FRESH WATER LEVEL SENDER

Part Numbers: 3281

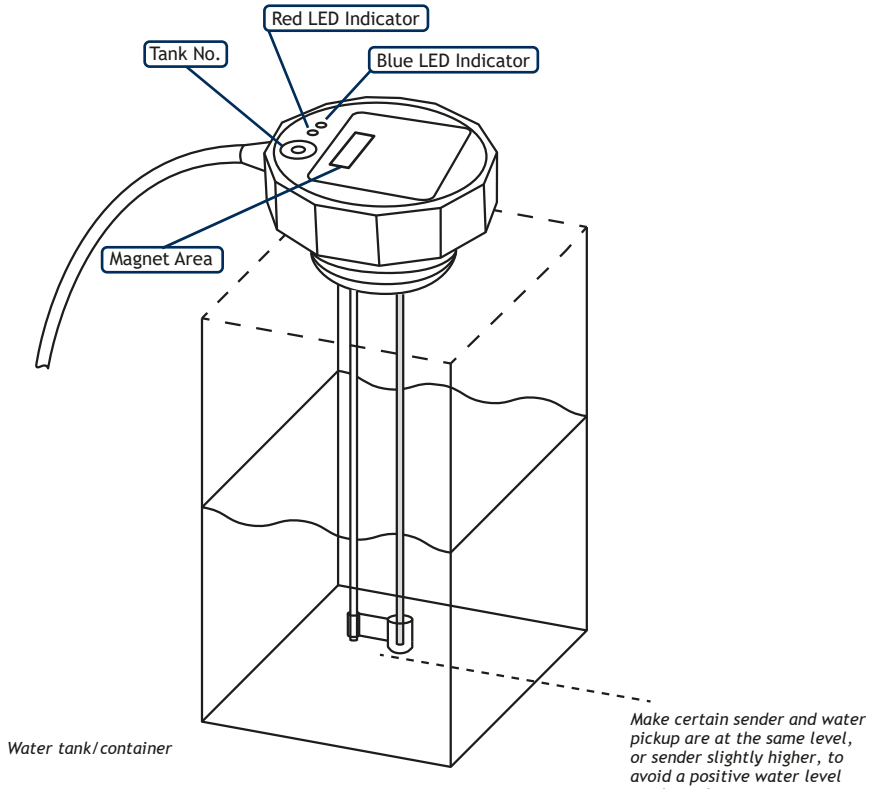
INSTALLATION AND OPERATING INSTRUCTIONS

The Oceanis Systems' 3281 NMEA2000® Fresh Water Level Sender measures the tank level or tank volume of the vessels fresh water tanks.

It is very important that it is installed and set up correctly according to this manual. Please read and follow the installation and setup instructions carefully to achieve the best results. (applicable for all variants)

The 3281 NMEA2000® Fresh Water Sender has the following features:

- Water level sensing from 250mm to 2 metres
- User settable for tank Level or tank Volume output
- User settable tank instance from 0 to 11
- Heartbeat blue LED to indicate normal activity
- Red Warning LED to indicate damaged rods.
- 1.25" BSP single threaded mount
- NMEA2000® Interface



1 INSTALLATION

Take great care when unpacking the sender that the coated rod is not damaged in any way. If the coating is scraped or punctured the sender will not work.

We test every sender before it is packed so the coated rod is protected against transit damage. Do not remove the protective packaging until you are ready to install the sender.

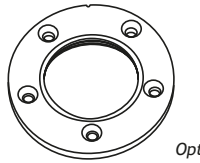
You should find the following items in the 3281 shipping tube:
1 x 3281 NMEA2000® Fresh Water Level Sender
1 x Water Sender Probe End Cap (May already be attached)
1 x 3281 User Manual (This document)
1x 30g tube of silicone, if unit is not already cut to length

1.1 MOUNTING LOCATION AND REQUIREMENTS

The sender is designed to be mounted on a flat area on the top of the water tank over the tank's deepest part. Examine the tank internal structure and choose a location that ensures the sender probes will not chafe on any of the tank's internal structure or baffles.

The sender requires a 1.25 inch standard BSP threaded mounting hole with a small 45° machine chamfer at the top to seal against the sender mounting O ring.

If the tank has an existing SAE 5 bolt hole then the optional 3261 Mounting ring can be attached to the SAE 5 bolt holes to provide a 1.25" BSP threaded hole mount for the Water Sender.

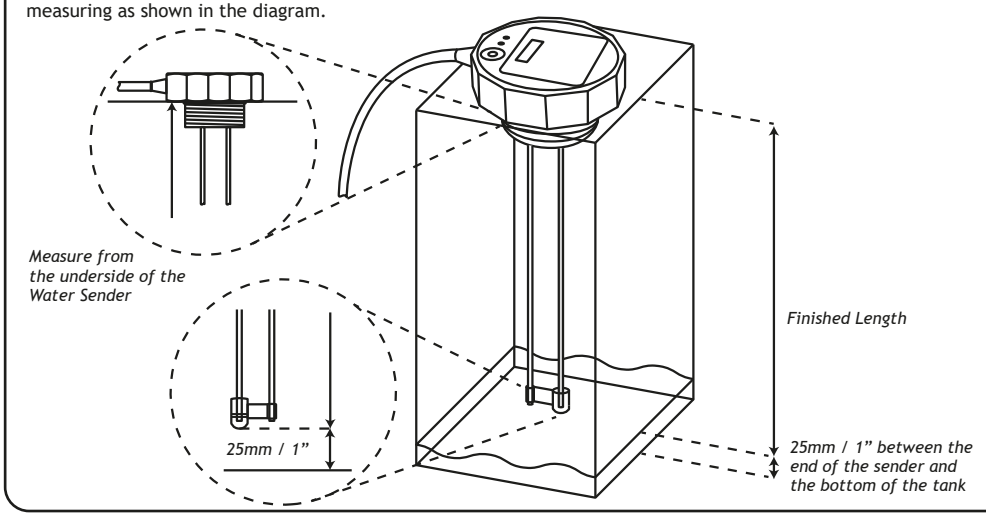


Optional 3261 Mounting Ring.

1.2 MEASURING SENDER LENGTH

The sender may be supplied already cut to length with the probe end cap already installed and be ready to install into the tank if you have supplied the required cut length at the point of ordering. In this case there is no extra work to do in this part.

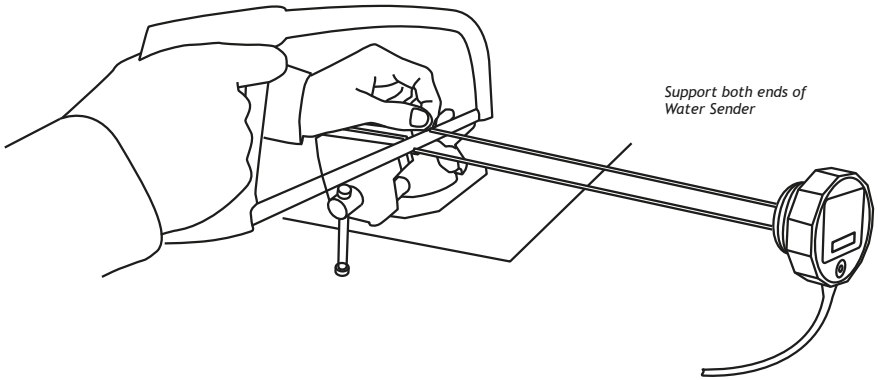
If the sender was supplied in a standard length to be cut down then the finished length should be determined by measuring as shown in the diagram.



1.3 CUTTING TO LENGTH

Cut the coated and uncoated rod to length using a sharp hacksaw.

CAUTION
BE VERY CAREFUL NOT TO DAMAGE THE PLASTIC COATING ON THE REMAINING LENGTH OF ROD DURING THE CUTTING PROCESS. IF YOU ARE SUPPORTING THE ROD DURING THE CUTTING PROCESS SUPPORT THE ROD ON THE PART BEING REMOVED. IF THE PLASTIC COATING IS DAMAGED THE SENDER WILL NOT WORK!

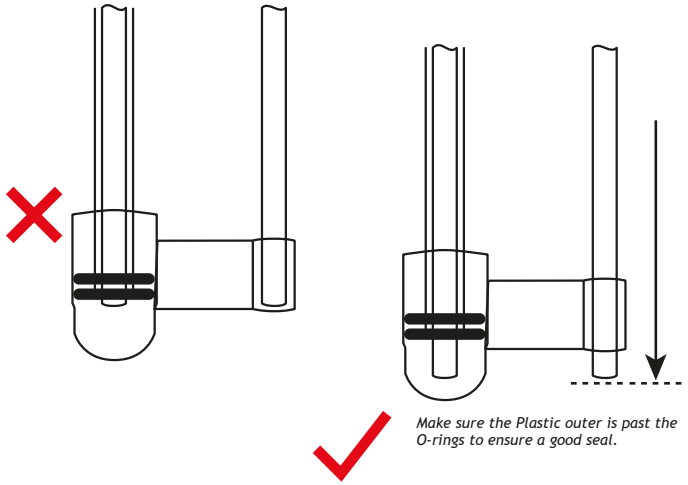


Support both ends of Water Sender

After cutting the rods to length, remove any sharp edges with a file and trim the insulation back by 5mm. The cut end now needs to be insulated by means of the clear plastic end cap included with the unit. Enter the insulated rod in the enclosed part of the end cap and the plain rod in the other end as shown in this image.

Fill the clear plastic end cap with silicone sealant before pushing insulated rod onto the cap.

Push the insulated rod firmly into the enclosed end until it is fully home as shown the following image. This will be quite stiff and care must be taken not to damage the coated rod in this operation.



Make sure the Plastic outer is past the O-rings to ensure a good seal.

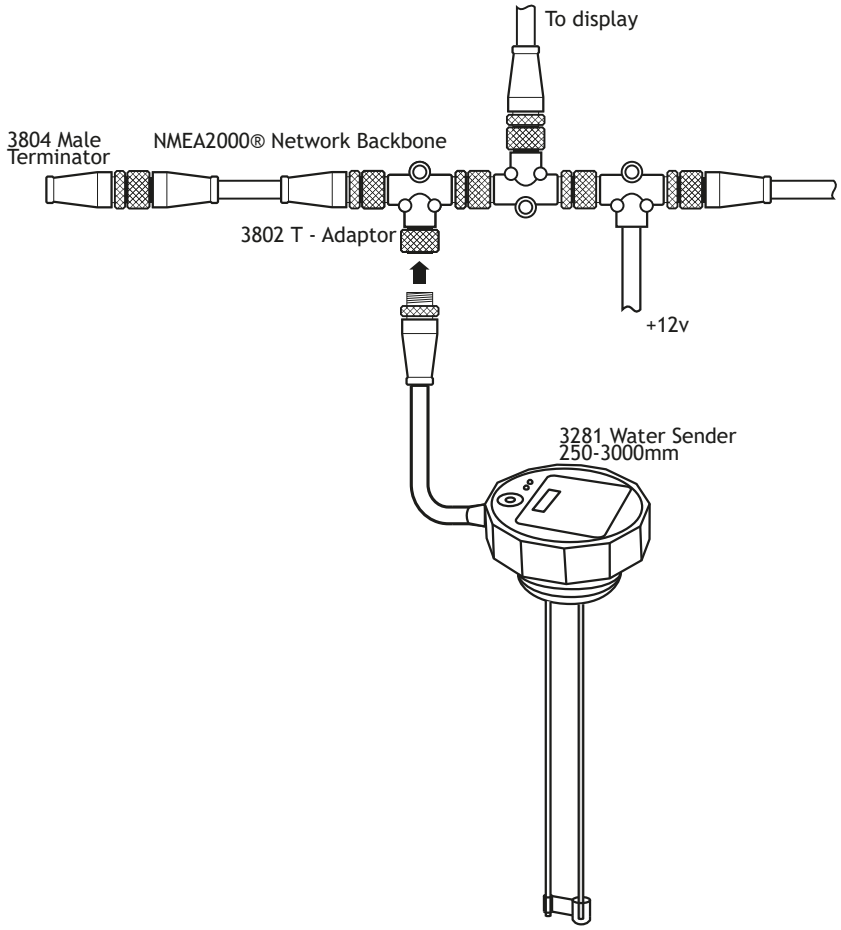
1.4 INSERTING SENDER INTO THE TANK

Carefully insert the Water Sender probe into the threaded hole in the top of the tank. Ensure that the probe coating does NOT scrape against the edge of the tank. Tighten sender sufficiently to prevent leaks.

1.5 CONNECTING THE NMEA2000® INTERFACE

The unit must be connected with POWER OFF to prevent damage.

The NMEA2000® interface cable on the unit should be connected to a nearby NMEA2000® Tee connector (part number 3802). The male end of the cable should be inserted into the female Tee connection noting the position of the keyway in the plug and the socket. This cable can be extended up to a maximum length of 6 metres to the Tee connector. Ensure that the locking ring is securely tightened so that the connection is waterproof and secure.



2 CONFIGURATION

2.1 TANK DEVICE INSTANCE

NMEA2000® requires a unique Device Instance to be set for each 3281 NMEA2000® Fresh Water Sender on a single network. This is settable from device instance 0 to Device Instance 12 using the right hand small rotary switch on the top of the sender labeled “Tank No.”

This means that each Fresh Water tank should have a device instance starting from 0. The Instance can be set at any time regardless if power is on or off. The switch counts from 0 – 9 then A – B being equivalent to Device Instance 0 – 11.

The NMEA2000® Device Instance is set by using the small rotary switch on the front panel labeled “Tank No.” as per the following table:

Switch Position	Device Instance SW2
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	Invalid
D	
E	
F	

2.2 SETTING THE OUTPUT MODE

The 3281 Fresh Water Sender has two output modes to choose from. Level Mode or Volume Mode.

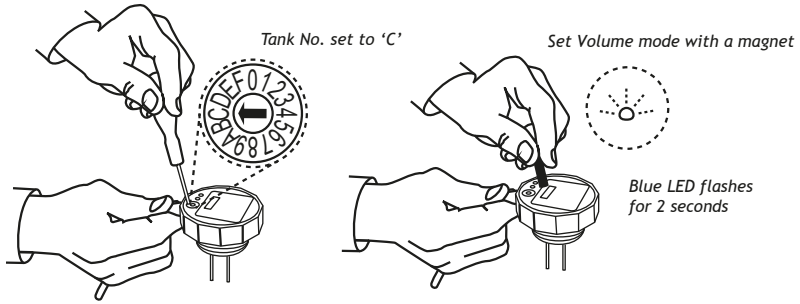
LEVEL MODE is when the sender outputs from 0–100%. It indicates the exact LEVEL of the fluid in the tank. The user can tell when the unit is in Level Mode because the blue LED flashes ONCE every 2.5 seconds when a level message has been sent.

VOLUME MODE is when the sender outputs from 0-100% but reflects the actual fluid volume within the tank taking allowance for the tanks internal shape. The user can tell when the unit is in Volume Mode because the blue LED flashes twice rapidly every 2.5 seconds when a volume message has been sent.

The Volume Mode PGN message is exactly the same as the Level Mode PGN message which means that the volume can easily be shown on any NMEA2000® display that accepts Fluid Level PGNs from tank senders. The Volume Mode Tank data can be entered from any Oceanic Systems Display that is equipped to set up this data. Please contact us for more information on these displays. It can also be set up at manufacture if the information is made available at the time of ordering.

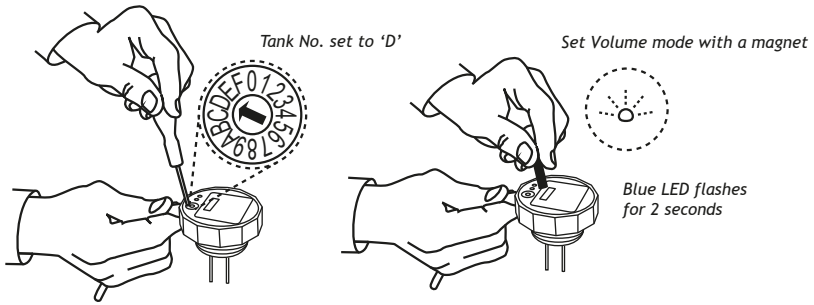
SETTING LEVEL MODE

Level Mode can be set by setting the “Tank No.” switch to “C” and then placing a small magnet on the “Magnet Calibration” position on the label. The blue LED will flash for 2 seconds to indicate that the unit saw the magnet. Then return the “Tank No.” switch to it’s original position and the sender will transmit Level messages as indicated by the blue LED flashing ONCE briefly every 2.5 seconds.



SETTING VOLUME MODE

Volume Mode can be set by setting the “Tank No.” switch to “D”, then placing the magnet on the “Magnet Calibration” position on the label. The blue LED will flash for 2 seconds to indicate that the unit saw the magnet. When the switch is returned to it’s original positions the sender will transmit Volume messages as indicated by the blue LED flashing rapidly TWICE every 2.5 seconds.



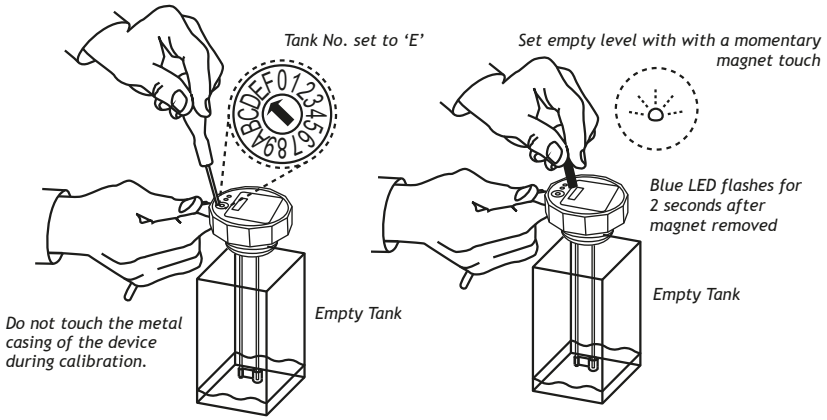
If the senders Volume Mode Tank Data has NOT been set up, and the unit is accidentally set to Volume Mode, the data transmitted will actually be the Level Data. This means the unit will remain fully functional.

3 SETTING TANK EMPTY TANK FULL CALIBRATION

When the unit is first installed it needs to be calibrated to the tank. This is easily done as follows:

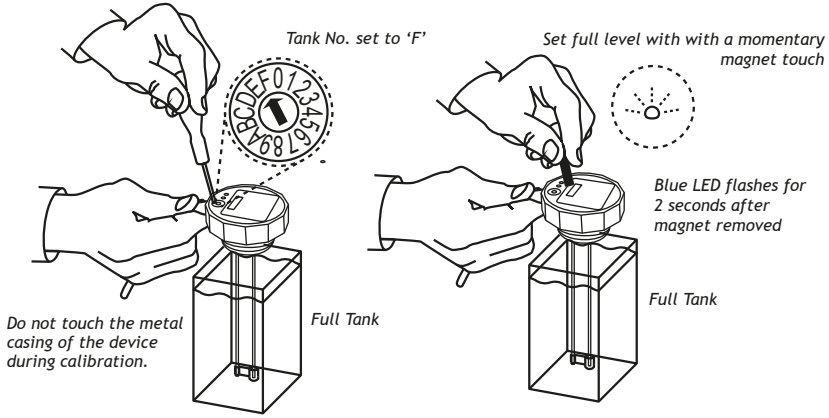
3.1 TANK EMPTY CALIBRATION

When the unit is first installed in an EMPTY tank and powered on the Tank Empty Calibration is done by setting the “Tank No.” switch to “E” then applying a small magnet momentarily on the “Magnet Calibration” position on the label. The blue LED will light for 2 seconds to indicate that the unit saw the magnet and that the empty calibration is complete. DO NOT HOLD THE MAGNET AGAINST THE SENDER as this can delete settings



3.2 TANK FULL CALIBRATION

The Tank Full Calibration is easily done in a FULL tank and powered on by setting the “Tank No.” switch to “F”. Then place a small magnet on the “Magnet Calibration” position on the label to set the Full Calibration position. The blue LED will light for 2 seconds to indicate that the sender saw the magnet and that the full calibration point has been set. DO NOT HOLD THE MAGNET AGAINST THE SENDER as this can delete settings



In all cases do not forget to set the “Tank No. switch back to it’s original tank number.

4 TROUBLESHOOTING

The following table will help diagnose common faults:

LED does not flash	Check power on network or Tank Type switch not set to valid value
LED flashes rapidly	Network not terminated correctly or no other NMEA2000® device on the network
LED flashes once every 2.5 seconds	Normal Operation in Level mode (see 2.3 above)
LED Flashes twice every 2.5 seconds	Normal Operation in Volume mode (see 2.3 above)
LED on for about 2 seconds	Calibration magnet detected
Inaccurate Reading	Check end cap still installed on end of sender, carefully clean the sender rods and recalibrate using instructions above.
Red LED on or red LED flashing intermittently	While a short is detected due to an ill fitting end cap or damaged sleeve the red LED will be on.
Calibration settings lost	If the magnet is held against the magnet for too long it's possible that the settings get lost. They can be re-loaded by following the instructions in section 3, being careful to touch the magnet momentarily.

MAINTENANCE

Ensure that the sender is mounted securely in the top of the tank and that there are no liquid leaks. Reset and tighten if necessary. Check the security of the NMEA2000® cable to the NMEA2000® Tee Connector and tighten if necessary. Clean the unit with a soft cloth. Do not use chemical cleaners as they may remove label markings. The probes should be cleaned with plenty of water and a soft rag. Be very careful not to damage the coated rod whilst cleaning.

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