
CPM 8000

Instruction Manual

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General Information

This manual was written to describe the operations of the therapy unit, CPM (Continuous Passive Motion), CPM 8000 model. It has general instructions for the operation, precaution instructions and maintenance recommendations.

For maximum life and efficiency of the CPM 8000, we recommend that you read and understand the whole manual for the due precautions.

Before applying any treatment on a patient, the user must know the operating procedures, indications, contraindications, hazards and precautions.

CPM

CPM or Continuous Passive Motion is a postsurgical procedure developed to help in the patient's recovery after a joint surgery.

The CPM 8000 Knee CPM Unit is normally used in the postsurgical period for total recovery of the knee and of the Anterior Cross Ligament (ACL). After a joint surgery, when a patient cannot move it, the tissue near the joint becomes hard and the tissue has scars, resulting in a joint with limited movements. On flexing and stretching the joint with controlled and repeated speed, through an arc of motions indicated during a long period of time, the CPM 8000 Knee CPM Unit reduces the contrary effects of immobilization and of the trauma in the knee joint.

The equipment allows, for example, stimulation of the quadriceps, movement of the foot dorsiflexion, monitoring of the speed, among other facilities.



Accessories that come with the device

- Power cable.
- Cable to connect the CPM Unit to CPM 8000.
- UNIT CONTROL (CPM Unit 4060)
- Thigh and Leg Support.
- Foot Support
- Band to fasten the feet.
- CPM 8000 User Manual.
- Program Maker Software User Manual.
- USB Cable
- CD with the Program Maker software



WARNINGS

- Read, understand and practice the precaution and operation instructions of this manual before operating or using the unit.
- Extreme caution when using on or near children.
- Only use CPM 8000 for the purposes determined, as described in this manual.
- Shut off the switch before disconnecting the unit from the power source.
- Do not use the chord to disconnect the unit. Hold the power chord from the base.
- Take care when carrying, transporting or storing the CPM 8000 unit to prevent damages to the unit due to falls, improper transport or storage methods.
- The sale of this device in Brazil is restricted to doctors or specialized professionals.
- Ensure that the unit is connected to a suitable power network, according to the national and local power standards.
- Keep the hair, loose clothes, bed linen, fingers and toes away from the unit's hinged components.
- Always turn off and remove the unit from the socket before performing services or cleaning.
- Take care when using accessories or auxiliary devices like: muscular stimulators, cold packs and other modalities.
- Direct the control wire outside the reach of the CPM 8000 moving mechanism to help prevent damages.
- Inconsistent patients or patients under strong influence of a drug must be constantly followed up or monitored when using CPM 8000.
- The CPM 8000 unit must be fully visible throughout the time of use. Never cover the unit with bed linen or any other material that can hide it during the operation.
- The equipment should not be operated outside the temperature range specified in the technical features since there may be overheating and safety hazard.
- The CPM 8000 must not be operated near (< 5 meters) any shortwave diathermy equipment.



Installing / Connecting to the power network

For perfect operation of your equipment, we suggest that the electrical installations comply with the following standards:

- ➔ Brazil:
 - NBR 5410/1990 – Low-voltage electrical installations;
 - NBR13534/1995 – Electrical installations in health establishments – Safety requirements.
- ➔ Other Countries:
 - IEC 60364-7-7 (10/2002) – Electrical Installations – medical locations;
- Or another listed standard applied in the country of use.
- Place the CPM 8000 on a firm, smooth and stable surface to assure stability of the unit during operation;
- Connect the power cable to the tripolar connector located in the back panel and connect it to the electric power socket;
- The CPM 8000 uses automatic power source and operates in any supply voltage between 100V~ and 230V~ and frequency of 50 or 60 Hz.
- **The power supply voltage must be within the range specified ($\pm 10\%$), otherwise, there can be equipment breakdown and safety hazard.**

Changing Fuses

- To change the fuses, turn off the device through the ON/OFF switch and disconnect the power cable from the power network.
- Disconnect power cable from the CPM 8000.
- Using a screwdriver, place it in the slot of the fuse holder and turn it counterclockwise. Remove the protective box of the fuse.
- Check the burned fuse and change it for one of the same value (2 A - 250 V~).
- Replace the fuse box in the CPM 8000.
- Connect the power cable to the CPM 8000.
- Connect the power cable to the power network.




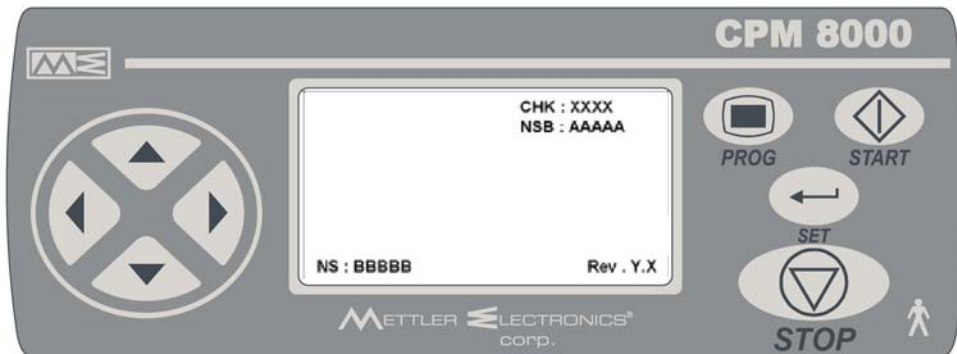
Display language

The CPM 8000 allows accessing three display languages:

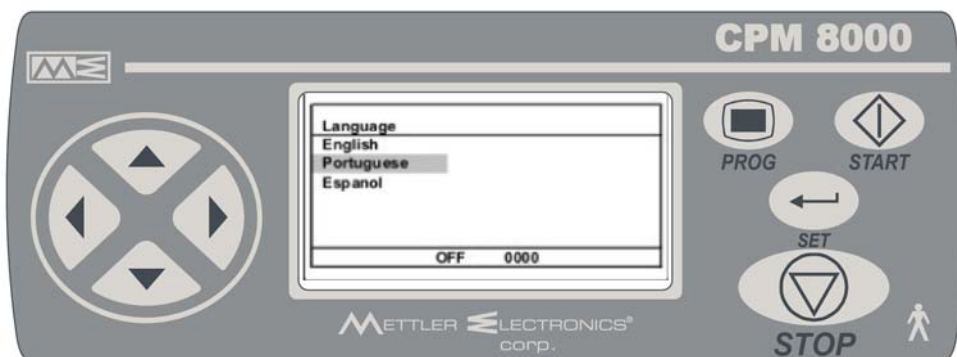
- ➔ Portuguese
- ➔ English
- ➔ Spanish


If you wish to change the current language, follow the steps below:


1. Connect the CPM Unit to the CPM 8000
2. Connect the tripolar power cable to the power and to the CPM 8000.
3. Connect the CPM 8000 through the ON/OFF switch.
4. Press and keep the key pressed 
5. Turn on the device – the equipment will emit a continuous beep, displaying the screen:



6. Followed by the screen

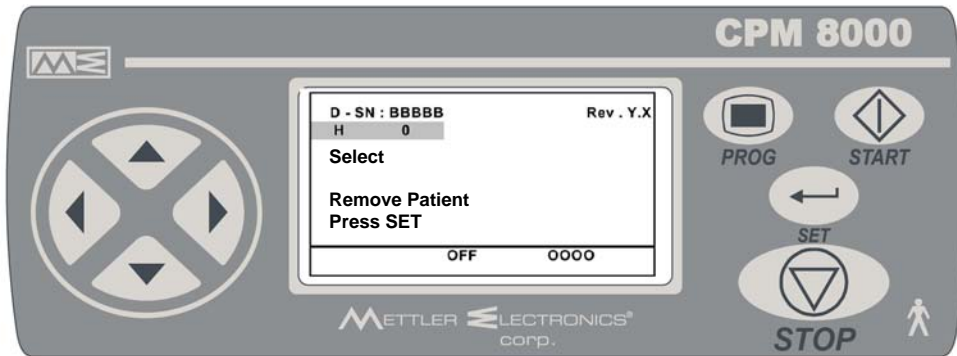


7. Release the key 

8. Select the language desired through the keys 



- 9. Press the key
- 10. The equipment will exit the language selection mode, displaying the screen:



- 11. Select the desired H, and proceed according to the instructions of the item BOOTING, page 14.
- 12. Or turn off the CPM 8000

CPM 8000:



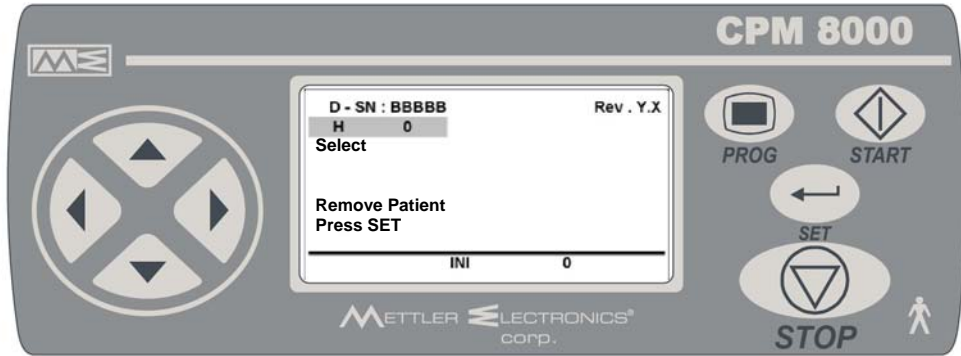
Characteristics:

- Extension: - 10° to 120° (steps of 5°)
- Flexion: 0° to 120° (steps of 5°)
- Extension Delay: time of rest for extension - 0 to 15 s
- Flexion Delay: time of rest for flexion - 0 to 15 s
- Speed: 30 % a 100 %.
- Mean time of a complete flexion/extension is 140 seconds (± 5%), at speed of 100%; and 480 seconds (± 5%) at speed of 30%;

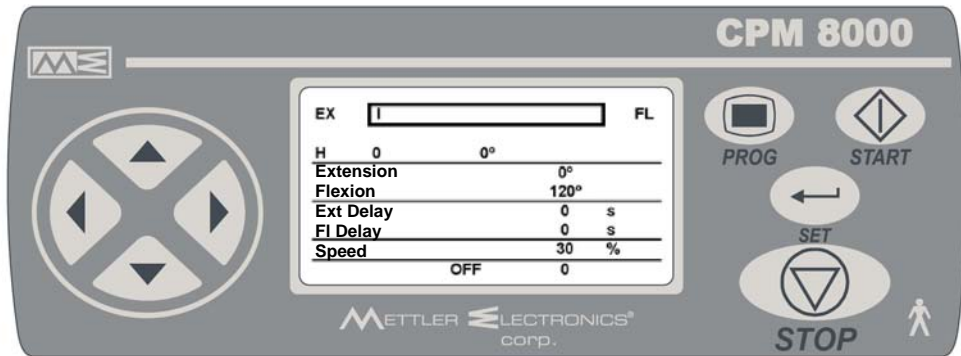


Control Panel:

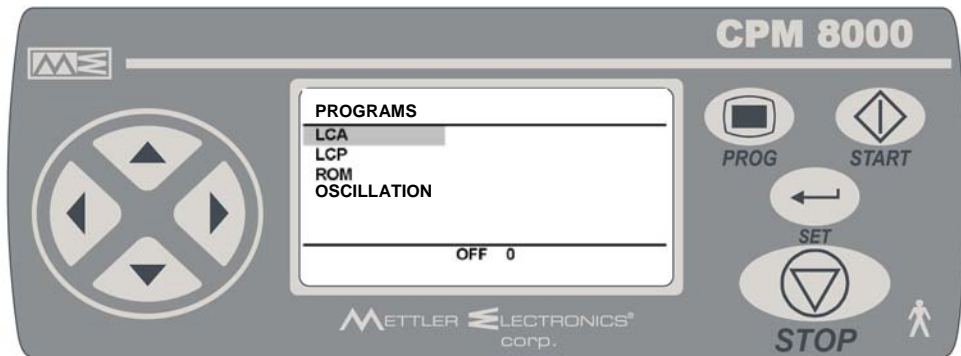
1. Booting screen:



2. Main Menu

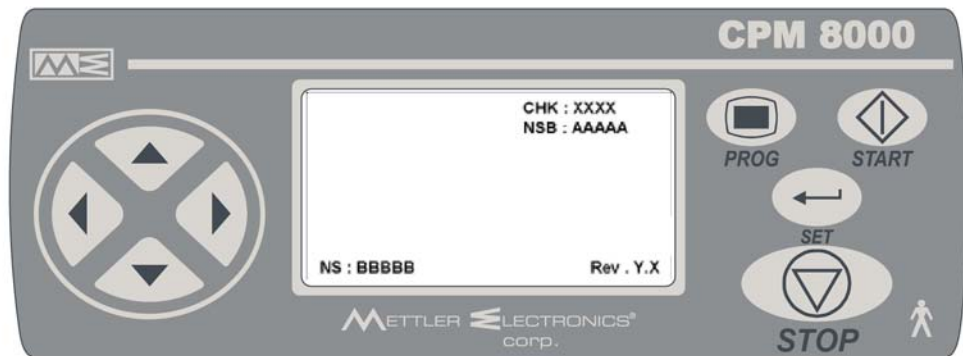


3. Programs

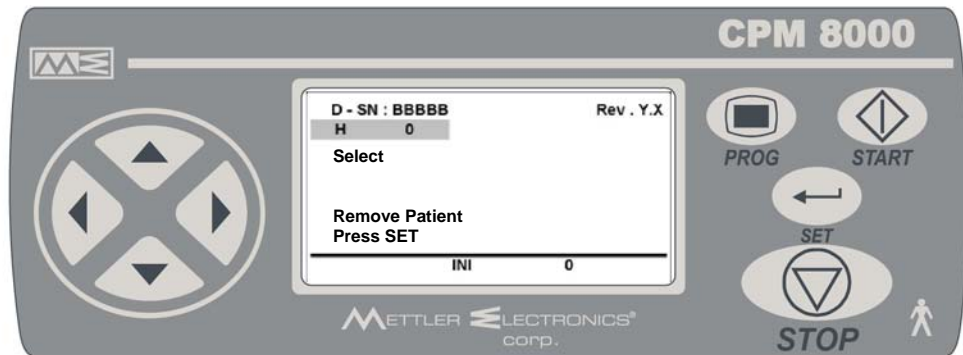




Display Information:



CHK.: XXXX – Software Registration
 NSB.: AAAAA – Serial number of the PCB of the CPM Unit Control.
 NS.: BBBBB – Serial number of the CPM 8000
 Rev.: Y.X – version of the CPM Unit Control Software



D – SN.: BBBBB – Serial number of the CPM 8000 PCB
 Rev.: Y.X – Version of the CPM 8000 software
 H = 0 – Thigh height adjustment position.
 OFF 0000 – Indicates communication between the Unit Control and CPM 8000 .



EX	XXXX I	XXXXX	FL
H	0	30°	
Extension		30°	
Flexion		90°	
Ext Delay		5	s
FI Delay		5	s
Speed		50	%
	ON	0	

Description:

EX	XXXX I	XXXXX	FL
----	--------	-------	----

Displays the ROM (Range Of Motion) selected for the cursor.

Extension	30°	
Flexion	90°	

Displays the values selected for Extension and Flexion.

Ext Delay	5 s	
FI Delay	5 s	

Displays the times (seconds) selected for rest (Delay) selected for Extension and Flexion.

Speed	50%	
--------------	------------	--

Displays the speed selected (in %).

ON	0	
-----------	----------	--

Informs that the support is in motion.

OFF	0	
------------	----------	--

Informs that the support is stationary.

INI	0	
------------	----------	--

Informs that the cursor is in calibration phase

WAIT	0	
-------------	----------	--

Informs that the cursor is in direction of Extension = 0°

ERROR	0010	
--------------	-------------	--

Informs the error code.

PROG 0	OFF	0
---------------	------------	----------

Informs that there is selected program.



CPM 8000 operation:

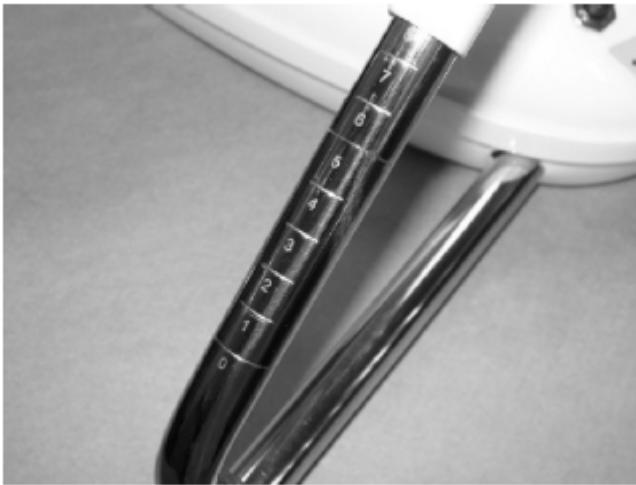
Measure the patient

Measure the patient from the hip joint (greater trochanter) up to the knee in centimeters.



This measurement is called Height H.

Adjust the height H according to the scale in the CPM 8000 and table



Height H cm	Number
37	0
38	1
39	2
40	3
41	4
42	5
43	6
44	7
45	8

Through the handle, fix the adjustment of the height H selected.



Position the patient according to the figure. The knee's axis of rotation should coincide with the CPM 8000 axis of rotation. As shown below.



Adjust the support of the Foot and Ankle through the handles, as shown in the figure below.





CPM 8000—Knee CPM Unit

The patient must be in a comfortable position for the CPM 8000 to perform the movements with the knee, as shown in the sequence below:



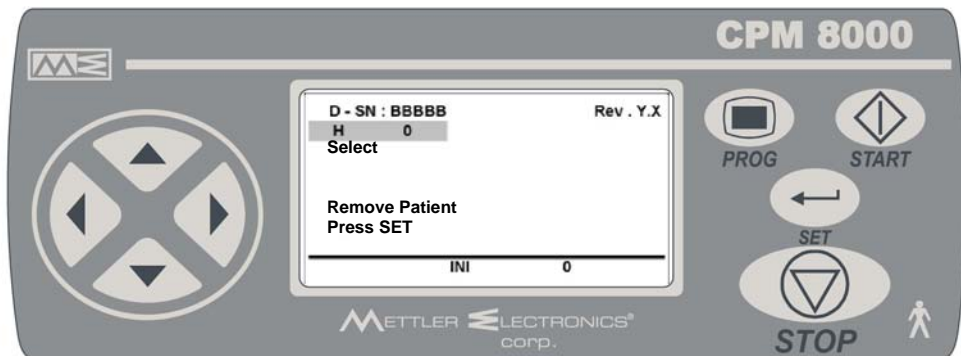



Booting:


1. Connect the tripolar power cable to the power and to the CPM 8000.
2. Connect the CPM 8000 through the ON/OFF switch.
3. The display will show the Start screen:



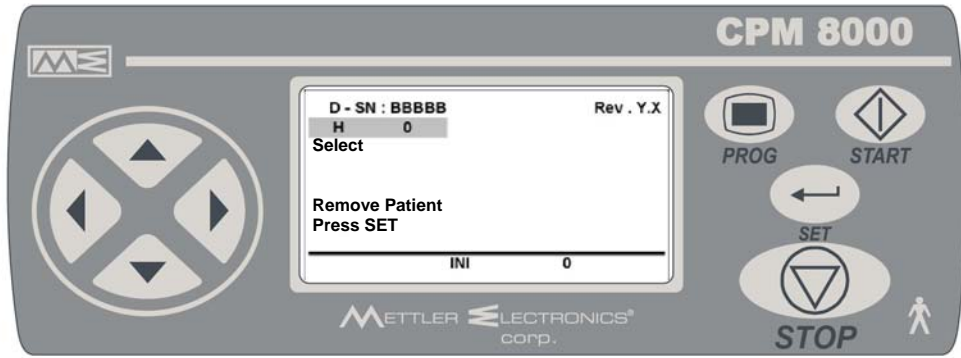
4. Changing to the screen:



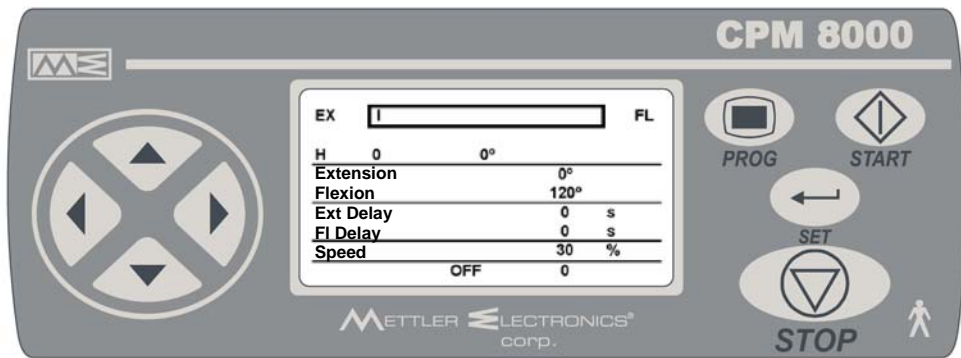
5. Use the keys  to select the value of H according to the parameters of table H (page 11).

6. Press the  key to start the calibration.

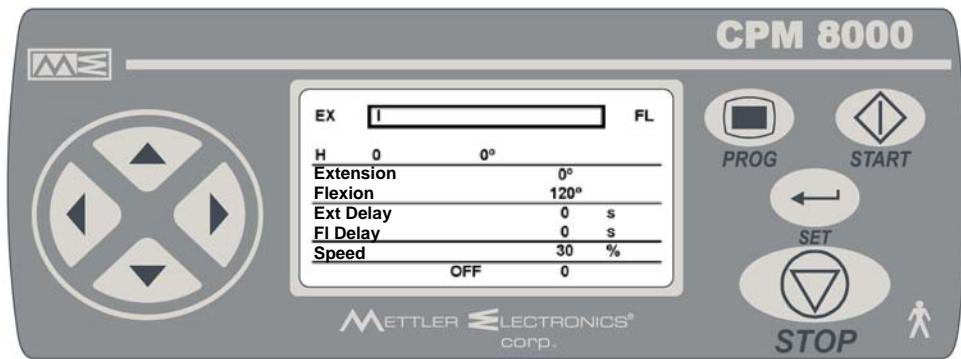
7. The display will show the following screen when in boot mode:



The CPM 8000 moves the support in the direction of maximum flexion up to the end of the course. Displaying the screen:



The CPM 8000 moves the support in the direction of extension. When the angle of extension reaches zero degree (0°), the support stops, and the display shows the screen:




- The CPM 8000 is ready for:
- A. Use in Manual Mode
 - B. Use in Continuous Mode
 - C. Use in Program Mode



8. Use in Manual Mode:

The manual mode allows selecting the direction (extension or flexion) That is:

Select the speed, direction and angle and press the  key.

Procedure for manual use:

8.1. After booting, the display will show the screen:


EX	XXXX I	XXXXX	FL
H	0	30°	
Extension		30°	
Flexion		90°	
Ext Delay		5	s
Fl Delay		5	s
Speed		50	%
	ON	0	

8.2. Through the  and  keys, select the values of Extension, Flexion and Speed desired.

Example:

Extension = 30°, Flexion = 90° and Speed = 50%

EX	XXXX I	XXXXX	FL
H	0	30°	
Extension		30°	
Flexion		90°	
Ext Delay		0	s
Fl Delay		0	s
Speed		50	%
	ON	0	

8.3. Position the cursor in Extension = 30° and press the  key. The support will move up to the initial angle selected. The ROM (Range of Motion) selected from 30° to 90° and the speed of 50% in manual mode is ready.



EX	XXXX I	XXXXX	FL
H	0	30°	
Extension		30°	
Flexion		90°	
Ext Delay		0	s
FI Delay		0	s
Speed		50	%
	OFF	0	

8.4. To move the support up to Flexion = 90°, position the cursor in Flexion = 90° and press the **SET** key.

EX	XXXX I	XXXXX	FL
H	0	30°	
Extension		30°	
Flexion		90°	
Ext Delay		0	s
FI Delay		0	s
Speed		50	%
	ON	0	

The support will move up to Flexion angle = 90°

8.5. In case there is need to increase or reduce the angles of Flexion, Extension and speed, position the cursor in Flexion, Extension or speed, select the new parameter, position the cursor in the desired direction, press the **SET** key.

9. Use in Continuous Mode

The Continuous mode allows selecting the speed and Extension and Flexion angles; and starting the support movement continuously in the direction Extension → Flexion → Extension.



That is:

Procedure for continuous use:


9.1. After booting, the display will show the screen:



EX	XX I	FL
H	0	0°
Extension		0°
Flexion		120°
Ext Delay		0 s
FI Delay		0 s
Speed		30 %
	OFF	0

- 9.2. Through the  and  keys, select the values of Extension, Flexion and Delay (Extension and Flexion) and Speed desired.
 Example:
 Extension = 10°, Flexion = 100°, Extension Delay = 5 s, Flexion Delay = 10 s, and Speed = 60%

EX	XX I	XX	FL
H	0	0°	
Extension		10°	
Flexion		100°	
Ext Delay		5 s	
FI Delay		10 s	
Speed		60 %	
	OFF	0	

- 9.3. Press the  key. The support will go up to the Flexion position = 10° selected.

EX	XX I	XX	FL
H	0	10°	
		10°	
		100°	
		5 s	
Extension		10 s	
Flexion		60 %	
Ext Delay	ON	0	Std By
FI Delay			
Speed			



9.4. After the support is positioned in the Flexion position = 10°, press the **START** key again. The support will move continuously according to the parameters selected.

EX	XX	I	XX	FL
H	0		10°	
Extension			10°	
Flexion			100°	
Ext Delay		5	s	
FI Delay		10	s	
Speed		60	%	
	ON	0	CPM On	

9.5. There being the need to stop movement, press the **STOP** key.

9.6. To restart movement, press the **START** key. The support will move up to the Extension selected.

EX	XX	I	XX	FL
H	0		10°	
Extension			10°	
Flexion			100°	
Ext Delay		5	s	
FI Delay		10	s	
Speed		60	%	
	OFF	0	Std By	

9.7. Press the **START** key again. The support will restart the movement.

10. Use in Program Mode

The Program mode allows selecting through the **PROG** key the programs recorded in the memory of the CPM Unit, through the Program Maker software.

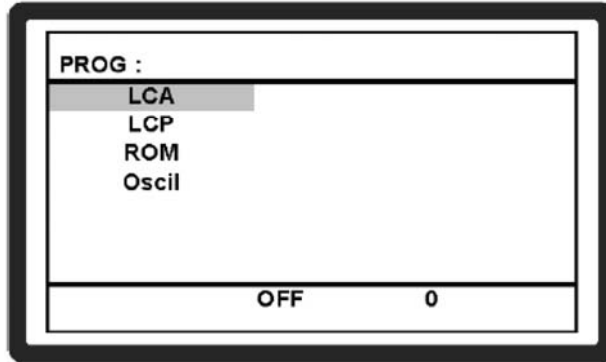
Procedure for use of the Programs:



10.1. To select the desired program, press the



key. The display will show the screen:



10.2. Through the



keys, select the program desired.

10.3. Press the



key.



EX	X I	XXX	FL
H	0	5°	120 m
Extension		5°	
Flexion		100°	
Ext Delay		10	s
FI Delay		10	s
Speed		50	%
PROG 0	OFF	0	



10.4. To start movement, press the **START** key.

10.5. The support will start the program's movement.

EX	X I	XXX	FL
H	0	5°	120 m
Extension		5°	
Flexion		100°	
Ext Delay		10	s
FI Delay		10	s
Speed		50	%
PROG 0	ON	0	CPM On

The display informs that the CPM Unit has selected program:

PROG 0	OFF	0
--------	-----	---




10.6. To disable the selected program, press the **PROG** key, and the **STOP** key twice.

10.7. The display will show the screen:



EX	X I	XXX	FL
H	0	5°	
Extension		5°	
Flexion		100°	
Ext Delay		10	s
Fl Delay		10	s
Speed		50	%
	OFF	0	

10.8. After exiting the selected program, the CPM 8000 can be used in the Manual or Continuous modes.

NOTE: In case of discomfort to the patient, press the  key and remove the patient from the CPM 8000.

→ Programs

Through the CPM 8000 PROGRAM MAKER software, the user can record and delete specific Protocols.

Consult the CPM 8000 PROGRAM MAKER SOFTWARE user manual

The Program Maker software has 5 specific programs that can have the parameters changed through the software, and the FREE program, which allows ample programming of the parameters desired:

Program 1: LCA

Description: Evolves from 5° to 5°, with the programmed pauses

- Extension = - 5 °
- Flexion = 100 °
- Extension Delay = 20 seconds
- Flexion Delay = 10 seconds
- Speed = 30%
- Step = 5 °

Program 2: Total Arthroplasty

Description: Evolves from 5° to 5°, with the programmed pauses

- Extension = - 5 °
- Flexion = 90 °
- Extension Delay = 20 seconds
- Flexion Delay = 20 seconds
- Speed = 30%
- Step = 5 °

Program 3: LCP



Description: Evolves from 5° to 5°, with the programmed pauses
Extension = 0 °
Flexion = 60 °
Extension Delay = 10 seconds
Flexion Delay = 10 seconds
Speed = 30%
Step = 5 °

Program 4: ROM

Description: Evolves from 5° to 5°, with the programmed pauses
Extension = 0 °
Flexion = 90 °
Extension Delay = 5 seconds
Flexion Delay = 5 seconds
Speed = 30%
Step = 5 °

Program 5: Oscillation

Description: There will be three oscillations in the last 5° to reach the Flexion and Extension selected. That is:

0° -> 5° -> 0° -> 5° -> 80° -> 85° -> 80° -> 90°
Extension = 0 °
Flexion = 90 °
Extension Delay = 0 seconds
Flexion Delay = 0 seconds
Speed = 40 %
Step = 5 °

Specific programs can be recorded using the Program Maker software.

IMPORTANT: *CPM 8000 does not allow functioning of the CPM 8000 Program Maker with the CPM Unit connected to the CPM 8000*

If the user connects the CPM Unit to the CPM 8000 and also to the CPM 8000 Program Maker software, the display will display the message:





To use the CPM 8000, disconnect the USB cable from the CPM Unit and press the key

The CPM 8000 will enter the boot screen.

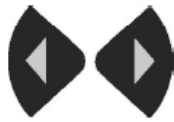
Adjusting a New Parameter H :

The CPM 8000 allows selecting a new parameter H without the need to reboot.

Changing parameter H:


1. To change parameter H, position the cursor in Flexion with angle equal to 45°.




2. Press the  keys at the same time, the parameter H will be enabled to be changed.

3. Use the keys to select the new parameter H.




4. Press the  keys at the same time to return to the main menu.



On pressing the  keys and the parameter H is not enabled, the display will show the ERROR 0040 message.





On pressing the  keys and the parameter H is not enabled, check if the Flexion angle is less than 45°. Proceed according to item 1




Emergency Stop:

1. In case there is need to stop the therapy, the patient will stop the CPM 8000 immediately by pressing one of the switches, as shown in figure A.

The Unit Control will emit two Beeps, and display the ERROR 020 message.

To restart movement, press the  key, and the  key for the support to the return to the selected position of the Extension.



Press the  key again to start the movement again.

2 . If the value of H selected in the UNIT CONTROL is greater than that set in the CPM 8000 (figure C), the support rod when in Extension direction can activate the emergency stop (figure B), stopping the movement.

The UNIT CONTROL will emit two Beeps, and display the ERROR 020 message. Turn off the CPM 8000, position H in the value desired, turn on the CPM 8000 and select the same value of H in the UNIT CONTROL.

Figures:



Figure A



Figure B



Figure C

Indications

The use of CPM 8000 is indicated for rehabilitation of the knee and hip in:

- *Postsurgical recovery from surgeries via laparoscopy*
- *Reconstruction of the knee (ligaments and meniscus)*
- *Fractures (patellar, femoral, tibial plateau)*
- *Surgeries of the hip*
- *Burns*
- *Joint mobilization*

Contraindications

The use of CPM 8000 must be avoided or suspended definitively or temporarily in cases of:

Relative contraindications:

- *Deep venous thrombosis (prevention)*
- *Arthritis and arthrosis*
- *Lesions of the meniscus, with presence of free intra-articular bodies*
- *Degenerative bone diseases*
- *Vascular lesions*
- *Acute edemas*
- *Lesions in conjunctive tissue*



- *People with difficulties to understand should only use the device under supervision*

Absolute contraindications:

- *Lesions with total and/or partial loss of sensitivity*
- *Flaccid, spastic phase neurological lesions*
- *Lesions in acute phase of evolution*
- *Non-consolidated fractures*

Preventive maintenance.

- We recommend that the CPM 8000 be inspected and calibrated once a year by the factory or authorized technical service.
- Always check, before use, if there are no damages in the manual control cable and in the power cable.
- This equipment has an estimated service life of 5 years. After this period, we recommend subjecting the equipment to a full inspection by METTLER ELECTRONICS CORP. in order to continue using it safely and efficiently.

Cleaning.

- Whenever required, clean the equipment using a cloth wet with water and soap. Always ensure that the device is disconnected from the power supply before cleaning and avoid wetting the electrical contacts of the wires and connectors.

Important observations:

- Corrective maintenance of this equipment, in addition to those prescribed above, must be conducted by authorized technical assistance from METTLER ELECTRONICS CORP. only.
- Electrical diagrams, circuits and parts lists are not supplied to the end consumers. If necessary, contact the Mettler Electronics Corp. Authorized Technical Assistance.
- Use of parts and accessories not specified by METTLER ELECTRONICS CORP. can compromise equipment safety. METTLER ELECTRONICS CORP. will not be held liable for such procedure.

Corrective maintenance

Problem	Solutions
The CPM 8000 cannot be turned on	<ul style="list-style-type: none"> ● Check if the power cable is connected to the power network; ● Check if the ON/OFF switch is in the correct position; ● Check if the protective fuses are not



	<p>open;</p> <ul style="list-style-type: none">• Check the integrity of the power cable.
<p>The CPM 8000 displays the main screen, the boot set screen, but does not boot.</p>	<ul style="list-style-type: none">• Check if the display shows one of the ERRORS: 8 or 10.• If yes, turn the ON/OFF switch on and off and restart the process.• If the problem persists, contact the technical assistance.
<p>The CPM 8000 displays ERROR 01 or 02</p>	<ul style="list-style-type: none">• Turn the ON/OFF switch off and on and restart the process.• Contact the technical assistance.
<p>The CPM 8000 displays ERROR 03</p>	<ul style="list-style-type: none">• Contact the technical assistance.
<p>The CPM 8000 displays ERROR 04</p>	<ul style="list-style-type: none">• Press the STOP key of the Unit Control, then press the START key twice to restart the movement.• If the ERROR persists, contact the technical assistance.
<p>The CPM 8000 displays ERROR 08</p>	<ul style="list-style-type: none">• Turn the ON/OFF switch off and on and restart the process.• If the ERROR persists, contact the technical assistance.
<p>The CPM 8000 displays ERROR 10</p>	<ul style="list-style-type: none">• Check the integrity of the UNIT CONTROL connection cable.• Check connection of the Unit Control with the CPM 8000.• Turn the ON/OFF switch off and on and restart the process.• If the ERROR persists, contact the technical assistance.
<p>The CPM 8000 displays ERROR 20</p>	<ul style="list-style-type: none">• Check if the STOP switches were not enabled. Figures 1 and 2.• Check if the parameter H is correct in the Unit Control and in the adjustment. Figure 3.• Turn the ON/OFF switch off and on and restart the process.• If the ERROR persists, contact the technical assistance.
<p>The CPM 8000 displays ERROR 24</p>	<ul style="list-style-type: none">• Turn the ON/OFF switch off and on and restart the process.• If the ERROR persists, contact the technical assistance.
<p>The CPM 8000 displays ERROR 40</p>	<ul style="list-style-type: none">• Check if the parameter H is correct in the Unit Control and in the adjustment. Figure 3.• Check the ADJUSTMENT OF THE PARAMETER H, as described in page 28.



	<ul style="list-style-type: none"> • Turn the ON/OFF switch off and on and restart the process. • If the ERROR persists, contact the technical assistance.
The CPM 8000 displays ERROR 05 or 06	<ul style="list-style-type: none"> • Turn the ON/OFF switch off and on and restart the process. • If the ERROR persists, contact the technical assistance.

Figures:



Figure 1



Figure 2

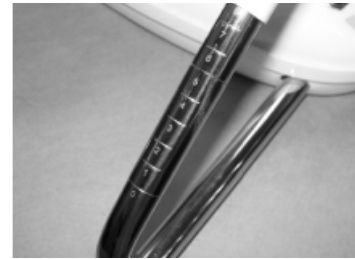


Figure 3

Error Table

Error Code	Description
01	Flexion end of course switch enabled
02	Extension end of course switch enabled
03	Extension and Flexion end of course switches enabled
04	Excess current
05	Excess current + Flexion end of course switch enabled
06	Excess current + Extension end of course switch enabled
08	Failure in Encoder
10	Communication failure between CPM 8000 and the CPM Unit Control.
20	STOP switches were enabled Figures 1 and 2.
24	Excess current + STOP switches were enabled
40	Error in change of parameter H selected value (figure 3) different from value H of the Unit Control.

For Technical Assistance: Service Department

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Technical features

- Origin: Brazil
- Model: CPM 8000
- Function and application: Therapy equipment for passive movement
- Power supply voltage : 100 to 230 V~ automatic
- Supply frequency: 50/60 Hz
- Maximum Consumption: 55 VA
- Fuse: 2.0 A – 250 V ~ 20 AG
- Dimensions: 120 x 30 x 42 (cm)
- Weight: 15 Kg

-
- Classification according to NBR IEC 60601.1 standards
 - Type of protection against electric shock:.....class I
 - Level of protection against electric shock of the applied part:.....type BF
 - Level of protection against harmful water penetration:...IPX0
 - Methods of disinfection:.....none, only cleaning. See item on preventive maintenance
 - Level of safety of application in the presence of an anesthetic mixture inflammable with air, oxygen or nitrous oxide:.....not suitable
 - Mode of operation:.....continuous
-

Adjustment parameters:

- Speeds:
- Maximum (100%) : 70 s ± 10% (- 10° to 120 °)
: 75 s ± 10% (120 ° to - 10°)
- Mean (60%) : 120 s ± 10% (- 10° to 120 °)
: 120 s ± 10% (120 ° to - 10°)
- Minimum (30%) : 240 s ± 10% (- 10° to 120 °)
: 250 s ± 10% (120 ° to - 10°)
- Working angles : - 10° (± 2°) to 120 ° (± 2°)
- ROM (Range of Motion) : For H = 8 from -10° to 120 °
: For H = 5 from -10° to 115 °
: For H = 0 from -10° to 110 °

Equipment environmental operating conditions:

- Room temperature : +10°C to +40°C
- Relative humidity : 0% to 80%
- Atmospheric pressure : 700 hPa to 1060hPa

Environmental conditions for transport and storage:

- Room temperature : -10°C to 60°C
- Relative humidity : 20% to 90%
- Atmospheric pressure : 500hPa to 1060hPa





Accessories:



- Power cable.
- Cable to connect the CPM Unit to CPM 8000.
- UNIT CONTROL (CPM Unit)
- Thigh and Leg Support.
- Foot Support
- Band to fasten the feet.
- CPM 8000 User Manual.
- Program Maker Software User Manual.
- USB Cable
- CD with the Program Maker software





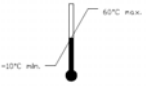
Symbols

Equipment symbols

	Means equipment off
	Means equipment on
	This symbol indicates that the equipment causes physiological effects and that the user must check the instructions manual before using.
	Applied part is type BF



Symbols on the pack

	Caution fragile. Handle with care
	Keep in a dry place
	This side up. This symbol indicates the right transport position
	Maximum piling. Indicates the maximum number of boxes that can be piled. The quantity is marked in the intermediary square.
	Minimum and maximum temperature limits for transport and storage.

Information on electromagnetic compatibility

This equipment requires special precautions in relation to its electromagnetic compatibility and must be installed and placed into operation according to the information provided below.

There are no detachable accessories that affect the CPM 8000's compliance with the electromagnetic compatibility standard. All the parts are fixed in the equipment.

In case of the need for repairs in the equipment, always use the authorized technical service, since changing the length of cables, elimination or improper change of some internal suppression components can result in increased emission or reduced immunity of the CPM 8000.

Terminologies and Definitions:

For purposes of the standard NBR IEC 60601-1:1994 + amendment 1997, the following conditions apply, used in the Manufacturer Declarations & Orientations :

- Meaning given to the verbal forms "should" and "may"

- "should" means that compliance with the requirement or test in question is mandatory in order to comply with the Standard.
- "would" means that compliance with the requirement or test in question is strongly recommended, but not mandatory in order to comply with the Standard.
- "may" means that compliance with the requirement or test in question is only a particular way of obtaining compliance with the Standard



Declarations

MANUFACTURER DECLARATION AND INSTRUCTIONS - ELECTROMAGNETIC EMISSIONS		
CPM 8000 is intended for use in the electromagnetic environment described below: The purchaser or operator of CPM 8000 must ensure that it is being used in such environment.		
Emission test	Compliance	Electromagnetic environment - orientation
RF Emission CISPR 11	Group 1	CPM 8000 uses RF energy for its internal operation only. Therefore, its RF emission is very low and not likely to cause any interference in another electronic equipment nearby.
RF Emission CISPR 11	Class A	
Emission of harmonics IEC 61000-3-2	Class A	
Voltage fluctuation / Emission of flicker IEC 61000-3-3	Compliant	CPM 8000 is intended for use in establishments that are not domestic and that are not connected directly to the public low voltage power network that supplies buildings with domestic purposes.


MANUFACTURER DECLARATION AND ORIENTATION – ELECTROMAGNETIC IMMUNITY			
CPM 8000 is intended for use in the electromagnetic environment specified below: The purchaser or operator of CPM 8000 must ensure that it is being used in such environment.			
Immunity test	IEC 60601 Test level	Compliance level	Electromagnetic environment - orientation
Electrostatic discharge IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	The floor can be of wood, concrete or ceramic. If the floor is covered with synthetic material, the air's relative humidity should be at least 30%.



Fast transients / Bursts IEC 61000-4-4	± 2 kV power line ± 1 kV input line and signal line	± 2 kV power line Not applicable	
Surge IEC 61000-4-5	± 1 kV differential mode ± 2 kV ordinary mode	± 1 kV differential mode ± 2 kV ordinary mode	
Voltage drops, short interruptions and voltage variations in power supply. IEC 61000-4-11	<5% Ut (>95% drop in Ut) For 0.5 cycle 40% Ut (60% drop in Ut) For 5 cycles 70% Ut (30% drop in Ut) For 25 cycles <5% Ut (>95% drop in Ut) For 5 s	<5% Ut (>95% drop in Ut) For 0.5 cycle 40% Ut (60% drop in Ut) For 5 cycles 70% Ut (30% drop in Ut) For 25 cycles <5% Ut (>95% drop in Ut) For 5 s	The quality of the power network must be that of a typical hospital or commercial environment.
Magnetic fields of the network frequencies (50/60 Hz) IEC 61000-4-8	3 A/m	3 A/m	The magnetic fields of the network frequencies must be levels characteristic of a typical commercial or hospital environment.
Note: Ut is the A.C network voltage before application of the test level.			

MANUFACTURER DECLARATION AND ORIENTATION – ELECTROMAGNETIC IMMUNITY			
CPM 8000 is intended for use in the electromagnetic environment specified below: The purchaser or operator of CPM 8000 must ensure that it is being used in such environment.			
Immunity test	IEC 60601 Test Level	Compliance level	Electromagnetic environment - orientation



			<p>Portable and mobile RF communication equipment should not be used closer to any CPM 8000 part, including cables, more than the separation distance recommended calculated by the equation, applicable for the transmitter frequency.</p> <p>Recommended separation distance</p> $d = 1,17 \cdot \sqrt{P}$
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	$d = 1,17 \cdot \sqrt{P}$ <p>80 MHz to 800 MHz</p>
Irradiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d = 2,3 \cdot \sqrt{P}$ <p>800 MHz to 2.5 GHz</p>
			<p>Where P is the maximum output power of the transmitter in watts (W), according to the transmitter manufacturer, and d is the recommended separation distance in meters (m).</p> <p>The field generated by fixed RF transmitters, as determined by an electromagnetic field in the location ^a, must be less than the level of compliance in each frequency range. ^b</p> <p>There can be interference around equipment with the following symbol:</p> 
<p>NOTE 1: the greatest frequency in the range is applied in the range of 80 MHz and 800 MHz.</p> <p>NOTE 2: this procedure may not apply in all cases. Electromagnetic propagation is affected by absorption and reflection of structures, objects and people.</p>			
<p>a. The intensity of fields generated by fixed transmitters, such as cell sites for telephones (cell/wireless) and land mobile radios, amateur radios, AM, FM and TV radio diffusion stations may not be theoretically prognosed accurately. To evaluate the electromagnetic environment due to the fixed RF transmitters</p>			



, in a study of the electromagnetic field in the location must be considered. If the field intensity measured at the site in which the CPM 8000 is used exceeds the compliance level above, the CPM 8000 must be observed to ascertain if it is working properly. If abnormal performance is noticed, additional measures may be required, such as reorientation or relocation of the CPM 8000;

b. Above the frequency scale of 150 kHz to 80 MHz, the field intensity must be less than 3 V/m.

Recommended separation distances between portable and mobile RF communication equipment and the CPM 8000			
The CPM 8000 is intended for use in an electromagnetic environment in which the RF disturbances are controlled. The purchaser or operator of the CPM 8000 can help prevent electromagnetic interference by keeping a minimum distance between portable and mobile RF communication equipment (transmitters) and the CPM 8000, as recommended below, according to the maximum output potential of the communication equipment.			
Declared maximum output potential of the transmitter (W)	Separation distance according to the transmitter frequency		
	150 kHz to 80 MHz $d = 1,17\sqrt{P}$	80 MHz to 800 MHz $d = 1,17\sqrt{P}$	800 MHz to 2.5 GHz $d = 2,3\sqrt{P}$
0.01	11.70 cm	11.70 cm	23.00 cm
0.1	37.00 cm	37.00 cm	72.70 cm
1	1.17 m	1.17 m	2.30 m
10	3.70 m	3.70 m	7.27 m
100	11.70 m	11.70 m	23.00 m
For transmitters with declared maximum output power not listed above, the recommended separation distance (d in meters) can be determined using the equation applicable to the transmitter frequency; where P is the maximum output power of the transmitter in watts (W), according to its manufacturer. NOTE 1: the 80 MHz and 800 MHz apply to the separation distance for the highest frequency. NOTE 2: this procedure may apply in all cases. Electromagnetic propagation is affected by absorption and reflection of structures, objects and people.			



Final considerations

It has been Mettler Electronics' policy to continuously improve the quality of its products. Mettler Electronics Corp. reserves the right to make modifications in the design and specifications, and to also add to and improve its products, without the obligation to install them in already manufactured products.

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