



Operating Manual

Drum Filter

Model:

TM2

Version:

2019

1. Introduction

Congratulations with your new TROME Drum Filter model TM2.

To make sure that your TM2 works properly it is essential that you read this manual carefully.

Please follow all instructions, hints and information exactly to avoid any problems with the operation of the TM2.

Should any questions or problems occur which are not mentioned in this manual please contact your representative.

2. Important security information and warnings

This manual should be accessible at any time as it contains important information regarding the installation and operation, as well as for trouble shooting.






We recommend to keep a copy of this manual directly at the location of your filter so that it is available for technicians etc. when needed.

PLEASE NOTE!

Trome vof is not responsible for any damages of the TM2 or injuries which occur due to neglect of the manual and the security notes and instructions contained in it.

3. General information regarding the used pictograms

You will find the following pictograms in this manual and/or on the TM2. These pictograms point to important information or contain warnings. The exact meaning is described below:

	<p>Important information that requires special attention.</p>
	<p>Danger due to electricity.</p>
	<p>Increased risk of damage/injuries for items or persons.</p>
	<p>Danger of injuries due to moving parts.</p>
	<p>Read manual before use.</p>

4. Information regarding your TM2

4.1: Drum filter

An identification tag is applied on the casing of your TM2. This information is recorded below:

Serial Number:

4.2: Control box (CB) and emergency stop (ES)

An identification tag is applied on the inside of the CB and ES. This information is recorded below:

Serial Number CB:

Serial Number ES:

5. EG-Conformity Statement



Manufacturer: Trome vof
Tulpenstraat 9
1840 Londerzeel
Belgium

Machine type: Drum Filter incl. electrical control unit
(Model on the ID label)

Guide Lines/Directives: Machinery Directive EU 2006/42/EC, 98/37/EC
Low Voltage Directive 73/23/EEC

Trome herewith confirms the conformity of the product described in this manual with the above mentioned directives and regulations.

Dendermonde, October 2013.

A handwritten signature in black ink, appearing to read 'Sven Trossaert', with a horizontal line drawn through it.

Sven Trossaert, Manager

A handwritten signature in black ink, appearing to read 'Wouter Meeus', with a horizontal line drawn through it.

Wouter Meeus, Manager

6. Modifications on the TM2

Please note that any modifications on the TM2 without written approval of Trome or an authorized dealer will result in the immediate expiration of the CE-sign. Furthermore Trome will not be responsible for any damages or injuries resulting from these modifications.

7. Spare parts

Only genuine spare parts from Trome or an authorized dealer should be used. If spare parts from other suppliers/manufacturers are used, Trome will not be responsible for any damages/injuries.

8. Description and functioning of the TM2

A drum filter TM2 is a mechanical filter which removes waste and other fine particles from the system water via a micro screen (filter screen). The TM2 is able to "monitor" the changes in water levels and to "recognize" when the micro screen needs to be cleaned. Therefore a TM2 automatically adjusts to the waste intake and only flushes when necessary. The other big advantage of a TM2 is that all detritus such as fish waste, uneaten feed etc. will not remain in the system water. Instead all waste is flushed out of the water column automatically after a very short period of time.

Functioning principle:

The (contaminated) water is fed into the TM2 via the inlet pipe. The water enters directly into the drum. The filter drum is covered with a fine filter mesh (standard 60 micron). Water can only leave the drum by passing through the mesh. All particles larger than 60 micron will remain inside the filter drum. The clean water leaves the drum filter's chamber via the outlet pipe and can then pass into the following filtration step.

The waste particles trapped inside the drum will slowly clog the filter screen making it more difficult for the water to pass through. Therefore the water level in the drum will slowly rise. Once the water level reaches a certain maximum level, which can be manually adjusted with the level sensor positioned at the inside of the drum, a flushing process is activated by the control box. During the flushing process the drum is rotated by the gear motor while high pressure water is sprayed onto the outside of the filter screen by multiple spray nozzles. The waste particles that were clogging the filter screen are flushed into the waste tray, positioned inside the filter drum, and leave the TM2 via the waste water outlet. More water can flow again through the cleaned filter screen and the water levels will equal at previous levels. The flushing time can be manually set with the timer in the control box. Due to the use of the water level sensor the filter only flushes when necessary, i.e. when the waste intake reaches certain limits.

9. Transporting and moving the TM2

The TM2 can be transported/moved by a fork lift or similar devices while standing on a pallet. To move the filter by hand the inlet and outlet sockets can be used (**Do not use the collar, motor cover or waste outlet socket!**).

10. Installation and connections



The installation should be executed by qualified personnel only.

10.1 Before installation

The TM2 is transported in a wooden box pallet. The box and pallet are made separately and during packaging, the box is placed from above and finally fixed to the pallet. To unpack, just remove the screws that fix the box on the pallet and lift the box. (At least 2 persons are needed).

The TM2 should be carefully inspected before installation. Make sure that the packing and the TM2 show no signs of any damage. Check the inside of the TM2 and make sure that there are no remains or items in it.

10.2 Installation and connections

The TM2 needs to be placed on a solid and flat surface. **It is essential that the entire bottom surface is supported (and for example not only the edges).** When the filter has been placed at the desired location it needs to be positioned horizontally by using a spirit level.



The TM2 needs to be placed at a proper location and **it must not be exposed to direct sunlight. The TM2 has to be protected against freezing.** Please make sure that the filter is protected against temperatures below 0 deg. Celsius. If the temperature might become lower the TM2 needs to be covered accordingly.

The inlet and outlet pipes are to be connected to the sockets on the TM2. Make sure that the connected pipes do not create any mechanical load or tension onto the TM2 casing. The connecting pipes should be as straight as possible (use as less elbows as possible). The pipe dimensions should suit the desired flow rates.

The pipe for the waste water discharge should be installed with a decline of min. 1%!

10.3 Connection of the flushing pump

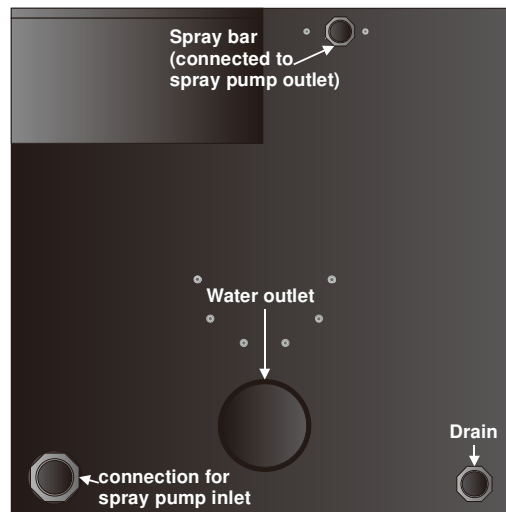


Figure 1

Position of the pump: it is advised to place the flushing pump as low as possible, at least **below the water level inside the drum to keep the pump primed.**

Priming of the pump: different types of pumps are used depending on the model. For priming instructions we refer to the pump manual (included).

The flushing pump can be connected with pipes or suitable high-pressure hoses (included in the connection set, optional). The water inlet of the spray bar has a $\frac{3}{4}$ inch connector. A hose adaptor or pipe socket can be connected to it. The water outlet of the flushing pump is connected to the spray bar.

The water inlet of the flushing pump is connected to the connector at the bottom of the TM2 chamber (figure 1).

11. Control Box and Emergency Stop

The control box (CB, figure 2) and emergency stop (ES, figure 3) are completely assembled. The emergency stop must be mounted on the casing of the TM2 within reach of the moving parts, the best position depending on your situation. The control box can be mounted on a wall,... nearby.



Figure 2

S1: main switch (ON/OFF)
D1: manual flush

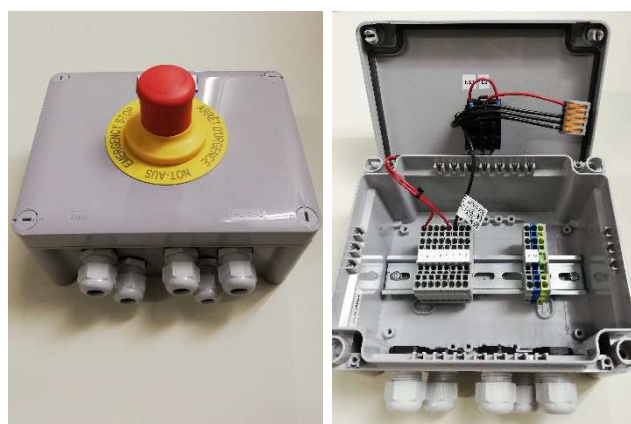


Figure 3

11.1 Connections

As every situation is unique, the CB and ES are not yet connected, the connecting cables are delivered separately. It is advised first to mount the CB and ES on their definitive positions, second cut the cables on the correct length and third make the connections.

Three cables are delivered with the control box (figure 4):

- Power cable (A): to connect CB and ES and to connect the spray pump and motor to the ES.
- Signal cable (7 wires) (B): to connect CB and ES.
- Sensor cable (C): to connect the sensor with the ES.

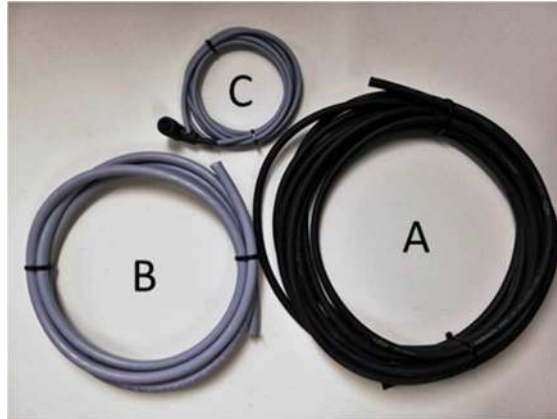
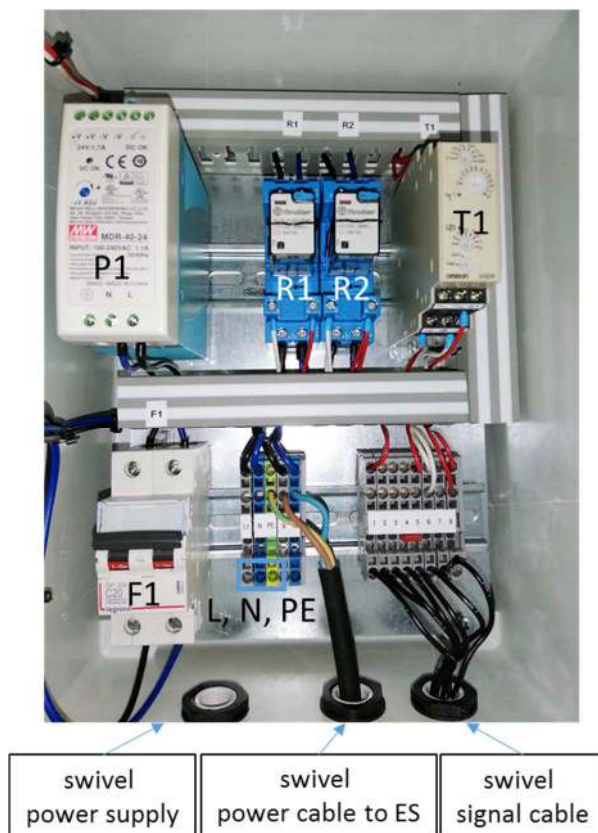


Figure 4

For wiring details we refer to the electrical wiring diagrams in appendix 1.

CB (figure 5):

- Power supply: insert your power supply (230V 50Hz/60Hz) cable through the swivel into the control box and connect onto terminals L, N and PE (figure 5).
- Power cable (supplied) between CB and ES: connect the power cable on clamp 9, 10 and PE.
- Signal cable (supplied) between CB and ES: connect signal cables 1-7 on the corresponding clamps 1-7.



P1: power supply 24Vdc
 F1: fuse
 T1: timer
 R1 & R2: relais 1 & 2

swivel power supply swivel power cable to ES swivel signal cable

Figure 5

ES (figure 6):

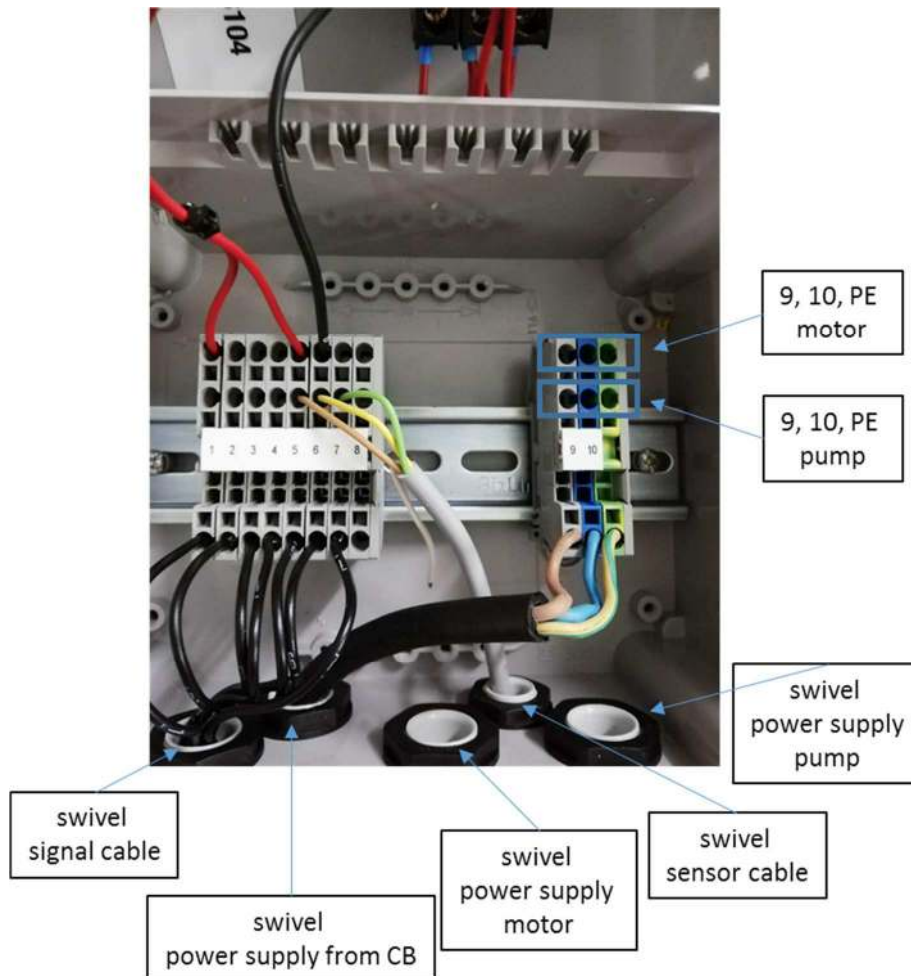


Figure 6

- Power cable between CB and ES (supplied): connect the power cable on clamp 9, 10 and PE.
- Power supply motor: connect the power cable (supplied) on clamp 9, 10 and PE.
- Power supply pump: connect the power cable (supplied) on clamp 9, 10 and PE.
- Signal cable between CB and ES (supplied): connect signal cables 1-7 on the corresponding clamps 1-7.
- Sensor cable: connect the brown cable on clamp 5, the yellow cable on clamp 6 and the green cable on clamp 7 (white cable is not used).

11.2 Timer setting

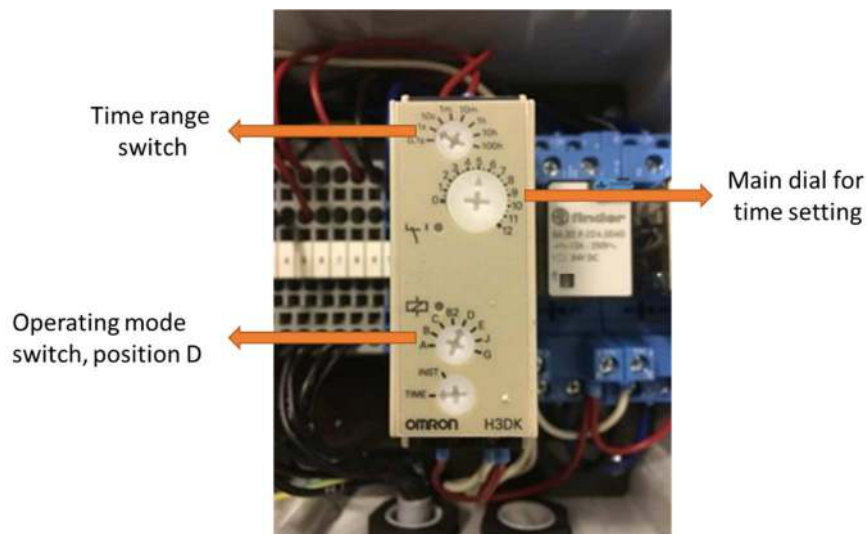


Figure 7

The flushing time can be adjusted depending on your situation (figure 7, main dial).

Factory setting of the time range switch is 1 sec. Factory setting of the main dial (duration of a flushing cycle) is 4 sec. Operating mode switch should always be in position D (signal off delay).



Before starting up and connecting the power supply make sure that the emergency stop button is pushed and the power supply is interrupted until start-up.



PLEASE NOTE:

The control unit is completely installed and ready-to-use. However it is recommended that a qualified electrician re-checks the power connection. We also recommend to connect the control unit to a circuit breaker for further safety.

12. Start-up

12.1 Before start-up

It is important to re-check all relevant points again. These include:

- Checking all connections (correct position, no leakages etc.)
- Checking all safety devices (motor cover etc.)

12.2 Outlet configuration



The outlet of the TM2 has to be raised with an elbow and/or T-piece or another configuration depending on your situation. This ensures that the filter chamber does not get entirely empty after flushing or during a power failure. Critical differences in water levels inside and outside of the filter drum are avoided.

12.3 Setting the level sensor and outlet

In order to use the maximal capacity (and thus minimal water consumption) of the filter, the level sensor is to be set as high as possible without water going over the overflow at the moment a cleaning cycle is triggered.

The T-piece (or elbow with pipe) at the outlet needs to be positioned so that the difference in water levels inside and outside the drum at the moment a cleaning cycle is initiated, is ± 10 cm. **This avoids too much strain on the gears etc. due to the weight of the water inside the drum.**

However, the position of the sensor is adjustable in case your situation requires this. The outlet configuration should be adjusted in order to have the ± 10 cm level difference again.

The exact position of the level sensor and the outlet configuration can only be set when water is flowing through the TM2. To start up, activate the circuit breaker, unlock the emergency stop button, turn the main switch in position "1" and start the water pump of your system. Readjust the position of the level sensor if needed and readjust the position of the outlet configuration accordingly.

Stay away from the moving gears to prevent injuries!

Check whether the flushing works and that the nozzles are not plugged. If you find plugged nozzles push the emergency stop button and remove the nozzles from the nozzle holder as explained under section 13.1. Once the cleaned nozzles are back into position, unlock the emergency stop button.

Check whether the spray water goes into the waste tray. If this is not the case, the angle of the nozzles needs to be adjusted. Call your representative for assistance.

12.4 “Teaching” of the sensor.

The sensor needs to be set to the local conditions for both “no water” (air or “empty state” in sensor manual) and “in water” (“full state” in sensor manual) as local conditions may vary in temperature, salinity,...

The sensor can also be set to reduce the influence of fouling.

The sensor manual is included in the sensor packaging and the most important sections can be found in appendix 2.

Important to know:

- the measuring point is 15mm above the end of the sensor
- for the correct functioning, the end of the probe should be at least 10mm above the bottom of the 90° elbow of the sensor holder (TM1 and TM2 only)



In the first days after the start-up it is recommended to check the nozzles on a daily basis and clean them if necessary.

Check whether the cleaning and flushing process works and the filter operates according to its application.

In case the flow rate of the system is changed, you might have to reposition the level sensor and outlet configuration.

13. Maintenance



Before doing any maintenance works the emergency stop button has to be pushed and the power supply has to be interrupted! Failing to do so might result in damages or injuries!

13.1 Spray nozzles



Figure 8

It might happen that one or more nozzles get plugged. This results in poor cleaning of the filter screen. Should a nozzle be plugged you can clean it with a tooth brush.

Please do not use any hard or sharp objects like cutter knives or steel brushes as they would damage the nozzles.

Spray nozzles will wear out: the nozzle opening will become larger which leads to a less efficient cleaning of the screen and subsequent a higher cleaning frequency and water consumption. It is advised to check the nozzles at least once per year and replace in due time.

How to replace a spray nozzle: push the emergency-stop-button. Fix the grey nozzle holder with a wrench nr 23 (figure 8). Remove the blue nozzle from the nozzle holder by turning it counter-clock-wise ($\frac{1}{4}$ turn). Be careful when taking out the nozzle and make sure the seals do not fall into the TM2. Place a new nozzle in the grey nozzle holder and lock it by turning clock-wise ($\frac{1}{4}$ turn). Turn the control box on again by unlocking the emergency-stop-button.

13.2 Filter screen

The mesh is fixed onto the supporting structure, isolating damages of the mesh within one cell. In many cases damaged mesh can be closed using an inert sealant/mounting glue.

In case the filter screen needs to be replaced, it can be changed easily. To change the screen the fixing screws of the drive gear need to be removed first (figure 9). Then the drive gear can be removed so the drum can move freely.

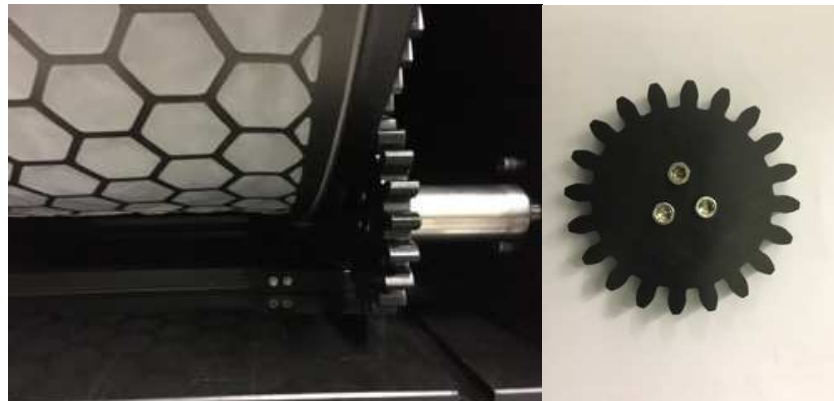


Figure 9

Remove the screws of the bars on both sides of the screen and remove the bars (figure 10). The filter segment can be taken out by pulling on one side and sliding the segment out of the slots (figure 11).



Figure 10



Figure 11

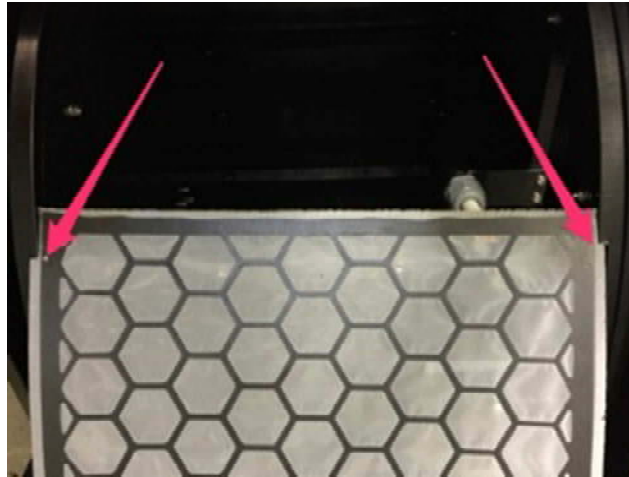


Figure 12

The new screen segment can now be placed by sliding it into the slots (figure 12). An inert lubricant (vaseline,...) can be applied on the edges of the screen to facilitate sliding in the screen segment. Reposition the bars and tighten the screws.

When tightening the screws please make sure that you do not “overtighten” them, especially in case an electrical tool is used (use position 7 for a 10,5V electrical screw driver with 18 steps or equivalent). Stop turning the screws when you feel a resistance (manual).

After installing the new screen segment simply turn the drum to a position that allows mounting of the drive gear back onto the drive axis. Tighten the screws of the drive gear.

13.3 Drum sealing

A rubber sealing (figure 13) prevents that water loaded with particles leaks from the inside of the drum into the clean water compartment. The friction of the rotating drum will wear out the sealing and in time leakage might occur. **It is advised to check the sealing at least once per year and replace in due time.**

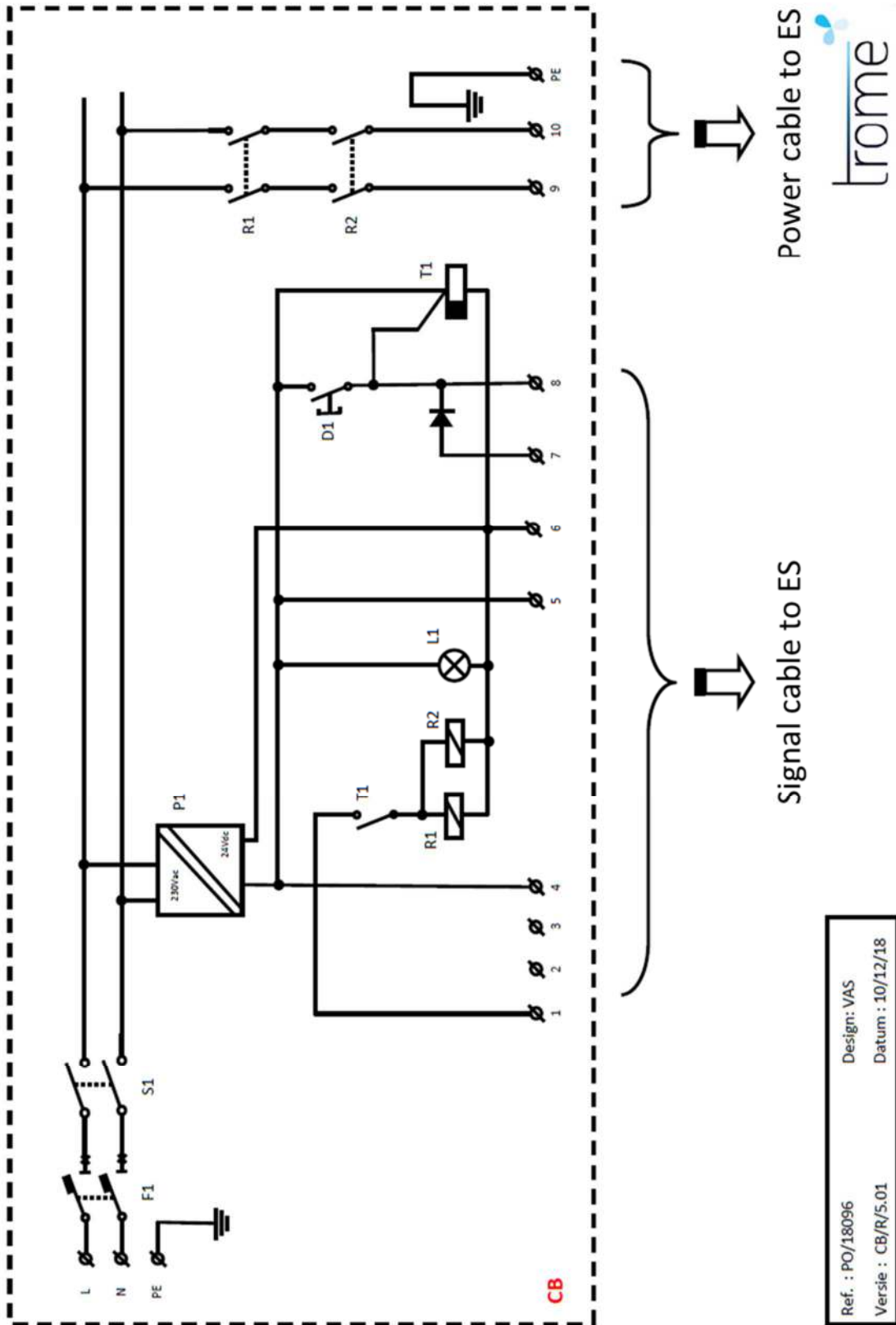


Figure 13

14. Technical Specifications

	TM1	TM2	TM3	TM4
Dimensions Casing:				
Length:	550mm	561 mm	630mm	980mm
Width:	300mm	524 mm	760mm	760mm
Height:	410mm	520 mm	760mm	760mm
Dimensions Filter Drum:				
Dia.:	238mm	400mm	650mm	650mm
Length:	340mm	300mm	350mm	700mm
Total surface area filter screen:	0,25 m ²	0,38 m ²	0,71 m ²	1,43 m ²
Effective surface area filter screen:	0,11 m ²	0,17 m ²	0,34 m ²	0,66 m ²
Standard mesh size filter screen:	60µm	60µm	60µm	60µm
Standard Flow Rate:	5 - 7 m ³ /h	15 - 20 m ³ /h	30 - 40 m ³ /h	60 - 75 m ³ /h
Effective surface area filter screen (m²) / m³	0,023 - 0,015	0,011 - 0,0084	0,011 - 0,0084	0,011 - 0,0088
Dimensions:	-			
Inlet:	1 x 63 mm	1 x 110 mm	1 x 160 mm	1 x 200 mm
Outlet:	1 x 75 mm	1 x 110 mm	1 x 160 mm	1 x 200 mm
Waste Water Outlet:	1 x 50 mm	1 x 110 mm	1 x 110 mm	1 x 110 mm
Motor:	AC 0,18kW	AC 0,18kW	AC 0,37kW	AC 0,37kW
Electrical Supply Sensor/Motor:	24V / 230V / 50Hz			
Classification Control box Casings:	IP66			
Classification Buttons/Switches CB:	IP65			
Electrical Supply Control box:	230V / 50Hz (standard model)			
Materials of Construction:	-			
HDPE:	Casing, Filter Drum, Support Screen, Waste Water Tray etc.			
Stainless Steel 316:	Drive axis, screws			
POM:	Drum gear, drive gear, bearings			
PP:	Spray Nozzles			
Nylon:	Mesh			

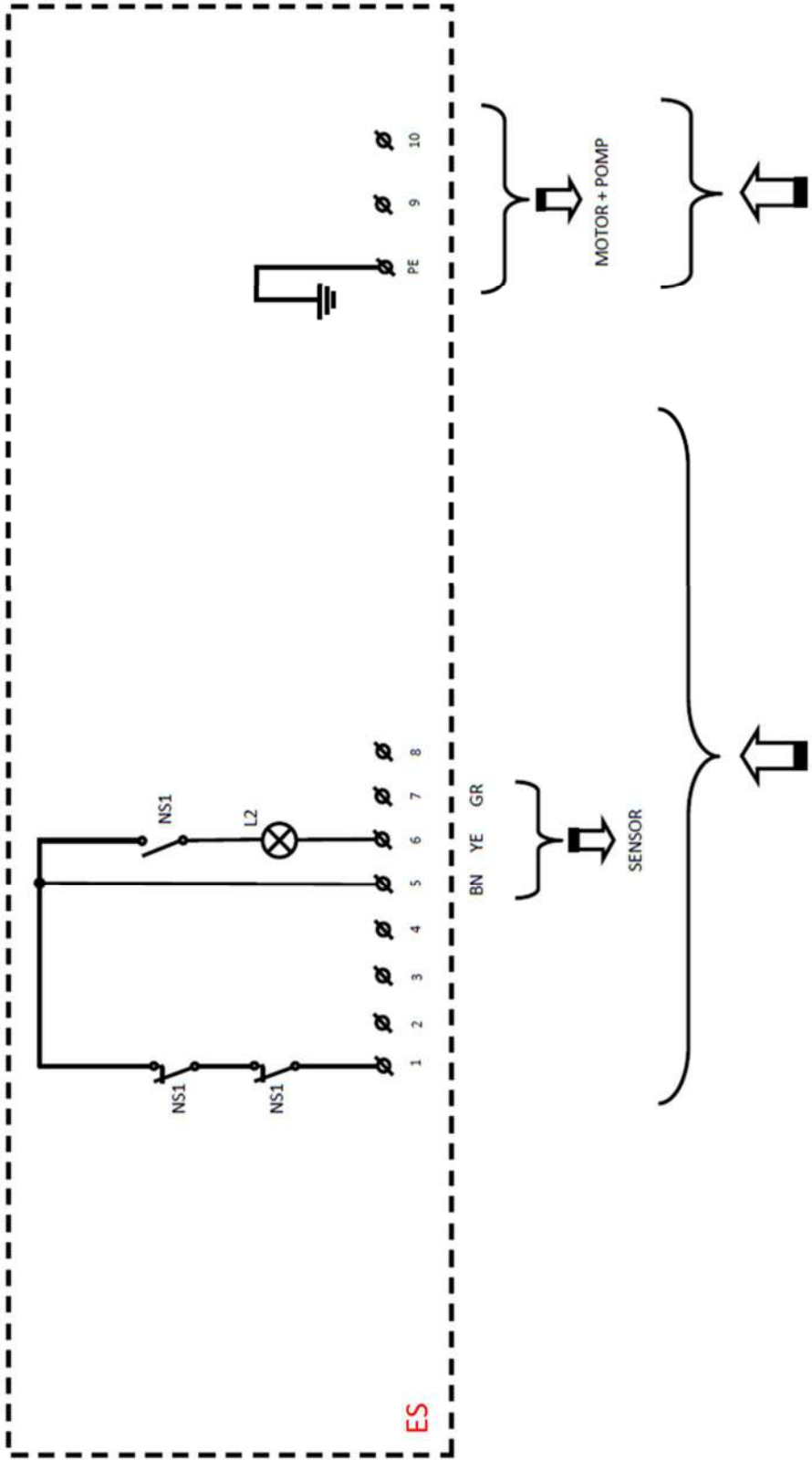
Appendix 1: Electrical wiring diagram CB and ES



Power cable to ES

Signal cable to ES

Ref. : PO/18096	Design: VAS
Versie : CB/R/5.01	Datum : 10/12/18



Power cable from CB

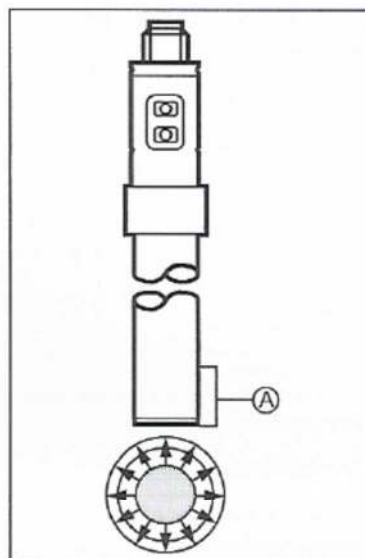
Signal cable from CB

Ref. : PO/18096
 Design: VAS
 Versie : CB/R/5.01
 Datum : 10/12/18



Appendix 2: Sensor Manual

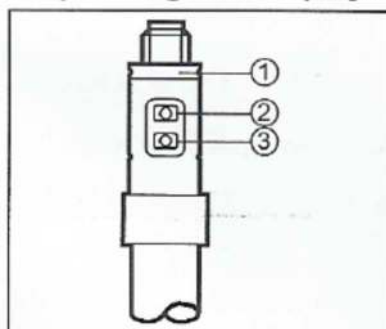
The unit operates with radial detection characteristics. Therefore media below the active zone are not detected. Despite different electrical properties media are only detected when the active zone (A) is covered.



4.2 Features of the unit

- NO or NC function can be set by programming buttons (→ chapter 8 Settings)
 - NO function: output closed when the level has been reached / output open when the level has not been reached.
 - NC function: output open when the level has been reached / output closed when the level has not been reached.
- Automatic adjustment function to the medium to be detected by programming buttons (→ chapter 8 Settings). This allows reliable detection of media with a low dielectric constant (e.g. oil).
- Level selectable by the installation length (→ 5.3).
- The unit is virtually immune to build-up on the probe of almost any kind. The position of the switching level within the active zone can however change with build-up.
- Operating and switching status indication via LED ring.

7 Operating and display elements



- 1: LED ring green / yellow
 - green: operation display
 - yellow: switching status indication
- 2: programming button OUT OFF
- 3: programming button OUT ON

8 Settings

Before the first set-up the basic teach empty state must be carried out.

8.1 Carry out the basic teach empty state

The basic teach empty state sets the unit to the empty tank and the installation conditions (e.g. the set installation length). Previous settings are deleted.

- ▶ Empty the tank until the medium is at least 20 mm below the end of the probe.
- ▶ Press [OUT OFF], keep it pressed for min. 2 s / max. 6 s.
- > The yellow LED flashes slowly. When the button is released, it goes out.
The unit is then ready for operation and set as NO unit (output ON when the level has been reached).

If the unit is to be set as NC unit:

- ▶ After emptying the tank press [OUT ON] instead of [OUT OFF]. After releasing the pushbutton, the yellow LED lights continuously.

8.2 Carry out the basic teach full state

The empty adjustment is sufficient for media with a low dielectric constant (e.g. oils). For aqueous media the sensitivity must be optimised by a full adjustment. The full adjustment does not change the settings of the empty adjustment.

- ▶ Fill the tank until the active zone of the unit is covered.
- > If the unit is set as NO unit (→ 8.1), the yellow LED lights, if it is set as NC unit, it goes out.
- ▶ If the unit is set as NO unit: press [OUT ON] and keep it pressed for at least 6 s.
- > The yellow LED flashes slowly, after 6 s it flashes quickly. After releasing the pushbutton, it lights continuously.

If the unit is set as NC unit: After filling the tank press [OUT OFF] instead of [OUT ON]. After releasing the pushbutton, the yellow LED goes out.

8.3 Set the deposit suppression (option)

This setting largely suppresses deposits in the tank and on the probe. Previous settings are not changed.

- ▶ Empty the tank until the medium is at least 20 mm below the end of the probe end. If the unit is set as NO unit (→ 8.1), the yellow LED goes off, if it is set as NC unit, it lights.
- ▶ If the unit is set as NO unit: press [OUT OFF] and keep it pressed for at least 6 s.
- > The yellow LED flashes slowly, after 6 s it flashes quickly. When the button is released, it goes out.

If the unit is set as NC unit: After emptying the tank press [OUT ON] instead of [OUT OFF]. After releasing the pushbutton, the yellow LED lights continuously.