

# TWIN CHECK: NEW IMPROVED DESIGN IN LINE WITH THE 4.0 CONCEPT (IMPA: 65 28 21)

## Electronic Water-in-Oil / BN Test

For optimization of measuring processes and easy monitoring of trends in the condition of lubricating and hydraulic oil, Martechnic® has successfully accomplished modernization and modification of its proven test device TWIN CHECK following the concept of digitalization in the area of portable test equipment. A user-friendly TWIN CHECK 4.0 with a new modular design solution offers several upgraded configurations.

The collected data of **water-in-oil and alkalinity reserve (BN, formerly TBN)** measurements gets recorded and stored on an internal memory chip with large capacity. Due to the required setting of date, time and the name of the measurable parameter prior to starting the test, it is possible to easily check whether the test procedures have been actually conducted. This enables avoidance of any inaccuracies or falsifications of test results. Besides, owing to the automatic data recording and storing, there is no necessity to manually additionally document the obtained corresponding values. Through the USB to serial connection the test results can be quickly imported into a terminal program and further into Excel for plotting of a graph which portrays the trend in the oil condition (please, see the graph).



*The interchangeable parts of the TWIN CHECK 4.0 include a display in conjunction with a mainboard, a cable connection between the mainboard and the pressure cells, a pressure transmitter (pressure sensor), 9V block battery, a cable connection to the battery, USB cable and a reaction vessel.*

### Features:

#### Parameters to measure

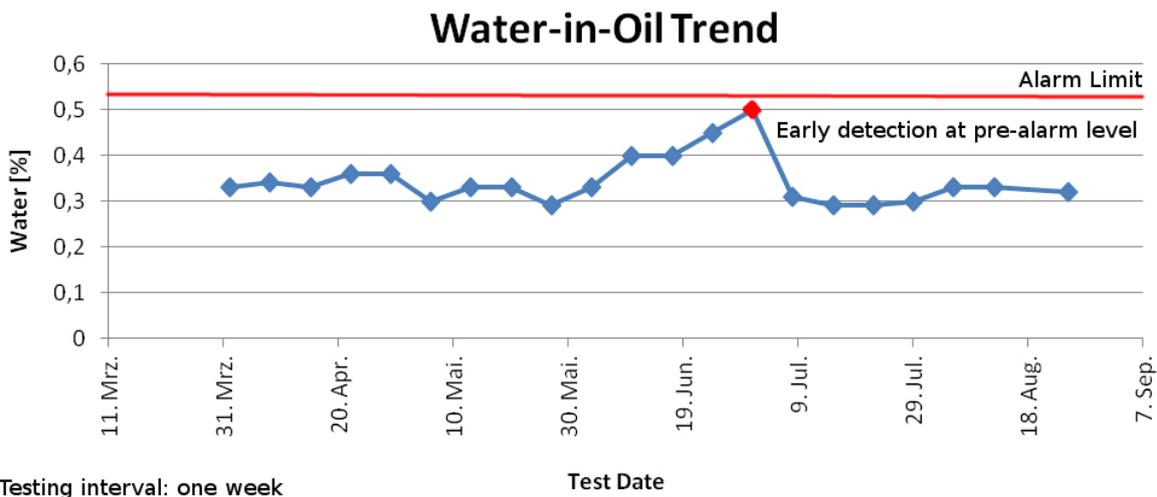
- Water-in-oil
  - Measuring range: 0 – 1.0 vol. % H<sub>2</sub>O
  - Measuring time: depends on the measured value (min. 2 - max. 20 min.)
  - Accuracy: +/- 3 %
- Base Number
  - Measuring range: 0 - 150 BN
  - Measuring time: depends on the measured value (min. 2 - max. 20 min)
  - Accuracy: +/- 1 BN

### Benefits:

- Applicable for all mineral oil based fluids
- Improved design with easy-to-follow navigation menu for high accuracy measurements
- Digital read-out of test results

- Internal memory chip with average data storage of 2.5 years
- USB to serial cable connectivity for data transfer and trend analysis
- Water-in-oil measurements: 6 modes for up to 6 various oil grades of different engines
- BN determination: 6 modes for up to 6 various oil grades of different engines
- Maintenance and repair on board is possible

The essential distinctive feature of the TWIN CHECK 4.0 is the possibility to replace every single constituent part (no matter plugged or screwed) in case of malfunction or damage occurred. Therefore, Martechnic® provides engineers and users with an advanced cost-effective option previously not available on the market. After short on-site technical diagnosis and determination of malfunction cause (employing, for example, the MT TEST KIT VERIFYER for detection of pressure related problems) the required component can be ordered and independently replaced.



The content of water in oil and alkalinity reserve is defined in the identical test procedure. The two chambers of the reaction vessel of the TWIN CHECK 4.0 get filled with the oil sample and the reagent. After closing the device, the integrated pressure sensor adopts the external (ambient) pressure as a measurement line with a zero-referenced value. Once the procedure is completed, by shaking the test device every two minutes for 15 seconds the measuring process takes place. The pressure build-up is directly proportional to the water/BN present in the oil under examination. As soon as the pressure is no more increasing (i.e. the water/BN parameter is constant), the TWIN CHECK 4.0 automatically stops measuring and displays the end-result. Therefore, the amount of time required for testing varies in accordance with the measured water-in-oil/BN value. So, for instance if no water in oil is detected within the first two minutes of the measuring process, the test result will be automatically shown on the electronic display of the test unit.

With regard to the BN test, it is necessary to conduct a single time calibration for each oil grade of the engine system (corresponds to the BN modes available) prior to proceeding with measurements of the alkalinity reserve.