AGG 3

Power generator controller.
Extension for SMS-operated Alarm & Switch Controller Sikom GSM 12A.

Installation and User Manual

1. Overview of AGG 3

Push-buttons for controlling the generator manually:
stop   start

Output relays for start and ignition

Input for start detection

Data to/from GSM 12A

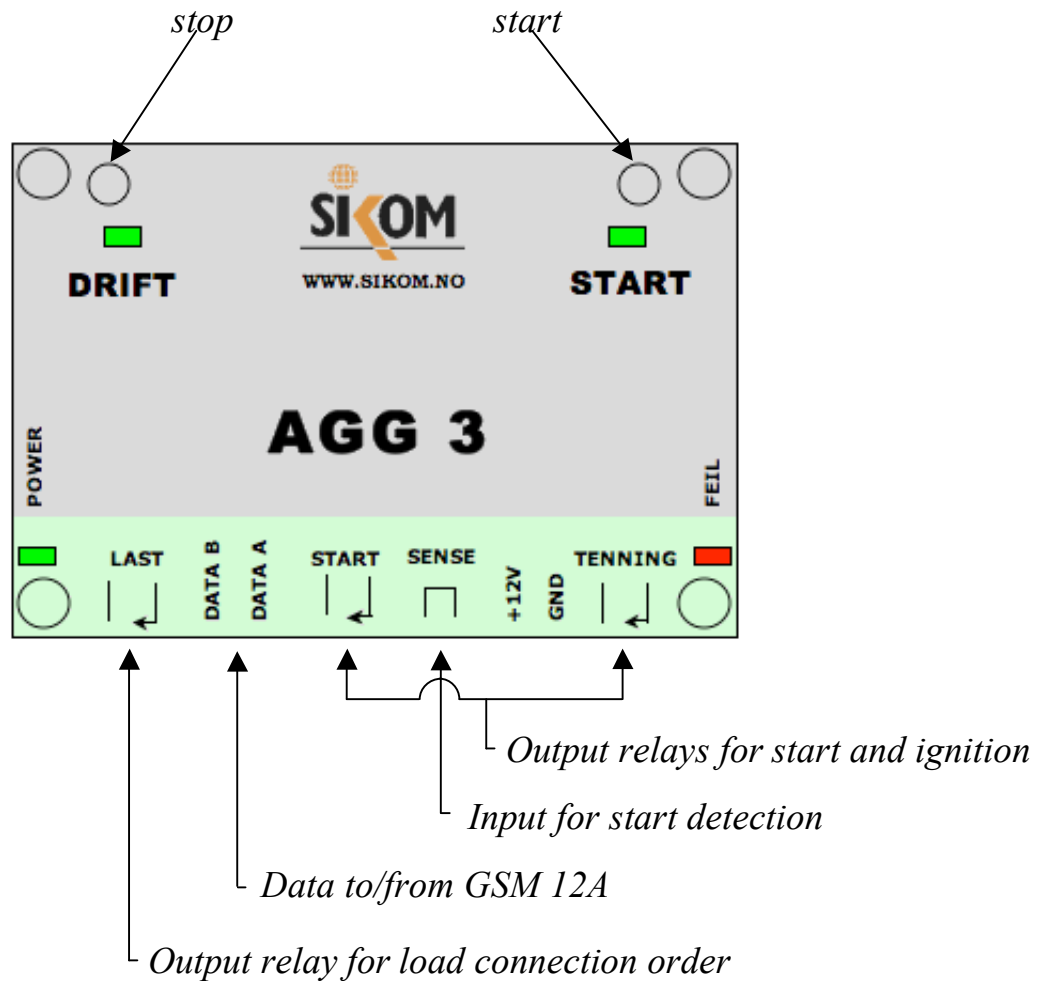*Output relay for load connection order*

Fig. 1. Overview of AGG 3

- 3 output relays rated 16A 50VDC :
  - ignition ("**TENNING**")
  - start ("**START**")
  - load connection ("**LAST**").
- 2 push-buttons for local start/stop of generator.
- 4 LEDs:
  - power ("**POWER**", for AGG 3 itself)
  - fault ("**FEIL**")
  - running status of generator: start ("**START**") and running ("**DRIFT**").
- Input for monitoring of engine rotation ("**SENSE**").
- Data bus ("**DATA A**", "**DATA B**") for connecting to GSM 12A.

2. Connections

The following connections are required before using AGG 3.

2.1. Connection to GSM 12A

AGG 3 must be connected to **GSM 12A** in order to be operated remotely.
Connect terminals "**DATA A**" and "**DATA B**" of **AGG 3** to "**DATA A**", respectively "**DATA B**" of **GSM 12A** (cf. Fig. 2).

2.2. Connection to the power generator

Relay contacts "**TENNING**" (ignition) and "**START**" (start) of **AGG 3** are to be connected to the power generator so that they replace the ignition key and the start switch (cf. Fig. 2).

The relay labelled "**LAST**" (load) is designed to activate an auxiliary relay, which in turn connects the load that consumes the generated power.

NB! This auxiliary relay must be rated to stand the load consumption!

The auxiliary relay is to be mounted in series on the live 230V phase output of the generator (cf. Fig. 2) so that the load only gets connected once the generator has reached a sufficient rotational speed and the engine has run warm enough. Some generators get damaged when started under load. The delay before connecting the load is adjustable with **AGG 3:** please refer to the manual of the generator for adjusting this delay correctly.

The terminal pair labelled "**SENSE**" constitutes a voltage measurement input used by **AGG 3** for determining if the generator has started and is running.
This input is polarity independent. The starter motor will be disconnected when the voltage reaches a user-defined threshold between the two **SENSE**–terminals or between one of the **SENSE** inputs and GND. The generator engine will be considered as started and running as long as the measured voltage is higher than this threshold. **Max voltage on SENSE input: 16V.**

Some generators have a 12V charging output that can be used for this purpose, but then the charging output will not be usable simultaneously for charging. If the generator has no charging output, use instead its 230VAC output with an auxiliary relay (depending on the generator type) to determine if the start is successful or not.
A third alternative is to mount an RPM rotational speed monitor and to adjust it for use with **AGG 3**.

2.3. Connection to the power supply

Connect the power supply (necessary for powering on **AGG 3**) to terminals **+12 volt** and **GND.**
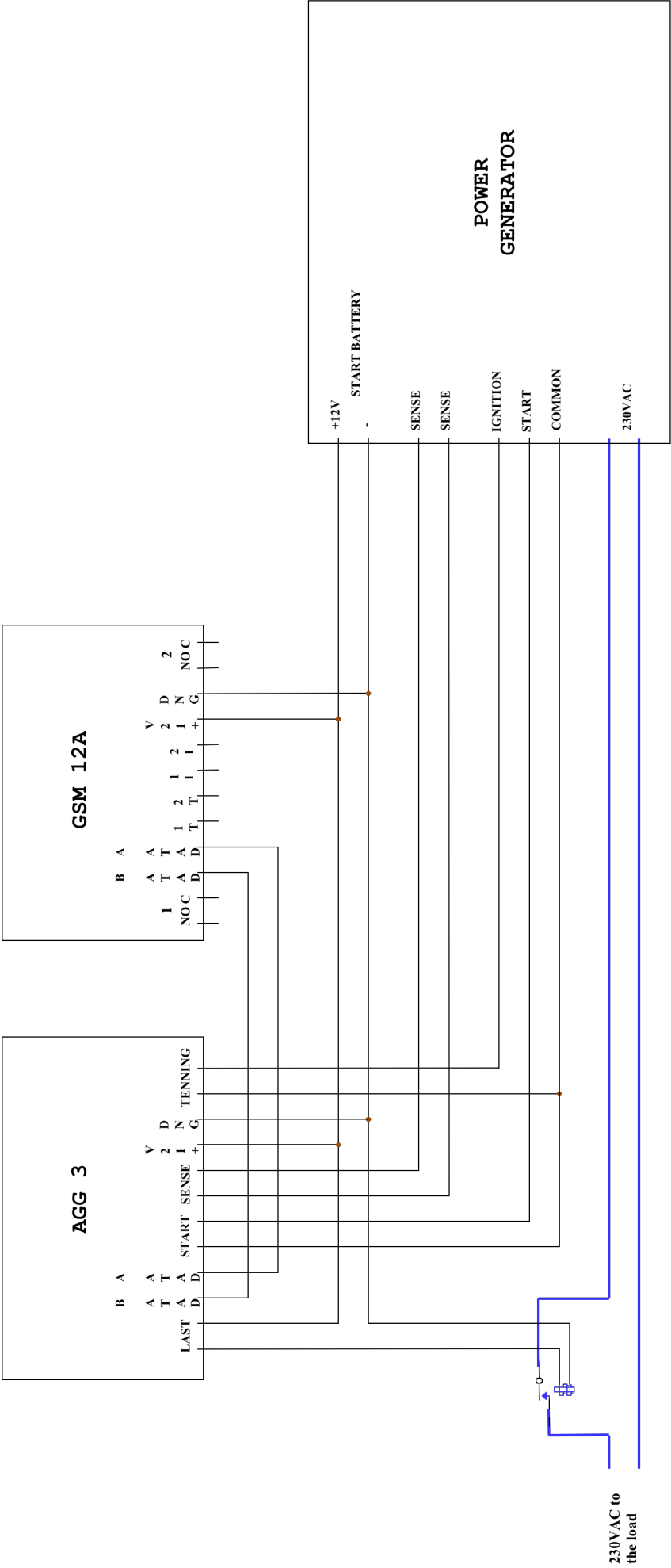**NB!** Do not power on **AGG 3** before all other connections are done.

Fig. 2. Connections between AGG 3, GSM 12A and the power generator

3. Configuration

AGG 3 must not be powered on before all connections have been made. Once powered, its LED labelled "**POWER**" will turn on.

NB! DO NOT START THE GENERATOR BEFORE ALL START-UP PARAMETERS HAVE BEEN ADJUSTED!

3.1. Adjusting the start-up parameters

The start-up parameters of **AGG 3** are set by sending SMS commands to **GSM 12A**. Several commands may be combined within a single SMS message.

E.g.: the SMS **1234 F09 E00 H03** sets voltage threshold to 9V, start motor disconnection delay to 0 seconds, and load connection delay to 3 minutes.

F	Voltage threshold for start detection

Command **F** sets the voltage threshold that will disconnect the start motor as soon as the generator engine is running. This threshold is influenced by the method used for monitoring the rotational speed.
The start motor gets disconnected once the "**SENSE**" input is higher than this threshold.

E.g.: **1234 F07** for disconnecting at 7V (the voltage is always written with 2 digits)
E.g.: **1234 F10** for disconnecting at 10V

NB!   Max. 15V!

E	Delay before disconnecting the start motor

Command **E** sets the delay before disconnecting the start motor, after the voltage threshold set with **F** has been reached. This is to fine-tune the disconnection point.

E.g.: **1234 E00** sets no delay (the delay is always written with 2 digits)
E.g.: **1234 E13** sets a delay of 1.3 seconds before the disconnection

NB!   Max 1.5 seconds!

Voltage threshold and disconnection delay must be determined experimentally. Start with a low voltage threshold and increase it gradually until an adequate level is found. Stop the generator with the left-hand push-button of **AGG 3** if the start engine does not get disconnected in time.

H	Delay before connecting the load

The connection of the load may be delayed for some minutes after the generator has started. This is to prevent possible damage to the generator engine by letting it run warm before it gets loaded.
Command **H** is followed by the delay in minutes before the load is connected.
NB! Please refer to the manual of your generator for the recommended delay.

E.g.: **1234 H00** sets no delay (the delay is always written with 2 digits)
E.g.: **1234 H03** sets a delay of 3 minutes after start before the load is connected

NB!   Max 15 minutes!

4. Operating the generator

GSM 12A and **AGG 3** are configured and controlled by means of regular SMS messages sent from mobile phones. The factory-set personal access code **1234** will be used in the following examples. You should set a new access code as soon as possible – and remember it!

4.1. How to send SMS commands

SMS messages must always contain the following:
  • First, the 4-digit access code
  • Then, any control commands (several can be sent in the same SMS)

Send SMS commands to **AGG 3** by using the phone number of the SIM card inside your **GSM 12A**.

4.2. Operation by means of SMS commands

Q	**Start/stop generator, request status**

Command **Q** is followed either by **0** for *stop,* **1** for *start* or **2** for requesting current status and configuration parameters.

E.g.:   **1234 Q1**   starts the generator
E.g.:   **1234 Q0**   stops the generator
E.g.:   **1234 Q2**   requests an SMS with current status and configuration parameters

4.3. Starting & stopping the generator

The generator can be started/stopped manually (with the push-buttons of **AGG 3**) or with SMS messages. Error and start/stop follow-up messages are sent to the mobile phone number stored inside **GSM 12A**. However, explicitly requested status messages (with command **Q2**) are sent to the requesting phone.

4.3.1. Starting the generator
Once the start button has been depressed (during approx. 1 second), or an SMS containing the start command has been received, the LED labelled "**START**" will turn on and the ignition start. After a few seconds, the start motor will run until it has been detected that the generator engine has started. The start motor will run for at most 15 seconds. A new attempt will take place after a pause of 30 seconds in case of failure.

If the generator engine does not run after 5 attempts, ignition will be switched off and an SMS sent with the message "**Error: Generator does not start!**". Further attempts may be ordered by sending the start command again.

Once the generator engine has started, the load will be connected after some minutes (programmable delay 0 – 15min). The LED labelled "**DRIFT**" will then turn on and an SMS with the message "**Generator started!**" sent off.

4.3.2. Possible faults
If the generator stops during operation (e.g. if it runs out of fuel), the load will get disconnected, ignition switched off and the SMS message "**Error, generator stopped!**" sent off.

The LED labelled "**ERROR**" will blink red to signal the fault. It will not be allowed to start the generator again before the issue has been solved and the stop button of **AGG 3** briefly pushed to reset the fault status.

4.3.3. Stopping the generator

The generator is stopped either by depressing the stop button of **AGG 3** or by sending the stop command by SMS. The load will then be disconnected and ignition switched off.

AGG 3 will check if the generator engine has really stopped before sending the confirmation message "`Generator stopped!`". If the engine does not stop within 12 seconds (useful for diesel engines), the message "`Error: Generator does not stop!`" will be sent. The LED labelled "**ERROR**" will blink red to signal the fault. The stop button of **AGG 3** must be briefly operated to stop the generator and reset the fault status.

5. Troubleshooting

No light from any LED:
- Is the power supply of **GSM 12A** and **AGG 3** connected (terminals **+12V** and **GND**) correctly?
- Does the battery (or other power supply) provide sufficient voltage/power?

LED labelled "ERROR" blinks:
- The generator has stopped because of a fault (no fuel?).
- The generator did not stop at command.
- Problem with RPM (engine rotation speed) monitoring.

No contact by SMS:
- Please consult the manual of **GSM 12A**.

Message "Generator does not stop" is received:
- Please consult the manual of the generator.

6. Preconditions and advice

- In an SMS, **1** always means *ON* and **0** (zero) is always *OFF*.
- Uppercase and lowercase letters can be used equally in commands.
  E.g., **S** is the same as **s**.
- The 4-digit personal access code always comes as the first 4 characters of a message.
- Space characters (blanks) may be used between commands, but not inside a command:
  e.g., **1234 R1** is valid, but **1234 R 1** will not be understood.
- Commands sent to **GSM 12A/AGG 3** may be combined inside a same SMS message:
  e.g., **1234 R1 S** activates relay #1 and requests a status message.
- Always wait 1 minute or more between each SMS message sent to **GSM 12A** (messages may take some time to be delivered).

7. Technical specifications

Manufacturer: Sikom AS, Norway
Model: AGG 3
Operating voltage: 7.5 – 15.0 V DC
Relays: 16A - 50V (use an auxiliary relay for connecting the load to the generator!)
Max voltage on SENSE input: 16V
Consumption: 22 mA (standby)
Operating temperature: -20 to +50 ºC
Dimensions (LxDxH):   111 x 28 x 62 mm
Weight: 130g

AGG 3 is designed for indoor use only.

This equipment complies with the European R&TTE directive.
Further information may be obtained by contacting either the Swiss importer through
www.EcoStarter.com or the manufacturer:

Sikom AS
Jernbanegata 16/18
P.O. Box 223
7601 Levanger
Norway

Internet address: www.sikom.no

8. Recycling information

The WEEE (Waste Electrical and Electronic Equipment) symbol indicates that this product must not be disposed of along with other household waste. It is the customer's responsibility to dispose of the product properly by taking it to a designated site for recycling. To locate a recycling/disposal site near you, contact your local city recycling program, your regular waste disposal service or the agent from whom you purchased this product.

For Switzerland, this product includes in its purchase price a contribution (the advanced recycling fee) to the SWICO Recycling Warranty, which means that used equipment can be handed in free of charge for recycling. Collection sites are listed at www.swicorecycling.ch.

9. Warranty

Sikom A.S. products are covered by a two years warranty against any faults due to material flaws or manufacturing errors, which limit or render useless certain functions described for the product. The warranty requires the customer to present the original bill, with date of purchase and type of equipment clearly readable.

What is covered by the warranty?
During the warranty period, Sikom A.S. reserves the right to repair the product or to replace defective parts with functionally equivalent parts. If, after several attempts, Sikom A.S. is unable to correct the problem, and the product does not work as described in the manual, Sikom may elect to refund the purchase price or to replace the product with a functionally equivalent one. All replaced parts and products become the property
of Sikom A.S.

What is not covered by the warranty?
- Indirect damage to life, health, property, revenue and environment caused by circuits and appliances connected to the unit (install and use this product responsibly).
- Costs related to (re)installing, transporting and dismantling units; recycling may be governed by special rules (see the relevant chapter).
- Damages caused by use outside of the operating conditions specified in the manual.
- Malfunctions caused by transport damages.
- Any unauthorized repair, modification or disassembly.
- Use of non-original parts.
- External factors, such as lightning, power supply issues, mobile network issues, flood damage or fire.
- Units with modified, removed or unreadable serial number.

Sikom assumes no responsibility for any errors that may appear in this manual.
Information contained herein is subject to change without notice.