

CONTOIL®

VZD 4, VZD 8 and VZDA 4 CE, VZDA 8 CE



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Safety instructions

Designed use

This unit is designed for acquisition, calculation, displaying and sending data. Results from incorrect use or from use other than designated, can suspend the operational safety of the devices. The manufacturer accepts no liability for damages being produced from this.

Installation, commissioning and operation

Installation, connection to the electricity supply, commissioning and maintenance of the device must be carried out by trained, qualified specialists authorized to perform such works. The specialist must have read and understood these Mounting and operating instructions and must follow the instructions they contain.

The installer must ensure that the measuring system is correctly wired in accordance with the wiring diagrams.

Before working on electrical installation, make sure to disconnect the power supply and ensure that nobody can reconnect it without your permission.

Pay attention to the following points:

- Voltage, operation data
- Maximum transmission length
- Cable cross section, length
- Ambient temperature and mounting position

Operational safety

The manufacturer reserves the right to modify technical data without prior notice. Your local distributor will supply you with current information and updates to these Mounting and operating instructions.

Return of the instruments

The following procedures must be carried out before a device requiring repair or calibration, for example, is returned to Aquametro Oil & Marine AG:

- Always enclose a fully completed "Repair Form" with the device. Only then Aquametro Oil & Marine AG can transport, examine and repair a returned device.

Notes on safety conventions and icons

The devices are designed to meet state-of-the-art safety requirements. They have been tested and left the factory in a condition in which they are safe to operate. They can, however, be a source of danger if used incorrectly or for use other than the designated use. Consequently, always pay particular attention to the safety instructions indicated in these Mounting and operating instructions by the following symbols:



Warning!

"Warning" indicates an action or procedure which, if not performed correctly, can result in injury or a safety hazard. Comply strictly with the instructions and proceed with care.



Caution!

"Caution" indicates an action or procedure which, if not performed correctly, can result in incorrect operation or destruction of the device. Comply strictly with the instructions.

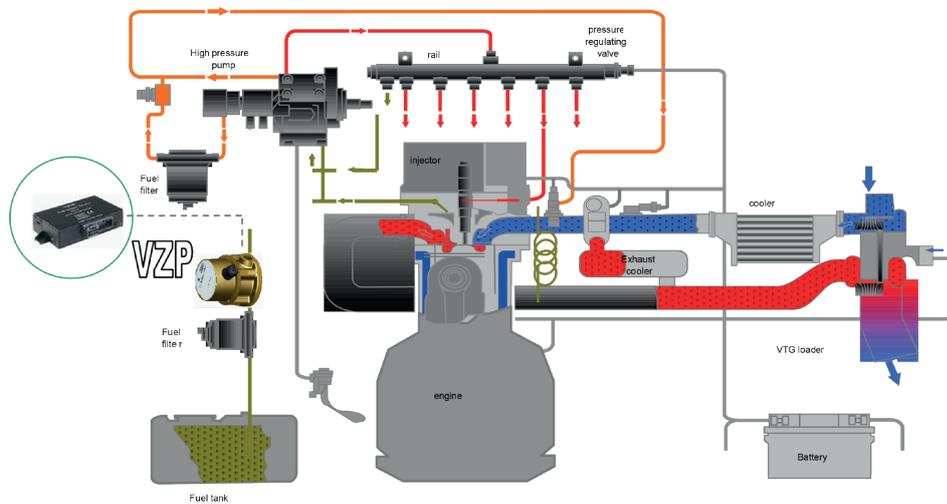


Note!

"Note" indicates an action or procedure which, if not performed correctly, can have an indirect effect on operation or trigger an unexpected response on the part of the device.

Configuration overview

Schematic of a configuration for vehicle consumption measurement



This drawing is just as an example. Different configurations are possible.

General considerations for vehicle consumption measurement

Basic functions

- The flow meter has no ON/OFF switch. Press one of the keys to wake up the flow meter.
- The display is numbered on the upper left corner. This numbers are used to quick locate the right display.
- After 60 sec. of not operating, the flow meter goes in a so called sleep mode.
- The flow meter will stay in the sleep mode until a key is pressed or one impulse from the flow meter is detected.

Installation advices

- The flow meter has to be always protected by a fuel filter. The max. mesh size depends on the flow meter size. The original installed engine filter is ideal for all flow meter sizes.
- Be aware, that all the fuel which is passing through the supply line **AND** is not consumed by the engine, **MUST** return to the supply line after the flow meter.
- The leak line of the injector **MUST** be returned after the flow meter.
- The arrow on the flow meter must show in flow direction.
- The flow meter must be absolutely free of gas inclusions.
- High pressure hammers from injection pump have to be avoided on flow meter (for example, with a min. 2 meter wound-up hose between flow meter and injection pump).
- When ever possible, install the flow meter on a place with low vibrations.

For your security



- **DO NOT** program or change parameters while you drive. This is dangerous for you and the other traffic participants.
- During the electrical installation (if they are) disconnect the vehicle battery.
- Be careful when disconnecting the pipes (exit of fuel will occur).
- After installation check all pipes for leaks.

Important information for custody transfer installation of the flow meter

Please read this section before installing the flow meters in a custody transfer application!

Installation position

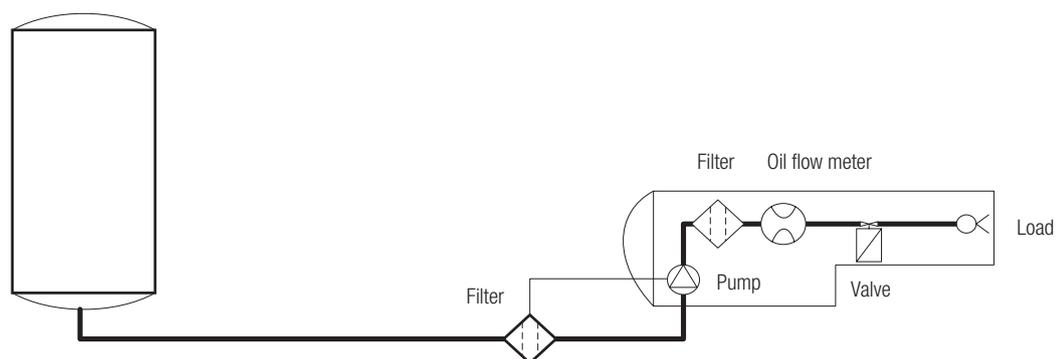
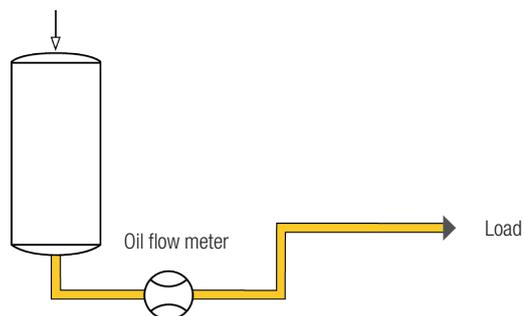
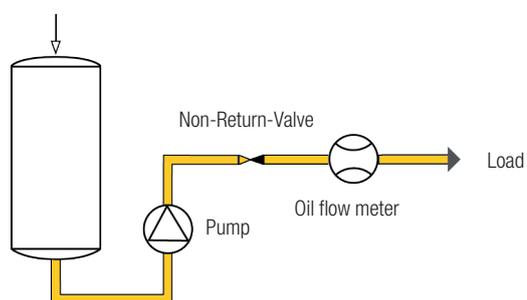
All installation position are allowed, except the position "display top-down."

Responsibility

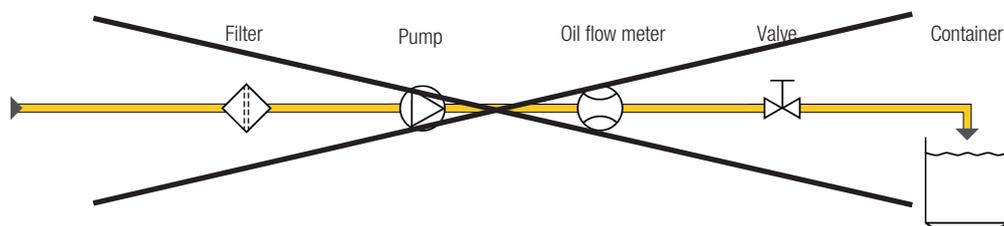
The user/installer take the responsibility for the correct installation according to the custody transfer law.

Installation examples

The drawings below are just intended as examples.



Not valid installation for custody transfer



Versions with type approval or official verification

Please read this section before installing the flow meters in a custody transfer application! This flow meter bears the approval number of the metrological construction type certification in accordance with Directive 2014/32/EU, as well as the metrological CE marking and are therefore provided for custody clearing. The meters must be used only for direct consumption measurement and installed in permanently installed pipes.

Pulse signals generated by the unit can be transferred to external counters. Though, according to the declaration of conformity, only the values from the display of the measuring device can be used for custody transfer. The local display of the counter is decisive in fiscal use.

Application

The CONTOIL® oil meter with MID approval are used almost exclusively where the measured liquid (fuel oil, diesel) goes directly to the consumer (burners of heating systems). The transfer point is the output of the flow meter.

Measuring systems through which a fluid is sold (gas pumps at service stations, measuring systems on road tankers, measuring systems for loading and unloading of vehicles of all kinds) are subject to different standards and guidelines.

Such a facility is used for the clearing and must usually be checked for operation on site or through the local weights and measures office and sealed.

In consideration of and in compliance with the applicable standards for the clearing, the CONTOIL® fuel oil meters with MID approval can be used.

Check at least these points before the end of installation:

- Before installing the flow meter, make sure the pipes have been flushed to avoid the possible remaining of swarf and / or dirties.
- The liquid (fuel oil, diesel, oils, etc) must be free of air bubbles. When necessary, an air separator and / or a non-return valve must be installed.
- Check all connections for leaks free.
- Check the installation for its accuracy.

How to commission



Before you start take this consideration:

Modification of the fuel flow path can lead to expiring of the warranty. In some countries it is also subject to a new certificate of matriculation. For more information contact the local authorities.

In addition, this installation must be done by an authorized and certified company or person. Please be aware, an incorrect installation will lead to an incorrect operation of the engine and therefore to an inoperable vehicle. In some cases it will cause serious damage to the vehicle. In such case, Aquametro Oil & Marine AG will deny all responsibilities.

VZD 4 or VZD 8 rotation of the cover (for better reading)

In some cases, due to the installation position, it may be useful to rotate the cover. For this, do the following:

1. Put a fabric on a flat table (this is just to avoid scratches on the display).
2. Turn the flow meter up side down and put it on the fabric.
3. Loosen the 4 screws.
4. **DO NOT** lift the body!
5. Slip the 4 screws out of the holes.
6. Turn the body of the flow meter in the way it should be for a better reading.
7. Put the screws back in the holes and tight it with a torque of
VZD 4 = 2.5 Nm
VZD 8 = 8 Nm

Before you start the installation on vehicle

Please read the chapter General considerations before you start.

1. Check/Set the following parameter:

a. Pulse Value IN

1. Go to the Service Menu (display05) and press key2. You will be directed to display19.
2. Press key2 again. A pencil will appear and the first changeable digit will start blinking.
3. Enter the password (standard: 1111).
4. After the last digit is entered, you will be redirected to display19.
5. Press key1 to move to display23.
6. If you install a VZD 4 the value must be 5 ml, for a VZD 8 the value must be 12.44 ml.
7. If you have to make some changes, enter the Edit Mode (see „Operating Instruction“ a few pages ahead).
8. Check also the display2A (Pulse value OUT). Make sure it is the same or bigger than pulse value IN
9. Go to the next step.

b. Unit

1. Go to display24.
2. Check the unit value (liter, Gallons or Kg).
3. If you have to change it, enter the Edit Mode (see Functionality of the Keys).
4. Go to the next step.

c. Service Code (password)

This change is optional and has to be done with care.

1. Go to display32 (Service Code).
2. Enter the <Edit Mode>.
3. Enter the new service code, **write it down and keep it in a save place.**



Without the Service code you won't be able to access the <Service> menu anymore!

2. Install, according to the vehicle circumstance and local legal issues, the flow meter in the fuel flow path to the injection pump (see section "Configuration overview") and make sure a fuel filter is installed before the flow meter to avoid impurities.
3. Install the flow meter between the pre-filter and the fine-filter or, if this is not possible, install between the flow meter and the injection pump about 1.5 m long hose and bend it round (see picture configuration overview).
4. The installed cable is not needed. Please protect the cable ends with tape, bend it together and fix it in a way it can not disturb.

Installation on vehicle and connection to fleet manager, GPS

The VZD 4 or VZD 8 has two outputs.

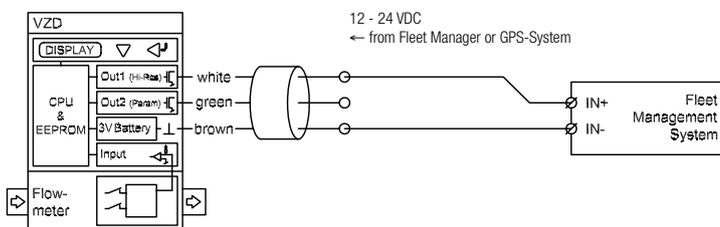
Output 1 (white cable):

The pure (or Hi-Res) signal is transferred to the output. This means, each turn of the rotary piston is sent to the output without addition of corrections parameters.

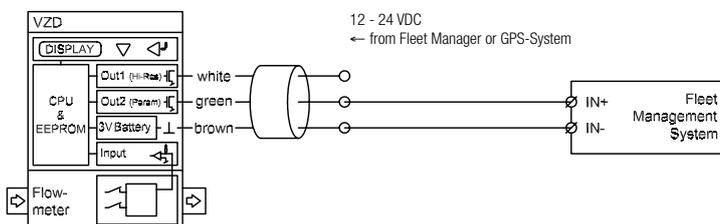
Output 2 (green cable):

The signal is transferred to the build-in computer. There it will be calculated with the appropriate parameters (corrections factors, etc.) and only the calculated signal will be send to the output.

Pure (Hi-Res) signal



Calculated signal



Connect the cable as described above:

Go to the section Startup (commissioning) for the initial checks and startup.

Startup (commissioning)

In this section we assume that the installation of all required instruments and component has been done in a correct and professional way, that means, **the fuel system is purged according to the engine manufacture advices, leak and bubble free.**

If this is not the case, please set the system in proper operating condition.

1. Start the engine and let it run at minimum load until it reached its operating conditions (heat exchange water between 70 °C - 90 °C).
2. Check all pipe connections for leaks free.
3. Check all electrical connections for good contacts.
4. Monitor the total consumption (display01) and ensure yourself it is counting (depending on the flow range and on the chose attenuation, this can take several seconds).
5. Monitor the current consumption (display03) and ensure yourself it is counting.
6. If you have a VZD 4/8 or VZD CU set all the needed parameters. For this go to the section Operating Instruction for the flow meter and VZD CU and change all the parameter you may think they are important for you.

What do if it is not functioning?

The display is dark or has no information on it

1. The flow meter is in sleep mode. Press any key to wake it up.
2. If it still did not work contact your local dealer for more information.

Everything is running but still no changes on the displayed value

1. When the engine is running, at least the current consumption should show a change after 30 sec. If this is not the case, do the following:
 - a. Check the cable for proper connection (see also section "Electrical connections and specifications").
 - b. Is the flow meter connected the right way (look at the arrow on the body)?
 - c. Disconnect the flow meter from the fuel pipes.
Gently blow into the flow meter entry (look at the arrow). You must hear a quiet noise of the rotating rotary piston. If you hear nothing, the flow meter is blocked. In most of the case, impurities are the reason for that.
 - d. Check the fuel and pipes for impurities. Use a filter before the flow meter (the mash size must be 0.08 mm for the VZD/VZP 4 and 0.1 mm for the VZD/VZP 8).
 - e. The best way to avoid impurities is to install the flow meter between the pre-filter und the fine-filter.

I did the above, but it is still not running

1. Install the VZD 4 or VZD 8 like described under VZD 4 or VZD 8 (installation on vehicle).
2. Take a volt meter and connect the plus to the green cable and the minus to the brown cable.
3. Set the volt meter to measure the voltage.
4. Put the ignition key to position ignition. You should read a value between 3 - 24 Volts (this value depend on the external calculator or Fleet Manager and can be object to variation). Remember this value.
5. Start the engine. The now displayed value must drop continuously from before displayed value to a lower value and back.
6. If this is not the case, contact your local representative.

After Installation, an <Error> is displayed

Find out the error with the list below and call your local dealer.

Error-Code	Error-Description
Err_none	No failure
Err_Sys	System error
Err_Powr	Power error. Low battery charge
Err_Temp	Temperature error
ERR_EEP	Eprom failure

Operating Instruction

The Control Unit on the flow meter has no ON/OFF switch.

It has a sleep mode.

What does it mean?

When no activities (pulse) are recognized on the connected line (supply line) the flow meter will switch OFF itself. It will awake when the first pulse is coming in or one key is pressed.

The consumed voltage is very slow (less than 2 μ A), so that no discharge of the build in battery can occur during a very long period.

The Menu structure has 3 branches:

- Main Menu
Is intended for the daily user. It informs him about the daily needed information.
- Info-Menu
Is intended for the advanced user. It shows him deeper information about the flow meter. No parameter changes are possible.
- Service-Menu.
Is only for the service-engineer and for the owner of the vehicle (in a company it can be the responsible for the fleet). This section is password protected. Because it give you complete access to all parameters, it is absolutely important to be a trained and qualified person. Inaccurate parameter changes in this section can result in fault calculations and mistakes.

Display, Key-function, Navigation and Tree-Structure

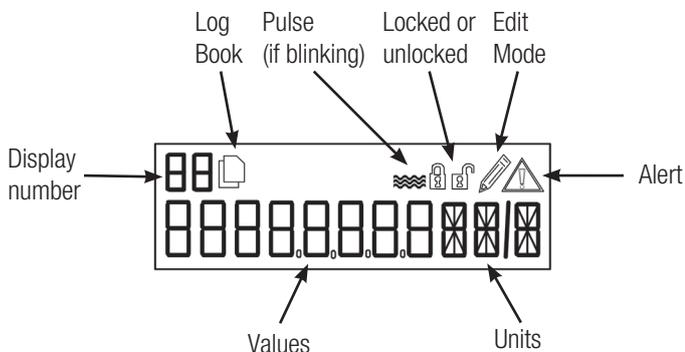
The Display

The display has 2 lines.

The first line has: 2 digit for numbering the display, log book sign, wave sign, lock/unlock sign, edit sign, alert sign.

The second line has: 8 digit for values and 3 digits for units.

The numbering on the upper left corner (display number) is used to quick locate the right display.



The keys have multiple functions. Depending on which part of the menu you are, they can have different functions.

Move down ward:

Press key1 and release it.

Move up ward:

Press key2 and hold it down, press key1 to move up ward.

Exit the Service Mode or Info Mode

1. Go through until the end of the menu. At the end of the menu, you will exit automatically.
2. Go back ward until you reach the service or info menu.
3. After a time-out of 60 sec. it will exit automatically to the main menu.

Edit-Mode

To enter the „edit mode“ you have to enter first the „Service Mode“ (see example on this section).

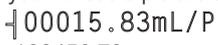
Exit the Edit-Mode:

To exit the Edit-Mode, you have 2 possibilities:

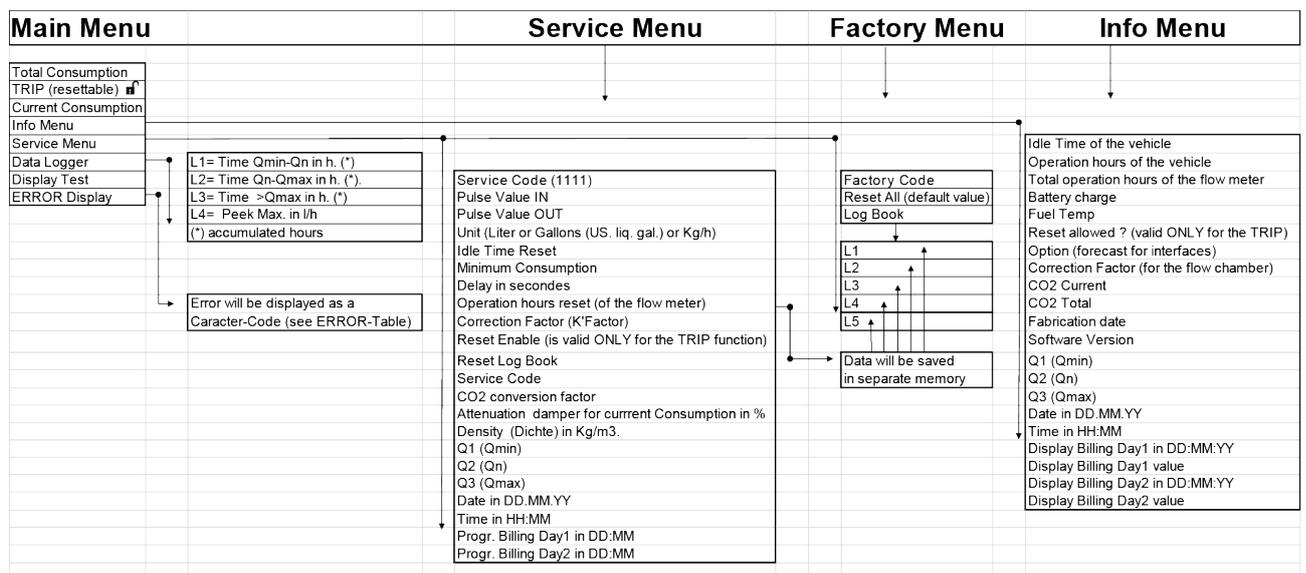
1. Go through until the end of the menu. At the end of the menu, you will exit automatically.
2. Go back ward until you reach the start of the menu.
3. After a time-out of 60 sec. it will exit automatically to the <Main Menu>.

Example:

You want to enter the pulse value of the used flow meter VZD 8 (12.5 ml) and you are at display01 (Total Consumption).

- If the display is not working, than press a key to wake it up.
- Press 4 time the key1 (move down ward). Now you are on display05 (Service).
- Press the key2 (enter), and you will enter the display19.
- Press again key2 to enter the edit mode. This is the place where a 4-digit code is requested. A pencil will appear on the right corner of the display to show, you are in the edit mode now. The first changeable digit will start blinking.
- The standard entry code is: **1111**.
- Use the key1 (or key2 and key1) to scroll until you see the right number (in our case the number 1).
- When you have the right number, press the key2. This has the following effect: acceptance of the value and moving to the next digit.
- Repeat the procedure again, until you reach the last digit position and all 4 digits (1111) are visible. The last digit is still blinking.
- Press key2 again. Now the code is accepted and the pencil disappears.
- You are on display19.
- Press key1 and you will see display23. This display shows the current pulse value.
- Move to display23. This display shows the current pulse value.
- Press key2 for edit mode. The fist digit is blinking, just to show you where the cursor is.
- Now you will see a picture similar to the picture below:

 Pos. 123456 78
- Move with key2 to the position where you want start with the changes (in our case to position 5).
- Use the key1 (or key2 and key1) to scroll until you see the right number (in our case the number 1).
- When you have the right number, press the key2. This has the following effect: acceptance of the value and moving to the next digit.
- Use the key1 (or key2 and key1) to scroll again until you see the right number (in our case the number 2) and press key2 again. It will accept this value and move to the next position.
- The dot (decimal point) will be over passed.
- Use the key1 (or key2 and key1) to scroll until you see the right number (in our case the number 4) and press key2 again. The value will be accepted and the blink moves to the next position.
- Repeat the procedure again, until you reach the last digit position and all 4 digits (1244) are visible. The last digit is still blinking.
- Press key2 to stop blinking.
- Press key2 again to exit the edit mode. At this point the pencil will disappear.

Tree structure



User Mode ... daily information for the user

Key1= down Key2+Key1= up

Total Consumption



This picture shows the total consumption of the engine since commissioning.

Trip Consumption



This picture shows the consumption of the engine since the last reset.
If you want to reset the trip, press Key2.

Trip Reset

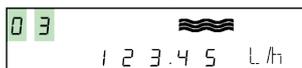


To enter this function you must press the key1 on the trip consumption function and you must have the right to do the reset.



Key1: move between Yes and NO.
Key2: accept the new choice and exit <Edit Mode>.

Actual Consumption



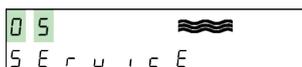
This picture shows the current consumption of the engine in l/h, in g/h. or in Kg/h.

Info



Info Menu
(more below in the section For Managers...more and deeper information)

Service



Service Menu
(more in the section For Service Peoples...parameter setting)

Logger Menu



Logger Menu
Press key2 to enter the logger infos.

Logger Info



L1: Time Qmin-Qn in hours:

This is the time, the engine was working in the optimal range.

L2: Time Qn-Qmax in hours:

This is the time, the engine was working over the allowed range. Such conditions may lead to destroyed flow meters.

L3: Time over Qmax in hours:

This is definitively NOT allowed. This will cause the termination of the guarantee.

L4: Peak max in liter/hours:

This is the max. peak of the flow it was even reached with this flow meter.

Display test



Press Key2 to start the display test.

It will show all digits and signs. Check the display for missing digit or sign. To exit the test, press Key1 or wait about 60 sec..

ERROR display



This display informs you when an error has occurred. The chart below gives you an overview about the error-codes:

ERROR chart

Codes	Description
Err_none	No error was detected
Err_Sys	System error
ERR_Powr	Power error
Err_Temp	Temperature error

Info Mode ... more and deeper information for manager

Key1= down Key2+Key1= up



Take a few minutes to read first the section display, key-function and navigation.
In the Info Mode you have all the relevant flow meter information at a glance.

Entering the Info Mode

Be AWARE: NO changes are possible in the Info Mode.
This is just intended for information.



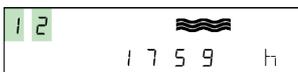
Press Key2 to enter the Info mode.

Display11



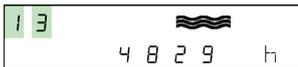
Vehicle Idle Time is the amount of time while the vehicle was idle and the engine running. This maybe helpful, to calculate the idle hours. Range: from 0.1h to 999.9h.

Display12



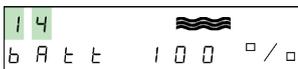
Operation hours is the amount of time while the engine was running and the vehicle working. This is helpful, to calculate the operation hours of the vehicle. Range: from 0h to 99'999h.

Display13



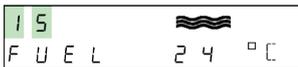
Total operation hours are the time the flow meter was operating since the commission.

Display14



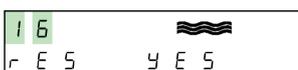
Battery: shows the battery status (in 00, 25, 50, 75 and 100 %).

Display 15



Fuel Temp.: temperature of the fuel. This is measured at the flow sensor and should not be higher than 50 °C. In case of higher temperature, consult your vehicle representative.

Display 16



Reset allowed: when this parameter is set to <Yes>, you can reset all the value where a reset is possible. Otherwise a reset is not allowed.

Display 17



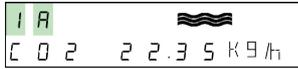
Option: For future use.

Display18



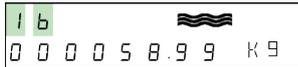
K' Factor (CF): Optimization value for best sensor performance.
The showed value is a % value that means, the result is corrected according to this value. For more explanation, go to Display 29 on the next section.

Display1A



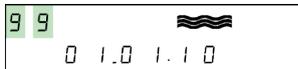
Current CO₂ emission in Kg/h.

Display1b



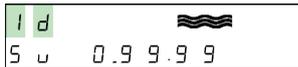
Total CO₂ emission in kg since commissioning.

Display99



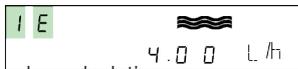
Fabrication date for internal use only.

Display1d



Software version (Sv) for internal use only.

Display1E



value calculation.

Minimal Flow Rate Value (Qmin)
This is the minimal possible flow rate for this type of flow meter. It is used for the logger-

Display1F



ger-

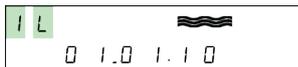
Max. Flow Rate Value (Qn)
This is the maximal possible flow rate for this type of flow meter. It is used for the logger-

Display1h



Discontinuous Flow Rate Value (Qmax)
This is the max. flow rate for a short period for this flow meter. It is used for the logger-

Display1L



Date in DD.MM.YY

Display1P



Time in HH:MM

Display 6A



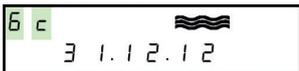
This screen shows the date of the billing day1 which was entered by display60.
At time 23.59.59 the actual values of the Total will be stored.

Display 6b



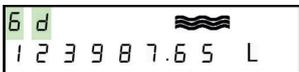
This screen shows the Total which was captured at the date of the billing day1 (Display 6A)

Display 6c



This screen shows the date of the billing day2.
At time 23.59.59 the actual values of the Total will be stored

Display 6d



This screen shows the Total which was captured at the date of the billing day2 (Display 6c)

IMPORTANT: see section Important information for custody transfer

Service Mode ... parameter setting (for service people)

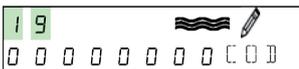
In this section we assume that the service engineer is familiar with the precedent sections.
In the Service Mode you have unrestricted access to all vital parameter. Please be careful in changing parameters. Inadequate parameter settings can lead to incorrect functions and calculations.



A good way to avoid mistakes is to write down the parameters before you change it.

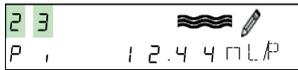
Take a few minutes to read first the section display, key-function and navigation.

Entering the Service Mode



- If the display is not working, then press a key to wake it up.
- Press 4 time the key1 (move down ward). Now you are on display05 (Service)
- Press the key2 (enter), and you will enter the display19
- Press again key2 to enter the edit mode. This is the place where a 4-digit code is requested. A pencil will appear on the right corner of the display to show, you are in the edit mode now. The first changeable digit will start blinking.
- The standard entry code is: 1111
- Use the key1 (or key2 and key1) to scroll until you see the right number (in our case the number 1)
- When you have the right number, press the key2. This has the following effect: acceptance of the value and moving to the next digit.
- Repeat the procedure again, until you reach the last digit position and all 4 digits (1111) are visible. The last digit is still blinking.
- Press key2 again. Now the code is accepted and the pencil disappears.
- You are on display19 again.
- Press key1 and you are on display 23. From here you can scroll through the menu.

Display23



Pulse value IN in ml/pulse.
For parameter changing, enter the edit mode.
These values define how many ml is 1 pulse. The range is from 1 ml to 9999.999 ml.

Note:
VZD4 / VZD4 CE has a pulse-IN value of 5.0 ml
VZD8 / VZD8 CE has a pulse-IN value of 12.44 ml

Display2A



Pulse value OUT in ml/pulse.
For parameter changing, enter the edit mode.
These values define how many ml is 1 pulse. The range is from 150 ml to 9999.999 ml.

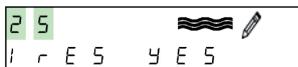
Note:
VZD4 / VZD4 CE has a pulse-OUT value of 150 ml
VZD8 / VZD8 CE has a pulse-OUT value of 300 ml

Display24



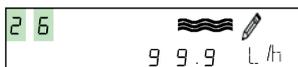
Unit in liter or in gallons (US liq. gal.)
For parameter changing, enter the edit mode.

Display25



Idle Time Reset
This is the time, during which the engine is running, but the vehicle is not working. This counter start to count, when the engine is in idle speed (minimum consumption) and a predefined time is elapsed (delay). It gives you an overview about the “non-working-time” of the vehicle.
For parameter changing, enter the edit mode.

Display26



Minimum Consumption in l/h
This is the consumption of the engine in idle speed, that means, the vehicle is standing. It is needed, in conjunction with the delay parameter, for the idle time calculation.
For parameter changing, enter the edit mode.

Note:
This value runs hand in hand with the delay explained in the next step.

Display27



Delay in Seconds

Enter the time the flow meter should wait before it starts to count up the vehicle idle time after reaching the min. consumption.

Example:

Min. consumption is set to 10 l/h and the delay is set to 30 seconds.

What happened?

When the engine goes below the consumption of 10l /h and this value will not be over passed for 30 sec., the flow meter will start to count the vehicle idle time.

For parameter changing, enter the edit mode.

Display28



Operation Hours Reset

Set the operation hours to zero.

For parameter changing, enter the edit mode.

Display29



K' Factor (CF) in +/- %

Optimization value for best sensor performance.

The shown value is a % value. That means, the result is corrected according to this value.

Example:

if the entered value is +0.005 %, then the incoming pulse will be increased to +0.062 ml/pulse more

- Pulse setting: 12.44 ml/pulse (standard)
- CF: +0.005
- Corrected value: $12.44 + (0.005 * 12.44) = 12.502$ ml/pulse

This value can be used to compensate the chamber volume or to compensate the heating-influence on the fuel. In our example the chamber volume is not longer 12.44 but 12.502.

Display30

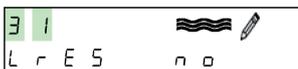


Reset Enable

This input allows (or allows not) the reset of the trip (daily consumption).

For parameter changing, enter the edit mode.

Display31



Reset Data Logger

This input allows (or allows not) the reset of the data logger.

For parameter changing, enter the edit mode.

Display32



Service Code change

The standard service code is 1111.

For parameter changing, enter the edit mode.



Caution:

if you change the service code, save the new one in a safer place. Without service code you have no possibility to enter the service mode. You have to send the instrument to the

factory.

Display33



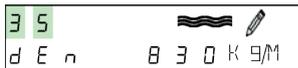
CO₂ Value
Enter the new value for the CO₂ emission calculation.
For parameter changing, enter the edit mode.

Display34



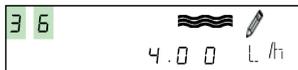
Attenuation value is to avoid jumps of the actual consumption.
Allowed range is from 0 % to 80 %.

Display35



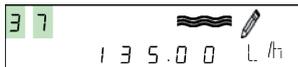
Density in Kg/m³
This value is needed to calculate volume to mass.
The max. value is 1500 Kg/m³.

Display36



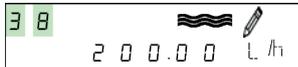
Q1 (Qmin)
Enter the minimum flow rate value. This value is needed for statistic calculations. The range is from 0.1 l/h to 9'999 l/h.

Display37



Q2 (Qn)
Enter the continuous flow rate value. This value is needed for statistic calculations. The range is from 0.1 l/h to 999'999 l/h.

Display38



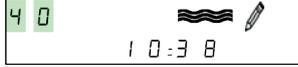
Q3 (Qmax.)
Enter the discontinuous flow rate value. This value is needed for statistic calculations. The range is from 0.1 l/h to 999'999 l/h.

Display39



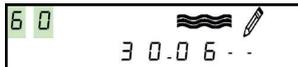
Date in DD.MM.YY

Display40



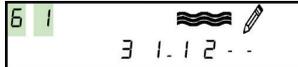
Time in HH:MM

Display60



Enter the day and month of billing day1.
At time 23.59.59 the actual values of the Total will be stored and showed by the Display6A.

Display61

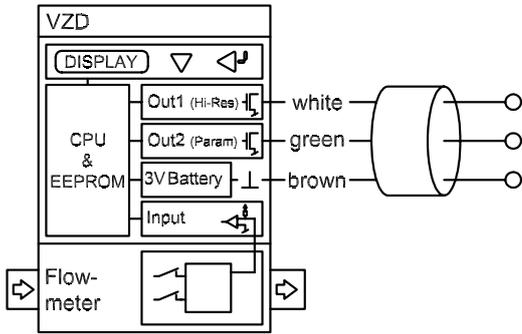


Enter the day and month of billing day2.
At time 23.59.59 the actual values of the Total will be stored and showed by the Display6d.

IMPORTANT: see section Important information for custody transfer

Electrical connections and specifications

VZD 4 and VZD 8



Explanation of the wires:

White	Pulse Out1 without correction (it takes no care of the programmed parameters)
Green	Pulse Out2 with correction (it takes care of the programmed parameters)
Brown	Ground

Attention: for both of the above statement see display29 and display2A

Note: the external (remote) device must bring 12 - 24 Volt on to the white or green cable. This will be redirected over the brown cable to the external (remote) device.

Output1 (without correction):

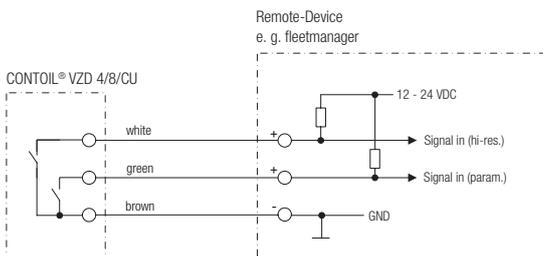
Flow-Sensor	Pulse IN value (fix) ml/pulse	Pulse OUT value (fix) ml/pulse	Pulse OUT width (fix) msec	Pulse OUT frequency Hz	Current load (open drain output) mA	OUTPUT operational voltage VDC	OUTPUT dropout voltage VDC at 50 mA
VZD 4	5.0	5.0	20	max. 4.5	max. 50	max. 48	max. 2
VZD 8	12.44	12.44	20	max. 4.5	max. 50	max. 48	max. 2

Output2 (with correction):

Flow-Sensor	Pulse IN value (fact. setting) * ml/pulse	Pulse OUT value (selectable) ml/pulse	Pulse OUT width (fix) sec	Pulse OUT frequency Hz	Current load (open drain output) mA	OUTPUT operational voltage VDC	OUTPUT dropout voltage VDC at 50 mA
VZD 4	5.0	150...2'000	1	max. 0.2	max. 50	max. 48	max. 2
VZD 8	12.44	150...2'000	1	max. 0.2	max. 50	max. 48	max. 2

* This value can be changed on the VZD 4 and VZD 8. It represents also the chamber volume of the mentioned calibrated flow meters. However, the Pulse IN value can be changed in case where a higher accuracy is needed. For using this feature, you must determine the exact chamber volume of the given flow meter by yourself.

Symbolic explanation of the „pulse output“ by flow meter



Specification and technical data

The display on the Control Unit

On the Control Unit there is a display with 2 lines with 11 digits and 10 signs. Here you can read directly the parameter and the calculated values.

The LCD display can work between -20 °C and 60 °C without damages. By temperatures around 0 °C a LCD display will get slow. The display read-out is limited. Over a temperature of 60 °C the contrast of the LCD display will get worse and the liquid crystal can be damaged. Within this temperature the sensor will not be damaged, but the proper operation is not assured.

	VZD 4	VZD 8
Hydraulic connection	M14x1.5	M14x1.5
Nominal pressure	25	25
Temperature (C°)	-20 to +60	-20 to +60
Protection class (IP)	66	66
Safety: Vehicle approved for vibration, shock and electrical emission and imission	Yes	Yes
Max. flow rate (l/h) ¹⁾	80	200
Nominal flow rate (l/h)	50	140
Min. flow rate (i/h)	1	4
Registration capacity	99999999	99999999
Accuracy (%) better than	1	1
Safety filter mesh size	0.125	0.150
Volume of measuring chamber (ml)	5.0	12.44

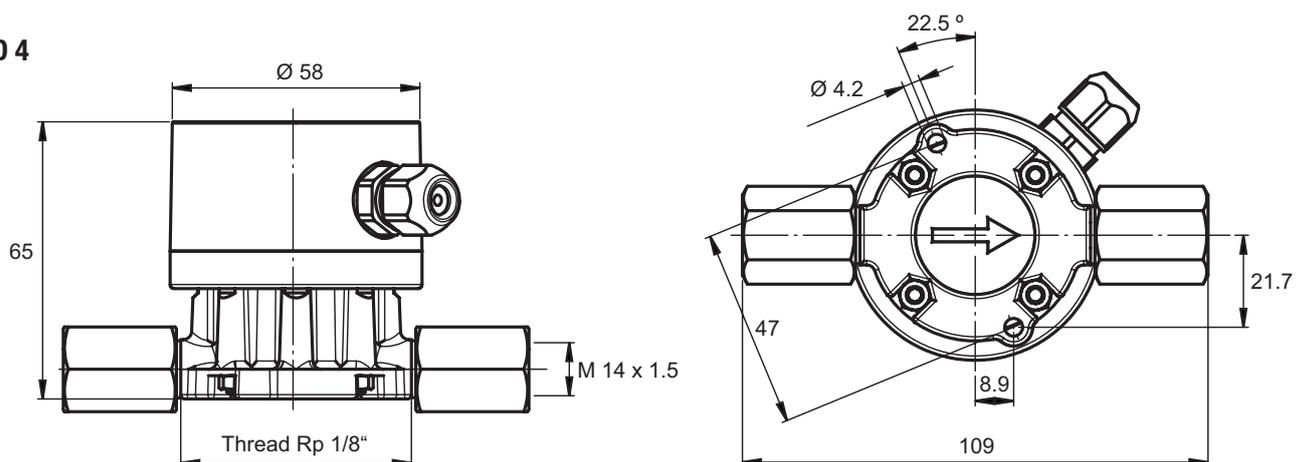
1) Remark: max flow rate is allowed only for a short moment. It is not intended for long time work.

VZDA 4 and 8 with directive 2004/22/CE (MID)

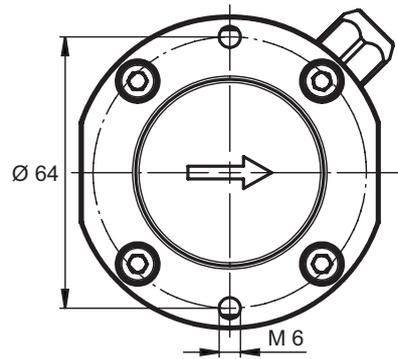
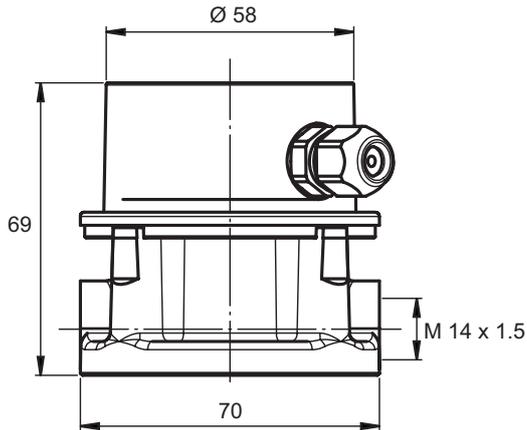
			VZDA 4 CE	VZDA 8 CE
Data according to type approval specifications				
Temperature max		°C	50	50
Maximum flow rate	Qmax	l/h	20	140
Nominal flow rate	Qcont	l/h	20	140
Minimal flow rate	Qmin	l/h	2	14
Accuracy class			1	0.5
Maximal permissible error	+/- %	of actual value	0.5	0.3
Dirt filter mash size max.	mm		0.08	0.1
Connection threads of meter	Metric		M14x1.5	M14x1.5

Dimensions

VZD 4



VZD 8



Ordering information

Description	Type	Art. No.
Flow meter for 1 l/h to 50 l/h with display	CONTOIL® VZD 4	94679
Flow meter for 4 l/h to 80 l/h with display	CONTOIL® VZD 8	94680
Flow meter for 1 l/h to 50 l/h with pulse	CONTOIL® VZP 4	94681
Flow meter for 4 l/h to 80 l/h with pulse	CONTOIL® VZP 8	94682
Flow meter for 1 l/h to 20 l/h	CONTOIL® VZDA 4 CE	95111
Flow meter for 4 l/h to 140 l/h	CONTOIL® VZDA 8 CE	95112
Hose connector for VZD / VZP		
Remark: 2 set of hose connectors are needed for each flow meter	Hose connector	80447
Spare set of couplings for VZD 4 and VZP 4 or VZO 4 OEM	Coupling set VZD/VZP	80630
Screw thread conversion from 1/8" to M14 x 1.5		
Including 2 coupling, 2 copper seals and 1 filter for flow meter entrance		

Warranty information

All Aquametro Oil & Marine AG products are produced under high quality levels and ISO 9001 standards. Every single flow sensor is submitted to an accuracy test that is documented in a test protocol. The test benches used for this process are under constant control of the Swiss and the German Authorities (METAS and PTB). The electronic products have to pass an individual quality test. Therefore Aquametro Oil & Marine AG guarantees for the product quality (perfect material, machining and function) of every delivered product. Further details are specified in our General Terms of Business.

