Will-Fill

Automated Coolant Controller

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Contents

1. Introduction

Congratulations with the purchase of your Will-Fill device, the premium coolant controller.

This manual gives a general explanation of all the functions of the Will-Fill Device. Every menu of the Device is explained in this document.

1.1. Definitions

Throughout the manual specific wording is used to indicate certain elements of the Will-Fill Device or metal working process. The definitions are given in the following list to facilitate the reading and understanding of the Will-Fill Manual.

- **Coolant**: The mixture of water (H_2O) and oil that is created by the Will-Fill Device. Fluid that is used in metal working machines for lubrication between tool and work piece, and cooling of both elements. In some cases also referred to as Emulsion, but this does not cover all functions. The abbreviation of Metal Working Fluid, MWF, is used on the display of the Will-Fill Device and also refers to Coolant.
- **Max volume** and **Max Level** are both used to express the maximum coolant level. Throughout the manual, they can both be used interchangeably, while having the same meaning, being that of the **Max volume** of the Coolant in the Coolant Tank.
- **Oil**: Mineral or Synthetic oil that is used as lubrication and coolant agent. The oil is dissolved in water and is a key component of the Emulsion. Also known as concentrate.
- **Device**: Term that is used to refer to the Will-Fill Device, installed as add-on in the machining process.
- **Machine**: refers to the turning, milling, grinding, … machine. The core of the machining process on which the material is being worked and the coolant is being used.
- **Process**: refers to group of machines, devices and installations that handle different aspects of the metal working process.
- **Coolant tank**: indicates the container that holds a large volume of Emulsion. This is a separate container, placed next to the Machine, in some case equipped with a lubrication unit. **Coolant tray** on the other hand refers to the tank below the Machine that holds the Emulsion.
- **MSR**: is the abbreviation for MeaSuRement of the Emulsion. MSR's can be triggered for various reasons.

1.2. Device types

The Device is available in different types with a set of different options. The Devices types are indicated by a combination of letters and numbers. This manual is valid for the following Device types:

Will-Fill NEO S/MD120	Will-Fill NEO S/M-D220	Will-Fill NEO S/MD320	Will-Fill NEO S/MD420
Will-Fill NEO S/MD520	Will-Fill NEO S/M-D620	Will-Fill NEO S/MD720	Will-Fill NEO S/MD820
Will-Fill ION S/MD120	Will-Fill ION S/MD220	Will-Fill ION S/MD320	Will-Fill ION S/MD420
Will-Fill ION S/MD520	Will-Fill ION S/MD620	Will-Fill ION S/MD720	Will-Fill ION S/MD820

The table below indicates the meaning of the different codes that are being using in the Device type:

Device	Only %, Temp & Level MSR (NEO) or also pH & EC (ION)	Single (S) or Multi (M)	Length of the Substructure
Will-Fill	NEO	SD	120

Device	Only %, Temp & Level MSR (NEO) or also pH & EC (ION)	Single (S) or Multi (M)	Length of the Substructure
	ION	MD	220
			320
			420
			520
			620
			720

The difference between the **NEO** and the **ION** consists of the ION-model also being equipped with a pH and an electroconductivity sensor. Other than that, there is no difference.
The **Single** Device is designed for installation on a tank of a single Machine. It is the most standard Device. The **Multi** Device however is meant to be installed on a central tank, which feeds multiple Machines directly with coolant of the same concentration.
The length of the **Substructure** defines the measuring range of the device. The physical length of the substrucutre is the measuring range + 65 mm (2.55 inches).

1.3. Intended use (Operational scope)

The intended use, or opertional scope, of the Device is explained in this chapter. It's important to note that the Device should only be used as described here.

For any Will-Fill Device, the operational scope consist of 6 tasks:

Measuring

All Devices will perform regular measurements. Depending on the options, more parameters are easured. By default (NEO), the concentration, temperature and level of the Coolant are measured. When fillings are performed the consumed water and oil is also measured. An ION Device will also measure the pH level as well as the electrical conductivity of the Coolant.

Analysis

When a measurement is performed, the Device performs an analysis to define at what ratio the water and oil should be added to maintain the maximum level of Coolant.

Filling

After the analysis, the water and oil are being added, according to the calculated volumes. In the meantime the level is monitored at all time. The fresh water and concentrate are added while Coolant is circulating in the Device. This allows for optimal mixing.

Conditioning

When the Device is in Stand-by, the Coolant will be regularly circulated by the Device. This will keep the Coolant moving, prolonging the life time of the Coolant. As the Device runs 24/7, the conditioning takes place every hour (depending on defined parameters).

Data capture

All measurement data and event logs are saved on the device. They are made available to the customer by different interfaces that allow direct access to the Device.

Reporting

If the Device is connected to the internet, it will automatically upload the measurement data and event logs to the my.will-fill.com-cloud server. Here the data is transformed into graphs, that allow for easy interpretation and preventive maintenance of the Coolant.

By performing these 6 tasks continuously, the Device automatically controls the parameters of the Coolant.

2. Safety regulations

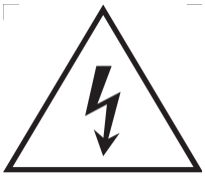
2.1. About the symbols

Different symbols are used in this manual. It's important that you familiarize yourself with the meaning of all symbols to ensure correct use of the Device. The meaning of the symbols are described below.

DANGER:
This symbol indicates information that, if ignored, will certainly result in personal injury or even death due to incorrect handling.

Warning:
This symbol indicates information that, if ignored, could possibly result in personal injury or even death due to incorrect handling.

CAUTION:
This symbol indicates information that, if ignored, could result possibly in personal injury or physical damage due to incorrect handling.

Symbol	Explanation
	The symbol is attached to the outside of the Device. It indicates that at the location where it is applied, the Device should be handled with caution, as there is a possibility of electrical shock. In the case of the round plastic covers, the shock can only occur if the cover is taken away.
	The symbol is attached to the outside of the Device. It indicates that before the use of the Device, this manual should be read. All connection points of the Device are explained in the manual. For this information, refer to Installation of Device *(on page 22)*.
	The symbol is attached to the oustide of the Device. It indicates that the Device should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.

Symbol	Explanation
Important:	This symbol indicates that an important remark is being made, which requires reading with care. Failure to do so might result in damage to the Device.
Note:	This symbol indicates that there is extra information given.
Remember:	This symbol indicates information that should be applied multiple times when using the Device, and thus should not be forgotten. Failure to do so might result in damage to the Device.
Restriction:	This symbol indicates that an action/handling is described that should not be exectued at/with the Device. Failure to do so might result in damage to the Device.
Tip:	This symbol indicates that information is given to make the use of the Device easier.
Troubleshooting:	This symbol indicates that information is given to help solve a problem or a question that can occur when using the Device.
Attention:	This symbol draws the attention to an important element, which studying it for correct use. Failure to do so might result in damage to the Device.

2.2. Safety Regulations

When maintenance on the Device is required, always use the safety regulations that apply within your organization. Will-Fill is a Device that is permanently under water pressure and air pressure. Wearing safety goggles during maintenance is recommended.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

CAUTION:
It is not allowed to spray water on or in the Device, as this will severely damage the Device and it might cause injuries to yourself and/or persons around you.

CAUTION:
Whenever worked is being carried out on the Device, shut down the Device and unplug the power cord.

CAUTION:
Whenever worked is being carried out on the Device, close the water and air feed to the Device and make sure the pressure is released on both inlets.

CAUTION:
Never disassamble the different disks of the body. Internal channels of the body are pressurized during operation and assembly requires thorough pressure testing. Improper (re-)assembling can result in either damaging the Device and some of its components or can result in (serious) injury.

Important:
Always make sure the head of the Device is higher than the substructure of the Device. The substructure can contain Coolant and/or water, which can damage the sensors and probes if the substructure is raised above the head. When the Device is put in its side, make sure to support the head, so that it is always higher than the body.

Attention:
Make sure to never tilt the Device without releasing all coolant from the substructure and all oil from the gearbox. If device is tilted with either of these fluids inside, this will cause damage to one or more components or sensors.

Important:
The drain hole in the substructure is the only safe way to release all the coolant that is sitting inside the substructure after it has been submerged. Make sure that all coolant is drained via the drain hole by removing the drain plug before tilting the device on its side. Not draining the substructure will mostly likely result in damage to one or more sensors of the Device.

Important:
The drain hole on the body, located on the backside of Device, is the only safe way to release all lubrication oil from the gearbox. Make sure that all oil is drained via the drain hole by removing the drain plug before tilting the device on its side. Not draining the gearbox will mostly likely result in damage to one or more components of the Device.

Restriction:
When working on the Device, only take actions as explained in this manual. Dismantling the Device further than described in the Manual will void the warrantee.

Restriction:
Never place the Device upside down. Fluids inside the Device might cause damage to components.

2.3. Materials of Device

The following is a list of materials that are used in the Device, which may come in contact with the Coolant or Concentrate. It is required to check the contents of oils and additives that are used in the Coolant and to make sure that those contents do not react with the materials listed below.

The following materials are used in the device and may come in contact with the Coolant:

- Glass
- Polymerized Polytetrafluoroethylene (PTFE)
- Polyoxymethylene (POM)
- Fluocarbon (FKM)
- Aluminium AW-6026 T6 (AlMgSiBi)
- Stainless steel 1.4305 (AISI 303)
- Stainless steel 1.4429 (AISI 316L)
- Polyether Ether Ketone (PEEK)
- Polypropylene (PP)
- Polyethylene (PE)

Attention:
Damages on the Device that originate due to used of chemicals that react with the materials listed above, are not covered by any warrantee.

2.4. Certifications

For the following components ot the Device, separate certificates are available upon request:.

- Power supply EPP-200-x
  CB Test certificate, in conformity with IEC 60950-1(ed.2), IEC 60950-1(ed.2);am1 and IEC 60950-1(ed.2);am1
  Declaration of conformity CE, in conformity with RoHS Directive (2011/65/EU), Low voltage Directive (2014/30/EU),
  Electromagnetic Compatibility Directive (2014/30/EU)
  TÜV Certificate, in conformity with EN 62368-1:2014+A11
- WiFi & BT Dongle WUBT-239ACN(BT)
  CE Statement of compliance, in conformity with standards ETSI EN 301 489-1 V2.2.3 & V3.2.4,
  ETSI EN 300 328 V2.2.2. (2019-07) & V2.1.1 (2017-05) and EN 62311:2008
  FCC Statement of compliance, in conformity with standards FCC Part 1 Subpart B: Class B, ANSI C63.4:2014
  IC Statement of compliance, in conformity with standards ICES-003 issue 7, ANSI C63.4-2014 and ANSI C63.4a-2017
  Teleec Radio Test Report, in conformity with Test Regulation Article 2 paragraph 1 item 19, MIC notice 88 Appendix 43, ARIB STD-T66
  REACH Declaration of conformity

3. Device Fundamentals

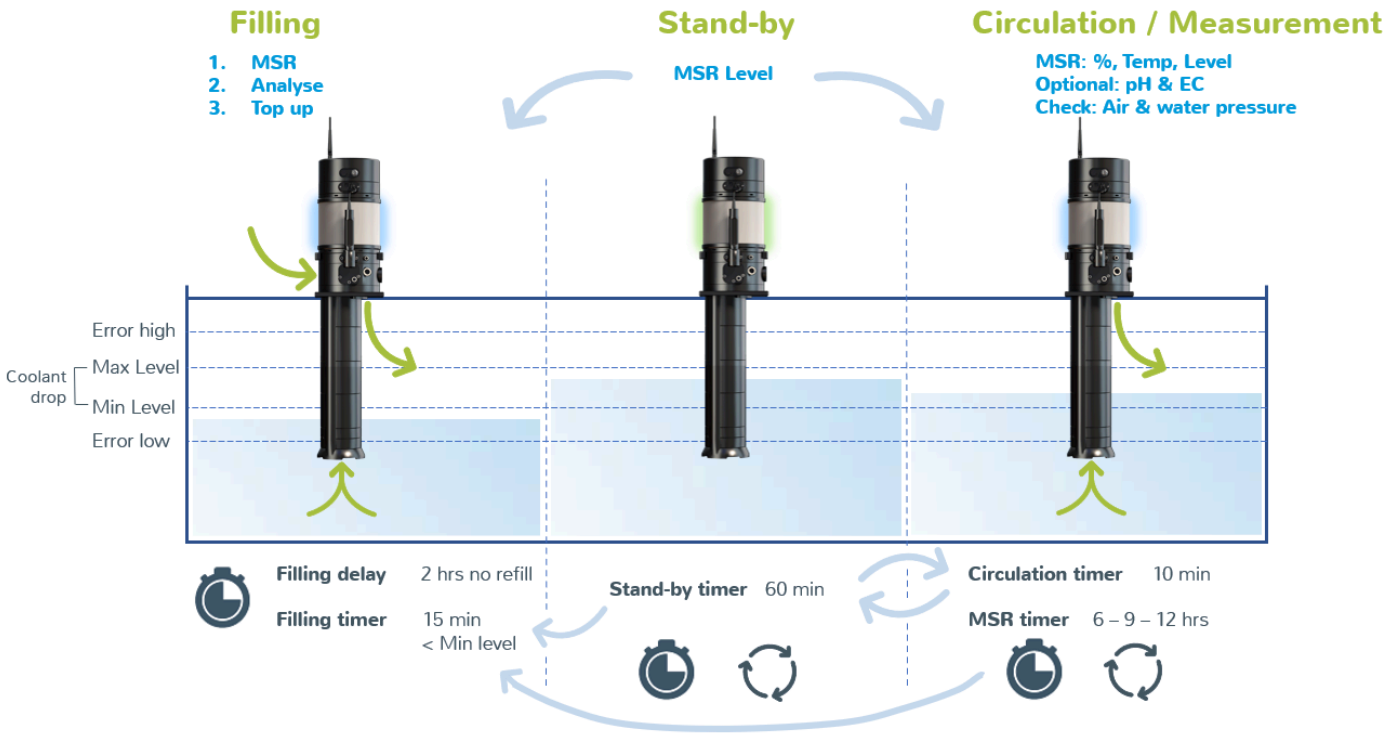
In this chapter the fundamental elements of the Device are explained. The following 2 topics will be handled:

The different states of the Will-Fill, including a more in-depth overview of how the Device functions.
The different colors the Device emits and the maning of them.

3.1. Functioning of Device

By means of the below diagram the general functioning of the Device will be explained as well as the key parameters of operation.

Once the Device is started, it will go to the default Stand-by state. All other actions always originate from this state. The image below gives an overview of the different states and their procedures. these will be explained in detail.



3.1.1. Stand-by state

In the Stand-by state the Device is showing key measurement results and it is reading for anticipating changes in the coolant tank.

On the screen of the Device, the measurement results will be shown. These are the results of the last succesfully performed measurement. This means that, depending on the measurement interval, these results can be a couple of hours old. The key parameters like Concentration, Temperature, pH, EC, level of coolant and level of the oil will slide over the screen from right to left as a banner. From this screen, the main menu can be accessed by pressing the **Enter**-button, or a shortcut to the **Oil capacity** or **Alarm info** is available.

```
Standby
Set %: 7.5    Curren
Current: 7.3  Temper
Oil     Menu     ALM
```

Function
The top line of the screen shows the actual state. The 2nd and 3rd line show the measurement results of the different sensors. The last line indicates access to menu and shortcuts in the menu.
When the filling timer starts, it will be indicated on the bottom line of the screen.

Input
Oil: Oil Capacity
Menu: Main menu
ALM: Alarm info

In the background, the coolant level is being monitored continuously. Every 6 mintues, the laser will conduct a measurement to check whether the level of the coolantis below the minimum level or not. If this is the case, the filling timer can start. The progress of the filling timer will be shown on the screen. In the background, a level measurement is done every 6 seconds to monitor correctly the level fluctuations. Only when the coolant level remains under the minimum level at all times for the entire duration of the filling timer, the filling state becomes active and the filling procedure can start.

During the stand-by state the stand-by timer is also active. When the stand-by timer is finished and the set time has lapsed, the Device changes autoatically to the Circulation state.

3.1.2. Circulation & Measurement state

In the Circulaiton state the Device is circulating the coolant. No water or oil is added, the coolant is only being kept in motion. During the measurement state, the coolant is passing by the sensors, allowing the Device to conduct an automatic measurement.

During circulation, the coolant is being pumped up via the coolant inlet on the bottom of the substructure, it is mixed in the mixing chamber of the Device and then released via the overflow outlet, right underneath the rectangular plate (top of coolant tank). The circulation will also happen when the Machine is turned off. Even when the Will-Fill detects a lack of water or air pressure, the circulation will still happen in order to keep the coolant conditions optimal.

On the screen of the Device, the progress of the **Circulation timer** is shown. Once the timer has lapsed, the Device returns back to the Stand-by state.

```
Circulation
Circulation: 57 %

Oil     Menu     ALM
```

Function
The top line of the screen shows the actual state. The 2nd line show the progress of the circulation.

Input
Oil: Oil Capacity
Menu: Main menu
ALM: Alarm info

Tip:
Every time the Device returns to Stand-by, it will check for errors to display.

The measurement state is activated every time the **Automatic measurement timer** has lapsed. This timer is always running in the background and is not interrupted by the changing of states. When the timer has finished at the same time that another procedure is active (filling, circulation, …) the automatic measurement will be started only when the Device has returned correctly to the Stand-by mode.

In the measurement state, a complete measuring cycle is performed, during which the different characteristics of the coolant are measured. This consists of 4 major sections:

Checking sensors
flushing Device with coolant
Measurement of coolant
Rinsing & cleaning of Device

Once the entire cycle is completed, an overview with the results of all the measurements is given. Upon exiting this menu,the **automatic measurement timer** starts again and the Device returns to the Stand-by state.

For more information on the Measurement cycle, please refer to MSR Now *(on page 68)*.

When the Device measures a concentration that is below the set threshold (**Minimum percentage**) during an automatic measurement, then the Device goes automatically to the Filling state and an **Oil-only filling** will start to bring the concentration of the coolant back to the desired percentage.

3.1.3. Filling state

In the Filling state the Device will add (a mixture of) water and/or oil and mix it with existing coolant, before releasing the homogenous coolant mixture to the tank via the overflow outlet.

On the screen of the Device, the different steps of the filling procedure are shown. It is important to note that the Device will start with performing a complete measurement cycle. This is required to get an actual overview of the current volume and concentration.

Once the measurement is done, the Device can calculate the different parameters of the filling. This includes how much water and/or oil will be added. Eventual feedback from the checks and measurements that need to be notified to the end-user will be initiated in this step.

Finally, the filling procedure will start, during which water and oil are added to the tank. The progress is shown on the screen.

```
Filling to 59 %
Level: 17 %
H2O: 6,6 L
OIL: 0.75 L  F: 16.1
```

Filling to refers to the actual percentage until which the tank will be filled. This percentage is based on the total measuring range of the Device.
Level is the actual level at this moment.
H2O indicates the amount of water that has already been added.
OIL shows the amount of oil that is already added, while the **F**-value keeps track of the amount of oil that still needs to be added, because of the water that has already been added.
When the level is equal or higher to the target, the filling will stop.
All percentages indicated on this screen, refer to the percentage of the substructure is submerged.

Keep in mind that the Device is capable of creating coolant at a maximum concentration of 1,5 %. In case a higher percentage is required, the Device will remember how much water was added and how much oil needs to be added still in order to have the correct

concentration. The adding of the oil will happen in a seperate step of the filling procedure. Once also the eventual oil has been added, the Device returns to the Stand-by state. For more information on the filling procedure, please refer to Refill now *(on page 111)*.

3.2. Device colors

During operation, the Device will change its color. Each color represents a specific state in which the Device is at that moment and allows for getting an idea of the performance easily and quickly.

	1. Stand-by - Green When the Device is emitting a green light, it means that it is in the Stand-by state. Everything is working fine and the Device is regularly checking the level of the Coolant. Different timers of operation are active in the background.
	2. Action - Blue Whenever a blue light is emitted by the Device, a specific action is taking place. This can entail one of the following operations: • Filling • Measuring • Circulation After such an action, either a next action is executed or the Device returns back to Stand-by.

3. Notification - Yellow

When the Device is flashing yellow, it means that one or more notifications are active. Such a notification means that a manual check and/or action is required, but whatever it is, it doesn not block the operation of the Device. There is low urgency for the notification, but it should be looked at within 24 hours in order to overcome escalation of an eventual problem.

If the Device is connected with the my.will-fill.com-cloud system, a mail with more information on how to handle the notification is sent.

4. Alarm - Red

If the red light is active, something is wrong with the Device. An urgent manual intervention is required, as the Device will no longer perform its standard tasks. This intervention should be exectued immediately.

If the Device is connected with the my.will-fill.com-cloud system, a mail with more information on how to handle the alarm is sent.

4. Installation

In this chapter the different steps of the installation of a Device are explained. This is not limited to the physical installation, but also surrounding factors and requirements are handled.

4.1. Before installation

Before starting the installation of the Device into the coolant tank, it is important to check that the installation requirements are met and that there is adequate space available for the Device to fit in and on the tank.

4.1.1. Installation requirements

For proper functioning of the Device, it must be installed in a correct environment. Next to that, the Device needs to be connected to uninterrupted power supply, as well as water, compressed air and oil. For complete reporting and notifications, an internet connection is necessary.

Installation environment

The Device contains different sensors which are sensitive. Allthough it is developed with the Process conditions in mind, the following surrounding parameters should be met for correctly storing, installing and using the Device.

- The storing and operating temperature must remain higher than 15 °C (59 °F) and below 40 °C (104 °F).
- Always store and install inside. Air humidity must remain between 10 % rh and 85 % rh - non condensing! Never spray water, Coolant or concentrate on the Device.
- Do not operate the Device in vicinity of high-frequency machines. For pumps that are installed on the tank, keep a side-to-side distance of minimal 30 cm (11,8 inches).
- The Device should be in stalled on a level surface (horizontal). The maximum deviation is 1°. The Device must be installed on top of a Coolant tank, as it is not standing equipment. Referr to mounting holes below for proper installation and fixation.
- The Device can be installed and used up to a height of maximum 2000 m above sea level.

The Device has pollution degreee PD2.

Uninterrupted Power supply

The Device requires an uninterrupted power supply with following characteristics: 110 V - 240V AC (+/- 10 %) @ 50Hz - 60Hz. Maximum current is 1 A. Depending on the region, a specific power plug is provided.

The Device has overvoltage catergory OVCII.

Permanent Water supply

The Device requires a permanent water supply. Pressure must be between 1,5 bar - 5 bar, with a flow of minimal 120 L/min. For easily installation, the water source has a 3/8' female coupler or a push-in coupler for a flexible hose with diameter 16 mm. It is advised to install a tap in front of the connection point, so the water tap when be closed when working on the Device.

Permanent Compressed Air supply

The Device requires a permanent compressed air supply. Pressure must be between 5 bar - 9 bar, with a flow of minimal 5 L/hour. For easily installation, the compressed air source has a ¼' female coupler or a push-in coupler for a flexible hose with diameter 8 mm.

Permanent Oil supply

The Device requires a permanent oil supply. The oil should not be pressurized and can sit in a barrel or container next to the Device. Quantity available when full can range from 25 to 9999 liter. The oil pumping system is tested to cover a distance of 40 m (131,23 in) when placed at the same height, but it is recommended to install the barrel within a 3 m (9,84 in) radius.

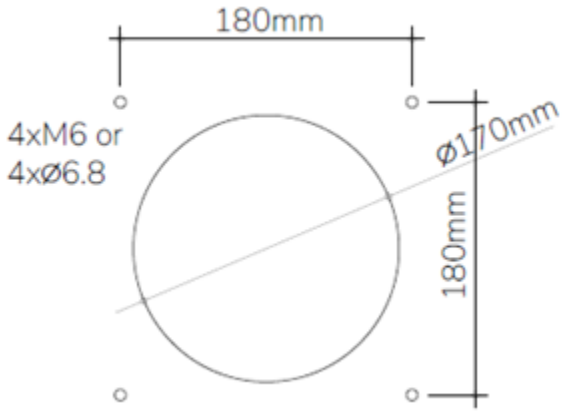
When using the central oil distribution option, the oil source has a ¼' female coupler or push-in coupler for a flexible hose with diameter 10 mm.

Network connection with internet access

For making full use of the online reporting capabilities and the e-mail notifications that are sent bby the device, a network connection with internet access is required. The Device has both 10/100 Mbit ethernet (by RJ45-connector) or WiFi (2,4 GHz and 5 GHz) connectivity available. For safe use, it's recommended to provide adequate protection by means of a company firewall (MAC address verification possible). Specific network settings can be configured on the Device. During testing of the equipment, unshielded cables were used.

Mounting hole in Coolant tank

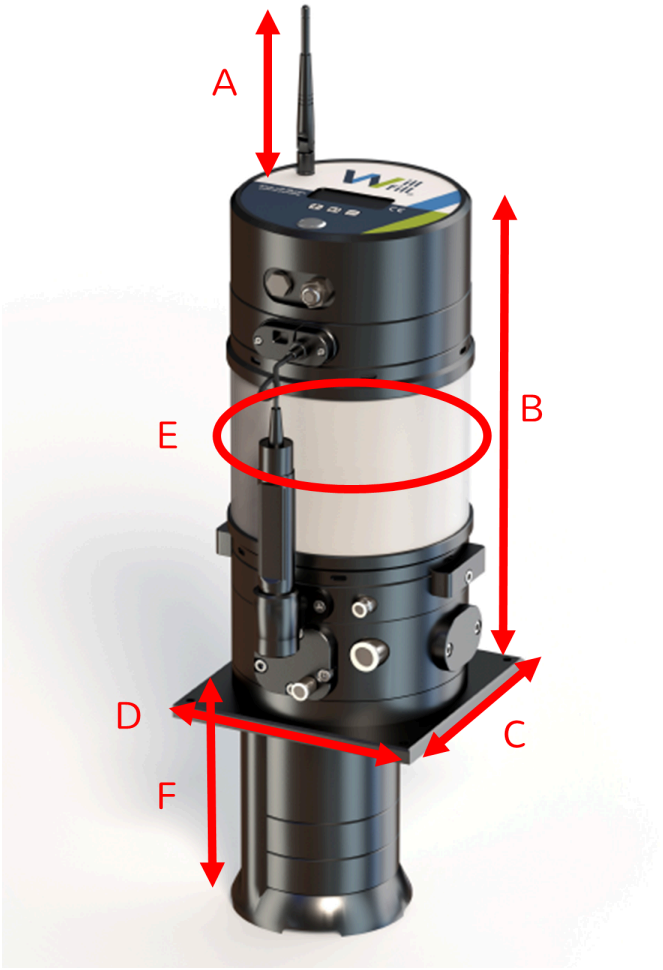
The Device is partially submerged in the Coolant tank. For that reason a whole must be foreseen in the top of the Coolant tank. The dimensions of the hole are given in the figure below. The center of the hole conincides with the intersection of the 2 diagonals of the 4 fixation holes.



Attention:
If the installation is done by the customer, a correct installation and properly connecting al tubes, cables, etc. are the responsibility of the customer.

4.1.2. Device dimensions

The installation location of the Device should be the cleanest section of the tank. Above all, it should fit, therefor the rough dimensions are given in the table below.



Dimension	NEO	ION
A	115 mm - 4,528 in	
B	425 mm - 16,732 in	
C	200 mm - 7,874 in	
D	200 mm - 7,874 in	
E	∅ 215 mm - ∅ 8,465 in	∅ 300 mm - ∅ 11,811 in

Dimension	NEO	ION
F	D120: 185 mm - 7,283 in D220: 285 mm – 11.220 in D320: 385 mm - 15,157 in D420: 485 mm - 19,094 in D520: 585 mm - 23,031 in D620: 685 mm - 26,969 in D720: 785 mm - 30,906 in D820: 885 mm - 31,843 in	

4.1.3. Handling the Device

Below instructions on how to handle the Device when moving it around are given.

When lifting the Device out of the box or out of the Tank, this should be done carefully. Never lift the Device by the head part (indicated in red in figure).

For lifting the Device, preferably use the handles on either side or the rectangular base plate if more convenient.

When putting the Device aside, never tilt the Device without releasing all fluids.

Attention:
Make sure to never tilt the Device without releasing all coolant from the sub-structure and all oil from the gearbox. If device is tilted with either of these fluids inside, this will cause damage to one or more components or sensors.

Important:
The drain hole in the substructure is the only safe way to release all the coolant that is sitting inside the substructure after it has been submerged. Make sure that all coolant is drained via the drain hole by removing the drain plug before tilting the device on its side. Not draining the substructure will mostly likely result in damage to one or more sensors of the Device.

Important:
The drain hole on the body, located on the backside of Device, is the only safe way to release all lubrication oil from the gearbox. Make sure that all oil is drained via the drain hole by removing the drain plug before tilting the device on its side. Not draining the gearbox will mostly likely result in damage to one or more components of the Device.

4.2. Installation of Device

The installation of the Device consists of mounting it into the tank in the first place, and secondly, connecting the different media and power supply. Before the correct installation location is considered.

4.2.1. Installation point

For good fucntioning of the Device, it is imperative to select the correct installation point.

Always install the Device in the main Coolant Tank of your Process. This is where you typically organize the **periodic refills**. In most cases, this is near the pumps that supply the clean Coolant to the Machine. It's important that Will-Fill can detect the consumption of Coolant by level fluctuations inside the Coolant tank. If this is not possible consult your local distributor or Will-Fill.

For good operation and flow of the Coolant, it is important to keep the inlet (arrow faacing upwards) and outlet (arrow facing downwards) clear at all times. Notice that the outlet is ends slightly lower than the rectagular base plate. The outlet should be inside the mounting hole of the Coolant. In this way, there can be a perfect stream of emulsion in and around the Device.

Restriction:
If the outlet of the Device is obstructed or sits on top of the Coolant tank, this might cause spilling of Coolant.

4.2.2. Water connection

Connect the black tube to the Device and the provided filter on one end, and the filter and water source on the other end. Make sure that there are no leaks.

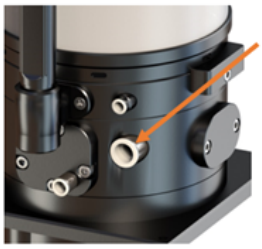
Step I

It's convenient to place the water filter near the Device by means of the supplied magnets, but the point of installation is different for every Process. Make sure the arrow on the filter is pointing in the correction direction, being in the same direction as the water flow.

Step II

In front of the filter, towards the Device, connect the supplied black tube.

Insert the black tube into the water connection push-in coupling at the Device.



Step III

When required, cut the supplied black tube to length and connect it with the chosen water supply.

Important:
Minimum pressure is 2 bar and maximum pressure is 5 bar.

Important:
For proper operation of the Device, the water pressure must always be present.

Step IV

Open the tap of the water supplyO and check your installation for leaks. If a leak is detected, the water pressure should be released, so that it is possible to seal the leaking fitting in an adequate manner.

Important:
When connecting the water cable, always make sure to use the delivered black hose. In case a different hose is used, leaks can occur. The use of other hoses is at customer's risk and responsibility.

4.2.3. Air connection

Connect the supplied blue tube to the Device and the air source. Place the supplied valve in between. Make sure that there are no leaks.

Step I

Cut the supplied blue tube to length and connect it to the Device on one end and to the supplied air valve on the other end.

Step II

When connecting to the air valve, make sure the valve is connected in the right direction. The arrow should align with the flow of the air.

Step III

Cut the supplied blue tube to length and connect it with the chosen air supply.

Important:
Minimum pressure is 5 bar and maximum pressure is 9 bar.

Important:
For proper operation of the Device, the air pressure must always be present.

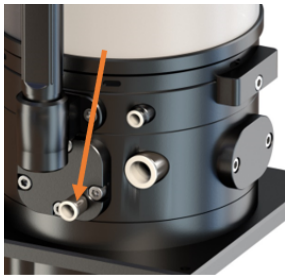
Step IV

Open the air supply and check your installation for leaks. If a leak is found, the air pressure should be released, so that it is possible to seal the leaking fitting in an adequate manner.

Important:
When connecting the air hose, always make sure to use the delivered blue hose. In case a different hose is used, leaks can occur. The use of other hoses is at customer's risk and responsibility.

4.2.4. Oil connection

Connect the transparent tube to the Device and the filter element to be placed in the oil barrel, and make sure that there are no leaks. After bleeding the oil line, no air should enter the tube.



Step I

Make the supplied transparent tube to length and connect it to the Device on one end and to the supplied filter element on the other end.

Step II

Insert the transparent tube with the weighted filter element into the oil reservoir.

Note:
The filter weight will keep the filter at the bottom of the barrel. Make sure the tube is long enough and that it can reach the bottom of the barrel.

Important:
When connecting the oil hose, always make sure to use the delivered transparent hose. In case a different hose is used, leaks can occur. The use of other hoses is at customer's risk and responsibility.

4.2.5. Power connection

Plug in the power cable into the power socket. Make sure the power cable and power plug are dry.

Important:
Power characteristics: 110 V - 240V AC (+/- 10 %) @ 50Hz - 60Hz. Maximum current is 1 A.

Important:
The power plug is the only way of interrupting the power supply to the Device. Therefor, make sure that the power plug is easily accessible in case a quick interruption of power is required.

Restriction:
It is not allowed to cut the power plug off the cord and connect the Device directly into the electrical cabinet. Direct connection to the electrical cabinet will alter the overvoltage category of the Device. Such a setup is not tested and does not fall into the operational scope of the Device. Using the Device with such a direct connection is the sole responsibility of the Customer.

CAUTION:
If the power cord is damaged, do not replace this yourself. Always contact Will-Fill or certified distributor for proper reaplcement of the power cord with an original one.

4.2.6. Network connection

The network connection allows for connection to the Device via LAN cable (RJ-45 connector). This is used when information, such as log files and configuration files, is to be downloaded. Also the OPCua interface can interface via the cabled connection.

Step I
Connect the network cable to the Device. Slide away the plastic cover (1) first, before plugging in the cable as indicated by the arrow. Make sure to push the RJ-45 connecter deep enough in the socket until you hear a 'click'.

Step II
Connect the network cable to a router or switch that is supplied by customer.

Step III

If DHCP is enabled on the connected network, the Device will receive automatically an IP-address. If not, configure the static IP via the Access point mode of the Device.

Important:

Always make sure to use at least an unshielded CAT5e cable, that can handle a transmission speed of 100Mbit/S. In case a different hose is used, communication interruptions can occur. The use of other cables is at customer's risk and responsibility.

4.2.7. USB connection

The USB connection allows for connection to a PC via USB cable (USB Mini-B <-> USB). This is only to be used by service persons, who received proper training, of Will-Fill or certified Distributors.

Step I

Connect the USB cable to the Device. Slide away the plastic cover (1) first, before plugging in the cable as indicated by the arrow. Make sure to push the USB Mini-B connecter deep enough in the socket.

Step II

Connect the USB cable to a PC.

Step III

Configure the network port correctly on the PC to access the Device.

CAUTION:

The USB connection is only to be used for transferring data. It is not possible, nor intended to charge any device via this port!

4.2.8. Oil Level connection (Optional)

The Oil Level Sensor measures precisely how much oil (concentrate) is remaining in the oil container. This also eliminates the need for indicating the available volume when refilling the oil container.

Step I

Connect the oil cable to the Device. This is done by sliding in the connector first (mind the correct allignment of the tooth).

Step II

Fixate the connection by screwing the lower connector handle.

Step III

Connect the Oil Sensor to the other end of the cable and place the sensor on top of the oil container.

Step IV

Perform the calibration process of the oil level sensor so that the volume is indicated correctly.

Important:
When connecting the sensor cable, always make sure to use the delivered cable. In case a different cable is used, miscommunication can occur. The use of other cables is at customer's risk and responsibility.

4.2.9. External MWF Level connection (Optional)

The external MWF Level Sensor allows for mesuring the level of a different tank than in which the Device is installed. This is required in setups where a split tank is present. The Will-Fill is then installed in the clean tanks, which typically overflows into the dirty tank. This implies that level fluctuations are visible in the dirty tank.

Step I
The cable of the external MWF is fixed to the head, as indicated in the image.

Step II
Place the sensor on the part of the tank where the level fluctuates. A hole of diameter 50 mm needs to be made in cover of the tank.

Important:
When connecting the sensor cable, always make sure to use the delivered cable. In case a different cable is used, miscommunication can occur. The use of other cables is at customer's risk and responsibility.

5. First start of Device

This chapter describes how to boot up the Device for the first time, as well as how to proceed through the Startup Wizard which helps with the full configuration of the Device. By following correctly each step as described, the Device is ready for operation.

When the Device is started, the Startup tests will be performed. During these tests, all components of the Device, like sensors, motors & valves are tested. Only when all tests are successful, the Startup wizard will start.

5.1. Power-on tests

Before a Startup Wizard can be started, the Device needs to check wether all sensors and actuators are working correctly. To this end, all components will be checked first, before continuing to either measurement or Startup Wizard.

> **Tip:**
> The tests are performed automatically. If all is well, they require no actino from the operator.

5.1.1. Start device

Start the Device
Powering on the Will-Fill can be done by pressing the power button shortly.
This button will light up to let you know the device is powered.

```
Booting
```

> **Note:**
> It can take up to **5 minutes** before a message appears on the screen because of the start-up of the internal processes. Right before the first message appears on the screen you will hear a **short tone**.

5.1.2. Serials

```
    Will-Fill:
    123ABCD5678
  TYPE: XXXXXXXX
    PCB: 4.03
```

Function
The Device will display the name of Device “Will-Fill”, afterwards its serials are displayed for 5 seconds:
“1234ABCD5678” is the serial number of the Device. This serial number is linked with the internal PC of the Device.
“Type” is the Type Number of device: NEO/ION + SINGLE/MULTI + substructure length.
“PCB” is the version of the printed circuit board.

5.1.3. Time & Date

```
   TIME DATE
Loading software
Version: 2.3.17
     Menu
```

Function

The Device will display the time (hh:mm) and date (for 5 seconds).
The time and date shown during start-up will be used to log the measurements and consumption.
The Device will show which firmware version it will load.
'Menu' indicates that it's possible to access the instant menu of the Device.

> **Tip:**
> When certain tests or calibration need to be performed, it is convenient to navigate to the Menu immediately from this screen.

5.1.4. Checking Local Data Transfer

```
OPCUA (NOT) ACTIVE
OPCUA OK
FTP (NOT) ACTIVE
FTP OK
```

Function

The Device will Check whether the local data transfer functions are operational.
These include the File Transfer Protocol (FTP) or OPCua.
If active: "OK" is displayed, if not active 'NOT OK" is displayed.

> **Remember:**
> This is a seperate option that needs to be activated by supplier.

5.1.5. Checking System Parameters

```
OPCUA (NOT) ACTIVE
OPCUA OK
FTP (NOT) ACTIVE
FTP OK
```

Function

The Device will Check if all necessary parameters are present and correct.
If all parameters are present you will get a notification **CHECK INI OK**.

```
Ini error
fPercent_D

 Restore
```

Function

If the test fails, the Device will notify you of the parameter that's causing the issue.
Regular backups are taken by the device, and at this point the device will use those backups. By pressing **Restore** the correct file will automatically be restored and the device will restart. If afterwards the same error comes up again, you should contact Will-Fill.

Input

Restore: Restores required file from local backup

5.1.6. Checking analog input

```
CHECK ANALOG SENSOR
NOT USED
```

Function
The Device will Check whether an analog input signal is received. If no extra sensor is connected, **NOT USED** will be shown.
The different sensor types can be connected:

```
CHECK ANALOG SENSOR
TEMP SENSOR OK
```

Function
A seperate tempterature sensor is connected. Communication with this sensor is OK.

```
CHECK ANALOG SENSOR
OIL SENSOR OK
```

Function
A seperate oil level sensor is connected. Communication with this sensor is OK.

5.1.7. Checking Emulsion level

```
CHECK MWF LEVEL ...
MWF LEVEL OK
```

Function
The Device will measure the height of the Emulsion level and check if it is OK.

```
ALARM: 40
Level now > Max Lev
75,5% > 70.2%
Retry   ---     Cont
```

Function
If the level is higher than the maximum user defined level the Device will show the difference in level. The operator can give a keypress to continue. If no keypress is given, the Device will continue automatically after 10 seconds.

Linked Alarm: 40

Input
Retry: performs measurement again
Cont: Continue with tests and ignore alarm

```
Alarm: 17
MWF too high
Level: 97.5%
Error value: 96.3%
```

Function
When the level is higher the the **Error Level High** as defined in the Device, the tests will stop. The Device will until the level drops below the error level, and only then continue the tests.

Linked Alarm: 17

Attention:
This alarm cannot be ignored or skipped (safety against flooding).

```
No coolant detected
or level out of
range
Menu    ---     Fill
```

Function

When the level is lower than the detectable level (as defined by sub-structure legnth), the option to do a top-up is presented. The Device will not continue unless the level rises into the measuring range.

Input

Menu: access instant menu

Fill: access Filling menu to perform top-up

> **Tip:**
> Accessing the menu can also help to check the level by navigating to **Main menu > Settings menu > Emulsion settings > Check level**

5.1.8. Checking Oil pump

```
CHECK OIL PUMP ...
OIL PUMP OK
```

Function

The Device will switch the Oil pump on for 10 seconds. During this time the Device will Check if the pump is actually rotating. The RPM is also logged for analysis. If the pump rotates, **OIL PUMP OK** and the Device will continue to the next test.

```
ALARM: 4
OIL PUMP
Not Rotating
Retry           Cont
```

Function

If the Oil pump is not rotating or the rotations are not logged by the Oil Sensor, an alarm is displayed.

Input

Retry: performs test again

Cont: Continue with tests and ignore alarm

Linked Alarm: 04

5.1.9. Checking Circulation pump

```
CHECK CIR PUMP ...
CIR PUMP OK
```

Function

The Device will switch the Circulation pump on for 10 seconds. During this time the Device will Check if the pump is actually rotating. The RPM is also logged for analysis. If the pump rotates, **CIR PUMP OK** and the Device will continue to the next test.

```
ALARM: 6
CIR PUMP
Not Rotating
Retry          Cont
```

Function
If the Circulation pump is not rotating or the rotations are not logged by the Circulation Sensor, an alarm is displayed.

Input
Retry: performs test again
Cont: Continue with tests and ignore alarm

Linked Alarm: 06

5.1.10. Checking Main valve

```
CHECK MAIN VALVE ...
MAIN VALVE OK
```

Function
The Device will toggle the main valve on & off, and will Check whether the valve has actually changed its position. If the valve has switched, a notification **MAIN VALVE OK** will be displayed.

```
ALARM: 7
no MAIN Valve
position detected
Retry          Cont
```

Function
If the Main valve is not moving up and down or the movements are not logged by the Main valve Sensor, an alarm is displayed.

Input
Retry: performs test again
Cont: Continue with tests and ignore alarm

Linked Alarm: 07

5.1.11. Checking Switch 01

```
CHECK H2O PRESSURE...
H2O DETECTION ON/OFF
```

Function
The Device will show how different configurations for Switch 01 are set.
If none of them is set this section will not be shown on the display. Typically, the H_2O-pressure sensor is connected here.

H_2O Pressure
If the hardware is installed, the Device can detect sufficient water pressure. This detection will disable any measurements or top-ups if no H_2O-pressure is detected.

```
Alarm: 51
No H2O Pressure
Detected
Retry          Cont
```

Function
If the H_2O-pressure sensor is installed and activated, but no pressure is detected, a notification will be displayed.

Input
Retry: performs test again
Cont: Continue with tests and ignore alarm

Linked Alarm: 51

```
CHECK TOP-UP HOLD
TOP-UP HOLD ON/OFF
```

Function
Top-up Hold
The Device can be connected on an external switch, e.g. level sensor, machine output…. If the connection is switched to active, the Device will delay top-up untill the switch is deactivated.

5.1.12. Checking Switch 02

```
CHECK AIR PRESSURE...
AIR DETECTION ON/OFF
```

Function
The Device will show how different configurations for Switch 02 are set.
If none of them is set this section will not be shown on the display. Typically, the Air-pressure sensor is connected here.

Air Pressure
If the hardware is installed, the Device can detect sufficient air pressure. This detection will disable any measurements or top-ups if no Air pressure is detected.

```
Alarm: 50
No AIR Pressure
Detected
Retry          Cont
```

Function
If the Air pressure sensor is installed and activated, but no pressure is detected, a notification will be displayed.

Input
Retry: performs test again
Cont: Continue with tests and ignore alarm

Linked Alarm: 50

5.1.13. Checking H_2O-valve

```
CHECK H2O VALVE...
H2O VALVE OK
```

Function
The Device will open the H_2O-valve for 5 seconds. During this time the Device will Check if any H_2O-counts are being registered by the flow sensor. The RPM of these counts is also logged for analysis. If counts are present, the notification **H2O VALVE OK** will be shown.

```
Alarm: 3
No H2O rotor
counts detected
Retry          Cont
```

Function
If no counts are registered or the water flow is too weak/not present, an alarm will be given.

Input
Retry: performs test again
Cont: Continue with tests and ignore alarm

Linked Alarm: 03

5.1.14. Checking Brix Sensor

```
CHECK BRIX SENSOR...
BRIX SENSOR OK
```

Function
The Device will establish communication with the Brix (Refractometer) Sensor. If this communication succeeds, the notification **BRIX SENSOR OK** will be shown.

```
Alarm: 8
Brix sensor error

Retry          Cont
```

Function
If no communication can be established with the Sensor, an alarm will be given.

Input
Retry: performs test again
Cont: Continue with tests and ignore alarm

Linked Alarm: 08

5.1.15. Checking Temperature Sensor

```
CHECK TEMP SENSOR...
TEMP SENSOR OK
```

Function
The Device will establish communication with the Brix (Temeprature) Sensor. If this communication succeeds, the notification **TEMP SENSOR OK** will be shown.

```
Alarm: 8
Brix sensor error

Retry          Cont
```

Function
If no communication can be established with the Sensor, an alarm will be given.

Input
Retry: performs test again
Cont: Continue with tests and ignore alarm

Linked Alarm: 08

5.1.16. Checking EC Sensor

```
CHECK EC SENSOR...
TEMP SENSOR OK
```

Function
The Device will establish communication with the EC (Electro-Conductivity - Hardness) Sensor. If this communication succeeds, the notification **EC SENSOR OK** will be shown.

5.1.17. Checking pH Sensor

```
CHECK pH SENSOR...
TEMP SENSOR OK
```

Function
The Device will establish communication with the pH (Acidity - Bacteriae level) Sensor. If this communication succeeds, the notification **PH SENSOR OK** will be shown.

5.2. Startup Wizard

Once the Device tests are successfully finished, the Startup Wizard will start when the Device is started for the first time.

5.2.1. Setting Time Zone

```
Startup Wizard 1
SET TIME ZONE
       GMT xx
 Next          Edit
```

Function
The Device runs with an internal clock, but if connection with internet is provided, the NTP time is loaded from a NTP server to automatically set the correct time. The time zone can be adjusted to reflect the correct location of installation.

Input
Next: Accept settings and proceed to the next step
Edit: Change the setting for this parameter

> **Important:**
> The correct tim e is required to log measurements, events and consumption values correctly.

```
>GMT +00
 GMT +01
 GMT +02
  +     Save     -
```

Function
Navigate through the menu to select the correct time zone.

Input
+/-: Navigate up/down through the menu
Save: Save information and proceed to the next step

```
Startup Wizard 2
Device will reboot
to set time
 OK              NO
```

Function

To apply the Time zone changes, it is required to reboot the Device. If not required, skipping the reboot is possible.

Input

Yes: Reboot the device

No: Proceed to next step

5.2.2. Setting Water Quality

```
Startup Wizard 3
Demineralized H2O
Yes deminirealized
 Next          Edit
```

Function

The Device can accept different kinds of water, like tap water, rain water or demineralized water. Dir maintenance purposes it's important to select the correct type.

Input

Next: Accept settings and proceed to the next step

Edit: Change the setting for this parameter

> **Note:**
> Using demineralized water has a positive effect on keeping the sensors clean and is advised.

```
>YES Demineralized
 NOT Demineralized
 Cancel
  +     Save     -
```

Function

Select the correct type. If Reverse Osmosis water or Demineralized water is used, select **YES**.

Input

+/-: Navigate up/down through the menu

Save: Save information and proceed to the next step

5.2.3. Setting re-use of emulsion and filtration

```
Startup Wizard 4
MWF reuse & Filtered
YES 100% Filtered
 Next          Edit
```

Function

The Device is developped to adjust the level and concentration, even when already used emulsion is flowing back to the tank. To calculate the maintenance intervals correctly, the amount of filtration and return needs to be selected.

Input

Next: Accept settings and proceed to the next step

Edit: Change the setting for this parameter

```
>YES 100% Filtered
 Yes 50% Filtered
 YES 0 % Filtered
 NO
  +     Save     -
```

Function
Select the correct layout for the installation:
YES 100% Filtered: The Emulsion is reused and all Emulsion will be filtered before it goes back to the Process.
The Device will measure reused Emulsion.

YES 50% Filtered: The Emulsion is reused and 50% of the Emulsion will be filtered before it goes back to the process.
The Device will measure reused Emulsion.

YES 0% Filtered: The Emulsion is reused and 0% of the Emulsion will be filtered before it goes back to the process.
The Device will measure reused Emulsion.

NO: The Emulsion is not reused.
The Device will not measure reused Emulsion.

Input
+/-: Navigate up/down through the menu
Save: Save information and proceed to the next step

5.2.4. Setting machined material

```
Startup Wizard 5
Material used
MIX
 Next          Edit
```

Function
The Device can work with all machined materials. To calculate the maintenance intervals correctly, the correct machined material needs to be selected.

Input
Next: Accept settings and proceed to the next step
Edit: Change the setting for this parameter

```
>MIX
 IRON
 ALUMINIUM
 STEEL
 PLASTICS
 COPPER
 OTHER
  +     Save     -
```

Function
Select the correct material for the installation:
MIX: a variation of all types of material
IRON: cast iron or ductile iron
ALUMINIUM: all types of aluminum
STEEL: all types of steel, and super alloys
PLASTICS: all types of plastics and composites
COPPER: all yellow materials
OTHER: not specified in list above

Input
+/-: Navigate up/down through the menu
Save: Save information and proceed to the next step

5.2.5. Setting climate control of Room

```
Startup Wizard 6
Room temp ctrl
YES 25°C
 Next          Edit
```

Function
The Device checks the termperature of the Emulsion. The correct environmental parameters for the temperature need to be set.

Input
Next: Accept settings and proceed to the next step
Edit: Change the setting for this parameter

```
Room temperature
controlled
YES/NO
Change   Set    Save
```

Function
Select the correct situation for the Process.

Input
Change: Toggle between **YES/NO**
Set: Set the setpoint temperature if activated
Save: Save information and proceed to the next step

```
Room setpoint
25°C

  +     Save     -
```

Function
Set the correct temperature as average setpoint.

Input
+/-: Increase/decrease the setpoint value
Save: Save information and proceed to the next step

```
Temp fluctuation
50%

  +     Save     -
```

Function
Set the allowed fluctuation on the setpoint (percentage of setpoint).

Input
+/-: Increase/decrease the setpoint value
Save: Save information and proceed to the next step

5.2.6. Setting climate control of Emulsion

```
Startup Wizard 7
MWF temp ctrl
YES 21°C
 Next          Edit
```

Function
The Device checks the termperature of the Emulsion. The correct environmental parameters for the temperature need to be set.

Input
Next: Accept settings and proceed to the next step
Edit: Change the setting for this parameter

```
MWF temperature
controlled
YES/NO
Change   Set    Save
```

Function
Select the correct situation for the Process.

Input
Change: Toggle between **YES/NO**
Set: Set the setpoint temperature if activated
Save: Save information and proceed to the next step

```
Chiller setpoint
21°C

  +     Save     -
```

Function
Set the correct temperature of setpoint of the Chiller unit.

Input
+/-: Increase/decrease the setpoint value
Save: Save information and proceed to the next step

```
Temp fluctuation
25%

  +     Save     -
```

Function
Set the allowed fluctuation on the setpoint (percentage of setpoint).

Input
+/-: Increase/decrease the setpoint value
Save: Save information and proceed to the next step

5.2.7. Learning H_2O values

```
Startup Wizard 8
Learning H2O
Values
 Yes           Next
```

Function
The Device will set the initial values of the water. This is required for performing correct Refractometer measurements and gives idea about the quality of the incoming water.
The Device will only learn the values of EC and PH if the technology is installed and activated, and only when “not demineralized water” is selected.

Input
Yes: Perform initialisation of values
Next: Accept settings and proceed to the next step

```
Initial H2O Values
Flushing
```

Function
The Device is flushed with fresh water to make sure that a correct measurement is performed.

```
Initial Brix H2O
Old:   0.1
New:   0.3
Retry          Save
```

Function

The Brix value of the water is measured. This is used for intialisating the Refractometer measurements.

Input

Retry: Perform measurement again

Save: Save information and proceed to the next step

```
Initial EC H2O
Old: 357
New: 259
Retry          Save
```

Function

The EC value of the water is measured. This indicates the hardness of the incoming water.

Input

Retry: Perform measurement again

Save: Save information and proceed to the next step

```
Initial pH H2O
Old: 7.2
New: 7.5
Retry          Save
```

Function

The pH value of the water is measured. This indicates the acidity of the incoming water.

Input

Retry: Perform measurement again

Save: Save information and proceed to the next step

```
Initial H2O values
Saving...
```

Function

The different intial values of the measurements are stored in the Device.

```
Storing Sensors
```

Function

Furhter calculations for the Sensors (if needed) are completed. The Device automatically goes to the next step.

5.2.8. Bleeding Oil line

```
Startup Wizard 9
Bleeding Oil line?

 Yes           Next
```

Function
This function makes it possible to bleed the oil line by starting the oil pump. The air is released from the oil line and ensure correct dosing. This is always necessary when installing a new Device.
The operator can stop the oil pump when he sees that the oil has reached the Device.

Input
Yes: Perform initialisation of values
Next: Accept settings and proceed to the next step

```
Startup Wizard 9
Bleeding Oil line
Oil pump active
Press to stop
```

Function
The Oil Pump will start and oil will be pumped into the oil tube. The Pump is self-priming, so no specific precautions need to be taken. When the oil reaches the device, allow rotation for 3 more seconds and stop the pump.

Input
Any key: Stop the Oil pump

5.2.9. Setting Brix index

```
Startup Wizard 10
Brix index
1.00
Edit     ---     Next
```

Function
To convert the Brix measurement into a concentration of oil, the Brix index needs to be instructed. This is specific for every tupe of oil and can be found in the datasheet of the oil.

Input
Edit: Change the setting for this parameter
Next: Accept settings and proceed to the next step

```
Brix index
Old:   1.00
New:   1.60
  +     Save     -
```

Function
Set the Brix (Refractometer) Index for the Oil (concentrate) that is used in the Process.

Value limits
Min: 0.1
Max: 3

Input
+/-: Increase/decrease the value
  pulsating keypress = 0.1
  single keypress = 0.01
Save: Save information and proceed to the next step

5.2.10. Selecting Oil capacity

For keeping how much oil is left in the nearby container of the Device, different methods are available.

Every Device has the possibility of calculating the remainder of oil. With this method, the amount of oil available is instructed to the Device when it is refilled. Based on consumption data, the Will-Fill keeps the available volume.
If an optional Oil Level Sensor is fitted, the Device will receive readings from the sensor to alert about the remaining amount of oil. In this case, the consumption of oil is still calculated. More Will-Fill's can draw oil from the same barrel.

5.2.10.1. Device will calculate consumed oil

```
Startup Wizard 11
Oil Capacity
30 Liters
 Edit          Next
```

Function
The available oil capacity can be set. This volume will be used in future for resetting the oil capacity. So it's best to start with a full container.

Input
Edit: Change the setting for this parameter
Next: Accept settings and proceed to the next step

```
Oil Capacity
Old: 200 L
Current: 45 L
Set   Cancel   Reset
```

Function
Set or Reset the available oil volume.

Input
Set: Set the setpoint temperature if activated
Cancel: Return to previous menu
Reset: Reset the value with formerly saved value

```
Oil Capacity
Old: 200 L
New: 150 L
  +     Save     -
```

Function
Set the available volume of oil.
This value will be used next time when pressing **Reset**.

Input
+/-: Increase/decrease the setpoint value
  pulsating keypress = 10 Liter
  single keypress = 1 Liter
Save: Save information and proceed to the next step

5.2.10.2. Device is connected to central oil feed

```
Startup Wizard 11
Oil Capacity
Central feed
 Edit          Next
```

Function
The oil is being fed by a central system. The Device will not send out any notifications about a low level of available oil.
No further configuration is to be done.

Input
Edit: Change the setting for this parameter
Next: Accept settings and proceed to the next step

5.2.10.3. Device will measure oil level

```
Startup Wizard 11
Oil Capacity set
by level sensor
        Set
```

Function
The available oil capacity will be measured by the external oil level sensor. To use this type, it is required to initialise the sensor to the right container volume.

Input
Set: Start calibration of the Oil Level Sensor

5.2.10.3.1. Execute Oil Level Sensor calibration

```
Oil sensor Cal
Please select
container size
---      Ok      ---
```

Step I
The Device has the most common containers predefined in the system. These can be selected from the list. Any deviating container can be defined as well.

Input
Ok: Make selection

```
>60L Barrel
 200L Barrel
 1000L IBC
 Other
Up     Select   Down
```

Step II
Select the correct container or choose **Other** to define a custom container.

Input
Select 60L / 200L / 1000L: Step VII
Select Other: Start customized container setup; Step III

```
Select Cilinder
or rectangular
Container shape
Cil     ---      Rec
```

Step III
Select whether the container has rectangular or cilindric shape.

Input
Cil: Cilindric shape; Step IV
Rec: Rectangular shape; Step III

```
Oil radius?
Old: 140 mm
New: 85 mm
+       Save       -
```

Step IV

Set the correct radius of the barrel.

Input

Pulsating keypress: 100 mm

Single keypress: 10 mm

Save: Confrim value; Step V

```
Container Height
Old: 300 mm
New: 320 mm
+       Save       -
```

Step V

Set the correct height of the barrel

Input

Pulsating keypress: 10 mm

Single keypress: 1 mm

Save: Confrim value; Step V

```
SELECT OIL VOLUME
Other 643 L

Next     ---    Edit
```

Step VI

The total volume of the barrel is calculated and shown on the screen.If correct, continue to next step. If incorrect, editing is possible.

Input

Next: confirm volume; Step VIII

Edit: Remake selection of barrel; Step II

```
SELECT OIL VOLUME
60L / 200 L / 1000 L

Next     ---    Edit
```

Step VII

The total volume of the barrel is shown on the screen. If correct, continue to next step. If incorrect, editing is possible.

Input

Next: confirm volume; Step VIII

Edit: Remake selection of barrel; Step II

```
Ok will set
0079 cm as level
value
---      Ok      ---
```

Step VIII

The Devices measures the actual distance to the level of the oil, and show the value on the screen.

Input

Ok: Confirm distance; Step IX

```
Volume Now?
Old: 185 L
New: 134 L
+       Save       -
```

Step IX

Set the current volume that is present in the barrel. The Device will calculate correlate the volume in the barrel with the measured distance of the sensor.

Input

Pulsating keypress: 10 Liter

Single keypress: 1 Liter

Save: Confrim value; Step IX

```
Oil Calibration
Calculating volume
```

Step X

The correlation between distance and volume is calculated. The Devices automaticlly return to **Calibrate Oil Level**.

5.2.11. Setting Percentage (Oil/H_2O)

```
Startup Wizard 12
Percentage OIL/H2O
xx.xx%
Edit     ---     Next
```

Function

The Device will maintain a stable concentration of oil in the tank. In this step the desired concentration is set.

Input

Edit: Change the setting for this parameter

Next: Accept settings and proceed to the next step

```
Percentage
Old:   5.00%
New:   4.60%
  +     Save     -
```

Function

Set the Brix (Refractometer) Index for the Oil (concentrate) that is used in the Process.

Value limits

Min: 1 %

Max: 25 %

Input

+/-: Increase/decrease the value

pulsating keypress = 0.5 %

single keypress = 0.1 %

Save: Save information and proceed to the next step

5.2.12. Setting Periodic Measurements

```
Startup Wizard 13
Periodic MSR timer
In 12 hours
Edit     ---     Next
```

Function

The Device will perform a full measurement cycle with a fixed interval. In this step the interval can be defined.

Input

Edit: Change the setting for this parameter

Next: Accept settings and proceed to the next step

```
MSR Periodic
Old:   12 hour(s)
New:   9 hour(s)
  +     Save     -
```

Function

Set the desired interval for the periodic measurements to be performed.

Value limits

Min: 3 hours

Max: 72 hours

Input

+/-: Increase/decrease the value

pulsating keypress = 3 hours

single keypress = 3 hours

Save: Save information and proceed to the next step

> **Tip:**
> If the oil/water ratio is too low, an ‘oil only filling’ will be automatically performed if the Emulsion level allow it and the oil capacity is in range.

5.2.13. Setting Initial Measurements

```
Startup Wizard 14
Initial MSR starts
In 6 hours
Edit     ---     Next
```

Function

The Device will perform a full measurement cycleat a fixed time after completing the installation. The result of this measurement will be used as a comparing point for future measurements and will be shown on the thicker screen. In this step the interval can be defined.

Input

Edit: Change the setting for this parameter

Next: Accept settings and proceed to the next step

```
MSR Initial
Old:   6 hour(s)
New:   9 hour(s)
  +     Save     -
```

Function

Set the desired interval for the initial measurements to be performed.

Value limits

Min: 3 hours

Max: 72 hours

Input

+/-: Increase/decrease the value

pulsating keypress = 3 hours

single keypress = 3 hours

Save: Save information and proceed to the next step

5.2.14. Dry or Wet Startup

```
(No) Coolant detected
Continuing to
wet startup ...
Ok       ---       No
```

Function

The Device will check to see which startup sequence is needed. If the Device can already detect coolant it will continue to a Wet start up; see Chapter 6 WET START-UP. if no coolant can be detected, it will continue to a dry start up; see Chapter 5 DRY STARTUP.

Input

Ok: Accept settings and proceed to the next step

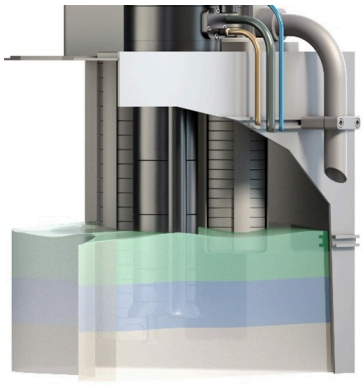
Note:

Dry or wet startup procedures are performed to determine the relationship between the distance measured by the level sensor and the volume of the tank.

Important:

It is important to STOP the Process at this time. This way any fluctuation, that might interfere with correct calibration of the level sensor, are excluded.

5.2.14.1. Dry Startup explained



Function

With a dry Startup, the Device cannot detect any coolant. This means that the level inside the tank is too low to be detected by the Device. To perform a volume calibration, the DEvice will first top up to a level the Device can detect. This is indicated by the **blue** volume in the graphic.

The volume that will be added during the calibration is made visible with the **green** volume in the graphic.

Important:
The green volume is at least 30 mm high. Make sure there is enough room in the tank to accommodate this volume.

Important:
Make sure the Machine of the Process in on stand-by.

5.2.14.1.1. Maximum Level

```
Dry Startup
Max Level
xx.x cm ?
 OK      ---     Edit
```

Function

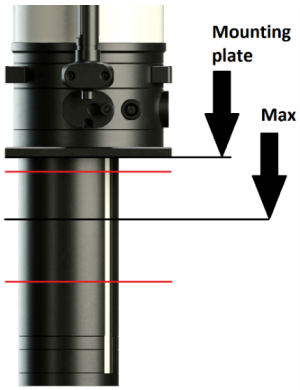
Set the Max Level before adding emulsion. This value represents the maximum level the Device will fill to during start up, as well as later in normal use.

The bigger the difference is between Max Level and Min Level on startup, the more accurate the Device will be in regard to its level values.

Input

OK: Accept setting and continue to next step; Step II

Edit: Change the setting for this parameter



The maximum value is measured in centimeters from the base plate down to the Emulsion level.

Tip:
To prevent flooding, it's best to keep this level at least at 10-20 % of the total height of the tank.

Tip:
If a level gauge is present on the tnak, set the maximum level in the middle of the normal operating range

```
Max Level
Old: xxx.x cm
New: xxx.x cm
  +     Save     -
```

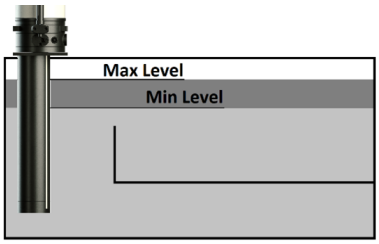
Input

+/-: Increase/Decrease the value Save: Save information and proceed to the next step

pulsating keypress = 0.5 cm

single keypress = 1 cm

Save: Save information and proceed to the next step



Attention:

If there is some type of reservoir or conveyor belt present in the Coolant tank that is only open on the top, it's important that the Min Level value rises above the top of this reservoir. The maximum value for Min Level is influenced by the value of Max Level. The only way to return from Min Level to Max Level is to cancel the startup and completely restart the wizard so it's advised to take this into account at this stage. Set the maximum level high enough, so there is space for setting a minimum level which is at least 3 centimeters lower.

5.2.14.1.2. Minimum Level

```
Dry Startup
Min Level
xx.x cm ?
 OK      ---     Edit
```

Function

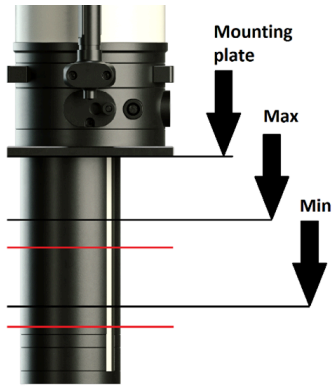
Set the Min Level for performing the Startup. In a first filling step, the Device will fill up the tank up to this level. Afterwards a second top-up is performed to fill to the maximum level and define the relation between the distance measured and the volume added.

So the bigger the difference between Max Level and Min Level on start up the more accurate the Device will be in regards to the Level values. This Min Level is also measured in centimeters from the mounting plate down to the coolant level.

Input

OK: Accept setting and continue to next step; Step II

Edit: Change the setting for this parameter



The minimum value is measured in centimeters from the base plate down to the Emulsion level.

Tip:

Make sure the value isn't larger than the measuring range of the Device.

```
Min Level
Old: xxx.x cm
New: xxx.x cm
  +     Save     -
```

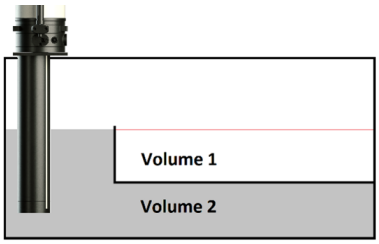
Input

+/-: Increase/Decrease the value

pulsating keypress = 0.5 cm

single keypress = 1 cm

Save: Save information and proceed to the next step



Attention:

If there is some type of reservoir or conveyor belt present in the Coolant tank that is only open on the top, it's important that the Min Level value rises above the top of this reservoir. The maximum value for Min Level is influenced by the value of Max Level. The only way to return from Min Level to Max Level is to cancel the startup and completely restart the wizard so it's advised to take this into account at this stage. Set the maximum level high enough, so there is space for setting a minimum level which is at least 3 centimeters lower.

5.2.14.1.3. Undetected Coolant Volume

```
Dry Startup
Undetected volume
0 L
Edit     ---     Next
```

Function

Set the Coolant volume that is already present in the system. During the first filling, the Device tracks how much water is added into the tank. By setting the volume already present, the total volume can be calculated by the Device.

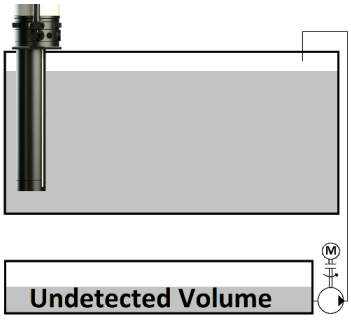
Input

Edit: Change the setting for this parameter

Next: Accept setting and continue to next step

Tip:

This value shouldn't be 0. Filling a tank from scratch with Device is not advised, as it might take long to fill up the required oil.



The volume to enter into the Device is either the Coolant inside the tank, but not yet detected by the Device, and/or the Coolant in a seperate tank that can never be measured by the Device.

Attention:
Some deviation here will not prevent the Device from reaching its set value later on. The Will-Fill is programed to adjust itself, depending on previous results in order to reach the desired percentage. So some minor deviation here will result in the Device taking a bit longer to reach its desired percentage because it's using wrong level values for its calculations. This would also make it harder to correctly tune the Device to its application (Max Volume, Coolant drop, ...).

```
Undetected Coolant?
Old:  Litres
New:  150 Liters
  +     Save     -
```

Input
+/-: Increase/Decrease the value
pulsating keypress = 50 Liter
single keypress = 5 Liter
Save: Save information and proceed to the next step

5.2.14.1.4. Start top-up with coolant

```
Dry Startup
Will fill with
Coolant xx,x%
Start    ---    Cancel
```

Function
A dry start up takes place with 2 filling cycles, one up to Min Level and a second one up to Max Level. The values that have been reached at the end of these cycles will be used to calibrate the Device to the container that it has been installed into.
In this step the top-up can be started or canceled. Cancelling means the entire Start-up wizard needs to be done again.

Input
Start: Start filling the Tank
Cancel: Cancel the filling, and Startup wizard

5.2.14.1.5. Filling to Min Level

```
Filling to xx %
Level: xx %
H2O: xxx.X L
Oil: xxx.x L F: xx.x
```

Function

The Device will fill the Coolant Tank to the minimum level value. When this value is reached it will continue to confirmation of a steady level.

Filling to refers to the actual percentage until which the tank will be filled. This percentage is based on the total measuring range of the Device.
Level is the actual level at this moment.
H2O indicates the amount of water that has already been added.
OIL shows the amount of oil that is already added, while the **F**-value keeps track of the amount of oil that still needs to be added, because of the water that has already been added.
When the level is equal or higher to the target, the filling will stop.
All percentages indicated on this screen, refer to the percentage of the substructure is submerged.

Note:
It's important that during the filling procedure at Startup, the Process is not running. Fluctuations in the tank can disturb the calibration of the level sensor, which can lead to less accurate operation of the Device.

5.2.14.1.6. Level steady

```
Startup Wizard
Level steady?
xx% = xx%
Yes     Show      No
```

Function

After the filling itself, the level of the tanks needs to be verified, whether it is steady. If there are compartiments (with filters in between) in the tank, it might take some time before the level gets steady.

Input

Yes: Accept level and continue to next step
Show: Go to **Show level** screen to verify
No: The filling cycle restarts to attain correct level

```
Level: xxx.x L
+: xxxx.x L : xx%
-: xxxx.x L : xx%
Reset   Time    Exit
```

Function

To monitor the fluctuation of the level this screen will show the minimum and maximum level value registered by the Device.
This should remain stable.

> **Tip:**
> If the level isn't stable, go back to previous step and restart the filling cycle.

Input

Reset: Min-, Max- values and Timer will be reset
Time: Level value at the top of the screen will be replaced by time and the Time button will be replaced by Level
Exit: Return to previous step

```
Time: xxx Min
+: xxxx.x L : xx%
-: xxxx.x L : xx%
Reset   Level    Exit
```

Function

Showing the time doesn't only allow to track the fluctuation, but also how long it takes before if becomes stable. The time is registered in the background, even when the level is showing on the screen.

> **Tip:**
> The time that has passed, will help to determine the filling time in a later step.

Input

Reset: Min-, Max- values and Timer will be reset.
Time: Time value at the top of the screen will be replaced by Level and the Level button will be replaced by Time
Exit: Return to previous step

5.2.14.1.7. Filling to Max Level

```
Filling to xx %
Level: xx %
H2O: xxx.X L
Oil: xxx.x L F: xx.x
```

Function

The Device will fill the Coolant Tank to the maximum level value. When this value is reached it will continue to confirmation of a steady level.

Filling to refers to the actual percentage until which the tank will be filled. This percentage is based on the total measuring range of the Device.
Level is the actual level at this moment.
H2O indicates the amount of water that has already been added.
OIL shows the amount of oil that is already added, while the **F**-value keeps track of the amount of oil that still needs to be added, because of the water that has already been added.
When the level is equal or higher to the target, the filling will stop.
All percentages indicated on this screen, refer to the percentage of the substructure is submerged.

Note:
It's important that during the filling procedure at Startup, the Process is not running. Fluctuations in the tank can disturb the calibration of the level sensor, which can lead to less accurate operation of the Device.

5.2.14.1.8. Level steady

```
Startup Wizard
Level steady?
xx% = xx%
Yes     Show      No
```

Function

After the filling itself, the level of the tanks needs to be verified, whether it is steady. If there are compartiments (with filters in between) in the tank, it might take some time before the level gets steady.

Input

Yes: Accept level and continue to next step
Show: Go to **Show level** screen to verify
No: The filling cycle restarts to attain correct level

```
Level: xxx.x L
+: xxxx.x L : xx%
-: xxxx.x L : xx%
Reset   Time    Exit
```

Function

To monitor the fluctuation of the level this screen will show the minimum and maximum level value registered by the Device.
This should remain stable.

> **Tip:**
> If the level isn't stable, go back to previous step and restart the filling cycle.

Input

Reset: Min-, Max- values and Timer will be reset
Time: Level value at the top of the screen will be replaced by time and the Time button will be replaced by Level
Exit: Return to previous step

```
Time: xxx Min
+: xxxx.x L : xx%
-: xxxx.x L : xx%
Reset   Level    Exit
```

Function

Showing the time doesn't only allow to track the fluctuation, but also how long it takes before if becomes stable. The time is registered in the background, even when the level is showing on the screen.

> **Tip:**
> The time that has passed, will help to determine the filling time in a later step.

Input

Reset: Min-, Max- values and Timer will be reset.
Time: Time value at the top of the screen will be replaced by Level and the Level button will be replaced by Time
Exit: Return to previous step

5.2.14.1.9. Filling cycle(s) completed

```
Generating
Backup...
```

Function

When the fillings cycles have ended and level is steady, the calibration of level is completed. The Device will save the newly calibration values in the backup memory.
The Device automatically goes to the next step.

5.2.14.2. Wet Startup explained

Function

With a wet Startup, the Device can detect coolant. This means that the level inside the tank is high enough to be detected by the Device. To perform a volume calibration, the Device offers 2 different procedures.
The Fill-Procedure will immediately add the calibration volume. This is made visible with the **green** volume in the graphic. By increasing the level with a fixed distance and counting how much water and oil are inserted, the Device works out the relation between the level and the volume.

Important:
The green volume is at least 30 mm high. Make sure there is enough room in the tank to accommodate this volume.

Important:
Make sure the Machine of the Process in on stand-by.

The Calculated-Procedure requests for the dimensions of the tank as well as the current level. Due to all dimensions, the volume is calculated by the Device.
This is the quickest way to perform the calibration and is very suited for rectangular- or circular-shaped tanks (viewed from top).

```
Wet startup
A: Calculate
B: Learn (fill)
A     Cancel     B
```

Function

Make a selection between the 2 procedures that can be used to perform the wet startup.

Input

A: Select Calculated startup and start the procedure
Cancel: Stop the Startup Wizard
B: Select Filled startup and start the procedure,

5.2.14.2.1. Calculated Procedure

During this procedure, the dimensions of the tank and current level are inserted into the Device. It will calculate the current volume and relation between the distance measured of the level and the volume in the tank

```
Calculated Start up
Will start

Back     ---     Next
```

Function

Confirmation that the Calculated procedure is chosen.

Input

Back: Return back to selection of procedure
Next: Accept and continue to next step.

```
Calculated Start up
What is the
surface area?
---     Select   ---
```

Step I

At first, the surface area of the tank (top view) will be determined.

Input

Select: Proceed to selection list; Step II

```
>Enter size
 Calc rectangle
 Calc circle
 Cancel
Up     Select   Down
```

Step II

In this step the correct way of defining the surface is selected. Either the surface is known, and it can entered; Step III. If not, the Device will accept step by step all dimensions and calculated the surface itself, based on the selection of the tank being rectangular (Step IV) or circular (Step VI).

Input

Up: Navigate to higher line in the list

Select: Confirm selection and proceed to the next step

Down: Navigate to lower line in the list

```
Surface area?
Old: 0.00 sq m
New: 0.78 sq m
 +      Save      -
```

Step III

Insert the area of the surface of the coolant tank, viewn from above.

Input

+/-: Increase/decrease the value

Save: Confirm value and proceed to the next step; Step VII

```
Rectangle Length?
Old: 0.00 m
New: 0.6 m
 +      Save      -
```

Step IV

Insert the length of the long side of the coolant tank, viewn from above.

Input

+/-: Increase/decrease the value

Save: Confirm value and proceed to the next step; Step V

```
Rectangle width?
Old: 0.00 m
New: 1.3 m
 +      Save      -
```

Step V

Insert the length of the short side of the coolant tank, viewn from above.

Input

+/-: Increase/decrease the value

Save: Confirm value and proceed to the next step; Step VII

```
Circle radius?
Old: 0.00 m
New: 0.25 m
 +      Save      -
```

Step VI

Insert the radius of the coolant tank, viewn from above.

Input

+/-: Increase/decrease the value

Save: Confirm value and proceed to the next step; Step VII

```
Calculated Start up
Surface area:
0.78 sq m
Edit      ---     Ok
```

Step VII

Confirm the calculated or inserted surface area.

Input

Edit: Edit the surface area; Step II

Ok: Confirm value and proceed to the next step; Step VIII

```
Calculated Start up
Current fluid
height?
---     Enter    ---
```

Step VIII

In this step the actual height of the coolant is inserted. This value is measured from the bottom of the tank, and is used to calculate the current volume of coolant in the tank.

Input

Enter: Proceed to the next step; Step IX

```
Actual depth?
Old: 0.00 m
New: 0.45 m
 +      Save      -
```

Step IX

Insert the level of the coolant, measured from the **bottom** of the tank.

Input

+/-: Increase/decrease the value

Save: Confirm value and proceed to the next step; Step X

```
Calculated Start up
Current volume
35,1 Liters
Edit      ---     Ok
```

Step X

Confirm the calculated volume in the tank.

Input

Edit: Edit the dimensions of the tank; Step II

Ok: Confirm value and proceed to the next step; Step XI

```
Calculated Start up
Checking level...

---     ---     ---
```

Step XI

The Device checks the current level, saves the calibration and calculates the minimal and maximal volume that can be measured by the Device.

The Device will autoamtically go to Step XII

```
Calculated Start up
Max: 105.6 L
Min:  28.1 L
Cancel   Save   Edit
```

Step XII

Confirm the calculated volume in the tank.

Input

Cancel: Edit the dimensions of the tank; Step II

Save: Confirm value and proceed to the next step; Step XV

Edit: Edit the volume of coolant in Tank; Step XIII

```
Calculated Start up
A: Undetected Volum
B: Restart
A     Cancel     B
```

Step XIII

Make a selection between adding an undetected volume, ie. a volume that holds coolant, but cannot be detected by the Device, or restart inserting the dimensions.

Input

A: Set the undetected volume for this tank; Step XIV

Cancel: Stop the Startup Wizard

B: Restart the procedure; Step II

```
Undetected Coolant
Old: 000 Liter
New: 050 Liter
 +      Save      -
```

Step XIV

Insert the volume of undetected Coolant.

Input

+/-: Increase/decrease the value

Save: Confirm value and proceed to the next step; Step X

```
Calculated Start up
Max: 155.6 L
Min:  78.1 L
Cancel   Save   Edit
```

Step XV

Confirm the calculated volume in the tank.

Input

Cancel: Edit the dimensions of the tank; Step II

Save: Confirm value and proceed to the next step; Step XVI

Edit: Edit the volume of coolant in Tank; Step XIII

```
Checking level...
```

Step XVI

After confirming the volume, the level inside the tank is checked.

The Device automatically continues to Step XVII

```
Level: 85.1 L
+: 86.2 L : 23 %
-: 85.0 L : 22 %
Reset   Time    Exit
```

Step XVII

The Device will continuously measure the level in the Tank and show the volume on the screen. On line 2 & 3, the maximum and minimum values are kept.

Input

Reset: Reset the maximum and minimum values and continue measureing

Time: Show the duration of measuring

Exit: Confirm and exit the Wet startup procedure.

5.2.14.2.2. Filled Procedure

```
Checking Level
Device will beep
when level is
in range
```

Function

The Device will check the level of the Coolant and will beep when the level is in a range where the Device can perform a wet start up.
The Devices automatically continues to the next step.

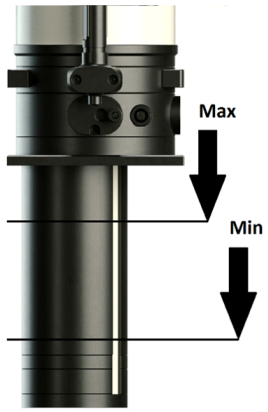
```
Wet Startup
Min: xx cm Max: xx cm
Level: xx.x cm
Fill to xx cm
```

Step I

While the Device is Checking the level some values are being displayed.
Min is the minimum level at which a wet start up can be done.
Max is the maximum level to which a wet start up can be done.
Level shows the current level.
Fill to is the level to which the Device will be filled if the wet start up is started at the current level.

Input

Any key: proceed to the next step; Step II



All these values are measured in centimeters from the base plate down to the Emulsion level.
The values are generated based on the length of the substructure of the Device and cannot be changed by the user.
+/-: Increase/Decrease the value
Save: Save information and proceed to the next step

```
Wet Startup
Min: xx cm Max: xx cm
Level: xx.x cm
Level too low!
```

Error I

If the level in the Tank can be measured, but is below the minimum value, fresh coolant should be added to the tank. Whenever the Device detects a level that is in range, it will start beeping.
If the level is too high, a similar error is shown, and Coolant should be removed from the tank until it is in an acceptable range.

```
Wet Startup
Enter detected
Coolant Volume
        Ok
```

Step II

The actual volume needs to be inserted in the Device. By doing this, the Device knows with which volume the actual level corresponds.

Input

Ok: proceed to entering the current colume; Step III

```
Volume Now ?
Old: 100 L
New: 250 L
+       Save       -
```

Step III

Insert the correct volume.

Note that the accuracy of these values will determine the accuracy of the level measurements of the Device.

Input

+/-: Increase/Decrease the value

pulsating keypress = 50 Liter

single keypress =5 Liter

Save: Save information and proceed to the next step; Step IV

Attention:

Some deviation here will not prevent the Device from reaching its set value later on. The Will-Fill is programed to adjust itself, depending on previous results in order to reach the desired percentage. So some minor deviation here will result in the Device taking a bit longer to reach its desired percentage because it's using wrong level values for its calculations. This would also make it harder to correctly tune the Device to its application (Max Volume, Coolant drop, …).

```
Wet Startup
Detected Coolant
Volume: 250 L
Edit            Next
```

Step IV

Shows the entered value for the volume of Coolant that is present in the Tank.

Input

Edit: Change the value; Step III

Next: Proceed to the next step; Step V

```
Wet Startup
Max Level
xx.x cm ?
 OK      ---     Edit
```

Step V

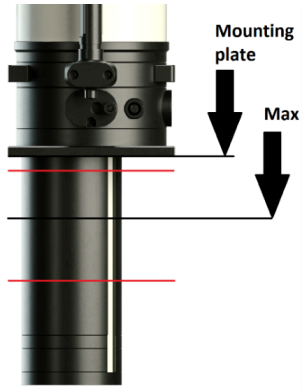
Set the Max Level before adding emulsion. This value represents the maximum level the Device will fill to during start up, as well as later in normal use.

The bigger the difference is between Max Level and Min Level on startup, the more accurate the Device will be in regard to its level values.

Input

OK: Accept setting and continue to next step; Step VI

Edit: Change the setting for this parameter



The maximum value is measured in centimeters from the base plate down to the Emulsion level.

> **Tip:**
> To prevent flooding, it's best to keep this level at least at 10-20 % of the total height of the tank.

> **Tip:**
> If a level gauge is present on the tnak, set the maximum level in the middle of the normal operating range

```
Max Level
Old: xxx.x cm
New: xxx.x cm
  +     Save     -
```

Step VI

Change the maximum level to the desired value, while keeping sufficient safety clearance betweene maximum level and top of the tank.

Input

+/-: Increase/Decrease the value Save: Save information and proceed to the next step

pulsating keypress = 0.5 cm

single keypress = 1 cm

Save: Save information and proceed to the next step

```
Wet Startup
Will fill with
Coolant xx,x%
Start    ---    Cancel
```

Step VII

In this step the top-up can be started or canceled. Cancelling means the entire Start-up wizard needs to be done again.

Input

Start: Start filling the Tank; Step VIII

Cancel: Cancel the filling, and Startup wizard

```
Filling to xx %
Level: xx %
H2O: xxx.X L
Oil: xxx.x L F: xx.x
```

Step VIII

The Device will fill the Coolant Tank to the maximum level value. When this value is reached it will continue to confirmation of a steady level.

Filling to refers to the actual percentage until which the tank will be filled. This percentage is based on the total measuring range of the Device.
Level is the actual level at this moment.
H2O indicates the amount of water that has already been added.
OIL shows the amount of oil that is already added, while the **F**-value keeps track of the amount of oil that still needs to be added, because of the water that has already been added.
When the level is equal or higher to the target, the filling will stop.
All percentages indicated on this screen, refer to the percentage of the substructure is submerged.

Note:
It's important that during the filling procedure at Startup, the Process is not running. Fluctuations in the tank can disturb the calibration of the level sensor, which can lead to less accurate operation of the Device.

```
Generating
Backup...
```

Step IX

When the filling cycles has ended and level is steady, the calibration of level is completed. The Device will save the newly calibration values in the backup memory. The Device automatically goes to the next step.

5.2.15. Setting Coolant drop

```
Startup Wizard 18
Coolant drop
needs to be set
        Ok
```

Function

The coolant drop is the amount of drop in coolant level that naturally occurs when the Process is running. It's the difference between the maximum level (all pumps off) and minimum level (all pumps on).
When a level below the minimum level is measured in Stand-by, the Device needs to react by starting the filling timer. If the Level doesn't rise above minimum value before the timer is over, the Device will start a refill.
The best way to set this up is to determine the Process volume of the coolant and add at least 15% to this volume. By doing this the Device will not become hyperactive whenever a small amount of coolant is missing.

Input

Ok: Proceed to the next step; Step I

```
Level: xxx.x L
+: xxxx.x L : xx%
-: xxxx.x L : xx%
Reset   Time    Exit
```

Step I

In order to determine the process volume you are forwarded to the Show Level function.

1. Make sure all pumps are switched off.
2. Reset the values of Show level.
3. Switch on all the pumps until the value remains stable.
4. Switch off all the pumps (and wait for coolant to return).
5. Compare the max value + with the min value – to determine the process volume.
6. It's also advised to Check the amount of time that has passed and set this as a filling timer.

Input

Reset: Min-, Max- values and Timer will be reset

Time: Level value at the top of the screen will be replaced by time and the Time button will be replaced by Level

Exit: Proceed to next step; Step II

```
Coolant drop ?
Old: 50 L
New: 130 L
+       Save       -
```

Step II

Change to value to the difference in volume between maximum and minimum level that was measured in the previous step.

Input

+/-: Increase/Decrease the value

pulsating keypress = 10 Liter

single keypress = 1 Liter

Save: Save information and proceed to the next step

5.2.16. Startup wizard completed

```
Startup Wizard
has successfully
been completed
---      Ok      ---
```

Function

Start up wizard has successfully been completed.

The Device will check to see if it still needs to add oil or whether it can start with circulation before performing a first measurement.

5.2.17. Skipping Oil

```
Will add
more oil

Ok      ---     Skip
```

Function
Depending on the set percentage, it is very likely that the Device has not added enough oil during the adding of the water. During every filling cycle, the Device remembers how much oil to add extra after the filling of water and oil together. In this step, the Device will add sufficient oil.
If desired, it is possible to skip this adding of oil. Once the oil adding has started, it is not possible to interrupt this.

Input
Ok: Proceed with adding the remainder of oil
Skip: Skip the adding and move on to measurement and Stand-by mode.

```
Finishing Oil
Will add 15.3 Liter
Main Valve Open
Pump counts xxxx
```

Function
The Device will first check the main valve and circulation pump are working correctly before starting to add oil. Then the adding itself will start.

This function is practically the same as “Refill now Oil only”.
After the oil has been added the Device will continue to Circulation before measurement.

```
Adding Oil
1.0L of 15.3 L

Press to pause
```

Function
Oil will be added to the Tank. During this, coolant is circulating in the Device, and the oil is injected into the existing Coolant. Inside the Device, this is first mixed before being released into the Tank.

This function is practically the same as “Refill now Oil only”.
After the oil has been added the Device will continue to Circulation before measurement, and finally Stand-by mode.

5.2.18. Circulating before measurement

```
Circulation xx %
Startup was
successfull
Circulation to MSR
```

Function
The Device is circulating the coolant before the first measurement takes place.
If any button is pressed you can access the menu and Check certain settings. The timer for this circulation will restart whenever you return from the menu.

The first measurement is similar to starting a manual **MSR now**. This is explained in the next chapter.

5.3. MSR Now

This function allows to start a measurement cycle.

When the **MSR Now**-function is selected, the Device will execute a full measuring cycle. All the available properties of the Coolant will be measured. A measuring cycle can take up to 7-8 minutes. Once the measuring cycle has started, it cannot be interrupted anymore. A cleaning cycle is included and the measurement results will be displayed afterwards.

The different steps of a measuring cycle are explained in this chapter, including the pre-tests and cleaning cycle. The information shown on the screen during this cycle is always built up using the same structure or format:

- The first line on the screen consists of 3 pieces of information:
  - **MSR**: type of procedure that is running, in this case Measurement.
  - **5**: type of measurement that is taking place, in this case type 5.
  - **(2)**: step of the specific measurement sequence. The MSR sequence consists of 18 steps.

  Each measurement type is triggered by a different action. The measurement type refers to the action that triggered the measurement to take place:

  - (0) triggered by the program (level too low)
  - (1) user pressed MSR in the MSR menu
  - (2) periodic timer has initiated periodic measurement
  - (3) after dry start-up the amount of oil needs to be adjusted
  - (4) is initial measurement
  - (5) measurement after starting device
  - (6) after installation oil needs to be added
  - (7) after filling a control measurement is performed
  - (8) triggered by Will-Fill HQ via Cloud or ftp command
- Lines 2, 3 & 4 are the status lines of the procedure and show which step is (being) executed. The step on the fourth line is the current step. At the end of each line, the status of each step is reflected between brackets.
  - (0) means that the test is running
  - (1) means that the test is OK
  - (2) means that the test is skipped or has failed

5.3.1. Measuring cycle

A measuring cycle of the Will-Fill has a specific sequence. First the functioning of the components of the device is verified, next the measurement is performed and finally the internal channels and measuring chambers of the Device are cleaned.

5.3.2. Media checks

Prior to the measurement, the Device will verify whether all media, required for good operation, are present to the device. To perform a measurement it's necessary that oil, water and air are present.

```
MSR: 5 (2)
 -Oil Pressure (2)
 -H20 Pressure (0)
 -Air Pressure (0)
```

The minimum pressure for the air is 5 bar, while for the water it is set at 1,5 bar.

Restriction:
The oil pressure is only checked if the optional sensor is installed.

5.3.3. Oil level check

The Oil level of the external barrel is checked.

```
MSR: 5 (3)
 -Oil Level (0)
```

The Device will check the level of oil in the external barrel either based on the calculated value (default), or on the reading of the level via the oil level sensor (option). If the oil is provided by a central supply system (option), this test will be skipped.

5.3.4. Coolant level check

The Device will perform level measurements of the Coolant.

```
MSR: 5 (4)
 -MWF Level (0)
```

Before the MWF level measurements starts, the level sensor will be rebooted.

During the reboot of the level sensor, the screen on the left is shown.

```
Alarm 17
MWF too high
Level: 87 %
Error value: 86 %
```

The results and interpretation of the volume of this measurement are considered at the end of the measuring cycle during the analysis.

If the level is too high, as a safety against overfilling, the notification on the left is given at this moment and the measurement is aborted. This is foreseen because, during the measurement and cleaning cycles, extra water is added to the tank. If the measurement cycle would continue, it might flood the tank.

5.3.5. Flushing device

The Device will flush itself with Coolant to ensure that all sensors will receive fresh Coolant.

```
MSR: 5 (6)
 -Flush (0)
```

During the flushing, the Device will open and close the main valve while the circulation pump is rotating. A steady stream of Coolant will flow from the coolant outlet of the Device.

```
Measure error
Main valve Closed
Pump counts xxxx
Retry        Standby
```

If the main valve isn't functioning, this error message will be generated.

```
Measure error
Circultation pump
not rotating
Retry        Standby
```

If the circulation pump doesn't rotate, this error message will be generated.

5.3.6. Taking sample

The Device will take a sample of Coolant and direct it towards the measuring chambers of the different sensors.

```
MSR: 5 (7)
 -Sample (0)
```

The Device will send Coolant to the sensors by shutting the main valve while the circulation pump is rotating. This pushes the Coolant to the sensors. When the samples are in front of the different sensors, the measurement can start.

5.3.7. Brix Measurement

The Device will measure the concentration of Oil inside the Coolant. This is done by an in-line refractometer, often referred to as the Brix sensor. The Brix value is used to determine the percentage of oil in the Coolant. To calculate the percentage, it's required to first subtract the Brix value of the used water and next multiply the resulting value with the refractometer index. This refractometer index value is available in the datasheet of the coolant oil (concentrate).

```
MSR: 5 (8)
 -MWF BRIX (0)
```

Brix measurements are being performed. To achieve a reliable result, an average of a couple of measurements is being used. These measurements will only be used for further analysis, if the deviation between the measurements isn't too great. This maximum deviation can be setup in the menu (**MSR menu > MSR Settings > Brix > MSR Deviation**).

```
MSR: 5 (9) BRIX
Measurement ...
Brix: 7.9
Percent: 7.71
```

The result of the MSR is given both as Brix value and as percentage.

The measurement must be above the acceptable percentage, otherwise it will not be used for a refill of the Coolant tank. This acceptable percentage can be setup in the menu (**MSR menu > MSR Settings > Brix > Acceptable %**).

If an error occurs during the measurements, no error is given at this point. At the review after the cycle, this is indicated. When there is no Brix or Percent value shown on screen, it means that the measurement has not succeeded. The Device will automatically proceed to the next step.

```
MSR: 5 (10)
 -MWF TEMP (1)
```

The temperature of the MWF will also be measured in this step.

5.3.8. EC Measurement

The Device will measure the electro-conductivity of the Coolant.

```
MSR: 5 (11) EC
Measurement ...
EC: 1523.19 uS
```

EC measurements are being performed. To achieve a reliable result an average of a couple of measurements is being used. These measurements will only be used, if the deviation between the measurements isn't too great. This maximum deviation can be setup in the menu (**Main menu > MSR menu > MSR Settings > EC > MSR Deviation**).

5.3.9. pH Measurement

The Device will measure the pH value of the Coolant.

```
MSR: 5 (11) PH
Measurement ...
PH: 8.2
```

pH measurements are being performed. To achieve a reliable result an average of a couple of measurements is being used. These measurements will only be used, if the deviation between the measurements isn't too great. This maximum deviation can be setup in the menu (**Main menu > MSR menu > MSR Settings > PH > MSR Deviation**).

5.3.10. Brix rinsing

The Device will clean the internal channels and the measuring chambers of the different sensors.

```
MSR: 5 (12)
 -Clean H2O (2)
```

The Device will clean the internal channels and sensors with fresh water. All sensors are being cleaned, so that there is no contamination when another procedure is executed.

5.3.11. H_2O measurements

The Device will perform the H_2O measurements of the fed water. These values will be used by the Device for showing on the screen as a comparison with the actual measured value. This is the last step of the measuring cycle.

```
MSR: 5 (13)
 -H2O BRIX (0)
```

The H_2O measurements are performed. The Brix measurement is done to have a reinitialization value of the Brix sensor. These measurements include the Brix, Temperature, EC and PH value of the incoming water.

```
MSR: 5 (14)
 -H2O TEMP (0)
```

```
MSR: 5 (15)
 -H2O EC (0)
```

```
MSR: 5 (16)
 -H2O PH (0)
```

```
MSR: 5 (17)
 -Cleaning
```

After the H_2O measurements, the channels and measuring chambers are cleaned.

5.3.12. Cleaning cycle

The Device will perform a thourough cleaning cycle. By executing this cleaning cycle and verifying the results afterwards, the manual cleaning frequency can be reduced.

```
Cleaning: (3) Brix
Rinse valve ON/OFF
```

The Device will clean itself by circulating fresh water through the channels and measuring chambers, as well as drying with compressed air afterwards.

```
Cleaning: (3) Brix
Rinse valve ON/OFF
Percent: 0.03
```

To verify the presence of water (and correct cleaning), the Brix value of the rinsing water is measured and shown on the screen.

```
Cleaning: (3) Air
Rinse valve ON/OFF
Percent: 0.00
```

The sensors inside the device are being dried with compressed air. To verify correct drying, the Brix value is measured and shown on the screen. This value should be 0.00.

5.3.13. MSR error analysis and Overview

The Device will analyse all measurements and check for errors. By giving a full overview of all the measurements, the statuses of each step and results can be reviewed. Any notifications or alarms related to the measurement, will be raised in the Device and communicated by e-mail (if an internet connection is available).

```
MSR: 5 (18)
 -Analyzing errors
```

While the Device is performing the analysis and interpreting the results, this message is given on the screen.

```
>OIL Pressure    2-0
 H2O Pressure    1-1
 AIR Pressure    1-1
 OIL Level       1-0
 MWF Level       1-1
 Check           1-1
 Flush           1-1
 Sample          1-1
 MWF Brix        1-1
 MWF Temp        1-1
 MWF EC          1-1
 MWF PH          1-1
 H2O Clean       2-0
 H2O Brix        2-0
 H20 Temp        2-0
 H20 EC          2-0
 H2O PH          2-0
 Clean           1-1
 Back
Up     View     Down
```

The Device will give a complete overview of all actions it has taken during the measurement cycle and report on the amount of iterations required for each action. This can be viewed on the screen.

The numbers at the end of each line indicate whether the action was executed or skipped (first number) and how many attempts it took to execute the action (second number).

The result of a step in the measurement cycle is given by:

- 0: step not available by program
- 1: step executed and OK
- 2: step skipped
- 3: Step resulted in error

It's possible to select a specific step of the measurement cycle and press **View** to get more info on that particular step. In the case of a measurement, the Device will show the actual measured value that is stored.

This overview screen is also available in Alarm info (**Main menu > Alarm info**), but only when there are no alarms active.

The Device will automatically exit this screen after the timeout and proceed to Standby mode. At this point eventual alarms that were activated during the procedure, will come up on the screen.

5.4. Stand-by

```
Standby      ALARM 2
Percentage: 4.9
Goal: 5
OIL     Menu     ALM
```

Function

When the Device enters Stand-by mode it will first Check for alarms. If any are active, they'll be showed on the screen first, as they should be handled.
Next, the last measurement results will be loaded into the memory and these will roll over the screen. At first, the concentration is shown and can be compared with the set concentration.
It is possible that in the Stand-by screen, an **ALARM X** is shown in the top right corner. This means a critical alarm is active in the background.

Input

OIL: Access the menu to check and /or reset the amount of oil in the barrel next to the Device
Menu: Access the Main menu of the Device, this spassword protected
ALM: Access the alarm menu that shows any active alarms

> **Tip:**
> The mentioned menus above are available in this manual in the corresponding chapters.

```
Standby
Current ec: 1245  mS
Initial ec: 957 mS
OIL     Menu     ALM
```

Function

Secondly, the measured EC-value is shown and can be compared with the initial EC-value.

```
Standby
Current ph: 9.2
Initial ph: 8.7
OIL     Menu     ALM
```

Function

Thirdly, the pH-value is shown and can be compared with the initial pH-value.

```
Standby
Volume now: 237 L
Max Volume: 250 L
OIL     Menu     ALM
```

Function

Thirdly, the current Coolant level is shown and can be compared with the maximum Coolant level.

```
Standby
Oil capacity: 17.5 L
MSR 15:45 2023-05-27
OIL     Menu     ALM
```

Function

Finally, the current Oil level is shown. Below the moment on which the last measurement was made is shown.

```
Alarm: x
Description
Description continued
Clear   Reset    Cont
```

Function

If an alarm or notification becomes active, it will be shown on the screen. If accessed via the alarm menu, it has the same appearance.
On the first line, the number of the alarm is given. Each alarm/notification has a seperate number and is linked with a specific manual to solve the issue.
The second and third line describe what the problem is.
The fourth line depends on the nature of the notification and allows to take action on the device typically.

Input

Clear: Clear alarm and continue
Reset: Reset a value
Cont: Keep alarm in background and continue

6. Device operation

This chapter the entire Main menu of the Device is explained in detail. Each menu and function is explained thouroughly so the end-)user has a good understanding of how to set certain parameters or conduct various tests/calibrations.

6.1. Main menu

This menu allows to navigate to the different sub-menu's to update parameters of the Device. Only persons with understanding of the Device are allowed to make changes in the Main menu. To this end, the access to the **Main menu** can be restricted by enabling a password requirement to prevent unauthorized access.

```
>MSR menu
 Condition menu
 Filling menu
 Data menu
 Settings menu
 Alarm info
 Start-up wizard
 Serials
 Maintenance
 Consumption
 Back
Up    Select    Down
```

By pressing the **MENU** button, access to the **Main menu** is gained. Navigating this menu is possible by pressing the **+**-button for going up in the menu, and **-**-button for going down. With the **Select**-button, it's possible to select a function or submenu. Each menu has a **Back**-function at the bottom of the list to return to the either the previous menu or Stand-by.

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
Every time the Device returns to Stand-by, it will check for errors to display.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.2. Notifications & alarms list

This page gives a list of all possible notifications and alarms, including a link to the specific page.

Notification Number	Description & Link

6.3. MSR menu

This menu allows to start a measurement cycle and navigate to the settings concerning the measurements the Device makes. Within this menu it's possible to edit parameters as well as performing calibration of different sensors when needed.

```
>MSR Now
 MSR Settings
 MSR Initial
 Auto MSR
 Correction MSR
 MSR Counter
 Auto H2O MSR
 Auto add OIL
 Back
Up    Select    Down
```

This menu allows you to start a measurement or edit any parameter linked to measurements within the Device.

Path

Main menu > MSR Menu

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.3.1. MSR Now

This function allows to start a measurement cycle.

When the **MSR Now**-function is selected, the Device will execute a full measuring cycle. All the available properties of the Coolant will be measured. A measuring cycle can take up to 7-8 minutes. Once the measuring cycle has started, it cannot be interrupted anymore. A cleaning cycle is included and the measurement results will be displayed afterwards.

The different steps of a measuring cycle are explained in this chapter, including the pre-tests and cleaning cycle. The information shown on the screen during this cycle is always built up using the same structure or format:

- The first line on the screen consists of 3 pieces of information:
  - **MSR**: type of procedure that is running, in this case Measurement.
  - **5**: type of measurement that is taking place, in this case type 5.
  - **(2)**: step of the specific measurement sequence. The MSR sequence consists of 18 steps.

  Each measurement type is triggered by a different action. The measurement type refers to the action that triggered the measurement to take place:

  - (0) triggered by the program (level too low)
  - (1) user pressed MSR in the MSR menu
  - (2) periodic timer has initiated periodic measurement
  - (3) after dry start-up the amount of oil needs to be adjusted
  - (4) is initial measurement

    - (5) measurement after starting device
    - (6) after installation oil needs to be added
    - (7) after filling a control measurement is performed
    - (8) triggered by Will-Fill HQ via Cloud or ftp command
- Lines 2, 3 & 4 are the status lines of the procedure and show which step is (being) executed. The step on the fourth line is the current step. At the end of each line, the status of each step is reflected between brackets.
    - (0) means that the test is running
    - (1) means that the test is OK
    - (2) means that the test is skipped or has failed

6.3.1.1. Measuring cycle

A measuring cycle of the Will-Fill has a specific sequence. First the functioning of the components of the device is verified, next the measurement is performed and finally the internal channels and measuring chambers of the Device are cleaned.

6.3.1.2. Media checks

Prior to the measurement, the Device will verify whether all media, required for good operation, are present to the device. To perform a measurement it's necessary that oil, water and air are present.

```
MSR: 5 (2)
 -Oil Pressure (2)
 -H20 Pressure (0)
 -Air Pressure (0)
```

The minimum pressure for the air is 5 bar, while for the water it is set at 1,5 bar.

Restriction:
The oil pressure is only checked if the optional sensor is installed.

6.3.1.3. Oil level check

The Oil level of the external barrel is checked.

```
MSR: 5 (3)
 -Oil Level (0)
```

The Device will check the level of oil in the external barrel either based on the calculated value (default), or on the reading of the level via the oil level sensor (option). If the oil is provided by a central supply system (option), this test will be skipped.

6.3.1.4. Coolant level check

The Device will perform level measurements of the Coolant.

```
MSR: 5 (4)
 -MWF Level (0)
```

Before the MWF level measurements starts, the level sensor will be rebooted.

During the reboot of the level sensor, the screen on the left is shown.

```
Alarm 17
MWF too high
Level: 87 %
Error value: 86 %
```

The results and interpretation of the volume of this measurement are considered at the end of the measuring cycle during the analysis.

If the level is too high, as a safety against overfilling, the notification on the left is given at this moment and the measurement is aborted. This is foreseen because, during the measurement and cleaning cycles, extra water is added to the tank. If the measurement cycle would continue, it might flood the tank.

6.3.1.5. Flushing device

The Device will flush itself with Coolant to ensure that all sensors will receive fresh Coolant.

```
MSR: 5 (6)
 -Flush (0)
```

During the flushing, the Device will open and close the main valve while the circulation pump is rotating. A steady stream of Coolant will flow from the coolant outlet of the Device.

```
Measure error
Main valve Closed
Pump counts xxxx
Retry        Standby
```

If the main valve isn't functioning, this error message will be generated.

```
Measure error
Circultation pump
not rotating
Retry        Standby
```

If the circulation pump doesn't rotate, this error message will be generated.

6.3.1.6. Taking sample

The Device will take a sample of Coolant and direct it towards the measuring chambers of the different sensors.

```
MSR: 5 (7)
 -Sample (0)
```

The Device will send Coolant to the sensors by shutting the main valve while the circulation pump is rotating. This pushes the Coolant to the sensors. When the samples are in front of the different sensors, the measurement can start.

6.3.1.7. Brix Measurement

The Device will measure the concentration of Oil inside the Coolant. This is done by an in-line refractometer, often referred to as the Brix sensor. The Brix value is used to determine the percentage of oil in the Coolant. To calculate the percentage, it's required to first subtract the Brix value of the used water and next multiply the resulting value with the refractometer index. This refractometer index value is available in the datasheet of the coolant oil (concentrate).

```
MSR: 5 (8)
 -MWF BRIX (0)
```

Brix measurements are being performed. To achieve a reliable result, an average of a couple of measurements is being used. These measurements will only be used for further analysis, if the deviation between the measurements isn't too great. This maximum deviation can be setup in the menu (**MSR menu > MSR Settings > Brix > MSR Deviation**).

```
MSR: 5 (9) BRIX
Measurement ...
Brix: 7.9
Percent: 7.71
```

The result of the MSR is given both as Brix value and as percentage.

The measurement must be above the acceptable percentage, otherwise it will not be used for a refill of the Coolant tank. This acceptable percentage can be setup in the menu (**MSR menu > MSR Settings > Brix > Acceptable %**).

If an error occurs during the measurements, no error is given at this point. At the review after the cycle, this is indicated. When there is no Brix or Percent value shown on screen, it means that the measurement has not succeeded. The Device will automatically proceed to the next step.

```
MSR: 5 (10)
 -MWF TEMP (1)
```

The temperature of the MWF will also be measured in this step.

6.3.1.8. EC Measurement

The Device will measure the electro-conductivity of the Coolant.

```
MSR: 5 (11) EC
Measurement ...
EC: 1523.19 uS
```

EC measurements are being performed. To achieve a reliable result an average of a couple of measurements is being used. These measurements will only be used, if the deviation between the measurements isn't too great. This maximum deviation can be setup in the menu (**Main menu > MSR menu > MSR Settings > EC > MSR Deviation**).

6.3.1.9. pH Measurement

The Device will measure the pH value of the Coolant.

```
MSR: 5 (11) PH
Measurement ...
PH: 8.2
```

pH measurements are being performed. To achieve a reliable result an average of a couple of measurements is being used. These measurements will only be used, if the deviation between the measurements isn't too great. This maximum deviation can be setup in the menu (**Main menu > MSR menu > MSR Settings > PH > MSR Deviation**).

6.3.1.10. Brix rinsing

The Device will clean the internal channels and the measuring chambers of the different sensors.

```
MSR: 5 (12)
 -Clean H2O (2)
```

The Device will clean the internal channels and sensors with fresh water. All sensors are being cleaned, so that there is no contamination when another procedure is executed.

6.3.1.11. H_2O measurements

The Device will perform the H_2O measurements of the fed water. These values will be used by the Device for showing on the screen as a comparison with the actual measured value. This is the last step of the measuring cycle.

```
MSR: 5 (13)
 -H2O BRIX (0)
```

The H_2O measurements are performed. The Brix measurement is done to have a reinitialization value of the Brix sensor. These measurements include the Brix, Temperature, EC and PH value of the incoming water.

```
MSR: 5 (14)
 -H2O TEMP (0)
```

```
MSR: 5 (15)
 -H2O EC (0)
```

```
MSR: 5 (16)
 -H2O PH (0)
```

```
MSR: 5 (17)
 -Cleaning
```

After the H_2O measurements, the channels and measuring chambers are cleaned.

6.3.1.12. Cleaning cycle

The Device will perform a thourough cleaning cycle. By executing this cleaning cycle and verifying the results afterwards, the manual cleaning frequency can be reduced.

```
Cleaning: (3) Brix
Rinse valve ON/OFF
```

The Device will clean itself by circulating fresh water through the channels and measuring chambers, as well as drying with compressed air afterwards.

```
Cleaning: (3) Brix
Rinse valve ON/OFF
Percent: 0.03
```

To verify the presence of water (and correct cleaning), the Brix value of the rinsing water is measured and shown on the screen.

```
Cleaning: (3) Air
Rinse valve ON/OFF
Percent: 0.00
```

The sensors inside the device are being dried with compressed air. To verify correct drying, the Brix value is measured and shown on the screen. This value should be 0.00.

6.3.1.13. MSR error analysis and Overview

The Device will analyse all measurements and check for errors. By giving a full overview of all the measurements, the statuses of each step and results can be reviewed. Any notifications or alarms related to the measurement, will be raised in the Device and communicated by e-mail (if an internet connection is available).

```
MSR: 5 (18)
 -Analyzing errors
```

While the Device is performing the analysis and interpreting the results, this message is given on the screen.

```
>OIL Pressure    2-0
 H2O Pressure    1-1
 AIR Pressure    1-1
 OIL Level       1-0
 MWF Level       1-1
 Check           1-1
 Flush           1-1
 Sample          1-1
 MWF Brix        1-1
 MWF Temp        1-1
 MWF EC          1-1
 MWF PH          1-1
 H2O Clean       2-0
 H2O Brix        2-0
 H20 Temp        2-0
 H20 EC          2-0
 H2O PH          2-0
 Clean           1-1
 Back
Up     View     Down
```

The Device will give a complete overview of all actions it has taken during the measurement cycle and report on the amount of iterations required for each action. This can be viewed on the screen.

The numbers at the end of each line indicate whether the action was executed or skipped (first number) and how many attempts it took to execute the action (second number).

The result of a step in the measurement cycle is given by:

- 0: step not available by program
- 1: step executed and OK
- 2: step skipped
- 3: Step resulted in error

It's possible to select a specific step of the measurement cycle and press **View** to get more info on that particular step. In the case of a measurement, the Device will show the actual measured value that is stored.

This overview screen is also available in Alarm info (**Main menu > Alarm info**), but only when there are no alarms active.

The Device will automatically exit this screen after the timeout and proceed to Stand-by mode. At this point eventual alarms that were activated during the procedure, will come up on the screen.

6.3.2. MSR settings

This menu allows to change settings regarding the measurements the Device makes. Within the menu it's possible to edit parameters as well as performing calibration of sensors when needed.

```
>Auto MSR Timer
 Correction Timer
 Correction Factor
 Initial MSR Timer
 PH
 EC
 Brix
 Temp
 Enable/Disable MSR
 Back
Up    Select    Down
```

The timer functions enable the user to set the pace of automatic measurements, while each specific media menu allows to access all the settings that are related to that medium and perform the calibration (if required) of the respective sensor.

Path

Main menu > MSR Menu > MSR Settings

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.3.2.1. Auto MSR timer

This timer defines the frequency of the automatic measurements.

```
Auto MSR timer
Old  12 hour(s)
New  6  hour(s)
+       Save       -
```

Function
This value is the minimum time that must pass before an automatic measurement takes place. If the Device is not in Srand-by, an automatic measurement cannot be started.

Values
Min: 3 hours
Max: 48 hours
Default: 12 hours

Path
Main menu > MSR menu > MSR settings > Auto MSR timer

Input
Pulsating keypress: 3 hours
Single keypress: 3 hours

In most cases the value can be left at 12 hours or set to 9 hours. This will result in 4-5 measurements per day, when the production process is active.

Important:
Increasing the frequency of the automatic measurements, will result in an increase of the frequency of manual cleaning (and calibration) interventions for the sensors.

6.3.2.2. Correction timer

This timer defines the time in between the end of an automatic refill cylce and the start of a correction measurement. A correction measurement will measure the concentration and adjust the internal dosing unit for the oil to increase the accuracy of the oil-adding-system.

```
Correction timer
Old  10 minute(s)
New  12 minute(s)
+       Save       -
```

Values
Min: 1 minute
Max: 1440 minutes (= 24 hours)
Default: 20 minutes

Path
Main menu > MSR menu > MSR settings > Correction timer

Input
Pulsating keypress: 10 minutes
Single keypress: 1 minute

This timer can be increased when it is known that the circulation of the coolant is not optimal. If the Device is installed in a seperate tank, it's best to increase the timer to allow circulation by the process first. This way the process will assist the Device with mixing freshly added and existing Coolant first. Afterwards when new and existing coolant is properly mixed, the Device will execute the extra measurement to define whether or not a correction needs to be made in the oil dosing unit.
If this extra time would not be given, it is possible that the new and existing coolant is not properly mixed, and the correction measurement would not give a realistic result, which would lead to incorrect adjustment of the oil dosing unit.

6.3.2.3. Correction factor

This value describes how big (and fast) the automatic corrections of the oil system will be.

```
Correction factor
Old  050
New  042
+       Save       -
```

Values
Min: 1
Max: 100
Default: 50

Path
Main menu > MSR menu > MSR settings > Correction factor

Input
Pulsating keypress: 5
Single keypress: 1

Important:
Only change this value if you have a very thourough understanding of the device. Wrong values can lead to under or overcompensation of the oil adjusting mechanism, which will lead to wrong concentration values of the Emulsion.

6.3.2.4. Initial MSR timer

This timer defines how many time is left between the installation of the Device and the start of the initial measurement to set the initial values on the screen.

These measurement values will be displayed on the screen along with the most recent measurements so you can easily see what has changed since the installation.

The values will automatically be displayed when the device is in Standby or Circulation mode.

```
Initial MSR timer
Old  6.0 hour(s)
New  5.0 hour(s)
+       Save       -
```

Values

Min: 0.5 hours

Max: 72 hours (= 3 days)

Default: 6.0 hours

Path

Main menu > MSR menu > MSR settings > Initial MSR timer

Input

Pulsating keypress: 0,5 hours

Single keypress: 5 hours

6.3.2.5. pH menu

This sub-menu gives acces to the settings regarding the pH measurements and the pH calibration.

```
>Max PH
 Min PH
 Enable/disable PH
 Calibration alert
 MSR Deviation
 MSR Consumption
 Calibration PH
 Back
Up    Select    Down
```

Apart from the **Calibration PH** and **MSR Consumption**, all the elements allow to edit specific parameters concerning the pH measurements. **MSR Consumption** gives read-only values, while the calibration allows the calibrate the pH probe.

Path

Main menu > MSR Menu > MSR Settings > PH

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.3.2.5.1. Max pH

This value defines the high threshold of the pH value. If a measurement result exceeds the set maximum value, a notification will be generated on the Device and mail notification will be sent.

```
Max PH value
Old  8.5 PH
New  11 PH
+       Save       -
```

Values
Min: Min pH + 1
Max: 14
Default: 13

Path
Main menu > MSR menu > MSR settings > PH > Max PH

Input
Pulsating keypress: 1
Single keypress: 0,5

6.3.2.5.2. Min pH

This value defines the low threshold of the pH value. If a measurement result is below the set minimum value, a notification will be generated.

```
Min PH value
Old  4.0 PH
New  4.5 PH
+       Save       -
```

Values
Min: 1
Max: Max ph - 1
Default: 6

Path
Main menu > MSR menu > MSR settings > PH > Min PH

Input
Pulsating keypress: 1
Single keypress: 0,5

6.3.2.5.3. Enable/Disable pH

This function allows enabling or disabling of all pH measurements for the Device.

```
PH
Enabled/Disabled

Edit    Save    Exit
```

Values
Enabled or Disabled
Default: Enabled

Path
Main menu > MSR menu > MSR settings > PH > Enable/Disable PH

Input
Edit: Change setting
Save: Apply changes
Exit: Leave function

6.3.2.5.4. pH Calibration alert

This value is the maximum amount of pH measurements that can take place before a notification is generated that indicates the need for a calibration of the pH probe.

```
PH-cal alert
Old   500 MSR cycles
New  1000 MSR cycles
+       Save       -
```

Values
Min: 5
Max: 1500
Default: calculated by Startup wizard

Path
Main menu > MSR menu > MSR settings > PH > Calibration alert

Input
Pulsating keypress: 10
Single keypress: 1

6.3.2.5.5. pH MSR Deviation

Determines the accuracy of the pH measurements. A measurement consists of the average of a series of readouts of the sensor. These readouts will first be compared to each other to determine if they don't deviate too much, to take their average afterwards as a reliable measurement. The entered value is the maximum deviation that is allowed.

```
Deviation PH
Old  0.5 PH
New  1.5 PH
+       Save       -
```

Values
Min: 0.5 pH
Max: 10 pH
Default: 5 pH

Path
Main menu > MSR menu > MSR settings > PH > MSR Deviation

Input
Pulsating keypress: 1 PH
Single keypress: 0.5 PH

6.3.2.5.6. MSR Counter

These values indicate the number of measurements that have taken place after the last reset.

```
MSR Counter
PH  180   Brix   500
EC  250   Total 1200
+        Ok        -
```

Values
PH = Number of measurements with PH probe since the last time it was calibrated.
Brix = Number of measurements with Brix sensor since the last time it was cleaned (and reset).
EC = Number of measurements with EC probe since the last time it was calibrated.
Total = Total number of measurements the device has performed.

Path
Main menu > MSR menu > MSR settings > PH > MSR Counter
OR
Main menu > MSR menu > MSR settings > EC > MSR Counter
OR
Main menu > MSR menu > MSR Counter
OR
Main menu > Consumptions > MSR Counter

6.3.2.5.7. Calibrate pH Probe

This function starts the process of calibrating the pH Probe.

Prerequisites:
Make sure to have the following items ready to succesfully calibrate the pH probe:

1. Calibration fluids pH 7.0 and 10.01
2. Glass of water to rinse the probe
3. Teflon tape for sealing

Similar to a battery, the base value of the pH probe will go down due to consumption of the internal liquid. This depletion will affect the measurement results. With the calibration process, it's possible to learn the Device what values are currently present, so that the measurement results remain accurate.

```
Calibrate PH

Continue?
Auto    Man     Exit
```

Start the Calibration process by navigating to the correct menu.

Path
Main menu > MSR menu > MSR settings > PH > Calibration PH
OR
Main menu > Maintenance > Calibration PH

Step I

Disconnect the pH probe cable by disconnecting the BNC-connector.

Step II

Screw the pH probe out of the Device body.

Step III

Clean the probe with tap water, remove dirt with rack or toothbrush and dry with compressed air.

Step IV

Connect the pH probe cable again and select **Auto** for the automated calibration procedure.

Step V

Open the calibration fluid PH7 with scissors.

Step VI

Submerge the probe in the Calibration solution PH7 and gently shake so that the fluid is completely in contact with the probe.

```
Calibrate PH

Continue?
Auto    Man     Exit
```

Step VII

Select the automatic calibration by pressing **Auto**, so that the Device will automatically detect when the value is stable and it is OK to proceed to the next step.

Input

Auto: Start automatic calibration; Step VIII

Man: Start manual calibration pH

Exit: Leave function

```
Calibrate PH
Rinse probe + PH7
PH7: 14389
         Ok     Exit
```

Step VIII

The device will perform regular measurements with the pH probe. On the screen, the readout value is given, as well as the deviation that is occurring since last measurement. When the deviation between measurements is small enough, the Device will automatically proceed to the next step. In the manual procedure, the operator needs to press **Ok** to continue to the next step of the calibration.

Values

Under normal conditions, the value should be around 15.000 in this step. Depending on the probe this can vary.

Input

Ok: Save value for PH 7; Step IX

Exit: Leave function

Important:
If the value is still drifting rapidly after 3 minutes, the pH probe will need replacing.

```
Calibrate PH
Rinse probe + PH10
PH7: 21057
         Ok     Exit
```

Step IX

Clean the probe with tap water, dry with compressed air. Open the calibration fluid sachet with scissors and submerge the probe in the calibration solution.
When the deviation is small enough, the Device will continue to the next step.

Note:
It is OK to deconnect briefly the probe from the Device to perform the necessary actions.

Values

Under normal conditions, the value should be around 21.000 in this step. Depending on the probe this can vary.

Input

Ok: Save value for PH 10; Step X

Exit: Leave function

Important:
If the value is not changing after being submerged in calibration fluid PH10 or it still drifting rapidly after 3 minutes, the pH probe will need replacing.

```
Calibrate PH
PH: 10.01
Done. Save?
Yes              No
```

Step X

The calibration process is done. Remount the pH probe into the pH holder of the Device. This should be done while the screen on the left is still active. This way it's certain that the device doesn't perform unexpected actions that result in spilling Coolant.

Step XI

Disconnect the pH Probe cable by disconnecting it from the BNC-connector.

Step XII

If required, put teflon tape around the thread of the pH probe. Screw the pH probe in the holder of the Device body.

Step XIII

Reconnect the pH probe cable with the BNC-connector.

CAUTION:

Only the first 1 cm – 1,5 cm of thread of the probe should be screwed in. Always use Teflon tape to prevent leaks of water or Coolant via the probe. Screwing in the probe too deep can cause damage to the pH probe, which can lead to incorrect measurements and might require replacement of the probe.

```
Calibrate PH
PH: 10.01
Done. Save?
Yes              No
```

Step XIV

The calibration process is completed. The new calibration values need to be saved to the Device. If the process did not go as described above, press **No** to restart. If the process was executed according to this manual, **Yes** can be pressed.

Input

Yes: Save new calibration (overwrite old calibration)

No: Leave function (continue working with old calibration)

Step XV

Restart the Device in order for the calibration to take effect.

6.3.2.6. EC menu

This sub-menu gives access to the settings regarding the EC measurements and the EC calibration.

```
>Max EC
 Min EC
 Enable/disable EC
 Calibration alert
 MSR Deviation
 MSR Counter
 Calibration EC
 Back
Up    Select    Down
```

Apart from the **Calibration EC** and **MSR Counter**, all the elements allow to edit specific parameters concerning the EC measurements. **MSR Counter** gives read-only values, while the calibration allows the claibrate the EC probe.

Path

Main menu > MSR Menu > MSR Settings > EC

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.3.2.6.1. Max EC

This value defines the high threshold of the EC value. If a measurement result exceeds the set maximum value, a notification will be generated.

```
Max EC value
Old  12000 microS
New  12500 microS
+       Save       -
```

Values

Min: Min EC + 10 microS/cm²

Max: 200.000 microS/cm²

Default: 12.000 microS/cm²

Path

Main menu > MSR menu > MSR settings > EC > Max EC

Input

Pulsating keypress: 100 microS/cm²

Single keypress: 10 microS/cm²

6.3.2.6.2. Min EC

This value defines the low threshold of the EC value. If a measurement result is below the set minimum value, a notification will be generated.

```
Min EC value
Old  200 microS/cm²
New  250 microS/cm²
+       Save       -
```

Values

Min: 1 microS/cm²

Max: Max EC - 10 microS/cm²

Default: 120 microS/cm²

Path

Main menu > MSR menu > MSR settings > EC > Min EC

Input

Pulsating keypress: 100 micros/cm²

Single keypress: 10 microS/cm²

6.3.2.6.3. Enable/Disable EC

This function allows enabling or disabling of all EC measurements for the Device.

```
EC
Enabled/Disabled

Edit    Save    Exit
```

Values

Enabled or Disabled

Default: Enabled

Path

Main menu > MSR menu > MSR settings > EC > Enable/Disable EC

Input

Edit: Change setting

Save: Apply changes

Exit: Leave function

6.3.2.6.4. EC Calibration alert

This value is the maximum amount of EC measurements that can take place before a notification is generated that indicates the need for a calibration of the EC probe.

```
EC-cal alert
Old   500 MSR cycles
New  1000 MSR cycles
+       Save       -
```

Values

Min: 5

Max: 1500

Default: calculated by Startup wizard

Path

Main menu > MSR menu > MSR settings > EC > Calibration alert

Input

Pulsating keypress: 10

Single keypress: 1

6.3.2.6.5. EC MSR Deviation

Determines the accuracy of the EC measurements. A measurement consists of the average of a series of readouts of the sensor. These readouts will first be compared to each other to determine if they don't deviate too much, to take their average afterwards as a reliable measurement. The entered value is the maximum deviation that is allowed.

```
Deviation EC
Old  1045 microS
New  1150 microS
+       Save       -
```

Values
Min: 50 microS/cm²
Max: 50.000 microS/cm²
Default: 1.045 microS/cm²

Path
Main menu > MSR menu > MSR settings > EC > MSR Deviation

Input
Pulsating keypress: 50 microS/cm²
Single keypress: 5 microS/cm²

6.3.2.6.6. MSR Counter

These values indicate the number of measurements that have taken place after the last reset.

```
MSR Counter
PH  180   Brix   500
EC  250   Total 1200
+        Ok        -
```

Values
PH = Number of measurements with PH probe since the last time it was calibrated.
Brix = Number of measurements with Brix sensor since the last time it was cleaned (and reset).
EC = Number of measurements with EC probe since the last time it was calibrated.
Total = Total number of measurements the device has performed.

Path
Main menu > MSR menu > MSR settings > PH > MSR Counter
OR
Main menu > MSR menu > MSR settings > EC > MSR Counter
OR
Main menu > MSR menu > MSR Counter
OR
Main menu > Consumptions > MSR Counter

6.3.2.6.7. Calibrate EC Probe

This menu starts the calibration of the EC Probe.

Prerequisites:
Make sure to have the following items ready to succesfully calibrate the EC probe:

1. Calibration fluids 84 µS/cm² and 12.880 µS/cm²
2. Glass of water to rinse the probe
3. Tools for unscrewing the probe, in this case an Allen key - 3 mm

During an EC measurement, the probe will measure the electrical conductivity between the two pads at the end of the probe. Unlike a pH probe, an EC probe does not consume a measuring medium. This results in less required calibrations that are required.

In the next topics, the different steps for calibrating the probe are given.

6.3.2.6.7.1. Open head

Step I

Before opening the head, start by powering off the Device.

For **power off** keep pressing the power button untill the device beeps. After the beep, release the power button. The Device will run a shutdown cleaning cycle and will auto power off. Once the Device is powered off, disconnect the power cord.

Step II

When the Device is off, disconnect the pH probe cable by disconnecting it from the BNC-connector. Leave the pH probe mounted in the Device.

Step III

Take away the tension of the screw underneath the LAN-access plate, which holds the BNC-connector of the pH probe.

Step IV

Turn the head counterclockwise until you can lift it.

Important:
Be carefull when lifting the head, as there is no joint keeping the head attached to the body. The electric connections are the only items linking the body and head together, but they cannot support the weight of the head. Always hold the head in your hand until all cables between body and head are disconnected.

Step V

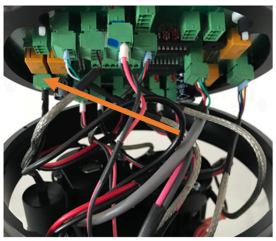
When necessary for exchanging components or executing calibration, disconnect the cables so the head is completely disconnected from the body. If not, f.i. for checking cables, leave all cables in place.
If required, take a photo of the cables before unplugging them. When disconnected, place the head next to the body on its side. Do not place it on a wet surface and make sure it does not roll away.

Tip:
All connectors of the sensors, motors and valves are color marked and correspond with the plugs on the main PCB inside the head. Each combination of color and connectors poles is unique.

6.3.2.6.7.2. Reconnect EC Sensor & Start Device

Step I

Inside the body, release the tension of the 2 screws that clamp the EC probe at 2 sides. The orange arrow is pointing towards the EC probe.
Once this is done, slide the probe vertically upwards, out of the housing of the Device until it is completely free.



Step II

Take the head and reconnect the sensor cable of the EC probe. Make sure that the correct connector is being used.
The orange arrow points to the Yellow EC probe connector with 2 poles, connected to a 2-pin connector.
Plug in the head of the Device, connected with the EC probe.

Start the Device

Powering on the Will-Fill can be done by pressing the power button shortly.
This button will light up to let you know the device is powered.

Note:
It can take up to **5 minutes** before a message appears on the screen because of the start-up of the internal processes. Right before the first message appears on the screen you will hear a **short tone**.

```
Initiating
Start-up tests

----    MENU    ----
```

Function

This screen will display **Initiating** for 10 seconds and will give the user the opportunity to skip loading and checking of parameters along with the start-up tests and start up measurement and go directly to the **Main menu**.

When the device is functioning correctly this function isn't used, but for calibration purposes or if there are problems with the device, this comes in handy to change certain settings.

Make sure to use the shortcut to menu for calibrating the EC probe, so that all tests are skipped.

Important:

If the tests have started, the Device will generate different alarms as the sensors, motors and valves are not connected. Shut down the Device and start the Device to access the shortcut menu.

6.3.2.6.7.3. Execute EC Probe calibration

Start the Calibration process by navigating to the correct menu.

Path

Main menu > MSR menu > MSR settings > EC > Calibration EC

OR

Main menu > Maintenance > Calibration EC

```
Calibrate EC

Continue?
        Yes     Exit
```

Step I

Clean the EC probe with tap water, remove dirt with rack or toothbrush and dry with compressed air.

Step II

Open the calibration fluid EC 84 µS/cm², insert the EC probe and press **Yes**.

Input

Yes: Start calibration

Exit: Leave function

```
Calibrate EC
Rinse probe +EC84
EC84: 57
        Ok      Exit
```

Step III

Submerge the EC probe in the 84 µS/cm²-calibration solution and gently shake so that the fluid is completely in contact with the probe.

Step IV

When the value is stable, press **Ok**.

Input

Ok: Save value for EC 84 µS/cm² and continue calibration

Exit: Leave function

Important:
If the value is still drifting rapidly after 3 minutes, the EC probe needs to be replaced.

```
Calibrate EC
Rinse probe +EC12880
EC12880: 3117
        Ok      Exit
```

Step V

Open the calibration fluid EC 12.880 µS/cm². Submerge the EC probe in the 12.880 µS/cm²-calibration solution and gently shake so that the fluid is completely in contact with the EC probe.

Step VI

When the value is stable, press **Ok**.

Input

Ok: Save value for EC 12.880 µS/cm² and continue calibration

Exit: Leave function

Important:
If the value is still drifting rapidly after 3 minutes, the EC probe needs to be replaced.

```
Calibrate EC
EC: 12880
Done. Save?
Yes              No
```

Step VII

Confirm the calibration by pressing **Yes**.

Input

Yes: Save the new values of calibration.

No: Cancel calibration and leave function

Step VIII

The calibration of the EC probe is now completed. Follow the next steps to build together the Device again:

Install the EC probe into the body of the Device and clamp it by means of the 2 screws.
Reconnect all the plugs of the sensors, motors and valves in the correct places.
Mount the head back onto the Device and put tension on the screw under the LAN plate.
Reconnect the pH probe.
Plug in the power cord in the socket and turn on the Device.

Tip:
All connectors of the sensors, motors and valves are color marked and correspond with the plugs on the main PCB inside the head. Each combination of color and connectors poles is unique.

6.3.2.7. Brix menu

This sub-menu allows to change settings regarding the Concentration (=Brix) measurements.

```
>Max percentage
 Min percentage
 Brix index
 Enable alarms
 Cleaning alert
 MSR Deviation
 MSR Counter
 Acceptable %
 Back
Up    Select    Down
```

All the elements allow to edit specific parameters regarding the Brix measurements.

Path

Main menu > MSR Menu > MSR Settings > BRIX

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.3.2.7.1. Max percentage

This value defines the high threshold of the concentration value. If a measurement result exceeds the set maximum value, a notification will be generated.

```
Percentage Max?
Old  11.0 %
New  9.5 %
+       Save       -
```

Values
Min: Min percentage + 1 %
Max: 25 %
Default: Set percentage + 3 %

Path
Main menu > MSR menu > MSR settings > BRIX > Max percentage

Input
Pulsating keypress: 1 %
Single keypress: 0,1 %

6.3.2.7.2. Min percentage

This value defines the low threshold of the pH value. If a measurement result is below the set minimum value, a notification will be generated. When a lower percentage is measured during and automatic MSR, an oil only-filling will start to correct the percentage of the Coolant, if oil only-fillings are enabled on the Device.

```
Percentage Min?
Old: 05.0 %
New: 04.5 %
+       Save       -
```

Values
Min: 1 %
Max: Max percentage - 1 %
Default: Set percentage - 3 %

Path
Main menu > MSR menu > MSR settings > BRIX > Min percentage

Input
Pulsating keypress: 1 %
Single keypress: 0,1 %

6.3.2.7.3. Brix index

The refractometer index (or Brix index) can be set. Every coolant oil (concentrate) has its own specific refractometer index and this can be found on the datasheet of the oil. This value enables the device to tranlate the brix measurements into a correct percentage.

```
Brix index
Old  1.05
New  1.20
+       Save       -
```

Values

Min: 0.10

Max: 3.00

Default: 1.00

Path

Main menu > MSR menu > MSR settings > BRIX > Brix Index

OR

Main menu > Settings > Oil Settings > Brix Index

Input

Pulsating keypress: 0.1 %

Single keypress: 0.01 %

6.3.2.7.4. Enable Brix alarms

This function defines whether alarm notification for measurements, exceeding the threshold values, should be given or not for the Device.

```
Brix alarms
Enabled/Disabled

Edit    Save    Exit
```

Values

Enabled or Disabled

Default: Disabled

Path

Main menu > MSR menu > MSR settings > BRIX > Enable Brix alarms

Input

Edit: Change setting

Save: Apply changes

Exit: Leave function

6.3.2.7.5. Brix cleaning alert

This value is the maximum amount of Brix measurements that can take place before a notification is generated that indicates the need for a manual cleaning of the Brix sensor. When the amount of measurements is surpassed, the Device will still function, but to guarantee correct readouts, it's recommended to clean the sensor.

```
Brix cleaning alert
Old   500 MSR cycles
New  1000 MSR cycles
+       Save       -
```

Values
Min: 5
Max: 1500
Default: calculated by Startup wizard

Path
Main menu > MSR menu > MSR settings > BRIX > Cleaning alert

Input
Pulsating keypress: 10
Single keypress: 1

6.3.2.7.6. Brix MSR Deviation

Determines the accuracy of the Brix measurements. A measurement consists of the average of a series of readouts of the sensor. These readouts will first be compared to each other to determine whether they don't deviate too much, to take their average afterwards as a reliable measurement. The entered value is the maximum deviation that is allowed.

```
Deviation Brix
Old  0.5 Brix
New  1.5 Brix
+       Save       -
```

Values
Min: 0.5 Brix
Max: 10 Brix
Default: 0.9 Brix

Path
Main menu > MSR menu > MSR settings > BRIX > MSR Deviation

Input
Pulsating keypress: 1 Brix
Single keypress: 0.5 Brix

6.3.2.7.7. Brix MSR Counter

This value indicates the number of measurements that have taken place since the last reset.

```
Brix Counter
Now:  862
Max:  1500
Reset            Ok
```

Values

Now = Number of measurements with the Brix sensor since the last time it was cleaned.

Max = Maximum number of measurements that can be executed with the Brix sensor. When it reaches this value, cleaning of the sensor and reset of value is required.

Path

Main menu > MSR menu > MSR settings > BRIX > MSR Counter

OR

Main menu > Maintenance menu > Counters > MSR Counter

Input

Reset: Set the value to 0

Ok: Leave function

Remember:

After cleaning of the Brix sensor, the Brix counter needs to be reset to 0. This way, the Device can correctly keep track of the MSR's and send out a notification when the periodic cleaning is required.

6.3.2.7.8. Acceptable percentage

This value is the minimum value a measurement has to be, in order to register as a correct measurement that can be used for a refill. For all measurements that are lower than this value, the measurements will be discarded. If mandatory filling is active and a filling is required to keep the correct volume in the Coolant tank, but a percentage lower than the acceptable percentage is measured, the Device will top up the Coolant with a fixed percentage. If the Mandatory filling is disabled and the measurement result is below the Acceptable percentage, no refill will take place. By setting this value in function of the normal workings of your device, it's possible to prevent adding too much (too little) oil by one faulty measurement.

```
Acceptable %
Old  0.5 %
New  1.0 %
+       Save       -
```

Values

Min: 0.5 %

Max: Min percentage - 3 %

Default: 1.5 %

Path

Main menu > MSR menu > MSR settings > BRIX > Acceptable %

OR

Main menu > Filling menu > Filling Settings > Mandatory Filling > Acceptable %

Input

Pulsating keypress: 0.5 %

Single keypress: 0.1 %

6.3.2.8. Temperature menu

This sub-menu gives access to the settings regarding the temperature measurements.

```
>Max temp
 Min temp
 Calibration temp
 Back
Up    Select    Down
```

All the elements allow the editing of specific parameters regarding the temperature measurements.

Path

Main menu > MSR Menu > MSR Settings > Temp

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.3.2.8.1. Max Temperature

This value defines the high threshold of the temperature measurement. If a measurement result exceeds the set maximum value, a notification will be generated.

```
Max Temperature
Old  40 degrees C
New  35 degrees C
+       Save       -
```

Values
Min: Min temperature + 1 °C
Max: 60 °C
Default: 40 °C

Path

Main menu > MSR menu > MSR settings > Temp > Max Temp

Input
Pulsating keypress: 5 °C
Single keypress: 1 °C

6.3.2.8.2. Min temperature

This value defines the low threshold of the temperature measurement. If a measurement result is below the set minimum value, a notification will be generated.

```
Min Temperature
Old  10 degrees C
New  18 degrees C
+       Save       -
```

Values
Min: 1 °C
Max: Max temperature - 1 °C
Default: 10 °C

Path

Main menu > MSR menu > MSR settings > Temp > Min Temp

Input
Pulsating keypress: 5 °C
Single keypress: 1 °C

6.3.2.8.3. Calibrate Temperature

This menu allows to give an offset to the default measurement of the temperature sensor.

Prerequisites:
Make sure to have a handheld thermometer ready to succesfully calibrate the temperature sensor.

This calibration allows to offset the measuring result of the temperature of the Coolant. The new value is added/subtracted from the measured value, and will be used in further analysis.

```
Temp Calibration
Old: 0.0 Degrees C
New: 1.0 Degrees C
Edit    ---     Back
```

Start the Calibration process by navigating to the correct menu.

Values
Min: -10.0 °C
Max: 10.0 °C
Deafult 0.0 °C
Path
Main menu > MSR menu > MSR settings > Temp > Calibration
Input
Edit: Adjust the temperature offset; Adjustment menu
Back: Go back to Temperature menu

```
Temp Calibration
Old: 0.0 Degrees C
New: 1.0 Degrees C
 +      Save      -
```

Input
Pulsating keypress: 1.0 °C
Single keypress: 0.1 °C
Save: Save values and return to Calibration menu

6.3.2.9. Enable/Disable MSR

When a measurement of the percentage has a result lower than the minimum or higher than the maximum, it's possible to choose to exclude these values from the MSRlog.txt. When disabled, the other measurement results will be available and the concentration and Brix value will be 0. When enabled, all measurement values of the measurement will be skipped.

```
MSR-log skipping
for acceptable %
Enabled/Disabled
Edit    Save    Exit
```

Values
Enabled or Disabled
Default: Disabled
Path
Main menu > MSR menu > MSR settings > Enable/Disable MSR
Input
Edit: Change setting
Save: Apply changes
Exit: Leave function

6.3.3. MSR initial menu

This sub-menu allows to define the initial values for the Device. Either the results of the last measurements are taken, or a new measurement is peformed after a delay (**Initial MSR timer**) and those results will be considered initial..

```
>Set current
 Start delayed MSR
 Back
Up    Select    Down
```

Path
Main menu > MSR Menu > MSR Settings

```
Initial MSR
PH: 07.0
EC: 1050
Saving...
```

When selecting **Set current**, the new values are shown on the screen for 5 seconds. The device will return to the MSR initial screen. Selecting **Start delayed MSR** will start atimer for a measurement and the results will be used as initial measurement.

6.3.4. Auto MSR

This function allows the Device to perform automatic measurements with a fixed interval when the function is enabled. Auto measurements will be logged. When the measured level is too low or the measured concentration is too low, a filling cycle to add oil will be started. When disabled, no automatic, periodic measurements will be made, only the measurements required for a filling cycle will be performed.

```
Auto MSR
Enabled/disabled

Edit    Save    Exit
```

Values
Enabled or Disabled
Default: Enabled

Path
Main menu > MSR menu > Auto MSR

Input
Edit: Change setting
Save: Apply changes
Exit: Leave function

6.3.5. Correction MSR

This function allows the Device to perform correction measurements after a top-up when enabled. Such control measurements will be used by the Device to adjust the PID setting of the oil intake system. Correction measurements will be logged. When disabled, the correction measurements will not happen.

```
Correction MSR
Enabled/Disabled

Edit    Save    Exit
```

Values

Enabled or Disabled

Default: Enabled

Path

Main menu > MSR menu > Correction MSR

Input

Edit: Change setting

Save: Apply changes

Exit: Leave function

6.3.6. MSR Counter

These values indicate the number of measurements that have taken place after the last reset.

```
MSR Counter
PH  180   Brix   500
EC  250   Total 1200
+        Ok        -
```

Values

PH = Number of measurements with PH probe since the last time it was calibrated.

Brix = Number of measurements with Brix sensor since the last time it was cleaned (and reset).

EC = Number of measurements with EC probe since the last time it was calibrated.

Total = Total number of measurements the device has performed.

Path

Main menu > MSR menu > MSR settings > PH > MSR Counter

OR

Main menu > MSR menu > MSR settings > EC > MSR Counter

OR

Main menu > MSR menu > MSR Counter

OR

Main menu > Consumptions > MSR Counter

6.4. Condition menu

This menu allows to navigate to the Settings concerning the conditioning of the Coolant.Within the menu it's possible to edit parameters to optimize the Coolant's life time.

```
>Standby Timer
 Circulation Timer
 Back
Up    Select    Down
```

This menu allows to edit any timers linked to the regular conditioning of Coolant by the Device.

Path

Main menu > Condition menu

Note:

If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.4.1. Standby timer

This timer defines the minimum amount of time that the Device will remain in stand-by mode. During this time the Device will be monitoring the Coolant and can also start measurements. The Device always alternates between Standby and Circulation if there are no measurements or other actions needed.

```
Standby timer
Old  60 min
New  100 min
+       Save       -
```

Values
Min: 60 mins
Max: 120 mins
Default: 60 mins

Path
Main menu > Condition menu > Standby timer

Input
Pulsating keypress: 10 min
Single keypress: 1 min

In most cases the value can be left at 60 minutes. Shorter interval is only required when additional circulation/mixing is required.

Important:
The Standby timer should always be larger than the filling timer. If it is shorter, the Filling Timer will never lapse and thus a filling can never start.

6.4.2. Circulation timer

This timer defines the amount of time that the Device will circulate the Coolant. During this time the Coolant will be mixed and aerated. Circulation and Standby will alternate constantly, unless any specific actions or measurement is required.

```
Circulation timer
Old  15 min
New  10 min
+       Save       -
```

Values
Min: 1 mins
Max: 40 mins
Default: 10 mins

Path
Main menu > Condition menu > Circulation timer

Input
Pulsating keypress: 10 min
Single keypress: 1 min

In most cases the value can be left at 15 minutes. Longer circulation is only needed when additional circulation/mixing is required, f.i. with a big volume tank.

6.5. Filling menu

This menu gives access to the settings regarding the filling processes.

```
>Refill now
 Filling Settings
 Back
Up    Select    Down
```

This menu allows to execute a filling cycle immediately or it gives access to the settings regarding the filling cycles of the Device.

Path

Main menu > Filling menu

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.5.1. Refill now

This sub-menu allows to choose the type of filling cycle that is performed immediately.

```
>Fixed
 Variable
 Oil only
 H2O only
 Back
Up    Select    Down
```

This sub-menu allows a type of filling cycle to be started manually. Depending on the chosen cycle, the Device will first perform a measurement cycle or start the filling cycle immediately.

Path

Main menu > Filling menu > Refill now

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.5.1.1. Fixed filling

This function allows to top up the coolant to the maximum level with a fixed percentage (the desired percentage) coolant. The filling cycle will not perform a measurement as a fixed percentage will be used for topping up. Afterwards the sensors will be cleaned as part of the filling cycle.

```
Filling to 800 L
Fixed %: 7.5 %
Checking ...
```

Step I

The device will analyze the current level to see if emulsion can be added.

- If no coolant is detected, filling start immediately; Step III
- If coolant is detected and level < Max level, filling will start; Step II
- If coolant is detected and level > Max level, filling is aborted; Error I

```
Filling fixed
already full

         Ok
```

Error I

The Device indicates that the tank is already full. The filling must be aborted. The operator can press OK or the device automatically returns to Standby.

Input

Ok: Leave function

```
Filling fixed
Coolant present
Continue?
Yes              No
```

Step II

The Device indicates that it can detect coolant and that there is space available to perform a top-up.

Input

Yes: Continue with filling; Step III

No: Leave function

```
Filling to 800 L
Fixed %: 7.5 %
Will start
Cancel           Ok
```

Step III

The Device indicates that it will fill the tank to a total volume of 800 L, with a target percentage of 7.5 %. After confirming, more detailed calculations and checks will be performed for determing correct mixture to add.

Input

Cancel: Leave function

Ok: Start calculations for filling; Step IV or Error II

```
Bad values
Check desired %
and continue
         Ok
```

Error II

If there is an error in the calculations, the Device will indicate this and cancel the filling cycle.

Input

Ok: Leave function

```
Filling values
fH2O§FS§TM: 49.65
Fixed
         Ok
```

Step IV

By showing the filling values, the Device indicates that the calculations are valid and that the filling can start.

Input

Ok: Start filling

```
Filling start ...
```

Step V
Before the filling starts, the proper functioning of the Device's components are checked. During this step the level sensor is rebooted and verified.

```
Filling test
Main Valve: 0/1
Cir Pump: 40
H2O Valve: 32
```

Step VI
The filling tests comprise of checking whether the main valve, the circulation pump and water valve are functioning properly. When this is the case, the Device will automatically proceed to the filling itself.

```
Filling to 59 %
Level: 17 %
H2O: 6,6 L
OIL: 0.75 L  F: 16.1
```

Step VII
At this moment the tank is in the process of being filled. On the screen the progress is indicated.
Filling to refers to the actual percentage until which the tank will be filled. This percentage is based on total measuring range of the Device.
Level is the actual level at this moment.
H2O indicates the amount of water that has already been added.
OIL shows the amount of oil that is already added, while the **F**-value keeps track of the amount of oil that still needs to be added, because of the water that has already been added.
When the level is equal or higher to the target, the filling will stop.
All percentages indicated on this screen, refer to the percentage of the substructure of the Device.

```
Filling test
Main Valve: 0/1
Cir Pump: 39
H2O Valve: 36
```

Step VIII
Typically with fixed percentage fillings, adding the water will be faster than adding the oil (concentrate). This is why the **F**-value is kept. Before the oil is added seperately while mixing with existing Coolant, the Device will check the main valve, circulation pump and water valve.

```
Finishing Oil
Will add: 0.6 Liter
Main valve Open/Clos
Pump counts: 742
```

Step IX
The oil pump is verified for proper working. If Ok, the Device proceeds to the next step.

```
Adding OIL
0.3L of 0.6L

Press to pause
```

Step X
The oil pump starts and will add oil to the existing Coolant. The oil is mixed with the Coolant in the mixing chamber before it is released into the tank.
Input
Any key: Adding oil will pause; Error III

```
Cleaning: (2) Flush
```

Step XI
Once the oil is completely added, the Device starts a cleaning procedure, starting with flushing all the sensors and mixing chamber with Coolant.

```
Cleaning: (3) Brix
rinse valve ON/OFF
Percent 0.02
```

Step XII
The next step in the cleaning process is the cleaning of the Brix sensor. The measurement values are being used to determine if water is really present at the sensor.

```
Cleaning: (6) Air
rinse valve ON/OFF
Percent 0.00
```

Step XIII
The next step in the cleaning process is the drying of the Brix sensor. The measurements check whether no more water is present at the sensor.

```
Adding OIL
PAUSED
Please select
Cont            OIL
```

Error III
The pause menu during the adding of oil allows for resetting the capacity of oil available to the Device or continuing the adding.
Input
Cont: Continue to add oil
OIL: Reset the oil capacity

For more information on resetting the oil capacity, check the following chapter:
Oil capacity *(on page 147)*.

Important:
In normal operation, when the filling starts automatically, the entire program is executed automatically. All screens where input is requested have a timeout. When a timeout has lapsed, automatically the next logic step is chosen in order to complete the filling.

6.5.1.2. Variable filling

This function allows to top up the coolant to the maximum level with a mixture of water and oil, in such a way that when the filling is done, the volume and concentration of the total tank are at the target values. This type of filling cycle will perform a measurement first to determine the correct mixture for topping up.

```
Filling to 260 L
Variable %: 7.5 %
Checking ...
```

Step I
The device will analyze the current level to see if emulsion can be added.

- If no coolant is detected, add coolant first for MSR; Step III
- If coolant is detected and level < Max level, filling will start; Step II
- If coolant is detected and level > Max level, filling is aborted; Error I

```
Filling variable
already full

         Ok
```

Error I

The Device indicates that the tank is already full. The filling must be aborted. The operator can press OK or the device automatically returns to Stand-by.

Input

Ok: Leave function

```
Filling Variable
Level in range
start MSR
Yes               No
```

Step II

The Device indicates that it can detect Coolant and that there is space available to perform a top-up.

Input

Yes: Start measurements; Step IV

No: Leave function

```
Filling to 210 L
Variable %: 7.5 %
Will start
Cancel            Ok
```

Step III

The Device indicates that it will fill the tank to the minimum level of 210 L, at which a measurement will then take place. After confirming, the fixed filling to the minimum level (MSR-level) will start.

Input

Cancel: Leave function

Ok: Start fixed filling to MSR-level; after fixed filling, a measurement will take place; Step IV

```
MSR: 0 (3)
 -H2O Pressure (0)
 -Air Pressure (0)
 -Oil Level (0)
```

Step IV

A full measurement cycle is started. Based on the measurements, the necessary calculations are done to define the volume and concentration of the top-up.

For more information on the MSR cycle, please refer to:

MSR Now *(on page 68)*

```
fCLP: 129
fCLM: 12
flCorr_Now: 0.09
Cancel            Ok
```

Step V

After the measurements, the analysis will be done and firstly the volume is considered. If OK, then the value for present volume and volume to add are shown.

Input

Cancel: Leave function

Ok: Start filling

```
Error fCLM!
fCLM: -20
flCorr_Now: -0.105
         Ok
```

Error II

If there is a fault in the calculations, an error indicating that the current level is already higher than the maximum level, is shown.

Input

Ok: Leave function

```
Filling Values
fH2O§FS§TM: 526
Add now
         Ok
```

Step VI

In the second step after the analysis, the concentration is considered. If there are no errors, a last confirmation before filling is shown. If the concentration is already too high, the filling switches to a water only filling [Figure 110].

Input

Ok: Continue to variable filling

```
Coolant percentage
too high
Add H2O only?
No               Yes
```

Error III

If the concentration is already to high, the filling switches to a H_2O only filling.

Input

No: Leave function

Yes: Switch to Water only filling

For more information on the Water only filling, please refer to:

H2O only filling *(on page 118)*

```
Bad values
Check desired %
and continue
         Ok
```

Error IV

When the level has been too low (detection not possible) at the start of the filling, it's possible that the concentration values are off after the first filling. The variable filling cannot continue. Restart the procedure and if required change the desired percentage to increase it in smaller steps.

Input

Ok: Leave function

```
Filling to 59 %
Level: 17 %
H2O: 6,6 L
OIL: 0.75 L  F: 16.1
```

Step VII

Once analysis is concluded, the tank will be filled. On the screen the progress is indicated.

Filling to refers to the actual percentage until which the tank will be filled. This percentage is based on the total measuring range of the Device.

Level is the actual level at this moment.

H2O indicates the amount of water that has already been added.

OIL shows the amount of oil that is already added, while the **F**-value keeps track of the amount of oil that still needs to be added, because of the water that has already been added.

When the level is equal or higher to the target, the filling will stop.

All percentages indicated on this screen, refer to the percentage of the substructure is submerged.

If there is still oil to be added, then this will happen now. After the filling, the Device is entirely cleaned. When device is cleaned and all self-checks are OK, the device returns to stand-by. This last part of the procedure is identical to that of a fixed filling.

Fixed filling *(on page 111)*

Important:
In normal operation, when the filling starts automatically, the entire program is executed automatically. All screens where input is requested have a timeout. When a timeout has lapsed, automatically the next logic step is chosen in order to complete the filling.

6.5.1.3. Oil only filling

This function allows to top up the Coolant to the correct percentage (the target percentage) by only adding oil. The filling cycle will perform a measurement to define the correct amount of oil to add and mix. Afterwards the sensors will be cleaned as part of the filling cycle.

```
Adding oil
to reach: 7.5 %
Checking ...
```

Step I
The Device will first perform a level check to ensure that there is room for adding the oil. If the level is above the maximum level, confirmation to continue is asked first (Error I). This is typically possible as only a limited volume of oil will be added.

```
Adding oil
Already above
max level
Ignore  ---   Cancel
```

Error I
The Device indicates that the tank is already full. The filling is paused. The operator can press OK or the Device will automatically return to Stand-by.
Input
Ignore: Continue to measurement; Step II
Cancel: Leave function

```
Filling with oil
to Percentage: 7.5 %
Will measure 1st
Cancel           Ok
```

Step II
A full measurement cycle will take place (Step III).
Input
Cancel: Leave function
Ok: Continue with filling; Step III

```
MSR: 6 (3)
 -H2O Pressure (0)
 -Air PRessure (0)
 -Oil Level (0)
```

Step III
A full measurement cycle is started. Based on the measurements, the necessary calculations are done to define volume and concentration of the top-up.
The device may rise above the Max level by executing this function, but it will not exceed the Error High Level value.

For more information on the MSR cycle, please refer to:
MSR Now *(on page 68)*

```
Not enough oil
to complete
Adding remaining oil
```

Error II
When there is not enough oil available to finish the entire filling, the remaining amount of oil will be added. Afterwards a notification is given to refill the barrel of oil.
Input
For more information on setting the oil capacity, please refer to:
Oil capacity *(on page 147)*

```
Adding OIL
0.3L of 0.6L

Press to pause
```

Step IV
During the filling, the progress is show on the screen.
When the filling is completed, the device returns to Stand-by.
Input
Any key: Pause filling oil

```
Adding OIL
PAUSED
Please select
Cont            OIL
```

Error III
The pause menu during the adding of oil allows for resetting the capacity of oil available to the Device or continuing the adding.
Input
Cont: Continue to add oil
OIL: Reset the oil capacity

For more information on setting the oil capacity, please refer to:
Oil capacity *(on page 147)*

```
Adding oil
Error oil pump
not rotating
Retry        Cancel
```

Error IV
During the filling oil, the oil pump is monitored. If it stops unexpectedly, an error is given. This allows to check what is wrong.
Input
Retry: Perform oil pump check again
Cancel: Leave function

Important:
In normal operation, when the filling starts automatically, the entire program is executed automatically. All screens where input is requested have a timeout. When a timeout has lapsed, automatically the next logic step is chosen in order to complete the filling.

6.5.1.4. H_2O only filling

This function allows to top up the coolant to the maximum level with water only, in order to reduce the concentration. The filling cycle will perform a level measurement to define the correct volume of water to be used for topping up. Cleaning of the sensors is in this case not required.

```
Filling with H2O
to 650 Liters
Checking ...
```

Step I

A measurement will take place and water will be filled until the standard volume.

```
Adding H2O
Already above
max level
         Ok
```

Error I

If too much Coolant is present, an error will be given to abort the filling.

Input

Ok: Leave function

```
Adding H2O
Level = ok
Continue?
Yes               No
```

Step II

The Device indicates that it can detect Coolant and that there is space available to perform a top-up.

Input

Yes: Continue with filling; Step III

No: Leave function

```
Filling H2O
581 L => 650 L
49.2% => 62%
```

Step III

The Device indicates that it will fill the tank to a total volume of 650 L. The percentages refer to the percentage of the substructure that is submerged at the indicated levels.

```
Filling stopped
Max volume added or
max level reached
Retry             Ok
```

Step IV

If there is an error during adding the water, the Device will indicate this and cancel the filling function.

Input

Retry: perform H_2O only filling again

Ok: End filling and continue to Stand-by

Important:

In normal operation, when the filling starts automatically, the entire program is executed automatically. All screens where input is requested have a timeout. When a timeout has lapsed, automatically the next logic step is chosen in order to complete the filling.

6.5.2. Filling settings menu

This menu gives access to settings regarding the filling parameters.

```
>Percentage
 Safety Factor
 Filling Timer
 Oil-free filling
 Mandatory filling
 Acceptable %
 Filling Delay
 Filling block I/O
 Filling block inv.
 Partial fill factor
 Back
Up    Select    Down
```

This menu allows to select the type of filling cycles to perform, as well as set parameters that prevent filling cycles from starting too soon.

Path

Main menu > Filling menu > Filling settings

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.5.2.1. Percentage

This value defines the target concentration. Each time the Device needs to top up the coolant tank, it will calculate at which percentage it has to add new coolant, in order to achieve this target percentage after topping up the tank to the maximum level.

```
Percentage
Old  09.5 %
New  09.0 %
+       Save       -
```

Values

Min: 1 %

Max: 25 %

Default: 7.0 %

Path

Main menu > MSR menu > MSR settings > Fillings settings > Percentage

Input

Pulsating keypress: 1 %

Single keypress: 0,1 %

6.5.2.2. Safety Factor

This function allows to set a safety factor that will be applied to the percentage of the new mixture that is added. Each time the Device needs to top up the coolant tank, it will reach (e.g.) 98% of the desired concentration for the Coolant at Max level. This factor makes it possible to make a choice between over- or undershooting the desired concentration.

```
Percentage
Old  97 %
New  98 %
+       Save       -
```

Values

Min: 1 %

Max: 130 %

Default: 97 %

Path

Main menu > MSR menu > MSR settings > Fillings settings > Safety Factor

Input

Pulsating keypress: 1 %

Single keypress: 0.5 %

6.5.2.3. Filling timer

This timer defines the amount of time that the level has to remain below the Min level (= Max level – Coolant drop), before the Device will start the cycles needed in order to top up the metalworking fluid.

```
Filling timer
Old  20 minute(s)
New  22 minute(s)
+       Save       -
```

Values

Min: 1 minute

Max: 120 minutes

Default: 20 minutes

Path

Main menu > Filling menu > Filling settings > Filling Timer

Input

Pulsating keypress: 10 minutes

Single keypress: 1 minute

This timer can be set larger when it is known that the return takes a long time due to f.i. filter media that restricts the flow or with the use of bigger systems. Defining a too short time can result in flooding the tank, as Coolant can come back from the Process after the filling cycle has finished.

Important:
Only change this value if you have a very thourough understanding of the Device. Wrong values can lead to the Device becoming hyperactive and fill too soon, which might lead to a Coolant tank flood.

6.5.2.4. Oil-free filling menu

This sub-menu gives access settings regarding oil free fillings. When enabled, the device is able to perform fillings with water only when the oil barrel is empty. This way, the Coolant levels remain correct and the normal working of the Machine isn't interrupted. When disabled, oil-free fillings are not performed and it is required to fill the oil barrel before another top-up can take place.

```
>Enable/Disable
 Max attempts
 Back
Up     Select   Down
```

Path

Main menu > Filling menu > Filling Settings > Oil-free Filling

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.5.2.4.1. Enable/Disable Oil-free Filling

This function allows enabling or disabling the Oil-free Filling option on the Device. These Oil-free fillings are performed when a top-up of the coolant tank is required, the oil barrel is empty and this option is enabled.

```
Oil-free Filling
Enabled/Disabled

Edit    Save    Exit
```

Values
Enabled or Disabled
Default: Disabled

Path

Main menu > Filling menu > Filling settings > Oil-free filling > Enable/Disable

Input
Edit: Change setting
Save: Apply changes
Exit: Leave function

6.5.2.4.2. Max attempts of Oil-free Filling

This function allows to set the number of oil-free fillings that can be performed. If the number is attained, the Device will cease all filling activity until the oil barrel is filled again.

```
Max Oil-free
Old: 2 attempts
New: 3 attempts
+       Save       -
```

Values
Min: 1
Max: 10
Default: 3

Path

Main menu > Filling menu > Filling settings > Oil-free filling > Max attempts

Input
Pulsating keypress: 1
Single keypress: 1

6.5.2.5. Mandatory filling menu

This sub-menu gives access to the settings regarding Mandatory fillings. When enabled, the Device is able to perform fillings with a fixed percentage when the measurements cannot take place or return an unacceptable result. This way, the Coolant levels remain correct and the normal working of the Machine isn't interrupted. When disabled, mandatory fillings are not performed and it is required to resolve the reason why the measurement was not correct, before a refill can take place.

```
 Enable/Disable
 Max attempts
 Percentage
 Back
Up     Select   Down
```

Path

Main menu > Filling menu > Filling Settings > Mandatory Filling

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.5.2.5.1. Enable/Disable Mandatory Filling

This function allows enabling or disabling the Mandatory Filling option on the Device. These Mandatory fillings are performed when a top-up of the coolant tank is required, but the in-line refractometer sensor doesn't provide a good result and this option is enabled.

```
Mandatory Filling
Enabled/Disabled

Edit    Save    Exit
```

Values

Enabled or Disabled

Default: Disabled

Path

Main menu > Filling menu > Filling settings > Mandatory Filling > Enable/Disable

Input

Edit: Change setting

Save: Apply changes

Exit: Leave function

6.5.2.5.2. Max attempts of Mandatory Filling

This function allows to set the number of mandatory fillings that can be performed. If the number is attained, the Device will cease all filling activity until a measurement cycle has been successfully completed.

```
Max mandat. filling
Old: 5 attempts
New: 10 attempts
+       Save       -
```

Values

Min: 1

Max: 10

Default: 5

Path

Main menu > Filling menu > Filling settings > Mandatory filling > Max attempts

Input

Pulsating keypress: 1

Single keypress: 1

6.5.2.5.3. Mandatory Filling Percentage

This value is the fixed percentage that the Mandatory Filling option will use when topping up the coolant. This value can be changed depending on the material that is machined and how much concentrate is typically required to keep a stable percentage.

```
Mandatory %
Old: 1.5 %
New: 1.2 %
+       Save       -
```

Values

Min: 0.5 %

Max: 25 %

Default: 1.5 %

Path

Main menu > Filling menu > Filling settings > Mandatory filling > Percentage

Input

Pulsating keypress: 0.5 %

Single keypress: 0.1 %

6.5.2.6. Acceptable percentage

This value is the minimum value a measurement has to be, in order to register as a correct measurement that can be used for a refill. For all measurements that are lower than this value, the measurements will be discarded. If mandatory filling is active and a filling is required to keep the correct volume in the Coolant tank, but a percentage lower than the acceptable percentage is measured, the Device will top up the Coolant with a fixed percentage. If the Mandatory filling is disabled and the measurement result is below the Acceptable percentage, no refill will take place. By setting this value in function of the normal workings of your device, it’s possible to prevent adding too much (too little) oil by one faulty measurement.

```
Acceptable %
Old  0.5 %
New  1.0 %
+       Save       -
```

Values
Min: 0.5 %
Max: Min percentage - 3 %
Default: 1.5 %

Path
Main menu > MSR menu > MSR settings > BRIX > Acceptable %
OR
Main menu > Filling menu > Filling Settings > Mandatory Filling > Acceptable %

Input
Pulsating keypress: 0.5 %
Single keypress: 0.1 %

6.5.2.7. Filling delay

This timer defines the minimum amount of time that has to pass after a filling cycle has ended, before a new filling cylce can start.

```
Filling delay
Old  0.5 hour(s)
New  4 hour(s)
+       Save       -
```

Values
Min: 0.5 hours
Max: 48 hours
Default: 1.0 hours

Path
Main menu > Filling menu > Filling settings > Filling Delay

Input
Pulsating keypress: 1 hour
Single keypress: 0.5 hour

This timer can be set larger to build in extra safety against executing too many fillings. When it is known that the consumption of the Process is only a limited amount, the timer can be set longer. Defining a too short time could result in too many filling cycles and thus flooding the tank.

6.5.2.8. Filling block I/O (if installed)

This function allows to enable or disable the filling block. When enabled, all fillings are blocked as long as the incoming signal is high (Normal Open).

```
Filling block
Enabled/disabled

Edit    Save    Exit
```

Values
Enabled or Disabled
Default: Disabled

Path
Main menu > Filling menu > Filling settings > Filling block I/O

6.5.2.9. Filling block invert (if installed)

This function allows to invert the required signal for the filling block. When regular, Normal Open stays active. When inverted, Normal Closed becomes active. The Current Status indicated the status of the external switch.

```
Filling block signal
Inverted/Regular
Current Status
Edit    Save    Exit
```

Values
Inverted or Regular
Default: Regular

Path
Main menu > Filling menu > Filling settings > Filling block invert

6.5.2.10. Partial fill factor

This function allows to set a factor to the coolant drop. During a filling, the volume of the coolant drop is the maximum volume that can be added during a single filling. When this volume is reached, the filling will stop. This value allows to change the volume that can be added during the filling. A value smaller than 100 % will reduce the volume, a value larger than 100 % will increase the volume. The volume to be added is always a percentage of the coolant drop.

```
Partial fill factor
Old: 100 %
New: 050 %
+       Save       -
```

Values
Min: 10 %
Max: 500 %
Default: 100 %

Path
Main menu > Filling menu > Filling settings > Partial fill factor

Input
Pulsating keypress: 10 %
Single keypress: 1 %

This value can be set smaller than 100 % when it is the goal to work with small fillings. Setting a smaller volume, helps to reduce thermal shock for the Coolant. Also when the filling timer is typically high because of a slow return, setting a smaller value will help prevent a flooding of the tank. In circumstances where there is a small tank and thus little room available in the Coolant tank for security, a smaller percentage will help the stability.

6.6. Data menu

This menu allows to navigate to the Settings concerning the data aspects of the device.

```
>Connections
 Updates
 Backups
 Time and date
 Back
Up    Select    Down
```

This menu allows to edit any parameter of the network connections, backups and Time & date settings.

Path
Main menu > Data menu

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.6.1. Connections menu

This sub-menu allows to edit to the Settings concerning the different network connections (LAN or WLAN).

```
>WiFi
 4G
 LAN
 Back
Up    Select    Down
```

This menu allows to edit any parameter of the (W)LAN settings and reboot the connection for troubleshooting.

Path

Main menu > Data menu > Connections

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.6.1.1. WiFi menu

This sub-menu allows to edit to the Settings concerning the WLAN network (WiFi) connections.

```
>WiFi Status
 Restart WiFi
 Access Point
 Back
Up    Select    Down
```

This menu allows to edit any parameter of the WLAN settings (WiFi) and reboot the connection for troubleshooting.

Path

Main menu > Data menu > Connections > WiFi

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.6.1.1.1. WiFi Status

Displays the IP address and the Gateway of the WiFi connection. This information is read-only and cannot be changed from this view.

```
WiFi Details
IP 192.168.0.255
GW 255.255.255.0
---      Ok      ---
```

Path

Main menu > Data menu > Connections > WiFi > WiFi Status

Input

OK: Leave function

6.6.1.1.2. Restart WiFi

This function allows to manually restart the WiFi connection in order (re)connect with the last known WiFi network that is saved in the Devices' setttings.

```
Restart WiFi
to last network?

No      ---      Yes
```

Function

Initiate the restart of the WiFi connection by pressing **Yes**.

Path

Main menu > Data menu > Connections > WiFi > Restart WiFi

Input

No: Leave function

Yes: Restart WiFi connection; Step 1

```
Restart WiFi
No data found
unable to restart
         Ok
```

Error 1

The configuration file does not contain the right information to restart the WiFi connection.

Navigate to the acces point mode in order to insert the correct settings.

Input

Ok: Leave function

```
Restart WiFi
Successfull

         Ok
```

Step 1

The configuration file did contain the right information to restart the WiFi connection.

Connection with WiFi network has been made and the Device can connect to the my.will-fill.com-server.

Input

Ok: Leave function

```
Restart WiFi
Unsuccessfull

         Ok
```

Error 2
The configuration file did contain the right information to restart the WiFi connection, but the connection with the my.will-fill.com-server could not be made.
Connection with WiFi network has been made and the Device is available in the local WLAN.

Input
Ok: Leave function

6.6.1.1.3. Access Point

This function allows to star the Acces point mode on the Device. It allows to user to connect directly to the Will-Fill and insert the correct network settings to connect to the existing network (LAN or WLAN).

```
Back to
Access point?

No      ---      Yes
```

Function
At this point the device is in Access Point mode and will transmit its own Wi-Fi network.

Path
Main menu > Data menu > Connections > WiFi > Access point
OR
Main menu > Data menu > Connections > LAN > Access point
Input
No: Leave function
Yes: Switch to access point mode; result is given in next step.
Activating the access point mode might take 2-3 minutes.

```
Will-Fill
in Access point

         Ok
```

Step 1
The Device is now in Access point mode and connecting to the Device is possible.
The network name is My-Will-Fill-xxxxxx, where the x's stand for the device serial number. In case of a connection via WiFi, the network can be found in the list of available WiFi networks on your mobile or PC. After connecting to the network, use the password "**6kNszY1X**".
In case of wired connection, it's not required to select the network and connect with a password.
When connection is established, open a browser (chrome recommended) and navigate to **10.0.0.1**. When the page opens, configure the settings for the WiFi and or LAN network. Once the device is connected to the internet through the local network, it will appear as online in the my.will-fill.cloud-environment..

Input
Ok: Leave function

6.6.1.2. 4G menu

This sub-menu allows to edit to the Settings concerning the 4G (mobile phone) connection.

```
>This function
is locked
To unlock
Contact supplier
```

This menu is only available on request and is not (yet) available to users.
After a timeout of 10 seconds the Device returns to the **Connections menu**.

Path

Main menu > Data menu > Connections > 4G

6.6.1.3. LAN menu

This sub-menu allows to edit to the Settings concerning the LAN network (ethernet) connections.

```
>LAN Status
 Restart LAN
 Access Point
 Back
Up    Select    Down
```

This menu allows to edit any parameter of the LAN settings (ethernet) and reboot the connection for troubleshooting.

Path

Main menu > Data menu > Connections > LAN

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.6.1.3.1. LAN Status

Displays the IP address and the Gateway of the LAN connection. This information is read-only and cannot be changed from this view.

```
LAN Details
IP 192.168.0.255
GW 255.255.255.0
---      Ok      ---
```

Path

Main menu > Data menu > Connections > LAN > LAN Status

Input

OK: Leave function

6.6.1.3.2. Restart LAN

This function allows to manually restart the LAN connection in order (re)connect with the last known LAN network that is saved in the Devices' setttings.

```
Restart LAN
to last network?

No      ---      Yes
```

Function
Initiate the restart of the LAN connection by pressing **Yes**.

Path
Main menu > Data menu > Connections > LAN > Restart LAN
Input
No: Leave function
Yes: Restart LAN connection; Result is given in next step

```
Restart LAN
No data found
unable to restart
         Ok
```

Function
The configuration file does not contain the right information to restart the LAN connection.
Navigate to the acces point mode in order to insert the correct settings.

Input
Ok: Leave function

```
Restart LAN
Successfull

         Ok
```

Function
The configuration file did contain the right information to restart the LAN connection.
Connection with LAN network has been made and the Device can connect to the my.will-fill.com-server.

Input
Ok: Leave function

```
Restart LAN
Unsuccessfull

         Ok
```

Function
The configuration file did contain the right information to restart the LAN connection, but the connection with the my.will-fill.com-server could not be made.
Connection with LAN network has been made and the Device is available in the local LAN.

Input
Ok: Leave function

6.6.1.3.3. Access Point

This function allows to star the Acces point mode on the Device. It allows to user to connect directly to the Will-Fill and insert the correct network settings to connect to the existing network (LAN or WLAN).

```
Back to
Access point?

No      ---      Yes
```

Function
At this point the device is in Access Point mode and will transmit its own Wi-Fi network.

Path
Main menu > Data menu > Connections > WiFi > Access point
OR
Main menu > Data menu > Connections > LAN > Access point
Input
No: Leave function
Yes: Switch to access point mode; result is given in next step.
Activating the access point mode might take 2-3 minutes.

```
Will-Fill
in Access point

         Ok
```

Step 1
The Device is now in Access point mode and connecting to the Device is possible. The network name is My-Will-Fill-xxxxxx, where the x's stand for the device serial number. In case of a connection via WiFi, the network can be found in the list of available WiFi networks on your mobile or PC. After connecting to the network, use the password "**6kNszY1X**".
In case of wired connection, it's not required to select the network and connect with a password.
When connection is established, open a browser (chrome recommended) and navigate to **10.0.0.1**. When the page opens, configure the settings for the WiFi and or LAN network. Once the device is connected to the internet through the local network, it will appear as online in the my.will-fill.cloud-environment..

Input
Ok: Leave function

6.6.2. Updates menu

This sub-menu allows to edit to the Settings concerning the firmware updates of the Device.

```
>Allow updates
 Get Updates
 Reset Updates
 Sync Data
 Back
Up    Select    Down
```

This sub-menu allows to change settings concerning the firmware updates of the Device as well as managing the transfer of measurement data and reports to the my.will-fill.com-server.

Path
Main menu > Data menu > Updates

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.6.2.1. Allow updates

This function allows to enable or disable automatic updates of the firmware via the cloud services of Will-Fill.

```
Allow updates
Enabled/Disabled

Edit    Save    Exit
```

Values
Enabled or Disabled
Default: Enabled

Path
Main menu > Data menu > Updates > Allow updates

Input
Edit: Change setting
Save: Apply changes
Exit: Leave function

6.6.2.2. Get updates

This function allows to check the availability of updates of the firmware via the cloud services of Will-Fill. In case there is an update available, the Device will perform the upgrade immediately.

```
Check for
updates?

No      ---      Yes
```

Path
Main menu > Data menu > Updates > Get updates

Input
No: Leave function
Yes: Check (and update)

```
Checking for
updates...
No updates
```

Error 1
No updates can be installed. This means that either the Device is up-to-date or there is no connection to the serveravailable. The Device will return to the **Updates menu**.

```
Checking for
updates...
Updates available
```

Step 1
Updates can be installed. The Device will start with performing the update.

```
Updating
Please do not
power off
```

Step 2
The Device is downloading the files and performs the update immediately.

```
Updating
Done
Please power off
```

Step 3
The Device has installed the update. In order to apply, restart the Device by powering off and restarting it.

For **power off** keep pressing the power button untill the device beeps. After the beep, release the power button. The Device will run a shutdown cleaning cycle and will auto power off. Once the Device is powered off, disconnect the power cord.

Start the Device
Powering on the Will-Fill can be done by pressing the power button shortly.
This button will light up to let you know the device is powered.

> **Note:**
> It can take up to **5 minutes** before a message appears on the screen because of the start-up of the internal processes. Right before the first message appears on the screen you will hear a **short tone**.

```
Updating
Failed
Contact Will-Fill
         Ok
```

Error 2
The update could not be performed. Contact Will-Fill to check why it was unsuccessfull and to have the update be executed manually.

Input
Ok: Leave function

6.6.2.3. Reset updates

This function allows to delete the files of the failed update, so that the update can take place again.

```
Clear
updates?

No      ---      Yes
```

Path
Main menu > Data menu > Updates > Reset updates

Input
No: Leave function
Yes: Check (and delete)

```
Clearing
updates...
```

Step 1
The Device is deleting the files that were downloaded during the previous update attempt.

```
Updates cleared
```

Step 2
All updates files have been cleared.
It's possible to restart the update process by starting the **Get updates** function.

6.6.3. Backup menu

This sub-menu allows to edit to the Settings concerning the backup of the firmware and configuration files of the Device.

```
>Perform Backup
 Restore Backup
 Upload Backup
 Download Backup
 Enable auto Backup
 Auto Backup Time
 Back
Up    Select    Down
```

This sub-menu allows to change settings concerning the backups of the firmware and configuration files of the Device as well as managing the settings of the automatic bakcup procedure.

Path
Main menu > Data menu > Backups

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.6.3.1. Perform Backup

This function creates a backup of the firmware and all the configuration files that hold the Device settings.

```
Generating
backup ...
```

Function
The backup is being performed. All files are saved in a seperate location on the Device.

Path
Main menu > Data menu > Backup menu > Perform Backup

```
Generating
backup done
```

Result
Backup has been performed successfully.
The Device returns automatically to the Backup menu.

6.6.3.2. Restore Backup

This function restore a previously made backup of the firmware and all the configuration files that hold the Device settings.

```
Restoring
backup ...
```

Function
The restore of a previously made backup is being performed. All files, saved in a seperate location on the Device, are placed back in the system folder for use.

Path
Main menu > Data menu > Backup menu > Restore Backup

```
Restoring
backup done
```

Result
Backup has been performed successfully.
The Device returns automatically to the Backup menu.
Reboot the Device for the changes to take effect.

For **power off** keep pressing the power button untill the device beeps. After the beep, release the power button. The Device will run a shutdown cleaning cycle and will auto power off. Once the Device is powered off, disconnect the power cord.

Start the Device
Powering on the Will-Fill can be done by pressing the power button shortly.
This button will light up to let you know the device is powered.

Note:
It can take up to **5 minutes** before a message appears on the screen because of the start-up of the internal processes. Right before the first message appears on the screen you will hear a **short tone**.

6.6.3.3. Upload Backup

This function allows to store a previously made backup of the firmware and all the configuration files on the my.will-fill.com-server.

```
Backup will be
Uploaded to cloud

Ok      ---   Cancel
```

Function
This function allows to store a previously made backup of the firmware and all the configuration files on the my.will-fill.com-server. In case of fatal crash of the Device, it is possible to restore all data from the server.

Path
Main menu > Data menu > Backup menu > Upload Backup

Input
Ok: Start upload
Cancel: Leave function

```
Uploading
backup ...
```

Step 1
Upload is being preformed.
The Device returns automatically to the Backup menu when the upload is complete.

6.6.3.4. Allow auto Backup

This function allows to enable or disable automatic backups of the firmware and configuration files directly on the device. This backup will be made at regular intervals.

```
Backups
Enabled/Disabled

Edit    Save    Exit
```

Values
Enabled or Disabled
Default: Enabled

Path
Main menu > Data menu > Backup menu > Enable auto Backup

Input
Edit: Change setting
Save: Apply changes
Exit: Leave function

6.6.3.5. Auto Backup timer

This timer defines the interval in between automatic backups, taken by the Device.

```
Backup time?
Old  03 day(s)
New  04 day(s)
+       Save       -
```

Values
Min: 1 day(s)
Max: 14 day(s)
Default: 3 days

Path
Main menu > Data menu > Backup menu > Auto Backup timer

Input
Pulsating keypress: 1 day
Single keypress: 1 day

Tip:
The obtain optimal protection against data loss, it's best to set this timer shorter than the automatic reboot time. This way a backup is taken before every automatic reboot of the Device.

6.6.4. Auto Reboot timer

This timer defines the interval in between automatic reboots, executed by the Device, to free up memory etc. in the internal PC.

```
Reboot time?
Old  03 day(s)
New  04 day(s)
+       Save       -
```

Values

Min: 3 day(s)

Max: 14 day(s)

Default: 7 days

Path

Main menu > Data menu > Auto Reboot timer

Input

Pulsating keypress: 1 day

Single keypress: 1 day

Tip:
The obtain optimal protection against data loss, it's best to set this longer shorter than the automatic backup time. This way a backup is taken before every automatic reboot of the Device.

6.7. Settings menu

This menu allows to edit the Settings concerning the different media used by the Device and the general settings for using the menu.

```
>General
 Emulsion settings
 Oil settings
 H20 settings
 Air settings
 Back
Up    Select    Down
```

This menu allows to edit any parameter of settings for the user menu, as well as setting for the coolant, oil, water and air that is being used by the Device.

Path

Main menu > Settings menu

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.7.1. General menu

This menu allows to edit the Settings concerning the general settings for using the menu.

```
>Password on/off
 Set Password
 Metric / imperial
 Buzzer on/off
 Language
 Back
Up    Select    Down
```

This menu allows to edit any parameter of settings for the user menu, like password settings and the use of the internal buzzer.

Path

Main menu > Settings menu > General

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.7.1.1. Password on/off

This function allows to enable or disable the requirement of entering a password before gaining access to the Main menu.

```
Password
Enabled/Disabled

Edit    Save    Exit
```

Values

Enabled or Disabled

Default: Enabled

Path

Main menu > Settings menu > General > Password on/off

Input

Edit: Change setting

Save: Apply changes

Exit: Leave function

Remember:
For the key functions like resetting the **Oil capacity** and checking the **alarm info** the use of the Main menu and password is not required, as they are available as a shortcut in the **Stand-by** screen.

6.7.1.2. Set Password

This function allows to change the password needed for gaining access to the Main menu.

```
Password

        0000
+       Next       -
```

It's required to insert the current password to enter this menu.In the next steps, you'll be asked to enter the new password and also confirm the new password.

Path

Main menu > Settings menu > General > Set Password

Input

+: Increase number

Next: Jump to next character. At 4th character, go to next screen.

-: Decrease number

6.7.1.3. Metric / Imperial

This function allows to choose in which unit the information is displayed to the user. Choice is between Metric and Imperial units. At this moment, only Metric units are available.

```
Metric / Imperial
Metric

Edit    Save    Exit
```

Values

Metric or Imperial

Default: Metric

Path

Main menu > Settings menu > General > Metric / Imperial

Input

Edit: Change setting

Save: Apply changes

Exit: Leave function

6.7.1.4. Buzzer on/off

This function allows to enable or disable the use of the internal buzzer (sound) by the Device.

```
Buzzer
Enabled/Disabled

Edit    Save    Exit
```

Values

Enabled or Disabled

Default: Disabled

Path

Main menu > Settings menu > General > Buzzer on/off

Input

Edit: Change setting

Save: Apply changes

Exit: Leave function

6.7.1.5. Language

This function allows to choose the language that is used by the Device. At this moment only English is available.

```
Language
English

Edit    Save    Exit
```

Values

English

Default: English

Path

Main menu > Settings menu > General > Language

Input

Edit: Change setting

Save: Apply changes

Exit: Leave function

6.7.2. Emulsion Settings

This sub-menu allows to edit the Settings concerning the emulsion (or coolant).

```
>Max volume
 Coolant drop
 Show Level L
 Show Level CM
 Undetected volume
 Error high level
 Back
Up    Select    Down
```

This menu allows to edit any parameter related to the level of the emulsion.

Path

Main menu > Settings menu > Emulsion Settings

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.7.2.1. Max Volume

This value is the maximum volume the Will-Fill will reach every time it tops up the coolant.

```
Max Volume
Old:  820 Liter
New:  1020 Liter
+       Save       -
```

Function

This value defines the maximum volume the Will-Fill will try to reach every time it tops up the coolant.

When the value is saved and the current level is lower than the minimum level (= **Max level** – **Coolant drop**), then the Device will ask to perform a filling to the **Max level**.

This function bypasses the Filling timer.

Values

Min and Max values are calculated during the installation of the Device by means of the level sensor and in function of what setting was made during the installation. These values are thus dependent on the Machine (including the Coolant tank) on which the Device has been installed. The maximum level is also influenced by the value of the Coolant drop.

The default value is related to the Coolant tank size and also configured during the installation.

> **Note:**
> If the Coolant tank is equipped with a level gauge, set your **Max Volume** in the middle of the normal operating range of the tank.

Path

Main menu > Settings menu > Emulsion Settings > Max Volume

Input

Pulsating keypress: 50 Liters

Single keypress: 5 Liters

```
Add coolant
Now?

Yes     ---       No
```

Function

This function allows to fill up the tank to the maximum level, as saved just before. If **Yes** is selected, a full measuring cycle will be performed, before starting the top-up sequence. The entire cycle will be handled automatically.

Input

Yes: Execute filling cycle

No: Leave function (new **Max Volume** is saved)

6.7.2.2. Coolant Drop

This value is the difference in volume between the situation where the Machine is at rest and the situation where all the pumps are activated and Coolant is stably circulating through the Process. For the Device to start a filling cycle, the level of the Coolant has to drop with a volume of the **Coolant drop**, and stay there for the duration of the **Filling timer**.

```
Coolant Drop
Old:  130 Liter
New:  150 Liter
+       Save       -
```

Function

This value represents the maximum liters of fluctuation that can be considered to be normal for the working of the machine. Typically this is the difference between the volume when the Process is at a standstill and the volume when all pumps of the Process are activated, and Coolant is circulating.
The best way to set this up is to determine the coolant drop of the Coolant by calculating the difference between the 2 situations, and add at least 15% to this volume. By doing this the device will not become hyperactive whenever a small amount of coolant is missing due to all pumps starting up.
When the Device measures that there is more coolant missing from the Coolant Tank than the coolant drop, the filling cycle will start.

Values

Min and Max values are calculated during the installation of the Device by means of the level sensor. These values are thus dependent on the Coolant tank on which the Device has been installed.
The default value is related to the Coolant tank size and also configured during the installation.

Path

Main menu > Settings menu > Emulsion Settings > Coolant Drop

Input

Pulsating keypress: 10 Liters
Single keypress: 1 Liters

6.7.2.3. Show Level in L

Show Level is a function that can display the fluctuation of the Coolant in Liters and show the time that has passed since the function has started.

```
Level: xxx.x L
+: xxx.x L : xxx.x %
-: xxx.x L : xxx.x %
Reset   Time    Exit
```

Function

At the top line the current level is displayed, “+” represents the max level and “-“ the min level since the function has started.

This function allows to check the changes in Coolant levels while activating all the pumps on the machine so you have a good guideline to set the Coolant drop and Filling timer.

Whenever the Machine is working, it will pump up Coolant from the tank and as it doesn’t instantly return, this will cause fluctuations of the Coolant level. These fluctations can be bigger and more irregular when the Process has different Coolant Tanks connected to each other.

It would not be good to start a refill every time the levels drop below the minimum level because if the coolant returns afterwards then the coolant reservoir would overflow. Therefore the right settings for **Coolant drop** and **Filling timer** are essential for the correct working of your device.

Values

The shown values are read-only.

Path

Main menu > Settings menu > Emulsion Settings > Show Level in L

Input

Reset: Resets the level values to current level and the timer value to 0

Time: Switches to Time View

Exit: Leave function

```
Time: xxx min
+: xxx.x L : xxx.x %
-: xxx.x L : xxx.x %
Reset   Level   Exit
```

Values

The shown values are read-only.

Input

Reset: Resets the level values to current level and the timer value to 0

Level: Switches to Level View

Exit: Leave function

6.7.2.4. Show Level in cm

Show Level is a function that can display the fluctuation of the Coolant in cm and show the time that has passed since the function has started.

```
Level: xxx.x L
+: xxx.x L : xxxx cm
-: xxx.x L : xxxx cm
Reset   Time    Exit
```

Function

At the top line the current level is displayed, “+” represents the max level and “-“ the min level.

This function allows you to check the changes in coolant levels while activating all the pumps on the machine so you have a good guideline to set the Coolant drop and filling Timer.

Whenever the machine is working it will pump up coolant from the reservoir and as it doesn’t instantly return, this will cause fluctuations of the coolant level. These fluctations can be bigger and more irregular when the Process has different Coolant Tanks connected to each other.

It would not be good to start a refill every time the levels drop below the minimum level because if the coolant returns afterwards then the coolant reservoir would overflow. Therefore the right settings for coolant drop and filling timer are essential for the correct working of your device.

Values

The shown values are read only.

Path

Main menu > Settings menu > Emulsion Settings > Show Level in cm

Input

Reset: Resets the level values to current level and the timer value to 0

Time: Switches to Time View

Exit: Leave function

```
Time: xxx min
+: xxx.x L : xxxx cm
-: xxx.x L : xxxx cm
Reset   Level   Exit
```

Values

The shown values are read only.

Input

Reset: Resets the level values to current level and the timer value to 0

Level: Switches to Level View

Exit: Leave function

6.7.2.5. Undetected Volume

This value allows for adjusting the total volume of Coolant, so that undetected (for the Device) tanks can be taken into consideration when calculating the required volume of oil to add. Typically this is used to indicate extra tanks that are not measured by Will-Fill; like f.i. a chiller or additionnal filtration tanks.

```
Undetected Volume
Old:  120 Liter
New:  150 Liter
+       Save       -
```

Function
Adjusting this value will allow to more precisely set the total volume present in the entire process. This needs to be correct as the Device uses this total volume to define the correct amount of oil to add during a filling cycle.

Values
Min: 0 L
Max: undefined
Default: 0 L

Path
Main menu > Settings menu > Emulsion Settings > Undetected Volume

Input
Pulsating keypress: 50 Liters
Single keypress: 5 Liters

6.7.2.6. Error high Level

This value is the maximal level the coolant can reach, measured from the baseplate of the Device towards the fluid (depth).

```
User error high
Old:  1.2 cm
New:  2.3 cm
+       Save       -
```

Function
The value is expressed in cm's. The smaller the value, the higher the level is allowed to be.
If the Coolant level rises up past this value and thus the distance between the base plate & the value gets smaller than this value, the Device will go into safety mode. When the level drops back below this value the device will exit the safety mode.

Values
Min: 0 cm
Max: device length - 2 cm
Default: 3 cm

Path
Main menu > Settings menu > Emulsion Settings > Error high Level

Input
Pulsating keypress: 1 cm
Single keypress: 0.5 cm

6.7.3. Oil Settings

This sub-menu allows to edit the Settings concerning the oil (concentrate).

```
>Bleeding line
 Oil capacity
 Brix index
 Oil notification
 Oil pump factor
 Calibration Level
 Oil counter
 Cleaning Alert
 Initial EC OIL
 Oil pressure sensor
 Back
Up    Select    Down
```

This menu allows to edit any parameter related to the oil made avialable to the Device.

Path

Main menu > Settings menu > Oil Settings

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.7.3.1. Bleeding line

This function allows to bleed the oil line by starting the oil pump.

```
Bleeding Oil
Line
Oil pump off
Start          Back
```

Function

By bleeding the oil line, all air will go out of the line. The oil pump is self-bleeding, so no special precautions need to be taken. Proper bleeding of the oil line at startup will increase the precision of the Device when it comes to keeping the concentration stable.

Path

Main menu > Settings menu > Oil Settings > Bleeding line

Input

Start: Starts the oil pump motor; oil pump on
Back: Leave function

```
Bleeding Oil
Line
Oil pump on
       Press to stop
```

Input

Any key: stops oil pump motor; Oil pump off

6.7.3.2. Oil capacity

This function shows the current amount of oil available and allows to reset the available capacity.

```
Checking level
...
```

Step I

Upon entering the function, the Device will check the current level of the oil. Whether an external oil sensor is installed or the capacity is entered manually, the Device will refresh the value and show it.

Path

Main menu > Settings menu > Oil Settings > Oil Capacity

Input

No key: level is checked; Step II

```
Oil Capacity
Volume: 175.6 L

Edit     ---    Exit
```

Step II

The Device show the available oil capacity. If no external oil sensor is used, it's possible to edit the current capacity of the oil.

Values

Min: 5 Liter

Max: 1000 Liter

Default: defined during start-up wizard

Input

Edit: Change the available oil capacity; Step III

Exit: Leave function

```
Oil Capacity
Old: 175.6 L L
Current: 193.2 L
Set   Cancel   Reset
```

Step III

Gives an overview of the last value that the capacity has been set to and the current value.

Input

Set: Choose a new value to set the level to; Step IV

Cancel: return back to previous screen; Step II

Reset: Reset the value to the default value that has been saved the previous time; Step IV

```
Oil Capacity
Old: 175.6 L L
Current: 193.2 L
 +     Save      -
```

Step IV

Allows to set a new value.

Input

pulsating keypress = 10 Liter

single keypress = 1 Liter

```
Oil Capacity
Reset to 200 L?

Yes     ---      No
```

Step V

Allows to set a previously stored value.

Input

Yes: Restore the previous saved value (f.I. 200 L)

No: Return to previous screen without changing; Step IV

Tip:
This function is also available directly from the Stand-by screen by pressing the **+**-button (**OIL** when the Device is in Stand-by. By using this shortcut, it is not necessary to enter the menu password.

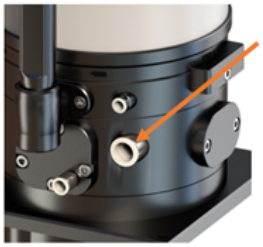
6.7.3.3. Water connection

Connect the black tube to the Device and the provided filter on one end, and the filter and water source on the other end. Make sure that there are no leaks.

Step I
It's convenient to place the water filter near the Device by means of the supplied magnets, but the point of installation is different for every Process. Make sure the arrow on the filter is pointing in the correction direction, being in the same direction as the water flow.

Step II
In front of the filter, towards the Device, connect the supplied black tube.

Insert the black tube into the water connection push-in coupling at the Device.



Step III

When required, cut the supplied black tube to length and connect it with the chosen water supply.

> **Important:**
> Minimum pressure is 2 bar and maximum pressure is 5 bar.

> **Important:**
> For proper operation of the Device, the water pressure must always be present.

Step IV

Open the tap of the water supplyO and check your installation for leaks. If a leak is detected, the water pressure should be released, so that it is possible to seal the leaking fitting in an adequate manner.

> **Important:**
> When connecting the water cable, always make sure to use the delivered black hose. In case a different hose is used, leaks can occur. The use of other hoses is at customer's risk and responsibility.

6.7.3.4. Brix index

The refractometer index (or Brix index) can be set. Every coolant oil (concentrate) has its own specific refractometer index and this can be found on the datasheet of the oil. This value enables the device to tranlate the brix measurements into a correct percentage.

```
Brix index
Old  1.05
New  1.20
+       Save       -
```

Values

Min: 0.10

Max: 3.00

Default: 1.00

Path

Main menu > MSR menu > MSR settings > BRIX > Brix Index

OR

Main menu > Settings > Oil Settings > Brix Index

Input

Pulsating keypress: 0.1 %

Single keypress: 0.01 %

6.7.3.5. Oil Notification

This value defines the level at which the Device will generate an oil low-notification.

```
Oil Notification
Old:  20 Liter
New:  10 Liter
+       Save       -
```

Function
When the Oil Notification is active, it's best to immediately refill the oil container/barrel. If a refill of oil comes too late, then the device will switch to Oil free filling cycles (if enabled).

Values
Min: 5 Liter
Max: 200 Liter
Default: 10 Liter

Path
Main menu > Settings menu > Oil Settings > Oil Notification

Input
Pulsating keypress: 5 Liter
Single keypress: 1 Liter

6.7.3.6. Oil pump factor

This value defines the amount of microliters that is displaced during a single rotation of the motor (=count). It defines how much microliter of oil is added when the motor is rotating.

```
Oil pump factor
Old:  120 microL/c
New:  263 microL/c
+       Save       -
```

Function
On default the theoretical value of 265 microLiters/Count value is being used. If **Correction Measurements** are enabled, the Device will take measurements after each filling cycle, in order to adjust the oil pump factor to the value that gives the best results for keeping the concentration stable. Eventual errors in total volume defined or fluctuations between installations due to different oils used or oil tube lengths are corrected by the PID.
The automatic adjustment of the pump factor to its ideal value can take up to a few weeks after installation of the device, depending on the number of filling cycles will be performed.

Values
Min: 100 microL/c
Max: 265 microL/c
Default: 265 microL/c

Path
Main menu > Settings menu > Oil Settings > Oil pump factor

Input
Pulsating keypress: 5 microL/c
Single keypress: 1 microL/c

6.7.3.7. Calibrate Oil Level (optional)

This function allows to calibrate the oil level sensor. This needs to happen whenever a oil sensor is connected to a new head.

Prerequisites:

Make sure to have a tape measure ready to succesfully calibrate the temperature sensor.

```
Oil Capacity
Volume: 266.4 L
Distance: 83.7 cm
Cal     ---     Exit
```

Function

This function allows to calibration the oil level sensor. A one-time calibration is necessary as the measured distances depend on the hardware of the sensor and the main PCB of the Device.

Path

Main menu > Settings menu > Oil settings > Calibrate Level

OR

Main menu > Maintenance > Calibration > Cal Level OIL

Input

Cal: Start Calibration of oil level sensor

Exit: Leave function

6.7.3.7.1. Execute Oil Level Sensor calibration

```
Oil sensor Cal
Please select
container size
---      Ok      ---
```

Step I

The Device has the most common containers predefined in the system. These can be selected from the list. Any deviating container can be defined as well.

Input

Ok: Make selection

```
>60L Barrel
 200L Barrel
 1000L IBC
 Other
Up     Select   Down
```

Step II

Select the correct container or choose **Other** to define a custom container.

Input

Select 60L / 200L / 1000L: Step VII

Select Other: Start customized container setup; Step III

```
Select Cilinder
or rectangular
Container shape
Cil     ---      Rec
```

Step III

Select whether the container has rectangular or cilindric shape.

Input

Cil: Cilindric shape; Step IV

Rec: Rectangular shape; Step III

```
Oil radius?
Old: 140 mm
New: 85 mm
+       Save       -
```

Step IV

Set the correct radius of the barrel.

Input

Pulsating keypress: 100 mm

Single keypress: 10 mm

Save: Confrim value; Step V

```
Container Height
Old: 300 mm
New: 320 mm
+       Save       -
```

Step V

Set the correct height of the barrel

Input

Pulsating keypress: 10 mm

Single keypress: 1 mm

Save: Confrim value; Step V

```
SELECT OIL VOLUME
Other 643 L

Next     ---    Edit
```

Step VI

The total volume of the barrel is calculated and shown on the screen.If correct, continue to next step. If incorrect, editing is possible.

Input

Next: confirm volume; Step VIII

Edit: Remake selection of barrel; Step II

```
SELECT OIL VOLUME
60L / 200 L / 1000 L

Next     ---    Edit
```

Step VII

The total volume of the barrel is shown on the screen. If correct, continue to next step. If incorrect, editing is possible.

Input

Next: confirm volume; Step VIII

Edit: Remake selection of barrel; Step II

```
Ok will set
0079 cm as level
value
---      Ok      ---
```

Step VIII

The Devices measures the actual distance to the level of the oil, and show the value on the screen.

Input

Ok: Confirm distance; Step IX

```
Volume Now?
Old: 185 L
New: 134 L
+       Save       -
```

Step IX

Set the current volume that is present in the barrel. The Device will calculate correlate the volume in the barrel with the measured distance of the sensor.

Input

Pulsating keypress: 10 Liter

Single keypress: 1 Liter

Save: Confrim value; Step IX

```
Oil Calibration
Calculating volume
```

Step X

The correlation between distance and volume is calculated. The Devices automaticlly return to **Calibrate Oil Level**.

6.7.4. H_2O Settings

This sub-menu gives access to the settings regarding the water.

```
>Initial EC H2O
 Initial PH H2O
 Initial Brix H2O
 Pressure Release
 Pressure Sensor
 Pressure Check
 H2O rotor alert
 Rotor Calibration
 Back
Up    Select    Down
```

This menu gives access to perform initial measurements for the water as well as to edit any parameter related to the water pressure.

Path

Main menu > Settings menu > H2O Settings

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.7.4.1. Initial EC H_2O

Displays the initial EC values for H_2O and offers the possibility of teaching new H_2O-values. When using demineralized water, this function will not be available.

```
Initial EC H2O
Now: 1200 microS

Teach     ---   Back
```

Path

Main menu > Settings menu > H2O Settings > Initial EC H2O

Input

Teach: EC MSR of H_2O starts; Step II

Back: Leave function

```
Initial EC H20
Old: 1200 microS
New: 1100 microS
Retry  Cancel   Save
```

Step II

The Device will start a measuring cycle for determining the EC-value of the H_2O. Afterwards the result is shown.

Input

Retry: restart the EC MSR of H_2O

Cancel: Leave function (and ignore changes)

Save : Save new values and leave function

6.7.4.2. Initial pH H_2O

Displays the initial pH values for H_2O and offers the possibility of teaching new H_2O-values. When using demineralized water, this function will not be available.

```
Initial PH H2O
Now: 7.5

Teach     ---   Back
```

Path

Main menu > Settings menu > H2O Settings > Initial PH H2O

Input

Teach: pH MSR of H_2O starts; Step II

Back: Leave function

```
Initial EC H20
Old: 7.5
New: 7.8
Retry  Cancel   Save
```

Step II

The Device will start a measuring cycle for determining the pHvalue of the H_2O. Afterwards the result is shown.

Input

Retry: restart the pH MSR of H_2O

Cancel: Leave function (and ignore changes)

Save : Save new values and leave function

6.7.4.3. Initial Brix H_2O

Displays the initial Brix values for H_2O and offers the possibility of teaching new H_2O-values. The Brix value of the water allows to initialize the refractometer sensor. this happens automatically during the start-up wizard.

```
Initial Brix H2O
0.2

Teach     ---   Back
```

Path
Main menu > Settings menu > H2O Settings > Initial Brix H2O

Input
Teach: Brix MSR of H_2O starts; Step II
Back: Leave function

```
Initial Brix H20
Old: 0.2
New: 0.4
Retry  Cancel   Save
```

Step II
The Device will start a measuring cycle for determining the Brix-value of the H_2O. Afterwards the result is shown.
Input
Retry: restart the Brix MSR of H_2O
Cancel: Leave function (and ignore changes)
Save : Save new values and leave function

6.7.4.4. H_2O Pressure Release

This function allows the pressure to be released of the H_2O supply. Before this function is used, it is important to shut off the water supply.

```
Make sure water-
supply is disabled

Back      ---     Ok
```

Function
This function is convenient to use when the water hose needs to be disconnected from the Device. Releasing the pressure will allow for the deconnecting to be done smoother.

Path
Main menu > Settings menu > H2O Settings > Pressure release

Input
Ok: The Device starts checking the pressure; Step II
Back: Leave function

```
Water Pressure
still present
Please check supply
Retry            Ok
```

Error I
Retry: restart the pressure release
Ok : Leave function

```
No Water Pressure
detected
Safe to disconnect
         Ok
```

Step II
Ok: Leave Function; water line can be disconnected.

6.7.4.5. H_2O Pressure Sensor

This function allows to enable or disable H_2O pressure notifications. If disabled, Will-Fill will not check the pressure during operation and before wet functions.

```
Pressure sensor
Enabled/Disabled

Edit    Save    Exit
```

Path

Main menu > Settings menu > H2O Settings > H2O Pressure Sensor

Input

Edit: Change setting

Save: Apply changes

Exit: Leave function

Attention:

It is advised to keep this function enabled at all times.

6.7.4.6. H_2O Pressure Check

This function allows to quickly perform an H_2O pressure check, to see if water is present to the Device. This value is read-only and the Device will automatically return to the H_2O-menu.

```
Checking H2O
pressure...

---     back     ---
```

Path

Main menu > Settings menu > H2O Settings > H2O Pressure Check

6.7.4.7. H_2O rotor alert

This is the maximum amount of liters H_2O that can be counted till the flow counter gets inaccurate. An alarm is generated that indicates the need for replacement of the rotor of the flow counter.

```
H2O Maintenance
Now: 2 L
Max: 73182 L
Reset    ---      Ok
```

Path

Main menu > Settings menu > H2O Settings > H2O rotor alert

Input

Reset: Set new value to 0

Ok: Leave function

6.7.5. Air Settings

This sub-menu allows to edit the Settings concerning the air the Device uses.

```
>Pressure Release
 Pressure Sensor
 Back
Up    Select    Down
```

This menu allows to edit any parameter related to the air made avialable to the Device.

Path

Main menu > Settings menu > Air Settings

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.7.5.1. Air Pressure Release

This function allows the pressure to be released of the Air supply. Before this function is used it is important to shut off the air supply.

```
Releasing pressure
Progress: 1 - 99 %
Air valve open
```

Function
This function is convenient to use when the air tube needs to be disconnected from the Device. Releasing the pressure will allow for the deconnecting to be done smoother. Upon starting the function, the air valve will open in an attempt to release the pressure.

Path

Main menu > Settings menu > Air Settings > Pressure release

```
Pressure released
Air valve closed

Retry    ---     Back
```

Step II
Retry: restart the pressure release
Back : Leave function

6.7.5.2. Air Pressure Sensor

This function allows to enable or disable air pressure notifications. If disabled, Will-Fill will not check the pressure during operation and before wet functions.

```
Pressure sensor
Enabled/Disabled

Edit    Save    Exit
```

Path

Main menu > Settings menu > Air Settings > Air Pressure Sensor

Input
Edit: Change setting
Save: Apply changes
Exit: Leave function

Attention:
It is advised to keep this function enabled at all times.

6.8. Alarm menu

This menu allows to browse the different alarms and/or notifications that are currently active on the Device.

```
xxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxx
Clear    ---   Reset
```

Depending on the notification, it's possible to clear it by pressing the **Clear**- or **Reset**-button. If another notification is active, it will show on the screen immediately. The same options for clearing the alarm are present.

It's also possible that a reset of a certain value is required. In this case, (re)set the value, save it and return back to the stand-by screen.

When there are no alarms active, the overview of the last measurement cycle is given. For more information, please refer to MSR error analysis and Overview *(on page 74)*.

Note:
In the specific alarm manuals, more information on each notification can be found.

Path

Main menu > Alarm-info

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.9. Startup wizard

This wizard guides the operator through all the settings that need to be set for the Device to perform correctly. This should be done whenever the Device is installed in a new tank, as one of the crucial elements is the 'calibration' of the level sensor relative to the dimensions of the tank. Other parameters are required as well.

```
Startup Wizard 1
Wifi: Connecting
SN: xxxxxxxxxxxx
Press to continue
```

Note:
All settings will be lost when starting the wizard (except network settings).

Note:
For more detailed information, please refer to:

Path

Main menu > Startup wizard

Important:
This function should only be exectued by persons that are trained on executing the Startup wizard. For this reason, the access to this function is restricted with a password. Please contact your local distributor for obtaining the password.

6.10. Serials menu

This menu allows to view the serial numbers to identify the Device.

```
>Device type
 PCB
 SN
 Year
Up    Select    Down
```

Path

Main menu > Serials

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.10.1. Device type

Displays the typenumber of the Device. The A-code describes all options that are included in the Device.

```
Device type
IONSD120
A0SD120S02S11P1E1C1
---      Ok      ---
```

Path

Main menu > Serials > Device type

Input

Ok: Leave Function

6.10.2. PCB

Displays the PCB type of the Device.

```
Serial PCB
2.02

---      Ok      ---
```

Path

Main menu > Serials > PCB

Input

Ok: Leave Function

6.10.3. Serial number

Displays the serial number of the Device. This is a unique number required for identification on the my.will-fill.com-cloud server.

```
Serial BB
2017BBBK1339

---      Ok      ---
```

Path

Main menu > Serials > Serial

Input

Ok: Leave Function

6.10.4. Year

Displays the production year of the Device.

```
Production Year
2021

---      Ok      ---
```

Path

Main menu > Serials > Year

Input

Ok: Leave Function

6.11. Maintenance menu

This menu allows to activate tasks related to all mechanical components of the device. Different maintenance tests can be started from this menu.

```
>Manual Tests
 Counters
 Calibration
 Cleaning cycle
 Back
Up    Select    Down
```

Note:

For more detailed information, please refer to: Operational Maintenance *(on page 193)*

Path

Main menu > Maintenance

Note:

If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:

While the device is in menu the LEDs will remain steady blue.

6.11.1. Manual tests

This sub-menu allows to .

```
>Valves
 Cir pump
 Oil pump
 RPM tests
 PH msr
 EC msr
 Brix msr
 Analog Sensor
 Leds
 Laser
 On/off relais
 Back
Up    Select    Down
```

This sub-menu allows .

Path

Main menu > Maintenance menu > Manual Tests

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.11.1.1. Valves

This sub-menu allows to test the different valve that are present in the Device.

```
>H2O valve
 Air valve
 Main valve
 Rinse valves
 Rinse endurance
 Back
Up    Select    Down
```

This sub-menu allows to test the different valves that are present in the Device.

Path

Main menu > Maintenance menu > Manual Tests

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.11.1.1.1. H2O Valve

This function allows to test the functioning of the water valve and the rotor for counting how much water is flowing through the ystem.

```
H2O Flow sensor...
123
75.48
Exit    0/0    Start
```

Function

This function is to test the water valve and water rotor. When the valve is opened, the water flows through the system and counts (rotations) of the water rotor are shown on the screen. If no counts appear, either the sensor is not properly connected/working or the motor is not correctly connected/working.
The numbers indicate the counts of the rotor.

Path

Main menu > Maintenance menu > Manual Tests > Valves

Input

Exit: Leave function
0/0: Opens and closes the valve. The counter is not reset.
Start: Resets the counter value to 0 and opens the valve at the same time.

Troubleshooting:
When testing the water valve or water rotor by pressing **Start**, the counts and volume should increment immediately. If this is not the case, either the water valve or the water rotor sensor is not functioning properly.

6.11.1.1.2. Air Valve

This function allows to test the functioning of the air valve.

```
Air Valve
0

Exit    0/0     ---
```

Function

This function is to test the air valve. When the valve is opened, the air flows through the system. This is not linked with a counter, but the air makes bubbles in the Coolant. This is an audible sound.
The number indicates the status of the valve: 0 is closed, 1 is open.

Path

Main menu > Maintenance menu > Manual Tests > Valves

Input

Exit: Leave function
0/0: Opens and closes the valve.

6.11.1.1.3. Main Valve

This function allows to test the functioning of the main valve.

```
Air Valve
0

Exit    0/0     ---
```

Function
This function is to test the main valve. This valve toggles between circulation of the Coolant through (mainly) the substructure or via the measuring chambers. When the test is started, the circulation pump will automatically start. Initially, the Coolant flows through the substructure only. When the valve is closed (status 1), the Coolant flows via the measuring chamber.
The number indicates the status of the valve: 0 is open, 1 is closed.

Path
Main menu > Maintenance menu > Manual Tests > Valves

Input
Exit: Leave function
0/0: Opens and closes the valve.

6.11.1.1.4. Rinse Valves

This function allows to test the functioning of the rinsing valves for cleaning either the Brix sensor or the pH & EC sensors.

```
Rinsing Valves


Exit    Brix     PH
```

Function
This function is to test the rinsing valves. This valve toggles separately clean the Brix sensor or the pH & EC sensors. When either of the valves are opened, water will flow through the system via the corresponding sensor. This produces an audible sound. There is no sensor to indicate the status.

Path
Main menu > Maintenance menu > Manual Tests > Valves

Input
Exit: Leave function
Brix: Open or close Brix valve
PH: Open of close pH & EC valve

6.11.1.1.5. Rinse Endurance

This function allows to test the functioning of the rinsing valve for high intensity use of the Brix sensor.

```
Brix rinse
Endurance test

Exit     ---   Start
```

Function
This function is to test the rinsing valves by automatically toggling the Brix valve on and off quickly. This will produce an audible sound.

Path
Main menu > Maintenance menu > Manual Tests > Valves

Input
Exit: Leave function
Start: Start endurance test

```
rinsing
Count: 43
Attempt: 1
rinse valve ON/OFF
```

Function
When the test starts, water flows through the system. The counts of toggling on and off are shown on the screen. 1 attempt produces +/- 45 counts. The last lines shows the actual state of the valve.

Input
Press any key during toggling to exit
Reset: reset counts to 0 and restart
Exit: Leave funcrtion
Cont: Continue with test

6.11.1.2. Circulation pump test

This function allows to test the functioning of the circulation pump.

```
Cir pump Test
4851

Exit    0/0    Start
```

Function
This function is to test the circulation ump, which pumps around the Coolant during circulation and which also brings a sample of Coolant up to the sensors.
When the motor is started, the counts (rotations) are shown on the screen. If no counts appear, either the sensor is not properly connected/working or the motor is not correctly connected/working.

Path
Main menu > Maintenance menu > Manual Tests

Input
Exit: Leave function
0/0: Starts and stops the motor. The counter is not reset.
Start: Resets the counter value to 0 and starts the motor at the same time.

6.11.1.3. Oil pump test

This function allows to test the functioning of the oil motor that drives the oil pump and dosing system.

```
Oil pump Test
368
Liters: 0,0024
Exit    0/0    Start
```

Function
This function is to test the oil motor. When the motor is started, the counts (rotations) are shown on the screen. If no counts appear, either the sensor is not properly connected/working or the motor is not correctly connected/working.

Path
Main menu > Maintenance menu > Manual Tests

Input
Exit: Leave function
0/0: Starts and stops the motor. The counter is not reset.
Start: Resets the counter value to 0 and starts the motor at the same time.

6.11.1.4. RPM tests

This sub-menu allows to check the RPM's for the different rotating elements.

```
>H2O RPM
 CIR RPM
 OIL RPM
 Back
Up    Select    Down
```

This sub-menu allows to check the different RPM's for the water rotor as well as both motors (Circulation and oil pump).

Path

Main menu > Maintenance menu > Manual Tests

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.11.1.4.1. Water RPM test

This function allows to check the amount of rotation per minute of the water flow.

```
H2O valve
test rpm


Exit    ---    Start
```

Function

This function is to check the amount of rotation per minute of the water flow. The H2O valve will be opened for a fixed time interval when starting the test, and the rotations of the water rotor will be counted. Afterwards the RPM is given, as well as the flow of the water.

Path

Main menu > Maintenance menu > Manual Tests

Input

Exit: Leave function

Start: Start the test.

```
Testing Flow
Counts: 147
```

Step 1

After pressing start, the water valve will be opened and the rotor starts. To get a correct result, the startup counts are ignored to calculate a stable RPM of the rotor. This test can take up to 15 seconds to complete.

Input

No input possible, the result is shown automatically.

```
H2O valve
Counts: 259
rpm: 1146
Retry    ...    exit
```

Result

The result of the test is given. The total amount of counts is available, as well as the final stable RPM.

Input

Retry: Restart the test.

Exit: Leave function

6.11.1.4.2. Circulation RPM test

This function allows to test the RPM of the circulation motor.

```
Cir pump
test rpm

Exit    ---    Start
```

Function

This function is to test the RPM of the circulation motor.

Path

Main menu > Maintenance menu > Manual Tests

Input

Exit: Leave function

Start: Start the test.

```
Cir pump
counts = 432

Exit    ---    Start
```

Step 1

After pressing start, the circulation motor will start. The counts are indicated on the screen and increase. This test can take up to 2 minutes.

Input

No input possible, the result is shown automatically.

```
Cir pump
test
rpm: 1515
Retry    ---    exit
```

Result

The result of the test is given. The final RPM is indicated.

Input

Retry: Restart the test.

Exit: Leave function

6.11.1.4.3. Oil RPM test

This function allows to test the RPM of the oil pump motor.

```
Oil pump
test rpm

Exit    ---    Start
```

Function
This function is to test the RPM of the oil pump motor.

Path
Main menu > Maintenance menu > Manual Tests

Input
Exit: Leave function
0/0: Reset the counter value to 0.
Back: Start the test. Press again to stop the test.

```
Test RPM oil pump
counts 1114

Exit    ---    Start
```

Step 1
After pressing start, the oil pump motor will start. The counts are indicated on the screen and increase. This test can take up to 2 minutes.

Input
No input possible, the result is shown automatically.

```
Oil pump
test
rpm: 1532
Retry    ---    exit
```

Result
The result of the test is given. The final RPM is indicated.

Input
Retry: Restart the test.
Exit: Leave function

6.11.1.5. pH test measurement

This function allows to test the measuring of the pH sensor.

```
PH sensor...
PH=8.45
T=5
Exit    ---     ---
```

Function
This function is to test the measuring of the pH sensor. The sensor should be taken out of the Device and put into the fluid manually. When inserting the pH sensor into the fluid, the measuring starts automatically and the value will be given on the screen.

Path
Main menu > Maintenance menu > Manual Tests

Input
Exit: Leave function

6.11.1.6. EC test measurement

This function allows to test the measuring of the EC probe.

```
EC sensor...
EC=3584
T=5
Exit    ---     ---
```

Function
This function is to test the measuring of the EC probe.
When inserting the EC probe into the fluid, the measuring starts automatically and the value will be given on the screen.

Path
Main menu > Maintenance menu > Manual Tests

Input
Exit: Leave function

6.11.1.7. Brix test measurement

This function allows to test the measuring of the Brix sensor.

```
Brix sensor...
Status=1   H2O=0.03
Value=6.5  %: 8.3
Exit    Pump    Meas
```

Function
This function is to test the measuring of the Brix (Concentration) sensor. For this test, the sensor stays mounted inside the Device (regular location). Before a measurement can take place, the circulation pump needs to be started by pressing the **Pump**-button. Give it enough time so that the Coolant can reach the sensor. After 15 seconds, press the **Meas**-button to preform a measurement. The result is given on the screen directly afterwards.

Path
Main menu > Maintenance menu > Manual Tests

Input
Exit: Leave function
Pump: Start circulation pump
Meas: Perform measurement of the Coolant

6.11.1.8. Analog test measurement

This function allows to test the connected analog sensor.

```
Analog sensor
0%
0fV D:7.325
Exit    ---     ---
```

Function
This function is to test the connected analog sensor. This is typically the external oil level sensor. The value is given on the screen immediately and updates every second automatically.

Path
Main menu > Maintenance menu > Manual Tests

Input
Exit: Leave function

6.11.1.9. LED's test

This function allows to test the functioning of the LED's.

```
Leds
Mode=1
Int=500 Cnt=3
Exit    mode    nxt cl
```

Function
This function is to test the functioning of the LED's. The different colors can be selected, as well as the various blinking modes that are present in the Device.

Path
Main menu > Maintenance menu > Manual Tests

Input
Exit: Leave function
mode: Change blinking mode; constant, short blink, long blink, constant + blink, ...
nxt cl: Select next color

6.11.1.10. Laser test

This function allows to test the functioning of the laser that detects the Coolant level.

```
Laser
Interval 1min
Level= 245 mm
Exit    Meas     Int
```

Function
This function is to test the functioning of the laser that detects the Coolant level. The distance indicated on the screen is the distance from the top of the Coolant tank to the level of the Coolant.

Path
Main menu > Maintenance menu > Manual Tests

Input
Exit: Leave function
Meas: Measure distance now
Int: Measure distance with interval (=1 min)

6.11.1.11. Relais On/Off test

This function allows to test the different relays that are present in the Device.

```
On/Off
BRIX
BRIX=On
Exit    0/0      PH
```

Function

This function is to test the different relays that are present in the Device. Relays to activate are Brix, pH, EC & Laser. On the 2nd line of the screen it's indicated which relays will be toggled. The status of the relay is also givin on the screen.

Path

Main menu > Maintenance menu > Manual Tests

Input

Exit: Leave function

0/0: Toggles the selected relay

PH: Toggles which relay that will be activated

CAUTION:

Do not activate and deactivate the relays too quickly. Toggling the power on and off of the Laser and Brix sensor can cause damage to the internal circuits of these sensors.

6.11.2. Counters

This sub-menu allows to choose the type of filling cycle that is performed immediately.

```
>Cleaning counters
 MSR counters
 Alerts
 Back
Up    Select    Down
```

This sub-menu allows a type of filling cycle to be started manually. Depending on the chosen cycle, the Device will first perform a measurement cycle or start the filling cycle immediately.

Path

Main menu > Filling menu > Refill now

Note:

If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:

While the device is in menu the LEDs will remain steady blue.

6.11.2.1. Cleaning Counters menu

This sub-menu allows to choose the type of filling cycle that is performed immediately.

```
>Device filter
 Oil filter
 Back
Up    Select    Down
```

This sub-menu allows --both blocked by supplier.

Path

Main menu > Filling menu > Refill now

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.11.2.1.1. Device filter

This sub-menu allows to ed

```
>This function
is locked
To unlock
Contact supplier
```

This menu is only available on request and is not (yet) available to users.
After a timeout of 10 seconds the Device returns to the **Connections menu**.

Path
Main menu > Data menu > Connections > 4G

6.11.2.1.2. Oil filter

This sub-menu allows to ed

```
>This function
is locked
To unlock
Contact supplier
```

This menu is only available on request and is not (yet) available to users.
After a timeout of 10 seconds the Device returns to the **Connections menu**.

Path
Main menu > Data menu > Connections > 4G

6.11.2.2. MSR Counters menu

This sub-menu allows to reset the different counters of the different sensors/probes.

```
>Brix counter
 EC counter
 PH counter
 Back
Up    Select    Down
```

This sub-menu allows a type of filling cycle to be started manually. Depending on the chosen cycle, the Device will first perform a measurement cycle or start the filling cycle immediately.

Path
Main menu > Filling menu > Refill now

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.11.2.2.1. Brix MSR Counter

This value indicates the number of measurements that have taken place since the last reset.

```
Brix Counter
Now:  862
Max:  1500
Reset            Ok
```

Values

Now = Number of measurements with the Brix sensor since the last time it was cleaned.

Max = Maximum number of measurements that can be executed with the Brix sensor. When it reaches this value, cleaning of the sensor and reset of value is required.

Path

Main menu > MSR menu > MSR settings > BRIX > MSR Counter

OR

Main menu > Maintenance menu > Counters > MSR Counter

Input

Reset: Set the value to 0

Ok: Leave function

Remember:

After cleaning of the Brix sensor, the Brix counter needs to be reset to 0. This way, the Device can correctly keep track of the MSR's and send out a notification when the periodic cleaning is required.

6.11.2.2.2. EC MSR Counter

This value indicates the number of measurements that have taken place since the last reset.

```
EC Counter
Now:  662
Max:  1200
Reset            Ok
```

Values

Now = Number of measurements with brix probe since the last time it was cleaned.

Max = Maximum number of measurements that can be executed with Brix sensor. When it reaches this value, cleaning of the sensor and reset of value is required.

Path

Main menu > Maintenance menu > Counters > MSR Counter

Input

Reset: Set the value to 0

Ok: Leave function

Remember:

After cleaning of the Brix sensor, the Brix counter needs to be reset to 0. This way, the Device will alert correctly the moment for the next cleaning.

6.11.2.2.3. pH MSR Counter

This value indicates the number of measurements that have taken place since the last reset.

```
PH Counter
Now:  662
Max:  1200
Reset            Ok
```

Values

Now = Number of measurements with brix probe since the last time it was cleaned.

Max = Maximum number of measurements that can be executed with Brix sensor. When it reaches this value, cleaning of the sensor and reset of value is required.

Path

Main menu > Maintenance menu > Counters > MSR Counter

Input

Reset: Set the value to 0

Ok: Leave function

Remember:

After cleaning of the Brix sensor, the Brix counter needs to be reset to 0. This way, the Device will alert correctly the moment for the next cleaning.

6.11.2.3. Alerts menu

This sub-menu allows to set when the Alerts for cleaning of the different sensors/probes is given.

```
>Brix Alert
 EC Alert
 PH Alert
 Back
Up    Select    Down
```

This sub-menu allows to set when the Alerts for cleaning of the different sensors/probes is given. Chaning these values can have an impact on the Device behaves. Only changes these values when the impact is clear.

Path

Main menu > Filling menu > Refill now

Note:

If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:

While the device is in menu the LEDs will remain steady blue.

6.11.2.3.1. Brix cleaning alert

This value is the maximum amount of Brix measurements that can take place before a notification is generated that indicates the need for a manual cleaning of the Brix sensor. When the amount of measurements is surpassed, the Device will still function, but to guarantee correct readouts, it's recommended to clean the sensor.

```
Brix cleaning alert
Old   500 MSR cycles
New  1000 MSR cycles
+       Save       -
```

Values
Min: 5
Max: 1500
Default: calculated by Startup wizard

Path
Main menu > MSR menu > MSR settings > BRIX > Cleaning alert

Input
Pulsating keypress: 10
Single keypress: 1

6.11.2.3.2. EC Calibration alert

This value is the maximum amount of EC measurements that can take place before a notification is generated that indicates the need for a calibration of the EC probe.

```
EC-cal alert
Old   500 MSR cycles
New  1000 MSR cycles
+       Save       -
```

Values
Min: 5
Max: 1500
Default: calculated by Startup wizard

Path
Main menu > MSR menu > MSR settings > EC > Calibration alert

Input
Pulsating keypress: 10
Single keypress: 1

6.11.2.3.3. pH Calibration alert

This value is the maximum amount of pH measurements that can take place before a notification is generated that indicates the need for a calibration of the pH probe.

```
PH-cal alert
Old   500 MSR cycles
New  1000 MSR cycles
+       Save       -
```

Values
Min: 5
Max: 1500
Default: calculated by Startup wizard

Path
Main menu > MSR menu > MSR settings > PH > Calibration alert

Input
Pulsating keypress: 10
Single keypress: 1

6.11.3. Calibration

This sub-menu allows to .

```
>Cal H20 rotor
 Cal PH
 Cal EC
 Cal Level MWF
 Cal Level OIL
 Cal TEMP
 Back
Up    Select    Down
```

This sub-menu allows a type of filling cycle to be started manually. Depending on the chosen cycle, the Device will first perform a measurement cycle or start the filling cycle immediately.

Path

Main menu > Filling menu > Refill now

Note:
If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:
While the device is in menu the LEDs will remain steady blue.

6.11.3.1. Calibrate H_2O rotor

This sub-menu allows to ed

```
>This function
is locked
To unlock
Contact supplier
```

This menu is only available on request and is not (yet) available to users.
After a timeout of 10 seconds the Device returns to the **Connections menu**.

Path

Main menu > Data menu > Connections > 4G

6.11.3.2. Calibrate pH Probe

This function starts the process of calibrating the pH Probe.

Prerequisites:
Make sure to have the following items ready to succesfully calibrate the pH probe:

1. Calibration fluids pH 7.0 and 10.01
2. Glass of water to rinse the probe
3. Teflon tape for sealing

Similar to a battery, the base value of the pH probe will go down due to consumption of the internal liquid. This depletion will affect the measurement results. With the calibration process, it's possible to learn the Device what values are currently present, so that the measurement results remain accurate.

```
Calibrate PH

Continue?
Auto    Man     Exit
```

Start the Calibration process by navigating to the correct menu.

Path

Main menu > MSR menu > MSR settings > PH > Calibration PH

OR

Main menu > Maintenance > Calibration PH

Step I

Disconnect the pH probe cable by disconnecting the BNC-connector.

Step II

Screw the pH probe out of the Device body.

Step III

Clean the probe with tap water, remove dirt with rack or toothbrush and dry with compressed air.

Step IV

Connect the pH probe cable again and select **Auto** for the automated calibration procedure.

Step V

Open the calibration fluid PH7 with scissors.

Step VI

Submerge the probe in the Calibration solution PH7 and gently shake so that the fluid is completely in contact with the probe.

```
Calibrate PH

Continue?
Auto    Man     Exit
```

Step VII

Select the automatic calibration by pressing **Auto**, so that the Device will automatically detect when the value is stable and it is OK to proceed to the next step.

Input

Auto: Start automatic calibration; Step VIII

Man: Start manual calibration pH

Exit: Leave function

```
Calibrate PH
Rinse probe + PH7
PH7: 14389
         Ok     Exit
```

Step VIII

The device will perform regular measurements with the pH probe. On the screen, the readout value is given, as well as the deviation that is occurring since last measurement. When the deviation between measurements is small enough, the Device will automatically proceed to the next step. In the manual procedure, the operator needs to press **Ok** to continue to the next step of the calibration.

Values

Under normal conditions, the value should be around 15.000 in this step. Depending on the probe this can vary.

Input

Ok: Save value for PH 7; Step IX

Exit: Leave function

Important:
If the value is still drifting rapidly after 3 minutes, the pH probe will need replacing.

```
Calibrate PH
Rinse probe + PH10
PH7: 21057
         Ok     Exit
```

Step IX

Clean the probe with tap water, dry with compressed air. Open the calibration fluid sachet with scissors and submerge the probe in the calibration solution.
When the deviation is small enough, the Device will continue to the next step.

Note:
It is OK to deconnect briefly the probe from the Device to perform the necessary actions.

Values

Under normal conditions, the value should be around 21.000 in this step. Depending on the probe this can vary.

Input

Ok: Save value for PH 10; Step X

Exit: Leave function

Important:
If the value is not changing after being submerged in calibration fluid PH10 or it still drifting rapidly after 3 minutes, the pH probe will need replacing.

```
Calibrate PH
PH: 10.01
Done. Save?
Yes              No
```

Step X

The calibration process is done. Remount the pH probe into the pH holder of the Device. This should be done while the screen on the left is still active. This way it's certain that the device doesn't perform unexpected actions that result in spilling Coolant.

Step XI

Disconnect the pH Probe cable by disconnecting it from the BNC-connector.

Step XII

If required, put teflon tape around the thread of the pH probe. Screw the pH probe in the holder of the Device body.

Step XIII

Reconnect the pH probe cable with the BNC-connector.

CAUTION:

Only the first 1 cm – 1,5 cm of thread of the probe should be screwed in. Always use Teflon tape to prevent leaks of water or Coolant via the probe. Screwing in the probe too deep can cause damage to the pH probe, which can lead to incorrect measurements and might require replacement of the probe.

```
Calibrate PH
PH: 10.01
Done. Save?
Yes              No
```

Step XIV

The calibration process is completed. The new calibration values need to be saved to the Device. If the process did not go as described above, press **No** to restart. If the process was executed according to this manual, **Yes** can be pressed.

Input

Yes: Save new calibration (overwrite old calibration)

No: Leave function (continue working with old calibration)

Step XV

Restart the Device in order for the calibration to take effect.

6.11.3.3. Calibrate EC Probe

This menu starts the calibration of the EC Probe.

Prerequisites:

Make sure to have the following items ready to succesfully calibrate the EC probe:

1. Calibration fluids 84 µS/cm² and 12.880 µS/cm²
2. Glass of water to rinse the probe
3. Tools for unscrewing the probe, in this case an Allen key - 3 mm

During an EC measurement, the probe will measure the electrical conductivity between the two pads at the end of the probe. Unlike a pH probe, an EC probe does not consume a measuring medium. This results in less required calibrations that are required.

In the next topics, the different steps for calibrating the probe are given.

6.11.3.3.1. Open head

Step I

Before opening the head, start by powering off the Device.

For **power off** keep pressing the power button untill the device beeps. After the beep, release the power button. The Device will run a shutdown cleaning cycle and will auto power off. Once the Device is powered off, disconnect the power cord.

Step II

When the Device is off, disconnect the pH probe cable by disconnecting it from the BNC-connector. Leave the pH probe mounted in the Device.

Step III

Take away the tension of the screw underneath the LAN-access plate, which holds the BNC-connector of the pH probe.

Step IV

Turn the head counterclockwise until you can lift it.

Important:

Be carefull when lifting the head, as there is no joint keeping the head attached to the body. The electric connections are the only items linking the body and head together, but they cannot support the weight of the head. Always hold the head in your hand until all cables between body and head are disconnected.

Step V

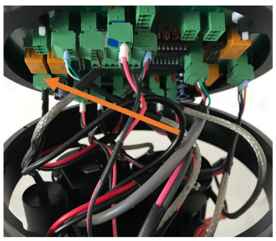
When necessary for exchanging components or executing calibration, disconnect the cables so the head is completely disconnected from the body. If not, f.i. for checking cables, leave all cables in place.
If required, take a photo of the cables before unplugging them. When disconnected, place the head next to the body on its side. Do not place it on a wet surface and make sure it does not roll away.

Tip:
All connectors of the sensors, motors and valves are color marked and correspond with the plugs on the main PCB inside the head. Each combination of color and connectors poles is unique.

6.11.3.3.2. Reconnect EC Sensor & Start Device

Step I

Inside the body, release the tension of the 2 screws that clamp the EC probe at 2 sides. The orange arrow is pointing towards the EC probe.
Once this is done, slide the probe vertically upwards, out of the housing of the Device until it is completely free.



Step II

Take the head and reconnect the sensor cable of the EC probe. Make sure that the correct connector is being used.
The orange arrow points to the Yellow EC probe connector with 2 poles, connected to a 2-pin connector.
Plug in the head of the Device, connected with the EC probe.

Start the Device

Powering on the Will-Fill can be done by pressing the power button shortly.
This button will light up to let you know the device is powered.

Note:
It can take up to **5 minutes** before a message appears on the screen because of the start-up of the internal processes. Right before the first message appears on the screen you will hear a **short tone**.

```
Initiating
Start-up tests

----    MENU    ----
```

Function
This screen will display **Initiating** for 10 seconds and will give the user the opportunity to skip loading and checking of parameters along with the start-up tests and start up measurement and go directly to the **Main menu**.
When the device is functioning correctly this function isn't used, but for calibration purposes or if there are problems with the device, this comes in handy to change certain settings.

Make sure to use the shortcut to menu for calibrating the EC probe, so that all tests are skipped.

Important:
If the tests have started, the Device will generate different alarms as the sensors, motors and valves are not connected. Shut down the Device and start the Device to access the shortcut menu.

6.11.3.3.3. Execute EC Probe calibration

Start the Calibration process by navigating to the correct menu.

Path
Main menu > MSR menu > MSR settings > EC > Calibration EC
OR
Main menu > Maintenance > Calibration EC

```
Calibrate EC

Continue?
        Yes     Exit
```

Step I
Clean the EC probe with tap water, remove dirt with rack or toothbrush and dry with compressed air.

Step II
Open the calibration fluid EC 84 µS/cm², insert the EC probe and press **Yes**.

Input
Yes: Start calibration
Exit: Leave function

```
Calibrate EC
Rinse probe +EC84
EC84: 57
        Ok      Exit
```

Step III

Submerge the EC probe in the 84 µS/cm²-calibration solution and gently shake so that the fluid is completely in contact with the probe.

Step IV

When the value is stable, press **Ok**.

Input

Ok: Save value for EC 84 µS/cm² and continue calibration

Exit: Leave function

Important:
If the value is still drifting rapidly after 3 minutes, the EC probe needs to be replaced.

```
Calibrate EC
Rinse probe +EC12880
EC12880: 3117
        Ok      Exit
```

Step V

Open the calibration fluid EC 12.880 µS/cm². Submerge the EC probe in the 12.880 µS/cm²-calibration solution and gently shake so that the fluid is completely in contact with the EC probe.

Step VI

When the value is stable, press **Ok**.

Input

Ok: Save value for EC 12.880 µS/cm² and continue calibration

Exit: Leave function

Important:
If the value is still drifting rapidly after 3 minutes, the EC probe needs to be replaced.

```
Calibrate EC
EC: 12880
Done. Save?
Yes              No
```

Step VII

Confirm the calibration by pressing **Yes**.

Input

Yes: Save the new values of calibration.

No: Cancel calibration and leave function

Step VIII

The calibration of the EC probe is now completed. Follow the next steps to build together the Device again:

Install the EC probe into the body of the Device and clamp it by means of the 2 screws.
Reconnect all the plugs of the sensors, motors and valves in the correct places.
Mount the head back onto the Device and put tension on the screw under the LAN plate.
Reconnect the pH probe.
Plug in the power cord in the socket and turn on the Device.

Tip:
All connectors of the sensors, motors and valves are color marked and correspond with the plugs on the main PCB inside the head. Each combination of color and connectors poles is unique.

6.11.3.4. Calibrate Level Coolant

This sub-menu allows to ed

```
>This function
is locked
To unlock
Contact supplier
```

This menu is only available on request and is not (yet) available to users.
After a timeout of 10 seconds the Device returns to the **Connections menu**.

Path

Main menu > Data menu > Connections > 4G

6.11.3.5. Calibrate Oil Level (optional)

This function allows to calibrate the oil level sensor. This needs to happen whenever a oil sensor is connected to a new head.

Prerequisites:

Make sure to have a tape measure ready to succesfully calibrate the temperature sensor.

```
Oil Capacity
Volume: 266.4 L
Distance: 83.7 cm
Cal     ---     Exit
```

Function

This function allows to calibration the oil level sensor. A one-time calibration is necessary as the measured distances depend on the hardware of the sensor and the main PCB of the Device.

Path

Main menu > Settings menu > Oil settings > Calibrate Level

OR

Main menu > Maintenance > Calibration > Cal Level OIL

Input

Cal: Start Calibration of oil level sensor

Exit: Leave function

6.11.3.5.1. Execute Oil Level Sensor calibration

```
Oil sensor Cal
Please select
container size
---      Ok      ---
```

Step I

The Device has the most common containers predefined in the system. These can be selected from the list. Any deviating container can be defined as well.

Input

Ok: Make selection

```
>60L Barrel
 200L Barrel
 1000L IBC
 Other
Up     Select   Down
```

Step II

Select the correct container or choose **Other** to define a custom container.

Input

Select 60L / 200L / 1000L: Step VII

Select Other: Start customized container setup; Step III

```
Select Cilinder
or rectangular
Container shape
Cil     ---      Rec
```

Step III

Select whether the container has rectangular or cilindric shape.

Input

Cil: Cilindric shape; Step IV

Rec: Rectangular shape; Step III

```
Oil radius?
Old: 140 mm
New: 85 mm
+       Save       -
```

Step IV

Set the correct radius of the barrel.

Input

Pulsating keypress: 100 mm

Single keypress: 10 mm

Save: Confrim value; Step V

```
Container Height
Old: 300 mm
New: 320 mm
+       Save       -
```

Step V

Set the correct height of the barrel

Input

Pulsating keypress: 10 mm

Single keypress: 1 mm

Save: Confrim value; Step V

```
SELECT OIL VOLUME
Other 643 L

Next     ---    Edit
```

Step VI

The total volume of the barrel is calculated and shown on the screen.If correct, continue to next step. If incorrect, editing is possible.

Input

Next: confirm volume; Step VIII

Edit: Remake selection of barrel; Step II

```
SELECT OIL VOLUME
60L / 200 L / 1000 L

Next     ---    Edit
```

Step VII

The total volume of the barrel is shown on the screen. If correct, continue to next step. If incorrect, editing is possible.

Input

Next: confirm volume; Step VIII

Edit: Remake selection of barrel; Step II

```
Ok will set
0079 cm as level
value
---      Ok      ---
```

Step VIII

The Devices measures the actual distance to the level of the oil, and show the value on the screen.

Input

Ok: Confirm distance; Step IX

```
Volume Now?
Old: 185 L
New: 134 L
+       Save       -
```

Step IX

Set the current volume that is present in the barrel. The Device will calculate correlate the volume in the barrel with the measured distance of the sensor.

Input

Pulsating keypress: 10 Liter

Single keypress: 1 Liter

Save: Confrim value; Step IX

```
Oil Calibration
Calculating volume
```

Step X

The correlation between distance and volume is calculated. The Devices automaticlly return to **Calibrate Oil Level**.

6.11.3.6. Calibrate Temperature

This menu allows to give an offset to the default measurement of the temperature sensor.

Prerequisites:
Make sure to have a handheld thermometer ready to succesfully calibrate the temperature sensor.

This calibration allows to offset the measuring result of the temperature of the Coolant. The new value is added/subtracted from the measured value, and will be used in further analysis.

```
Temp Calibration
Old: 0.0 Degrees C
New: 1.0 Degrees C
Edit    ---     Back
```

Start the Calibration process by navigating to the correct menu.

Values
Min: -10.0 °C
Max: 10.0 °C
Deafult 0.0 °C
Path
Main menu > MSR menu > MSR settings > Temp > Calibration
Input
Edit: Adjust the temperature offset; Adjustment menu
Back: Go back to Temperature menu

```
Temp Calibration
Old: 0.0 Degrees C
New: 1.0 Degrees C
 +      Save      -
```

Input
Pulsating keypress: 1.0 °C
Single keypress: 0.1 °C
Save: Save values and return to Calibration menu

6.11.4. Cleaning cycle

This function allows to perform a thorough cleaning of the Device.

```
Cleaning Cycle
Follow Instructions

Abort    ---     Yes
```

Function
This function allows to perform a thorough cleaning of the Device. Depending on the chosen cycle, the Device will first perform a measurement cycle or start the filling cycle immediately.

Path
Main menu > Filling menu > Refill now

Input
Abort: Leave function
Ok: Start cleaning cycle

```
Cleaning cycle
MSR Counter to 0
if successfull
Yes      ---     No
```

Step 1

One of the steps of the cycle is to clean the Brix sensor. This means the Brix MSR counter can be reset to 0. The Device asks for confirmation to reset the counter to 0 before continuing. It's OK to answer **Yes** in this step.

Input

Yes: Reset counter afterwards

No: No counter reset afterwards

```
Cleaning cycle
Dry out MSR chamber
progress: 65 %
Yes      ---     No
```

Step 2

Section 1 of the measuring chamber will be dried out.

Input

No input possible, continues to Step 3 automatically

```
Cleaning cycle
Dry out MSR chamber
Section I finished
---      Next    ---
```

Step 3

Once section 1 of the measuring chamber is dried out, continue to next step.

Input

Next: Continue to Step 4

```
Cleaning cycle
Dry out MSR chamber
progress: 37 %
Yes      ---     No
```

Step 4

Section 2 of the measuring chamber will be dried out.

Input

No input possible, continues to Step 5 automatically

```
Cleaning cycle
Dry out MSR chamber
Section II finished
---      Next    ---
```

Step 5

Once section 2 of the measuring chamber is dried out, continue to next step.

Input

Next: Continue to Step 6

```
Cleaning cycle
Install pressurized
cleaner to valve
---      Push    ---
```

Step 6

On the front of the device, next to the air connection, a check valve is present. Push the cleaning agent onto the valve and press at same time the **Push**-button to continue to Step 7.

Input

Push: Continue to Step 7

```
Cleaning cycle
Hold till LEDs are
Steady GREEN
progress: 48 %
```

Step 7

The cleaning agent enters the Device. Only when the progress reaches 100 %, the cleaning agent can be released.

Input

No input possible, continues to Step 8 automatically

```
Cleaning cycle
Section I Cleaned

---      Next    ---
```

Step 8

Section 1 is cleaned, continue to next step.

Input

Next: Continue to Step 9

```
Cleaning cycle
Install pressurized
cleaner to valve
---      Push    ---
```

Step 9

Push the cleaning agent against the same valve again, while pressing the **Push**-button.

Input

Push: Continue to Step 10

```
Cleaning cycle
Hold till LEDs are
Steady GREEN
progress: 86 %
```

Step 10

The cleaning agent enters the Device. Only when the progress reaches 100 %, the cleaning agent can be released.

Input

No input possible, continues to Step 11 automatically

```
Cleaning cycle
Section II Cleaned

---      Next    ---
```

Step 11

Section 2 is cleaned, continue to next step.

Input

Next: Continue to Step 12

```
Cleaning cycle
relearn initial Bri
H2O values
Learn    ---    Skip
```

Step 12

As the quality of the incoming water might have changed since the installation or last cleaning cycle, it can be measured again. This way a reliable Brix measurement is obtained.

Input

Learn: Continue to Step 13 and initialize the Brix sensor

Skip: Continue to Step 16 and skip Brix sensor initialization

```
Initial Brix H2O
Flushing
Brix: 0.3
```

Step 13

Fresh water will pass by the Brix sensor.

```
MSR: 0 (0) BRIX
Measurement ..
```

Step 14

A set of measurements is conducted to obtain correct water quality.

```
Initial Brix H2O
Old: 0.2
New Brix: 0.4
Retry   Cancel  Save
```

Step 15

The result of the measurement is given on the screen. The previously saved value as a reference is available as well.

Input

Retry: Redo the measurement (Step 13)

Cancel: Exit function

Save: Save measurement results and continue cleaning cycle

```
Saving ...
Storing Sensors...
```

Step 16

The result of the measurement is being saved and sensors are initialized.

The Cleaning cycle has finished.

6.12. Consumption menu

This menu allows to view consumption values of the water and coolant oil used during automatic and manual filling cycles.

```
>Consumtion 1
 Consumption 2
 Consumtion total
 Back
Up    Select    Down
```

Path

Main menu > Consumptions

Note:

If no button has been pressed within 10 seconds the Will-Fill returns to the previous menu or Stand-by.

Tip:

While the device is in menu the LEDs will remain steady blue.

6.12.1. Consumption 1

These values show counter 1 for consumption of water and oil in liters.

```
>Consumption 1
H2O:   1713 Liters
OIL:     84 Liters
Back    ---    Reset
```

Function

Consumption counter 1 and consumption counter 2 show the consumtion of water and oil used by the Device. These 2 counters can be reset independantly of each other by the end-user.

Path

Main menu > Consumptions > Consumption 1

Input

Back: Leave function

Reset: reset counters to 0

6.12.2. Consumption 2

These values show counter 2 for consumption of water and oil in liters.

```
>Consumption 2
H2O:   35784 Liters
OIL:    3219 Liters
Back    ---    Reset
```

Function

Consumption counter 1 and consumption counter 2 show the consumtion of water and oil used by the Device. These 2 counters can be reset independantly of each other by the end-user.

Path

Main menu > Consumptions > Consumption 2

Input

Back: Leave function

Reset: reset counters to 0

6.12.3. Consumption total

These values show the total counter for consumption of water and oil in liters. These counters cannot be reset.

```
>Consumption Total
H2O:   54178 Liters
OIL:    4217 Liters
        Back
```

Path

Main menu > Consumptions > Consumption total

Input

Back: Leave function

Reset: reset counters to 0

6.12.4. MSR Counter

These values indicate the number of measurements that have taken place after the last reset.

```
MSR Counter
PH  180   Brix   500
EC  250   Total 1200
+        Ok        -
```

Values

PH = Number of measurements with PH probe since the last time it was calibrated.

Brix = Number of measurements with Brix sensor since the last time it was cleaned (and reset).

EC = Number of measurements with EC probe since the last time it was calibrated.

Total = Total number of measurements the device has performed.

Path

Main menu > MSR menu > MSR settings > PH > MSR Counter

OR

Main menu > MSR menu > MSR settings > EC > MSR Counter

OR

Main menu > MSR menu > MSR Counter

OR

Main menu > Consumptions > MSR Counter

7. Operational Maintenance

7.1. Introduction

The Operational Maintenance chapter is intended for maintenance personnel in the company that is executing maintenance on the machines and their peripheral equipment like the Will-Fill Device. This chapter will guide you step-by-step through the different procedures you'll have to execute periodically on the Device. This will allow it to run in a stable way.

How to perform this Operational Maintenance
It is important to notice that the procedures in this chapter should be executed periodically. It is therefore best to incorporate the procedures described in this chapter into the general preventive maintenance plan of the shop floor.
In this chapter, a checklist is presented to follow up on the different maintenance elements. Also the process factor, that helps determining how often these actions need to take place, will be explained.
Next, the different maintenance procedures are explained step-by-step. The procedures are referenced in the checklist.

E-mail
Trough the cloud dashboard notification emails are sent to notify users of events that occur at the Device or Process. In attachment of such e-mails, procedures to resolve such alarms are included. Some of these procedures are identical to the ones explained here. This doesn't mean that these procedures can be excluded from the (periodic) maintenance.

7.2. Maintenance Checklist

7.2.1. Checklist

The table below gives an overview of the different procedures to follow, as well as the frequency with which they have to be executed.

Procedure	Component	Task	Frequency
1	Water connection	Check for leaks	Every 6 months x PF
2	Oil connection	Check for leaks	Every 6 months x PF
3	Air connection	Check for leaks	Every 6 months x PF
4	Brix sensor	Clean	Every 6 months x PF
5	External water filter	Clean & Replace	Every 6 months x PF
6	Oil filter (barrel)	Clean	Every 12 months x PF
7	pH Sensor	Calibration	Every 12 months x PF
8	Emulsion intake filter	Clean	Every 12 months x PF

When a Will-Service Technician performs a maintenance visit, this person will also perform these procedures and more elaborate ones on the same components as agreed in the maintenance contract. To benefit in a maximum way, it is best to plan your maintenance interval in such a way that both Will-Service's and your own maintenance moment is spread throughout the year. PF that is indicated in the table above stands for Process Factor. This is explained below.

7.2.2. Process factor

The process factor is a factor that determines how often a maintenance task is required on the Device. In the table above a timing is given for ideal processes. When certain variables of the process are different, the factor will change and subsequently maintenance on the Device will be required more or less frequent.

For obtaining your process factor, search the materials that are used from the list below:

Material	**Description**	**Process Factor**
Mix	Variation of all types of material	0,7
Iron	Cast iron or ductile iron	0,6
Aluminium	All types of aluminium	0,9
Steel	All types of steel, incl. super alloys	0,8
Plastics	All types of plastics and composites	0,9
Copper	All yellow materials	0,7
Other	Not specified higher	0,6

Use the Process Factor as derived in the table above to multiply it with the default frequency, corresponding with the material that is being machined at the process. The result will indicate the frequency with which the maintenance tasks need to be performed.

7.3. Maintenance Procedures

7.3.1. Water connection

Connect the black tube to the Device and the provided filter on one end, and the filter and water source on the other end. Make sure that there are no leaks.

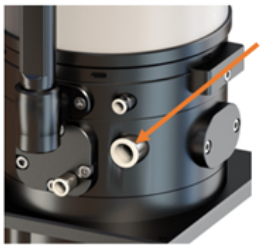
Step I

It's convenient to place the water filter near the Device by means of the supplied magnets, but the point of installation is different for every Process. Make sure the arrow on the filter is pointing in the correction direction, being in the same direction as the water flow.

Step II

In front of the filter, towards the Device, connect the supplied black tube.

Insert the black tube into the water connection push-in coupling at the Device.



Step III

When required, cut the supplied black tube to length and connect it with the chosen water supply.

Important:
Minimum pressure is 2 bar and maximum pressure is 5 bar.

Important:
For proper operation of the Device, the water pressure must always be present.

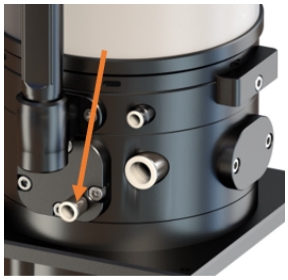
Step IV

Open the tap of the water supplyO and check your installation for leaks. If a leak is detected, the water pressure should be released, so that it is possible to seal the leaking fitting in an adequate manner.

Important:
When connecting the water cable, always make sure to use the delivered black hose. In case a different hose is used, leaks can occur. The use of other hoses is at customer's risk and responsibility.

7.3.2. Oil connection

Connect the transparent tube to the Device and the filter element to be placed in the oil barrel, and make sure that there are no leaks. After bleeding the oil line, no air should enter the tube.



Step I

Make the supplied transparent tube to length and connect it to the Device on one end and to the supplied filter element on the other end.

Step II

Insert the transparent tube with the weighted filter element into the oil reservoir.

Note:
The filter weight will keep the filter at the bottom of the barrel. Make sure the tube is long enough and that it can reach the bottom of the barrel.

Important:
When connecting the oil hose, always make sure to use the delivered transparent hose. In case a different hose is used, leaks can occur. The use of other hoses is at customer's risk and responsibility.

7.3.3. Air connection

Connect the supplied blue tube to the Device and the air source. Place the supplied valve in between. Make sure that there are no leaks.

Step I
Cut the supplied blue tube to length and connect it to the Device on one end and to the supplied air valve on the other end.

Step II
When connecting to the air valve, make sure the valve is connected in the right direction. The arrow should align with the flow of the air.

Step III
Cut the supplied blue tube to length and connect it with the chosen air supply.

Important:
Minimum pressure is 5 bar and maximum pressure is 9 bar.

Important:
For proper operation of the Device, the air pressure must always be present.

Step IV
Open the air supply and check your installation for leaks. If a leak is found, the air pressure should be released, so that it is possible to seal the leaking fitting in an adequate manner.

Important:
When connecting the air hose, always make sure to use the delivered blue hose. In case a different hose is used, leaks can occur. The use of other hoses is at customer's risk and responsibility.

7.4. Clean Brix Sensor

Procedure to clean the Refractometer (Brix) sensor.

7.4.1. Open head

Step I

Before opening the head, start by powering off the Device.

For **power off** keep pressing the power button untill the device beeps. After the beep, release the power button. The Device will run a shutdown cleaning cycle and will auto power off. Once the Device is powered off, disconnect the power cord.

Step II

When the Device is off, disconnect the pH probe cable by disconnecting it from the BNC-connector. Leave the pH probe mounted in the Device.

Step III

Take away the tension of the screw underneath the LAN-access plate, which holds the BNC-connector of the pH probe.

Step IV

Turn the head counterclockwise until you can lift it.

Important:

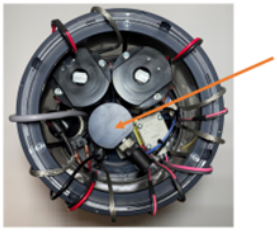
Be carefull when lifting the head, as there is no joint keeping the head attached to the body. The electric connections are the only items linking the body and head together, but they cannot support the weight of the head. Always hold the head in your hand until all cables between body and head are disconnected.

Step V

When necessary for exchanging components or executing calibration, disconnect the cables so the head is completely disconnected from the body. If not, f.i. for checking cables, leave all cables in place.
If required, take a photo of the cables before unplugging them. When disconnected, place the head next to the body on its side. Do not place it on a wet surface and make sure it does not roll away.

Tip:
All connectors of the sensors, motors and valves are color marked and correspond with the plugs on the main PCB inside the head. Each combination of color and connectors poles is unique.

7.4.2. Clean Brix sensor lens



Step I

The Brix Sensor is located in the center of the Device. It has a black, aluminium body and which has a big connector.

Step II

Remove the Brix sensor from its socket. This can be done by gently pressing the Sensor down while rotating CCW.

Step III

Check the lens and remove all dirt that is present. For cleaning the lens, by default water and a cloth should be used. In case of sticky contamination, a cleaning agent (alcohol/brake cleaner) can be used.

Attention:
Never use sanding paper, sanding fleece or any other abrasive material/fluid to clean the sensor, as they will damage the sensor glass!

Step IV

Re-install the Brix sensor on its socket. Make sure the black o-ring is in place. Installing the sensor is done by gently pressing the Sensor down while rotating CW.

Step V

Follow the next steps to rebuild the Device again:

1. Reconnect all the connectors of the sensors, motors and valves in the correct places
2. Mount the head back onto the Device and put tension on the screw under the LAN plate.
3. Reconnect the pH probe.
4. Plug in the power cord and turn on the Device.
5. When the Device has started up, make sure to reset the Brix counter to 0, as explained in next step.

> **Tip:**
> All connectors of the sensors, motors and valves are color marked and correspond with the plugs on the main PCB inside the head. Each combination of color and connectors poles is unique.

7.4.3. Brix MSR Counter

This value indicates the number of measurements that have taken place since the last reset.

```
Brix Counter
Now:  862
Max:  1500
Reset            Ok
```

Values

Now = Number of measurements with the Brix sensor since the last time it was cleaned.

Max = Maximum number of measurements that can be executed with the Brix sensor. When it reaches this value, cleaning of the sensor and reset of value is required.

Path

Main menu > MSR menu > MSR settings > BRIX > MSR Counter

OR

Main menu > Maintenance menu > Counters > MSR Counter

Input

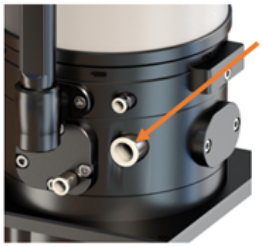
Reset: Set the value to 0

Ok: Leave function

Remember:
After cleaning of the Brix sensor, the Brix counter needs to be reset to 0. This way, the Device can correctly keep track of the MSR's and send out a notification when the periodic cleaning is required.

7.5. Clean water filter

Procedure to clean out or replace the fleece in the water filter.



Step I
Close the water tap and release the pressure of the water tube by starting the "release water pressure" function on the Device.
Main menu > Settings menu > H2O Settings > Pressure release
For more information on this feature, please refer to H2O Pressure Release *(on page 156)*

Step II
Disconnect the water supply at the Device and, let the remaining water run into the coolant tank.

image

Step III
Use the custom wrench (1) that is delivered together with the filter to unscrew the transparent part of the filter (2).
Water will be inside this part, so it's best to place a bucket underneath the filter to catch the remaining water.

Step IV
Take out the filter element (white, round cilinder) and clean the transparent filter piece with tap water and dry with a cloth.
Depending on the contamination of the filter element, this can either be cleaned or replaced.
The filter fleece can be taken off the holder, by removing the rings on top and bottom, and sliding the fleece over the cilinder.
When replacing the cilinder, make sur that the ring with the blades is placed in the black piece.

Step V
Reassemble the water filter and connect it with the water supply and the Device.
Open the water tap. Once in Stand-by, the Device will resume the normal operations.

7.6. Clean oil filter

Procedure to clean out the filter in the external barrel of oil.

Step I
Disconnect the oil line from the Device to allow all oil to return to the barrel.

Step II
Lift up the oil line when it is empty and make sure the last remainder of oil leaks into the barrel.

Step III
When the line and filter are completely empty, clean out the filter with water and dry with compressed air.

Step IV
Put the line and filter back into the barrel (and make sure the filter can reach all the way to the bottom.

Step V
Reconnect the oil line onto the Device.

7.7. Calibrate pH Probe

This function starts the process of calibrating the pH Probe.

Prerequisites:
Make sure to have the following items ready to succesfully calibrate the pH probe:

1. Calibration fluids pH 7.0 and 10.01
2. Glass of water to rinse the probe
3. Teflon tape for sealing

Similar to a battery, the base value of the pH probe will go down due to consumption of the internal liquid. This depletion will affect the measurement results. With the calibration process, it's possible to learn the Device what values are currently present, so that the measurement results remain accurate.

```
Calibrate PH

Continue?
Auto    Man     Exit
```

Start the Calibration process by navigating to the correct menu.

Path
Main menu > MSR menu > MSR settings > PH > Calibration PH
OR
Main menu > Maintenance > Calibration PH

Step I

Disconnect the pH probe cable by disconnecting the BNC-connector.

Step II

Screw the pH probe out of the Device body.

Step III

Clean the probe with tap water, remove dirt with rack or toothbrush and dry with compressed air.

Step IV

Connect the pH probe cable again and select **Auto** for the automated calibration procedure.

Step V

Open the calibration fluid PH7 with scissors.

Step VI

Submerge the probe in the Calibration solution PH7 and gently shake so that the fluid is completely in contact with the probe.

```
Calibrate PH

Continue?
Auto    Man     Exit
```

Step VII

Select the automatic calibration by pressing **Auto**, so that the Device will automatically detect when the value is stable and it is OK to proceed to the next step.

Input

Auto: Start automatic calibration; Step VIII

Man: Start manual calibration pH

Exit: Leave function

```
Calibrate PH
Rinse probe + PH7
PH7: 14389
         Ok     Exit
```

Step VIII

The device will perform regular measurements with the pH probe. On the screen, the readout value is given, as well as the deviation that is occurring since last measurement. When the deviation between measurements is small enough, the Device will automatically proceed to the next step. In the manual procedure, the operator needs to press **Ok** to continue to the next step of the calibration.

Values

Under normal conditions, the value should be around 15.000 in this step. Depending on the probe this can vary.

Input

Ok: Save value for PH 7; Step IX

Exit: Leave function

Important:
If the value is still drifting rapidly after 3 minutes, the pH probe will need replacing.

```
Calibrate PH
Rinse probe + PH10
PH7: 21057
         Ok     Exit
```

Step IX

Clean the probe with tap water, dry with compressed air. Open the calibration fluid sachet with scissors and submerge the probe in the calibration solution.
When the deviation is small enough, the Device will continue to the next step.

Note:
It is OK to deconnect briefly the probe from the Device to perform the necessary actions.

Values

Under normal conditions, the value should be around 21.000 in this step. Depending on the probe this can vary.

Input

Ok: Save value for PH 10; Step X

Exit: Leave function

Important:
If the value is not changing after being submerged in calibration fluid PH10 or it still drifting rapidly after 3 minutes, the pH probe will need replacing.

```
Calibrate PH
PH: 10.01
Done. Save?
Yes              No
```

Step X

The calibration process is done. Remount the pH probe into the pH holder of the Device. This should be done while the screen on the left is still active. This way it's certain that the device doesn't perform unexpected actions that result in spilling Coolant.

Step XI

Disconnect the pH Probe cable by disconnecting it from the BNC-connector.

Step XII

If required, put teflon tape around the thread of the pH probe. Screw the pH probe in the holder of the Device body.

Step XIII

Reconnect the pH probe cable with the BNC-connector.

CAUTION:

Only the first 1 cm – 1,5 cm of thread of the probe should be screwed in. Always use Teflon tape to prevent leaks of water or Coolant via the probe. Screwing in the probe too deep can cause damage to the pH probe, which can lead to incorrect measurements and might require replacement of the probe.

```
Calibrate PH
PH: 10.01
Done. Save?
Yes                No
```

Step XIV

The calibration process is completed. The new calibration values need to be saved to the Device. If the process did not go as described above, press **No** to restart. If the process was executed according to this manual, **Yes** can be pressed.

Input

Yes: Save new calibration (overwrite old calibration)

No: Leave function (continue working with old calibration)

Step XV

Restart the Device in order for the calibration to take effect.

7.8. Clean Coolant intake filter

Procedure to clean out the filter of the Coolant intake at the bottom of the Device.

Step I

Power off the Device so it's possible to lift it out of the tank.

For **power off** keep pressing the power button untill the device beeps. After the beep, release the power button. The Device will run a shutdown cleaning cycle and will auto power off. Once the Device is powered off, disconnect the power cord.

Step II

Lift the Device out of the Coolant tank and place it into a container that can catch any leaking Coolant. Depending on the setup, it might be more convenient to disconnect the water, air and oil supply before lifting the Device out of the Coolant tank.

Step III

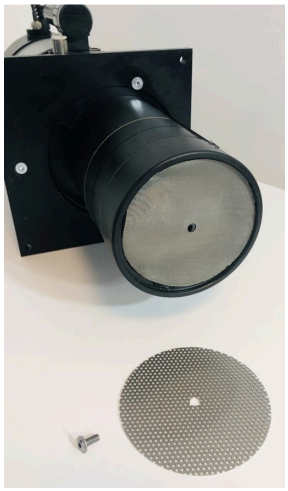
Screw out the drain plug with an allan key 7 mm and let the substructure drain completely.

Important:
The drain hole in the substructure is the only safe way to release all the coolant that is sitting inside the substructure after it has been submerged. Make sure that all coolant is drained via the drain hole by removing the drain plug before tilting the device on its side. Not draining the substructure will mostly likely result in damage to one or more sensors of the Device.

Step IV

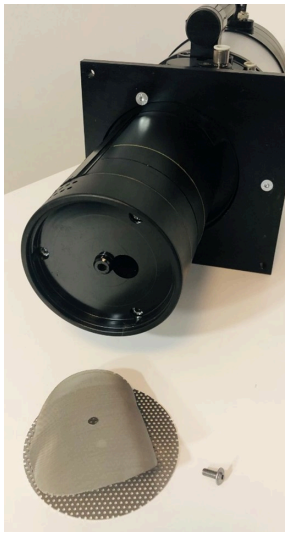
Carefully tilt the Device and place it on the side so that the bottom of the Device is accessible. Support the section of the head with a piece of wood.

Important:
Always make sure the head of the Device is higher than the substructure of the Device. The substructure can contain Coolant and/or water, which can damage the sensors and probes if the substructure is raised above the head. When the Device is put in its side, make sure to support the head, so that it is always higher than the body.



Step V

Unscrew the bolt in the center of the filter and take out the first coarsefilter.



Step VI

Take out the second (fine) filter.

Step VII

Clean both filters and the inlet of the Device with water and a cloth. Dry with compressed air.

Step VIII

Place back the filters in the right order and fixate with the screw.
Mount the Device back in the machine and reconnect water, oil and electricity. Turn on the Device.

Start the Device

Powering on the Will-Fill can be done by pressing the power button shortly.
This button will light up to let you know the device is powered.

Note:
It can take up to **5 minutes** before a message appears on the screen because of the start-up of the internal processes. Right before the first message appears on the screen you will hear a **short tone**.

7.9. Service Information

This section describes a number of components that are used in/with the Device more in detail, which is convenient for certified service personnel.

- Main PCB Lithium battery: CR2032, 3 Volt, 235 mAH; diam. 20 mm

- 84 µS/cm EC fluid: Hanna Instruments, HI7033, Conductivity Standard 84 µS/cm, +/- 1 µS/cm @ 25 °C (77 °F)
- 12880 µS/cm EC fluid: Hanna Instruments, HI7030, Conductivity Standard 12880 µS/cm, +/- 50 µS/cm @ 25 °C (77 °F)
- pH 7.01 fluid: Hanna Instruments, HI70007, Buffer Solution, +/- 0.01 pH @ 25 °C
- pH 10.01 fluid: Hanna Instruments, HI70010, Buffer Solution, +/- 0.01 pH @ 25 °C

8. Device unmounting

In this chapter it's explained how to unmount the device from the Coolant tank. Since both water and electricity are connected, it's important to do this in a safe way. Follow the next steps for disconnecting safely the Device.

8.1. Prepare Device for unmounting

Before shutting down the Device, the pressures of the different lines should be released. The steps below explain how to do this. This will greatly help with disconnecting the tubing afterwards.Once the correct operations have been performed, the Device should be shut down.

8.1.1. H_2O Pressure Release

This function allows the pressure to be released of the H_2O supply. Before this function is used, it is important to shut off the water supply.

```
Make sure water-
supply is disabled

Back      ---     Ok
```

Function
This function is convenient to use when the water hose needs to be disconnected from the Device. Releasing the pressure will allow for the deconnecting to be done smoother.

Path
Main menu > Settings menu > H2O Settings > Pressure release

Input
Ok: The Device starts checking the pressure; Step II
Back: Leave function

```
Water Pressure
still present
Please check supply
Retry             Ok
```

Error I
Retry: restart the pressure release
Ok : Leave function

```
No Water Pressure
detected
Safe to disconnect
         Ok
```

Step II
Ok: Leave Function; water line can be disconnected.

8.1.2. Air Pressure Release

This function allows the pressure to be released of the Air supply. Before this function is used it is important to shut off the air supply.

```
Releasing pressure
Progress: 1 - 99 %
Air valve open
```

Function

This function is convenient to use when the air tube needs to be disconnected from the Device. Releasing the pressure will allow for the deconnecting to be done smoother. Upon starting the function, the air valve will open in an attempt to release the pressure.

Path

Main menu > Settings menu > Air Settings > Pressure release

```
Pressure released
Air valve closed

Retry    ---     Back
```

Step II

Retry: restart the pressure release

Back : Leave function

8.1.3. Shut down device

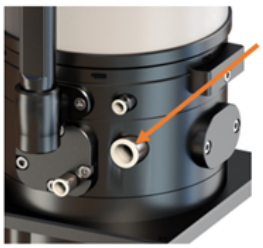
For **power off** keep pressing the power button untill the device beeps. After the beep, release the power button. The Device will run a shutdown cleaning cycle and will auto power off. Once the Device is powered off, disconnect the power cord.

8.2. Disconnect tubing

Once the Device is shut down, the different tubes (water, air and oil) should be disconnected, as well as the power plug.

8.2.1. Disconnect water

Disconnect the black tube from the Device.



Step I

Make sure the water tap is closed before proceeding with disconnecting the black water tube.

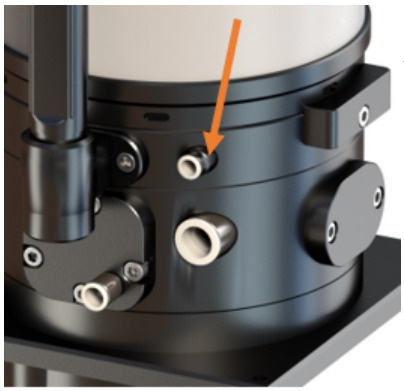
Even when pressure has been taken off, some water will come out of the tube. Make sure to have a recipient ready to catch this water.

8.2.2. Disconnect air

Disconnect the blue tube from the Device.

Step I

Before disconnecting the air tube, make sure the valve is closed. When closing the valve, the excess air escapes the tube, so disconnecting is easy.

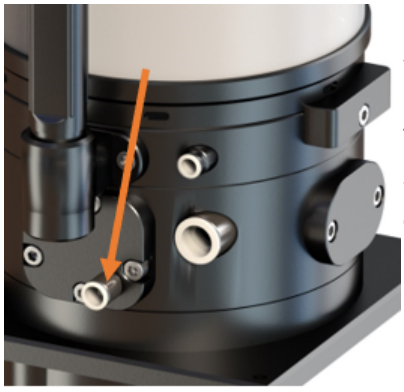


Step II

Disconnect the blue tube from the Device.

8.2.3. Disconnect oil

Disconnect the transparent tube from the Device.



Step I

Disconnect the transparent tube from the Device.
The oil line is not pressurized, so no specific steps need to be undertaken.
Some oil might drop out still, so have a recipient ready to ccatch the excess amount of oil. Spilling can be reduced by facing the opening of the tube upwards.

8.2.4. Disconnect power supply

Disconnect the power supply by pulling the power cord out of the power socket.

Step I

Unplug the power cord from the power socket. Before doing this, always make sure the Device is no longer power on.

For **power off** keep pressing the power button untill the device beeps. After the beep, release the power button. The Device will run a shutdown cleaning cycle and will auto power off. Once the Device is powered off, disconnect the power cord.

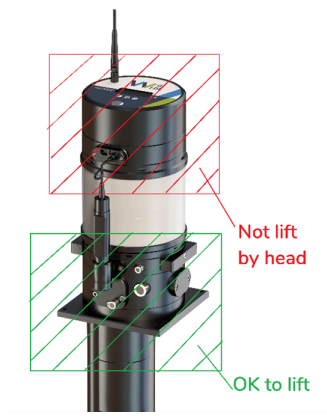
8.3. Unmouting the Device

When all cables are disconnected, it's OK to remove the Device from the Coolant tank. To do this in a safe way, follow the instructions below.

8.3.1. Handling the Device

Below instructions on how to handle the Device when moving it around are given.

When lifting the Device out of the box or out of the Tank, this should be done carefully. Never lift the Device by the head part (indicated in red in figure).



For lifting the Device, preferably use the handles on either side or the rectangular base plate if more convenient.

When putting the Device aside, never tilt the Device without releasing all fluids.

Attention:
Make sure to never tilt the Device without releasing all coolant from the sub-structure and all oil from the gearbox. If device is tilted with either of these fluids inside, this will cause damage to one or more components or sensors.

Important:
The drain hole in the substructure is the only safe way to release all the coolant that is sitting inside the substructure after it has been submerged. Make sure that all coolant is drained via the drain hole by removing the drain plug before tilting the device on its side. Not draining the substructure will mostly likely result in damage to one or more sensors of the Device.

Important:
The drain hole on the body, located on the backside of Device, is the only safe way to release all lubrication oil from the gearbox. Make sure that all oil is drained via the drain hole by removing the drain plug before tilting the device on its side. Not draining the gearbox will mostly likely result in damage to one or more components of the Device.

8.3.2. Draining the Device

In order to release all coolant from the Device, the substructure needs to be drained by taking out the plug near the bottom of the substructure. For draining the oil from the gearbox, the drain plug on theback of thebody needs to be taken out.

Prerequisites:

1. Allan key 7 mm
2. Allan key 3 mm
3. Low recipient

Step I

Before taking the plug out, place the Device in a recipient. Preferably a lower recipient, for easy access to the plug, that can hold at least 3 liters of fluid.

Step II

Unscrew the plug out of the substructure. The plug has a 7 mm Allan key.

Step III

Keep the Device upright and unscrew the lug out of the body (rear side). The plug has a 3 mm Allan key.

Step IV

Tilt the Device backwards to let the oil drain out of the gearbox of the body.

8.3.3. Unscrew pH Probe

Taking out the pH probe allows for storing it properly during transport.

Step I

Disconnect the pH probe cable by disconnecting the BNC-connector.

Step II

Screw the pH probe out of the Device body.

Step III

Clean the probe with tap water, remove dirt with rack or toothbrush and dry with compressed air.

Step IV

Place the plastic, transparent cap over the probe. Make sure the sponge inside is wet. This will prevent the probe from drying out.

Step V

Dry out the holder in which the pH probe was placed with a cloth.

8.4. Transporting the Device

When the Device is unmounted completely, it can be made ready for transport. As the Device is laboratory equipment which is sensitive, it requires carefull packing before transport.

Step I

Install the plastic protection on the upper structure.

Step II

Install the EPS foam on the head.

Step III

Install the EPS in the middle of the Device.

Step IV

Install the EPS foam at the bottom of the Device.

Step V

Install the Device with the EPS protection in the cardbord box.

Attention:

If you don’t have the original packing material, replace the pre shaped EPS foam with other impact resistant materials to make sure there is no damage to the Device during transport.

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