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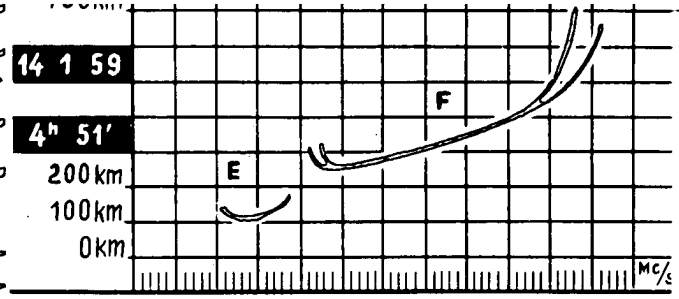

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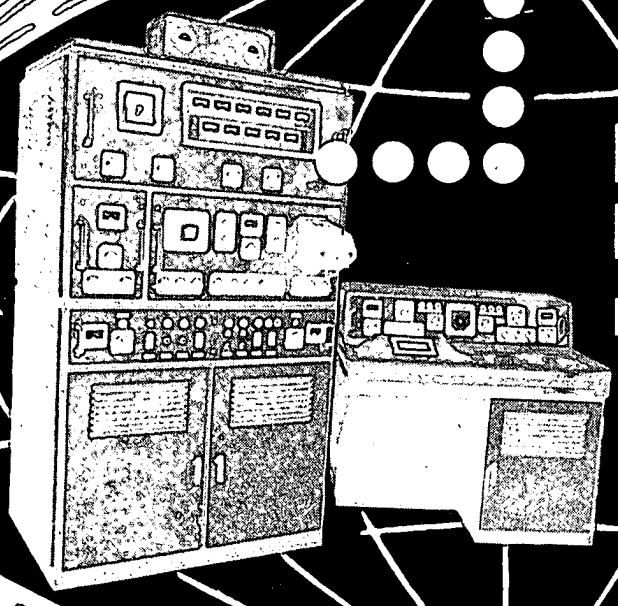


Ionosphere height recorder

Typ IRX5830

ELEKTROIMPEX
BUDAPEST – HUNGARY

Ionosphere Height Recorder Type IRX 5830

The ionosphere height recorder is the basic equipment by means of which the radiophysical characteristics of the ionosphere are explored all over the world.

The Hungarian made pulse-operated automatic ionosphere research equipment measures and records by preliminary programming the height of the various ionosphere layers.

Our ionosphere height recorder has met full satisfaction of the customers and operates already with success on several places of the world. Owing to its advantageous technical qualities it was awarded with the

GRAND PRIX

at the Bruxelles Worldexhibition in 1958.

The ionosphere height recorder Type IRX 5830 represents an advanced stage of development of the earlier type. At designing the later type special consideration has been given to the recommandations for the International Geophysical Year. Besides the new station affords a number of facilities to the personnel of the station unknown in the earlier type.

The equipment comprises the following parts:

The Transmitter operates with impulse-modulation in the 1-20 Mc/s frequency band without switch-over. In case of automatic operation its frequency sweep takes about 40 seconds. The apparatus is also suitable for manual operation.

The Receiver operates on the same frequency range as the transmitter and their synchron tuning is determined by the system of mixing. In order to suppress disturbances caused by broadcast transmitters, special circuits are provided.

The Frequency-marker Generator emits signal on the cathode-ray tube over 1 Mc/s and 100 kc/s. Signals are produced by means of a 1 Mc/s crystal oscillator.

The Indicator contains two cathod-ray tubes. The tube with long afterglow is used for instantaneous evaluation while the screen with blue light is provided for purposes of photographic recording. The unit also contains the linear time base for distance measuring and the circuits producing the electronic height markers. The photographic recording camera attachable to the indicator makes time exposures on a continously moving 35 mm film strip. Time, date and station markings are recorded by the camera simultaneously with the exposures.

The Operator's Panel cares for the automatic or normal operation of the entire apparatus.

The Supply Units ensure the power supply of the apparatus from the mains.

The Control Desk is equipped with the following units:

Programming unit. This is mounted in the upper part of the desk. The front panel of the programming unit is fitted with the programming clock which besides the common 24-hour dial is provided with signal lamps indicating the times when programmes have been switched on, and the methods of service selected by the operating personnel.

The minute pulses for the control of the programming clock are generated by a built-in master clock.

The programming unit further incorporates three receiver sensitivity regulating knobs enabling by the way of remote control the adjustment of three selected sensitivity values switched on by programme clock at the appropriate time. (I.G.Y. recommendation).

There is a special signalling device mounted in the programming unit to indicate mains failures.

Deflecting Unit. This unit incorporates the deflecting and voltage supply circuits of the very long afterglow visual

cathode-ray tube with 23 cm diameter. The control signal for the operation of the unit is fed over coaxial cables coming from the main equipment.

Description

The frequency determinating element of the equipment is the variable frequency oscillator (VFO) the frequency of which may be varied between 31-50 Mc/s by means of a hand- or motordriven variable condenser. Mixing its output to the 30 Mc/s signal of an pulse operated oscillator, the necessary frequency range of 1-20 Mc/s can be achieved. After amplification this signal is fed into the aerial. The reflected 1-20 Mc/s signal coming from the aerial is mixed in the receiver by means of the signals of the variable frequency oscillator producing an intermediate frequency of 30 Mc/s. The receiver is a double frequency changer superheterodyne, the frequency of the second auxiliary oscillation being 28,6 Mc/s. The 28,6 Mc/s frequency is produced by means of repeatedly doubling the 7,15 Mc/s signal of the crystal oscillator. The 30 Mc/s signal required for driving the pulse modulated transmitter is also generated from this 28,6 Mc/s frequency mixing it with the signal of a 1,4 Mc/s gated oscillator. Before to be fed into the transmitter the resulted 30 Mc/s signal is filtered and amplified. After the second mixing in the receiver the 2nd 1,4 Mc/s intermediate frequency is amplified, detected and fed into the differentiating and video amplifying stages.

The equipment is controlled by a pulse-generator. Its pulses control the indicator, the transmitter, the frequency-marker generator and the receiver. In the indicator these pulses start a saw-tooth generator the output of which is the time base of the cathode-ray tubes.

The height indicator circuit comprises a pulse oscillator, a signal shaper and a controlling multivibrator.

The monitor tube is deflected horizontally by means of the voltage obtained from the rectification of an approx. 20 kc/s signal. The amplitude of the 20 kc/s signal is varied by the capacitive divider running on a common shaft with the variable frequency oscillator.

The frequency markers are obtained by comparing the signals of the variable frequency oscillator with the harmonics of a 1 Mc/s crystal oscillator or a 100 kc/s divider. Besides the afore mentioned the transmitter consits from a broadband amplifier too. The last five stages are pulse operated, by separate gating valves. The output of the transmitter is balanced and the phase inverting in the final stage is occured.

Layout

The main equipment is built in a frame of angle aluminium bars. Receiver, indicator, transmitter, operator's panel and the four power supply units constitute separate units as shown in the illustration. These drawer shaped units glide on castors and may be easily removed. Feed voltages and low-frequency connections are plugged, while high-frequency voltages are coupled with screwed Amphenol-type connectors. With regard to the applied high voltages the apparatus can be operated only with doors shut. The control instrument, its switch, the manual sensitivity control knob, and differentiating circuit switch are mounted on the front plate of the receiver. The two cathode-ray tubes and the photographic recorder are placed on the front plate of the indicator assembly. The control knobs of the two cathod-ray tubes, the phase control knob, the amplitude control of the saw-tooth, the impulse width switch, the altitude measuring range switch, the km-marker switch, the km-marking brightness regulator and the change-over switch of A or B indication types, as well as a control instrument are also mounted there. On the front plate of the transmitter is located the frequency scale and below it, somewhat to the right the tuning knob used in case of manual operation.

To the left from the scale is the amplitude control of the horizontal deflection. On the control panel there are 11 instruments placed in two rows. The six instruments of the upper row control the tubes of the transmitter. In the lower row are two instruments for measuring the cathode current of the wideband amplifier, two control instruments measuring the plate current of all the tubes and an instrument measuring the grid current of the variable frequency oscillator. Below the instruments are mounted the switches of the control instruments. The operating panel contains the controls for operating the apparatus and for photographic recording. On the front plate, from left to right, the following devices are located:

Control instrument of supply unit with switch, above it a neon glow lamp indicating the condition of the fuse, the press button and switch of the frequency sweeping motor. By means of the next button the possible missing time signals can be substituted, while the time and date signal in the indicator can be illuminated with the forthcoming knob. In case of manual operation the motor of the photographic recorder may be started by the next knob, after which follows the knob switching on and off the anode voltages, the bias voltage switch, the filament circuit switch, the change-over switch for manual or automatic operation, and, finally, the mains voltage control instrument. Below, in supply unit No.4. is the voltage control switch for correcting the network supply in case of voltage surges. It can be reached after opening the doors, when only the network voltage control instrument remains under tension. The apparatus is fully de-energized by either interrupting the two automatic cutouts or by removing the connection at the back of the apparatus. The input connection of the time signal and an earthing screw are also located here. Transmitter and receiver aerial outlets are mounted on top of the apparatus. The transformers of the apparatus are placed in air-tight, soldered metal housings fitted with ceramic outlets.

The control desk is built similarly to the main equipment. On the upper part of it, in the middle of the operator's programming panel there is a programming clock, to the right of which is the operating switch and on the left the program selector. The remote gain control is accomodated right above the operating switch. Below it is the adjusting button of the three programming sensitivity channels, and to the right from those the mains voltage measuring instrument. Under this instrument there are signalling lamps indicating the 24 Volt supplies and the cutout of the mains. On the left side of the operator's programming panel, from the programming selector to the left there is the switch of repeated recording and below it the brightness regulator of the cathod-ray tube built in the control desk. The instrument placed on the left part checks by means of a switch accomodated below it, the tensions arising on certain points of the desk. On the right part of the control desk behind the door, on the front side of the first deflection unit the focusing and position adjusting potentiometres of the cathod-ray tube are accomodated.

According to separate wish right from the potentiometres a master clock can be built in. The power supply unit and its fuses are placed below the deflection unit. The screen of the long afterglow cathod-ray tube with the protecting unbreakable glass shield is placed on the left side of the desk. On the right part of the control desk lifting up the writing panel, room is provided for the documentation of the station.

Technical Characteristics

1.) Frequency band:	1 to 20 Mc/s, continuous without change-over.
2.) Frequency marking:	every 1 Mc/s and 100 kc/s generated by means of a 1 Mc/s quartz crystal. The marker

signals are generated by electronic methods, and the appear, beneath the ionograms on the screen of the cathod-ray tube. At recordings on film tapes at ionogram lengths of 8 centimetres the signals appear with frequency markers of 1 Mc/s and 100 kc/s, at ionogram lengths of 3 centi-metres, with frequency markers of 1 Mc/s.

3.) Accuracy of the frequency markers: within ± 16 kc/s

4.) Length of the ionograms: 3 or 8 centimetres; date, time and stations name are on the left side of the ionogram. Selection of the length of ionograms, i.e. the film tape speed, is carried out by means of the control knob mounted on the photo register camera.

5.) Width of the transmitter pulse: 50 or 100 µsec.

6.) Pulse repetition frequency: 50 cycles (synchronous with the mains, may be shifted in phase).

7.) Pulse peak output of the transmitter: 16-4 kW depends of frequency, measured on a 2 x 400 ohm dummy antenna.

8.) Sensitivity of the receiver: 10 µV on balanced input at signal-to-noise ratio 3 to 1.

This value is obtained for the receiver without input filter.

9.) Bandwidth of the receiver: appr. 24 kc/s between the 3 dB gain drop points.

10.) Selectivity of the receiver: 40 decibels for ± 40 kc/s deviation from the nominal frequency.

Note: the values of 9. and 10. are valid for a 100 µV input signal.

11.) Height ranges: adjustable to 300-800-1400 kilometres.

12.) Height marking: at every 50 or 100 kilometres

13.) Accuracy of height marking: ± 2 km ± $5 \times 10^4 \times H/C^o$, where H denotes the height of observation.

14.) Automatic operation: the station records automatically according to the following programming:

1) at the 60th minute of every hour
2) at the 59th, 60th, 01st minute of every hour
3) at the 30th, 60th minute of every hour
4) at the 30th, 59th, 60th, 01st minute of every hour
5) at the 15th, 30th, 45th, 59th, 60th, 01st minute of every hour

6) at the 15th, 30th, 45th, 59th, 60th, 01st minute of every hour
7) at every 5th minute of every hour
8) at every 5th minute and at the 59th, 01st minute of every hour
9) at every minute of every hour. Recording at the 59th minute takes place at reduced gain, at the 01st minute at maximum gain, as specified in the I.G.Y. recommendation. Programming of the equipment is effected from the control desk. The signalling clock built-in the control desk signals the time position of the automatic operation, and simultaneously the time. Change-over or programming also takes place from the control desk.

15.) Registration of time: besides height and frequency, hour and minute are recorded on the ionogram automatically, date and the name of the station manually. Adjusting the master clock properly it can be obtained with assurance that on course of recording the times signal should correspond with

the 3 Mc/s frequency on the ionogram. (I.G.Y. recommendation).

16.) **Sweep time of the ionogram:** appr. 40 seconds.

17.) **Aerials:** both transmitter and receiver operate with independent balanced vertically radiating broadband aerials, the real resistance being 800 ohms.

18.) For the change-over of the transmitter aerials relays are built-in controlling the change-over of the transmitter antennae when the ionogram passes 6 Mc/s frequency. The frequency of change-over may be varied.

19.) **Reading of the principal parameters of the ionogram:** besides the two cathod-ray tubes a third one has been provided for this purpose in the separate control desk. This is a very long afterglow tube with 23 cm screen diameter.
The obtainable picture has a size of 10 by 16 centimetres. The tube screen is mounted nearly in the horizontal plane and the screen level is approximately at the usual height of a table board. A special protective glass slab covers the screen of the cathod-ray tube. The 1 Mc/s

frequency markers appear on the visual tube at the full height of the ionogram.

20.) Input of the receiver: The receiver is provided with a low-pass filter attenuating all frequencies exceeding 20 Mc/s. One member of this filter is tuned to 30 Mc/s, so that the frequency mentioned above is filtered out.

21.) Aerial current signalling: Two signalling lamps are inserted in the leads of the transmitter aerial. The lamps signal the output current. If the exact value of the aerial current is required, the current may be measured by connecting the meter of the dummy antenna to the transmitter output.

22.) Realibility: When the station has been set for the five minute programming and after 48 hours of service the electrical parameters will not change, nor the assemblies warm up to temperatures which exceed the guaranteed value. Unless otherwise specified by the manufacturing firm the temperature of the component parts cannot exceed the ambient temperature by more than 35 degrees centigrade.

23.) **Power supply unit:** The station operates from 220 volt ± 5 % 50 cycle single-phase mains. Voltage variations between 190 and 240 volts may be compensated by means of a manually operated nine-position switch. The 220 volt supply voltage is indicated by a built-in voltmeter. Total power consumption of the station including the control desk: appr. 3 kVA.
To assure in case of mains cutout the undisturbed operation of the Ionosphere Height Recorder's signalling system it is necessary to apply a 24 volt d.c. spare supply.

24.) **Mains failures** are indicated by a signalling lamp mounted on the control desk.

25.) **Clima conditions:** The station operates within +12 and +35 degrees centigrade. Errors in height and frequency indication vary according to the temperature coefficient. Storing temperature of the equipment cannot exceed -35 degrees centigrade. After storing, before putting in service the equipment has to be dried at an ambient temperature of +20 degrees centigrade and a relative humidity of 75 per cent, for twenty four hours.

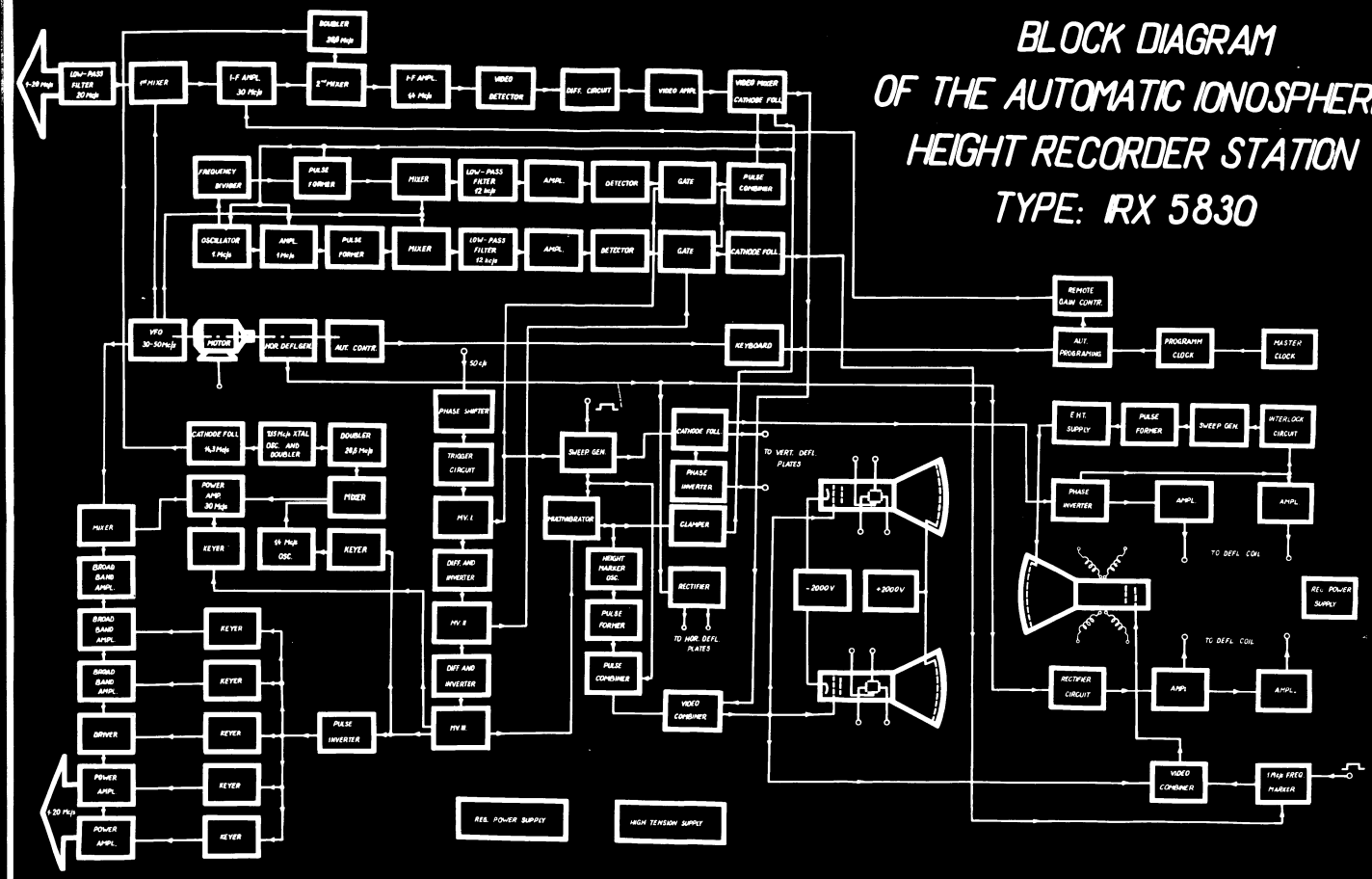
26.) **Humidity test:** When operated at a relative humidity of 90 per cent during 48 hours no error should occur in the adjustment of the five-minute program.

27.) **Dimensions and weight:**

main equipment
194 x 115 x 84 cm
685 kg.

control desk
115 x 104 x 84 cm
190 kg.

BLOCK DIAGRAM OF THE AUTOMATIC IONOSPHERE HEIGHT RECORDER STATION TYPE: IRX 5830



Elektroimpex

CHARGING EQUIPMENT FOR SUBSIDIARY STORAGE BATTERIES OF POWER PLANTS

Series ESA

Application

The battery charging equipment of the ESA series has been designed for charging of floating subsidiary storage batteries of power plants. The chargers of this series, operating at 110 or 220 V rated voltages, are suitable for lead accumulators including 55 or 110 cells. Quick charging is hand controlled, floating is automatically controlled with the battery voltage varying in proportion of the regulating accuracy at a load change of 30 and 100 per cent.

The equipment is operated from a three phase 50 cycles mains of 3 x 380 V. There is a series transformer to be used with mains voltages of other ratings. Mains current reaches the primary of the three-phase two-winding mains transformer through the primary fuses, the mains switch, and the regulating transducers.

The transformer secondary feeds the selenium rectifier in three-phase bridge circuit.

Direct voltage and current are measured by suitable moving coil instruments. The d. c. circuits are protected by fuses.

A separate auxiliary rectifier supplies the excitation current for regulating the transducers, by variations of the produced current. During the charging process, while the equipment hand controlled the current of the auxiliary rectifier is adjusted by resistances, cut in the circuit by means of a rotary switch. During operation with automatic voltage control the exciter current of the transducers is influenced by the regulator in such a way that the battery tension remains within the voltage margins, conforming to the accuracy of regulation. In case of a mains failure the voltage monitoring circuit disconnects the equipment from mains. Simultaneously there are acoustic and visual alarm signals. The acoustic signals can be silenced by throwing a key, whereafter both the acoustic and the visual reappear as soon as the mains voltage has returned. When having silenced the acoustic signal once more with the key, the equipment can be reconnected to the mains by hand.

The arrival of the regulator in one final position or in the other is indicated again by acoustic and visual signals. Such a case can be produced, among many others, by a sudden and permanent slight load or by a steady loading current exceeding the rated value etc.

The equipment is housed in a floor-type sheet-iron cabinet mounted on a frame, from section iron. The frontplate serves as instrument and operation board. The side panels are detachable. At the rear the cabinet is open. Here are the connecting terminals, arranged on a suitable terminal strip.

Advantages

The most important advantage of the equipment is its suitability for both charging and floating. With automatic regulation the battery voltage can be kept at about 2.15 to 2.2 V, the most favourable cell voltage. This largely increases the service life of the storage battery, without damage to the accumulator plates and without capacity losses to the charged battery. Under such conditions the whole of the consumer current is supplied by the rectifier, with none coming from the battery. On the contrary, the battery is under trickle-charge.

Another outstanding feature is that the accuracy of the built-in voltage regulator is independent of the mains frequency or its variations. Consequently direct voltage is uninfluenced by occasional mains frequency fluctuations. The equipment operates with high efficiency. The cell voltage being steadily kept at 2.15 to 2.2 V, the storage battery must never be used for discharging operation. The equipment operates without wire. It includes no moving or rotary components and can safely be operated even without attendance.

Elektroimpex

MOTOR-CAR STARTER RECTIFIERS

Series IE

Application

Motor-car starter rectifiers of the series IE have been designed for starting motor-cars, trucks and other petrol or Diesel-engine driven vehicles. Connected in parallel to the car battery, the smaller type is suitable for vehicles with 6 or 12 V starters, the large one for those with 6, 12 or 24 V starters.

Description

The motor-car starter rectifier can be operated from three phase 50 cycles mains of 3 x 380 and 3 x 220, or of 3 x 190 and 3 x 110 V respectively.

Adjustment to the actual mains voltage is from the terminal strip of the mains transformer.

Mains voltage reaches the primary of the three-phase two-winding mains transformer through the protecting fuses and through a mains switch. The secondary feeds the three-phase selenium rectifier in bridge-connection.

There are tappings on the secondary of the mains transformer for adjusting the direct voltage in accordance with the starter voltage by means of a multiposition switch.

A switch in the d. c. circuit serves for connecting the starter rectifier to the motor car starter. This switch can be operated by a push-button, provided that the motor-car starter has been connected with correct polarity. In the contrary case the switch fails to operate.

When starting the motor-car, the rectifier, connected in parallel with the storage battery, takes over a considerable part of the load.

The starter rectifier housed in a convenient sheet-iron cabinet, rests on a handled angle-iron frame which can be wheeled on self-adjusting castors. The operation board, arranged under a hinged inclined cover, accommodates the mains switch, the rotary switches, the starter knob, the fuses and a signal lamp for indicating the operation.

Advantages

The most significant feature of the starter rectifier is, that it not only disposes of all starting problems of motor-cars, but prevents a premature destruction of the storage batteries. During ignition the sudden and heavy surge currents (of thousand A order) have been overstressing the battery, while

the considerable load has reduced the battery voltage to a degree no more sufficient for turning round the starter. By the use of the starter rectifier the storage battery hardly participates (if at all) in the ignition process, all the required power being supplied by the mains. A further advantage is that the voltage does not, even under heavy load, drop below the rate required by the starter for turning around.

The switch in the d. c. circuit prevents the starter to be connected with wrong polarity and the storage battery to be damaged thereby, in case of such disorder as the rectifier equipment will fail not to respond to the pressure of the starter knob.

The starter rectifier can economically be used in garages and auto-car yards. Owing to its small size, it can readily be wheeled amidst car rows and started without the least difficulty.

Type	Mains voltage (a.c.)	Switch-over to starter voltages of	Stabilized amperage for ignition (approx.)	Dimensions			Weight
				Length	Width	Height	
	V	V	A	mm	mm	mm	kg
IE 12/250	3 x 110 3 x 190 3 x 220 3 x 380	6–12	250	1000	450	1005	
IE 24/400	3 x 110 3 x 190 or 3 x 220 3 x 380	6–12–24	400	1835	655	1110	

Elektroimpex

CHARGING EQUIPMENT FOR STORAGE BATTERIES USED IN EMERGENCY LIGHTING PLANTS

Series OT

Application

Storage battery chargers of the OT-series have been designed for charging lead accumulators of 55 or 110 cells with a current of specified rate, or for trickle-charging formerly charged batteries when out of service.

The equipment is suitable to be employed mainly for emergency lighting plants used in theatres, cinemas etc. Rather rarely and for short periods as such plants are required to operate, they must always be kept in charged state ready whenever to perform duty.

The chargers are suitable for both quick-charging and trickle charging.

Description

Essentially the storage battery charger includes:

a) a quick-charger circuit and

b) a trickle-charger circuit.

The quick-charger circuit is fed from a three-phase 50 cycles a. c. mains of 3 x 380 or 3 x 190 V. Adjustment to the actual mains voltage is on the terminal strip of the mains transformer. Mains voltage reaches the transformer primary through the primary fuse and the magnetic mains switch. The three phase mains transformer has two windings for the required transformer ratio. The secondary is fitted with tappings, coupled to the terminals of a rotary switch for the charging current to be controlled. The secondary of the mains transformer feeds a three-phase selenium rectifier in bridge connection.

D. c. voltage and current are measured by a suitable moving-coil instrument. The d. c. circuits are protected by fuses. By means of the quick-charger circuit the batteries can be charged up to the voltage peak. When approaching the peak, the charging current diminishes in consequence of the battery voltage in the usual manner of rectifiers.

A charged battery while not under load is apt to loose part of its capacity owing to self-discharge. To prevent it, such a battery is subjected to trickle-charging with a current rated 1 to 1.5 mA for each ampere-hour of its capacity, equivalent to a 2.15 to 2.2 V cell voltage of the charged battery. It is for this purpose that the trickle-charger circuit of the OT-type equipment is used. As soon as quickcharg

ing of the batteries has been completed, the equipment is switched over to trickle-charging. This is done by actuating a switch with a pilot lamp indicating the commutation. The trickle-charging current is adjusted coarsely from the terminal strip of the trickle-charger transformer and finaly by means of a continuously variable rheostat.

The trickle-charger transformer is a low-power single-phase transformer with two windings, feeding a single-phase selenium rectifier in bridge connection.

The trickle-charger circuit, arranged on a separate chassis is easy to access and to handle.

The equipment is housed in a floor type sheet iron cabinet with an angle-iron frame. The front plate of the cabinet is made to serve as instrument and operation board, accommodating the indicator instruments, the step switch, the mains switch also controlling the quick-and trickle-charger circuits, the fuses and the signal lamp.

The side plates provided with ventilation holes are detachable. At the rear the cabinet is open. Here are the clamp terminals for the mains current and the direct current connection.

Advantages

The OT series of equipment have the signal feature of being suitable for quick-and trickle-charging as well and of readily and conveniently allowing themselves to be switched over from one kind of service to the other by the turn of a switch.

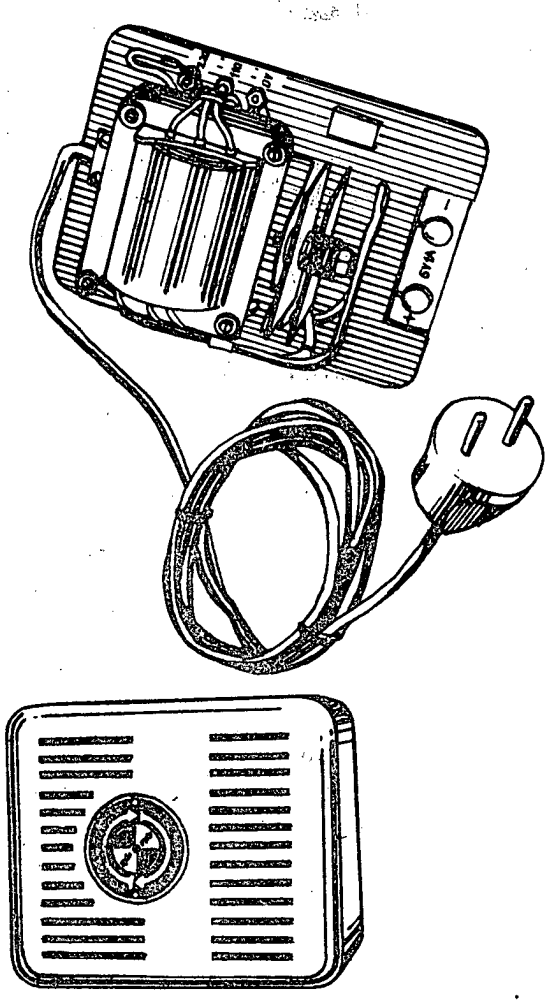
Regulation by varying the mains transformer with a rotary switch does not involve any loss. To protect its contacts, the rotary switch is actuated in currentless state. There is a special circuit to cut out the magnetic switch for the switch-over time. Thus the usual scorching faults by arc formation during the switch-over period are safely eliminated.

Even when under partial load the equipment has a favourable efficiency. It includes no moving or rotating components. Operation is noiseless and perfectly clean. The charger requires neither maintenance nor attendance, a feature particularly favorable for prolonged trickle-charging.

SMALL ACCUMULATOR CHARGER TYPE TT

483/2504

Approved For Release 2009/04/16 : CIA-RDP80T00246A007000800002-4



APPLICATION

The TT type charging equipment is designed for charging 3-cell /accordingly 6 V/ lead accumulators. Accordingly it can be used with accumulators for light cars, motorcycles, battery-type wireless receivers, hand lamps, etc.

DESCRIPTION

The equipment is fed from a 110 or 220 V 50 cycles single-phase mains. The initial charging current intensity of approx. 1 A /accumulators of 6 - 10 Ah capacity/ decreases in course of the charging process in proportion with the growing accumulator voltage.

The equipment is housed in a metal or a plastic cabinet fitted with removable lid. Arranged on the base plate are the two-coiled transformer, the selenium element in push-pull circuit and the D.C. terminals. The transformer is adjusted to the actual mains voltage by means of the accordingly marked screws on the base plate.

ADVANTAGES

Operating from the ordinary lighting mains, the equipment requires no connection to a power network. Mains and accumulator connections are simply established by a fork plug and by terminals with insulated heads respectively. The charging current needs no separate adjustment as the equipment, once switched on, operates entirely by itself. It charges an accumulator of approx. 6 Ah capacity overnight, i.e. in 8 to 10 hours. Larger accumulators take proportionally more time. The equipment requires small space and is stress-resistant.

Type	Number of cells	Accumulator voltage V	Max. charging current A	Max. measurements mm			Weight kg
				height	width	depth	
TT 6/1	3	6	1	80	100	100	0.8

Measurements vary according to design.

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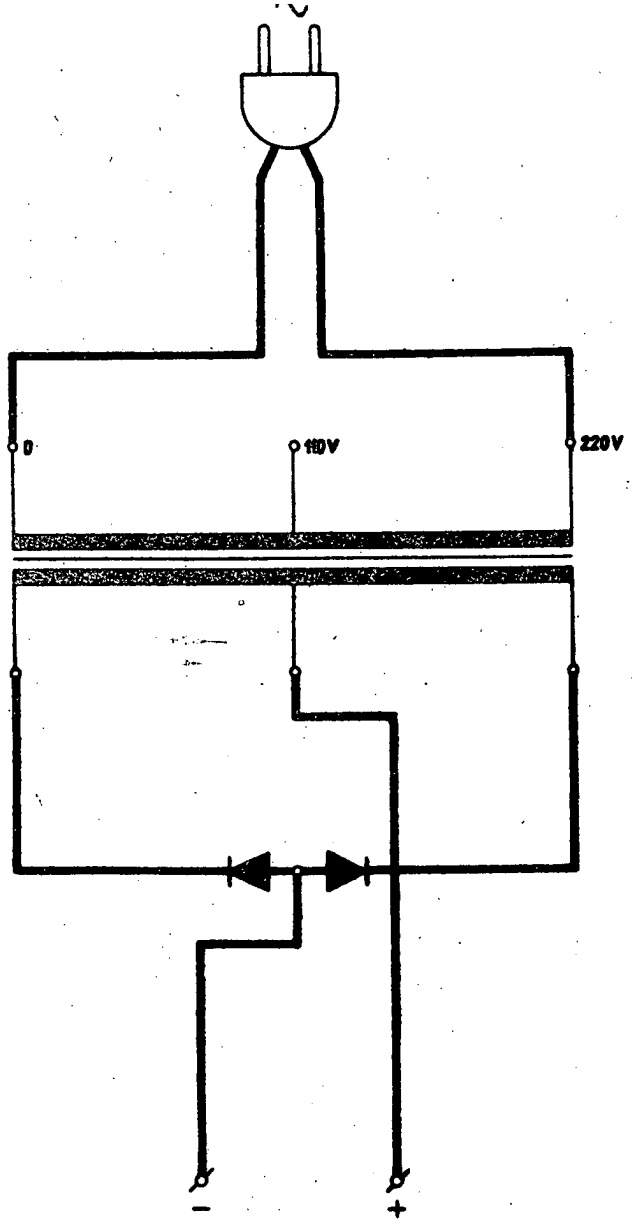

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HUNGARIAN TRADING COMPANY FOR ELECTRICAL GOODS AND PRECISION INSTRUMENTS

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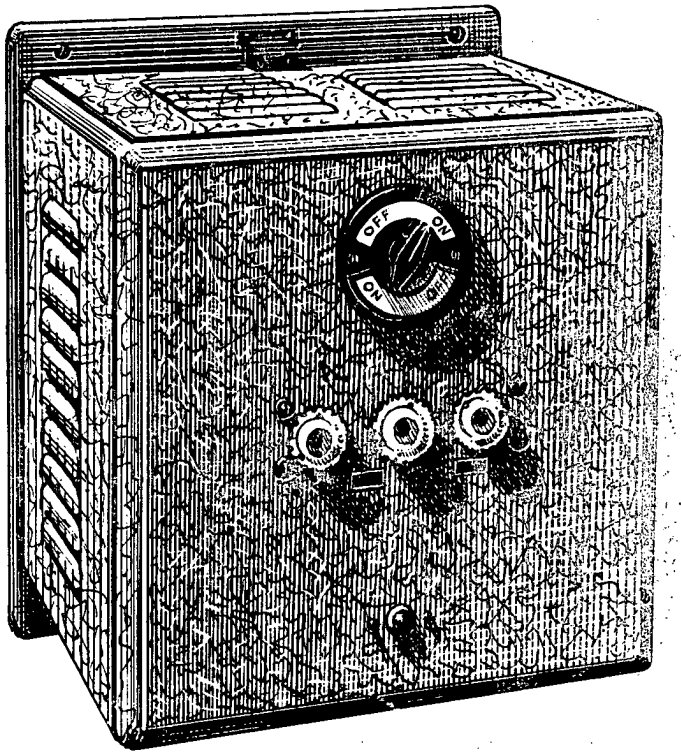
ACCUMULATOR CHARGERS FOR SMALL TELEPHONE EXCHANGES TYPE TF

483/2507

Approved For Release 2009/04/16 : CIA-RDP80T00246A007000800002-4



Approved For Release 2009/04/16 : CIA-RDP80T00246A007000800002-4

APPLICATION

The TF type accumulator chargers serve for the quick or the buffer charging of 12 or 24-cell /accordingly of 24 or 48 V/ lead accumulators with the tabulated initial amperages.

Used primarily for the buffer-type current supply of smaller telephone exchanges and repeater stations, the chargers will perform duty wherever smoothened /filtered/ D.C. of 24 or 48 V is required.

DESCRIPTION

The equipment is fed from a 110 or 220 V 50 cycles single-phase mains. The transformer is adjusted to the actual mains voltage from the terminal strip.

The mains current, passing the primary fuses and the mains switch, is led to the primary winding of the double-coiled transformer. The secondary tappings are conducted to a step-switch which, in case of quick charging, controls the charging current intensity or, in case of buffer charging, the amperage required by the consumer in action.

The equipment is switched over from one type of operation to the other by means of the mains switch. A choke coil, cut out from the D.C. circuit in case of quick charging, smoothens the buffer current to such a degree that the remaining ripple does not interfere with the telephone service.

An increase of the accumulator voltage in case of quick charging results in the usual reduction of the initial charging current intensity. The charging current can be reset by means of the step-switch. When, with the step-switch in maximum position, the cell voltage has reached approx. 2.7 V, about half the initial current intensity can still be adjusted.

Selenium rectifiers connected in single-phase bridge circuit care for rectification.

Direct voltage and current read on a moving-coil voltmeter and amperemeter respectively. The D.C. part of the apparatus is secured by melting fuses.

The chargers are housed in grey or silver-blue varnished sheet-iron cabinets; the smaller types are designed to be mounted on the wall, the larger ones to stand on the floor. Ventilating apertures on the removable side plates care for the necessary air-flow. The floor-type equipment is open at the rear.

The instrument and control board, occupying the entire front of both types, includes the mains and D.C. fuses, the mains switch, the step-switch and the instruments. Mains and D.C. connections are established on top of the wall-design and at the rear of the floor-design.

ADVANTAGES

The lossfree adjustment by altering the transformer tappings results in high efficiency of the equipment. In buffer operation the charging current is adjustable according to the average consumption by means of a 7 or a 10-position step-switch.

The equipment is readily switched over from quick to buffer operation by the throwing of a single switch.

Type	Design	Number of cells	Accumulator voltage V	Initial charging current A	Max. measurements mm			Weight kg
					height	width	depth	
TF 24/1	Wall design	12	24	1	320	275	200	3.5
TF 24/3	" "	12	24	3	370	315	200	6
TF 24/6	" "	12	24	6	420	365	240	9.5
TF 24/10	" "	12	24	10	420	365	300	25
TF 24/20	Floor design	12	24	20	992	450	400	60
TF 24/30	" "	12	24	30	992	450	400	80
TF 48/3	Wall design	24	48	3	420	365	240	10
TF 48/6	" "	24	48	6	420	365	300	22
TF 48/10	" "	24	48	10	520	415	320	55
TF 48/15	Floor design	24	48	15	992	450	400	75

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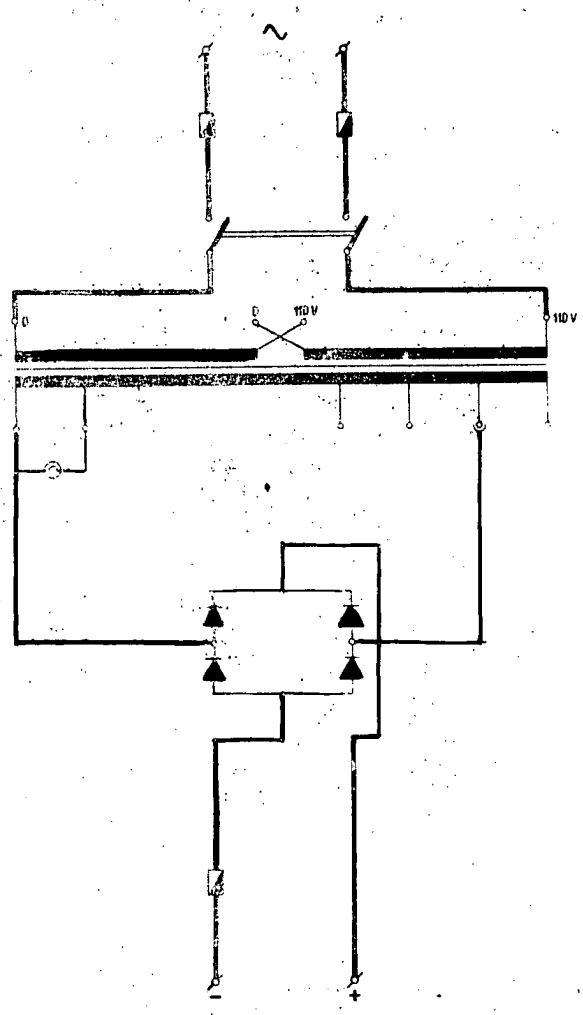

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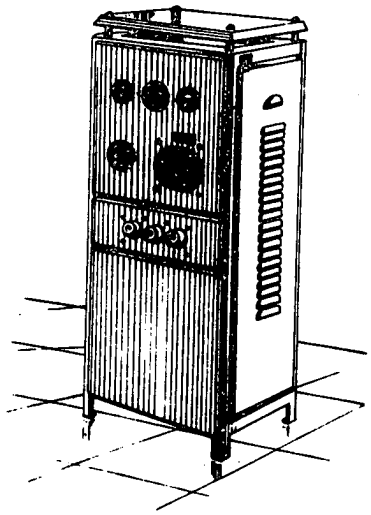
UNIVERSAL ACCUMULATOR CHARGERS TYPE UT



483/2502

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APPLICATION

The UT type rectifiers serve for charging 3, 6 or 12-cell /respectively 6, 12 or 24 V/ lead accumulators with the tabulated initial amperages. Accordingly they can be used in garages, vehicle yards and repair shops for charging accumulators of various voltages and ampere-hour capacities.

DESCRIPTION

The equipment is fed from a 110 or 220 V 50 cycles single-phase mains. The transformer is adjusted to the actual mains voltage from the terminal strip.

The mains current, passing the primary fuses and the mains switch, is led to the primary winding of the double-coiled transformer. The secondary tappings are conducted to a step-switch. One of the incorporated step-switches serves for setting the accumulator charging voltage in steps of 6, 12 or 24 V, the other for adjusting the charging current intensity in seven steps. An increase of the accumulator voltage results in the usual reduction of the tabulated initial charging current intensity. The charging current can be reset by means of the seven-step switch.

When, with the step-switch in maximum position, the cell voltage has reached approx. 2.7 V, about half the initial current intensity can still be adjusted.

Direct current and voltage measurement is by moving-coil ampere and voltmeters. The D.C. part of the apparatus is secured by melting fuses.

Selenium rectifiers connected in single-phase bridge circuit care for rectification.

The rectifiers are housed in a grey or a silver-blue varnished sheet-iron cabinet; the smaller types are designed to be mounted on the wall, the larger ones to stand on the floor. Ventilating apertures on the removable side plates care for the necessary air-flow. The floor-type equipment is open at the rear. The instrument and control board, oc-

cupying the entire front of both types, includes the mains and the D.C. fuses, the mains switch, the step switches and the measuring instruments.

Mains and accumulator connections are established over accordingly marked terminals on top of the wall design and at the rear of the floor design.

ADVANTAGES

The universal apparatus is equally suited for accumulators of 6, 12 and 24 V and can be simply switched over with a commutator. The charging current is adjustable in fine steps without loss.

Operation is silent; rectification begins immediately after the switching. Thanks to its simple construction, the equipment requires practically no attendance.

Type	Design	Number of cells	Accumulator voltage V	Initial charging current A	Max. measurements mm			Weight kg
					height	width	depth	
UT 24/1	Wall design	3-6-12	6-12-24	1	320	275	200	3
UT 24/3	" "	3-6-12	6-12-24	3	370	315	200	4.5
UT 24/6	" "	3-6-12	6-12-24	6	420	365	240	8
UT 24/10	" "	3-6-12	6-12-24	10	420	365	240	22
UT 24/20	Floor design	3-6-12	6-12-24	20	992	450	350	58

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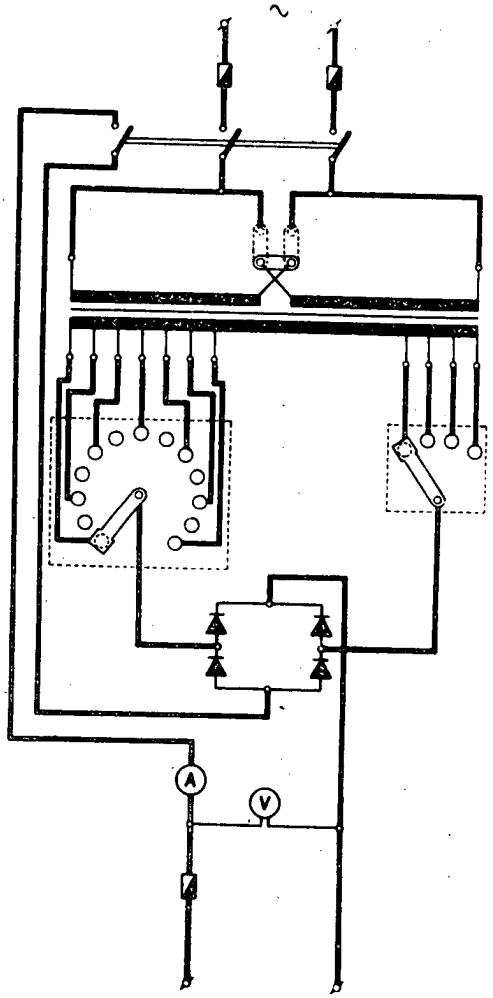

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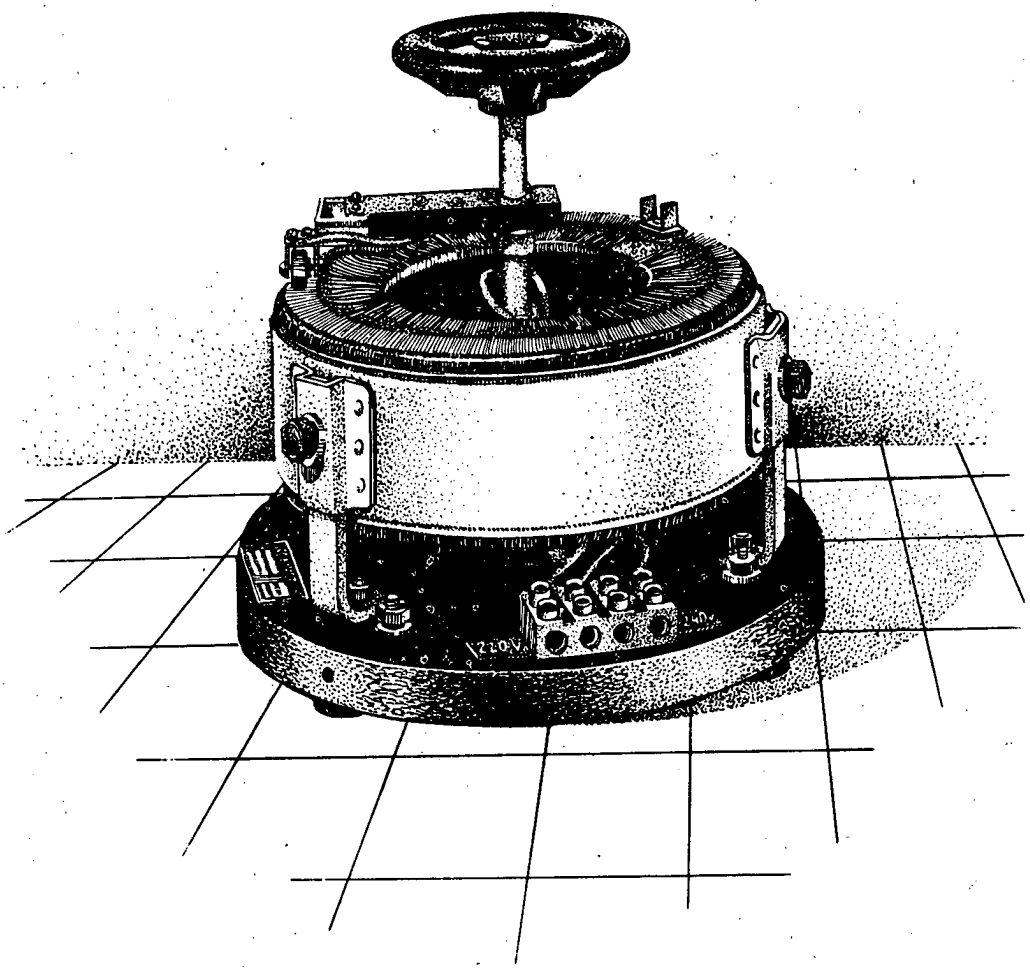
REGULATING TRANSFORMERS
TYPE S AND SI

483/2508



APPLICATION

The regulating transformers have been evolved for the purpose for adjusting alternating-voltage mains supply in laboratories, assay rooms, industrial plants, for the voltage adjustment of cinema and theatre lighting equipment and so forth.

DESCRIPTION

Up to 1000 V outputs the equipment is similar in design to a ring-type automobile transformer. The wire section within the track of the roll-type collector is bare. The carbon roll of the collector is mounted on a fixing bridge which runs in a metal bearing and permits of being turned around during adjustment. A pressure-spring holds the collector roll against the wire, thus caring for continuous safe contact in any position. The current flows from the collector roll through a flexible spiral conductor to the terminal strip of the regulating transformer.

The regulating transformer of vertical shaft arrangement is mounted in a sheet-iron base plate fitted with rubber feet. On the transformer jacket there are ventilating apertures. A circular dial below the control knob serves to indicate the approximate adjusted voltage rate.

Above 1000 VA outputs the equipment is similar in design to a core-type automobile transformer. The tappings of the single turns are conducted to a special step-switch along the segments of which glides a silvered metal roll. A pressure-spring cares for the safe contact of the collector. Suitably dimensioned impedances limit the current arising in the turns, short-circuited by the metal roll.

With its shafts arranged vertically, the regulating transformer is housed in a silver-blue varnished sheet-iron cabinet.

Both types are fitted with terminals for the mains inlet and the conductors of the regulated voltage.

ADVANTAGES

The regulating transformers combine high efficiency of regulation with simple and convenient handling, sturdy construction and dependable operation. Regulation, unlike in the resistance-type equipment, requires no power and dispenses with heat generation noxious to the transformer and its surroundings.

Type	Mains voltage V	Regulated voltage V	Load capacity A	Output kVA	Max. measurements mm height	width	depth	Weight kg
S 250/500	220	0 - 250	2.3	0.5	150	250		15
S 250/1000	220	0 - 250	4.5	1	170	270		20
SI 3 E	220	0 - 235	13	3				
SI 6 E	220	0 - 235	25	6	700	500	400	55
SII 8 H	3x380	3x0 - 400	25	18				

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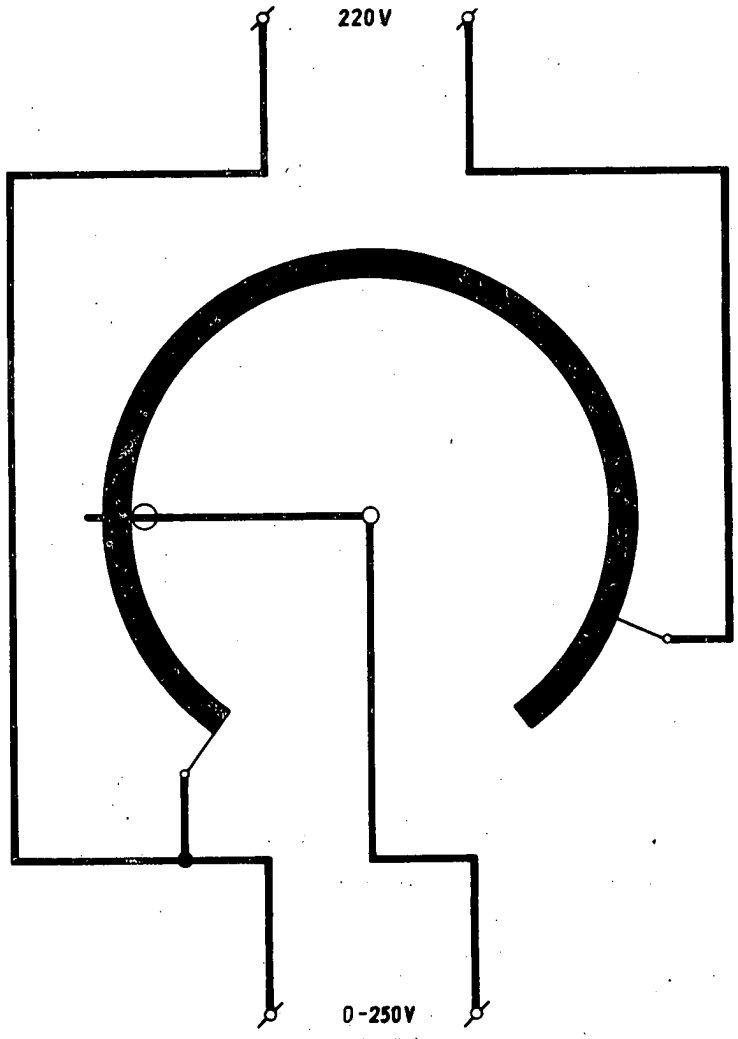

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TYPE GF RECTIFIER CUBICLE FOR PLATING PURPOSES

683/48

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Application

GF-type rectifier cubicles, designed to provide current for electrochemical tanks and platting baths, can be applied whereever low voltages and high current-intensities are required.

Description

The cubicle is operated from a three-phase 50 cycles mains of 3x380 V. Nominal currents and voltages are given in the table below.

The mains current passes through the primary fuses and mains switch into a preliminary transformer provided for coarse-step regulation. To this end the tappings of this transformer are connected to a rotary switch by means of which the voltage impressed to the main transformer can be adjusted. Fine-step adjustment is facilitated by the tappings of the primary winding of the main transformer, these being connected, similarly to the tappings of the preliminary transformer, to a rotary switch. Regulation is thus performed in 49 steps within the given voltage range.

The main transformer is a three-phase transformer of suitable transformer ratio provided with two windings.

The star-connected secondary of the transformer supplies the current for the selenium rectifier network.

Rectification is performed by a three-phase selenium rectifier bridge circuit.

Moving coil instruments are provided for measuring d.c. current and voltage.

During regulation, the rotary switch contacts carry no current while switching takes place, the exciting circuit of the magnetic mains switch being broken by the locking mechanism of the rotary switch already at the beginning of the switching.

With loads lower than the rated current, d.c. voltage will increase due to the characteristics of the selenium rectifier.

The equipment, mounted on a section-iron frame, is housed in a cubicle finished in gray or silverblue supported by the platform. With higher performances /exceeding 500 A/ efficient cooling is secured by means of a separate cooling-apparatus. The hot air should be guided off through a pipe leading to a round opening on the top plate of the equipment.

The side and rear covering plates can be removed; the rear of types provided with no fan is open.

The front plate is used as an operation and instrument board accomodating the fuses of the equipment and of the fan circuits, the mains switch, the rotary switches and the metering instruments.

The equipment should be installed in dust-free premises.

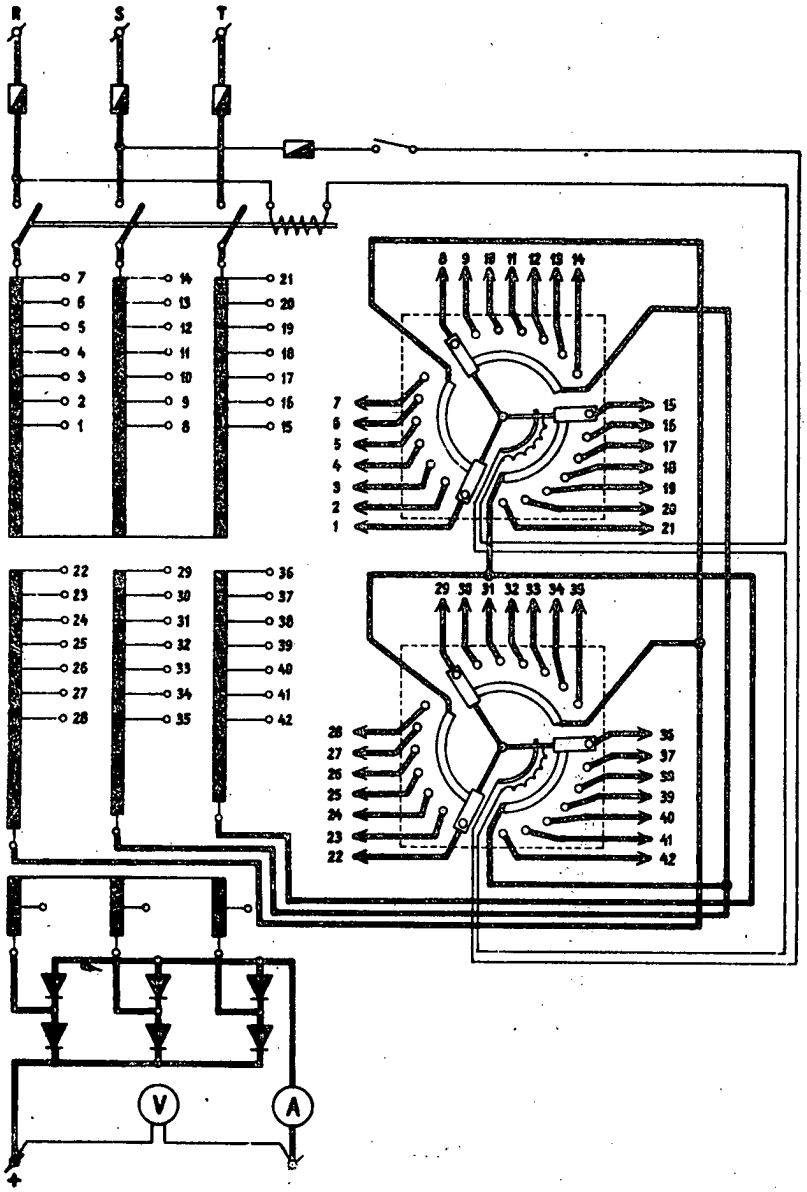
Advantages

The most significant advantage of the equipment is loss-free regulation within the rectifier. Thanks to the fine-regulation, bath resistance can be much lower than usual, only voltage differences in the tappings having to be bridged by the bath resistance.

A further advantage is that switching takes place under no-current conditions. Sparks during switching are thus eliminated and the service life of the rotary switch considerably increased.

The equipment is of sturdy, hard-wearing construction, its service life under normal operating conditions far extends that of rotary rectifiers.

Type	D.c. ratings		Dimensions			Weight
	Voltage V	Current A	Heights	Width	Depth	kg
			mm			
GF 3-15/100	3-15	100	1192	850	500	250
GF 3-15/250	3-15	250	1592	800	700	350
GF 3-15/500	3-15	500	1950	800	850	450
GF 3-15/1000	3-15	1000	2150	1200	1200	600



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CURRENT SUPPLY UNITS FOR TELEPHONE EXCHANGES TYPE PK

483/2506

The PK type accumulator charging equipment serves for the D.C. supply of large, accumulator-fed units, such as telephone exchanges, repeater stations and similar plants. The type of current supply varies according to the electrical arrangement and the kind of service of the accumulator and the rectifier.

The most contemporary equipment is the buffer-operated drip-charger with automatic voltage regulation for serving one or two batteries. In single-battery service the charger, the accumulator and the consumer are constantly coupled in parallel. With the cell voltage permanently kept at 2.15 to 2.25 V by the automatic voltage control, the conservation current, just intensive enough to make up for the self-discharge loss, flows across the fully charged accumulator. The rectifier solely supplies the consumer current.

The accumulator consists of 23 stock cells and, generally, of 3 spare cells. Under normal service conditions the consumer is connected in parallel with the 23 cells. In case of a mains failure, voltage regulation ceases and the current supply of the consumer is taken over by the accumulator. The cell voltage drops before long to 2 V, and later below. To keep the consumer voltage at approx. 48 V, the spare cells are linked to the stock cells. The moment the mains voltage returns, the spare cells are cut out, and parallel connection of the 23 stock cells with the consumer is reestablished. A control switch, with different functions in each position, performs all these switchings. In two-battery service it switches the batteries either to charging or to discharging and links the spare cells to them.

DESCRIPTION

The current supply units are fed from a 3 x 380 or a 3 x 190 V 50 cycles three-phase mains. In case of other voltages a series transformer is built into the equipment.

The mains current, passing the primary fuses and the mains switch, as well as the fuses and the switch of the rectifier