iE 150

4921240684A

Automatic Transfer Switch (ATS)

Data sheet

Improve Tomorrow

1. iE 150 ATS

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1. iE 150 ATS

1.1 About the controller

1.1.1 About

The iE 150 Automatic Transfer Switch (ATS) controller can automatically transfer the power supply when it detects a failure. The controller can handle all types of power sources and the user can select how the controller should respond to a failure. The ATS can control up to three breakers, which means that you can use it in a wide range of emergency power solutions.

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

The values and alarms are shown on the LCD display screen, which is sunlight-readable. Operators can easily control the breakers from the display units. Alternatively, use the communication options to connect to an HMI/SCADA system.

1.1.2 Software versions

The information in this document relates to software version:

Software	Details	Version
iE 150	Controller application	1.35.0

You can select the **Core** or **Sync** software package.

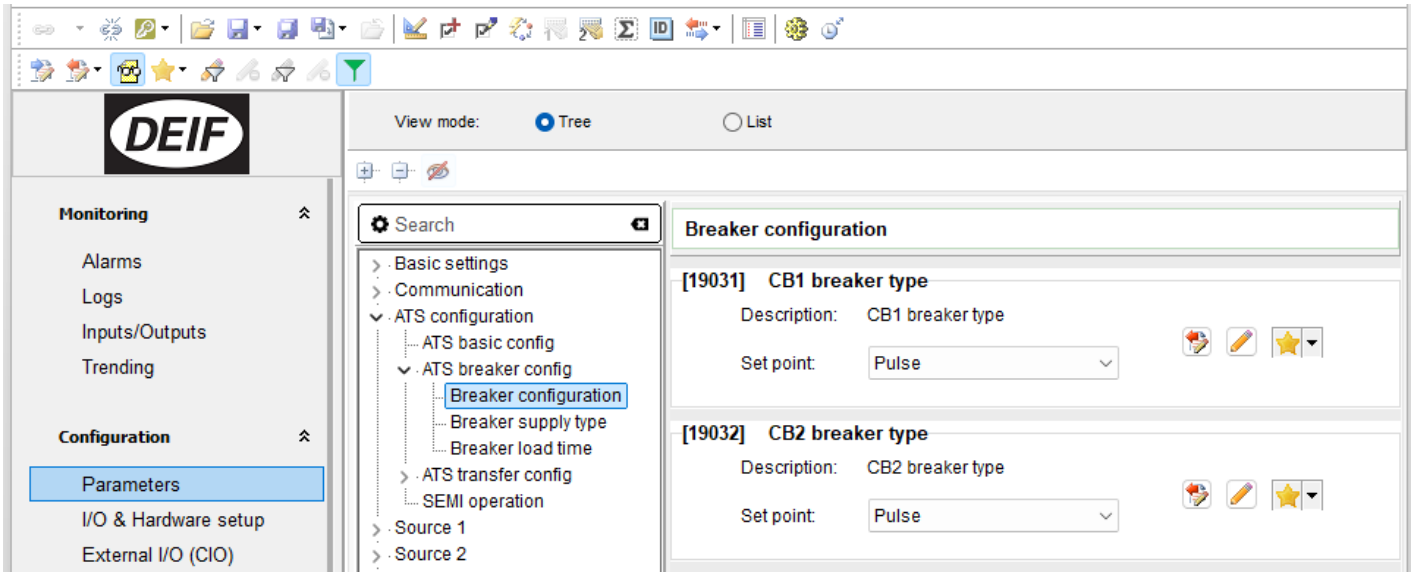
1.1.3 Emulation

iE 150 ATS includes an emulation tool to verify and test the functionality of the application, for example breaker handling.

Emulation is useful for training and for testing basic functionality that needs to be set up or verified.

1.1.4 Easy configuration with the utility software

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



1.2 Functions and features

1.2.1 ATS controller functions

Functions	Core	Sync
Open transition	●	●
Open delayed transition	●	●
Open in-phase transition		●
Closed transition		●
Closed transition with an adjustable overlap time		●
Priority of source: • Prioritise S1 • Prioritise S2 • Shift priority at blackout • Prioritise both S1 and S2 • Cyclic mode	●	●
Power sources: • Mains/mains • Genset/mains • Mains/genset • Genset/genset	●	●
Elevator switch	●	●
External control of mains breaker	●	●
Protections	●	●
Manual close if source fails	●	●

1.2.2 General functions

AC functions	Core	Sync
100 to 690 V AC (selectable)	●	●
CT -/1 or -/5 (selectable)	●	●
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	●	●
4th current measurement • Power source 2 current	●	●
Sets of nominal settings	4	4

General functions	Core	Sync
Emulation for testing and front load commissioning	●	●
Built-in test sequences (simple test and load test)	●	●
PLC logic (M-Logic)	20 lines	20 lines
Counters, including:	●	●

General functions	Core	Sync
• Breaker operations • kWh meter (day, week, month, total) • kvarh meter (day, week, month, total)		

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

Display and language functions	Core	Sync
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	●	●

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

1.3 Alarms and protections

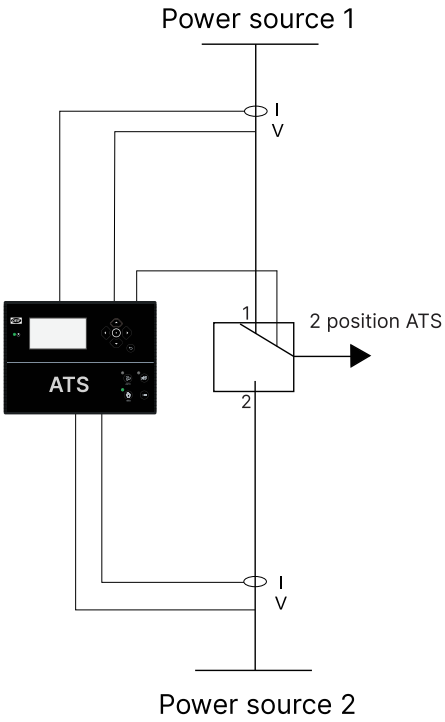
Protections	Alarms	ANSI	Operate time
Reverse power	2	32R	<200 ms
Fast over-current	2	50P	<40 ms
Over-current	4	50TD	<200 ms
Voltage dependent over-current	1	50V	
Over-voltage	2	59	<200 ms
Under-voltage	3	27P	<200 ms
Over-frequency	3	81O	<300 ms
Under-frequency	3	81U	<300 ms
Unbalance voltage	1	47	<200 ms
Unbalance current	1	46	<200 ms
Loss of 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
Emergency stop	1		<200 ms
Low auxiliary supply	1	27DC	

Protections	Alarms	ANSI	Operate time
High auxiliary supply	1	59DC	
Breaker 1 (CB1) external trip	1		
Breaker 2 (CB2) external trip	1		
BTB breaker external trip	1		
Synchronisation failure alarms			
Breaker open failure	1/breaker	52BF	
Breaker close failure	1/breaker	52BF	
Breaker position failure	1/breaker	52BF	
Close before excitation failure	1		
Phase sequence error	1	47	
Hz/V failure	1		
Not in Auto	1		
Positive sequence (mains) voltage low	1	27	<60 ms
Directional over-current	2	67	<100 ms
Negative sequence voltage high	1	47	<400 ms
Negative sequence current high	1	$46I_2$	<400 ms
Zero sequence voltage high	1	$59U_0$	<400 ms
Zero sequence current high	1	$50I_0$	<400 ms
Power-dependent reactive power	1	40	-
IEC/IEEE inverse time over-current	1	51	-

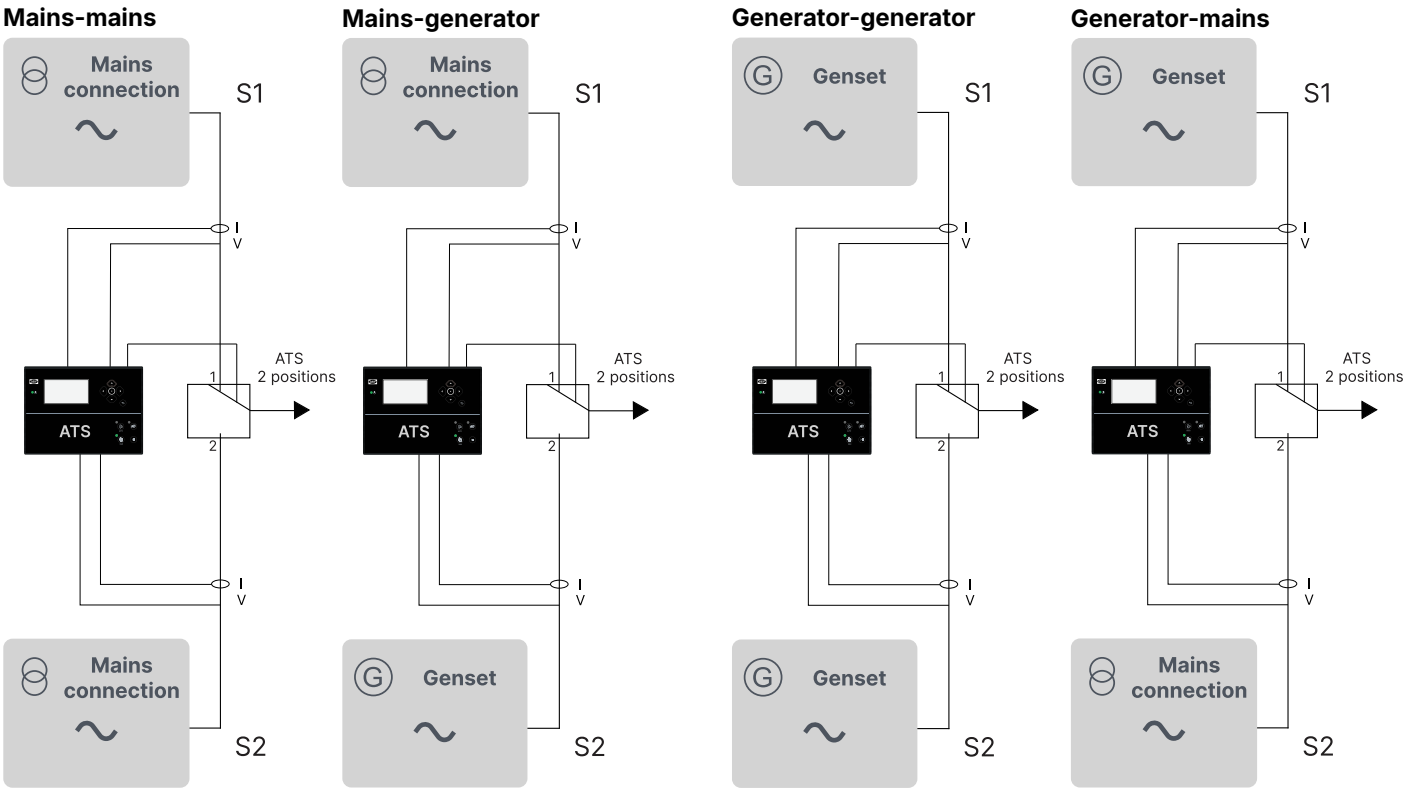
1.4 Applications

1.4.1 Applications with one breaker and 2 positions

There is no neutral in applications with one breaker and 2 positions.



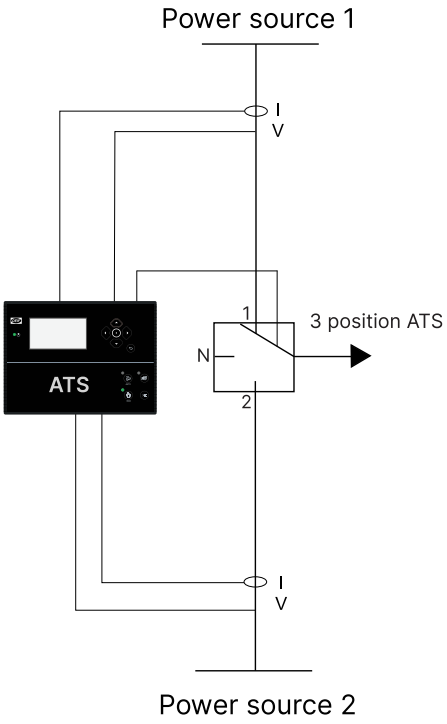
Examples



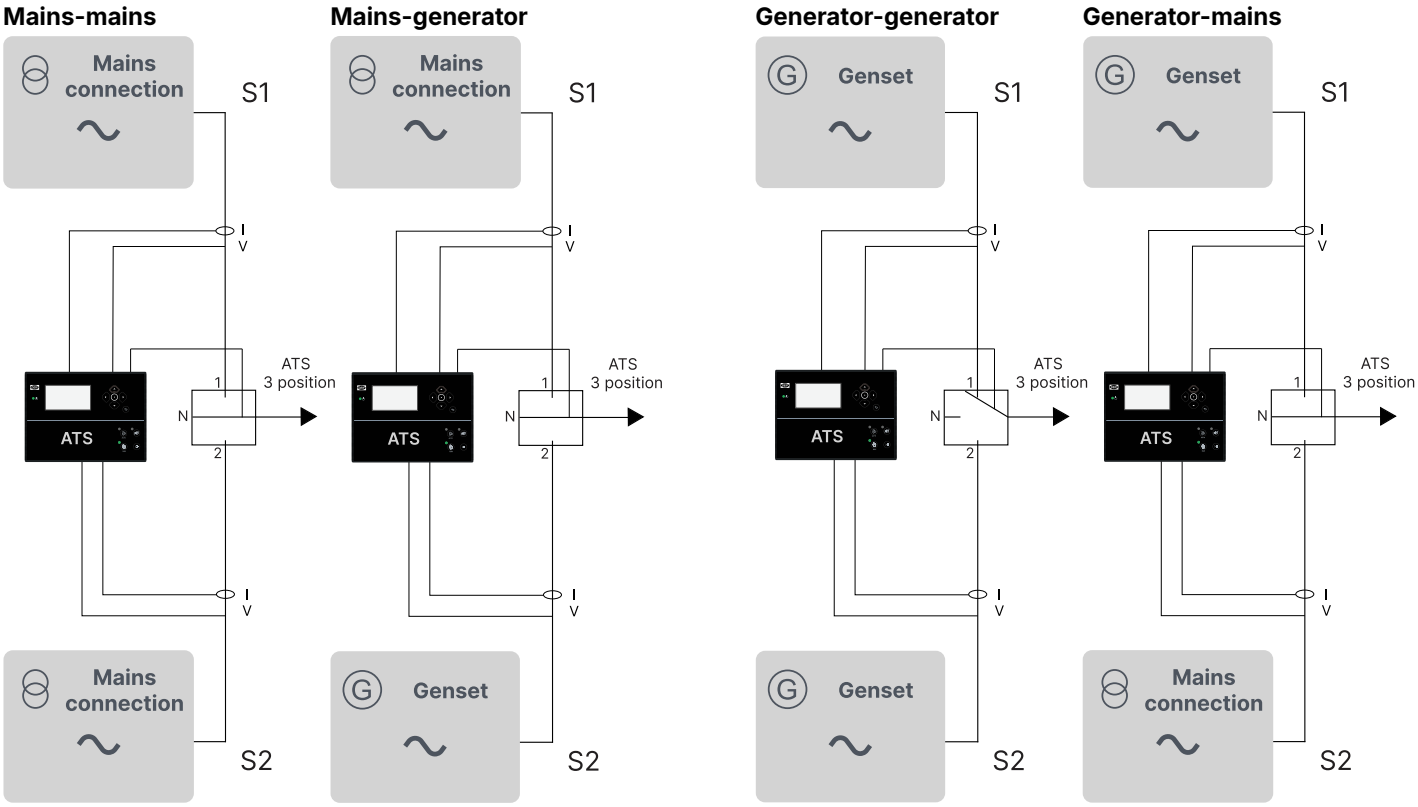
NOTE The mimics on the display depend on the sources selected. For example, the display mimics for the mains/generator application are different from the generator/mains application.

1.4.2 Applications with one breaker and 3 positions

There is a neutral position in applications with one breaker and 3 positions.

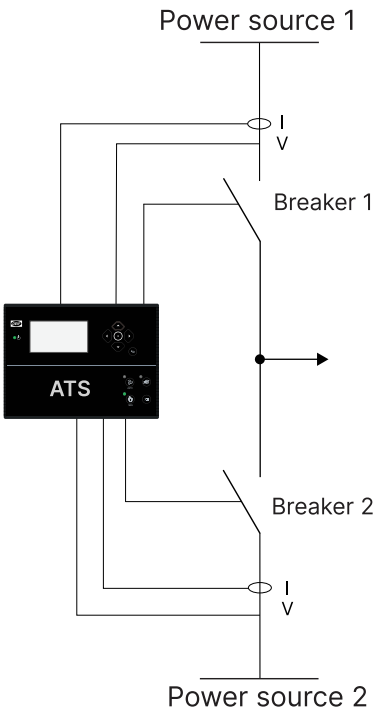


Examples



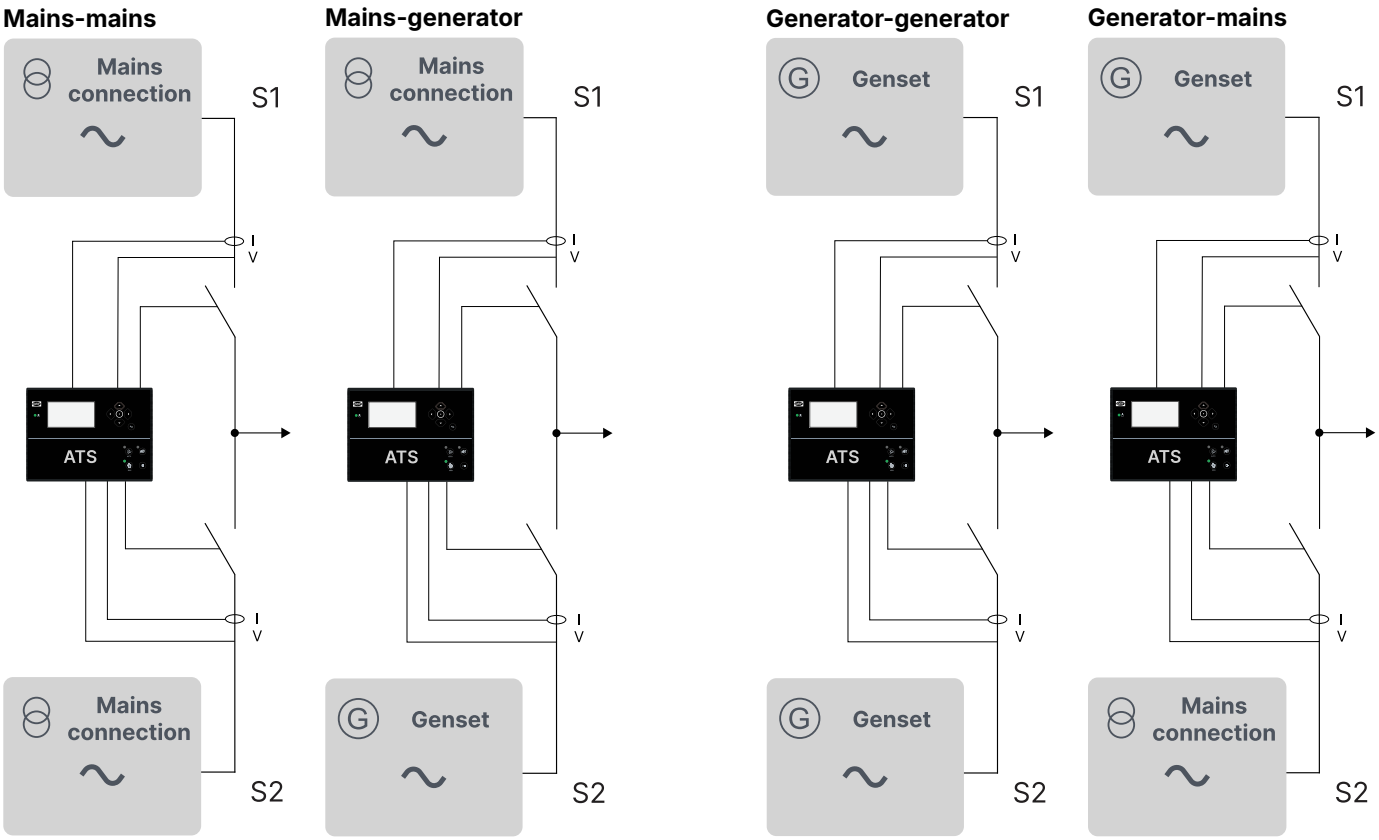
NOTE The mimics on the display change depending on the sources selected. For example, the display mimics for the mains/generator application are different from the generator/mains application.

1.4.3 Applications with two breakers



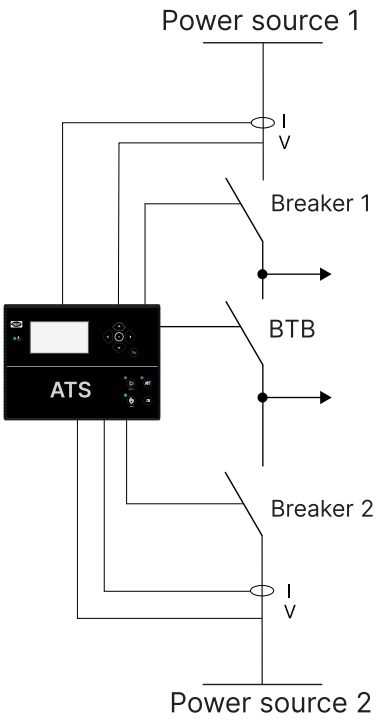
The controller automatically changes the supply if the primary supply fails.

Examples



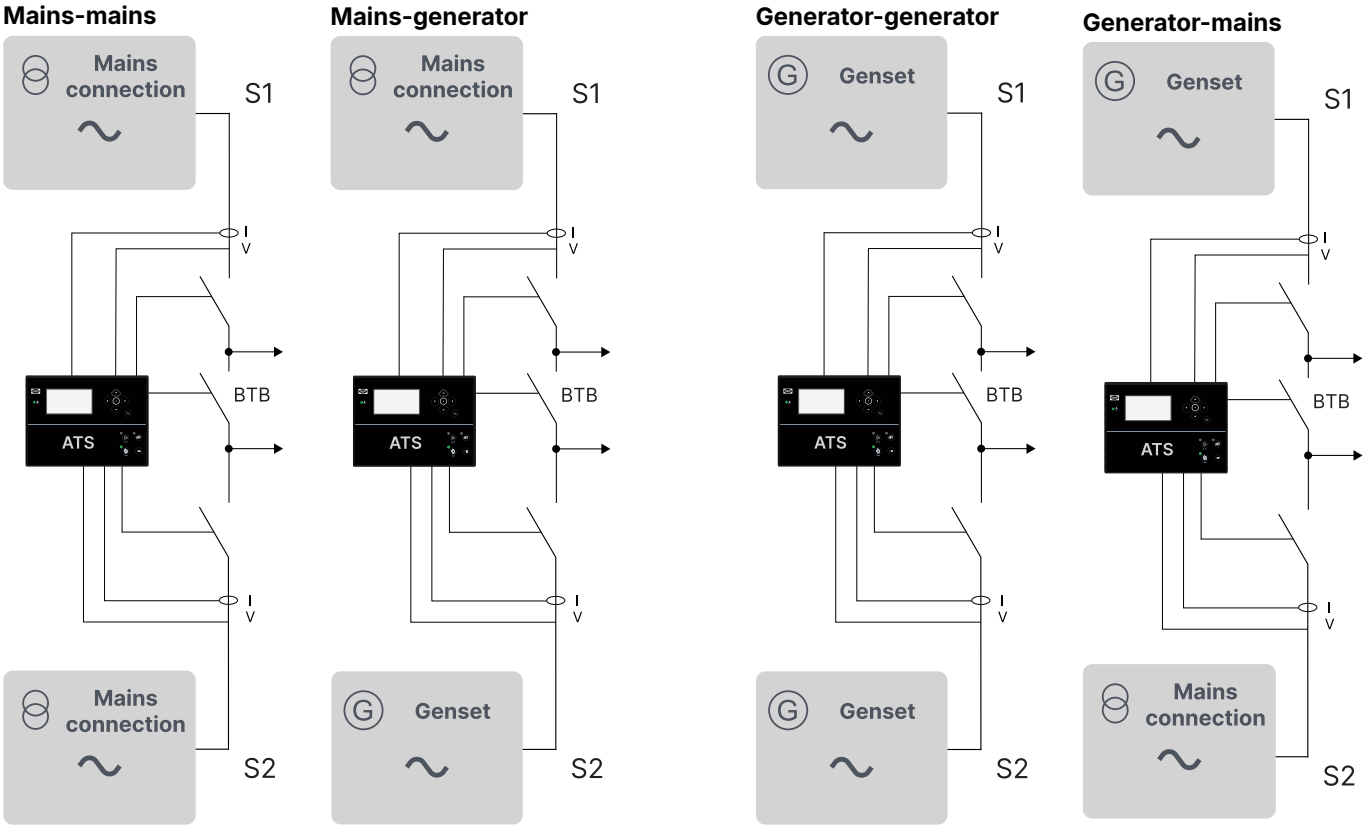
NOTE The mimics on the display change depending on the sources selected. For example, the display mimics for the mains/generator application are different from the generator/mains application.

1.4.4 Applications with three breakers



The 3-breaker setup is for two sources and two load points. It can be used in medium voltage ATS systems, such as in data centres. Source 1 or both can be set as the primary source.

Examples



NOTE The mimics on the display change depending on the sources selected. For example, the display mimics for the mains/generator application are different from the generator/mains application.

1.5 Compatible products

1.5.1 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.

1.5.2 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 general PID control. See www.deif.com/products/iom-200230

1.5.3 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.

1.5.4 Remote display: iE 150

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

1.5.5 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)

1.5.6 Controller types

Parameter	Setting	Controller type	Minimum software
9101	Genset unit	Non-sync generator controller	Core
	Genset unit	Generator controller	Sync
	Mains unit	Mains controller	Sync
	Bus Tie Breaker unit	BTB controller	Sync
	Genset Hybrid unit	Hybrid Genset-Solar controller	Core
	Engine Drive unit	Engine drive controller	Core
	Remote display unit	Remote display	None
	Battery unit	Battery storage controller	Premium
	Solar unit	Solar controller	Premium
	ATS unit	Automatic transfer switch (open transition)	Core
	ATS unit	Automatic transfer switch (closed transition)	Sync
	Genset PMS lite unit	PMS lite controller	Sync

Software packages and controller types

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

- **Core**
  - You can change the controller type to any other controller that uses **Core**.
  - **Core** software only supports non-synchronisation applications.
- **Sync**
  - You cannot change the controller type.
  - **Sync** software supports synchronisation applications.
- **PM** (power management)
  - You cannot change the controller type.
- **Premium**
  - You can change the controller type to any other controller type.
  - All functions are supported.

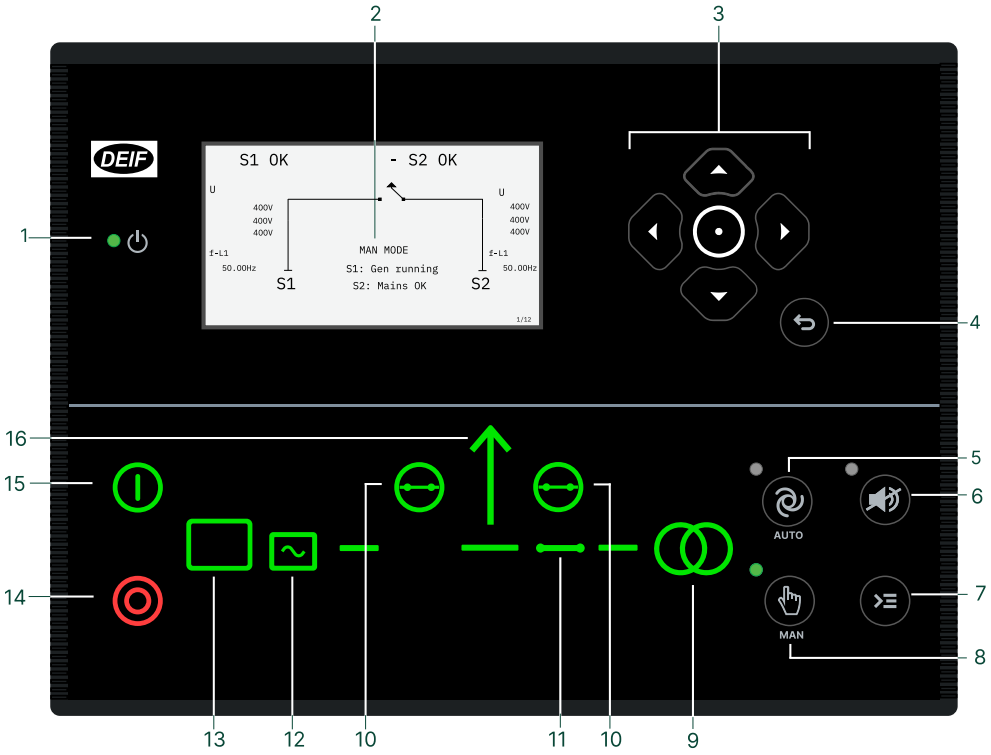
You can select the controller type under `Basic settings > Controller settings > Type`.

NOTE For the iE 150 Marine controllers, see www.deif.com/products/ie-150-marine.

2. iE 150 ATS with 1 breaker (ATS breaker)

2.1 2 positions (without neutral)

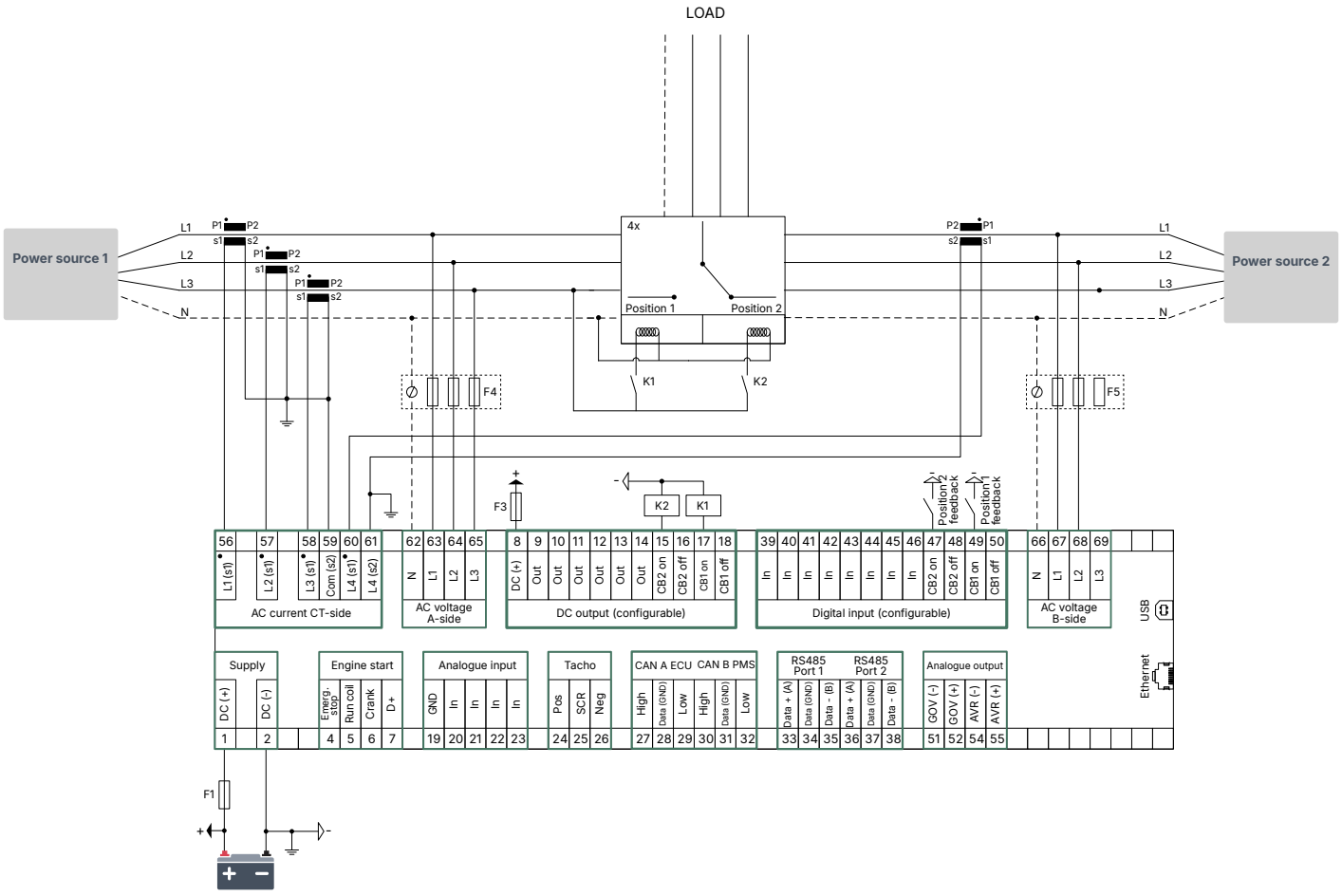
2.1.1 Display layout



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.
	Enter button	Confirms the selection
4	Back button	Go to the previous page.
5	AUTO mode	The controller automatically connects and disconnects the breakers. In genset applications, the controller also automatically starts and stops, the genset. No operator actions are needed.
6	Silence horn	Stops an alarm horn (if configured) and enters the Alarm menu.
7	Shortcut menu	Access the Engine and General shortcuts, Jump menu, Mode selection, Test, and Lamp test.
8	Manual mode	The operator or an external signal can connect or disconnect the breaker, and in genset applications, start and stop the genset. The controller cannot automatically connect or disconnect the breaker, or start and stop the genset.
9	Mains symbol	Green: Mains voltage and frequency are OK. The controller close the breaker. Red: Mains failure.

No.	Name	Function
10	Close breaker	Push to close the breaker. In genset applications, the genset is automatically started when you push this button before closing the breaker.
11	Breaker symbols	Green: Breaker is closed. Red: Breaker failure.
12	Generator	Green: Generator voltage and frequency are OK. The controller can 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.
13	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.
14	Stop	Stops the genset if the controller is in manual mode.
15	Start	Starts the genset if the controller is in manual mode.
16	Load symbol	Green: The supply voltage and frequency are OK. Red: Supply voltage/frequency failure.

2.1.2 Typical wiring

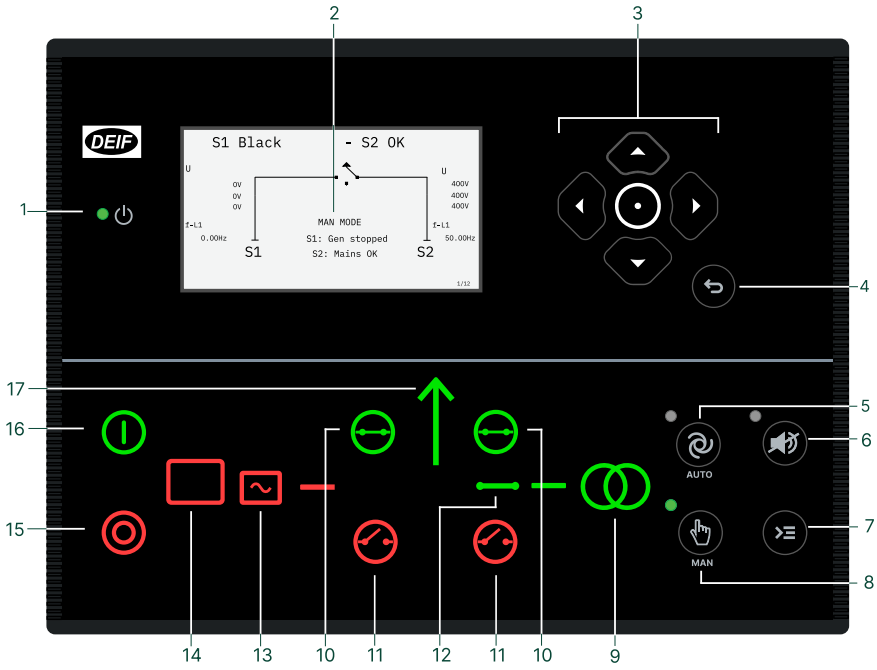


Fuses

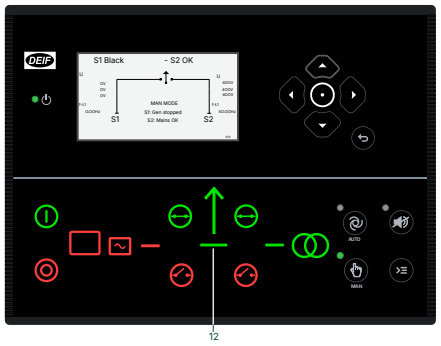
- F1: 2 A DC max. time-delay fuse/MCB, c-curve
- F3: 4 A DC max. time-delay fuse/MCB, b-curve
- F4, F5: 2 A AC max. time-delay fuse/MCB, c-curve

2.2 3 positions (with neutral)

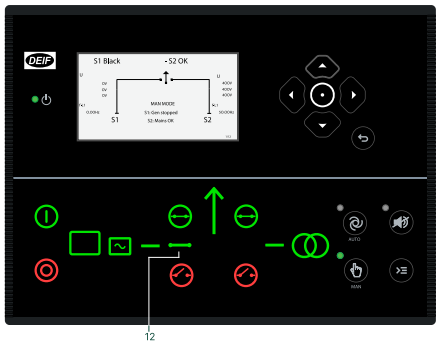
2.2.1 Display layout



Neutral position



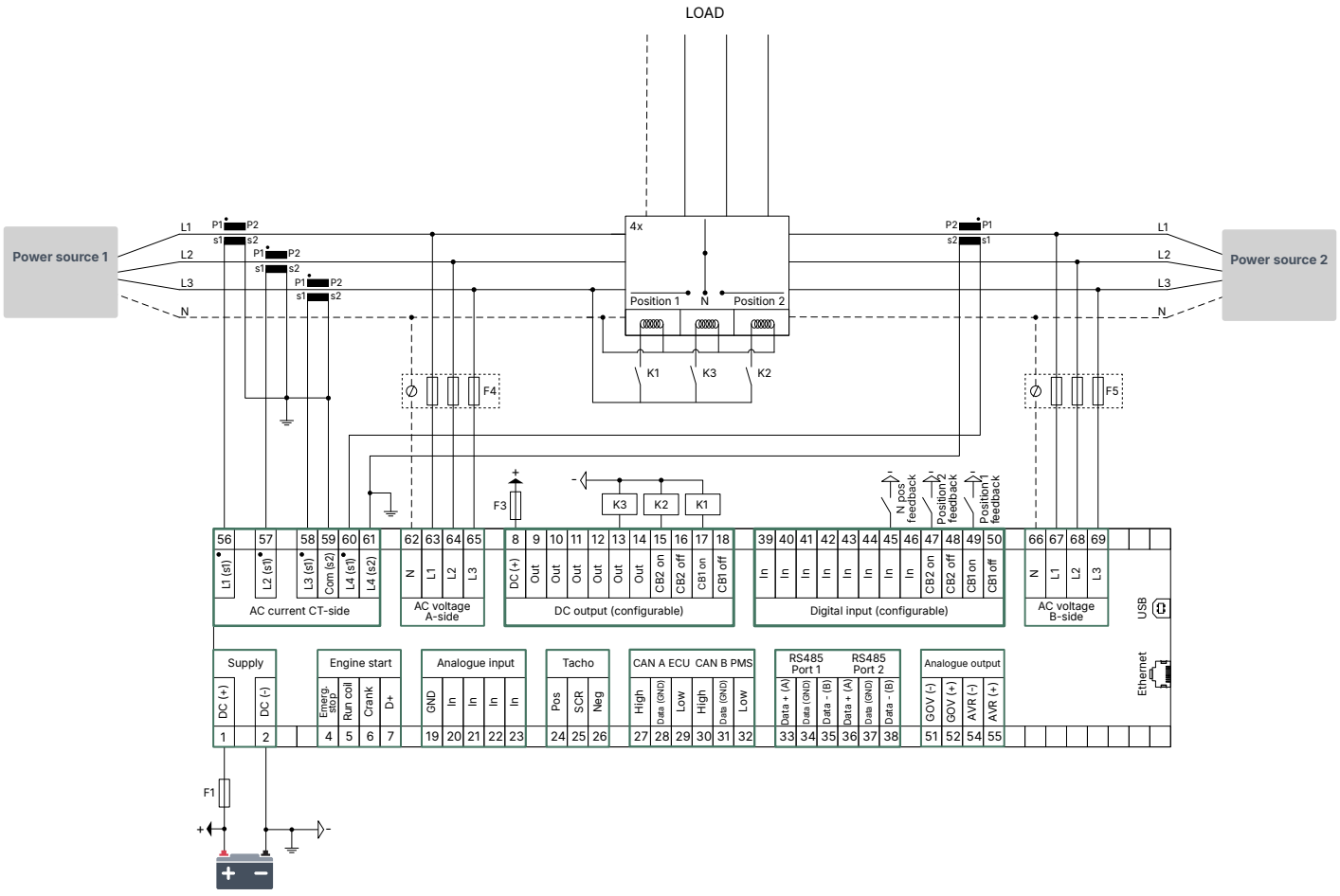
Position 1 (source 1)



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.
	Enter button	Go to the Menu system. Confirm the selection on the screen.
4	Back button	Go to the previous page.
5	AUTO mode	The controller automatically connects and disconnects the breakers. In genset applications, the controller also automatically starts and stops, the genset. No operator actions are needed.
6	Silence horn	Stops an alarm horn (if configured) and enters the Alarm menu.
7	Shortcut menu	Access the ATS priority selection, Jump menu, Mode selection, Lamp test.
8	Manual mode	The operator or an external signal can connect or disconnect the breaker, and in genset applications, start and stop the genset. The controller cannot automatically connect or disconnect the breaker, or start and stop the genset.
9	Mains symbol	Green: Mains voltage and frequency are OK. The controller close the breaker. Red: Mains failure.
10	Close breaker	Push to close the breaker. In genset applications, the genset is automatically started when you push this button before closing the breaker.

No.	Name	Function
11	Open breaker	Push to open the breaker. In genset applications, the genset is automatically stopped when you push this button before opening the breaker.
12	Breaker symbols	Green: Breaker is closed. Red: Position failure.
13	Generator	Green: Generator voltage and frequency are OK. The controller can 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 the controller is in manual mode.
16	Start	Starts the genset if the controller is in manual mode.
17	Load symbol	Green: The supply voltage and frequency are OK. Red: Supply voltage/frequency failure.

2.2.2 Typical wiring

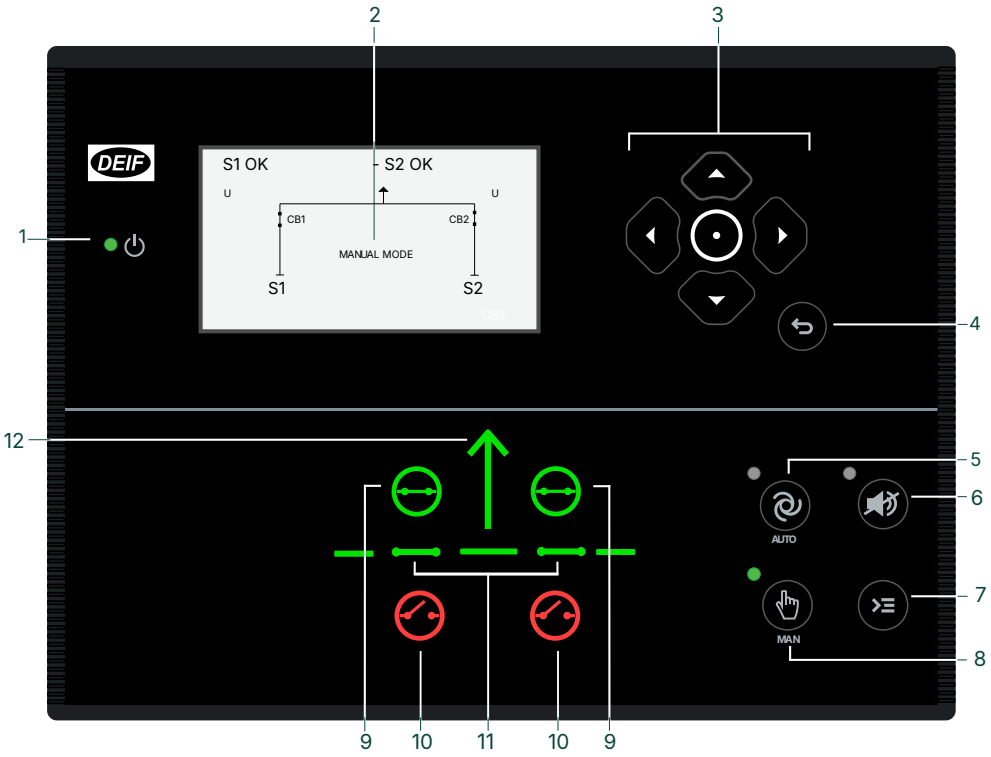


Fuses

- F1: 2 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

3. iE 150 ATS with 2 breakers

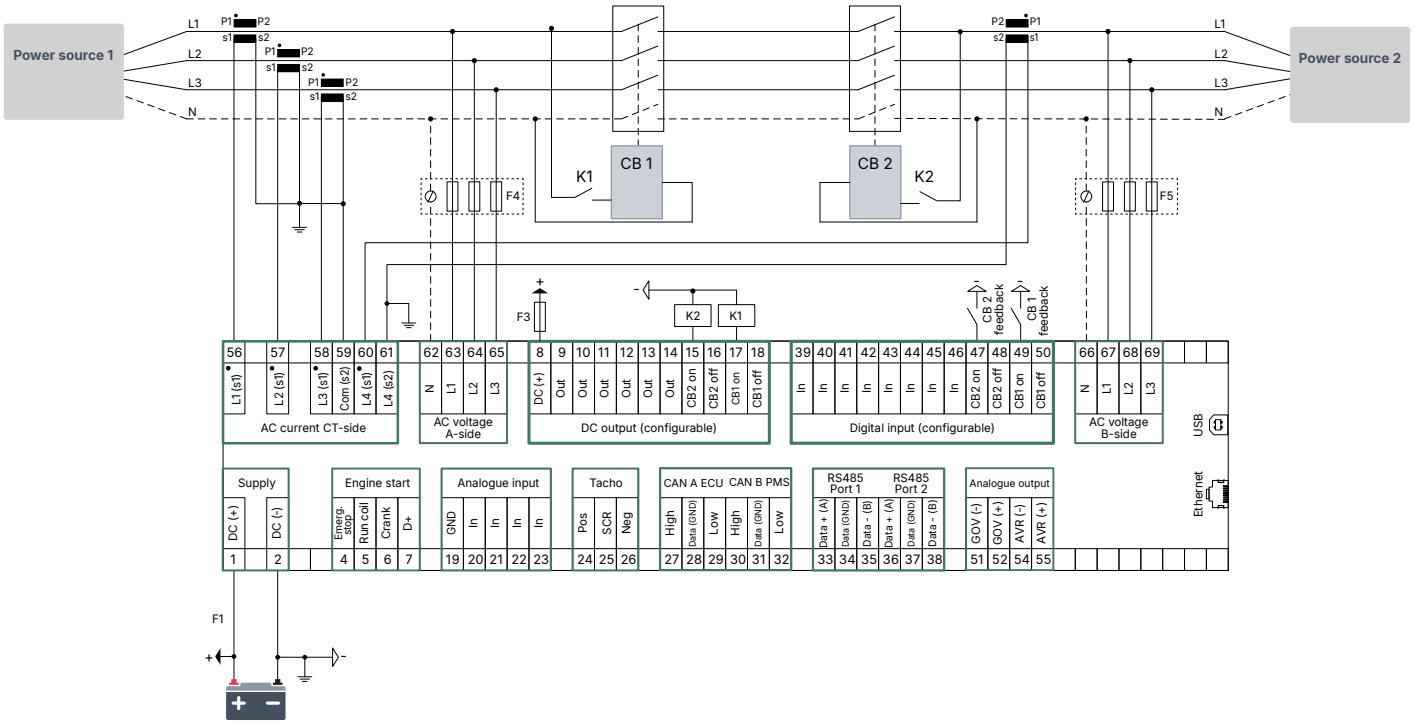
3.1 Display layout



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.
	Enter button	Go to the Menu system. Confirm the selection on the screen.
4	Back button	Go to the previous page.
5	AUTO mode	The controller automatically connects and disconnects the breakers. In genset applications, the controller also automatically starts and stops, the genset. No operator actions are needed.
6	Silence horn	Stops an alarm horn (if configured) and enters the Alarm menu.
7	Shortcut menu	Access the ATS priority selection, Jump menu, Mode selection, Lamp test.
8	Manual mode	The operator or an external signal can connect or disconnect the breaker, and in genset applications, start and stop the genset. The controller cannot automatically connect or disconnect the breaker, or start and stop the genset. The controller automatically synchronises before closing a breaker.
9	Close breaker	Push to close the breaker. In genset applications, the genset is automatically started when you push this button before closing the breaker.

No.	Name	Function
10	Open breaker	Push to open the breaker. In genset applications, the genset is automatically stopped when you push this button before opening the breaker.
11	Breaker symbols	Green: Breaker is closed. Green flashing: Synchronising. Red: Breaker failure.
12	Load symbol	Green: The supply voltage and frequency are OK. Red: Supply voltage/frequency failure.

3.2 Typical wiring

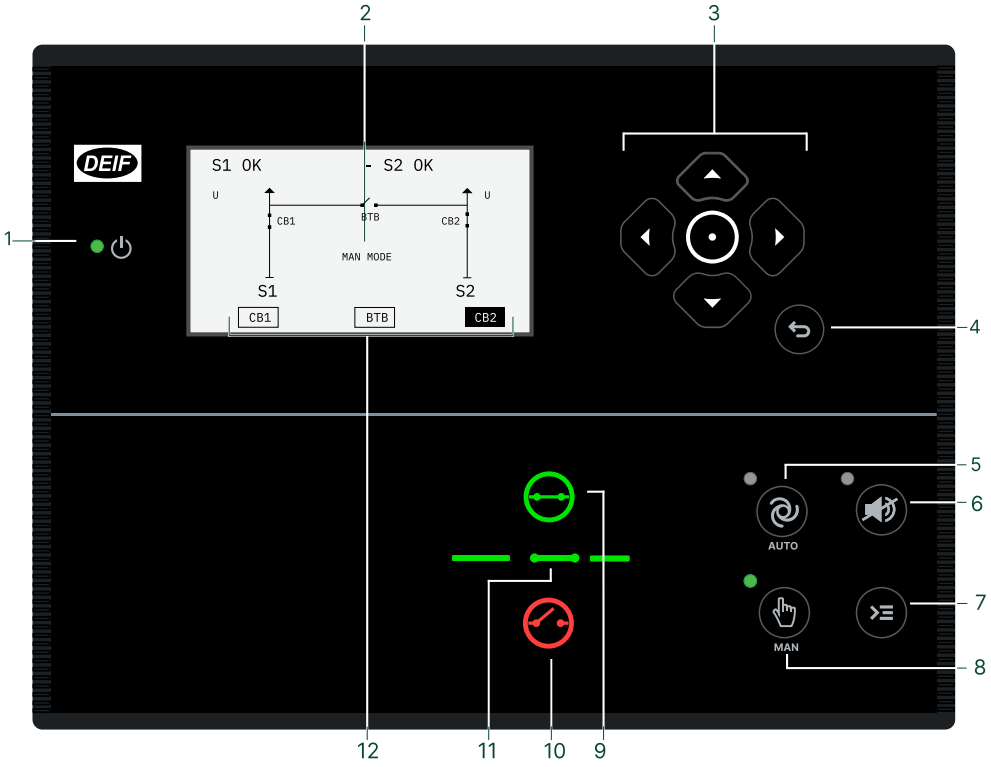


Fuses

- F1: 2 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

4. iE 150 ATS with 3 breakers

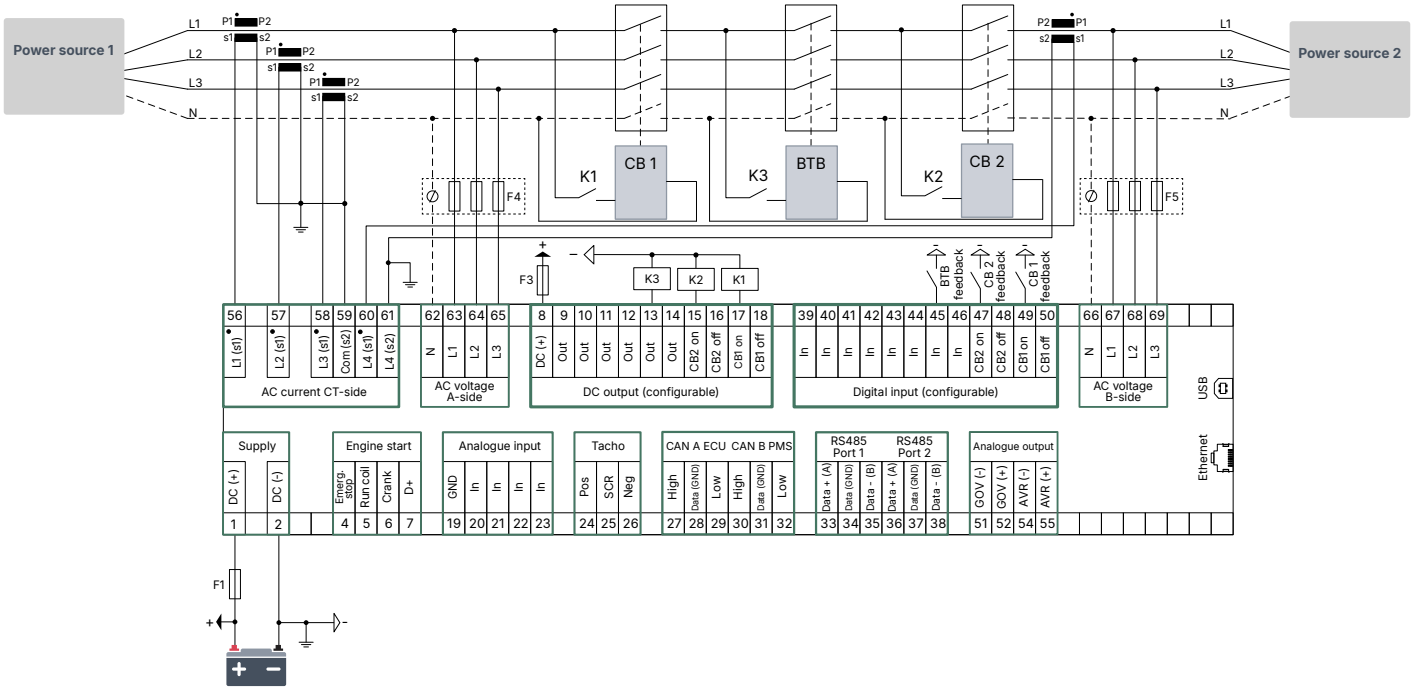
4.1 Display, buttons and LEDs



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.
	Enter button	Go to the Menu system. Confirm the selection on the screen.
4	Back button	Go to the previous page.
5	AUTO mode	The controller automatically joins and splits the busbar, and connects and disconnects the breakers. No operator actions are needed. In genset applications, the controller also automatically starts and stops gensets.
6	Silence horn	Stops an alarm horn (if configured) and enters the Alarm menu.
7	Shortcut menu	Access the ATS priority selection, Jump menu, Mode selection, Lamp test.
8	Manual mode	The operator or an external signal can join or split the busbar, and connect or disconnect the breakers. The controller cannot automatically do these actions. The controller automatically synchronises before closing a breaker.
9	Close breaker	Push to close the breaker. In genset applications, the genset is automatically started when you push this button before closing the breaker.

No.	Name	Function
10	Open breaker	Push to open the breaker. In genset applications, the genset is automatically stopped when you push this button before opening the breaker.
11	Breaker symbols	Green: Breaker is closed. Green flashing: Synchronising. Red: Breaker failure.
12	Breaker selection	Use the navigation arrows to select the breaker you want to control. As shown on the display, the selected breaker is highlighted.

4.2 Typical wiring

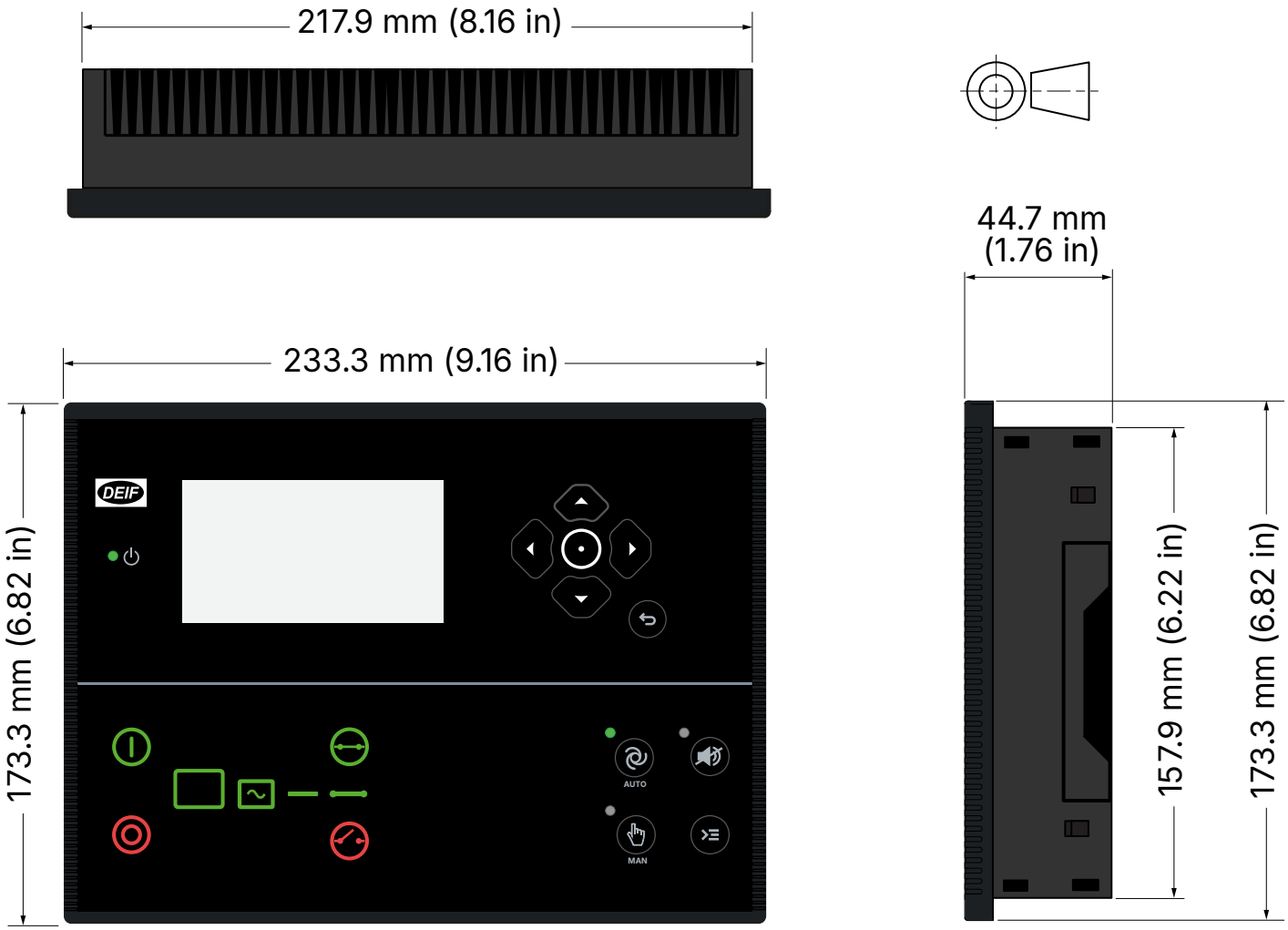


Fuses

- F1: 2 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

5. Technical specifications

5.1 Dimensions



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

5.2 Mechanical specifications

Operation conditions	
Vibration	Response: • 10 to 58.1 Hz, 0.15 mmpp

Operation conditions	
	• 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

5.3 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

5.4 Controller

5.4.1 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 3 A outputs	2 x outputs 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: • 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
Log book	Data log and trending function
Language	Multi-language display

5.4.2 Communication

Communication	
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)

5.5 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.

5.5.1 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.

Requirements	
Current transformers	Use Listed or Recognized isolating current transformers
Communication circuits	Only connect to communication circuits of a listed system/equipment

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