HIGH-VOLTAGE CAPACITIVE INSTRUMENT TRANSDUCER

CHVT-500

Equipment Certificate

MC2.727.002-01 EC

Manufacturer: OOO “NPP Mars-Energo”
Legal address:
V.O. 13 Line, 6 - 8, office 40H, St. Petersburg, Russia

2019

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This Equipment Certificate contains information about the specifications of the high-voltage capacitive instrument transducer CHVT-500 (the CHVT or the transducer below) and covers important aspects of its operation, certification and warranty conditions.

The corporate code for the documentation related to the transducer is MC2.727.002.

1. General guidelines

1.1 After manufacture, the transducers undergo factory acceptance and primary verification tests.

1.2 Any repair or verification of the transducer must be performed by authorized service technicians.

2. General information

2.1 Intended use

The CHVT is intended to transform high AC voltage on its input to low AC voltage on its output with a constant scaling factor.

The CHVT can be used:

- As a reference measuring instrument in the course of accuracy testing / calibration of working-class voltage measuring transformers of 0.2 accuracy class or less accurate
- For high-voltage measurements.

2.2 Certificates

Certificate of Compliance GOST R number: РОСС RU.СП29.Н01580

National Registry Number: 77712-20

3. Specifications

3.1 Design and operation

The operation principle is based on the scaling conversion of input analogue voltage signals. The transducer consists of 2 units:

- Primary Conversion Unit (PCU) that includes a gas-filled capacitor (High-Voltage Instrument Capacitor – IHC) and Current-to-Voltage Converter
- Instrument Amplifier of Voltage (UIN).

3.2 Technical and accuracy specifications

The technical and accuracy specifications are listed in Tables 3.1 and 3.2.

Table 3.1 – Accuracy specifications

Parameter	Value
RMS value of rated primary voltage (50 Hz), U_N	500/√3 kV
Rated secondary voltage	100/√3; 100; 100/3; 110/√3;110; 110/3; 120 V
Range of primary voltage measurements as a percentage of rated primary voltage U_N	from 40 to 120%
Limits of permissible fundamental measurement error for the transducer of accuracy class 0.1[1)]: Ratio error δ_{Ku} Phase error $\Delta\varphi$	 ±0.1% ±5.0 min
Limits of permissible fundamental measurement error for the transducer of accuracy class 0.05: Ratio error δ_{Ku} Phase error $\Delta\varphi$	 ±0.05% ±2.0 min
RMS value of test voltage (50 Hz) applied during 1-min test	$1.32 \cdot U_N+15$[2)] kV
1) Values of measurement error for other accuracy classes are as stated in Table 21 of National Standard GOST 1983-2015 2) U_N – rated primary voltage	

Table 3.2 – Technical Specifications

Parameter	Value
Power supply: - AC voltage - AC frequency	 207 to 253 V 49.8 to 50.2 Hz
Operating conditions: - Ambient temperature °C - Relative humidity at +30 °C - Atmospheric pressure	 15 to 25 °C 80%, or less 84.0 to 106.7 kPa
Gauge pressure of SF6 gas filling - rated (nominal) - minimum	 0.35 MPa 0.25 MPa
Electrical capacitance of HV capacitor (as part of Primary Conversion Unit PCU)	40 to 60 pF
Load resistance of UIN amplifier	No less than 100 kOhm
Load capacitance of UIN amplifier	No more than 5.0 nF
Power consumed by UIN amplifier	No more than 10 VA
Weight of UIN amplifier	No more than 2 kg

Parameter	Value
Weight of HV capacitor as part of PCU	No more than 140 kg
Overall dimensions: a) UIN amplifier - Height - Width - Length b) PCU - Height - Diameter	 150 mm 220 mm 272 mm 2550 mm 900 mm
Mean time to first failure	No less than 8000 hours

3.3 General specifications

3.3.1 The time of continuous operation of the transducer powered from mains is no less than 8 hours.

3.3.2 The lifetime of the transducer is 10 years.

3.3.3 With respect to the resistance to mechanical impacts, the transducer complies with Group 2 according to Russian State Standard GOST 22261.

3.3.4 The electrical strength of insulation complies with Russian State standard GOST 1516.2 ("Electrical equipment and installations for AC voltages 3 kV and higher. General methods of dielectric tests").

4. Scope of supply

The scope of supply is listed in Table 4.1.

Table 4.1 – Scope of supply

Name	Designation	Quantity
Capacitive HV Transducer CHVT-500 including: - Primary Conversion Unit PCU	MC2.727.002-01	1
- Amplifier of voltage UIN [1)]	MC2.032.161	
Measuring cable C2 (linkage PCU-UIN)	MC4.853.161	1
Cable C1 (linkage between HV capacitor IHC and Current-to-Voltage Converter)	MC6.705.002	1
User Manual	MC2.727.002-01 UM	1
Equipment Certificate	MC2.727.002-01 EC	1
Transportation box	MC4.171.100	1
Cable C4 (corona-free high-voltage connection)	MC4.850.002	1

1) The number of amplifiers depends on the order (minimum 1 unit).

5. Warranty

5.1 All products of MARS-ENERGO are warranted against defects in manufacture or material **for a period of 5 (five) years** from the date of purchase from MARS-ENERGO. Warranty period for the batteries is 6 (six) months from the date of purchase from MARS-ENERGO. Equipment believed to be defective may be sent within the warranty period to MARS-ENERGO for inspection (Warranty Claim enclosed, transportation prepaid). If the inspection carried out by MARS-ENERGO confirms that the product is defective, it will be repaired or replaced (at the option of MARS-ENERGO) at no charge, within the limitations specified below, and returned prepaid to the location specified in the buyer's Warranty Claim. All replaced parts become the property of MARS-ENERGO.

Warranty terms and conditions

5.2 In the event of any Device's failure or defect in manufacture or material during the warranty period (provided that the transportation, storage and operating conditions outlined in this Manual are fulfilled), send the Device to MARS-ENERGO along with the sales invoice or other proof of Device's ownership and date of purchase. If the documents outlined in the previous section are absent, the warranty period is calculated from the date of manufacture of the Device.

MARS-ENERGO retains the right to reject a warranty claim, if the documents listed in the previous section are filled out incompletely, incorrectly or illegibly. This warranty will not be applicable for the Devices whose serial number has been altered, removed or made illegible.

This warranty will not be applicable for damages to your Device caused during shipment to and from the location of MARS-ENERGO.

This warranty will not be applicable:

1) For parts requiring regular maintenance or replacement due to natural wear
2) For consumable parts (parts, the nature of which is to become worn or depleted with use, such as batteries)
3) For damages to the Device caused by:

a) any use other than correct use described in the User manual including:

- Handling the Device resulting in mechanical damages, cosmetic defects, Device modification, or damages to the LCD
- Damages caused by incorrect installation
- Damages caused by any maintenance other than correct maintenance described in the User manual
- Damages caused by installation and use inconsistent with the technical and safety standards in force in the country where the Device has been installed and used

b) Damages caused by computer virus infection or by use of software not supplied by MARS-ENERGO, or damages caused by incorrect software installation

c) Damages caused by condition or defects of a system or its elements with which or as part of which the Device was used, excluding other MARS-ENERGO products intended for use with the Device

d) Damages caused by accessories or ancillary equipment not made or authorized by MARS-ENERGO with respect to their type, condition or characteristics

e) Damages caused by repairs or attempts to repair the Device executed by an unauthorized person or company

f) Damages caused by adjustments or modifications made to the Device without prior written consent of MARS-ENERGO.

g) Damages caused by negligent handling

h) Damages caused by accidents, fire, ingress of liquids, chemicals or other materials, flood, vibration, heat, improper ventilation, variations of supply voltage, improper power supply or input voltage, , electrostatic discharge including lightning, or any other impacts or external actions beyond the reasonable control of MARS-ENERGO and not covered by the technical documentation for the Device.

The present warranty only covers hardware failures. This warranty does not cover failures of software (produced either by MARS-ENERGO or by other manufacturers), which are the subject of express or implied end user license agreements, separate warranties, or exclusions.

5.3 It is highly recommended to make a backup copy of the data from the Device's internal memory and store it on another (external) media. MARS-ENERGO shall in no circumstances be liable for any direct or indirect damages or losses, whether incidental, consequential or otherwise, including but not limited to loss of profits, loss of use or any deletion, corruption, destruction or removal of data, disclosure of confidential information or infringement of privacy, data recovery expenses, losses arising out of interruption of commercial, production or other activities based on use or loss of use of the Device.

5.4 The warranty terms and conditions for the transducer CHVT-500 purchased by a legal entity are stated in the purchase order. In this case, the warranty procedures are governed by the civil law.

Manufacturer's address for warranty claims:

MARS-ENERGO
V.O. 13 line, 6–8, office 40H
Saint-Petersburg, Russia, 199034
Tel.: +7 812 327-21-11, +7 812 633-04-60
E-mail: mars@mars-energo.com
www.mars-energo.ru

6. Packing form

CHVT -500, serial number _____,
was packed by the Manufacturer in compliance with the Technical Requirements in force.

Packer's signature _____ (Initials and name)

Date_____

7. Acceptance form

CHVT -500, serial number _____,
was manufactured in compliance with the Technical Specifications MC2.727.002 TS and accepted for intended use.

Head of Quality Control Department _____ (Initials and name)

Corporate Seal

Date_____

8. Verification details

CHVT -500, serial number_____, is verified after manufacture, after each repair and at regular intervals in routine use. The longest acceptable interval between verifications is 2 (two) calendar years.

Use the check form below to keep verification records over the lifecycle of the Transducer.

Date of verification	Type of verification	Verification results (accepted/not accepted for use)	Name and signature of a responsible person	Date of next verification

9. Recycling

The transducer relates to the electrical and electronic equipment that must be recycled in compliance with the WEEE directive. The transducer must not be disposed as domestic waste.