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Manual introduction

This is the user manual for Gowing2, a dynamic arm support system. This product is developed, manufactured and distributed by Focal Meditech B.V. or one of its authorized representatives.

This manual contains important information regarding Gowing2, its intended use and possible consequences of usage. The aim of this information is to ensure successful, safe and effective use of the device. This manual contains essential information for using Gowing2, information about safety issues and contact information.

Please read this information carefully: increase of knowledge of the arm support will result in an increase of effectiveness. Important: always keep this user manual in a convenient location for easy reference.
### Symbol explanation

#### Symbols used in this manual

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><img src="danger.png" alt="Danger" /></td>
<td>This symbol in combination with the word “Danger” is used when there is important information which can help you avoid the risk of an equipment failure and serious personal injury or death.</td>
</tr>
<tr>
<td><img src="warning.png" alt="Warning" /></td>
<td>This symbol in combination with the word “Warning” is used when there is important information to avoid certain actions that can lead to an equipment failure.</td>
</tr>
<tr>
<td><img src="caution.png" alt="Caution" /></td>
<td>This symbol in combination with the word “Caution” is used to warn about possible unsafe practices. Extra attention is required.</td>
</tr>
<tr>
<td><img src="disposal.png" alt="Disposal" /></td>
<td>This symbol indicates that this product is not to be disposed of with your household waste, according to the WEEE Directive (2002/96/EC) and your national law. This product should be handed over to a designated collection point, e.g., on an authorized one-for-one basis when you buy a new similar product or to an authorized collection site for recycling waste electrical and electronic equipment (EEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority, approved WEEE scheme or your household waste disposal service.</td>
</tr>
</tbody>
</table>

#### Packaging

<table>
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<th>Symbol</th>
<th>Description</th>
</tr>
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<td>Fragile</td>
</tr>
<tr>
<td><img src="this-way-up.png" alt="This way up" /></td>
<td>This way up</td>
</tr>
<tr>
<td><img src="keep-away-from-water.png" alt="Keep away from water" /></td>
<td>Keep away from water</td>
</tr>
<tr>
<td><img src="do-not-stack.png" alt="Do not stack" /></td>
<td>Do not stack</td>
</tr>
<tr>
<td><img src="non-sterile-product.png" alt="Non-sterile product" /></td>
<td>Non-sterile product</td>
</tr>
<tr>
<td><img src="do-not-use-if-package-is-damaged.png" alt="Do not use if package is damaged" /></td>
<td>Do not use if package is damaged</td>
</tr>
</tbody>
</table>

### Certification Notices

- **This is a CE Class I medical device**

- **Do not remove this label. If the label is removed, the warranty will be void.** This label is positioned at the rear side of Gowing.

- **Do not remove this label. If the label is removed, the warranty will be void.** This label is positioned at the bottom side of the Eneaswitch.

- **Do not remove this label. If the label is removed, the warranty will be void.** This label is positioned at the rear side of the Power module.

#### Classification cf. Dutch Cliq 2013:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
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<tr>
<td>241827030309</td>
<td>Dynamic Arm Supports, compensation of impaired arm muscle function and change of range of motion, load arm construction, hybrid actuation</td>
</tr>
<tr>
<td>241827060309</td>
<td>Dynamic Arm Supports, managing excessive muscle functioning, hybrid actuation</td>
</tr>
<tr>
<td>241827090309</td>
<td>Dynamic Arm Supports, redistribution of pressure/forces, hybrid actuation</td>
</tr>
<tr>
<td>241827990306</td>
<td>Forearm support</td>
</tr>
<tr>
<td>241827990900</td>
<td>Axis locking</td>
</tr>
</tbody>
</table>
Safety notices

Danger: Prevent direct contact with water or any other liquid. Failure of this can lead to malfunctioning of device or bodily harm.

Danger: Prevent extreme temperature (see environment conditions). Failure of this can lead to malfunctioning of the device or bodily harm.

Danger: During installation ensure there is a fuse of 7.5A between power supply and Gowing2. Failure of this can lead to malfunctioning of the device and bodily harm.

Danger: Mechanical energy is stored for balancing the arm. During non-intended removal of the arm from the arm fitting of Gowing2, this mechanical energy will be released resulting in a fast moving lever and arm fitting which can result in bodily harm.

Warning: Do not modify any part of this equipment without authorization of the manufacturer. Failure of this can lead to malfunctioning and will void the warranty.

Warning: In case of faulty device contact Focal Meditech. Do not try to fix it yourself. Failure of this will void the warranty.

Warning: In case of doubt about safety of the device contact Focal Meditech.

Warning: In case of a serious incident when using the device, contact Focal Meditech and the national authority of your country.

Contact information

Gowing2 is manufactured and sold by

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Internet: www.focalmeditech.nl
Intended use, intended users and operation of the device

Intended use
Gowing\(^2\) is a dynamic arm support system. It is designed for users requiring considerable compensation against gravity during movements of the human arm.

Intended users
The intended users of the dynamic arm support Gowing\(^2\) are users in the need of a function device requiring limited learning efforts:

1. Persons challenged by considerable muscular weakness resulting in the inability to perform essential Activities of Daily Living (ADL) activities including eating, drinking, facial care, computer use and wheelchair control. Simple arm supports do not compensate sufficiently.
2. Persons challenged by excessive muscle functioning.
3. Persons in the need of redistribution of pressure/forces.
4. Persons who are at risk for Complaints of Arm Neck and-or Shoulder (CANS), overload or strong fatigue due to challenging working conditions, which may be due to continuous or frequent task performance above shoulder level or performance of many static manual activities.
5. Combinations of these.

Operation of the device
The dynamic arm support system Gowing\(^2\) is a system that consists of several axes which are interconnected via pivoting points. At the end of the system an arm fitting, elbow fitting and optionally a wrist support are attached. Gowing\(^2\) can be mounted on a chair, wheelchair or movable frame. The forearm of the user is placed in the arm fitting, and Gowing\(^2\) can support the weight of the forearm and partly the upper arm. The axes of Gowing\(^2\) will support movements of the human forearm and hand.

Gowing\(^2\) has a robust design combined with low friction and low play. This is realised by using high quality bearing systems combined with high accuracy mechanical parts which result in a smoothly running system. Therefore little energy is required to introduce the intended movements. The smooth running Gowing\(^2\) combined with the accurate fit of the arm fitting means the user needs only very little muscle power to move his or her arm. The kinematic chain of the axes results in a large range of motion. If required, personal adaptations are possible.

Gowing\(^2\) can be used one- or two sided. The selection for one or two Gowings depends on several properties of the user, like the needs of the user combined with the personal limitations and possibilities.

The user of Gowing\(^2\) can use this device in various environments like home, the workplace, school, institutional settings or outdoors. Gowing\(^2\) can be used within a restricted range of environmental humidity.

Gowing\(^2\) is not designed to able to cope with large forces. Gowing\(^2\) cannot be used as a support when standing up, sitting down or as an autonomous lifting device (without supporting the human arm).

Gowing\(^2\) is not designed to withstand impacts that can be introduced during collisions with a wall or other objects. Also Gowing\(^2\) is not constructed to withstand high external vertical forces that can be introduced for example by (abnormal use of) patient hoist systems for the transport of disabled persons.

Usage of the device
Gowing\(^2\) supports the execution of numerous daily activities like eating, drinking, tooth brushing, typing or scratching one’s nose. Independence in lifting and manipulating objects and in personal care is possible again. In general it is desirable for users to use their remaining capacities as much as possible. The device adds force to the user’s arm when lifting objects in the vertical plane, but (if not in the lifting mode) no more force is added than strictly is needed. The principle at work here is called ‘Assist as needed’. Application of this principle is both beneficial from a health perspective and for one’s self esteem. Furthermore it is also cost effective. Gowing\(^2\) operates on the basis of compensation of the weight of the arm. This is called ‘balancing the arm’. The large horizontal movements hardly require any effort anymore. The construction enables easy and quick reach of the mouth and face. Gowing\(^2\) returns the natural freedom of movement to the user. Gowing\(^2\) does not make the wheelchair any wider – not even when the arm of the user is rotated inwards. Gowing\(^2\) allows the user to choose for assisted movements (assist as needed) to move freely or to let the device lift the arm in order to stabilise the arm.

Warning: If the user experiences problems using the Gowing\(^2\), please contact Focal Meditech or a healthcare professional as soon as possible.

Risks and contra-indications
No essential user risks are known while using Gowing\(^2\). Gowing\(^2\) is an aid which should be used by the intended users. There are no known contra-indications for Gowing\(^2\). To be able to use Gowing\(^2\) the following warnings must be taken into account.

Warning: The arm support system cannot be used by the user as a support when standing up and sitting down. During the evaluation of Gowing\(^2\) attention is required to determine if the user is able to sit in a stable position and if one can stand-up without using a support.
The following parts of Gowing² are described below:

- From a user perspective the contact point with Gowing² is the arm fitting where the forearm of the user is positioned in. This arm fitting is mostly a part that is individually adapted to the user.
- The elbow fitting. The upper arm of the user should be in contact with this part during the use of Gowing². It will prevent that the user will slip out of the arm fitting when the user bends his elbow.
- The wrist support. This part can be used to support the wrist and hand. This wrist support can be shifted and can be removed. The support itself can rotate.
- The Load arm with moving base plate to which the arm fitting, elbow fitting and wrist support are attached.
- The Load arm is connecting the arm fitting, elbow fitting and the wrist support to the body of Gowing².
- At the top of Gowing² there are two eject knobs. Pressing these two knobs towards each other makes it possible to remove the Human Interface, containing the loadarm, arm fitting,
elbow fitting and wrist support.

- **Body of Gowing**\(^2\): The body of Gowing\(^2\) contains: the actuator for the lift function, the actuator to adjust the balance force and an actuator to operate the blocking mechanism for any up/down and forward/backward movement.
- **The tilt module** contains the sensor and actuator for the tilt function, the blocking mechanism system for the rotation and the control electronics. Finally a red handle is attached to this module. This handle can be used to remove Gowing\(^2\).

The tilt module can be used to adjust the rotation axis of Gowing\(^2\) with respect to the horizontal plane. With the help of the tilt module the direction of the right arrow can be adjusted or set to perpendicular to the gravity plane. (The right arrow shows the movement of the tilt module).

The Power module contains the On/Off switch of Gowing\(^2\). Under the module two connectors are available, one for the power supply and one for the Focal bus. These connectors do not have to be disconnected if Gowing\(^2\) is removed using the red handle.

Next to the switch is an indication LED, if the Gowing\(^2\) is switched on the LED should be light up.

- **Green**: properly connected, working fine.
- **Red**: Gowing\(^2\) is not properly connected, see remove/placing Gowing\(^2\).
- **Green with Orange blinking**: there is an error, for more information see trouble shooting guide.

### Adjusting the arm swing, arm fitting and elbow fitting

To move the arm freely the weight of the arm is balanced. To balance the arm in the vertical direction, considerable forces are required. For safe use the following is important:

- the arm is positioned in a stable way in the arm fitting
- the arm is always in contact with the elbow rest.

If you notice that the arm is not stable and tends to slip out, reposition the arm in the proper way.

---

**Warning:** Adjusting the arm fitting can result in a malfunction of Gowing\(^2\).

The arm fitting can be adjusted in one axis. Adjusting the position of the arm fitting is done in the following way: Loosen one or multiple set screws of the arm fitting. Adjust the arm fitting by shifting this fitting in the direction of the arrow. Fasten all adjustment screws of the arm fitting.

**Caution:** Adjusting the elbow fitting can result in a malfunction of Gowing\(^2\).

The elbow fitting can be adjusted in two directions:

1. Adjusting the rotation of the elbow fitting: loosen the “bolt elbow fitting” until the fitting can be rotated. Adjust the fitting in the desired position and fasten the “bolt elbow fitting”.
2. Adjusting the position of the elbow fitting: loosen one or multiple “set screws elbow fitting”. Adjust the elbow fitting by shifting this fitting in the direction of the arrow. Fasten all “set screws elbow fitting”.

---
Removing / mounting the Gowing²
Gowing² can easily be removed from the Power module.

**STEP 1:**
Set all settings to default.

**STEP 2:**
Remove the user’s arm from the arm fitting.

**STEP 3:**
Switch off Gowing².

**STEP 4:**
Disconnect the human interface and store it in the case.

**STEP 5:**
Place your right hand on position 1 and your left hand on position 2.

**STEP 6:**
Rotate the red handle upwards in the direction of the arrow.

**STEP 7:**
Tilt the Gowing² approximately 15° in the direction of the arrow.

**STEP 8:**
Move the Gowing² up in a slanted line until it is free from the Power module.

**STEP 9:**
Store Gowing² always in its case to prevent the Gowing² being damaged.

---

**Caution:**
The positions of the arm fitting and elbow fitting are crucial for the performance of Gowing². Changing these positions can result in a severe decrease of the performance or even malfunction of Gowing². Therefore only trained persons are allowed to change the settings of the arm fitting and elbow fitting.

---

**Disconnecting the human interface**

**Danger:**
Please carefully disconnect/remove the different parts and take notice of the steps described in this manual to avoid possible injuries.

The human interface containing the loadarm, arm fitting, elbow fitting and wrist support can be removed easily. To disconnect the lever, press both red knobs at the top of Gowing², and move the lever away from the body in the upwards direction.

Replacing the human interface can be done by pushing the lever into the body. The buttons do not have to be pushed. When the human interface is in position, it cannot be removed without pressing the buttons.

Optionally for storage purposes a holder for the human interface can be mounted at the back of the wheelchair.
Placing Gowine\(^2\) to the power module (right handed version)

**STEP 1:** Hold the Gowine\(^2\) with your right hand on position 1 and your left hand on position 2.

**STEP 2:** Hold the Gowine\(^2\) above and in a tilted position approximately 15° towards the Power module.

**STEP 3:** Move the Gowine\(^2\) down in a slanted line until it catches the hook of the power module.

**STEP 4:** Tilt the Gowine\(^2\) down until the body of Gowine\(^2\) is vertical.

**STEP 5:** Push the red handle down.

**STEP 6:** Attach the human interface to Gowine\(^2\).

**STEP 7:** Position the user's arm in the arm fitting.

**STEP 8:** Switch on Gowine\(^2\).

Left handed version of the Gowine\(^2\)

The removing and placing procedure of the left handed version of Gowine\(^2\) are similar. The only difference is that your left hand is on position 1 and your right on position 2.

Removing the cables

In case the Power module of Gowine\(^2\) has to be removed, the two cables must be disconnected first.

To remove the Focal bus connector: hold the connector as close as possible inside the mounting base and pull and disconnect the connector. The connector should slide easily out of the chassis part.

To remove the power connector: hold the connector as close as possible inside the mounting base and turn counter clockwise the outer ring until it moves completely free. Then pull the connector out of the chassis part.
Eneaswitch

Gowin2 has a 9-button interface called Eneaswitch2 with LED indicators and a buzzer for user feedback. The functions are divided in three columns (see drawing below). The Eneaswitch2 is easy to operate. The level of protection (Ingress Protection) is IP22. Even though the IP rating is at this level, care must be taken not to operate the silicone keypad with sharp objects. This can damage the silicone keypad and makes it vulnerable to moisture.

Adjustment of balancing force / blocking function

The left column contains the blocking function and the adjustment of the balancing force. Gowin2 has blocking mechanisms for its up/down movement, forward/backward movement and rotation (in the horizontal plane). The human interface containing the arm fitting, elbow fitting and the optional wrist support does not have a blocking mechanism. This results in the behaviour that the arm of the user can still swing and rotate in the arm fitting.

The push button has a toggle function. This means that the blocking mechanism will be activated when it is deactivated and vice versa. Incidentally it may appear that not all axes are blocked although the blocking mechanisms are activated. Should this occur minimal arm movement will block all axes immediately.

When the blocking mechanism is deactivated, it can be the case that one or more axes remain blocked. To deactivate the blocking mechanism a little movement is required that will result in a decrease of the force on the blocking mechanism. The design of the blocking mechanism results in the behaviour that the state transition of Gowin2, from blocked to unblocked, will never occur directly when a force is on this mechanism. While the blocking mechanism is activated it is not possible to adjust the balance force or the lift position.

Two buttons are assigned to adjust the balance force in the vertical plane. Pushing the plus + button will result in increasing the balance force. Pushing the minus − button will result in decreasing the balance force. The speed of adjustment of the balance force depends on the time the button is pressed. The longer the button is pressed, the faster the adjustment will be. If the adjustment has reached its end the ring-LED will blink red and a beep will sound. If the plus + or minus − button is pressed when the system is locked the ring-LED will blink red and a double beep will sound.

Adjustment of the tilt function

The buttons in middle column are used for the tilt function. Gowin2 is able to adjust its position with respect to the gravity in the horizontal plane. The button marked with + will adjust the tilt module to the position where the rotating axis is set perpendicular to the gravity plane. After pressing this button the LEDs around this button will start blinking green and the tilt module will level to 0°. After reaching this position the controller will switch off if there is no movement for the duration of 10 seconds. For most users the 0° position will be the best setting. The buttons + and − can be used to adjust the tilt of Gowin2. This option can be used to help the arm of the user to have a preferred movement in the forward or backward direction. + Means tilt forward and − means tilt backwards. If the tilt function has reached its end the ring-LED will blink red and a beep will sound.

Adjustment of the lift function

The buttons in the right column are used for the lift function of Gowin2. Gowin2 is able to lift the lever and hereby the arm of the user. This means that no force of the user is required to bring the arm to a certain position. When pushing the button +, the lever will go to the lowest position. The user is now able to move the arm freely again. The buttons + and − can be used to adjust the lift position. The speed of adjustment of the balance force depends on the duration the button is pushed.
The longer the button is pushed, the faster the adjustment will be. The button ① means lift the lever up and ① means lower the lever.

If the lift has reached its end the ring-LED will blink red and a beep will sound. If the ① or ① button is pressed when the system is locked the ring LED will blink red and a double beep will sound.

**Optional inputs on the Eneaswitch³.**

The Eneaswitch³ has two optional input ports (mini-jack 3.5mm stereo). Via the stereo to mono splitter two switches can be connected to a single input port. In total there can be a maximum of four switches connected to the Eneaswitch³. Be sure that the device is turned off before connecting external switches. It is also possible to plug a switch directly into the input port. The functionality for each external switch can be set via software.

The type of external switch is free to choose but the length of the cable, or total length of the cables when extended with an extension cable, should not be longer than 3 meters.

**Functions that can be set are:**
- Tilt
- Balance
- Block
- Lift
- Default
- Single switch

---

**Single switch control Eneaswitch³.**

The single switch mode of Gowing² allows the user to control the Gowing² with only one switch. To control the Gowing² in single switch mode there must be one external switch be configured as “Single switch”. The configuration can only be done by authorised people.

The single switch control starts scanning after pressing the external button. The function that is indicated by the blue LED will be activated when the external switch is being pressed. For example in the figure above the “lock” function will be activated by pressing the external switch. If the user does not give an input within 1 second the scanning resumes.

If a function is indicated by two blue LEDs, the corresponding function will also be activated when the external switch is being pressed. The output of the function will toggle between the two indicated blue LEDs. For example, in the figure above the “lift” function will be activated by pressing the external switch. If the user does not give an input within 1 second the scanning resumes.
Installation instructions

Installing the Gowing
If the Gowing needs to be installed on other equipment (for example an electric wheelchair), the operation of other equipment will not be impacted by the installation of the Gowing. See page 10 of this manual.

Installation of the Gowing needs to be executed by Focal or a certified professional that is approved by Focal Meditech or one of its authorized professionals, to ensure a safe integration of the Gowing and the other equipment.

Installing the Eneaswitch
To provide a secure mounting of the Eneaswitch it will be delivered with mounting bracket. The Eneaswitch should be always be mounted using this clip. The clip can be mounted on or in the worktop of a wheelchair. This can be done using the treated holes (M4) in the clip. If the Eneaswitch should be mounted in a worktop a hole (Ø 65mm) must be drilled in the worktop.

Battery pack and charger
The battery pack can be used if there is no or not enough power to operate Gowing, for example on a working chair or manual wheelchair. The battery pack comes with a charger and a power cable to connect the battery pack to the power module. For more information see the user manual of the battery pack.

Power adapter
Usually when the Gowing is used on a stand in a fixed position the power adapter can be used. The power adapter will use the power from a wall socket to supply the Gowing with the necessary power. For more information see the user manual of the power adapter.

Accessories
Battery pack and charger
The battery pack can be used if there is no or not enough power to operate Gowing, for example on a working chair or manual wheelchair. The battery pack comes with a charger and a power cable to connect the battery pack to the power module. For more information see the user manual of the battery pack.

Power adapter
Usually when the Gowing is used on a stand in a fixed position the power adapter can be used. The power adapter will use the power from a wall socket to supply the Gowing with the necessary power. For more information see the user manual of the power adapter.

Warning: Take extra care how to position the Gowing control switch if the user controls Gowing with the hand of the Gowing supported arm (and vice versa). In these cases it is strongly recommended to place an extra switch in case the user is not able to reach the controls any more. The Eneaswitch of Gowing has a separate input for a switch that can be used as a "default" button. When this "default" button is pushed the blocking mechanism will be unblocked, the balance force will be minimised and the lift position will be lowered to the lowest position, giving the user the opportunity to control Gowing again.

This switch can be placed somewhere close to the head, the other hand, legs or any other position where the user is able to control a switch.
Maintenance instructions

Hardware maintenance
Do not place the device in direct sunlight or in the direct vicinity of a heat source, otherwise this might result in discolouration or scorching of plastic parts. Direct sunlight may reduce the lifetime of system parts and interfere with operation.

All housings, cables and connectors must be regularly inspected. If any housing or cable is visibly damaged, do not use the device. It is prohibited to physically modify Gowing\textsuperscript{2}. There are no serviceable parts inside Gowing\textsuperscript{2}. Contact Focal Meditech for any maintenance issues.

In case Gowing\textsuperscript{2} is not mounted on the mounting base it should always be stored in its case to prevent falling or other impacts that can damage the system.

Cleaning
Maintenance of Gowing\textsuperscript{2} is limited. Gowing\textsuperscript{2} can be cleaned using a moist cloth and a non-aggressive cleaning agent.

Reuse
To reuse Gowing\textsuperscript{2}, it must be disassembled and reviewed by a professional from Focal or a certified professional that is approved by Focal Meditech or one of its authorized professionals. Gowing\textsuperscript{2} must intensively be cleaned and inspected. The keypad of the Eneaswitch\textsuperscript{2} can be removed and replaced by a new one.

The arm fitting, elbow fitting and wrist support have to be replaced.

Focal will refurbish and repackage the reused Gowing\textsuperscript{2} in such a way that it will meet the safety and performance requirements according to applicable regulations.

Decommissioning
### Appendix 1 Technical specifications

#### Gowing specifications

**Mass**
- Mass Gowing²: 7.1 [kg]

**Dimensions (in default position)**
- Height: 706 [mm]
- Width: 84 [mm]
- Depth: 299 [mm]

**Mounting position (angle)**
- Maximum allowed: -10...10 [°]

**Range of motion**
- Up/Down: 550 [mm] @ end of lever
- Forward backward stroke: 400 [mm] @ end of load arm
- Horizontal rotation: -69...+69 [°]

**Balance mass**
- Up/Down:
  - Mass: 0.25...5 [kg] @ end of load arm
  - Electronic adjustable: 0...100 [mm] @ end of load arm

**Lift capacity**
- Up/Down:
  - Mass: 0...7 [kg] @ end of load arm
  - Electronic adjustable: 0...100 [%]

**Blocking mechanism**
- Up/Down movement:
  - Blocking force: 100 [N] @ end of load arm
  - Index (default position): 15 [mm] @ end of load arm
- Forward/Backward movement:
  - Blocking force: 100 [N] @ end of load arm
  - Index (default position): 23 [mm] @ end of load arm
- Horizontal rotation:
  - Blocking force: 100 [N] @ end of load arm
  - Index (default position): 15 [mm] @ end of load arm

**Tilt function (Integrated tilt module)**
- Angle: -16...120 [°]
- Accuracy: 1.5 [°]
- Speed: 2.7 [°/s]

**Operation voltage**
- Nominal voltage: 20 [V]

**Operation current (incl. Power module and Eneaswitch²)**
- Standby: 40 [mA]
- During adjustments typical: 0.4 [A]
- During adjustments maximum: 1.0 [A]

**Power consumption (incl. Power module and Eneaswitch²)**
- Standby: 1 [W]
- During adjustments typical: 10 [W]
- During adjustments maximum: 24 [W]

**Storage conditions**
- Temperature: -40...85 [°C]
- Humidity: 35...85 [%] non condensing

**Operation conditions**
- Temperature: 5...+40 [°C]
- Humidity: 35...85 [%] non condensing

**Degree of protection**
- IP-class: IP32 (IEC60529)
### Power Module specifications (part of Gowing\(^2\))

**Mass**
- Mass Power module
  - 0.135 [kg]

**Dimensions**
- Height
  - 62 [mm]
- Width
  - 70 [mm]
- Depth
  - 39 [mm]

**Mounting position (angle)**
- Maximum allowed
  - -10...10 [°]

**Input voltage**
- Nominal input voltage
  - 24 [V]
- Absolute input voltage range
  - 23...40 [V]

**Input current**
- Standby
  - 10 [mA]

**Output current**
- Maximum continues @ 25°
  - 0.9 [A]
- Maximum continues @ 50°
  - 0.6 [A]

**Power consumption**
- Standby
  - 0.24 [W]
- Maximum continues @ 25°
  - 21.6 [W]
- Maximum continues @ 50°
  - 15 [W]

**Storage conditions**
- Temperature
  - -40...+85 [ºC]
- Humidity
  - 35...85 [%] non condensing

**Operation conditions**
- Temperature
  - 5...+50 [ºC]
- Humidity
  - 35...85 [%] non condensing

**Degree of protection**
- IP-class
  - IP32 (IEC60529)

### Eneaswitch\(^2\) specifications (part of Gowing\(^2\))

**Mass**
- Mass Eneaswitch\(^2\)
  - 0.122 [kg]

**Dimensions (with mounting clip)**
- Height
  - 15 [mm]
- Width
  - 75 [mm]
- Depth
  - 77 [mm]

**Cable length**
- Length
  - 2445±20 [mm]

**Input voltage**
- Nominal input voltage
  - 20 [V]

**Input current**
- Standby
  - 10 [mA]
- Maximum continues
  - 0.17 [A]

**Power consumption**
- Standby
  - 0.2 [W]
- Maximum continues @ 25°
  - 3.4 [W]

**Storage conditions**
- Temperature
  - -40...+85 [ºC]
- Humidity
  - 35...85 [%] non condensing

**Operation conditions**
- Temperature
  - 0...+50 [ºC]
- Humidity
  - 35...85 [%] non condensing

**Degree of protection**
- IP-class
  - IP22 (IEC60529)
**Gowing’s dimensions**
Dimensions of Gowing’s are variable. This is because it is a product with moving parts and it is a product with different configurations. All dimensions are given in [mm] millimetres.

**Dimensions (human interface excluded)**

**Dimensions armrest Large (right handed version)**

**Dimensions armrest X-Large (right handed version)**
Appendix 2 Part numbers

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<tr>
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<th>Description</th>
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<td>Power module</td>
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<td>605694</td>
<td>Case with inlay Gowing^2</td>
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<tr>
<td>605547</td>
<td>Eneaswitch^2</td>
</tr>
<tr>
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<td>Battery pack</td>
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<td>605893</td>
<td>Charger battery pack</td>
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<td>Battery power cable 2.9m</td>
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<td>605937</td>
<td>Battery power cable 4.0m</td>
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<td>Stereo extension cable 3.5mm jack 1m</td>
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Content of case Gowing^2

Place reserved for optional switches
Place reserved for Human interface

Eneaswitch^2

Power module

Gowing^2

The case of Gowing^2 contains the following parts:
- Gowing^2
- Power module
- Eneaswitch^2
- Battery power cable
- Quick Start Guide

Some parts are individual and are added on specifications but these depend on the user:
- Human interface
  - Load arm
  - Arm fitting
  - Elbow fitting
  - Wrist support
- Switches
- Extension cable for switches
- Splitters
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This is the Quick start guide for Gowing 2, a dynamic arm support system. This product is developed, manufactured and possibly distributed by Focal Meditech B.V. This quick start guide contains the basic information regarding Gowing 2. The aim of this information is to ensure successful, safe and effective use of the device. This quick start guide will give you a quick look on the features and important safety warnings of Gowing 2. Please take note of the safety warnings before using Gowing 2.

Dit is de snelstartkaart voor Gowing 2, een dynamische armondersteuning. Dit product wordt ontwikkeld, geproduceerd en eventueel gedistribueerd door Focal Meditech B.V. Deze snelstartkaart bevat de basisinformatie over Gowing 2. Het doel van deze informatie is te zorgen voor een succesvol, veilig en effectief gebruik van het apparaat. Deze snelstartkaart geeft u een snelle blik op de functies en belangrijke veiligheidswaarschuwingen van Gowing 2. Houd rekening met de veiligheidswaarschuwingen voordat u Gowing 2 gebruikt.
**Overview / Overzicht**

- Eject knob / Ejectschakelaar
- Load arm / Draagarm
- Elbow fitting / Elleboogsteun
- Arm fitting / Armschaal
- Wrist support / Polsondersteuning
- Indication LED / Indicatie LED
- On / off switch / Aan/uitschakelaar
- Power module / Aan/uitschakelaar
- Handle / Hendel
- Rotation / Rotatie
- Tilt module / Kantelmodule

**Figure 1: Overview Gowing® with terms of specific parts**

**Figuur 1: Overzicht Gowing® met benaming specifieke onderdelen**

---

**Safety notices / Veiligheidsnotities**

- **Danger:** Prevent direct contact with water or any other liquid. Failure of this can lead to malfunctioning of device or bodily harm.
  **Gevaar:** Voorkom direct contact met water of enige andere vloeistof. Het niet voorkomen hiervan kan leiden tot onjuist functioneren van het apparaat of tot lichamelijke schade.

- **Danger:** Prevent extreme temperature (see environment conditions). Failure of this can lead to malfunctioning of the device or bodily harm.
  **Gevaar:** Voorkom blootstelling aan extreme temperaturen. Het niet voorkomen hiervan kan leiden tot onjuist functioneren van het apparaat of tot lichamelijke schade.

- **Danger:** During installation ensure there is a fuse of 7.5A between power supply and Gowing®. Failure of this can lead to malfunctioning of the device and bodily harm.
  **Gevaar:** Let er tijdens de installatie op dat er tenminste een zekering van 7,5A bevindt tussen de energiebron en Gowing®. Indien dit niet gedaan wordt kan dit leiden tot onjuist functioneren van het apparaat of tot lichamelijke schade.

- **Danger:** Mechanical energy is stored for balancing the arm. During non-intended removal of the arm from the arm fitting of Gowing®, this mechanical energy will be released resulting in a fast moving lever and arm fitting which can result in bodily harm.
  **Gevaar:** Mechanische energie wordt opgeslagen om de arm te balanceren. Tijdens niet-bedoelde verwijdering van de arm uit de armschaal van Gowing® zal deze mechanische energie vrijkomen wat resulteert in een snel bewegende hendel en armschaal wat lichamelijk letsel tot gevolg zou kunnen hebben.
**Warning:** Do not modify any part of this equipment without authorization of the manufacturer. Failure of this can lead to malfunctioning and will void the warranty.

**Waarschuwing:** Wijzig geen enkel onderdeel van dit apparaat zonder toestemming van de fabrikant. Indien dit toch gedaan wordt, kan dit leiden tot onjuist functioneren van het apparaat en het verlies van garantie.

**Warning:** In case of a faulty device contact Focal. Do not try to fix it yourself. Failure of this will void the warranty.

**Waarschuwing:** Neem indien het apparaat onjuist functioneert direct contact op met Focal. Probeer het niet zelf te repareren. Het niet opvolgen van deze waarschuwing kan leiden tot het verlies van garantie.

**Warning:** In case of doubt about the safety of the device contact Focal Meditech.

**Waarschuwing:** Neem in geval van twijfel over de veiligheid van het apparaat contact op met Focal Meditech.

**Warning:** In case of a serious incident when using the device, contact Focal Meditech and the national authority of your country.

**Waarschuwing:** Bij een ernstig voorval met betrekking tot dit apparaat dient contact te worden opgenomen met Focal Meditech en de bevoegde autoriteit van de lidstaat.

---

Before switching on Gowing, the Gowing has to be attached to the Power Module (See "Attach / Detach Gowing"). Gowing can be switched on by turning the on/off switch to (I). The indication LED will light up green. If the LED lights up red, Gowing might not be properly attached to the Power Module.

Voordat de Gowing ingeschakeld mag worden, moet Gowing zijn bevestigd aan de Power Module (zie "koppelen / ontkoppelen Gowing"). Gowing kan worden ingeschakeld door de aan/uit naar (I) te schakelen. De indicatie-LED zal groen oplichten. Als de LED rood oplicht, is Gowing mogelijk niet goed bevestigd aan de Power Module.
Detach Gowing\(^2\) from Power Module (right handed version):

**STEP 1:** Set all settings to default
**STEP 2:** Remove the user’s arm
**STEP 3:** Switch off Gowing\(^2\)
**STEP 4:** Disconnect the human interface and store it in the case
**STEP 5:** Place your right hand on position 1 and your left hand on position 2 (see Figure 3)
**STEP 6:** Rotate the red handle upwards in the direction of the arrow (see Figure 4)
**STEP 7:** Tilt the Gowing\(^2\) approximately 15° in the direction of the arrow (see Figure 5)
**STEP 8:** Move the Gowing\(^2\) up in a slanted line until it is free from the Power Module (see Figure 6)
**STEP 9:** Store Gowing\(^2\) always in its case to prevent the Gowing\(^2\) from breaking or being damaged.

Het ontkoppelen van Gowing\(^2\) van de Power Module (rechtshandige versie):

**STAP 1:** Zet terug naar de standaardinstelling
**STAP 2:** Neem de arm van de gebruiker weg
**STAP 3:** Schakel Gowing\(^2\) uit
**STAP 4:** Koppel de human interface los en bewaar deze in de opbergdoos
**STAP 5:** Plaats uw rechterhand op positie 1 en uw linkerhand op positie 2 (zie Figuur 3)
**STAP 6:** Trek de rode hendel omhoog in de richting van de pijl (zie Figuur 4)
**STAP 7:** Kantel de Gowing\(^2\) ongeveer 15° in de richting van de pijl (zie Figuur 5)
**STAP 8:** Verplaats de Gowing\(^2\) omhoog in een schuine lijn totdat deze vrij is van de Power Module (zie Figuur 6)
**STAP 9:** Bewaar Gowing\(^2\) altijd in de opbergdoos om te voorkomen dat de Gowing\(^2\) wordt beschadigd.
**Attach Gowing® to the Power Module (right handed version):**

**STEP 1:** Grab Gowing® with your right hand and on position 1 and your left hand on position 2.

**STEP 2:** Hold Gowing® above the Power Module in a tilted position of approximately 15°.

**STEP 3:** Lower Gowing® in a slanted line until it catches the hook of the Power Module.

**STEP 4:** Tilt Gowing® straight until the body of Gowing® is vertical.

**STEP 5:** Push down the red handle.

**STEP 6:** Attach the human interface to Gowing®.

**STEP 7:** Position the user's arm in the arm fitting.

**STEP 8:** Switch on Gowing®.

**Het plaatsen van de Gowing® van de Power Module (rechtshandige versie):**

**STAP 1:** Pak Gowing® met uw rechterhand op positie 1 en uw linkerhand op positie 2.

**STAP 2:** Houd Gowing® in een gekantelde positie van ongeveer 15° boven de Power Module.

**STAP 3:** Laat Gowing® zakken totdat deze in de haak van de Power Module grijpt.

**STAP 4:** Kantel Gowing® naar beneden totdat Gowing® rechtop staat.

**STAP 5:** Druk de rode hendel naar beneden.

**STAP 6:** Bevestig de human interface op Gowing®.

**STAP 7:** Plaats de arm van de gebruiker in de armschaal.

**STAP 8:** Schakel Gowing® in.

The attach/detach procedure of the left handed version of Gowing® is similar. The only difference is that your left hand is on position 1 and your right hand on position 2.

De procedure voor het afnemen en plaatsen van de linkshandige versie van Gowing® is gelijk. Het enige verschil is dat de linkerhand geplaatst moet worden op positie 1 en de rechterhand op positie 2.

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**Attach / Detach the human interface / Koppelen / ontkoppelen van de human interface**

**Figure 7: Attach / detach human interface**

The human interface containing the load arm, arm fitting, elbow fitting and wrist support can be removed easily. To detach the human interface, press both red eject knobs at the top of Gowing® and move the human interface away from the body in the upwards direction.

De human interface inclusief draagarm, de armschaal, elleboogsteun en polsstuun kunnen gemakkelijk worden afgenomen. Om de human interface te ontgrendelen moeten de beide rode ontkoppelknoppen bovenaan de Gowing® worden ingedrukt. Beweeg de human interface in bovenwaartse richting van de behuizing van Gowing® weg (zie Figuur 7).

Attaching the human interface can be done by pushing the lever into the body. The buttons do not have to be pushed. When the human interface is in position, it cannot be removed without pressing the buttons.

The left column contains the blocking function and the adjustment of the balancing force. Gowing\textsuperscript{2} has blocking mechanisms for its up/down movement, forward/backward movement and rotation (in the horizontal plane). Two buttons are assigned to adjust the balance force in the vertical plane. Pushing the plus button will increase the balance force. Pushing the minus button will decrease the balance force.

De linker kolom bevat de blokkeerfunctie en de aanpassing van de balanskracht. Gowing\textsuperscript{2} heeft blokkeermechanismes voor hoog/laag en voor/achterwaarts bewegingen en de rotaties (in het horizontale vlak). Twee knoppen in de linker kolom dienen voor het aanpassen van de balanskracht in het verticale vlak. Het indrukken van de plus knop resultert in een toename van de balanskracht. Het indrukken van de minus knop resulteert in afname van de balanskracht. De snelheid waarmee de balanskracht aangepast wordt is afhankelijk van de duur van het indrukken van de knop. De aanpassing zal sneller plaatsvinden als de knop langer wordt ingedrukt.

The buttons in middle column are used for the tilt function. The button marked with \( \mathcal{Q} \) will adjust the tilt module to the position where the rotating axis is set perpendicular to the gravity plane. After pressing this button the LEDs around this button will start blinking green and the tilt module will level to 0°. For most users the 0° position will be the best setting. The buttons \( \mathcal{Q} \) for forward and \( \mathcal{Q} \) for backwards can be used to adjust the tilt of Gowing\textsuperscript{2}.

De knoppen in de middelste kolom worden gebruikt voor de kantelfunctie. De knop \( \mathcal{Q} \) past de kantelmodule aan naar de positie waar de roterende as loodrecht op het zwaartekrachtsvlak staat. Bij het indrukken van de o-knop beginnen de LED's rond deze knop groen te knipperen en de kantelmodule wordt op 0° ingesteld. Voor de meeste gebruikers is de 0°-positie de beste instelling. De knoppen \( \mathcal{Q} \) en \( \mathcal{Q} \) kunnen worden gebruikt om de kanteling van de Gowing\textsuperscript{2} aan te passen.
The single switch mode of Gowing\textsuperscript{2} allows the user to control the Gowing\textsuperscript{2} with only one switch. To control Gowing\textsuperscript{2} in single switch mode there must one external switch be configured as “Single switch”. This can only be done by authorised people.

De single switch-modus van Gowing\textsuperscript{2} stelt de gebruiker in staat om de Gowing\textsuperscript{2} met slechts één schakelaar te bedienen. Om de Gowing\textsuperscript{2} in een-knops bediening te gebruikten, moet er één externe schakelaar worden geconfigureerd als “Single switch”. Dit kan alleen worden gedaan door geautoriseerde personen.

The single switch control starts scanning after pressing the external switch. The function that is indicated by the blue LED will be activated when the external switch is being pressed. For example, in Figure 11 the “lock” function will be activated when the external switch is being pressed. If the user does not give an input within 1 second the scanning resumes.

De single switch-modus van Gowing\textsuperscript{2} stelt de gebruiker in staat om de Gowing\textsuperscript{2} met slechts één schakelaar te bedienen. Om de Gowing\textsuperscript{2} in een-knops bediening te gebruikten, moet er één externe schakelaar worden geconfigureerd als “Single switch”. Dit kan alleen worden gedaan door geautoriseerde personen.

The single switch control starts scanning after pressing the external switch. The function that is indicated by the blue LED will be activated when the external switch is being pressed. For example, in Figure 11 the “lock” function will be activated when the external switch is being pressed. If the user does not give an input within 1 second the scanning resumes.
De bediening met één schakelaar begint te scannen na het indrukken van de externe knop. De functie die door de blauwe LED wordt aangegeven, wordt geactiveerd wanneer de externe schakelaar wordt ingedrukt. Bijvoorbeeld in Figuur 11 zal de blokkeer functie worden geactiveerd wanneer op de externe schakelaar wordt gedrukt. Als de gebruiker gedurende 1 seconde geen input geeft, wordt het scannen hervat.

If a function is indicated by two blue LEDs, the corresponding function will also be activated when the external switch is being pressed. Subsequently the activated function will toggle between the two indicated blue LEDs. See Figure 12 where the lift function will be activated when the external switch is being pressed. If the user does not give an input for 1 second the scanning resumes.

Als een functie wordt aangegeven door twee blauwe LEDs, wordt de bijbehorende functie ook geactiveerd wanneer de externe schakelaar wordt ingedrukt. Vervolgens wisselt de geactiveerde functie tussen de twee aangegeven blauwe LEDs. Zie Figuur 12 waar de lift functie zal worden geactiveerd wanneer de externe schakelaar wordt ingedrukt. Als de gebruiker gedurende 1 seconde geen input geeft, wordt het scannen hervat.
Appendix 5 Troubleshooting guide

Gowing2 saves errors for maintenance and service reasons and is able to show these errors in the troubleshoot mode. In the troubleshoot mode the LEDs of the Eneaswitch2 will be used to show the error codes of Gowing2.

**Entering the troubleshoot mode**

Push the button ⊗ in the right column for 5 seconds and you will enter the configuration menu.

By pressing the “lock” icon you will enter the list of errors that have occurred, by pressing the ① and ② arrows you can step through the errors. ① means previous error message and ② means next error message. If an error occurs, please contact Focal Meditech for assistance and provide the error message.

To exit the error messages menu press the “lock” icon. To exit the configurations menu press the button ⊗ of the right column. When there is no user input for 20 seconds the Eneaswitch2 will turn back to operational mode.

In the figure above (right side) you see an illustration of a possible error.
Appendix 7 Conditions and Warranty

Conditions and Warranty: Gowing supplied through a representative of Focal Meditech

Conditions and Warranty in the case of supply through a representative of Focal Meditech are subject to conditions of the national or local representative and in accordance with national law.

Conditions and Warranty: direct supply by Focal Meditech BV to end users

In the case of direct supply by Focal Meditech BV to end users, Conditions and Warranty are subject to the Consumer General Terms and Conditions issued by Koninklijke Metaalunie and in accordance with Dutch law.