DATA SHEET

ASC 150 Storage

1. ASC 150 Storage

1. ASC 150 Storage

1.1 About

The ASC 150 Storage controller can be used as a single controller to add a storage system to an existing site, or with other DEIF controllers in a power/energy management system. The ASC 150 Storage controller controls and protects an energy storage system (ESS) with communication to a BMS, BCU, and/or a PCS.

In an energy management system, the controller is designed for seamless integration of electrical storage with other power sources. You can prioritise the energy sources for supplying the load, and recharging the battery. The ASC 150 Storage controller includes a configurable charge scheme (charge/discharge levels).

The controller has built-in AC measurements. There are two sets of voltage measurements (three phases, and (optional) the neutral phase), and one set of current measurements (three phases). There is also a 4th current measurement that can be used to measure mains power, or for power metering.

Operators can easily control the system from the display unit. Alternatively, use the communication options to connect to an HMI/ SCADA system.

Grid forming or grid following

These modes are controlled by the ASC 150 Storage controller using the PCS and BCU.

- **Grid forming**

  Grid forming is also called island, or V/f mode. For grid forming (V/f mode) the ASC 150 Storage controller can act as the only energy source. The battery can provide the grid forming power in island operation, and work together with non-grid forming sources, like solar and wind.

  If the system includes gensets, these are stopped if the load level, battery capacity, and state of charge conditions are fulfilled. When the battery is discharged or the load increases beyond the battery capacity, the gensets are reconnected. The controller can also suppress genset starts from Solar controller spinning reserve requests.

- **Grid following**

  Grid following is also called parallel, or P/Q mode. For grid following (P/Q mode), the ASC 150 Storage controller is always connected to another grid forming source, like a mains or genset. The battery can be used as power buffer, providing spinning reserve and peak shaving.

- **Droop mode**

  If the ESS supports this, the ASC Storage controller can run the ESS in droop mode for both Grid forming and Grid following. The controller controls the storage charge and discharge using V/f or P/Q set points from the configured droop curve (that is, like a virtual synchronous generator (VSG)).

Energy source or power source

The energy and power source functions determine the source priority. The source functions are not directly related to grid forming and grid following.

- **Energy source**

  For the energy source function, the ASC 150 Storage controller prioritises battery power over genset power. As a result, the system uses as much battery power as possible before starting any genset.

- **Power source**

  For the power source function, the ASC 150 Storage controller operates parallel to other sources. Genset power is prioritised over battery power. This mode is used to ensure that spinning reserve requirements are met.

AC- or DC-coupled

The ASC 150 Storage controller can be used for both AC- and DC-coupled ESS applications.

For AC-coupled systems, you can define battery charging and discharging scheme. Using the charge scheme, in DEIF power management, you'll also be able to define the energy sources (gensets, PV or mains) that you allow for charging purposes.

AC busbar
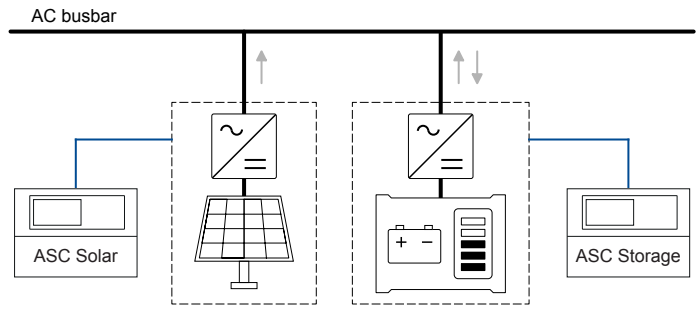
For DC-coupled systems, the battery is charged by its own PV bus. Depending on the PV-Battery system and supplier, the ASC 150 Storage controller can communicate with the PV inverter, and limit the current from the PV to the battery.

AC busbar
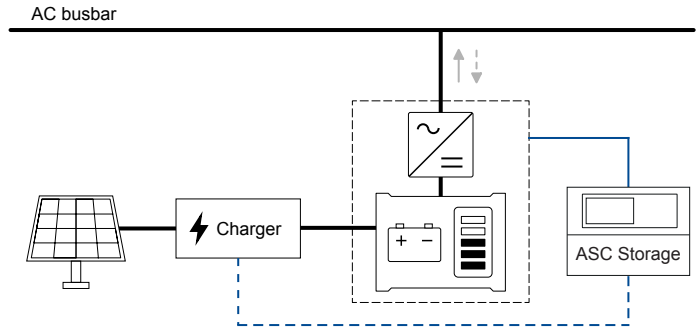
1.1.1 Software packages

You can choose the **Extended** or **Premium** software package.

1.2 Single-line application diagrams

1.2.1 Single storage controller

The ASC 150 Storage can operate as a single controller, that is, without power management communication to other controllers. Single controllers are particularly useful for brownfield applications. Single controllers can also be used in greenfield applications.

The single controller must get the power measurements and breaker positions for the power sources in the rest of the application.
- **Only one other power source**: You can use the controller's 4th current transformer terminals to measure the power.
- **Multiple other power sources**: You must use power meters or transducers.

The ASC 150 Storage controller calculates the charging and discharging set points. The set points are determined by:
- The operating mode
- The system load and configuration
- The state of charge in the storage
- The power readings from the other power source(s)
- The breaker position(s) of the other power source(s)

Software variants

Single storage controller	Extended	Premium
External gensets	4	16
External mains	0	16
Energy storage breaker (ESB) control	x	x
Mains breaker control (paralleling)		x
External power source (for example, genset) start and stop by an external relay, based on: • State of charge (SOC) • System load	x	x
Optimal load point for the genset(s)	x	x

Single storage controller with genset(s)
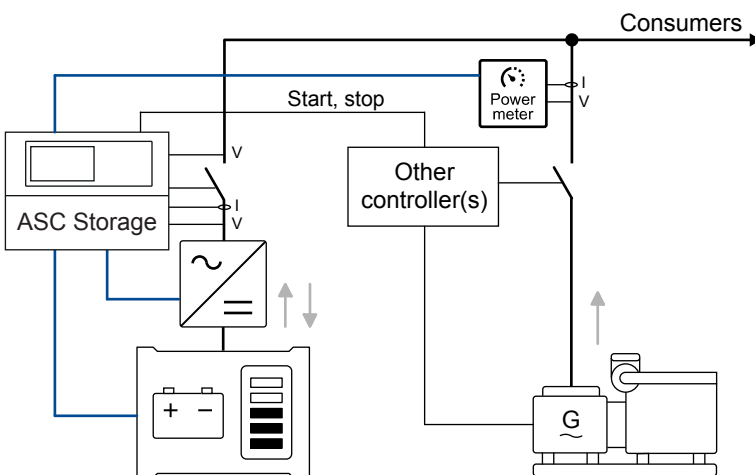
The ASC 150 Storage controller can support the load, so that the genset can run at its optimal load point.

> **Ideal for ESS rental applications**
>
> You can use the ASC 150 Storage single controller for emission-free power rental solutions with a single ESS. The controller provides full communication with the ESS. The controller can communicate with a BCU (battery control unit) or

directly with a BMS (battery management system) and PCS (power control system) over Modbus. You can use the ASC 150 Storage controller with a wide range of energy storage systems (ESS), and in any rental application.

Single storage controller with one mains
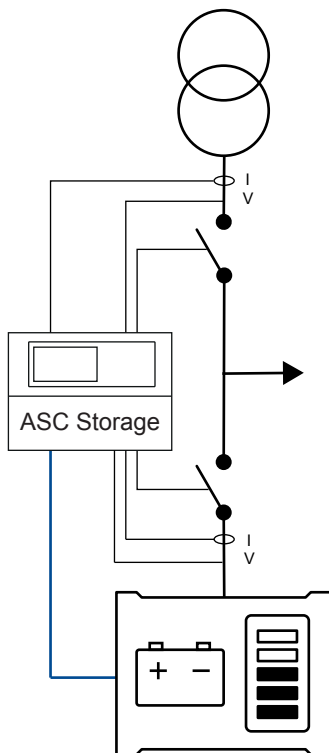
- **Peak shaving**: The storage supplies the peak load demand and runs parallel to mains.
- **Load take-over**: The load is moved from mains to storage, for example, during peak demand periods or periods with a risk of power outages.
- **Mains power export**: The storage produces a fixed kW set point (excluding increasing load).

Single storage controller with PV
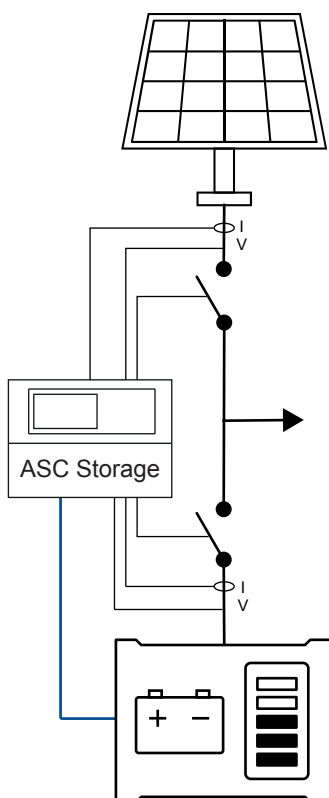
1.2.2 Grid-tied

The ASC 150 Storage controllers can integrate seamlessly into grid-tied applications. This includes power management applications with other DEIF controllers using CAN bus communication.

The ASC 150 Storage can control an ESS to take peak loads, provide mains power export, provide fixed power. If there is a mains failure, the controller can run in island mode. The ASC 150 Storage can also provide the spinning reserve for a PV plant, thereby improving the green energy penetration to the grid.

These controller configurations can be used in greenfield applications. To use these configurations in brownfield applications, all the genset, mains, storage and solar controllers must be replaced with DEIF controllers. The DEIF system can treat existing BTB controllers as externally controlled BTBs.

Grid-tied storage
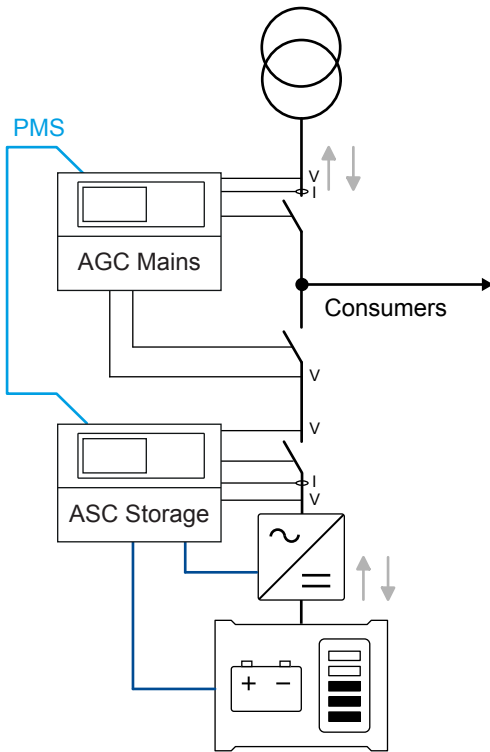
Grid-tied hybrid genset-storage
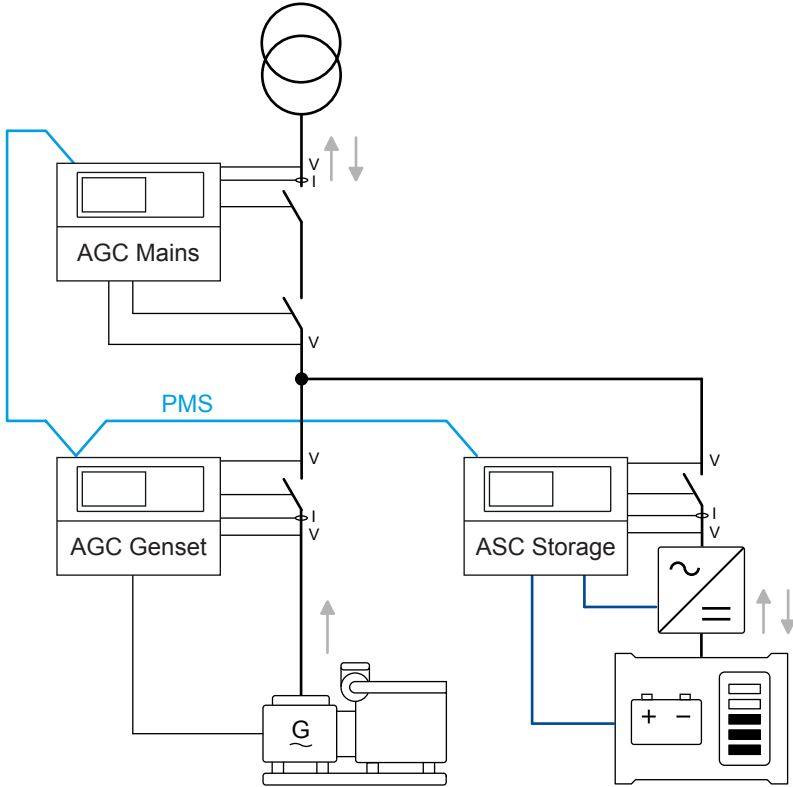
Grid-tied hybrid solar-storage
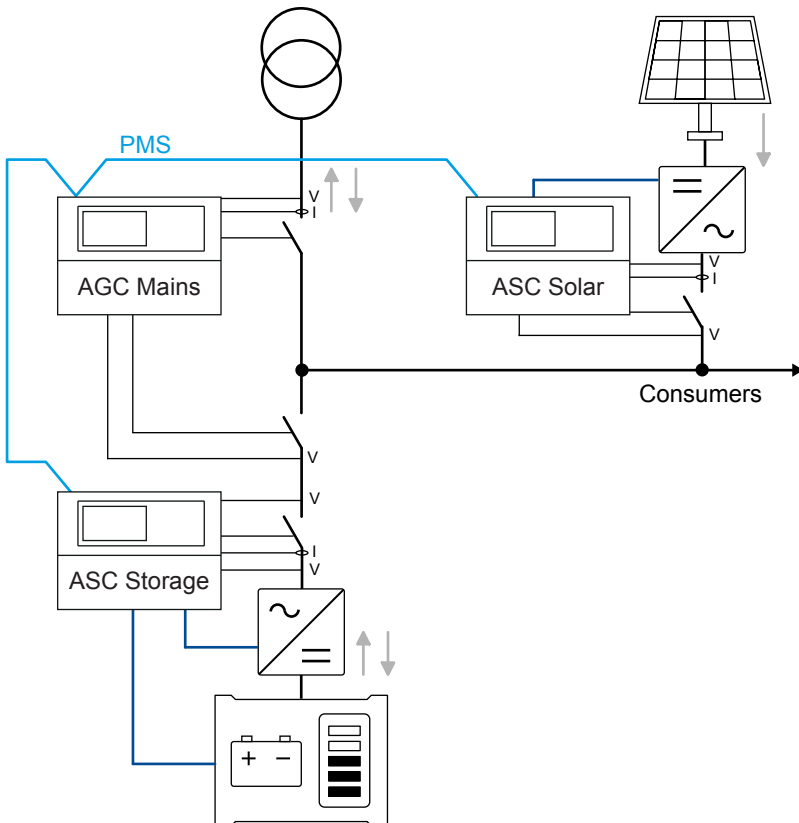
Grid-tied hybrid solar-genset-storage

PMS

AGC Mains

ASC Solar

Consumers

PMS

AGC Genset

ASC Storage

G
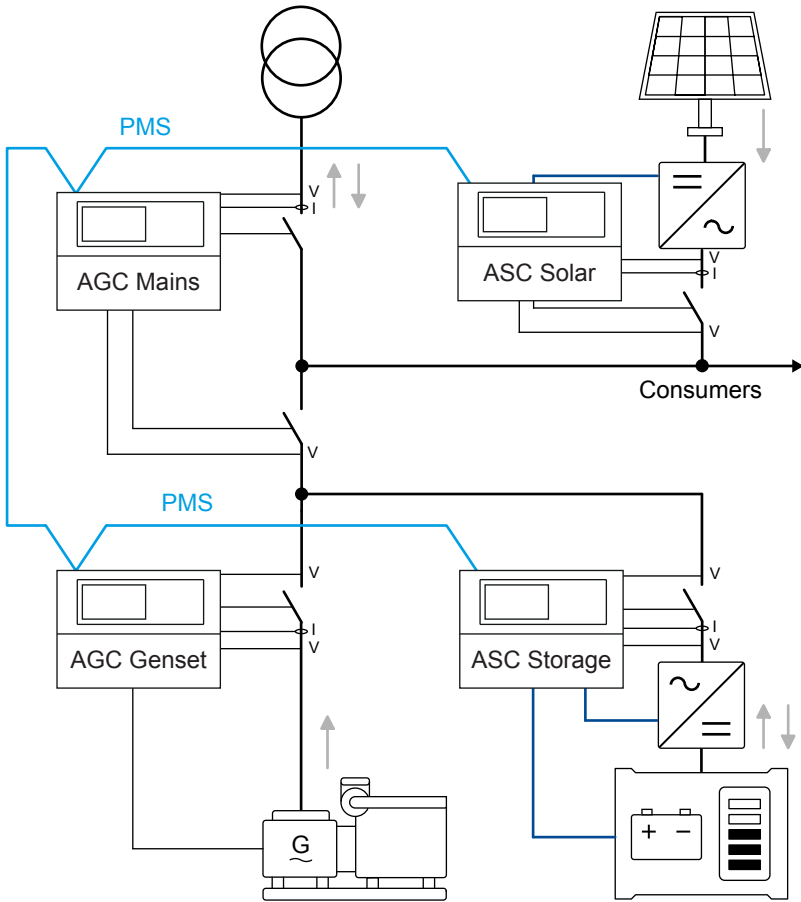
Multi-mains with storage

AGC Mains

AGC Mains

PMS

AGC Mains

AGC BTB

PMS

ASC Storage

PMS

ASC Storage

ASC Storage

ASC Storage
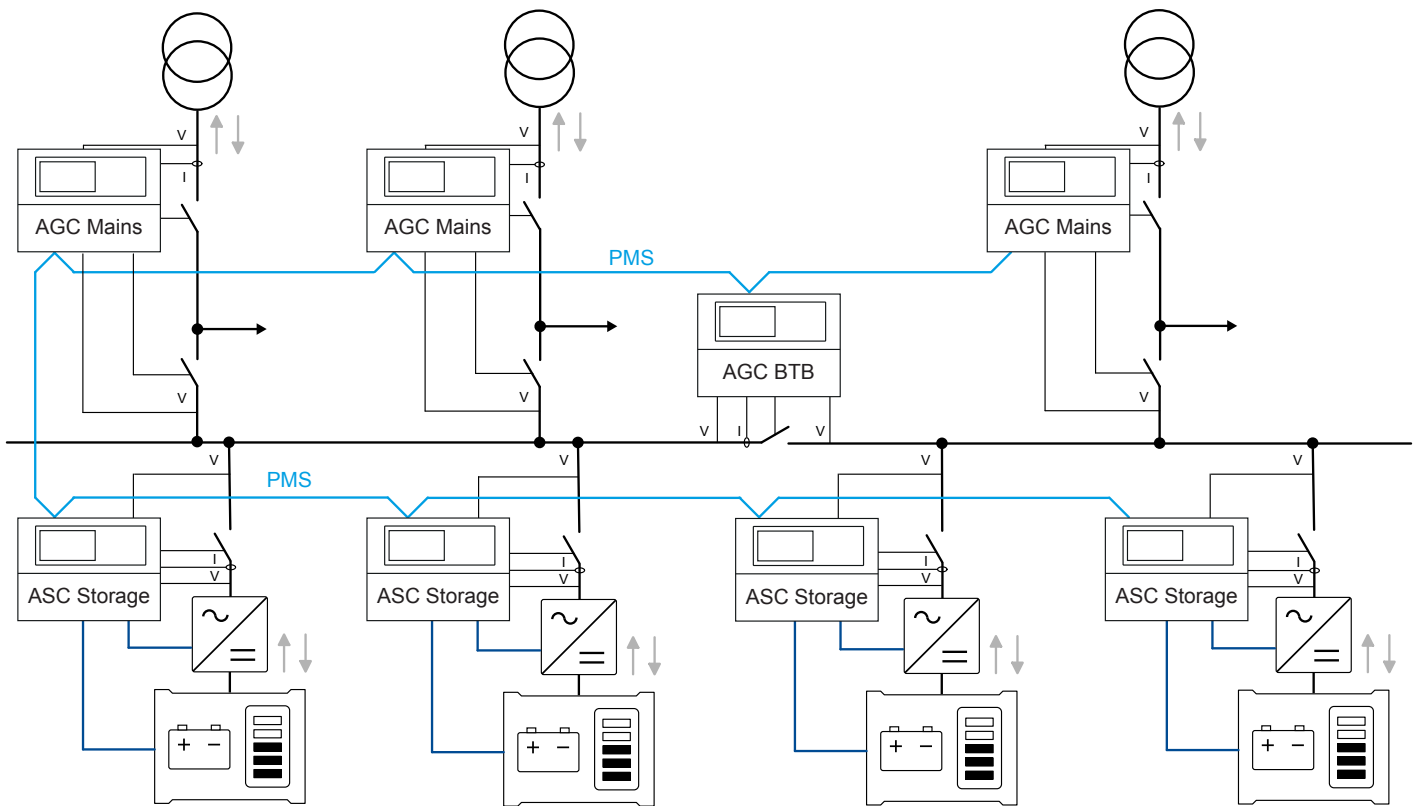
1.2.3   Off-grid

The ASC 150 Storage controllers provide flexibility for off-grid applications.

These controller configurations can be used in greenfield applications. To use these configurations in brownfield applications, all the genset, mains, storage and solar controllers must be replaced with DEIF controllers. Existing BTB controllers can be replaced, or treated as externally controlled BTBs.

Off-grid with solar and storage
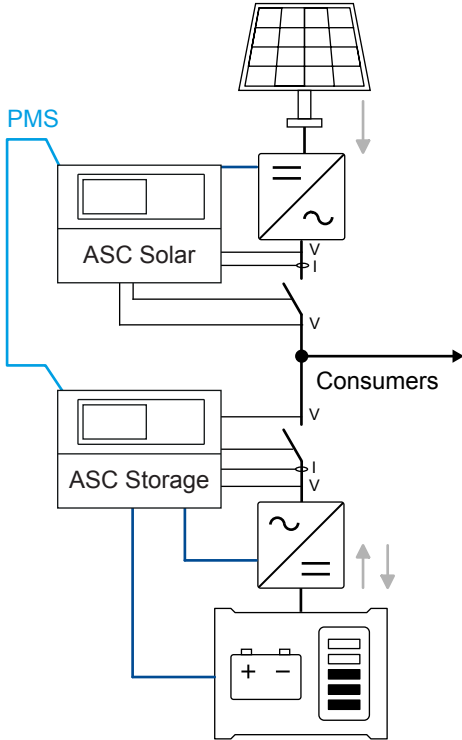
Off-grid with genset(s) and storage
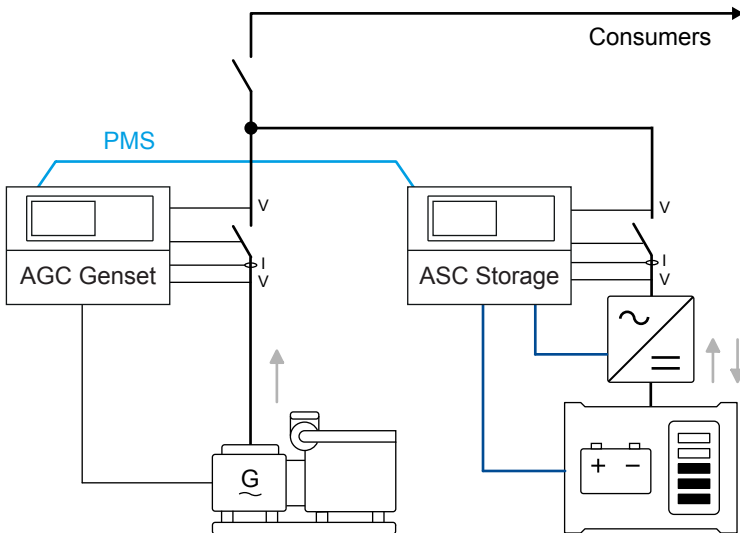
To improve power quality, the ASC 150 Storage can supply peak loads while gensets start. The ASC 150 Storage controller can support the load, so that the genset can run at its optimal load point. If the ESS is designed to supply the busbar load, the ESS can be the only source connected to the busbar.

Off-grid with genset(s), solar and storage
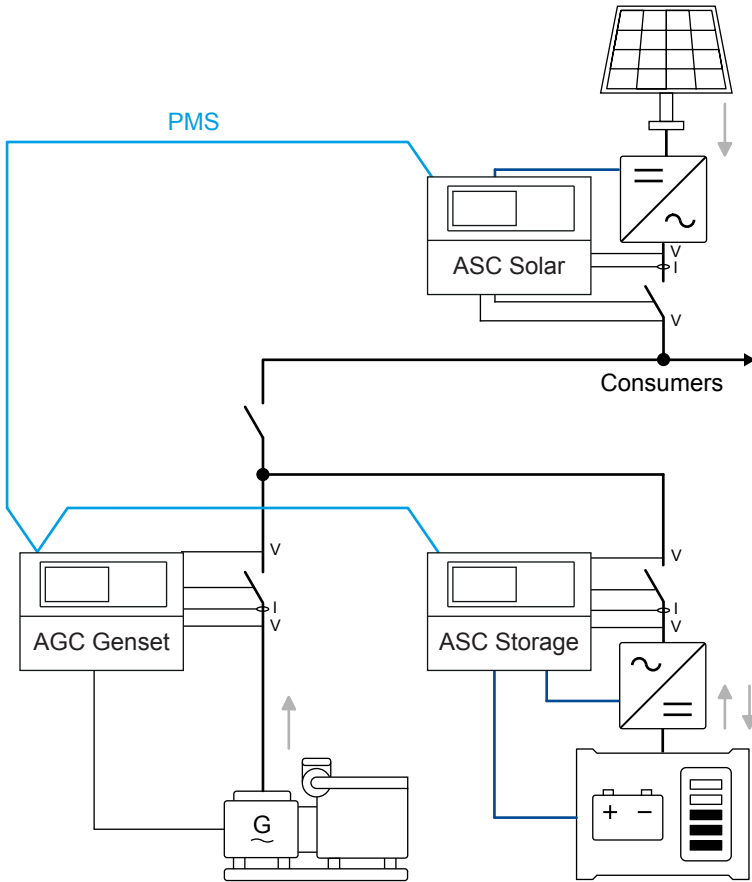
1.3 Front overview
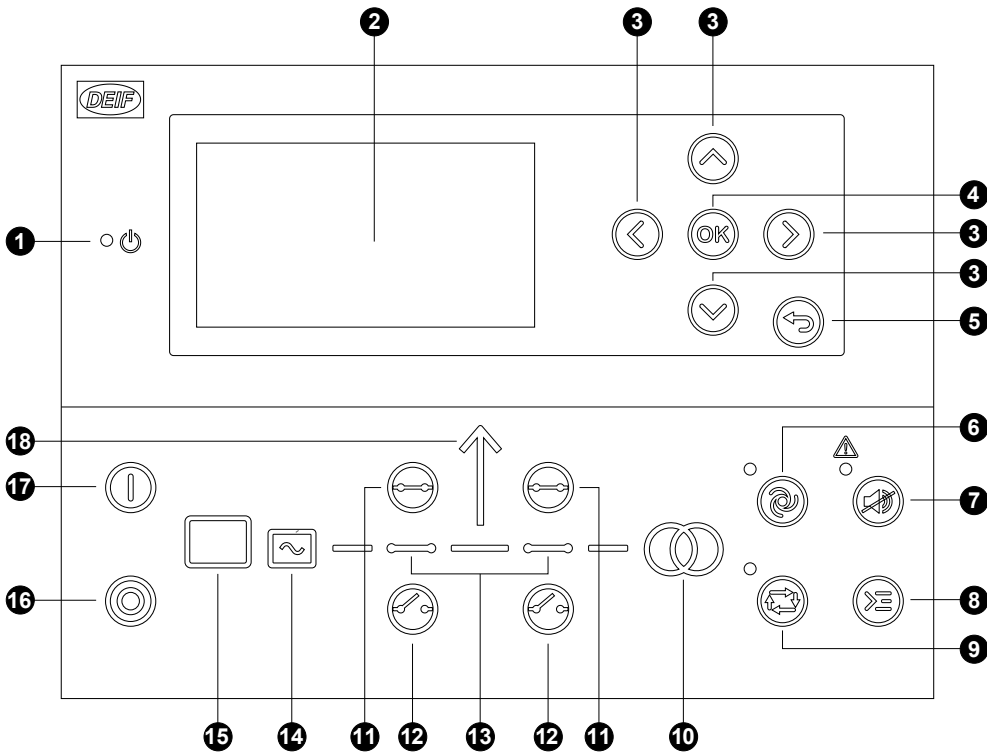
No.	Name	Function
1	Power	Green: The controller power is ON.

| 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	Enter 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 storage system. The controller automatically controls the power to and from the storage system. No operator actions are needed.
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, and Storage.
9	SEMI-AUTO mode	The operator or an external signal can also start or stop, and open and close the storage breaker. 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/busbar voltage and frequency are OK. The controller can synchronise and close the breaker. Red: Mains/busbar voltage 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	Power converter	Green: Power converter voltage and frequency are OK. The controller can synchronise and close the breaker. Green flashing: The power converter voltage and frequency are OK, but the V&Hz OK timer is still running. The controller cannot close the breaker. Red: The power converter voltage is too low to measure.
15	Battery management system	Green: There is storage system available feedback. Green flashing: The storage system is getting ready. Red: The storage system is not running, or there is no availability feedback.
16	Stop	Stops the power converter if SEMI-AUTO or Manual is selected.
17	Start	Starts the power converter if SEMI-AUTO or Manual is selected.
18	Load symbol	Off: Power management application Green: The supply voltage and frequency are OK. Red: Supply voltage/frequency failure.

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

1.4 Typical wiring for the Storage controller
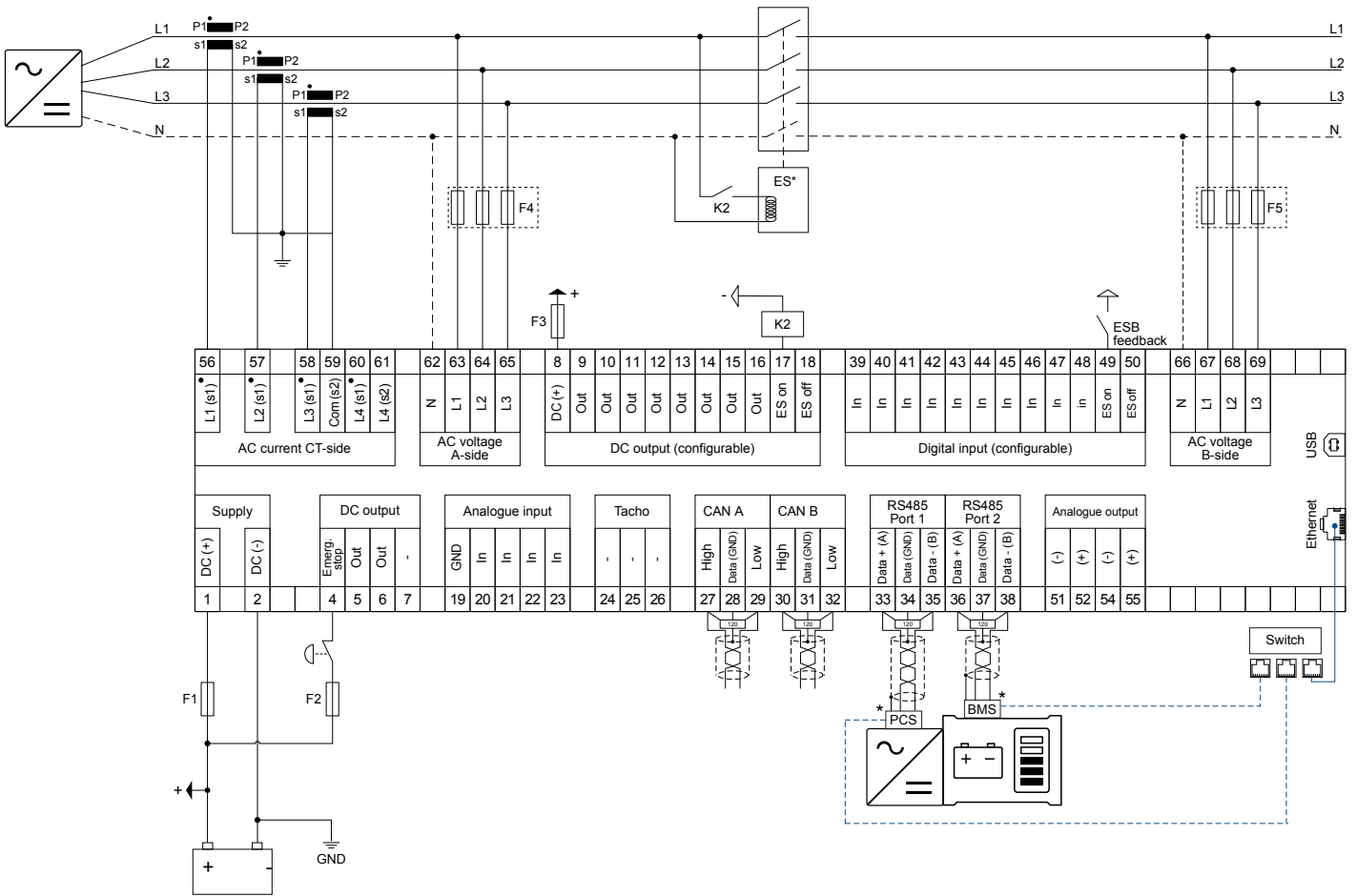
NOTE * ES: Optional ES breaker.

* BMS and PCS: The controller can use RS-485 or Ethernet communication. The RS-485 communication can be daisy chained from one port.

Fuses:

• F1, F4, F5: 2 A MCB, c-curve

• F2: 6 A MCB, c-curve

• F3: 4 A MCB, b-curve

1.5 Functions and features

1.5.1 Storage functions

Storage functions	Extended	Premium
Power DC-DC system (PDS): DC-coupled solar, current limitation		x
Energy storage breaker (ESB) control	x	x
Energy usage monitoring	x	x
Power management	x	x
Reactive power control		x

Battery management system functions	Extended	Premium
BMS communication	x	x
Derate based on BMS state	x	x
Temperature-dependent derate	x	x
Energy usage monitoring	x	x
Maintenance alarms	x	x
Configurable run coil/signal	x	x

Power converter functions	Extended	Premium
Built-in analogue power converter control	x	x
External analogue inverter control via IOM 230	x	x
PCS and BCU communication	x	x
Derate power converter output based on BMS maximum charge/discharge and state of charge (SOC)	x	x
Power ramp up and down control	x	x

Protection packages	Extended	Premium
BMS protection	x	x
Inverter protection	x	x

Power management functions	Extended	Premium
Generator priority selection: • Fuel optimisation • Genset starts automatically for low state of charge		x x
Optimal load point for the genset(s)	x	x

NOTE If you need to use redundant controllers (option T1), use an ASC-4 Battery controller.

1.5.2   General controller functions

AC functions	Extended	Premium
Sets of nominal settings	4	4
Select the AC configuration: • 3-phase/3-wire • 3-phase/4-wire • 2-phase/3wire (L1/L2/N or L1/L3/N) • 1-phase/2-wire L1	x x x x	x x x x
100 to 690 V AC (selectable)	x	x
CT -/1 or -/5 (selectable)	x	x
4th current measurement: Power from a Mains, Genset, or PV	x	x

General functions	Extended	Premium
Emulation for testing and front load commissioning	x	x
Built-in test sequences (Simple test, Load test, Full test, and Auxiliary supply test)	x	x

General functions	Extended	Premium
PLC logic (M-Logic)	40 lines	80 lines
Counters, including:	x	x
• Breaker operations	x	x
• kWh meter (day, week, month, total)	x	x
• kvarh meter (day, week, month, total)	x	x
General purpose PID regulators (2 x built-in analogue outputs)		x
4 additional analogue outputs (using 2 x IOM 230)		x
Simple load shedding and adding	x	x
Changeable controller type	x	x

Setting and parameter functions	Extended	Premium
Quick setup	x	x
User permission level	x	x
Password-protected setup	x	x
Trending on USW	x	x
Event logs, up to 500 entries	x	x

Display and language functions	Extended	Premium
Supports multiple languages (including Chinese, Russian, and other languages with special characters)	x	x
20 configurable graphical screens	x	x
Graphical display with six lines	x	x
Parameters can be changed on the display unit	x	x

Modbus functions	Extended	Premium
Modbus RS-485	x	x
Modbus TCP/IP	x	x
Configurable Modbus area	x	x

1.5.3 BMS, BCU and PCS communication

The controller supports a wide range of BMS, BCU and PCS protocols.

Implementing new protocols

Since new systems are launched every year, DEIF developers continuously implement new protocols. If your system is not listed, please contact DEIF. We can work with you to quickly implement the required protocol.

More information
See **Application note, DEIF hybrid controller compatibility** for the list of the supported protocols.

1.5.4 Emulation

The controller includes an emulation tool to verify and test the functionality of the application, for example plant modes and logics, breaker handling, mains 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 Easy configuration with the utility software

Set up an application easily with a PC and the utility software.

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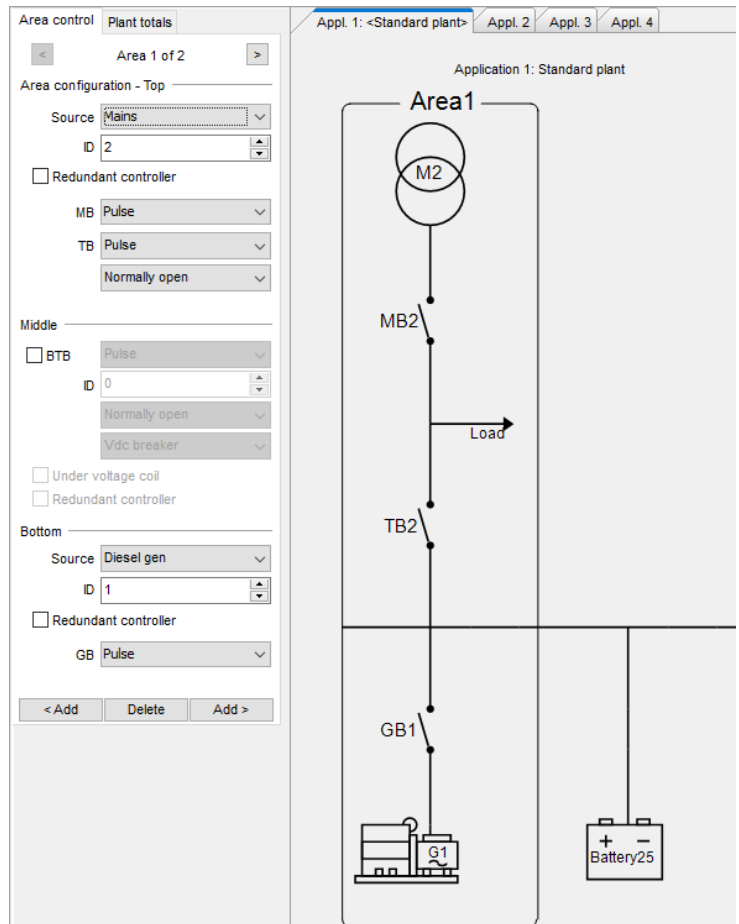
1.6 Power management

1.6.1 Introduction

The power management system automatically supplies the power that is necessary for the load efficiently, safely and reliably.

The power management system:
- Automatically charges and discharges the ESS
- Automatically uses the ESS as spinning reserve for PV and microgrids
- Automatically starts and stops generators
- Automatically closes and opens breakers
- Optimises the diesel genset load for high efficiency and low carbon footprint
- Optimises the fuel consumption
- Balances the loads in the system
- Deploys plant logic
- Makes sure that the system is safe

You can monitor the complete power management system from a graphical supervision page in the utility software. You can also see running status, hours in operation, breaker status, the condition of the mains and busbars, fuel consumption, and so on.

Multi-master system

The power management system is a multi-master system, for increased reliability. In a multi-master system all vital data is transmitted between the controllers, so that all the controller know the power management status (calculations and position) in the application. As a result, the application does not have a single master controller.

Busbar sections

The plant can be divided by one to eight bus tie breakers. This makes it possible to run different sections of the plant in different plant modes. For example, you can use this to test a section, or to divide the load into primary and secondary loads.

1.6.2   Power management plant modes

The plant modes are configurable and can be changed at any time. All modes can be combined with Automatic Mains Failure mode (AMF). You can use the controllers for the following applications:

Standard plant modes	Applications
Island mode	Power plant with synchronising generators.
Automatic Mains Failure	Critical power/emergency standby plants, black start generator.
Fixed power	Power plant with fixed kW set point (including building load).
Peak shaving	Power plant where 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 a risk of power outages.
Mains power export	Power plant with fixed kW set point (excluding building load).

1.6.3   Power management features

Power management features	Extended	Premium
Power management operation: • Number of generator controllers • Number of mains controllers • Number of BTB controllers • Number of solar controllers • Number of storage (BESS) controllers • Number of load controllers (ALC-4)	32 32 8 16 32 8	32 32 8 16 32 8
Hybrid ready (compatible with ASC-4 and ASC 150)	x	x
Load controller support (compatible with ALC-4)	x	x
Genset load-dependent start and stop	x	x
EasyConnect	x	x
Asymmetrical genset load sharing	x	x
N + X (Secured mode)	x	x
Genset priority selection: • Manual • Running hours • Fuel optimisation	x x 	x x x
Safety stop of genset	x	x

1.7 Protections overview

Protections	No. of	ANSI	Operate time
Fast over-current	x2	50P	<40 ms
Over-current	x4	50TD	<200 ms
Voltage dependent over-current	x1	51V	
Over-voltage	x2	59	<200 ms
Under-voltage	x3	27P	<200 ms
Over-frequency	x3	81O	<300 ms
Under-frequency	x3	81U	<300 ms
Unbalanced voltage	x1	47	<200 ms
Unbalanced current	x1	46	<200 ms
Under-excitation or reactive power import	x1	32RV	<200 ms
Over-excitation or reactive power export	x1	32FV	<200 ms
Overload	x5	32F	<200 ms
Neutral current	x1	51N	<100 ms
Busbar over-voltage	x3	59P	<50 ms
Busbar under-voltage	x4	27P	<50 ms
Busbar over-frequency	x3	81O	<50 ms
Busbar under-frequency	x3	81U	<50 ms
Emergency stop	x1	1	<200 ms
Low auxiliary supply	x1	27DC	
High auxiliary supply	x1	59DC	
ES breaker external trip	x1	5	
Synchronisation failure alarms		25	
Breaker open failure		52BF	
Breaker close failure		52BF	
Breaker position failure		52BF	
Phase sequence error	x1	47	
De-load error	x1	34	
Hz/V failure	x1	53	
Not in Auto	x1	34	

2. Compatible products

2.1 Power management

You can use these controllers together in a power management system:

- **AGC 150 Generator** (see www.deif.com/products/agc-150-generator)
- **AGC 150 Mains** (see www.deif.com/products/agc-150-mains)
- **AGC 150 BTB** (see www.deif.com/products/agc-150-btb)
- **ASC 150 Solar**
- **ASC 150 Storage**
- **AGC-4 Mk II** (see www.deif.com/products/agc-4-mk-ii)
- **AGC-4** (see www.deif.com/products/agc-4)
- **ASC-4 Solar** (see www.deif.com/products/asc4-solar)
- **ASC-4 Battery** (see www.deif.com/products/asc4-battery)
- **ALC-4 (Automatic Load Controller)** (see www.deif.com/products/alc-4)

2.2 Remote monitoring service: Insight

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

2.3 Additional inputs and outputs

ASC 150 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 general PID control.

2.4 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.

2.5 Other equipment

DEIF has a wide variety of other equipment that is compatible. This includes synchroscopes, meters, transducers, current transformers, power supplies, and battery chargers. See www.deif.com

2.6 Controller types

If the AGC 150 or ASC 150 has an extended or premium software package, you can change it to any AGC 150 or ASC 150 controller type. Select the controller type under `Basic settings > Controller settings > Type`.

Parameter	Setting	Controller type
9101	DG unit	Genset (Generator or Stand-alone) controller
	Mains unit	Mains controller
	BTB unit	BTB controller
	DG HYBRID unit	Genset-Solar hybrid controller
	ENGINE DRIVE unit	Engine drive controller
	Remote unit	Remote display
	ENGINE DRIVE MARINE unit	Engine drive controller for marine use
	DG MARINE unit	Stand-alone genset controller for marine use
	Solar unit	Solar controller
	Storage unit	Battery storage controller

Parameter	Setting	Controller type
	DG unit	Genset (Generator or Stand-alone) controller
	Mains unit	Mains controller
	BTB unit	BTB controller

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 From 3.5 to 10 Hz:

Current measurement

	• +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

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 outputs	2 outputs (15 A DC inrush and 3 A continuous, supply voltage 0 to 36 V DC) 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: • 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

Display unit

Type	Graphical display screen (monochrome)
Resolution	240 x 128 pixels
Navigation	Five-key menu navigation

Display unit	
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 meter 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: 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 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 Communication

| Communication	
CAN A	CAN port You can connect these in a daisy chain (and operate them at the same time): • CIO 116, CIO 208, and CIO 308 • IOM 220 and IOM 230 Data connection 2 wire + common Not isolated External termination required (120 Ω + matching cable)
CAN B	Spare CAN port / power management Data connection 2 wire + common Isolated External termination required (120 Ω + matching cable) PMS 125 kbit and 250 kbit
RS-485 Port 1	Used for: • Modbus master to PCS/BCU, BMS and PDS • Power meters • Modbus RTU, PLC, SCADA, Remote monitoring (Insight) Data connection 2-wire + common Isolated External termination required (120 Ω + matching cable) 9600 to 115200
RS-485 Port 2	Used for: • Modbus master to PCS/BCU, BMS and PDS • Power meters • Modbus RTU, PLC, SCADA, Remote monitoring (Insight) Data connection 2-wire + common Not isolated External termination required (120 Ω + matching cable) 9600 to 115200
RJ45 Ethernet	Used for: • Modbus master to PCS/BCU, BMS and PDS • Modbus to PLC, SCADA, and so on • NTP time synchronisation with NTP servers • Backup power management system (PMS) communication between AGC 150 and ASC 150 controllers Isolated Auto detecting 10/100 Mbit Ethernet port
USB	Service port (USB-B)

3.4 Approvals

Standards
CE

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

3.5 Dimensions and weight
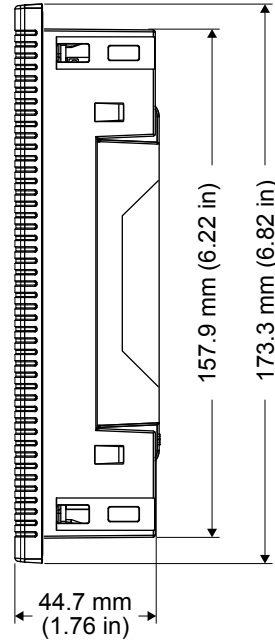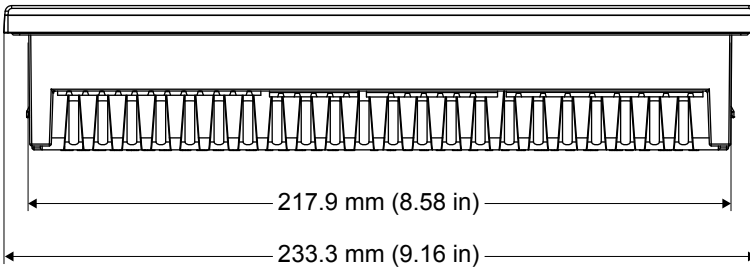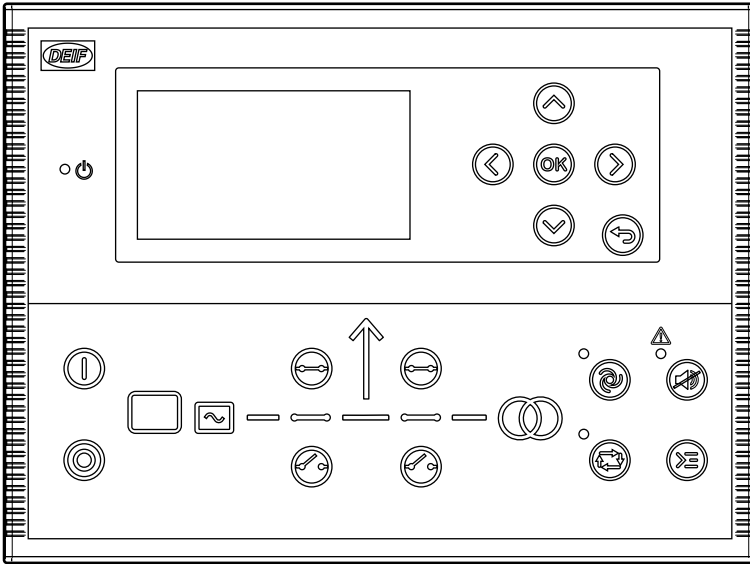
Dimensions and weight	
Dimensions	Length: 233.3 mm (9.16 in) Height: 173.3 mm (6.82 in) Depth: 44.7 mm (1.76 in)
Panel cutout	Length: 218.5 mm (8.60 in) Height: 158.5 mm (6.24 in) Tolerance: ± 0.3 mm (0.01 in)
Max. panel thickness	4.5 mm (0.18 in)
Mounting	UL/cUL Listed: Type complete device, open type 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.xx.