

SAFETY EQUIPMENT

PHASE COMPARATORS

Phase comparators according to IEC/EN 61481 (DIN VDE 0682 Part 431) are designed for testing the in-phase condition of three-phase systems.

Tests for in-phase conditions shall be carried out by skilled or instructed persons only.

Phase comparators have to be tested for correct operation, immediately before and after use.

Phase comparators that do not have a self-testing element have to be tested for correct operation by attaching the phase comparator to parts of the installation which are connected to supply voltage.

Testing in-phase conditions with the aid of a phase comparator is considered as live working.

Phase comparators may only be used for the nominal voltages/nominal voltage ranges as indicated on the rating plate. The operator may be at risk if the phase comparator is used at higher or lower voltages than indicated on the rating plate (incorrect indication, electric shock and arcing).

Phase comparators marked "For indoor and outdoor systems" may not be used in wet weather.

Phase comparators marked "For use in indoor and outdoor installations and for use in wet weather conditions" may be used for indoor and outdoor installations in all weather conditions (e.g. rain, snow, fog and dew).

Restrictions apply to the use of phase comparators according to IEC/EN 61481 (DIN VDE 0682 Part 431) in factory assembled (type-tested) installations.

Due to reduced insulation distances, flashover may occur when inserting the test prod into the installation. The user of the phase comparator or operator of the switchgear installation should consult the manufacturer of the type-tested installation before using the phase comparator.

Design of a phase comparator

Phase comparators according to IEC/EN 61481 (DIN VDE 0682 Part 431) can be used as **two-pole devices** (resistive phase comparator) and as **single-pole devices** (capacitive phase comparator).

The design of the single-pole phase comparator resembles that of a capacitive voltage detector and it uses a microprocessor controlled memory system.

Classified as complete devices, both PHV and PHV I phase comparators are tested as complete devices.

Single-pole phase comparators consist of a handle with handguard, insulating part, indicator and test prod with test electrode. Two-pole phase comparators have an additional connecting cable.

The **insulating part** is the section of the phase comparator between the handguard and the red ring. This insulating part provides adequate safety distance and safe isolation from supply voltage.

The **test prod** with test electrode above the red ring allows the user to reach remote parts of the installation and eliminates the effects of interference fields.

Design of Phase Comparators

The **handguard** provides a visible barrier between the handle and the insulating part and prevents the user from making contact with the insulating part.

The **red ring** indicates the end of the insulating part in the direction of the test electrode. It represents a visible limit and indicates which part of the equipment may make contact with energised components in the installation. The insulating part is located between the red ring and handguard may not make contact with energised components but contact with earthed components is allowed.

The **test electrode** is the part of the phase comparator that is used to make contact with the installation that has to be tested.

