

Hand Warmer

Adjustable heating device



Hand Warmer (P012-62)

Contact & Product

mo-Vis bvba



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Hand Warmer User & Installation manual

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Important information about this Manual

Congratulations for choosing a mo-Vis product! If you would like to learn more about mo-Vis and its products, we invite you to visit our website: www.mo-vis.com.

Before you install or begin using this product, it is important that you read and understand the content of these installation and operating instructions, the safety instructions in particular.

The installation instructions will guide you as an installer through the options and possibilities with the mo-Vis product. The mo-Vis product should be adjusted with the mo-Vis Configurator software.

The operating instructions are primarily intended to acquaint you with the functions and characteristics of the mo-Vis product and how you can use it in the best manner possible. They also contain important safety and maintenance information, as well as describe possible problems that can arise during use.

Always keep the operating instructions handy in connection with your wheelchair, since the need for important information can arise concerning its use, safety and maintenance.

All information, pictures, illustrations and specifications are based on the product information that was available at the time of printing. Pictures and illustrations shown in these instructions are representative examples and are not intended to be exact depictions of the various parts of the product.

We reserve the right to make changes to the product without prior notice.

Ordering documentation

You can download additional copies of this User & Installation manual on the mo-Vis website: www.mo-vis.com.

Support, scrapping and spare parts

Technical support

In case of technical problems, we advise you to contact your dealer.

If the dealer is not available, or unknown, please contact mo-Vis bvba by email support@mo-vis.com or by phone +32 9 335 28 60.

Always state the device serial number when contacting mo-Vis. This ensures you are provided with the correct information.

Spare parts and accessories

Spare parts and accessories must be ordered by the dealer at mo-Vis bvba.

Scrapping & recycling

For scrapping, adhere to your local waste legislation.

Dispose of obsolete electronic parts responsibly in accordance with local recycling regulations.

Warranty

mo-Vis bvba warrants the Hand Warmer to be free from defects in material and workmanship for a period of 2 years under proper use, care and service.

All warranties only cover parts and do not extend beyond the initial purchaser from an authorised mo-Vis dealer.

Start of the warranty period

Each warranty shall begin on the date the product is first delivered to the customer.

Repair and replacement

For warranty service, we advise you to contact the dealer from whom the product was purchased. In the event of a defect in material or workmanship, the dealer must obtain a return authorisation (RA) number from mo-Vis and the product must be shipped to a service centre designated by mo-Vis. mo-Vis will repair or, at mo-Vis' option, replace any product covered by the warranty.

Disclaimer and Limitations of Remedies

The express warranties set forth in this agreement are in lieu of all other warranties of merchantability or fitness of purpose. In no event shall mo-Vis be liable for any direct, indirect, incidental or consequential damages resulting from any defect in this product. Warranty of parts subject to “normal wear and tear” (e.g. pads, joystick balls, batteries ...) are not covered in the warranty except as it applies to defects in material or construction.

Amendments

No person is authorised to alter, extend or waive the warranties of mo-Vis.

Voiding of warranties

The foregoing warranties are contingent upon the proper installation, use, maintenance and care of the product. The warranty will be void if the product has been installed or used improperly, or if it has been repaired or any part replaced by persons other than mo-Vis or an authorised dealer. The Hand Warmer unit is considered as a non-serviceable part.

The addition of equipment or features that are not manufactured or recommended by mo-Vis could affect the intended function of the mo-Vis product and may invalidate the warranty.

Understanding usage

The health care professional (authorised installer) is responsible for understanding the intended use of the mo-Vis equipment, the specifications and its programming parameters. mo-Vis cannot be held responsible for damage caused by incorrect installation or incorrect use of the product. Misuse, mishandling or storage is not covered by this warranty.

Safety precautions

General

The Hand Warmer is intended to be fitted on any power wheelchair with 24 V connection.

Incorrect use or installation may lead to risk of injury to the user and damage to the wheelchair or other property.

In order to reduce these risks, you should carefully read this instruction manual, paying particular attention to the safety instructions and warning texts.

Any unauthorised use of the product may lead to increased risk of accident. Carefully follow the recommendations in this manual in order to prevent accidents from use.

The Hand Warmer unit is a non-serviceable part.

In case of doubt for alterations and adjustments, always contact a qualified service engineer.

Warning labels

This manual contains the following warning labels, which are intended to draw attention to situations that could lead to unwanted problems, e.g. personal injury or damage to the wheelchair.



CAUTION!

Please use caution where the symbol appears.



WARNING!

Please use extreme caution where the symbol appears. Failure to observe warnings can lead to personal injury or property damage.



CAUTION!

Limited liability

mo-Vis accepts no liability for personal injury or damage to property that may arise from the failure of the user or other persons to follow the recommendations, warnings and instructions in this manual.



CAUTION!

EMC Requirements

The electronics of a power wheelchair and its options can be affected by external electromagnetic fields (for example from mobile telephones). Similarly, the electronics of the wheelchair or options themselves can also emit electromagnetic fields that can affect the immediate surroundings (for example certain alarm systems in businesses).

The limit values for Electromagnetic Compatibility (EMC) with respect to power wheelchairs are set in the harmonised standards for the EU in the Medical Devices Directive, No. 93/42/EEC. Hand Warmer complies with these limit values.



WARNING!

Assembly

The Hand Warmer should only be installed or adjusted by a qualified service engineer or someone with adequate knowledge to perform the adjustment in an expert manner.

Maintenance and service

Carry out only the service and maintenance activities specified in this manual, as long as you comply with the demands stated in this manual for a specific action. All other service, alterations to and interventions on the Hand Warmer must be carried out by a qualified service engineer or someone with adequate knowledge to perform the adjustment in an expert manner. In case of doubt, contact a qualified service engineer or mo-Vis.



Use only spare parts or accessories approved or recommended by mo-Vis. All other use could lead to changes which might impair the function and safety of the product. It could also lead to the warranty becoming void.

CAUTION!

Testing

The Hand Warmer should always be tested without any person sitting in the wheelchair after the physical installation of the Hand Warmer or adjustment of the parameters.

Design and function of the Hand Warmer

Purpose

The Hand Warmer main functionality is to keep the area around a wheelchair input device warm. This increases the comfort of the user and its ability to control the input device.

General

The device is an air heater, which is powered by the wheelchair battery power (24V) and contains its own control electronics.

Air is drawn at the front, heated, and forced out again at the front using an internal fan. As the air inlet and outlet are at the same side, warm air is recycled instead of using air from the cold environment. This results in a huge advantage with regards to power consumption and efficiency.

Parts and accessories

Hand Warmer Set

A Hand Warmer set (P012-62) consists of the following parts:

	Product description	Product code
	Hand Warmer unit	P012-61
	Hand Warmer Extension Lead 180mm	P012-40
	Hand Warmer Mounting Set	M012-45
	Hand Warmer manual, with Serial number sticker	D-P012-62-70

Hand Warmer Mounting Set

The Hand Warmer Mounting Set (M012-45) is included in the Hand Warmer Set (P012-62).

The Hand Warmer Mounting Set consists of the following parts:

	Product description	Product code
	Q2M half Clamp D6 + bolt 14mm	M004-04
	Q2M Rod D6 50mm (1 piece)	M004-74
	Hand Warmer Dual lock (22*9*3.5mm): 2 pieces	M012-40

Optional accessory: 2-hands dome (M012-31)

To enclose the area around the hands and to better maintain the air temperature, a Perspex dome-shaped hood is available as an option.



- This dome reduces heat loss, resulting in a decreased power consumption, without compromising comfort.
- The 2-hands dome can be ordered with the code M012-31. Contact your dealer or mo-Vis for ordering.
- The dome is delivered with four hook and loop fastener pads to attach the dome to any flat surface, e.g. a tray.
- for its dimensions, see Technical data, page 35.
- The dome openings can easily be adjusted, as Perspex is a material that can be cut or shaved.



CAUTION!

Use proper tools to adjust the dome openings. Warranty is void for any fault as a result of adjusting the dome.

With the Configurator software it is possible to adjust the working of the Hand Warmer according to the users' needs. The auto Off time, the number of power settings (max.3), the min/max. temperature of the heater and the min/max. speed of the fan (airflow) are fully adjustable.

Software download

- You can download the software on the mo-Vis website: www.mo-vis.com.
- For all details on how to install and use the software, we advise you to consult the manual of the mo-Vis Configurator software (included in the software download).

User profiles

Depending on your profile (user, attendant, dealer, OEM), you will be able to configure a number of parameters for the Hand Warmer.

- For a user profile, no password is required.
- Attendant, Dealer and OEM profiles require a password.

Installation instructions

Safety precautions



CAUTION

At full power the device will produce warm air (up to 70°C/158° F), it is advised to leave a minimum distance between the hand and the warmer of 10 cm (4 in).

If the distance is less it is necessary to limit the maximum heater temperature using the configurator to 70°C/158° F (air will then be 60°C/140° F) or less.



CAUTION

The devices' air inlet and outlet are both at the front.

Leave at least a distance of minimal 5 cm (2 in) between the front of the device and any object.



WARNING

The device has an open structure at the front. Mount the device in such a way that no water (rain) can enter the device. Some drops of water will not cause problems, excess water must be avoided.



WARNING

The XLR connector is internally fused with a fuse of 5 A. This is necessary because the wire gauge cannot carry more current. Therefore, it is not allowed to cut the XLR connector and make a connection directly to the wheelchair batteries unless a fuse of max 5 A is added.

The unit continuously measures the temperature and supply voltage. Whenever a fault is detected the device will switch itself off. In case there would be an undetected fault, the device contains an additional internal fast blow fuse of 4 A and a PTC fuse of 3 A.

Preparations

Qualified service engineer

Only a qualified service engineer may install the Hand Warmer.

Tools

Use an Allen wrench to install the Hand Warmer Mounting Set and Hand Warmer.



CAUTION!

Use the proper tools to install and adjust the Hand Warmer. The use of improper tools may cause damage to the device.

**CAUTION!**

Do not tighten screws with an excessive force.

Installation plan

Set up an installation plan before starting the installation. Based on the users' needs and with actual measurements of the wheelchair and the user, this plan should specify:

- Where which part of the Hand Warmer should be placed
- How the Hand Warmer will be operated
- The Hand Warmer parameter settings

Serial number sticker

The additional serial number sticker (included in the package) has to be adhered to the back of this manual.

Installation of the Hand Warmer

Mounting options

The Hand Warmer can be mounted on any location on the wheelchair.

- You can mount the Hand Warmer using the included mo-Vis Quick to Mount (Q2M) Hand Warmer mounting set to easily install the Hand Warmer on the wheelchair (tray, armrest, ...).
- You can equally use any other mounting system
- Alternatively, but is not advised, but you may mount the Hand Warmer without using the Q2M half clamp and fix the device on a flat surface with the hook and loop fastener pads (included in the package). At the bottom of the Hand Warmer two rimmed spaces are provided for placing these hook and loop fasteners.

Mounting using Q2M

To install the Hand Warmer unit, proceed as follows – according to your installation plan:

1. Define the place and position of the Hand Warmer on the wheelchair. The Hand Warmer can be mounted on any location on the wheelchair.
2. Secure the Q2M half clamp and bolt on the bottom of Hand Warmer housing. (2 positions in 90° steps are possible)
3. Slide the unit over a Q2M rod, or any other 6 mm rod, to position the Hand Warmer on the wheelchair (a Q2M rod D6 50 mm is included).

You can use any other parts of the Quick-to-Mount (Q2M) mounting system (e.g. rods and clamps, Q2M mounting base, ...) to complete the installation.

Contact your dealer or mo-Vis for more information, or ordering additional clamps or rods.



CAUTION!

Tighten the screws firmly, but not excessively with an Allen key. Excessive force may damage the unit.

Connecting

Place and connect the Hand Warmer Extension Lead (included) with the Hand Warmer connector and lead the XLR power cable to the wheelchair joystick or battery. Secure the power cable to the wheelchair with straps or fasteners.



WARNING!

Make sure that cabling is mounted in such a way that excessive wear and tear is avoided.



WARNING!

The XLR power cable connector contains a fuse. Use an adapter to connect to non-XLR power connections

Operation and level selection

At the back of the device a push button and jack connection are provided. A button connected to the jack connection has the same functionality as the on-board push button.

The functionality of the button is to cycle through the levels (power settings) of the device. You can adjust the number of levels using the mo-Vis Configurator software to alter the parameters.

The green LED at the front indicates the status of the device (see table).

Mode	LED indicator
Sleep mode	Off
Stand-by	Short on, very long off
Active Level 1	Short on, long off
Active Level 2	Short on, medium off
Active Level 3	Short on, short off
Fault	Number of flashes, long off

Parameter configuration

The device is equally equipped with an isolated mini USB connection at the back. Use this connection to connect the device

to a PC to interact with the mo-Vis Configurator software. See the configurator manual for more information.

Automatic error detection

The device contains a controller that continuously checks the integrity of the device, whenever a problem is detected the device will be switched off automatically. When this happens check the fault flash code or use the configurator to check why the device stopped.

First time use

Dealer assistance

During first time use by the user it is advised that the dealer or service engineer assists and explains the different possibilities to the customer (the user and/or his attendant).

If needed, the dealer can make final adjustments.

User testing

It is important that the customer is fully aware of the installation, how to use it and what can be adjusted to optimise his experience.

As a dealer, proceed as follows:

1. Explain and show the customer how you have executed the installation, and explain the function of every (new) button.

2. Have the user test all positions of the Hand Warmer (and the optional 2-hands dome):
 - Is the Hand Heater well positioned in accordance with client's needs?
 - Can the user safely operate the Hand Heater with the least effort?
 - Is the heating of the Hand Warmer in all available levels optimal for the user?
3. If needed, adjust the Hand Warmer and retest till optimal position and functioning.
4. Explain to the customer possible problems and how to address them (see Troubleshooting).

Using the Hand Warmer

Conditions of use

The Hand Warmer is intended for use as installed by the dealer, in accordance to the installation instructions in this manual.

The foreseen conditions of use are communicated by the dealer or service engineer to the user and/or attendant during the first time use.

If the conditions of use change significantly, please contact your dealer or a qualified service engineer to avoid excessive wear and tear or unintended damage.



WARNING

The device has an open structure at the front. Mount the device in such a way that no water (rain) can enter the device. Some drops of water will not cause problems, excess water must be avoided.

It is advised to use the 2-hands dome or another protection device to protect the Hand Warmer when used in outside conditions.

User adjustments



WARNING!

Changes in parameter settings may cause damage to devices or the wheelchair, or may cause injuries to persons.



CAUTION!

Only change parameters without any person sitting in the wheelchair



CAUTION!

Only test new settings without any person sitting in the wheelchair

As a user or attendant, you can make a limited number of parameter adjustments yourself with the mo-Vis Configurator software.

Although the number of parameters you can change as a user or attendant is limited, we advise changing only parameters you completely understand.

- For a list of parameter settings, see Parameter settings.

Troubleshooting

When a fault occurs the LED will start to flash. There is a long delay and then a number of flashes with a short delay. Count the number of flashes and look up the according code in the table below.

Flash Count	Reason	Required action
1	-	-
2	-	-
3	Power Supply, Under/Over voltage	Check power connections and power cable
4	Temp Sensor	Replace PCB
5	Power Switch	Replace PCB
6	ADC Internal Analog to Digital Converter	Replace PCB
7	Test Flag failed or diagnostic failed	Redo tests Replace PCB
8	CPU fault	Replace PCB
9	Scheduler fault	Update Software Replace PCB
10	Coding Error	Update Software

		Replace PCB
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If the problem persists after intervening, please contact your local dealer or mo-Vis Service Engineer to attend to the problem.

Error codes

The system maintains a fault log with counters. Each time a specific fault occurs its counter will be incremented by one (the maximum count value is 254).

The fault log can be accessed by the configurator (Dealer Level), it is possible to clear one fault counter or all counters.

Fault	Reason	Required action
CPU Error RAM	CPU consistency check failed.	Replace PCB.
CPU Error FLASH		
CPU Error EEPROM		
Run Error Scheduler	Firmware consistency check failed.	Update Software or Replace PCB
Code Error Framework		
Code Error Application		

MSP Command Corrupt	Corrupt command was received.	Connection with the PC (Configurator program) went wrong, try again. Connection with the PC (Configurator program) went wrong. Update Firmware or update Configurator Software. Try again.
MSP Command Unknown	Unknown command was received.	
MSP Sub Command Unknown	Unknown Sub Command was received.	
MSP Argument Invalid	Invalid argument received.	
MSP Device Not Ready	Device as not ready to receive an MSP command.	
MSP Device Wrong State	The device is not able to receive a command in the current device state.	
PCB Test Failed	Factory test failed.	A fault occurred during factory testing.
Application Test Failed		
Field Test Failed	Field test failed (Calibration).	A fault occurred during field testing (Calibration).

Test Flag Check	One or more test flags not set.	Redo tests and/or replace PCB.
ADC	ADC Conversion error.	Replace device
Under/Over Supply	Over/Under Voltage Detected.	Check the power connection and power cable.
Too Hot	Heating system or temp sensor faulty.	Remove dust in device and replace device if not solved.
Power Switch	Internal Safety Power Switch faulty.	Replace device.
Temp Sensor	Temp Sensor Failed.	

Maintenance

Cleaning

Clean all parts of the Hand Warmer and the optional 2-hands dome on a regular basis (monthly), or whenever needed.

- Gently remove dust and dirt with a damp cloth.
- Use only non-aggressive disinfectant cleaning agents



WARNING!

Do not immerse the Hand Warmer unit in water or do not use excessive amounts of liquid.

Monthly check

Monthly, or whenever needed, check whether:

- All bolts and screws are still firmly tightened
- There is no damage to any wiring
- There is no excessive wear to any of the parts

Hand Warmer unit maintenance

The Hand Warmer is maintenance-free. Under regular use circumstances, the Hand Warmer unit and different parts do not require additional maintenance.

Parameter settings

With the mo-Vis Configurator Software you can change the parameters of the Hand Warmer. Depending on your user profile (user, attendant, dealer, OEM), you will be able to change a number of parameters.

Parameter	Min	Max	Default	Description
Auto Off	0	600	240	<ul style="list-style-type: none">– The device will automatically switch off after a set time (in minutes).– Changing the level (using the button) will reset the timer– a value of 0 means the device will never switch off.
Levels	1	3	3	The number of available power levels.
Minimum Temp	40	80	50	The temperature (in °C) of the heater at the lowest power level.

Maximum Temp	40	80	75	The temperature (in °C) of the heater at the highest power level.
Minimum Fan Speed	10	100	20	The fan speed (airflow) (in %) at the lowest power level.
Maximum Fan Speed	10	100	85	The fan speed (airflow) (in %) at the highest power level.

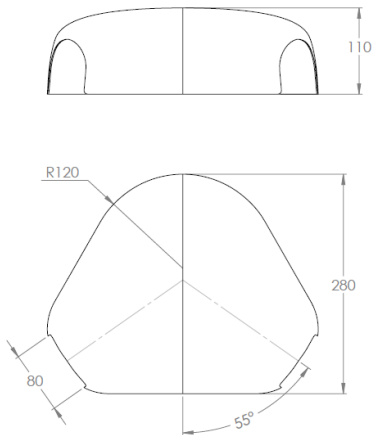
Product description & code

- Hand Warmer Set (P012-62)
- Hand Warmer Unit (P012-61)
- Hand Warmer Dome Set (M012-31)
- Hand Warmer Mounting Set (M012-45)
- Hand Warmer Power Cable 180 mm (P012-40)

Dimensions Hand Warmer unit

- 50 mm x 29 mm x 29 mm (HxWxD)
1.97 in x 1.41 in x 1.41 in (HxWxD)

Dimensions 2-hands dome (cm)



Voltage supply

- Safety Limits : 12 to 35V
- Normal Use : 18 to 26V

Current supply

- At full power : 2.0 A

Power consumption

- Idle mode : 20 mA
- Sleep mode : 1.7 mA

Cable length

- Pigtail : 15 cm (0.49 ft.)
- Extension Lead : 180 cm (5.9 ft.)

XLR connector

- Pin 1: V+ (internally fused 5 A)
- Pin 2: GND
- Pin 3: NC

Tested According (relevant sections)

ISO7176, EN12184

Weight

125 g (4.4 oz.)

Heater Temperature Shutdown

- 100°C (212°F)

Installation date: . . / . . /

Dealer:



Dealer stamp:

A large, empty rectangular box with a thin green border, intended for a dealer stamp.

Serial number sticker

A large, empty rectangular box with a thin green border, intended for a serial number sticker.