

LINE CONDITIONERS

PE 1411/10 9415 014 11101

PE 1411/15 9415 014 11151 ←

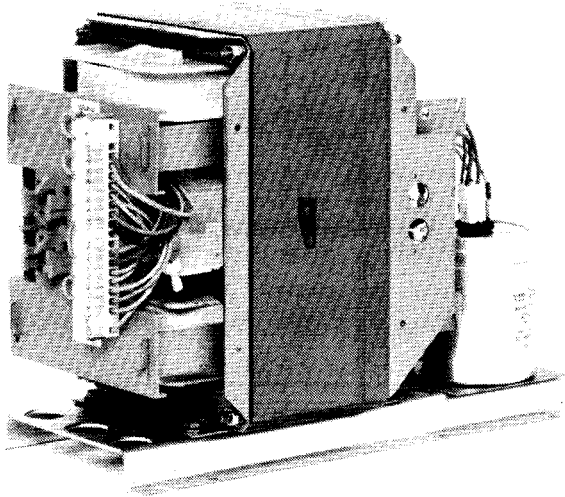
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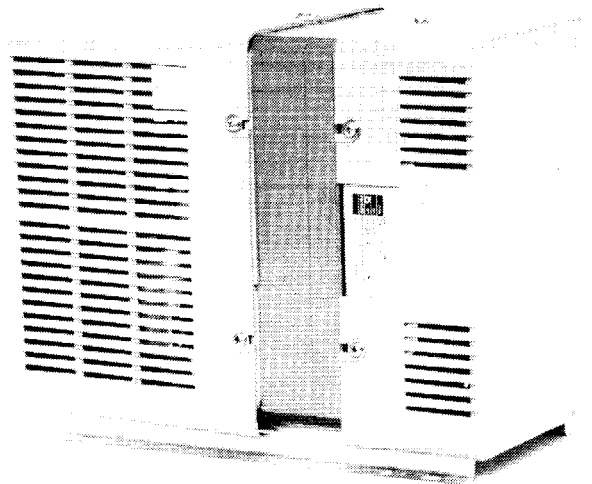
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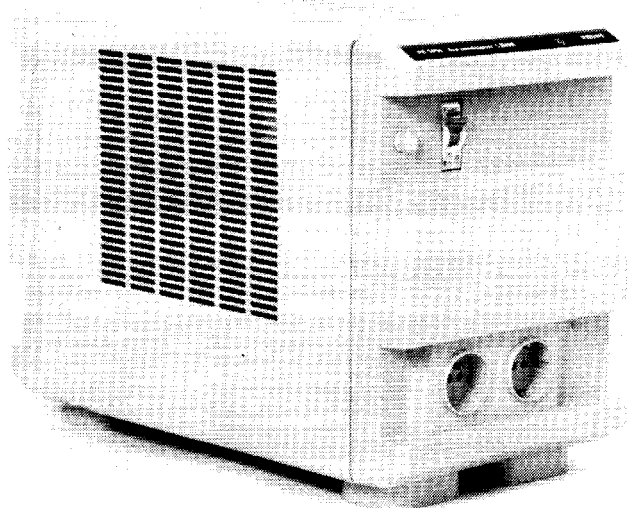
PE 1411/10



PE 1411/15



PE 1411/20



9499 160 18601

840509



PHILIPS

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ABBREVIATIONS

ADJ	Adjustment
BW	Bandwidth
Dm	Mains distortion
Do	Output distortion
F _n	Function
f _m	Mains frequency
G	External supply
I _m	Mains current
I _o	Output current
I _{on}	Nominal output current
LS	Local sensing
M	Master
OVP	Overvoltage protection
PARD	Periodic and random deviation
P _o	Output power
p-p	Peak-to-peak value
PWF	Power failure indication
RS	Remote sensing
r.m.s.	Root mean square value
R _p	Programming resistor
S	Slave
T	Mounting unit (5,08 mm) DIN 41494
T _a	Ambient temperature
t _r	Energy-reserve time
U	Rack unit (height) DIN 41494
U _m	Mains voltage
U _{max}	Maximum output voltage
U _o	Output voltage
U _{on}	Nominal output voltage
U _p	Programming voltage
U _t	Trip voltage O.V.P.

SAFETY PRECAUTIONS

In the interests of safety to personnel and equipment, it is strongly recommended that this page is read and thoroughly understood by all intended users before attempting to put this instrument into service.

This apparatus has been manufactured according to safety Class 1 standards as listed in Sect. 2.1.1. and has been supplied in a safe condition. This manual contains information and warnings which must be followed by the user to ensure safe operation and to retain the apparatus in a safe condition.

Where necessary, warning and caution statements and/or symbols are marked on the apparatus.

CAUTION is used to indicate correct operating or maintenance procedures in order to prevent damage to or destruction of equipment or other property.

WARNING calls attention to a potential danger that requires correct procedures or practices in order to prevent personal injury.

SYMBOLS :



Read the operating instructions (black/yellow)



Protective earth (ground) terminal (black)

* Any interruption of the protective conductor inside or outside the apparatus, or disconnection of the protective earth terminal is likely to make the apparatus dangerous ; intentional interruption is prohibited.

Impaired safety protection

Whenever it is likely that safety-protection has been impaired, the instrument must be made inoperative and be secured against any operation. The matter should then be referred to the appropriate servicing authority. Safety protection is likely to be impaired if, for example, the instrument fails to perform the intended measurements or shows signs of damage.

Important warnings :

Wherever appropriate in the manual, four important warnings are inserted in short, reminder form to maintain subject continuity. However, if there is any doubt about their meaning, always refer to the detailed explanation below :

WARNING A : Before any connection is made to a voltage source, the protective earth terminal shall be connected to a protective conductor. The stabilizer must be earthed in accordance with the IEC 348 safety regulations.

When a stabilizer is brought from a cold to a warm environment, condensation may cause a hazardous condition : ensure therefore that the earthing requirements are strictly adhered to.

If a three-core mains cable with mains plug is used, the mains plug shall be inserted into a socket provided with a protective earth contact. The protective action shall not be negated by the use of an extension lead without protective conductor.

The cross-section of the earth conductor must be at least equal to the cross-section of the mains conductors and in accordance with the local safety regulations.

If the stabilizer is rack-mounted, the rack must be connected to the Safety Earth in accordance with IEC 348. The cross-section of the earth conductor must be sufficient and depending on the total power of all instruments mounted in this rack.

WARNING B : After delivery, the apparatus must be connected to the power source only by a qualified person. Before making any connection, the safety measures must be thoroughly understood and observed. All adjustments, replacements, repairs, etc... shall be carried out by a qualified person aware of the hazards involved, with the instrument completely disconnected from the mains wherever possible. After disconnection, allow 4 minutes for capacitors to discharge before handling the stabilizer.

WARNING C : For continued protection against fire, only fuses with the required rated current and of the specified type shall be used for replacement ; the use of repaired fuses and the short-circuiting of fuse-holders is prohibited. The instrument shall be disconnected from all voltage sources when a fuse is to be replaced. As the stabilizer is electronically protected against most faults, a blown fuse indicates a major defect. Before replacing the fuse, always check the electronic circuit.

UNPACKING

On delivery, check the stabilizer as soon as possible to ascertain whether any damage has occurred in transit.

Retain all packing materials until all items of the power supply have been accounted for and checked.

* Visual inspection

Carry out a mechanical check on, e.g. connectors, terminal blocks, external fuse-holders and other enclosures. Check items for dents, chips or other signs of damage. Check that all accessories are present in accordance with the accessories list (Sect. 2.4).

* Claims

In the event of obvious damage or shortages, or if the safety of the stabilizer is suspect, a claim should be filed with the carrier immediately. A PHILIPS Sales or Service Organisation should also be notified in order to facilitate the repair of the instrument.

WARNING D : If nominal values are changed, the rating type-plate must be suitably amended.

GENERAL

1. INTRODUCTION

The PE 1411/10 (OEM or open-version) and PE 1411/15, PE 1411/20 (closed version) are line conditioners which deliver a sinewave output with galvanic separation between input and output. The output is short-circuit proof. Several stabilizers of the same type may be connected in parallel or in a three-phase configuration.

NOTE : The design of this stabilizer is subject to development and improvement. Consequently, this stabilizer may incorporate minor changes in detail from the information contained in this manual. Only values with tolerances or limits can be considered as guaranteed data. Figures without tolerances are informative data without guarantee.

2. CHARACTERISTICS

This section deals with the technical specifications of the stabilizer with regard to the input and output conditions (i.e. amplitudes, regulation, stability, etc.) safety aspects and interference level. In addition, it covers details of environmental and mechanical data, and gives a list of accessories that are provided with the stabilizer.

2.1. ELECTRICAL DATA

The values given in this section are valid within the rated range of operation (- 10°C to + 45°C). On delivery, the stabilizer is adjusted at an ambient temperature of 23°C, with convection cooling.

2.1.1. GENERAL

* Safety.

In accordance with (Safety class 1) IEC 65, IEC 348, IEC 380, IEC 435
VDE 550 : only for the transformers

Leakage current (from chassis to earth) :
max. 0,5 mA r.m.s. at 50 Hz (on delivery)

* Dielectric strength test : see Fig. 541.
Every unit has been factory tested to withstand the following voltages :

- between primary and chassis : 2,0 kV.a.c.
- primary and secondary : 1,5 kV.a.c.
- secondary and chassis : 1,5 kV.a.c.

In the event of repetition of the dielectric strength tests, it is necessary to follow the instructions laid down in the Service Manual. If the Service Manual is not in stock the Supply Centre must be contacted in order to obtain the supplementary information.

* Output terminals : the output terminals are floating with respect to earth. The voltage between any one of the output terminals and earth may not exceed 500 V a.c. (r.m.s.).

* Noise level.

PE 1411/10 : max. 40 dBA
PE 1411/15 : max. 40 dBA
PE 1411/20 : max. 40 dBA

2.1.2. INPUT

Mains voltage (a.c.) nominal
220 V (198 V - 242 V) or
240 V (218 V - 266 V) by wiring

Mains frequency
50 Hz ($\pm 2\%$) or
60 Hz ($\pm 2\%$) by wiring

Consumption, input current
Type Im (1) Fuses (2)

PE 1411/10	1,3 A	3,15 A
PE 1411/15	1,3 A	3,15 A
PE 1411/20	1,3 A	3,15 A

(1) at mains voltage of 220 V

(2) the delayed action fuses, provided by the user, are to be mounted outside the stabilizer.

Efficiency (at full load)

PE 1411/10	: min. 89 %
PE 1411/15	: min. 89 %
PE 1411/20	: min. 89 %

2.1.3. OUTPUT

ON DELIVERY Type	wired as	INPUT	OUTPUT
PE 1411/10	STABILIZER	220V/50Hz	220 V
PE 1411/15	STABILIZER	220V/50Hz	220 V
PE 1411/20	STABILIZER	220V/50Hz	220 V

Type	P _o (VA)	U _m (V)	U _o (V)	f _m (Hz)
PE 1411/10	200	220/240	220/240	50/60
PE 1411/15	200	220/240	220/240	50/60
PE 1411/20	200	220/240	220/240	50/60

2.1.4. OUTPUT EFFECTS

2.1.4.1. AS STABILIZER

* Output voltage nominal value U_{on} :
220 V (+ 1, - 1) % or
240 V (+ 2, - 2) %

* Source effect (U_m : + 10 % or - 10 %)
Valid for a constant mains frequency of 50 Hz, an input distortion of max. 5 % and a linear resistive load between no load and full load.
max. - 1 %, + 1 %

* Combined load and source effect :
Valid for a constant mains frequency of 50 Hz, an input distortion of max. 5 %, a mains input voltage between + 10 % and - 10 % and a linear resistive load between no load and full load.
max. - 1,9 %, + 3,0 % from U_{on}

* Warm-up time : 4 hours
with a cold core (+ 25°C), the output voltage is approximately 1,5 % higher.

- * Distortion (output)
max. 4 % under all conditions referred to under source and load effect.
- * Transient suppression :
min. 30 dB for asymmetrical pulses
- * Source frequency effect (fm : 50Hz \pm 2% or 60Hz \pm 2%)
For each 1 % mains frequency variation, the max. output variation is 1,5 %

2.1.4.2. AS FILTER

- * Output voltage nominal value U_{on} :
220 V (+ 1, - 1) % or
240 V (+ 2, - 2) %
- * Source effect (U_m : + 10 % or - 10 %)
Valid for a constant mains frequency of 50 Hz, an input distortion of max. 5 % and a linear resistive load between no load and full load.
max. - 2 %, + 2 %
- * Combined load and source effect :
Valid for a constant mains frequency of 50 Hz, an input distortion of max. 5 %, a mains input voltage between + 10 % and - 10 % and a linear resistive load between no load and full load.
max. - 2,9 %, + 6 % from U_{on}
- * Warm-up time : 4 hours
with a cold core (+ 25°C), the output voltage is approximatively 1,5 % higher.
- * Distortion (output)
max. 4 % under all conditions referred to under source and load effect.
- * Transient suppression :
min. 60 dB for asymmetrical pulses
- * Source frequency effect (fm : 50Hz \pm 2% or 60Hz \pm 2%)
For each 1 % mains frequency variation, the max. output variation is 1,5 %

2.1.5. PROTECTION

Overcurrent : natural limitation of transformer with leakage flux path.
Short-circuit current : between 150 % and 200 %

2.2. ENVIRONMENTAL DATA

The environmental data mentioned in this manual are based on the results of the manufacturer's checking procedures.
Details of these procedures and failure criteria are supplied on request by the PHILIPS Organisation in your country, or by PHILIPS EXPORT BV, SCIENTIFIC & INDUSTRIAL EQUIPMENT DIVISION, EINDHOVEN, THE NETHERLANDS.

2.2.1. CLIMATIC CONDITIONS

Designation	Type
	PE 1411/10/15/20
- Ambient temperature	
- rated range of use	: (-10/+45)°C
- limit range of operation	: (-20/+45)°C
- limit range for storage and transport	: (-40/+70)°C
- Relative humidity	: (20/90) %
(of the ambient air) non-condensing	

COOLING

- The ambient temperature is defined as the temperature 20 mm below the unit. Mount the power supply unit with the cooling surfaces in a vertical plane so that the air circulation in the unit is maximum.
- The current values given in Section 2.1.3. may be only applied when the unit is in a free-standing position and the rising warmed air is not impeded.

2.2.2. ENVIRONMENTAL TESTS

Performance tests, operating

Description	IEC-68
Cold test	2-1 Ad 2 h.(-20°C)
Dry heat	2-2 Bd 2 h.(+40°C)
Damp heat steady state	2-3 Ca 10 d.(+45°C)

Tests for storage and transport

Description	IEC-68
Cold test	2-1 Ab 72 h.(-40°C)
Dry heat	2-2 Bd 96 h.(+70°C)
Vibration test	2-6 Fc
Bump test	2-29 Eb
Cyclic damp heat test	2-30 Db 21 d.(+25°C to + 40°C)
	90 - 100 % RH

Packaging according to UN-D-1400


The test methods mentioned are in accordance with those of the relevant ISO-Standards.

2.3. MECHANICAL DATA

2.3.1. OVERALL DIMENSIONS AND WEIGHT (see Fig. 100, 101, 102)

	PE 1411/10	PE 1411/15	PE 1411/20
Height :	178 mm	183 mm	310 mm
Width :	160 mm	158 mm	220 mm
Depth :	212 mm	226 mm	255 mm
Mass :	7 kg	8 kg	9 kg

2.3.2. MOUNTING

Connecting Block :	PE 1411/10/15	PE 1411/20
INPUT :	X1	mains supply cable
OUTPUT :	X1	wall plug
 :	X4	-

2.4. ACCESSORIES

- mains supply cable

2.4.1. OPERATING MANUAL

2.4.2. OPTIONAL

Plugs and sockets for PE 1411/20.

- /201 Valid in Germany, Austria, Holland, Sweden, ...
- /202 Valid in Belgium, France, ...
- /203 Valid in Great-Britain, Hong-Kong, ...
- /204 Valid in Switzerland.

DIRECTIONS FOR USE

3. INSTALLATION**3.1. INITIAL INSPECTION**

Refer to Safety Precautions and Unpacking

SEE WARNING A - PROTECTIVE EARTHING

/10/15 Connect the stabilizer to a protective earth with : - terminal X4 : M6
/20 Provided with a main plug with earth contact.

3.2. MOUNTING INSTRUCTIONS

SEE WARNING A - PROTECTIVE EARTHING

A line conditioner attains a nominal working temperature higher than a conventional transformer, due to the high flux density in the core.

A physical spacing and/or orientation of the transformer field must be realized to avoid interactions with circuits like audio, CRT displays, etc ...

3.3. DISMANTLING

SEE WARNING B - Before handling or dismantling first disconnect from all voltage sources.

Removal and access :

/10 version
- the connecting blocks are accessible without dismantling
/15/20 version
- the connecting blocks are accessible after removing the cover (see Fig. 150, 151, 152, 153, 154, 155).

3.4. OUTPUT CONNECTIONS

NOTE : The output effects given in Sect. 2.1.4. can be influenced by external connections or parameters (e.g. cross-sections of the load connections, distance between output terminals and load characteristics of the load.

PE 1411/10/15 : Connecting block : X1
Phase : terminals U1 and V1
Max. cross-section : 1,5 mm²

The cross-section of the wires must be of adequate current-carrying capacity (also dependent on the distance between the line conditioner and the load).

PE 1411/20 : output : wall plug on-front panel.

3.5. MAINS CONNECTION

Before inserting the mains plug into the mains socket, make sure that the instrument is set to the local mains voltage.

NOTE : If the mains plug has to be adapted to the local situation, such adaptation should be done by a qualified person only !

See WARNING A - protective earthing. Page 3.

See WARNING B - authorized mains connection & disconnection procedures. Page 3.

See WARNING C - fuse types and renewal procedure. Page 3.

See WARNING D. Page 3.

PE 1411/10/15 : Connect the power supply to the a.c. mains voltage (see also Sect. 5.2.) through connector :
Connecting block : X1 : terminals U and V
max. cross-section 1,5 mm²

The current-carrying wires to the mains must be of sufficient cross-section depending on the mains voltage and the distance between the mains and the stabilizer.

PE 1411/20 : INPUT : mains supply cable with plug. (length : 2 m)

4. OPERATING INSTRUCTIONS**4.1. GENERAL INFORMATION**

This section outlines the procedures and precautions necessary for operation.

It identifies and briefly describes the functions of front and rear panel controls and indicators, and explains the practical aspects of operation to enable an operator to evaluate quickly the instrument's main functions.

4.2. SWITCHING "ON"

After the stabilizer has been connected to the mains (line) voltage in accordance with Installation, Sections 3.1. and 3.6. it can be switched on, after which the instrument is ready for use.

With normal installation, in accordance with Section 3 and after a warming-up time of 2 hours, the characteristics specified in Section 2 are valid.

4.3. CONTROLS, ADJUSTMENTS, INDICATORS AND TERMINALS

(Fig. 100, 101, 102)

Front panel : H1 indicates the presence of the output voltage (PE 1411/20)
S1 switch ON/OFF (PE 1411/20)
X3 wall plug (PE 1411/20)
Rear panel : X1 input/output connection block (PE 1414/10/15)
Side panel : X4 earth terminal (PE 1414/10/15)

4.4. SERIES, PARALLEL THREE-PHASE CONNECTIONS**4.4.1. SERIES CONNECTION**

Not applicable

4.4.2. PARALLEL CONNECTION

Stabilizer of the same type may be connected in parallel; if for technical information, please contact the "Supply Centre" see Section 6.

4.4.3. THREE-PHASE CONNECTIONS

Stabilizers of the same type may be connected in a three-phase configuration ; for technical information, please contact the "Supply Centre", see Section 6.

5. ADJUSTMENTS

See WARNING B - adjustments by qualified person only. After switching off wait 4 minutes before handling.

5.1. GENERAL

WARNING D : when changing the nominal values, the rating type-plate must be suitably amended.

IMPORTANT : as all the transformers of one stabilizer are parallel connected, all single transformers must be identically wired to the chosen configuration.

5.2. MAINS INPUT (see Fig. 201)

On delivery, the stabilizer is wired for :
 input voltage : 220 V
 mains frequency : 50 Hz
 configuration : as "STABILIZER"

For other configurations, see Table 1.
 For 110 V mains connections, please contact the "Supply Centre".

5.3. OUTPUT ADJUSTMENTS (see Fig. 201)

On delivery, the stabilizer is wired for :
 output voltage : 220 V 50 Hz
 configuration : as "STABILIZER"

For other configuration, see Table 1.

6. SERVICING

See WARNING B ; Servicing by qualified person only !

If other technical information is required, please contact the "Supply Centre".

PHILIPS INDUSTRIE s.a.
 Service Power Supplies Department
 Boulevard de l'Europe, 131
 B-1301 WAVRE
 BELGIUM
 Telex : 59058 philwa b
 Tel : 10/41.65.11

OR

PHILIPS EXPORT BV
 S & I Service Publications
 Building TQ III-2
 EINDHOVEN
 THE NETHERLANDS
 Telex : 35000

Safety measures require that the instrument should first be put into its original state and that the spare parts are identical to the original components.

The use of a mains-isolating transformer during service is necessary.

6.1. FUSE REPLACEMENT

Not applicable

TABLE 1 : CONNECTIONS POSSIBILITIES

f_m	50 HZ				60 HZ						
STAB/ FILTER	STAB	FILT		STAB	FILT						
U_m	220V	220V	240V	220V	240V	220V	240V				
U_{on}	220V	220V	240V	220V	240V	220V	240V	220V	240V	220V	240V
FIG	220	221	222	223	224	225	226	227	228	229	230

DISMANTLING
PE 1411/20

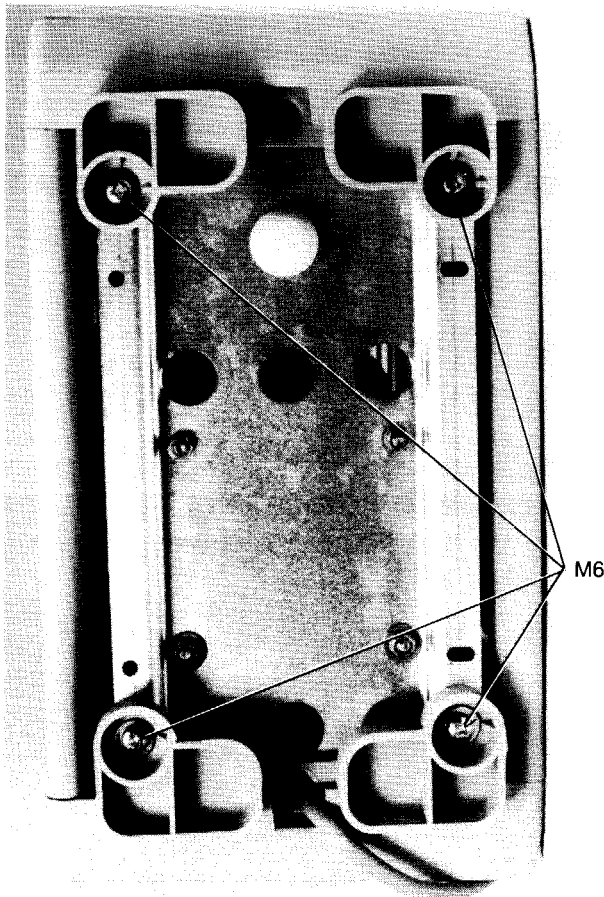


FIG. 150

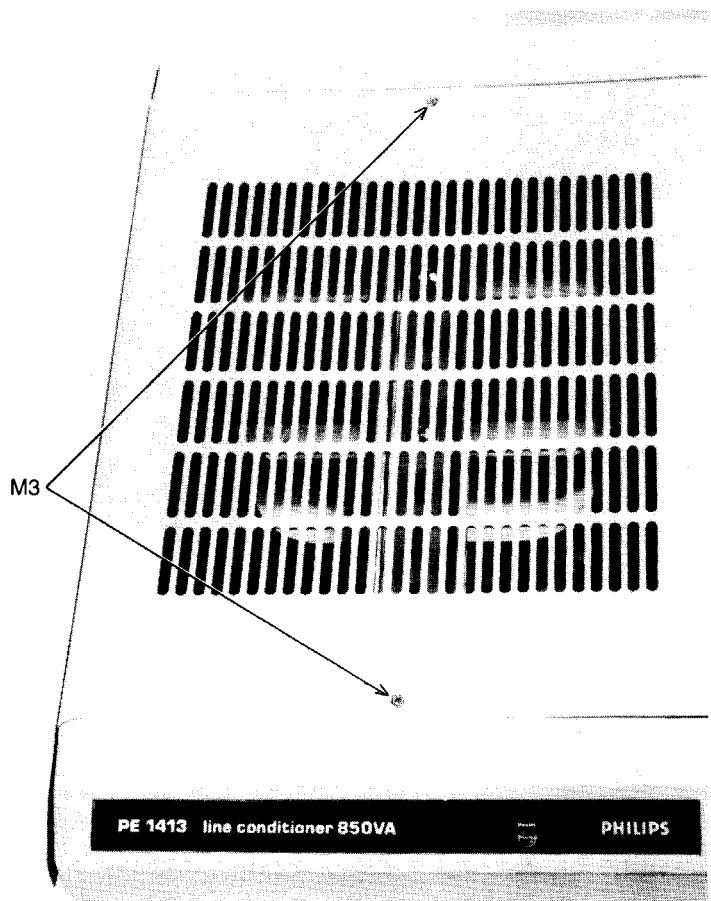


FIG. 151

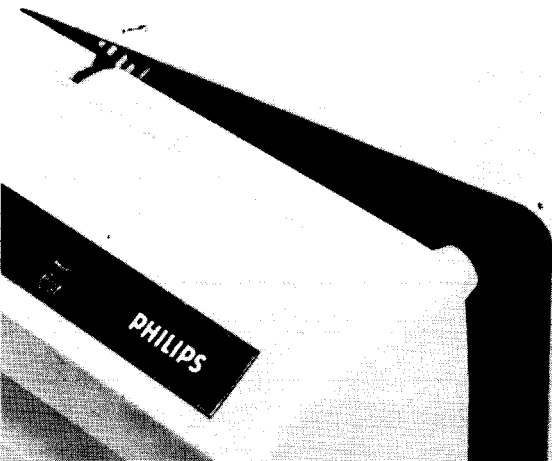
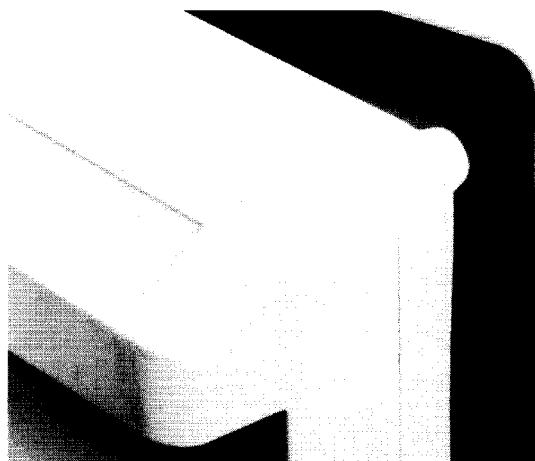


FIG. 152



PE 1411/15

FIG. 153

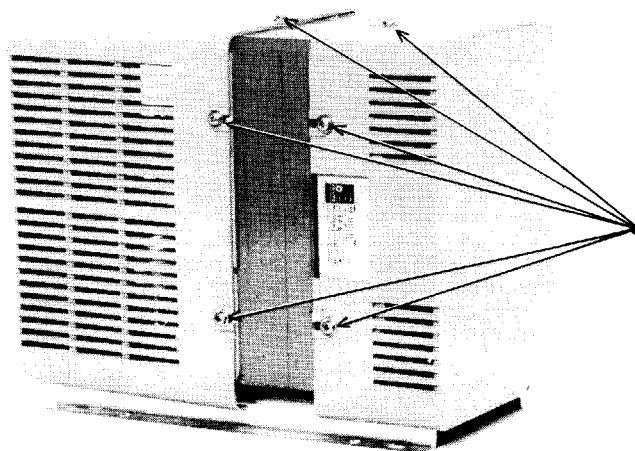


FIG. 154

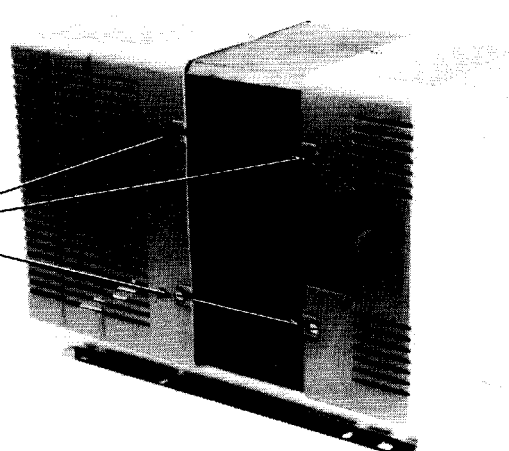


FIG. 155

DIMENSIONS

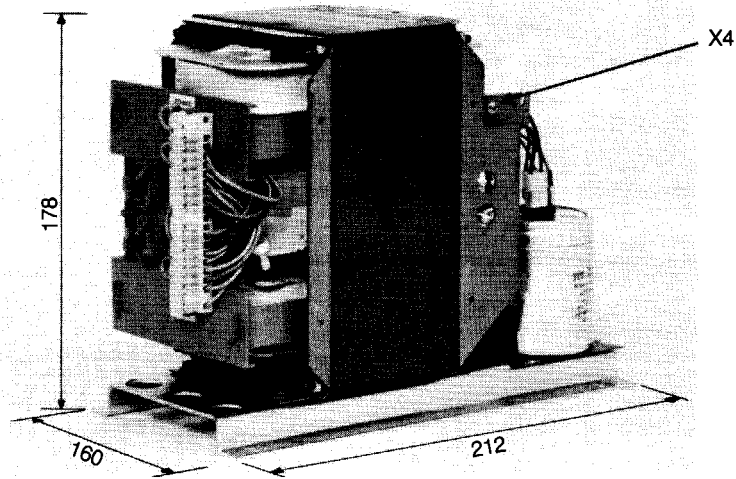


FIG. 100

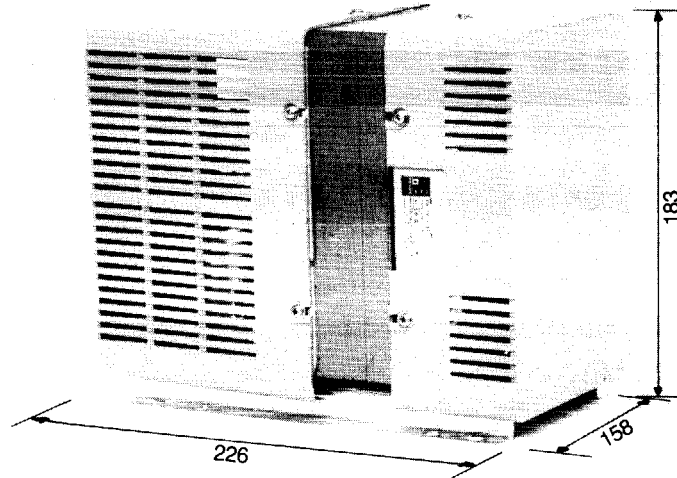


FIG. 101

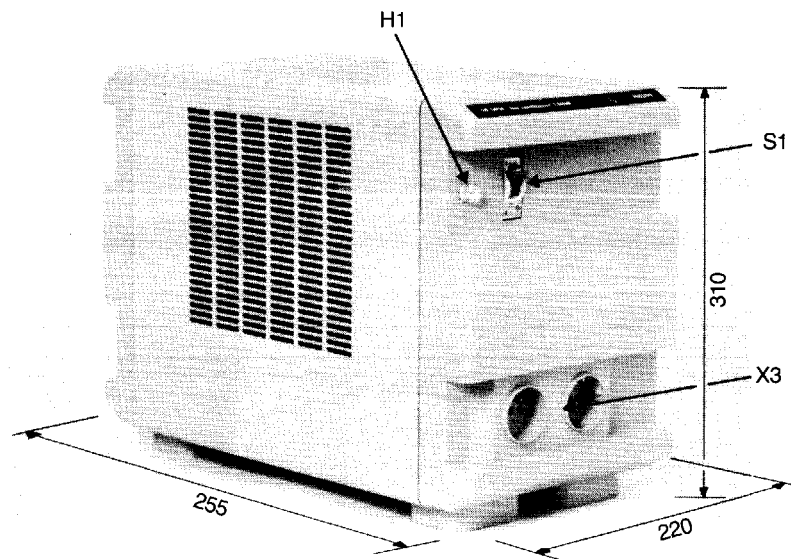
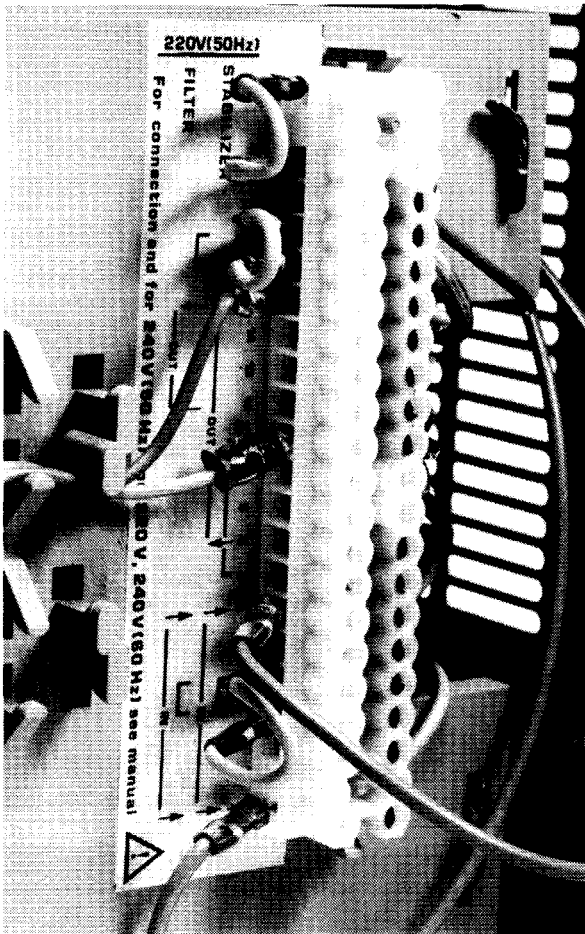


FIG. 102

CONNECTIONS

AS FILTER
(220V, 50 Hz)



AS STABILIZER
(220V, 50 Hz)

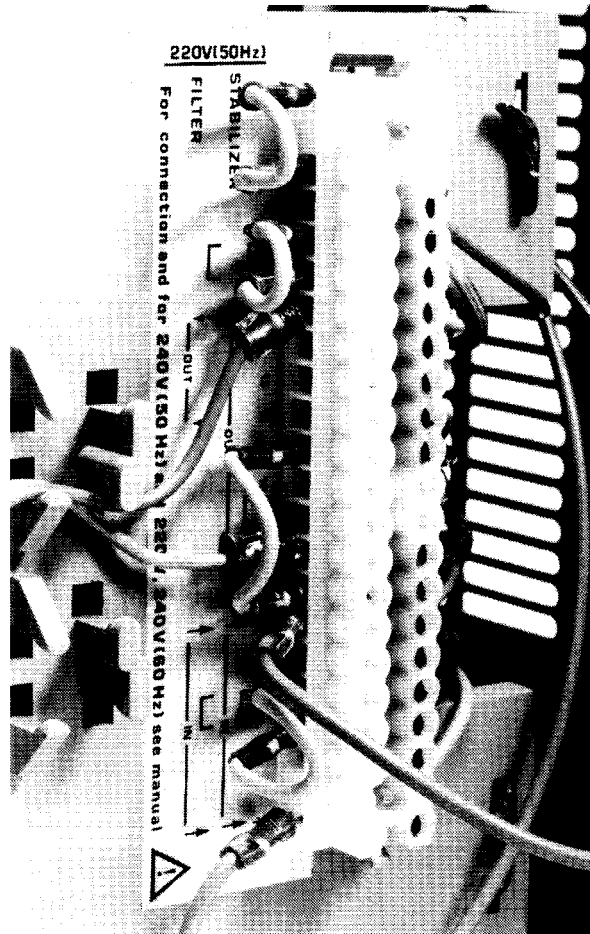


FIG. 201

VIEW CAPACITORS 60 Hz

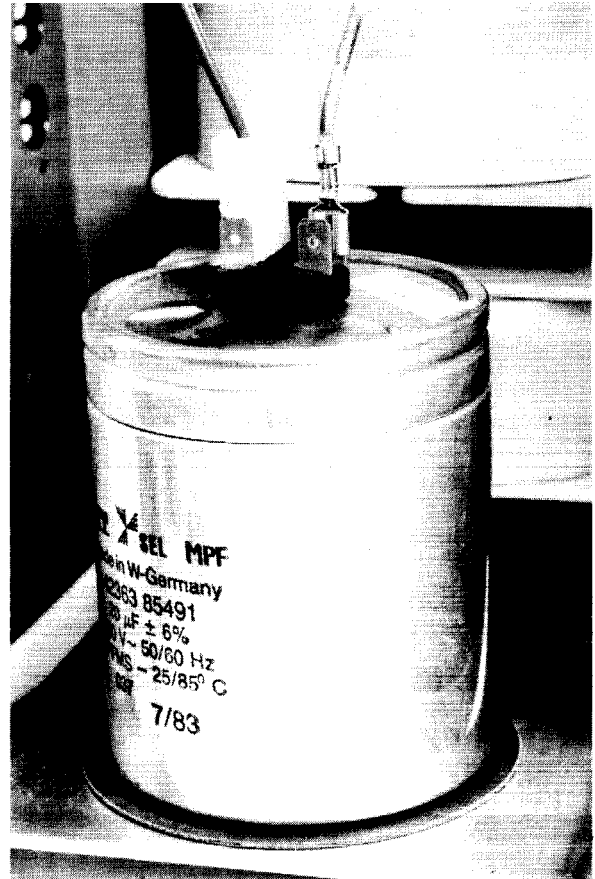


FIG. 203

VIEW CAPACITORS 50 Hz

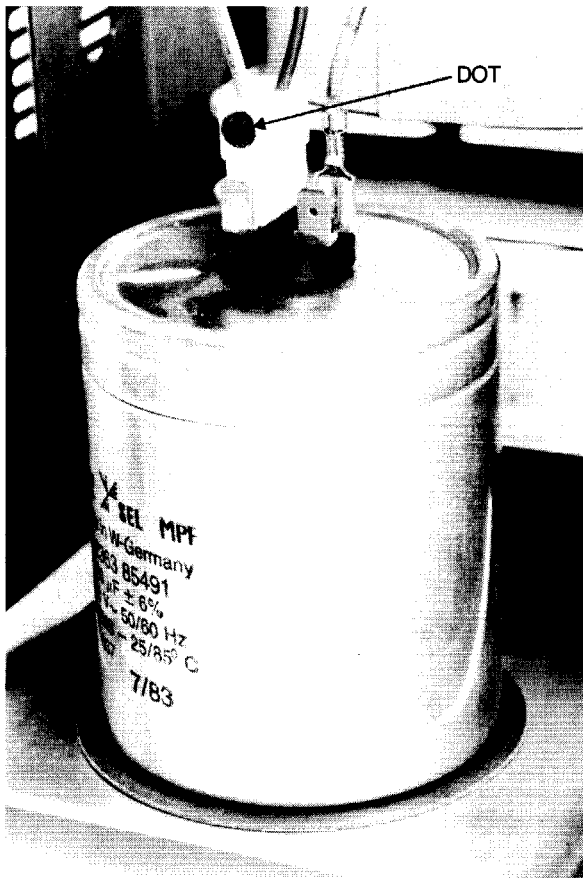


FIG. 204

STAB 220V(50HZ)/220V

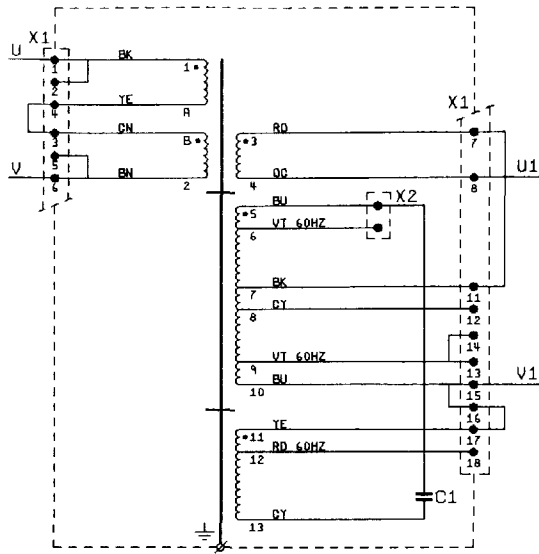


FIG. 220

FILT 220V(50HZ)/220V

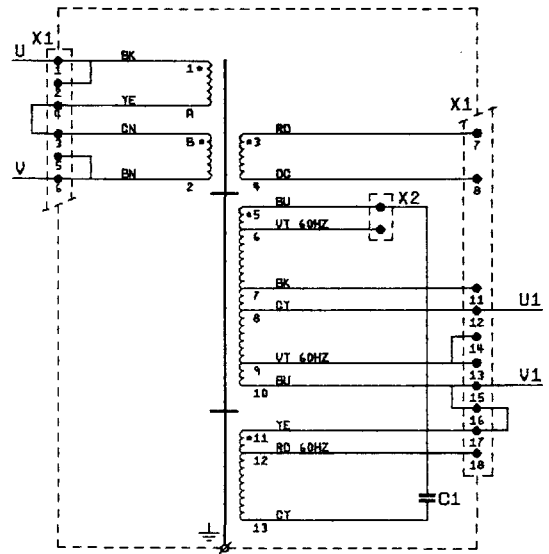


FIG. 221

FILT 220V(50HZ)/240V

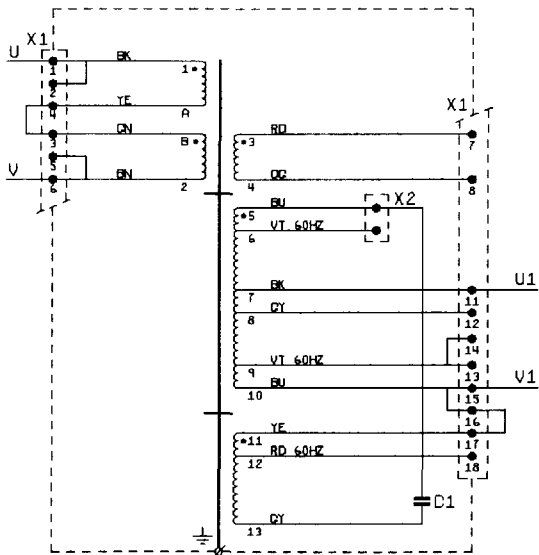


FIG. 222

FILT 240V(50HZ)/220V

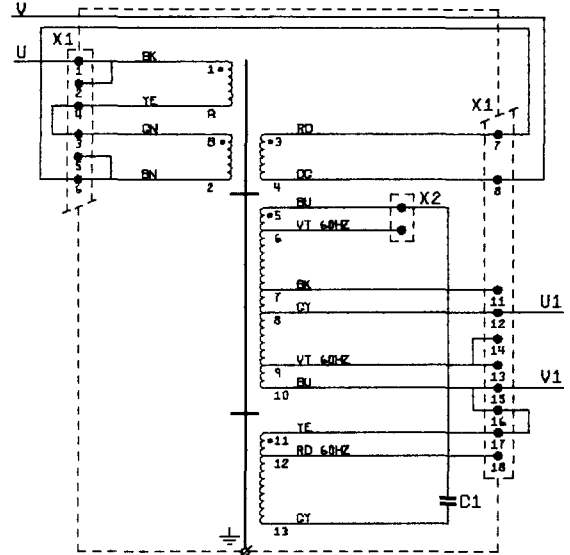


FIG. 223

FILT 240V(50HZ)/240V

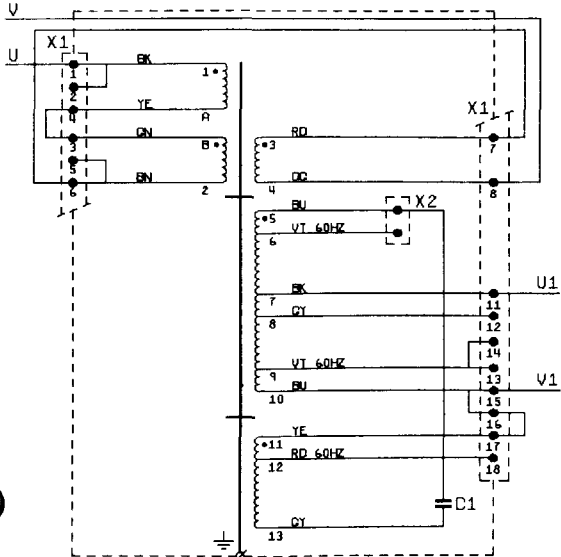


FIG. 224

STAB 220V(60HZ)/220V

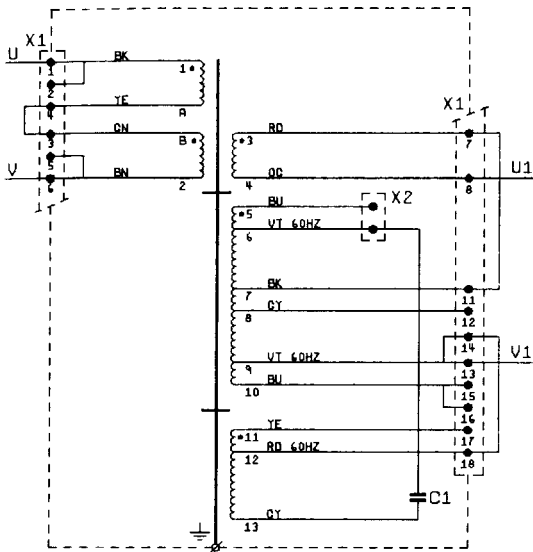


FIG. 225

STAB 240V(60HZ)/220V

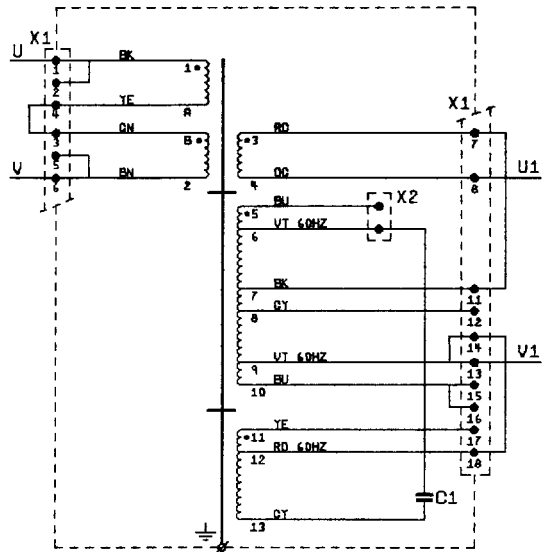


FIG. 226

FILT 220V(60HZ)/220V

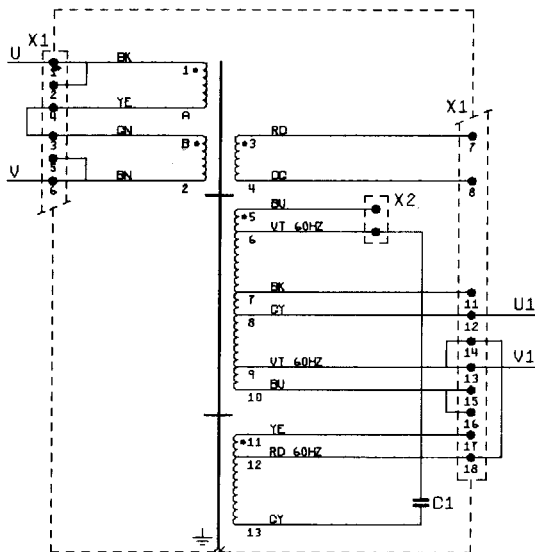


FIG. 227

FILT 240V(60HZ)/220V

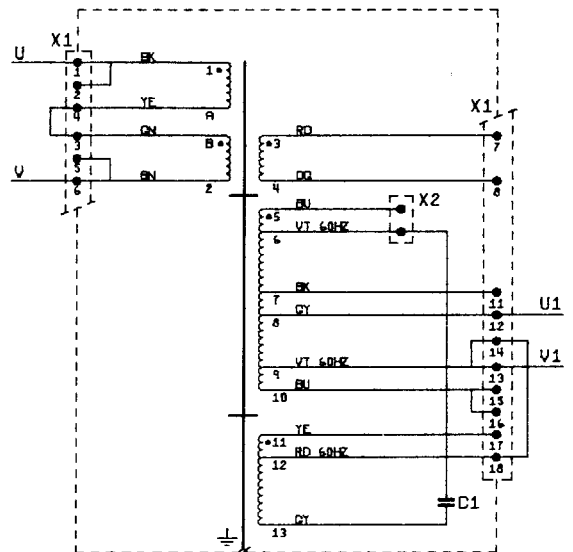


FIG. 228

FILT 220V(60HZ)/240V

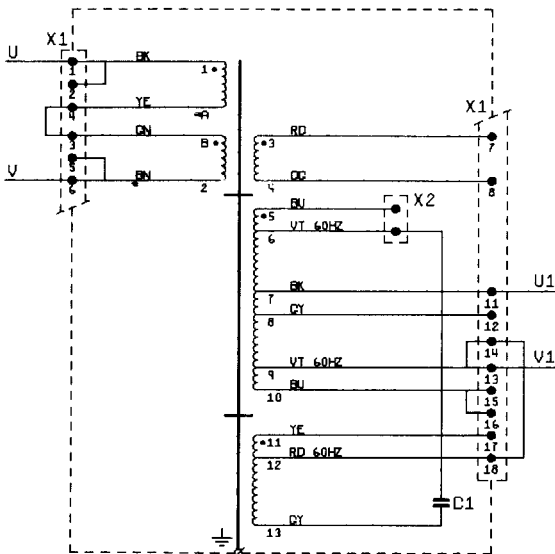


FIG. 229

FILT 240V(60HZ)/240V

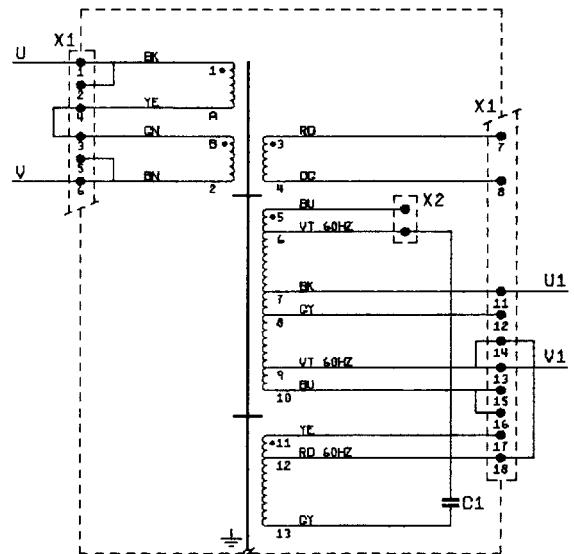
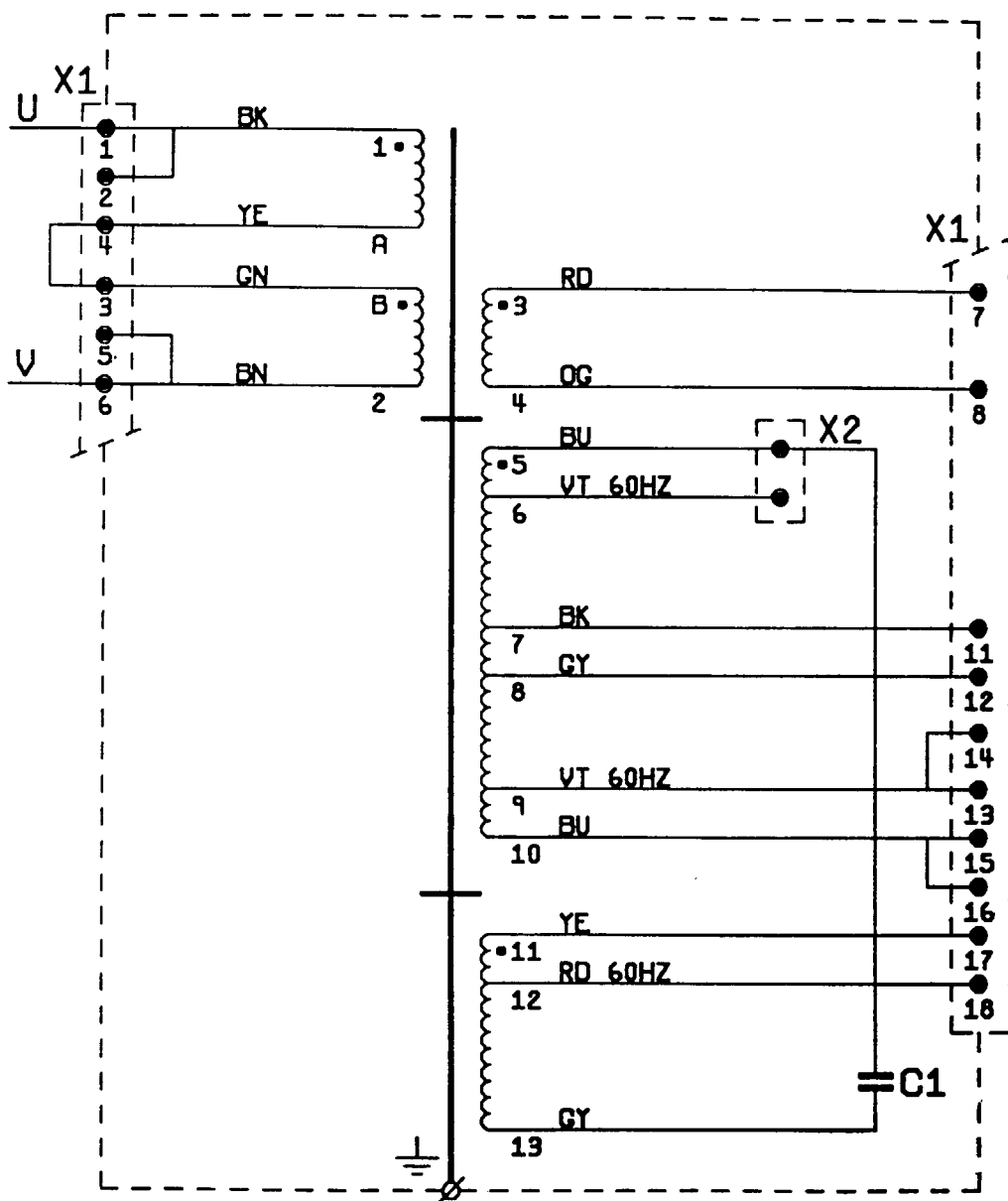


FIG. 230

CIRCUIT DIAGRAM (TRANSFORMER)

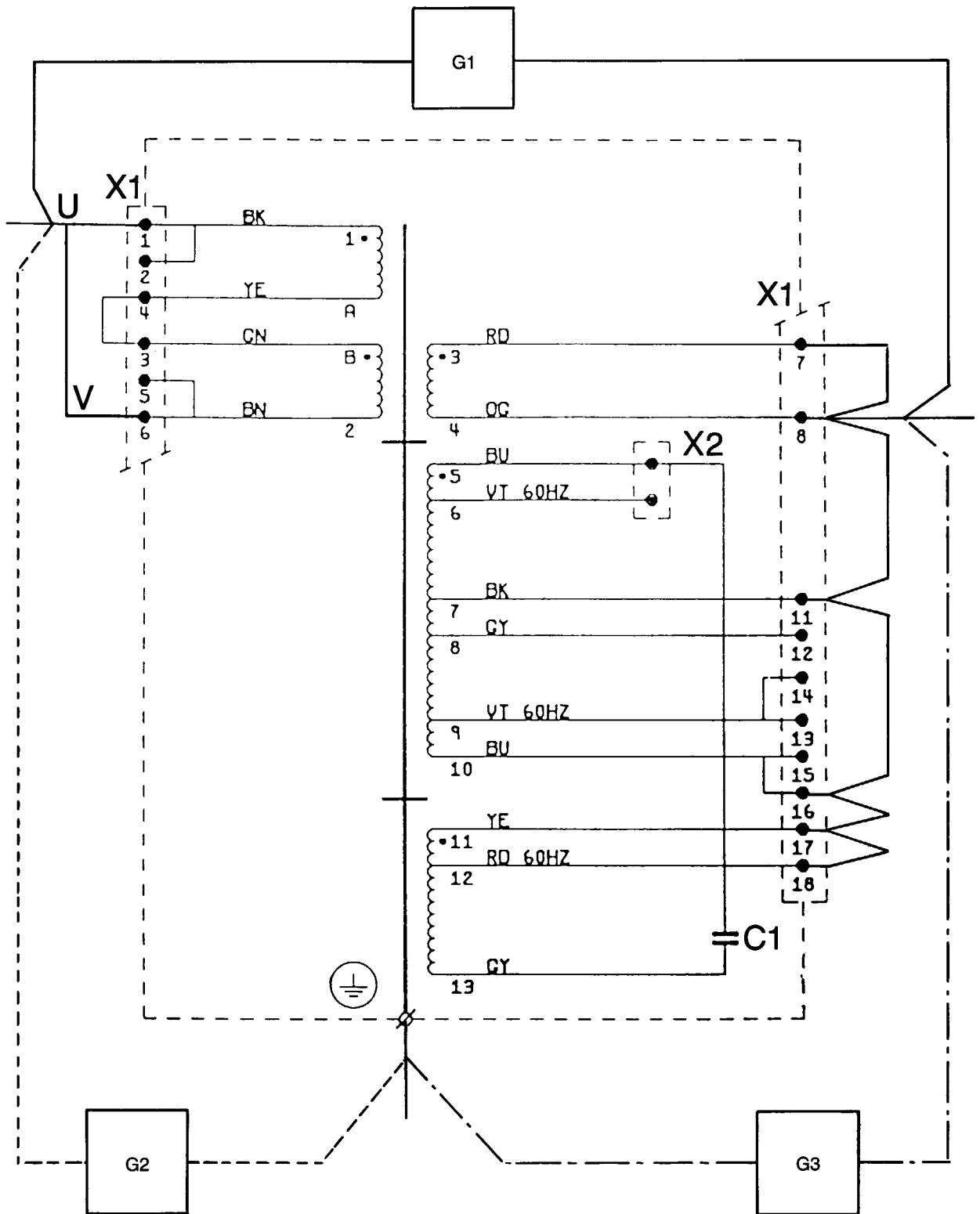


Colour codification : (IEC 757)

Colour	Letter code
Black	BK
Brown	BN
Red	RD
Orange	OG
Yellow	YE
Green	GN
Blue (including light blue)	BU
Violet (purple)	VT
Grey (state)	GY
White	WH
Pink	PK
Gold	GD
Turquoise	TQ
Silver	SR
Green-and-yellow	GNYE

FIG. 1000

DIELECTRIC STRENGTH TEST SET-UP



- TEST 1: BETWEEN PRIMARY AND SECONDARY: U_{HT} - 2,0 kVa.c.
- - - TEST 2: BETWEEN PRIMARY AND CHASSIS: U_{HT} - 1,5 kVa.c.
- · - TEST 3: BETWEEN SECONDARY AND CHASSIS: U_{HT} - 1,5 kVa.c.

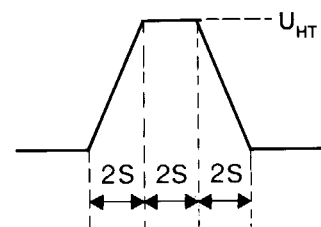


FIG. 541