



# Users' Manual

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## *MAX POWER*



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## 1. Disclaimer

This manual contains general instructions for the use, operation and care of this PowerTraxx system. The instructions are not complete. Safe and proper use of this PowerTraxx system is solely at the discretion of the user. Safety information is included as a service to the user. All other safety measures taken by the user should be within and under consideration of applicable regulations. It is recommended that training on the proper use of this PowerTraxx system be provided before using it in an actual situation.

Retain this manual for future reference. Include it with the PowerTraxx system in the event of transfer to new users. Additional free copies are available upon request from FERNO Manufacturing.

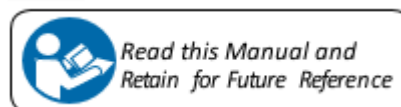
### Bloodborne Disease Notice

To reduce the risk of exposure to blood or other potentially infectious materials when using the PowerTraxx system, follow the disinfecting and cleaning instructions in this manual.

### Operator Training

Operator using the fastening system:

- must read and understand this manual
- must have training on proper use of the fastening system
- must have a training on emergency-medical service and emergency patient-handling procedures
- must have the physical ability to assist the patient
- must practice with the fastening system before using it with a patient
- must keep training records. For a sample training record sheet, see "Training Record"



Ferno products meet the requirements of Medical Device Directive MDR 2017/745 as established by the European Union.

The MAX POWER meets the following standards:

- IEC 60601-1-2 (electrical and electromagnetic medical equipment standards)
- IP 55
- EN 1789:2020



### Technical specification:

<b>Overall Height</b>	<b>997,9 mm</b>
<b>Overall Width</b>	<b>392 mm</b>
<b>Overall Depth</b>	<b>172 mm</b>
<b>Load Limit</b>	<b>227 kg</b>
<b>Weight</b>	<b>18 kg</b>

The MAX Power is compatible with the MAX Chair.

## 2. Attaching and detaching the MAX Power (track)

When using the Max chair with the MAX Power:

The chair features an attachable track to aid operators when ascending and descending stairs.

### **To attach the track:**

First, position the tracks with the lock turned up to receive the axle of the chair. Next, lift the chair just slightly so the axel can be placed directly into the track lock. Press down on the chair until a click is heard, indicating that the chair is now firmly attached to the track. Then lift the end of the track toward the chair until the top lock is engaged and the track no longer swings free.



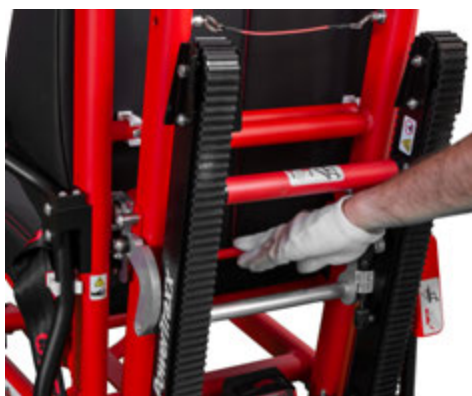
Locating lower Track lock onto axle

### **To detach the track:**

First, locate the bar between the track and chair labeled “push to unlock.” While holding the track's handle press down on this bar, unlocking the top lock.

Next locate the lever at the bottom of the track labeled “pull to unlock.” Pull up on this lever to disengage the bottom lock.

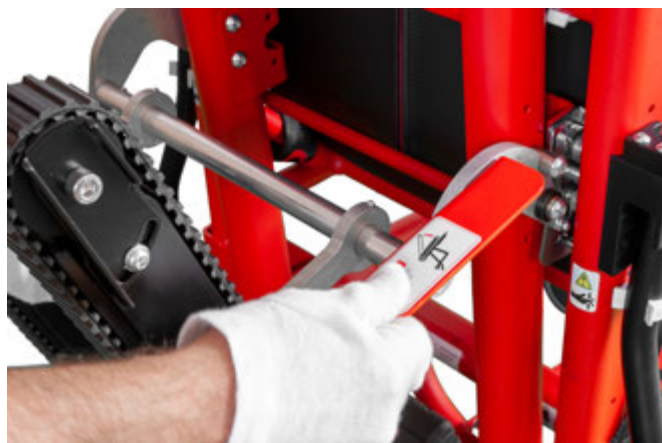
Pull the track toward the operator with two hands. The track is now free.



### 3. Fold & Unfold MAX Power (track)

The track aids in descending stairs. Do not unfold the track if the chair is not needed to descend stairs.

To fold the track into the back of the chair, push the lever downwards as shown, until the track locks into position:



To unfold the track from the rear of chair, pull the bar fitted to the track until the track locks into position:



#### 4. Adjust handle of the MAX Power

The MAX Power is fitted with an adjustable height handle. To adjust the handle, the operator must pull up on the red cable under the handle. This disengages the handle to slide up or down. When the desired position is reached the operator must release the cable.



Pull the red cable under the handle upward and slide the handle up or down to its desired position.



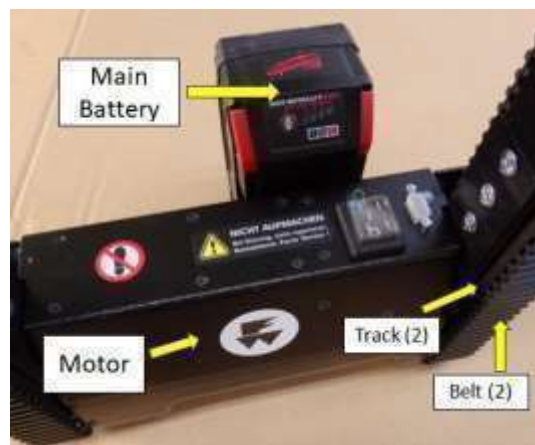
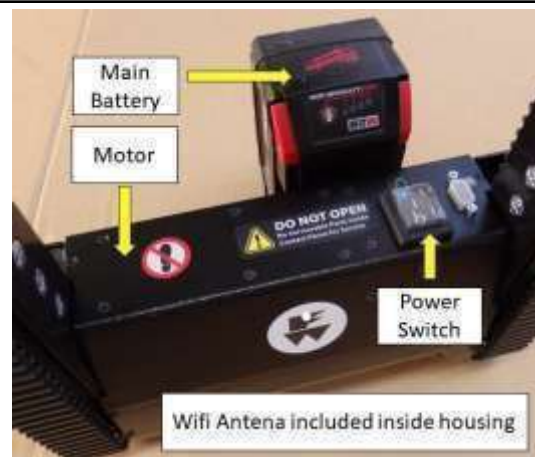
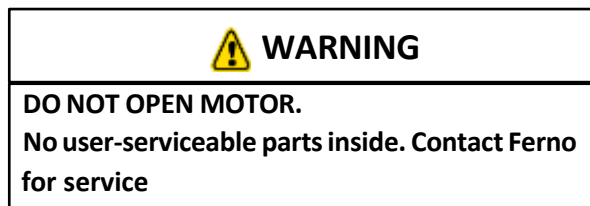


## 5. Power System

### 5.1. PowerTraxx Components

The PowerTraxx consists of the following components:

- **CONTROL PANEL:** The control panel is attached to the lift bar. It allows the operator to control the speed and direction of the belts and monitor the batteries and other aspects of the chair.
- **PADDLES:** The paddles are attached to the control panel. The amount of pressure used by the operator to press the paddle determines the speed of the belts.
- **BELT:** The belts engage the stairs. The motor powers the belts. The user controls the speed and direction using the paddles.
- **MAIN BATTERY:** The 28V battery attaches to the motor and provides power. It is easily to remove, charge, and reattach. See Main Battery.
- **MOTOR:** The motor is located between the tracks at the base of the chair. The motor receives input from the paddles to control the speed and direction of the belts. It also monitors other aspects of the chair.
- **ANTENNA:** The antenna is mounted to the top of the motor. It allows wireless communications between the motor and control panel.
- **POWER SWITCH:** The switch is mounted to the top of the motor and allows easy ON/OFF control of the power system.
- **BRAKE (part of the motor):** The brake allows the belts to move only when a paddle is used. The brake engages automatically when the system has power. The operator may disengage the brake for nonpowered descent.
- **SPEED LIMITER (part of the motor):** If the system loses power or the brake is disengaged, the belts are free to rotate for non-powered descent. However, the speed limiter retards the speed of the belts to improve operator control for the descent.





## Items Supplied

- 28 VDC Lithium-ion rechargeable battery (1)
- 28 VDC Battery charger (1) Choice of:
  - 100-120 VAC (60 Hz North America; 50/60 Hz Japan); UL Certified
  - 220-240 VAC, 50/60 Hz (Europe); CE Certified
- Interconnect cord with carrying case
- Users' manual



Main Battery



Battery Charger



Interconnect Cord

### 5.2 Main Battery

**Note:** *The battery and charger instructions from Milwaukee supersede those in this manual. For additional information, see the manuals provided with these components.*

The term “main battery” is used in this manual to describe the Milwaukee® 28-Volt DC, lithium-ion battery. The control panel also uses batteries. See Control-Panel Batteries.

The main battery powers the belts. It is sealed for resistance to precipitation, dirt, body fluids, cleaning solutions, etc. Use only the Ferno-approved battery and battery charger. A battery is provided with purchase of a chair or PowerTraxx retrofit kit.

#### 5.2.1 Main battery information

- Lithium-ion batteries have no “battery memory.” You do not need to fully discharge the battery before recharging it.
- A typical fully-charged battery provides power to move an average patient (250 pounds/113 kg) up more than 200 stairs.

### WARNING

**Improper charging can cause injury or damage. Use only the Ferno-approved battery with the chair, and charge only with the Ferno-approved battery charger**

### Important

**Battery capacity can be affected if the battery is stored for long periods below 0°F (-17°C) or over 150°F (66°C).**



- Typical charging time is about one hour. Actual charging time varies based on frequency of recharge, depth of discharge, and battery age. If a battery becomes deeply discharged, extend the charging time.
- Patient weight, extreme temperatures, and the combination of using the chair to go up and/or down stairs affect the amount of use available from each battery charge.
- The manufacturer's recommended operating temperature for the battery itself is 14°F to 120°F (-10°C to 49°C). The battery may be used in temperatures outside this range. Battery capacity can be affected if the battery is stored for long periods below 0°F (-17°C) or over 150°F (66°C).
- Recycle batteries at the end of their service life. Do not dispose of batteries with municipal waste.
- Do not open the battery. There are no serviceable parts inside the battery.

### 5.2.2 Using the main battery

- The mounting slots are compatible with the motor and with the battery charger
- Press the two red release buttons to disconnect the battery from the chair or battery charger
- To check the charge of the main battery, press the test button on the battery
- Store the battery ONLY in a cool, dry place. DO NOT store where temperatures may exceed 120°F (50°C)
- If two batteries are available, keep the spare battery charged and ready for use

### 5.2.3 Main battery charge indicator

The charge indicator on the main battery illuminates one to four red lights to indicate the charge remaining in the battery (approximately 25% intervals).

Press the test button and the light(s) will illuminate briefly. With a full charge, all four lights are displayed. If the charge is lower than 10%, the first light flashes four times when the test button is pressed.

Extreme temperature (cold or hot), extreme patient weight, and the age of the batteries affect how quickly the charge in the batteries is used.

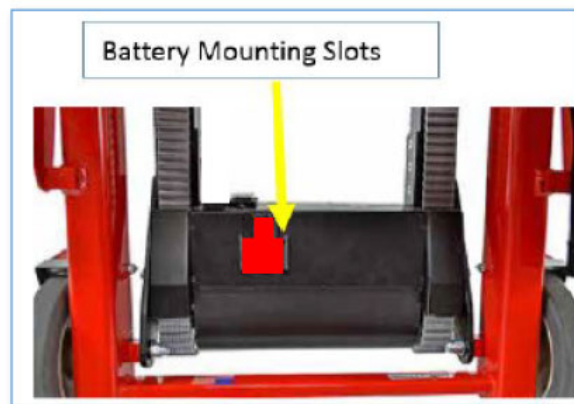


*For additional information, see the Milwaukee® battery and battery charger manuals. Milwaukee® products are trademarks of the Milwaukee® Electric Tool Corporation, Brookfield, Wisconsin, USA. Milwaukee® is a subsidiary of Techtronic Industries Co. Ltd. For warranty claims, take the charger or battery to an authorized Milwaukee Service Center.*

### 5.2.4 Main Battery shutoff

If the internal temperature of the battery becomes too high, the main battery will shut off to protect itself, and all powered chair motion stops.

To verify the battery has overheated, press the test button on the battery. The battery will indicate it is overheated by flashing the lights alternately. Allow the battery to cool before use. When the battery is ready for use, pressing the test button will show the remaining charge.



### 5.3 Attaching and Removing the Main Battery

**To attach the main battery to the chair:** Align the mounting slots on the main battery with the mating ridges on the motor. Slide the main battery onto the slots until it snaps into the locked position. Verify that the main battery is securely mounted on the motor before using the chair.

**To remove the main battery from the chair:** Press both red release buttons on the main battery and slide it off the ridges on the motor.



### 5.4 Battery Charger

**Note:** *The battery and charger instructions from Milwaukee supersede those in this manual. For additional information, see the manuals provided with these components.*

A battery charger suitable for use with your local power supply is supplied with the chair:

- 100-120 VAC (60 Hz North America; 50/60 Hz Japan)
- 220-240 VAC, 50/60 Hz (Europe and other areas)

#### Important

**Battery capacity can be affected if the battery is stored for long periods below 0°F (-17°C) or over 150°F (66°C)**

#### Important

**If the battery charger will be used inside an ambulance it must be mounted. Mount the charger using the mounting bracket built into the battery-charger (Mounting hardware is not supplied).**

An adapter plug (not supplied) may be needed to adapt the charger plug for the outlet. Typical charging time is about one hour. If the batteries are deeply discharged, extend the charging time. Actual charging time may vary based on frequency of recharge, depth of discharge, and age of batteries. Store the charger **ONLY** in a cool, dry place. **DO NOT** store where temperatures may exceed 120°F (50°C).

**If the charger will be used inside an ambulance, it must be securely mounted (mounting hardware not supplied).**

A charger is included with purchase of a chair or PowerTraxx retrofit kit. For additional batteries or chargers.



#### 5.4.1 Indicator lights

The charger has one red and one green indicator light. The lights work together to provide the following information:

- **RED (Continuous):** The battery is connected and is being charged.
- **GREEN (Continuous):** Charging is complete.
- **RED(Flashing):** The temperature of the battery is outside the proper charging range. Charging will begin when the battery reaches the correct charging temperature of 32°F-150°F (0°C-65°C).
- **RED/GREEN (Flashing alternately):** The battery is damaged or faulty. Replace the battery.

#### 5.4.2 Charging the main battery

To attach a main battery for charging, align the slots on the main battery with the mating ridges on the charger. Slide the main battery onto the charger until it locks into position. Verify that the main battery is properly connected and the indicator light on the charger is lit. To disconnect, press the two red release buttons on the main battery and slide it off the charger.



#### 5.5 Power Switch

The rocker-style power switch is located on top of the motor. It allows easy ON/OFF control of the power system.

The switch is protected from liquids and dirt by a rubber cover. You can press the switch through the cover. Do not remove the rubber cover.



To use the chair:

1. Press  (ON).
2. Tap a paddle up or down to awaken the wireless controller.
3. Allow a few seconds for the wireless connection to be established. When the control panel and motor link, the motor will emit three audible beeps.
4. Use the chair as instructed in this manual.
5. Press  (OFF) to disengage the power.

### 5.6 Paddles

The paddles are affixed to the control panel on the extending lift bar, where they are accessible to the operator's hands. The paddles are labeled with the symbol of a stairway and an arrow for "descend/down" and "ascend/up".

The amount of pressure used to press the paddle affects the speed of the belts. This allows the operator to control the speed of the chair on stairs.



To use a paddle:

1. Position your hands to comfortably grasp the extending lift bar, with at least one paddle accessible to your thumb.
2. Press the top or bottom of either paddle to operate the powered track system.





## 6 Control Panel

### 6.1 Control Panel Overview

The control-panel components are:

- **Brake Button** - The symbol on this button is a “Stop Sign” with a slash through it.
- **Indicator Light** - The light is illuminated red, green, or is not illuminated to provide feedback to the user.
- **Mode Button** - The symbol on this button is the Ferno “FW” logo.
- **Display** - The liquid-crystal display provides information about a variety of chair functions, including battery charge, battery status, brake status, calibration and setting information, and more.





#### 6.1.1 Software versions

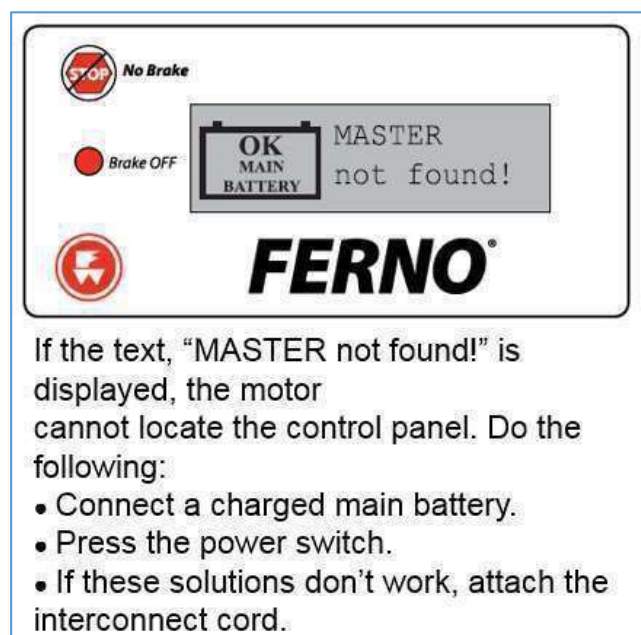
The information displayed varies depending on the software installed in the motor and control panel. The software version is displayed briefly during the calibration procedure. Be aware that you will need to calibrate the paddles to exit this mode.

#### 6.1.2 Wireless connection

Each time the power switch is pressed ON, the motor must make a wireless connection with the control panel.

1. Press the power switch . The motor will beep every five seconds until it locates and connects with the control panel, or until you press .
2. Tap a paddle in either direction. The control panel awakens and attempts to connect with the motor.
3. When the components link, the motor emits three beeps. The display shows the standard screen indicating the status of the Main Battery. If there is sufficient power, the brake is engaged.

If the link fails, the control panel briefly displays the text, “MASTER not found!”. After this, the control panel will go to sleep.





## 6.2 Brake Button

The brake prevents the belts from moving unless a paddle is pressed. By default, the brake is engaged when the system has power. To disengage or re-engage the brake, press the brake button on the control panel.

Disengage the brake to allow the belts to rotate without power (for example, to descend stairs without using the power system).

Depending on the version of the software, both the display and indicator light will change to match the current state of the brake. Refer to the images at right.

### 6.2.1 Original software

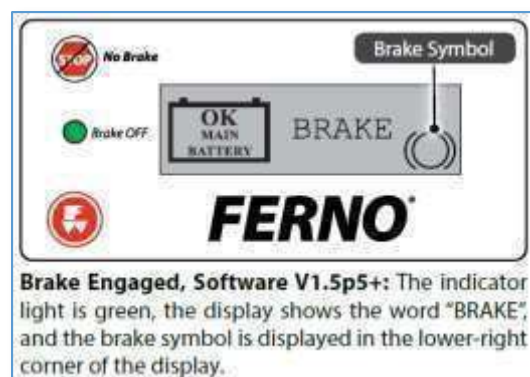
- **Brake engaged:** The indicator light is off; the display shows the word, "BRAKE".
- **Brake disengaged:** The indicator light is red and the display shows the word "IDLE".

### 6.2.2 Software v 1.5p5+


- **Brake engaged:** The indicator light is green; the display shows the word "BRAKE", and the brake symbol is displayed.
- **Brake disengaged:** The indicator light is red; the display shows the word "IDLE". The brake symbol is not displayed.


### 6.2.3 Speed limiter

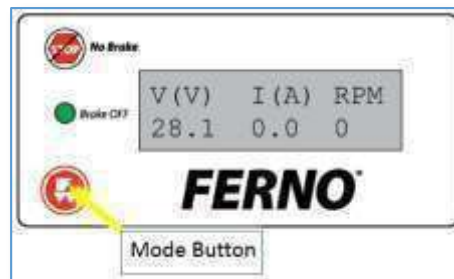
With or without power, an internal speed-limiting device limits the speed of the belts as the chair descends stairs. Use care and control the descent of a chair that is unpowered or has the brake disengaged.



### 6.3 Mode Button

The mode button is the Ferno logo 

Press and hold  for four seconds to show the chair status on the display. The display will show the current voltage and amperage used by the power system, plus the revolutions per minute (RPM) of the motor.



**Note:** *The RPM indicator tells only the speed of the motor, not the belts.*

The chair can be used normally while the status screen is displayed. To return to the standard screen, press the mode button briefly.



### 6.4 Display: Ascending (UP) or Descending (Down)

When a paddle is pressed, the display shows your choice of direction by displaying the word “UP” or “DOWN”. The text is shown while the tracks are in motion. When the paddle is released, the display returns to the standard screen.

### 6.5 Display: Battery Status

The display shows battery-status information for the main battery and the AA batteries in the control panel.


#### 6.5.1 Main battery

The main battery is shown as an icon on the left side of the display. With a full or moderate charge, the text inside the icon reads, “OK Main Battery.” As the charge becomes low, the display will show different icons based on the software version installed in the control panel (refer to the chart below).



**Note:** *A charge indicator is also built into the main battery. If in doubt, press the test button on the main battery.*

### 6.5.2 AA batteries

Two AA-size batteries power the control panel. If the AA battery warning icon (  ) appears in the upper right corner of the display, replace the AA batteries.

Also, if there are no lights on the control panel and the paddles stop functioning, the AA batteries may need to be replaced.

	Original Software	Updated/ Mixed Components	Current v1.5p5+
Full to Moderate Charge	OK Main Battery	OK Main Battery	OK Main Battery
Low Charge	CHECK Main Battery	CHECK Main Battery LED Blinks Red	CHECK Main Battery LED Blinks Red
Insufficient Charge Remains	CHECK Main Battery	CHECK Main Battery LED Blinks Red	"X" Through Battery LED Blinks Red



## 6.6 Display: Fault Codes

Software version 1.5p5+ and later provides feedback on the display for three different faults, if they occur.

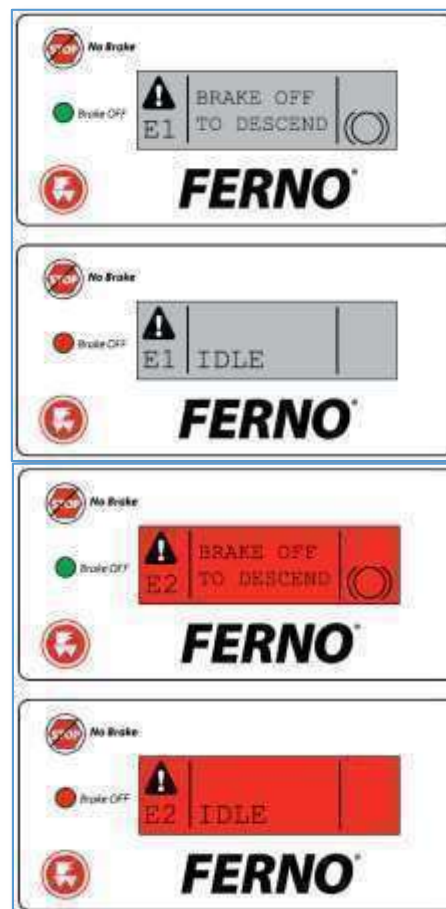
Fault codes are not displayed if the chair has an earlier version of the software. If a fault occurs, the chair will stop functioning and the display will turn off.

In all cases, contact EMSAR or your Ferno distributor for assistance.

**Control-Panel Fault (E1)** – If there is a fault or damage to the control panel (such as a loose or cut wire), a warning triangle symbol and error code “E1” are shown at the left side of the display.

**Motor Overheating Fault (E2)** – If the motor becomes overheated, a warning triangle symbol and error code “E2” are shown at the left side of the display, and the background is illuminated red.

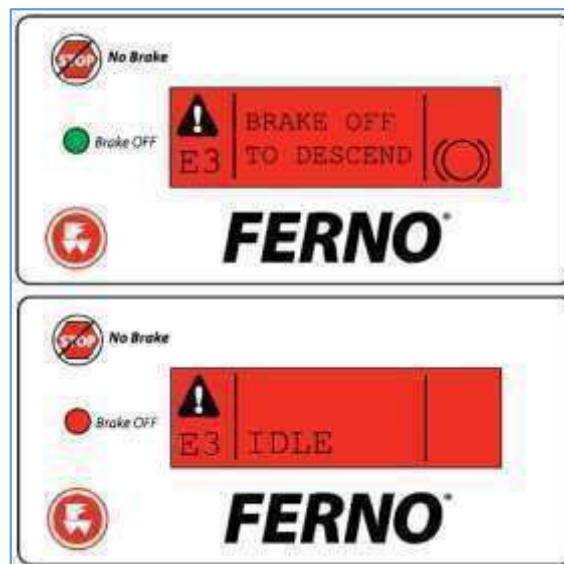
**Failure of Motor Module (E3)** – If the motor module (circuit board, electronics, etc.) fails, a warning triangle symbol and error code “E3” are shown at the left side of the display, and the background is illuminated red.



### 6.6.1 Using a chair with a fault

If a fault code appears, the operators do the following:

- If the brake is engaged, the center area of the display shows a text reminder: “Brake Off To Descend”. This is a reminder to the operators that the chair may be used in its nonpowered mode.
- The operators make preparations to use the chair in non-powered mode, including stopping on the stairs, adding additional helpers, or other preparations to help control the chair. Follow local protocols for non-powered chair operation.
- Press the brake button to disengage the brake. The display changes to “IDLE”, which verifies the brake is disengaged. Also, the brake symbol is not shown.
- The warning triangle and fault code remain visible on the display until repairs are made.



## 7. Additional PowerTraxx Information

### 7.1 Interconnect Cord

The interconnect cord physically connects the control panel with the motor. It serves two purposes:

- (Optional) The interconnect cord can be connected permanently to bypass the wireless system. If you decide to use the interconnect cord permanently, arrange the cord so it will not be pinched by opening, closing, or using the chair.
- The interconnect cord can re-establish the wireless link between the control panel and motor. The control panel and motor are linked during assembly and should not lose contact during normal use. If the connection is lost, do the following to re-link the components:

1. Open the access door to the control panel batteries and connect the telephone-style plug on the interconnect cord to the port on the control panel.
2. Use a flat-blade screwdriver to remove the two screws and wireless antenna.
3. Plug the serial plug on the interconnect cord into the port on the motor.
4. Turn the power switch on and allow the unit to synchronize the wireless controller to the motor.
5. Disconnect the interconnect cord and reattach the wireless antenna and control-panel access door.





## 7.2 Calibrating the Paddles

### 7.2.1 Knowing when calibration is needed

The paddles are pressure-sensitive. When properly calibrated, the paddles allow the operator to control the speed of the belts.


Applying less pressure should make the belts move slowly, while depressing the paddle fully should make the belts move as quickly as possible.

Recalibration of the paddles is needed when you observe any of the following:

- there is no difference between a light touch of the paddle and fully-depressing the switch (the belts should not immediately begin moving at full speed with only light pressure)
- if the belts continue to move when the switch has been released (no pressure)





### 7.2.2 Calibration procedure

1. If needed, disconnect the interconnect cord. Press the power switch . Wait until the lights on the control panel turn off and the control panel is inactive (about five seconds).

**Note:** *The calibration procedure cannot begin unless the interconnect cord is disconnected, the power is OFF, and the control panel is inactive.*

2. Do not touch the up/down paddles.

3. Simultaneously press the brake  and mode  buttons on the control panel.

**Note:** *If Step 3 is completed properly, the control panel will illuminate with a red background. The software version is briefly shown, then the calibration sequence begins. If the background is not red and the standard screen is displayed, repeat Steps 1-3.*

4. Instruction: “Throttle UP 100% Then Press a Key”: Press and hold the ASCEND part of the paddle fully, then press the mode or brake button.

5. Instruction: “Throttle DW 100% Then Press a Key”: Press and hold the DESCEND part of the paddle fully, then press the mode or brake button.

6. Instruction: “Throttle IDLE 0% Then Press a Key”: Leave the paddle in the neutral position and press the mode or brake button.

7. If you completed all steps properly, the display will show “Calibration OK!” Begin using the chair normally.

### 7.2.3 If the calibration fails

Repeat Steps 1-7. Do not press the paddles until directed to, and press in the proper direction. If the paddles cannot be recalibrated, contact Ferno Technical Support for assistance.



## 8 Maintenance

The PowerTraxx system requires regular maintenance. Set up and follow your own maintenance schedule. More frequent maintenance will be required in situations of heavy use. If any damage is discovered, take the PowerTraxx system out of service until repair or replacement can be made.

Action	As Needed	Each Month
Disinfecting	•	
Cleaning	•	
Inspection	•	•

When using any product for maintenance, follow the manufacturers` guidelines and read the manufacturers` material-safety data sheet.

## 9 Warranty and Service

Standard terms and conditions apply to all sales. A copy is available upon request. These contain full details of warrant terms and do not limit the statutory rights of the customer.

For service, maintenance and any questions regarding this, or any other FERNO product, please contact:

Ferno Slovakia s.r.o.

Bošáca 893 913 07

Slovakia

Tel: + 421 (0) 32 7708 010

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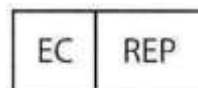
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