

Russian Classification of Products by Economic APPROVED BY

Kontour Engineering and Technology  
Center LLC

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\_\_\_\_\_ “ \_\_\_\_”, 2017

**RADIO-COMMUNICATION SERVICE TESTER**

**RST-430**

**CERTIFICATE**

PS 26.51.44-008-86866068-2017

Novosibirsk city

2017

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## 1 PURPOSE

The RST-430 Radio-Communication Service Tester is designed for maintenance and repair of radio stations with frequency and amplitude modulation, operating in the frequency range from 1.6 to 470 MHz in stationary and mobile laboratory conditions.

The field of application of the RST-430 include tuning, monitoring and testing of radio stations during their release from production and subsequent operation.

Functional purpose and features of RST-430:

- HF generator;
- LF generator;
- HF frequency meter;
- LF frequency meter;
- modulation meter (frequency, amplitude);
- LF alternating current voltmeter;
- harmonic distortion factor meter;
- power meter.

The RST-430 provides verification of basic parameters of radio stations:

- transmitter carrier frequency;
- transmitter carrier power;
- frequency deviation;
- amplitude modulation;
- transmitter amplitude frequency modulation characteristic (AFMC);
- nonlinear-distortions factor (NDF) of transmitter and receiver modulation characteristic;
- transmitter modulation input sensitivity;
- modulating signal frequency (ringing signal frequency)
- receiver sensitivity (SINAD method, method of modulation switching off)
- receiver output voltage;
- receiver amplitude frequency characteristic (AFC);
- NDF of receiver output signal.

## 2 BASIC TECHNICAL SPECIFICATIONS

Table 1 – Basic technical specifications

Specification	Value
Setting range of HF output signal frequency, MHz	0.1 to 470
Setting increment of minimal HF output signal frequency, kHz	1
Permissible relative basic error limit of setting HF output signal frequency, %	$\pm 3 \cdot 10^{-4}$

Table 1 (continued)

Specification	Value
Setting range of HF output level at load of $50 \pm 0.5$ Ohm, in frequency range from 1.6 to 470 MHz, dBm (mV)	- 27 to - 126 ( $0.11 \cdot 10^{-3}$ to 9.99)
Setting increment of minimal HF signal output level, dB ( $\mu$ V)	1 (0.01)
Permissible absolute error limit of setting HF signal output level in frequency range from 1.6 to 470 MHz, dB	$\pm 4$
In frequency range of output HF signal from 0.1 to 1.599 MHz	not standardized
Setting range of frequency deviation for HF signals at FM, kHz	0.2 to 20
Setting increment of minimal HF signals frequency deviation, kHz	0.1
FM modulating frequency range of HF output signal, kHz	0.02 to 20
Setting increment of FM modulating frequency of minimal HF output signal, Hz	1
Permissible relative error limit of setting HF output signal frequency deviation in modulating frequency range from 0.1 to 10 kHz, %	$\pm [5 + 5 (D_{set}/D_{upper})]^*$
In modulating frequency range from 0.02 to 0.099 kHz In modulating frequency range from 10.001 to 20 kHz	not standardized not standardized
Setting range of HF output signal AM coefficient, %	0 to 100
Setting increment of minimal HF output signal AM coefficient, %	1
AM modulating frequency range of HF output signal, kHz	0.2 to 10
Permissible absolute error limit of setting HF output signal AM coefficient in modulating frequency range from 0.2 to 10 kHz, %	$\pm (1 + 0,07 \cdot M_{set})^{**}$
In modulating frequency range from 0.02 to 0.199 kHz, In modulating frequency range from 10.001 to 20 kHz	not standardized not standardized
Setting range of HF output signal frequency, kHz	0.02 to 20
Setting increment of minimal HF output signal frequency, Hz	1
Permissible absolute basic error limit of setting HF output signal frequency, Hz	$\pm 1$
Setting range of HF signal output voltage, V	0.001 to 2
Setting increment of minimal HF signal output voltage, mV	1
Permissible absolute error limit of setting the HF signal output voltage in voltage range from 0.02 to 2 V, in frequency range from 0.1 to 20 kHz, V	$\pm (0,02 + 0,05 \cdot V_{set})^{***}$
In output voltage range from 0.001 to 0.0199 V In frequency range from 20 to 99.9 Hz	not standardized not standardized

Table 1 (continued)

Specification	Value
Nonlinear-distortions factor (NDF) of HF signal output voltage, %, not over	1
Measurement range of HF input signal frequency, MHz	0.5 to 1000
Permissible relative error limit of measuring HF input signal frequency in range from 1.6 to 470 MHz, %	$\pm 3 \cdot 10^{-4}$
In frequency range from 0.5 to 1.599 MHz	not standardized
In frequency range from 470.001 to 1000 MHz	not standardized
Measurement range of HF input signal frequency deviation at FM, kHz	0.1 to 20
FM modulating frequency range of HF input signal, kHz	1 to 10
Permissible relative error limit of measuring HF input signal frequency deviation, %	$\pm [5 + 5 (D_{set}/D_{upper})]$ ****
Measurement range of HF input signal AM coefficient, %	1 to 100
AM modulating frequency range of HF input signal, kHz	1 to 10
Permissible relative error limit of measuring HF input signal AM coefficient, %	$\pm 10$
Measurement range of HF input signal power in frequency band from 0.4 to 470 MHz, W	0.2 to 20
Permissible relative error limit of measuring HF input signal power, %	$\pm [10 + (P_{upper} / P_{measure})]$ *****
Measurement range of LF input signal frequency, Hz	20 to $1 \cdot 10^5$
Permissible absolute basic error limit of measuring LF input signal frequency, Hz	$\pm 1$
Measurement range of sinusoidal AC voltage of LF input signal in frequency range from 0.02 to 20 kHz, V	0.02 to 15
Permissible relative error limit of measuring LF input signal AC voltage, %	$\pm 2$
NDF measurement of LF input signal, %	1 to 100
Permissible absolute error limit of measuring LF input signal NDF, Hz	
in range from 1 to 50 %	$\pm [1 + 0,1 \cdot NDF_{measure}]$ *****
in range from 51 to 100 %	not standardized
Electrical power specifications: - DC voltage, V	10 to 15
Power consumption , W, not over	25

End of Table 1

Specification	Value
Continuous operation time, h/days	8
Average service life, years, at least	5
Mean time between failures, h, at least	10000
Weight without transport case, kg, not over	4
Complete set weight (in transport case), kg, not over	10
Overall dimensions, mm, not over	
Device housing:	
- height	155
- width	300
- length	165
Transport case	
- height	410
- width	470
- length	220
Operating conditions:	
- ambient temperature, °C	+10 to + 35
- relative humidity at 25 °C, %	40 to 90
- atmospheric pressure, kPa (mm Hg)	84 to 106.7 (630 to 800)
<p>* - where <math>D_{upper} = 20</math> kHz - upper value of frequency deviation setting range;  <math>D_{set}</math> - set value of frequency deviation, kHz.</p> <p>** - where <math>M_{set}</math> is set value of amplitude modulation coefficient, %.</p> <p>*** - where <math>V_{set}</math> - set value of output voltage, V.</p> <p>**** - where <math>D_{upper} = 20</math> kHz - upper value of frequency deviation measurement range;  <math>D_{measure}</math> - measured value of frequency deviation, kHz.</p> <p>***** - where <math>P_{upper} = 20</math> W - upper value of HF power signal measurement range;  <math>P_{measure}</math> - measured value of HF signal power, W.</p> <p>***** - where <math>NDF_{measure}</math> - measured value of nonlinear-distortions factor, %.</p>	

### 3 BASIC INTRODUCTION TO THE RST-430 RADIO-COMMUNICATION SERVICE TESTER

***The RST-430 Radio-Communication Service Tester operation principle, instructions on safety precautions, preparation for operation, operating procedure and verification procedures for operating capacity are given in the Operating manual RE 26.51.44-008-86866068-2017.***

RST-430 Radio-Communication Service Tester verification is conducted in accordance with document MP 26.51.44-008-86866068-2017 “RST-430 Radio-Communication Service Tester. Verification procedure”, approved by the Federal State Unitary Enterprise “Siberian State Red Banner of Labor Research Institute of Metrology” (FGUP SNIIM) on April 3, 2017.

## 4 COMPLETE SET

Table 2 - RST-430 delivery set

Name	Designation	Quantit	Note
RST-430 Radio-Communication Service Tester	ITTsK468166.002	1	
AC-DC ~220V/=12V Transducer*		1	
HF cable	ITTsK418542.005	1	
LF cable	ITTsK418542.006	1	
Transport case	ITTsK468976.005	1	
Operating manual	RE 26.51.44-008-86866068-2017	1	
Verification procedure	MP 26.51.44-008-86866068-2017	1	
Certificate	PS 26.51.44-008-86866068-2017	1	
<p>Note:</p> <p>* - A laboratory DC voltage source of 10 to 15 V, an AC-DC transducer of 220 V 50 Hz / = 12 V or a battery with a rated voltage of 10.8 V to 15.6 V can be used as a power source</p>			

## 5 CERTIFICATE OF ACCEPTANCE

Radio-Communication Service Tester RST-430

Factory number \_\_\_\_\_

Manufacturing date \_\_\_\_\_ “\_\_\_\_”, 20\_\_\_\_\_

corresponds to TU 26.51.44-008-86866068-2017, verified and stamped by the State Metrological Control Authorities and declared ready for operation.

Quality Control Department stamp

Verification officer's stamp

Verification officer

\_\_\_\_\_

Verification date \_\_\_\_\_

6 CERTIFICATE OF COMPLETENESS AND PACKAGING

RST-430 radio-communication service tester

Factory number \_\_\_\_\_

Manufacturing date \_\_\_\_\_ “\_\_\_\_”, 20\_\_\_\_

Completed and packaged in accordance with the requirements of TU 26.51.44-008-86866068-2017.

Packer \_\_\_\_\_ Packaging date \_\_\_\_\_

7 MANUFACTURER'S WARRANTY

7.1. The manufacturer guarantees compliance of the RST-430 Radio-Communication Service Tester with the requirements of TU 26.51.44-008-86866068-2017, provided that the operation, storage and transportation conditions are observed.

7.2 Operation warranty period - 12 months from commissioning date.

7.3 Shelf life warranty - 1 year from manufacturing date.

7.4 The manufacturer provides free repair of the RST-430 Radio-Communication Service Tester and upon expiry of the service life repair shall be made in accordance with a contract.

8 DISPOSAL

This device does not contain chemical and radiation-hazardous components. The RST-430 disposal after the end of its service life shall be done according to the user enterprise instructions for disposal of waste electrical and electronic equipment of the country of operation.

9 INFORMATION ON PRODUCT COMMISSIONING

RST-430 Radio-Communication Service Tester

Factory number \_\_\_\_\_

Manufacturing date \_\_\_\_\_ “\_\_\_\_”, 20\_\_\_\_

Commissioned \_\_\_\_\_ “\_\_\_\_”, 20\_\_\_\_

Seal

\_\_\_\_\_  
(signature and name of the person responsible for the product operation)





