



TWIN CHECK 4.0 - Instructions of use

Initial Settings of the TWIN CHECK 4.0 Unit

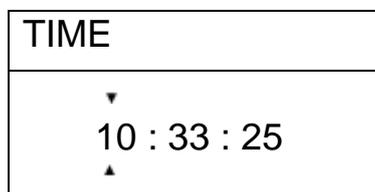
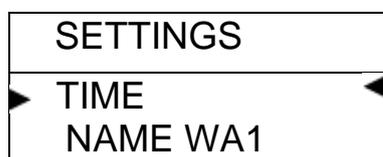
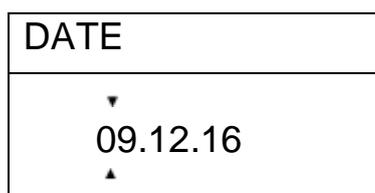
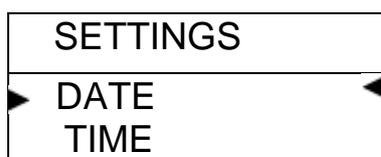
1. Turn the TWIN CHECK 4.0 on by pressing the “ON / OFF” button and holding it for 3 seconds.

2. In the main navigation menu, please select “SETTINGS” mode by using the up and down arrow keys and confirm your choice by pressing on the “OK [ENTER]” button.



3. In the “SETTINGS” menu, please complete all necessary settings such as date, time and the name of the parameter to measure (water-in-oil or base number). This will help to always ensure the accuracy of information with proper record keeping and trending of oil analysis data.

4. Navigating through the mode “SETTINGS” set the date and time of measurement.



To set the date and time, please use the “OK [ENTER]” button to switch between day, month and year/ hours, minutes and seconds and the up and down arrow keys to select the correct number.





- The test device TWIN CHECK 4.0 contains six channels for measuring water-in-oil concentration and BN in different engine systems: main engine, auxiliary diesel etc.

Provide a name for the parameter to determine in accordance with the number of engines to be tested.

There are six channels for water-in-oil measurements: WA1, WA2, WA3, WA4, WA5 and WA6.

SETTINGS	
▶	NAME WA1 ◀
	NAME WA2
	NAME WA3
	NAME WA4
	NAME WA5
	NAME WA6

NAME WA1
▼
WA1_NAME
▲

Choose the channel and type the name for all subsequent water-in-oil measurements. Press the "OK [ENTER]" button and then the up and down arrow keys to select letters.

The same procedure has to be performed with regard to setting a name for BN measurements.

SETTINGS	
▶	NAME BN1 ◀
	NAME BN2
	NAME BN3
	NAME BN4
	NAME BN5
	NAME BN6

NAME BN 1
▲
BN1_NAME
▼

For example, type M/E for main engine lube oil in the channel BN1 or type A/E for auxiliary diesel engine oil in the channel BN2.

- After all the required settings are finished, please, follow further instructions in accordance with the selected test, namely water-in-oil or BN.





Water-in-Oil Test

For determination of water concentration in the oil sample, the following test kits components have to be employed: TWIN CHECK 4.0 unit, WA-SOL- water-in-oil reagent composition kit (WA-SOL Basic and WA-SOL Activator), a syringe and a plastic beaker with the oil sample.



Water-in-Oil Content

1. Open the TWIN CHECK 4.0 unit (unscrew the upper part with pressure sensor and reaction vessel).



2. Fill the larger chamber of the reaction vessel with the prepared solution up to the lower marked point. In case of accidental solution spill into the smaller chamber of the reaction vessel, please, wipe it away immediately with a soft cleaning cloth.





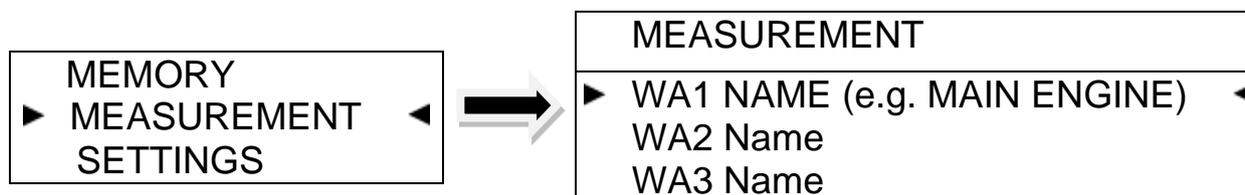
3. Draw 10 ml of the oil sample using the syringe and fill it into the smaller chamber of the reaction vessel.



4. Close the lid of the reaction vessel carefully. Make sure that the liquids do not mix yet.

5. Turn the TWIN CHECK 4.0 on by pressing the “ON / OFF” button and holding it for 3 seconds.

6. In the navigation menu please select the “MEASUREMENT WA” mode by using the arrow keys. The name of the measured parameter previously set will appear on the display.





7. Please, carefully follow the instructions appearing on the display one after another. The five steps of the measuring process are indicated as **S.../5** and displayed in the upper right corner.

MEAS WA1	S1/5
VESSEL FILLED? OK? PRESS ENTER	

Step 1/5: Do not mix the filled liquids yet.

MEAS WA1	S2/5
ZERO WAIT...	

Step 2/5: Wait until the built-in pressure sensor adopts the external (ambient) pressure as a measurement line with a zero-referenced value.

MEAS WA1	S3/5
SHAKE FOR 15 S OK? PRESS ENTER	

Step 3/5: The oil sample and the reagent can be mixed now by shaking the device for 15 seconds.

MEAS WA1	S4/5
WATER=0.00 vol% WAIT...	

Step 4/5: As long as the measuring process takes place, please, shake the device every two minutes for 15 seconds.





MEAS WA1	S5/5
WATER=0.34 vol% FINISHED	

Step 5/5: Once the measured value is determined, the TWIN CHECK 4.0 automatically stops measuring and displays the end-result.



Note: The measuring time can vary significantly starting from two minutes (no water detected in the oil sample and the measurement gets cut off automatically) to maximum twenty minutes (maximum total reaction time). The measuring range covered is **0 – 1.0 vol. % H₂O**.

Important: The end-result will be automatically saved on the internal memory chip. The large memory capacity enables storing the measured values for approximately two and a half years. Once the memory is full, the stored data will be automatically overwritten with newly recorded measured values.





Attention: No manual intervention in the measuring process is required. If the measuring process is terminated manually by user, the measured value will not be saved. Please, always wait until the TWIN CHECK 4.0 automatically stops measuring once the actual reaction has been finished. The measured value will be then immediately displayed on the digital screen.

8. In order to see the last 30 measured values, please select the “MEMORY” mode and navigate using the up and down arrow keys.



MEMORY	
11.12.2016	15:52:32
WA1: WA1 NAME	
WA=0.00 vol%	▲▼01/30



All other memory contents are available via interface (USB to serial connection).

Note: In case the content of water in oil exceeds 1% volume, the reaction vessel has to get emptied and cleaned and the above-described test procedure has to be conducted once again using 5 ml of the oil sample instead of 10 ml. Once the measurement is completed, the end-result on the display should be multiplied by 2 to provide the correct value (higher measurement accuracy).





BN Test

For determination of the base number of the oil sample/ samples under examination the following test kit components have to be used: TWIN CHECK 4.0 unit, ALCA Solution, a syringe and a plastic beaker with the oil sample.



Calibrating TWIN CHECK 4.0 (for Measuring BN Values Only)

As marine lubricants have different additive packages, they react differently with ALCA Solution. For measuring BN of the oil under examination, the TWIN CHECK 4.0 has to be calibrated with a reference sample and a known BN value.

1. If fresh oil is available, please take the BN value from the data sheet.
2. For used oil, please take the BN value determined at the shore-based laboratory.

Important: When sending a sample to the lab, please, keep one sample for calibration.

The TWIN CHECK 4.0 contains six channels to test up to six different oil grades. The modes are named as follows: BN1, BN2, BN3, BN4, BN5 and BN6.

Note: For each oil grade a calibration procedure has to be conducted just one time before measuring the BN value.





1. Open the TWIN CHECK 4.0 unit (unscrew the upper part with pressure sensor and reaction vessel).



2. Fill the larger chamber of the reaction vessel with the thoroughly shaken ALCA solution up to the lower marked point. In case of accidental solution spill into the smaller chamber of the reaction vessel, please, wipe it away immediately with a soft cleaning cloth.



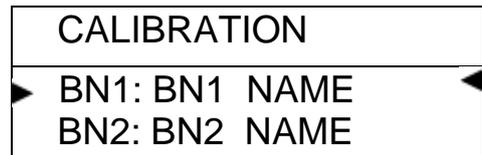
3. Draw 10 ml of the oil sample using the syringe and fill it into the smaller chamber of the reaction vessel.





4. Close the lid of the reaction vessel carefully. Make sure that the liquids do not mix yet.
5. Turn the TWIN CHECK 4.0 on by pressing the "ON / OFF" button and holding it for 3 seconds.

6. Please, select the "CALIBRATION" mode by using the arrow keys. The name of the BN previously set will appear on the display.



Please, select the corresponding name of the BN and proceed with the instructions appearing on the display one after another. The five steps of the calibration process are indicated as **S.../ 5** and displayed in the upper right corner.

CAL STEP	S1/5
VESSEL FILLED? OK? PRESS ENTER	

Step 1/5: Do not mix the filled liquids yet.

CAL STEP	S2/5
ZERO WAIT...	
CAL STEP	S3/5
SHAKE FOR 15 S OK? PRESS ENTER	

Step 2/5: Wait until the built-in pressure sensor adopts the external (ambient) pressure as a measurement line with a zero-referenced value.

Step 3/5: The oil sample and the reagent can be mixed now by shaking the device for 15 seconds.





CAL STEP	S4/5
P= 0.00 BAR WAIT...	

Step 4/5: As long as the measuring process takes place, please, shake the device every two minutes for 15 seconds.

CAL STEP	S5/5
BN NEW OIL ▲00▼ OK? PRESS ENTER	

Step 5/5: Enter the BN value of the oil using the up and down arrow keys in accordance with the data sheet. By pressing "OK" the typed BN value will be automatically saved. The oil grade can now be used for all subsequent measurements.

Measuring BN Value of the Oil Sample

After calibration the TWIN CHECK 4.0 is ready for measuring the BN value.

1. Open the TWIN CHECK 4.0 unit (unscrew the upper part with pressure sensor and reaction vessel).



2. Fill the larger chamber of the reaction vessel with the thoroughly shaken ALCA solution up to the lower marked point. In case of accidental solution spill into the smaller chamber of the reaction vessel, please, wipe it away immediately with a soft cleaning cloth.

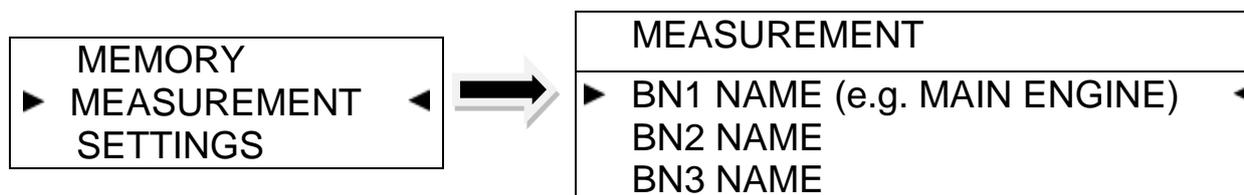




3. Draw 10 ml of the oil sample using the syringe and fill it into the smaller chamber of the reaction vessel.



4. Close the lid of the reaction vessel carefully. Make sure that the liquids do not mix yet.
5. Turn the TWIN CHECK 4.0 on by pressing the “ON / OFF” button and holding it for 3 seconds.
6. Please, select the “MEASUREMENT BN” mode by using the arrow keys. The name of the measured parameter previously set will appear on the display.



7. Please, carefully follow the instructions appearing on the display one after another. The five steps of the measuring process are indicated as **S.../ 5** and displayed in the upper right corner.

MEAS BN1	S1/5
VESSEL FILLED? OK? PRESS ENTER	

Step 1/5: Do not mix the filled liquids yet.

MEAS BN1	S2/5
ZERO WAIT...	

Step 2/5: Wait until the built-in pressure sensor adopts the external (ambient) pressure as a measurement line with a zero-referenced value.

MEAS BN1	S3/5
SHAKE FOR 15 S OK? PRESS ENTER	

Step 3/5: The oil sample and the reagent can be mixed now by shaking the device for 15 seconds.





MEAS BN1	S4/5
BN=00 WAIT...	

Step 4/5: As long as the measuring process takes place, please, shake the device every two minutes for 15 seconds.

MEAS BN1	S5/5
BN=12 FINISHED	

Step 5/5: Once the measured value is determined, the TWIN CHECK 4.0 automatically stops measuring and displays the end-result.

Note: The measuring time can vary significantly starting from two minutes to maximum twenty minutes (maximum total reaction time). The measuring range covered is **0 – 100 BN**.

Important: The end-result will be automatically saved on the internal memory chip. The large memory capacity enables storing the measured values for approximately two and a half years. Once the memory is full, the stored data will be automatically overwritten with newly recorded measured values.



Attention: No manual intervention in the measuring process is required. If the measuring process is terminated manually by user, the measured value will not be saved. Please, always wait until the TWIN CHECK 4.0 automatically stops measuring once the actual reaction has been finished. The measured value will be then immediately displayed on the digital screen.

- In order to see the last 30 measured values, please select the “MEMORY” mode and navigate using the up and down arrow keys.

CALIBRATION MEMORY MEASUREMENT



MEMORY
11.12.2016 15:52:32
BN1: BN1 NAME
BN=00 ▲▼01/30





All other memory contents are available via interface (USB to serial connection).

USB Cable Connection for Data Transfer

The test device TWIN CHECK 4.0 is equipped with the USB port and cable to transfer the files saved on the memory chip to PC. First, the data has to be imported into a terminal program. Then by using text document the measured values can be exported into Excel for creating a graph required to observe the trend (water-in-oil/BN) in the oil condition.

Please, unscrew and open the TWIN CHECK 4.0 unit as shown on the picture below and plug in the USB cable. The device is then ready for the USB to serial connection and data export.

