

# ACTAS P260+ | P360+ Portable Switchgear Test Systems





# ACTAS

## Portable Switchgear Test Systems

Switchgear devices are situated at the key points of electrical energy transmission and distribution systems. Their reliability has a decisive influence on the availability, safety and economic efficiency of electricity supply systems.

Only regular, on-site tests can ensure that switchgear devices function perfectly throughout their operational life.

ACTAS test systems provide precise information as to the condition of the chamber and drive unit without requiring them to be opened. The sheer number of parameters to be determined, the wide variety of different types of switchgear equipment in use and the harsh environmental conditions encountered during on-site tests place extreme demands on test equipment.

### Comprehensive on-site switchgear testing

Using the integrated control panel of ACTAS P260 + | P360 +, it is possible to carry out complete tests on medium-, high- and extra-high-voltage switchgear. Analysis can be performed quickly, easily, automatically and with a high degree of flexibility within a single test procedure using the following measurements:

- PIR and main contact measurement on up to 12 main contact chambers
- Operating time determination with grounding on both sides on 12 or more contact chambers with PROMET
- Static/dynamic resistance determination on 12 or more contact chambers with PROMET
- Status of up to 12 auxiliary contacts
- Motor current measurement directly or via current clamps
- Coil current measurement on up to three closing and opening coils
- 9 analog/digital sensors for pressure, travel and temperature measurement
- 3 voltage measurement inputs for motor and coil voltages
- 2 relay outputs for controlling external actuators
- Undervoltage release and minimum operating voltage testing with EPOS

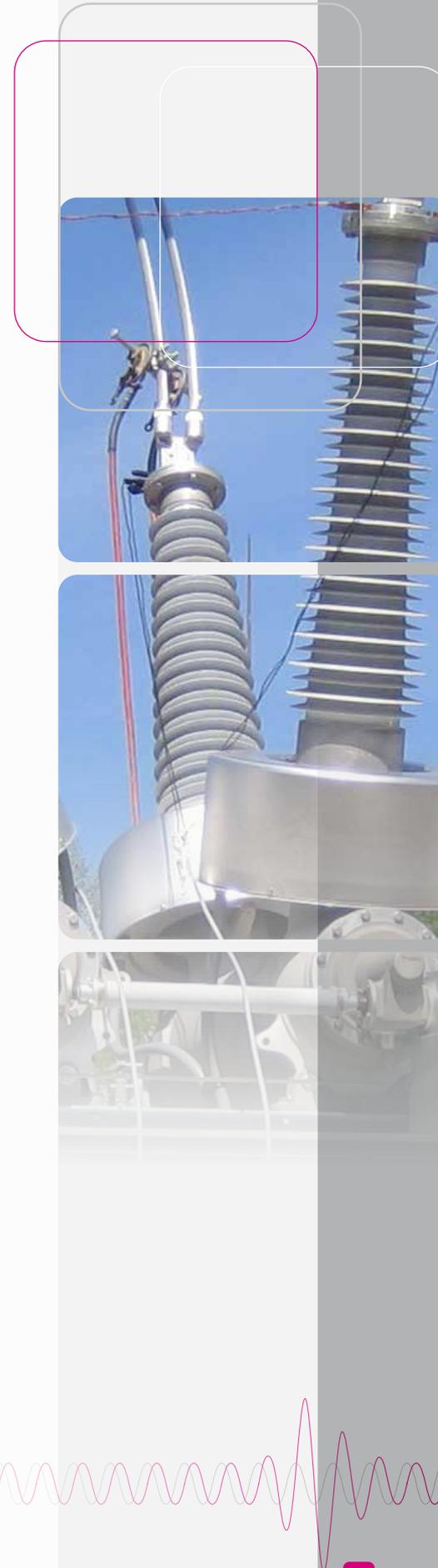
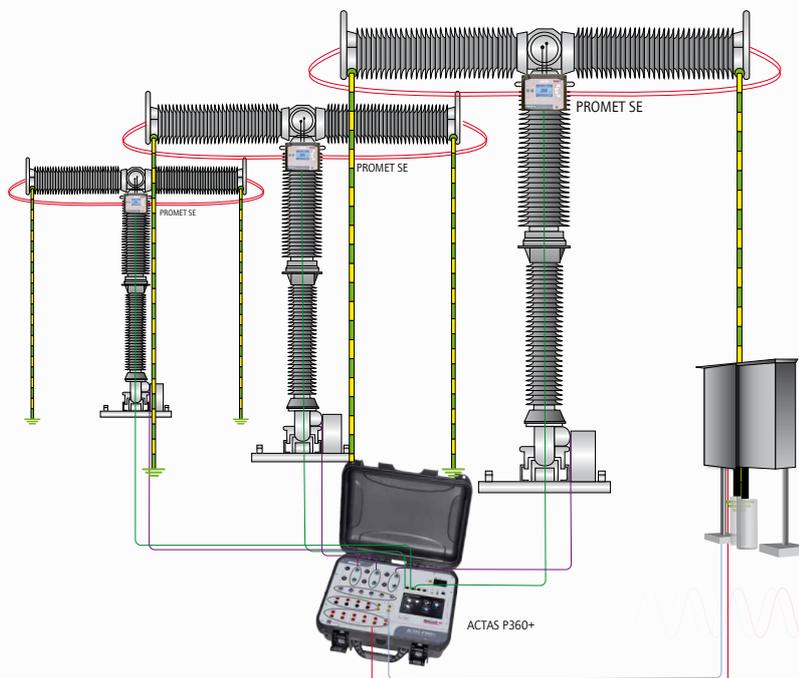
The test fulfils all the requirements stipulated in IEC 62271-100 for assessing the mechanical behaviour of high-voltage circuit breakers.

### Contact travel visualization

In contrast to evaluation via a simple binary signal, as is the case with high-frequency measuring methods, the ACTAS P260 + | P360 + test systems, in combination with PROMET resistance measuring devices, allow sound diagnosis of breaker units over the entire switching process. Measurement results are displayed in curve form. This allows an accurate assessment of the start of travel and the final position of the contacts and even reveals time differences between the movements of the main and resistive contacts.

### Assessing the interrupter unit by analysing contact resistance

Regular measurements of the static and dynamic contact resistance allow an accurate assessment of the condition of the entire contact system. This ensures that maintenance requirements can be identified at an early stage and down times kept to a minimum. Using three PROMET SE ohm meters and the CSW3 connection unit, contact resistance measurements can be carried out on up to 12 main contact chambers and can be incorporated within the test procedure. The test current can be set to a maximum of 200 A. Even very low resistance values in the single-digit micro-ohm range can be measured extremely accurately. The measured values are used for the evaluation of tests and are included in the test report.



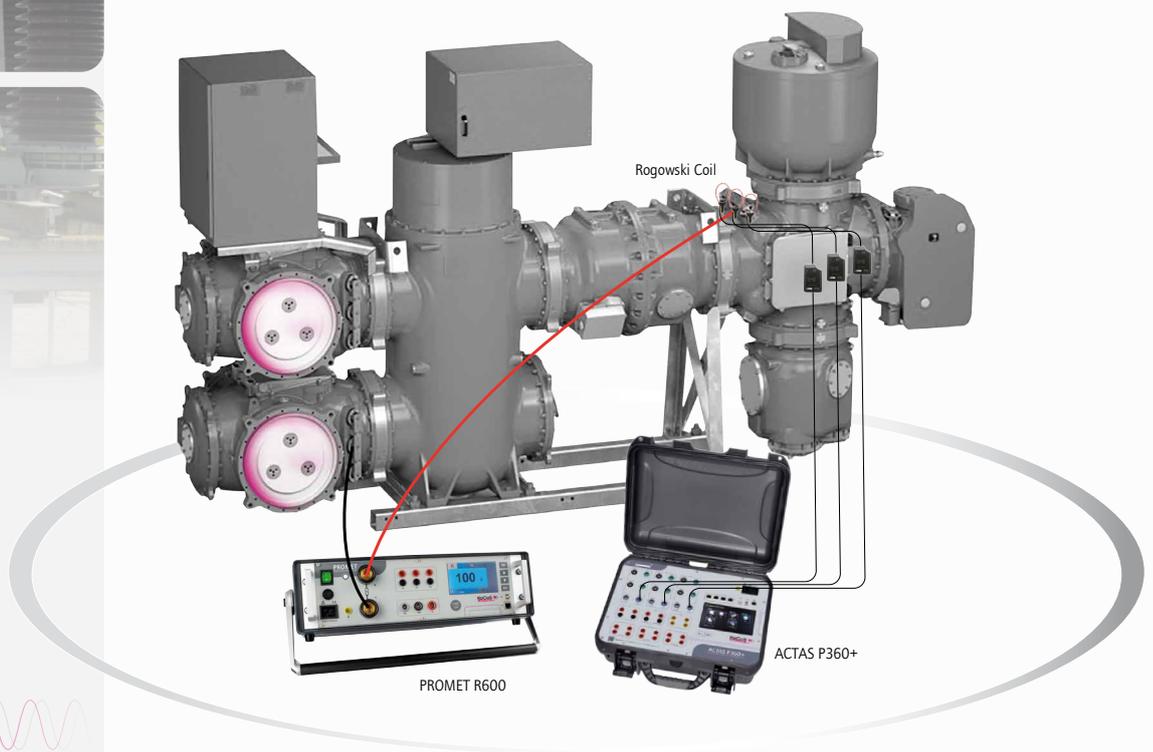


### Static and dynamic measurement

A high contact resistance within a switchgear device leads to high power loss coupled with thermal stress which can potentially cause serious damage to the switchgear device. Problems, such as high transfer resistance resulting from poor connections, can be identified by measuring static contact resistance. Dynamic contact resistance measurements can be used to determine the resistance characteristic during a freely definable switching operation. Measurements of this type give an indication of the length and state of the arcing contacts of high-voltage breakers, for example.

### Testing with earthing on both sides

Switchgear equipment is often tested with earthing on both sides in order to prevent danger caused by capacitively coupled voltages from neighbouring components. However, when switchgear equipment is tested using conventional measuring methods, earthing must be removed on at least one side. When tests are carried out in combination with PROMET, measurements can be carried out with earthing on both sides. For testing GIS systems, Rogowski coils are used, which are attached to the insulated earth electrode in order to measure the switching times via current pulses generated during the switching moment. This provides a great safety advantage, and by eliminating the steps to remove the ground wire, testing becomes easier and faster.



### Motor and coil tests

The ability to connect a powerful AC/DC source makes it possible to test the correct functioning of motors and coils of switchgear devices directly and independently of the station voltage. Analyses of motor and coil operation, through the determination of the minimum operating voltage and through testing undervoltage releases for coils, for example, are reproducible and can always be carried out under identical conditions.

### Integrated operating and evaluation unit

The resistive 7" touch screen, a new operating concept and extra powerful hardware make for easy operation and optimum display of all information. The clear, well-structured user interface is self-explanatory and guides the user quickly and intuitively to complete the task in hand. All test parameters are displayed clearly and can be set directly. The measurement results are shown on the display together with the associated signatures enabling conclusions to be drawn directly as to the state of the switchgear device. A test report can be produced in PDF format to document the test.

### Remote control over Wi-Fi

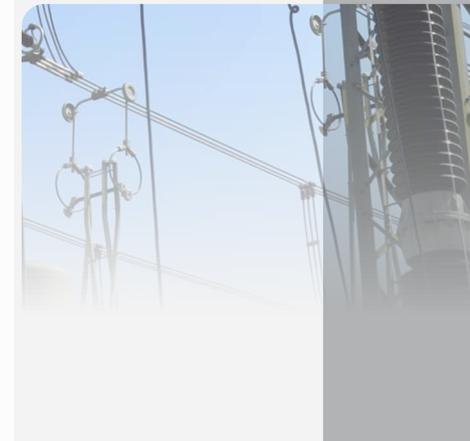
Because ACTAS P260 + I P360 + can be controlled with a smart phone, or tablet etc., the test instrument can also be operated from some distance away. This allows the stipulated minimum distance to be observed when carrying out first trip measurements, for example.

### ACTAS testing software

Configuration and analysis of tests are carried out with the ACTAS testing software and the control panel located on the test system. The experience gained from almost 30 years of developing and manufacturing switchgear test systems and working closely with network operators and switchgear manufacturers has been fully incorporated into the development of the test software.

It is easy for tests to be called up, edited or used as templates. A graph of all measured signal characteristics, featuring zoom functions and measurement cursors, offers a wide variety options for detailed analysis.

Test analysis and test management can also be carried out with a PC. Test data can be imported or exported with a USB flash drive or a network connection.





### Result help

The ACTAS testing software features a comprehensive help function to support users in the selection and evaluation of the measurement results. Descriptions and graphs facilitate the correct interpretation of the results obtained.

### Automatic generation of test reports

For the documentation of the test results, both the device and the PC software offer the option of automatically creating a test report. Results and curves of the recorded signals as well as switchgear data and test parameters are documented in detail. The PC software included in the scope of delivery can also be used to create customer-specific test report templates.

### Accessories



Measuring lead



Screw clamp



Test clamp for main contacts



Terminal adapter



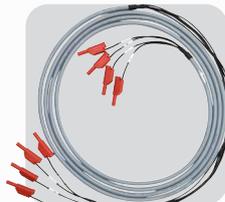
Main contact cable



Auxiliary contact cable



Voltage measurement cable



Coil cable



Current measurement cable

### Compact, robust and reliable

ACTAS P260 + | P360+ are compact, robust test systems which are specially designed for portable use and come in a practical hard-top case. During the development process, special attention was paid to their ability to withstand harsh transport and operational conditions.

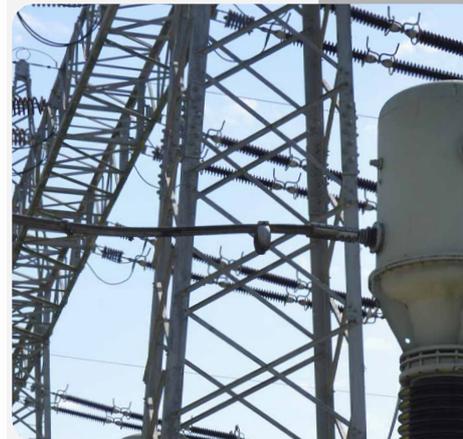
The use of tried and tested hardware components and the very high electromagnetic compatibility of the test systems ensure that they function reliably, even in extra-high-voltage environments.

### Special measurement test monitor PIR

Via the main contact inputs of the ACTAS test systems P260 + | P360 + it is possible to measure the resistance value as well as the time during which the resistance contact is active.

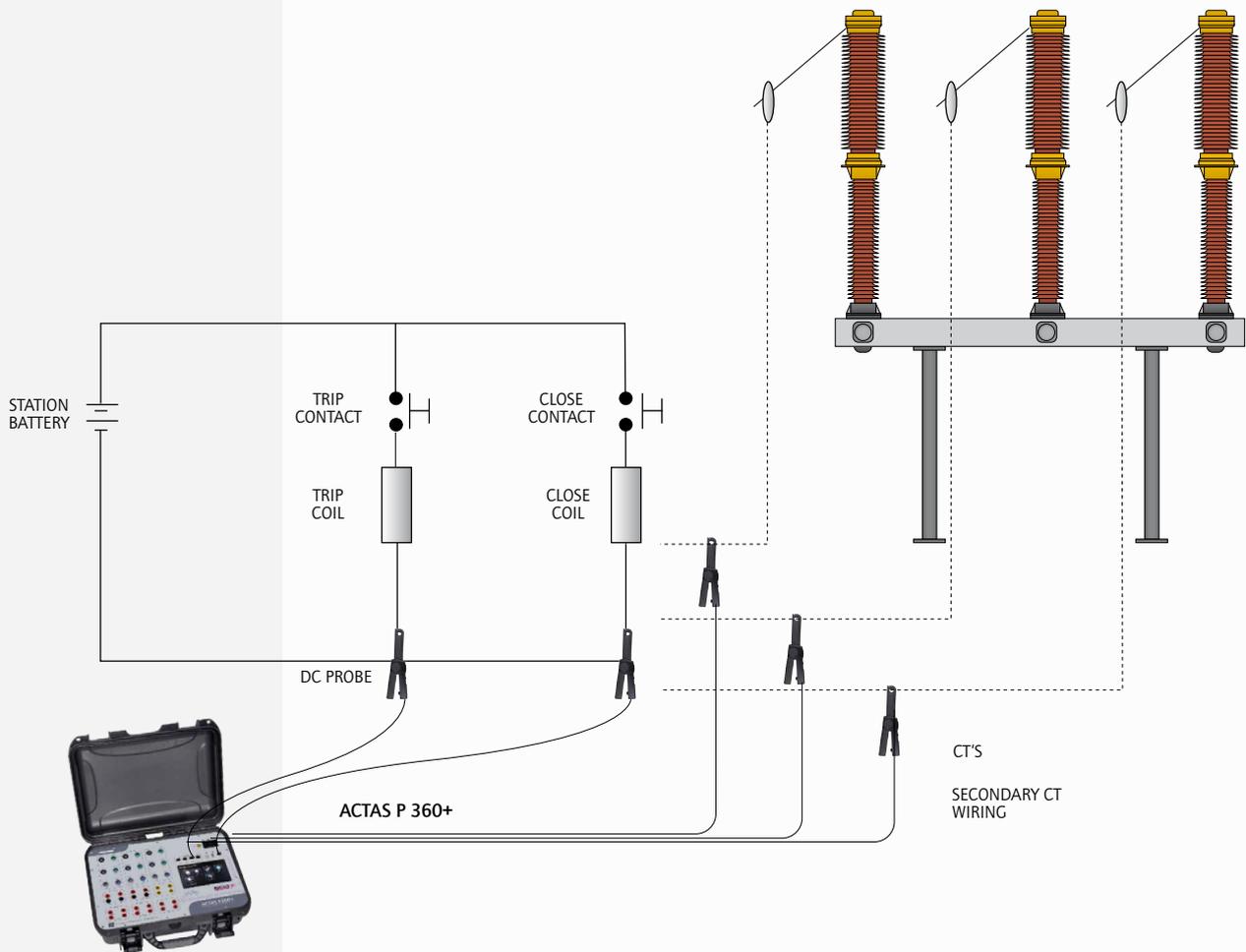
### Testing of gas-insulated medium-voltage switchgear

ACTAS P360+ enables the switching times of a medium-voltage system encapsulated in SF6 gas to be measured in the simplest possible way via the capacitive measuring points of the switch's own VDS system. The connection is made directly to the measurement inputs of the ACTAS test system without any further measurement components..



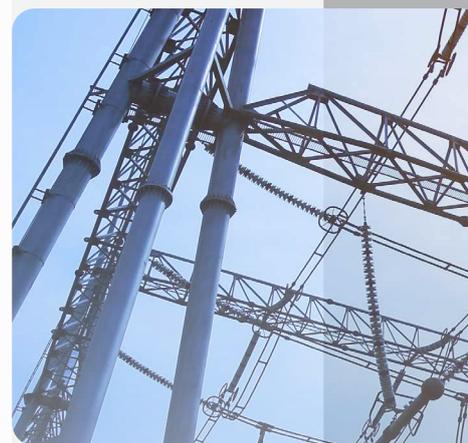
### FIRST Trip Measurements

Due to the wide range of connection options for sensors, ACTAS can also be used to perform first trip measurements. Up to five current clamps are connected to the secondary side of the current transformers and to the coils for this purpose. Using external trigger signals, the ACTAS test system can determine the switching time at the first switching operation fully automatically.



## Technical data

	P360	P260
Operating voltage	110...265 VAC/DC	
Control outputs for closing coils	3	1
Control outputs for opening coils	3	2
Main and PIR contacts	6 x 2	3 x 2
Coil current	3 x 2 (I/O)	1 x 2 (I/O) + 1 x 0
Coil / motor / station voltage	3	1
Motor current via shunt	1	1
Sensor (+ / - 10 V / digital)	6	3
Sensor (+ / - 10 V / 0...20 mA)	3	1
Auxiliary contacts	3 x 4	2 x 4
Reference voltage for sensors 10 VDC / 200 mA	3	1
Relay control outputs	2	1
PC connection	1 x Ethernet	
Interfaces	1 x USB A / 1 x USB B	
Interfaces for external devices	3 x RJ45 for external devices 1 x RJ45 for CSW3	
User interface	7" graphical display with touch screen and 2 function keys	
Housing	Robust hard-top case	
Protection class	IP65 (closed)	
Dimensions (mm)	475 x 375 x 180	424 x 340 x 173
Weight (kg)	6.9	5.3
Gewicht (kg)	6,9	5,3



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