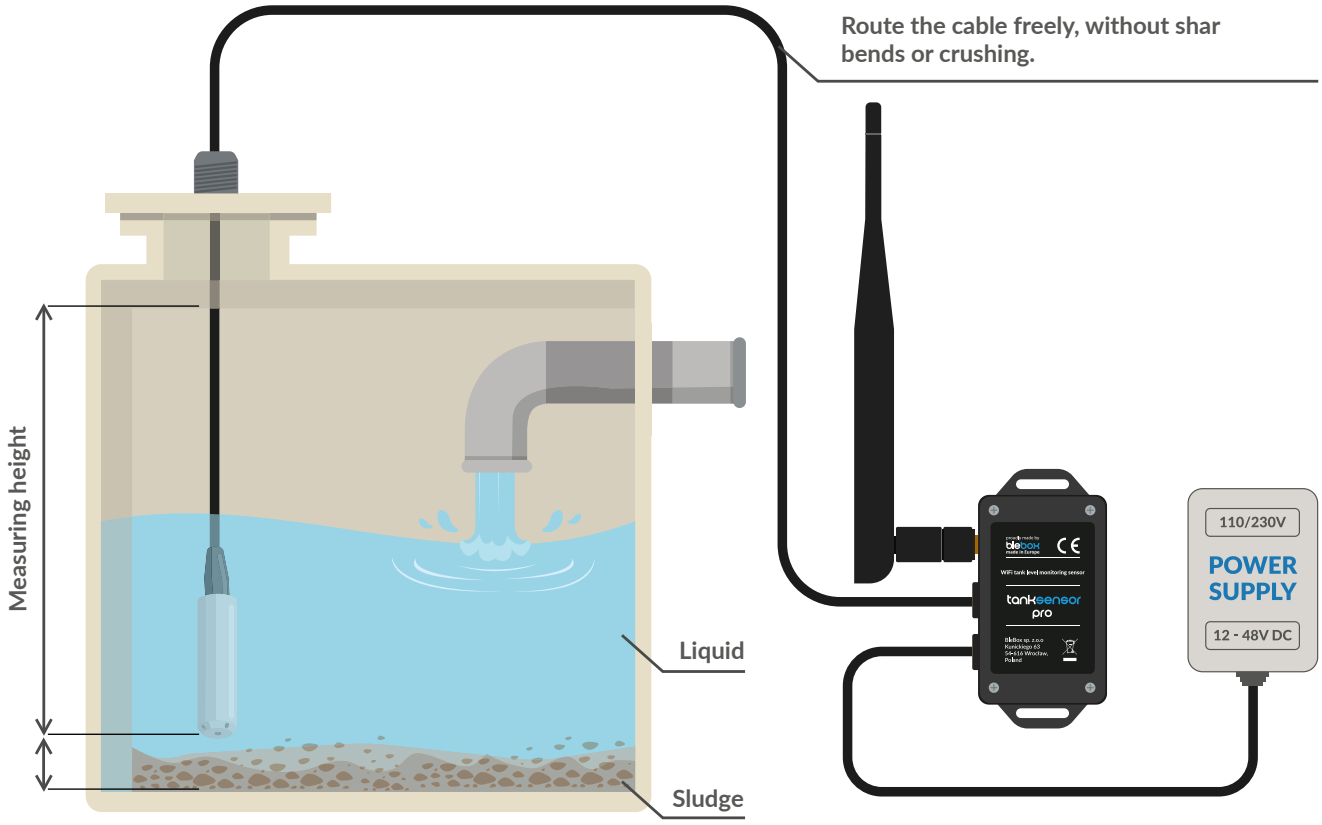
Connection diagrams

1. Wiring diagram – “blebox tankProbe500” probe

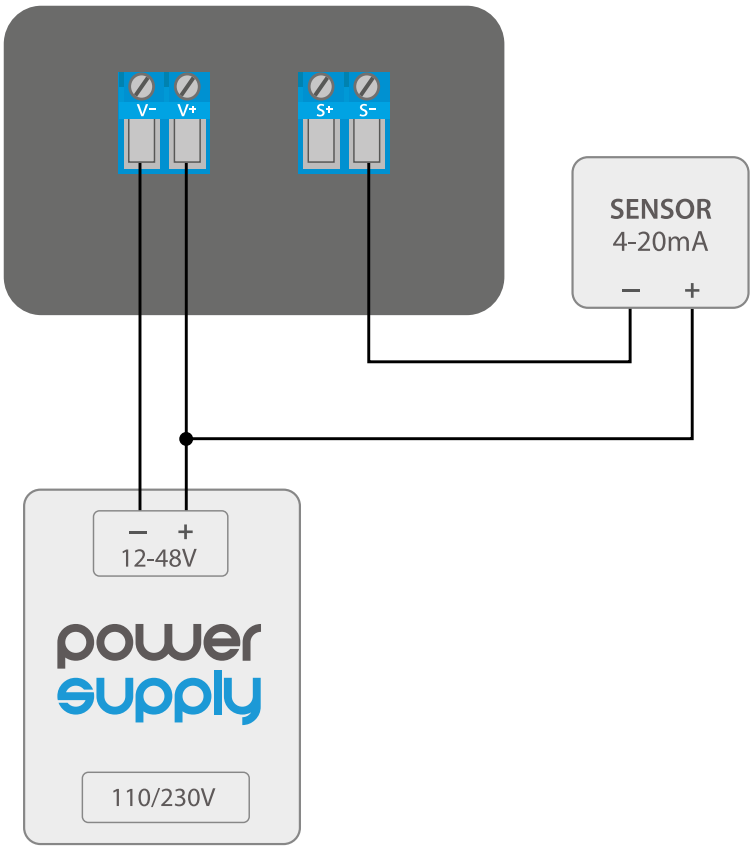


2. Installation diagram – blebox tankProbe500 hydrostatic probe

The probe should be installed away from liquid inlet and outlet points, pumps, mixers and other sources of turbulence.

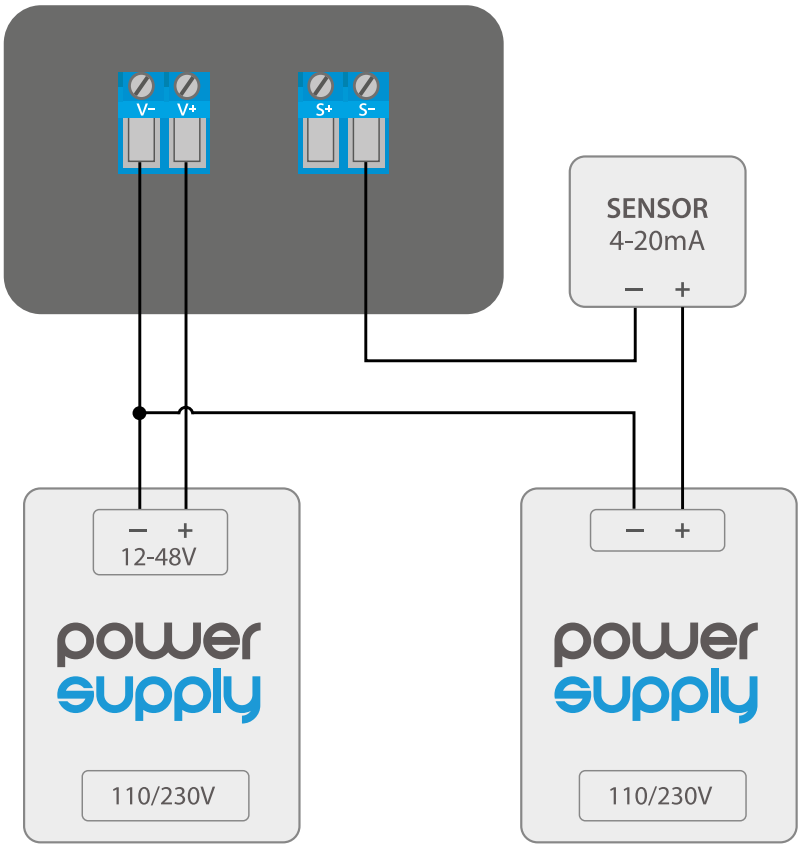


3. Wiring diagram – powering the probe from the controller's power supply

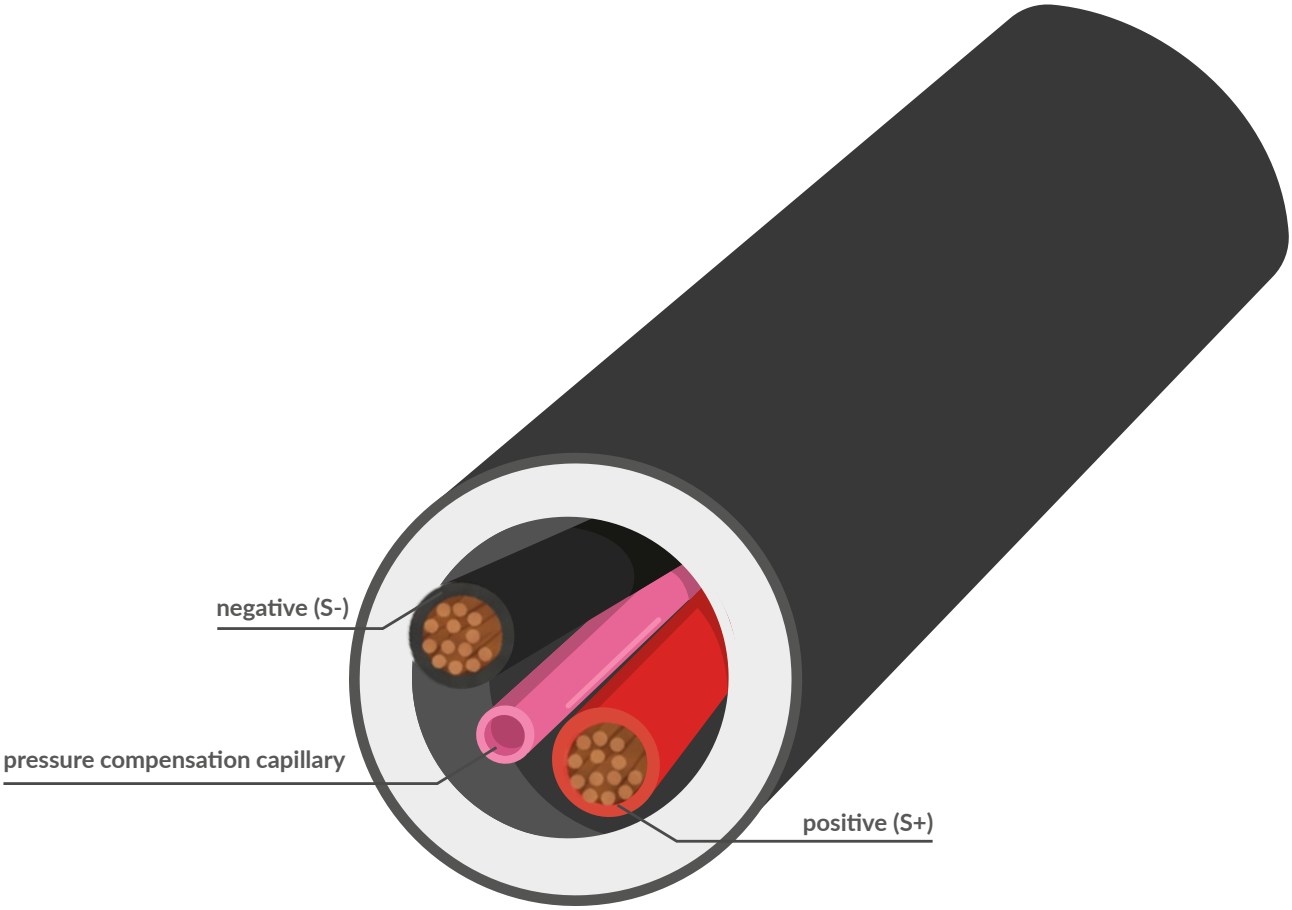


Before connecting your own probe, make sure that its supply voltage matches the voltage of the power supply.

4. Wiring diagram – powering the probe from an independent power supply



Before connecting your own probe, make sure that its supply voltage matches the voltage of the power supply.



DO NOT block or bend the capillary



DO NOT allow the capillary to become contaminated



DO NOT allow water to enter the capillary

