

# Automatic Genset Controller AGC 150



## General description

The AGC 150 is an easy-to-use control unit containing all necessary functions for protection and control of a genset. It can be used as a single unit for one genset, or it can be connected in a complete power management system with up to 32 controllers for synchronising projects, island or parallel to the mains. The power management system handles the load sharing between gensets and the load-dependent start and stop. AGC 150 contains all necessary 3-phase measuring circuits, and all values and alarms are presented on the sun proof LCD display.

## Applications

The AGC 150 is a compact all-in-one unit designed for the following applications:

Plant mode	Application
Island mode	Power plant with synchronizing generators or a stand-alone generator. It can also be used in critical power plants.
Automatic Mains Failure	Critical power/emergency standby plants, black start generator.
Fixed power	Power plant with fixed kW setpoint (including building load).
Peak shaving	Power plant where a generator supplies peak load demand paralleled to the mains.
Load take-over	Plant mode where the load is moved from mains to generator, for example peak demand periods or periods with risk of power outages.
Mains power export	Power plant with fixed kW set point (excluding building load).

## Main features

### Easy power management setup

The AGC 150 includes Easy Connect. This means:

- When gensets are connected via CANbus, the controllers automatically detect each other.
- If more gensets are connected via CANbus later, these will also be detected automatically.
- Application configuration possible via the display.

### Easy and user-friendly interface

- Parameters access via the display and the Utility Software.
- Pre-configured sensor curves.
- Draw and play application setup via the Utility Software.
- Full power management compatibility with other AGC controllers from DEIF.

### Hybrid support

Generator controller in a micro-grid system, together with DEIF controller ASC-4 (PV and Battery).

### New design - Easy to mount

Adaptive mimic, with easy switching between applications. Compact design making it suitable for all applications.

### Guided experience

Only buttons relevant for a function are visible to the user.

### User levels in settings

Configure three user levels with a password for each level: Customer, Service and Master. Configure each parameter for a user level, and only the parameters relevant for the user are shown.

### Shortcut menu

Configurable shortcuts give the user easy access to frequently used functions.

### PLC functions

Programmable functions (M-Logic) in a user-friendly environment.

### Alarm and Event logging

View historical alarms and events on the display and with the Utility Software (up to 500 alarms and 500 events).

### Graphical Display

View important genset and/or system information on the easy-to-read graphical display, shown as text, symbols, numbers, and even a graphical synchroscope.

### Built-in analogue AVR and GOV control

Eliminates the need for external equipment (voltage and PWM).

### CIO support

AGC 150 supports CANbus based I/Os, which increases the number of inputs and outputs.

### Tier 4 final support

AGC 150 can be used with the latest electrical Tier 4 Final engines and show values requested by the standard.

## Functions and features

### Key functions and features

- Engine start sequences
- Engine and generator protections
- Engine communication via CANbus
- Run coil and crank configurable when using electric engine
- Tier 4 Final support with clear alarm indications
- Diesel and gas genset support
- 3-phase generator and busbar sensing
- Phase compensation for D/Y transformer
- Four current sensing inputs
- Integrated governor and AVR outputs for control
- State-of-the-art synchronisation and load sharing
- Synchroscope and sync check
- Digital voltage regulation support for different DVR
- Voltage and frequency matching
- Three synchronisation methods: Dynamic, Static and Close before excitation
- 12 digital outputs (configurable)
- 12 digital inputs (configurable)
- Two analogue outputs (-10 to 10 V)
- Four multi-inputs:
  - Resistor, 0 to 4000  $\Omega$
  - Voltage, 0 to 10 V
  - Current, 4 to 20 mA
  - Digital input
- Deadbus sensing
- Ground relay
- Mains support for stand-alone system (AMF)
- Analogue load sharing with external box
- 128 genset support via digital load sharing (CANshare)
- ROCOF and Vector jump protection
- Fuel usage monitoring
- Maintenance alarms
- Grid support

### Power management

- A power management system can include up to 40 controllers (32 genset or mains support and 8 bus tie breakers)
- ASC support (Solar, Battery)
- ALC support (load management)
- Load sharing support via PM with AGC-4 and AGC 200 v4
- Droop mode

### Easy overview

- Remote monitoring support with Insight
- Weekly scheduler
- Emulation for testing and frontload commissioning
- Built-in *Guided experience* to help the user
- Engine alarms in clear text on the display

- Graphical display:
  - LCD, back-lit
  - High resolution, 240 x 120 pixels
  - Six lines
  - Operating temperature from -40 to +70 °C (-40 to +158 °F)
- Five-key navigation menu
- Event log with 500 entries (can be exported to a CSV file)
- Alarm log with 500 entries (can be exported to a CSV file)

### Digital AVR support

Together with DEIF's DVC 310 digital voltage controller, the AGC 150 supports features such as Engine AID (for the rental market) and fast and secure CBE critical power start-up (run-up syncing).

### Highly configurable

- Controller configuration from the front panel (PIN code protected) or with free PC tool via USB, Ethernet & RS485
- PC tool with trending and wizards helping the user with configuration
- 20 configurable views
- Four fully configurable PID controllers
- CAN flags between controllers
- CANbus based extension module for Inputs/Outputs
- Real time clock
- User configurable logic (lite PLC)
- Ethernet communication for PLC, SCADA or BMS
- Multi-language support (incl. Chinese, Russian and other languages)

### Three software packages

The AGC 150 can be equipped with three different software packages: Core, Extended and Premium.

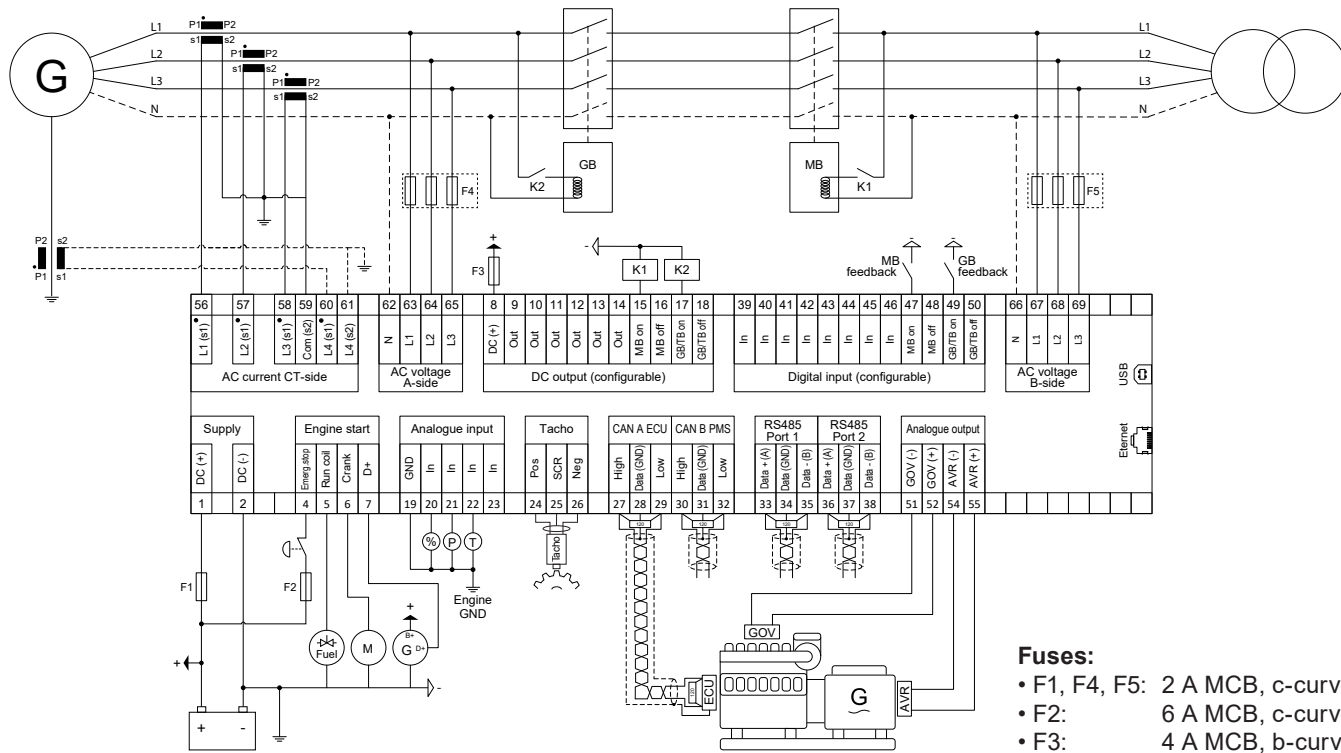
The software packages are shaped to fit these purposes:

- **Core:** Simple paralleling, like rental and constructions
- **Extended:** Standby power, like simple backup power stations
- **Premium:** Small CHP or similar medium complex sites

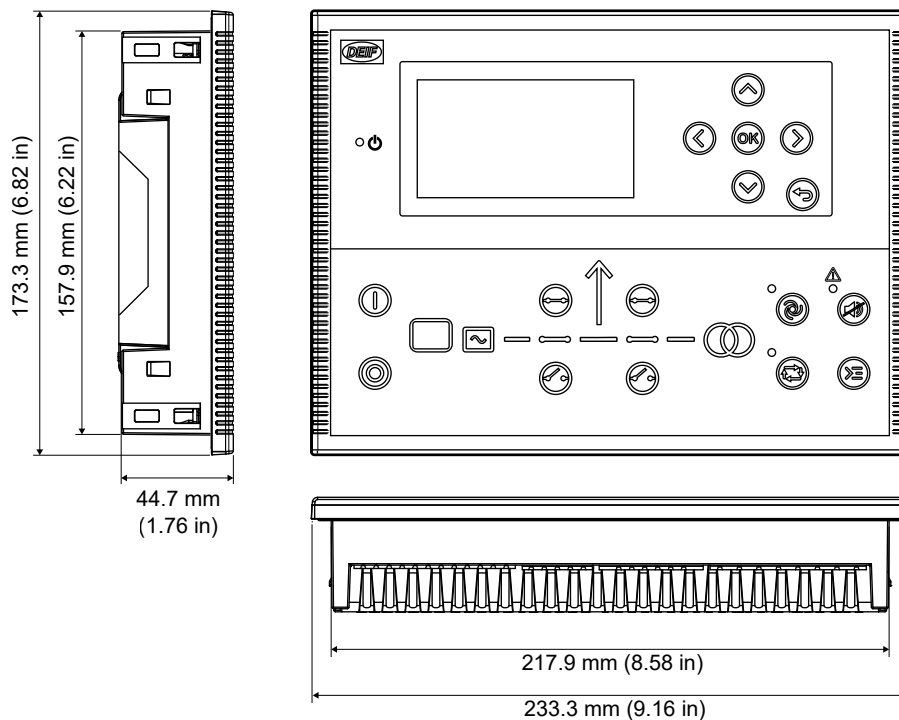
See the data sheet for a more detailed description of each package.

# Wiring and dimensions

## Typical wiring



## Dimensions



Designed and made in Denmark.

# Technical specifications

## Power supply

- Nominal voltage: 12/24 V DC
- Operating range: 6.5 to 35 V DC
- Load dump protection (ISO16750-2)
- Measuring range: 0 to 50 V DC (35 V DC continuously)

## Operating conditions

- Operating temperature: -40 to +70 °C (-40 to +158 °F)
- Storage temperature: -40 to +85 °C (-40 to +185 °F)

## Environment

- Altitude: 0 to 4000 m
- Humidity: 20/55 °C at 95 % RH
- Protection degree: IP65 in panel, IP20 on terminals
- Pollution degree 2
- Self-extinguishing plastic

## Measuring

- Voltage range: 100 to 690 V, phase-to-phase
- Max. measured voltage: 10 to 135 % of nominal
- Voltage accuracy:  $\pm 1$  % of nominal
- Current range: 1 A and 5 A, 2 to 300 %
- Max. measured current: 3/15 A overload
- Current accuracy:  $\pm 1$  % of nominal
- Frequency range: 3.5 to 75 Hz
- Power accuracy:  $\pm 1$  % of nominal

## Inputs/Outputs

- Digital inputs: 12 (max. +50 V, min. -24 V)
- Digital outputs: 2 (15 A inrush / 3 A continuously)  
10 (2 A inrush / 0.5 A continuously)
- Digital common: 12/24 V DC
- Analogue inputs: 4
- Analogue outputs: 2
- CANbus 1 and 2
- RS-485 1 and 2
- RJ-45 Ethernet
- USB (service-port)

## Approvals

- CE
- cULus Listed to UL508 Industrial control equipment
- cULus recognized to UL6200 controls for stationary engine gensets

## Protections

2 x Reverse power	ANSI 32R
2 x Short circuit	ANSI 50P
4 x Over-current	ANSI 51
1 x Voltage-dependent over-current	ANSI 51V
2 x Over-voltage	ANSI 59P
3 x Under-voltage	ANSI 27P
3 x Over-frequency	ANSI 81O
3 x Under-frequency	ANSI 81U
1 x Unbalanced voltage	ANSI 47
1 x Unbalanced current	ANSI 46
1 x Under-excitation or var import	ANSI 32RV
1 x Over-excitation or var import	ANSI 32FV
5 x Overload	ANSI 32F
1 x Earth current	ANSI 51G
1 x Neutral current	ANSI 51N
3 x Busbar/mains over-voltage	ANSI 59P
4 x Busbar/mains under-voltage	ANSI 27P
3 x Busbar/mains over-frequency	ANSI 81O
3 x Busbar/mains under-frequency	ANSI 81U
1 x Emergency stop	ANSI 1
2 x Overspeed	ANSI 12
1 x Low auxiliary supply	ANSI 27DC
1 x High auxiliary supply	ANSI 59DC
1 x Generator breaker external trip	ANSI 5
1 x Tie/mains breaker external trip	ANSI 5
Synchronisation failure alarms	ANSI 25
Breaker open failure	ANSI 52BF
Breaker close failure	ANSI 52BF
Breaker position failure	ANSI 52BF
1 x Close before excitation failure	ANSI 48
1 x Phase sequence error	ANSI 47
1 x De-load error	ANSI 34
1 x Crank failure	ANSI 48
1 x Running feedback error	ANSI 34
1 x MPU wire break	
1 x Start failure	ANSI 48
1 x Hz/V failure	ANSI 53
1 x Stop failure	ANSI 48
1 x Stop coil, wire break alarm	ANSI 5
1 x Engine heater	ANSI 26
2 x Max. ventilation/radiator fan	
1 x Not in Auto	ANSI 34
1 x Fuel fill check	
1 x Vector jump	ANSI 78
1 x df/dt (ROCOF)	ANSI 81R
2 x Under-voltage and reactive power, U and Q	
1 x Positive sequence (mains) voltage low	ANSI 27
2 x Directional over-current	ANSI 67
1 x Negative sequence voltage high	ANSI 47
1 x Negative sequence current high	ANSI 46
1 x Zero sequence voltage high	ANSI 59G
1 x Zero sequence current high	ANSI 50G
1 x Power-dependent reactive power	ANSI 40
1 x IEC/IEEE inverse time over-current	ANSI 51

### For more information, please contact:

DEIF A/S · Frisenborgvej 33 · DK-7800 Skive · Denmark  
Tel.: +45 9614 9614 · Fax: +45 9614 9615 · info@deif.com · www.deif.com