AGC 150 Hybrid

4189341317B

Genset and PV controller

Operator's manual

Improve Tomorrow

1. Introduction

1.1 Symbols for hazard statements

DANGER!

This shows dangerous situations.

If the guidelines are not followed, these situations will result in death, serious personal injury, and equipment damage or destruction.

WARNING

This shows potentially dangerous situations.

If the guidelines are not followed, these situations could result in death, serious personal injury, and equipment damage or destruction.

CAUTION

This shows low level risk situation.

If the guidelines are not followed, these situations could result in minor or moderate injury.

NOTICE

This shows an important notice

Make sure to read this information.

1.2 About the operator's manual

This document gives the necessary information to operate the controller.

CAUTION

Installation errors

Read this document before working with the controller. Failure to do this may result in human injury or damage to the equipment.

Intended users of the operator's manual

The operator's manual is for the operator that uses the controller regularly.

The manual describes the LEDs, buttons and screens on the controller, alarm handling, and the logs menu.

1.3 Warnings and safety

Factory settings

The controller is delivered pre-programmed from the factory with a set of default settings. These settings are based on typical values and may not be correct for your system. You must therefore check all parameters before using the controller.

Data security

To minimise the risk of data security breaches:

- As far as possible, avoid exposing controllers and controller networks to public networks and the Internet.
- Use additional security layers like a VPN for remote access, and install firewall mechanisms.
- Restrict access to authorised persons.

1.4 Legal information

Third party equipment

DEIF takes no responsibility for the installation or operation of any third party equipment, including the **genset**. Contact the **genset company** if you have any doubt about how to install or operate the genset.

Warranty

NOTICE

Warranty

The controller 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.

Copyright

Software version

This document is based on the AGC 150 software version 1.11.0.

2. About the AGC 150 Hybrid

2.1 About controller operation

The AGC 150 Hybrid controller has all the functions needed to protect and control a system that includes gensets, up to 16 inverters, and a mains connection.

Greenfield and brownfield applications

In greenfield applications, the AGC 150 Hybrid controller can provide protection and control for a genset, the genset breaker, the inverters, the PV breaker, and a mains breaker.

You can also use the AGC 150 Hybrid controller to control PV power when this is added to an existing plant (brownfield applications).

Grid-tied

The controller can feed surplus PV energy to the grid. As an alternative to this, the controller can regulate the PV production to match the self consumption. This prevents feed-in PV power to the grid.

Off-grid

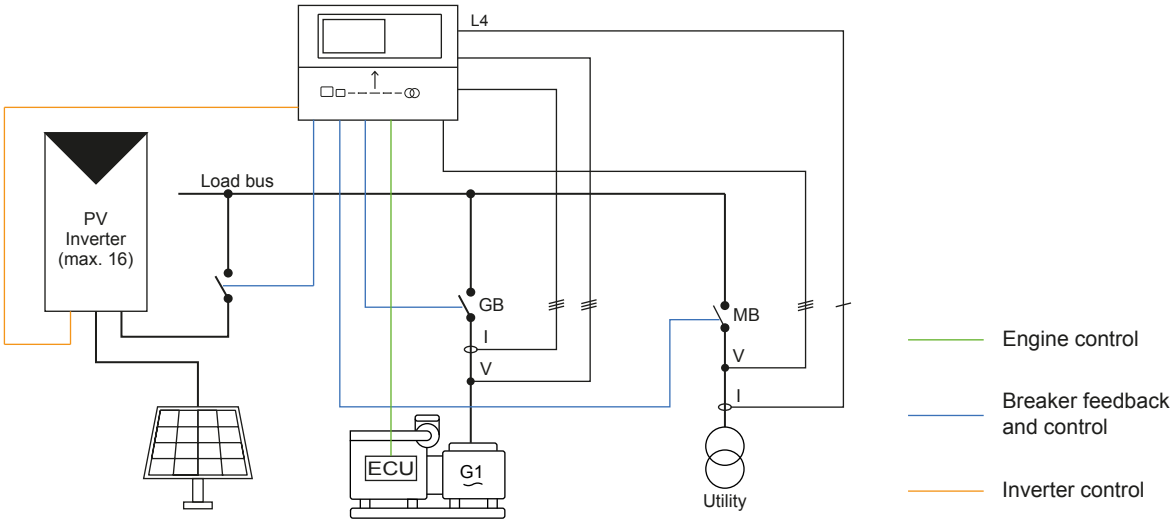
The controller can combine PV power with genset power. The controller uses the genset power measurements to calculate the set points for the PV power.

2.2 Applications

2.2.1 Greenfield

Hybrid application with a genset, PV and mains

One controller can control an application with a single genset, PV, and mains. It also controls the PV breaker and the mains breaker. The controller regulates the genset governor and AVR.



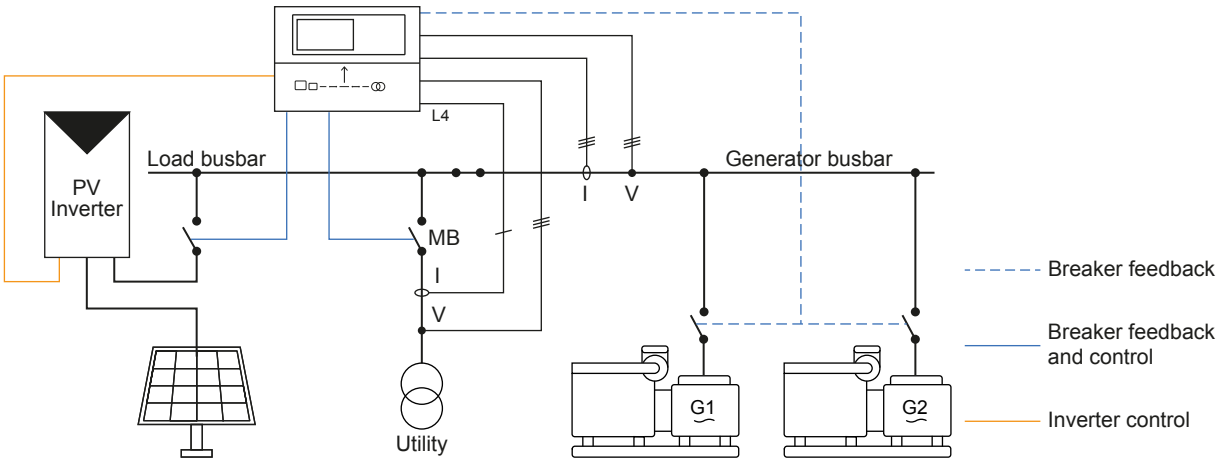
More information
See the **AGC 150 Hybrid data sheet** for the variations on the greenfield arrangement.

2.2.2 Brownfield

Adding PV to an application with synchronising gensets

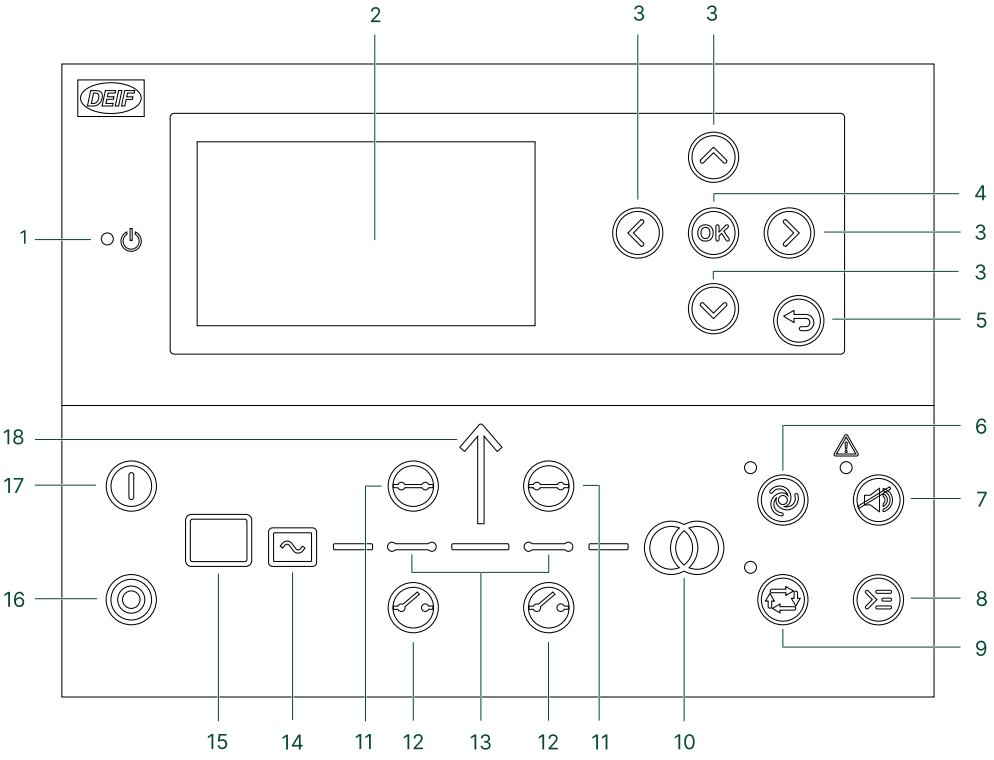
When PV power is added to a power management system (PMS), the application can include a maximum of two synchronising gensets. The PMS controls Genset 1 (G1) and Genset 2 (G2), and the genset breakers. The AGC 150 Hybrid controller is not part of the PMS.

Three sets of nominal settings are used in the controller to control the PV power. Different nominal settings are used in the controller when Genset 1 and 2, Genset 1 or Genset 2 are connected.



More information
See the **AGC 150 Hybrid data sheet** for the variations on the brownfield arrangement.

2.3 Display, buttons and LEDs



No.	Name	Function
1	Power	Green: The controller power is ON.

No.	Name	Function
		OFF: The controller power is OFF.
2	Display screen*	Resolution: 240 x 128 px. Viewing area: 88.50 x 51.40 mm. Six lines, each with 25 characters.
3	Navigation	Move the selector up, down, left and right on the screen.
4	OK	Go to the Menu system. Confirm the selection on the screen.
5	Back	Go to the previous page.
6	AUTO mode	The controller automatically starts and stops (and connects and disconnects) the genset. The controller also automatically connects and disconnects the PV and mains. No operator actions are needed.
7	Silence horn	Stops an alarm horn (if configured) and enters the Alarm menu.
8	Shortcut menu	Access the Jump menu, Mode selection, Test, Lamp test, and Hybrid (PV semi start and stop).
9	SEMI-AUTO mode	The operator or an external signal can start, stop, connect or disconnect the genset. The operator or an external signal can also open and close the other breakers (PV and mains). Automatic controller actions are not possible. The controller automatically synchronises before closing a breaker, and automatically de-loads before opening a breaker.
10	Mains symbol	Green: Mains voltage and frequency are OK. The controller can synchronise and close the breaker. Red: Mains failure.
11	Close breaker	Push to close the breaker.
12	Open breaker	Push to open the breaker.
13	Breaker symbols	Green: Breaker is closed. Green flashing: Synchronising or de-loading. Red: Breaker failure.
14	Generator	Green: Generator voltage and frequency are OK. The controller can synchronise and close the breaker. Green flashing: The generator voltage and frequency are OK, but the V&Hz OK timer is still running. The controller cannot close the breaker. Red: The generator voltage is too low to measure.
15	Engine	Green: There is running feedback. Green flashing: The engine is getting ready. Red: The engine is not running, or there is no running feedback.
16	Stop	Stops the genset if SEMI-AUTO or Manual is selected.
17	Start	Starts the genset if SEMI-AUTO or Manual is selected.
18	Load symbol	Green: The supply voltage and frequency are OK. Red: Supply voltage/frequency failure.

NOTE * You can use the display to monitor PV operation.

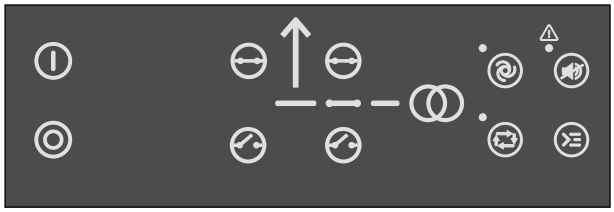
3. Operating the system

3.1 Mimic function

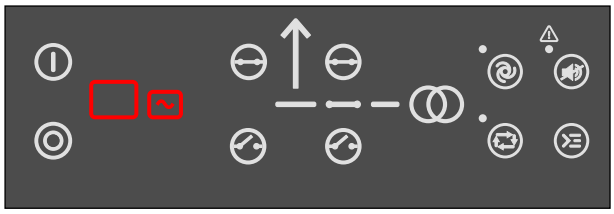
Settings > Basic settings > Controller settings > Display > LED mimic

Parameter no.	Item	Range
6082	LED mimic	Standard with genset Standard Guided with genset Guided

Standard
The control buttons and LEDs are shown.
If you stop the genset, the motor/generator symbols are not shown.

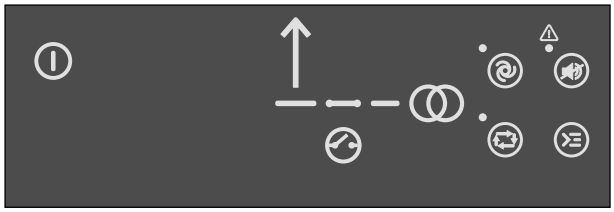


Standard with genset
The control buttons and LEDs are shown.
If you the stop the genset, the motor/generator symbols are shown in red.



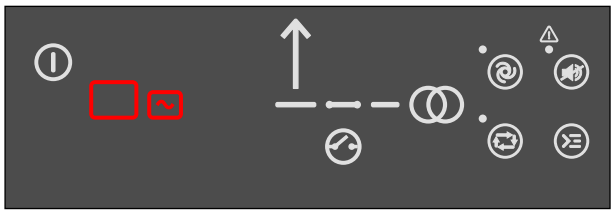
Guided
Active control buttons and LEDs are shown, inactive are not shown.

Example: The controller is in SEMI-AUTO mode, and the genset is not operating. Only the start button and the button to open the mains breaker are shown as these are the only possible action.



Guided with genset
Active control buttons, LEDs and the motor/generator symbols are shown, inactive are not shown.

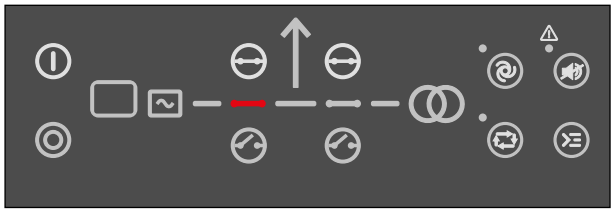
Example: The controller is in SEMI-AUTO mode, and the genset is not operating. The only possible action is to start the genset, or open the mains breaker. Therefore, only the start button, the red motor/generator symbols, and the button to open the mains breaker are shown.



All Mimic settings

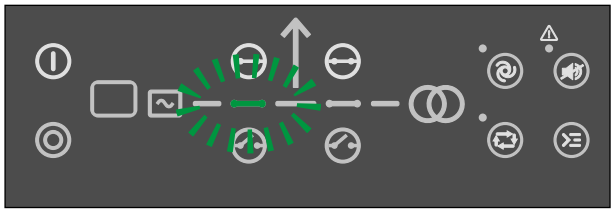
The breaker symbol is shown in red:

- Breaker position failure
- Breaker close failure



The breaker symbol flashes green:

- The controller is synchronising
- The controller is de-loading



3.2 Running modes

The controller has four running modes, and a test mode. To configure the running mode push the *Shortcut* button and select *Running Modes*. Configure the test mode in `Settings > Power set points > Test`. To run the test push the *Shortcut* button and select *Start Test*.

Mode	Description
AUTO	The controller automatically starts and stops (and connects and disconnects) the genset. The controller automatically connects and disconnects the PV and mains. The operator cannot start a sequence manually.
SEMI-AUTO	The operator or an external signal can automatically start, stop, connect and disconnect the genset. The operator or an external signal can also open and close the PV breaker and the mains breaker. The controller cannot do these actions. The controller automatically synchronises before closing a breaker, and automatically de-loads before opening a breaker.
MANUAL	The operator can use the digital increase/decrease inputs (if they are configured) and the buttons on the display. When the genset starts in manual mode, it starts without subsequent regulation. The operator cannot control the PV inverters in manual mode.
BLOCK	The controller cannot start a sequence. Select the block mode when you do maintenance work.
Test	You can select Simple test, Load test, Full test, and Battery test.

NOTE The genset shuts down if you select the block mode while the genset is operating.

3.3 Display settings

To adjust for ambient lighting, configure the display settings.

`Settings > Basic settings > Controller settings > Display > Display control`

Parameter	Text	Range	Default
9151	Backlight dimmer	0 to 15 *	12
9152	Green LEDs dimmer	1 to 15 *	15
9153	Red LEDs dimmer	1 to 15 *	15
9154	Contrast level	-20 to +20	0

Parameter	Text	Range	Default
9155	Sleep mode timer	1 to 1800 s	60 s
9156	Enable (Sleep mode timer)	OFF ON	ON
9157	Alarm Jump	OFF ON	ON
9158	Engineering units	Bar/Celcius PSI/Fahrenheit	Bar/Celcius

NOTE * Low numbers are minimum brightness and high numbers are maximum brightness.

4. Hybrid modes

The controller operates in hybrid mode when it is in AUTO mode and SEMI-AUTO mode. There is no control of the PV inverters in manual mode.

AUTO mode

The PV inverters start automatically when voltage and frequency are available. You can configure a signal for PV auto start. The PV inverters start if the signal is activated, and voltage and frequency are available.

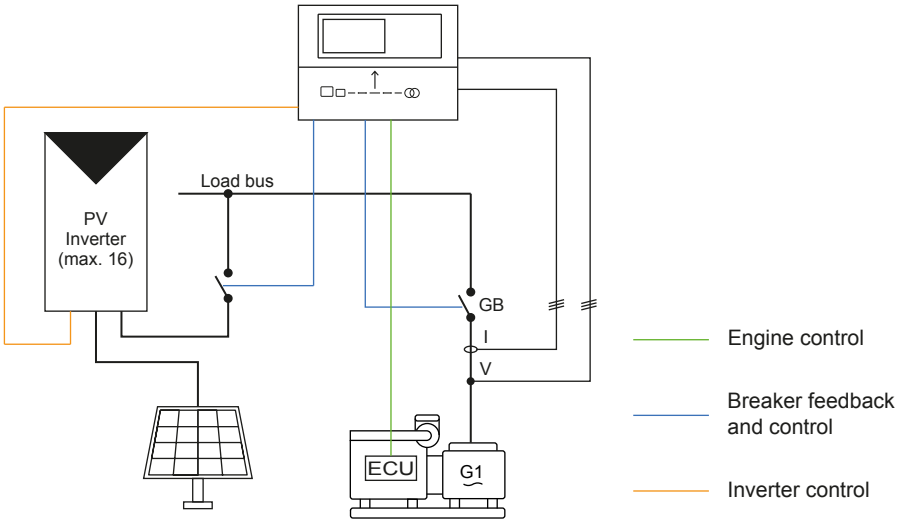
SEMI-AUTO mode

The PV inverters start if they receive a start signal from the controller, and the voltage and frequency are available.

4.1 PV Island operation

The PV inverters supply as much of the load as possible. The genset operates at or at more than the minimum genset load.

The AGC 150 Hybrid controller can control an application that combines PV power with genset power. It calculates the power set points for the PV power based on the genset power measurements. This ensures that the minimum genset load requirement is met.



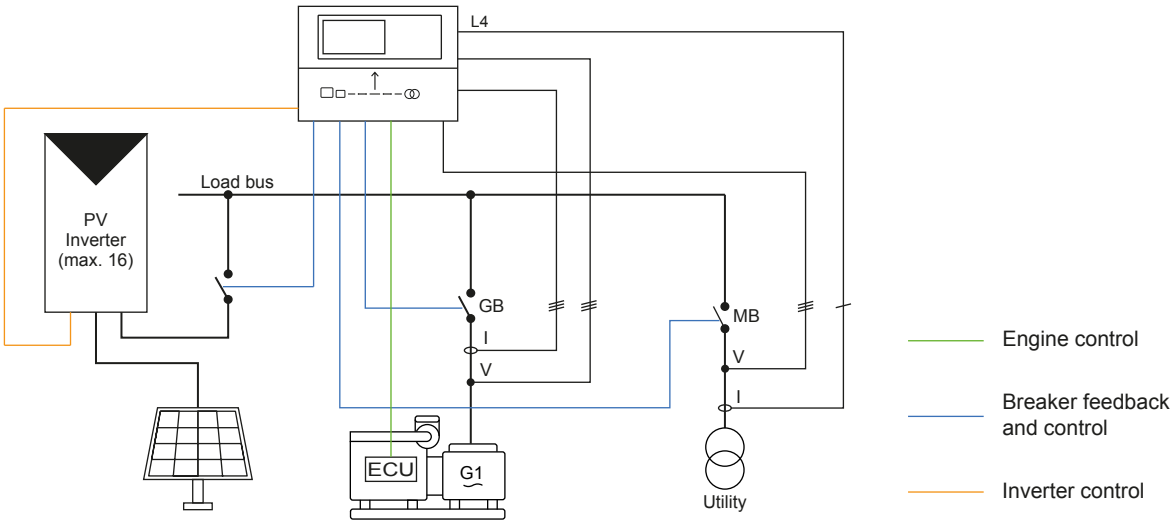
Start sequence

1. Activate a start signal.
   - In AUTO mode, activate the auto start/stop input.
   - In SEMI-AUTO mode:
     a. Push the *Start* button to start the genset.
     b. Go to the Hybrid shortcut menu to activate the PV inverters.
2. The genset starts and the generator breaker closes.
3. The genset supplies the load.
4. The PV inverters start the reconnect process to the busbar.
5. When the PV inverters are ready, the genset ramps down to the minimum genset load. The PV inverters supply the remaining load.
6. If the PV inverters cannot supply the load, the genset supplies the extra load.

4.2 PV AMF (Automatic mains failure)

During normal operation, the PV inverters supply the load the prevent/minimise the import or export of power at the mains. If there is a mains failure, the genset is started to take over from the mains.

One AGC 150 Hybrid controller can control an application with a single genset, PV, and mains. The AGC 150 regulates the genset governor and AVR. It also controls the PV breaker and the mains breaker. For the genset regulation, you can use the AGC 150 analogue outputs. Alternatively, regulate the governor and AVR using the ECU.



Start sequence

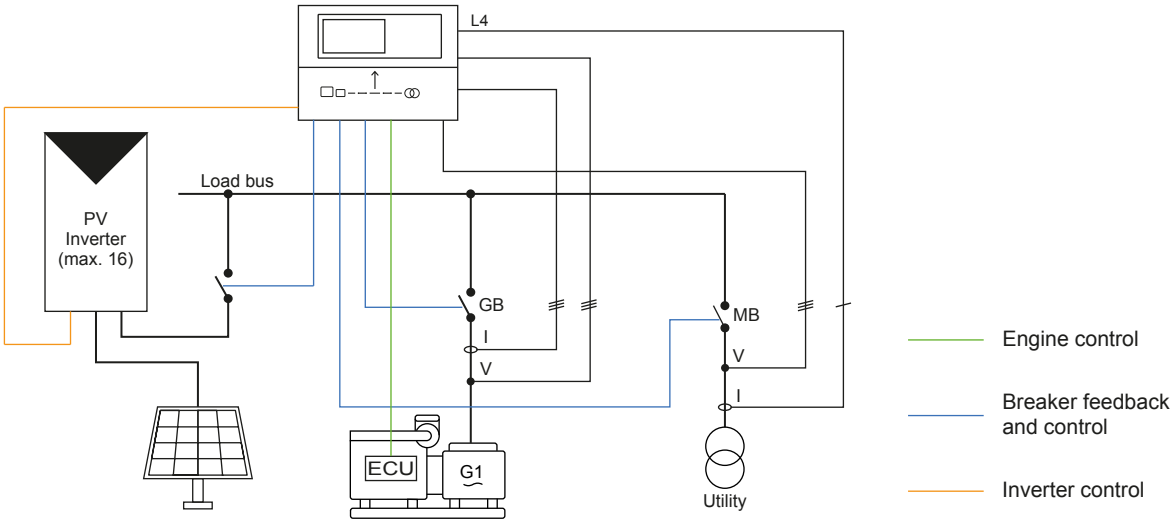
1. Select AUTO mode.
2. The PV inverters supply the load.
3. If the PV inverters cannot supply the full load, the mains supplies the remaining load.

If a mains failure occurs

1. The mains breaker opens.
2. The PV inverters stop supplying the load.
3. The genset starts, and the generator breaker closes.
4. The genset supplies the load.
5. The PV inverters start the reconnect process to the busbar.
6. When the PV inverters are ready, the genset ramps down to the minimum genset load. The PV inverters supply the remaining load.

4.3 PV LTO (Load take-over)

The PV inverters supply the load to prevent/minimise import or export of power.



Start sequence in AUTO mode

1. The PV inverters supply the load.
2. If the PV inverters cannot supply the full load, the remaining power is imported from the mains.
   a. The genset can also supply the remaining load.
   b. Activate the auto start/stop input to start the genset.
   c. The controller synchronises the generator breaker to the busbar.
   d. When the generator breaker is closed, the load is transferred from the mains to the genset until the load is at the open breaker point.
   e. The mains breaker then opens.

Start sequence in SEMI-AUTO mode

1. Activate the PV inverters from the Hybrid shortcut menu on the controller.
2. The PV inverters supply the load.
3. If the PV inverters cannot supply the full load, the mains supplies the remaining load.

4.4 PV Fixed power

In AUTO and SEMI-AUTO mode, the PV inverters supply the load configured in the set point for PV fixed power. If you start the generator, it supplies the load configured in the set point for general fixed power.

Start sequence

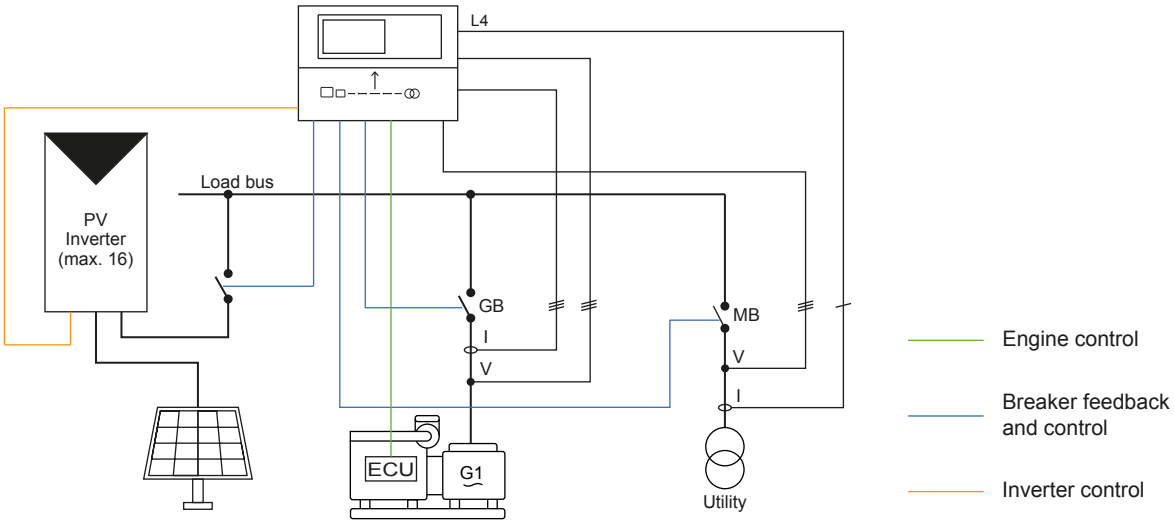
1. Activate a start signal.
   - Select AUTO mode. The PV inverters start automatically when you select AUTO mode.
   - In SEMI-AUTO mode, push the *Shortcut* button on the controller. Select *Hybrid*, and then *PV semi start*.
2. The PV inverters supply the load configured in the set point for PV fixed power (parameter 17131).
3. If you start the generator, it supplies the load configured in the set point for general fixed power (parameter 7051).
4. When the load increases to more than the set points, the mains supplies the extra load.

`Settings > Hybrid > General configuration > PV fixed power set`

Parameter	Text	Range	Default
17131	Power Set	0 to 100 %	100 %

4.5 PV MPE (Mains power export)

In this mode a constant level of power through the mains breaker is maintained. The power can be exported to the mains or imported from the mains, but always at a constant level. This mode is also used when a fixed level of imported power is necessary. The set point can be set to 0 kW. This is to make sure that the load is supplied from the PV/genset and that there is no import or export of power from the mains.



Start sequence

1. Activate a start signal.
   - In AUTO mode, the PV inverters start automatically. To start the genset, activate the auto start/stop input.
   - In SEMI-AUTO mode, activate the PV inverters from the Hybrid shortcut menu. To start the genset, push the *Start* button.
2. The PV inverters ramp up to reach the MPE kW set point (parameters 7001 and 7002).
3. If the PV inverters cannot supply this load, the mains and the genset supply the remaining load.

You can select how the remaining load is supplied by the genset and the mains with parameter 17171. Select one of these options:

OFF

- The genset operates at the minimum genset load.
- The mains imports or exports the load configured in the set point for mains power.
- The PV inverters ramp up to reach the MPE set point.
- The genset supplies the load configured in the set point for minimum genset load.
- The mains supplies the remaining load.
- If the load increases to more than the capacity of the PV inverters, the genset ramps up.

PV Threshold

- The mains supplies the load configured in the set point for mains power.
- The PV inverters ramp up to reach the MPE set point.
- The genset starts/stops as specified by the set points in parameters 17172 and 17174.
- The genset supplies the load configured in the set point for minimum genset load.
- If the load increases to more than the capacity of the PV inverters, the genset ramps up.
- If the load increases to more than the capacity of the genset, the mains supplies the remaining load.

Mains Threshold

- The mains supplies the load configured in the set point for mains power.
- The PV inverters ramp up to reach the MPE set point.

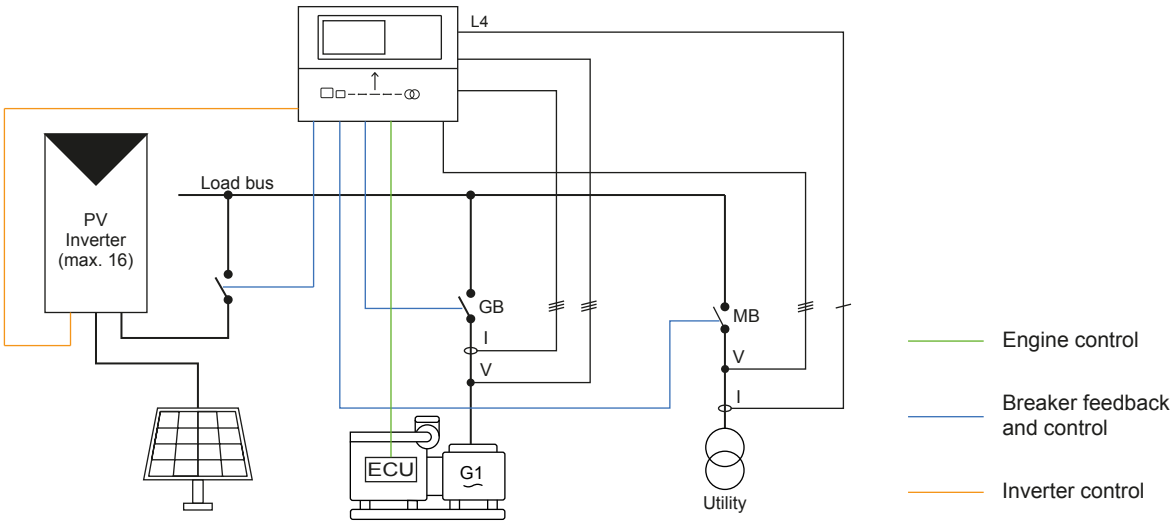
- The genset starts/stops as specified by the set points in parameters 17176 and 17178.
- The genset supplies the load configured in the set point for minimum genset load.
- If the load increases to more than the capacity of the PV inverters, the genset ramps up.
- If the load increases to more than the capacity of the genset, the mains supplies the remaining load.

Settings > Hybrid > General configuration > PV DG Start mode

Parameter	Text	Range	Default
17171	PV DG start selection	OFF PV Threshold Mains Threshold	OFF
17172	PV DG start load	0 to 110 %	90 %
17173	PV DG start load timer	2.0 to 999.9 s	5.0 s
17174	PV DG stop load	0 to 110 %	70 %
17175	PV DG stop load timer	2.0 to 999.9 s	5.0 s
17176	Mains DG start load	-30000 to 30000 kW	1000 kW
17177	Mains DG start load timer	2.0 to 999.9 s	5.0 s
17178	Mains DG stop load	-30000 to 30000 kW	700 kW
17179	Mains DG stop load timer	2.0 to 999.9 s	5.0 s

4.6 PV Peak shaving

The PV inverters supply the load. When the load is less than the peak shaving set point, the genset stops. If the load is more than the peak shaving set point, the genset starts.



Settings > Power set point > MPE/Peak shaving > Day/Night power set.

Parameter	Text	Range	Default
7001	Mains power, Day	-20000 to 20000 kW	750 kW
7002	Mains power, Night	-20000 to 20000kW	1000 kW
7021	Start generator set point	5 to 100 %	80 %
7023	Start generator min. load	0 to 100 %	5 %
7031	Stop generator set point	0 to 80 %	60 %

Settings > Power set point > MPE/Peak shaving > Day/Night settings

Parameter	Text	Range	Default
7011	Daytime period, start hour	0 to 23	8
7012	Daytime period, start min.	0 to 59	0
7013	Daytime period, stop hour	0 to 23	16
7014	Daytime period, stop min.	0 to 59	0

5. Menus

5.1 Menu structure

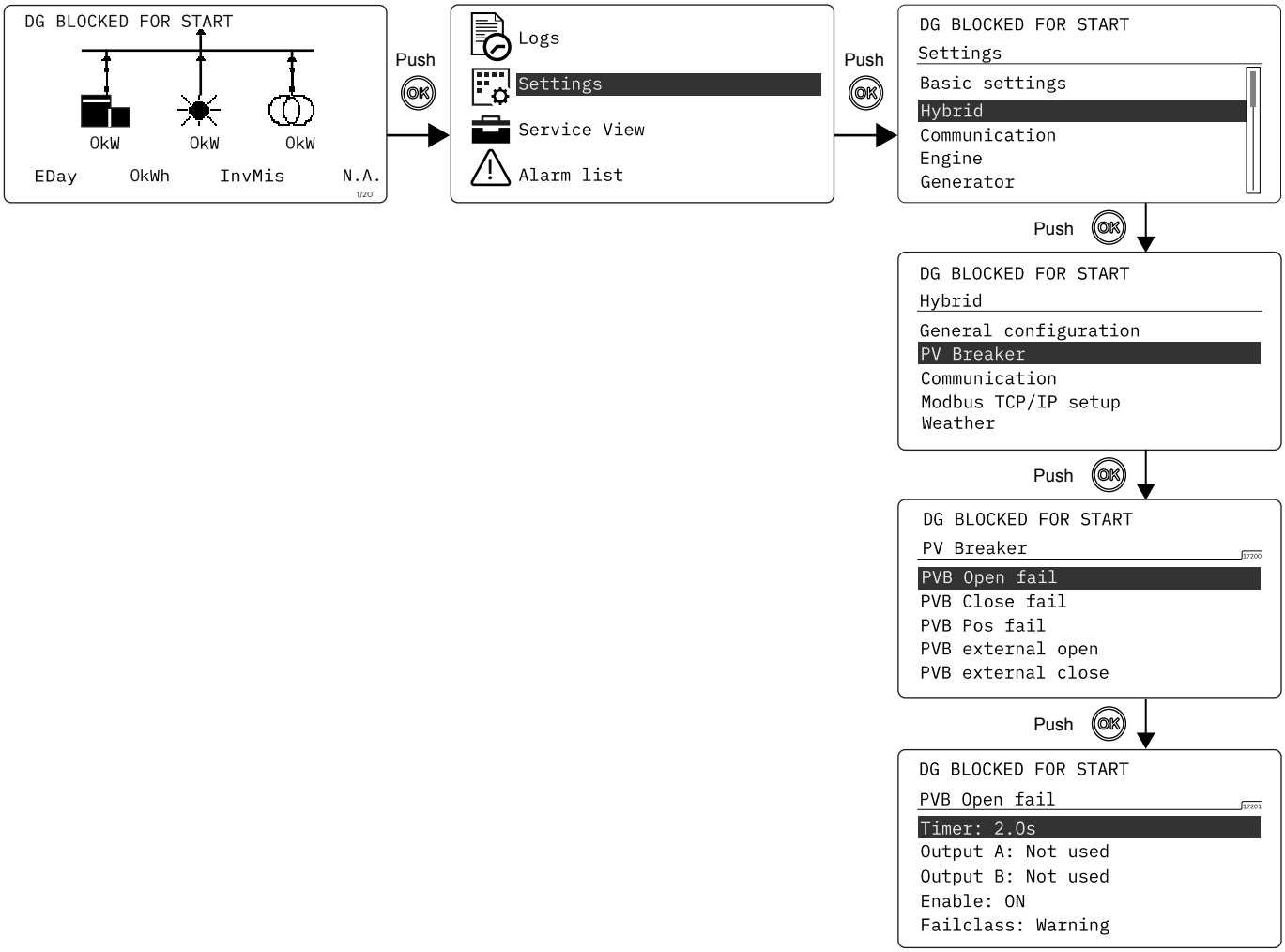
The controller has two menu systems, which can be used without password entry:

- **The View menu system**: Shows the operating status and values. The system has 20 configurable windows, that can be entered with the arrow buttons.
- **The Settings menu system**: The operator can see the controller's parameters. A password is necessary to change the parameter settings.

5.2 Settings menu

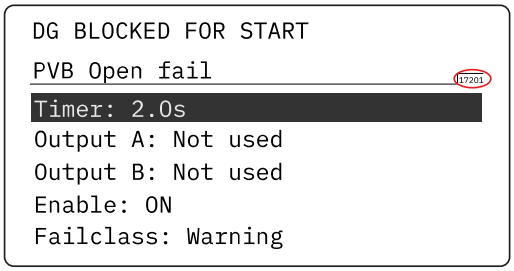
You can configure the controller in the settings menu and you can also find information, which is not available in the view menu. From the view menu, push the OK button to find the settings menu. Use the ⌄ and ⌃ buttons to find the different settings parameter and select with the OK button.

Settings menu example



5.2.1 Menu numbers

Each parameter has a menu number. You can find the number in the upper right corner on the display screen.



You can also find the menu number with the utility software:

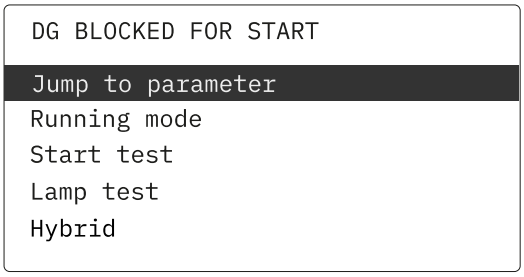
1. Select *Parameters*  from the vertical toolbar on the left.
2. Set the view mode to list. The view mode can be found in the left corner of the screen.
3. The menu numbers are in the *Channel* column.

5.2.2 The jump to parameter function

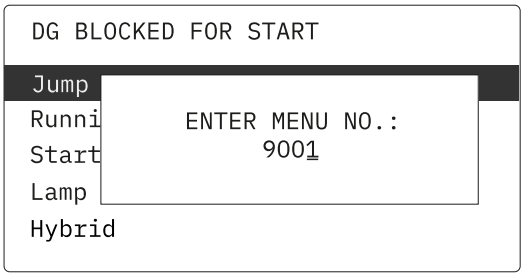
If you know the menu number for a parameter, you can use the jump to parameter function to go directly to the parameter.

On the controller

1. From the view menu, push the *Shortcut* button to see the jump to parameter function:



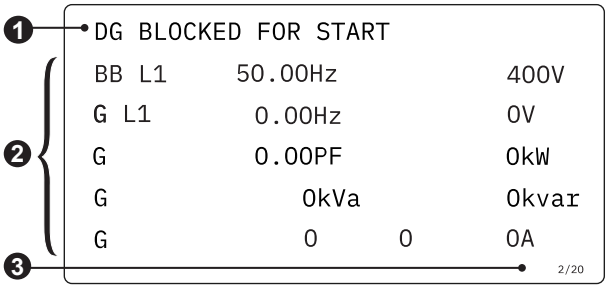
2. Use the and buttons to go to *Jump to parameter* and push the button.



3. Use the and buttons to change the numbers, and push the button to save. Use the and buttons to move to the next number.

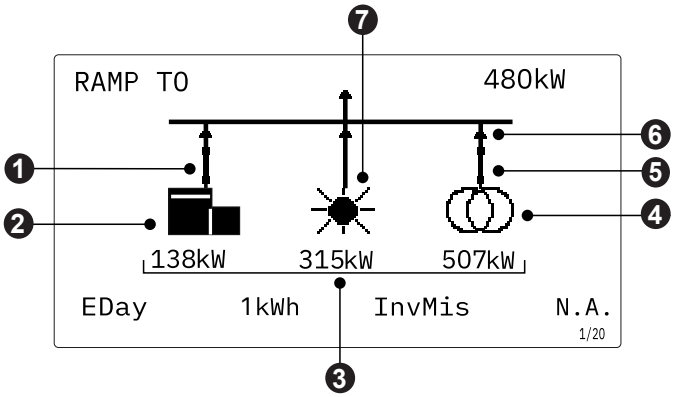
5.3 View menu

The view menu is shown when the controller is turned on, and you can see the operating status and values. The event and alarms list will also be shown if an alarm is on.



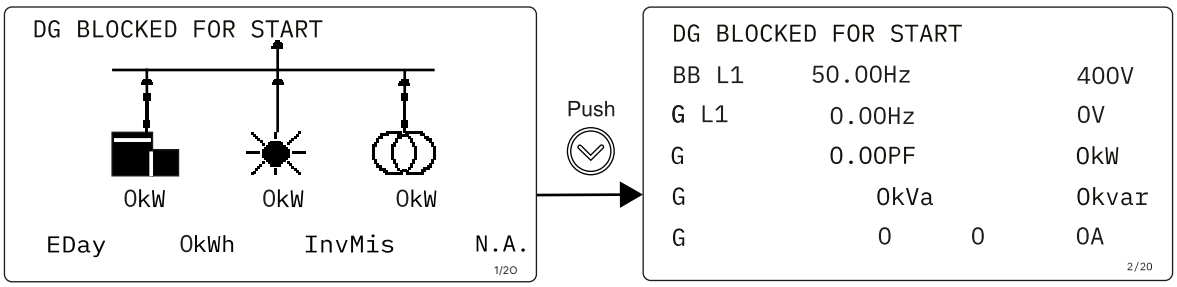
1. Operating status
2. Values and information
3. Page number

Display view 1 shows an active image and is therefore different from the other views. The image shows the power values and the direction of the power flow. The image also provides breaker feedback.



1. Generator breaker
2. Generator symbol
3. Power values
4. Mains symbol
5. Mains breaker
6. The arrows show the direction of the power flow
7. PV symbol

The view menu has 20 different display views. Use the and buttons to select a view.



5.3.1 Display views

The controller has 20 different display views, and 5 of the views are pre-configured. You can configure the views with the utility software.

Line	View 1	View 2	View 3	View 4	View 5
1	Supervision	BB L1 0.0Hz 0V	-	BB L1 0.0Hz 0V	G U-L1L2 0V
2	-	G L1 0.0Hz 0V	Synchroniser	G 0.00PF 0kW	G U-L2L3 0V
3	-	G 0.00PF 0kW	-	G 0kVA 0kvar	G U-L3L1 0V
4	-	G 0kVA 0kvar	-	G 0 0 0A	G U-Max 0V
5	Supervision	G 0 0 0A	-	G L1 0.0Hz 0V	G U-Min 0V

Line	View 6	View 7	View 8	View 9	View 10
1	G I-L1 0A	G f-L1 0.00Hz	G P 0kW	P available 0kW	G U-L1N 0V
2	G I-L2 0A	G f-L2 0.00Hz	G Q 0kvar	P consumed 0kW	G UL2N 0V
3	G I-L3 0A	G f-L3 0.00Hz	G S 0kVA	P 0kW 0%	G UL3N 0V
4	-	-	G PF 0.00	PV P reference	Energy Total 0kWh
5	-	-	PV Q reference	PV actual nom. P	Run absolute 0hrs

Line	View 11	View 12	View 13	View 14	View 15
1	BB U-L1L2 0V	G Angle L1L2 0deg	Run absolute 0hrs	PV P energy, total	PV Q energy, total
2	BB U-L2L3 0V	G Angle L2L3 0deg	GB Operations 0	PV P energy, year	PV Q energy, year
3	BB U-L3L1 0V	G Angle L3L1 0deg	MB operations 0	PV P energy, month	PV Q energy, month
4	BB U-Max 0V	BB-Gen Angle 0deg	PV breaker status	PV P energy, week	PV Q energy, week
5	BB U-Min 0V	-	-	PV P energy, day	PV Q energy, day

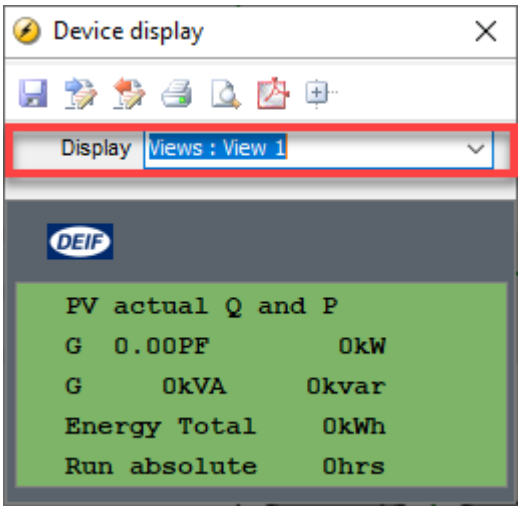
Line	View 16	View 17	View 18	View 19	View 20
1	PV curtailed energy, total	Start attempts 0	Multi input 20 0	P available 0%	P 0kW 0%
2	PV curtailed energy, year	GB Operations 0	Multi input 21 0	P consumed 0%	Q 0kvar 0%
3	PV curtailed energy, month	MB operations 0	Multi input 22 0	G 0.0PF 0%P	S 0kVA 0%
4	PV curtailed energy, week	U-Supply 0.0V	Multi input 23 0	BB f-L1 0.00Hz	BB Angle L2L3 0deg
5	PV curtailed energy, day	Date and Time	MPU 0rpm	BB Angle L1L2 0deg	BB-Gen Angle 0deg

5.3.2 Display text

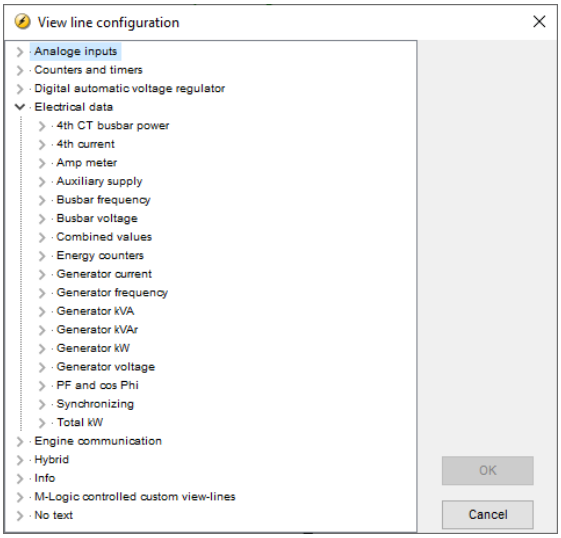
Configure the display views

You can configure the display views with the utility software:

1. Select the *Configuration of the user views*  button in the toolbar.
2. In the pop-up window, select the display view to be changed.



3. Select the display line you want to change.
4. In the pop-up window, select the text you want and click OK.



Display text

You can select five of the display texts for each display view.

5.4 Status texts

Status text	Condition
ACCESS LOCK	The configurable input is activated, and the operator tries to activate one of the blocked keys.
AMF ACTIVE	The controller is in auto mode during a mains failure.
AMF AUTO	The controller is in auto mode and ready to respond.
AMF MAN	The controller is in manual mode and waiting for operator input.
AMF SEMI	The controller is in semi-auto mode and waiting for operator input.
Aux. test ##.#V ####s	The battery test is activated.
BLOCK	Block mode is activated.
COMPENSATION FREQ.	Compensation is active. The frequency is not at the nominal setting.
COOLING DOWN ###s	Cooling-down period is activated.
DELOAD	The controller is decreasing the load of the genset in order to open the breaker.

Status text	Condition
DERATED TO #####kW	Displays the ramp-down set point.
DG BLOCKED FOR START	The generator has stopped and has active alarm(s).
EXT. START ORDER	A planned AMF sequence is activated (without a mains failure).
EXT. STOP TIME ###s	The extended stop timer is running.
FIXED POWER ACTIVE	The controller is in auto mode and supplying fixed power.
FIXED POWER AUTO*	The controller is in auto mode and ready to respond.
FIXED POWER MAN	The controller is in manual mode and waiting for operator input.
FIXED POWER SEMI	The controller is in semi-auto mode and waiting for operator input.
FULL TEST	Test mode is activated.
FULL TEST ###.#min	Test mode is activated and test timer counting down.
GB ON BLOCKED	The generator is running, the GB is open and there is an active Trip GB alarm.
GB TRIP EXTERNALLY	Some external equipment has tripped the breaker. An external trip is logged in the event log.
GENSET STOPPING	Cooling down has finished.
Hz/V OK IN ###s	The voltage and frequency on the genset is OK. When the timer runs out the generator breaker can be closed.
IDLE RUN	The Idle run function is active. The genset does not stop until a timer has expired.
IDLE RUN ###.#min	The Idle run function is active. The genset does not stop until the timer has expired.
ISLAND ACTIVE	The controller is in auto mode and supplying power while not connected to a mains supply.
ISLAND AUTO	The controller is in auto mode and ready to respond.
ISLAND MAN	The controller is in manual mode and waiting for operator input.
ISLAND SEMI	The controller is in semi-auto mode and waiting for operator input.
Loadshare conf error	Analogue load sharing is selected, but there is no IOM.
LOAD TAKE OVER AUTO	The controller is in auto mode and ready to respond.
LOAD TAKE OVER MAN	The controller is in manual mode and waiting for operator input.
LOAD TAKE OVER SEMI	The controller is in semi-auto mode and waiting for operator input.
LOAD TEST	Test mode is activated.
LOAD TEST ###.#min	Test mode is activated and test timer counting down.
LTO ACTIVE	The controller is in auto mode and taking over the load.
MAINS FAILURE	Mains failure and mains failure timer expired.
MAINS FAILURE IN ###s	The frequency or voltage measurement is outside the limits. The timer shown is the mains failure delay.
MAINS f OK DEL ####s	Mains frequency is OK after a mains failure. The timer shown is the mains OK delay.
MAINS P EXPORT AUTO	The controller is in auto mode and ready to respond.
MAINS P EXPORT MAN	The controller is in manual mode and waiting for operator input.
MAINS P EXPORT SEMI	The controller is in semi-auto mode and waiting for operator input.
MAINS U OK DEL ####s	The mains voltage is OK after a mains failure. The timer shown is the mains OK delay.
MPE ACTIVE	The controller is in auto mode and exporting power to the mains.
PEAK SHAVING ACTIVE	The controller is in auto mode and doing peak shaving.
PEAK SHAVING AUTO	The controller is in auto mode and ready to respond.

Status text	Condition
PEAK SHAVING MAN	The controller is in manual mode and waiting for operator input.
PEAK SHAVING SEMI	The controller is in semi-auto mode and waiting for operator input.
RAMP TO #####kW	The power ramp is ramping in steps. The next step that is reached after the timer has expired is displayed.
READY AMF AUTO	The controller is in auto mode and the genset is stopped.
READY FIXED P AUTO	The controller is in auto mode and the genset is stopped.
READY ISLAND AUTO	The controller is in auto mode and the genset is stopped.
READY LTO AUTO	The controller is in auto mode and the genset is stopped.
READY MPE AUTO	The controller is in auto mode and the genset is stopped.
READY PEAK SHAV AUTO	The controller is in auto mode and the genset is stopped.
SELECT GENSET MODE	A genset mode has not been selected.
SHUTDOWN OVERRIDE	The configurable input is active.
SIMPLE TEST	Test mode is activated.
SIMPLE TEST ###.#min	Test mode is activated and test timer counting down.
START DG(s) IN ###s	The start genset set point has been exceeded. The genset starts when the timer expires.
START PREPARE	The start prepare relay is activated.
START RELAY OFF	The start relay is deactivated during the start sequence.
START RELAY ON	The start relay is activated.
STOP DG(s) IN ###s	The stop genset set point has been exceeded. The genset stops when the timer expires.
SUNSPEC IDENTIFYING	Connecting to PV inverter.
SUNSPEC INCOMPATIBLE	PV inverter is not compatible.
SUNSPEC INITIALIZED	PV is initialised.
TOO SLOW 00⟵----------	Generator running too slow during synchronisation.
--------⟶ 00 TOO FAST	Generator running too fast during synchronisation.
WARM UP RAMP	Warm up ramp is active. The available power is limited until the pre-defined temperature is reached, or when the input that activated warm up ramp is deactivated.
---xx-------- >00< ----------	Generator is synchronising. The "xx" marks the actual generator phase angle position in the synchronisation. When the "xx" is aligned over the 00 centre, the generator is synchronised.

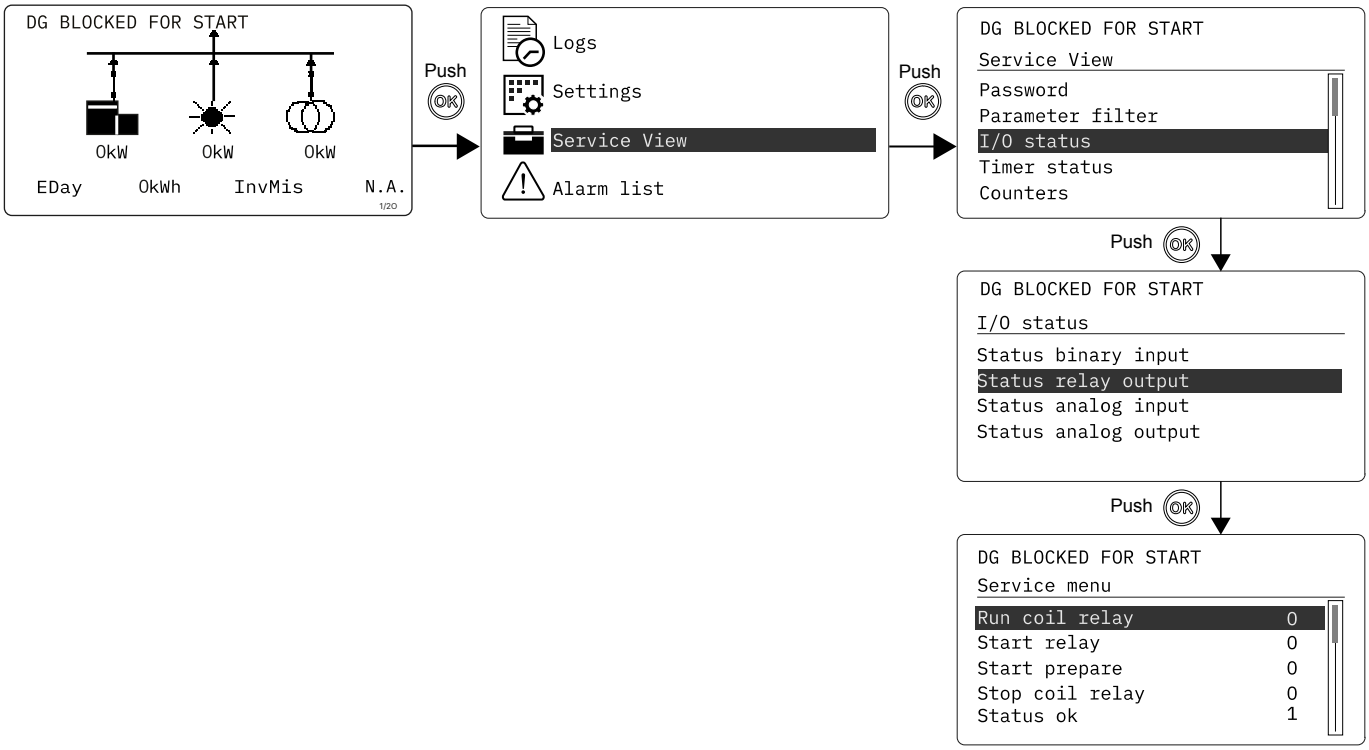
NOTE * In a Stand-alone application setup, only the PV inverters are able to produce to the grid.

5.5 Service view

You can use the service view to see the status of the controller. You can change the passwords in the service menu, but not the other controller settings.

From the view menu, push the OK button and select *Service View* . Use the ⌄ and ⌃ buttons to go through the parameters in the service view, and use the OK button to select the parameters.

Service view example

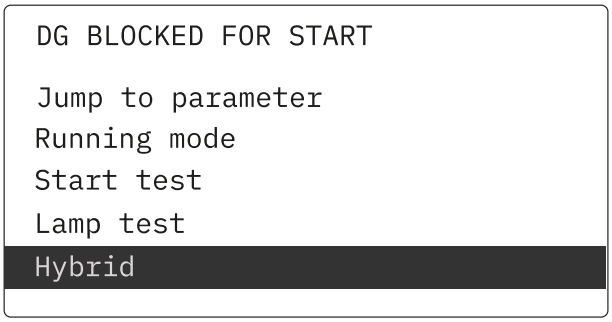


5.6 Hybrid shortcut menu

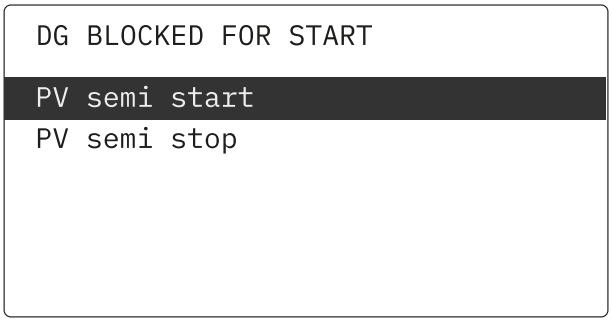
You can start and stop the PV inverter in the shortcut menu when the controller is in SEMI-AUTO mode.

On the controller

1. From the view menu, push the *Shortcut* button to see the menu.



2. Use the *Up* and *Down* buttons to go to *Hybrid* , and push the button.

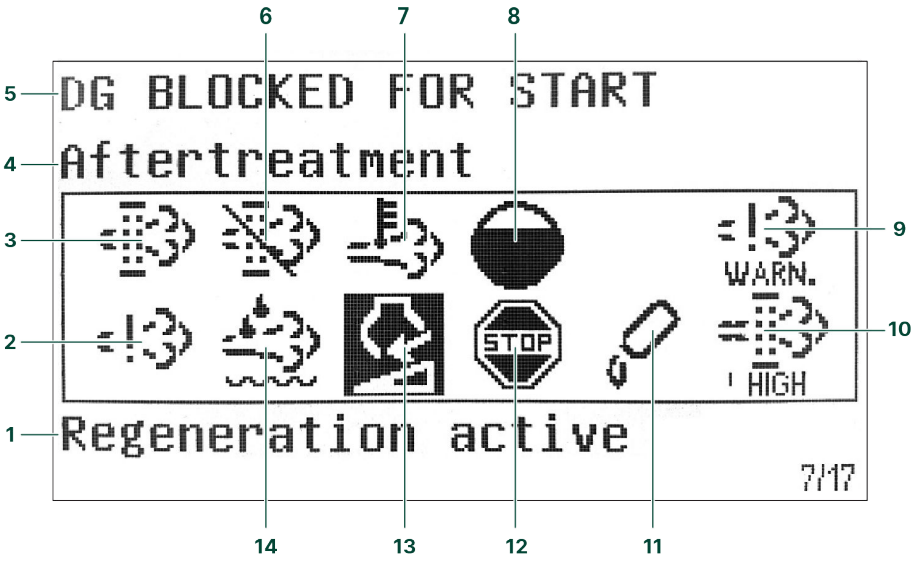


3. Use the *Up* and *Down* buttons to go to *PV semi start* or *PV semi stop* menu, and push the button to select.

5.7 Exhaust after-treatment (Tier 4/Stage V)

AGC 150 meets the Tier 4 (Final)/Stage V requirements. The user can use the display to monitor (and control) both the engine, and the exhaust after-treatment system.

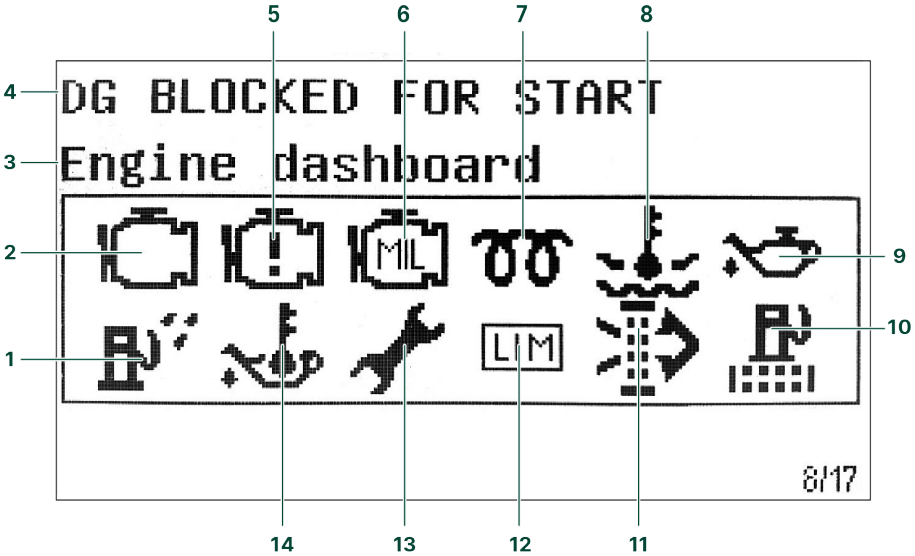
After-treatment page

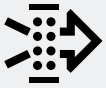


No.	Referent	Symbol	Description
1	After-treatment status	-	
2	Engine emission system failure		Emission failure or malfunction.
3	Diesel Particle Filter (DPF)		A regeneration is needed.
4	Page name	-	
5	Controller status	-	
6	Diesel Particle Filter (DPF) Inhibit		Regeneration is inhibited.
7	High temperature - Regeneration		There is a high temperature and regeneration is in process.
8	HC burn-off		
9	Engine emission system failure level	LOW HIGH WARN.	Emission failure or malfunction, with the severity.

No.	Referent	Symbol	Description
10	Diesel Particle Filter (DPF) level		The severity of the needed regeneration.
11	DEF level warning		
12	DEF shutdown		
13	DEF level inducement		Mid-level inducement
			Severe inducement
14	Diesel Exhaust Fluid (DEF)		The DEF tank level is low.

Engine dashboard



No.	Referent	Symbol	Description
1	Water in fuel		
2	Engine interface status		An engine warning.
3	Page name	-	-
4	Controller status	-	
5	Engine interface status		An engine shutdown.
6	Engine interface status		An engine malfunction.
7	Cold start		
8	High engine coolant temperature		
9	Low engine oil pressure		
10	Fuel filter clogging		
11	Air filter clogging		
12	LIMIT lamp		Only for MTU engines.
13	Oil change		
14	High engine oil temperature		

NOTE Grey symbols show that communication is available for the referent. An engine type might not support all of the referents.

6. Alarm handling and log list

6.1 Alarm handling

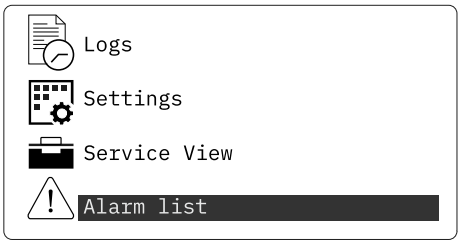
If the function *Alarm Jump* is on, the controller will automatically show the alarm list on the display screen when an alarm occurs.

`Service View > Display > Alarm Jump`

Parameter	Text	Range	Default
9157	Alarm Jump	OFF ON	ON

Access the alarm list from the display unit

1. From the view menu, push the OK button.
2. Use the ▲ and ▼ buttons to go to the *Alarm list*.

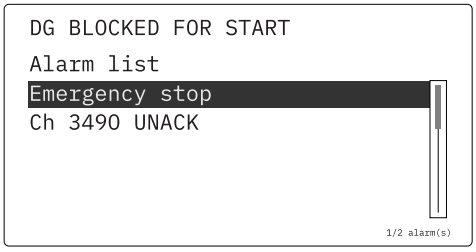


3. Push the OK button to view the *Alarm list*.
4. Push the ↩ button to go back.

The alarm list contains both acknowledged and unacknowledged alarms that are active. An alarm is active, if you have not cleared the alarm condition, which started the alarm. Once an alarm is acknowledged and you have cleared the alarm condition, the alarm is removed from the alarm list. If there are no alarms, then the alarm list will show *No alarms*.

The display screen can show only one alarm at a time. The number of alarms is shown on the right at the bottom of the screen.

Example of an unacknowledged alarm



To see the other alarms, use the ▲ and ▼ buttons to go through the list. To acknowledge an alarm, select the alarm and push the OK button.

Access the alarm list with the utility Software

Select *Alarms* ⚠ on the vertical panel on the left.

CAUTION

Caution

If an alarm is blocking a genset in AUTO mode from starting, the genset will automatically start if the condition that triggered the alarm has gone and the alarm has been acknowledged.

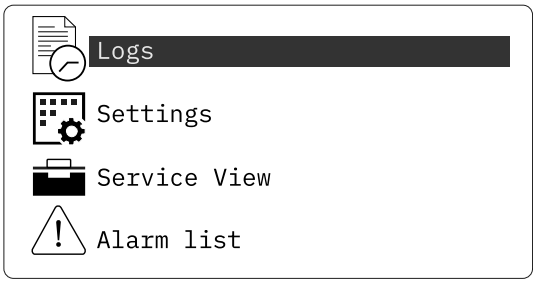
6.2 Logs menu

These are the log sub-menus:

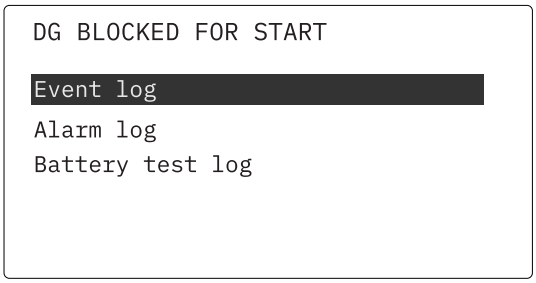
1. Event log: Shows up to 500 events.
2. Alarm log: Shows up to 500 alarms. Only the latest 100 alarms are shown on the display unit, while the remaining alarms are shown in the utility software.
3. Battery test log: Shows up to 52 tests, either *Test OK* or *Test failed*.

Access the log menu from the controller

1. From the view menu, push the OK button.
2. Use the ^ and v buttons to go to *Logs*.



3. Push the OK button to select *Logs*.
4. Select the log you want to see and push the OK button.



5. To leave the *Log* , push the button.

Access the log list with the utility software

1. In the vertical panel on the left, select *Logs* .
2. In the task bar, select *Read logs* .
3. Select the *Log list* you want to see.