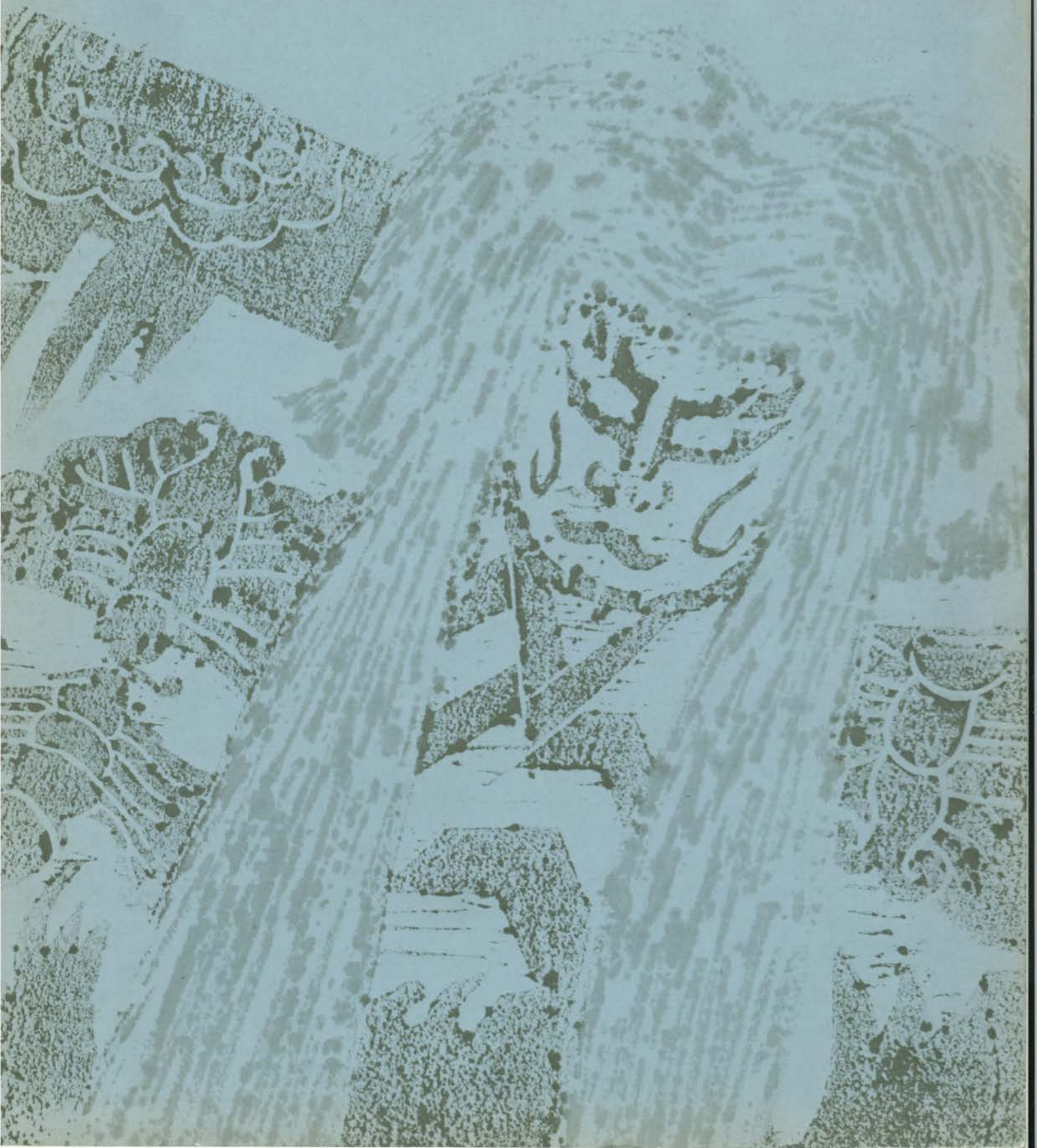
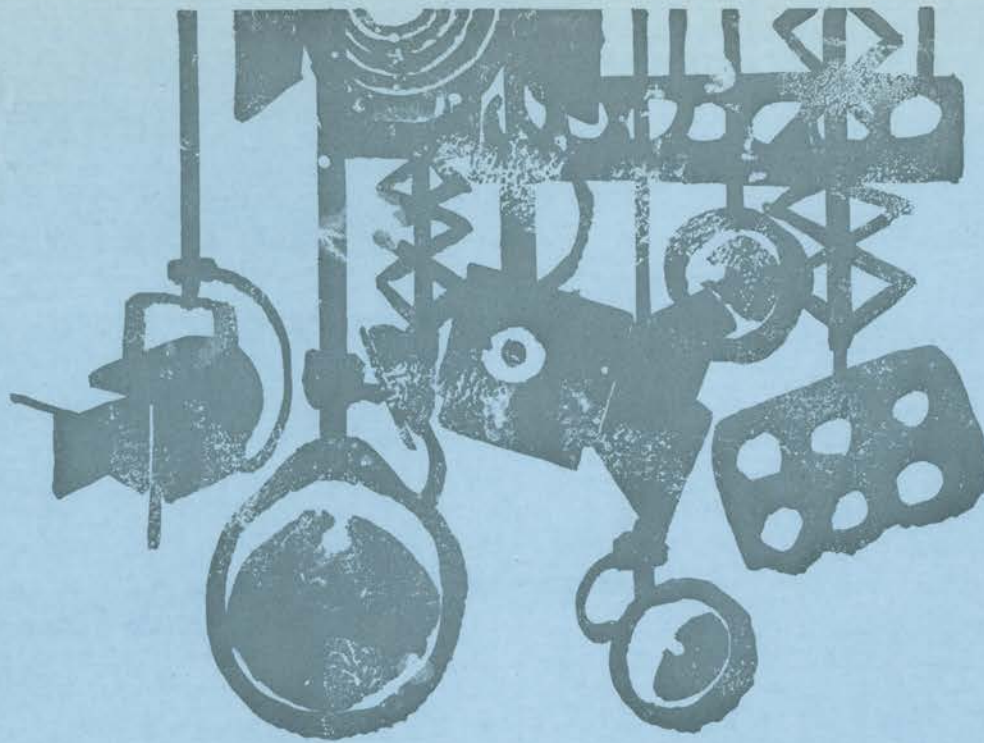


MAPLINO
DIMMER CONTROL
LIGHTING EQUIPMENT
FOR STAGE
AND TELEVISION STUDIO





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Lighting Control Dimmer Equipment for Lighting of Stage and Television Studio

Stage Lighting can bring a good theatrical effect in dramatic performance by using the technique of dimmer control, brightness change, and light arrangement, etc.

To make the effective use of the function, one must have a good command of lighting technique such as brightness change, fade-in, fade-out, quick and slow change of color tone.

For this purpose, dimmer control equipment which can turn on and off on any circuit at will, light control console, and a lighting switchboard are necessary.

Because the television programs are prepared in a studio and communicate to the viewer through T.V. set, many equipments have been furnished in a studio to make the picture beautiful, solid and realistic.

In these years, addition to this, according to the development of colorcast, color has become an important element and good many of effect in lighting has been expected.

So, lighting equipment not only able to respond to the change of picture tone occurred from the change of color tone, but also be able to handle easily, efficiently, rapidly, and surely is just needed.

About the lighting control method, many methods have been changed in succession. For example, liquid resistance method, metallic resistance method, autotransformer method, thyatron method, and magnetic amplifire method.

Among these methods, the excellence of multi-branch type dimming transformer (U-type Autotransformer dimmer) is appreciated and it has governed the lighting control method in Japan for many years.

Recently, with the remarkable development of semi-conductor, the study of using its technique into the light-control method has been established in Japan.

Actually, it is adopted as a semi-conductor light control equipment in many theateres and television studios. For example, this semi-conductor light control method is adopted to the stage lighting facilities of National Theatre, Imperial Theatre, Nissei Theatre and television studio lighting facilities of NHK, TBS, NTV, MBS, CBC, using a latest technical skill and a epock making plan.

SCR Dimmer Equipment is developed with the progress of semi-conductor which can control the lighting by the current control, applying the characteristics of SCR (thyrister).

MARUMO's SCR Lighting Control Equipment can make the light control curve which follow the demand of brightness change and television studio lighting.

Adopting the merit of both dimmer curve and eye-sensitiveness curve of U-type autotransformer dimmer which has been used hitherto widely on stages and in television studio, MARUMO SCR Dimmer Control Equipment use the method to select the characteristics which suit the spot where needs the lighting control.

This can be contributed only by MARUMO's technical skill having the long established wide experience in the field of dramatie performance not only in mechanical and electrical engineering.

SCR-TYPE DIMMER CONTROL EQUIPMENT

Pecularity of Epock Making MARUMO SCR DIMMER CONTROL EQUIPMENT Invents the Dimmer Characteristics by SCR Dimming Unit Itself.

Up to the present, our semi-conductor dimming control adopted the method of simple current control, and to make the suitable dimmer curve for dimming, it invented and selected the dimmer characteristics by combining the value of fader resistance which operate with the dimming unit.

In case of handling by a single fader only, dimmer characteristics which approximate the eye-sensitiveness curve could be obtained, but in case of handling by the group fader which is handled collectively or by the cross fader which change the scene, because of an alternating current control, it formed a curve like character "S" comparing the eye-sensitiveness curve, which did not suit the dimmer characteristics of stage and television studio lighting.

MARUMO's SCR Dimmer Characteristics create ideal dimmer characteristics by dimming unit itself. So, the best light control characteristics which meet the spot can be obtained using whether single, group, cross or master fader.

Brightness characteristics, also, can select optionally two-square curve (similar to mansell curve) or three-square curve (similar to dimmer curve of the U-type autotransformer dimmer), both of which are rectified ideally.

Using Double Brush Fader in Controlling Mechanism

SCR Dimmer Equipment is operated completely by faders.

As for the relationship of each working fader, when the master fader holds a position of 100% output, of dimmer equipment can be controlled by the single fader from 0% to 100% at will. But, when the output of master fader is 50%, the control of dimmer equipment by the single fader applies only within the limits of 0% to 50%. Again, when the single fader is set to 50%, it can be controlled from 0% to 50% by controlling the master fader. In this case, the position where the single fader is set to 50% can not settle the lower limit of the

master fader control, though it can settle the upper limit of the control.

In this case, dimmer curve also became dimmer characteristics of master fader, losing the single fader characteristics.

To dissolve this defect, by using the double brush fader instead of the single fader and setting the upper limit and lower limit of the dimmer control by the two knobs of each fader, it can be controlled freely by the group fader, not changing its characteristics.

It can be controlled in the conventional way by using the two knobs of the fader collectively.

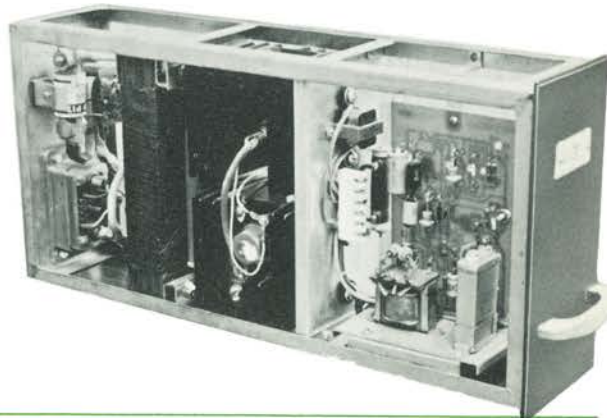
There is no difference between the actual graduation of fader and output value in spite of the load change

In the semi-conductor dimming control method which we have been close with, indicating graduation of the fader does not always agree with the expected output.

MARUMO's SCR Dimming Unit provide the auto-control equipment to fix the output voltage value which impose the load.

The advantages comparing the conventional way are as follows:

- 1) Graduation of fader always agree with the output value of dimming.
- 2) No change of the output value can be seen in dimming in spite of the voltage change of main power source which sometimes occur.
- 3) There is no difference of voltage in spite of the load change. Therefore, there is no need to change the position of fader cowing to the less capacity of the load.





- 4) No difference of output voltage depend on temperature.

Every mechanism described above are under Patent Pending.

Unit Luck Board

SCR Dimmer Control Unit is set in this board like a drawer. It is easy to take out and exchange each unit.

The excellence of the MARUMO Dimmer Control Unit is already explained.

Standard Specification of SCR Dimmer Control Unit

Source Voltage	AC 100V
Load Capacity	60A (40A) 0W-6KW (0W-4KW)
Load	Incandecent lump
Control Source	DC 12V 0.5mA (below)
Output Voltage	OV-100V
Wattage Loss	Below 60W
Source Voltage	95V-115V
Room Temperature	5°C-45°C
Cooling Method	5m/sec motor fan
Over Current	66A (44A)
Quick Cut-off Fuse Capacity	250A (200A)

In addition to this standard specification, dimmer control units which suit the variety of source power according to the application is available.

Load Capacity is:

Incandecent lumps

Standard product is 4KW, 6KW & 12KW at AC 100V. According to the source voltage, products within the limit of 4KW-40KW per unit is available.

Fluorescent lumps

There are two dimmer units as follows:

In case of:

100v AC 40W lump 50set, 100set

200v AC 40W lump 50set, 200set

But Fleqency is 50cy or 60cy.

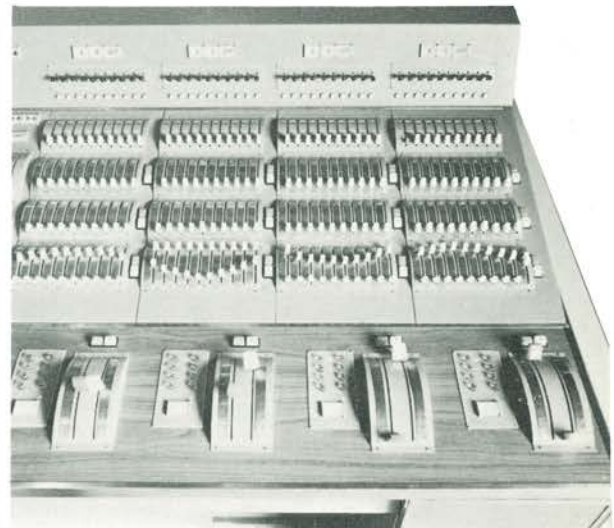
Performance

1. A protective circuit which get rid of the destruction of semi-conductor occuring from the rush current of lamp is provided in the unit.

2. A protective absorption circuit is provided in case of imposing the surge voltage from the power source.
3. Provide a protective equipment lest the over current should run in the SCR.
4. Provide a circuit which control the fixed value automatically so that there is no change in load voltage according to the change of power source voltage or the momentary voltage descent when bears additionally to the load of small capacity.
5. Provide a quick cut-off fuse which protect the SCR unit from destruction by the short circuit.

SCR-Type Lighting Control Console

This table is made to be able to control quick and slow change of Lighting according to the execution by master fader, cross fader, group fader, pre-set fader and many push buttons, all of which are set in.



Pre-set Fader

This is the single fader to pre-set and control the lighting plan of each scene. Ordinarily, the standard number of pre-set tier is: 3 tiers from 20 to 100 plots, and more than 4 tiers above 100 plots.

MARUMO's pre-set fader uses the double brush fader in the first tier only.

When controlled by the group fader connecting with the double brush fader which limits the upper limit and the lower limit of the dimming control, actually, one more scene can be pre-set.

So, controlling system can be simplified producing the same stage effect comparing the former type.



Group Fader

By the PFG select and change-over switch, some pre-set group can be selected optionally. (PFG:--P: Pre-set, F: Free, G: Group)

So, variety of lighting which meet the condition of the scene can be obtained.

PFG Select and Change-over Switch

This is the switch to select each dimmer control circuit. By using this switch, the selection of pre-set, group or free fader can be made.

Cross Fader

Flexible cross change of any two scene at will and change-over can be made. In the television studio, it is desirable to install cross fader to be able to control each set, so this is very convenient.

Master Fader

This is the main fader among the controlling system. This can indicate the dimming degree by the dimmer pilot lamp, the working tier and the next working tier by the tier indication lamp and the change-over from cross fader to master fader. In addition, this provide the control switch for color changer, lighting main switch, and direct-dimmer switch.

Combination of each fader on the control console can be selected optionally for the use of the operator.

Weak Current Type Dimming Control Select and Contact Mechanism (Cross Bar System)

This mechanism is used in the dimming control equipment which fix the combination of load and dimmer transformer by combining the weak current which control each dimmer transformer.

Usually, in SCR dimmer control equipment-MARU-MO UMS-Type Dimmer Control Equipment-dimming control is made by faders.

In this case, it is, by all means, necessary for dramatics to dim any group by one action to combine the fader and dimmer optionally. So, in this case, as this dimmer control current is the small capacity power (DC10V-24V mA), the technique of telephone exchange which is highly developed in these years can be applied to the selection of fader and dimmer.

Operation can be made easily by the push button switches and various kinds of combination can be made in a short time.

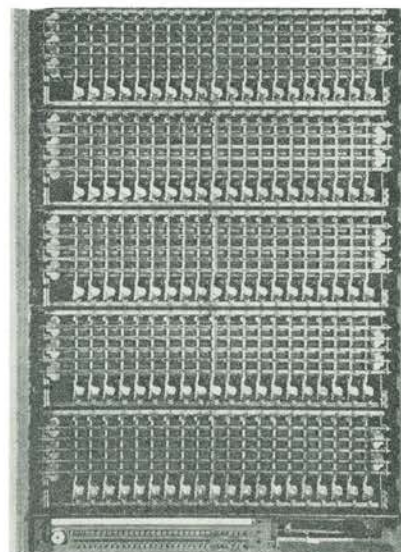
In establishment, please plan according to the standard basis as follows:

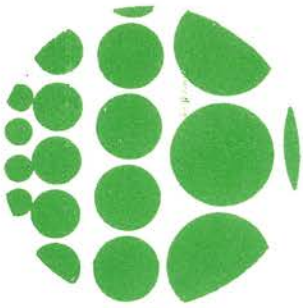
Standard combination:

Fader Circuit 10 circuit-1 unit

Dimmer Circuit 20 circuit-1 unit

As 10×20 is one unit of the cross bar, any fraction requires one more unit.





Load Circuit Select Plug Board

This facility can select and contact the dimmer transformer and load circuit by plug code. Many lighting equipments are furnished in T.V. studio, but it is not necessary to facilitate dimmer transformers to each of them. By providing dimmer transformers of one-half or one-third of the total number of circuits, lighting control can be made to contact them to the necessary circuits.

Dimmer Preset Board

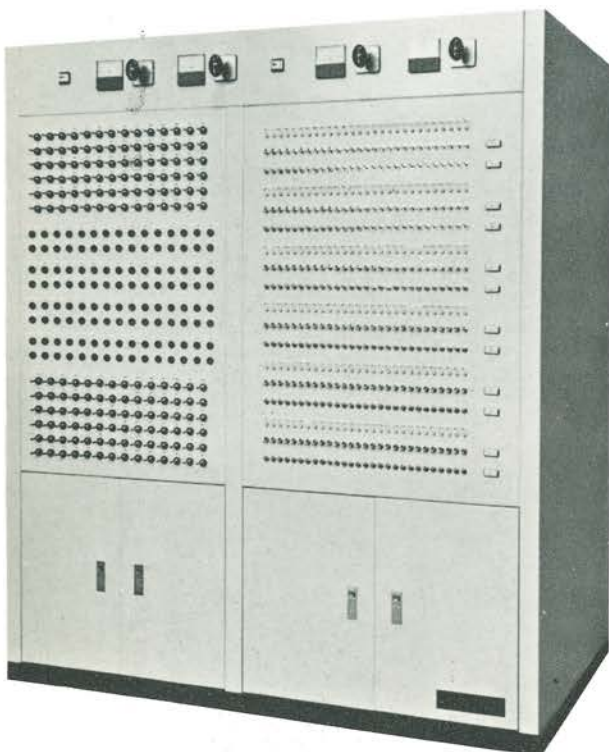
Preset fader which can preset the lighting plot beforehand is arranged on this board. Usually, only one preset fader for the first scene is provided on the control console and other preset faders for the rest scenes and PFG change-over switches are also arranged.

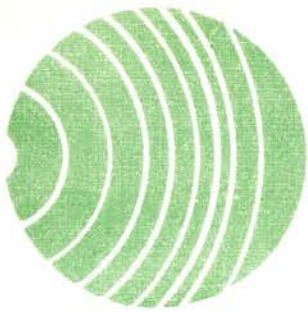
Direct-Dimmer Preset Board

Able to switch-on a light by changing all loads of the stage lighting to direct circuit or dimmer circuit. Also capable of presetting the dimmer circuit to various scenes combining with the D & L Mg Switchboard.

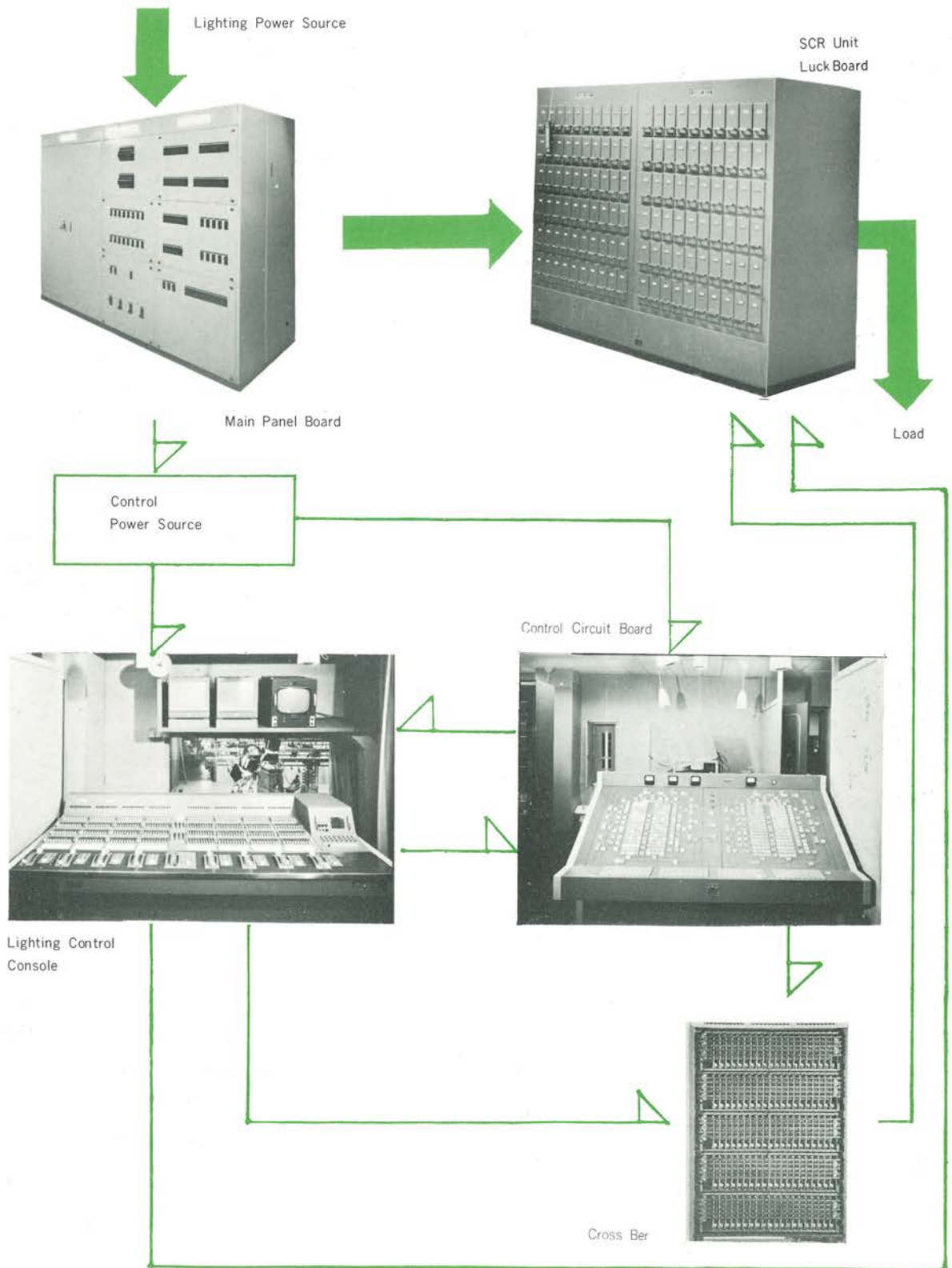
Movable SCR Dimmer Control Equipment

It is put SCR Dimmer Control Unit in on movable case, each unit is electrically separated and by combination of one or some it can be used opinionally. SCR Dimmer Control Equipment Unit possess two concents, by the ehang-over of D.L.M.G.S.W. it can be selected opinionally of SCR Dimmer Control Unit or load. Operation, each unit has Pre-set Single Fader of two place and one set Close Fader of changing place.



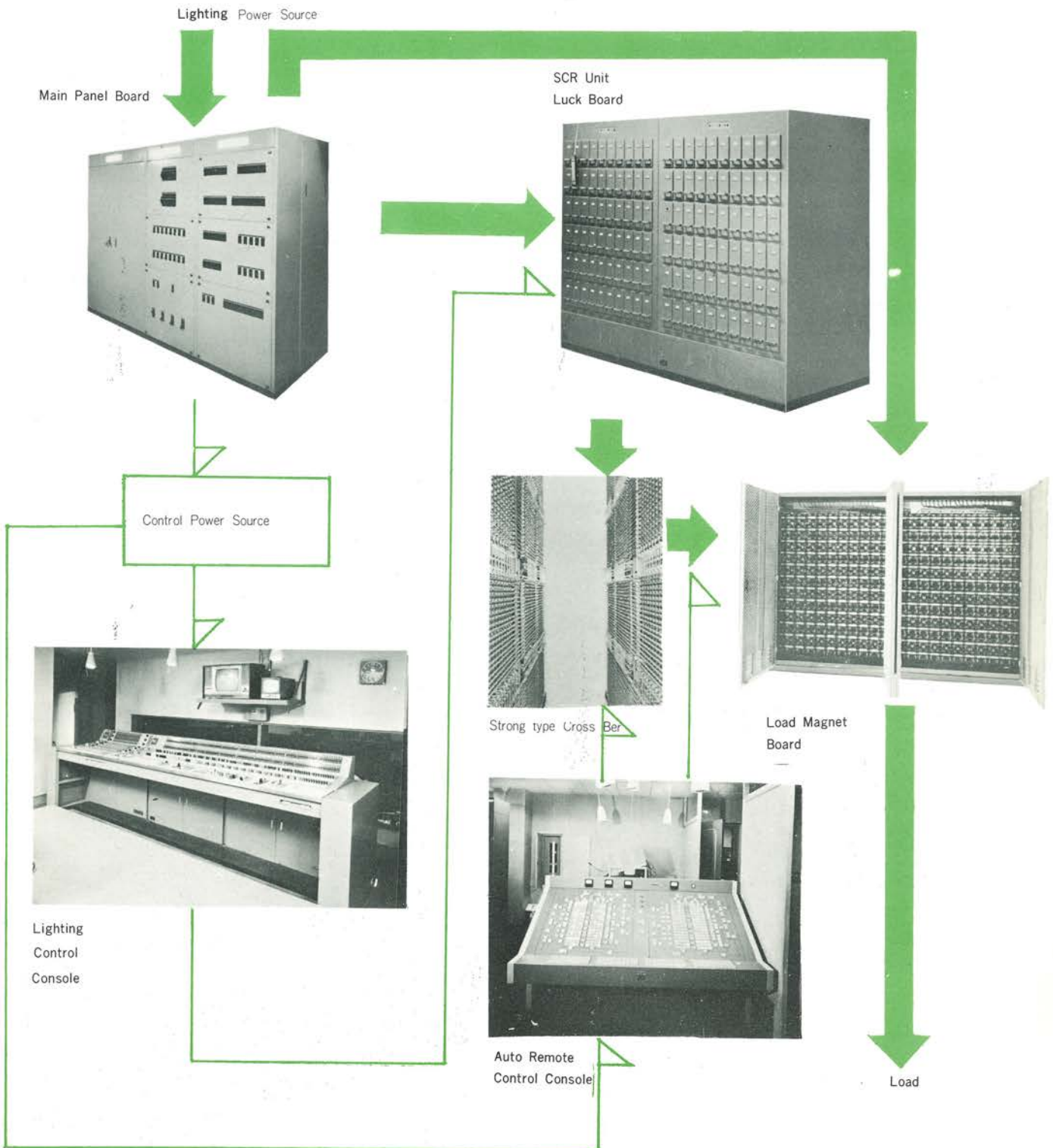


Systematical Illustration SCR Type Dimming Control Equipment (for T.V. Studio)





Systematical Illustration of SCR Type Dimmer Control Equipment (for Stage)



U-TYPE DIMMER CONTROL EQUIPMENT

U-Type Dimmer Control Equipment is made in 1934, as a multi-branch type dimmer transformer in advance of Germany and U.S.A. Since then, it has been ruled the theatrical lighting control method in Japan for many years taking the place of resistance and reactance dimmer transformer.

Still now, it is used widely as a theatrical dimming control equipment because of its advantages of flexibility, steadiness in dimmer characteristics, and durability.

This equipment is the combination of U-Type Dimmer Transformer and Dimmer Control Bank.

U-Type Autotransformer Dimmer

MARUMO U-Type Autotransformer is an autotransformer with load capacity of 10KW-40KW as an unit with five to ten branches of free control dimmer unit. Unique dimmer change can be obtained by handling each handle independently.

This is controlled by the voltage change caused from the vertical movement of contact brushes and no difficulty occurs if stopped for a long time in the way of dimming.

Following is a specification of a standard product.

Power Source:	AC 100V 50-60cycle
Capacity:	10KW-40KW
Capacity of Secondary Side	10A-60A
Branch numbers of the Secondary Side:	5-10

U-Type Dimmer Control Bank

MARUMO U-Type Dimmer Control Bank is such mechanism as control mechanically and remotely by co-operating both contact brush of each branch of autotransformer dimmer and handles of the dimmer bank by wire rope.

Individual Handle

This is a dimming control handle by operating the each contact brush on secondary side of each autotransformer dimmer. Equal number of the total number of the provided branches of secondary side is needed. One group of individual handles consists of about ten which arranged in a line on the main shaft and put together to three to six tiers which divided to right-side and left-side into six to twelve divisions.

Stopper

This is attached to each handle and when you pre-set the dimming degree, each handle stops at the position of this stopper in case of operation. There are two kinds of stoppers, upper limit and lower limit.

Quick Motion Handle

Able to control each individual handle on each tier quickly together.

Slow Motion Handle

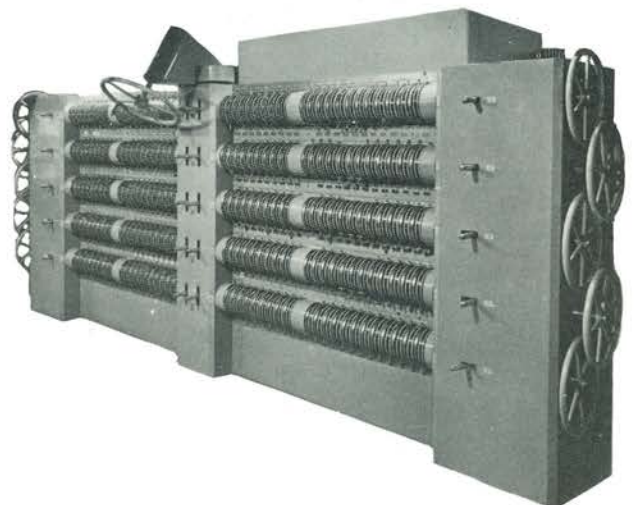
Able to control each individual handle on each tier slowly together.

Grand Master Handle

Able to control all individual handles putting together.

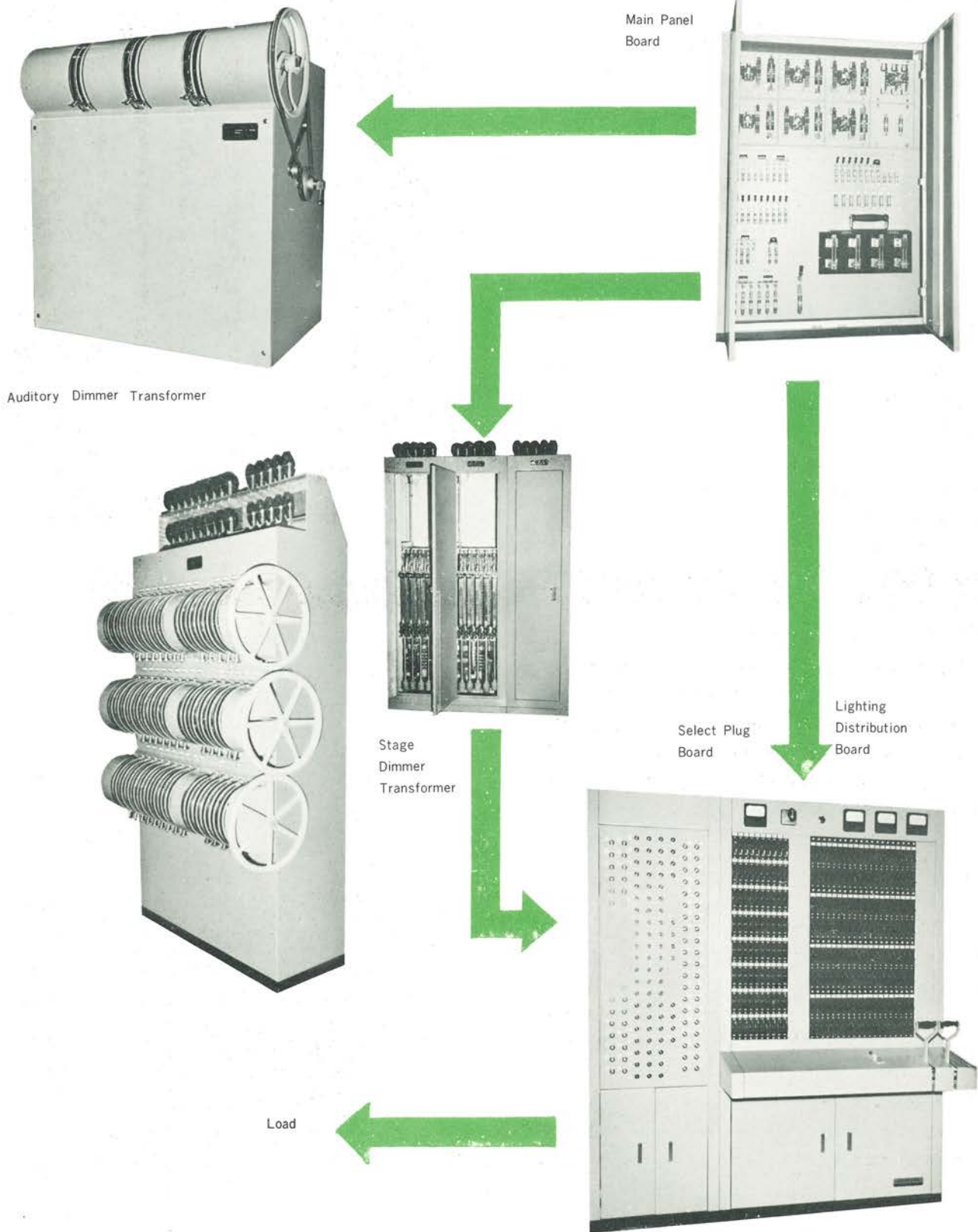
Brightness Change-over Clutch

By changing-over this lever up and down, brightness change from full brightness to dead dark can be obtained as a result of the one-way revolution of the grand master handle.





Systematical Illustration of U Type Dimmer Control Equipment

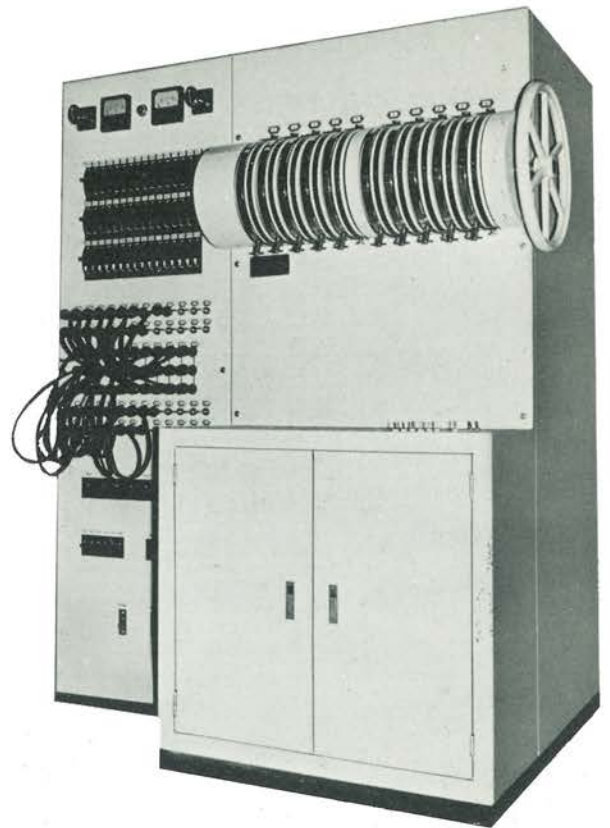


UR-TYPE DIMMER CONTROL EQUIPMENT

This is a dimming control equipment which combined all control system in one, making good use of the efficiency of U-Type Autotransformer Dimmer.

Accordingly, one can easily operate by using the necessary dimming control equipments. This is suitable for the lighting control of auditorium, small hall and gymnasium.

Capacity: 5KW 10KW 15KW 20KW 30KW

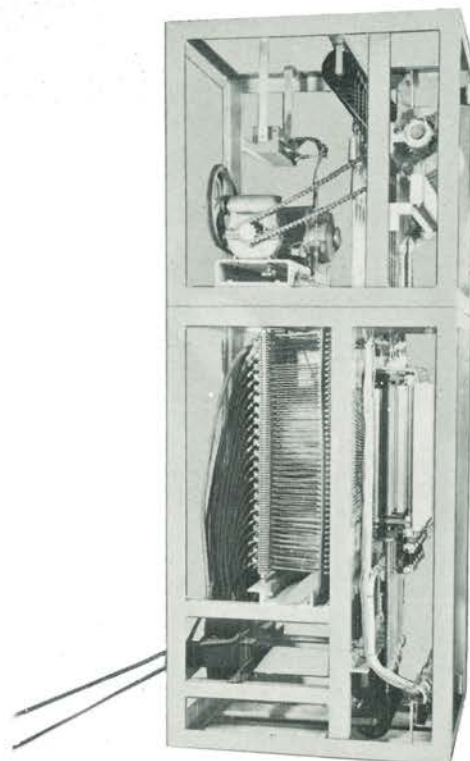


UM-TYPE DIMMER CONTROL EQUIPMENT

UM-Type Dimmer Control Equipment consists of U-Type Autotransformer Dimmer, UM-Type Dimmer Control Bank and Control Console. Formerly, this kind of dimming equipment had been dimming every other group responding to the dimmer degree set up to each circuit. So, if one wanted to make an opposite action to some part of it, he had to operate by his own hand, one by one.

But this UM-Type makes it possible to control brightness of each individual handle optionally, not only to control the same direction on each tier. Addition to this, it is also possible to control remotely the brightness of the selected circuit which is set optionally.

In this equipment, DC Motor is used and it is able to control the speed freely with the control switches on the dimming control console.



CR-TYPE DIMMER CONTROL EQUIPMENT

This equipment can be used independently or, compounding some unit, collectively which can handle large capacity of dimming control.

It also can be used as a dimming control switchboard in combination with the control switchboard. Suitable as the dimmer control equipment for the auditory and the stage of a small hall.

Individual Autotransformer Dimmer

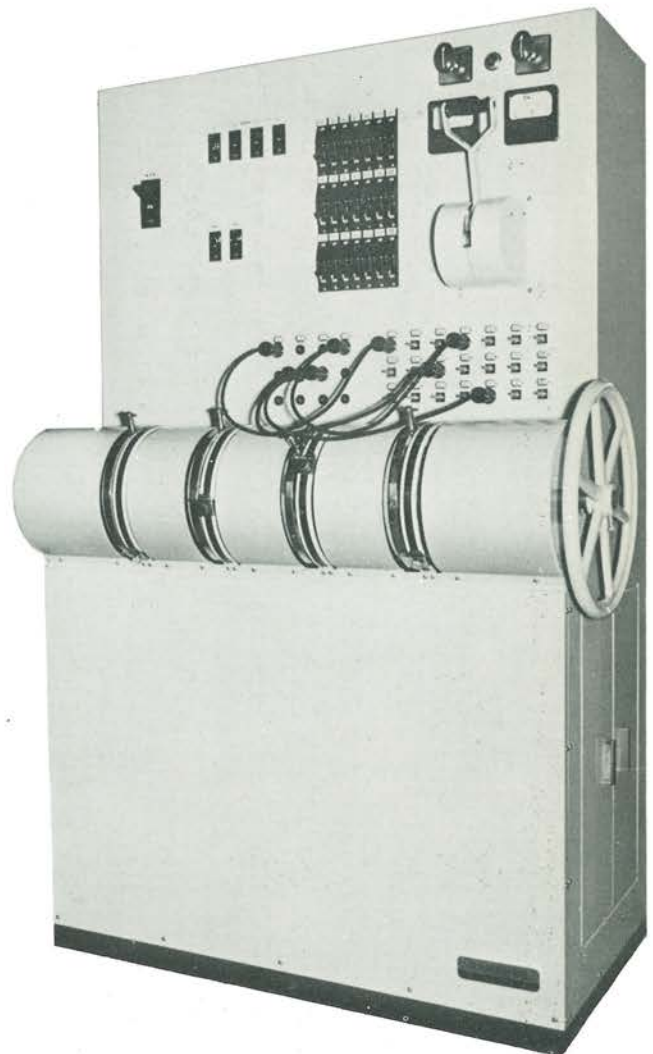
This shapes round and be able to set any dimming degree for many hours, and also be able to control remotely by combining the electric motor equipment.

Power Source: AC 100V Single Appearance
Capacity : 1 KW-7.5 KW

Combined Dimmer Control Equipment

This consists of some units of individual dimmer transformer combined in one frame. It is possible to combine transformers of different capacities in one.

Operation is made by handle individually or collectively.



CRD-TYPE DIMMER CONTROL EQUIPMENT

Utilizing the characteristics of CR-Type autotransformer Dimmer, this equipment is very portable because of its square shape.

It is also very convenient for the color photography because the voltage adjustment can be made up to 120V. Consequently, this is suitable for photo studio, motion picture studio and location of T.V. relay.

Capacity: 3KW, 5KW, 10KW, 15KW

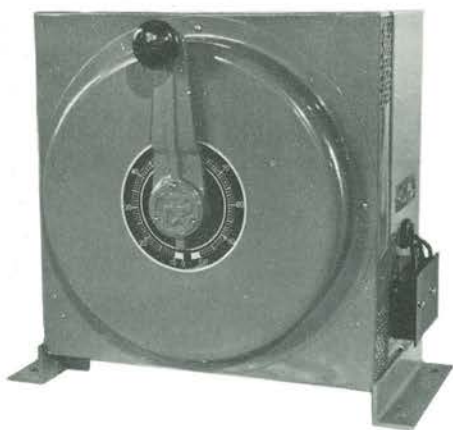


RGR-TYPE DIMMER CONTROL EQUIPMENT

This is an improved one from the CR-Type Dimming Control Equipment and has almost the same function as CR-Type.

Standard capacity is from 1KW to 5KW.

Please use the CR-Type in dimming control of a fluorescent lamp.

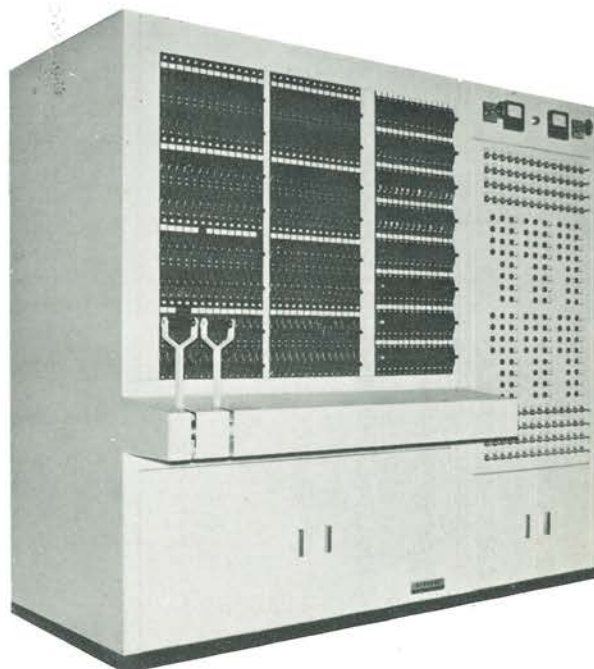


LIGHTING CONTROL SWITCH BOARD

A smooth operation of the complexed light controlling is available by this switchboard which holds a position between the U-Type or UM-Type Dimmer Control Equipment or Combined Dimmer Control Equipment and the load, combining the various kinds of loads.

For this purpose, many circuits are arranged clearly, and load branch switch (2 scene), load fuse, load indication pilot lamp, DL switch which change-over the load circuit to the direct circuit, brightness change switch are provided on this board. It is able to change-over the direct-dimmer circuit remotely by the magnet switch.

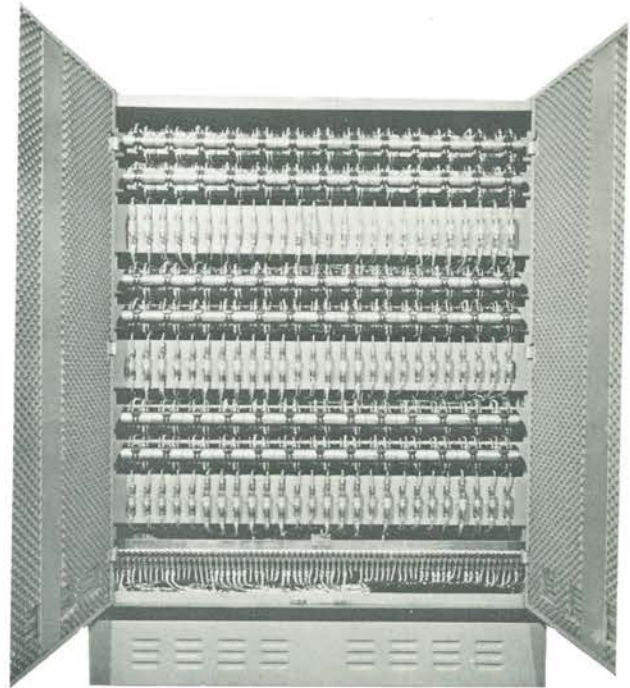
Suitable place for installation may be opposite side of the dimming control bank or beside of it where the stage can be seen.





Dimming Control Switchboard

This is made to be able to control stage lighting by itself putting together all necessary equipments, the dimming transformer, the switchboard, the plug board, and the main board, etc.

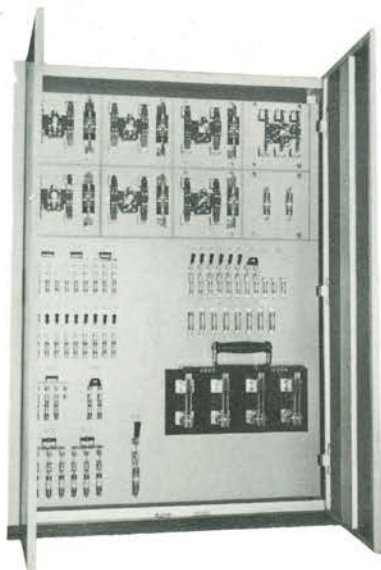


MAIN PANEL BOARD

This is an main operating control board which receive all necessary electric power and distribute it to each equipment.

This provides grand main switch, dimming main switch, direct main switch, main direct-dimmer change-over switch, branch switch for auditorium, main switch for control line and main Mg switch, etc.

In this board, knife switch or no-fuse breaker, etc. are used.





DIMENSIONS

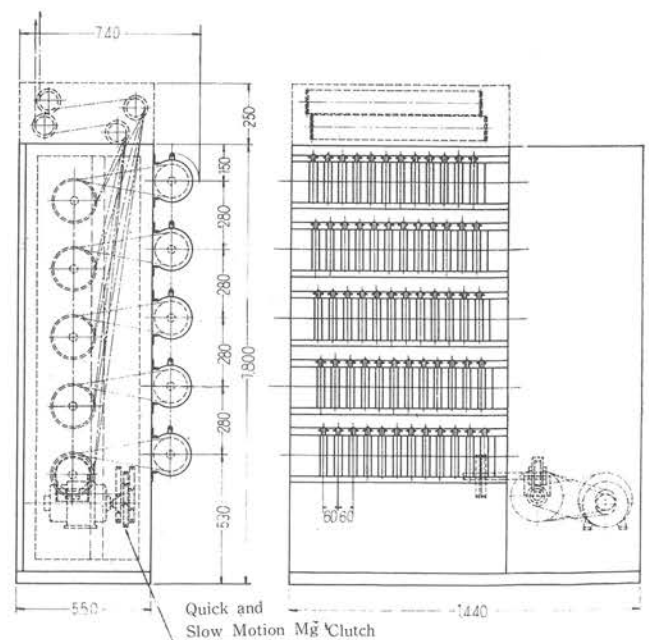
SCR Type Dimmer Unit Luck Board



ex : Dimension of Space.
 $130 = 100x + (10x - 10) \times x$
(x : number of SCR units)

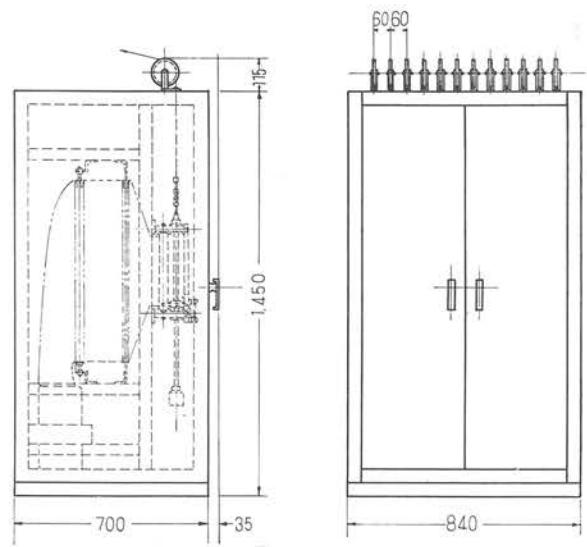
x	SCR unit
4	550%
5	600%
7	720%
8	880%
9	950%
10	1100%

UM Type Dimmer Control Handle

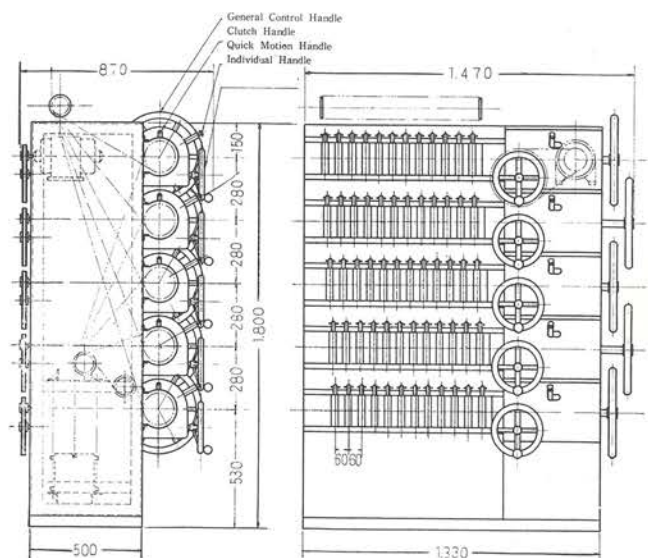




Standard U Type Dimmer Transformer (No.1)

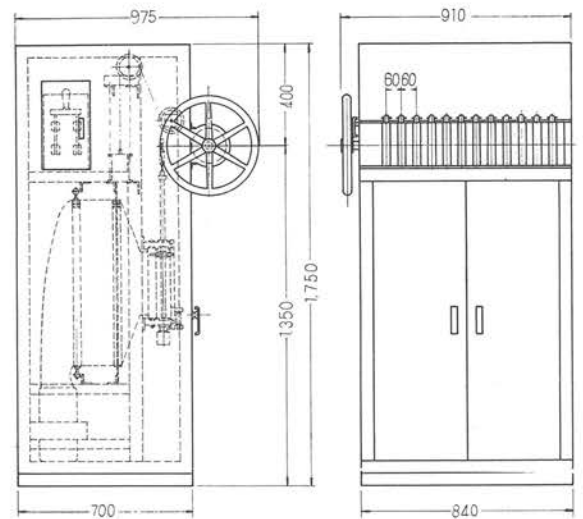


Manual-driven U Type Dimmer Control Bank

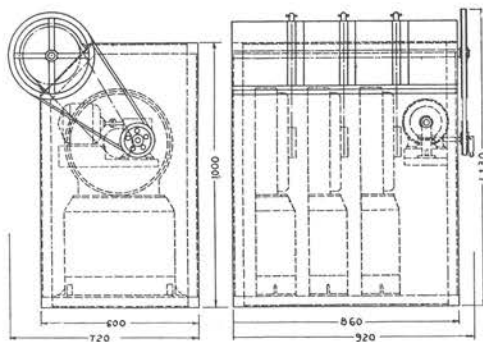




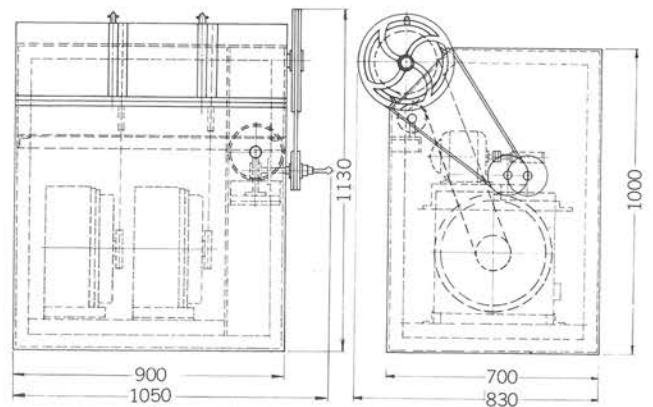
**Motor & Manual-driven UR-Type
Dimmer Control Bank.**

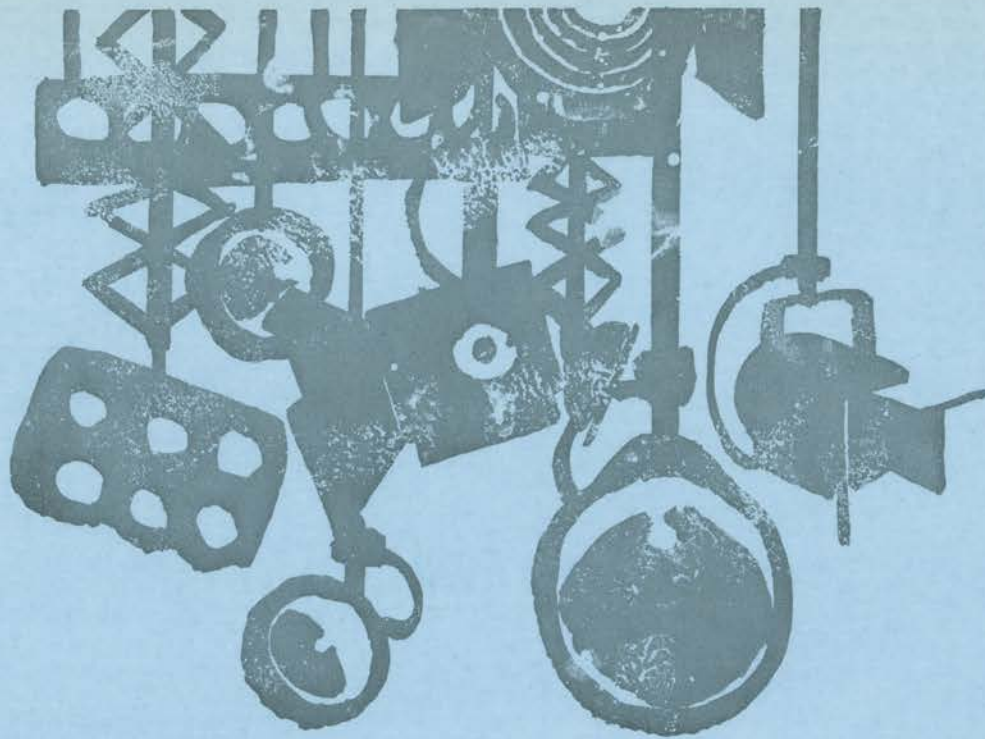


RCR-5Type Dimmer Control Bank.



**CR-5 Type Auto-trance former Dimmer.
3-units Conbinate Motor Driven.**





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