5-Wire SensorsTester

Microprocessor Tester

PH-5 plus

PROFESSIONAL

User Manual

New!

CE

Microprocessor Tester PH-5 plus Professional (New Version) is a broadband digital device, simultaneously supporting up to 10 sensors. It supports all 5-wire commercially available optical and pneumatic sensors manufactured by the following companies: NIEHUSER, LIBERTY, DIXON, SCULLY, OPW, CIVACON, ALFONS HAAR and so on.

Among the devices available on the market, PH-5 stands out with:

- ✓ 100% measurement repeatability.
- ✓ Tester's possibility of working with all optical and pneumatic sensors according to all standards.
- ✓ The possibility of detecting and determining sensor parameters' instability.
- ✓ The possibility of detecting the sensor's susceptibility to external factors, such as temperature and shocks.
- ✓ The possibility of detecting deviations of sensor parameters from its factory parameters.
- ✓ The possibility of detecting sensor operating parameters at the lower limit of the parameters set out in the EN13922 standard.
- ✓ Automatic operation self-test and accurate calibration.
- ✓ Automatic control of battery level.
- ✓ A great number of the supported sensors, up to 10.
- ✓ Visualization of indications on two digital displays with simultaneous pleasant-to-the-ear acoustic signal.
- ✓ Small size and low weight. Housing with rubber fit to the hand.
- ✓ Long duration of the Tester operation on internal Li-ION batteries, 2 x 3.8V 1250mAh, current consumption from 195mA batteries while measurements done using 9 optical sensors. The output voltage supplying the sensors is 12V.
- ✓ Low price against the possibility tester.

- ✓ 10 pin plug with 4m cable.

The greatest advantage of the presented tester is its broadband operation with a continuous reading of parameters, even at exceeded thresholds of operation, that does not exist in other devices. Correct measurement is accompanied by a further-modulated acoustic alarm. If the allowed range of the **EN 13922** standard is exceeded, the value displayed on the lower display will flash repeatedly and the acoustic alarm will not be heard.

Due to precise measurements, we can define: the sensor type, the stability of parameters, the sensor parameters divergence from the factory parameters, susceptibility to external factors, such as temperature and shocks. ***No other tester on the market can do it***. In order to precisely check the sensor, immerse the sensor in hot water when the tester is on. The heated sensor should be subjected to gentle wooden knocking or a rubber tool object while observing the measurement results. The measurement by cannot be changed due to shocks. The parameters cannot change more than 0,1-0,2ms due to heating.

The thresholds of operations programmed in testers cause users' confusion. We will never know if the checked sensor is within its technical parameters, whether its parameters are stable and whether its parameters are not too close to the threshold parameters of the standard. ***Installing the device at loading terminals with parameters deviating from the ones imposed by the standard should be noted*** In addition, supply voltage has a large impact on the performance of sensors. The pulse width can vary by as much as more than 0.5ms when changing the supply voltage of sensors only by 3V (9V-12V). We have to assume that supply voltages of sensors on terminals and testers are very different. ***So indications of testers without measurement display should be taken as indicative.***

The parameters of sensors from different manufacturers are very different from each other. Techincal parameters of sensors of the same type must be the same, +/- 0.1ms. For example, a measurement of a new optical sensor by NIEHUSER is 1,0ms. Using other sensors of the same type, the measurement is 1,1ms and 0,9ms. In the case of larger differences, despite the fact that the parameters are within the accepted standard, it should be seen as a fault of the sensors. NIEHUSER pneumatic sensors measure with the pulse width of 1,6ms. CIVACON sensors measure with the pulse width of 1,7ms, SCULLY 1,3ms, DIXON 1,1ms a ALFONS HAAR 2,0ms. Other testers do not verify it.

Using the appropriate **Art 402** cables, we can use the PH-5 tester to work with any other tester available on the market. Using one wire terminating with a testing needle, we can check the quality of subsequent sensors mounted on the tank without disassembly. The second wire (black) is attached to the bodywork. We check the wire input and output signals in yellow and blue in turn. This is only possible if a tester such as N17-SKG is connected to the diagnostic plug, which will energize the sensors and provide a control signal. **Thanks to the serial connection of the sensors (on the signal side) there is no other way to correctly diagnose and detect the faulty sensor. It is impossible to carry out a good diagnosis with a single tester without the displayed parameters on the display.** For those who do not have any tester, we also recommend the purchase of a mini tester PH-5 mini **Art 339**, which together with the PH-5 plus tester will allow us greater precision and reliability in diagnosing the sensors.

Description of the PH-5 plus tester operation.

After switching on the device on the lower display shows for a moment the name of the tester „PH5" Figure 1. then tester does self-test. Self-test is indicated lighting the lower blue LED. On the upper display should appear digit „3" informing the number of sensors. On the lower three-digit display Figure 2. appear for three seconds pulse width output from the tester 0.30ms. **These values must always be the same!**

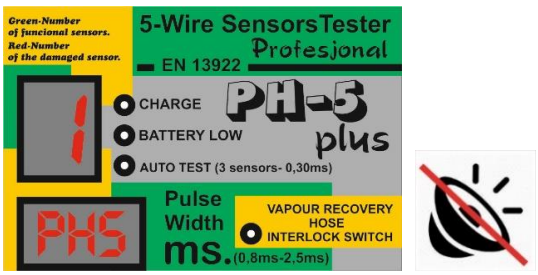


Figure 1.

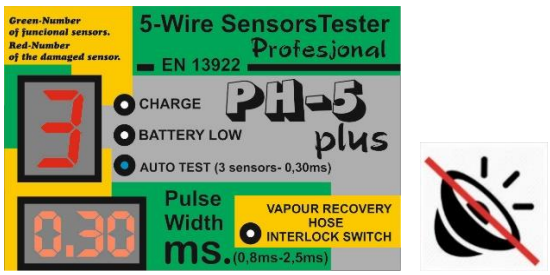


Figure 2.

If the upper display shows a red digit and the lower display shows no measurement „0.", and there is no accompanying modulated sound, it informs that the sensor is faulty or immersed in the liquid. Exception is when tester is not connected to sensors. With no connection of the tester on the lowwer display will display digit „0", and upper display will display digit „1" Figure 11. In the upper display, the number of efficient sensors will always be displayed in green. **The number of the defective sensor or submerged in a liquid will be displayed in red . In the case of efficient sensor / sensors, the lower display will always continuously display a measurement and a modulated sound will be heard. NOTE. If any of the sensors is immersed in the liquid during normal measurement, the lower display displays "0" and there is no accompanying modulated sound. The number of the submerged sensor will be displayed in red.**

Examples: In Figure 3A. example: 6 efficient sensors, Figure 3B: 4 efficient sensors.

In Figure 3C. example of damage or immersion in sensor liquid 4.

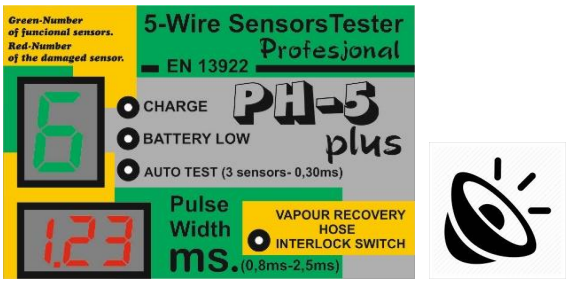


Figure 3A.

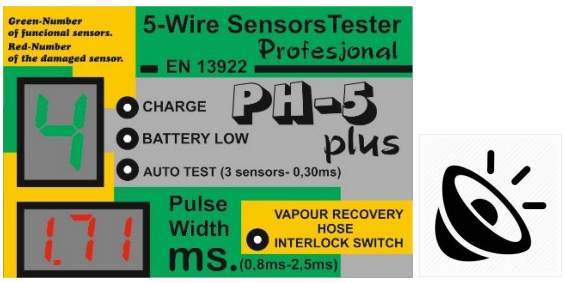
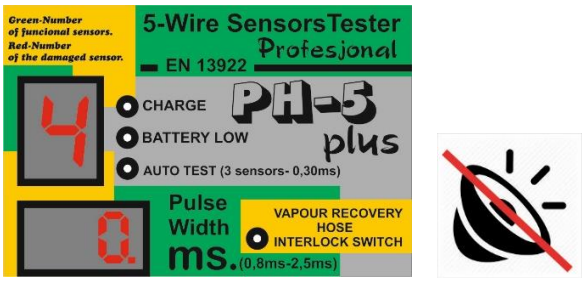


Figure 3B.

Figure 3C.



The following examples (Figure 4,5,6) show damage to the 6-th, last sensor, in the system. Figure 4. The sixth sensor can be immersed in the liquid. The sensors immersed in the liquid will not generate pulses, as a result, there will be no measurement on the lower display "0". No acoustic signal. Figure 5 and Figure 6 show exceeding the allowable range on the lower display, Figure 5 shows exceeding the lower limit (0,80 ms), Figure 6 shows exceeding the upper limit (2,50 ms). The lower displays flashes in both cases, there is no modulated acoustic signal.

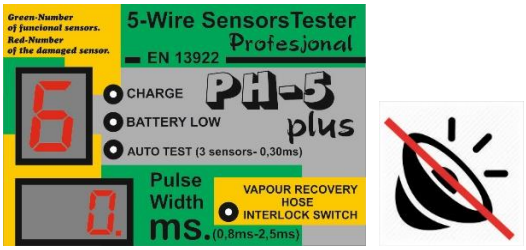


Figure 4.

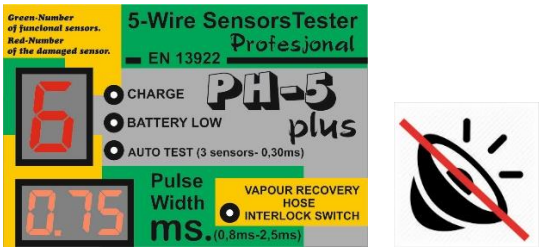


Figure 5.

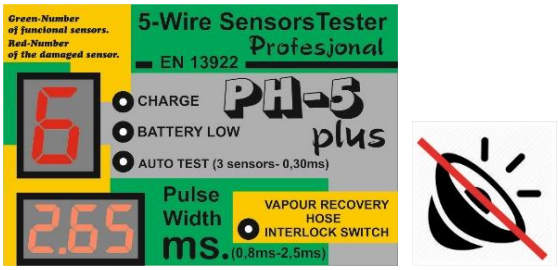


Figure 6.

With efficient sensors, operating according to EN 13922, the measurement on the lower display should be within the range of 0,8ms to 2.5ms.

Measurements outside the permitted range <0,8ms and >2.5ms will be accompanied by flashing of the lower display and there will be no characteristic modulated acoustic signal. We can set any response threshold of the display or mute it. The factory threshold is set according to EN13922 standard.

The modulated signal in this device indicates the efficiency of the tested sensor. It enables carrying out work without the need for observing the display.

If the measurement on the lower display is incorrect (<0,8ms, >2.5ms), it will always be caused by faulty operation of the last sensor in the system. Other sensors, irrespective of their number, never affect the width of the measured pulse output. In such a case, replace the last sensor with another efficient sensor or replace it with a new one.

Below, there is an example of a measurement of 10 pieces of interconnected sensors. The example in Figure 7, all sensors are efficient, modulated acoustic signal can be heard. Figures 8, the sensor is damaged or immersed in the liquid. Figure 9, the upper permitted range of measurement (2,50 ms) in the lower display is exceeded. No acoustic signal can be heard in both cases, and the lower display flashes in Figures 9.

Figure 7.

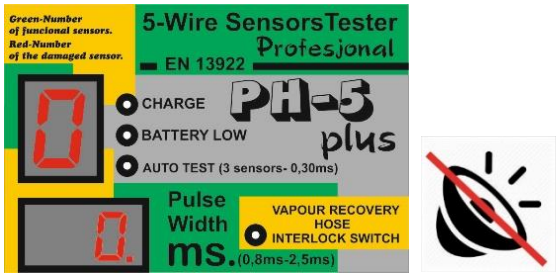


Figure 8.

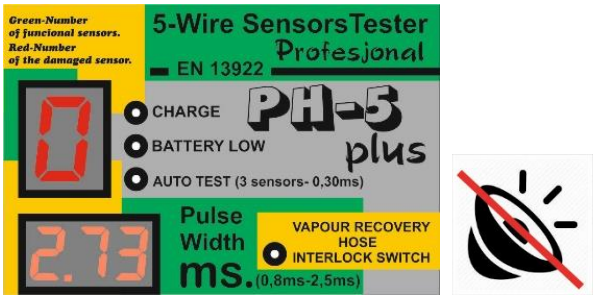


Figure 9.

The following Figure 10 shows one efficient sensor. The measurement is accompanied by a modulated acoustic signal. In addition we can conclude that the manufacturer of the measured sensor is company SCULLY.

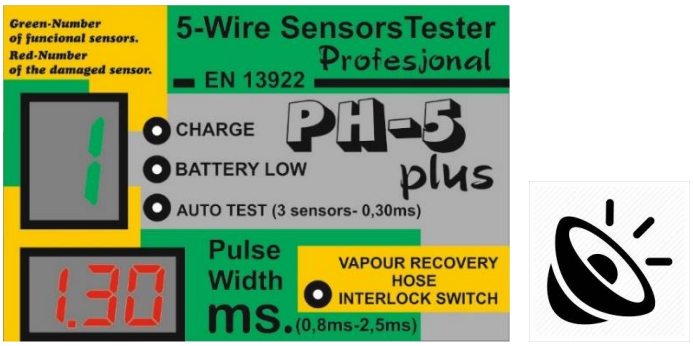


Figure 10.

The following two examples, Figure 11 and Figure 12, show a measurement of a single damaged sensor.

In the example in Figure 11, the sensor can be efficient, but immersed in the liquid. Figure 12 shows exceeding the upper threshold of the permitted range on the lower display. The lower display flashes, there is no accompanying acoustic signal in both cases.

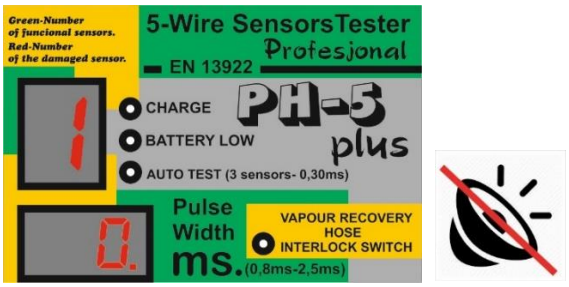


Figure 11.

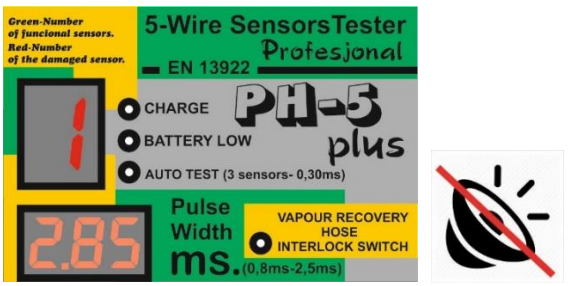


Figure 12.

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Tester is equipped with a monitoring supply voltage . Battery discharge status is signaled by illumination of the central yellow LED.

The tester has an automatic control charging. After connect the charger to device, red LED will flashes.

The fourth flashing LED in white, indicating proper operation of the VAPOUR RECOVERY HOSE INTERLOCK SWITCH with a PIN 9 output of a diagnostic socket. This LED will be flashing only in the case of using the diagnostic plug.

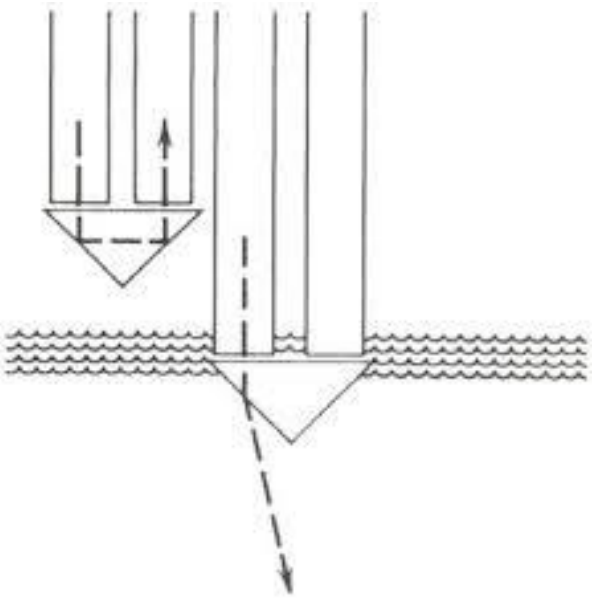
The PH-5 device is equipped with colored wires terminated with colored alligator clips at one end. The colors correspond to the colors of the cables from the sensors. On the other end of the wires, there is a popular Dsub-9PIN plug by CANON with embossed, gold-plated contacts.

The tester is equipped with a power charger companies Kruger & Matz KM0004, Input AC (100-240V) /50-60Hz, Output DC 9V, 2A.

Each tester is controlled on a specially created position with nine sensors of different types. The sensors are connected in the same manner as on the tanker, there are randomly immersed in the liquid to be verified. In addition, the testers are checked using precise control and measurement apparatus. Their compliance with the **EN13922** standard is checked within the limits of all parameters controlled by the tester.

NOTE. If other parameter values, not listed in the description, such as: offset signal voltage, waveform voltage, frequency, are incorrect, measurements on the lower display will be impossible. There is also no modulated sound signal.

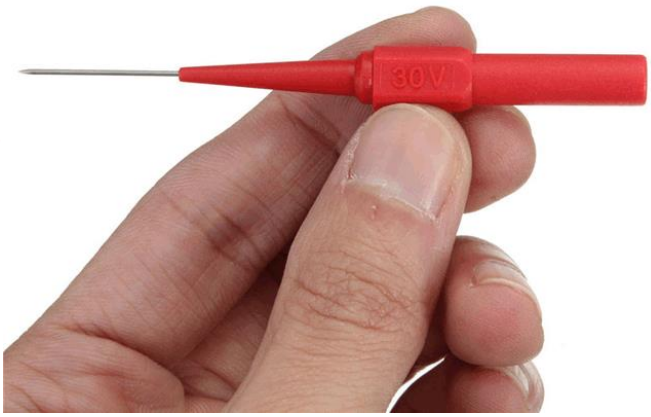
Due to the acoustic signals emitted by the PH-5 Tester, going to the top of the tank, where the sensors are installed, there is no need for taking the tester every time. There is no need for continuous observing the reaction of the device, as it is in the case of the other testers.

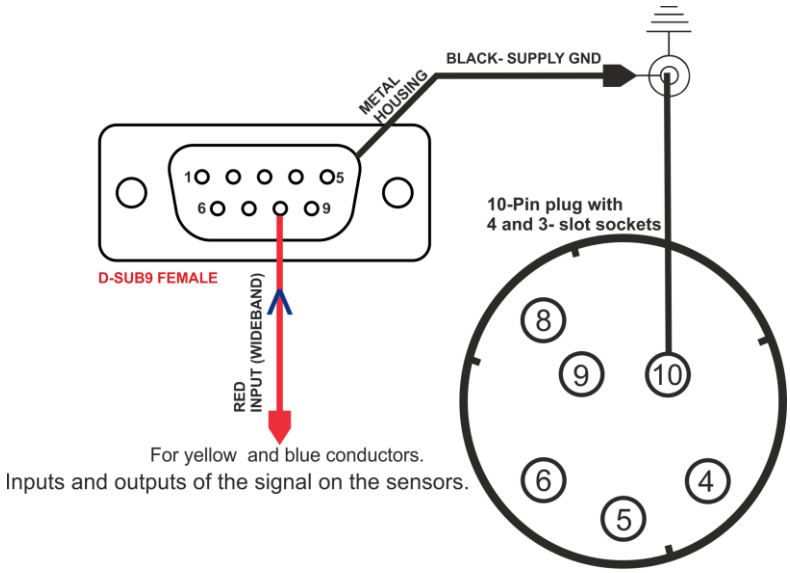


Principle of the overflow sensor prism.

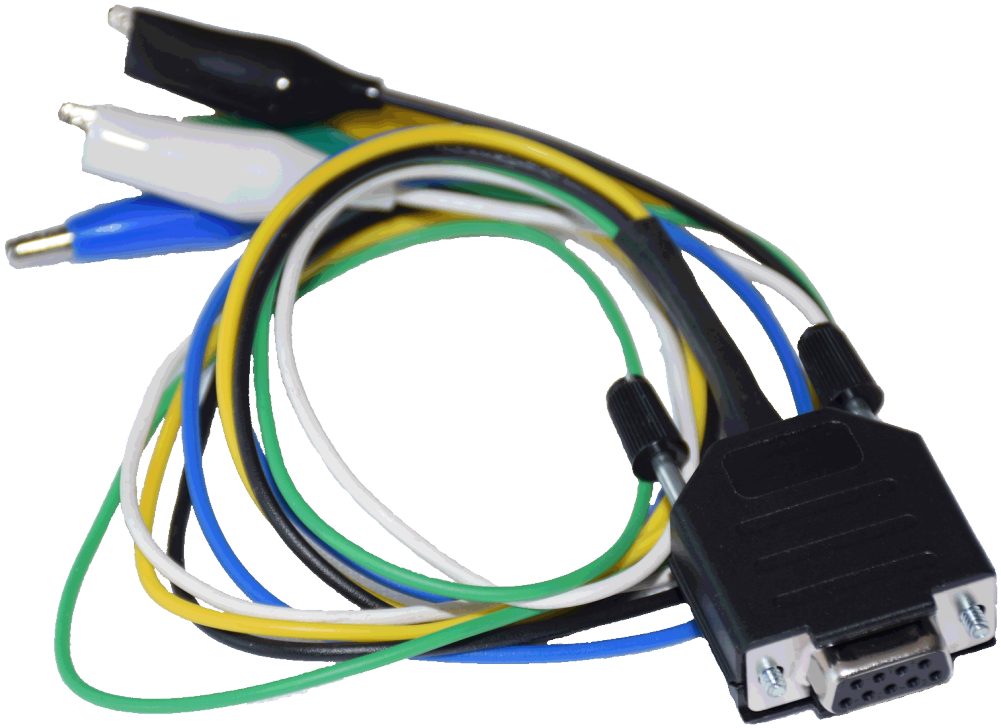
Art 400. PH-5 plus. Basic set with plug.

Art 401. PH-5 plus, without plug. ***Tester PH-5 plus self-tester but also works with all market testers!***





Art 402. Cables with terminals for the tester (socket: Ø4mm). They enable the tester to cooperate with other testers such as N17-SKG.



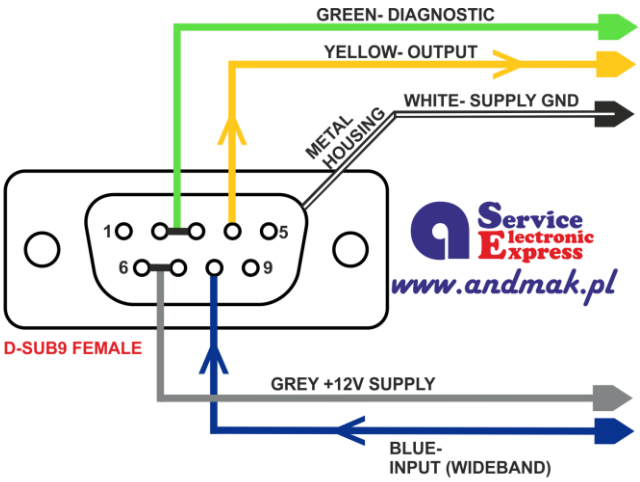


Diagram of the pins of D-Sub 9 tester PH-5 conector.
5-wire sensors.

Art 403. Cables 5 wire.

Art 404. **Charger (Power Adaptor) AC 100-240V/50-60Hz, Output 9V, 2A.**

Art 405. **Foil Front. Set.**

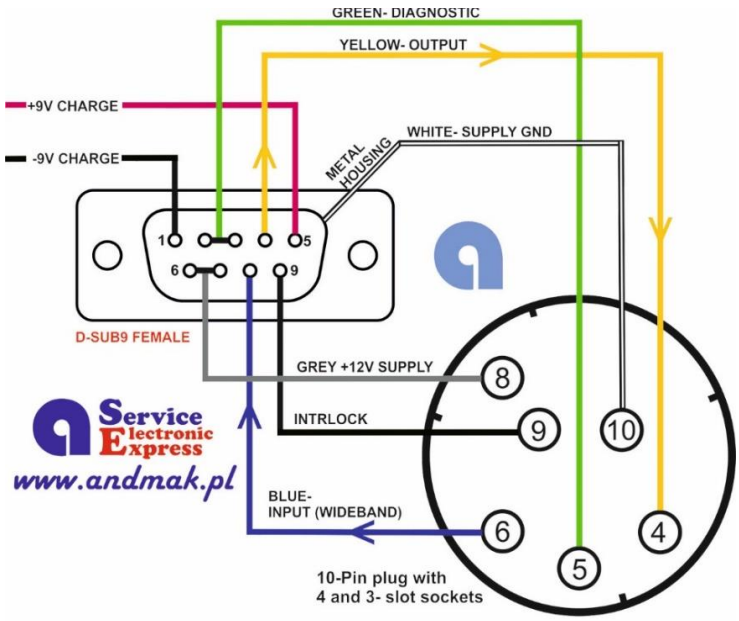


Diagram of the pins of D-Sub 9 tester PH-5 conector.
5-wire sensors.

Art 286. Diagnostic plug with 4m cable.

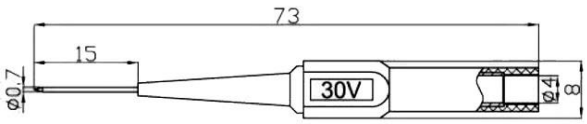
Art 339. **PH-5 mini. Included is a 9V 6F22 high-performance battery invisible in the photo.** PH-5 mini works only with another tester. ***Tester PH-5 mini works with all testers on the market!*** *Three probes in the set are visible in the picture.*

Art 406. Only Tester PH-5 plus.

Art 411. D-SUB 9. Gold-plated contacts.

Art 412. D-SUB 9 in the housing. Gold- plated contacts.

Art 409. Clip.



Art 408. Testing needle (0,7mm).

Test needle socket: Ø4mm; 0,7/73mm. It easily breaks through insulation.

Art 410. Probe, socket Ø4mm.

Attention:

To extend your battery life always remember to:

-keep the charge level between 20% and 100%.

-do not charge the battery more than 10 hours.

Protect from sunlight and high temperature.

Protect from liquids and dampness.

Do not throw into fire.

This symbol on the product or package indicates that it should not be disposed of with other household waste.

The user is responsible for supplying used equipment to the designated collection point of electrical and electronic equipment.

CE Certificate. The Declaration of Conformity is posted at www.andmak.pl/ce.

Note.

Older versions of testers will no longer be produced. Spare parts will still be available.

PH-5 available until exhaustion!

The whole is subject to full 24 month warranty. We provide express warranty and post-warranty service.

Manufacturer:

P.H.U. ANDMAK SERWIS Andrzej Mąkosa, ul. Wośnicka 13C. 26-612 Radom- POLAND

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