



ACS

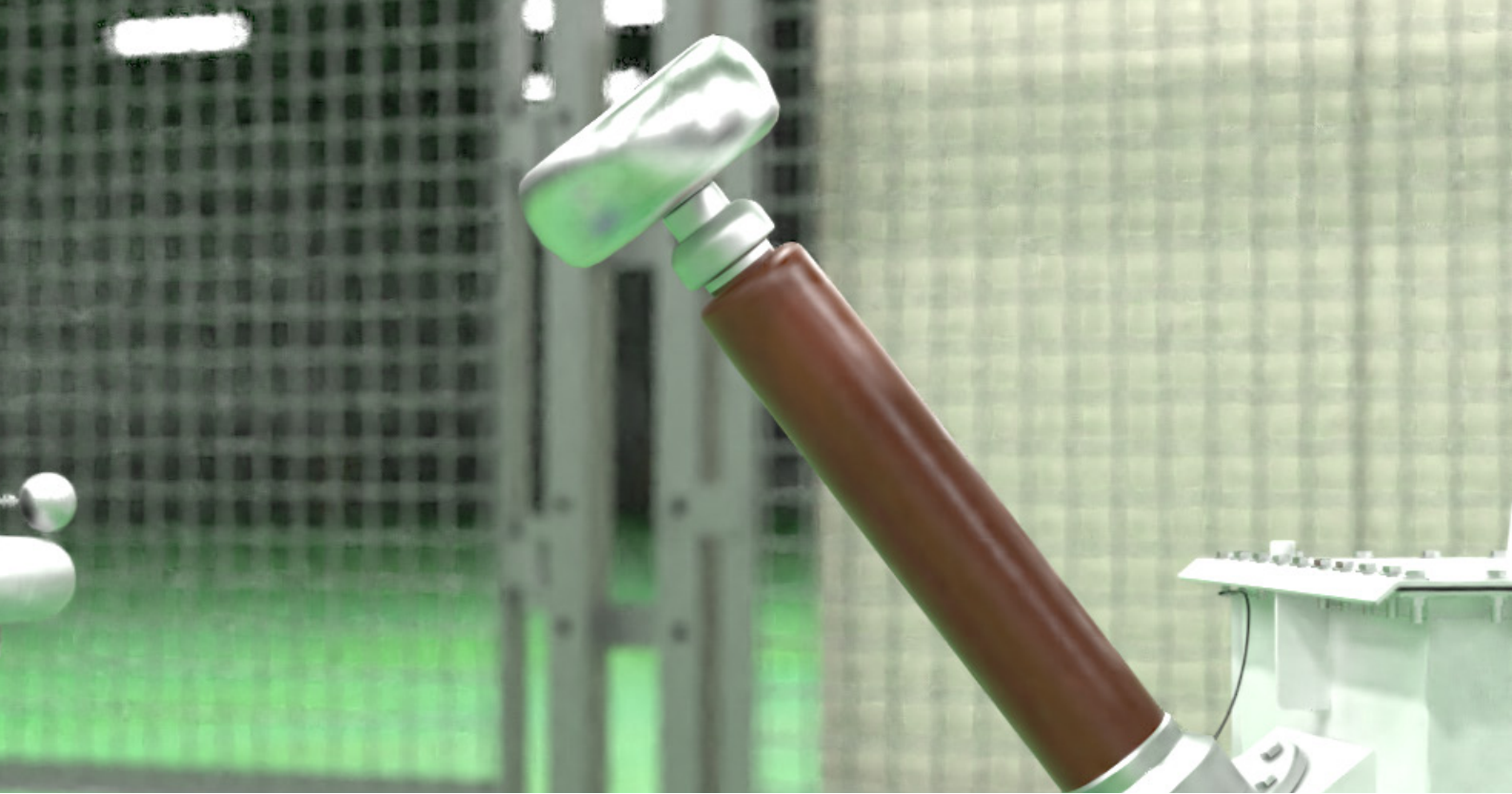
AC Test Sets

Leaflet



HAEFELY

Current and voltage – our passion



GENERALITIES

AC high voltage sources are used for dielectric proof tests on high voltage components - according to IEC and ANSI standards - such as distribution transformers, instrument transformers, switchgear, bushings, motors, cable terminations to give just a few examples.

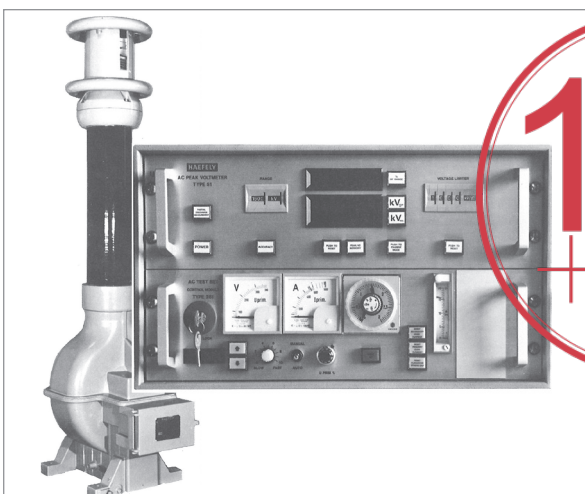
The ACS range is our latest generation of standard dielectric test sets. Over 100 years of experience in high voltage test equipments has gone into design and manufacture of the series. The ACS test sets are easy and safe to use with long trouble free life cycle.

HAEFELY HVC 300 AC controls the system. This state of the art PLC based control includes all necessary components for the operation of the test system and communicates with a standard Windows based computer running

CaMS™ (Control and Measurement Studio).

CaMS™ is HAEFELY's universal platform for controlling test systems and measuring instruments. It is extremely easy to use and has a very gentle learning curve and allows the operator to start using the system with minimal training.

The ACS test sets can be combined with our highly accurate measuring instruments to perform additional tests like partial discharges or $\tan \delta$ (dissipation factor). If combined with a PD detector the PD free option guarantees $< 1 \text{ pC}$ to test up to the highest standards or customer requirements.



Haefely test set type TEOS - 1979



FEATURES

- Fulfils IEC, IEEE and other relevant standards.
- Highest industrial Safety Integrity Level SIL 3 (ISO 61508) certified.
- All in one solution from a single supplier
- HVC 300 AC control unit with HAEFELY CaMS™ user interface
- Tank type oil isolated HV transformer with capacitive bushing, temperature indicator and dehydrated breather.
- Fastest and most reliable electronic flash detection
- PD free (option)

ADVANTAGES

- ✓ Guarantees test procedures and measurements as defined in the standards, guarantees reliable and traceable test results.
- ✓ Guarantees maximum operator safety.
- ✓ Plug and play including the source and the measuring devices
- ✓ Windows based graphical user interface allows the operator to start using the system with minimal training.
- ✓ Reliable transformer design which guarantees a long trouble free life.
- ✓ Detects a test object failure in a fraction of the time required by traditional current based detection
- ✓ The PD free options allows a PD level as low as 1 pC



QUICK & EASY

ACS test sets includes the HAEFELY CaMS™ software, developed to control high voltage test systems from a computer without almost no training



SAFE

The ACS test sets are SIL 3 certified, highest industrial safety level available



RELIABLE

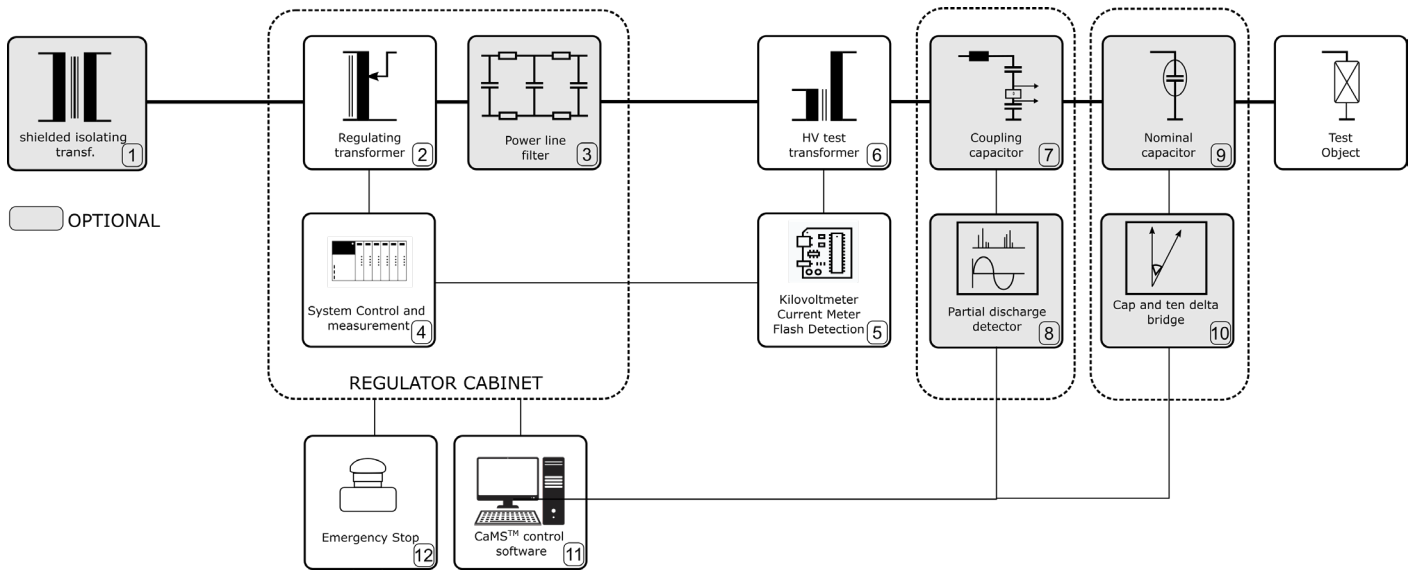
The used of intensive tested components, and our swiss quality manufacturing processes, guarantees a failure free test system

APPLICATIONS

Performing dielectric test on high voltage apparatus like:

- HV components
- Instrument Transformers
- Distribution Transformers
- Switchgear
- Bushings and Arrestors
- Rotating machines
- Cable joints
- Connectors
- Isolators

ACS SYSTEM



The HAEFELY ACS test sets consist of two main components, the High voltage transformer type PK and the regulator type STL with control unit HVC 300 AC, embedded.

cable or a fiber optic connection (option) from a standard Windows based computer running Control software CaMS™. The regulator can be placed outside the control room increasing operator safety.

ACS compact design with only 2 components reduces the setup time and the required space in HV laboratory.

Control of the system is done using an Ethernet CAT 5



STL - REGULATOR CABINET

The STL includes all components and electrical connections required to switch the voltage, adjust the output voltage, control the system, measure the output voltage and current and control the SIL 3 certified safety circuit.

Regulator

Output voltage regulation is done by an air insulated column-type transformer. This technology guarantees a smooth regulation with practically no steps through the voltage range. The specially designed brushes with limited mechanical contact ensures long life even under extensive use.

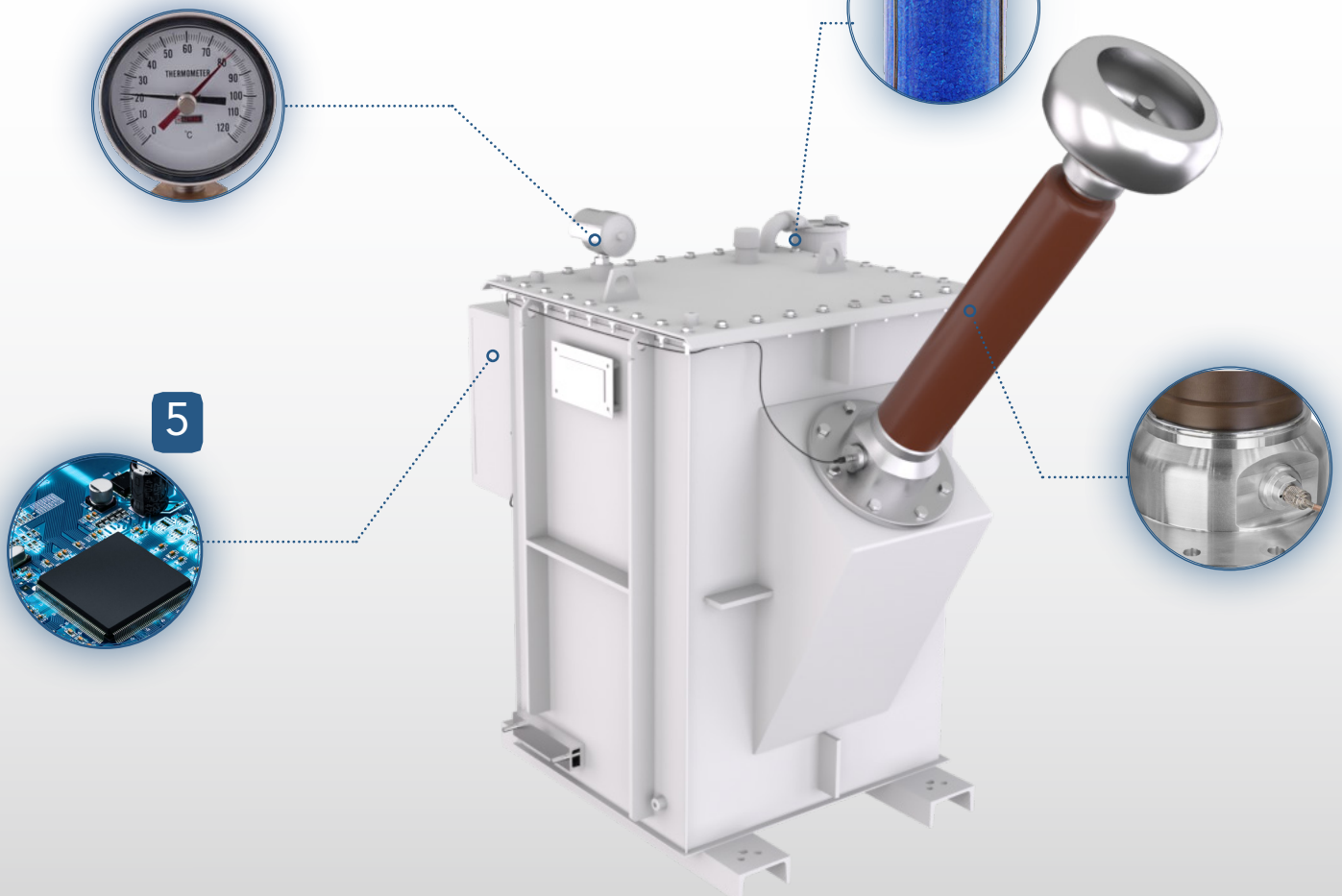
Regulator has a zero start interlock making sure the output voltage always starts from zero.

Power Breaker & Secondary contactor

The incoming power breaker, remote controlled from the software, is used for initial switching-on of the test system and for switching-off in case of a short-circuit. The emergency trip acts directly on the power breaker.

Low voltage filter

The low voltage filter (option), is mounted in the cabinet, this filter is optimized to reduce the PD noise propagated from the mains within the IEC mandated frequency band.



PK - HIGH VOLTAGE TRANSFORMER

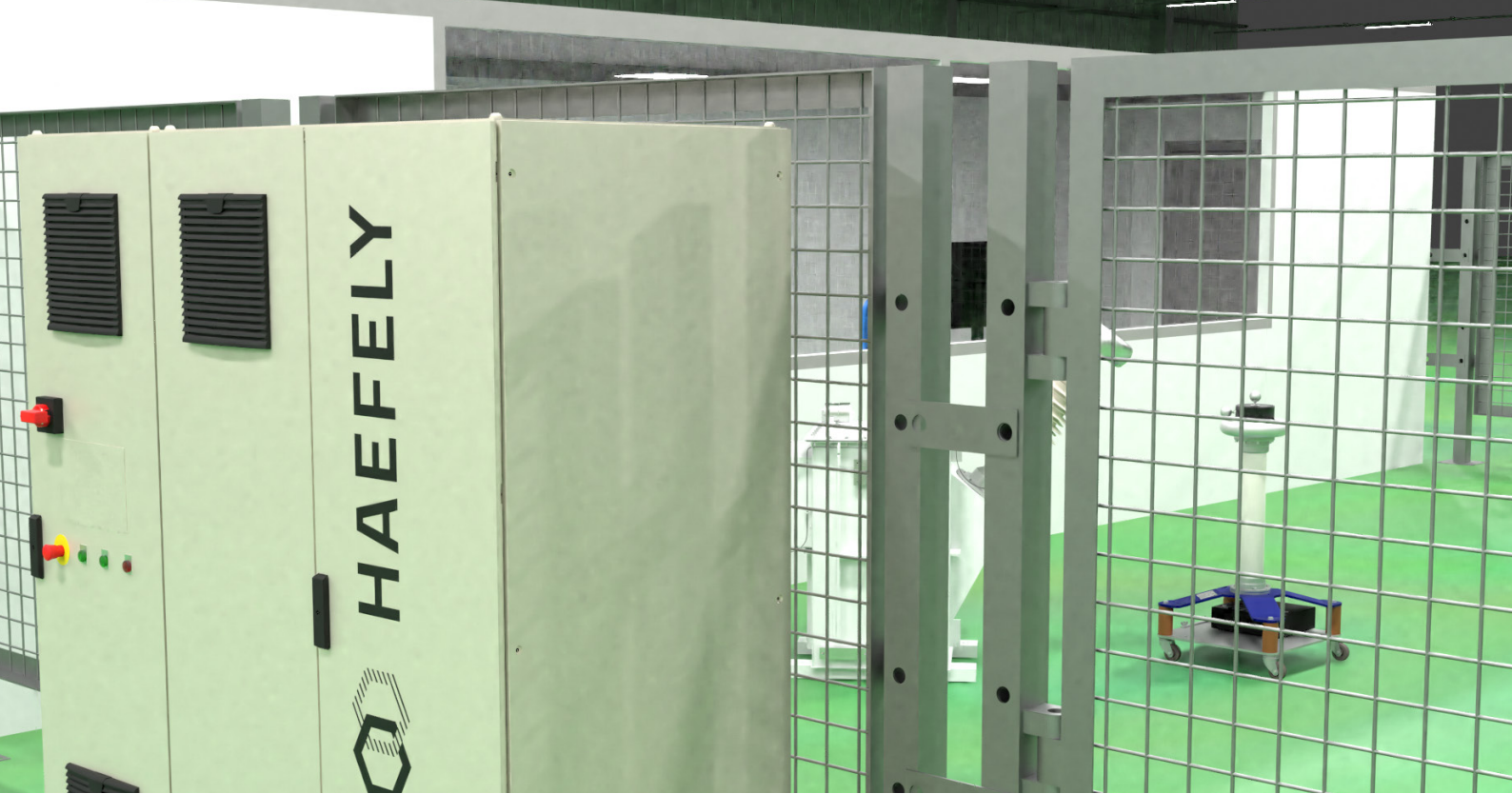
The oil insulated transformer is built into a steel tank and can be used indoor and outdoor (fair weather condition).

The test transformers are not completely filled with oil. The emptiness at the top allows oil to expand when it gets hot. The air in here passes through a dehydrating breather thus preventing condensation inside the tank during cool down of transformer.

A resin impregnated bushing brings the voltage out. It is mounted at an angle to facilitate the connection of the test object. Output voltage is measured using the bushing as a capacitive divider which guarantees a stable reading even at low voltages.

The Tank is equipped with an indicator with a display for maximum temperature reached .

An aluminium top electrode is placed on the bushing to allow PD free operation up the rated voltage.



ADDITIONAL MEASUREMENTS

ACS test sets can be easily combined with HAEFELY measuring instruments to perform combined dielectric and partial discharge test or tan delta (dissipation factor) test.

HAEFELY, as manufacturer of both the power supply and the measuring system, including all accessories, guarantees a smooth integration and easy operation of

the complete test system. Operator needs to deal with only one software and all information is collected by the same computer reducing foot print in the control room and making operation easier as all settings are done with the same device.

Complete test reports of the combined tests can be easily done with a few clicks.

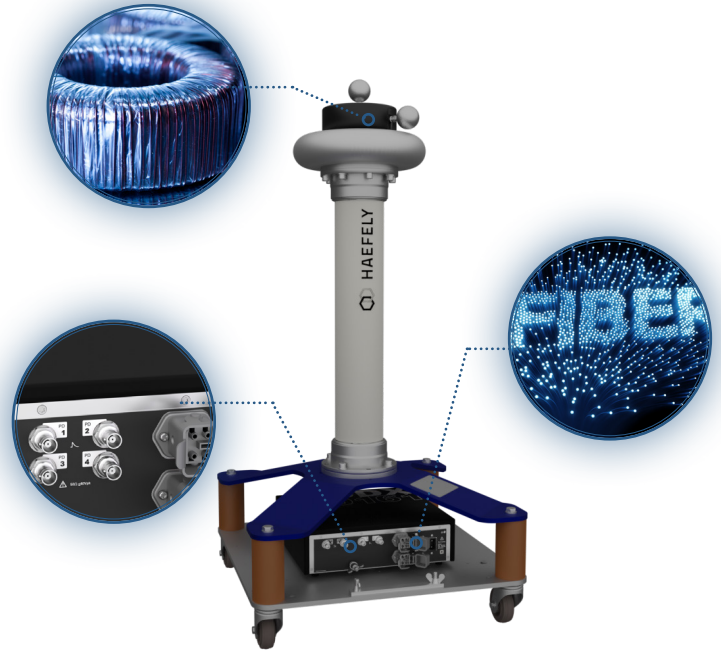


ACS PD MEASUREMENT

The ACS PD MEAS option for the ACS product line includes in an integrated solution all the necessary components to perform a partial discharge test, drastically reducing the connecting time and increasing PD sensitivity by avoiding long ground loops.

The ACS PD MEAS includes the HV filter, the coupling capacitor and the partial discharge detector, the detector is connected to the computer using a rugged fiber optic cable.

PD detector is controlled using HAEFELY CaMS™ software, making possible performance of combined dielectric and PD test in a single sequence and collection of all measurement results in one report.

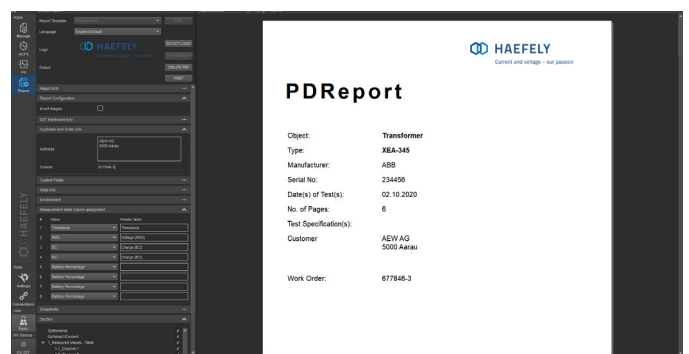
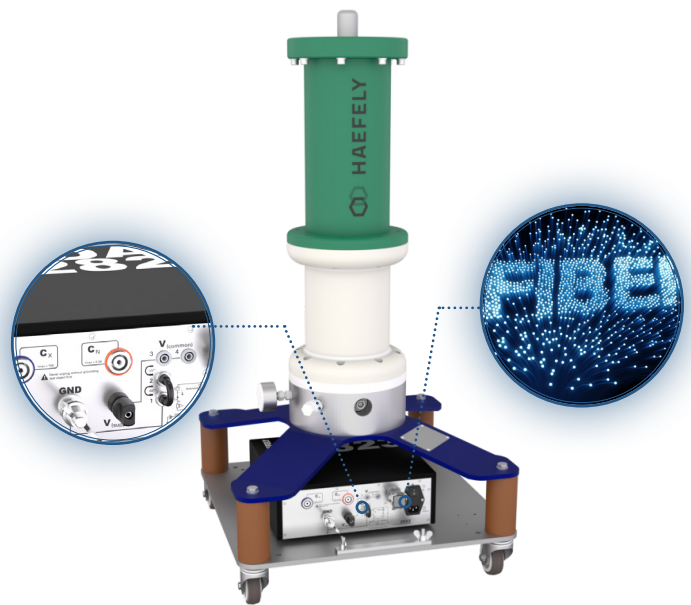


ACS TAN D (DISSIPATION FACTOR) MEASUREMENT

The ACS TAN D option for the ACS product line includes all necessary components to perform a tan delta (dissipation factor) measurement. It includes all required components, nominal capacitor and measuring instrument, in one single unit .

The HAEFELY IDAS 2823 measuring device included is the most accurate and sophisticated measuring device available in the market, combined with our standard nominal capacitors, guarantees a reliable test even when maximum accuracy is required.

The fiber optic connection between the measuring device and the computer increases operator safety as the measured current stays in the high voltage test field - decoupled galvanically from the control room.



HVC 300 AC - SYSTEM CONTROL

The HVC 300 AC is the continuation of a long line of highly successful Haefely AC Controls. HVC 300 takes the safety aspect of a high voltage control up several notches.

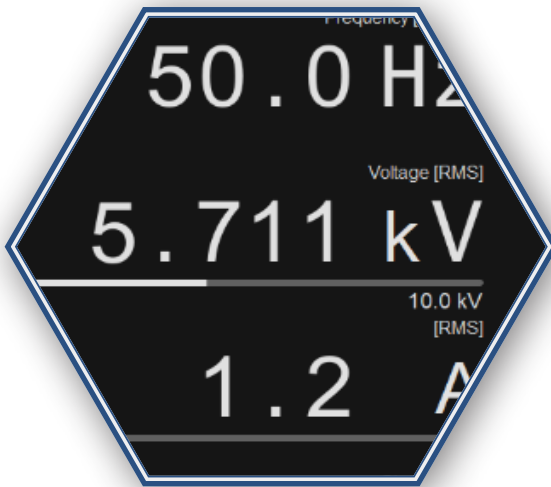
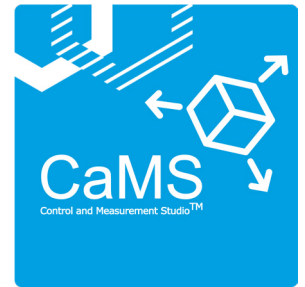
The design of the HAEFELY CaMS™ software interface is ultra-modern, and utilizes sophisticated visualization techniques only found in the latest mobile devices.

Automating sequences are extremely easy,

just fill the tables with required values and the software does the rest.

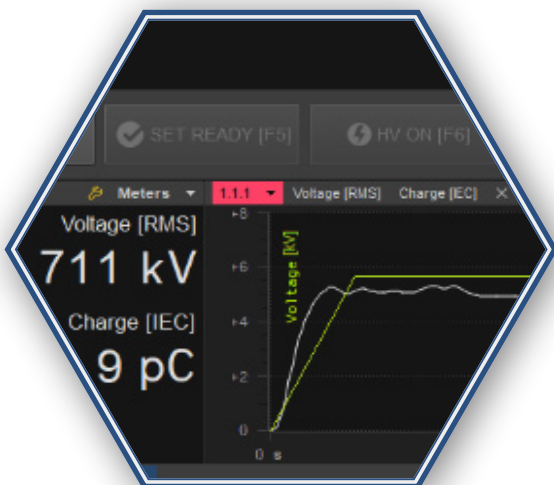
System settings are easily visible and accessible. No more digging into menus to find the setting needed.

System status, as well as failures and alarms are prominently visible and easy to reset when necessary. Continuous information about the system status is provided to the operator.



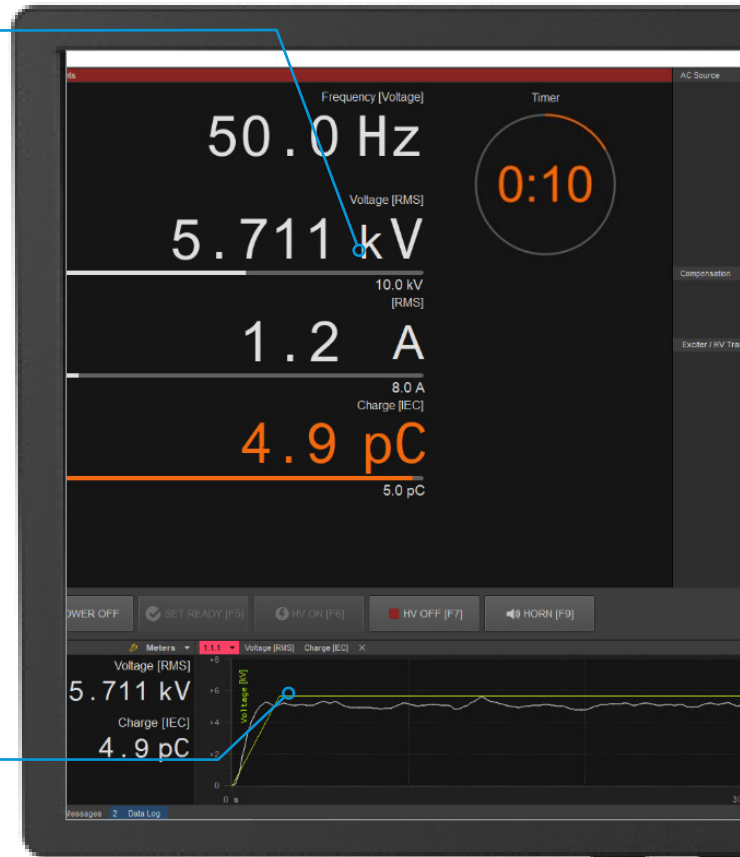
Large Indicators

Large numerical indicators with unit and bottom running range indication bar



Real Time Charts

Real time charts of voltage, current and PD (if included) shows the values evolution over time

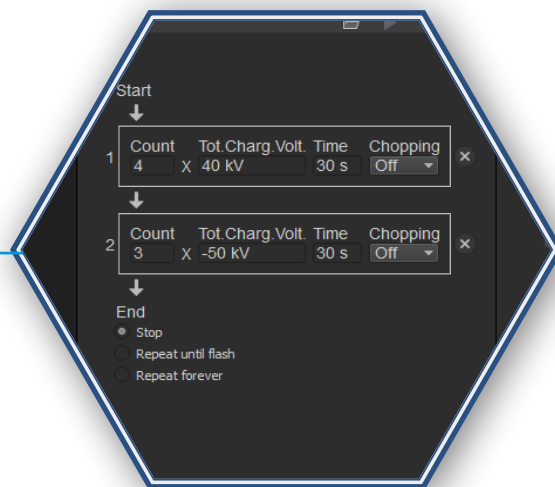
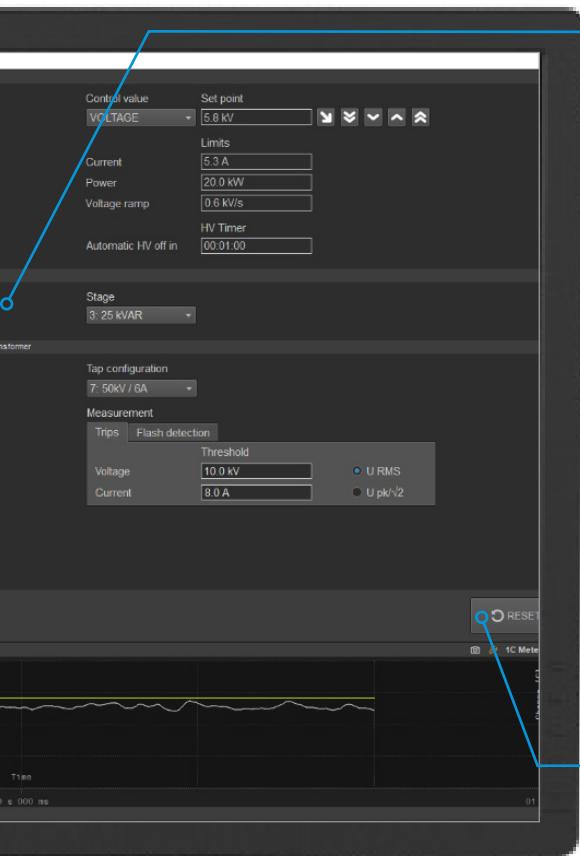


FEATURES

- Windows based graphical user interface with large indicators
- Maximum industrial safety level available - SIL 3 compliant
- Single communications cable between the test system and the control computer, fiber optic optional
- Standard and reliable PLC components

ADVANTAGES

- ✓ Easy to use and quick learning curve
- ✓ Maximum operator safety.
- ✓ Setup done in seconds, no need of large cable ducts.
- ✓ Longevity and easy availability of spare parts.



Automatic Sequencing

Automatic sequences can be stored and reproduced automatically by the software

PDReport

Object:	Transformer
Type:	XEA-345
Manufacturer:	ABB
Serial No:	23445
Time(s) of Test(s):	02

Reports

Combined PD and dielectric reports can be done in a few clicks.



ACS FAMILY MODELS

MODEL	VOLTAGE (kV)	POWER (kVA)
ACS 25-20	25	20
ACS 25-40	25	40
ACS 25-60 ⁽¹⁾	25	60
ACS 25-80 ⁽¹⁾	25	80
ACS 50-20	50	20
ACS 50-40	50	40
ACS 50-60	50	60
ACS 50-100	50	100
ACS 75-20	75	20
ACS 75-40	75	40
ACS 75-60	75	60
ACS 75-100 ⁽¹⁾	75	100
ACS 100-20	100	20
ACS 100-40	100	40
ACS 100-60	100	60
ACS 100-100	100	100

⁽¹⁾ reduced duty cycle

Complete technical specifications in the datasheet at www.haefely.com

SCOPE OF SUPPLY

ACS

AC dielectric test set ACS VV⁽³⁾-PP⁽⁴⁾

⁽³⁾VV = VOLTAGE ; ⁽⁴⁾PP = POWER

Including

1	Regulating cabinet	STL
2	Embedded measuring and control device	HVC 300 AC
3	Tank type step up transformer	PKT
4	Ground stick	
5	Emergency stop	
	Test report	
	Instruction manual	

Control Software

6	HAEFELY CaMS™ control software
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Included cables:

7	STL - PK power cables 20m length
8	STL - PK measuring cables 20m length
9	STL - Computer control cable 20m length



12



20



19




6


10

ACS OPTIONS



Communication cables

11	Rugged industrial fiber optic connection between control computer and system, 20m length.		ACS OPT-LINK
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Isolation / change of input voltage

12	ACS Isolating transformer or Change of input voltage 20 & 40 kVA		ACS TRANS 40
	ACS Isolating transformer or Change of input voltage 60 & 100 kVA		ACS TRANS 100



Partial Discharge Free

13	PD free option for ACS test sets, < 10 pC		ACS PD FREE 10
14	PD free option for ACS test sets, < 1 pC		ACS PD FREE 1




Other options

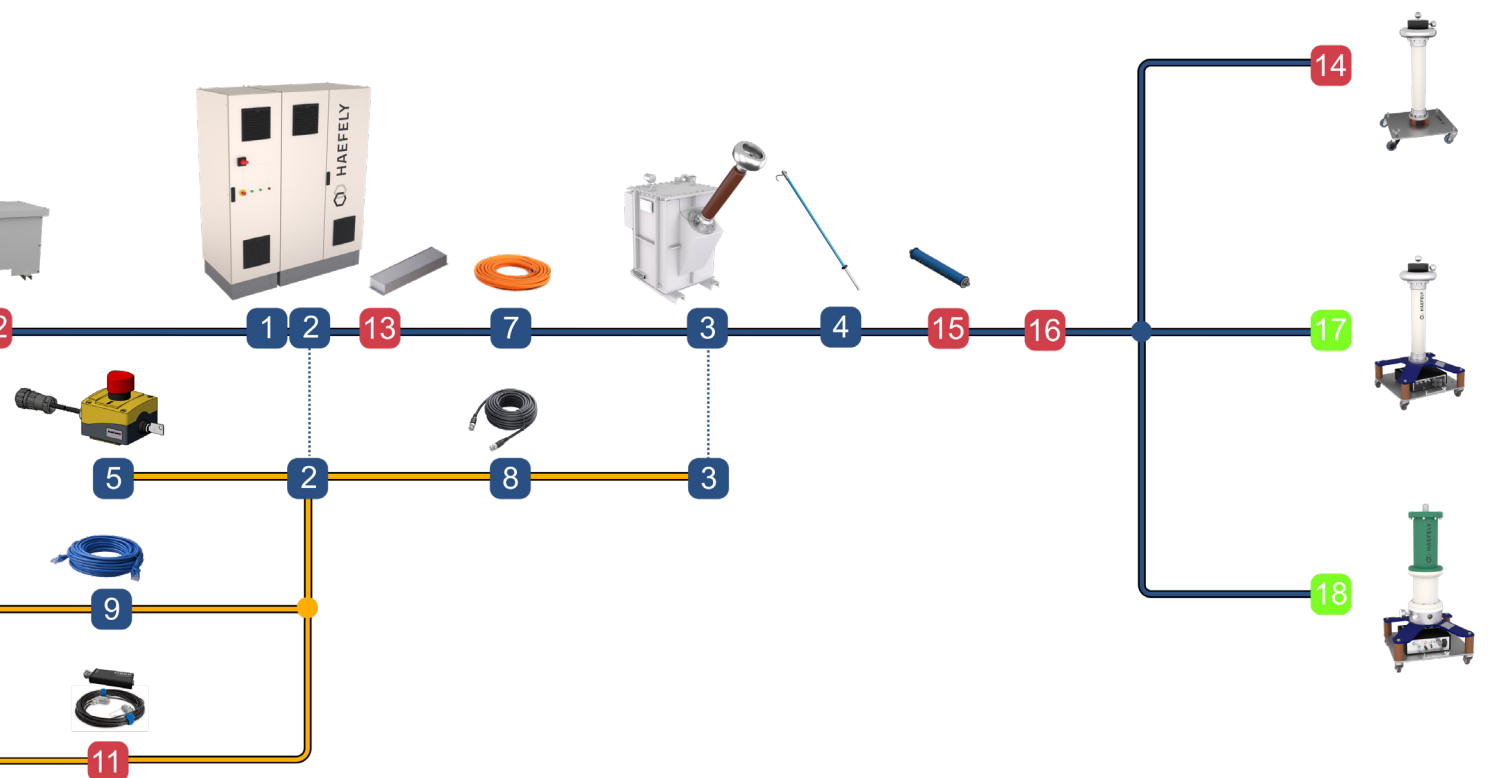
15	Serial output resistor to limit short circuit current during flash		ACS SER RES
16	Automatic earthing switch for ACS test sets - on request		ACS ES

ACS MEASUREMENT OPTIONS

17	ACS complete PD measuring system, including PD detector installed in the coupling capacitor type 9230, with high voltage filter & PD calibrator KAL		ACS PD MEAS
18	ACS complete Cap & Tan d measuring system, Including the IDAS 2823 installed in the nominal capacitor type 3370 and 20 m LEMO measuring ca-		ACS TAND MEAS

ACS COMPUTERS

19	Laptop, Intel processor, Windows 10, 15.6" display, Full HD (1920x 1080)		LAPTOP
19	Working Place inc. Laptop with Windows 10, USB Docking Stat, 24" Monitor, Mouse and Keyboard.		Wk Place
20	Industrial PC (EMC tested, suitable for working in HV laboratories) Intel processor, Windows 10, Monitor 22", keyboard and mouse included.		PCI 811b






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Subject to change without notice.

V21.03



HAEFELY

Current and voltage – our passion



HIGH VOLTAGE

INSTRUMENT

EMC


precision.
swiss made.