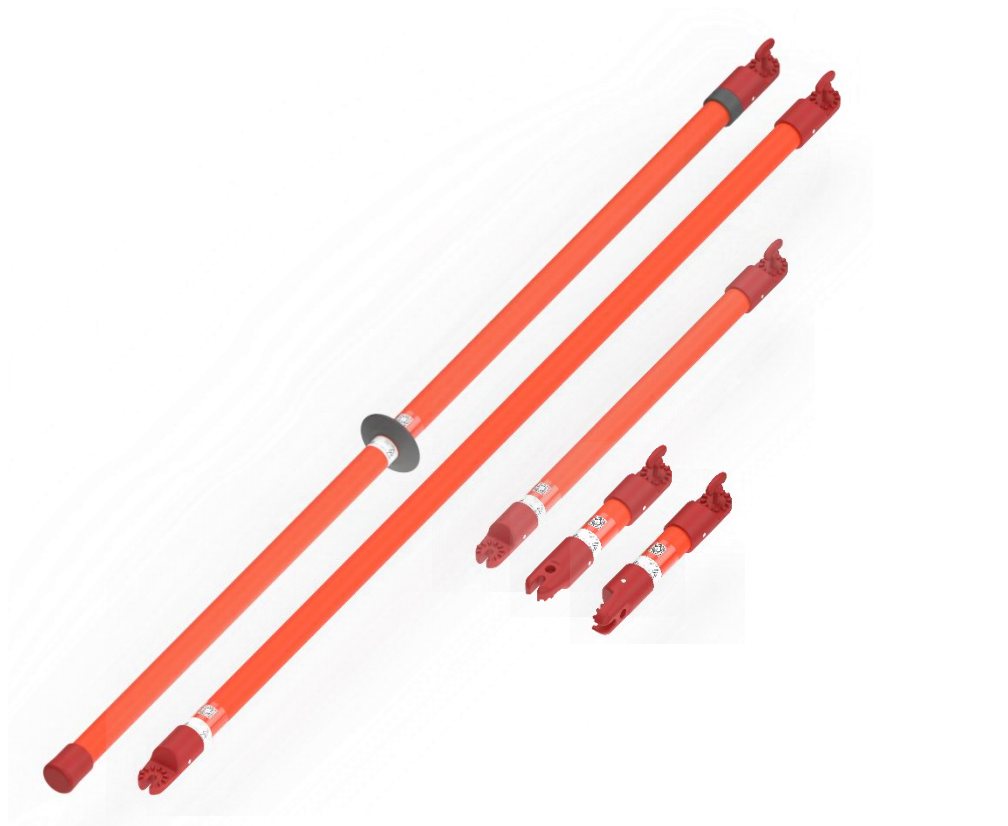


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OPERATING INSTRUCTIONS

Insulating handling stick L=1,3 m, up to 36 kV AC / 54 kV DC with intermediate elements



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1. PURPOSE

The insulating operating stick together with intermediate elements is intended for cleaning electrical equipment using a moistening method, for saturating cable terminations, and for handling bolted connections performed under live conditions up to 36 kV AC / 54 kV DC. They are used to carry out work with interchangeable tools mounted on them.

2. REQUIREMENTS

The requirements for the stick and intermediate elements are based on the following standards:

- PN-EN 60832-1:2010 Live working – Insulating sticks and attachable devices – Part 1: Insulating sticks
- PN-EN 60832-2:2010 Live working – Insulating sticks and attachable devices – Part 2: Attachable devices
- PN-EN 50110-1:2005 Operation of electrical installations

Each insulating element must have a marking indicating suitability for live working (Fig. 1).

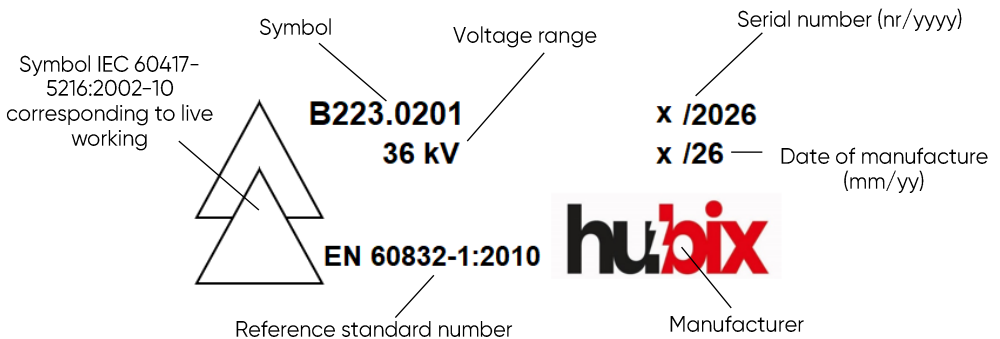


Fig.1 Label explanation.

3. REQUIREMENT FOR SAFE USE OF THE SYSTEM

Live working equipment may only be used by persons authorized by the operator of electrical installations, under conditions specified in live working instructions approved by the operator. **Insulating elements must not be used without first being mounted on the insulating stick!**

4. CONSTRUCTION

The stick (Fig. 2) has a hand guard and a limiting mark. The section between the hand guard and the beginning of the limiting mark is the insulating part. The operator may hold the pole only by the handle, i.e., below the hand guard.

The minimum length of the insulating section between the hand guard line and the limiting mark is 600 mm. Contact with live equipment is permitted only up to the limiting mark.

The stick is equipped with a splined end-fitting enabling attachment of various tools. Extensions and intermediate elements (Fig. 3) are fitted on one side with a splined end-fitting for attaching universal working elements and interchangeable tools, and on the other side with a splined socket allowing connection to the operating stick.

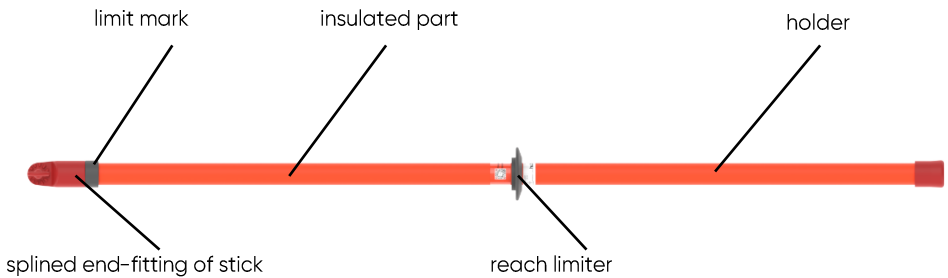


Fig. 2 Insulating stick

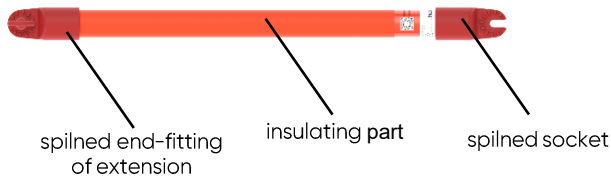


Fig. 3 Intermediate elements

5. PREPARATION FOR WORK

Before each use, inspect the insulating equipment by checking:

- surface condition (insulating properties) – the surface should be clean, with no visible traces of electrical discharges, tracking, or contamination paths that may conduct current;
- proper operation – no mechanical damage, no visible surface defects, and no damage to splined ends;
- validity of periodic tests.

IF ANY IRREGULARITIES ARE FOUND, THE STICK OR INTERMEDIATE ELEMENTS MUST BE WITHDRAWN FROM USE!

6. PROCEDURE IN CASE OF WEAR OR DAMAGE

Excessively worn or damaged components must be replaced with new ones.

The manufacturer is not responsible for unauthorized modifications or the use of tools not intended for live working.

The manufacturer guarantees full service support.

7. MAINTENANCE

The stick and intermediate elements must be cleaned after each use.

Clean using a dry cloth. It is recommended to wipe insulating surfaces with a cloth soaked in a silicone preparation intended for regenerating insulating equipment used for live working.

8. PERIODIC TESTS

The stick and intermediate elements are subject to periodic inspections. Tests should be carried out at least once a year according to the instructions. These are minimum requirements and may be adjusted depending on usage conditions.

8.1 Preparation for testing

Equipment must be clean and dry. Store for at least 4 hours under test conditions before testing.

Atmospheric conditions

Tests should be conducted under the following atmospheric conditions:

- temperature: 18°C to 28°C
- relative humidity: 45% to 75%
- pressure: 860 hPa to 1060 hPa

8.2 Visual inspection

The equipment must have clear markings for live working suitability. The surface must be clean and free of discharge traces or contamination paths.

8.3 Functional check

No mechanical damage should be present. Each element must be checked for proper attachment of tools.

8.4 Electrical tests

8.4.1 Stick and extension testing

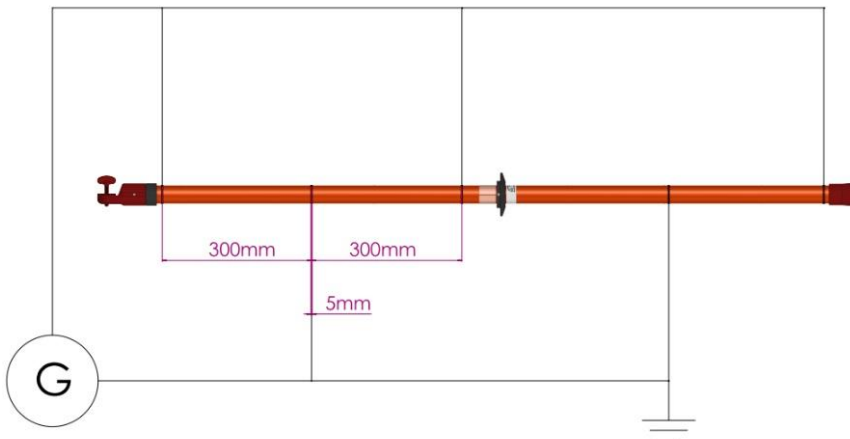


Fig. 4 Electric strength testing circuit

A test voltage of 100 kV / 50 Hz is applied to electrodes spaced 300 mm apart.

The voltage should reach maximum within 10–20 seconds.

Test duration: 1 minute.

Test is successful if:

- markings are present and legible;
- no damage or excessive wear is detected;
- tool attachment is correct;
- no flashover or breakdown occurs;
- no discharges or surface damage appear;
- no noticeable temperature increase occurs.

8.4.2 Intermediate elements testing

All attached elements are tested for bridging protection. Test voltage: $1.2 U_n$ (maximum rated voltage).

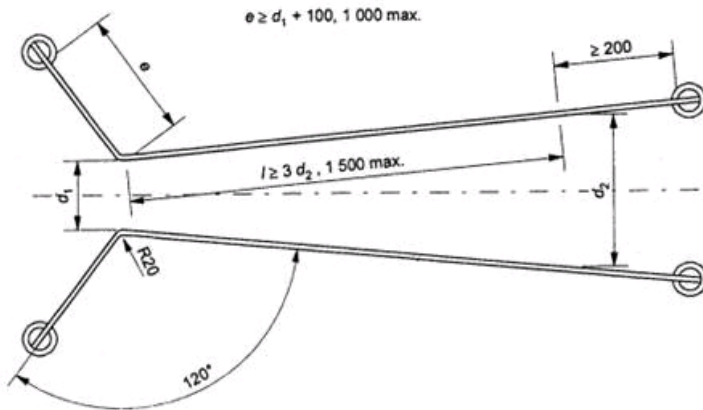


Fig. 5 Circuit for the testing of protection against bridging and spark discharge resistance

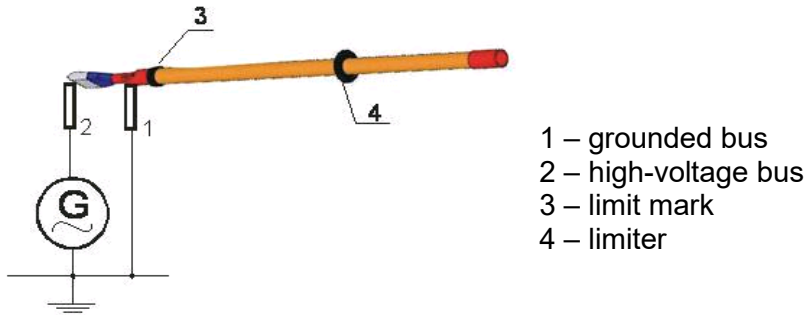


Fig. 5a General bridging protection testing setup

The test voltage with an RMS value of 43,2 kV / 50 Hz should be applied to the bars spaced as follows:

$$d1 = 180 \text{ mm,}$$

$$d2 = A1 + d1 + 200 \text{ mm}$$

where A1 – insertion depth (dimension from the limiting mark to the end of the attached element).

First stage

The tested element, attached to the insulating operating pole, should be placed on the grounded bar at the narrowed section where the distance between the electrodes equals d_1 , so that the tip of the attached element presses against the live bar.

Then, the tested element should be rolled along the bars to the final position (where the limiting mark is on the grounded bar), while maintaining contact of the element with both bars (Fig. 6).

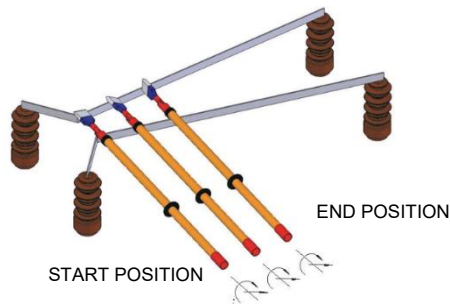


Fig .6 Testing protection against bridging, first stage

Second stage

The tested element, attached to the insulating operating pole, should be placed on the bars at the narrowed section defined by dimension d_1 , so that the tip of the element touches the live bar.

Then, the element should be rotated (without rolling) and moved towards the live bar until the limiting mark is on that bar. During the test, contact with both bars must be maintained (Fig. 7).

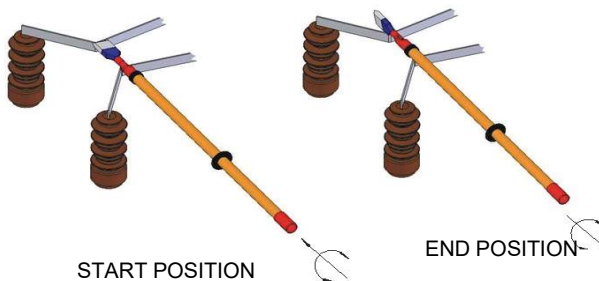


Fig .7 Testing protection against bridging, second stage

9. STORAGE AND TRANSPORT

Store and transport equipment in protective cases to prevent mechanical damage. Keep in dry rooms, away from heat sources and chemically aggressive environments. Protect from sunlight.

10. PI SYSTEM

The insulating equipment is marked with a QR code (Fig. 8). The PI system enables remote access to product documentation, validity of test inspections, and operational activities. To use it, scan the QR code located on the insulating equipment using a camera or another QR code reader application on a mobile device with cellular or Wi-Fi access.



Fig. 8 QR code (PI system)

11. WARRANTY

A warranty is granted for a period of 24 months from the date of sale of the product.

In the event of defects caused by improper manufacturing or the use of unsuitable materials, HUBIX undertakes to carry out free repairs during the warranty period or, if necessary, to replace defective parts, provided that the validity of the claim is confirmed by the Quality Control Department of our company.

The warranty becomes void in the following cases:

- mechanical damage resulting from improper transport or storage by the customer;
- mechanical damage to the insulated surface;
- use of the product contrary to the operating instructions;
- unauthorized replacement or repair of original parts;
- structural modifications;
- improper assembly or operation of the product.

Repairs carried out during the warranty period extend the warranty period by the duration of the repair.

If warranty terms are defined differently in contracts, the contractual provisions shall apply.

When submitting a complaint, the following information must be provided:

- reason for the complaint;
- non-conformity parameter;
- extent of damage;
- invoice number or pole serial number.