

## **OPERATING MANUAL**

### Portable Diesel Fuel Storage Unit (DFSU)

Eko Fuel Tank from METRIA Yuriy Ardashev  
with 2,500 / 3,500 / 5,000 / 9,000 L of rated capacity



These installation, operation and maintenance instructions contain critical recommendations and warnings!

Read this Manual carefully and follow all instructions it contains. Compliance with the Manual does not release from the obligation to comply with local regulations, in particular those related to OHS, fire safety, and environmental protection.

### **CAUTION!**

**Flow meters have been factory-calibrated for use with diesel fuel. Since special operating conditions (such as the actual flow rate, properties, and temperature of the measured fluid) may affect the accuracy of the measuring instrument, it shall be re-calibrated after installation with the diesel fuel grade which the DFSU will be filled with.**

## Contents

<b>1. Intended use .....</b>	<b>3</b>
<b>2. Technical specifications and configuration.....</b>	<b>3</b>
<b>3. Equipment configuration.....</b>	<b>3</b>
<b>4. Digital flow meter .....</b>	<b>4</b>
4.1 General background.....	4
4.2 Operating principle .....	5
4.3 Calibration.....	7
4.4 Device configuration .....	10
4.5 Maintenance.....	10
<b>5. Mechanical flow meter .....</b>	<b>12</b>
<b>6. Electric pump.....</b>	<b>14</b>
<b>7. Diesel fuel level indicator.....</b>	<b>19</b>
<b>8. Optional accessories: SMDP or CUBE MC (controlled user access) .....</b>	<b>27</b>
<b>9. Electrical system .....</b>	<b>27</b>
9.1 Protective earth (for 5000 and 9000L DFSUs).....	27
9.2 Eko Fuel Tank electrical power supply .....	28
9.3 Temporary power supply.....	29
<b>10. Operation – Recommendations.....</b>	<b>30</b>
10.1 Vehicle refueling .....	31
10.2 Filling the Eko Fuel Tank DSFU .....	32
10.3 Maintenance of the Eko Fuel Tank DSFU .....	33
<b>11. Positioning requirements of the Eko Fuel Tank DSFU .....</b>	<b>33</b>
<b>12. Safety principles.....</b>	<b>34</b>
<b>13. Transport and storage.....</b>	<b>36</b>

## 1. Intended use

The Eko Fuel Tank DFSU is intended for storage and on-site dispensing of fuel oils classified as flammable fluids of fire hazard class III, i.e. petroleum products with a flash point above 55°C. These liquids include Diesel fuel.

The DFSU is built in accordance with PN-EN 13341:2005+A1:2011 under the supervision of the Polish Office of Technical Inspection (UDT). The DFSU is designed as a self-supporting, double-shell structure made of UV-stabilised PE-HD. A hermetic dispensing cabinet (made of PEHD) with the access door secured with two locks is installed on the external shell of the DFSU. The cabinet houses the fuel dispensing equipment and monitoring systems.

Available capacities: 2,500, 3,500, 5,000, and 9,000 litres.

**Do not store gasoline or other fluids!**

## 2. Technical specifications and configuration

Capacity	2,500 litres	3,500 litres	5,000 litres	9,000 litres
Length (m)	2.04	2.95	2.95	3.35
Width (m)	2.04	2.23	2.23	2.55
Height (m)	2.11	2.34	2.34	2.95

Dimensions may vary within +/- 1%

The capacity ratings of 2,500, 3,500, 5,000, and 9,000 litres apply to the internal shell of the DFSU. The double-shell DFSUs are made of UV-stabilised PE-HD.

## 3. Equipment configuration

The complete DFSU with the dispensing system includes:

1. The double-shell tank with the dispensing cabinet (complete with two door locks)
2. The dispensing system, comprising:
  - a 230V/50Hz pump with the maximum capacity of 90 l/min;
  - a flexible suction hose with a non-return valve and a mesh filter;
  - the flow meter, available as a mechanical or a digital instrument;
  - an automatic dispenser nozzle with overfill protection;
  - a dispensing hose 6 m long
3. The monitoring system, comprising:
  - an interstitial leak detector;
  - a fuel level probe;
  - a transmitter interfaced with a maximum level sensor and the fuel level probe;
  - a receiver interfaced with a display unit;
4. The maximum level sensor: this device comprises the probe installed in the top part of the inner shell and a wiring plug which should be connected to a maximum level overflow indication system or a system which automatically stops the discharge

pump of the road tanker that fills the Eko Fuel Tank. The device protects the Portable DFSU from overflowing and spillage during refilling with the fuel.

5. An inner shell vent.
6. A 4" access hatch in the inner shell.
7. A 16" inspection cover in the outer shell.
8. A fuel fill port, 2" of size, which provides a sealed connection to the fuel delivery road tanker.
9. A protective earth wire extending from the Portable DFSU body.

The equipment configuration may vary with the ordered option of the Eko Fuel Tank.

## 4. Digital flow meter

### 4.1 General background

The flow meter movement includes oval gear wheels which ensure high accuracy of measurement across a wide flow rate range at a low pressure loss. The measurement is done by counting the revolutions of the gears, with one full turn being a unit of measure. The rotating gears feature magnets by which each full turn outputs a count signal to the magnetic sensor inside of the measuring chamber. The count signals are picked up and processed by a microchip.

The device inlet is protected by a stainless steel mesh filter accessed by removing the inlet end's side collar. The flow meter counter features non-volatile memory to store quantitative flow data even for prolonged periods without power supply.

Components:

- LCD panel and measurement electronics (isolated from the measuring chamber filled with Diesel fuel).

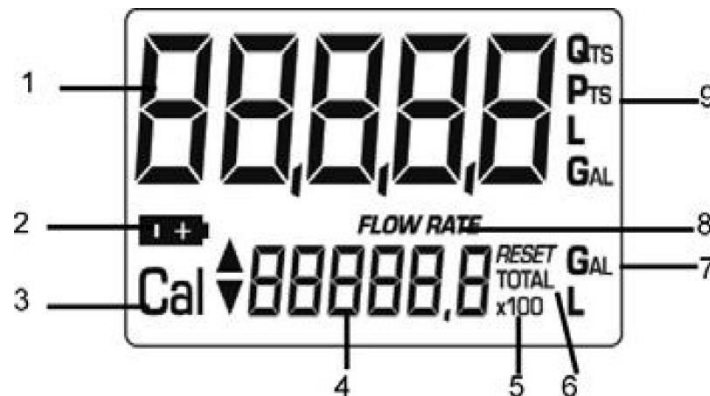
Technical specifications and diesel fuel grade details

Counter resolution [L/pulse]	33.5
Flow rate range [L/min 100]	100
Operating pressure [bar]	30
Burst pressure [bar]	60
Measurement system	oval gear wheels
Storage temperature [°C]	-20 to +70
Storage RH	95%
Maximum operating temperature [°C]	10 to +60
Pressure loss at maximum flow rate [bar] (Diesel fuel at 20°C)	0.3
Measurable fluids	Diesel fuel
Viscosity range [cSt]	2 to 5.35
Accuracy (within the measured volume range)	±0.5

Repeatability	0.2%
Threaded inlet and outlet ends	1"
Batteries	2 x 1.5 V
Battery life (estimated)	18 to 36 months

## 4.2 Operating principle

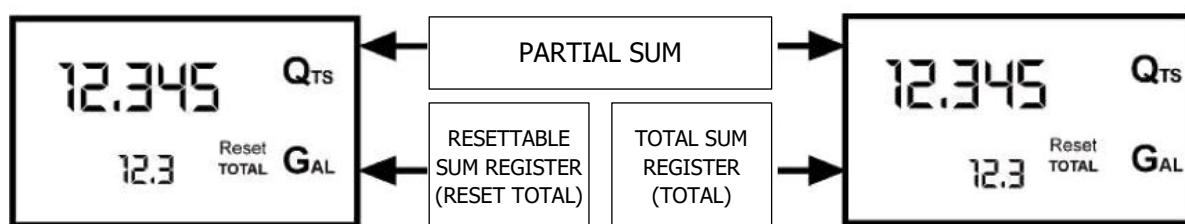
LCD



### DESCRIPTION:

1. Partial sum register, indicating the fluid volume transferred since the last RESET command
2. Battery charge indicator
3. Calibration mode indicator
4. Total sum and resettable sum register
  - 4.1. Total sum that cannot be reset (TOTAL)
  - 4.2. Resettable total (RESET TOTAL)
5. Sum multiplier indicator (x10 / x100)
6. Sum type indicator (TOTAL – total sum RESET TOTAL – resettable sum)
7. Sum measurement unit indicator: L = litres, Gal = U.S. gallons
8. Flow rate indicator
9. Partial sum measurement unit indicator: Qts = quarts, Pts = pints, L = litres, Gal = U.S. gallons

User function buttons



There are two buttons on the counter's panel: RESET and CAL.

- RESET: resets the partial register and the resettable sum to zero;
- CAL: enables the device calibration mode.

Pressing RESET + CAL at the same time enables the configuration mode. The counter's indications are displayed alternately with a factory preset frequency.

The total sum (TOTAL) cannot be reset. The total sum increments through the life of the flow meter.

The total sum (TOTAL) is displayed with the device in standby. The resettable sum is displayed:

- for a certain time (several seconds) after the partial sum has been reset;
- during refuelling of a vehicle from the DFSU;
- for several seconds after refuelling a vehicle, after which the device reverts to standby and the lower register displays the total sum.

### Resetting the partial sum

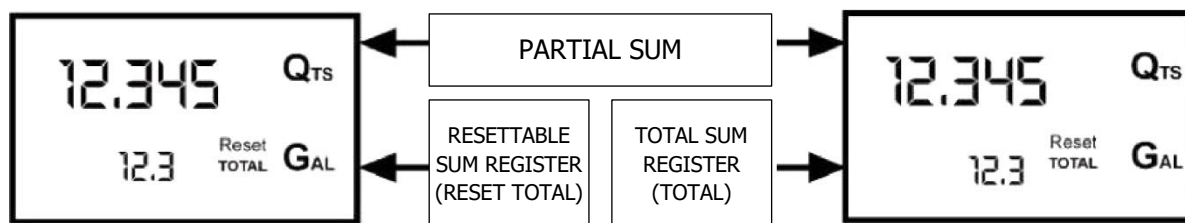
The partial sum is reset by pressing the RESET button when the device is in standby, which means when the display shows the word TOTAL.

When the RESET button is pressed, the display will show all the highlighted digits and all the digits that are not highlighted will be reset. When the process is completed, the display shows the reset partial sum and the resettable sum.

After a moment, the resettable sum indication is replaced by the non-resettable total sum (TOTAL).

### Resetting the resettable sum

The resettable sum can be reset to zero only when the partial sum has been reset. The resettable column can be reset by holding the RESET button when the display indicates RESET TOTAL, as illustrated with the following indications.



Operating flow chart:

10. Wait until the display goes into standby (indicating the total sum only, shown by the TOTAL message).
11. Briefly press the RESET button.
12. The device starts resetting the partial sum.
13. When the resettable total (RESET TOTAL) is indicated, press and hold RESET for at least 1 second.

14. The display will show these in sequence: all fields, all disabled fields, and the resettable total (RESET TOTAL) page.

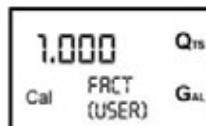
### 4.3 Calibration

The procedure to ensure a correct calibration process:

- Bleed air from the DFSU system before attempting calibration.
- Use a standard vessel with a minimum capacity of 5 litres or higher, which features an accurate graduated scale (it is best to use a 20-litre standard vessel).
- Dispense the fluid with a steady flow rate in accordance with the standard use until the standard vessel is full.
- Maintain a steady flow rate until the end of the graduated scale at the final stage of dispensing (end the filling of the standard vessel by pouring in small portions of the fluid with a normal flow rate).
- When you stop dispensing, wait for the fuel foam falls down and read the fuel level.

#### Calibration by dispensing

It is done by dispensing the fluid from the DFSU to a standard measuring vessel under actual operating conditions (of the flow rate, the viscosity, etc.). The procedure requires high precision.



#### 1. Press and hold CAL

The device enters the calibration mode and the CAL message appears in the bottom left corner of the display, with the calibration factor displayed above. In the same line of the CAL message, the messages FACT and USER appear. FACT means 'factory calibration', while USER means 'user calibration'.

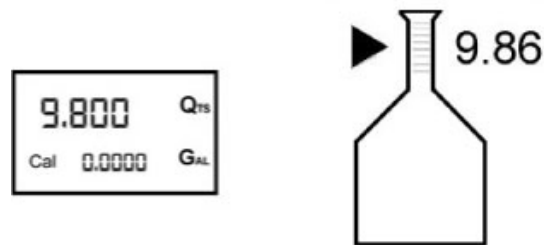
#### 2. Press and hold RESET



The message shown so far is reset and the device is ready for calibration. The message FIELD appears at the bottom of the display.

#### 3. Dispensing to the standard vessel

Maintain the flow counter settings as explained in step 2 above and start filling the standard vessel. When the Diesel fuel reaches the sufficient level on the graduated scale of the standard vessel, stop filling (at e.g. 9.86) and briefly press RESET. This acknowledges the end of dispensing for the device.



#### 4. Calibration

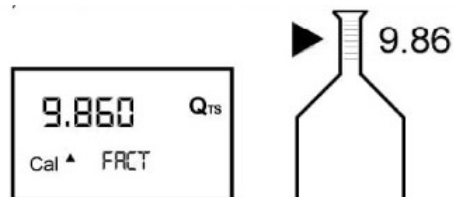
The result for the standard vessel (9.860) is higher than shown on the flow meter display (9.800) and this requires correction to be input with the reference arrows. In the lower left corner of the display, an arrow (up or down) appears, indicating the direction (to increase or decrease the displayed value). The sense of the arrow is switched over by pressing RESET briefly.

Then press CAL repeatedly until the result on the display matches the result read from the standard vessel.



#### 5. Press and hold RESET

Indicates that the calibration has been completed and the actual result is consistent with the value shown on the LCD.



#### 6. Inactivity

For a few seconds after the calibration a new calibration factor is established and displays until the device reverts to standby.

**NOTE!** From now on, the device will use the new, displayed calibration factor even if the batteries are replaced.

Calibration by direct modification of factor  $K$ . If the average percentage error is consistently repeated during several subsequent refuelling operations, the value of factor  $K$  must be corrected.

Example:

E% error value found: -0.9 %

CURRENT calibration factor: 1.000

New factor:

$$1.000 * [(100 - (-0.9)) / 100] = 1.000 * [(100 + 0.9) / 100] = 1.009 \text{ of user calibration}$$

Depending on the error value, increase the calibration factor value if the device reads a too high quantity of dispensed fuel or reduce the calibration factor value if the device reads a too low quantity of dispensed fuel.

Calibration procedure:

1. Press and hold CAL to enter the calibration mode.



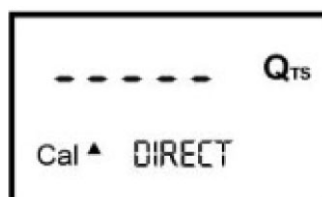
2. Press and hold RESET and the device will be ready for calibration by dispensing.



3. Pressing and holding RESET opens the direct calibration factor modification mode: the message DIRECT comes on with the current value of the calibration factor. A reference arrow (up or down) is shown in the bottom left corner of the display. The sense of the arrow is changed by briefly pressing RESET.
4. Brief press/press and hold CAL: the calibration factor is changed in the direction showed by the sense of the reference arrow – a single press of CAL changes the value by one increment, pressing and holding CAL changes the value by several increments.



5. Press and hold RESET  
The end of calibration is acknowledged for the device.



6. Inactivity

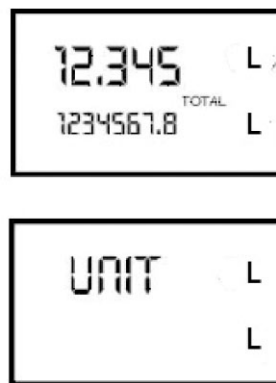
The new user factor K value is displayed for several seconds once it has been calibrated, the device reboots and waits for action until it goes into standby.

#### 4.4 Device configuration

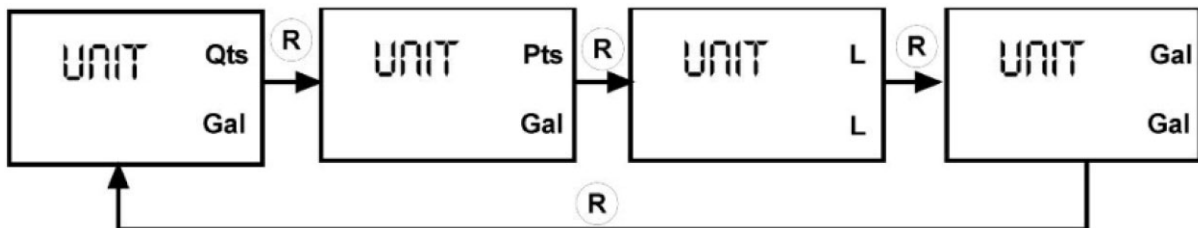
The flow meter counter provides a menu for the user to choose the unit of measure: quarts (Qts), pints (Pts), litres (Lit), or U.S. gallons (Gal).

To choose one of the 4 combined unit indications:

- Wait until the flow meter counter goes into standby.
- Press CAL and RESET at the same time. Hold the buttons until UNIT is displayed with the currently used unit of measure (here, it is litres / litres).



Pressing RESET briefly cycles through the unit combinations as shown in the figure below:



Press and hold CAL to save the new setting and the counter will reboot, after which it will be ready for dispensing in the new units of measure.

The device DOES NOT require recalibration after a change of the units of measure.

#### 4.5 Maintenance

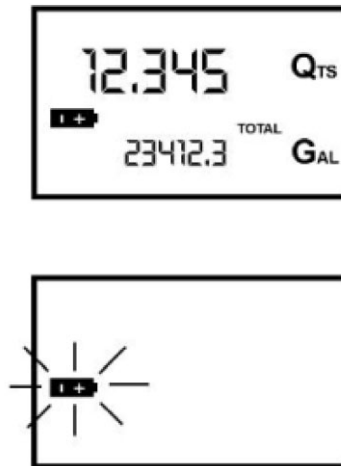
Maintenance is limited to the following actions:

- Battery replacement – required when the batteries begin to expire.
- Cleaning of the measuring chamber.

#### Changing the batteries

The counter is provided with two 1.5 V alkaline batteries (size N).

The counter can display two types of low battery warnings:



1. If the battery charge level shown on the LCD is below the 1st warning threshold, the battery icon comes on the display. The counter continues to operate normally, but the battery icon stays to warn the user that the batteries need to be replaced.
2. If the counter continues to operate so without replacing the batteries, ultimately the 2<sup>nd</sup> warning threshold is displayed for the low batteries and the counter is locked out of operation. The battery icon starts flashing with all other display contents gone.

Battery replacement procedure:

- Press RESET to update the sums.
- Remove the battery compartment lid (4).
- Remove the spent batteries.
- Install the new batteries in the same place, making sure that the positive poles are in the orientation shown on the lid (3). Close the battery compartment lid, making sure that the gasket (4) is properly seated.

The counter turns on automatically and it is ready for operation.

The device will display: the resettable sum, the total sum, and the partial sum with the values prior to the battery replacement.

Once the batteries have been replaced and supply voltage is resumed, the counter restarts with the last calibration factor used before the supply was interrupted. No recalibration is required.

### **Cleaning the mesh filter**

Clean the mesh filter at the intervals which will depend on the load of mechanical impurities in the fluid. To clean the mesh filter, disconnect the device from the piping as the mesh filter is located between the device body and the connection flange.

**Before cleaning, always verify that there is no fluid left in the Eko Fuel Tank DFSU.**

Procedure for mesh filter cleaning:

- Access the mesh filter disc on the digital flow meter by removing 2 mounting bolts from the flow meter connection to the pump on the inlet side of the meter.
- Remove the flow meter carefully to not to lose the seals in the flange.
- Remove the mesh filter.
- Clean the mesh filter with compressed air.
- Follow the removal steps in the reverse order to reinstall the mesh filter.

## 5. Mechanical flow meter

The mechanical flow meter is triggered to count by the flow of measured fluid, which propels the movement gear wheels installed in the meter's body. The meter features a non-resettable total counter of litres and the actual value sensor which can be reset with a knob.

### Technical specifications

Meter movement	Nutation disk
Flow rate (range)	20-120 litres/min
Operating pressure (max.)	3.5 bar
Burst pressure (min)	28 bar
Storage temperature (range)	-20°C to +80°C
Storage RH (max.)	95%
Operating temperature (range)	-10°C to + 60°C
Pressure losses (flow rate in l/min) With Diesel fuel	30-60
Pressure loss (bar)	0.05-0.2
Post-calibration accuracy	+/-1%
Repeatability (typical)	+/-0.3%
Readout resolution	0.1 litre
Connection ends (inlet/outlet)	1" BSP

### Calibration

The flow meter has been pre-calibrated by the manufacturer for use with Diesel fuel. Since special operating conditions (such as the actual flow rate, properties, and temperature of the measured fluid) may affect the accuracy of the measuring instrument, it shall be re-calibrated periodically.



1. Remove the brass screw plug.
2. Vent the system of air by dispensing the fuel until the flow becomes full, steady, and free of air bubbles.
3. Stop the flow by closing the dispensing nozzle and keep the pump running.
4. Operate the knob to reset the current counter.
5. Dispense with a flow rate at which the highest accuracy is required. Dispense to a standard calibration vessel measuring at least 20 litres of capacity. Do not reduce the flow rate to reach the graduated scale of the standard calibration vessel. The correct method is to open and close the full flow rate repeatedly until the required fill level.
6. Compare the volume shown on the graduated scale of the standard calibration vessel (the actual value) to the meter's reading (the indicated value).
  - If the indicated value is higher than the actual one, operate the calibration screw COUNTER-CLOCKWISE.
  - If the indicated value is lower than the actual one, operate the calibration screw CLOCKWISE.
7. Repeat steps 4 to 6 until satisfactory accuracy is achieved.
8. Retighten the plug again.

The o-ring installed on the calibration screw is to prevent accidental detachment of the latter. It does not seal and stop any fluid. It is then necessary to properly retighten the brass screw plug with its seal.

## 6. Electric pump



## DEVICE AND MANUFACTURER SPECIFICATIONS

MANUFACTURER: **PIUSI SPA / VIA PACINOTTI – Z.I. RANGAVINO / 46029 SUZZARA (Italy)**  
**(MN) NAMEPLATE** (EXAMPLE SHOWN WITH THE FIELDS EXPLAINED)



### DECLARATION OF CONFORMITY

Declaration of Conformity with the following Directives:

**73/23/CEE-89/392/CEEE-91/368/CEE-93/44/CEE-89/336/CEE-92/31/CEE-93/68/CEE**

MANUFACTURER **PIUSI SPA**  
**46029 SUZZARA (MANTOVINA) Italy**

HEREBY DECLARES THAT THE FOLLOWING PUMP MODELS **PANTHER 56-PANTHER 72** MEET THE FOLLOWING REGULATIONS:

#### EUROPEAN REGULATIONS:

##### EN 292-1

Safety of machinery. Basic concepts, general principles for design.

Basic terminology, methodology

##### EN 292-2

Safety of machinery. Basic concepts, general principles for design.

Technical principles and specifications

##### EN 294

Safety of machinery. Safety distances to prevent danger zones being reached by the upper limbs

##### EN 50081-1

Electromagnetic compatibility. Generic emission standard. Residential, commercial and light industry

##### EN 50082-1

Electromagnetic compatibility.

Generic immunity standard. Residential, commercial and light industry

##### EN 55014

Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus

##### CEI EN 60034-1

#### NATIONAL

##### REGULATION: DPR 547-55

Work accident prevention regulations

**Suzzara, 31 January 2000 VARINI OTT**

## Device overview:

**Pump:** self-priming, rotary electric vane pump with a bypass valve

**Motor** Asynchronous, single-phase, 2 pole, closed type motor (IP55 per EN 60034-86), with integrated ventilation, and coupled directly through a flange to the body.

**Filter:** Suction filter, requires periodic inspection.

## Technical specifications

1. Flow rate: 72 l/min (for capacities of 5,000-9,000L)  
56 l/min (for capacity of 2,500L)
2. Operating temperature limits, min.: -20°C / max.: +60°C
3. Diesel fuel viscosity limits: 2 to 5.35 cSt
4. Maximum RH limit: 90%
5. Supply voltage: 230V AC  $\pm$  5% nominal
6. Voltage frequency: 50 Hz  $\pm$  2% nominal
7. Power input: 500 W
8. Maximum bypass operation time (with the suction side closed): 2-3 min
9. Head: max. 2 m
10. Pump motor protection: automatic thermal breaker
11. Protection rating: IP55

## Operation of the pump

1. Before starting the pump, check and open the delivery valve (the dispensing nozzle or the pipeline valve).
2. Set the main power switch to ON. The bypass valve enables operation with the suction side closed for a very limited time.
3. Open the dispensing nozzle valve and start refuelling.
4. Verify the pump sucks and delivers the fluid; dry running is a hazard of pump failure.
5. Close the dispensing nozzle valve to stop refuelling.
6. Having refuelled, turn off the pump.

**The maximum operating time of the pump with the suction side closed is extremely short (2-3 minutes). Verify that the pump is powered off after use.**

## Troubleshooting

Problem	Possible cause	Remedy
MOTOR DOES NOT RUN	No power supply	Inspect the electrical wiring terminals and safety trips / breakers.
	Stuck impeller/rotor	Verify that no rotating component has failed or is stuck/clogged.
	Motor thermal protection tripped	Leave the motor until it cools down, verify if it starts afterwards, and identify the root cause of overheating.
	Motor fault	Contact the technical service.
MOTOR STARTS BUT RUNS SLOWLY	Low mains voltage	Restore the correct mains supply voltage.
LOW OR ZERO FLOW RATE	Low level in the tank on the suction side	Refill the tank to a correct level.
	Clogged check valve	Clean and/or replace the valve.
	Clogged filter	Clean the filter.
	Suction pressure too high	Install the pump lower relative to the tank level or increase the interconnection piping I.D.
	High lift pressure loss in the cycle (with the bypass open)	Use short interconnecting piping or increase their I.D.
	Clogged bypass valve	Remove and clean/replace the valve.
	Water enters the pump or the suction manifold	Verify the coupling seal integrity.
	Obstruction inside of the suction manifold	Install the piping suitable for the achieved suction performance.
	Low rotational speed	Check the pump supply voltage. Adjust the supply voltage and/or use power supply wiring with larger cores.
The suction manifold dropped on the tank bottom	Lift the manifold.	
PUMP RUNS WITH A LOUD NOISE	Cavitation	Reduce the suction pressure.
	Irregular operation of the bypass	Dispense until all air has been bled out.
	Air in the Diesel fuel	Inspect the suction manifold nozzles for damage.
PUMP BODY LEAKS	Failed packing	Inspect and replace the mechanical packing.

## Maintenance

The Panther 56 and Panther 72 pumps are built for minimum maintenance:

- Every week inspect that the pipe couplings are not loose to eliminate the risk of leaks.
- Every month inspect the pump body and clean it.
- Every month inspect and clean the pump filter and all other filters accessory to the pump.
- Every month inspect the power supply wiring.

## Noise level

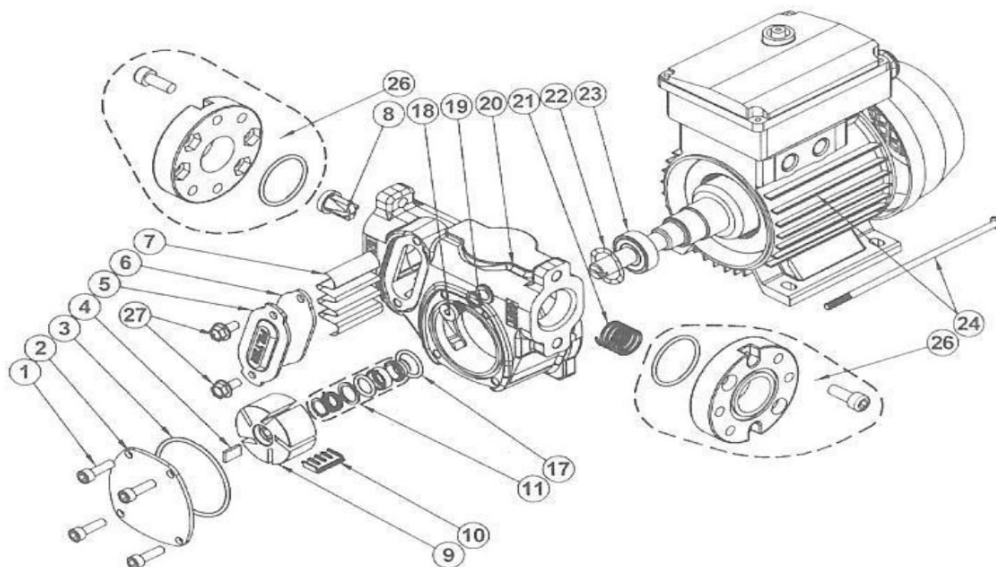
Under normal operating conditions, the operating noise of all pump models does not exceed **70 dB at a distance of 1 m** from the electric pump.

## Disposal of contaminated material

Do not dispose of contaminated components into the environment during maintenance or cleaning.

Proper disposal is established in relevant local regulations.

## EXPLODED VIEW DIAGRAM OF THE PUMP COMPONENTS AND SPARE PARTS



#	Part description	Qty
1.	Bolt, 5931 8.8 M6X12	6
2.	Cover, vane rotor chamber	1
3.	O-ring, 3237	1
4.	Rotor key	1
5.	Filter cover	1
6.	Gasket, filter cover	1
7.	Filter	1
8.	Bypass valve	1
9.	Rotor, 5-vane	1
10.	Pump vane	5
11.	Snap ring, shaft, dia. 10, UNI 7435	1
12.	Spring, mechanical packing	1
13.	Washer, copper	1
14.	O-ring, 2043	1
15.	Rotary plate, sliding, D.11	1
16.	Stationary plate, sliding, D.11	1
17.	O-ring, 2056	1
<b>18.</b>	<b>Vent plug</b>	1
19.	Spring washer, 1/8"G port	1
20.	Pump body	1
21.	Spring, bypass assy	1
22.	Compensating ring	1
23.	Bearing, 6203	1
24.	Motor	1
25.	Bar, clamp, M5X125	4
26.	Flange, set of	1

## 7. Diesel fuel level indicator

### Watchman Sonic Plus

Ultrasonic level sensor for Diesel fuel with an extra containment sensor

This product is only intended in household Diesel fuel tanks with the parameter limits shown in the technical specifications. Any other use of this product for non-household applications is at the sole risk of the user.

### CONTAINMENT ALARM

The containment sensor is intended to detect the presence of fluid in the interstitial space between the inner and the outer shell. The containment sensor output is read every 20 minutes. If the output reads an interstitial leak, the receiver indicates the containment alarm as explained in Section "Containment alarm indication". Note this means that it may take up to 20 minutes to detect a leak. With the interstitial space containment drained empty of ally fluid, the receiver resets automatically. It may take up to 20 minutes for the receiver to revert to normal operation after clearing the containment alarm. The containment alarm sound can be enabled or disabled with the switch (1) on the receiver, as explained in the manual.

This device is suitable for use in storage tanks for Diesel fuel and fuel oil types A2, C1, C2, and D as specified in BS 2 869. Before attempting to operate the device with other fluids, consult the device manufacturer or supplier. Before attempting to install the device, verify that the tank in which the Watchman Sonic Plus sensor is to be installed conforms to these requirements:

1. The tank is level;
2. The tank is no more than 200 m away along a straight line from the receiver and within the field of view of the latter;
3. The maximum height is 3 meters;
4. The Watchman Sonic Plus sensor must always be at least 10 cm above the fluid level in the tank. If the sensor is less than 10 cm above the fluid level, the readings can be inconsistent and incorrect;
5. The inner shell for the tank is installed with a spill containment tray.

### Receiver DIP switch settings

Refer to the tank height table to read the correct DIP switch settings. The DIP switches are installed in a recess on the back of the receiver, above the pins.

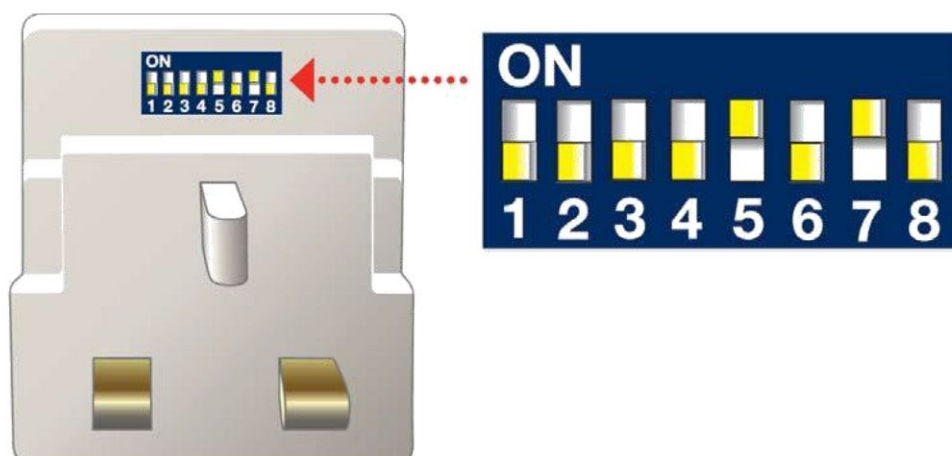
Use a flat blade screwdriver or the tip of a ball pen to move the DIP switches (see the illustrated example) up (to the ON position). Example: if the tank is 100 cm high, set DIP switches 5 and 7 ON (up). (See Fig. 1)

NOTE: DIP switches 1 and 2 are OFF (down) by default. To enable the low tank level sound alarm or the containment alarm, move DIP switch 1 up.

When ON (up), DIP switch 1 enables two functions.

1. If the low level is detected, every 60 minutes the device makes 5 fast sounds.
2. If the containment alarm is detected, the device will make 1-second long sound every 10 seconds.

DIP switch 2 is irrelevant to the user.



## Fig. 1

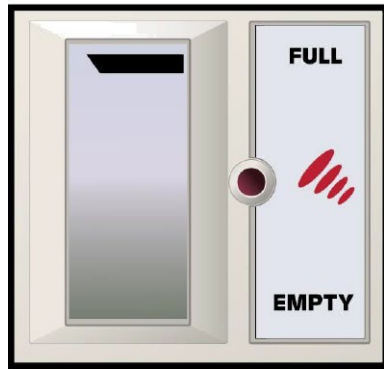
### Pairing the transmitter with its receiver

The receiver (Component A) needs to be paired with the transmitter (Component C) so that their system code is unique for the monitored tank. You only need to do it once. Connect the receiver to a suitable, easily accessible mains power outlet and turn on the receiver.

The display (Fig. 2) in the front of the receiver will show a flashing bar at the top, as shown in the figure. This means that the receiver is waiting for a unique code to be uploaded. The bar will flash for 2 minutes. In the meantime, the transmitter can be paired with its receiver.

Bring the transmitter to the right-hand side of the receiver as shown (Fig. 3), with the transmitter's white dot touching the receiver's black dot for approximately 20 seconds. This step is critical! This will allow transmitting a unique pairing code. The display will start showing an increasing number of bars. When 10 bars are displayed, they will begin to flash and indicate that the unique pairing code has been transmitted. Once paired, immediately install the transmitter at the tank.

- The receiver will wait for the unique code transmission for 2 minutes from being powered on.
- To modify the tank height settings, disconnect the receiver, modify the DIP switch settings as required, and power on the receiver again.
- When installing more than one Watchman Sonic Plus, wait 9 minutes before each next pairing operation.
- If the mains power is lost, the receiver is powered off, or moved to another power outlet: With the power supply restored or the device switched back on, the receiver display shows a flashing bar at the top. Now, re-pairing with the transmitter is not required. The bar at the top of the display will flash for 2 minutes and the last correct signal reading will be displayed.



**Fig. 2**



**Fig. 3**

### **Diesel fuel tank level reading**

The bar indicator shows the Diesel fuel level detected in the tank.

Note: The first accurate reading may take the Watchman Sonic Plus up to 2 hours.



**FULL**

**PRE-WARNING**

**ALMOST EMPTY**

### **Troubleshooting**

#### BATTERY REPLACEMENT

The lithium battery will last for an extremely long time of operation. When it is spent, it must be replaced.

Batteries are available for purchase in first-class photo stores or pharmacies. The required battery type is: VARTA CR2430.

- Remove the transmitter from the tank.
- Move the transmitter to a clean and dry place.
- Use a small Philips screwdriver to remove four screws underneath the transmitter's body.
- Remove the top cover.

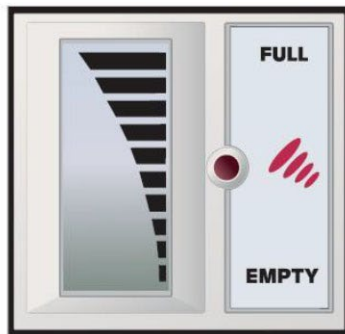
- Remove the battery from the snap-on seat.
- Install a new battery.
- Replace the cover.
- Tighten all four screws even, do not cross the threads.
- Install the transmitter back in the tank.

If the receiver detects a low battery charge, the following warning message will appear on the LCD: the Diesel fuel tank level and a constantly flashing warning triangle/ (See Fig. 4)

#### RECEIVER FAILURE INDICATION:

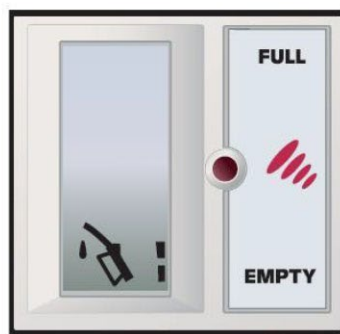
If the receiver detects a signal transmission loss for a considerable time, the LCD will show the icon shown in Fig. 5. The icon comes on after approx. 12 h from the last known good signal. (See Fig. 5) To correct the problem, move the receiver to a location where there is signal reception.

If the receiver does not detect the signal echo, the LCD will read the following message: A continuously flashing warning triangle and the indicator bar (5). (See Fig. 6) To correct this problem, check whether the transmitter is correctly placed in the tank and whether there is any interference from the walls of the tank, rebars, or ports.



**FULL**

**Fig. 4**



**PRE-WARNING**

**Fig. 5**



**ALMOST EMPTY**

**Fig. 6**

#### Containment alarm indication

If a leak is detected, all 10 bars on the display will begin flashing at short intervals with the red LED indicator. This indicates an interstitial liquid leak between the inner and the outer shell. The device remains in this mode as long as the interstitial leak sensor is immersed in the liquid.

Note: Leaving the interstitial leak sensor immersed for a long time will greatly reduce the battery life and void the product warranty.



**CONTAINMENT ALARM**

**Fig. 7**

**Table of DIP switch settings for the Watchman Sonic Plus receiver**

Measure the tank height along the plumb from the installation location of the transmitter to the tank bottom. Find the value in the table nearest to the height result. Ignore the DIP switch 1 and 2 settings. The only exception is listed under NOTE in Section 5.

Tank height (cm)	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
50						
55						ON
60					ON	
65					ON	
70				ON		
75				ON		ON
80				ON	ON	
85				ON	ON	
90			ON			
95			ON			ON
100			ON		ON	
105			ON		ON	ON
110			ON	ON		
115			ON	ON		ON
120			ON	ON	ON	
125			ON	ON	ON	
130		ON				
135		ON				ON
140		ON			ON	
145		ON			ON	ON
150		ON		ON		
155		ON		ON		ON
160		ON		ON	ON	
165		ON		ON	ON	ON
170		ON	ON			
175		ON	ON			ON
180		ON	ON		ON	

185		ON	ON		ON	ON
190		ON	ON	ON		
195		ON	ON	ON		ON
200		ON	ON	ON	ON	
205		ON	ON	ON	ON	ON
210	ON					
215	ON					ON
220	ON				ON	
225	ON				ON	ON
230	ON			ON		
235	ON			ON		ON
240	ON			ON	ON	
245	ON			ON	ON	ON
250	ON		ON			
255	ON		ON			ON
260	ON		ON		ON	
265	ON		ON		ON	ON
270	ON		ON	ON		
275	ON		ON	ON		ON
280	ON		ON	ON	ON	
285	ON		ON	ON	ON	ON
290	ON	ON				
295	ON	ON				ON
300	ON	ON			ON	

## Technical specifications

<b>Tank depth measurement:</b>	Minimum depth: 0.5 m Maximum depth: 3 m
<b>Display:</b>	Bar level indicator; each bar corresponds to 10% of the tank height. Pre-warning indicator (a flashing tank fill indicator) at a specific height above the tank bottom (see Section 13). Flashing red LED for the empty tank, triggered at a specific height above the tank bottom. (See Section 13) Compliant with EN60335.
<b>Max. transmission range:</b>	200 m under normal line of sight conditions. The actual transmission range of the device can be affected by external factors which reduce the transmitter range and/or the receiver sensitivity.
<b>Power supply:</b>	Receiver: 230 V, 50-60 Hz +/-10%. Transmitter: 3V lithium cell.
<b>Battery life:</b>	Max. 3 years (depending on the tank height)
<b>Wireless communication:</b>	433 MHz. FM-modulated transmission. EN 300-220.
<b>Dimensions:</b>	Receiver: 50 x 55 x 35 mm (without the antenna). Transmitter: 70 x 93 mm.
<b>Min/max operating temperature (transmitter):</b>	Operating temperature range: -10 to +60 °C. Operating RH: 0-100%. Hermetically sealed device made of UV stabilised PP3317 plastic.
<b>Tank installation hole size:</b>	32 mm 2" female BSP thread port

**Declaration:** The design of this device does not cause personal injury or other hazards due to contact with the product, does not cause high surface temperature or infrared, electromagnetic or ionizing radiation, and does not create other hazards unrelated to electricity, provided that the use of the device is in conformity with its operating and installation instructions.

**Warning:** If the device may come into contact with aggressive substances, the user is responsible for acting appropriately to prevent their adverse impact on the device and thus for ensuring that the appropriate type of protection is maintained. Aggressive substances mean liquids or gases that can be harmful to metals, or substances that may affect polymers.

Note the following to reduce the risk of electric shock:

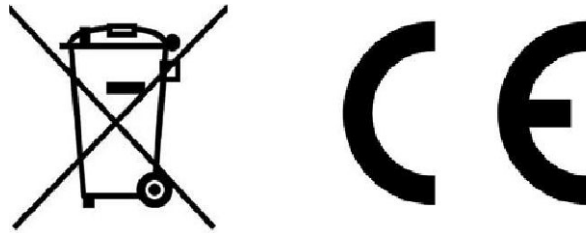
- The receiver is intended for indoor use. Do not use it outdoors.
- The receiver is hermetically sealed and do not attempt to open it.

Warranty: 2 years.

SUPPORT CONTACT:

sales@sensor-systems.com

© Kingspan Environmental Ltd 01-02-2009 TMG



### **Safety information**

Do not place in an explosive atmosphere.

Periodically verify that the device is intact and properly installed at the tank. Consult with the manufacturer on the chemicals to be used before operating the device. Do not attempt to repair the device by yourself. Send the device to the manufacturer for repair.

**Warning!** Electrostatic discharge hazard! Clean only with a damp cloth. Use VARTA CR2430 batteries only.

The product is not suitable for use in pressure vessels. For use in tanks with atmospheric ventilation.

### **8. Optional accessories: SMDP or CUBE MC (controlled user access)**

The SMDP or Cube MC system, i.e. the Fluid Dispensing Monitoring System, is intended for all operations which use liquid media that require control and billing. Thanks to SMDP, fluid dispensing is possible only for predefined vehicles and individuals, and each refuelling operation is recorded by the system. The system can be logged into with unique PIN codes or unique electronic tags, which additionally increases the certainty that only specific personnel refuel specific vehicles.

See the detailed manual in Appendix No. 1

### **9. Electrical system**

The Eko Fuel Tank is powered with 220V mains in the standard configuration.

#### **9.1 Protective earth (for 5,000 and 9,000L DFSUs)**

The procedure follows for effectively discharging the electricity accumulated by electrostatic charging of the mostly plastic Eko Fuel Tank DFSU and the connected accessories and the installation of effective anti-electrocution protection:

- Install an earth electrode made of copper or galvanised wire with a cross-section of 16 mm<sup>2</sup> near the Eko Fuel Tank DFSU to discharge static electricity to the ground.

Wire the following to the earth electrode:

- The Diesel fuel supply system used while refuelling the Eko Fuel Tank DFSU and the PE bolt terminal extending from the dispenser's enclosure.

Make the connection with an earthing conductor rated at less than  $10\Omega$ .

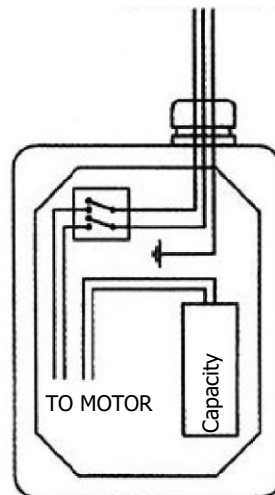
The PE cable (in a yellow/green jacket) of the pump power supply must be wired to the existing power supply mains.

Wiring guidelines for the Eko Fuel Tank DFSU:

- Connect the 230 V supply wires to the control box as shown in the wiring diagram. The wiring shall be done by a qualified electrician. Use a  $3 \times 2.5 \text{ mm}^2$  power cable. The power supply line must be protected with a circuit breaker of sufficient capacity.

## 9.2 Eko Fuel Tank electrical power supply

### SINGLE PHASE



**TN-C power system** (two-wire): Live wire (black or brown), neutral wire (blue); connect the PE wire (yellow/green) of the device to the neutral terminal (at the blue wire).

**TN-S power system** (with three power supply wires):

- Live wire (black or brown), neutral wire (blue), and PE wire (yellow/green); connect the PE wire (yellow/green) of the device to the PE wire (yellow/green) coming from the power mains.

### **Eko Fuel Tank overcurrent circuit breaker**

Aside from the motor protection trip in the pump terminal box, install an overcurrent circuit breaker in the power panel of the DFSU. The circuit breaker shall be rated C16A (breaking current: 16 A, type C characteristics)

### **CAUTION!**

Permanent wiring of the Eko Fuel Tank DFSU to the power panel shall be done by an electrician with a valid professional license for the work.

### 9.3 Temporary power supply

If the Eko Fuel Tank DFSU frequently relocated, an extension cord of suitable ratings may be used to supply electricity to the pump. The extension cord shall meet these specifications:

- Minimum wire size: 3x2.5 mm<sup>2</sup>;
- Braided copper conductors;
- PE pin (earth);
- Minimum protection rating: IP65;
- The circuit breaker rating of the extension cord power circuit shall be C16A (breaking current: 16 A, type C characteristics);
- The extension cord shall be in good repair, free from chafing, insulation damage, loose contacts/terminals, or evidence of any rework.

Connect the extension cord only with the main power switch of the pump turned OFF.

#### **CAUTION!**

Keep the extension cord connections away from moisture and water. Before prolonged standstill or the night (if unused at night), disconnect the electrical power supply.

## 10. Operation – Recommendations

- **Before operating the DFSU, read and understand the operating manuals of the electric pump and the flow meter.**

The Eko Fuel Tank DFSU is designed and built for safety in operation and enable relatively easy maintenance.

Having received the DFSU from delivery, verify that all of its equipment and accessories have been delivered and that there is no evidence of transport damage. If the DFSU is provided with a pumping and dispensing kit, the DFSU is ready for operation once filled with Diesel fuel and connected to the power supply.

The user is liable for compliance with national regulations for installation and operation of this product type and the fire and environmental protection guidance from local authorities. The owner and users of the DFSU shall take precautions adequate for the character and extend of foreseeable hazards to prevent injury and damage and, if required, to contain their consequences. In the event of a direct hazard to the public, the owner and users of the DFSU shall immediately notify emergency services and provide them with all information required for emergency response. Applicable national regulations specify the mandatory obligations.

Diesel fuel storage and dispensing units are under mandatory supervision of the Polish Office of Technical Inspection (UDT), and the UDT field office of relevant jurisdiction shall determine the technical inspection format for approval of this DFSU for operation and the applicability and frequency of its periodic inspection.

On a readily accessible part of the DFSU there is an indelible and legible nameplate which is resistant to corrosion and Diesel fuel. The nameplate contents follow:

- 1) Manufacturer's name
- 2) Type
- 3) Year of manufacture
- 4) Serial number
- 5) Specifications of the intended operating media
- 6) Capacity
- 7) Test pressure
- 8) Operating pressure
- 9) Quality control identification

Given the nature of the fluid intended to be stored in the DFSU and the potential environmental hazards, strict compliance with the following instructions is required:

- Fill the DFSU only via the Euro-coupling port under the refill port hatch. If the DFSU is provided with a low-mounted filling line, connect the filling hose to the 2" QR coupling in the dispensing cabinet. Do not overfill the DFSU!
- Do not hold contaminated Diesel fuel in the DFSU to prevent contamination and failure of the pumping system.
- Before starting the DFSU, read and follow its operating manual.
- Refill and refuel under supervision of authorized personnel only.

- Protect the DFSU from damage during handling, transport, and storage (see the transport and handling guidelines). Transport the DFSU only when **empty**.
- Always keep the DFSU equipment in good repair.
- If the DFSU is provided with a 230V/50Hz electric pump, properly wire the PE (provided with the DFSU) and have the electrical power wiring system installed in compliance with the pump's OEM (see the Appendix) and the applicable regulations.
- If the pump delivery is insufficient, clean the suction hose filter and the pump mesh filter. If additional Diesel fuel filters or a water separator is installed, inspect them for clogs and replace accordingly.
- **Periodically recalibrate the flow meter as shown in the Manual. If the system features a digital flow meter, periodically replace the batteries.**
  - Periodically inspect and maintain the interstitial leak sensor as shown in the Manual.
  - Protect the DFSU against unauthorised access.
  - Any alteration of the design, equipment, or intended use of the DFSU is **strictly prohibited** without the manufacturer's approval.

**If the DFSU or any equipment part of it is damaged, remove the DFSU from service until repaired. If the DFSU is found to be leaking, move all Diesel fuel to another vessel. Notify the DFSU supplier.**

Appendix No. 2 lists a table of capacity certification (with approximate values) for stocktaking of the actual Diesel fuel volume in the DFSU.

The tabulated data are burdened with an error caused by thermal expansion of the polyethylene material which the DSFU is made of.

### **10.1 Vehicle refueling**

When refuelling the vehicle from the DSFU for the first time, remember that the entire suction line can be filled with air. First, start the electric pump, place the dispensing nozzle in the fuel fill port of the vehicle and keep the dispensing nozzle open to allow venting of air. The pump can be operated for no more than 2 minutes until Diesel fuel starts flowing.

Once the vehicle has been refuelled, first stop the DSFU pump and when Diesel fuel stops flowing, release the dispensing nozzle trigger. A reversed sequence of these operations will leave pressurized Diesel fuel in the dispensing nozzle hose, which is not recommended.

- Operate the Eko Fuel Tank DSFU between ambient temperatures of -20°C to +40°C. Do not use the Eko Fuel Tank DSFU in inclement weather, including rain and strong wind.

**Make sure there is Diesel fuel in the Eko Tank DSFU before use.**

**Dry running of the pump will cause it to fail!**

- The maximum operating time of the pump with the dispensing nozzle closed shall not exceed 1 minute. Verify that the pump is powered off after use of the DSFU.
- Visually inspect the condition of the Eko Fuel Tank DSFU.
- Verify that the dispensing nozzle and the hose are in good repair and show no evidence of external damage.
- Approach the Eko Fuel Tank DSFU with the vehicle and stop the engine. Do not remain inside of the vehicle while refuelling.
- Immediately depart with the vehicle after refuelling. Do not leave any vehicle parked near the Eko Fuel Tank DSFU.
- Only one vehicle shall be parked at the Eko Fuel Tank DSFU when refuelling from it. The next vehicle to be refuelled must be parked 5 m away.
- Do not park the vehicle so that it will obstruct evacuation from the fire hazard.
- If Diesel fuel is spilled, immediately clean it up before using the Eko Fuel Tank DSFU again.
- If the containment of the Eko Fuel Tank DSFU fails, immediately pump the Diesel fuel to another tank and notify the supplier of the DSFU.
- Never obstruct or cover the ventilation port of the Eko Fuel Tank DSFU and keep it clean.
- If the Eko Fuel Tank DSFU is to be left unused, isolate it from the power supply.
- If a malfunction is found in the Eko Fuel Tank DSFU, have it repaired.

## 10.2 Filling the Eko Fuel Tank DSFU

Refill the Eko Fuel Tank DSFU from a road tanker or another vehicle designed for carriage of fire hazard class III materials. The Eko Fuel Tank DSFU has a sealed refill coupling in the standard configuration.

1. Refill the Eko Fuel Tank DSFU only to its nominal capacity which is 95% of the maximum capacity.
2. Refill and refuel with Diesel fuel under constant supervision of trained personnel.
3. When filling the DSFU with Diesel fuel, the refilling location shall be protected by safety signs, warning lights, etc. Special precautions shall be used if the road tanker is encroaching on the foot pavement or a street lane, obstructing traffic.
4. Before refilling the DSFU, inspect the filling port and the Diesel fuel oil in the DSFU. Verify that the DSFU stands stable and it is undamaged.
5. It is recommended to refill from road tankers which can be interfaced with the maximum level sensor output.
6. If the Eko Fuel Tank DSFU is at a considerable distance from the road tanker, always have an assistant monitor the refilling operation.
7. The maximum refilling flow rate of the Eko Fuel Tank DSFU is 350 l/min.

**Emergency response to Eko Fuel Tank DSFU failure (containment failure, electrocution, etc.):**

- Immediately stop all work in the hazardous area;
- Disconnect the power supply from the dispensing pump;
- Aid the injured having made sure that the hazardous area can be safely entered;
- Notify the manager/supervisor;
- The manager/supervisor with the ownership of the storage or the area in which the emergency has arisen, or a designated individual shall direct the emergency response and call the fire department if required;
- If the Eko Fuel Tank DSFU starts leaking, pump the contents to another device and call the manufacturer's authorized service.

### 10.3 Maintenance of the Eko Fuel Tank DSFU

The following table lists the maintenance activities required for operating the Eko Fuel Tank DSFU.

#	Action	Frequency
1	Inspect the technical condition and completeness of the Eko Fuel Tank DSFU	Before operating
2	Check the technical condition of the electrical wiring system	Before operating
3	Check the condition of protective earth and its line continuity	Once a month
4	Check the mesh filter and clean it if necessary	Once a month
5	Check the level sensor	Once a month
6	Calibrate the flow meter	Once every 2 months or every 40,000 litres dispensed
7	Check for leaks (containment loss)	Once a month
8	Inspect the pump's vent line	Once a month
9	Inspect the dispensing system	Once a month
10	Inspect the interior of the Eko Fuel Tank DSFU for contamination	Once a month
11	Clean all accessories	Once a month
12	Check for leaks at the couplings	Once a month

The details of operation and maintenance of the dispensing system's components (the pump, the flow meter, the interstitial leak sensor, etc.) are shown in the respective OEM's manuals.

### 11. Positioning requirements of the Eko Fuel Tank DSFU

The user of the Eko Fuel Tank DSFU is liable for compliance with national regulations for installation and operation of this product type and the fire and environmental protection guidance from local authorities.

1. Do not install or refill the Eko Fuel Tank DSFU if damaged or incomplete.
2. Place the Eko Fuel Tank DSFU on a flat (level), smooth, and firm surface made from a non-flammable material. The base surface must be at least 30 cm wider than the Eko Fuel Tank DSFU footprint. The base surface must be at least 5 cm thick.

3. The mains power connection for the Eko Fuel Tank DSFU shall be as specified by the pump motor. Wire the power supply only with suitable and fully functional extension cords or install a fixed power supply line.
4. If the power supply cable/wiring is exposed to damage, secure it by suspending overhead, running in an encasing pipe, or covering with a guard/canopy.
5. The Eko Fuel Tank DSFU cannot be installed inside of garage rooms, storage houses or any indoor location. Do not position it on foot pavements or other pedestrian circulation routes.
6. Provide enough clearance around the Eko Fuel Tank DSFU to enable easy and collision-free refuelling of vehicles.
7. Provide an access for the Diesel fuel delivery tankers to the Eko Fuel Tank DSFU.
8. Do not use open flame, smoke, or use any other sources of Diesel fuel ignition in direct vicinity of the Eko Fuel Tank DSFU. At the Eko Fuel Tank DSFU location, post fire protection signs which read *Do not smoke or use open flames*.
9. If the DSFU's dispensing system featured an 230 VAC electric pump, wire its electrical power supply system in compliance with the pump OEM's manuals and the applicable laws.
10. The location and clearance for the Eko Fuel Tank DSFU shall meet the minimum distances shown in the table:

<b>Required clearance:</b>	<b>Clearance</b>
Sewage or district heating chambers without drain traps Not applicable to a yard in which the Eko Fuel Tank DSFU is located features line drains open to petrochemical separators	> 5 m
Single family housing, collective housing, and public buildings	> 15 m
Water drawing points, district heating chambers, and entryways to indoor locations with the floor below the terrain level	> 5 m
Other buildings, land premises and road limits	> 5 m
Line of forest	> 10 m
Max. 1 kV power lines	> 3 m
15 kV to 30 kV power lines	> 5 m
30 kV to 110 kV power lines	> 10 m
Units with a surface temperature reaching more than 100°C	> 0.5 m

12. No explosion hazard zones need to be established for the Eko Fuel Tank DSFU intended for petrochemical products in fire hazard class III.
13. It is recommended to shield the Eko Fuel Tank DSFU from snow and direct sunlight.
14. Install a 12 kg dry powder fire extinguisher with at the Eko Fuel Tank DSFU the *Fire Extinguisher* sign and the *Do not smoke or use open flames*.

## **12. Safety principles**

1. Due to its ignition temperature, Diesel fuel is a flammable liquid qualified in fire hazard class III according to the Regulation §2 [1]. It is a liquid produced by distillation of crude oil and primarily comprising a mixture of C9 to C20 hydrocarbons.
  - Freezing temperature, grade dependent: -4°C to -40°C. Ignition temperature: 56°C to 64°C.

- Auto-ignition temperature: 270°C or higher.

Diesel fuel vapours are approximately 6 times heavier than atmospheric air and accumulate at the ground, low portions of indoor rooms, and lowest points of terrain. Under certain conditions, Diesel fuel vapours can form explosive mixtures with the air. Diesel fuel is sold at fuel stations which must meet stringent requirements established in the Regulation [1]; however, current regulations of law permit non-commercial use of Diesel fuel storage tanks by legal and natural persons for refuelling various types of machines and equipment.

[1] – Polish Regulation of the Minister of Economy dated 21 November 2005 and concerning the Technical Requirements for Liquid Fuel Depots and Stations, Long-Distance Transport Pipelines for Crude Oil and Petrochemical Products, and Locations Thereof (Dz.U. 2005.243.2060, as amended)

## 2. Hazards from stored Diesel fuel and their control:

- Protect the skin from repeated or long-term exposure to Diesel fuel.
- Wear protective gloves while refuelling.
- If Diesel fuel contaminates the skin, wash it immediately with water and soap.
- Do not eat or drink when operating the Eko Fuel Tank.
- Do not smoke or use open flames when operating the Eko Fuel Tank.
- Diesel fuel vapours are harmful and may cause inadvertent harm to human health; extreme caution is advised when handling Diesel fuel.
- Risk of injury: protect the eyes with protective glasses.
- Diesel fuel is toxic to aquatic and terrestrial life and may cause long-term harm to the environment.
- Diesel fuel increases the risk of fire; Diesel fuel vapours form explosive mixtures with the air and are heavier than the air, accumulating at the ground and in the lowest points of rooms.

3. Keep the operating site of the Eko Fuel Tank DFSU clean and organized. Provide sufficient light. The DFSU shall be supervised by the owner or its renter. The Eko Fuel Tank DFSU can only be operated by personnel at least 18 years of age who have understood the operating manual and operating safety principles of the DFSU. Keep children and bystanders away from the operating area.

4. The owner and users of the DFSU shall take precautions adequate for the character and extent of foreseeable hazards to prevent injury and damage and, if required, to contain their consequences. In the event of a direct hazard to the public, the owner and users of the DFSU shall immediately notify emergency services and provide them with all information required for emergency response. Applicable national regulations specify the mandatory obligations.

5. Emergency response to Eko Fuel Tank DFSU failure (containment failure, electrocution, etc.):

- Immediately stop all work in the hazardous area;
- Disconnect the power supply from the dispensing pump;
- Aid the injured having made sure that the hazardous area can be safely entered;
- Notify the manager/supervisor;

- The manager/supervisor with the ownership of the storage or the area in which the emergency has arisen, or designated individual shall call the fire department if required;
  - If the Eko Fuel Tank DFSU starts leaking, pump the contents to another device;
  - Call the manufacturer's authorized service.
6. Comply with the fire protection and OHS regulations applicable on site.

### **13. Transport and storage**

1. Transport and store the DFSU only when empty. Protect the DFSU from damage in transport.
2. Handle the DFSU with a forklift truck or a crane with slings and straps. The Eko Fuel Tank DFSU can only be transported on vehicles with at least four lashing points, capable of carrying the DFSU's weight and size, and providing facilities for lashing and securing the DFSU against movement in transport.
3. Do not push, pull, or roll the DFSU. Do not use any protruding points for lifting, pushing, or pulling the DFSU.
5. The load body of the transport vehicle must be flat, level, and free from sharp edges. Secure the DFSU against movement during transport.
6. Store the DFSU outdoors. No specific restrictions apply. The surface at the DFSU storage area shall be level, hardened, and free from sharp edges.
7. During transport and storage, the cover and ports shall be fully sealed and secured. All electrical wiring and hoses attached to the DFSU shall be coiled and secured, the dispensing nozzle secured in its holder, and the dispensing cabinet's door closed.
8. The Eko Fuel Tank DFSU can be stored in indoor areas only if empty of Diesel fuel.

The Warranty is shown in Appendix No. 3.