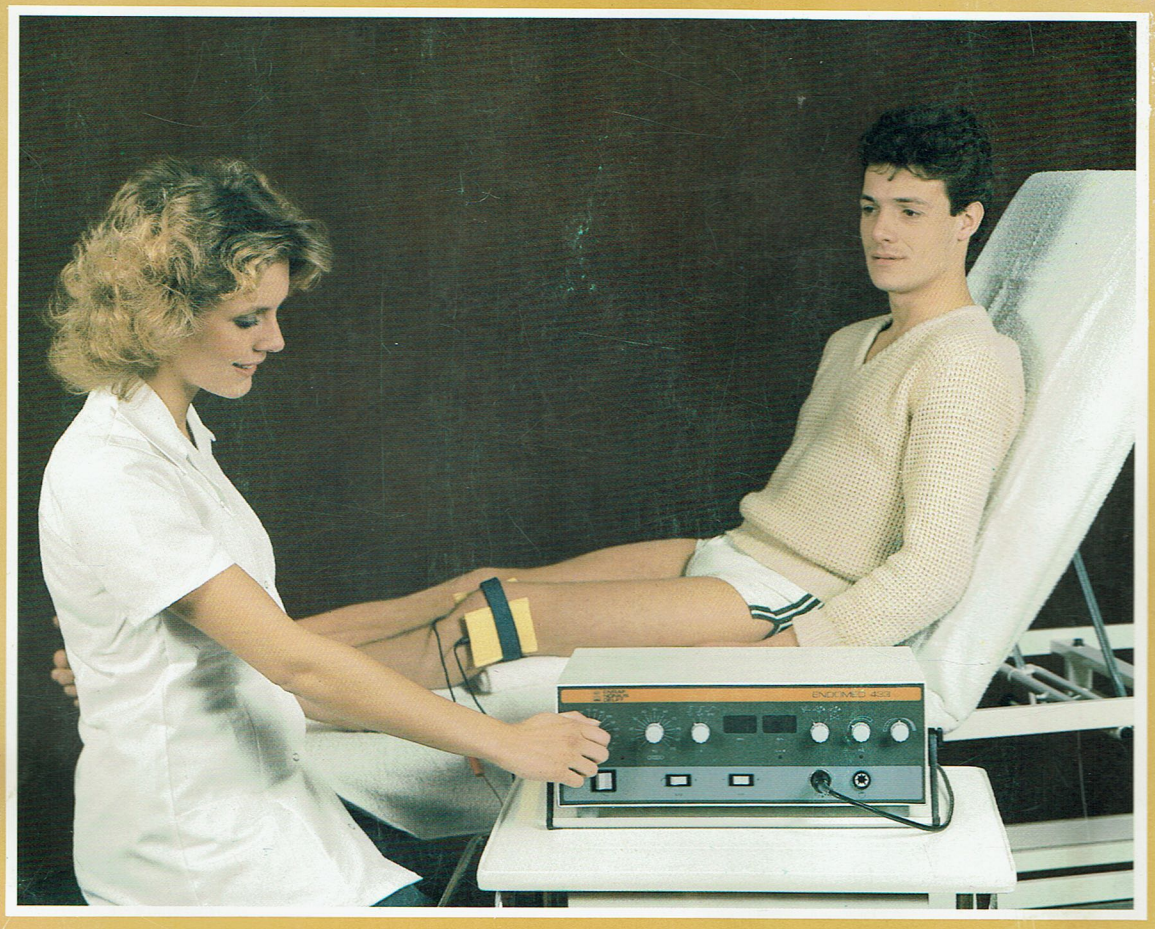
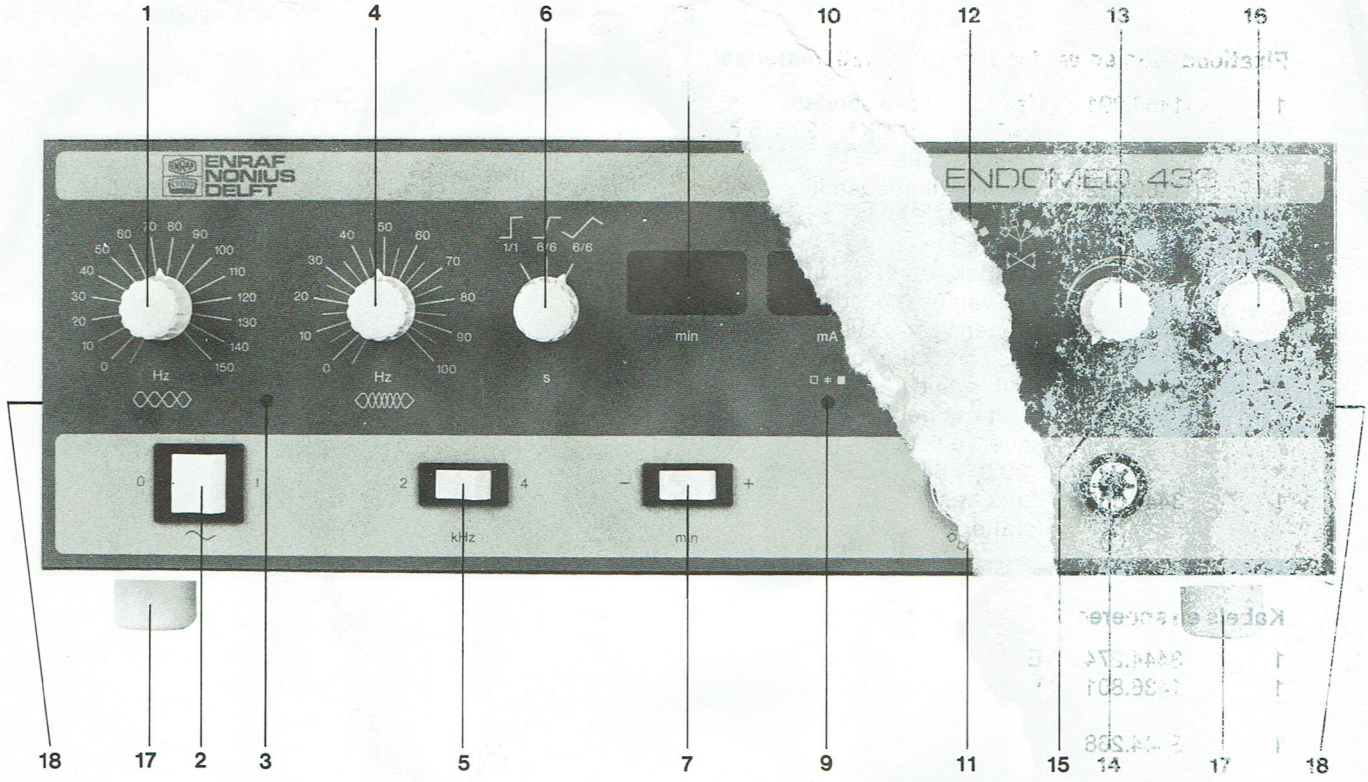
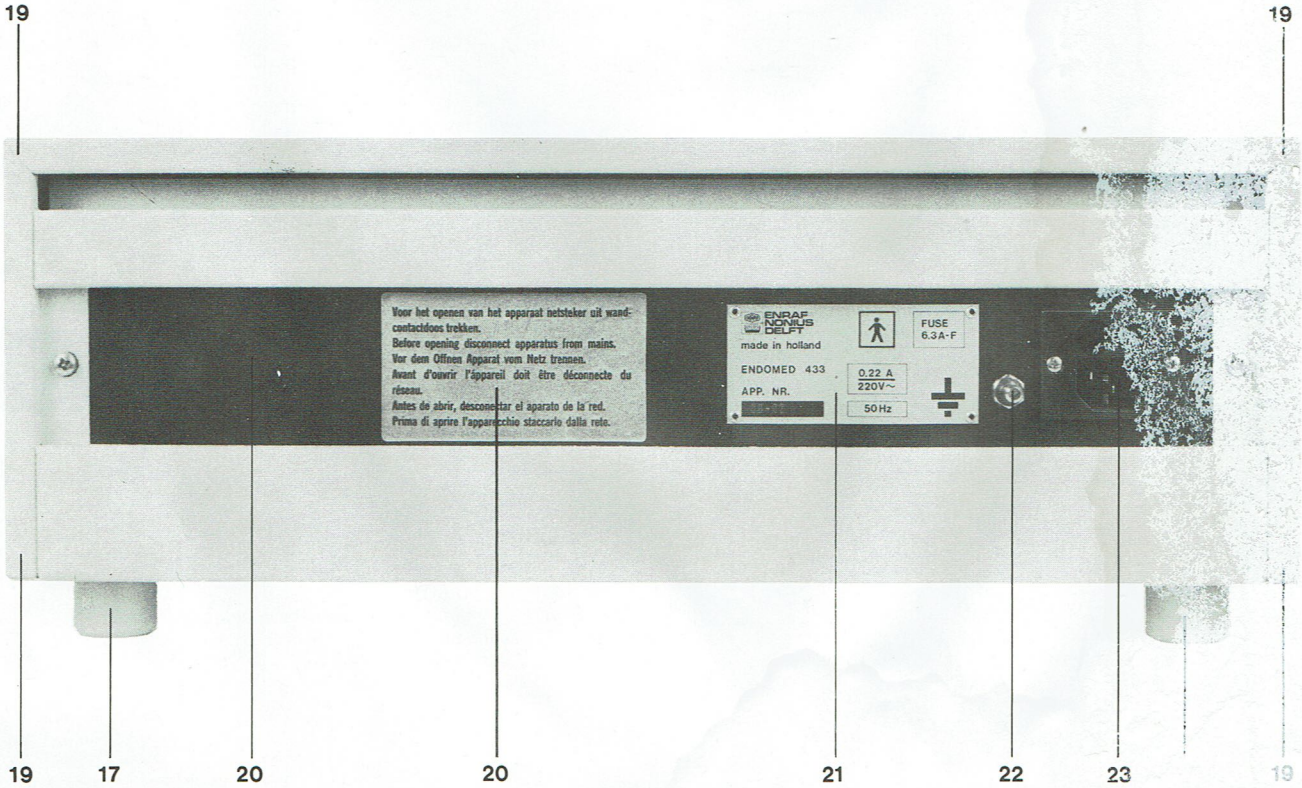
ENDOMED 433

Bedieningshandleiding
Operating instructions
Bedienungsanleitung
Mode d'emploi
Instrucciones de manejo



ENRAF NONIUS DELFT


1
4
6
10
12
13
16
ENRAF NONIUS DELFT
ENDOMED 433
Hz
Hz
s
min
mA
kHz
min
18
17
2
3
5
7
9
11
15
14
17
18


19
19
Voor het openen van het apparaat netstekker uit wandcontactdoos trekken.
Before opening disconnect apparatus from mains.
Vor dem Öffnen Apparat vom Netz trennen.
Avant d'ouvrir l'appareil doit être déconnecte du réseau.
Antes de abrir, desconectar el aparato de la red.
Prima di aprire l'apparecchio staccarlo dalla rete.
ENRAF NONIUS DELFT
made in holland
ENDOMED 433
APP. NR.
FUSE 6.3A-F
0.22 A
220V~
50Hz
19
17
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23
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INTRODUCTION

The ENDOMED 433 is a class I, type BF apparatus (according to IEC 601-1/BS 5724 P1), which means that it must be connected to a wall socket with protective earth contact.
The nominal voltage of this socket must be the same as the voltage shown on the type number plate [21]. A potential-equalization cable eventually prescribed by the local electricity board can be connected to the pin [22]. This apparatus is to be used at treatment room temperatures. It is not recommended to use it immediately after extreme fluctuations of temperature or to install it close to a source of heat. The ventilation opening, at the rear, must not be blocked.

NAMES OF PARTS

CONTROL PANEL

1 - Base frequency control
2 - On/off switch
3 - AMF signal lamp
4 - Sweep frequency control
5 - AC frequency selector switch
6 - Sweep-program selector switch
7 - Treatment-time setting switch
8 - Treatment-time display
9 - Warning lamp for the black circuit
10 - Display intensity (mA meter)
11 - Socket for patient cable
12 - Interferential form selector switch
13 - Intensity control
14 - Socket for remote control
15 - Warning lamp for monitoring the 0-position
16 - Balance control
17 - Rubber feet
18 - Fastening points for carrying handle

REAR PANEL

19 - Rubber feet
20 - Space for warning/safety stickers
21 - Type-number plate
22 - Connecting pin for potential-equalization cable
23 - IEC mains input with mains fuses

DESCRIPTION OF CONTROLS AND PARTS

(1) Base frequency control

The AMF can be adjusted continuously between 0 and 150 Hz.

(2) On/off switch

This is used to switch the apparatus on (I) or off (0). When the apparatus is switched on displays [8] and [10] and lamp [3] should light up.

(3) AMF signal lamp

Depending on the set AMF this lamp will flash (low AMF) or it will light continuously (from approx. 30 Hz onwards).

(4) Sweep frequency control

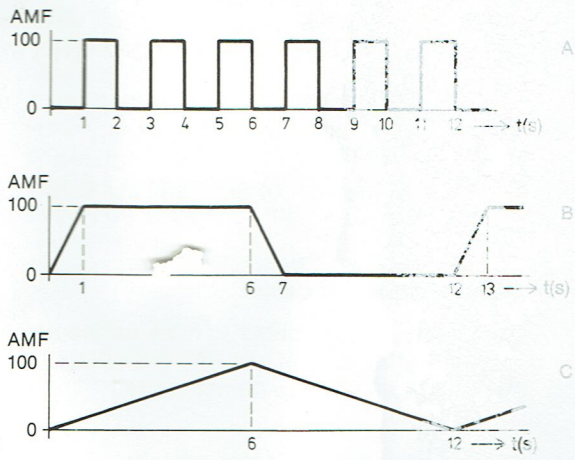
The sweep frequency is continuously variable between 0 and 100 Hz.

(5) AC frequency-selector switch

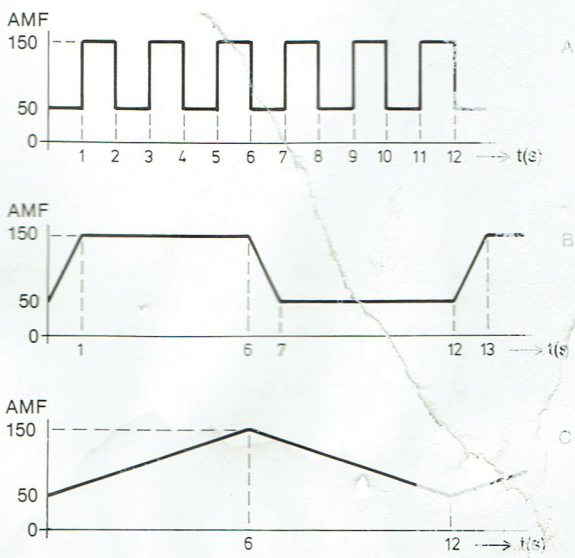
Medium-frequency AC frequencies of 2 or 4 kHz can be selected with this switch.

(6) Sweep-program selector switch

The following 3 sweep programs A, B and C can be selected:



Base AMF control [1] adjusted at '0'.
Sweep frequency control [4] adjusted at for instance '100'.



Base AMF control [1] adjusted at '50'.
Sweep frequency control [4] adjusted at for instance '100'.

(7) Treatment time setting switch

The treatment time is set by pushing the button to the right (+).
The treatment time is reduced by pushing the button to the left (–).
When released, the button returns to the centre position.
In this position the clock for the time setting runs back to '0'.
At the end of the treatment time the set current is automatically switched off.

(8) Treatment-time display

The set treatment time is shown in half minutes.
The flashing decimal point indicates that the clock is running.

(9) Warning lamp for the black circuit

Display [10] indicates the current intensity in the red circuit.
If, however, the current in the black circuit deviates considerably from that of the red circuit, lamp [9] will light up.

(10) Intensity display

The peak value of the set current intensity in the red circuit is shown in mA.

(11) Socket for patient cable

The 4-conductor patient cable can be connected to this socket (locating cam at top). If the VACOTRON is used, cable 1436.801 has to be connected.

(12) Interferential form selector switch

The following interferential forms can be selected:

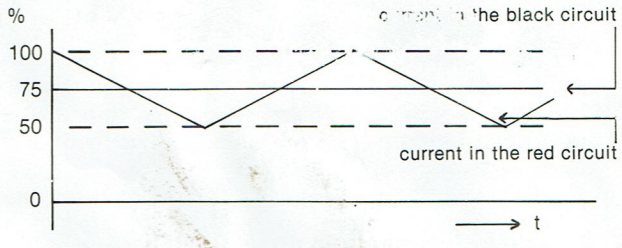
a) Two-pole (this means that a medium-frequency current modulated 100% in amplitude is applied to the tissue via the red pair of wires).

Four-pole (this means that medium-frequency currents which interfere in the tissue are applied to both the black and the red circuit).

As b) above, but with vector (this means that the current on the black channel is 75% of the set current; the current in the red channel varies from 50 to 100%).
When switching over a safety circuit becomes effective (see [15]).

(13) Intensity control

The peak value of the current is continuously variable between 0 and 150 mA; adjustment must be made from the '0' position (see also [15]).



(14) Socket for remote control

Connection of the remote control to this socket makes it possible to have the intensity controlled by the patient. The set intensity is independent from the position of the intensity control [13] on the apparatus.

(15) Warning lamp

This lamp lights if:
a) the apparatus is switched on with the intensity control [13] turned up
b) the AC frequency relector [5] switch is switched over with the intensity control [13] turned up;
c) another interferential form is chosen with the selector switch [12] with the intensity control [13] turned up;
d) the remote control is connected or disconnected;
e) the timer [8] is at ZERO.

The lamp extinguishes if the intensity control [13] (and/or the remote control) is turned down to '0' and/or the treatment time is set.

(16) Balance control

With 4-pole applications the current in the red circuit is increased and that in the black circuit decreased by turning the control counter-clockwise and vice versa by turning it clockwise; the starting position is the centre point.

(17) Rubber feet

The apparatus is fitted with sturdy rubber feet for stable positioning.

(18) Fastening points for carrying handle

An adjustable carrying handle can be easily mounted here according to the supplied mounting instructions. It can also be used to angle the apparatus *(see 'extra accessories' page 16).*

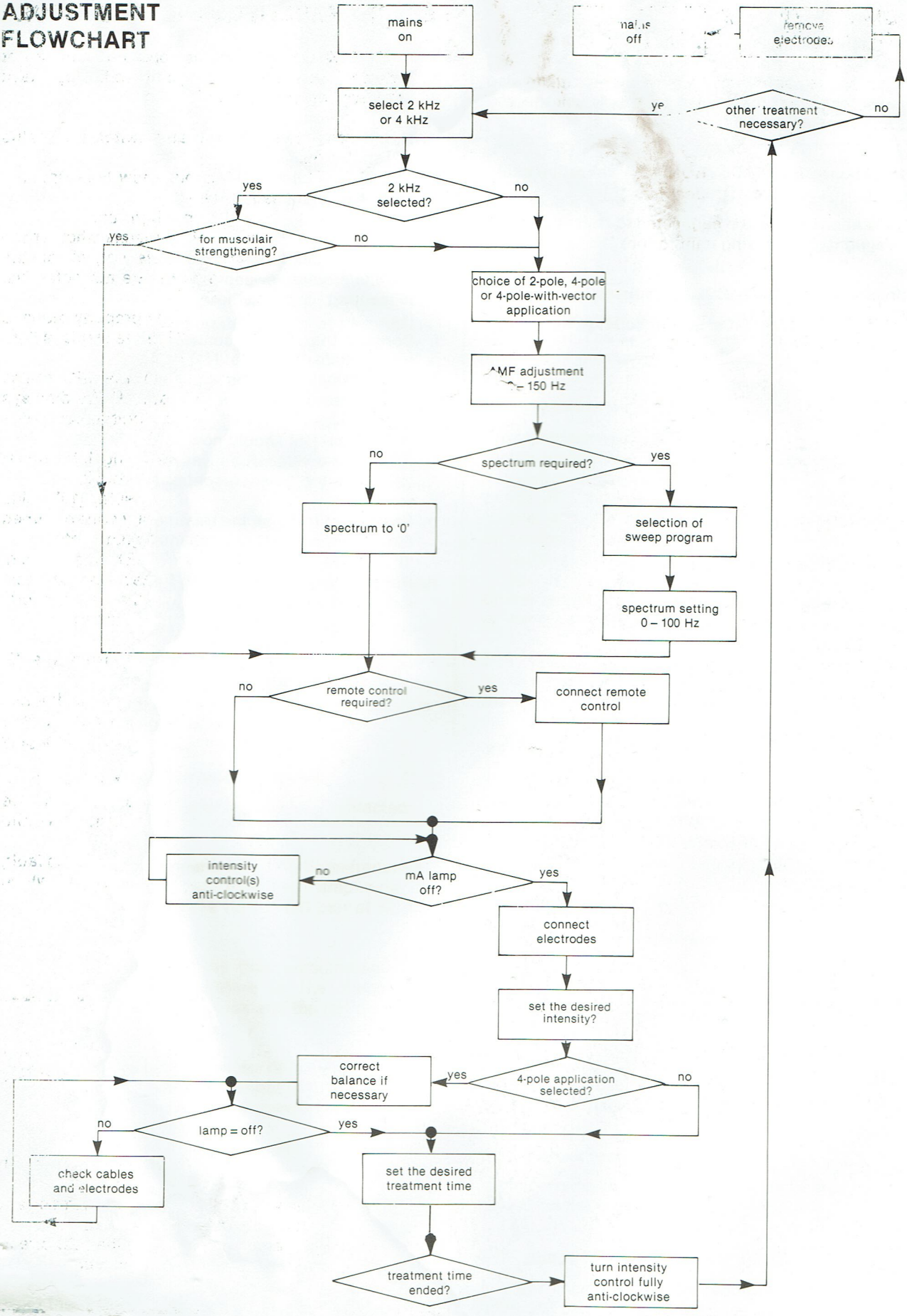
(19) Rubber feet

If the carrying handle is fitted the apparatus can, be placed on the rear side without damaging it.

(20) Space for warning/safety stickers

Any warning/safety sticker required by safety authorities can be stuck on this space.

ADJUSTMENT FLOWCHART



COMBINATION WITH OTHER ENRAF-NONIUS EQUIPMENT

For reasons of safety only combinations with apparatus of the same safety category, namely type BF, can be used.

Combination with VACOTRON
(for use of suction electrodes)

The VACOTRON can be connected to socket [11] with cable 1436.801 (locating cam to top).

Combination with SONOPULS® 417

The SONOPULS® 417 can be connected to socket [11] with cable 3444.268. This combination therapy is only possible in the two-pole position. An electrode is connected to the spare wire of the connection cable; the treatment head of the ultra-sound apparatus acts as a second electrode.
N.B. For reasons of safety only the SONOPULS® 417 can be used.

CLEANING AND DISINFECTING

The apparatus can be cleaned with a damp cloth, if necessary using a suitable household detergent (without abrasive).
Disinfect the electrodes with a cloth moistened with 70% alcohol. The apparatus must be switched off during cleaning and disinfecting and the plug removedfrom the wall socket.

H.F. INTERFERENCE SUPPRESSION

The apparatus is provided with an interference suppression filter. Together with the following measures interference will be reduced to a minimum:
— use separate mains groups for the ENDOMED 433 and any high-frequency equipment used;
— make the distance between the ENDOMED and other H.F. equipment as large as possible.

SIMPLE FAULT-TRACING PROCEDURE

If the ENDOMED 433 does not operate or does not operate well, you can go through the following check list to trace the possible fault:

a. — Connect the apparatus and switch the mains voltage on.
b. — Displays [8] and [10' should now light up... if they do, proceed to item h.
c. — Displays [8] and [10' do not light up.
d. — Check with a lamp or other means whether the wall socket is live... if it is not, check the mains fuses... if the fuses are not defective, contact your installer.
e. — Check that the mains cord is properly plugged into the IEC mains input [23] if the displays light up you have traced the fault.
f. — Connect the apparatus with the IEC mains cable of another apparatus... if the displays light up you have traced the fault; order mains cable 3444.290.
g. — If the apparatus is still not working, it is almost certainly defective. Proceed to item k.
h. — The displays light up... but display [10] yields no information with the intensity control turned up; now make the following adjustments:
remove the remote control which may be connected; connect the electrodes with the thoroughly wetted sponges to the red sockets; place the sponges against each other;
set the treatment time;
turn up the intensity, starting from the '0' position.
i. — Display [10] should now indicate the intensities... if so, the electrodes were not properly fastened or the sponges were not thoroughly wetted.
j. — If display [10] still shows no information, the 4-conductor cable and electrodes must be checked; if possible, use a different cable and electrodes for checking purposes.
k. — If you have still not traced the cause of the fault, the apparatus is probably defective, in which case contact your supplier.

THE OPENING OF THE APPARATUS AND ATTEMPTS AT REPAIR BY UNAUTHORIZED PERSONS CAN ADVERSELY AFFECT THE SAFETY OF THE APPARATUS AND ARE THEREFORE NOT PERMITTED

SAFETY

This apparatus has been built in accordance with the international standard IEC 601-1/BS 5724 Part 1 (see appendices).

It is accompanied by an ENRAF-NONIUS test certificate.
On this certificate you will find a number of important test values relating to safety and specifications.
This type of apparatus complies with the EEC directive relating to radio-interference suppression.

SPECIFICATIONS

Medium frequency	:	2 or 4 kHz.
AMF	:	0-150 Hz.
Spectrum	:	0-100 Hz.
Spectrum variant	:	⎍ 1/1 ⎍ 6/6 ⩘ 6/6.
Interference form	:	two-pole, four-pole, four-pole plus vector current.
Intensity	:	0-150 mA peak.
Treatment time	:	0-15 min.
Intensity	:	0-150 mA peak, steplessly adjustable, constant-current output.
Treatment time	:	0-15 min.

TECHNICAL DATA

Mains supply	:	220 V/50 Hz. Other voltages and frequencies on request.
Permissible mains voltage variations (tolerance)	:	± 10%.
Current consumption	:	0.22 A (at 220 V).
Mains fuses	:	two, 6.3 A, type FG.
Patient leakage current	:	≤ 100 µA (typically < 1 µA)
Do., single-fault condition (interruption of protective earth conductor)	:	≤ 500 µA (typically < 6 µA)
Earth leakage current	:	≤ 500 µA (typically < 28µA)
Do., single fault condition (interruption conductor)	:	≤ 1000 µA (typically < 56 µA)
Safety class	:	I type BF *)
IEC/EN/EC 601-1	:	report no. 2381-82.
VDE/TÜV Rheinland	:	report no. MT 2043.
SEV	:	report no. Q 1. 91/116.
DEMKO	:	report no. 69781 ESWS
Weight	:	8,6 kg.
Dimensions	:	44 x 30 x 14 cm (lxwxh).

*) : indicates that the apparatus must be connected to an earth wall socket.
BF indicates that the apparatus has a floating patient circuit.

ORDERING DATA

Qty	Catalogue No	Description
1	1433.901	ENDOMED 433, comprehensive interferential therapy unit complete with set of standard accessories (1433.891).
1	1433.762	Therapy booklet.

SET OF STANDARD ACCESSORIES 1433.891 CONSISTS OF:

1	3444.290	Mains cable 220 V.
1	3444.274	Patient cable 4-core with 2 red and 2 black plugs.
1	3444.183	Pen electrode.
1	1460.289	Velcro® fixing straps BACK TO BACK®, 120 x 3 cm - set of 2.
1	1460.290	Velcro® fixing straps BACK TO BACK®, 60 x 3 cm - set of 2.
1	1460.272	Pair of flexible, conductive rubber pad electrodes with cable and plug 4 x 6 cm.
1	1460.265	Same, but 6 x 8 cm.
1	1460.273	Moist pads for electrodes 4 x 6 cm set of 4.
1	1460.266	Same, but for electrodes 6 x 8 cm.
1	1433.750	Operating instructions.

OPTIONAL ACCESSORIES

1	1433.800	Carrying handle
1	1433.801	Hand intensity control

Electrodes and moist pads

1	1460.274	Pair of flexible, conductive rubber pad electrodes with cable and plug, 8 x 12 cm.
1	1422.809	Glove electrode.
1	1460.275	Moist pads for electrodes 8 x 12 cm, 1460.274, set of 4.
1	1422.810	Moist pad for glove electrode 1422.809, set of 4.
1	1413.806	Disc electrode ∅ 20 mm (2 required).
1	1413.808	Moist sponge for ∅ 20 mm, disc electrode 1413.806, set of 50 sponges.
1	1413.810	Rolling electrode width 30 mm., ∅ 25 mm.
1	1413.811	Iontophoresis electrode, sterilizeable 6 x 8 mm.
1	1422.807	Pair of 4-pole pads, unequal in size.
1	1460.281	Pair of unequal size moist pads for electrode 1422.807.

Qty	Catalogue No	Description

Fixing straps and accessories

1	1460.291	Velcro® fixing straps BACK TO BACK®, 120 x 5 cm, set of 2.
1	1460.292	Velcro® fixing straps BACK TO BACK®, 60 x 5 cm, set of 2.
1	3444.196	Velstick strip with Velcro adhesive material to store fixing straps, cables and other accessories.
1	3444.197	Self-adhesive strap to store cables etc. to strip 3444.196.
1	3444.365	Sand-filled fixing strap, 36 x 10 cm.

Electrode connecting cables

1	3444.274	4-core electrode cable.
1	1436.801	Connecting cable for VACOTRON to ENDOMED 433.
1	3444.268	Connecting cable for SONOPULS® 417 to ENDOMED 433.
1	3490.280	Earth potential equalization cable, length 3 m.
1	3490.281	Ditto, length 5 m.