



***GHZ-Digital***

***Electronic Power control unit for Hot  
Grips***

**User manual**

**V201-E  
Art.-No. 100227**

Electronic power control elements for hot grips  
User manual

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## 2 Preamble

**This document belongs to the electronic power control unit for hot grips, GHZ-D. It contains important hints about set-up and operation of this device. Always attach this document if you sell or give away the power control elements to a third party.**

Keep this user manual for future reference!

## 3 Introduction

Dear valued customer,

we appreciate your buy of the electronic power control unit GHZ-D. With this device you've purchased an item that represents state of the art technology.



This product complies with the regulations of valid, national directives. Conformity has been proved, the respective declarations and documents are deposited at the manufacturer of this product.

This device fulfils all requirements for a safe use within it's intended field of application. Pay attention to this manual to keep this status and to guarantee a non-hazardous operation!

Doing so will result in a long product life and reliable, safe operation.

## 4 Application / proper use

Intended use of this product is as a power control unit for motorcycle hot grips and comparable systems. Max. constant power output is 75W @ 14,4V. It's not allowed to operate this device under bigger load.

This device is motorcycle accessory. Mount all parts of this product in a way they are not exposed to direct splash water. Although all parts are protected against the penetration of humidity, a splash proof mounting decreases the detrimental effect of humidity and prolongs product life.

The device may only be operated at 12 Volt DC voltage. Obey all generally accepted electrical engineering standards while installing this device. If you don't have the necessary skills and knowledge for proper installation, do not hesitate to ask your local motorcycle garage to do it for you. Pay attention to the device's polarity. It contains an indicator that shows wrong polarity during initial installation. Complaints about system malfunction as a result of wrong polarity cannot be accepted.

The device does not feature an own fuse in its power supply cord. Only connect the device to a fused circuit. We recommend to connect the GHZ-D to a circuit that's controlled by the motorcycle's ignition switch. Doing so will switch off the power control unit when you switch off the ignition. Consider the additional current that is drawn by the electronic power control unit respectively the hot grips or grip heating. It might be necessary to insert a fuse with a 5 amps higher value into the circuit this device is connected to. We know from experience that the circuit that feeds the motorcycle horn is a good choice to connect the power control unit to.

It is essential for trouble-free operation of the electronic power control unit to have proper EMI shielding on your motorcycle. Otherwise interferences from the ignition system could lead to malfunctioning.

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Any other, non-intended use of this product could lead to damage of the device or to even more hazardous situations like short circuiting, fire, risk of electric shock and so on.

You are not allowed to modify this product or open it's housing! Always obey these safety rules!

### **5 Safety guidelines**

We can not accept complaints about system malfunction as a result of disregard of safety precautions. We accept no liability for consequential damages which result from this disregard.

Read the entire user manual carefully before attempting to put the electronic power control unit into operation! Due to safety reasons the components of this product may not be opened.

## 6 About the power control unit

The electronic power control unit has been designed in a way that it fits to almost all hot grips up to 75W power rating. It is intended to replace the original 2 or 3-step switch.

The control of the power level is done by pulse width modulation. To prevent damage to the device in the event of an earth-leakage the modulation happens to the negative output lead.

Separate control elements featuring 2 push buttons and an indicator LED are used to adjust the desired heat level. These control elements can be placed independently from the power electronics unit at an appropriate position in front of the rider. The LED indicates the actual output power level.

The adjustment of the desired heat level happens through pushing up/down buttons. Pushing the blue button decreases the heating power by 10%. Pushing the red button increases the heating power by 10%. Adjusting the power output to 0% means the hot grips are switched off. If you adjust the power output to 100% the hot grips are heating constantly at full power. Please make sure if your hot grips are designed to run with full power constantly. If not, reduce the power after initial heat up to prevent damage to your hot grips.

The actual heating power is indicated by a red LED. The on/off ratio of this LED corresponds to the power level. The longer the flashing time, the more power is delivered to your hot grips.

The GHZ-D features a temperature sensor, which shall be located in the airstream, away from hot parts like headlamp, engine or exhaust. That temperature sensor detects changes of the air temperature, which causes the GHZ-D to re-adjust the power output automatically. This results in a very constant & comfortable warmth. You can change the set power level at any time with the push buttons.

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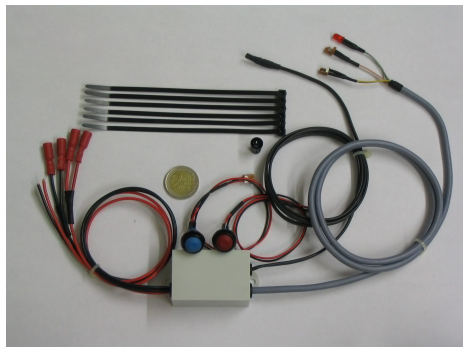
## Installation and operating instructions

The connecting cable between power electronics unit and control elements is approximately 90 cm long; the cable between temperature sensor and power electronics unit is approx. 100cm long. Both of them may neither be shortened nor extended.

## 7 Scope of delivery

The scope of delivery includes the following single items:

- 1 power electronics box connected with control elements
- 2 insulation displacement connectors (blue) for connection to the motorcycle's electrical system
- 6 cable tie wraps
- 1 cable eye, 4 OEM-style round connectors
- 1 user manual



Please check for completeness before starting any installation work.





## 10 Installation instruction

- a. Install your grip heating system according to the manufacturers guide.
- b. The switch, that is included in all hot grip sets, is not required and can be removed. Attention: Don't remove the round connectors on the hot grip's cables. These will be needed for the connection to this product, the GHZ-D.
- c. Select the mounting location carefully. Make sure that the GHZ-D is not exposed to direct heat radiation from parts like exhaust or hot engine parts. Ideal is a location behind the front fairing. A good location at naked bikes is under the seat. Although all components of the GHZ-1 are splash proof, it is recommended to select a protected location to avoid unnecessary exposure to water.
- d. Most hot grips on the market have a power consumption of 40-75W. The positive, fused circuit (+12V) of the motorcycle's horn is a good choice as power source for the GHZ-D.
- e. Fixate the power electronics unit with the attached cable tie wraps. Put a piece of sponge between the motorcycle's frame and the power electronics unit to reduce vibrations.
- f. The connection to negative ground (-12V) is done using the attached cable eye directly to the frame or using the insulation displacement connector to an existing ground lead.
- g. Every hot grip features two wires which are already equipped with round connectors. There is no need to observe polarity here. Connect one wire of each hot grip to a red output wire of the GHZ-D and the other wire of each hot grip to a black output wire of the GHZ-D. The output wires of the GHZ-1 are equipped with female round connectors.
- h. Rout the connection cable between the power electronics unit and control elements properly. The cable can be fixed with cable tie wraps. Be careful not to damage the cable by too sharp bending or squeezing. Make sure that the cable cannot be squeezed if the handle bar is turned to it's limits.

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- i. Identify an appropriate place to mount the control elements. When choosing the location for the control elements ensure good visibility and accessibility, even with motorcycle gloves. The following drill holes are required:
  - **Blue push button:** 13,5mm diameter
  - **Red push button:** 13,5mm diameter
  - **Indicator LED:** 8mm diameter
- j. Be careful not to damage any cables behind the drill holes.
- k. Check if the push button's sealing ring is in its place to ensure protection against splash water.
- l. The push buttons are connected to the power electronics unit using connectors. These connectors have different colors to avoid accidental interchanging of the connectors.
- m. Put the LED from behind through the 8mm drill hole, insert it into its socket until you recognize a snap-in. Put the LED-socket from the front side into the 8mm drill hole.
- n. Make sure the cables have proper strain relief to avoid damage by strain or vibrations. Use the attached cable tie wraps if necessary.
- o. Rout the temperature sensor + cable to the motorcycle front. Put the sensor in the airstream. Use the attached cable tie wraps to fixate cable and sensor. Be careful not to damage the cable by too sharp bending, sharp corners or squeezing. Make sure that the cable cannot be squeezed if the handle bar is turned to its limits.

## 11 Functional description

### 11.1. General

All the handling of the electronic power control unit GHZ-D is done by the two push buttons (red + blue).

Feedback about the status is given by the red indicator LED. Thus it is ensured that diversion of the rider is minimized during operation.

Please consider for your own safety that operation of the control elements during the ride impairs the riders attention and should therefore happen with increased caution.

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### 11.2. Switching on / operation

The electronic power control unit is equipped with a comfortable, digital program control, which adapts the amount of heat to the respective requirements. Switching the ignition on is registered by GHZ-D. This also activates the program control for the initiation sequence.

In this state the GHZ-D is still switched off, it waits for a start command via a push on one of the two push buttons (red or blue).

A single push on one of the buttons starts the initiation sequence.

During the first 15 seconds of the initiation sequence the GHZ-D will power down it's output terminals to give the motorcycle battery a chance to recover from cranking procedure. You'll see a fast flicker of the indicator LED during this stage.

In the second stage of the initiation sequence the GHZ-D will pre-heat the hot grips for 1 minute with 100% power to reach the desired heat level as fast as possible.

Please observe that the initiation sequence can not be interrupted since in this cycle the calibration and measurement of the temperature sensor takes place. During the initiation sequence the GHZ-D can only be switched off by switching off the ignition.

After this initiation sequence the GHZ-D will switch to automatic mode and will adapt the amount of heat to the respective requirements. The electronic power control elements will continue with the last set value from last ride.

### 11.3. Manual control

Using the 2 push buttons allows you to adjust the output power to your personal need for comfort.

The blue push button decreases the output power stepwise, the red one increases it.

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Output power can be carefully adjusted in increments of 10%. The lowest setting switches the power control elements off, only a negligible current is drawn in this state. The highest setting results in maximum constant power output.

Consequential the automatic temperature compensation is not active in the highest and lowest setting of the GHZ-D. Automatic control is active within the 10-90% range.

Please consider that some hot grips are not designed for constant operation with full power. For further information consult the corresponding documentation. The GHZ-D will therefore not exceed a 90% power level during automatic operation.

If you set the output power manually to 100% you have to avoid overload of the hot grips manually by decreasing the output power on time.

Each push on either the blue or red push button will decrease resp. increase the output power by 10%.

If the temperature sensor detects a temperature change, the GHZ-D automatically adjusts the output power to give you a constant warmth comfort.

Automatic control works within the 10-90% power output range.

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## Installation and operating instructions

### 11.4. Switching off

The device can be shut off in 2 ways:

#### 1. Switching off @ 0% power

If the power setting is decreased down to 0% by repetitive pushing of the blue button, the power control device is switched off. By pushing the red button it can be switched on again, the initiation sequence is skipped then.

#### 2. Switching off with ignition

The GHZ-D is switched off together with the ignition. The last set value is saved and the power control unit GHZ-D will continue at this specific power level next time it's switched on.

Next time the GHZ-D is activated, it will go through its initiation sequence as described above under "Switching on".

### 11.5. Reset

In case of a temporary failure, the GHZ-D can be reset to factory default like follows:

1. Switch off the ignition.
2. Keep the blue button pressed.
3. Switch ignition on while keeping the blue button pressed.
4. Wait for 5 seconds, release the blue button and switch ignition off.

Now the GHZ-D is reset to factory default.

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### 11.6. Status LED

The status LED delivers the following information:

<b>No light:</b>	Output is shut-off
<b>Fast flashing:</b>	GHZ-D is in initialisation phase, no power output
<b>Variable flashing:</b>	The LED's on/off ratio corresponds to the power level. The longer the flashing time, the more power is delivered to your hot grips.
<b>Constant light:</b>	Output power 100%

## 12 Testing

- Connect a 12V 21W lamp instead of hot grips to the output cords of the power control unit.
- The lamp should not light up if the output power is set to 0%. If the output power is set to 100%, the lamp should light up permanently. In all settings between these extremes the lamp should flash up in a variable rhythm. The more often you push the red button, the longer should the flashing period be, until it lights permanently at the 100% setting. If the power control unit is active, then the indicator LED lights permanently. To display the actual heating power, the indicator LED flashes in the same rhythm as power is delivered to the output terminals.

## 13 Trouble shooting

**Issue: I've installed the GHZ-D correctly, but the hot grips are getting warm on a different level.**

Perform the functional test that's described above.

- To do so separate the connection between hot grips and power control elements. Only the test lamp stays connected. If this test is successful, one of the hot grips has a direct electrical contact to the handle bar.
- This can occur with hot grips made from rubber, like those from -for instance- Daytona. A fix is to wrap a layer of self-adhesive tape between handle bar and hot grips. This problem occurs, if ever, on the left hand side, because the throttle sleeve is usually made from plastic and therefore an insulator.

**Issue: I change the set value, but the heat level doesn't change.**

Perform the functional test that's described above.

If the flashing rhythm doesn't change it is likely that humidity penetrated the components of the GHZ-D or there's a problem with bad insulation at the cable between the electronic box and the control elements. This may be caused by improper routing of the cable (wear from vibration).

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### **Q: Do I need a switch to power-off the GHZ-D?**

No, you don't. The GHZ-D is switched on and off together with the motorcycle's ignition system. If you want the device to be switched off during the ride, push the blue button repetitively until the indicator LED is off.

### **Q: GHZ-D works perfectly when the motorcycle's engine is not in operation. When the engine is running, the indicator LED shows an irregular flicker. What's going on here?**

There's presumably a problem with electromagnetic interference or distortions in the supply voltage caused by the motorcycle's ignition system. Check ignition components for proper EMI shielding. Keep the distance between ignition components (ignition coil, ignition cables, spark plugs, etc.) and components of the GHZ-D as big as possible.



## 14 Care & maintenance

All components of the electronic power control unit GHZ-1 are maintenance-free.

Use only a soft, dry cloth for cleaning. Do not use liquid cleaners which could attack the plastic housing.

Use a special plastic care fluid to bring back the plastic housing's original shine and fat black colour, if the surface got dull under the influence of time and sunlight.

Only properly trained personnel that is familiar with generally accepted electrical engineering standards is allowed to perform any type of repair on this product.

## 15 Disposal

Dispose this device after it's lifetime according to your local guidelines & regulations.

## 16 Technical data

Power supply:	12 V DC from a fused circuit
Max. load:	75 W max. @ 14,4 Volt, non-inductive load
Operating temperature:	-30°C - +45°C

## 17 Service / Support

Service handling and support is given by the merchant who supplied this product.

## 18 Imprint

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