TKA SCIENTIFIC INSTRUMENTS
OPTICAL RADIATION METERS

SPECTROCOLORIMETER «TKA-VD»

(TKA-VD/02)

Instruction manual

St. Petersburg
2009

Warning!

The producer reserves to itself a right to introduce some minor changes into construction and electric circuit of the device “TKA-VD” without indicating them in the instruction manual. Some elements different from those, indicated in the documentation, can be installed in the device, at that metrological and exploitation characteristics of the device won’t worsen.

1. INTRODUCTION

This set of exploitation documents, consisting of the instruction manual and passport, is compiled for studying of a principle of work of Spectroco-lorimeter “TKA-VD”/02 (further in the text called “device”) and also for being used as a guide while exploitation and servicing.

2. FEATURES

The device is designed to measure spectrum characteristics of light sources: relative spectral distribution $\varphi_{e,\lambda}(\lambda)$, chromaticity coordinates x, y, u, v, tristimulus values X, Y, Z and correlated colour temperature CCT.

3. TECHNICAL SPECIFICATIONS

3.1. Measuring Ranges:
- Illumination, lx …… 10 … 50 000;
- Corr. Colour Temp, K …… 1600 … 16 000.

3.2. Instrument Accuracy, %:…… 10,0.
3.3. Spectral Response, nm …… 390 … 750.
3.4. Instrument Accuracy, %: ……10, 0.
3.5. The limits of legitimate value of an absolute error in measuring of chromaticity coordinates x, y is not more than:
- Thermal sources…… ± 0,005.

3.6. Ambient temperature:
- To satisfy specifications…… 0º to +40ºC;
- Relative humidity, 85% RH (max) non condensing;

3.7. Dimensions
- BOS …… 165 W x 85 D x 35 H (mm),
- polychromator ……210 W x 60 D x 60 H (mm).

3.8. Weight, Approx, Kg ..... 1, 0.

4. ACCESSORIES

Spectrocolorimeter“TKA -VD”/02..... 1
Rechargeable Battery NiMH 8, 4 V 1
Battery charger 1
Instruction manual 1
Nullmodem (9-9) Cable RS-232C 1
User manual Freeware.....1
Software disc in a box.....1
Consumer packaging.....1
Industrial packaging.....1

5. CONSTRUCTION AND PRINCIPLE OF WORK

5.1 The principle of work of the device is based on measuring of radiation spectrum of a distant source of optical radiation in a visible range of 390…750 nm with further mathematical treatment of the results of measuring by microprocessor.
5.2. Construction
5.2.1. The device consists of two functional blocks: a BOS and a polychromator, connected with a floppy multi-core cable.
5.2.2. Introduction of Front Panel:
«ON/ OFF» - MAIN POWER SWITCH OF THE INSTRUMENT;
«HOLD» - Data-Hold,
«MODE» - SELECT OPERATION MODES.
5.2.3. Introduction of Rear Panel: battery compartment.

6. PRECAUTIONS BEFORE OPERATING

6.1 Before setting to work a consumer should learn carefully the function of the device, its technical characteristics, structure, and principle of work and also the methods of carrying out of measuring.
6.2 Check the availability of a battery. For this purpose you should open the lid of the battery compartment and to insert a battery if necessary. If after switching on or when the device is in operation the sign “Charge a battery!” appears on the display you should charge a battery.

7. ORDER OF WORK

7.1. Turn on the device by pressing the button **"ON/OFF"**
7.2. Place an inlet opening of an objective lens of the optoelectronic block parallel to the plane of a measured object. Make sure that a shadow from an operator, carrying out measuring, or shadows from other objects don't fall onto the objective lens.
Wait for 5-8 sec. and read the measured value on the digital display.
To switch over to another regime use the button **"MODE"**. It goes around a vicious circle:
1. *Depicting of illumination E, lx and chromaticity coordinates (x, y) (CIE1931);*
2. *Depicting of illumination E, lx and chromaticity coordinates (u, v) (CIE1960);*
3. *Depicting of tristimulus values X, Y, Z;*
4. *Depicting of correlated colour temperature TCC, K.*
7.3. In case the signal, caused by the light flux, increases, numerical value, depicted in line **E**, changes automatically to **klx**.
7.4. If measurements are beyond the receiver sensitivity, a sign **"Illumination is out of limit"** will appear.
7.5. If it is impossible to determine a correlated color temperature a sign **"Corr. Colour is not defined"** (regime of work 4).
7.6. To keep the measured reading on a display press the button **"HOLD"**. A letter **"H"** will appear in the right part of a display. To continue measuring press the button **"HOLD"** once more.
7.7. When in regime **"HOLD"** you press the button **"MODE"** information on spectral characteristics of the measured signal appears. Revision of the measured spectrum of a signal, according to the wave-lengths (**390…750 nm - 61point)** is made with a button **"MODE"**. To continue measuring press the button **"HOLD"** once more
7.8. Switch off the device after use.

8. MAINTENANCE

8.1 Installation and changing of batteries.
Before exploitation of a device install a battery which is in the set of accessories (If the enterprise-producer didn't do it).
Continued use with a low battery will lead to an abnormal reading.
Open the battery compartment. Please the battery into the insulation capsule and snap it onto the contacts.
If after switching on or when the device is in operation the sign "Charge a battery!" appears on the display you should charge a battery.
For charging a battery use a battery charger, which is in the set of accessories. The time of charging is 16 hours. Prolongation of the time of charging to 48 hours doesn't worsen the work of a battery charger.
When a battery charger is in operation you mustn't open the lid of a battery compartment.

9. STORAGE RULES

9.1. Storage Temperature & Humidity +5 to +40 ^{0}C , 85%RH (maximum).

10. ACCEPTANCE CERTIFICATE

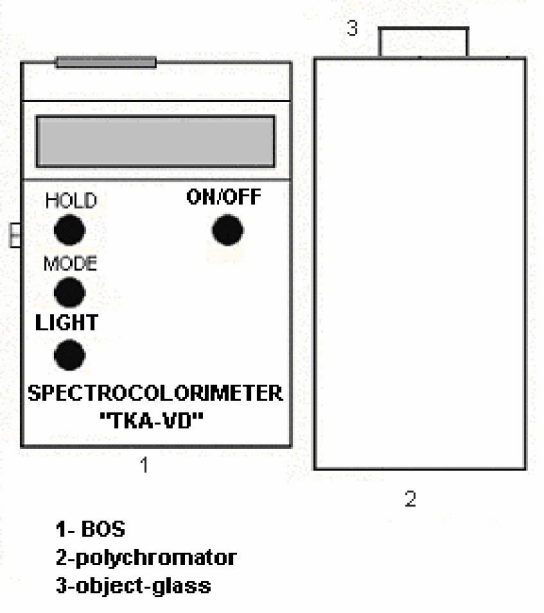
A combined device “TKA-VD”/02, works number
[ ] was found disposable for service.

Issue Date: “____” _____ 200___r.

The stamp of a Technical Control Department TCD:_____

Date of sale: “____” _____ 200___ r.

The Spectrocolorimeter Structure (see figure 1).



(figure 1)

11. WARRANTY

11.1. The producer guarantees operational capability of the device and its correspondence to the main technical and metrological characteristics if exploitation and storage rules are observed.
11.2. The warranty period is 18 months since the date of sale.
11.3. If the device goes wrong before termination of a warranty period it is necessary to compile an act in which indicate a kind of faultiness and the time, when the device went wrong and send.
11.4. In case of mechanical damages to the body of the device, interface cable or battery charger or in case the instruction manual is absent the producer doesn't have to fulfill the warranty.

12. INFORMATION ON CHECKS (CALIBRATIONS)

Date	Place	Conclusion	Checker

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