SmartBox AIR Wi-Fi

battery-operated, electronic remote level gauge for a non-pressurised tank

ABOUT THE MANUAL

- This manual is part of the product.
- This manual must be observed and handed over to the operator to ensure that the component operates as intended and to comply with the warranty terms.
- Keep it in a safe place while you are using the product.
- In addition to this manual, please also observe national regulations, laws and installation guidelines.

SAFETY ADVICE

Your safety and the safety of others are very important to us. We have provided many important safety messages in this assembly and operating manual.

✓ Always read and obey all safety messages.

⚠ This is the safety alert symbol.
This symbol alerts you to potential hazards that can kill or hurt you and others. All safety messages will follow the safety alert symbol and either the word "DANGER", "WARNING", or "CAUTION". These words mean:

⚠ DANGER

describes a **personal hazard** with a **high degree of risk**.
➜ May result in **death or serious injury**.

⚠ WARNING

describes a **personal hazard** with a **medium degree of risk**.
➜ May result in **death or serious injury**.

⚠ CAUTION

describes a **personal hazard** with a **low degree of risk**.
➜ May result in **minor or moderate injury**.

NOTICE describes **material damage**.
➜ Has an **effect** on ongoing operation.

ⓘ describes a piece of information   ✓ describes a call to action

⚠EX **⚠ DANGER** **May not be used in potentially explosive areas.**
Can cause an explosion or serious injuries.
✓ Must be installed by a specialised company in accordance with local industrial health and safety regulations.
✓ Installation outside the defined EX protection zone.

GENERAL PRODUCT INFORMATION

SmartBox AIR Wi-Fi is a battery-operated, electronic remote level gauge for a non-pressurised tank with a liquid operating medium consisting of: digital display unit with a 16-digit LC display, pressure pump and compatible measuring hose with weighted sleeve. The tank volume is determined by measuring the filling height on the basis of the pneumatic measuring principle. After each measuring process, the tank volume is then shown on the display together with the free capacity display. The free capacity display represents the filling volume that fits into the tank during the impending filling process.
The indicated measurements are not calibrated for invoicing.

Installation example - standard installation of SmartBox AIR Wi-Fi
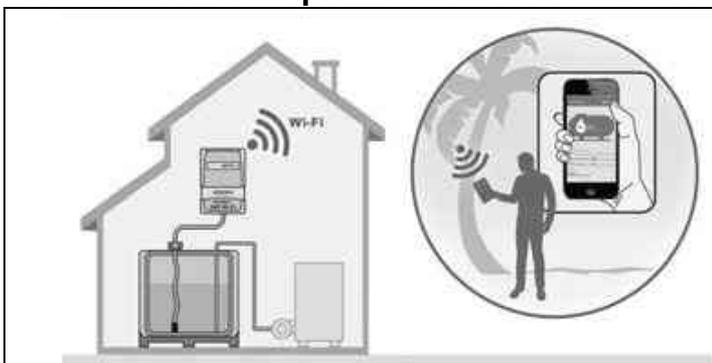
After a single login of the device onto the local WiFi network, information such as the filling level and battery status can be retrieved using the mobile phone app updated to the hour, day, week or month, depending on individual settings. This is possible if the mobile phone is connected to any network anywhere in the world.

INTENDED USE

NOTICE **The intended use in operating media refers to the** measuring hose with weighted nozzle.

Operating media
- Fuel oil
- HVO
- Fuel oil bio
- Diesel fuel
- FAME
- Vegetable oil
- Waste oil
- Rainwater
- other water-hazardous, non-flammable liquids

Other operating media upon request.

i You will find a **list of operating media** with descriptions, the relevant standards and the country in which they are used in the Internet at **www.gok.de/liste-der-betriebsmedien.**

⚠ WARNING

Escaping, liquid operating media:
- are hazardous to the aquatic environment
- are inflammable category 1, 2 or 3 liquids
- can ignite and cause burning
- can cause injury through people falling or slipping
- ✓ Capture operating media during maintenance work.

Place of operation
Display unit:
- with type of protection IP30, in protected and dry rooms
- ⚠ above the maximum tank filling level

Measuring hose with weighted nozzle:
- installation in non-pressurised tanks both indoors and outdoors
- for tank heights up to 4 m (water) and up to 4.50 m (fuel oil, HVO)

INAPPROPRIATE USE

All uses which exceed the intended use:

Display unit:
- changes to the product or to parts of the product
- installation in a potentially explosive area or outdoors
- installation below the maximum tank filling level

Measuring hose with weighted nozzle:
- installation in pressurised tanks and containers

USER QUALIFICATION

This product may be installed only by qualified experts. These are personnel who are familiar with setting up, installing, starting up, operating and maintaining this product.
"Equipment and systems requiring supervision may be operated only by persons aged at least 18, who are physically capable and who have the necessary specialist knowledge or who have been instructed by a competent person. Instruction at regular intervals, but at least once per year, is recommended."

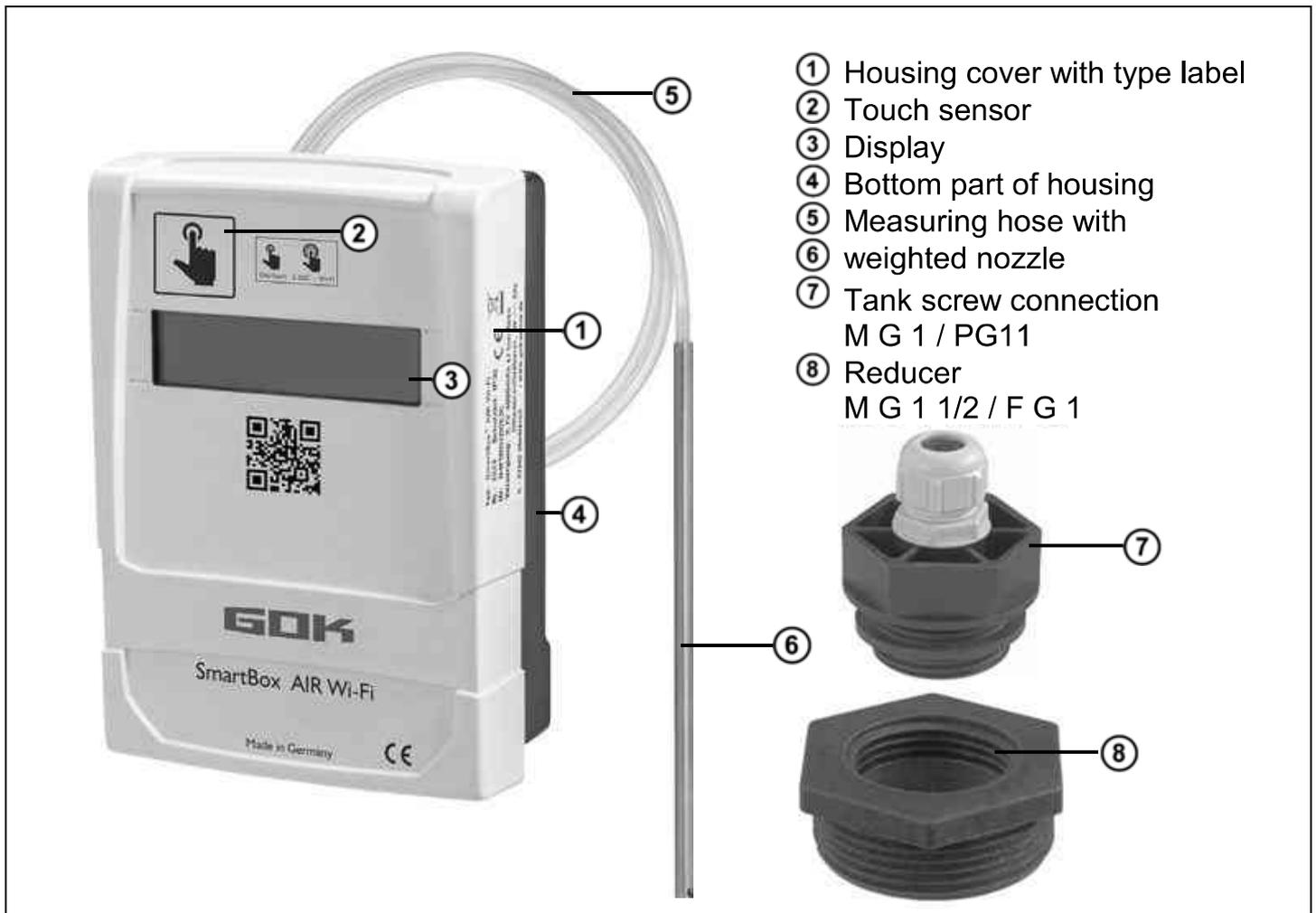| Activity	Qualification
Storing, transporting, unpacking, OPERATION, DISPOSAL	user and operator
ASSEMBLY, START-UP, TANK SETTINGS, APP SETTINGS, TROUBLESHOOTING, SHUT-DOWN,	qualified personnel,

FUNCTION DESCRIPTION

The tank volume is determined by measuring the filling height on the basis of the pneumatic measuring principle. For this purpose, the measuring hose is inserted into the tank up to the tank bottom and filled with the operating medium according to the filling level. The hose is inserted into the tank either by being connected to an existing measuring line in the tank or by using the enclosed assembly kit in an available tank opening.

The pressure pump is activated and pumps the medium out of the hose either by a manually triggered measuring process or by cyclic automatic measurements (hourly, daily, weekly, monthly). The longer this pumping process takes, the more operating medium is in the tank.

After each measuring process, the tank volume is then shown on the display together with the free capacity display. The free capacity display represents the filling volume that fits into the tank during the impending filling process.

The tank volume is displayed in litres, volume percent or filling height in centimetres, depending on the individual settings. These settings, along with all the other settings, can be conveniently defined and changed via a website on a smartphone by scanning a QR code on the inside of the housing cover.

DESIGN

① Housing cover with type label
② Touch sensor
③ Display
④ Bottom part of housing
⑤ Measuring hose with
⑥ weighted nozzle
⑦ Tank screw connection
 M G 1 / PG11
⑧ Reducer
  M G 1 1/2 / F G 1

ASSEMBLY

Before assembly, check that the product is complete and has not suffered any damage during transport. **ASSEMBLY must be carried out by a specialised company.**
The specialised company and the operator must observe, comply with and understand all of the following instructions in this assembly and operating manual. The housing of the display unit is suitable for wall mounting. Under normal circumstances, the display unit must be operated with the housing cover closed. It is installed and started up by a qualified technician while the unit is open.

Installing the measuring hose with weighted nozzle in the tank
Installation is carried out using the supplied installation kit consisting of:
• tank screw connection ⑦ for tanks for passing the measuring hose ⑤ with weighted nozzle through ⑥
• reducer ⑧ for reducing the threaded connection of a sleeve on the tank
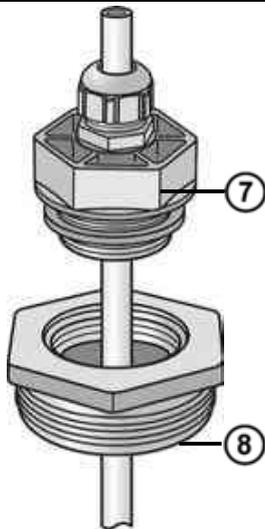
1. Slide the installation kit over the measuring hose with weighted nozzle.
2. Insert the measuring hose with weighted nozzle into the tank. Connecting threads on the tank that are larger than G1 can be adapted to the connecting thread G1 of the insert using commercially available reducers.
3. Screw the installation kit into the tank cap and form an odour-free seal (e.g. using PTFE tape).
4. Lower the measuring hose with weighted nozzle into the tank until the head of the weighted nozzle touches the tank bottom. Then secure the measuring hose with weighted nozzle by tightening the cable gland.
5. The weighted nozzle can also be positioned horizontally (on the tank bottom).

ℹ️ In the case of deposits on the tank bottom: Do not insert the hose all the way to the bottom and take this distance between the hose end and tank bottom into account during measurements.

Connecting the measuring hose to the pressure pump
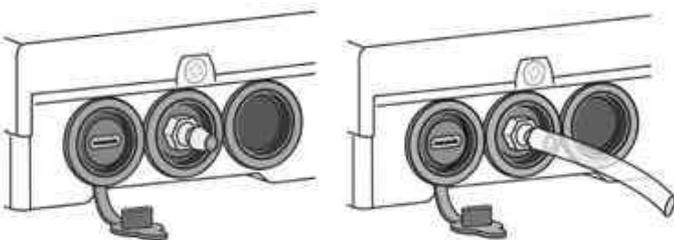
✓ Route the hose to the display unit without kinks.
✓ Do not pull the hose over sharp edges.
✓ Attach/connect the measuring hose to the connection nozzle of the pressure pump on the underside of the display unit and route it so that it slopes towards the tank.
✓ If necessary, shorten the length of the measuring hose.

NOTICE The measuring hose must be connected **tightly**. Check the **secure** attachment of the measuring hose to prevent accidental detachment.

⚠️ **WARNING** Escaping, liquid operating media:
• are hazardous to the aquatic environment
• are inflammable category 1, 2 or 3 liquids
• can ignite and cause burning
• can cause injury through people falling or slipping
✓ Capture operating media during maintenance work.

Installation of the display unit
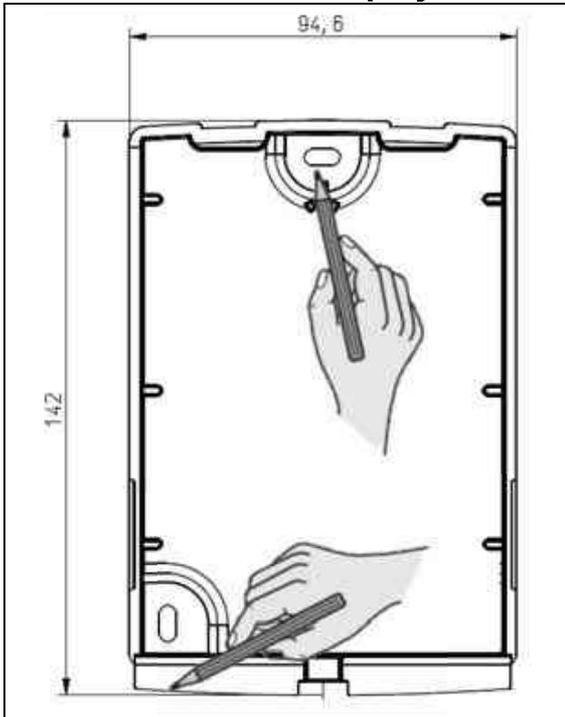
1. Loosen the screw on the bottom of the display unit and remove the top of the housing.
2. Place the display unit above the highest possible fill level of the tank on smooth, vertical wall.
3. Pierce the pre-cut holes on the inside back wall of the housing. Mark the points for installation.
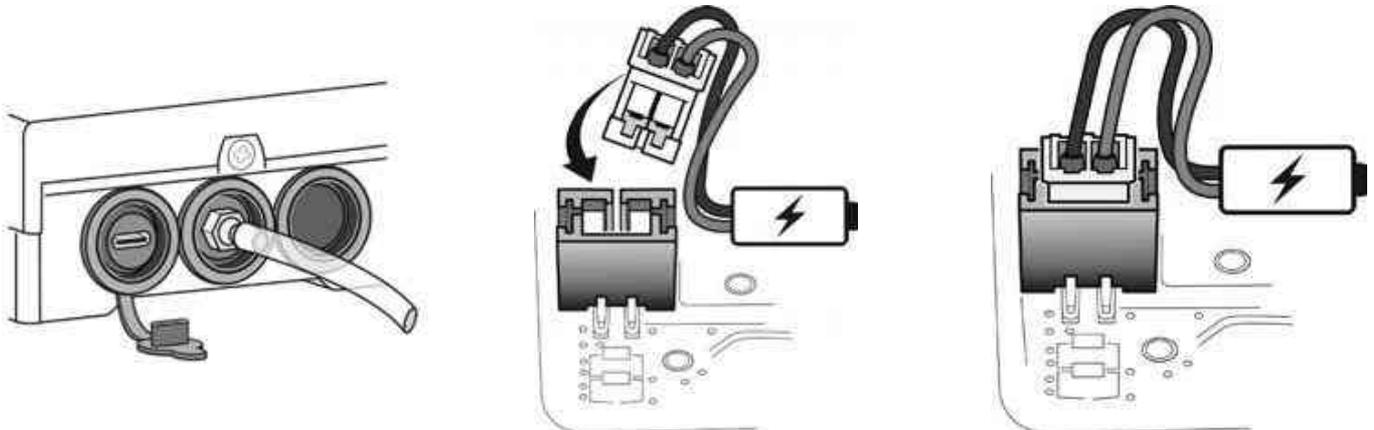
NOTICE Do not damage electronic components. Use a suitable tool to pierce the openings.

4. Place the display unit on the marks and fix it in place using the supplied anchors and screws.

NOTICE Reduce vibrations of the pressure pump on the wall with damping material if necessary.

POWER SUPPLY

NOTICE The USB cable must not be connected to the SmartBox AIR Wi-Fi.

The digital display unit of the SmartBox AIR Wi-Fi is powered by a lithium-ion battery. In the delivered condition, the cable connection to the battery is disconnected. To establish the POWER SUPPLY, with the device open, connect the white plug to the free connection on the circuit board.

CHARGING THE BATTERY

If the battery is empty or the battery capacity reaches 20%, the battery must be charged. The battery is charged via the USB-C port on the underside of the display unit. This requires a USB cable and a power supply (5 V / 2 A), which are not included in the delivery. It is also possible to charge the battery using a power bank. The charging process stops automatically after 3 hours. The charging process may need to be restarted if a weaker power supply is used.
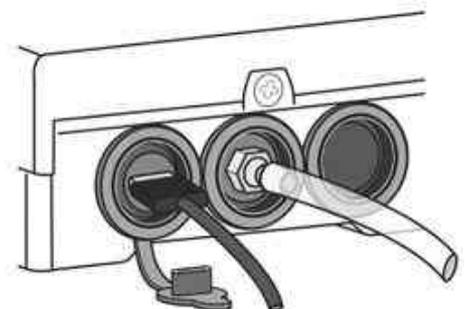
START-UP

Touching the touch sensor activates the display unit (hereinafter referred to as the device).
✓ Always touch the touch sensor with dry fingers.

After the device has been switched on, the following message appears during initial start-up:
➜ FOR SETUP: PLS. OPEN DEVICE; the display goes out again after 3 seconds.

ℹ Initial start-up or setup of the device is **not** possible via the app.

Activating the Wi-Fi hotspot of the SmartBox AIR Wi-Fi

This Wi-Fi hotspot as a local connection must be used to enter the tank data using a smartphone (mobile phone, tablet). It is **not** possible to enter the tank data in the app.

With the device open (see "Installing the display unit"), activate the Wi-Fi hotspot by pressing the "FITTER BUTTON". Display shows:

CON. TO DEVICE AND SCAN QR CODE

Connecting to the device and the Wi-Fi hotspot of the SmartBox AIR Wi-Fi

ℹ Hotspots are physical locations where users can wirelessly connect mobile devices such as a smartphone (mobile phone, tablet) to the internet. No mobile data is used when connected to the Wi-Fi hotspot.
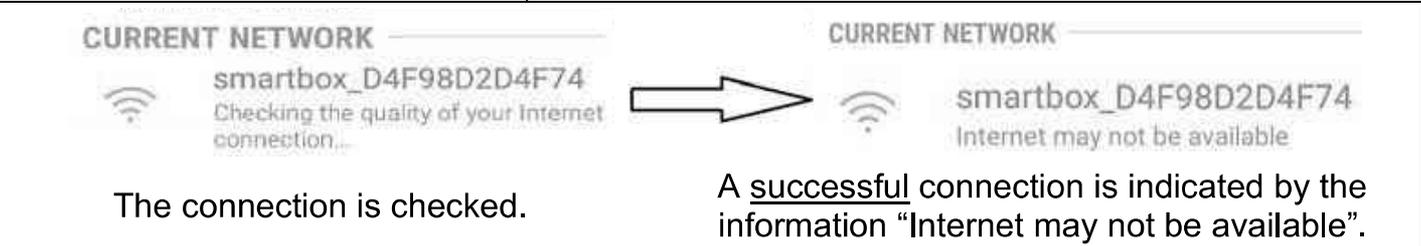
Typ: SmartBox AIR Wi-Fi
Bi.: 2024   Schutzart: IP30
ID: D4F98D2D4F74
Versorgung: 3,7 V 4000 mAh Li-Ion-Akku
D - 97340 Marktbreit · www.gok.de

AVAILABLE NETWORKS
smartbox_D4F98D2D4F74
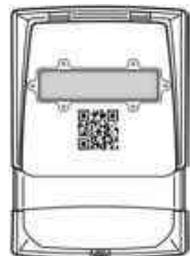
The name of the hotspot is ➜ smartbox_ + ID of the device. The ID can be found on the type label on the side of the device.
✓ Open the Wi-Fi settings on the smartphone (mobile phone, tablet).
✓ Connect to the device's Wi-Fi hotspot.
Selecting the network "smartbox_XXXXXXXXXXX" makes it a "CURRENT NETWORK".

CURRENT NETWORK
smartbox_D4F98D2D4F74
Checking the quality of your Internet connection.

CURRENT NETWORK
smartbox_D4F98D2D4F74
Internet may not be available

The connection is checked.

A successful connection is indicated by the information "Internet may not be available".

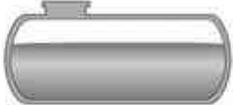ℹ The SmartBox AIR Wi-Fi is now connected to the Wi-Fi hotspot.

Scanning the QR CODE

To adjust the tank settings of the SmartBox AIR Wi-Fi on the SmartBox website:
✓ Tap the camera icon of the smartphone (mobile phone, tablet) and scan the QR code on the inside of the housing cover.
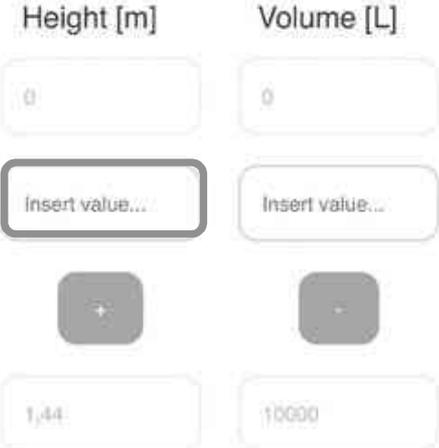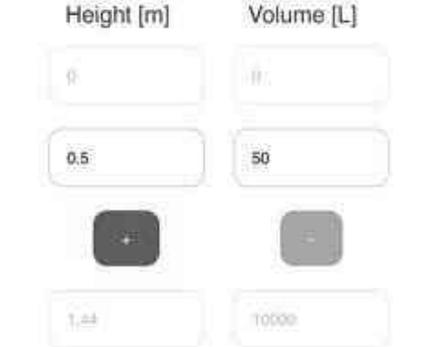✓ Open the SmartBox AIR Wi-Fi website.

TANK SETTINGS OF THE SMARTBOX AIR WI-FI ON THE WEBSITE

TANK SETUP Language* English *This setting also defines the device menu language.	Select the language: • German • English
Measuring unit Choose...	Enter unit: • Percent [%] • Meter [m] • Liter [L]
Medium type Choose...	Select operating medium: • Fuel oil, Fuel oil bio, Diesel fuel, FAME, HVO, Waste oil, Vegetable oil, Rainwater, other water-hazardous, non-flammable liquids • enter the density of a specific operating medium, see under: **User-defined settings (custom)**
Tank height [m] Insert value...	Internal tank height: • enter in meters.
Tank volume [L] Insert value...	Tank volume: • enter maximum tank volume in liters.
Tank shape Choose...	Select tank shape: • tank height and tank volume must be entered beforehand; otherwise an error message will be displayed.

Linear ⦿	**Linear** tank, rectangular tanks, vertical cylinders, basement-welded steel tanks.	
Cylinder (<=50000 L) ○	**Cylindrical tank** horizontal tanks, tubular tanks typical shape for steel outdoor or buried tanks.	
Cylinder (>50000 L) ○		
Ball ○	**Spherical** tank; buried tanks with spherical basic shape; frequently plastic buried tank (GRP).	
Oval ○	**Oval** basement tanks; typical shape of GRP tanks and single-walled sheet metal tanks.	
Convex ○	Plastic battery tanks, **convex,** slightly convex shape, alternative to linear.	
Concave ○	Plastic battery tanks, **concave,** slightly concave shape, alternative to linear.	
Sheet steel or battery ○	**Plate tank or plate tank battery** linear side walls, with semicircular arc top and bottom.	
Custom ○	see under: **User-defined settings (custom)**	
Filling limit [%] 95 Proceed	• Set the filling limit [%] (95 default setting) With fuel oil tanks, that is the shut-off point of the limit indicator. The default setting is 95%. For tanks which can be filled to the very top (e.g. water tanks), it is necessary to set the highest value of 99%.	

User-defined settings (custom)

Medium type Custom Medium Density [kg/m³] Insert name... Insert value...	Select operating medium: • user-defined (custom), • enter name and density value of a user-defined operating medium.

Height [m] Volume [L] 0 0 Insert value... Insert value... + - 1,44 10000	• Enter the calibration chart The lowest (0 / 0) and highest values (max. height / max. volume) are already defined as value pairs, and up to 14 additional values can be entered. A value pair can be added with "+" once the entry of the previous value pair has been completed.
Height [m] Volume [L] 0 0. 0.5 50 + - 1,44 10000	The first value pair entered can be changed but not removed. As of the second value pair entered, the pairs can be removed by selecting "-". This can be done at any time, i.e.: • no value has been entered, • only one value entered, • incorrect value entered, etc. Height [m] Volume [L] 2 2 0.5 50 1.2 100 + - 1,44 10000
2 Insert value...	If a value is entered incorrectly, the corresponding field is immediately highlighted in red and the following message appears: "Invalid value (value must be greater than 0 m, greater than the previous and less than the next value)."
Proceed ⇨ Proceed	Once all required values have been entered, the colour of the "Proceed" button changes from grey to blue, meaning that the button is active.

Overview of settings

Please check the entered data. Confirm Back	Check the entries: • select "Back" to make any necessary changes. • No changes necessary: select "Confirm"; a new window appears.
The tank setup was successful. You can now safely close the browser. OK	• Display changes from: CON. TO DEVICE + SCAN QR CODE to: -MEASURE LEVEL -SET WI-FI ✓ Select "OK" to close the web page in the browser.

Tank setup is complete.
If the FITTER BUTTON is accidentally pressed again, touch the touch sensor to return to the main menu.
✓ Close the housing cover and tighten the screw on the underside of the digital display unit.

- The first measurement can be started by touching the touch sensor.
- If the device is switched off, it can be switched on by touching the touch sensor.

SMARTBOX AIR WI-FI APP

The SmartBox AIR Wi-Fi app is available in the Google Play Store and in the Apple App Store.

Adding a device to the SmartBox AIR Wi-Fi App

SmartBox AIR Wi-Fi ⊕ ⚙ ▶	After opening the app, the start screen appears on the smartphone (mobile phone, tablet) with the prompt to add a device by touching the + symbol in the title bar. Any available SmartBox AIR Wi-Fi devices are already listed.
	A QR code scanner opens. ✓ Scan the QR code on the front of the housing cover. After successfully scanning the QR code, the device is listed on the start screen.

← Settings General settings 🌐 Language English Distributor data ⓞ Name 🏠 Address 📞 Phone ✉ Email	⚙ In the general settings; the app language can be selected and information on the fuel distributor can be entered.

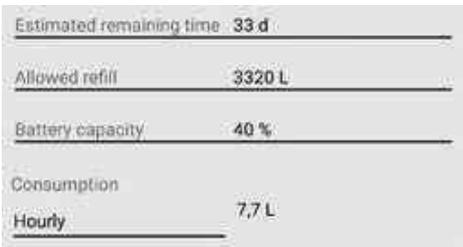## LOGGING THE SMARTBOX AIR WI-FI INTO THE LOCAL WI-FI NETWORK

	👆	If the device is switched off, it can be switched on by touching the touch sensor.
➜ -MEASURE LEVEL -SET WI-FI		Display shows:
➜ CON. TO DEVICE AND OPEN MOBILE APP		Touching the touch sensor for a longer period of time will cause the display to change and the device creates a Wi-Fi hotspot.
Typ: SmartBox AIR Wi-Fi Bj.: 2024 Schutzart: IP30 ID: D4F98D2D4F74 Versorgung: 3,7 V 4000 mAh Li-Ion-Akku D - 97340 Marktbreit · www.gok.de AVAILABLE NETWORKS 📶 smartbox_D4F98D2D4F74		The name of the hotspot is ➜ smartbox_ + ID of the device. The ID can be found on the type label on the side of the device. ✓ Open the Wi-Fi settings on the smartphone (mobile phone, tablet). ✓ Connect to the device's Wi-Fi hotspot. Selecting the network "smartbox_XXXXXXXXXXXX" makes it a "CURRENT NETWORK".
The connection is checked.		A <u>successful</u> connection is indicated by the information "Internet may not be available".
CURRENT NETWORK 📶 smartbox_D4F98D2D4F74 Checking the quality of your Internet connection... ➡ CURRENT NETWORK 📶 smartbox_D4F98D2D4F74 Internet may not be available		
SmartBox		The connection is established and the app can be opened on the smartphone (mobile phone, tablet). ⓘ The message "Please enable access to the network!" can be ignored at this point.
📶🏠 ⚙ 📄➡		Touching the Wi-Fi icon in the title bar opens the dialogue box for the Wi-Fi settings.
SSID _____ Password _____ 👁 CONFIRM		The SSID is the name of the local Wi-Fi network on which the SmartBox AIR Wi-Fi is to be logged in. The password can be found on the router of the internet provider. ✓ Enter the required data and select CONFIRM to continue.
-MEASURE LEVEL -SET WI-FI		Display shows: ⓘ The message stating that the data has been transferred to the device is not a confirmation that the data has been entered correctly.
The SSID and password were not sent to your SmartBox AIR Wi-Fi device. Make sure that your mobile device is connected to the local Wi-Fi network of your SmartBox AIR Wi-Fi device and try again.		If this message appears instead, the data was not transferred to the SmartBox AIR Wi-Fi because the smartphone (mobile phone, tablet) is not connected to the hotspot of the SmartBox Air Wi-Fi. ⓘ When entering the Wi-Fi data, the smartphone (mobile phone, tablet) must not be in power-saving/sleep mode.

-MEASURE LEVEL -MODIFY WI-FI		To confirm that the Wi-Fi login data has been entered correctly, the display text changes from ➜ to: SET WI-FI ➜ MODIFY WI-FI.
	👆	If the device has switched off in the meantime, it can be switched on by touching the touch sensor.
	👆	You can check whether the information has been entered correctly by subsequently carrying out a manual measurement by touching the touch sensor.
MEASUREMENT IN PROGRESS...		Display shows:
VALUE=0L REFILL=9500L	◿	If the display changes to:
	◿	with a visible triangle, this is an ERROR MESSAGE and means that either the Wi-Fi network was not found or the Wi-Fi login data was not entered correctly.
VALUE=6180L REFILL=9500L		If the display changes to: this means that the Wi-Fi login data was entered correctly.
SmartBox AIR Wi-Fi ⊕ ⚙ ▶ 6180 L Battery: 40 % SB_D4F98D2D4F74 Last refresh: 20.12.2024 10:02 Allowed refill: 3320 L		The app's start page now displays the corresponding device with the current date and time (if necessary, refresh the screen by swiping down).

ℹ	VALUE = litres of operating medium in the tank.

APP FUNCTIONS

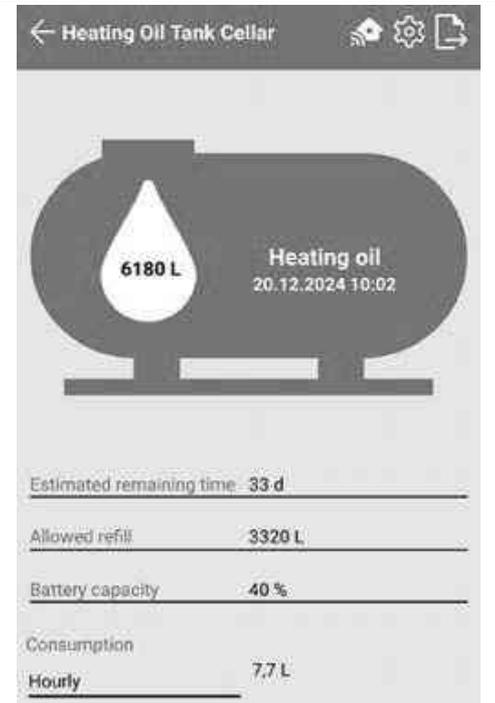|	
6180 L Heating oil 20.12.2024 10:02	• Touching the above image opens a detailed overview: • information on the operating medium (as previously selected) and date/time of the last update.
Estimated remaining time 33 d Allowed refill 3320 L Battery capacity 40 % Consumption Hourly 7,7 L	• Indication of the estimated time remaining (displayed only after 1 - 2 tanks consumed). • Permissible filling volume in litres. • Battery capacity. • Current consumption (selectable between hourly, daily, weekly, monthly; displayed only after 1 - 2 tanks consumed).

⚙	Touching the "Settings" icon opens an overview of the settings:

Settings 🖫	After changing settings:
Device settings	✓ Tap the save icon (floppy disk) to confirm.
Device ID	
D4F98D2D4F74	• Device ID – cannot be changed.
Device name	
Heating Oil Tank	• Definition of a device name for better differentiation
Measuring cycle	
Hourly	• Selection of the automatic measuring cycle*.
*Please note that hourly measuring cycle may significantly affect the battery life!	
Device language	• Device language.
English	
Display unit	• Display unit.
Liter	
Tank settings	• Settings (as previously selected) are only displayed here and cannot be changed.
Setup date 19.12.2024 16:05	
Maximum height 1,44 m	
Maximum volume 10000 L	
Filling limit 95 %	
Tank shape Linear	

*For any change to the automatic measuring cycle to take effect, a manual measurement must be performed on the device.

✓ Touch the touch sensor to start a manual measurement.

Heating Oil Tank Cellar 🔊 ⚙ 🗋	Settings 🖫
	Device settings
6180 L **Heating oil** 20.12.2024 10:02	• After saving the changes (e.g. entering the name "Heating Oil Tank Cellar") and tapping ← settings, the device appears with the assigned name ←Heating Oil Tank Cellar.
Estimated remaining time 33 d	
Allowed refill 3320 L	
Battery capacity 40 %	
Consumption Hourly 7,7 L	

• Tapping the "Export" icon creates a .csv file that can be opened in Excel. This file contains the time of all measurement (automatic and manual) as well as the corresponding filling level in litres, centimetres and percent.

TROUBLESHOOTING

Error	Error cause ➜ Action
ERROR 1	Bubbles in the measuring hose: ➜ Fully remove and drain the measuring hose. ➜ Check the connections for leaks. ➜ Then reinstall the measuring hose. Damage to the measuring hose (hole etc.): ➜ Repair the measuring hose or replace if necessary. Excessive tank height (> 4.7 m): ➜ Do not insert the measuring hose as far as the tank bottom; add the distance between the tank bottom and the weighted nozzle to the measured filling height.
Visible triangle on the display ◺	Wi-Fi network not found or Wi-Fi login data not entered correctly: ➜ repeat the steps described under "LOGGING THE SMARTBOX AIR WI-FI INTO THE LOCAL WI-FI NETWORK".
⚠ **No Wi-Fi network**	The last automatic measurement was not sent to the app: ➜ Check the network settings. ➜ Perform a manual measurement. ➜ Wait for the next automatic measurement.

SHUT-DOWN

- Remove the measuring hose with weighted nozzle from the tank and close the tank again by forming an odour-free seal.
- Disconnect the measuring hose from the pressure pump.
- To shut down the device, disconnect the white plug from the circuit board to interrupt the power supply to the battery.

DISPOSAL

To protect the environment, our electrical and electronic appliances may not be disposed of along with household waste.
At the end of its lifespan, each end user is obligated to pass old appliances to a district or area collection point, separate from household waste. This ensures that old appliances are disposed of properly and negative effects on the environment are avoided.
Our registration number for the electrical old appliances register (EAR) is: WEEE-Reg.-No. DE 78472800.

In order to protect the environment, products contaminated with water-hazardous substances or that have come in contact with such substances must not be disposed of in the domestic waste, to public waters or channels.
The product must be disposed of via local collection stations or a recycling station.

WARRANTY

We guarantee that the product will function as intended and will not leak during the legally specified period. The scope of our warranty is based on Section 8 of our terms and conditions of delivery and payment.

TECHNICAL CHANGES

All the information contained in this assembly and operating manual is the result of product testing and corresponds to the level of knowledge at the time of testing and the relevant legislation and standards at the time of issue. We reserve the right to make technical changes without prior notice. Errors and omissions excepted. All figures are for illustration purposes only and may differ from actual designs.

TECHNICAL DATA

Display unit SmartBoxAIR Wi-Fi	
Dimensions H/W/D in mm	144 x 99 x 45
LCD display	16 characters / 1-line
Measuring accuracy (± 1%).	± 1% of the measuring range end value
Ambient temperature	0°C to +50°C
Housing material	ABS / PC
Type of protection	IP30 acc. to EN 60529
Power supply unit (not included)	5V, 2A, USB-C

NOTES FOR REQUIRED TANK DATA

	Entry function	**Entry value**
Maximum height	Value max H ≤ 470 cm	_ _ _ cm
Maximum volume	Max V ≤ 99.999 L	_ _ _ _ _ L
Tank shape	**Linear** tank	❏
	Cylindrical tank	❏
	Spherical tank	❏
	Oval tank	❏
	Tank **convex**	❏
	Tank **concav**	❏
	Sheet steel tank or tank battery	❏
	User-defined settings (custom)	❏