Manual

Insulation Tester
IS 6600H, P 6680H

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Table of Contents

1 General Information

1.1 Information on this operating manual

This operating manual is part of the technical documentation for the insulation testers IS 6600H / IS 6680H of SPS electronic GmbH.
This operating manual contains all the information on how to operate this device properly, safely and economically, how to prevent dangerous situations, how to reduce repair costs and downtimes and how to prolong the service life of these devices.

Should you, while perusing this operating manual, find any misprints, any information you do not understand or which are incorrect please do not hesitate to inform SPS electronic GmbH about same.

Pictographs and Symbols

- **Warnings** are characterized by warning triangles with danger symbol and warn of dangers which can lead to personal injury and/or material damage:

General Warning

Danger caused by electric current or voltage

- **Information** on same are characterized by the Information Pictograph and give advice or additional information:

You can order accessories directly from *SPS electronic GmbH*.

- **Continuations** of contextual paragraphs on the next page are characterized by the symbol on the right-hand margin.

1.2 Requirements for the operation of this device

1.2.1 Regulations for application

The tester must be in an operational and reliable condition.

Only personnel having completely read and understood this operating manual and who are authorized skilled electricians or who have been instructed in electrical engineering are allowed to perform any operations with and at the testers.

The tester is not to be operated if or for:

- operations are performed which are not specified in this operating manual or which have not been recommended by SPS electronic GmbH concerning installation, operation, maintenance and service.
- unauthorized alterations and/or repairs
- dismantling and/or avoiding of safety devices
- use of components, tools, additional installations, supplements and working material which have not been approved or recommended by SPS electronic GmbH
- building in of spare parts which are not original SPS electronic GmbH spare parts or of spare parts from suppliers not recommended by SPS electronic GmbH

1.2.2 Product liability

The testers have been produced, adjusted and tested according to the state of the art and the approved safety requirements.
The devices comply with the conditions agreed upon by contract of the confirmation of order concerning execution, single parts and accessories selection.

SPS electronic GmbH will be liable for errors or omissions to the extent of the guarantee liabilities of the confirmation of order.
Applicable are the general conditions of delivery of the Central Association of Electrical Engineering and the Electronics Industry, registered association (ZVEI).

The contents of this operating manual is in compliance with the condition of the tester on the date when same was drawn up.
Subject to change are technical alterations because of further developments and improvements of these products by SPS electronic GmbH.
Liability claims can therefore not be derived from the contents of this operating manual (data, descriptions, graphs, misprints, etc.).

Errors and omissions excepted!

SPS electronic GmbH will only be liable in case of application of the testers according to regulations (pl. see 1.2.1).
If those regulations have not been applied the operator is solely responsible for risks of hazard to body and life of the user or a third party and impairments of the tester and other material assets!

1.3 General safety regulations

The insulation testers IS 6600H / IS 6680H have been manufactured according to the state of the art at the time of delivery.

Nevertheless the tester is not without hazards if it is applied by untrained personnel, applied improperly or not applied according to regulations.

In addition to this operating manual the generally applicable legal regulations and other binding instructions concerning safety regulations, regulations for preventing accidents and regulations for the protection of the environment must be adhered to.

Beware of high electronic voltage and electromagnetic fields

In case of defective test objects, like e.g. arc-overs, there can occur electromagnetic fields. This is of particular concern to persons with active or passive medical devices, like e.g. cardiac pacemaker.

1.3.1 Obligations of the operator

- The tester is only to be operated according to regulations and in operational condition (see chap. 1.2.1)
- Protective and safety devices, locking devices and couplings, etc. have to be inspected by an expert at least once a year.
- A protocol on the test results has to be drawn up in form of a **test report** same has to be retained.
- Instructions on operations with or at a machine or installation as to hazards to health and/or life of persons are obligatory.
- Persons who operate with or at an IS 6600H / IS 6680H have to confirm by their signature to have read and comprehended this operating manual especially in regard to the operating instructions.
- Dangerous zones resulting from the integration of the tester into a system or a device have to be located by the operator and safeguarded against.
  When assembling or installing devices, systems or items of equipment of different manufacturers or suppliers and after modifications by company or service personnel where changes within the electric equipement were made the operator has, before putting into operation, to perform a precise inspection according to the accident prevention regulations VBG 4 in compliance with the individually applicable rules of electrical engineering.

1.3.2 Operating instructions for personnel

- Operating instructions, general instructions and regulations are part of the tester and have to be accessible, readable and complete for all those who operate with or at the IS 6600H / IS 6680H.
- Before operating with or at the IS 6600H / IS 6680H questions have to be answered or uncertainties have to be explained by the personnel in charge.
- Any operations with or at the IS 6600H / IS 6680H may only be performed by workers skilled in electrical engineering or trained in electronic engineering and who have been given instructions for such operations and thus been authorized by the operator.
- Testing personnel may only operate the IS 6600H / IS 6680H when a skilled electrician is in charge.
- Adjustments, service and inspections have to be performed according to the instructions specified and according to schedule.

1.3.3 Safety installations

The IS 6600H / IS 6680H testers are, for the safety of the operating personnel, equipped with below safety equipment:

- Differential current safety cutoff (similar to an RCD) for Insulation and Hipot test (tripping threshold at > 3 mA rms, switch-off speed 6000 V → 50 V < 100 µs)
- connections for external safety circuit signal

Capacitive DUTs and DC high voltage

When testing with DC high voltage, capacitive DUTs are getting charged. At the end of an insulation test or HV-DC test, the test object is discharged, the PASS / FAIL signal is output only after the end of the discharge. That's why tests with DC high voltage always have to go through to the end in a controlled manner. If the contact is prematurely disconnected (or if the tester is switched off, mains voltage failure, etc.), the test object is not discharged and may still be charged with dangerously high energy!

If such conditions are met by appropriate DUT types, the personal safety measures according to EN 50191 must be observed!

1.3.4 Note on possible disorder of USB devices

When testing with high-voltage, it is possible that failing testpieces may cause disorder of USB devices in close surrounding of the test field.

Please see annex B for a problem description, and measures to avoid.

1.3.5 Information on further publications

For the protection of persons the trade associations and unions have published below literature:

- DIN EN 50191 — Installation and Operation of Electrical Installations
- DIN EN 50274 — Protection against Electric Shock – Protection against unintended direct contact of dangerous active parts
- DIN 40 008 part 3 — Safety Signs for Electrical Engineering; Warning Signs and Additional Signs
- DIN 40 050 — IP-Protective System, Protection against Contact, Foreign Matter and Water for Production Equipment
- DIN 57100 — Specifications for the Installation of Power Plants with Nominal Voltages of up to 1000 V
- BGI 891 — Establishing and operation of electrical test plants

2 Description

2.1 Device functions

You can perform safety tests at electric devices according to standard test regulations (EN, IEC, VDE etc.) with the hipot tester IS 6600H / IS 6680H.

Below tests can be performed:

	IS 6600H – Desktop device –	**IS 6680H** – 19" rack device –
IR: Insulation Resistance Test	100–6000 V DC / 20 mA	
HPAC: Highpot Test AC	100–5500 V AC / 20 mA	
HPDC: Highpot Test DC	100–6000 V DC / 20 mA	

The test device works with a fully electronic high-voltage generator. The high voltage is readjusted fully automatically during the test operation, depending on the load, once the test voltage has been correctly adjusted.

If the voltage change is too fast (> 2% per full wave), the voltage drop will be recognized as an error.

2.2 Technical Data

Measurements and weights	
Width / depth / height	HA 6600H: ca. 420 / 508 / 148 mm HA 6680U: ca. 482 / 439 / 133 mm (19" / 3 HE)
weight	ca. 20.4 kg

Ambient	
temperature	operation: 15 °C – 40 °C (allowed for general operation) storage: 5 °C – 60 °C
Air humidity	max. 70 % (non-condensing) (allowed for general operation)
ambient conditions to comply with the stated technical specifications	24 °C (±3 °C) and max. 50% relative air humidity (not condensing)

Connection data	
Power supply	wide range 110-230 V / 50-60 Hz
Power input	ca. 240 VA

IR Test (Insulation Resistance Test)			
Test voltage	programmable from 100 up to 6000 V DC residual ripple DC: < 3% acc. VDE 0432 / EN 61180		
Short circuit current	20 mA DC		
Limit value	Voltage dependent, max. 10 GΩ / kV		
Measuring range **R**	**range (automatic)** 100 kΩ - 50.0 GΩ **accuracy (of value)** ***(for pure ohmic load)*** 5% ± 1 digit 10% ± 1 digit	**resolution** 3 digits **in range** 1 GΩ/kV 10 GΩ/kV	
Measuring range **U**	**range** 600 V 6000 V	**resolution** 1 V 1 V	**accuracy** 1% of meas.range 0.2% of meas.range

** Maximum capacitive load should not exceed 1µF per second of ramp time. Otherwise there is chance for ringing (over-voltage).*

The total capacitive load must not exceed 10µF, otherwise correct discharge can not be guaranteed.

HV Test (High Voltage Test)			
Test voltage	programmable from 100 up to 6000 V DC residual ripple DC: < 3% acc. VDE 0432 / EN 61180		
Short circuit current	20 mA AC / 20 mA DC		
Measuring range **I**	**range** 400 µA DC 20 mA DC 500 µA AC 20 mA AC	**resolution** 0.01 µA 0.01 mA 0.01 µA 0.01 mA	**accuracy** 0.5% of meas. range 0.25% of meas. range 1.5% of meas. range 0.25% of meas. range
Measuring range **U**	**range** 550 VAC / 600 VDC 5500 VAC / 6000 VDC	**resolution** 1 V 1 V	**accuracy** 1.0% of meas.range 0.2% of meas.range

** Maximum capacitive load should not exceed 1µF per second of ramp time. Otherwise there is chance for ringing (over-voltage).*

The total capacitive load must not exceed 10µF, otherwise correct discharge can not be guaranteed.

I/O Test	
Inputs 1 – 4	input voltage: 24 V DC ± 10% to PIN 7 – 10 +24 V at PIN 11+12 input resistance: 6.6 kΩ
Outputs 1 - 4	output voltage: +24V ± 10% on PIN 1 - 4, GND on PIN 5+6 output current: max. 250 mA per output / max. 2 A total *potential free to test voltage and internal supply, short-circuit proof*

** Inputs are typically supplied by output voltage.*

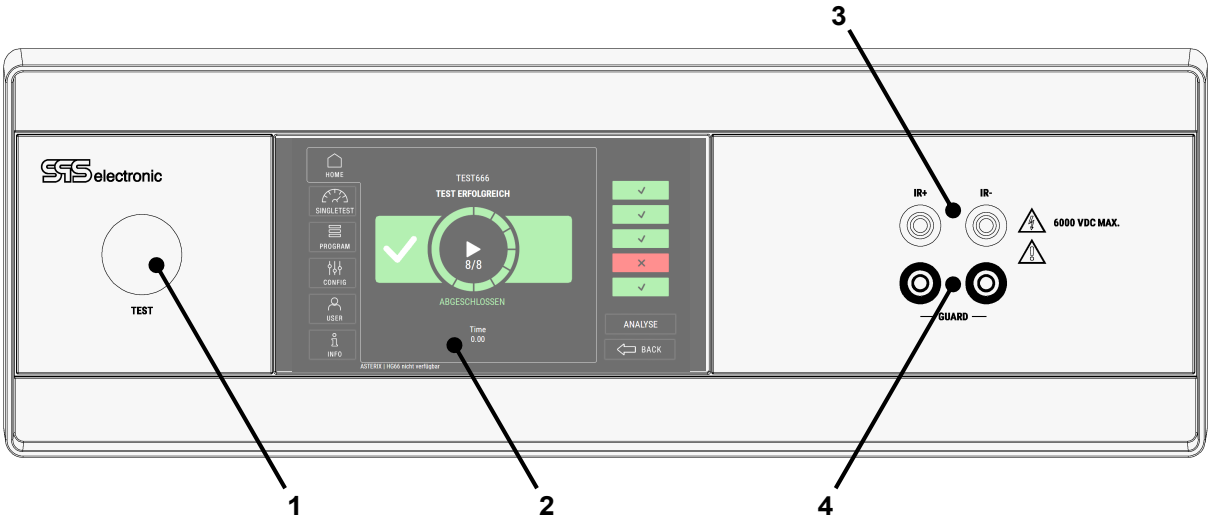
Features

- A multi-functional safety analyzer for safety testing in accordance with common national and international standards (IEC, EN, UL, VDE, etc.)
- Desktop device or 19" plug-in unit, with integrated LC touch display
- 7" TFT colour display 1024x600 pixels
- Operation with capacitive touch
- USB 2.0 interface
- Ethernet 10/100/1000 MBit
- 1GHz 32bit Dual-Core CPU + GPU with 512MByte RAM
- 1GB internal storage

2.3 Set-up of device

2.3.1 Front panel

HA 6600H:



1 Button TEST to start a test run

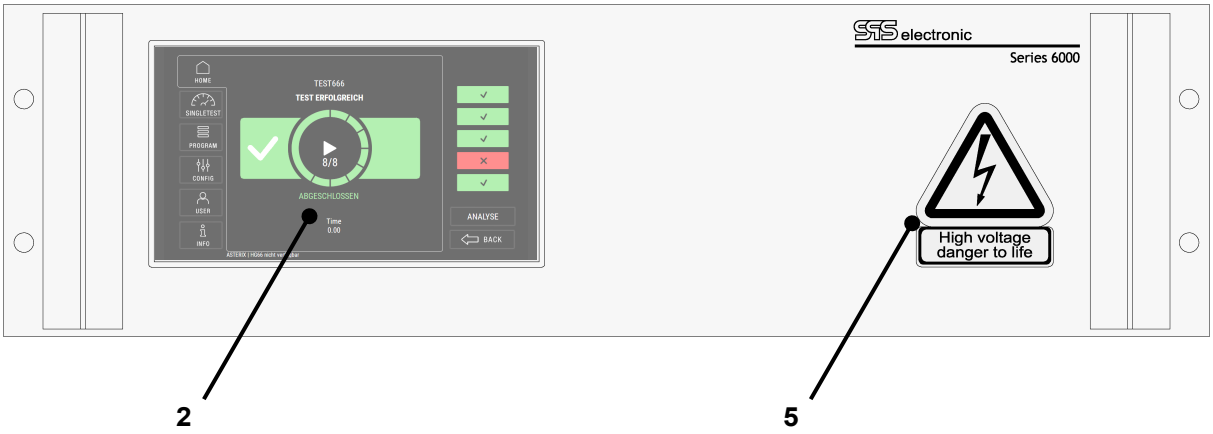
2 LC – Touch – Display

3 Connection sockets IR+, IR⁻ for connection of test voltage

4 Connection sockets GUARD for connection of guard lines

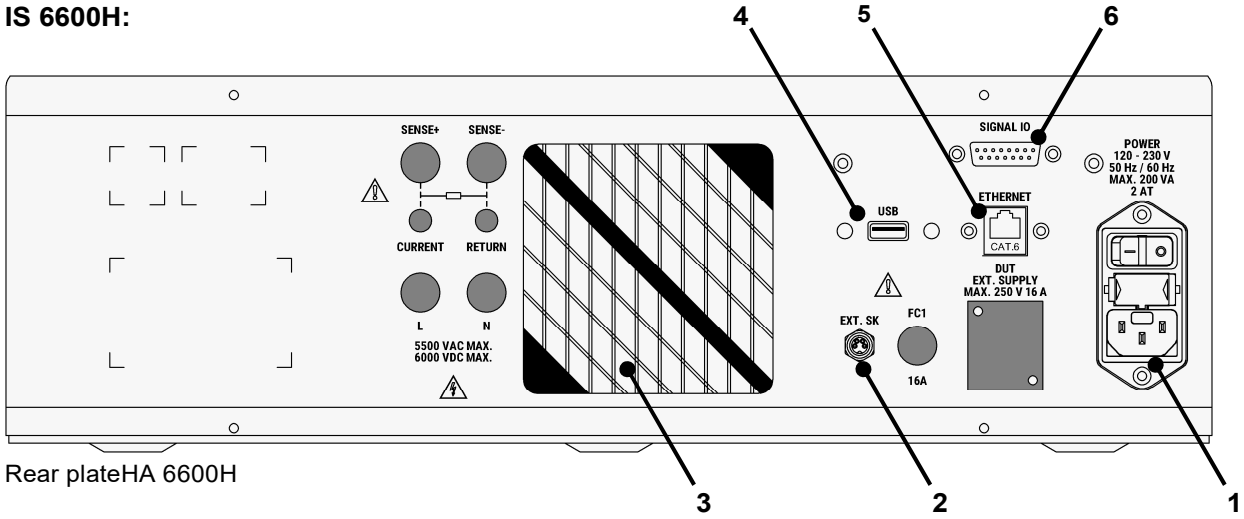
5 warning sign – *mandatory warning note: beware of high voltage*

HA 6680U:



2.3.2 Rear panel

IS 6600H:



Rear plateHA 6600H

1 cold equipment socket for power supply cable (POWER), with mains fuse (2 As), and ON/OFF switch of the device

2 connection socket for external safety contact (EXT. SK)

3 ventilation grid – keep free of obstruction!

4 USB connector (USB)

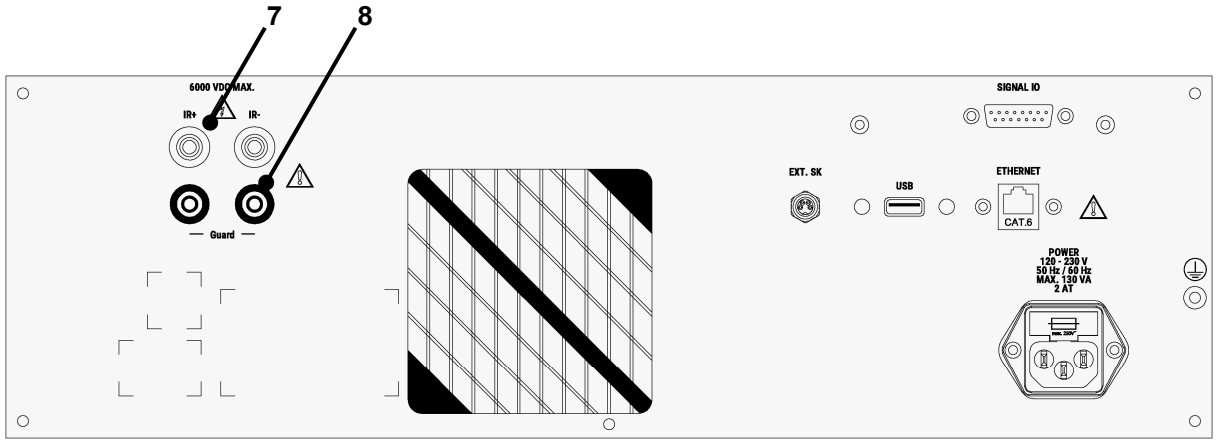
5 LAN interface: Ethernet connection (ETHERNET)

6 Digital I/O interface (SIGNAL IO)

7 4mm laboratory sockets for output of test voltage (IR+ / IR–)

8 4mm laboratory sockets for connection of GUARD lines

IS 6680H:



Rear plate IS 6680H

3 Putting into operation

3.1 Requirements

The testers IS 6600H / IS 6680H as well as all of the electric connections and lines must be in operational and reliable condition.
The General Safety Regulations (pl. see chapter 1.3) and the generally applicable legal rules as well as other binding directives for industrial safety, for accident prevention and for the protection of the environment have to be adhered to and persons staying in the area of operation must be informed respectively.

There is danger to life caused by electric current or voltage in case of handling electric installations inappropriately!

3.2 Connection of device

1. plug power cable of tester into cold equipment socket (POWER) at back of device
2. connect power cable to power supply
3. If provided for, connect external devices to interfaces
4. In case that hardware safety circuit (socket EXT-SK) is not actually getting used, the respective jumper plug must be plugged here.

As long as EXT.SK is not wired, testing is not possible with the IS 6600H / IS 6680H! (Because the safety circuit is not closed.)

3.3 Switching the device on

The IS 6600H is switched on with the power switch at the back of the device.
The IS 6680H is designed for system use and does not have a power switch. The device starts as soon as it is connected to mains power.
The test device then is starting its internal Operating System. This takes approx. 10 seconds.
When finished, the device is showing the start screen, and is ready to perform tests.

3.4 Switching the device off

The IS 6600H is switched off with the power switch at the back of the device.

In case of tests with high voltage (IS- and HV-test) the DUT has to remain connected until a test result is displayed. At the end of the test time the DUT is discharged.

If the IS 6600H / IS 6680H is switched off prematurely, the DUT cannot be discharged!

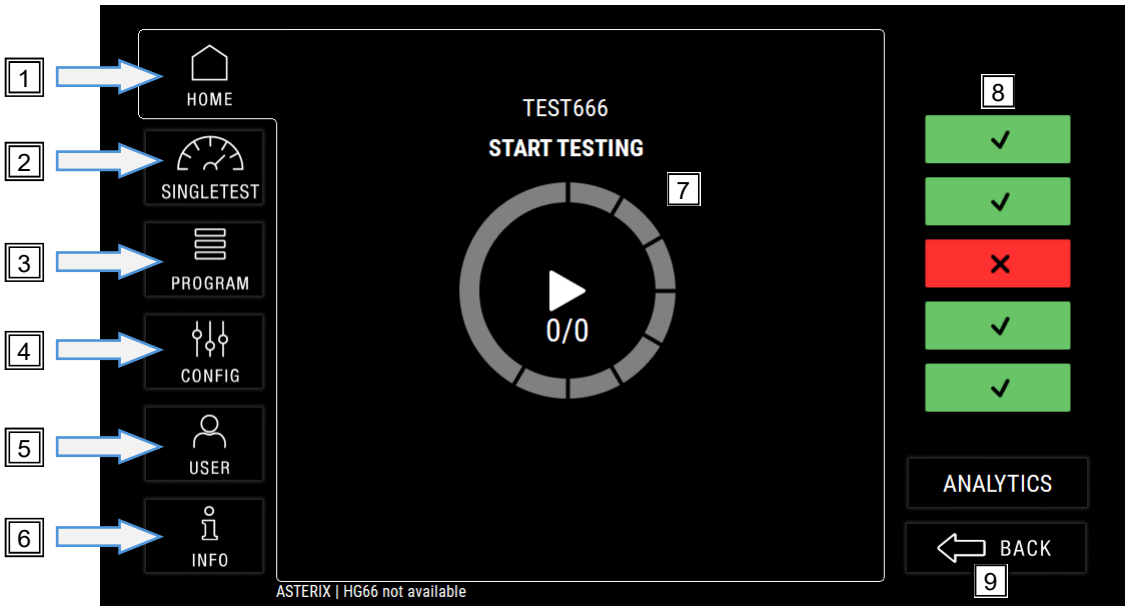
4 General Operation

4.1 Operating elements

All operations are carried out via the device's touch screen. If you want to push a function-button, switch between registers, chose an element out of a list – just touch the wanted element with your finger.

When entering parameter values or text, a virtual QWERTY or numerical keyboard is shown on the display, where you can enter numbers and characters as required.

4.2 Start Screen / Main Menu



After the user-login, the device is showing the start screen with the latest used program active. You can immediately start testing by pushing the START triangle ▶ in the middle of the screen.
To choose another test program, touch the symbol "PROGRAM" on the left. It will show a list of all test programs saved in the device, and you simply touch the program you want to use next.

(1) HOME – the start screen where testing operation takes place.

(2) SINGLE TEST – Execution of single test steps without the need to create a test program.

(3) PROGRAM – opens the program editor where test programs can be created or modified. Also, switching to another test program is done from here.

(4) CONFIG – opens the options dialog where general system settings can be made.

(5) USER – opens the user administration where users and passwords can be administrated.

(6) INFO – shows the info screen with basic information about the device.

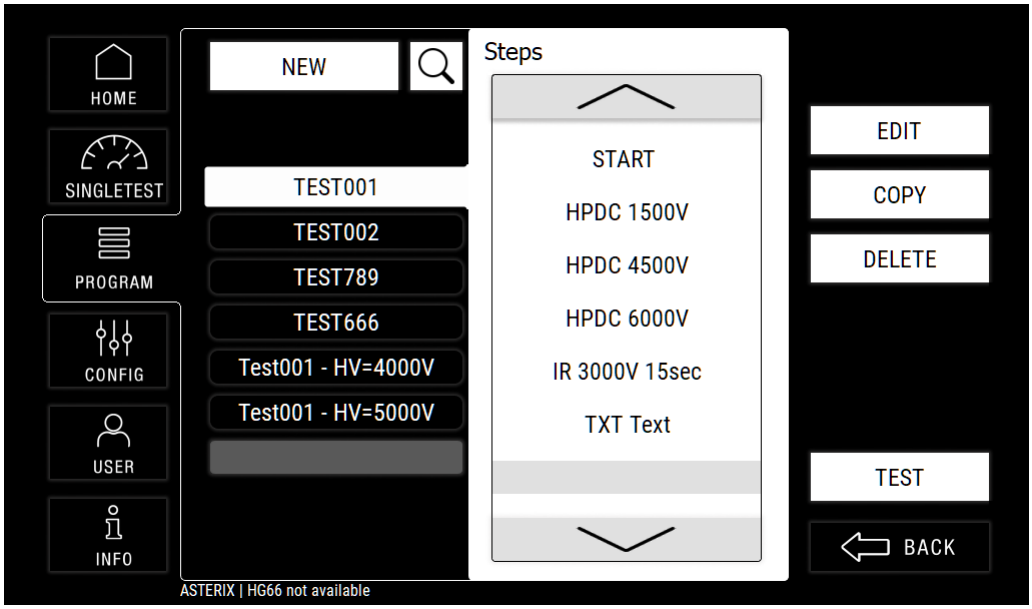
(7) (Test wheel) – shows the actual status and progress of a running test.

(8) (result bars) – they show the status/results of the past tests that have been done.

(9) BACK – Goes back from the current sub-menu to the previous menu, or back to the HOME screen.

4.3 Changing the Test Program

To switch to another test program, tap on the item "PROGRAM" at the left. This will bring up the test program list:



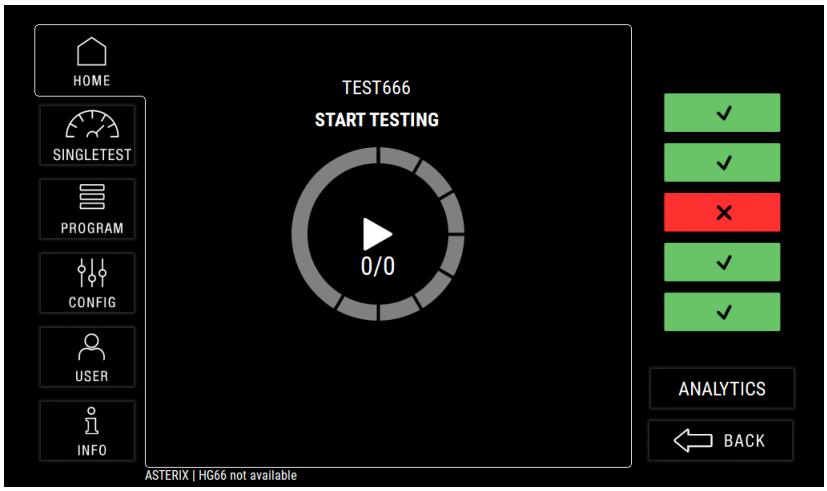
From the program list, select the test program you want to use next, then tap on the button "TEST". The test program is loaded active, and you'll be automatically back at the "HOME" screen to start with testing.

5 Testing Operation

5.1 Outline

- **Connecting the DUT**
  When using a connection box (e.g. "A3"), just put the DUT's mains plug into the power socket of the box. All electrical tests will now be executed via the DUT's mains supply.
  If required by the actual test norm, and/or if you need to test device parts that are not reachable via the mains connection, the DUT can also be contacted manually. At the rear of the IS 6600H / IS 6680H, there are connectors with all electrical outputs for custom test connections.

- **Loading of test program**
  After loading a test program (see previous page), the program is shown in the start screen:



- **Start of test**
  To run the test program, touch the START triangle ▶ in the middle of the test wheel.

- **Test step process**
  The test steps are consecutively carried out with their programd parameters.
  Depending on test step and set start control the single steps will start automatically or when contacting DUT or after activating start control.
  While one test step is in process the current measuring values are displayed. (See figures on next page.)

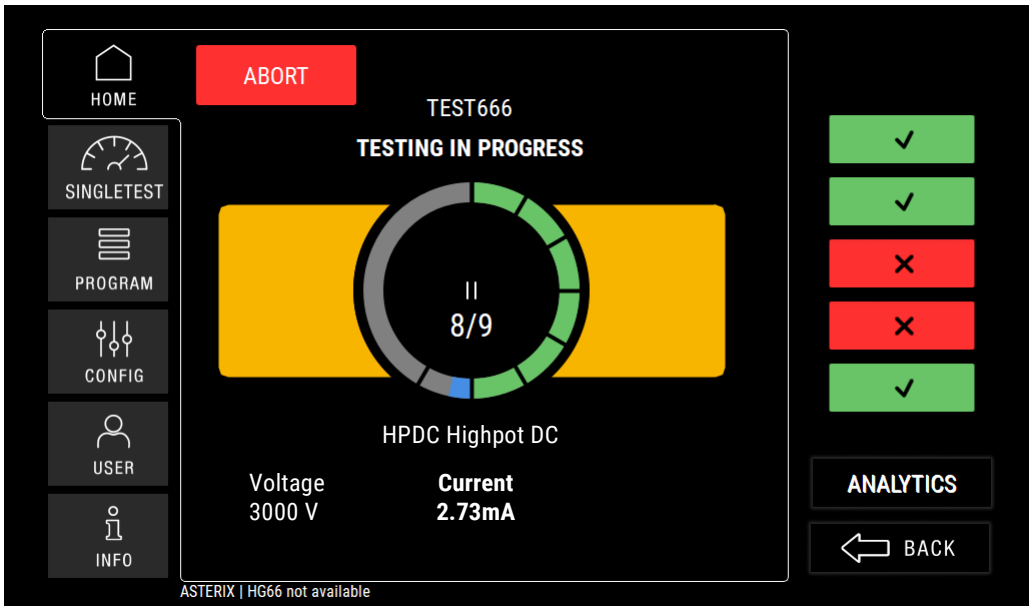
- **Test step result**
  If a test step ends with PASS, the next step will start immediately.
  If a test step ends with FAIL, then:
  - the test process is stopped.
  - the test's status bar is colored RED and marked with an [X].

- **Test result**
  If all test steps resulted in PASS, the complete test result is PASS.
  The device will show the start screen again, with the last test's status bar colored in GREEN, to indicate that the last test run was good.
  If the result of any one test step was FAIL, the complete test result is FAIL.
  The device will show the start screen again, with the last test's status bar colored in red.
  In the manual test mode you can now either
  - immediately start the next test with START key, or
  - examine the measuring values of the test process (pl. see chpt.5.4, p.20)

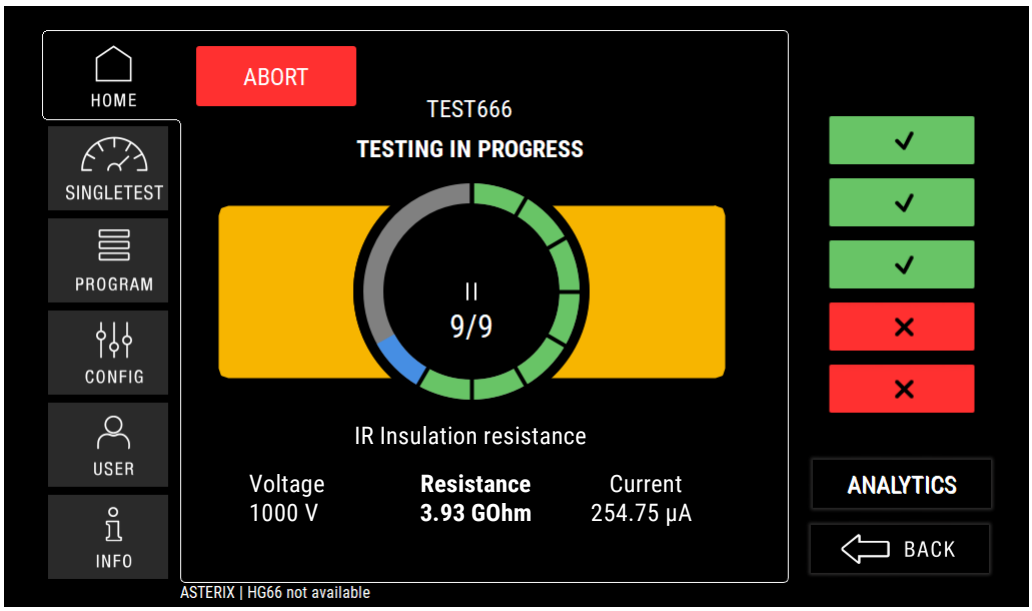
5.2 Screen display during a test step

When a test step is running, all important data is shown on the screen:
- successfully ended test steps are marked in GREEN in the test wheel
- the progress of the actually running test step is shown in BLUE
- below the test wheel, the actual test values and measurements are displayed.

E.g. Hipot test DC:



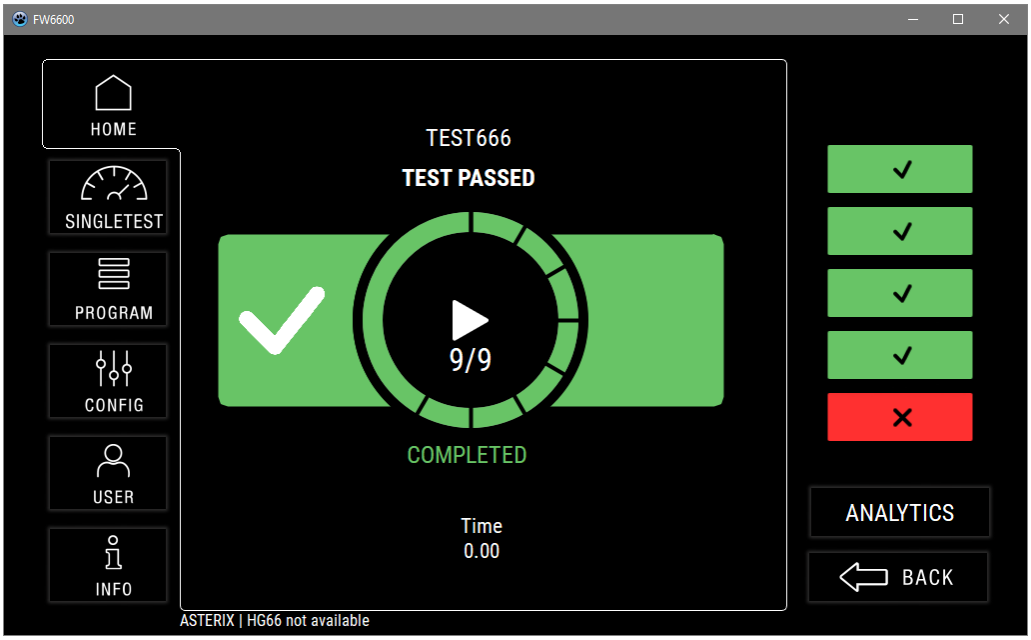
E.g. Insulation resistance test:



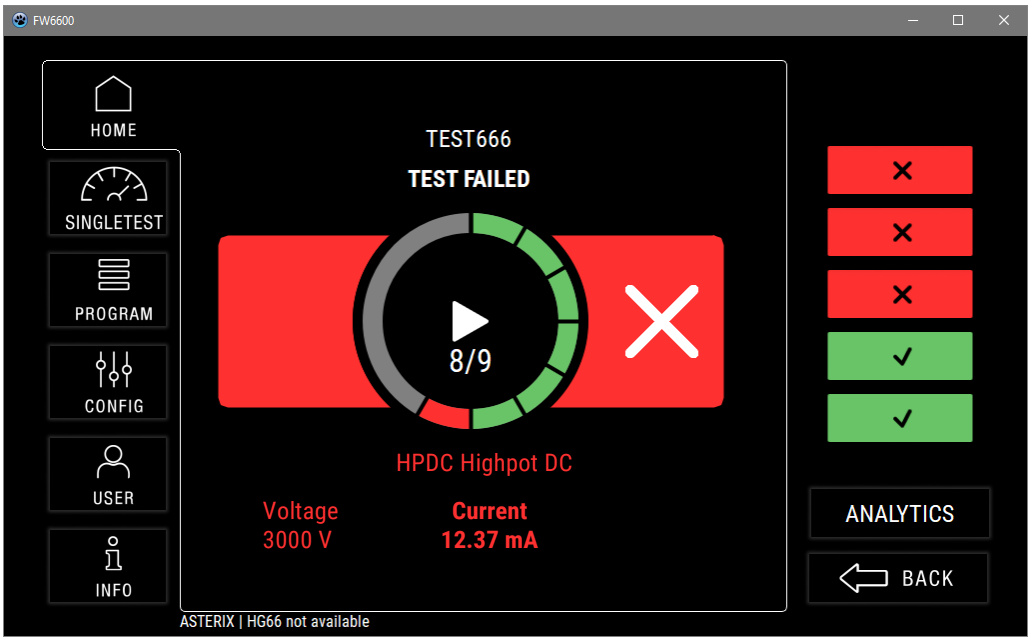
5.3 Display of PASS/FAIL Test Runs

When a test run has finished with result PASS, or if any test step did FAIL, this result is immediately shown with a green resp. red background sign.

E.g. test result PASS:

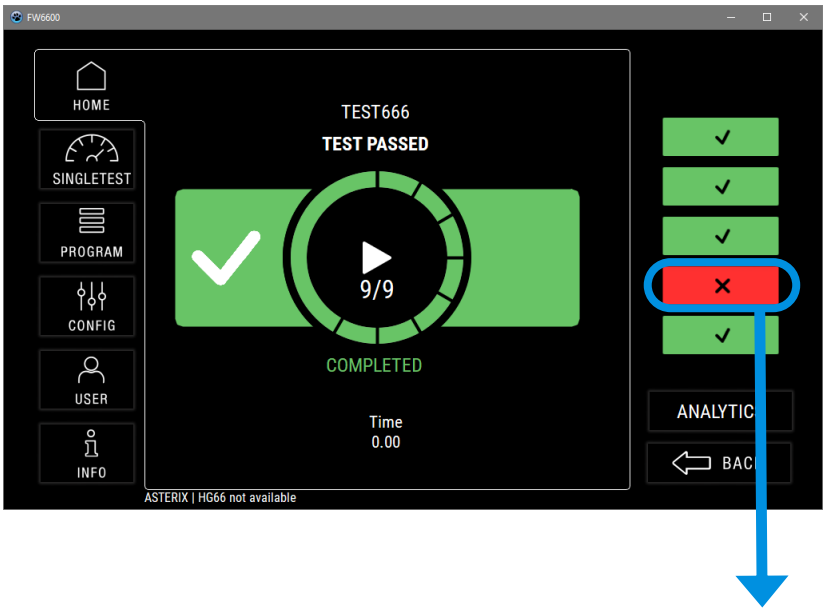


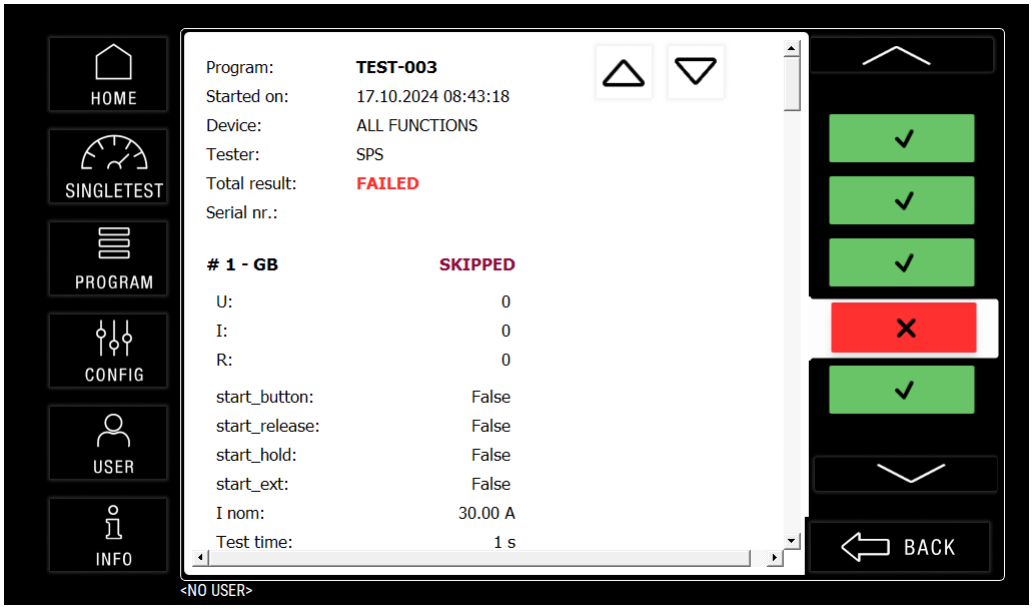
E.g. test result FAIL:



5.4 Reviewing Test results

When a test run has finished and the device is showing the start screen again, the status/result bars on the right side can be used to review the results of the latest test run(s):





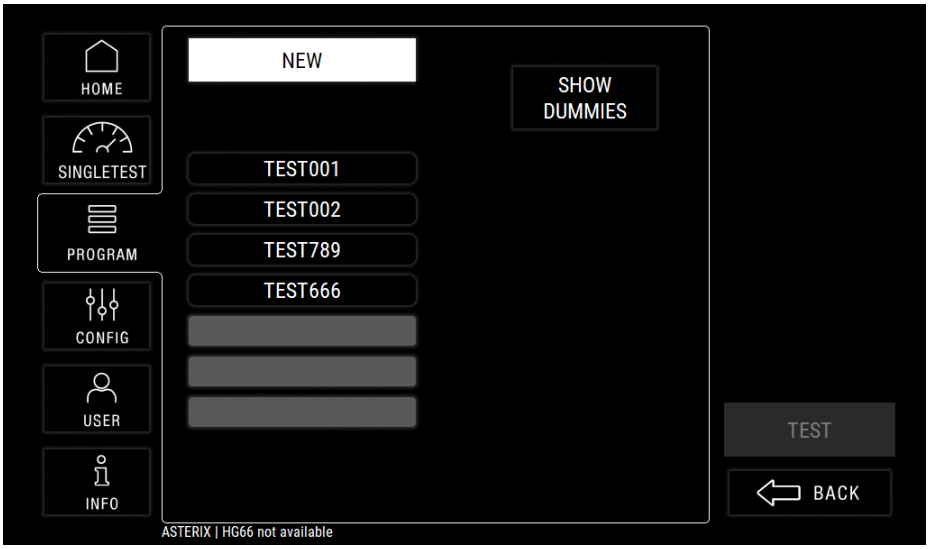
6 Creation of test programs

6.1 General information

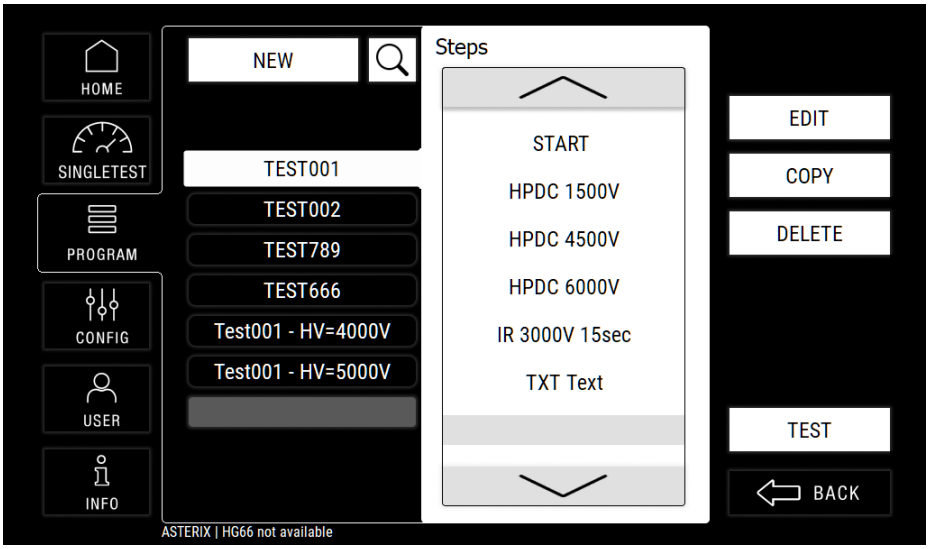
Due to the functionality of the test programs of the IS 6600H / IS 6680H complex test processes can be realized comfortably. Administration and organisation of various programs for different DUT types can be carried out without problems.
The created test programs are filed internally in a non-volatile memory and remain filed even if the device is completely cut off from power supply.

6.2 Managing of test programs

To create a new test program or to edit existing test programs, the "PROGRAM" module is used. When calling the module, you see the list of all test programs, and a "NEW" button to create a new test program:



When selecting one of the test programs, there appear the additional options to EDIT that program, or to DELETE the program, or to make a COPY (clone) of the program:



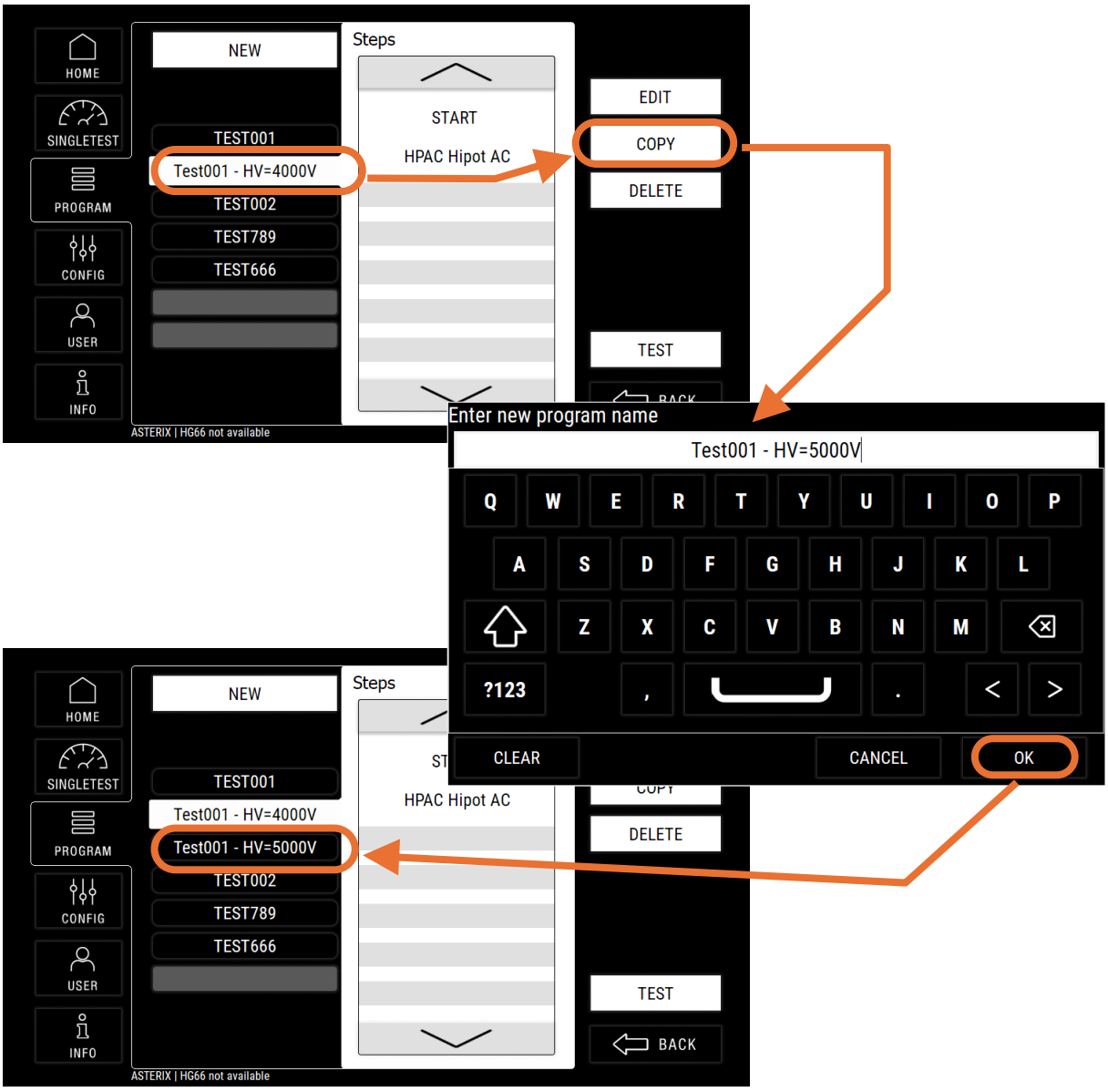
New – This option will create a new test program. First a dialogue is displayed into which a name for the new test program must be entered. After input and acknowledgement of name, test steps can be added to the program.

Note: The position of programs in the list can not be chosen. All programs are stored in that order in which they were created.

Edit – If you select the action "Edit" then the selected test program will be opened for operation. You can then insert or delete test steps, or alter test parameters of existing test steps.

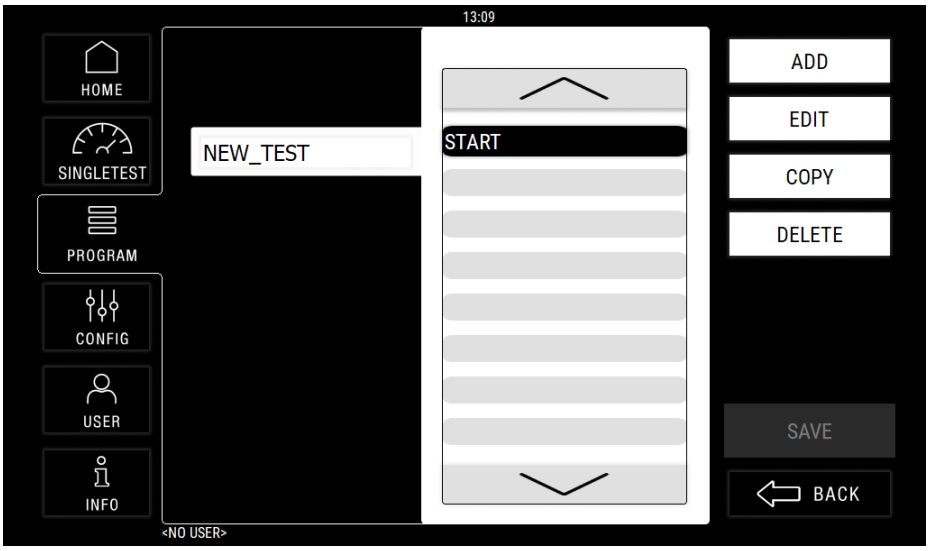
Delete – This will delete the selected program from the list.

Copy – With this option, a new program is created by duplicating the selected program. After choosing "Copy", you are prompted to enter a new name for the duplicated program:



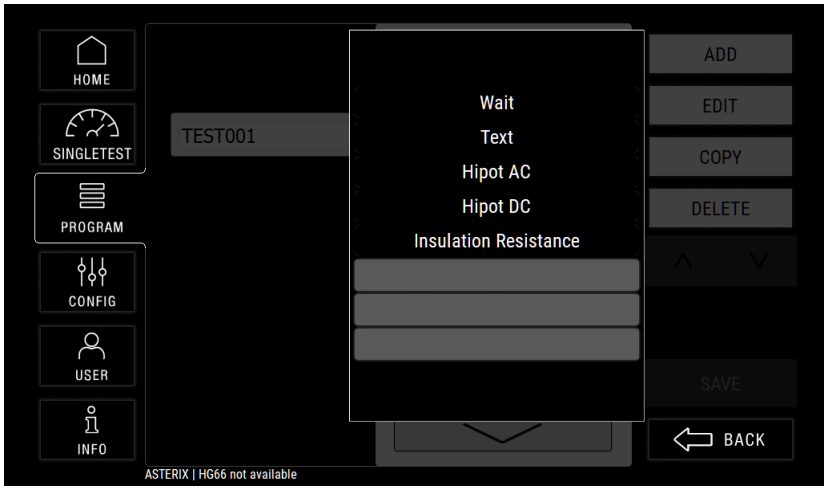
6.3 Editing of a test program

When a new program has been created, or an existing program was chosen with "Edit", the program is shown in detail view for further editing:



After creating a new program

ADD – This option will insert a new test step into the program. When "ADD" is actuated, a list with all available test steps will be shown.
The desired test step is selected simply by tapping on it.
The new test step will be inserted after the step that is currently selected/highlighted in the program.



Selection when inserting a new test step

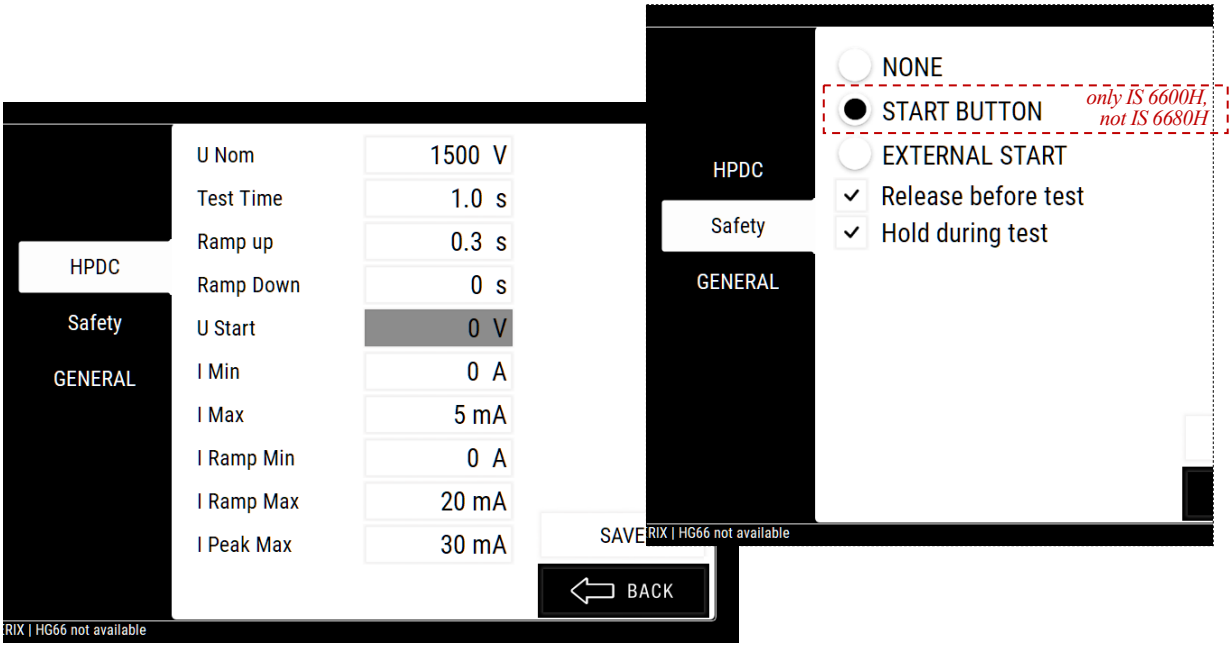
EDIT – If you select the action "Edit" then the selected test step will be opened for operation.

COPY – The selected test step is copied to an internal buffer.

DELETE – The highlighted test step is deleted from the program.

6.3.1 HPDC: Hipot Test DC

With the high voltage test, the electrical strength between the contacted potentials is evaluated.
In case of insufficient or damaged electric strength of the DUT, an arc-over will occur.



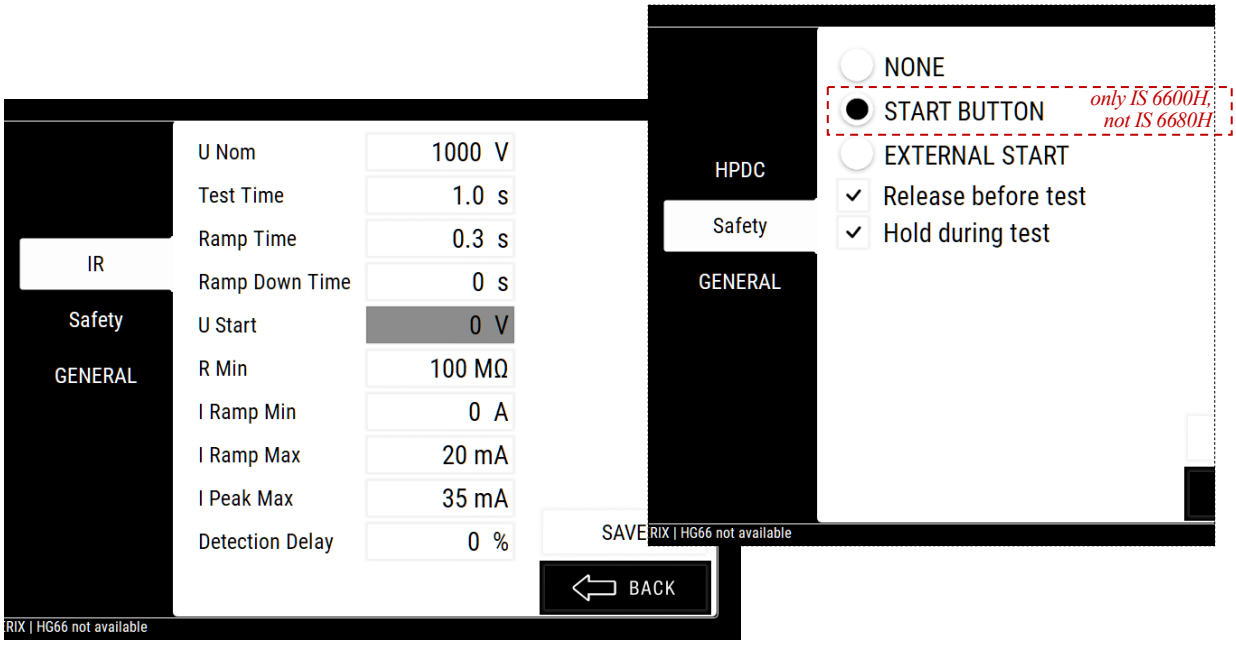
Explanation of test parameters for HPDC Hipot test:

• **U nom**	Preset value for test voltage	(100 – 6000 V [DC])
• **Test time**	Preset value for duration of test (without ramp time)	(0.1 – 999.9 s)
• **Ramp up**	Duration of time for voltage ramp when starting test	(0.0 – 999.9 s)
• **Ramp down**	Duration of time for dropping voltage ramp at test's end	(0.0 – 999.9 s)
• **U start**	Initial voltage value at start of voltage ramp	(0V – [U_{nom}])
• **I min**	Required minimum current for PASS result	(0.000 – 20.000 mA [DC])
• **I max**	Allowed maximum current for PASS result	(0.000 – 20.000 mA [DC])
• **I Ramp min**	Minimum allowed current during voltage ramp	(0.000 – 20.000 mA [DC])
• **I Ramp max**	Maximum allowed current during voltage ramp	(0.000 – 20.000 mA [DC])
• **I peak max**	Short current peaks up to this value are allowed	(0.000 – 30.000 mA [DC])
• **None**	Test starts immediately without query of any safety signal	
• **Start Button**	Test starts with the Start button on the device front panel (only HA 6600H)	
• **External Start**	Test starts with signal on the ext.IO (Input#1 or Input#3)	
• **Release Before Test**	The start signal must not already be activated at the beginning of the test	
• **Hold during Test**	The start signal must be present continuously during the test	

6.3.2 IR: Insulation Resistance Test

With the insulation test IR, the insulation resistance between the contacted potentials is evaluated.

In case of insufficient or damaged electric strength of the DUT, an arc-over will occur.



Explanation of test parameters for IS insulation test:

• **U nom**	Preset value for test voltage	(100 – 6000 V [DC])
• **t Test**	Preset value for duration of test (without ramp time)	(0.1 – 999.9 s)
• **R min**	Required minimum resistance for PASS-result	(100 kΩ – 10 GΩ)
• **t Ramp up**	Duration of time for voltage ramp when starting test	(0.0 – 999.9 s)
• **t Ramp down**	Duration of time for dropping voltage ramp at test's end	(0.0 – 999.9 s)
• **U start**	Initial voltage value at start of voltage ramp	(0V – [U_{nom}])
• **IR min**	Minimum allowed current during voltage ramp	(0.000 – 20.000 mA [DC])
• **IR max**	Maximum allowed current during voltage ramp	(0.000 – 20.000 mA [DC])
• **I Peak Max**	Short current peaks up to this value are allowed	(0.000 – 30.000 mA [DC])
• **Detection Delay**	The parameter "Detection delay" specifies the time span at the start of an insulation test that is <u>not</u> checked for the R_{min} threshold. <u>Example</u>: If "Detection Delay time" is set to e.g. 40% and a resistance test with a test duration of 10s is carried out, then the evaluation of the R_{min} threshold takes place only after 4 seconds. This function is helpful if test items require a certain amount of time due to their design (e.g. capacitive behavior) before stable measurements are obtained. Reckognition of general hardware faults (e.g. short-circuit detection) remains unaffected and still leads to immediate test break.	

6.3.3 TXT: Text Step

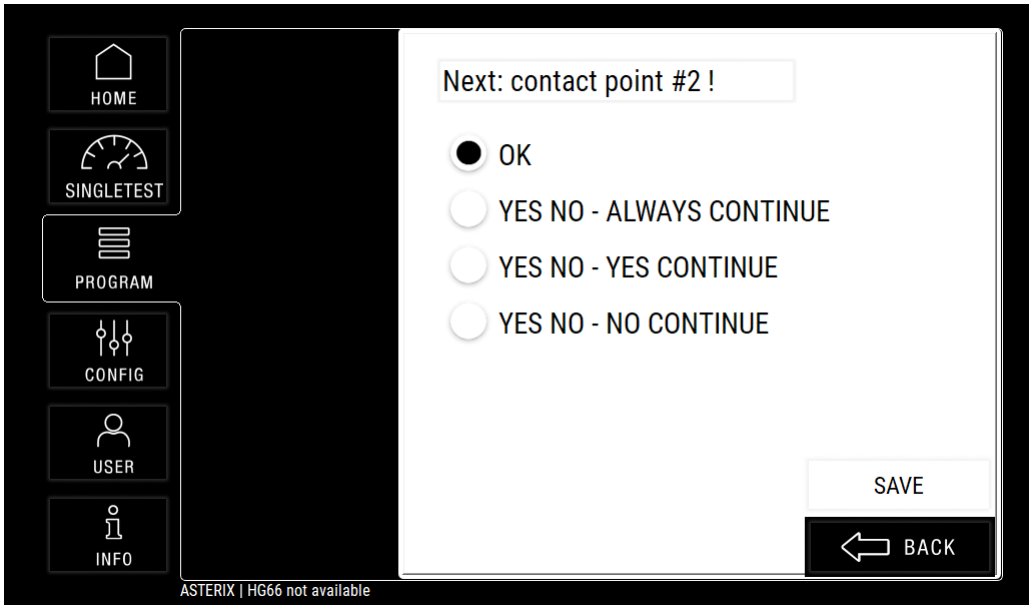
This step can be used to display hints to the operator, or questions to be answered with Yes/No.

In the case of yes/no questions, you can decide how the answer is to be evaluated:

Always continue: the test procedure is continued (but the question and answer appear in the test log)

Yes continue: If the answer is YES, the test sequence is continued; if NO, it is cancelled with an error

No continue: If the answer is NO, the test sequence is continued; if YES, it is cancelled with an error



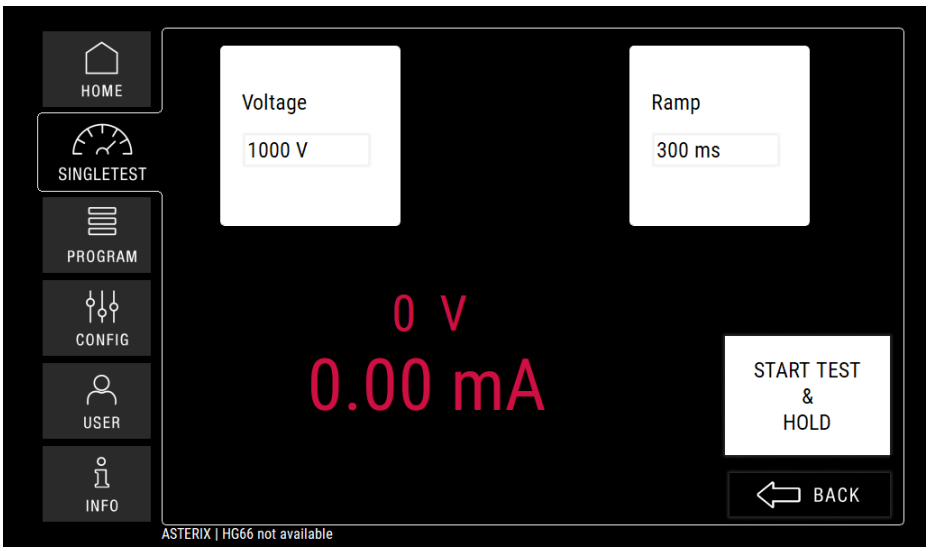
7 Additional Functions and Settings

7.1 Single Test

The single test operation is suitable for performing single tests with changing test parameters quickly and easily in sequence. To be able to find the appropriate test parameter for a new type of DUT, in order to create a new test program, the single step operation can be recommended.
Further possibilities for single DUTs could e.g. be special tests or tests for error finding – to create a program for this purpose alone would be too time-consuming.

When changing to the "Single Test" tab, you can directly choose which test to perform:

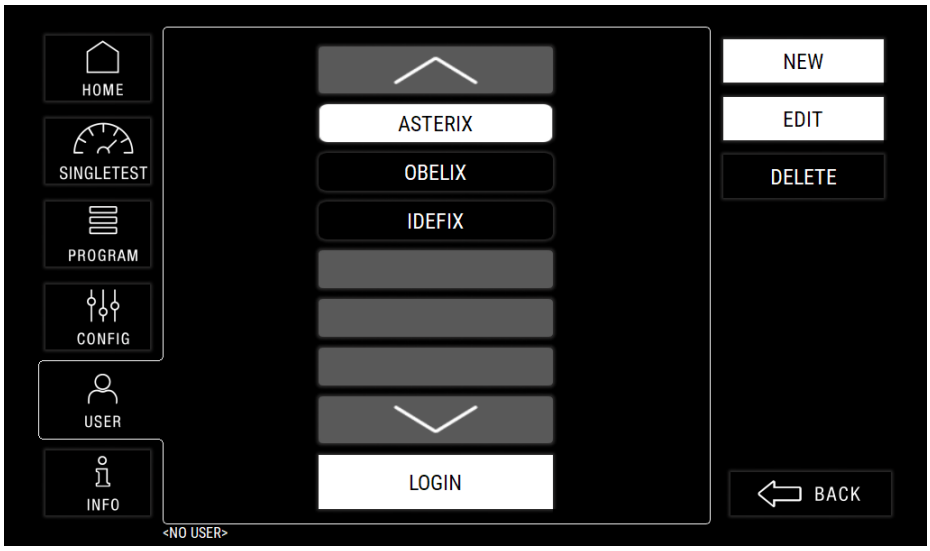
In the test tab, you can set the most important parameters, and then start the test with the "Run Test" button:



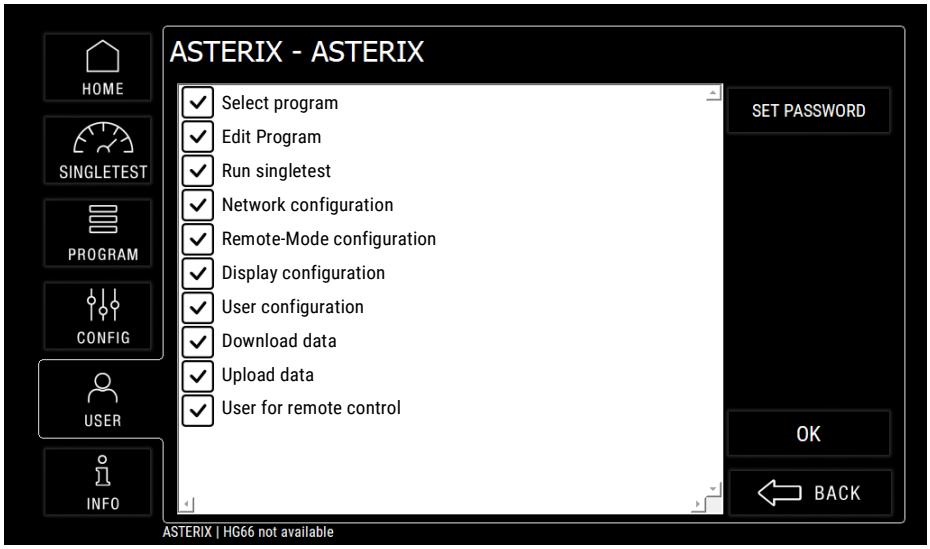
Note that the Single Test operation performs just measuring of values and displays them on the screen. There is no test result "Pass" or "Fail", and the measured values are not recorded in any way.

7.2 User Administration

In the "User" tab, there can be created individual user accounts. Individual "rights" can be assigned for each user, which determine which functions of the device are available to this user.



List of registered users



List of rights given to a user

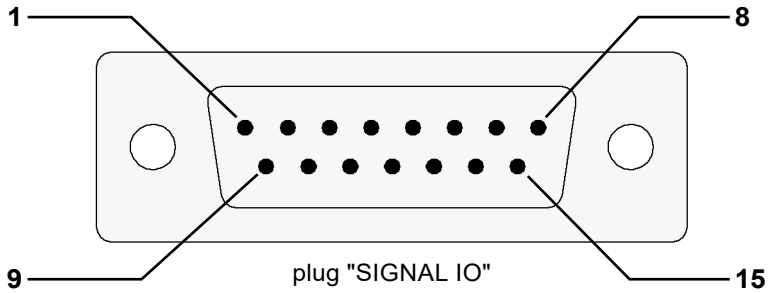
Notes:

– each user can set an individual password to protect his account, but it's also allowed to leave the password empty.
– when the user management system is used, there must be at least one user with the right "User administration"
– when not needed (laboratory use, etc.), the user management system can be completely switched off in the tab CONIG→USERS. In this case all device functions are open to everyone.

Annex

A Interface Configuration

A-1 External I/O Interface "SIGNAL IO"



plug "SIGNAL IO"
(D-sub15, male, on rear panel)

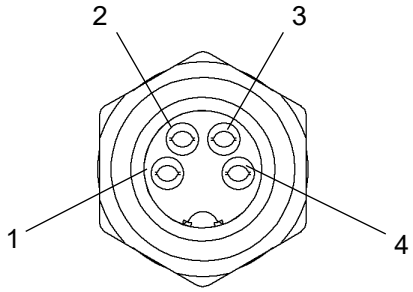
PIN	description	configuration
1	output 1	Passed
2	output 2	Failed
3	output 3	Testing
4	output 4	Discharge
5	GND	grounding
6	GND	grounding
7	input 1	Ext_Start
8	input 2	Ext_Start_PE
9	input 3	Ext_Start_HV
10	input 4	*not used*
11	+24 V DC *)	int. voltage against ground *)
12	+24 V DC *)	int. voltage against ground *)
13	*n.a.*	*not used*
14	*n.a.*	*not used*
15	*n.a.*	*not used*

*) internal 24V supply, do **NOT** feed in from external!

Note:
In standalone operation, the input and output signals are fixed and cannot be changed or reconfigured. When remotely controlled with the DAT3810 software, the inputs/outputs can be used freely as desired.

A-2 Connector for external protective circuit EXT.SK

4-pole M8 socket with female thread



To close the protective circuit, PINs 1 and 2 have to be short-circuited. PIN 3 and 4 are not assigned.

If no external safety loop application is provided, the supplied jumper plug must be connected. As long as this interface is open, no test operation is possible.

B USB devices, and "Testing with High Voltage"

- When testing with high voltage, a failing testpiece can be the cause for electromagnetic radiation (because of voltage arc-over at the weak point in the testpiece), and the resulting sparkling can cause EM radiation of high frequencies. This radiation gets emitted by the test lines – antenna principle – , and may get recepted again by USB lines in the closer surrounding.
- USB controllers are generally vulnerable to stray fields of high frequencies, and thus the communication with USB can get interrupted. In particular, it is possible that short occurances of stray fields put the USB-controller into a persistent inoperable state, so that USB communication keeps being interrupted.
- If such an USB malfunction occurs, often it is already sufficient to just unplug the USB cable, and plug it in again after a few seconds. If the malfunction still persists, it is needed to switch the affected devices off, and on again.

Concerned Situations and devices:

- generally every kind of PC or similar device that is using a USB connection, and is located in very close neighborhood to a test with high voltage.
- in particular such PCs that are using DAT3805 software to control a testing device, and are using an USB connection to the test device.
- also test devices when they are themselves using external USB devices, like e.g. USB keyboard, USB sticks for data exchange, etc.

Measures to avoid failures

- as far as possible, it is recommended to keep a sufficiently large distance between USB cables/devices, and testpiece / testing lines. (Recommended are at least 30cm, the practical rule is "the more, the better".)
- it is recommended to use well-shielded USB cables with ferrite-core coil.
  (On its own this is won't eliminate the possibility of errors, but it generally reduces sensitivity against stray fields, and makes occurance of errors less likely.)

EU-Konformitätserklärung
EU Declaration of Conformity
EU Déclaration de Conformité

Wir / We / Nous:

SPS electronic GmbH
True German Quality
Eugen-Bolz-Str. 8
74523 Schwäbisch Hall - Germany

erklären hiermit, dass das nachfolgende genannte Gerät den einschlägigen grundlegenden Sicherheitsforderungen der EU-Richtlinien entspricht.

declare, that the following unit complies with all essential safety requirements of the EU Directives.

Déclarons que le produit désigné ci-dessous est conforme aux exigences de sécurité des Directives EU.

Geräteart:	**Isolationsprüfgeräte**
Description of device:	**Insulation Testers**
Typ / Type:	**IS 6600H, IS 6680H**

EU Richtlinien / EU Directives / Directives EU:

☐ EG Maschinenrichtlinie 2006/42/EG mit Änderungen
EC Directive for machinery 2006/42/EC with amendments
Normes CE machines 2006/42/EC avec amendements

☒ EU Niederspannungsrichtlinie 2014/35/EU
EU Directive for low voltage 2014/35/EU
Normes CE basse tension 2014/35/EU

☒ EU Richtlinie Elektromagnetische Verträglichkeit 2014/30/EU mit Änderungen
EU Directive electromagnetic compatibility 2014/30/EU with amendments
Normes électromagnétiques CE compatibles 2014/30/EU avec amendements

☒ RoHS-Richtlinie 2015/863/EU (RoHS III)
RoHS directive 2015/863/EU (RoHS III)
Directive RoHS 2015/863/UE (RoHS III)

Angewandte harmonisierte Normen / Applicable harmonized standards / Normes Européennes harmonisées:

- EN 61 000-3-2:2019-12; EN 61 000-3-3: 2020-7 ; EN 61326:2013-07; EN 50 191:2011-10
- DIN EN ISO 12100:2011-03

Angewandte nationale Normen und technische Spezifikationen / Applicable national standards and technical specifications: Normes nationales et spécifications techniques particuliéres:

- – – –

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23.06.2025
Datum / date / date

Dipl. Ing. Johannes Geyer

Dieser Konformitätserklärung unterliegt grundsätzlich nur das von uns gelieferte oder in Betrieb genommene Gerät. Für Änderungen und Erweiterungen ist der Betreiber verantwortlich und damit für die Sicherstellung der Übereinstimmung der veränderten Anlage mit den betreffenden EU-Richtlinien.

This declaration of conformity is only subject to the device as it was delivered or commissioned by us. Any subsequent alterations and extensions are in the responsibility of the operator, and he therefore has to ensure the altered unit complies with the corresponding EU directives.

Cette déclaration de conformité se réfère uniquement à l'appareil que nous avons livré ou mis en service. L´utilisateur est responsable des changements ultérieurs et des extensions et doit donc s´assurer que l´unité change respecte les directives CE correspondantes.