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TECHNICAL INFORMATION № 1 / 2015 / EN

ATLAS 0176

BATTERY LOAD TESTER



I. INTRODUCTION

Battery Load Tester ATLAS 0176 was developed in ATLAS-SOLLICH Zakład Systemów Elektronicznych (Electronic Systems Factory), on request of aircraft battery Users such types as 20NKBN25U, 20KSX25P or 20KSX20P and others.

ATLAS 0176 tester is designed as a small-sized, easy to carry device, capable of measuring aircraft battery with nominal voltage 12V or 24V.

II. APPLICATION

Battery Load Tester is a device designed to measure voltage on terminals of the battery during flow of discharge current.

The device is used in measurements of Ni-Cd, silver-zinc and lead-acid batteries, of a nominal voltage of 12V or 24V.

The value of the load current is programmed by switches on the front panel of the device.

The ATLAS 0176 tester meets the requirements for resistance to external factors according to Polish Military Standard WPN 84/N-01003 in the group N1UZ, the devices transported by all modes of transport and not working on the move.

It can work in closed ventilated rooms at ambient temperatures 263K to 313K (-10°C to +40°C) with relative humidity to 95% and an atmospheric pressure in the range of 60 ÷ 105 hPa, placed on hard, dry and clean insulating surface, which is free from sand, dirt and dust.

III. CONSTRUCTION OF ATLAS 0176 TESTER

ATLAS 0176 tester is built in a small, compact, durable, made of light metal casing coated with durable powder coating highly resistant to mechanical and weather factors.

The front plate is made of metal, covered with a durable powder coating resistant to weathering and to abrasion.

On the front panel are placed:

- LED display of digital voltmeter
- Lights signaling the measuring cycle stages
- Switches allowing programming the load current
- Measuring cable terminated with universal measuring tips.

On the rear panel is located cooling fan.

Manufacturer label contains the device name, electrical parameters of the power supply and the serial number of the device.

In 0176 ATLAS device there are three functional systems:

1. A digital voltmeter
2. Control system of measurement cycle
3. System of programming discharge current value.

The device is equipped with universal connection terminals for connection batteries. For each type of battery, is possible to use specialized connectors to connect the device to the battery socket.

IV. CLIMATE CONDITIONS

1. ATLAS 0176 tester can operate in closed ventilated rooms,
2. The tester should be set on its legs, on an insulating surface which is hard, dry and clean, free from sand, dirt and dust,
3. Ambient temperature 263K to 313K (-10°C ÷ +40°C) ,
4. Relative humidity of air less than 95%,
5. Atmospheric pressure in the range 60 ÷ 105 hPa.

V. MECHANICAL DESIGN

1. The tester ATLAS 0176 is built in the casing based on the elements of the Schroff standard housing.
2. The housing is coated with a durable powder coating highly resistant to mechanical and weather factors.
3. The front plate is made of powder coated steel sheet and is weather and abrasion resistant.
4. On the front panel are located switches, indicators and voltmeter display.
5. All mechanical components within the housing are made of aluminum or steel. They are covered with powder paint, galvanized or electrochemically coated in black or white color.

VI. PRINCIPLE OF OPERATION

Controller and voltmeter of the tester are supplied with the voltage of a tested battery. The device does not require other external power sources.

The instrument automatically performs measuring test cycle of batteries. The operator only has to connect Tester terminals to the battery socket.

Switching test probes of the Tester to the battery terminals is carried out by flowing current with a value of 0.12 A. This causes the sparkles switching of the Tester. Switching current 0.12A is required for cleaning contact between measuring tips of Battery Tester and battery socket. This ensures sparkles switching of the load current in LOADING step.

The test cycle consists of four consecutive steps. Execution of each step is indicated on the instrument panel by LED lamps.

Measuring cycle consists of the following steps:

1. **ZAS** – power supply – indicates a proper connection of measuring terminals to the battery and starts measuring voltmeter.
Voltmeter shows the value of 00.00 V. It is checking of zeroing of the voltmeter.
Duration of this step is 2.5 sec.
2. **Ubat** – measurement of EMF (electromotive force) of the battery without flow of the load current.
Preparation to attach the load current.
Duration of this step is 5 sec.
3. **OBC** – load – flow of the load current and measuring the voltage at the terminals of the battery.
Saving the battery voltage measured after 5 seconds of load current flow.
Duration of this step is 5 sec.
4. **WYNIK** – displaying battery voltage measured at the end of OBC (load) step.
Duration of this step is 10 sec.
After 10 seconds, the device automatically disconnects.
The result display time can be shorten by disconnecting the measurement terminals of the battery socket.

VII. PREPARING TESTER TO WORK

Preparation of the tester to operation consists in:

1. The proper location of the tester
2. Placing the tester on isolated surface, hard, clean, free of dirt and dust
3. Checking if is not obstructed the cooling air flow from the bottom of the tester
4. Checking whether a rear panel of the tester is situated at a distance at least 50 to 100 cm to other devices or walls
5. Checking whether all the cables connected to the tester are disconnected from the battery
6. Checking whether all the cables and their connectors are clean and not corroded
7. Checking whether the connectors and cable ends are not shorted
8. Connecting the appropriate current plugs (which fits into the battery socket) to the measuring cable
9. Checking whether banana plugs of voltage cables are mounted in slots of current plugs.

Placement of the tester and the battery

1. Take off from the hand and forearm all metal things and metal ornaments.
2. Take off all kinds of metal pendants and chains from the neck.
3. Wear appropriate protective clothing without metal elements, wear goggles and gloves.
4. Check if the outside of the garment does not protrude any metal element or metal decoration.
5. Place the battery according to the accompanying drawings below "placement of the tester and battery".
6. Place the battery on surface, at the tester level or higher, not less than 100 cm from the tester.
7. Place the battery in such a way that its current socket is directed towards the Operator.
8. Check whether the battery is ready to operate according to the manufacturer recommendations (purity of housing, cells, links; check whether the vents are opened, etc.).
9. Battery and its connections should be clean of dirt, dust and sprayed electrolyte.

VIII. DESCRIPTION OF THE ELEMENTS PLACED OUTSIDE THE DEVICE

1. On the front panel of the device are located the following items:

1. The manufacturer logo and name of the device
2. The voltmeter display
3. Indicators of progress of the measurement process
4. Input of battery load cable
5. Switches to set value of load current
6. Load table for 24V and 12V batteries

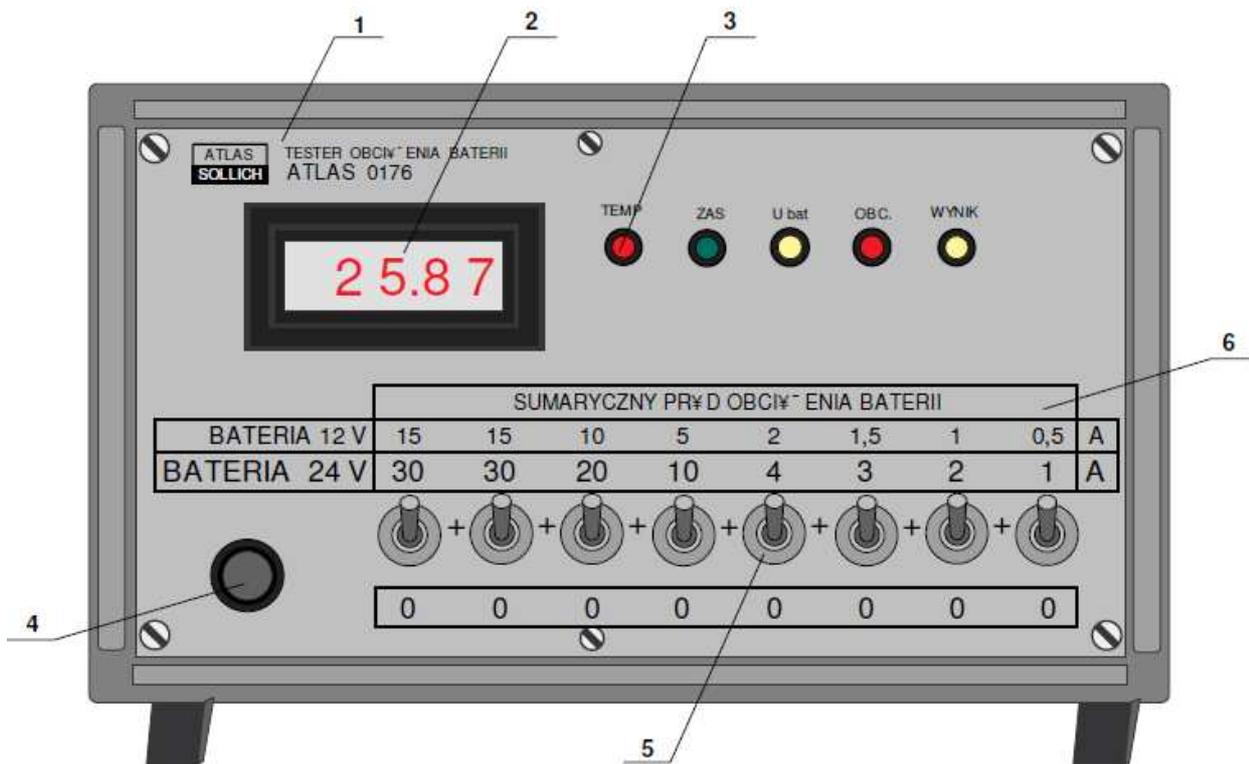


Fig.1. Front panel of ATLAS 0176 BATTERY LOAD TESTER

2. On the rear panel are located:

1. Cooling ventilation grills
2. Manufacturer label on which are placed:
 - manufacturer name
 - device name
 - electrical parameters of power supply
 - device serial number
 - CE safety mark

3. On the bottom cover of the device are located:

1. Cooling air inlet
2. Front Legs
3. Rear legs

IX. TECHNICAL DATA OF ATLAS 0176 TOB

| № | Parameter | Unit | Minimum value | Maximum value |
|----------|--|-------------|----------------------|----------------------|
| 1. | Battery voltage | V | 8,5 | 30 |
| 2. | Range of adjustment of load currents for rated voltage battery = 12V | A | 0,5 | 50 |
| 3. | Range of adjustment of load currents for rated voltage battery = 24V | A | 1 | 100 |
| 4. | Load type | resistive | | |
| № | Parameter | Unit | Value | |
| 5. | Inaccuracy of the load current setting | A | ±0,2A ±5% | |
| 6. | Time of load test after which the result is stored | sec | 5s ±0,2s | |
| 7. | Range of measuring voltmeter | V | 39.99 | |
| 8. | Resolution of voltage measurement | mV | 10 | |
| 9. | Battery voltage measurement inaccuracy | mV | ±50mV ±0,5% | |
| 10. | Diameter of measurement terminals for 20KSX25P battery | mm | 14 | |
| 11. | Diameter of measurement terminals for 12SAM28/12CAM28 battery | mm | 9 | |
| 12. | Diameter of measurement terminals for 20KSX20P/15SCS45 battery | mm | 11 | |
| 13. | Diameter of measurement terminals for Varta, Saft, Marathon batteries with MS25182-2 socket | mm | 14/9,5 | |
| 14. | Dimensions Width x Height x Length | mm | 255 x 168 x 376 | |
| 15. | Weight | kg | 4,2 ±0.2 | |
| 16. | Length of the measuring cables | m | 2,0 /+0,2 /-0,0 | |

X. ELEMENTS BEING A SUBJECT OF QUALITY CONTROL

1. Quality Control protocol should contain:

1. Name of the device
2. Type of the device
3. Serial number
4. Date of production

2. List of components and parameters to be evaluated

| No | Parameter | Compliance with the factory standard ZN | Remarks |
|----|---------------------------|---|----------------------------|
| 1. | Exterior view | | Acc. design documentation |
| 2. | Correctness of assembling | | Acc. design documentation |
| 3. | Marking | | Acc. design documentation |
| 4. | Test of device work | | Rated operating conditions |

3. List of electrical parameters which are subject to periodic checking

| Parameter | I bat | U bat 12V | U bat 24V |
|--|-------|-----------|-----------|
| Value measured by ATLAS 0176 | | | |
| Value measured by reference instrument | | | |
| permissible deviation | | ≤ 0,11 V | ≤ 0,17 V |

4. Accessories of ATLAS 0176 TOB Tester

| SPECIFICATION: | | | |
|----------------|---------------------------------|--------------------|-------------------|
| No | Name | Quantity in a set. | Included quantity |
| 1. | ATLAS 0176 Battery Load Tester | 1 pc. | pc. |
| 2. | ATLAS 0176-20KSX25P terminal | 2 pcs. | pcs. |
| 3. | ATLAS 0176-12SAM28 terminal | 2 pcs. | pcs. |
| 4. | ATLAS 0176-20KSX20P terminal | 2 pcs. optionally | pcs. |
| 5. | ATLAS 0176-PN7007 SAFT terminal | 2 pcs. optionally | pcs. |
| 6. | ATLAS 0176-USER terminal | 2 pcs. optionally | pcs. |

XI. INSPECTIONS AND MAINTENANCE

1. ATLAS 0176 tester should be installed in ventilated closed room on the non-conductive surface, hard, dry and clean, free from sand, dirt and dust.
2. Tester and all its parts and components must be kept clean on an ongoing basis.
3. Particular attention in the room should be paid at dust and volatile particles of electrolyte when operating battery. The source of the dust should be eliminated and the ventilation should be set in such a way that the electrolyte particles would be absorbed.
4. In a case that cables become dirty, battery charge/discharge cable and measuring cables should be wiped with clean cloth, wetted with warm water
5. Nickel-plated current connectors to plug the battery at the end of the load cable, should be systematically wiped with a clean cloth, wetted with warm water.
8. All other accessories working with the Tester should also be kept clean.
9. The tester should be systematically checked for control and measurement accuracy, during the period of 12 months. The checking may be made by the manufacturer or his authorized service.
10. In the case of irregularities in the operation of the tester, it should not be used.