Slovenski institut za kakovost in meroslovje
Slovenian Institute of Quality and Metrology

Poročilo o preskusu / Test Report

Št. / No.

T211-0091/09

Datum / Date

2009-05-07

Proizvod / Product

Electrical heating element for tramway switches

Technical data: 600 V, 900 W, 1,5 A, IP68, length: 3181 – 3450 mm

Naročnik preiskusa / Applicant

ELMERA Elektromehanički obrt za izradu svih vrsta grijača
Ivanec, Gorica 34, HR-10290 Zaprešić
Croatia

Proizvajalec / Manufacturer

ELMERA Elektromehanički obrt za izradu svih vrsta grijača
Ivanec, Gorica 34, HR-10290 Zaprešić, Croatia

Blagovna znamka / Trade Mark

ELMERA

Standardi - predpisi / Standards - regulations

According to agreement with the manufacturer.

Listov / Pages

3

Vrsta preizkusa / Purpose of test

Partial tests

Št. merjencev / No. of Items tested

2

Mapa predmeta št. / Subject File No.

C20090558

Kraj preskusa / Place of test

Tržaška c. 2, 1000 Ljubljana

Opomba / Remark

/

Zaključek - Conclusion

Electrical heating element for tramway switches was submitted to the measuring of insulation resistance and electric strength after the humidity test, electric strength at operating temperature and to the test of resistance to ingress of solid objects and to harmful ingress of water according to requirements for IP 68.

Test conditions and result are listed on the second page.

Electrical heating element for tramway switches passed the stated tests.
The findings presented in this report relate only to the items tested.
Date of samples received: 2009-04-08

Odgovoren za preskušanje / Responsible for the test

Andrej Perko

Slovenski institut za kakovost in meroslovje
Slovenian Institute of Quality and Metrology
Tržaška 2, 1000 Ljubljana
Slovenija / Slovenia

Direktor področja / Department Manager

Boštjan Glavič

INSULATION RESISTANCE AND ELECTRIC STRENGTH AFTER HUMIDITY TEST

Humidity test
Electrical heating element for tramway switches was placed in the humidity cabinet containing air with the relative humidity of (93 ± 3) %. The temperature of the air was maintained at 23 °C within 1 K.
The heating element was placed in the humidity cabinet for seven days.

After the humidity test the heating element was submitted to the electric strength and insulation resistance was measured.

Electric strength
The electrical heating element for tramway switches was subjected to a voltage of substantially sinusoidal waveform having frequency of 50 Hz and voltage of 2500 V for 1 min. The test was done between the live parts and metal casing of the heating element.

No breakdown occurred during the electric strength test.

Insulating resistance
The insulation resistance was measured between the live parts and metal casing of the electrical heating element with a d.c. voltage of 1000 V, 1 min after the application of the voltage.

Measured insulation resistance was $1{,}3 \times 10^4$ MΩ.

ELECTRIC STRENGTH AT OPERATING TEMPERATURE

The electrical heating element for tramway switches was operated under normal operation. When the stabilization of the temperatures was reached the heating element was disconnected from the supply and immediately subjected to a voltage of substantially sinusoidal waveform having frequency of 50 Hz and voltage of 2500 V for 1 min. The test was done between the live parts and metal casing of the heating element.

No breakdown occurred during the electric strength test.

RESISTANCE TO INGRESS OF SOLID OBJECTS AND TO HARMFUL INGRESS OF WATER IP68

The electrical heating element for tramway switches was submitted to the test of resistance to ingress of solid objects and to harmful ingress of water according to the standard EN 60529:1991+A1:2000.
The heating element was subjected to the test for the degree of protection of IP68.

For the IP68 test shorter heating element was prepared but the connection box was the same as at is on the heating element of normal size. For the test the heating element was fitted with the power supply cable of cross sectional area of 3 x 2,5 mm^2.

IP6X (dust tight enclosures)
The heating element was placed in a dust chamber in which talcum powder is maintained in suspension by an air current. The pressure inside the connection box was maintained bellow the surrounding atmospheric pressure by a vacuum pump. The test was done with the depression of 20 mbar and at the extraction rate 3 litres per hour. The test was continued for 8 hours.

After the test no ingress of talcum powder inside the connection box of the heating element.

IPX8 (watertight enclosures)
Test was made by immersing the heating element in the immersion tank 1000 mm below the surface of the water for 1 hour.

After the test no ingress of water inside the connection box of the heating element.

CONCLUSION

The electrical heating element for tramway switches comply with the requirements for performed tests.

LIST OF MEASURING EQUIPMENT

- High Voltage Tester: METREL Model: CE Tester, SIQ 103929
- High Resistance Meter: HEWLETT PACKARD Model: 4329A, SIQ 102510

PHOTO DOCUMENTATION:

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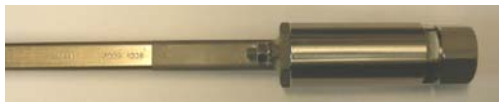

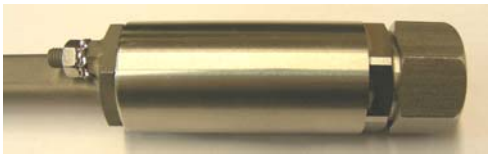

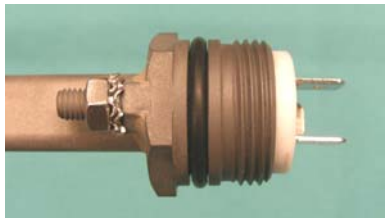

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