daviteq

USER GUIDE

Fuel Level Sensor PulseCAP 10®

Please read this user guide before installation or any further process with PulseCAP10 Applied for model: A, P, S1, S2

www.daviteq.com

NOTE

- The technicians who install sensor, must be graduated from college of mechanic or electric.
- The mechanical installation staff (drill, cut, grind, ect.) must have skills in mechanical engineering.
- The electrical installation staff (connect, ect.) must have skills in electrical engineering.
- The technician must be trained before using

SAFETY

- PulseCAP10 is intended to use with Diesel Oil, Vegetable Oil.
- PulseCAP10 must not be used with other flammable fluid such as Gasoline, Alcohol, Ethanol, Acetone, Toluene or other solvents.
- Be careful while drilling, cutting, grinding, ect. the fuel tank or other flammable fluid.
- Daviteq is not responsilble for compensation in case of explosion to bodily injury or property damage.

NOTE BEFORE INSTALLATION

- Read specifications thoroughly and make sure that its output are suitable to reading devices.
- Power supply must be in the permitted range.
- Do not take out the label and take off the lid as this will lead to the instability of the sensor and manufacturer could deny warranty. (except cutting of sensor length within the allowed range).
- Make sure all the necessary tools are ready before the installation.
- PulseCAP10 be equipped with screws. We advise customers should use inox rivets to fasten the plastic flange onto tank for all type of tanks and only using screws for the thick and hard ones.

SPECIFICATION

Output	- Analog (A): 1...5VDC - Pulse Witdth(P): 1.7 sec cycle, 5 Vp-p - RS232 (S1, S2): Tx, DS Protocol, %Vp-p - RS485 (R): Modbus RTU
Power Supply	8..50VDC for output: A, P, S1, S2 5..50VDC for output: Modbus RS485 Current Consumption: Max 15mA
Pressure/ Temperrature	2barg/-40°C...+85°C
Performance	Output Linearity: ±0.5% of Span at 25°C, Temperature drift: +0.03% of Span per 10°C
Resolution	1/1000 of measuring range
Sensor Material	Cast Aluminium, Thermal Plastic
Process Connection	4-bolt Plastic Flange
Electriccal Connector	3-way connector, IP67 with standard cable (7m)
Accessories	4-bolt Plastic Flange, Rubber Gasket 4mm, O-ring, 1A Fuse, Screws, Plastic Twister Seal, Connector Seal, Sensor Head Seal, User Guide
CERTIFICATE	CE-Marking, Standard: EN61236-1

- **Sensor length (mm): 700, 1000, 1500, 2000, 2500, 3000, 3500, 4000**
- **Minimum length (mm): 200**
- **Maximum length (mm): 4000**

FULL PACKAGE

A complete set includes the following parts:

TOOLS

No	Tool Name	No	Tool Name
01	Drilling machine	10	Drill Φ38
02	Pump	11	Silicone gasket
03	Rivet clippers (In case of using inox rivet)	12	Twist drill 4 mm (In case of using inox rivet)
04	Tube cutter	13	Electrical tape
05	Swivel Blade	14	Cutting pliers
06	Hacksaw	15	Phillips srewdriver
07	File	16	Pencil
08	Tape measures	17	Multi Meter
09	Allen key 2mm	18	Calibration can

SENSOR INSTALLATION GUIDANCE

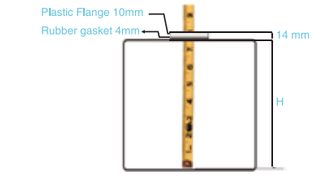
Discription	Note
1. Remove fuel: Remove all fuel from the tank	Some vehicles have been welded with oil filter so it is necessary to take out the float level sensor before removing the fuel
2. Clean the tank: - Remove or rotate the tank. - Clean the tank	Must clean the tank thoroughly
3. Central hole locating: The hole will be in the center of tank's up-per side or closest to center	This is an important step as it will affect the stability of the fuel trending graph directly
4. Drilling the central hole: - Use a 38 mm drill to do - Clean the wound by hand-held grinder. - Remove any burrs from the drilled hole by a file	Before drilling, it is vital to check whether the hole is affected by the internal metal frame or obstacles at the bottom of the tank

5. Flange installation:
- Place the 4mm rubber gasket at the center of the tank's upper side
- Place the plastic flange onto the rubber gasket (4mm)
- Mark 4 points at the bolt hole
- Use screws /rivets to fasten the 4mm rubber gasket and the plastic flange onto tank

- Only using screws for the thick and hard tanks.
- Unplug the screw/ rivet symmetrically

6. Sensor cutting and Auto-recognization

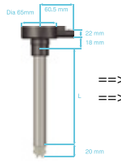
After flange installation, measure the tank height as below picture:



C=L+20+18-(H+14) => C = L+24-H (mm)

C: Length to be cutted.
L: Original length of the sensor.
H: Height of the tank.

* Example:
Sensor lenght is L = 700mm, H = 650 mm

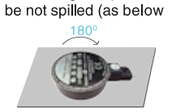


==> C = 74mm
==> cut the sensor tube a minimum length of 74 mm

7. Auto-recognization:
- After cutting, make sure the sensor tube is clean
- Replug the Filter footer and tighten the screw.
- Turn on the sensor in at least 30 seconds in order for the sensor to automatically recognize its new length.

8. Final:
- Place the O-ring on the top of the threads, ensure that it can touch the aluminum housing of sensor (as below picture):

- Install sensor into the threads of flange and turn it in clockwise direction.
- Using the O-ring enables to rotate the sensor within 180 degrees from final tighten position and assuring that the oil will be not spilled (as below picture):



- Use the 2mm allen key to lock the hex bolt to protect the sensor unthreading during operation.
- Connect the sensor with the cable.
- Use sensor head seal to cover the sensor and then use plastic twister seal to lock the head seal and connector seal to protect the sensor

DISASSEMBLY GUIDANCE

Please follow the below steps:	Note
Step 1: Cut the seal and open the sensor head seal Step 2: Remove the terminal connector Step 3: Use the 2mm allen key to unlock the hex bolt Step 4: Turn the sensor in counter-clockwise direction	- Do not hold the male connector to rotate sensor directly, that can make the male connector broken. - Do not use locking pliers, pipe wrenches, ect. to twist the sensor as this cause damages the structure of the sensor such as cast aluminium housing, label, signal cables (conector), circuit board, ect. and it will not be covered under warranty

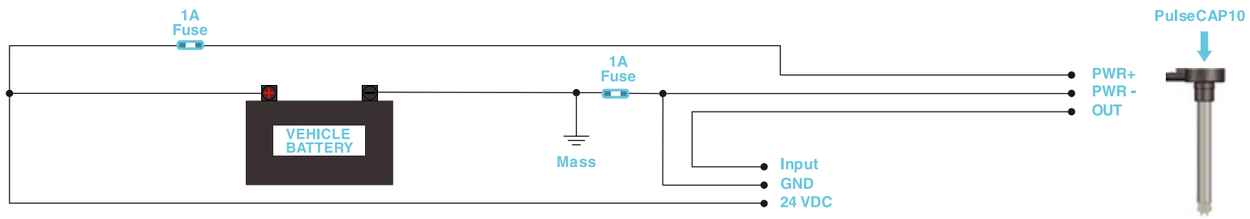
WIRE CONNECTING INSTRUCTION

FOLLOW LABELS IN WIRES:
Each cable includes wires which are marked labels according to types of connection.
(user should not cut these labels before installation to avoid confusing)

FOLLOW WIRE COLOURS:
White: PWR+(8..50VDC)
Blue: PWR-(0VDC)
Black: Output

CAUTION!
- Remain power supply permanently (it is advised to use power directly from battery for easy control when problems occur), should use 24VDC power with 1A fuse.
- The signal cable from sensor to the black box should be protected by corrugated hose or the Φ16 plastic tube, keep the cable avoid high temperature areas.
- Output wire of sensor must be connected to the proper input gate of the black box.

FUSE CONNECTION GUIDANCE



PERIODIC CLEANING GUIDANCE

1. Periodically clean the oil tank 2, 3 or 6 months depending on usage and contamination.
2. Periodically clean the sensor and filter footer 2, 3 or 6 months by:
- Cover a sensor's vent before using the air sprayer for another.
- Remove and clean the filter footer.

TROUBLESHOOTING FOR CAP10 ANALOG, PULSE AND RS232 OUTPUT FUEL LEVEL SENSOR

No.	PHENOMENA	GRAPH	REASONS	SOLUTIONS
1	Fuel level in graph or output signal is unchanged		There is liquid in the circuit board	Could not repair, need to replace new sensor
			Filter footer is clogged by dirts, particles	- Clean the filter footer and the oil tank - Blow away the impurities in the sensor
2	Fuel level in graph or output signal is closed to maximum value or exceeded		There is liquid in the circuit board	Could not repair, need to replace new sensor
			Male connector was spoiled by some reasons *(*only happens to Cap10 Analog output)*	
			There are conductive impurities between 2 electrodes	- Clean the filter footer and the oil tank - Blow away the impurities in the sensor
3	- NO output signal - The signal is under 1VDC - Fuel level in graph is keeping at lowest value *(*only happens to Cap10 Analog output)*		No power supply	- Check if the power cable is disconnected - Check if the sensor connector is loosing or disconnected
			Output signal cable is disconnected	Check the OUTPUT cable
			The circuit board is burnt (due to the mass was short-circuit during installation; or when repairing the car, a large electrical current accidentally went into the sensor)	Could not repair, need to replace new sensor
			Due to incorrect configuration of the reading device or server *(*only happens to Cap10 RS232 output)*	Using Terminal software on a connected computer with the sensor to check the signal
4	The signal is unstable, fluctuating constantly, and have an error from 3% to 10% compares with the volume of the tank		Bad terrain	Create additional algorithmic filter on reading device or server
			Due to the special size/shape tank, cause large fluctuating fuel level when moving	
			The mass is short-circuit during sensor installation	Check the installation again, and ensure the sensor and the chassis frame are insulated completely
			The sensor that installed is eccentric with oil tank	Reinstall to ensure the sensor is concentric with the oil tank to minimize the fluctuating fuel level when moving
5	The signal is normal, sometimes drops to 0 and then up to normal		Power supply for the sensor is not stable	- Check the sensor connector to see it is firmly connected - Check if the GND and PWR+ source are stable
6	The signal is normal, sometimes soars high and then back to normal		Sensor connector was spoiled by some reasons	Could not repair, need to replace new sensor
			There is liquid in the circuit board	
			There is impurities in the sensor's pipe	- Clean the filter footer and the oil tank - Blow away the impurities in the sensor

WARRANTY

Warranty is applied for Pulse CAP10 fuel level sensor manufactured by Dai Viet Controls & Instrumentation Company Ltd (Daviteq)
PluseCAP10 fuel level sensor will be warranted for a period of eighteen (18) months from date of delivery

CHAPTER 1: FREE WARRANTY CONDITIONS

1. Manufacturer undertakes to guarantee within 18 months.
2. Product failed due to defects in material or workmanship
3. Sirial number, label, warranty stamp remains intact (not purged, detected, edited, scraped, tore, blurry, spotty or pasted on top by certain items)
4. During warranty period, if any problem of damage occurs due to technical manufacturing, please notify our Service Centre for free warranty consultancy. Unauthorized treatments and modifications are not allowed.
5. Product failed due to the defects from the manufaturer, depending on the actual situation, Daviteq will consider replacement or repairs.

▶ Notes:

One way was shipping cost to the warranty centre shall be paid by Custmers

CHAPTER 2: PAID WARRANTY

1. The warranty period has expired.
2. Product is not manufactured by Daviteq.
3. Product failed due to damage caused by disasters such as fire, flood, lightning or explosion, ect.
4. Product damaged during shipment.
5. Product damaged due to faulty of installation, useage or power supply.
6. Product damaged caused by the customer.
7. Product rusted, stained by effects of the environment or due to vandalism, liquid (acids, chemicals, ect.)
8. Product damaged caused by unauthorized treatments and modifications.

▶ Note:

Customers will be subjected to all reparing expense and shipping cost.
If it arises disagreement with company's determining faults, both parties will have a third party inspection appraise such damage and its decision be and is final decision.

CHAPTER 3: CONTACT

Dai Viet Controls & Instrumentation Ltd., Co (Daviteq)
No. 11, Street 2G, Nam Hung Vuong Area Res., An Lac Ward, Binh Tan Dist, Ho Chi Minh City, Vietnam

Warranty service support is available from Monday to Friday (excluding Public Holidays as prescribed)
8: 00 AM - 12: 00 AM
1: 30 PM - 5: 00 PM

Hotline
+84.906.885.858
Service Manager

Tel: +84-28-6268.2523 (ext 122)
Fax: +84-28-6268.2520

WARNING: ANY INDIVIDUALS, ORGANIZATIONS CAUSES DAMAGE TO PRODUCT LEADING TO MATERIAL/PHYSICAL LOSSES, COMERCIAL PRETIGE /RETATION ON PURPOSE SHALL BE RESPONSIBLE FOR THE CIVIL, CRIMENAL LIABILITIES UNDER VIETNAMEESE LAW.

Daviteq sincerely thank you for entrusting and using products manufactured and provided by our company