

APT

Active Passive Trainer

PLUS

Instruction Manual



Made in Israel
Distributed by:

METTTLER **M**ELECTRONICS[®]
corp.

1333 South Claudina Street • Anaheim, CA 92805, U. S. A.

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NOTE: Design details may change without notice

SECTION A – PRE-SALES INFORMATION

1. INTRODUCTION

The **APT PLUS** is an electric exercise machine used for the improvement of physical abilities. The **APT PLUS** provides the user with a variety of exercise options and modes of operation that meet a broad range of physical needs.

A wide range of accessories are available that offer many exercise options and make the **APT PLUS** suitable for the maintenance of fitness and physical well being.

The **APT PLUS** can be operated in either the ACTIVE mode at varying degrees of resistance or in the PASSIVE mode at adjustable speed and torque levels. In the PASSIVE mode it is also possible to combine PASSIVE with ACTIVE training by using physical effort in conjunction with the electrical operation of the motor. The **APT PLUS** functions forwards or backwards and is suitable for arm or leg exercises (upper or lower limbs). In case the user has limited strength in the arm, it is recommended to have an attendant present during exercise.

The **APT PLUS**'s light weight makes it portable, easy to store and convenient to use in the comfort of one's home. The unit is also suitable for use in healthcare institutions.

Use of the **APT PLUS** is recommended for the maintenance of muscle strength, flexibility, muscle tone, endurance and general fitness for users of all ages.

2. TECHNICAL DATA

APT Plus Unit

Model 8200

Weight	22 lbs.
Length	28 in. Overall
Width	18 in.
Height	6.5 in. Folded
Working voltage	24 VDC
Revolutions per minute	20 - 60 RPM
Rotation Radius	1.5, 3.0, 4.5, 6.0 in.
Exercising Positions	15°, 30°, 45°, 60°
Current Rating	4.16 A Max.
Accuracy of measurement display	±10%
Optional additional functions	Remote control Heart rate monitor



Type B equipment

Equipment not suitable for use in the presence of flammable anaesthetic mixture with air or with oxygen or nitrous oxide.
Continuous operation

External Power Supply

Weight	1.8 lbs.
Length	7.5 in.
Width	3.5 in.
Height	1.8 in.
Input:	100~240 V 47-63 Hz 1.25 A
Output:	24 VDC 100 W Max. 4.16 A



Class I equipment

APT Plus Hi Lo

Model 8400

Weight	86 lbs.
Base Dimensions	40 x 30 in.
Height	40 in.
Working Height from Ground Up	50 in.

3. SAFETY

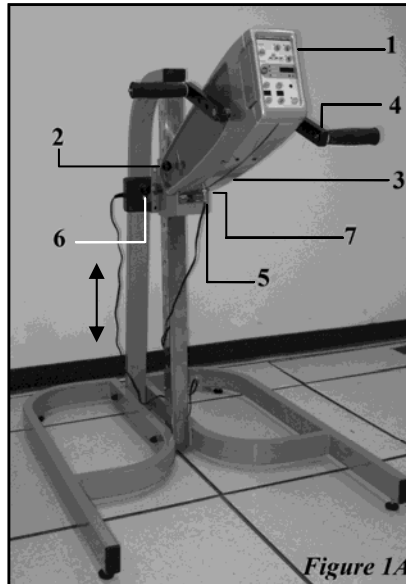
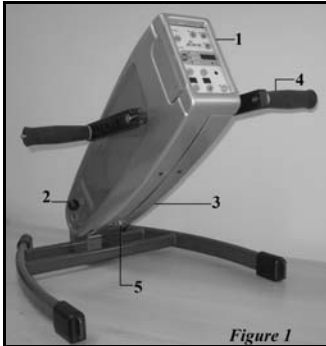
These safety considerations and tips will help you to operate the **APT PLUS** safely and prevent personal injury and damage to your wheelchair.

1. Read this manual and all labels before operating. If you do not fully understand any part of this manual, please contact your authorized dealer or service agent.
2. The **APT PLUS** should not be used in the vicinity of sensitive medical equipment.
3. Electromagnetic interference (“EMI”) can cause **APT PLUS** to behave erratically, which could be dangerous to the user. For your safety and protection, it is imperative that you read the information on EMI before operating the **APT PLUS**, see chapter 11.
4. EMC Warning: Radio wave sources such as radio and T.V. stations, transmitters and cellular telephones can affect the performance of powered wheelchairs and mobility devices.
5. Do not operate the **APT PLUS** when under the influence of alcohol, medications or drugs that may impair your safety.
6. Only the authorized dealer or service agent may perform specified set-up procedures and controller settings; programming of the settings outside the limits as specified by the manufacturer may have adverse effects on the performance.
7. Do not use the **APT PLUS** if it behaves abnormally or erratically, contrary to the usual performance as described in this user manual.
8. CAUTION: Surface temperatures can increase when exposed to external sources of heat (e.g. sunlight).

4. SYSTEM COMPONENTS AND DETAILS

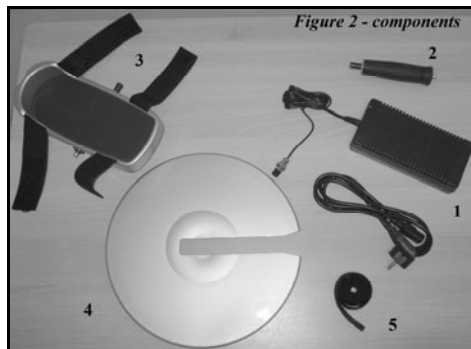
4.1. *APT PLUS* unit (Figure 1)

1. Operator panel
2. Angle release knob
3. Angle securing knob
4. Crank-arm
5. Power input socket
6. Socket (not in use)
7. Height release knob (*Hi-Lo* only)
8. Height securing knob (*Hi-Lo* only)



4.2. Primary components (Figure 2):

1. Power supply unit (Provided)
2. Straight hand-grips (Optional accessory)
3. Footrests (Optional accessory)
4. Finger protection disks (Provided)
5. Securing straps (Optional accessory)





When this equipment is no longer operational it must be sent to a separate collection facility for recovery and recycling.



CE approved Notified Body No. 0123.



Type B equipment.





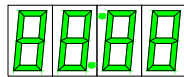


Read this user manual and all labels before operating.

The **APT PLUS** - Operator Panel

Figure 3



		On/Off button: green indicator is lit when the APT PLUS is switched on.
		Mode button: for selecting active or passive mode of operation.
		Green indicator is lit when ACTIVE mode is selected by mode button.
		Green indicator is lit when PASSIVE mode is selected by mode button.
		Indicates actual load level as percentage of chosen load level (see 16).
		Button for forward operation in the PASSIVE mode. The green indicator is lit to indicate forward operation.
		Button for backward operation in the PASSIVE mode. The green indicator is lit to indicate backward operation.
		Button activating Auto-Reverse function in the PASSIVE mode. In the ACTIVE mode this button activates the constant force function. The green indicator is lit when activated.
		Button for selecting display of data, (see 10-13):
		Green indicator is lit when Timer display is selected. The display will show the time the APT PLUS has been used in the current exercise period.
		Green indicator is lit when Counter display is selected. The display will show the total amount of revolutions of the crank arm in the current exercise period.







	 Power	<p>Green indicator is lit when Power display is selected. The display will show the power during exercise in Watts – only in Active mode.</p>
		<p>Heart rate monitor</p>
		<p>Display for Timer, Counter and Energy.</p>
	<p>Speed</p> 	<p>Exercise speed level selection push buttons + – Increases speed level (up to 10) - – Decreases speed level (down to 1)</p>
	<p>Load</p> 	<p>Exercise load level selection push buttons + – Increases load level (up to 10) - – Decreases load level (down to 1)</p>

5. ACCESSORIES



The following items are designed for use in combination with the **APT PLUS**.

CAUTION: The use of accessories other than these can be unsafe.

5.1 Hand grips and Footrests

#	ACCESSORY	USAGE DESCRIPTION	FIGURE
a)	Straight Handgrips	Used for most of the upper limb exercising.	
b)	Angled Handgrips	Ergonomically designed, mainly for strength exercising in the Active mode.	
c)	Hemi-glove	Used for securely supporting the wrist and hand on the handgrips for users who have little or no muscle strength.	
d)	Standard Footrests	Used for most of the lower limb exercising.	
e)	High support for footrests	May be attached to footrests for supporting the lower limbs of users that have little or no muscle strength.	
f)	Strap	Used to secure the APT Plus to chair or wheel chair to keep it from moving away from patient during exercise	

5.2 Optional added functions

#	ACCESSORY	USAGE DESCRIPTION	FIGURE
a)	Remote Control	Used mainly for lower limb exercising by users who have difficulty in reaching the operating panel.	
b)	Pulse rate monitor	Plugs into APT Plus and heart beats are registered by indicator on front panel.	

SECTION B – USER INFORMATION

6. PREPARING THE APT PLUS HI-LO



Figure 4

Figure 4A

6.1 Moving your **APT PLUS Hi-Lo**

The **APT PLUS Hi-Lo** can easily be moved by lifting the end of the frame and pushing the unit using its wheels, see Figure 4.

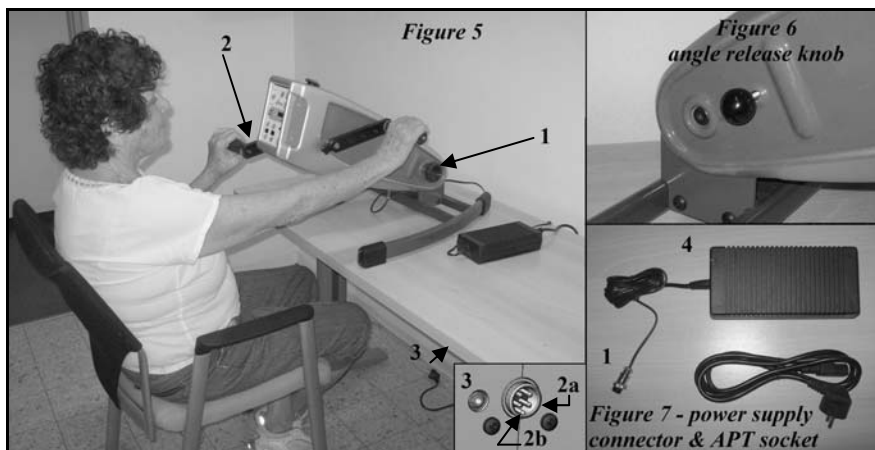
6.2 Positioning the **APT PLUS Hi-Lo**

Position the **APT PLUS Hi-Lo** close to an electrical socket outlet. The adjustable feet on the underside keep the **APT PLUS Hi-Lo** level and prevent it from sliding.

NOTE: Ensure that the **APT PLUS Hi-Lo** is level in order to prevent damage to the trainer or its components.

If readjustment of one of the feet is needed, open the contra nut (4A/1), turn the foot (4A/2) to the desired height and secure the foot with the contra nut (4A/1).

7. INSTALLATION FOR USE – ARMS EXERCISE



Step 1: Position the **APT PLUS** on a level table top close to an electrical socket outlet (Figure 5).

For the **APT PLUS Hi-Lo**: loosen the height securing knob (Figure 1A-8), pull the grey ring of the height release knob (Figure 1A-7) and adjust the unit to the required height. Release the grey ring and tighten the height securing knob (Figure 1A-7).

Step 2: Loosen the angle-securing knob (Figure 5-1) and adjust the **APT PLUS** to the required angle. To increase the angle, lift the body of the **APT PLUS**, allow it to “click” into one of the operating positions and retighten the securing knob. To decrease the angle, pull the angle release knob (Figure 6), lower the body of the **APT PLUS**, allow it to “click” into another operating position and tighten the securing knob.

CAUTION: Make sure that the minimum distance between crank arm and the table surface is approximately 5 cm. / 2” (Figure 5-2).

Step 3: Connect the output connector (Figure 7-1) of the power supply (Figure 7-4) to the **APT PLUS** power input socket (Figure 7-2a) while ensuring correct position of connector groove opposite the guide key of socket (Figure 7-2b).

NOTE: The **APT PLUS** must be used only with an original **APT PLUS** Power Supply unit.

Step 4: Install the finger protection discs (Fig. 8-1) by sliding them into the grooves on the outside edges of the crank arms (Figure 8-2) in the direction shown.

NOTE: The finger protection discs are important for safe operation of the unit during hands exercise.

Step 5: Insert handgrip (Figure 9-1) in one of the four mounting holes (Figure 9-2) in each of the **APT PLUS** crank arms. Installation or removal requires only a straight push or pull while simultaneously pressing on the release pin (Figure 9-3) at the end of the handle.

NOTE: The choice of mounting hole provides variable resistance levels and ranges of motion. See operation instructions.

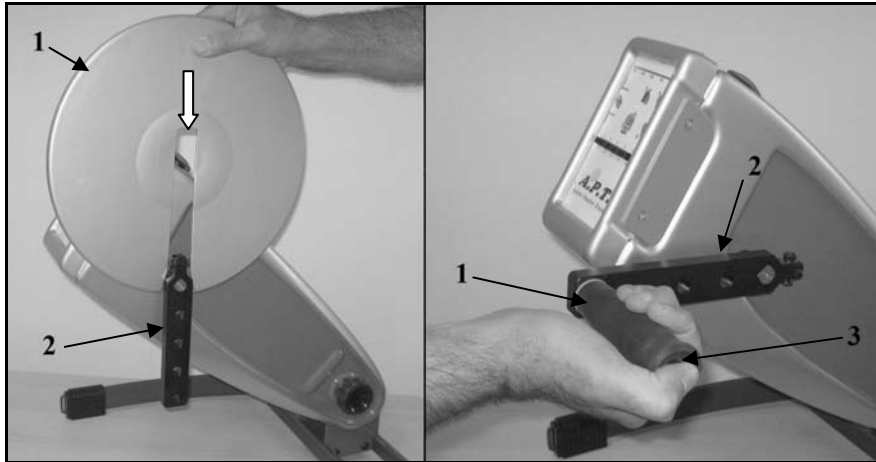




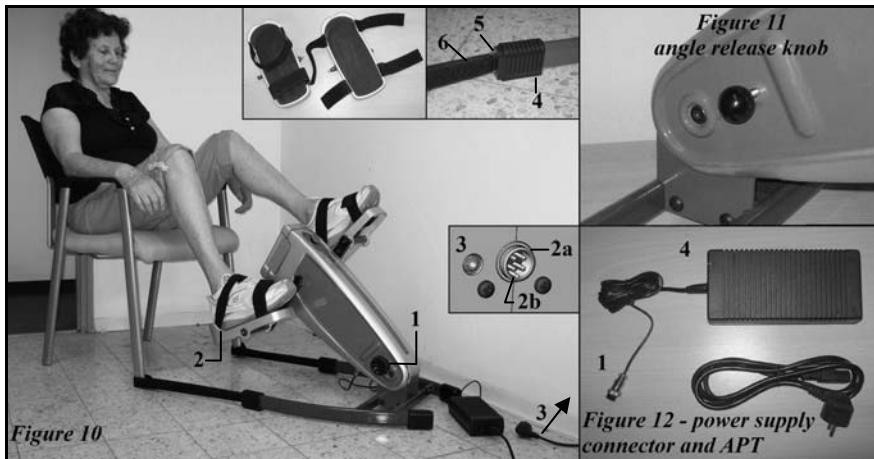
Figure 8
finger protection discs and crank

Figure 9
handgrip and crank

Step 6: Plug the power supply mains power plug into the electrical socket outlet (Figure 5-3). **To start operating,** press the  button. The **APT PLUS** will enter the stand-by position. Then press the  button. The green ACTIVE mode indicator will light up. You may start exercising in the ACTIVE mode. For operation instructions, see 5.1 & 5.2.

NOTE: If the **APT PLUS** moves across the table during arm exercises, anti-slip pads (Figure 8-3) may require cleaning.

8. INSTALLATION FOR USE – LEG EXERCISE



Step 1: Position the **APT PLUS** on the floor close to an electrical socket outlet (Figure 10).

Step 2: Loosen the angle-securing knob (Figure 10-1) and adjust the **APT PLUS** to the required angle. To increase the angle, lift the body of the **APT PLUS**, allow it to “click” into one of the operating positions and retighten the securing knob. To decrease the angle, pull the angle release knob (Figure 11), lower the body of the **APT PLUS**, allow it to “click” into another operating position and tighten the securing knob.

CAUTION: Make sure that the minimum distance between crank arm and the floor surface is approximately 5 cm. / 2” (Figure 10-2)

Step 3: Place a chair at the desired distance from the **APT PLUS**. If necessary, attach the Securing straps (Figure 10-6) between the **APT PLUS** base rings (Figure 10-5) and the chair legs to prevent any change in distance between the **APT PLUS** and the chair during leg exercises.

Step 4: Connect the power output connector (Figure 12-1) of the power supply (Figure 12-4) to the **APT PLUS** power input socket (Figure 12-2a) while ensuring correct position of connector groove opposite the guide key of socket (Figure 12-2b).

NOTE: The **APT PLUS** must be used only with an original **APT PLUS** Power Supply unit.

Step 5: Insert Footrest (Figure 13-1) in one of the four mounting holes (Figure 13-2) in each of the **APT PLUS** crank arms. Installation or removal requires only a straight push or pull while simultaneously pressing on the release pin (Figure 13-3) as shown. Secure feet in place with straps fastened diagonally as shown in Figure 10.

NOTE: The choice of mounting hole provides variable resistance levels and ranges of motion. See operation instructions.

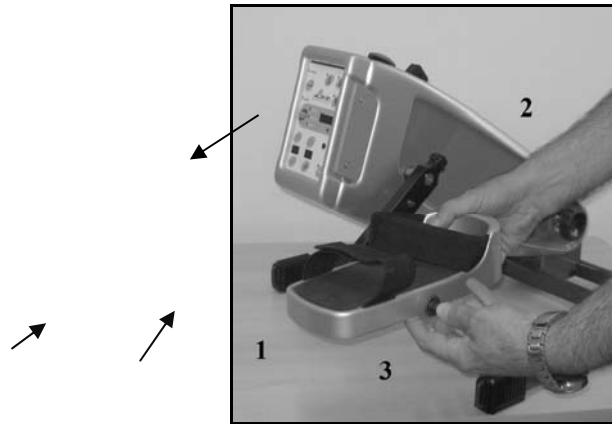




Figure 13

Step 6: Plug the power supply mains power plug into the electrical socket outlet (Figure 10-3). The **APT PLUS** will enter a stand-by position. **To start operating**, press the  button. The **APT PLUS** will enter the stand-by position. Then press the  button. The green ACTIVE mode indicator will light up. You may start exercising in the ACTIVE mode. For operation instructions, see 5.1 & 5.2.

NOTE: If the **APT PLUS** moves across the floor during leg exercises, anti-slip pads (Figure 8-3) may require cleaning. If possible – use the **APT PLUS** on a carpet or rubber mat.



9. OPERATION INSTRUCTIONS



NOTE: Install **APT PLUS** for arms or legs exercise as described in the previous chapters.

9.1 Active mode - ISOKINETIC operation

Step 1: Insert the handgrips or footrests in one of the four mounting holes according to the radius and range of motion required.

NOTE: As the effective crank arm length is reduced in the ACTIVE mode, the amount of effort required increases while the range of motion decreases, and vice versa.

Step 2: To activate the active mode from the stand-by position (after the electrical power is supplied to the **APT PLUS** and the  button is pressed): press the  button. The green ACTIVE mode indicator will light up.



Step 3: Set the desired load level by pressing one of the selection push buttons,  to increase the level or  to decrease the level.

Step 4: Rotate the **APT PLUS** handgrips or footrests forward or backward. Actual exercising force is displayed as a percentage (%) on the Bar Indicator.

NOTE: In this mode, an increase in the rotation speed (RPM) will lead to an increase in the exercising force.

9.2 Active mode - CONSTANT FORCE Operation

Step 1: Press the  button to activate the CONSTANT FORCE FUNCTION in the ACTIVE mode. The green indicator will light up.

Step 2: Set the desired load level by pressing one of the selection push buttons,  to increase the level or  to decrease the level.

Step 3: Rotate the **APT PLUS** handgrips or footrests forward or backwards. The exercising force as displayed on the Bar Indicator will now remain constant at 50% for the selected load level, irrespective of the crank arm rotation speed.



9.3 PASSIVE mode

Step 1: Insert the handgrips or footrests in one of the four mounting holes according to the radius and range of motion required.

NOTE: As the effective crank arm length is reduced in the PASSIVE mode, the range of movement is reduced and the degree of resistance that the motor can overcome is increased.


Step 2: To activate the passive mode from the stand-by position (after the electrical power is supplied to the **APT**

PLUS and the  button is pressed): press the  button two times, until the green PASSIVE mode indicator will light up. From the ACTIVE mode – press once only.

Step 3: Set the desired rotation speed by pressing one of the speed level push buttons and the desired force by pressing one of the force load push buttons:  to increase level,  to decrease level.


Step 4: Hold onto the handgrips (for arm exercise) or secure both feet to the footrests (for legs exercise). Make sure that **APT PLUS** is placed at a comfortable distance for exercise by turning the crank arms one complete revolution.

Press the  button for forward rotation.

Press the  button for backward rotation.

NOTE: There will be a short delay before the **APT PLUS** begins to turn in the chosen direction.

Step 5: The operation force of the crank arms should rotate the arms or legs of with no effort on the part of the user. This rotation force varies according to exercise level and crank arm mounting hole location selected.

Step 6: To stop the rotation of the crank-arms and exit the PASSIVE mode, press the  button. The indicators will turn off and the **APT PLUS** will return to the stand-by position.

9.4 COMBINED active/passive mode

Step 1: Operate the **APT PLUS** in the passive mode and work against the force of the motor by applying resistance to the rotation of the crank arms.

Step 2: The resistance force to the rotation is displayed on the on the Bar Indicator as a percentage (%) at each level.

Step 3: If the resistance force stops the crank arm rotation completely, the Bar Indicator reaches 100% and the red indicator will light up. After holding this position for approximately 2 seconds, the crank arm rotation will stop automatically.



NOTE: To restart, Press the  button for forward rotation, or the  button for backward rotation.

9.5 Passive mode – AUTO-REVERSE function




Step 1: Push the  button to activate the AUTO-REVERSE function in the PASSIVE mode. The green indicator will light up.

Step 2: Operate the **APT PLUS** as in usual passive or combined active/passive mode.


Step 3: When the resistance force stops the crank arm rotation completely, the Bar Indicator reaches 100% and the red indicator will light up. After holding this position for approximately 2 seconds, the crank arm rotation will stop automatically. After a short delay the **DIRECTION OF ROTATION WILL BE REVERSED**. This feature also serves as an **ANTI-SPASM** function, stopping the motor in case of muscle spasm and reversing the direction of rotation after a short delay.






Step 4: As long as the  button indicator is lit, this function will continue to operate in the PASSIVE mode.

9.6 Display




By pressing the  button, four different types of data can be displayed.

- ❑ Normally the display will show the time measuring the duration of exercising; the green  **Timer** indicator will be lit.

Each time the  button is pressed, the display will shift to show the next data type – as follows:

- ❑ Counter: displays the total of crank arm revolutions performed during an exercise period; the green  **Counter** indicator will be lit.
- ❑ Power: display the power used during an exercise period; the green  **Power** indicator will be lit. This display can only be activated in ACTIVE mode.

9.7 Shut down

Step 1: To turn off the **APT PLUS**, from the PASSIVE mode – press the  button once. From the Active mode – press twice. All indicators except for the one next to the  button will turn off and the **APT PLUS** will return to its stand-by position. To turn off the **APT PLUS** completely – press the  once.

Step 2: Disconnect the power from the **APT PLUS** by first disconnecting the mains electrical plug from the electrical socket outlet. Disconnect Power supply output connector from the **APT PLUS** power input socket.

CAUTION: For safe disconnection *always* take the mains plug out of the electrical socket before disconnecting the Power supply from the **APT PLUS**.

9.8 Emergency Switch

In the event of the need to stop the **APT PLUS** quickly, press the red mushroom headed button (Figure 14-1) situated on the top of the trainer body (above the control panel). This will immediately cut the electrical supply to the **APT PLUS**.

The button will stay depressed and as long as it is in this position the **APT PLUS** will not function.

In order to restore the electrical supply to the **APT PLUS**, turn the knurled black disc underneath the red button (Figure 14-2) in the direction of the white arrow (Figure 14-3) on the red button (clockwise). The red button will then return to its original position.

The **APT PLUS** may then be restarted as previously described.

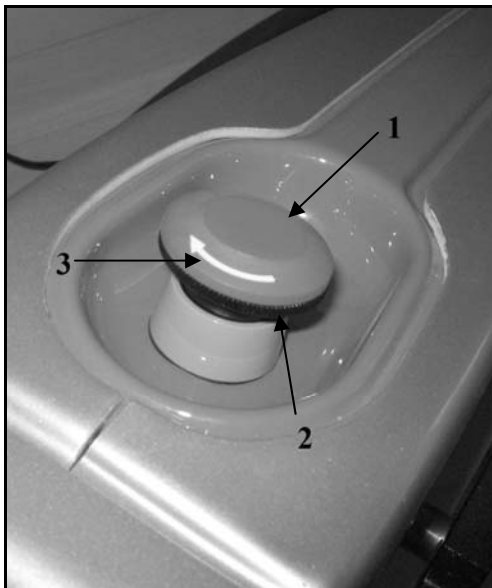


Figure 14 – Emergency Switch

10. TRANSPORTATION AND STORAGE

- The **APT PLUS** can be lifted safely in its folded position by grasping onto the centre of either of the legs of the base unit and carrying like a suitcase.
- For storage in a confined space, fold the **APT PLUS** unit by pulling the angle release knob (Figure 1-2) and lowering it to the flat position. Tighten the angle-securing knob (Figure 1-3) to prevent unintentional unfolding.
- Temperature range: -20°C to 40°C
- Relative humidity range: 10% to 80%
- Atmospheric pressure range: 700 hPa to 1060 hPa

11. EMI – ELECTROMAGNETIC INTERFERENCE

CAUTION: It is important that you read this information regarding the possible effects of electromagnetic interference on your **APT PLUS**.

Electromagnetic Interference (EMI) From Radio Wave Sources

The equipment may be susceptible to electromagnetic interference (EMI), which is interfering electromagnetic energy (EM) emitted from sources such as radio stations, TV stations, amateur radio (HAM) transmitters, two-way radios, and cellular phones. The interference (from radio wave sources) can cause the equipment to come to a sudden stop, or react in an uncontrolled manner. It can also permanently damage the equipment's control system.

There are a number of sources of relatively intense electromagnetic fields in the everyday environment. Some of these sources are obvious and easy to avoid. Others are not apparent and exposure is unavoidable. However, we believe that by following the warnings listed below, your risk to EMI will be minimized.

The sources of radiated EMI can be broadly classified into three types:

- 1) **Hand-held portable transceivers** (transmitters-receivers) with the antenna mounted directly on the transmitting unit. Examples include citizens band (CB) radios, "walkie-talkies", security, fire, and police transceivers, cellular telephones, and other personal communication devices.
**NOTE: Some cellular telephones and similar devices transmit signals while they are ON, even when not being used;
- 2) **Medium-range mobile transceivers**, such as those used in police cars, fire trucks, ambulances, and taxis. These usually have the antenna mounted on the outside of the vehicle; and
- 3) **Long-range transmitters and transceivers**, such as commercial broadcast transmitters (radio and TV broadcast antenna towers) and amateur (HAM) radios.

NOTE: Other types of hand-held devices, such as cordless phones, laptop computers, AM/FM radios, TV sets, CD players, and cassette players, and small appliances, such as electric shavers and hair dryers, so far as we know, are not likely to cause EMI problems to the equipment.

Because EM energy rapidly becomes more intense as one moves closer to the transmitting antenna (source), the EM fields from hand-held radio wave sources (transceivers) are of special concern. It is possible to unintentionally bring high levels of EM energy very close to the equipment's control system while using these devices. This can affect the equipment's operation. Therefore, the warnings listed below are recommended to prevent possible interference with the control system of your **APT PLUS**.


WARNINGS

Electromagnetic interference (EMI) from sources such as radio and TV stations, amateur radio (HAM) transmitters, two-way radios, and cellular phones can affect the equipment. Following the warnings listed below should reduce the chance of unintended reaction, which could result in serious injury.

- 1) Do not operate hand-held transceivers (transmitters-receivers), such as citizens band (CB) radios, or turn ON personal communication devices, such as cellular phones, while your **APT PLUS** is turned ON;
- 2) Be aware of nearby transmitters, such as radio or TV stations, and try to avoid operating your **APT PLUS** close to them;
- 3) If an unintended reaction occurs, turn your **APT PLUS** power switch OFF by using the emergency stop switch (see instructions on page 22);
- 4) Be aware that adding accessories or components, or modifying your **APT PLUS**, may make it more susceptible to EMI (Note: There is no easy way to evaluate their effect on the overall immunity of your **APT PLUS**);
- 5) Report all incidents of unintended reaction to your Authorized **APT PLUS** dealer or service center, and note whether there is a source of EMI nearby.

Guidance and manufacturer's declaration – electromagnetic emission		
The Electric Exercise Machine is intended for use in the electromagnetic environment specified below. The customer or the user of the Electric Exercise Machine should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration – electromagnetic immunity			
The Electric Exercise Machine is intended for use in the electromagnetic environment specified below. The customer or the user of the Electric Exercise Machine should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic transient / burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles < 5 % U_T (>95 % dip in U_T) for 5 sec	< 5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles < 5 % U_T (>95 % dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Electric Exercise Machine requires continued operation during power mains interruptions, it is recommended that the Electric Exercise Machine be powered from an uninterruptible power supply or a battery.
NOTE	U_T is the a. c. mains voltage prior to application of the test level.		

Guidance and manufacturer's declaration – electromagnetic immunity			
The Electric Exercise Machine is intended for use in the electromagnetic environment specified below. The customer or the user of the Electric Exercise Machine should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Radiated RF IEC 61000-4-3	3 V/m	3 V/m	<p>Portable and mobile RF communications equipment should be used no closer to any part of the EQUIPMENT Electric Exercise Machine including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> $d = \left[\frac{3,5}{E_1} \right] \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = \left[\frac{7}{E_1} \right] \sqrt{P} \quad 800 \text{ MHz to } 2,5 \text{ GHz}$ <p>where p is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m).^b</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,^a should be less than the compliance level in each frequency range.^b</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.			
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
<p>^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Electric Exercise Machine is used exceeds the applicable RF compliance level above, the Electric Exercise Machine should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Electric Exercise Machine.</p> <p>^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V₁] V/m.</p>			

Recommended separation distances between portable and mobile RF communications equipment and the Electric Exercise Machine.			
The Electric Exercise Machine is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Electric Exercise Machine can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Electric Exercise Machine as recommended below, according to the maximum output power of the communications equipment			
Rated maximum output of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = \left[\frac{3,5}{V_1} \right] \sqrt{P}$	80 MHz to 800 MHz $d = \left[\frac{3,5}{E_1} \right] \sqrt{P}$	800 MHz to 2,5 GHz $d = \left[\frac{7}{E_1} \right] \sqrt{P}$
0,01	0.12	0.12	0.23
0,1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.69	3.69	7.38
100	11.67	11.67	23.33
For transmitters rated at a maximum output power not listed above the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.			
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

SECTION C – SERVICE INFORMATION

12. GENERAL MAINTENANCE

The expected service life of the **APT PLUS** is at least 7 years.
Minimum ongoing maintenance should prevent unnecessary repairs.

The rugged design of the **APT PLUS** and the use of selected, modern materials ensure minimal requirements for care and maintenance.

NOTE: Improper handling or neglect in the care of the **APT PLUS** may reduce or cancel the coverage of the manufacturer’s warranty.

12.1 Regular care

Monthly checks

- Inspect Power supply cables and plug for visible damage.
- Check power-input connector for visible damage or insecure fastening.
- On a regular basis check that all screws and components are fastened tightly.
- Ensure that the anti-slip pads under the base are always kept clean.

Annual checks – Checks after repair

These annual checks shall be performed by an authorised technician.

- Ensure full functioning of Operator Panel (Fig. 3, page 10)
- Smooth rotation of Crank Arms (Fig.1.4 , page 8)
- Firm locking of Angle Securing Knob (Fig. 1.3 page 8)
- Ensure that the Input Socket (Fig. 1.5 page 8) is not damaged.
- Inspect the power supply for the following parameters:

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Safety Ground Leakage Current	Io=Full Load, Vin=240 VAC/60Hz			0.1	mA
Earth Impedance	25 A		22		mΩ
	40 A		27		
Isolation Resistance	Test Voltage=500 VDC	50			mΩ

CAUTION: If any damage is detected – do not use the APT PLUS. Please contact your authorized dealer. Only authorized personnel may carry out repairs. The power supply is not to be repaired.

12.2 Cleaning instructions

- Disconnect Power Supply and wipe dry with clean cloth.
- Take care not to allow water to enter the unit. Keep cables and electric components away from water and humidity.

CAUTION: For safe disconnection of the APT PLUS always take the mains plug out of the wall socket before removing the connector from the APT PLUS power socket.

13. DISPOSAL AND RECYCLING





The packing material must be separated to plastic and paper/cardboard components and submitted to authorized recycling locations.

The **APT PLUS** device consists of electronic components, cables, plastic parts, steel body and base frame, and aluminium parts. Do not discard any components to normal refuse facilities. When **APT PLUS** is no longer operational, it is to be dismantled and separated into above material groups and submitted to authorized recycling facilities.



14. TROUBLE-SHOOTING

Hereunder are some types of disorders, which can usually be repaired rather simply. If these following measures are unsuccessful, an authorized dealer should be contacted!

PROBLEM	CHECK POINT
The APT PLUS does not function at all	Power Supply not connected properly to mains outlet or to the APT PLUS .
	APT PLUS switched off. Press the  button to turn APT PLUS on.
	APT PLUS in stand-by mode. Press the  button to enter active or passive modes.
	Stop switch in lower - disconnection position. Turn switch anti-clockwise to release.
The crank-arms do not start to rotate in the passive mode	No direction selection button is selected. Press the  button (Figure 3-6) for forward rotation. Press the  button (Figure 3-7) for backward rotation
Model with remote control: remote unit not functioning smoothly	Remote unit's transmitter LED needs to be wiped clean.
	Remote unit batteries need replacement.

15. APPENDIX – EXERCISE PARAMETER VALUES

Table 1: Active Mode ISOKINETIC operation

Speed (RPM) Force (Kg) Power (Watt)			Bar Graph			
			25%	50%	75%	100%
Level	Speed		25	50	75	100
1	Force	R1	0.7	1.0	1.3	1.7
		R2	0.9	1.3	1.8	2.2
		R3	1.3	2.0	2.7	3.3
		R4	2.7	4.0	5.3	6.7
	Power	Watts	2.6	7.7	15.4	25.6
2	Force	R1	0.8	1.3	1.7	2.2
		R2	1.1	1.8	2.2	2.9
		R3	1.7	2.7	3.3	4.3
		R4	3.3	5.3	6.7	8.7
	Power	Watts	3.2	10.3	19.2	33.3
3	Force	R1	1.0	1.5	2.2	2.8
		R2	1.3	2.0	2.9	3.8
		R3	2.0	3.0	4.3	5.7
		R4	4.0	6.0	8.7	11.3
	Power	Watts	3.8	11.5	25.0	43.6
4	Force	R1	1.2	1.8	2.5	3.2
		R2	1.6	2.4	3.3	4.2
		R3	2.3	3.7	5.0	6.3
		R4	4.7	7.3	10.0	12.7
	Power	Watts	4.5	14.1	28.8	48.7
5	Force	R1	1.5	2.3	3.2	4.5
		R2	2.0	3.1	4.2	6.0
		R3	3.0	4.7	6.3	9.0
		R4	6.0	9.3	12.7	18.0
	Power	Watts	5.8	18.0	36.5	69.2
6	Force	R1	1.7	2.8	4.0	5.7
		R2	2.2	3.8	5.3	7.5
		R3	3.3	5.7	8.0	11.3
		R4	6.7	11.3	16.0	22.6
	Power	Watts	6.4	21.8	46.2	87.2
7	Force	R1	2.0	3.3	5.0	6.7
		R2	2.7	4.4	6.7	8.9
		R3	4.0	6.7	10.0	13.3
		R4	8.0	13.3	20.0	26.6
	Power	Watts	7.7	25.6	57.7	102.6
8	Force	R1	2.3	4.2	6.7	9.3
		R2	3.1	5.5	8.9	12.4
		R3	4.7	8.3	13.3	18.6
		R4	9.3	16.6	26.6	37.3
	Power	Watts	9.0	32.1	76.9	143.6
9	Force	R1	2.8	5.0	8.3	12.2
		R2	3.8	6.7	11.1	16.2
		R3	5.7	10.0	16.6	24.3
		R4	11.3	20.0	33.3	48.6
	Power	Watts	10.9	38.5	96.2	187.2
10	Force	R1	3.3	6.7	10.0	13.3
		R2	4.4	8.9	13.3	17.8
		R3	6.7	13.3	20.0	26.6
		R4	13.3	26.6	40.0	53.3
	Power	Watts	12.8	51.3	115.4	205.1

NOTE: Force Levels are indicated for Mounting Hole locations R1, R2, R3 & R4 on crank-arms (Figure 9 / Figure 13).

Table 2: Passive Mode

Level	Speed Level	Force Level			
	No-load Speed (RPM)	Stall Force (kg) Speed=0 R1=0.15m	Stall Force (kg) Speed=0 R2=0.1125m	Stall Force (kg) Speed=0 R3=0.075m	Stall Force (kg) Speed=0 R4=0.0375m
1	6	2.8	3.8	5.7	11.4
2	11.5	3.0	4.0	6.0	12.0
3	16	3.5	4.7	7.0	14.0
4	23	4.1	5.5	8.2	16.4
5	30	4.5	6.0	9.0	18.0

6	37	5.0	6.7	10.0	20.0
7	41	5.4	7.2	10.8	21.6
8	47	5.6	7.5	11.2	22.4
9	55	5.8	7.7	11.6	23.2
10	61	6.1	8.1	12.2	24.4

NOTE: Force Levels are indicated for Mounting Hole locations R1, R2, R3 & R4 on crank-arms (Figure 9 / Figure 13).

16. WARRANTY

The warranty period for the **APT PLUS** is twelve months and covers faulty materials and workmanship (consumables not covered: plastic coverings and batteries). Worn parts damaged as a result of excessive loading, improper handling, intentional damage or unauthorized maintenance or modification are not covered by the warranty.

For safety and for warranty assurance reasons, any modifications and repair of the **APT PLUS** or its components must be performed exclusively by authorized personnel and exclusively with original spare parts.