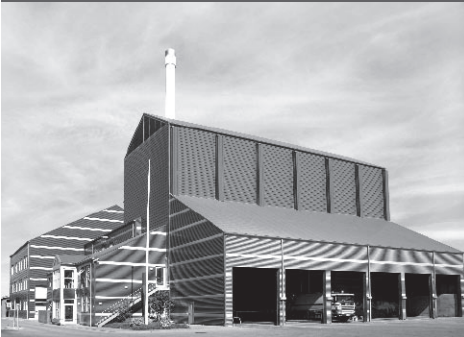




-power in control



INSTALLATION INSTRUCTIONS



Compact Genset Controller, CGC 400

- Mounting
- Terminal overview
- Wiring
- Communication wiring
- Unit dimensions and cutouts



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1. General information

1.1 Warnings, legal information and safety

1.1.1 Warnings and notes

Throughout this document, a number of warnings and notes with helpful user information will be presented. To ensure that these are noticed, they will be highlighted as follows in order to separate them from the general text.

Warnings



Warnings indicate a potentially dangerous situation, which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.

Notes



Notes provide general information, which will be helpful for the reader to bear in mind.

1.1.2 Legal information and disclaimer

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the engine/generator controlled by the unit, the company responsible for the installation or the operation of the set must be contacted.



The unit is not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.

The English version of this document always contains the most recent and up-to-date information about the product. DEIF does not take responsibility for the accuracy of translations, and translations might not be updated at the same time as the English document. If there is a discrepancy, the English version prevails.

1.1.3 Safety issues

Installing and operating the unit may imply work with dangerous currents and voltages. Therefore, the installation should only be carried out by authorised personnel who understand the risks involved in working with live electrical equipment.



Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.



DEIF do not recommend to use the USB as the primary power supply for the unit.

1.1.4 Electrostatic discharge awareness

Sufficient care must be taken to protect the terminal against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

1.1.5 Factory settings

The unit is delivered from factory with certain factory settings. These are based on average values and are not necessarily the correct settings for matching the engine/generator set in question. Precautions must be taken to check the settings before running the engine/generator set.

1.2 About the installation instructions

1.2.1 General purpose

These Installation Instructions mainly include general product and hardware information, mounting instructions, terminal strip descriptions, I/O lists and wiring descriptions.

The general purpose of this document is to give the user important information to be used in the installation of the unit.



Please make sure to read this document before starting to work with the unit and the genset to be controlled. Failure to do this could result in human injury or damage to the equipment.

1.2.2 Intended users

These Installation Instructions are mainly intended for the person responsible for the design and installation. In most cases, this would be a panel builder designer. Naturally, other users might also find useful information in the document.

1.2.3 Contents and overall structure

This document is divided into chapters, and in order to make the structure simple and easy to use, each chapter will begin from the top of a new page.

2. Mounting

2.1 CGC 400 mounting

2.1.1 Mounting of the unit

The unit is designed for mounting by means of six fixing clamps, which are included at delivery.

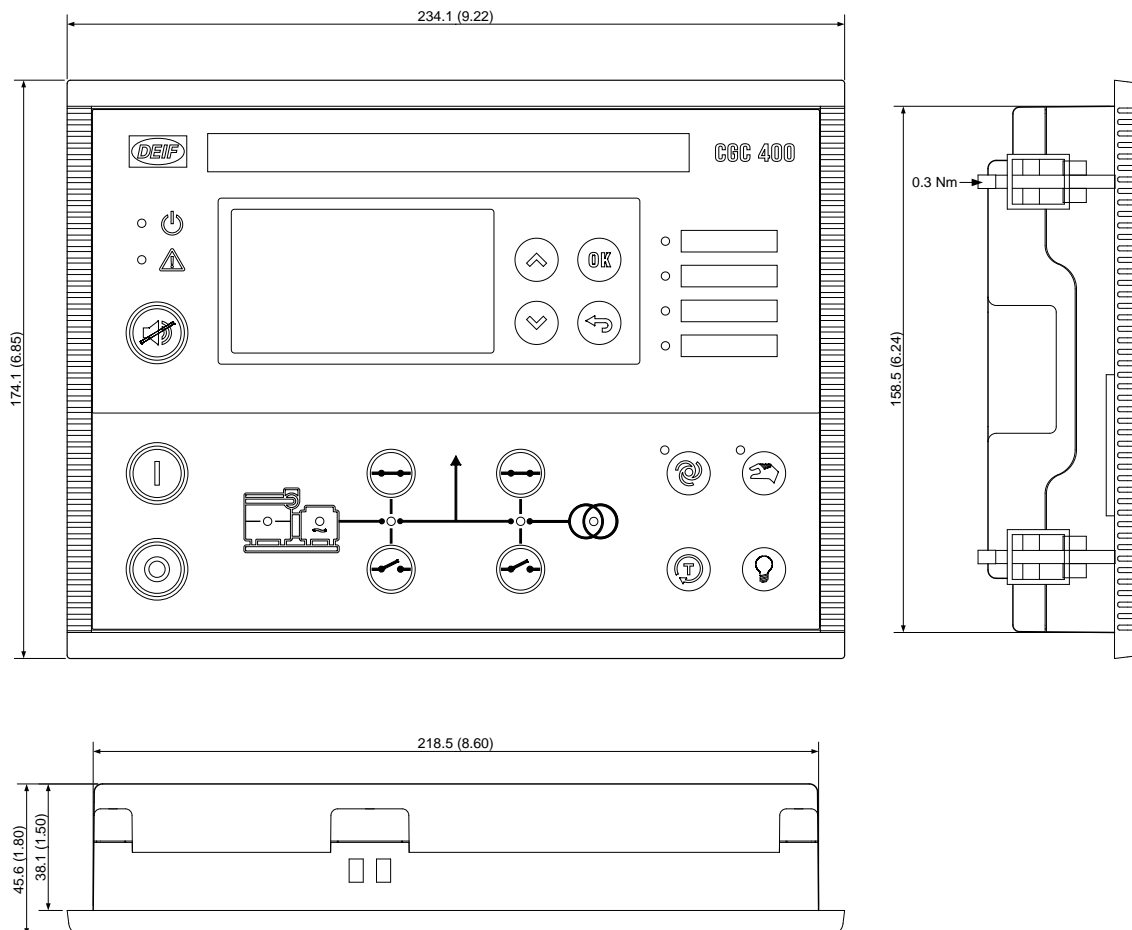
2.1.2 Unit dimensions and panel cutout

The unit is designed for mounting in the panel front.

In order to ensure optimum mounting, the panel door must be cut out according to the following measurements:

$$H \times W \text{ (mm)} = 160.0 \times 220.0 (+0.4/-0.0)$$

$$H \times W \text{ (inches)} = 6.30" \times 8.66" (+0.01575/-0.0)$$



2.1.3 Tightening torques

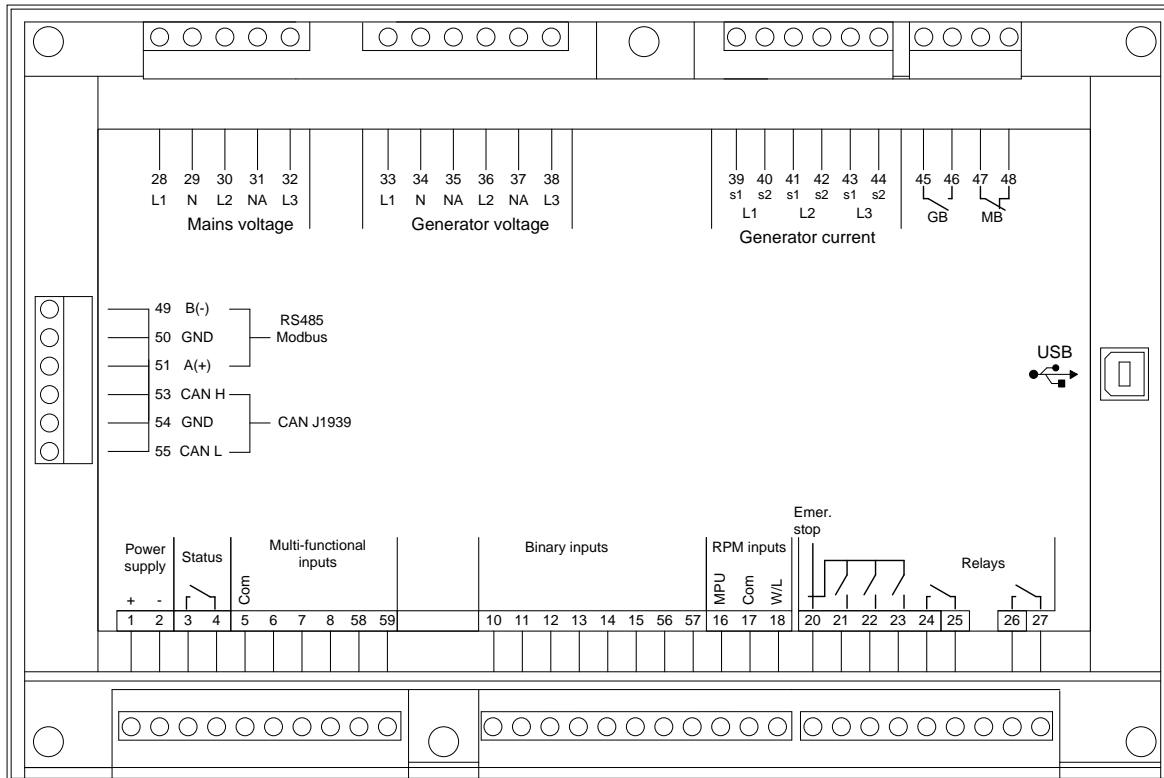
Unit panel door mounting:	0.3 Nm (see diagram in "Unit dimensions and panel cutout")
Plug connections (terminals):	0.5 Nm

3. Terminals

3.1 Terminal overview and description

3.1.1 Terminal overview

CGC 400 unit rear view



Terminals 28-32, 56-57 and 58-59 are not available in CGC 412.

3.1.2 Terminal description



Description of terms

For the relay outputs, the following terms will be used:
NO means Normally Open.
NC means Normally Closed.
Com. means common terminal for the individual relay.

Term	Technical data	Description
1	Power supply +	Auxiliary supply
2	Power supply -	
3-4*	Status output 2 A @ 35 V _{dc}	General status output/configurable
Digital input		
10	Digital input	Remote start/configurable
11	Digital input	Remote stop/configurable
12	Digital input	Remote alarm ack./configurable
13	Digital input	Shutdown override/configurable
14	Digital input	Configurable
15	Digital input	Configurable
56**	Digital input	Configurable
57**	Digital input	Configurable
Output		
20	Emergency stop and common for 21 to 23	Common for relay start prepare, starter (crank) and run coil, and input for emergency stop
21	Relay output 21	Start prepare/configurable, function NO
22	Relay output 22	Starter (crank)/configurable, function NO
23	Relay output 23	Run coil/configurable, function NO
24-25	Relay output 24	Horn/configurable function NO
26-27	Relay output 26	Configurable, function NO
Multi-functional inputs		
5	Common	Common for term. 6 to 8 and 58 to 59
6	RMI6 4 to 20 mA/binary input	Fuel level/configurable
7	RMI7 4 to 20 mA/binary input	Oil pressure/configurable
8	RMI8 4 to 20 mA/binary input	Water temp./configurable
58**	RMI58 4 to 20 mA/resistive/binary input	<ul style="list-style-type: none"> • Resistive input or • 4 to 20 mA from active transducer or • Binary with wire break • Pt100 • Pt1000
59**	RMI59 4 to 20 mA/resistive/binary input	<ul style="list-style-type: none"> • Resistive input or • 4 to 20 mA from active transducer or • Binary with wire break • Pt100 • Pt1000
Tacho RPM input		
16	RPM input (MPU)	Magnetic pickup/tacho generator
17	RPM-GND	Common for RPM input. Internally connected to terminal 2
18	RPM input (W/L)	Magnetic pickup. PNP, NPN or charge alternator W term.

Term	Technical data	Description
3-phase generator voltage input		
33	Gen. voltage L1	GENERATOR VOLTAGE
34	Gen. neutral	
35	Not used, must not be connected	
36	Gen. voltage L2	
37	Not used, must not be connected	
38	Gen. voltage L3	
3-phase generator current input		
39	Gen. current L1, s1	GENERATOR CURRENT
40	Gen. current L1, s2	
41	Gen. current L2, s1	
42	Gen. current L2, s2	
43	Gen. current L3, s1	
44	Gen. current L3, s2	
3-phase mains voltage inputs		
28**	Mains voltage L1	MAINS VOLTAGE
29**	Mains voltage neutral	
30**	Mains voltage L2	
31**	Not used, must not be connected	
32**	Mains voltage L3	
Breaker relays		
45	Relay R45	Generator circuit breaker/configurable, function NO (normally open)
46	Relay R45	
Optional relay for closing mains breaker		
47	Relay R47	Mains circuit breaker/configurable, function NC (normally closed)
48	Relay R47	
Modbus RS 485		
49	B(-)	Modbus RS-485 RTU. Speed is fixed to 9600 bit/s.
50	GND	
51	A (+)	
CAN bus port: engine interface		
53	CAN-H	The CAN bus interface to J1939. The 120 ohm termination resistor is wired internally. It is not needed to add an external resistor.
54	CAN-GND	
55	CAN-L	



* The status relay is the uP watchdog output. This relay is normally energised, and the switch is closed after power-up. If the uP fails or the power is lost, the relay will de-energise and the switch will open. If the unit fails to start up at power-up, then the relay switch will remain open.



****Terminals are not available in CGC 412.**

The relay output functions are configurable via the PC utility software and can be configured to cover the following functions:

- Alarm/limit
- Engine run indication
- Horn
- Idle speed output
- Not used
- Prepare
- Run coil
- Starter
- Stop coil
- Engine heater
- Fuel pump

It is possible to choose run coil on one relay and stop coil on another, thus supporting engines with double systems.

The multi-functional inputs can be configured to cover the following functions:

- RMI sensor input
- Pt100 and Pt1000
- 4 to 20 mA input
- Binary input with wire break (switch function)

Tacho RPM input (MPU) can be configured to cover the following functions:

- Magnetic pickup (2-wire)
- NPN or PNP pickup (these RPM inputs require external equipment)

Tacho RPM input with capacitor (W/L) can be configured to cover the following functions:

- Magnetic pickup (2-wire)
- W terminal on charger alternator
- NPN or PNP (these RPM inputs require external components)

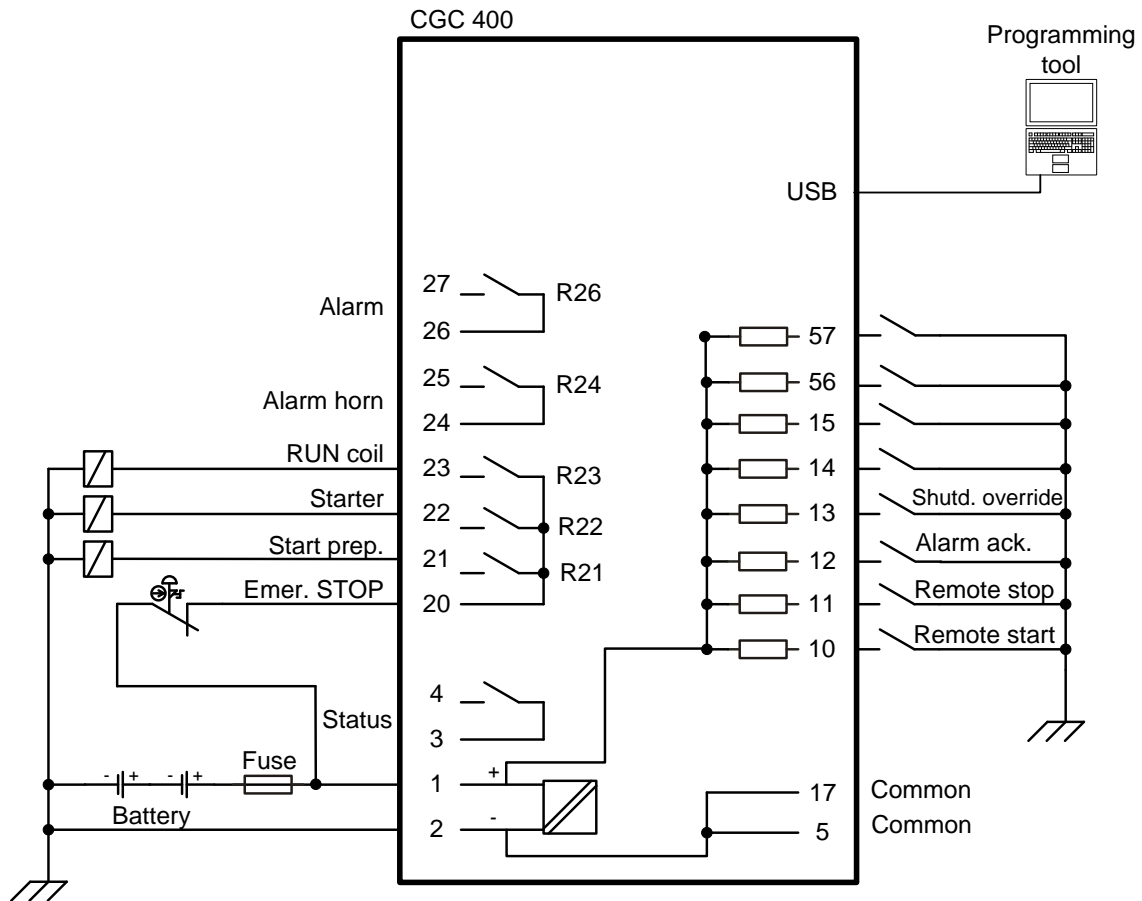
The generator voltage and current input can be configured to the following:

- Voltage 100 to 25000 V primary
- Current 5 to 9000 A primary

4. Wiring

4.1 Wiring diagram

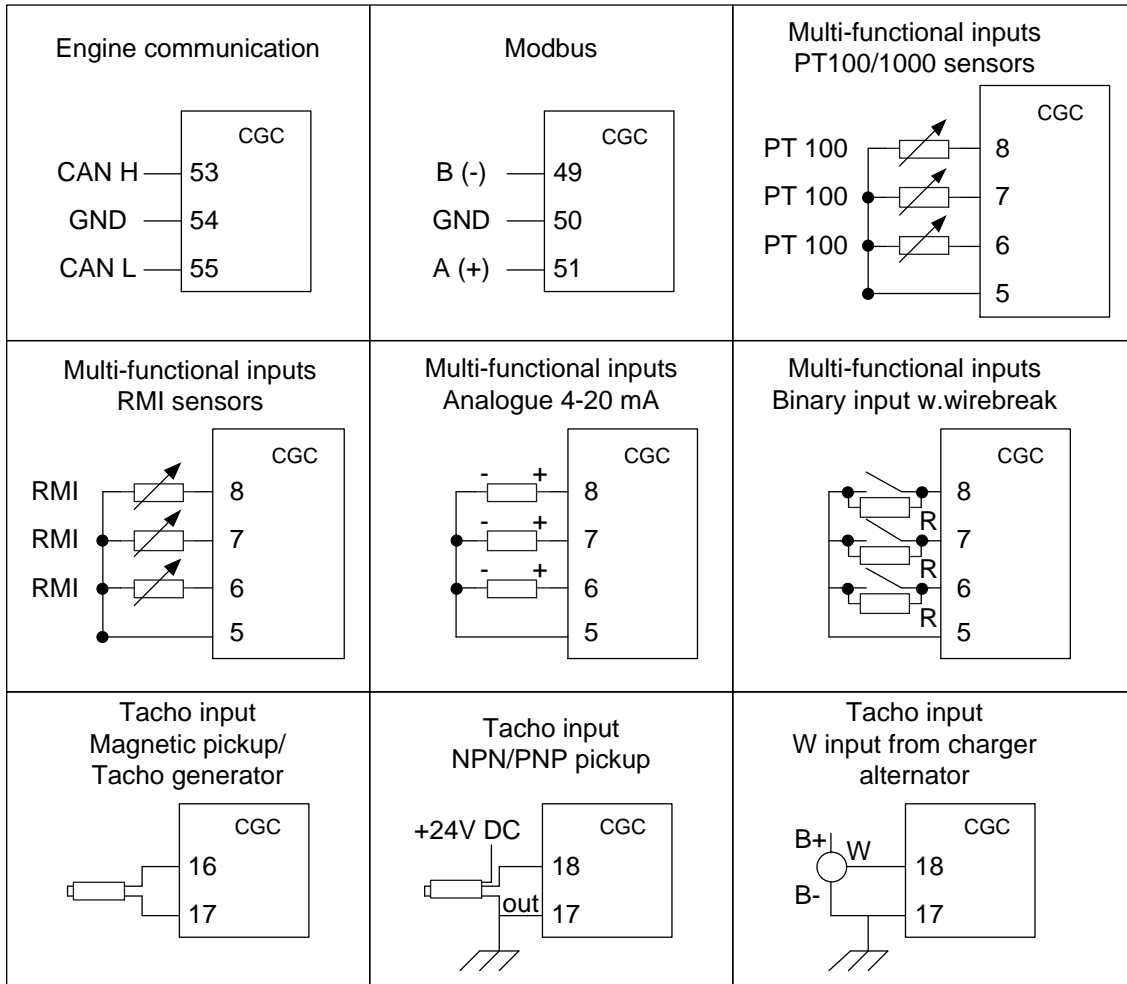
The wiring diagram below shows the default factory settings, but the use of inputs and outputs can be chosen freely.



It is important to protect the unit against damage caused by high voltages. Therefore, the fuse must not be more than 2 A slow-blow.

4.2 DC connections

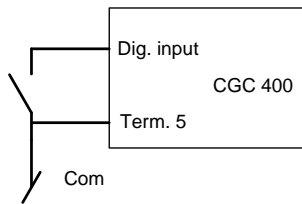
4.2.1 Communication, multi-input and tacho wiring instructions



Wiring of RMI 58 and 59 is done the same way as RMI 6-8

4.2.2 Binary inputs

Binary inputs 10 to 15 and 56 to 57 have an internal common positive (+), this means that they are triggered by a connection to negative (-).



i The binary inputs use fixed signals. Only the mode shift input and the test input (if the timer is used) use pulse signal.

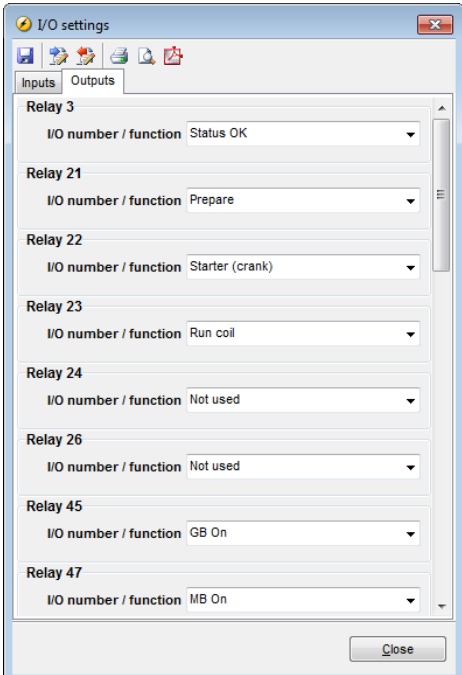
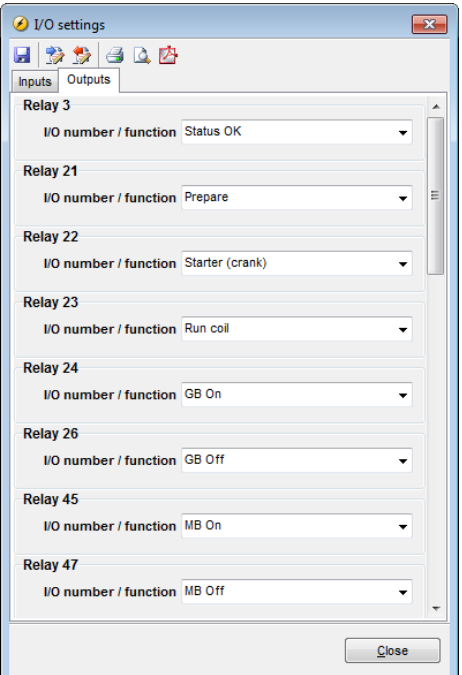
4.3 Breaker selection

4.3.1 Breaker selection

The controller can handle pulse, continuous and compact breakers. Selection of the breaker type is done in the application configuration with the PC utility software. Output for breaker handling is chosen in the I/O configuration of the PC utility software. In the table below is listed which outputs are needed for breaker handling depending on the breaker type.

Breaker type	GB on/MB on/TB on	GB off/MB off/TB off
Pulse breaker	X	X
Continuous breaker	X	
Compact breaker	X	X

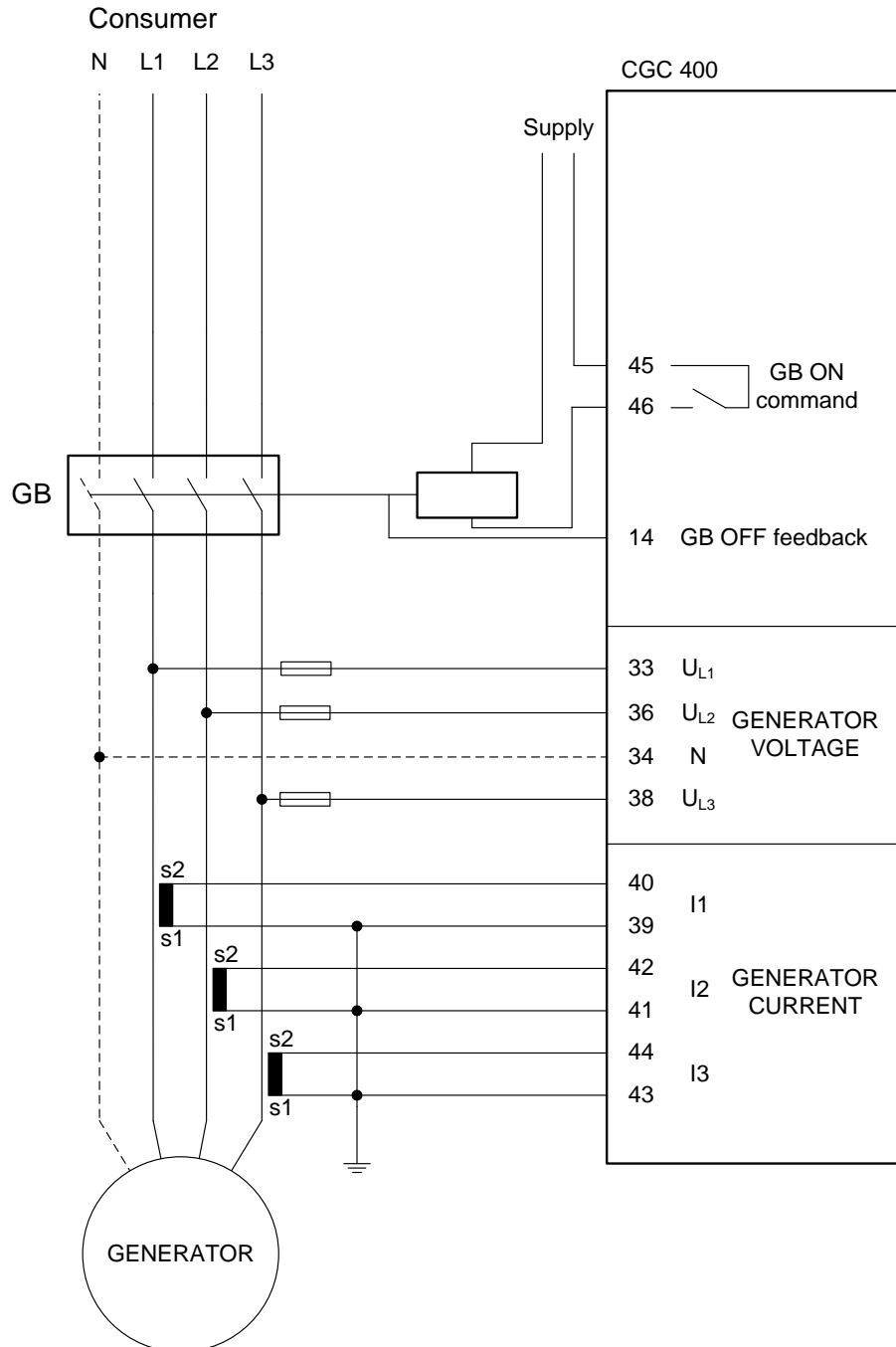
The pictures below are examples of how to set up breakers.

Continuous breaker output selection	Pulse breaker output selection																																				
 <p>The screenshot shows the 'I/O settings' dialog box with the 'Outputs' tab selected. It lists the following relay configurations:</p> <table border="1"><thead><tr><th>Relay</th><th>I/O number / function</th></tr></thead><tbody><tr><td>Relay 3</td><td>Status OK</td></tr><tr><td>Relay 21</td><td>Prepare</td></tr><tr><td>Relay 22</td><td>Starter (crank)</td></tr><tr><td>Relay 23</td><td>Run coil</td></tr><tr><td>Relay 24</td><td>Not used</td></tr><tr><td>Relay 26</td><td>Not used</td></tr><tr><td>Relay 45</td><td>GB On</td></tr><tr><td>Relay 47</td><td>MB On</td></tr></tbody></table>	Relay	I/O number / function	Relay 3	Status OK	Relay 21	Prepare	Relay 22	Starter (crank)	Relay 23	Run coil	Relay 24	Not used	Relay 26	Not used	Relay 45	GB On	Relay 47	MB On	 <p>The screenshot shows the 'I/O settings' dialog box with the 'Outputs' tab selected. It lists the following relay configurations:</p> <table border="1"><thead><tr><th>Relay</th><th>I/O number / function</th></tr></thead><tbody><tr><td>Relay 3</td><td>Status OK</td></tr><tr><td>Relay 21</td><td>Prepare</td></tr><tr><td>Relay 22</td><td>Starter (crank)</td></tr><tr><td>Relay 23</td><td>Run coil</td></tr><tr><td>Relay 24</td><td>GB On</td></tr><tr><td>Relay 26</td><td>GB Off</td></tr><tr><td>Relay 45</td><td>MB On</td></tr><tr><td>Relay 47</td><td>MB Off</td></tr></tbody></table>	Relay	I/O number / function	Relay 3	Status OK	Relay 21	Prepare	Relay 22	Starter (crank)	Relay 23	Run coil	Relay 24	GB On	Relay 26	GB Off	Relay 45	MB On	Relay 47	MB Off
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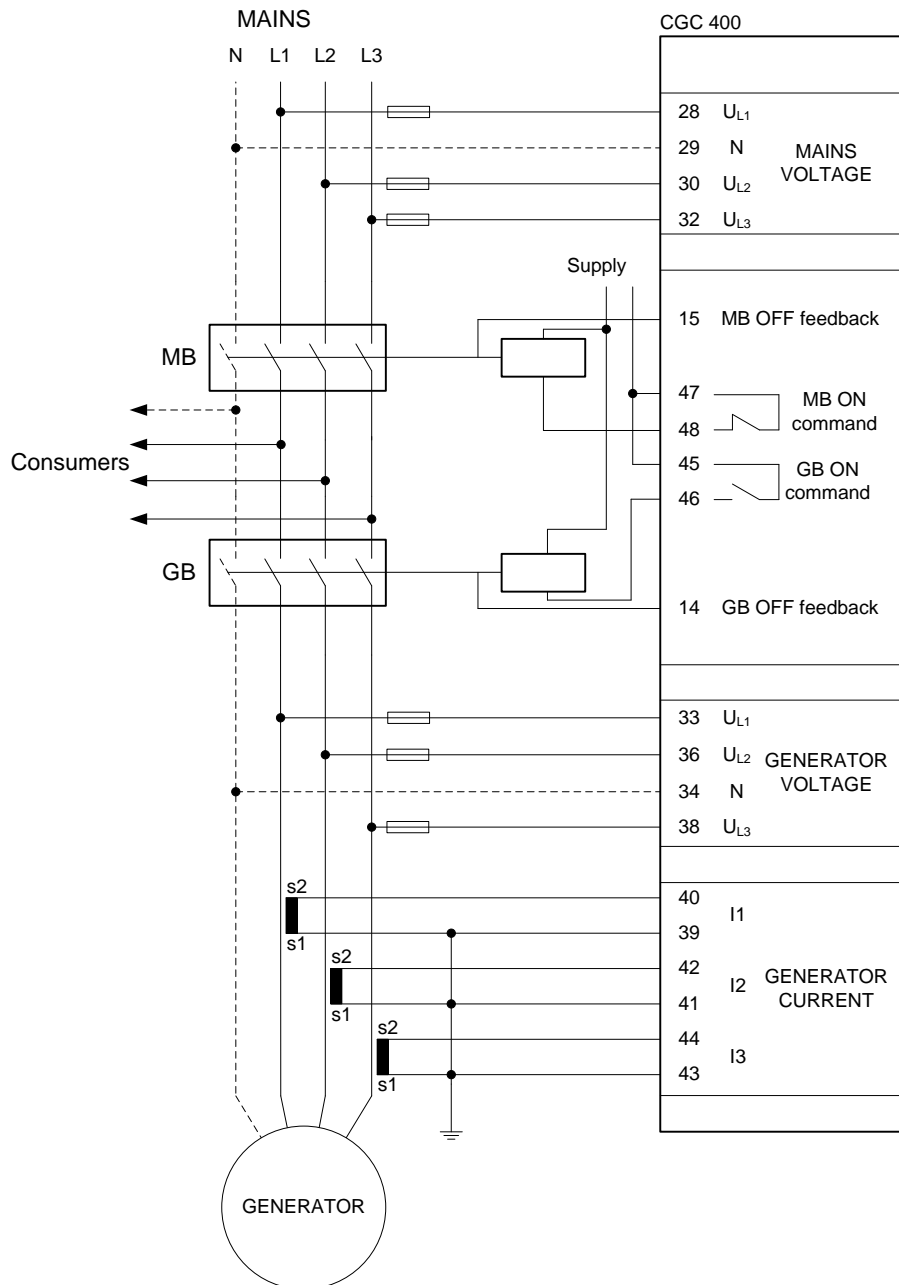
4.4 Connection of the 3-phase voltage and current

4.4.1 Connection of the 3-phase voltage and current

Wiring, AC interface

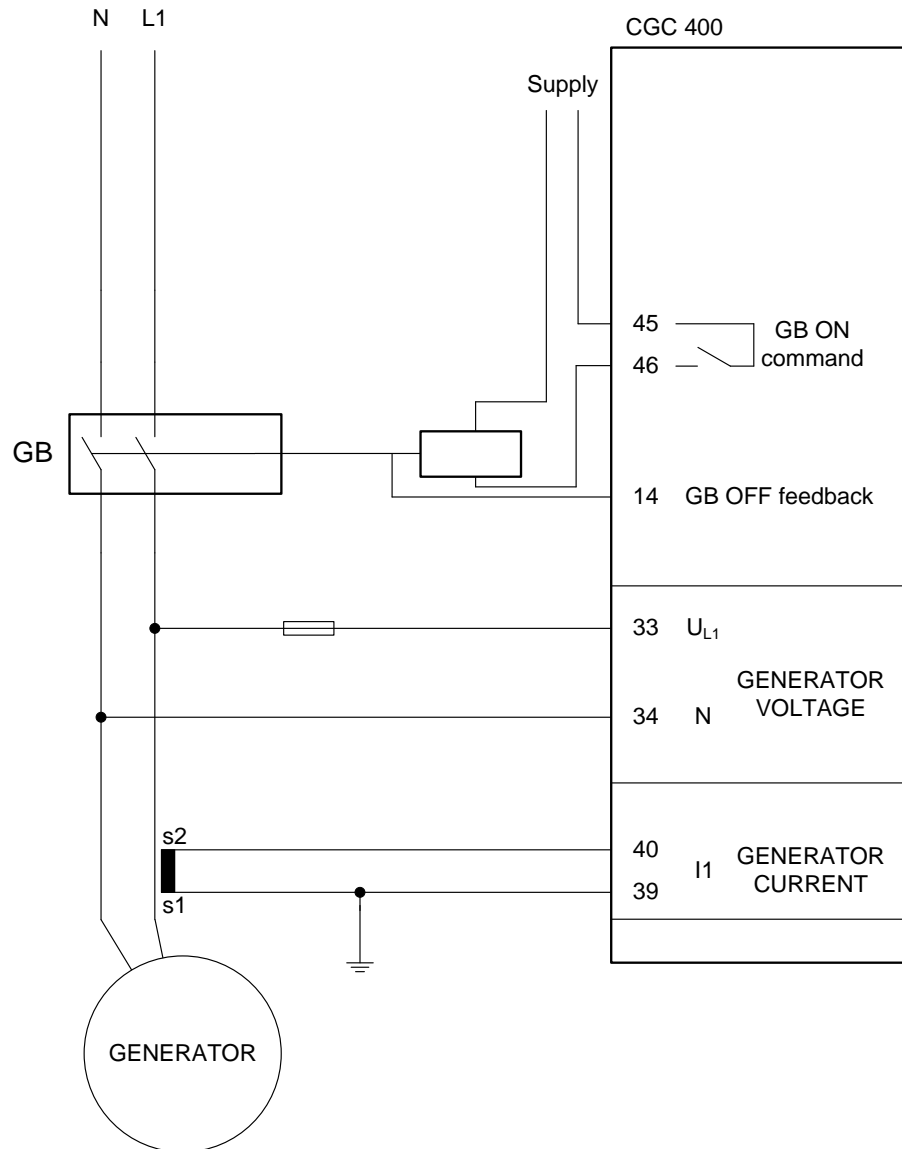


4.4.2 3-phase AMF wiring

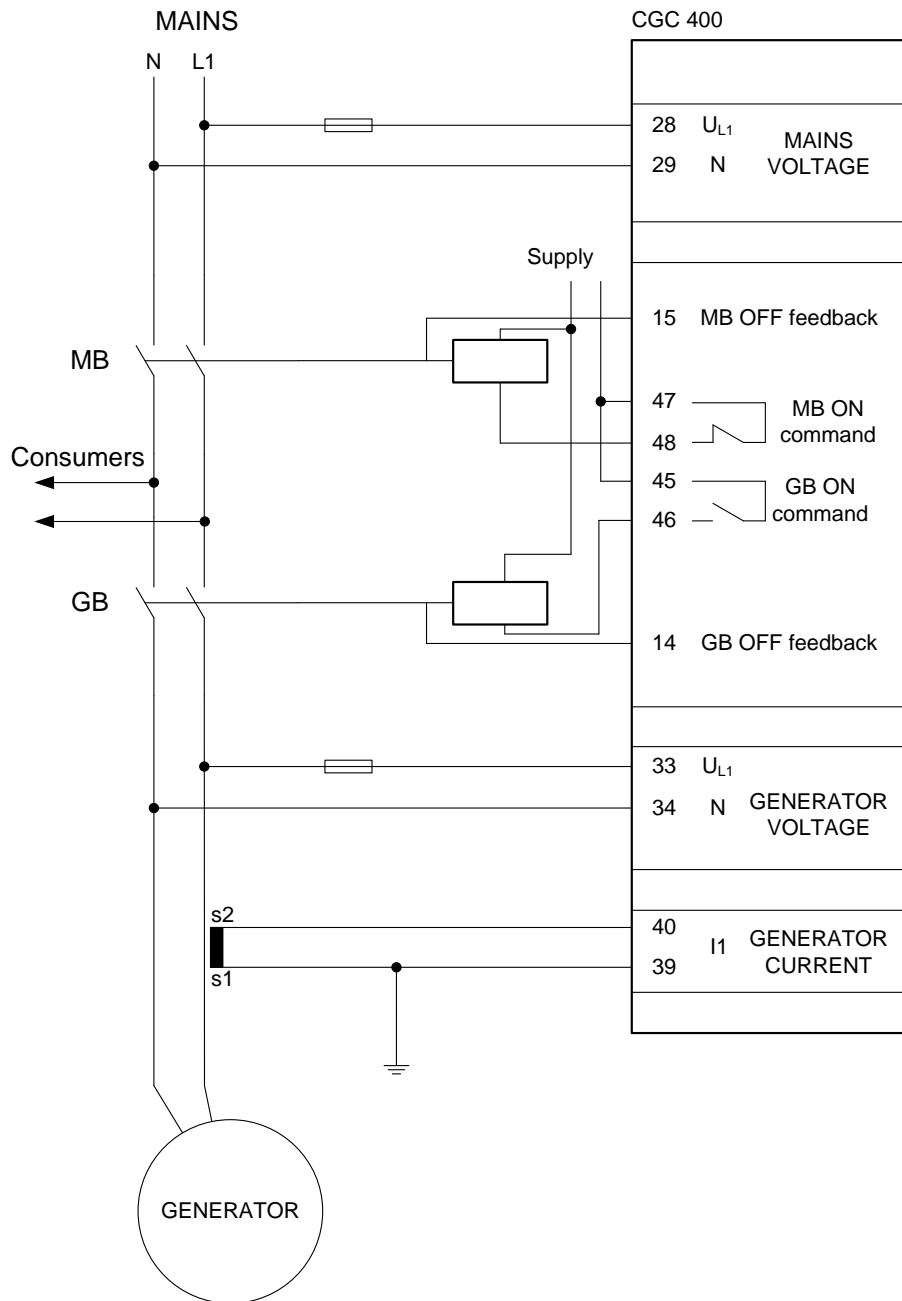


4.5 Connection of the 1-phase voltage and current

4.5.1 1-phase wiring

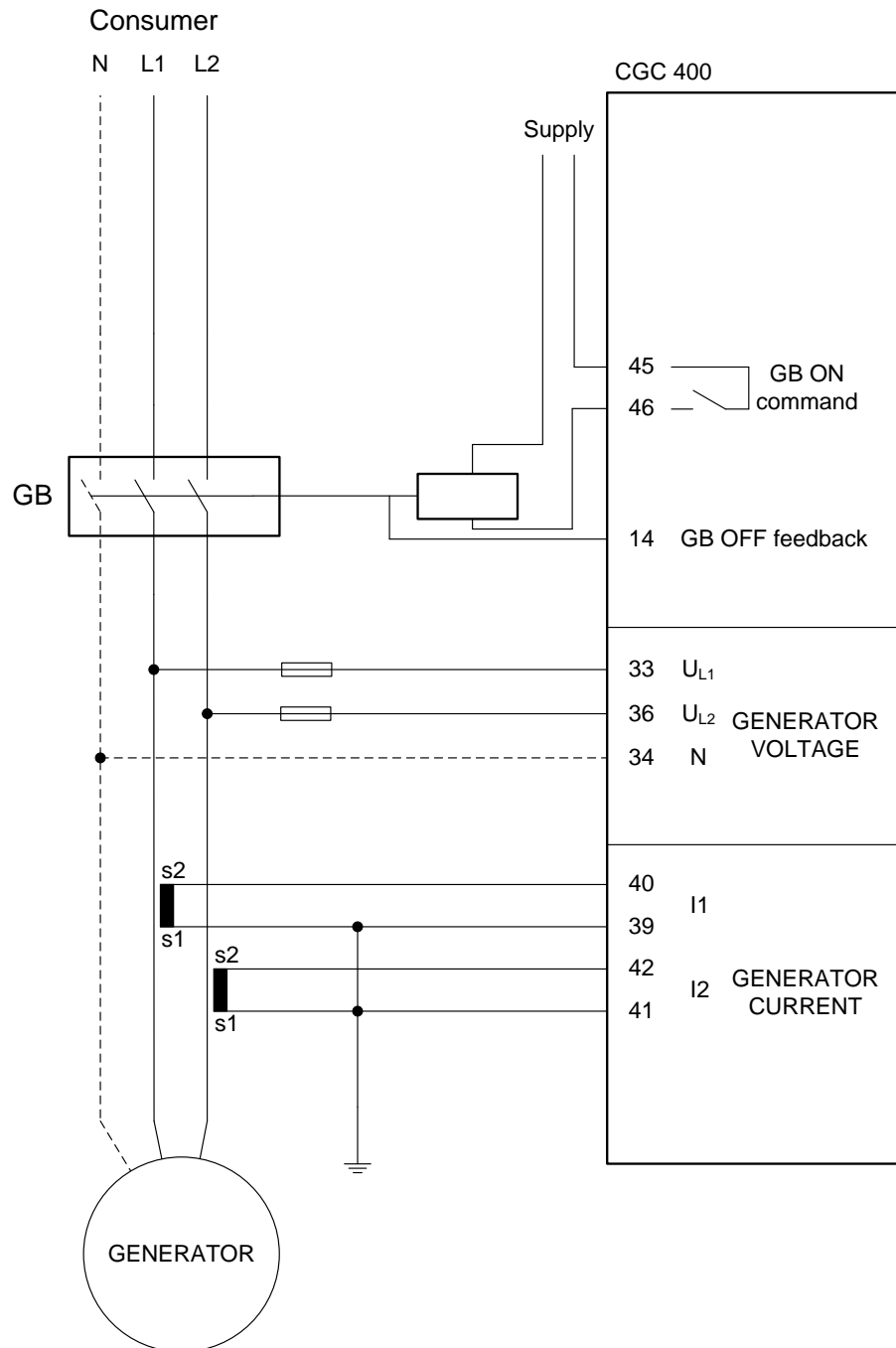


4.5.2 1-phase AMF wiring

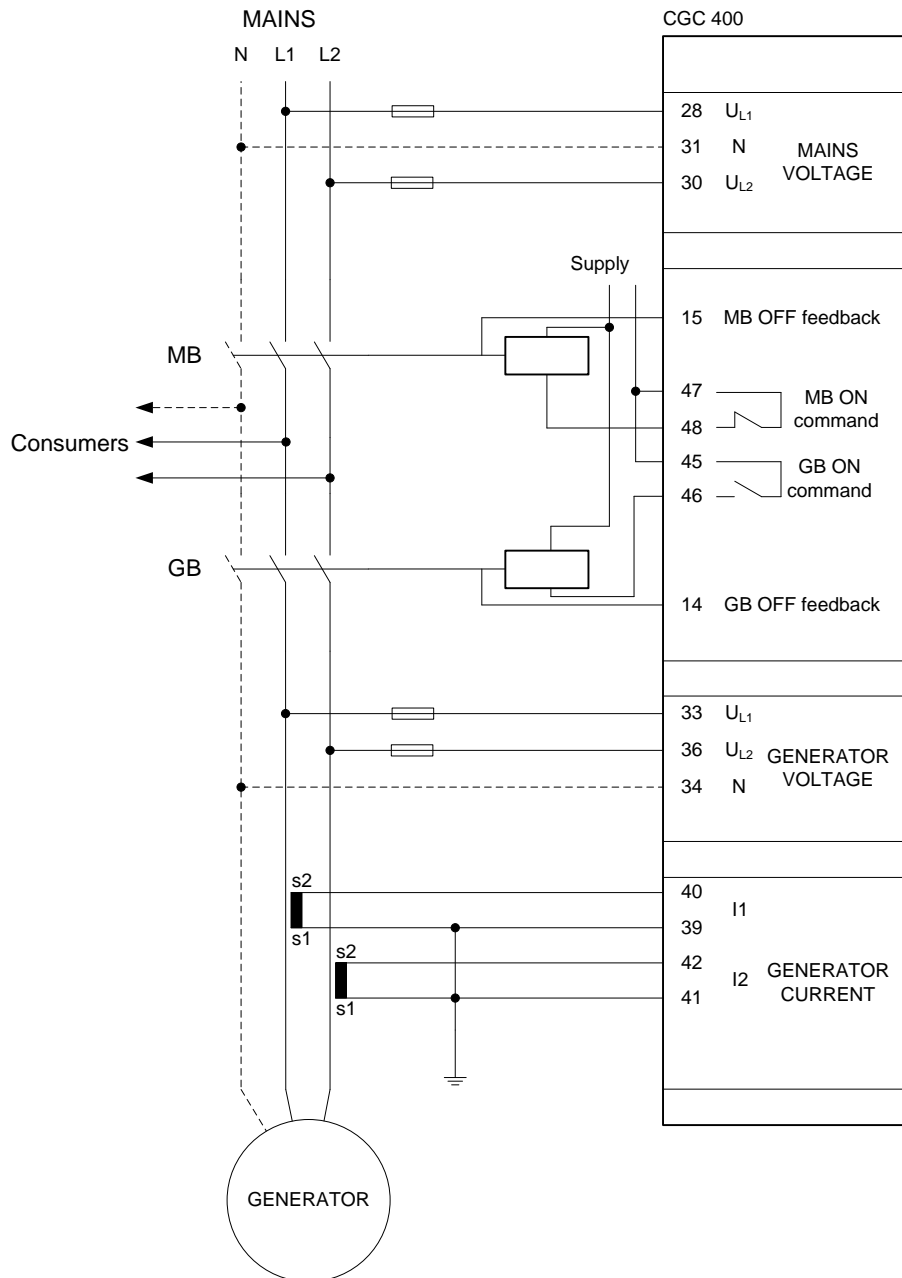


4.6 Connection of the split-phase voltage and current

4.6.1 Split-phase wiring



4.6.2 Split-phase AMF wiring



5. Communication

5.1 Wiring instructions

Cable

Belden 3106 A or equivalent. 22 AWG (0.324 mm²) shielded twisted pair, min. 95 % shield coverage.

CAN bus termination resistor

The size of the terminating resistors should be 120 Ω 1 %, 0.5 W resistor.



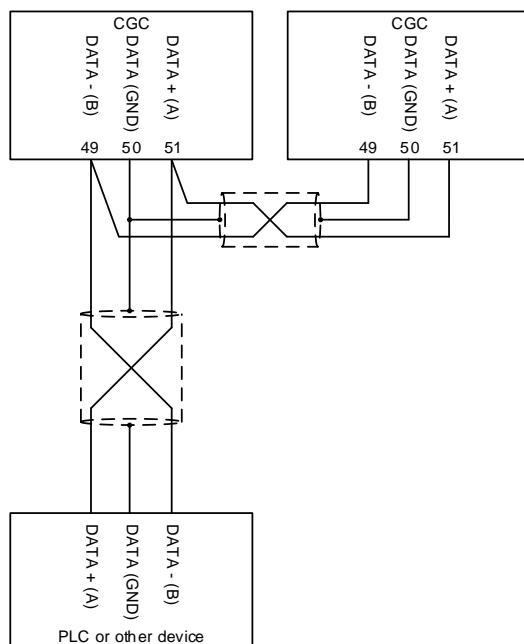
If the GND terminal is connected to a PLC or other device, the GND connection of this device must be isolated from earth!



Maximum length of the CAN bus line is 300 m.

5.2 Modbus RTU

5.2.1 Example with two CGC units



5.3 CAN bus engine communication

5.3.1 Example with one CGC unit

