



AGC 200 Advanced Gen-set Controller DATA SHEET



(ANSI)

(32)

(32)

(50/51)

(27/59)

(51V)

Operation modes

- Automatic mains failure
- Island operation
- Fixed power/base load
- Peak shaving
- Load take over
- Mains power export

Protection

- 5 x Overload
- 2 x Reverse power
- 5 x Over current
- Voltage dependent over current
- Gen. 3 x over/3 x under voltage
- Gen. 3 x over/ 3 x under frequency (81)
- Mains/busbar 3 x over/4 x under voltage (27/59)
 Mains/busbar 3 x over/4 x under freq. (81)
- Mains/busbar 3 x over/4 x under freq. (8
 Current/voltage unbalance (6
- Current/voltage unbalance (60)
 Loss of excitation/over excitation (40)

M-logic

- Simple logic configuration tool
- Selectable input/output events





Front

- Push-buttons for start and stop
- Push-buttons for breaker operations
- Status texts
- Alarm indication
- Prepared for additional operator panels

General

- USB interface to PC
- Free PC utility software for commissioning
- Mini SCADA in PC utility software
- SD card slot for lifetime logging
- 3/2/1-phase monitoring

Engine control

- CANJ1939 and MTU MDEC/ADEC communication
- Start/stop sequences
- 3 x configurable analogue/binary inputs



Generator Controller AGC 200

Application

The Generator Controller AGC 200 family is microprocessor-based control units containing all necessary functions for protection and control of a diesel engine. Furthermore, it contains a three-phase AC voltage measuring circuit. The unit is equipped with an LCD display presenting all values and alarms.

The AGC 200 series is compact all-in-one units. The variants are as follows:

| AGC 212: | Island single generator controller |
|---------------------------|--|
| AGC 213: | Single generator set controller, automatic |
| | mains failure |
| AGC 223: | Single generator set controller, automatic |
| | mains failure, peak shaving, load take |
| | over and mains power export |
| AGÇ ⁄232: | Generator set controller with digital load |
| | sharing for island applications |
| AGC ⁄242: | Generator set controller with power |
| | management, up to 16 generators |
| AGC 243: | Bus tie breaker controller with power |
| < | management, up to 16 generators |
| AGC 245: \smallsetminus | Mains breaker controller with power |
| | management, up to 16 generators |
| AGC 246 | Mains and tie breaker controller with |
| | power management, up to 16 generators |

The AGC 200 series is equipped with the following I/Os:

| | | | / / |
|----------------|----------------|-----------|-------------------|
| In-/outputs | | Available | |
| | 4-20mA | | |
| Multi-inputs: | Digital inputs | 3 (3) | |
| | VDO | | |
| Digital inputs | | 16(12) | |
| RPM (MPU) | | 1 ⁄ | |
| Relays | | 13(12) 🗸 | |
| Modbus comm | ٦ | 1 | $\langle \rangle$ |
| CANbus comr | n | 3 | - |
| TCP/IP comm | | 1 | |



The number in parenthesis indicates the number of user-configurable in-/outputs.

The 3 CAN communications are for options: Engine communication, Additional Operator Panel(s), External I/O modules and load sharing/power management

Test

The available gen-set modes except island operation include a test mode. The test can be configured in three different ways.

- Simple: Gen-set starting and running for a preset time. Generator breaker is open during the test.
- Load: Gen-set starting, synchronisation of the generator breaker. The test is carried out for a preset period of time at a fixed power setpoint parallel to the mains.
- Full: (Single gen-set only) Gen-set starting, synchronisation of the generator breaker, deload and opening of the mains breaker. The test is carried out for a preset period of time after which the load is transferred back to the mains connection.

Setup

Setup is easily done via a menu structure in the display (password-protected) or via the USB PC connection and the Multi-line 2 Windows[®]-based PC utility software. The PC utility software can be downloaded free of charge from www.deif.com. The utility software offers additional features such as monitoring of all relevant information during commissioning, saving and downloading of settings and downloading of software updates.

Options

In order to perfectly match the product solution to specific applications, the functionality of the AGC 200 can be equipped with a number of available options. The options selected by the customer will be integrated in the standard AGC 200 hereby securing the same user interface unaffected by whether the application needs a highly complex or a more basic gen-set controller.

M-logic

This configuration tool is part of the PC utility software which is free of charge. With this tool it is possible to customise the application to your needs. It is possible to dedicate specific functions or logical conditions to different inputs and outputs.



Single line application diagrams









Generator Controller AGC 200

Power management

Description

The AGC 200 series can be equipped with power management. Using this possibility, the AGC 200 will be able to handle various applications.

Common for all applications:

- Load-dependent start/stop operation
- Priority selection of gen-sets
- Ground relay control
- Plant division into sections for individual functionality
- Load management
- Multi-master system

In a multi-master system, all vital data is broadcasted from all units to all units, giving all units knowledge of their own position in the application. This philosophy makes the application immune to a failing master controller.

Start/stop control

Start and stop of the power management can be done in the following ways:

- Local: Start and stop is controlled from the display.
- Remote: Start and stop is controlled with a binary input.
- Timer: Start and stop is automatically controlled by internal command timers programmed through the PC utility software.

Priority selection

The priority routines in the AGC 200 can be based on:

- Manual selection
- Absolute running hours
- Relative running hours
- Fuel optimising

Load-dependent operation

The load-dependent starting and stopping of the gensets is based on an *available power* (spinning reserve) calculation. The next generator will start, when the available power decreases below the adjustable setpoint. It will stop, when too much power is available.

Priority selection

Priority routines are individually made for the mains in the plant sections and for the gen-sets.

- Manual selection based on ID
 - Running hours
 - Fuel optimising calculating the best combination of generator kW size and the plant load. Works with up to 16 gen-sets

Load management

If a certain amount of available power on the busbar is required to connect certain load groups, relays can be configured to activate when the specific amount of available power is reached and thereby connect a load group.

Ground relay

If configurable relays are available in the specific AGC 200 units, it is possible to control the star point ground connection of the generators. This is in order to have only one ground connection at a time.

Automatic Transfer Switch (ATS)

The AGC 200 supports applications where an ATS is used instead of a mains breaker.

Redundant CANbus

In systems where extra operation reliability is required, redundant CANbus communication lines can be used to provide back-up.

DEIF A/S

Available options

| Option | Description | | Option | Note |
|--------|--|-----------------|-----------|------------------------|
| ^ | Loss of mains protection package | | туре | |
| A | Cuer and under veltage (generator and husher/maine) | (ANSI) | Cottworo | |
| AI | Over- and undervollage (generator and busbar/mains) | (27/59) (81) | Soliware | |
| | Vector jump | (78) | | |
| | df/dt (ROCOF) | (81) | | |
| A4 | Positive sequence (mains) voltage low | (27) | Software | |
| A5 | Directional over current | (67) | Software | |
| С | Generator add-on protection package | | · | |
| C2 | Negative sequence voltage high | (47) | Software | |
| | Negative sequence current high | (46) | | |
| | Zero sequence voltage high | (59) | | |
| / | Zero sequence current high | (50) | | |
| Н | Serial communication | | | 1 |
| H2 | Modbus RTU (RS485) | | Software | |
| H6 | Cummins/GCS RS485 | | | |
| H8 | CANbus Interface. Selectable functions: | | | CAN A or B |
| | Additional Operator Panel interface (option X4) | | | |
| | External I/O modules (Becknoff type, NOT supplied by D | PEIF). | | |
| J | | | 1 | |
| J7 | PC caple for utility software (USB) 3 m. (UL94 (V1) approved | | | |
| L | Display gasket for IP65 | | Other | Chan dand in ID50 |
| L1 | | | Utner | Standard IS IP52 |
| LZ | Display -40 - C (-40 - F) | | Hardware | |
| N | | | Cathurana | |
| N | | | Software | |
| Х | Display | | | |
| X4 | Additional operator panel (AOP-2): 16 configurable LEDs, 8 confi | gurable | Other | Five options X4 can be |
| | buttons and 1 status relay. CANbus comm. Buzzer. | _ / / | | ordered for each AGC |
| | ``\/_//////////////////////////// | | | 200 unit. CAN A or B. |

(ANSI# as per IEEE Std C37.2-1996 (R2001) in parenthesis).



Principle diagram

Automatic mains failure/mains power export/peak shaving/load take over





*Mains current and ground current use the same AC current input and can therefore not be mounted simultaneously. They may or may not be used.

Single generator/load sharing/power management





*Ground current may or may not be used.



Display layout, AGC 213, 223





Rear side view



CANbus C is for engine communication. Available in all variants. CANbus A + C combination is only available in AGC 223/232. CANbus A + B + C combination is only available in AGC 24x.



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Generator Controller AGC 200

Technical specifications

| Accuracy: | Class 1.0 | Multi-functional inputs: | | |
|--|---|--------------------------|--|--|
| | Temperature coefficient: +/- 0.2% of full scale pr. 10 ℃ | | 0(4)-2 mA from active transmitter: 0-20 mA. +/- 1% | |
| | Short circuit: 5 % of 350 % * I _N | | Impedance: 50Ω | |
| | -40 <u>1530</u> 70 °C | | Binary Input: Dry contact inputs | |
| | To IEC/EN 60688 | | 3V DC internal supply, with cable | |
| Operating temp.: | -4070°C (-4158 F) UL/cUL Listed: Max-surrounding air temperature | | supervision Max. resistance for ON detection: 100Ω | |
| | 55°C (131 F) | | Pt 100: | |
| Storage temp.: | -4070°C (-40158°F) | | -40 – 250 °C (-40 – 482 F) +/- 1% To IEC/EN 60751 | |
| Climate: | 97% RH to IEC 60068-2-30 | | VDO: | |
| Meas. voltage: | 50690V AC (+20%) | | 0 – 1700 Ω, +/- 2% | |
| UL/cUL: | 50600V/AC (+20%) Phase to phase | Relay outputs, elec | etrical rating: | |
| Load: | 1.5MΩ | Relays 16-20 | | |
| Frequency: | 3070Hz | UL/cUL Listed: | 250V AC/24V DC/AC pending | |
| Meas. current: | 1A or 5A AC from current transformer | | Thermal rating @ 50°C pending | |
| Consumpt. max.: | 0.3 VA/phase | Relay 23: | 36V DC 8A | |
| Current overload: | $4 \times I_n$ continuously 20 x I_n 10 sec. (max. 75A) | UL/cUL Listed: | 24V DC/AC pending Thermal rating @ 50°C pending | |
| 80 x I _n 1 sec. (max. 300A) | | Relay 26 and 27: | ,36V DC/AC 16A | |
| Magnetic pick-up input: Voltage: 2 - 70V peak | | UL/cUL/Listed: | 24V DC/AC pending Thermal rating @ 50°C | |
| | Frequency: 10 -10000Hž Resistance: 250 - 3000Ω | Mounting: | Panel-mounted | |
| Aux. supply: | 6-36V DC continuously (UL/cUL: 7.532.7V DC) Max. 8W consumption | Front size: | 312 x 219 mm (122.8 x 86.2 in) | |
| | | Display: | 240 x 128 pixel backlight STN | |
| | The aux. supply inputs are to be protected by a 2A slow-blow fuse (UL/cUL listed: AWG 24) | Safety: | To EN 61010-1, installation category (over voltage category) III, 600V, | |
| Passive binary in voltage: | | | To UL508 and CSA22.2 No. 14-05 | |
| | Bi-directional optocoupler ON: 836V DC <2V: OFF Impedance: 4.7 kQ | | Installation category (over-voltage category) III, 300V, pollution degree 2 | |
| | | Protection: | Front: IP52/NEMA type 1 (IP65/NEMA type 1 with gasket, option L) Terminals: IP20/NEMA type 1 To IEC/EN 60529 | |
| | | EMC/CE: | To EN 61000-6-1/2/3/4 | |



IEC 60255-26

IEC 60533 power distr. zone IACS UR E10 power distr. zone

Generator Controller AGC 200

| Vibration | | Mounting | For use on a flat ourfood | of turns 2 |
|----------------------|---|-------------------------|---|--------------------------|
| vibration: | 313.2 Hz: 2 mm _{pp} 13.2100 Hz: 0.7g | Mounting: | (IP54) enclosure Main disconnect must be provided by | |
| | To IEC 60068-2-6 | | installer | , |
| | To IACS UR E10 | | Installation: To be instal | led in acc. |
| | | | with the NEC (US) or the | e CEC |
| | 1060 Hz: 0.15 mm _{pp} 60150 Hz: 1g | | (Canada) DC/DC conve | rter |
| | To IEC 60255-21-1 Response | | For AOP-2: | |
| | (class 2) | | Tightening torque: 0.5N Wire size: AWC | lm (4.4lb-in) 5 22-14 |
| | 10…150 Hz: 2g | Weight: | AGC 200: 1.6 kg (3.5 lb |) |
| | To IEC 60255-21-1 Endurance (class 2) | Wolght. | Option J6: 0.2 kg (0.4 lk | us) |
| | | | AGI -2. 0.4 kg (0.3 k | 55) |
| Shock: | 10g, 11msec, half sine | Response times: | | |
| | To IEC 60255-21-2 Response (class2) | (Delay set to minimum) | | |
| | | | Busbar: | |
| / | 30g, 11mse¢, half sine | | Over-/undervoltage: | <50 ms |
| | To IEC 60255-21-2 Endurance | | Over-/underfrequency: | <50 ms |
| | (class2) | | e tel /anaemequeney. | |
| | | | Generator: | |
| | 50g, 11msec, half sine | | Reverse power: | <200 ms |
| | To JEC 60068-2-27 | | Overcurrent: | <200 ms |
| | | | Short circuit: | < 40 ms |
| Bump: | 20g, 16msec, half sine To IEC 60255-21-2 (class2) | | Directional overcurrent | <100 ms |
| / / | | | Over-/undervoltage: | <200 ms |
| Material: | All plastic materials are self- | | Over-/underfrequency: | <300 ms |
| ~ / | extinguishing acc. to UL94 (V1) | | Overload: | <200 ms |
| Diver composition of | | | Current unbalance: | <200 ms |
| Plug connections: | AC voltage/current inputs; | \rangle | Voltage unbalance: | <200 ms |
| < | 3.5 mm (13 AVVG) multi-stranded | \wedge | React. power import: | <200 ms |
| | Other. 15 mm ² /16 AM/C) multi strandad | | React. power export: | <200 ms |
| | Sonvice port: LISB A B | | Negative sequence I: | <400 ms |
| | | | Negative sequence U: | <400 ms |
| | ICF/IF. KJ 45 | | Zero sequence I: | <400 ms |
| Tightoning torquo | min : | / | Zero sequence U: | <400 ms |
| ngniening torque, | | | Overspeed: | <400 ms |
| | AC voltage input: 0.5Nm (5-7lb-in) | | Digital inputs: | <250 ms |
| | Other: 0.5Nm (5-7lb-in) | | Analogue input | <250 ms |
| | | | Emergency stop: | <200 ms |
| Approval: | UL/CUL Listed to UL508 | | Earth current | <100 ms |
| UL markings: | Wiring: Use 60/75°C copper conductors only | / _ // / | Mains: | |
| | | | df/dt (ROCOF): | <130 ms |
| | Mounting: | / / / / | (4 periods) | |
| | (IP54) enclosure | | Vector jump: Positive sequence: | < 40 ms < 60 ms |
| | Installation: | | | |
| | To be installed in acc. with the NEC (US) or the CEC (Canada) | | | |
| | | $\langle / \rangle / /$ | / \langle \rangle | > |
| | Maximum ambient temperature: | ` / / / / | ^ / / / | |
| | 60°C (140 F) Wiring: | | | |
| | Use 60/75°C copper conductors only | \sim / | | |
| | | | | |
| | | | | |
| | | * | / / | |
| | | < | / | |



Unit dimensions in mm (inches)



Due to our continuous development we reserve the right to supply equipment which may vary from the described.



DEIF A/S



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