AGC 150 PMS lite

4921240648-D

Data sheet

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1. AGC 150 PMS lite

2. Compatible products

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1. AGC 150 PMS lite

1.1 About

The AGC 150 PMS lite controllers are for off-grid plants with up to 254 generators and/or bus tie breakers*. Each controller protects and controls a genset, and the genset breaker. Each bus tie breaker is controlled by a bus tie breaker controller. The operator can easily configure the plant from the display, without needing to use a PC with utility software. When the plant is running, the operator can see the total available and consumed power on each display, along with an overview of the operating information for all the generators in the plant.

The power management system makes sure that generators are started or stopped according to the load and priority. The controllers make sure that the generators share the load equally. The plant set up is quick because the controllers use the CAN bus connections to automatically detect each other and assign IDs.

The controller can also be used as a single controller. The controller can protect and control a genset, a genset breaker, and a mains breaker in single-controller applications.

The AGC 150 PMS lite is a compact, all-in-one controller. Each controller contains all necessary 3-phase measuring circuits.

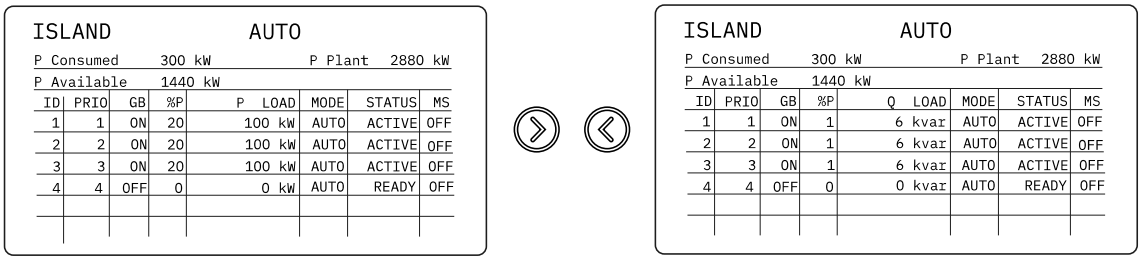
Values and alarms are shown on the LCD display screen, which is sunlight-readable. Operators can easily control the plant, gensets, and breakers from the display units. Alternatively, use the communication options to connect to a PLC. The PLC can then control the plant.

NOTE * For up to 254 gensets and/or bus tie breakers, all controllers must have software version 1.34 or later. For older software (versions 1.16 to 1.33), the limit is 127 gensets. For older software, bus tie breakers are not possible. Older software is not compatible with software version 1.34 or later.

1.1.1 PMS lite overview page

The PMS lite overview shows an overview of the operating information for all the generators. The operator can also see the total available power and the consumer power. Use the *left arrow* and *right arrow* buttons on the controller to change between the Power (kW) page and the Reactive power (kvar) page.

Service View > PMS lite overview



ISLAND AUTO

P Consumed 300 kW P Plant 2880 kW

P Available 1440 kW

ID	PRIO	GB	%P	P LOAD	MODE	STATUS	MS
1	1	ON	20	100 kW	AUTO	ACTIVE	OFF
2	2	ON	20	100 kW	AUTO	ACTIVE	OFF
3	3	ON	20	100 kW	AUTO	ACTIVE	OFF
4	4	OFF	0	0 kW	AUTO	READY	OFF

ISLAND AUTO

P Consumed 300 kW P Plant 2880 kW

P Available 1440 kW

ID	PRIO	GB	%P	Q LOAD	MODE	STATUS	MS
1	1	ON	1	6 kvar	AUTO	ACTIVE	OFF
2	2	ON	1	6 kvar	AUTO	ACTIVE	OFF
3	3	ON	1	6 kvar	AUTO	ACTIVE	OFF
4	4	OFF	0	0 kvar	AUTO	READY	OFF

NOTE MS is the multi-start function. OFF means the function is not enabled and ON means the function is enabled.

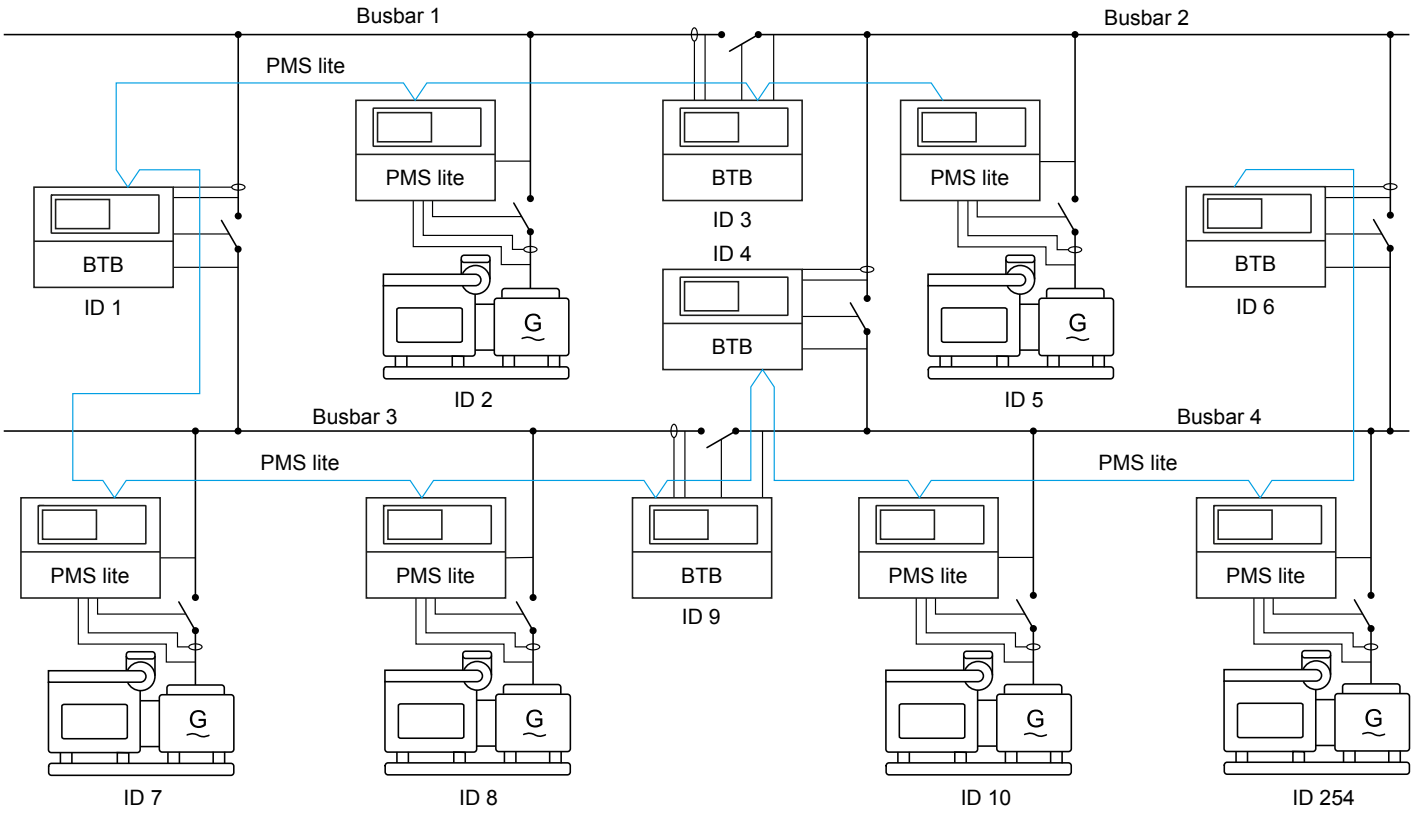
1.1.2 Software packages

The controllers use the AGC 150 **Core** software package.

1.2 Power management applications (multiple gensets)

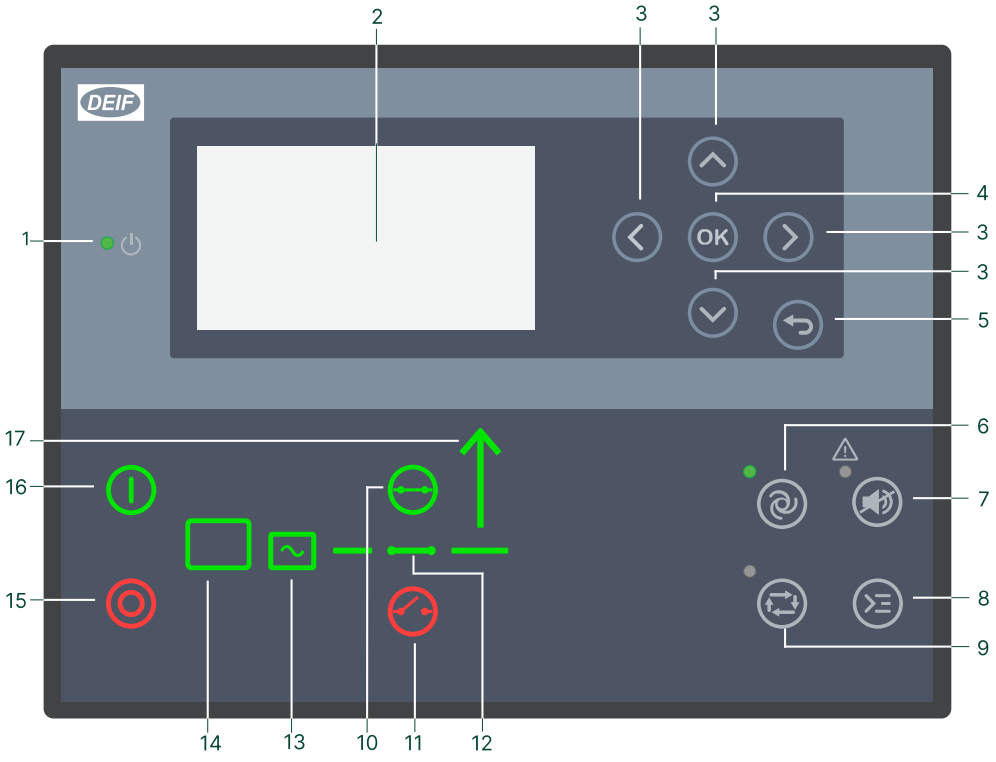
1.2.1 Single-line drawing

PMS lite, with up to 254 single gensets and/or bus tie breakers



NOTE To control gensets in a standard power management system, use iE 150 Generator or AGC 150 Generator controllers.

1.2.2 Display, buttons, and LEDs

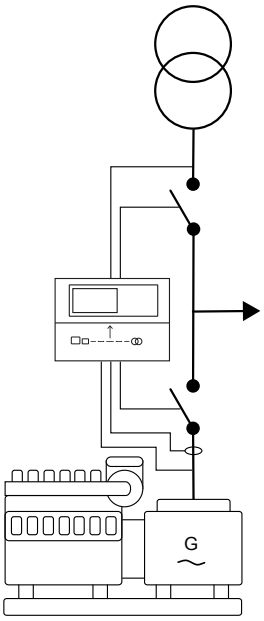


No.	Name	Function
1	Power	Green: The controller power is ON. OFF: The controller power is OFF.
2	Display screen	Resolution: 240 x 128 px. Viewing area: 88.50 x 51.40 mm. Six lines, each with 25 characters.
3	Navigation	Move the selector up, down, left, and right on the screen.
4	OK	Go to the Menu system. 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) gensets. No operator actions are needed. The controllers use the power management configuration to automatically select the power management action.
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.
9	MANUAL mode	The operator or an external signal can start, stop, connect, or disconnect the genset. The generator controller cannot automatically perform these actions. The controller automatically synchronises before closing a breaker, and automatically deloads before opening a breaker.
10	Close breaker	Push to close the breaker.
11	Open breaker	Push to open the breaker.
12	Breaker symbols	Green: Breaker is closed. Green flashing: Synchronising or deloading. Red: Breaker failure.
13	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.
14	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.
15	Stop	Stops the genset if MANUAL or No Reg is selected.
16	Start	Starts the genset if MANUAL or No Reg is selected.
17	Load symbol	OFF: Power management application. Green: The supply voltage and frequency are OK. Red: Supply voltage/frequency failure.

1.3 Single-controller applications

1.3.1 Single-line drawings

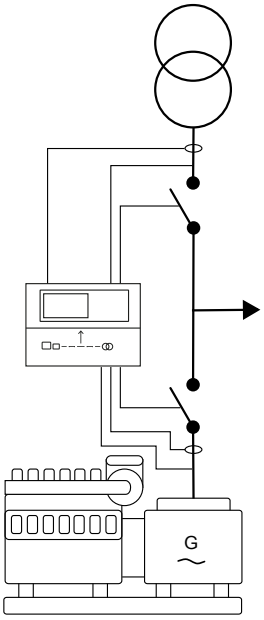
Automatic mains failure (AMF) and fixed power



Automatic Mains Failure (AMF): If there is a significant loss of mains power or a total blackout, the controller automatically changes the supply to the emergency generator. This makes sure that there is power during a mains failure and prevents damage to electrical equipment.

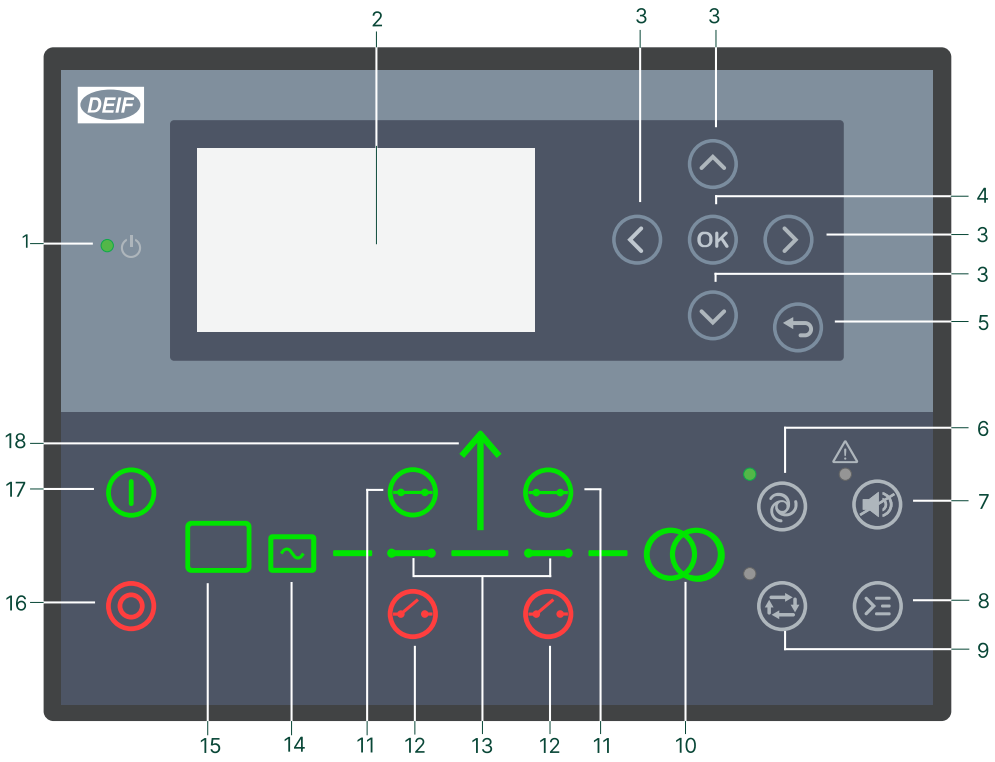
Fixed power: When given a signal, the controller automatically starts the genset and synchronises to the mains. After the generator breaker closes, the controller ramps up the load to the set point level. When the stop command is given, the genset is de-loaded and stopped after the cooling down period.

Peak shaving, load take-over, and mains power export



- **Peak shaving**: Power plant where the generator supplies the peak load demand and runs parallel to mains.
- **Load take-over**: Plant mode where the load is moved from mains to generator, for example, during peak demand periods or periods with a risk of power outages.
- **Mains power export**: Power plant with fixed kW set point (excluding increasing load).

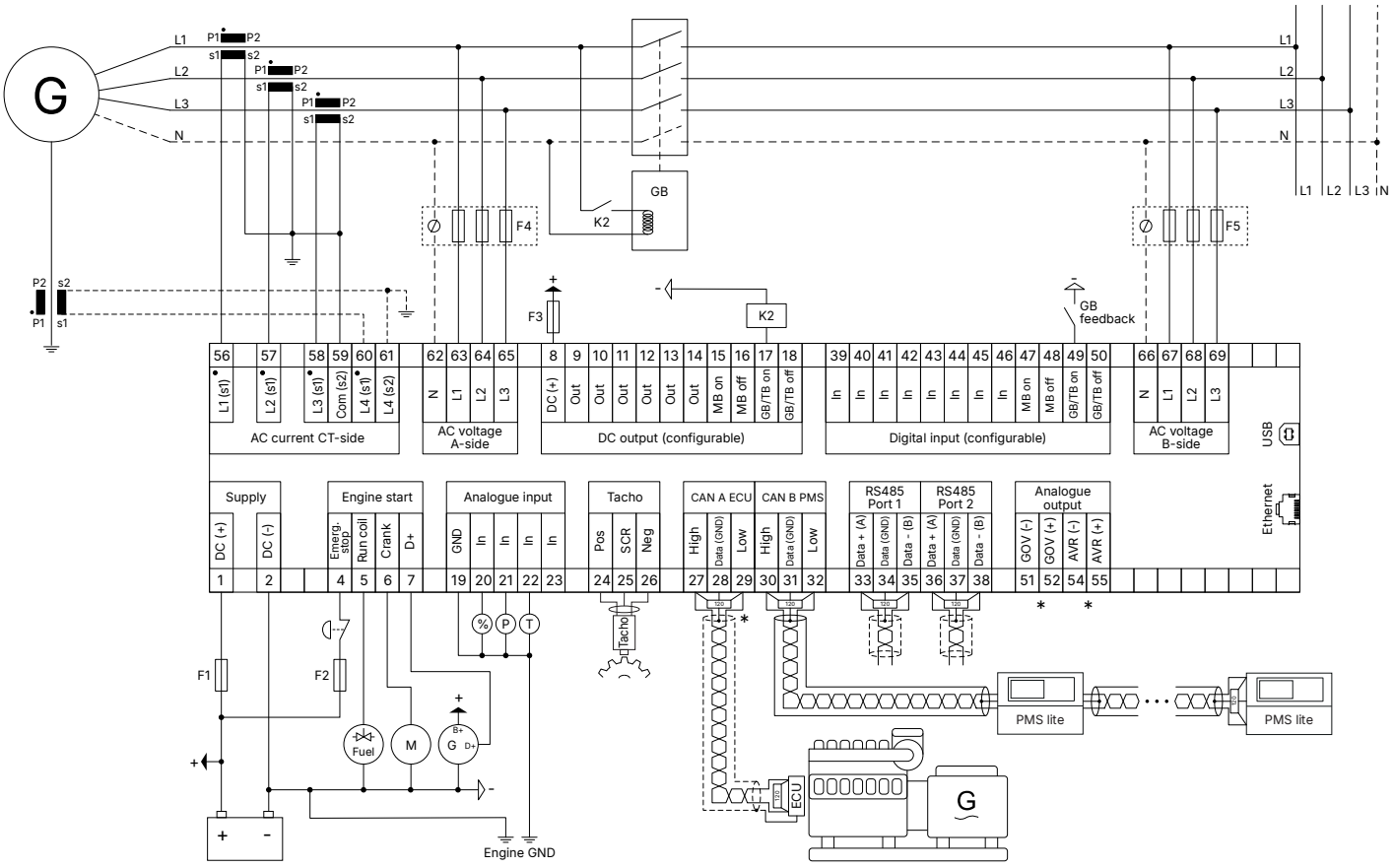
1.3.2 Display, buttons, and LEDs



No.	Name	Function
1	Power	Green: The controller power is ON. 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. No operator actions are needed. The controller also automatically opens and closes the mains breaker (open transitions, since there is no synchronisation).
7	Silence horn	Turns off an alarm horn (if configured) and enters the Alarm menu.
8	Shortcut menu	Access the Jump menu, Mode selection, Test, Lamp test
9	MANUAL mode	The controller cannot automatically start, stop, connect, or disconnect the genset, or open and close the mains breaker. The operator or an external signal can start, stop, connect, or disconnect the genset, or open or close the mains breaker.
10	Mains symbol	Green: Mains voltage and frequency are OK. The controller can 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. Red: Breaker failure.
14	Generator	Green: Generator voltage and frequency are OK. The controller can close the breaker.

No.	Name	Function
		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 MANUAL or No Reg is selected.
17	Start	Starts the genset if MANUAL or No Reg is selected.
18	Load symbol	Green: The supply voltage and frequency are OK. Red: Supply voltage/frequency failure.

1.4 Typical wiring for PMS lite controller



Fuses

- F1: 2 A DC max. time-delay fuse/MCB, c-curve
- F2: 6 A DC max. time-delay fuse/MCB, c-curve
- F3: 4 A DC max. time-delay fuse/MCB, b-curve
- F4, F5: 2 A AC max. time-delay fuse/MCB, c-curve

NOTE * The diagram shows EIC governor regulation. Alternatively, the governor and AVR can be regulated using the analogue outputs.

1.5 Functions and features

1.5.1 PMS lite controller functions

Power management system functions

Plant
Each display shows operating information for all the generators
Each display shows the total plant load and available power
Automatic detection and ID assignment
The operator can use the display to manually assign IDs
PMS settings • Different settings in each controller supported • Supports sharing the PMS lite configuration between controllers
Configurable baud rate for PMS lite communication (125/250 kbps)
PMS lite load sharing • Equal load sharing for active (P) and reactive (Q) power
Select number of generators to run
Select start all (generators)
Start timer (suspends LDSS)
Busbar section management

Generator priority
Assigned automatically
Assigned manually (multiple controllers can have the same priority)
Based on running hours

Load-dependent start and stop (LDSS)
Automatically start the next generator for high load
Automatically stop the next generator for low load
Manual start and stop available
Select the minimum number of running generators
PLC start-stop • Disable load-dependent start and stop • PLC controls start and stop using digital inputs, Modbus and/or M-Logic

Genset functions

Synchronising functions
Dynamic synchronisation
Continuous parallel operation
Short-time parallel

Generator functions
Built-in analogue AVR control
External analogue AVR control via IOM 230

Generator functions
Digital AVR control: Remote configuration, DVC - DEIF
Communication with KWG ISO5 isolation monitor (CAN bus)

Load sharing
PMS lite load sharing

Engine functions

Start and stop functions
Engine start and stop sequences
Temperature-dependent cooling down
Time-based cooling down
Configurable crank and run coil

Regulation functions
Governor regulation using: • Engine communication • Built-in analogue control • External analogue control using IOM 230 • Relays
Manual speed control using: • Digital inputs • Display screen menu (by the operator) • Analogue input • Modbus • Configured set point
Speed sensing using CAN, MPU, or frequency
Power ramp up and down

Engine protections	Alarms	ANSI	Operate time
Overspeed	2	12	<400 ms
Crank failure	1	48	
Running feedback error	1	34	
MPU wire break	1	-	
Start failure	1	48	
Stop failure	1	-	
Stop coil, wire break alarm	1	-	
Engine heater	1	26	
Max. ventilation/radiator fan	1	-	
Fuel fill check	1	-	
Maintenance alarms	Multiple		

Other engine functions
Fuel usage monitoring
Fuel pump logic and refill
Diesel exhaust fluid monitoring
Diesel exhaust fluid logic and refill
Generic fluid monitoring
Generic fluid logic and refill

Single controller functions

Operation modes
Automatic mains failure (AMF)
Fixed power
Peak shaving
Load take-over
Mains power export (MPE)

1.5.2 General functions

AC functions	Core
Sets of nominal settings	4
Select the AC configuration: • 3-phase/3-wire • 3-phase/4-wire • 2-phase/3-wire (L1/L2/N or L1/L3/N) • 1-phase/2-wire L1	●
100 to 690 V AC (selectable)	●
CT -/1 or -/5 (selectable)	●
4th current measurement (select one) • Neutral current (1 × true RMS) • Ground current (with 3rd harmonic filter) • Single controller: Mains current (and power)	●

General functions	Core
Emulation	●
Test sequences • Simple test • Load test • Full test	●
PLC logic (M-Logic)	20 lines
Counters, including: • Breaker operations • kWh meter (day, week, month, total) • kvarh meter (day, week, month, total)	●

Setting and parameter functions	Core
User-defined permission level	●
Password-protected setup	●
Trending with the USW	●
Event logs with password, up to 500 entries	●

Display and language functions	Core
Supports multiple languages (including Chinese and other languages with special characters)	●
20 configurable graphical screens	●
Graphical display with six lines	●
Parameters can be changed on the display unit	●
3 engine function shortcuts	●
20 configurable shortcut buttons	●
5 configurable display screen "LED lamps" (on/off/blink)	●

Modbus functions	Core
Modbus RS-485	●
Modbus TCP/IP	●
Configurable Modbus area	●

1.5.3 Easy configuration with or without the utility software

You can easily set up an application without the utility software.

You can also use the utility software to quickly configure the inputs, outputs, parameters, and settings.

1.5.4 Emulation

The controller includes an emulation tool to verify and test the functionality of the application, for example breaker handling and generator operation.

Application emulation is useful for training, customising plant requirements, and for testing basic functionality that needs to be set up or verified.

1.5.5 Supported ECUs and engines

The controller can communicate with the following ECUs and engines.

Manufacturer	ECUs	Engines	Tier 4/Stage V	Controller setting *Engine I/F [7561]*
Generic J1939	Any ECU that uses J1939	Any engine that uses J1939	●	Generic J1939
ANGLE	-	-	-	ANGLE
Baudouin	CPCB IV	-	-	Baudouin CPCB IV
Baudouin	WOODWARD PG+	-	-	Baudouin Gas

Manufacturer	ECUs	Engines	Tier 4/Stage V	Controller setting *Engine I/F [7561]*
Baudouin	Wise 10B	-	-	Baudouin Wise10B
Baudouin	Wise 15	-	●	Baudouin Wise15
Bosch	EDC17	-	-	Bosch EDC17CV54TMTL
Caterpillar	ADEM3	C4.4, C6.6, C9, C15, C18, C32, 3500, 3600	-	Caterpillar ADEM3
Caterpillar	ADEM4	C4.4, C6.6, C9, C15, C18, C32, 3500, 3600	-	Caterpillar ADEM4
Caterpillar	ADEM5	-	-	Caterpillar ADEM5
Caterpillar	ADEM6	-	-	Caterpillar ADEM6
Caterpillar	ADEM3, ADEM4	C4.4, C6.6, C9, C15, C18, C32, 3500, 3600	-	Caterpillar Generic*
Caterpillar	-	-	-	Caterpillar with C7.1 AT
Cummins	CM 500	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	-	Cummins CM500
Cummins	CM 558	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	-	Cummins CM558
Cummins	CM 570	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	-	Cummins CM570
Cummins	CM 570 Industrial	-	●	Cummins CM570 Industrial
Cummins	CM 850	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	-	Cummins CM850
Cummins	CM 2150	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	●	Cummins CM2150
Cummins	CM 2250	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	●	Cummins CM2250
Cummins	CM 2350	-	●	Cummins CM2350
Cummins	CM 2350 Industrial	-	●	Cummins CM2350 Industrial
Cummins	CM 2358	-	●	Cummins CM2358
Cummins	CM 2850	-	●	Cummins CM2850
Cummins	CM 2880	-	●	Cummins CM2880
Cummins	CM 2880 Industrial	-	●	Cummins CM2880 Industrial
Cummins	CM 500, CM 558, CM 570, CM 850, CM 2150, and CM 2250	QSL, QSB5, QSX15 and 7, QSM11, QSK 19/23/50/60	ECU-dependent	Cummins Generic*
Cummins	-	Industrial	-	Cummins Generic Industrial
Cummins	-	KTA19	-	Cummins KTA19
Cummins	PGI	-	●	Cummins PGI
Detroit Diesel	DDEC III	Series 50, 60, and 2000	-	DDEC III
Detroit Diesel	DDEC IV	Series 50, 60, and 2000	-	DDEC IV
Detroit Diesel	DDEC III, DDEC IV	Series 50, 60, and 2000	-	DDEC Generic*
Deutz	EMR2	-	-	Deutz EMR 2
Deutz	EMR3	-	-	Deutz EMR 3

Manufacturer	ECUs	Engines	Tier 4/Stage V	Controller setting *Engine I/F [7561]*
Deutz	EMR4	-	-	Deutz EMR 4
Deutz	EMR4 Stage V	-	-	Deutz EMR 4 Stage V
Deutz	EMR5	-	-	Deutz EMR 5
Deutz	EMR5 Stage V	-	●	Deutz EMR 5 Stage V
Deutz	EMR2, EMR3	-	-	Deutz EMR Generic*
Doosan	EDC17	-	-	Doosan G2 EDC17
Doosan	MD1	-	●	Doosan MD1
Doosan	G2 EDC17	-	●	Doosan stage 5
FPT Industrial	EDC17	-	-	FPT EDC17CV41
FPT Industrial	Bosch MD1	-	●	FPT Stage V
Guascor	GCS-e ECU	-	-	Guascor GCS
Hatz Diesel	-	3/4H50 TICD	●	Hatz
Hatz Diesel	EDC17	-	-	Hatz EDC17
Isuzu	ECM	4JJ1X, 4JJ1T, 6WG1X FT-4	-	Isuzu
Iveco	CURSOR	-	-	Iveco CURSOR
Iveco	EDC7 (Bosch MS6.2),	-	-	Iveco EDC7
Iveco	CURSOR, NEF, EDC7, VECTOR 8	-	●**	Iveco Generic*
Iveco	NEF	-	-	Iveco NEF
Iveco	Bosch MD1	-	●	Iveco Stage V
Iveco	Iveco NEF67	-	●	Iveco Stage V NEF67
Iveco	VECTOR 8	-	-	Iveco Vector8
JCB	-	ECOMAX DCM3.3+	●	JCB
JCB	-	P745 & P740 DieselMax Stage V Version 7	●	JCB 430/448 Stage V
Jichai	JC15D-ECU22	-	-	JC15D Weifu***
Jichai	JC15D WYS	-	-	JC15D WYS
Jichai	JC190	-	-	JC190
Jichai	JC15T JG	-	-	Jichai JC15T JG
Jing Guan	-	Gas	-	Jing Guan
John Deere	JDEC	PowerTech M, E, and Plus	●	John Deere
John Deere	FOCUS controls (version 2.1)	-	●	John Deere Stage V
Kingbang			●	Kingbang
Kohler	ECU2-HD	KD62V12	●	Kohler KD62V12
Kohler	-	KDI 3404	-	Kohler KDI 3404
Kubota	KORD3	-	●	Kubota Stage V
MAN	EDC17	-	-	MAN EDC17
MAN	EMC 2.0	-	-	MAN EMC Step 2.0

Manufacturer	ECUs	Engines	Tier 4/Stage V	Controller setting *Engine I/F [7561]*
MAN	EMC 2.5	-	-	MAN EMC Step 2.5
MAN	EMC 2.0, EMC 2.5	-	-	MAN Generic*
MTU	MDEC module M.201	-	-	MDEC 2000/4000 M.201
MTU	MDEC module M.302	Series 2000 and 4000	-	MDEC 2000/4000 M.302
MTU	MDEC module M.303	Series 2000 and 4000	-	MDEC 2000/4000 M.303
MTU	MDEC module M.304	-	-	MDEC 2000/4000 M.304
MTU	ADEC	Series 2000 (ECU7), Series 4000 (ECU7), and MTU PX	-	MTU ADEC
MTU	ADEC, ECU7 without SAM module (software module 501)	Series 2000 and 4000	-	MTU ADEC module 501
MTU	ECU7 with SAM module	Series 2000 (ECU7), Series 4000 (ECU7), and MTU PX	-	MTU ECU7 with SAM
MTU	ECU8	-	-	MTU ECU8
MTU	ECU9	-	●	MTU ECU9
MTU	ECU9 EMINOX	-	●	MTU ECU9 EMINOX
MTU	J1939 Smart Connect, ECU8, ECU9	Series 1600	● (ECU9 or later)	MTU J1939 Smart Connect
Perkins	ADEM3	-	-	Perkins ADEM3
Perkins	ADEM4	-	-	Perkins ADEM4
Perkins	CPCB IV			Perkins CPCB IV
Perkins	EDC17	-	-	Perkins EDC17C49
Perkins	ADEM3, ADEM4	Series 850, 1100, 1200, 1300, 2300, 2500, and 2800	-	Perkins Generic*
Perkins	-	Series 400 and 1200	●	Perkins Stage V
Perkins	-	Series 400 Model IQ IR IW IY IF	●	Perkins StV 400
Perkins	-	Series 1200F Model MT, MU, MV, MW, BM, and BN	●	Perkins StV 1200
Perkins	-	Series 1200J Model SU, VM	●	Perkins StV 120xJ (SU/VM)
PSI/Power Solutions	-	PSI/Power Solutions	●	PSI/Power Solutions
QiYao	-	-	-	QiYao Gas
Scania	EMS	-	-	Scania EMS
Scania	EMS S6 (KWP2000)	Dx9x, Dx12x, Dx16x	-	Scania EMS 2 S6
Scania	EMS 2 S8	DC9, DC13, DC16	●	Scania EMS 2 S8
Scania	EMS S6 (KWP2000)	Dx9x, Dx12x, Dx16x industrial engines	-	Scania S6 Industrial
Scania	EMS 2 S8	DC9, DC13, DC16 industrial engines	●	Scania S8 Industrial

Manufacturer	ECUs	Engines	Tier 4/Stage V	Controller setting *Engine I/F [7561]*
SDEC	F20	-	-	SDEC F20
SDEC	F31	-	-	SDEC F31
SDEC	F36	-	-	SDEC F36
SDEC	F45	-	-	SDEV F45
Steyr	EDC17	-	-	Steyr EDC17
VECV	E694	-	-	VECV E694
Volvo Penta	CPCB4			Volvo Penta CPCB4
Volvo Penta	D12 marine	-	-	Volvo Penta D12
Volvo Penta	EDC3	-	-	Volvo Penta EDC3
Volvo Penta	EDC4	-	-	Volvo Penta EDC4
Volvo Penta	EMS, EMS2.0 to EMS2.3	D6, D7, D9, D12, D16 (GE and AUX variants only)	● (ECU v 2.3 or later)	Volvo Penta EMS2
Volvo Penta	EMS2.3	-	●	Volvo Penta EMS2.3
Volvo Penta	EMS2.4	-	●	Volvo Penta EMS2.4
Volvo Penta	EDC3, EDC4	TAD4x, TAD5x, TAD6x, TAD7x	-	Volvo Penta Generic*
Weichai	-	-	-	Weichai Baudouin E6 Gas
Weichai	WOODWARD PG+	Diesel	●	Weichai Diesel
Weichai	WOODWARD PG+	Gas	●	Weichai Gas
Weichai	Wise 10B	-	●	Weichai Wise10B
Weichai	Wise 15	-	●	Weichai Wise15
Weichai	Wise 13	-	-	Wise13
Weichai	Wise 18B	-	●	Wise18B
Xichai	-	-	-	Xichai Gas
YANMAR	EDC17	-	-	YANMAR EDC17
YANMAR	-	Gas 4G	-	YANMAR gas 4G
YANMAR	-	TN, TNV	●	YANMAR Stage V
YANMAR	X11			YANMAR X11
Yuchai United	YCGCU (Version 4.2)	Diesel	●	Yuchai United Diesel
Yuchai United	YCGCU (Version 4.2)	Gas	●	Yuchai United Gas
Yuchai United	YC-BCR	-	-	Yuchai YC-BCR
Yuchai United	YC-ECU	-	-	Yuchai YC-ECU
Yuchai United	YC-ECU-A	-	-	Yuchai YC-ECU-A
Yunnei				Yunnei

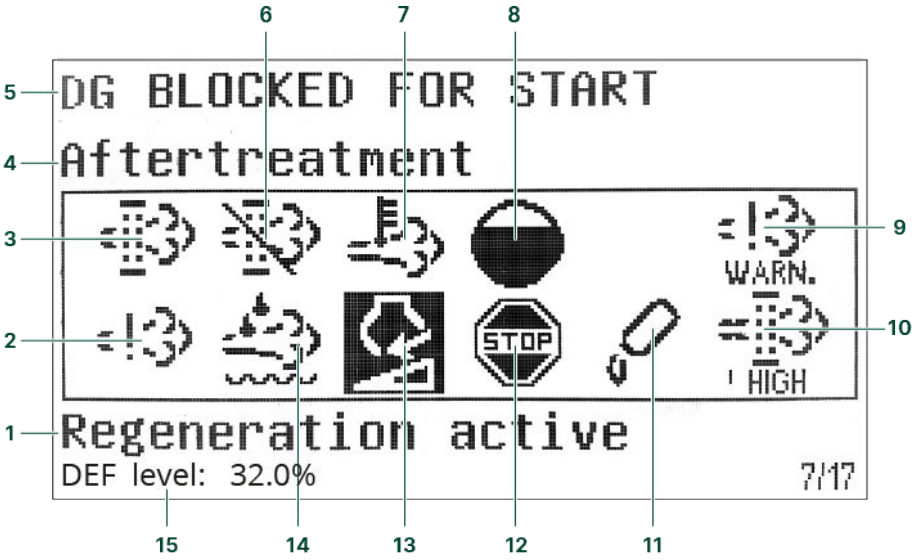
NOTE * Generic protocols are included for backward compatibility.
NOTE ** If supported by the ECU and engine.
NOTE *** Previously *Jichai*.

Other EIC protocols: Contact DEIF.

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

The controller meets the Tier 4 (Final)/Stage V requirements. Use the display to monitor and control the engine and the exhaust after-treatment system.

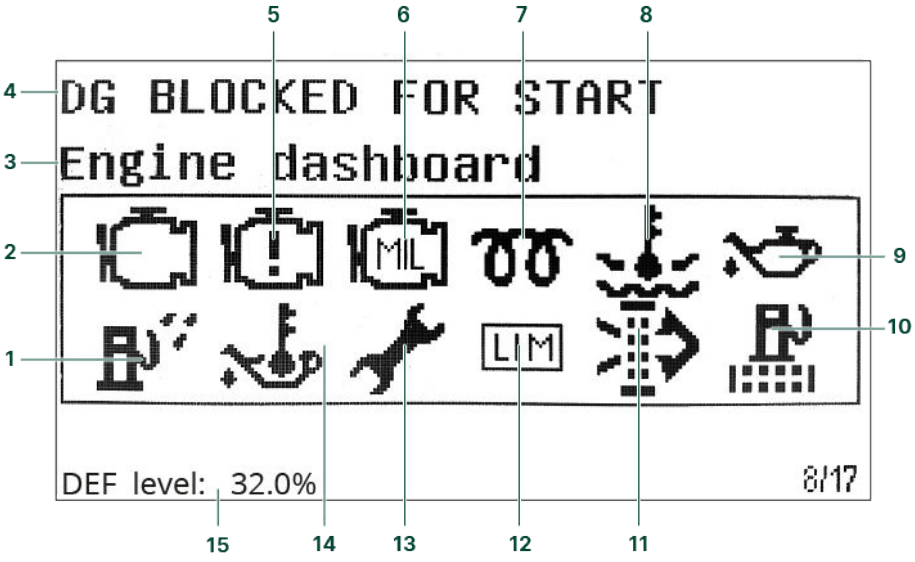
After-treatment page

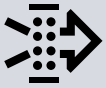


No.	Referent	Symbol	Description
1	After-treatment status	-	
2	Engine emission system failure		Emission failure or malfunction.
3	Diesel Particle Filter (DPF)		Regeneration is needed.
4	Page name	-	
5	Controller status	-	
6	Diesel Particle Filter (DPF) Inhibit		Regeneration is inhibited.
7	High temperature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

No.	Referent	Symbol	Description
10	Diesel Particle Filter (DPF) level	  	Regeneration needed, with the severity.
11	DEF level warning		Low DEF level.
12	DEF shutdown		DEF problem stops normal operation.
13	DEF level inducement		Mid-level inducement.
			Severe inducement.
14	Diesel Exhaust Fluid (DEF)		DEF quality is low.
15	Diesel Exhaust Fluid (DEF) % level		Shows the level (%) of the Diesel Exhaust Fluid.

Engine dashboard



No.	Referent	Symbol	Description
1	Water in fuel		There is water in the 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		The engine is cold.
8	High engine coolant temperature		The engine coolant temperature is high.
9	Low engine oil pressure		The engine oil pressure is low.
10	Fuel filter clogging		The fuel filter is blocked.
11	Air filter clogging		The air filter is blocked.
12	LIMIT lamp		Only for MTU engines.
13	Oil change		The engine needs an oil change.
14	High engine oil temperature		The engine oil temperature is high.
15	Diesel Exhaust Fluid (DEF) % level		Shows the level (%) of the Diesel Exhaust Fluid.

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

1.6 Protections overview

Protections	Alarms	ANSI	Operate time
Reverse power	3	32R	<200 ms
Fast over-current	2	50P	<40 ms
Over-current	4	50TD	<200 ms
Voltage dependent over-current	1	50V	
Over-voltage	2	59	<200 ms

Protections	Alarms	ANSI	Operate time
Under-voltage	3	27P	<200 ms
Over-frequency	3	81O	<300 ms
Under-frequency	3	81U	<300 ms
Unbalanced voltage	1	47	<200 ms
Unbalanced current	1	46	<200 ms
Under-excitation or reactive power import	1	32RV	<200 ms
Over-excitation or reactive power export	1	32FV	<200 ms
Overload*	5	32F	<200 ms
Inverse time earth over-current	1	50G	<100 ms
Inverse time neutral over-current	1	50N	<100 ms
Busbar over-voltage	3	59P	<50 ms
Busbar under-voltage	4	27P	<50 ms
Busbar over-frequency	3	81O	<50 ms
Busbar under-frequency	4	81U	<50 ms
Emergency stop	1		<200 ms
Low auxiliary supply	1	27DC	
High auxiliary supply	1	59DC	
Generator breaker external trip	1		
Synchronisation failure alarms	1		
Breaker open failure	1	52BF	
Breaker close failure	1	52BF	
Breaker position failure	1	52BF	
Phase sequence error	1	47	
De-load error	1		
Hz/V failure	1		
Not in Auto	1		
ROCOF (df/dt)	1	81R	<130 ms
Power-dependent reactive power	2	40	
Single-controller applications: Mains over-current (4th CT)	2		
Single-controller applications: Mains reverse power (4th CT)	2		
Single-controller applications: Mains overload (4th CT)	2		

NOTE * You can configure these protections for overload or reverse power.

2. Compatible products

2.1 PMS lite system

You can use these controllers together in a PMS lite system:

- **iE 150 PMS lite, BTB** (www.deif.com/products/ie-150)
- **AGC 150 PMS lite** (www.deif.com/products/ie-150)
- **AGC 150 BTB** (www.deif.com/products/agc-150-btb)
- **AGC-4 Mk II Genset, BTB** (www.deif.com/products/agc-4-mk-ii)

2.2 Remote monitoring service: Insight

Insight is a responsive remote monitoring service (www.deif.com/products/insight). It includes real-time genset data, a customisable dashboard, GPS tracking, equipment and user management, email and/or SMS alerts, and cloud data management.

2.3 Digital voltage controllers

DVC 350 is a digital AVR designed for alternators with SHUNT, AREP, or PMG excitation. The DVC 350 monitors and regulates the alternator output voltage. The controller can control the DVC 350 features and receive fault information directly with the CAN bus communication. For more information, see www.deif.com/products/dvc-350

DVC 550 is an advanced digital AVR designed for alternators with SHUNT, AREP, or PMG excitation. The DVC 550 monitors and regulates the alternator output voltage. The controller can control all the DVC 550 features and receive fault information directly with the CAN bus communication. For more information, see www.deif.com/products/dvc-550

2.4 Additional inputs and outputs

The controller uses CAN bus communication with these:

- **CIO 116** is a remote input expansion module. See www.deif.com/products/cio-116
- **CIO 208** is a remote output expansion module. See www.deif.com/products/cio-208
- **CIO 308** is a remote I/O module. See www.deif.com/products/cio-308
- **IOM 220** and **IOM 230** each have two analogue outputs. These can be used for governor and AVR regulation, or general PID control. See www.deif.com/products/iom-200230

2.5 Additional operator panel, AOP-2

The controller uses CAN bus communication to the additional operator panel (AOP-2). Configure the controller using M-Logic. On the AOP-2, the operator can then:

- Use the buttons to send commands to the controller.
- See LEDs light up to show statuses and/or alarms.

You can configure and connect two AOP-2s if the controller has the premium software package.

2.6 Remote display: AGC 150

The remote display is an AGC 150 that only has a power supply and an Ethernet connection to an AGC 150 controller. The remote display allows the operator to see the controller's operating data, as well as operate the controller remotely.

See www.deif.com/products/agc-150-remote-display

2.7 Other equipment

DEIF has a wide variety of other equipment that is compatible. Here are some examples:

- **Synchroscopes**
  - **CSQ-3** (www.deif.com/products/csq-3)
- **Battery chargers/power supplies**
  - **DBC-1** (www.deif.com/products/dbc-1)
- **Current transformers**
  - **ASK** (www.deif.com/products/ask-asr)
  - **KBU** (www.deif.com/products/kbu)
- **Transducers**
  - **MTR-4** (www.deif.com/products/mtr-4)

2.8 Controller types

Parameter	Setting	Controller type	Minimum software
9101	Genset unit	Generator controller	Core
	Genset unit	Generator Stand-alone controller	Stand-alone
	Mains unit	Mains controller	Core
	BTB unit	BTB controller	Core
	Genset HYBRID unit	Genset-Solar hybrid controller	Core
	ENGINE DRIVE unit	Engine drive controller	Stand-alone
	Remote unit	Remote display	None
	ENGINE DRIVE MARINE unit	Engine drive controller for marine use	Stand-alone
	Genset MARINE unit	Stand-alone genset controller for marine use	Stand-alone
	ASC 150 Storage*	Battery storage controller	Extended + Sustainability
	ASC 150 Solar*	Solar controller	Extended + Sustainability
	ATS unit	Automatic transfer switch (open transition)	Stand-alone
	ATS unit	Automatic transfer switch (closed transition)	Core
	Genset PMS LITE	PMS lite controller	Core

Software packages and controller types

The controller software package determines which functions the controller can use.

- **Stand-alone**
  - You can change the controller type to any other controller that uses Stand-alone software.
- **Core**
- **Extended**
  - You can change the controller type to any other controller type*.
    - * To change to a storage or solar controller, the controller must also have the sustainability option (S10).
- **Premium**
  - You can change the controller type to any other controller type*.
    - * To change to a storage or solar controller, the controller must also have the sustainability option (S10).

- All functions are supported.

You can select the controller type under `Basic settings > Controller settings > Type`.

3. Technical specifications

3.1 Electrical specifications

Power supply	
Power supply range	Nominal voltage: 12 V DC or 24 V DC Operating range: 6.5 to 36 V DC
Voltage withstand	Reverse polarity
Power supply drop-out immunity	0 V DC for 50 ms (coming from min. 6 V DC)
Power supply load dump protection	Load dump protected according to ISO16750-2 test A
Power consumption	5 W typical 12 W max.
RTC clock	Time and date backup

Supply voltage monitoring	
Measuring range	0 V to 36 V DC Max. continuous operating voltage: 36 V DC
Resolution	0.1 V
Accuracy	±0.35 V

Voltage measurement	
Voltage range	Nominal range: 100 to 690 V phase-to-phase (above 2000 m derate to max. 480 V)
Voltage withstand	U_n +35 % continuously, U_n +45 % for 10 seconds Measuring range of nominal: 10 to 135 % Low range, nominal 100 to 260 V: 10 to 351 V AC phase-to-phase High range, nominal 261 to 690 V: 26 to 932 V AC phase-to-phase
Voltage accuracy	±1 % of nominal within 10 to 75 Hz +1/-4 % of nominal within 3.5 to 10 Hz
Frequency range	3.5 to 75 Hz
Frequency accuracy	±0.01 Hz within 60 to 135 % of nominal voltage ±0.05 Hz within 10 to 60 % of nominal voltage
Input impedance	4 MΩ/phase-to-ground, and 600 kΩ phase/neutral

Current measurement	
Current range	Nominal: -/1 A and -/5 A Range: 2 to 300 %
Number of CT input	4
Max. measured current	3 A (-/1 A) 15 A (-/5 A)
Current withstand	7 A continuous 20 A for 10 seconds 40 A for 1 second
Current accuracy	From 10 to 75 Hz: • ±1 % of nominal from 2 to 100% current • ±1 % of measured current from 100 to 300 % current

Current measurement	
	From 3.5 to 10 Hz: • +1/-4 % of nominal from 2 to 100 % current • +1/-4 % of measured current from 100 to 300 % current
Burden	Max. 0.5 VA

Power measurement	
Accuracy power	±1 % of nominal within 35 to 75 Hz
Accuracy power factor	±1 % of nominal within 35 to 75 Hz

D+	
Excitation current	210 mA, 12 V 105 mA, 24 V
Charging fail threshold	6 V

Tacho input	
Voltage input range	+/- 1 V_{peak} to 70 V_{peak}
W	8 to 36 V
Frequency input range	10 to 10 kHz (max.)
Frequency measurement tolerance	1 % of reading

Digital inputs	
Number of inputs	12 x digital inputs Negative switching
Maximum input voltage	+36 V DC with respect to plant supply negative
Minimum input voltage	-24 V DC with respect to plant supply negative
Current source (contact cleaning)	Initial 10 mA, continuous 2 mA

DC outputs	
Number of 3 A outputs	2 x outputs (for fuel and crank) 15 A DC inrush and 3 A continuous, supply voltage 0 to 36 V DC Endurance tested according to UL/ULC6200:2019 1.ed: 24 V, 3 A, 100000 cycles (with an external freewheeling diode)
Number of 0.5 A outputs	10 x outputs 2 A DC inrush and 0.5 A continuous, supply voltage 4.5 to 36 V DC
Common	12/24 V DC

Analogue inputs	
Number of inputs	4 x analogue inputs
Electrical range	Configurable as: • Negative switching digital input • 0 V to 10 V sensor • 4 mA to 20 mA sensor • 0 Ω to 2.5 kΩ sensor
Accuracy	Current:

Analogue inputs	
	• Accuracy: ±20 uA ±1.00 % rdg Voltage: • Range: 0 to 10 V DC • Accuracy: ±20 mV ±1.00 % rdg RMI 2-wire LOW: • Range: 0 to 800 Ω • Accuracy: ±2 Ω ±1.00 % rdg RMI 2-wire HIGH: • Range: 0 to 2500 Ω • Accuracy: ±5 Ω ±1.00 % rdg

Voltage regulator output	
Output types	Isolated DC voltage output
Voltage range	-10 to +10 V DC
Resolution in voltage mode	Less than 1 mV
Maximum common mode voltage	±3 kV
Minimum load in voltage mode	500 Ω
Accuracy	±1 % of setting value

Speed governor output	
Output types	Isolated DC voltage output Isolated PWM output
Voltage range	-10 to +10 V DC
Resolution in voltage mode	Less than 1 mV
Maximum common mode voltage	±550 V
Minimum load in voltage mode	500 Ω
PWM frequency range	1 to 2500 Hz ±25 Hz
PWM duty cycle resolution (0-100%)	12 bits (4096 steps)
PWM voltage range	1 to 10.5 V
Voltage accuracy	±1% of setting value

Display unit	
Type	Graphical display screen (monochrome)
Resolution	240 x 128 pixels
Navigation	Five-key menu navigation
Log book	Data log and trending function
Language	Multi-language display

3.2 Environmental specifications

Operation conditions	
Operating temperature (incl. display screen)	-40 to +70 °C (-40 to +158 °F)
Storage temperature (incl. display screen)	-40 to +85 °C (-40 to +185 °F)
Accuracy and temperature	Temperature coefficient: 0.2 % of full scale per 10 °C
Operating altitude	0 to 4000 m with derating
Operating humidity	Damp Heat Cyclic, 20/55 °C at 97 % relative humidity, 144 hours. To IEC 60255-1 Damp Heat Steady State, 40 °C at 93 % relative humidity, 240 hours. To IEC 60255-1
Change of temperature	70 to -40 °C, 1 °C / minute, 5 cycles. To IEC 60255-1
Protection degree	IEC/EN 60529 • IP65 (front of module when installed into the control panel with the supplied sealing gasket) • IP20 on terminal side
Vibration	Response: • 10 to 58.1 Hz, 0.15 mmpp • 58.1 to 150 Hz, 1 *g*. To IEC 60255-21-1 (Class 2) Endurance: • 10 to 150 Hz, 2 *g*. To IEC 60255-21-1 (Class 2) Seismic vibration: • 3 to 8.15 Hz, 15 mmpp • 8.15 to 35 Hz, 2 *g*. To IEC 60255-21-3 (Class 2)
Shock	10 *g*, 11 ms, half sine. To IEC 60255-21-2 Response (Class 2) 30 *g*, 11 ms, half sine. To IEC 60255-21-2 Withstand (Class 2) 50 *g*, 11 ms, half sine. To IEC 60068-2-27, test Ea Tested with three impacts in each direction in three axes (total of 18 impacts per test)
Bump	20 *g*, 16 ms, half sine IEC 60255-21-2 (Class 2) Tested with 1000 impacts in each direction on three axes (total of 6000 impacts per test)
Galvanic separation	CAN port 2 (CAN B): 550 V, 50 Hz, 1 minute RS-485 port 1: 550 V, 50 Hz, 1 minute Ethernet: 550 V, 50 Hz, 1 minute Analogue output 51-52 (GOV): 550 V, 50 Hz, 1 minute Analogue output 54-55 (AVR): 3000 V, 50 Hz, 1 minute Note: No galvanic separation on CAN port 1 (CAN A) and RS-485 port 2
Safety	Installation CAT. III 600 V Pollution degree 2 IEC/EN 60255-27
Flammability	All plastic parts are self-extinguishing to UL94-V0
EMC	IEC/EN 60255-26

3.3 UL/cUL Listed

Requirements	
Installation	To be installed in accordance with the NEC (US) or the CEC (Canada)
Enclosure	A suitable type 1 (flat surface) enclosure is required Unventilated/ventilated with filters for controlled/pollution degree 2 environment
Mounting	Flat surface mounting
Connections	Use 90 °C copper conductors only
Wire size	AWG 30-12
Terminals	Tightening torque: 5-7 lb-in.
Current transformers	Use Listed or Recognized isolating current transformers
Communication circuits	Only connect to communication circuits of a listed system/equipment

3.4 Communication

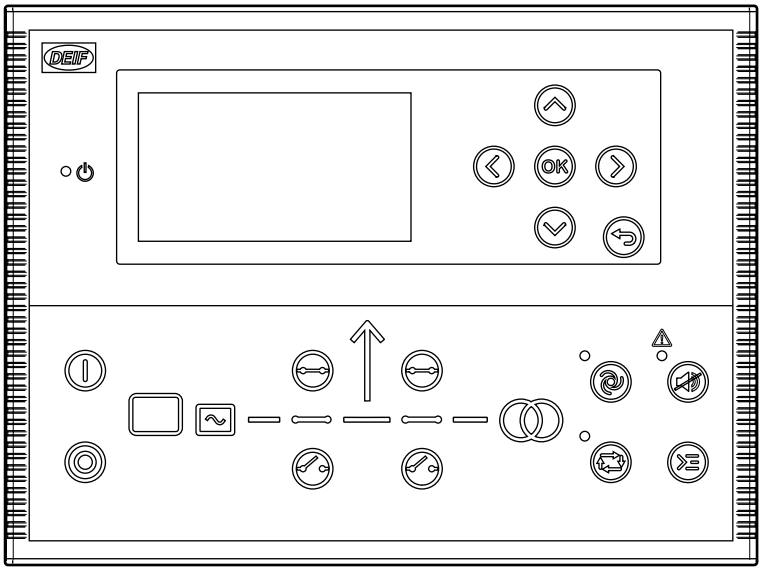
Communication	
CAN A	You can connect these in a daisy chain (and operate them at the same time): • Engine CAN Port • DVC 550 • CIO 116, CIO 208, and CIO 308 • IOM 220 and IOM 230 Data connection 2-wire + common, or 3-wire Not isolated External termination required (120 Ω + matching cable) DEIF engine specification (J1939 + CANopen)
CAN B	You can connect one of these: • PMS lite • AOP-2 Data connection 2-wire + common, or 3-wire Isolated External termination required (120 Ω + matching cable) PMS 125 kbit and 250 kbit
RS-485 Port 1	Used for: Modbus RTU, PLC, SCADA, Remote monitoring (Insight) Data connection 2-wire + common, or 3-wire Isolated External termination required (120 Ω + matching cable) 9600 to 115200
RS-485 Port 2	Used for: Modbus RTU, PLC, SCADA, Remote monitoring (Insight) Data connection 2-wire + common, or 3-wire Not isolated External termination required (120 Ω + matching cable) 9600 to 115200
RJ45 Ethernet	Used for: • Modbus to PLC, SCADA, and so on • NTP time synchronisation with NTP servers • PC utility software Isolated Auto detecting 10/100 Mbit Ethernet port
USB	Service port (USB-B)

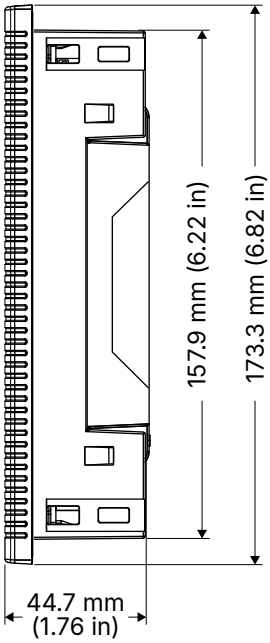
3.5 Approvals

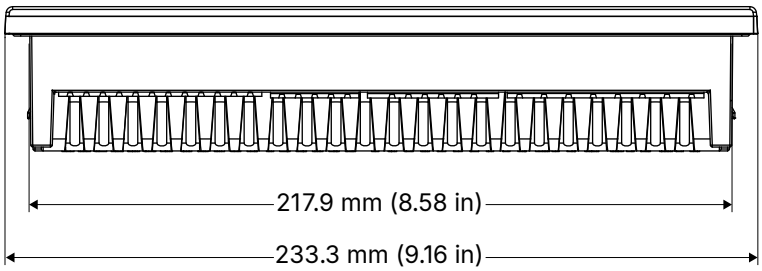
Standards
CE
UL/cUL Listed to - UL/ULC6200:2019 1.ed. Controllers for Use in Power Production

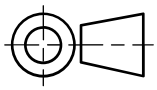
NOTE Refer to www.deif.com for the most recent approvals.

3.6 Dimensions and weight









Dimensions and weight	
Dimensions	Length: 233.3 mm (9.16 in) Height: 173.3 mm (6.82 in) Depth: 44.7 mm (1.76 in)
Panel cutout	Length: 218.5 mm (8.60 in) Height: 158.5 mm (6.24 in) Tolerance: ± 0.3 mm (0.01 in)
Max. panel thickness	4.5 mm (0.18 in)
Mounting	UL/cUL Listed: Type complete device, open type 1 UL/cUL Listed: For use on a flat surface of a type 1 enclosure
Weight	0.79 kg

4. Legal information

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.

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4.1 Software version

This document is based on AGC 150 software version 1.35.