HORSTMANN
GERMANY

# Instructions for Use

## Wega T1/ Wega T1 vario


104101-5527V1
EN
March 2025

# Contents

## General Information

The instructions must be read in full before using the device and kept in a safe place for future reference.

They reflect the latest technical standards at the time of printing. We reserve the right to make technical changes at any time and without prior notice as necessary in the context of ongoing developments. On publication of new technical documentation, the old document becomes invalid.

Installation, connection and commissioning of the device must be carried out by a qualified electrician. Among other things, the five safety rules according to DIN VDE 0105 must be observed.

## Important Terms

The terms listed below protect life and limb and determine the service life of the devices.

### DANGER

... indicates a dangerous situation that, if not avoided, can lead to death or serious injury.

### WARNING

... indicates a dangerous situation that, if not avoided, can lead to death or serious injury.

### CAUTION

... indicates a dangerous situation that, if not avoided, can result in wounds and minor injuries.

### NOTE

... is used when giving tips on using the device and has no reference to personal injury.

## CE Declaration of conformity

This device is in conformity with the requirements of the EC Electromagnetic Compatibility (EMC) Directive in their current form.

If required, the CE Declaration of Conformity may be obtained from the following address:

HORSTMANN GERMANY

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## General Safety Instructions

### DANGER

- Wega T1/ Wega T1 vario voltage detecting system may only be installed and used to determine the voltage status by a qualified electrician or by a person trained in electrical engineering.
- The five safety rules according to DIN VDE 0105 must be observed
  - Disconnect installation from the supply
  - Secure against being switched on again
  - Verify that the installation is dead
  - Earth and short-circuit the installation
  - Provide protection against all adjacent live parts or prevent access with barriers
- The display "Voltage present" or "Voltage not present" in accordance with DIN EN IEC 62271-213 is ensured if the Wega T1/ Wega T1 vario is used in accordance with its rated voltage and rated frequency and the adaptation to the overall system has been carried out.
- The measuring points are not an LRM interface and must not be used to determine the absence of voltage or for phase comparison.
- Before entering the medium-voltage range, check that all poles are de-energised.
- Damaged units which do not have a guaranteed level of functional efficiency or safety or which no longer have clearly legible labels may not be used.
- Before each use, the user must ensure that the unit is in perfect condition.
- Wega T1/ Wega T1 vario may only be used for the purpose specified in this manual.
- The right to claim under warranty shall be invalidated in the event of damages caused by a failure to observe the Instructions for Use. Horstmann is not liable for any consequential damage arising from or relating to this non-observance.
- Only use Wega T1 / Wega T1 vario voltage detecting system indoors.

### CAUTION

- Under unfavourable lighting conditions, shield or additionally illuminate the optical display.
- Store and transport Wega T1/ Wega T1 vario voltage detecting system under dry and clean conditions. Any damage must be avoided.

## Abbreviations

| Abbreviation | Meaning |
|---|---|
| LCD | Liquid crystal display |
| LRM | Low resistance modified |
| VDS | Voltage detecting system |

# 1 Intended Use

The Wega T1 and Wega T1 vario are three-phase voltage detecting systems for touch-safe insulated medium-voltage applications. They are typically used for connection to medium-voltage transformers that do not have a direct measuring point on the medium voltage. The test point of the MV connector sets is used here to determine the absence of voltage. In the complete system, the Wega T1/ Wega T1 vario is pre-mounted in a wall-mounted housing and can be securely fixed in clear view in close proximity to the transformer.

With correct layout and installation, the Wega T1/ Wega T1 vario is a suitable device for determining the absence of voltage in accordance with DIN VDE 0105 Part 100.

With regard to the response thresholds of the LCD display, the device fulfils the requirements for voltage detection and indication systems (VDIS) in accordance with DIN EN IEC 62271-213, which are capacitively coupled to active parts. This system is only approved for the medium-voltage connectors listed in chapter 8.

# 2 Device description

## 2.1 Scope of delivery

Complete set Wega T1:

- 1 Wega T1 voltage detecting system (customisation by arrangement)
- 1 wall housing
- 1 set of wall mounting brackets (4 pieces)
- 1 set of 3 m coaxial cables with cable ties
- 1 earthing cable 30 cm

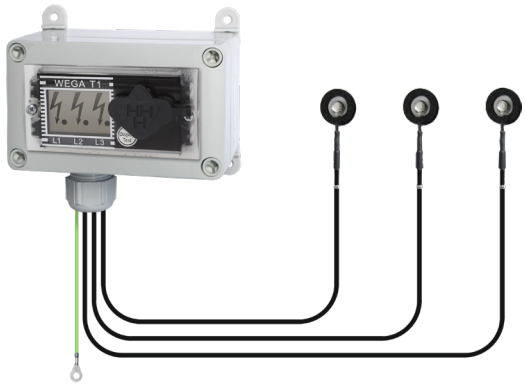


Fig. 2.1: Complete set Wega T1

- Optional:
  1 set of medium-voltage connectors approved for this application (see list of suitable medium-voltage connectors in chapter 8 “Technical data”

Complete set Wega T1 vario:

- 1 Wega T1 vario voltage detecting system with "low-range" capacitor cube
- 1 wall-mounted housing
- 1 set of wall mounting brackets (4 pieces)
- 1 set of 3 m coaxial cables with test point adapters
- 1 earthing cable 30 cm
- 1 set of cable ties for fastening the connecting cables
- 1 bag with accessories for test points and test point adapters

Fig. 2.2: Complete set Wega T1 vario

## 2.2 Display unit

- Plug-in housing for panel-mount: 96 mm x 48 mm, installation depth: 20 mm.
- The LCD display is powered by the measuring voltage. Auxiliary voltage is not required.

## 2.3 Connections and controls

### 2.3.1 Front page

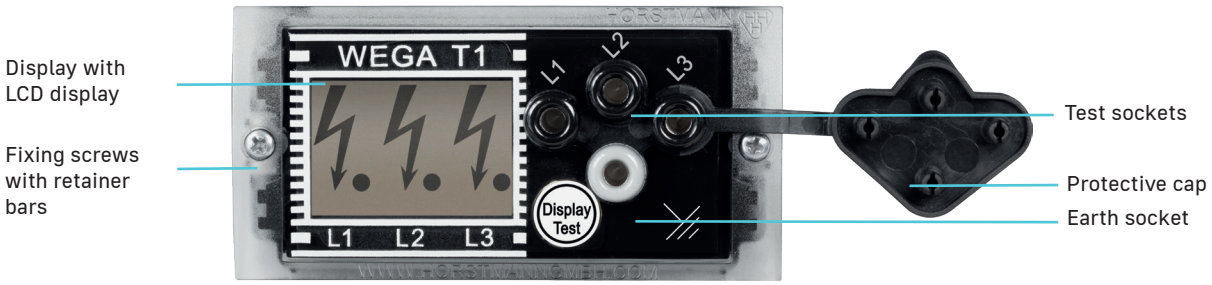


Fig. 2.3: Front view Wega T1/ Wega T1 vario

**DANGER**

The test sockets do not fulfil the requirements for LRM interfaces in accordance with DIN EN IEC 62271-213 and cannot be used to determine the absence of voltage or for phase comparison.

## 2.3.2 Rear View - Settings of the Capacitor Cube for the Wega T1 Vario

### 2.3.2.1 Fitting and removing the capacitor cube

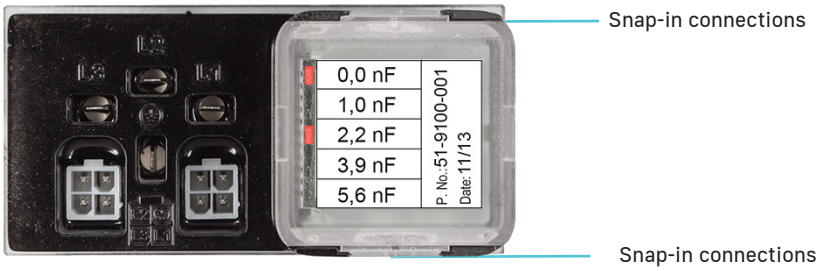


Fig. 2.4: Rear view of Wega T1 vario with snap-in connections

Insert the capacitor cube:

1. Insert the cube into the opening.
2. Engage the snap-in connections.

**NOTE**

When the capacitor cube is snapped into place:

- Connection point is sealed
- Contact to adaption capacitors is present

Removing the capacitor cube:

1. Press and release the snap-in connection.
2. Pull the capacitor cube out of the housing.

### 2.3.2.2 Adjusting the capacitor cube

Insert one or more jumpers to adjust the required capacitance.

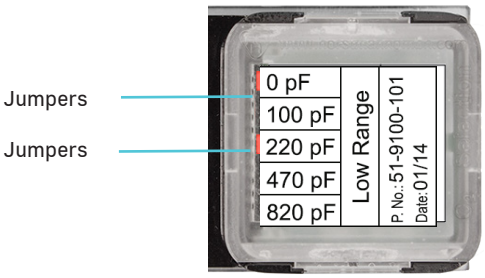


Fig. 2.5: View of capacitor cube with view of jumpers

# 3 Functional principle

## 3.1 Operation

The medium voltage can be detected via a capacitive divider consisting of a coupling capacitor in the medium-voltage connector and an adaption capacitor in the Wega T1/ Wega T1 vario. If the voltage at the divider exceeds or falls below defined limit values, "Voltage present" or "Voltage not present" is displayed.

## 3.2 Display indication

The display can be found on the front face of the device.

| Display | Meaning |
|---|---|
|  | Voltage present<br>Threshold value for voltage presence indication: 0.1 - 0.45 x Un. Installation note: The voltage signal is too low when operating the system at nominal voltage. The cause is usually the selected adaptation capacitor which is too large or the operation of the switchgear at a nominal voltage that is lower than originally envisaged. |
|  | Voltage is present and has passed integrated maintenance test<br>The current flowing through the display unit meets the current monitoring requirements of IEC 61243-5 (section 5.28) and IEC 62271-213 (section 11.4.2). A repeat test is not necessary due to the continuous monitoring.<br>**NOTE**<br>When using the LRM interface, there is a possibility that the voltage may drop, resulting in the extinguishing of the point symbol. |
|  | Voltage present and integrated maintenance test passed, but voltage signal too high<br>Installation note: Voltage signal too high. The cause is usually the selected adaptation capacitor which is too small, an earth fault or the operation of the switchgear at a nominal voltage that is higher than originally envisaged. |
|  | Voltage not present<br>In the all-pole switched-off state of the system, all symbols are switched off.<br>Applied voltage <0.1 x Un.. |

Tab. 3.1: Display symbols

## 3.3 Functional test

A function test is carried out in the installed and inactive state using the display test button.

- Press the ‘Display test’ button.
- All symbols on the LCD display are activated momentarily.

**DANGER**

The specified indication does not appear

- Wega T1/ Wega T1 vario is defective.
- Do not use the display for voltage detection!

## 3.4 Voltage Detection

The Wega T1/ Wega T1 vario is suitable for continuous operation. The voltage detecting system on the transformer to which the Wega T1/ Wega T1 vario is attached is therefore continuous.

The voltage status is shown for each phase on the LCD display (s. Tab. 3.1).

# 4 Installation

**DANGER**

Before installation or removal, it must be clearly established that the switchgear is de-energised; the five safety rules (see safety instructions at page 4) must be observed in all cases. Under no circumstances may installation or removal be carried out while the device is energised, and before installation it must be checked that the rated voltage specified on the type plate of the Wega T1/ Wega T1 vario voltage detecting system corresponds to the rated voltage of the transformer station.

## 4.1 Installing the wall-mounted housing

The wiring inside the wall-mounted housing has already been completed at the factory. After modifying the capacitor cube, the wall housing must be firmly closed again.

The wall-mounted housing can be mounted either on a mounting plate, a front panel or on a wall using the four wall mounting brackets included in the scope of delivery.

The earth connection of the wall-mounted housing must be connected to the earth of the transformer station via the M6 claw cable lug. The connection must be secure and durable and, if necessary, protected against corrosion.

## 4.2 Electrical connection of the coaxial cables

**NOTE**

Before electrically connecting the Wega T1/ Wega T1 vario voltage detecting system to the capacitive coupling points, it must be ensured that the medium-voltage connectors have been fully connected to the medium-voltage cable and to the transformer bushings in accordance with the manufacturer's installation instructions.

Only then may the Wega T1/ Wega T1 vario voltage detecting system be connected to the capacitive coupling points of the medium-voltage connectors using the coaxial cables supplied.

The following sequence must be observed for the electrical connection.

### Step 1:

Remove the cover cap of the capacitive coupling point of phase L1 from the medium-voltage connector, remove the original screw and washer and do not use any further. The cover cap is still used.

Fig. 4.1: Removing the cover cap, screw and washer

### Step 2:

Place the eyelet of the coaxial cable (marking "L1") with the inserted screw and the white insulating disc on the capacitive coupling point and tighten the screw. Make sure that the eyelet does not twist when tightening.

Fig. 4.2: Connecting the coaxial cable

**Step 3:** Align the cable feed and secure it to the medium-voltage connector with a cable tie to protect the supply cable.


Fig. 4.3: Fixation with cable ties

**Step 4:** Replace the cover cap of the capacitive coupling point of the medium-voltage connector and press on firmly.

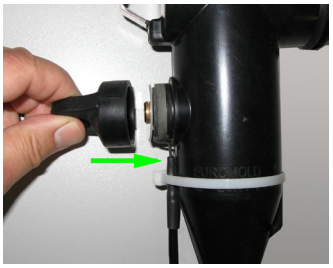

Fig. 4.4: Attaching the cover cap

**NOTE**

To install the coaxial cables for phases L2 and L3, repeat steps 1 to 4 accordingly.

**DANGER**

The medium voltage may only be switched on when all medium voltage connectors and coaxial cables are fully connected.

## 4.3 Setting the Wega T1 vario

To ensure the correct function of the voltage detecting system of the Wega T1 vario, the adaption capacitor in the Wega T1 vario must be set depending on the nominal voltage of the system and the medium voltage connector used, see Fig. 4.1. On delivery, the Wega T1 vario is set to "220 pF".

| Nominal voltage<br>Vn | Connector Type<br>Medium-voltage connectors | $C_2$ | Jumper position<br>Low Range Cube |
|---|---|---|---|
| 10...15 kV | Cellpack | 0 pF | 100 pF<br>220 pF<br>470 pF<br>820 pF |
| 16...24 kV | CGS 250 A<br>CWS 250 A | 220 pF | 100 pF<br>x 220 pF<br>470 pF<br>820 pF |
| 6...10 kV | Nexans/ Euromold<br>(K)200LR/G/VD<br>(K)200SR/G/VD | 0 pF | 100 pF<br>220 pF<br>470 pF<br>820 pF |
| 10...15 kV | | 220 pF | 100 pF<br>x 220 pF<br>470 pF<br>820 pF |
| 15...24 kV | | 570 pF | x 100 pF<br>220 pF<br>x 470 pF<br>820 pF |
| 8...15 kV | TE/ Raychem | 0 pF | 100 pF<br>220 pF<br>470 pF<br>820 pF |
| 12...24 kV | RSES-VD-525x<br>RSSS-VD-525x | 220 pF | 100 pF<br>x 220 pF<br>470 pF<br>820 pF |

Tab. 4.1: Adjustment the capacitor cube

If a different setting is required, the cover of the wall-mounted housing must be unscrewed. The capacitor cube on the back of the Wega T1 vario can then be pulled out of the housing (press the snap-in connections together). The jumper can be used to set the capacitor value required according to Fig. 4.1. The currently selected position of the jumper can be recognised by the red marking in the viewing window of the capacitor cube.

For details on handling the capacitor cube, see sections 2.3.2.1 and 2.3.2.2.

## 4.4 Electrical connection of the test point adapters

### NOTE

Before electrically connecting the Wega T1 vario voltage detecting system to the capacitive coupling points, it must be ensured that the medium-voltage connectors are fully connected to the medium-voltage cable and the transformer bushings in accordance with the manufacturer's installation instructions. Only then may the Wega T1 vario voltage indicator be connected to the capacitive coupling points of the medium-voltage connector using the coaxial cables supplied.

### DANGER

Depending on the type of medium-voltage connector, it may be necessary to touch the capacitive coupling points when installing the voltage indicator. The switchgear must therefore be disconnected and earthed before installation.

The following sequence must be observed for the electrical connection:

### Step 1: Preparation of the test points

Depending on the type of medium-voltage connector, the test point must be prepared for connecting the test point adapter. The necessary accessories can be found in the enclosed accessory bag.

a. Remove the original manufacturer's cover from the test point.

b. If the test point (especially the contact surface) is dirty, it must be cleaned with a clean, dry cloth.

c. The exposed test point must be prepared for connection of the test point adapter as follows:

Medium-voltage connectors:

| | |
|---|---|
| **Cellpack**<br>CWS 250A<br>CGS 250A | No measures required |
| **Nexans / Euromold**<br>(K)200LR/G/VD<br>(K)200SR/G/VD | Insert the dowel pin into the opening of the contact surface (see Fig. 4.5). The notches must be on the rear side of the dowel pin |
| **TE Connectivity**<br>RSES-VD-525-x<br>RSSS-VD-525-x | Screw the M8 grub screw into the M8 threaded hole in the contact surface and tighten lightly (see Fig. 4.6). |

### Inserting the notch pin and grub screw into the contact surfaces of the test points

Fig. 4.5: Nexans / Euromold

Fig. 4.6: TE Connectivity

## Notch pin and grub screw inserted in contact surface of the test points

Fig. 4.7: Nexans / Euromold

Fig. 4.8: TE Connectivity

### NOTE

After inserting the dowel pin or the M8 grub screw, visually check that it is flush with the surface of the contact area.

This is the only way to ensure that the contact spring in the test point adapter makes contact with the test point.

## Step 2: Preparation of the test point adapters

Depending on the type of medium-voltage connector, the test point adapter must be prepared before installation.

Medium-voltage connectors:

| | |
|---|---|
| **Cellpack**<br>CWS 250A<br>CGS 250A | Remove the intermediate adapter (e.g. with a blunt screwdriver) from the test point adapter, see Fig. 4.6.<br>Never use a sharp tool (e.g. knife) that could damage the housing of the test point adapter. |
| **Nexans / Euromold**<br>(K)200LR/G/VD<br>(K)200SR/G/VD | No measures required. |
| **TE Connectivity**<br>RSES-VD-525-x<br>RSSS-VD-525-x | No measures required. |

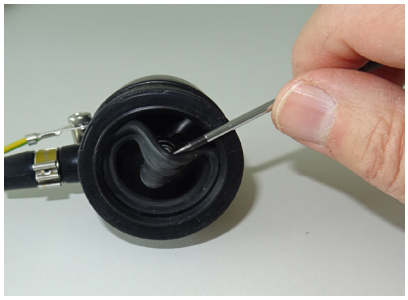

Fig. 4.9: Intermediate adapter

Then coat the inside of the test point adapter with the enclosed silicone grease (see Fig. 4.7).

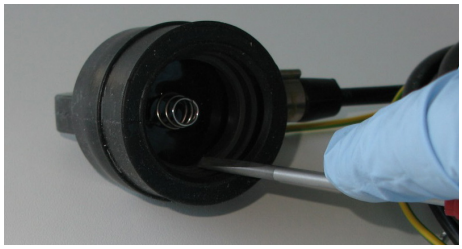

Fig. 4.10: Coating the inside of the test point adapter with silicone grease

For example, you can use the tip of a screwdriver and apply a little silicone grease to it. Alternatively, the silicone grease can also be applied with the fingertip, but protective gloves (e.g. made of latex) should be worn to avoid skin contact with the silicone grease.

**DANGER**

Avoid touching the contact spring in the centre of the test point adapter; this contact spring must not come into contact with the silicone grease.

### Step 1: Attaching the earth cable

Before attaching the test point adapters to the test points of the elbow connector, the earth connection cables of the test point adapters must be securely and permanently connected to earth potential via the A6 claw cable lugs.

### Step 2: Place the test point adapter on the test point of the elbow connector

Place the test point adapter on the capacitive coupling point of the medium-voltage connector and press until it clicks into place (see Fig. 4.8).

Fig. 4.11: Placing the test point adapter on the test point of the elbow connector

### Step 3: Attaching the connecting cables

The coaxial cables of the test point adapter must be attached to the shielded and earthed sheaths of the medium-voltage cables using the cable ties provided, for example, see Fig. 4.9.

Fig. 4.12: Attaching the connecting cables

**NOTE**

To install the test point adapter for phases L2 and L3, repeat steps 1 to 5 accordingly.

**DANGER**

The medium voltage may only be switched on when all medium voltage connectors and coaxial cables are fully connected.

## 4.5 Removal

To remove, insert a flat-blade screwdriver into a gap in one of the two fixings and turn. The unit then detaches from the section.

# 5 Commissioning

To adapt the Wega T1/ Wega T1 vario to different switchgear, coupling capacitors, nominal voltages or cable lengths, an adaption capacitor must be determined before commissioning.

## 5.1 Checking the installation before switching on the voltage for the first time

- Is the wall-mounted housing securely fastened and the cover screwed on?
- Is the earthing cable connected to earth?
- Are all three test point adapters firmly attached to the capacitive test point of the elbow connector?
- Are all cables fixed and secured with cable ties?
- Has the capacitor cube been set to the correct type of medium-voltage adapter?

## 5.2 Visual check after switching on the voltage for the first time

A correct customisation is deemed to exist, if:

- the arrow signal and the point symbol are visible for all three phases L1, L2 and L3.
- An incorrect customisation is deemed to exist if:
- the over voltage detecting system (tool symbols) is visible (adaption capacitor too small);
- the dot symbols are not visible (adaption capacitor too large);
- the arrow symbols can only be seen faintly (adaption capacitor much too large).

In these cases, the correct setting of the capacitor cube must be checked in accordance with Fig. 4.1 (medium-voltage connector type, rated voltage, plug-in position of capacitor cube).

# 6 Maintenance

## 6.1 Servicing

Ensure that the Wega is kept in a clean and dry state. Otherwise, the device is maintenance-free.
The device contains no batteries or any other parts which need to be replaced by the user.

## 6.2 Maintenance test

Maintenance tests on voltage detecting systems must be carried out in accordance with DIN EN IEC 62271-213. The dates of maintenance tests are regulated by the respective legal regulations of the places of use, e.g. in Germany maintenance test is compulsory after 6 years at the latest.

The Wega has a mechanism that constantly monitors the current through the display unit. The Wega therefore fulfils the requirements for current monitoring in accordance with DIN EN IEC 62271-213 (section 11.4.2). Maintenance test is not absolutely necessary due to this permanent monitoring.

As the LCD display may have a different contrast depending on the viewing angle, the following must be observed: The maintenance test is classed as passed if the dot symbol has the same contrast as the corresponding arrow symbol when viewed from a vertical angle on the front panel.

# 7 Disposal

At the end of its service life, the Wega T1/ Wega T1 vario must be disposed of in accordance with the legal regulations of the respective place of use.

## 8 Technical data

| Electrical data | |
|---|---|
| Nominal voltage | 6 - 36 kV (rated voltage of the transformer) |
| Nominal frequency | 50 / 60 Hz |
| Power supply | The LCD display is powered by energy taken from the measured voltage |
| Interface | One test socket per phase, one earth socket (without further function) |
| Display | LCD display with black symbols for:<br>▸ Voltage present<br>▸ Maintenance test passed and overvoltage |
| Voltage-limiting predetermined breaking point | 90 V ±20% (The effects of tripping the voltage-limiting predetermined breaking point must be checked against the switchgear's protection concept.) |
| Operating temperature | -25 °C to +65 °C |
| Operating time | Suitable for continuous operation |
| Matching capacitors | 3-phase adaptation of the Wega T1/ Wega T1vario to nominal voltage, coupling capacitance and connecting cables is possible by fitting matching capacitors at the manufacturer. |
| Earth connection | M6 claw cable lug |
| Medium-voltage connectors suitable for Wega T1 | Euromold (K) 158 LR<br>Euromold (K) 152 SR<br>Euromold M 400 LR / G<br>Pfisterer MSCE 250 A-24 |
| Medium-voltage connectors suitable for Wega T1 vario | Cellpack CWS 250A<br>CGS 250A<br>Nexans / Euromold (K)200LR/G/VD<br>(K)200SR/G/VD<br>TE Connectivity RSES-VD-525-x<br>RSSS-VD-525-x |
| **Mechanical data** | |
| Wall-mounted housing | 125 mm x 75 mm x 95 mm (W x H x D), incl. wall mounting brackets and Wega T1/ Wega T1 vario |
| Housing material | Polycarbonate |
| Total weight of complete system | Wega T1 - 750 g / Wega T1 vario - 1,200 g |
| Type of protection | IP54 |
| Test points | Inner diameter 4 mm |
| Adapter test point | Mechanical and electrical properties tested in accordance with the relevant sections of the standards DIN EN IEC 62271-213, IEEE Std 386™-2016, IEEE Std 495™-2007 and IEEE Std 592™-2018 |

**NOTE**

The listed medium-voltage connectors must be equipped with the option of a capacitive test point.