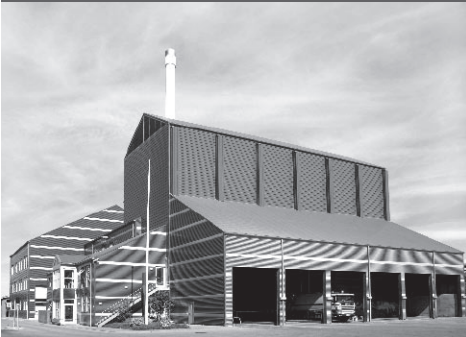# DEIF

-power in control

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OPERATOR'S MANUAL

Advanced Genset Controller, AGC 200

- Display readings
- Push-button functions
- Alarm handling
- Log list

1. General information

2. AGC 200 variants

3. Display, push-buttons and LEDs

4. Display and menu structure

5. Alarm handling and log list

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 Multi-line 2 unit, the company responsible for the installation or the operation of the set must be contacted.

⚠️ **The Multi-line 2 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 Multi-line 2 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.**

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 Multi-line 2 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 operator's manual

1.2.1 General purpose

This Operator's Manual mainly includes general product information, display readings, push-button and LED functions, alarm handling descriptions and presentation of the log list.

The general purpose of this document is to give the operator important information to be used in the daily operation of the unit.

⚠ **Please make sure to read this document before starting to work with the Multi-line 2 unit and the generator set to be controlled. Failure to do this could result in human injury or damage to the equipment.**

1.2.2 Intended users

This Operator's Manual is mainly intended for the daily user. On the basis of this document, the operator will be able to carry out simple procedures such as start/stop and control of the generator set.

1.2.3 Contents and overall structure
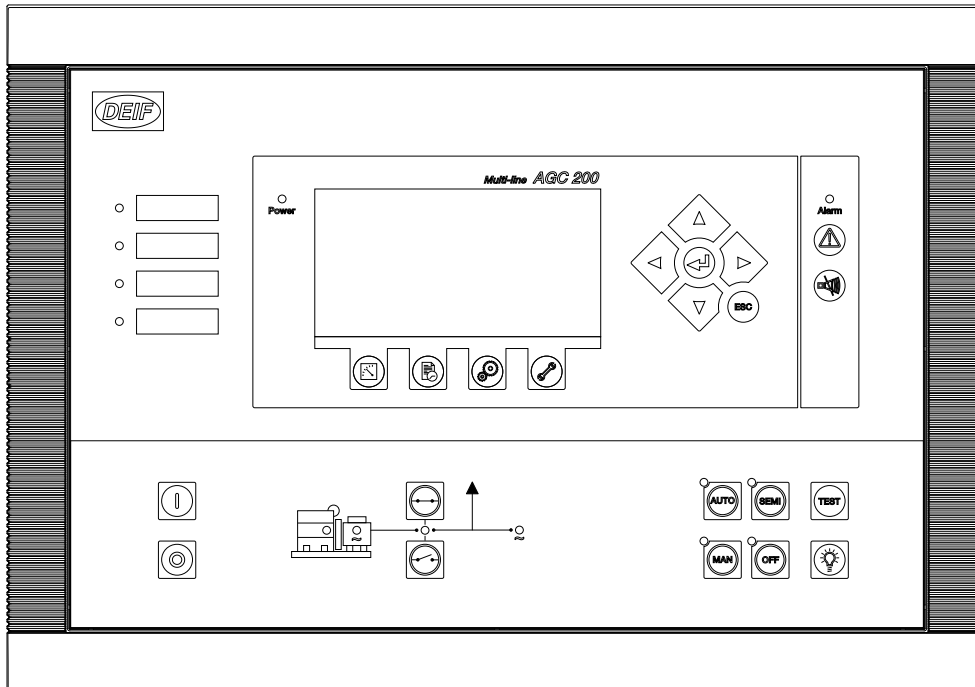
This document is divided into chapters, and in order to make the structure simple and easy to use, each chapter will begin from the top of a new page.
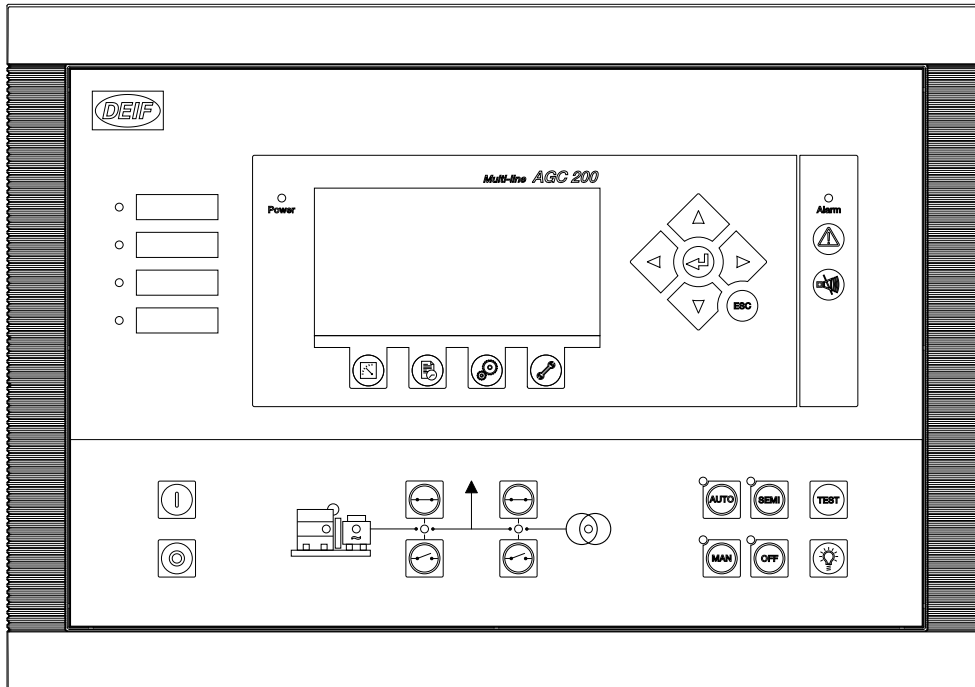
2. AGC 200 variants

2.1 Front views

2.1.1 Island, AGC 212/222/232/242

2.1.2 Automatic mains failure, AGC 213/233/243

2.1.3 Mains, AGC 245
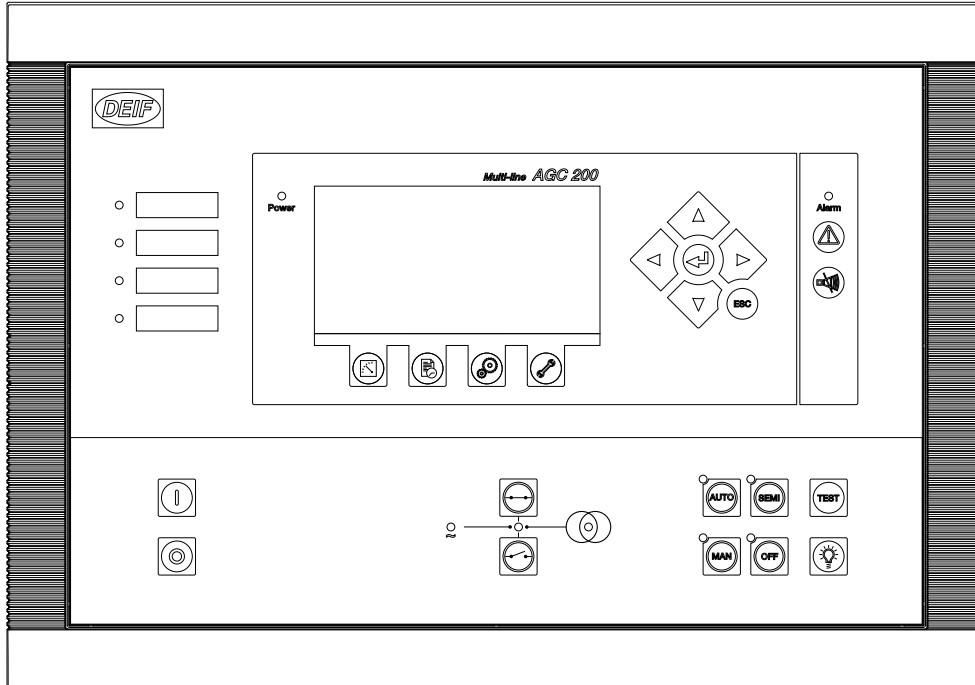
2.1.4 Mains and tie breaker, AGC 246
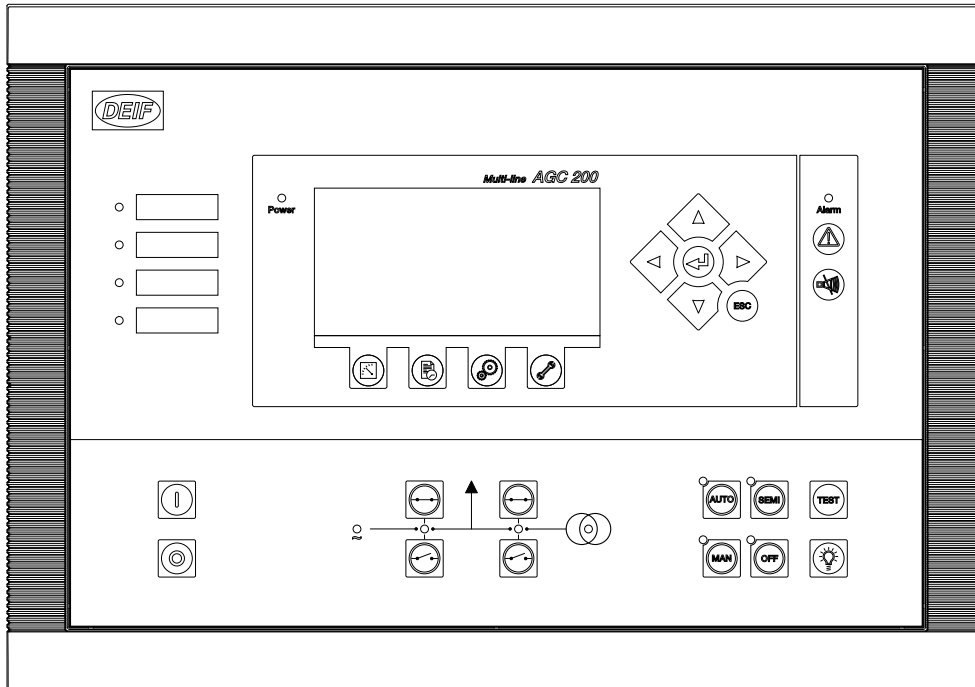
2.1.5 Bus tie breaker, AGC 244
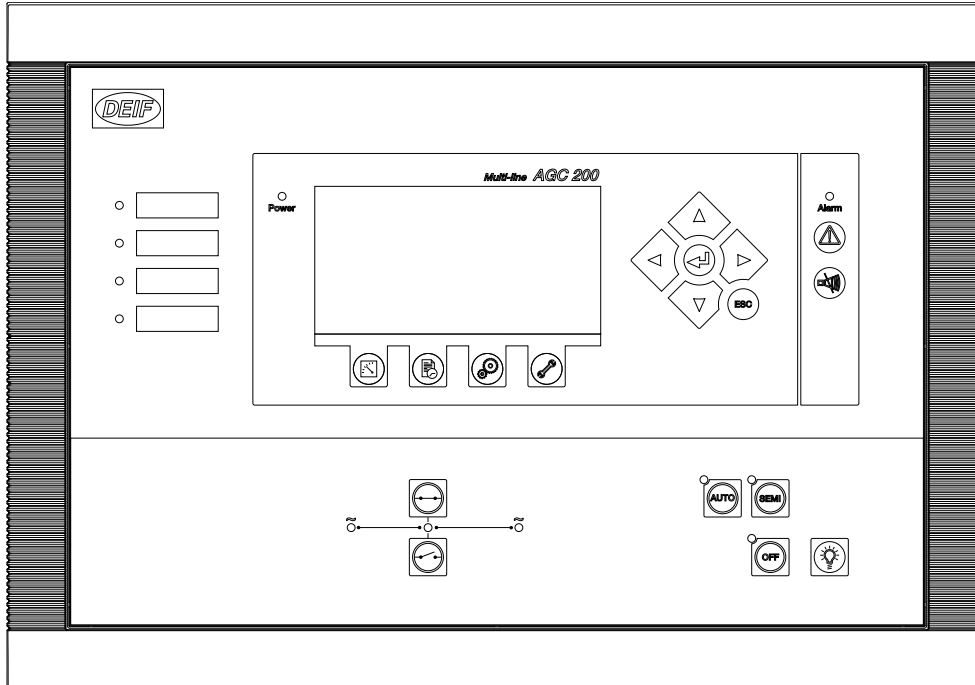
3. Display, push-buttons and LEDs

3.1 Push-button functions

The display unit holds a number of push-button functions which are described below:
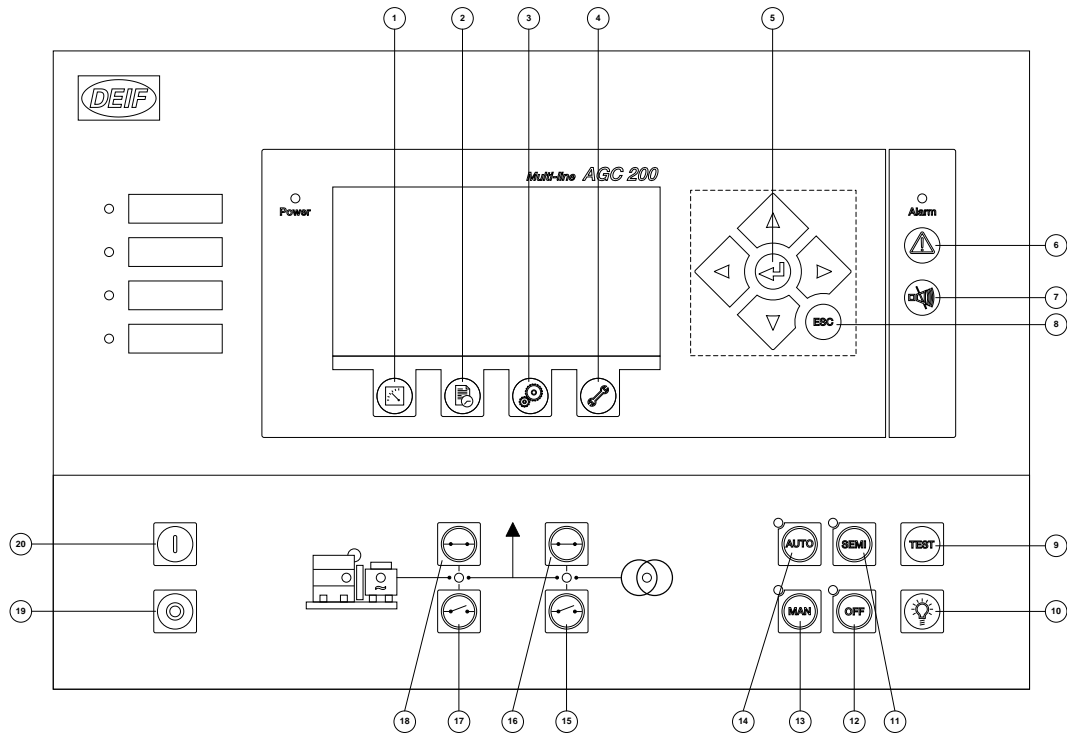
1. View of measured values
2. Log lists. The list holds 150 events. These events are deleted when the AGC is switched off
3. Parameter settings
4. Service menu
5. Navigation buttons
6. Alarm list
7. Silence horn
8. Escape/step backwards
9. Test mode
10. Lamp test
11. Semi-auto mode
12. Off mode
13. Manual mode
14. Auto mode
15. MB open
16. MB close
17. GB open
18. GB close
19. Stop: stop of the genset if semi-auto or manual is selected
20. Start: start of the genset if semi-auto or manual is selected

3.2 LED functions

The display unit holds 10 LED functions. The colour is green or red or a combination in different situations. The display LEDs are indicating as follows:
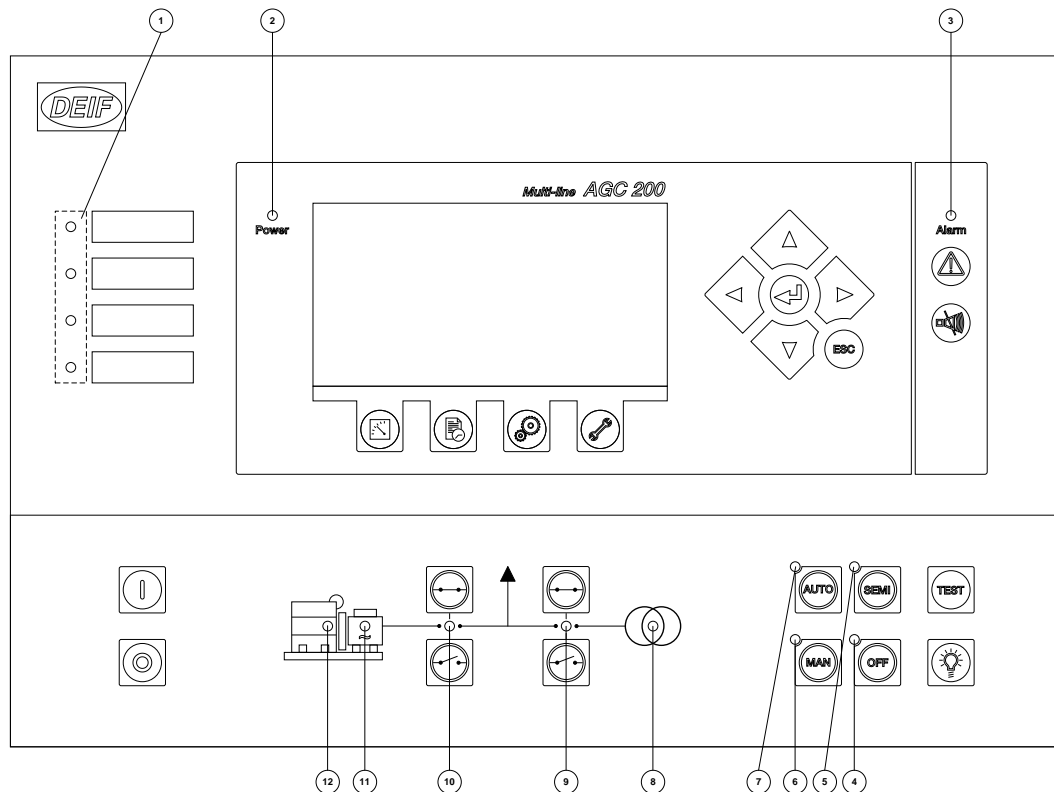
1. User-configurable LED
2. LED indicates that the auxiliary supply is switched on
3. LED flashing indicates that unacknowledged alarms are present. LED fixed light indicates that ALL alarms are acknowledged, but some are still present
4. Off mode
5. Semi-auto mode
6. Manual mode
7. Auto mode
8. LED is green if the mains is present and OK. LED is red at a mains failure. LED is flashing green when the mains returns during the "mains OK delay" time
9. LED indicates that the mains breaker is closed
10. LED indicates that the generator breaker is closed
11. LED green light indicates that the voltage/frequency is present and OK
12. LED indicates that the generator is running

4. Display and menu structure

4.1 About display and menu structures

4.1.1 LCD display

The display is a backlit LCD graphical display. The display light intensity, LED indication and contrast can be adjusted from menu 9150.

Basically, all measured and calculated values can be read in the display. These may be selected via the PC utility software (USW).

ℹ️ **For selection of values, see the Designer's reference handbook.**

4.1.2 Menu structure

The display includes two menu systems which can be used without password entry:

View menu system
This is the commonly used menu system. 20 windows are configurable and can be entered by using the arrow push-buttons.

Setup menu system (not commonly used by the operator)
This menu system is used to set up the unit, and if the operator needs detailed information that is not available in the view menu system.
Changing of parameter settings is password-protected.

4.1.3 Entry window

When the unit is powered up, an entry window appears. The entry window is the turning point in the menu structure and as such the gateway to the other menus. It can always be reached by pushing the BACK push-button three times.

ℹ️ **The event and alarm list will appear at power-up if an alarm is present.**

4.1.4 View menu

The view menus (V1, V2 and V3) are the daily use menus for the operator.
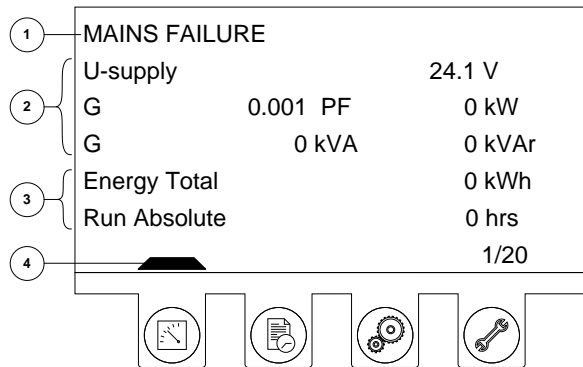
In the view menus, various measured values are on display. The views contain up to 20 different windows which can be selected using the ⬦ and ⬦ push-buttons located on the right hand side of the display.

1. First display line: operational status or measurements
2. Second display line: measurements relating to operational status
3. Third display line: measurements relating to operational status
4. Fourth display line: selection of setup and view menus

4.1.5 Status line texts

Status text	Condition	Comment
BLOCK	Block mode is activated	
SIMPLE TEST	Test mode is activated	
LOAD TEST		
FULL TEST		
SIMPLE TEST ###.#min	Test mode is activated and test timer counting down	
LOAD TEST ###.#min		
FULL TEST ###.#min		
ISLAND MAN	Genset stopped or running and no other action taking place	
ISLAND SEMI		
READY ISLAND AUTO	Genset stopped in Auto	
ISLAND ACTIVE	Genset running in Auto	
AMF MAN	Genset stopped or running and no other action taking place	
AMF SEMI		
READY AMF AUTO	Genset stopped in Auto	
AMF ACTIVE	Genset running in Auto	
FIXED POWER MAN	Genset stopped or running and no other action taking place.	
FIXED POWER SEMI		
READY FIXED P AUTO	Genset stopped in Auto	
FIXED POWER ACTIVE	Genset running in Auto	
PEAK SHAVING MAN	Genset stopped or running and no other action taking place.	
PEAK SHAVING SEMI		
READY PEAK SHAV AUTO	Genset stopped in Auto	
PEAK SHAVING ACTIVE	Genset running in Auto	
LOAD TAKEOVER MAN	Genset stopped or running and no other action taking place	
LOAD TAKEOVER SEMI		
READY LTO AUTO	Genset stopped in Auto	
LTO ACTIVE	Genset running in Auto	
MAINS P EXPORT MAN	Genset stopped or running and no other action taking place	
MAINS P EXPORT SEMI		
READY MPE AUTO	Genset stopped in Auto	
MPE ACTIVE	Genset running in mains power export mode	
DG BLOCKED FOR START	Generator stopped and active alarm(s) on the generator	
GB ON BLOCKED	Generator running, GB open and an active "Trip GB" alarm	

Status text	Condition	Comment
SHUTDOWN OVERRIDE	The configurable input is active	
ACCESS LOCK	The configurable input is activated, and the operator tries to activate one of the blocked keys	
GB TRIP EXTERNALLY	Some external equipment has tripped the breaker	An external trip is logged in the event log
MB TRIP EXTERNALLY	Some external equipment has tripped the breaker	An external trip is logged in the event log
IDLE RUN	The "Idle run" function is active. The genset will not stop until a timer has expired	
IDLE RUN ###.#min	The timer in the "Idle run"' function is active	
COMPENSATION FREQ	Compensation is active	The frequency is not at the nominal setting
Aux. test ##.#V ####s	Battery test activated	
DELOAD	Decreasing the load of the genset in order to open the breaker	
START DG(s) IN ###s	The start genset set point is exceeded	
STOP DG(s) IN ###s	The stop genset set point is exceeded	
START PREPARE	The start prepare relay is activated	
START RELAY ON	The start relay is activated	
START RELAY OFF	The start relay is deactivated during the start sequence	
MAINS FAILURE	Mains failure and mains failure timer expired	
MAINS FAILURE IN ###s	Frequency or voltage measurement is outside the limits	The timer shown is the mains failure delay. Text in mains units
MAINS U OK DEL ####s	Mains voltage is OK after a mains failure	The timer shown is the mains OK delay
MAINS f OK DEL ####s	Mains frequency is OK after a mains failure	The timer shown is the mains OK delay
Hz/V OK IN ###s	The voltage and frequency on the genset is OK	When the timer runs out, it is allowed to operate the generator breaker
COOLING DOWN ###s	Cooling-down period is activated	
GENSET STOPPING	This info is shown when cooling down has finished	
EXT. STOP TIME ###s		
PROGRAMMING LANGUAGE	This info is shown if the language file is downloaded from the PC utility software	

Status text	Condition	Comment
---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 in synchronism
TOO SLOW 00<-------------	Generator running too slow during synchronising	
-----------> 00 TOO FAST	Generator running too fast during synchronising	
EXT. START ORDER	A planned AMF sequence is activated	There is no failure on the mains during this sequence
SELECT GENSET MODE	Power management has been deactivated and no other genset mode has been selected	Option G5 must be available
QUICK SETUP ERROR	Quick setup of the application failed	
MOUNT CAN CONNEC-TOR	Connect the power management CAN line	
ADAPT IN PROGRESS	The AGC 200 is receiving the application, to which it has just been connected	
SETUP IN PROGRESS	The new AGC is being added to the existing application	
SETUP COMPLETED	Successful update of the application in all AGC units	
REMOVE CAN CONNEC-TOR	Remove the power management CAN lines	
RAMP TO #####kW	The power ramp is ramping in steps, and the next step that will be reached after the timer has expired will be displayed	
DERATED TO #####kW	Displays the ramp-down set point	
UNEXPECTED GB ON BB	Another generator breaker is closed on to the busbar (due to a GB position failure) while no voltage is present on the busbar	This indicates that other breakers cannot close to the busbar because of position failure on one or more GBs
WARM UP RAMP	Warm up ramp is active	The available power is limited until the predefined temperature is reached or when the input which activated warm up ramp is set low

4.1.6 Texts only related to power management (AGC 24x only)

Status text	Condition	Comment
DG unit		
BLACKOUT ENABLE	This info is shown if a CAN failure is present in a power management application.	
UNIT STANDBY	If redundant mains units are present, this message is shown on the redundant unit.	
DELOADING BTB XX	DG units are load sharing asymmetrically to deload BTB XX dividing two sections in an island application.	
BTB XX DIVIDING SEC.	BTB XX is dividing two sections in an island application.	
SYNCHRONISING TB XX	TB XX is synchronising.	
SYNCHRONISING MB XX	MB XX is synchronising.	
SYNCHRONISING BTB XX	BTB XX is synchronising.	
Deloading TB XX	Displays that a tie breaker is being deloaded in semi-auto mode.	
Mains unit		
UNIT STANDBY	If redundant mains units are present this message is shown on the redundant unit.	
TB TRIP EXTERNALLY	Some external equipment has tripped the breaker.	An external trip is logged in the event log.
BTB unit		
DIVIDING SECTION	A BTB unit is dividing two sections in an island application.	
READY AUTO OPERATION	BTB unit in Auto and ready for breaker operation (no active BTB trip" alarm).	
SEMI-AUTO OPERATION	BTB unit in Semi-auto	
AUTO OPERATION	BTB unit in Auto, but not ready for breaker operation (active "BTB trip" alarm).	
BLOCKED FOR CLOSING	Last open BTB in a ring bus.	
BTB TRIP EXTERNALLY	Some external equipment has tripped the breaker.	An external trip is logged in the event log.
All units		
BROADCASTING APPL. #	Broadcast of an application through the CAN line.	Broadcasts one of the four applications from one unit to the other AGCs in the power management system.

| Status text	Condition	Comment
RECEIVING APPL. #	AGC 200 receiving an application.	
BROADCAST COMPLE-TED	Successful broadcast of an application.	
RECEIVE COMPLETED	Application received successfully.	
BROADCAST ABORTED	Broadcast terminated.	
RECEIVE ERROR	Application is not received correctly.	

4.1.7 Available display views

View line configuration	
For generator	**For bus/mains**
G f-L1 frequency L1 (Hz)	M f-L1 frequency L1 (Hz)
G f-L2 frequency L2 (Hz)	M f-L2 frequency L2 (Hz)
G f-L3 frequency L3 (Hz)	M f-L3 frequency L3 (Hz)
Gen. active power (kW)	Mains active power (kW)
Gen. reactive power (kVAr)	Mains reactive power (kVAr)
Gen. apparent power (kVA)	Mains apparent power (kVA)
Power factor	Power factor
Voltage angle between L1-L2 (deg.)	Voltage angle between L1-L2 (deg.)
Voltage angle between L2-L3 (deg.)	Voltage angle between L2-L3 (deg.)
Voltage angle between L3-L1 (deg.)	Voltage angle between L3-L1 (deg.)
BB U-L1N	BB U-L1N
BB U-L2N	BB U-L2N
BB U-L3N	BB U-L3N
BB U-L1L2	BB U-L1L2
BB U-L2L3	BB U-L2L3
BB U-L3L1	BB U-L3L1
BB U-MAX	BB U-MAX
BB U-Min	BB U-Min
BB f-L1	BB f-L1
BB AngL1L2-180.0deg	BB AngL1L2-180.0deg
BB-G Ang -180.0deg	BB-M Ang -180.0deg
U-Supply (power supply V DC)	U-Supply (power supply V DC)
Energy counter, total (kWh)	Energy counter, total (kWh)
Energy counter, daily (kWh)	Energy counter, daily (kWh)
Energy counter, weekly (kWh)	Energy counter, weekly (kWh)
Energy counter, monthly (kWh)	Energy counter, monthly (kWh)
G U-L1N (voltage L1-N)	M U-L1N (voltage L1-N)
G U-L2N (voltage L2-N)	M U-L2N (voltage L2-N)
G U-L3N (voltage L3-N)	M U-L3N (voltage L3-N)
G U-L1L2 (voltage L1-L2)	M U-L1L2 (voltage L1-L2)
G U-L2L3 (voltage L2-L3)	M U-L2L3 (voltage L2-L3)
G U-L3L1 (voltage L3-L1)	M U-L3L1 (voltage L3-L1)
G U-Max (voltage max.)	M U-Max (voltage max.)
G U-Min (voltage min.)	M U-Min (voltage min.)

View line configuration	
G I-L1 (current L1)	M I-L1 (current L1)
G I-L2 (current L2)	M I-L2 (current L2)
G I-L3 (current L3)	M I-L3 (current L3)
Run abs. (absolute run time)	
Run rel. (relative run time)	
Next prio (next priority shift)	
Run ShtD O (shutdown override run time)	
Mains power A102	P TB A105
Number of GB operations	Number of TB operations
Start attempts	
Start att Std (start attempts standard)	
Start att Dbl (start attempts double)	
P available	P available
P mains	P mains
P DGs tot	P DGs tot
Number of MB operations	Number of MB operations
Service timer 1	
Service timer 2	
MPU	
Multi-input 46	Multi-input 46
Multi-input 47	Multi-input 47
Multi-input 48	Multi-input 48
View line configuration	
For generator	**For bus/mains**
Cos Phi	
	P tie breaker
Cos Phi (current)	
Power reference (actual)	
Power reference (current)	Power reference (current)
Fan A priority and hours	
Fan B priority and hours	
Fan C priority and hours	
Fan D priority and hours	
Parameter ID	
Governor regulator type	
AVR regulator type	
EIC readings	

View line configuration	
External analogue readings	

View menu example

The scrollbar indicates that more readings are available below
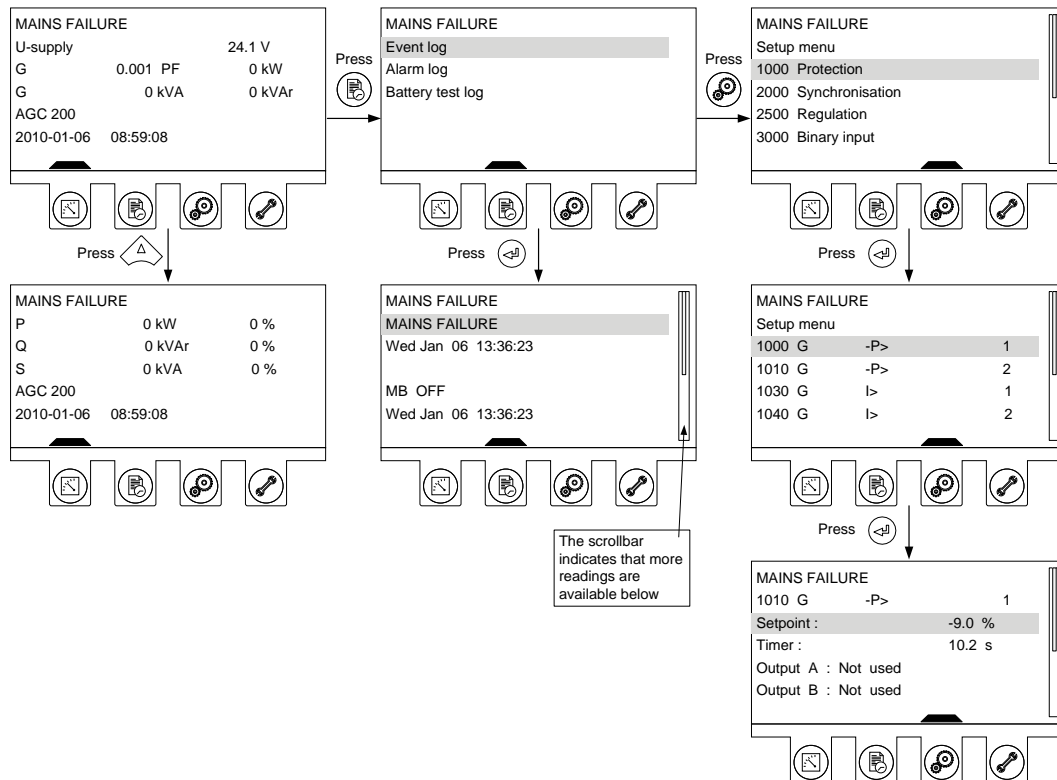
4.1.8 Mode overview

The unit has four different running modes and one block mode. The modes are selected directly with push-buttons in the lower right corner of the unit front.

Auto

In auto mode, the unit will operate automatically and the operator cannot initiate any sequences manually.

Semi-auto

In semi-auto mode, the operator must initiate all sequences. This can be done via the push-button functions, Modbus commands or digital inputs. When started in semi-automatic mode, the genset will run at nominal values.

Test

The test sequence will start when the test mode is selected.

Manual

When manual mode is selected, the binary increase/decrease inputs can be used (if they have been configured) as well as the start and stop push-buttons. When starting in manual mode, the genset will start without any subsequent regulation.

OFF

When the OFF mode is selected, the unit is not able to initiate any sequences, e.g. the start sequence.

(i) **OFF mode must be selected, when maintenance work is carried out on the genset.**

5. Alarm handling and log list

5.1 Alarm handling

When an alarm occurs, the unit will automatically go to the alarm list in the display. If this has been disabled

by setting "Alarm jump" (channel 6900) to OFF, you must press ⚠ to enter the alarm list.

If reading of the alarms is not desired, use the ESC push-button to exit the alarm list.

If you decide to enter the alarm list later, use the ⚠ push-button to jump directly to the alarm list reading.

The alarm list contains both acknowledged and unacknowledged alarms, provided that they are still active (that is, the alarm condition is still present). Once an alarm is acknowledged and the condition has disappeared, the alarm will no longer be displayed in the alarm list.
This means that if there are no alarms, the alarm list will read "No alarms".

⚠ **If an alarm is blocking a genset in AUTO from starting, the genset will automatically start and close the breaker if the condition that triggered the alarm has disappeared and the alarm has been acknowledged.**

```
MAINS FAILURE
Alarm list:
Ch  1300              UNACK
BB  U<              1
10-01-06      15:20:21:0

                      1/1 alarm (s)
```

This display example indicates an unacknowledged alarm. The display can show only one alarm at a time. Therefore, all other alarms are hidden.

To see the other alarms, use the △ and ▽ push-buttons to scroll in the display.

To acknowledge an alarm, place the cursor (grey area) over the channel number and then press ↵.

5.2 Log list

The log is divided into three different lists:

1. Events
2. Alarms
3. Battery test

The log list contains up to 150 events, the alarm list contains up to 30 historical alarms and the battery test list contains up to 52 historical battery tests.

An event is for example closing of breaker and starting of engine. An alarm is for example over-current or high cooling water temperature. A battery test is for example test OK or test failed.

To enter the log list:

1. Press ⊞ .

2. Select the needed list by using the △ and ▽ push-buttons (move the highlight of the list) and press
    the push-button.