Ballast Tank Switch UNI

for Piston Tanks type EA and TA in 6V to 12V item no. 1584-UNI

The UNI decodes a proportional (=servo) channel from the receiver to a forward-stop-reverse switch function for the Piston Tank motor. In neutral position of the stick, both relays are off and the motor is stopped. On half way to either end of the stick travel, one relay is activated and the Piston Tank motor starts running. With the Pressure Switch (DS) connected, maximum depth is limited to approx. 1.8 meters (5.9 ft). If the model dives below this level, the UNI will automatically switch to the "surfacing mode" and empty the Piston Tank. The model will then resurface unless the stick is back in neutral position. Otherwise, with the stick left at "full charge" the model will emerge to a depth above 1.8 meters after which the tank will start filling again (and so on).

Furthermore, the Pressure Switch (DS) acts as a second security device. Should the over pressure which builds-up within the hull while submerging (by flooding the tank) be lost due to a leakage, the "submerge mode" will be terminated by the switch. In this case, the green LED flashes steadily, and the system does not allow the submarine to submerge again until this has been corrected. Alternatively, the UNI offers another fail safe device. If the transmitter signal is lost - due to increased depth or other circumstances - the UNI will switch to "blow" (empty) the Piston Tank.

The UNI also offers a so-called Battery Voltage Monitor. The voltage of the Piston Tank motor battery is permanently verified. Should voltage fall below a specific threshold value (preset to 9V for 12V operation) for more than 5 seconds, the unit will switch to resurfacing. Low battery mode is indicated by lighting of the red LED. It is highly recommend to always making sure all batteries are fully charged before your model commences its journey!

Connecting Piston Tank & Pressure Switch to UNI

Before installing Piston Tank (PT), Pressure Switch (DS) and UNI in the model run a "dry" test of the entire dive system. Make all of the connections and mark the leads accordingly after verifying the system is set up correctly.

The UNI offers a terminal with 4 sockets for connecting Piston Tank and power supply (battery) with wire leads (cable cross section min. 0.5 sqmm / AWG22) as per the following diagram (turn page over). A complete set of wire leads, hoses for Piston Tank and Pressure Switch as well as outboard tubing connector is optionally available (item no. 1584-UNI-99).
The PT is equipped with 3 micro (end) switches, illustrated as S1, S2 and S3. Each micro switch has 3 contacts marked with 1, 2 and 4.

Micro switches S1 and S2 operate the PT's Auto Stop device. All 3 contacts of S1 and S2 are employed in connection to the UNI and the PT motor.
The third micro switch S3 serves for the function of the Auto Trim device. As soon as total tank volume has reached 85% (depends on actual tank volume) the PT will stop. At this level the model needs to be trimmed accordingly by adding or removing ballast (e.g. lead). On switch S3 only contacts 1 and 4 are employed.

Connect M1, M2, + and - to the socket block of the UNI as illustrated (turn page over). The cables should be soldered to the micro switches. For connecting S3 to the UNI a 2-pole wire with BEC connector (item no. 9128) is recommended. The female connector is plugged onto the 2-pole pin row marked “TA” on the UNI. Polarity of this connection, either on the UNI or PT is not relevant, as S3 serves merely as an on/off switch "closing" the Auto Trim circuit.

Connect Pressure Switch to the 2-pole pin row of the UNI marked “DS”. Again, BEC connector cable no. 9128 is ideal. **On the Pressure Switch, only contacts 1 and 3 are employed.** Again, the polarity of contact 1 and 3 is not relevant. Do not make any connection to pin 2 of the Pressure Switch (DS) - otherwise you risk destroying the switch!

Connecting UNI to Receiver

The UNI is connected to the Rx simply by plugging the pre-soldered lead on the UNI into the Rx. With the UNI connected to the main drive battery only, without connection to receiver (Rx) or with Rx switched off, will automatically switch the PT to EMPTY. This means that even if the Rx battery or the Rx itself fail the model will not be lost but brought safely to resurface. Before initial operation of the system, implement a 10 Amp fuse to avoid damaging the UNI due to connection mistakes. After having established that the system is operating correctly, the fuse can be removed.

Plug the 3-pole connection lead of the UNI into the corresponding channel on your receiver. Switch on transmitter and then receiver (follow this sequence!).

Ensure correct direction of flow!
Connect the UNI to the main drive battery BUT leave the Rx switched off. The UNI must switch to empty. If the PT runs in the opposite direction (i.e. Piston Rod extends outward), the tank must be IMMEDIATELY stopped by switching off main power. Reverse the polarity on the motor (NOT the UNI). Otherwise the PT will not stop at its end position (micro switch) and stall.

The red LED indicates low battery voltage. If battery capacity has dropped below preset threshold value the red LED will be lit. This consequently requires the main drive battery to be charged. If the LED lights up although battery voltage is sufficient threshold voltage might be set to high. This can be adjusted by turning the potentiometer on the UNI. Clockwise rotation of the potentiometer increases threshold value, meaning that low battery mode will set-in earlier (at a higher voltage). Anti-clockwise rotation will decrease this value; the battery monitor will activate resurfacing at lower battery voltage. For accurate adjustment a regulated mains unit is recommended. Alternatively, a battery with appropriate voltage can be used.

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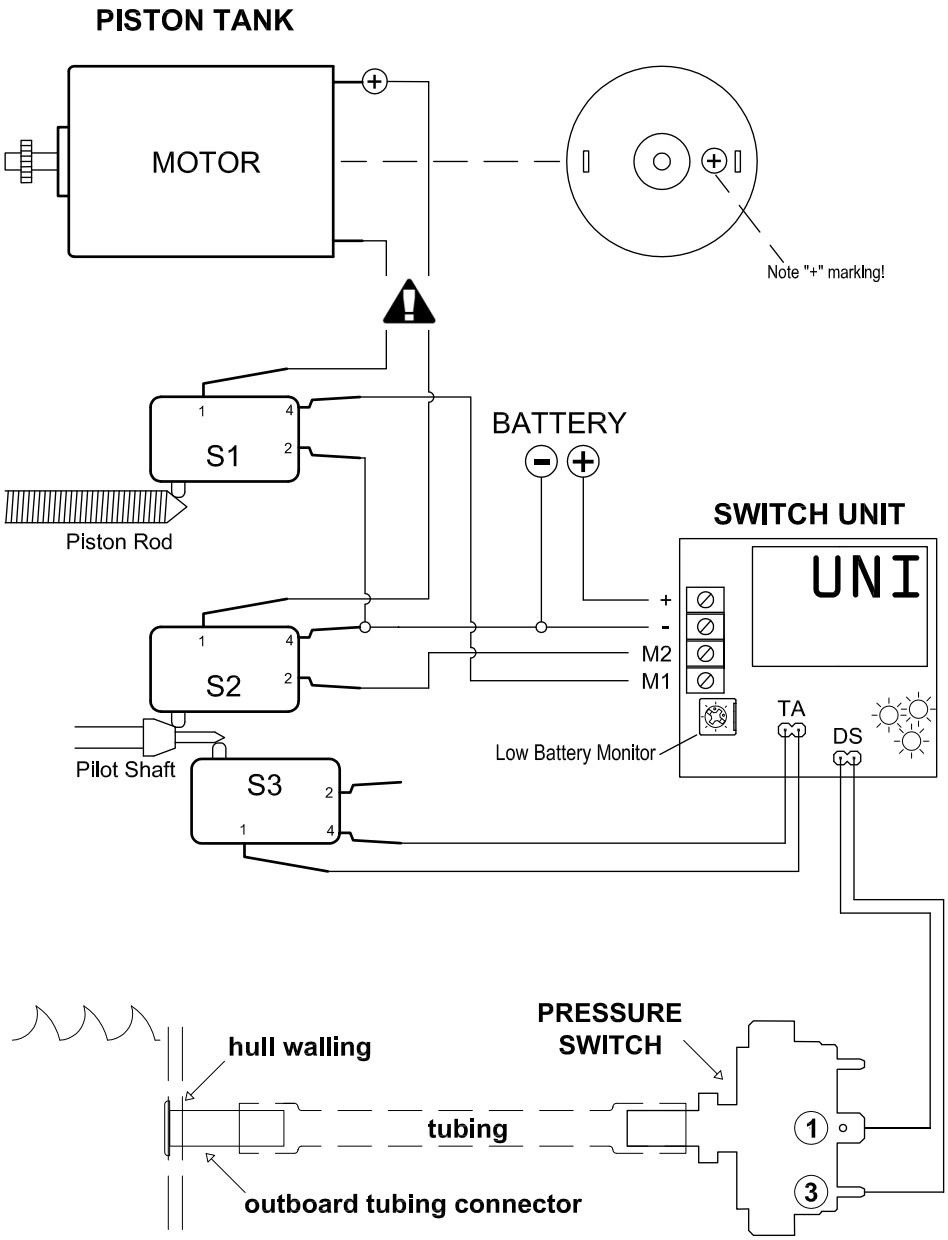

UNI with Piston Tank TA

Functional diagram of 3-position switch

3-position switch (ON/OFF/ON)

1. Tank is EMPTY.
2. Tank is being filled.
3. Tank can be stopped in any position.
4. Tank will be filled to about 85%.
5. Bring switch back to neutral.
6. Tank will be filled to 100%.
7. Tank will empty.

Please note:
At first, the tank will fill to about 85% of its volume. Bringing the switch to neutral and back to "filling" will result in a complete fill at 100%.
ALTERNATVELY to the 3-position switch one of the control sticks on your transmitter can be used.

With the red LED lit up for longer than 5 seconds, the UNI will no longer respond to transmitter commands and the automatic resurface mode will set in. If the red LED is already lit when powering up the system, the UNI will remain in the EMPTY mode.

The green LED indicates good signal quality. If transmitter signal is too weak or lost the green LED will be off. A lost or faulty signal will cause the UNI to automatically switch to EMPTY. The UNI will only react to transmitter commands after signal has reached an acceptable quality level. Other than that the unit will remain in the EMPTY mode.

Blinking of the yellow LED indicates activation of Pressure Switch. The UNI will remain in the EMPTY mode as long as Pressure Switch remains active.

During transport and storage main drive battery should be separated from the UNI as otherwise the battery will be discharged over time.

The fail safe system of the UNI might not function properly if your receiver already features such a device. Please read the manual of your R/C system or consult the manufacturer if in doubt.

Happy Sailings!

Trouble-free operation of the switch unit might only be possible in PPM modulation. In PCM modulation the unit may show dysfunctions (or not operate at all) due to non-standardized transmission signals in PCM. Ensure that your R/C system (transmitter and receiver) can be used in PPM. Please refer to the manual of your R/C for setting your system to PPM.

Please read the following instructions and safety warnings carefully BEFORE you commence with the assembly of this unit and installation of the dive system. For further safety instructions please refer to the instructions supplied with Piston Tanks. During the charging period all batteries must be removed from the hull. NEVER charge batteries inside the hull as almost all battery types gas while being charged. Insufficient air circulation during the charging period may lead to a serious EXPLOSION! We are not liable for any personal injury or damage of any kind incurred during the assembly and/or use of our products as we are neither able to delegate nor verify the assembly and/or use of these items. Please adhere to your country's safety guidelines during construction and operation of this item. This product is not suitable for persons under 16 years of age. Technical specifications are subject to change without notice.

This symbol indicates that after the service life of this electrical device has ended it must be disposed separately from domestic refuse at your communal waste collection.