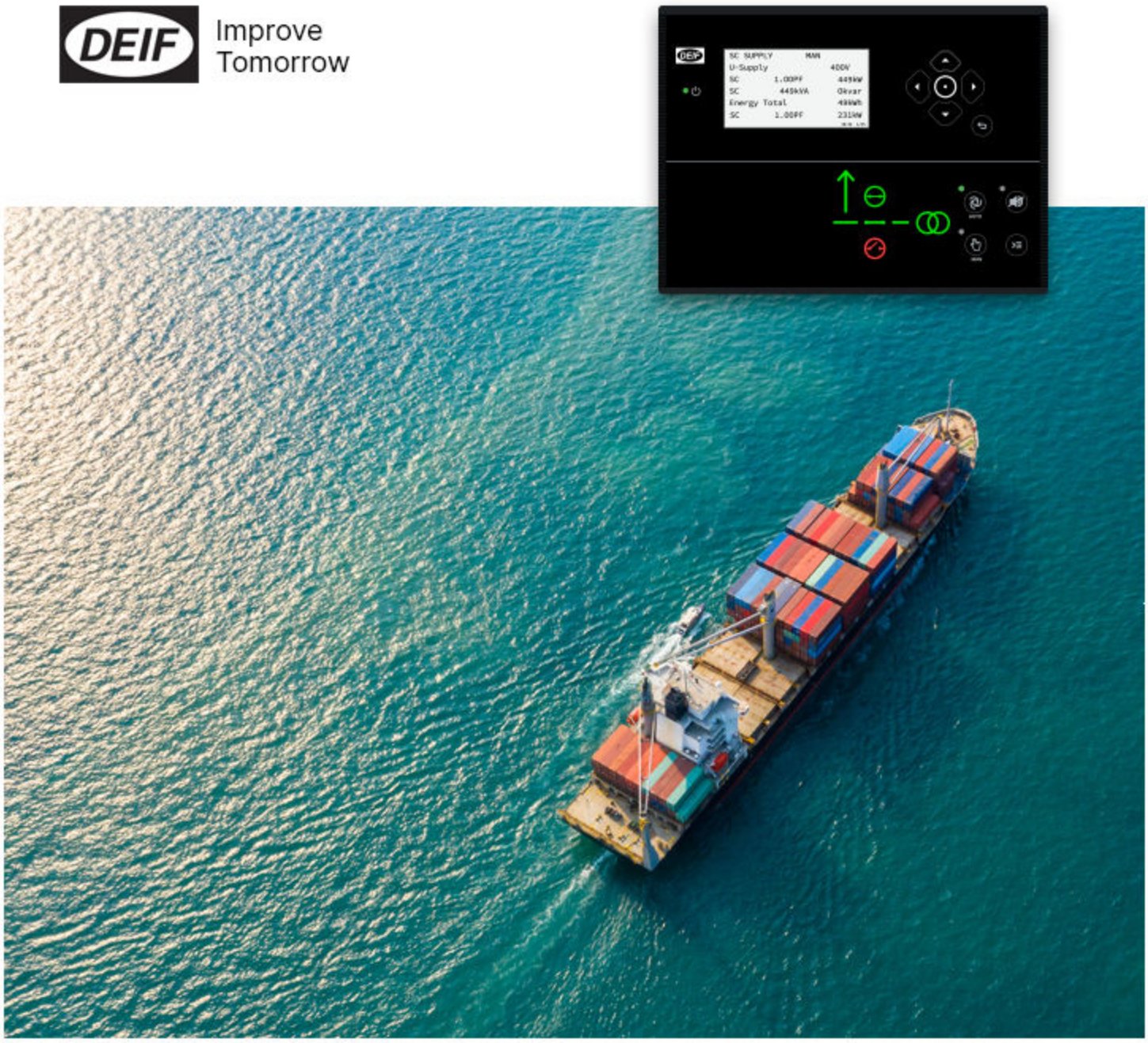
iE 150

Intelligent energy controller

Installation instructions

4189341437A

DEIF Improve Tomorrow



1. About the installation instructions

2. Prepare for installation

3. Mount the controller

4. Wiring the controller

5. End of life

1. About the installation instructions

1.1 Symbols and notation

Symbols for general notes

NOTE This shows general information.

More information
This shows where you can find more information.

Example

This shows an example.

How to ...
This shows a link to a video for help and guidance.

Symbols for hazard statements

DANGER!

This shows dangerous situations.

If the guidelines are not followed, these situations will result in death, serious personal injury, and equipment damage or destruction.

WARNING

This shows potentially dangerous situations.

If the guidelines are not followed, these situations could result in death, serious personal injury, and equipment damage or destruction.

CAUTION

This shows low level risk situation.

If the guidelines are not followed, these situations could result in minor or moderate injury.

NOTICE

This shows an important notice

Make sure to read this information.

1.2 Intended users of the Installation instructions

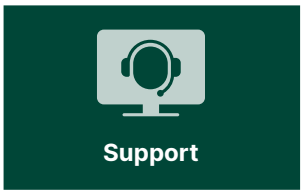
The Installation instructions are primarily intended for the people, who mount and wire up the controller. Designers may find it useful to refer to the Installation instructions, when developing the system's wiring diagrams, and operators may find it useful to refer to the Installation instructions while troubleshooting.

1.3 Need more information?

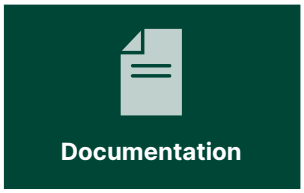
Get direct access to the resources that you need by using the links below.

Official DEIF homepage.

Help improve our documentation with your feedback.

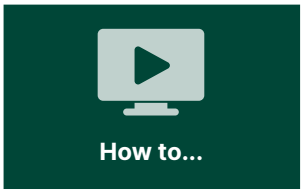


Self-help resources and how to contact DEIF for assistance.

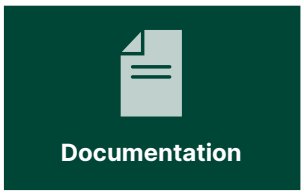


iE 150 documentation.

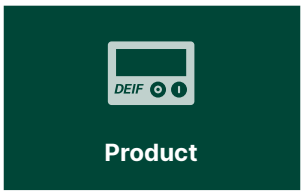
iE 150 product page.



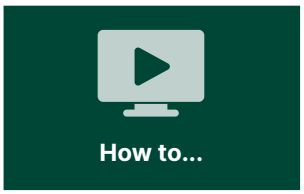
Learn how to use this product.



iE 150 Marine documentation.



iE 150 Marine product page.



Learn how to use this product.

1.4 Warnings and safety

Safety during installation and operation

When you install and operate the equipment, you may have to work with dangerous currents and voltages. The installation must only be carried out by authorised personnel who understand the risks involved in working with electrical equipment.

DANGER!

Hazardous live currents and voltages

Do not touch any terminals, especially the AC measurement inputs or any relay terminals, as this could lead to injury or death.

Current transformer danger

DANGER!

Electrical shock and arc flash

Risk of burns and electrical shock from high voltage.

Short all current transformer secondaries before breaking any current transformer connections to the controller.

Disable the breakers

DANGER!

Disable the breakers

Unintended breaker closing can cause deadly and/or dangerous situations.

Disconnect or disable the breakers BEFORE you connect the controller power supply. Do not enable the breakers until AFTER the wiring and controller operation are thoroughly tested.

Disable the engine start

DANGER!

Unintended engine starts

Unintended engine starts can cause deadly and/or dangerous situations.

Disconnect, disable or block the engine start (the crank and the run coil) BEFORE you connect the controller power supply. Do not enable the engine start until AFTER the wiring and controller operation are thoroughly tested.

UL/cUL Listed

The acceptability of the installation is determined as part of the final assembly.

If field-wired in the end application, you must use a physical barrier between the low voltage and higher voltage wiring connections to make sure that the circuits are separated.

Factory settings

The controller is delivered pre-programmed from the factory with a set of default settings. These settings are based on typical values and may not be correct for your system. You must therefore check all parameters and settings before using the controller.

Automatic and remote-controlled starts

CAUTION

Automatic genset start

The power management system automatically starts gensets when more power is needed. It can be difficult for an inexperienced operator to predict which gensets will start. In addition, gensets can be started remotely (for example, via an Ethernet connection, or a digital input).

To avoid personal injury, the genset design, the layout, and maintenance procedures must take this into account.

Electrostatic discharge

Electrostatic discharge can damage the controller terminals. You must protect the terminals from electrostatic discharge during the installation. When the controller is installed and connected, these precautions are no longer necessary.

Switchboard control (Marine)

In *Switchboard control*, the operator operates the equipment from the switchboard. When *Switchboard control* is activated:

- The controller trips the breaker and/or shuts down the engine, if an alarm situation arises that requires a trip and/or shutdown.
- The controller **does not** respond to a blackout.
- The controller **does not** provide power management.
- The controller **does not** accept operator commands.
- The controller cannot and **does not** prevent manual operator actions.

The switchboard design must protect the system when the controller is in *Switchboard control*.

DANGER!

Manual override of alarm action

Do not use switchboard or manual control to override the alarm action of an active alarm.

An alarm may be active because it is latched, or because the alarm condition is still active. If the alarm action is manually overridden, the latched alarm provides no protection.

Data security

To minimise the risk of data security breaches:

- As far as possible, avoid exposing controllers and controller networks to public networks and the Internet.
- Use additional security layers like a VPN for remote access, and install firewall mechanisms.
- Restrict access to authorised persons.

1.5 Legal information

Third party equipment

DEIF takes no responsibility for the installation or operation of any third party equipment, including the **genset**. Contact the **genset company** if you have any doubt about how to install or operate the genset.

Warranty

NOTICE

Warranty

The controller is not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

Trademarks

Windows® is a registered trademark of Microsoft Corporation in the United States and other countries.

All trademarks are the properties of their respective owners.

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.

Copyright

2. Prepare for installation

2.1 CAD drawings

DWG Drawings

www.deif.com/rtd/ie150/dwg

STP STEP-file

www.deif.com/rtd/ie150/stp

2D PDF

www.deif.com/rtd/ie150/2dpdf

3D PDF

To view a 3D PDF you must enable multimedia and 3D content in your PDF viewer.

www.deif.com/rtd/ie150/3dpdf

EDZ-file

www.deif.com/rtd/ie150/edz

2.2 Location

2.2.1 Front mount controller

The controller is designed for mounting in the panel front.
For UL/cUL listing, it must be:

- Mounted on a flat surface of a type 1 enclosure
- Installed in accordance with the NEC (US) or the CEC (Canada).

The equipment must be installed and operated in a clean and dry environment.

If the controller is installed in an area subject to constant high vibrations, the controller must be isolated from the vibrations. The installation environment must comply with the electrical, mechanical and environmental specifications of the controller as described in the data sheet.

Ventilation requirements and spacing

The back of the controller is not protected against dust. The accumulation of dust may damage the controller or lead to overheating. For proper ventilation, the controller must be mounted with its back vertical and its long axis horizontal.

2.3 Tools

Tool	Attachment	Torque	Used to
Screwdriver	PH2 or 5 mm flat	0.15 N·m (1.3 lb-in)	Tighten the fixing screw clamps
Wire stripper, pliers and cutters	-	-	Prepare wiring and trim cable ties
Safety equipment	-	-	Personal protection, according to local standards and requirements

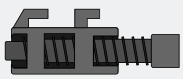
NOTICE

Torque damage to equipment

Do not use power tools during the installation. Too much torque damages the equipment.

Follow the instructions for the correct amount of torque to apply.

2.4 Materials

Material	Notes
Four screw clamps	To mount the controller in the front panel  Supplied with the product
Wires and connectors	To wire third party equipment to the controller terminals

Material	Notes
Ethernet cable	To connect the controller communication between controllers and external systems
Cable ties	To secure wiring and Ethernet cable

2.5 Personal Protective Equipment (PPE)

Follow all local requirements and regulations for wearing PPE while you install or wire the product.

Example PPE but not limited to:

 Ear protection

 Eye protection

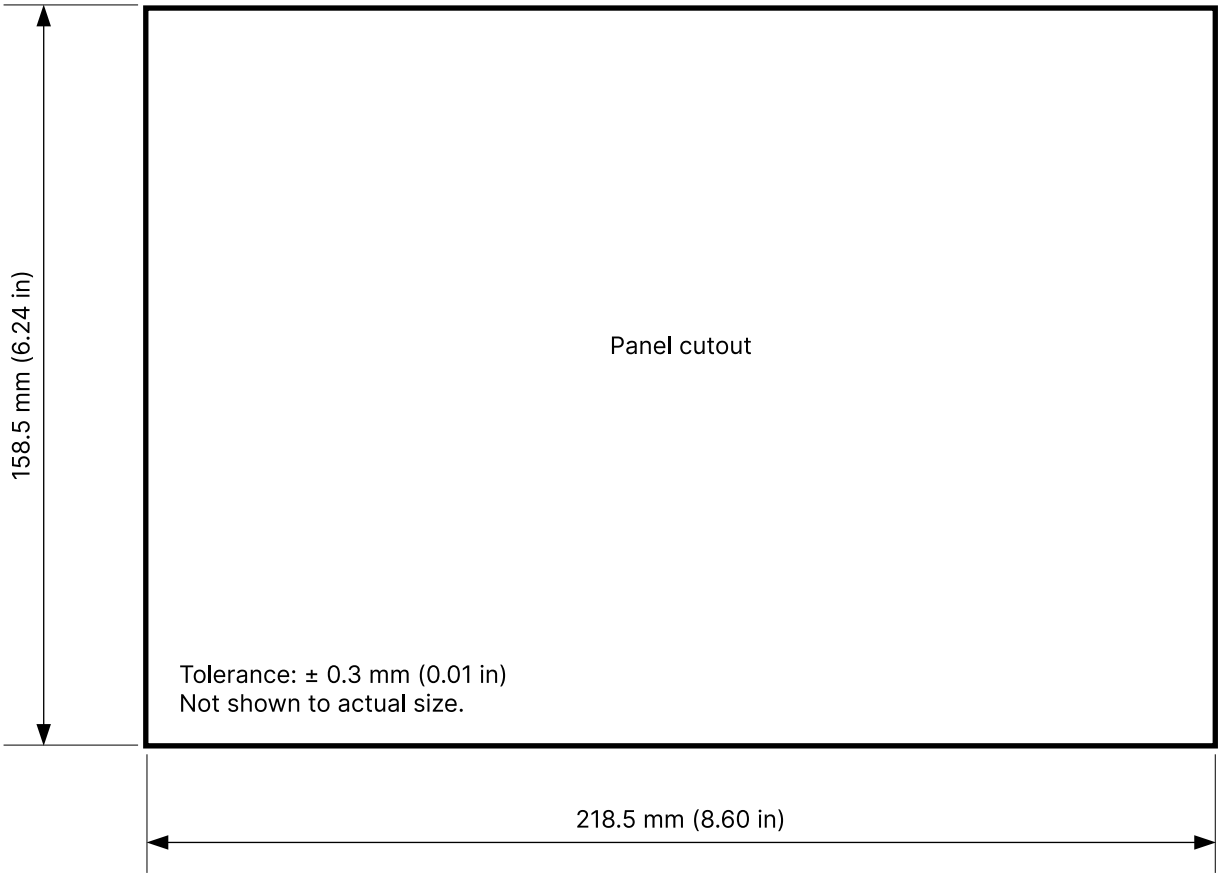
 Wear gloves

 Protective clothing

3. Mount the controller

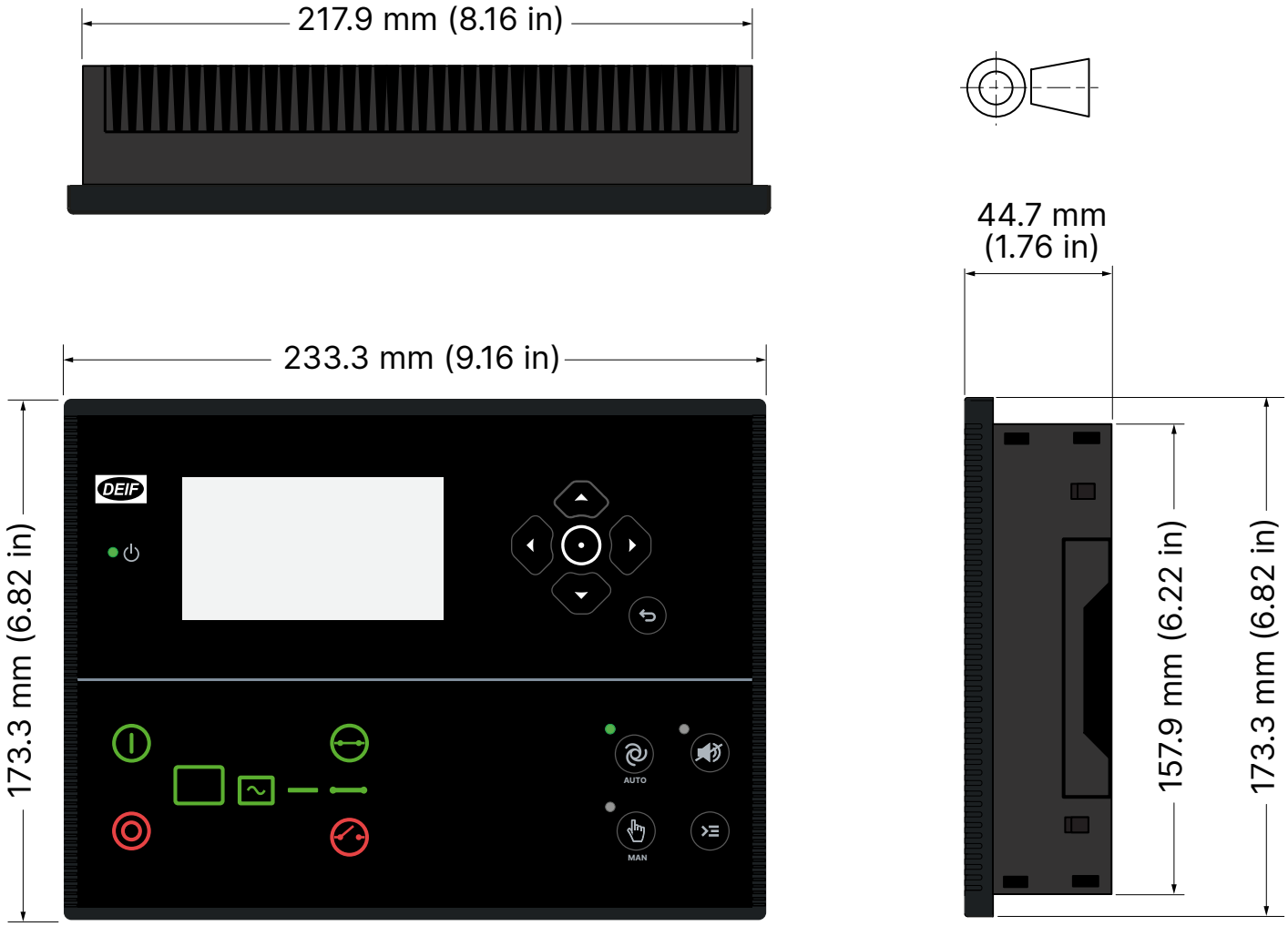
3.1 Panel cutout

This panel cutout drawing is a guideline and not scale 1:1. The dimensions will not be correct when printed.



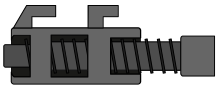
The maximum panel thickness is 4.5 mm (0.18 in).

3.2 Dimensions

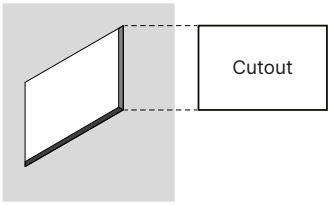


Dimensions and weight	
Dimensions	Length: 233.3 mm (9.16 in) Height: 173.3 mm (6.82 in) Depth: 44.7 mm (1.76 in)
Panel cutout	Length: 218.5 mm (8.60 in) Height: 158.5 mm (6.24 in) Tolerance: ± 0.3 mm (0.01 in)
Max. panel thickness	4.5 mm (0.18 in)
Mounting	UL/cUL Listed: Type complete device, open type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

3.3 Mount the controller

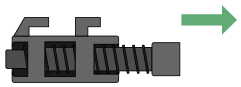


x 4 Use the four fixing screw clamps to mount the controller.

1. 

Cut a rectangular hole in the panel with a length of 218.5 mm (8.60 in) and a height of 158.5 mm (6.24 in).

The maximum thickness of the panel is 4.5 mm (0.18 in).

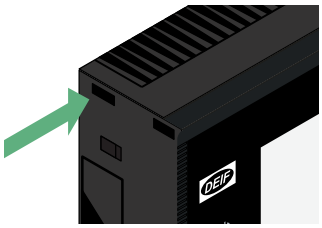
2. 

Make sure that each fixing screw clamp is loosened to the position shown.

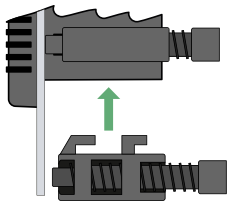
Do not remove the fixing screw clamp completely from the holder.

3. 

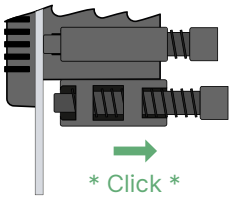
Put the controller into the panel cutout.

4. 

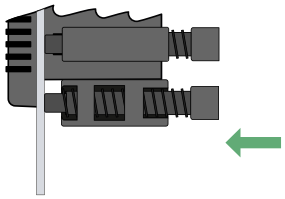
Locate the holes for the fixing screw clamps on the unit.

5. 

Put each fixing screw clamp into the mounting holes.

6. 

Slide each fixing screw clamp into position.

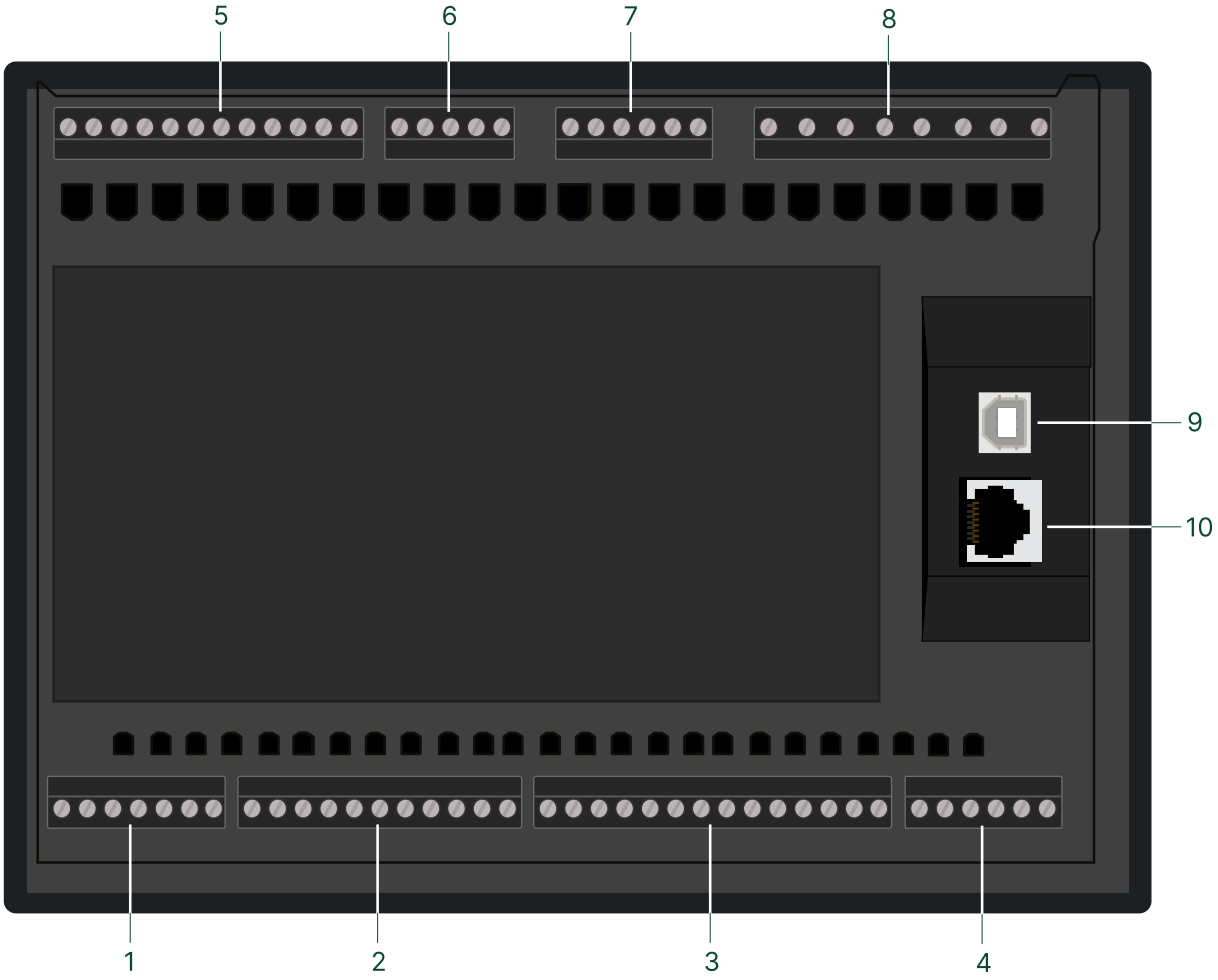
7. 

Turn the fixing screw clamp until the unit is secure to the panel surface.

Do not exceed the recommended torque of 0.15 N·m (1.3 lb-in).

4. Wiring the controller

4.1 Terminal connections



Terminal block 1: Supply/Engine start

Terminal	Text	Function	Technical data
1	Supply, DC (+)	+12/24 V DC	6.5 to 36 V DC
2	Supply, DC (-)	0 V DC	
3	Not used	-	-
4	Emerg. stop	Digital input and supply for terminals 5, 6 and 7	
5	Run coil	Configurable	Max. 3 A
6	Crank	Configurable	Max. 3 A
7	D+		See data sheet for technical data

Terminal block 2: DC output

Terminal	Text	Function	Technical data
8	Digital output supply, DC (+)		
9	Out	Configurable	Max. 500 mA
10	Out	Configurable	Max. 500 mA

Terminal	Text	Function	Technical data
11	Out	Configurable	Max. 500 mA
12	Out	Configurable	Max. 500 mA
13	Out	Configurable	Max. 500 mA
14	Out	Configurable	Max. 500 mA
15	MB on	SCB close Configurable (application dependent)	Max. 500 mA
16	MB off	SCB open Configurable (application dependent)	Max. 500 mA
17	GB/TB on	GB/BTB/ESB/PVB close Configurable (application dependent)	Max. 500 mA
18	GB/TB off	GB/BTB/ESB/PVB open Configurable (application dependent)	Max. 500 mA

Terminal block 3: Analogue input/MPU/CANbus

Terminal	Text	Function	Technical data
19	GND	Common	Must be grounded to Engine GND
20	In	Analogue input R/I/U	
21	In	Analogue input R/I/U	
22	In	Analogue input R/I/U	
23	In	Analogue input R/I/U	
24	Pos.	Tacho	
25	SCR	Tacho	
26	Neg	Tacho	
27	High	CAN A ECU	Not isolated
28	Data (GND)	CAN A ECU	Not isolated
29	Low	CAN A ECU	Not isolated
30	High	CAN B PMS	Isolated
31	Data (GND)	CAN B PMS	Isolated
32	Low	CAN B PMS	Isolated

Terminal block 4: RS-485

Terminal	Text	Function	Technical data
33	Data + (A)	RS-485-1	Isolated
34	Data (GND)	RS-485-1	Isolated
35	Data - (B)	RS-485-1	Isolated
36	Data + (A)	RS-485-2	Not isolated
37	Data (GND)	RS-485-2	Not isolated
38	Data - (B)	RS-485-2	Not isolated

Terminal block 5: Digital input

Terminal	Text	Function	Technical data
39	In	Configurable	Negative switching only, < 100 Ω
40	In	Configurable	Negative switching only, < 100 Ω
41	In	Configurable	Negative switching only, < 100 Ω
42	In	Configurable	Negative switching only, < 100 Ω
43	In	Configurable	Negative switching only, < 100 Ω
44	In	Configurable	Negative switching only, < 100 Ω
45	In	Configurable	Negative switching only, < 100 Ω
46	In	Configurable	Negative switching only, < 100 Ω
47	MB on	SCB closed* Configurable (application dependent)	Negative switching only, < 100 Ω
48	MB off	SCB open* Configurable (application dependent)	Negative switching only, < 100 Ω
49	GB/TB on	GB/BTB/ESB/PVB closed* Configurable (application dependent)	Negative switching only, < 100 Ω
50	GB/TB off	GB/BTB/ESB/PVB open* Configurable (application dependent)	Negative switching only, < 100 Ω

NOTE * Alternatively, if you need wire break detection, you can use multi-input 20/21/22/23.

Terminal block 6: Analogue output

Terminal	Text	Function	Technical data
51	GOV (-)	Voltage or PWM output	Isolated
52	GOV (+)	Voltage or PWM output	Isolated
53	Not used	-	-
54	AVR (-)	Voltage output	Isolated
55	AVR (+)	Voltage output	Isolated

Terminal block 7: AC current CT-side

Terminal	Text	Function	Technical data
56	L1 (S1)		
57	L2 (S1)		
58	L3 (S1)		
59	Com (S2)	Common	Must be connected to frame GND
60	L4 (S1)	Neutral or Busbar/Shore power	
61	L4 (S2)	Neutral or Busbar/Shore power	Must be connected to frame GND

Terminal block 8: AC voltage measurement

Terminal	Text	Function	Technical data
62	N	A-side	
63	L1	A-side	
64	L2	A-side	
65	L3	A-side	

Terminal	Text	Function	Technical data
66	N	B-side	
67	L1	B-side	
68	L2	B-side	
69	L3	B-side	

PC connection

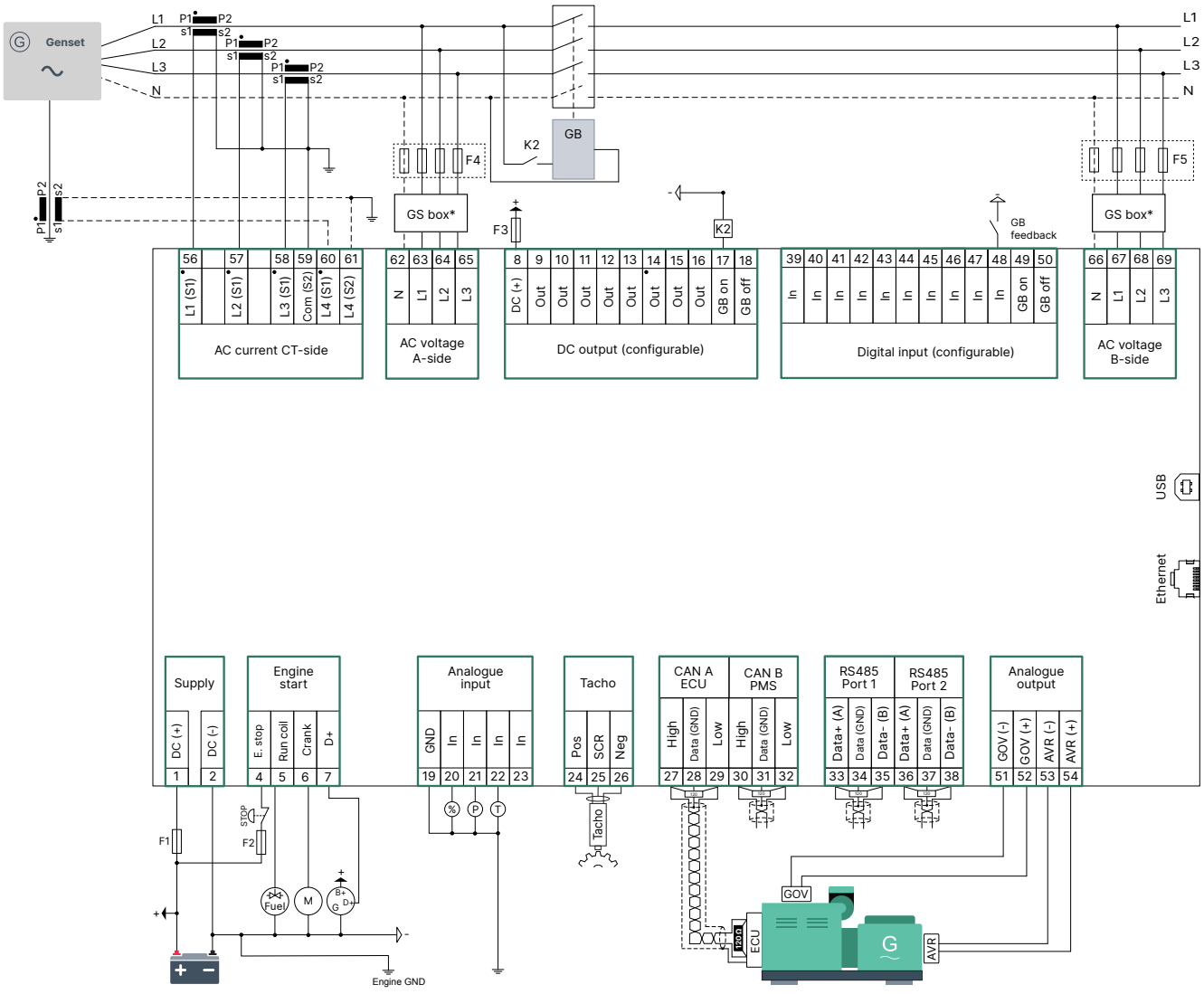
Description	Function	Technical data
USB connection	Service port	USB B

Modbus connection

Description	Function	Technical data
RJ45	Modbus TCP/IP connection	Ethernet

4.2 Typical wiring for Marine

4.2.1 Generator controller wiring

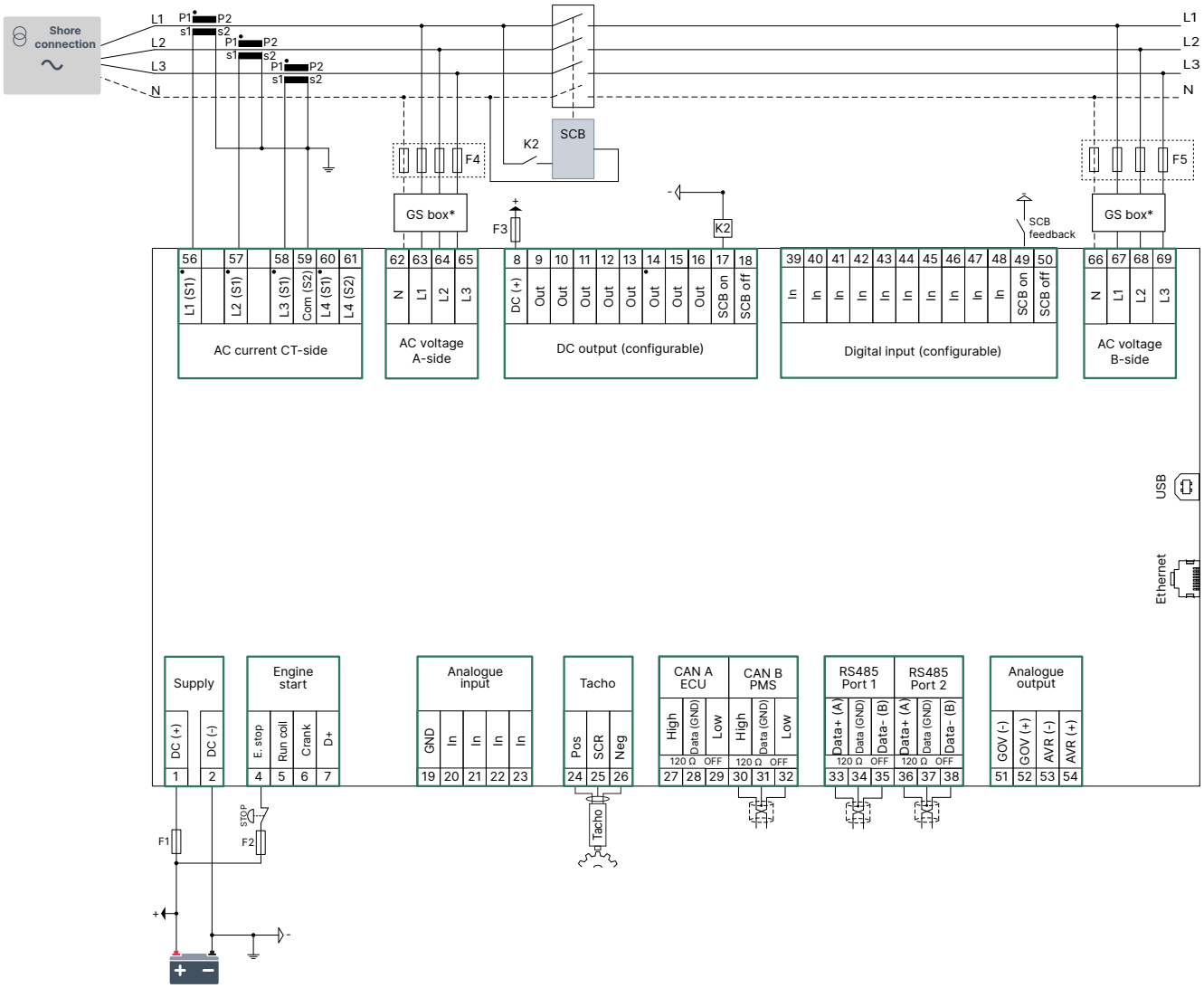


NOTE * One GS box provides galvanic separation for both sets of voltage measurements.

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

4.2.2 Shore controller wiring

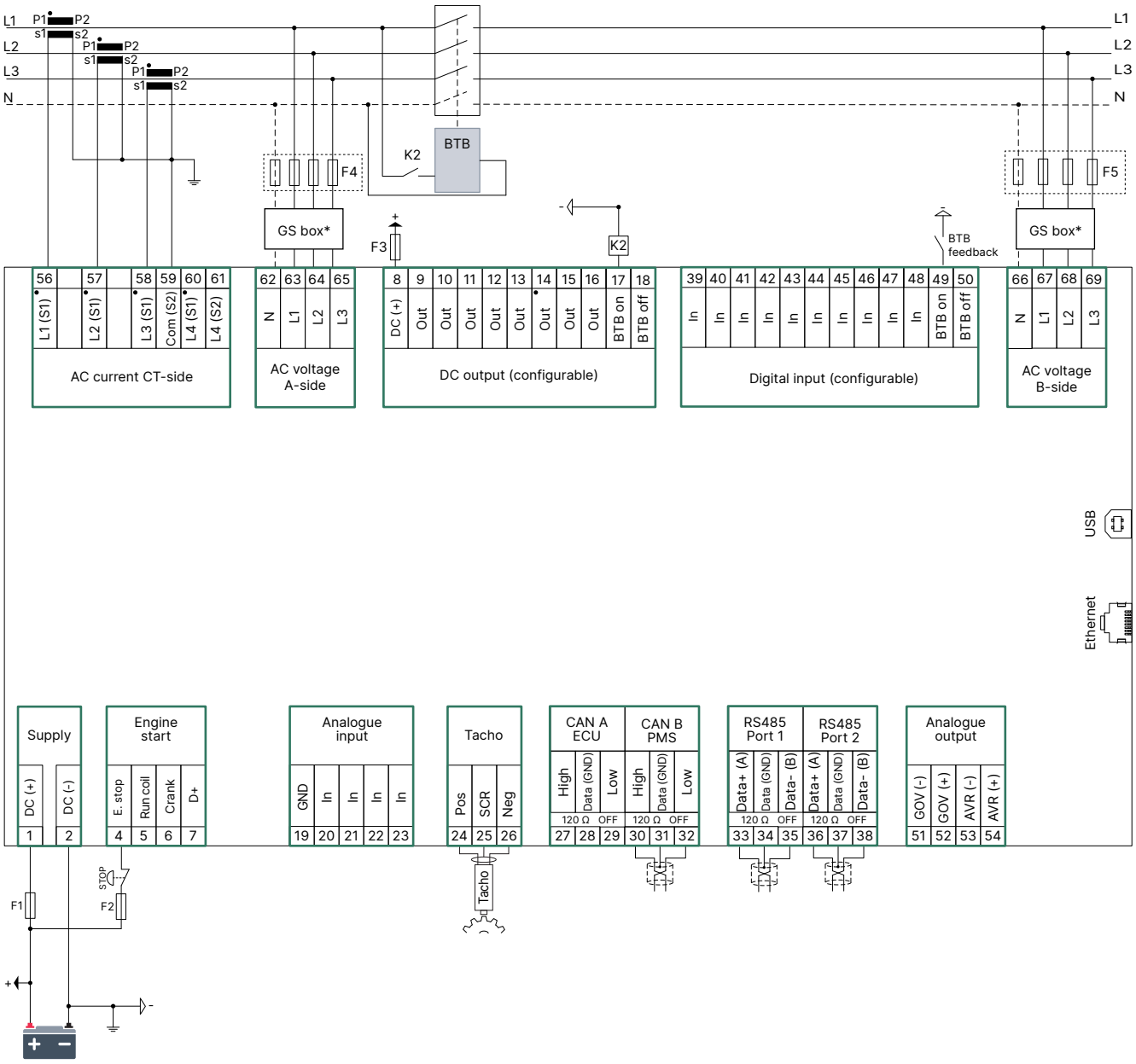


NOTE * One GS box provides galvanic separation for both sets of voltage measurements.

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

4.2.3 BTB controller wiring

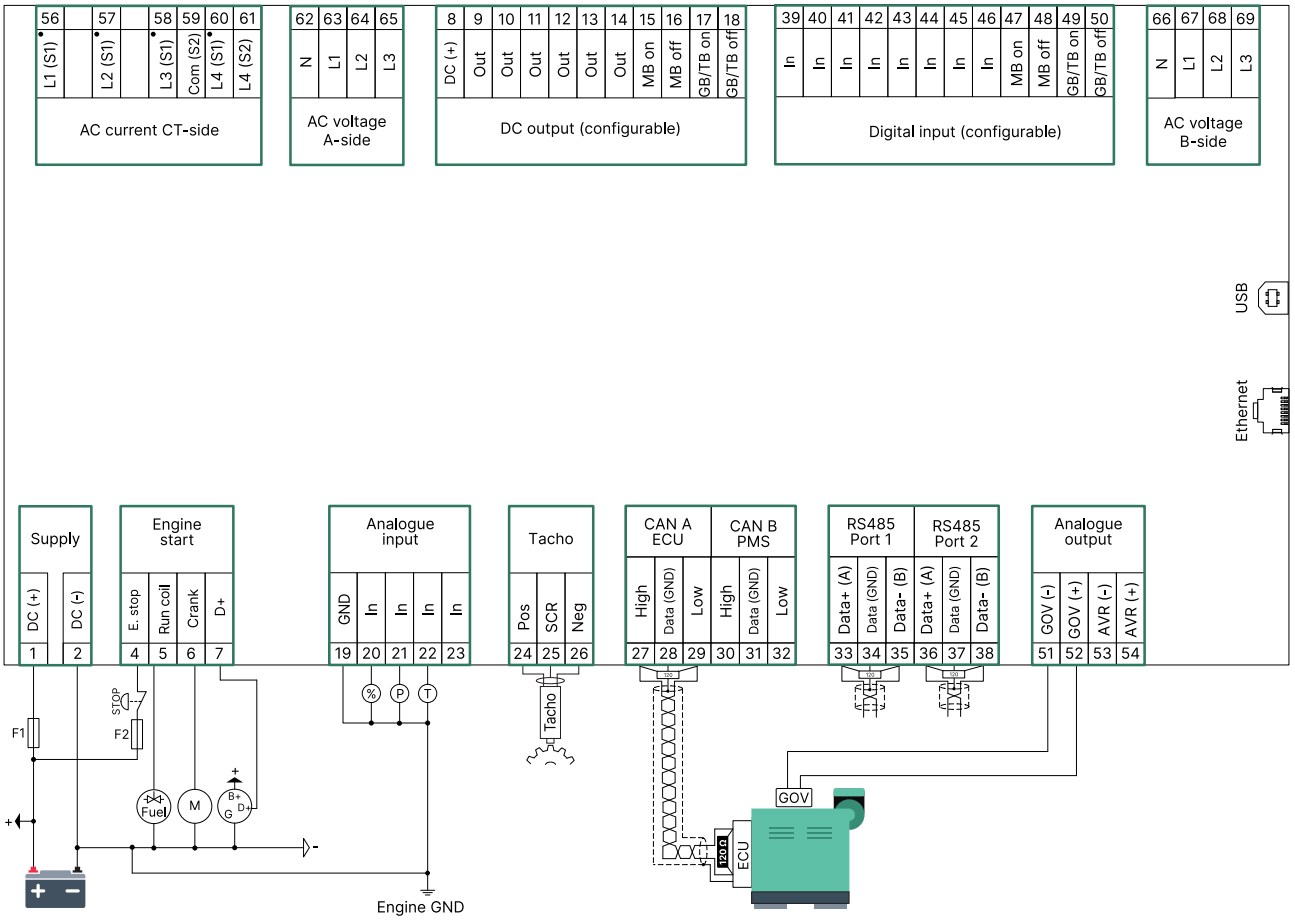


NOTE * One GS box provides galvanic separation for both sets of voltage measurements.

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

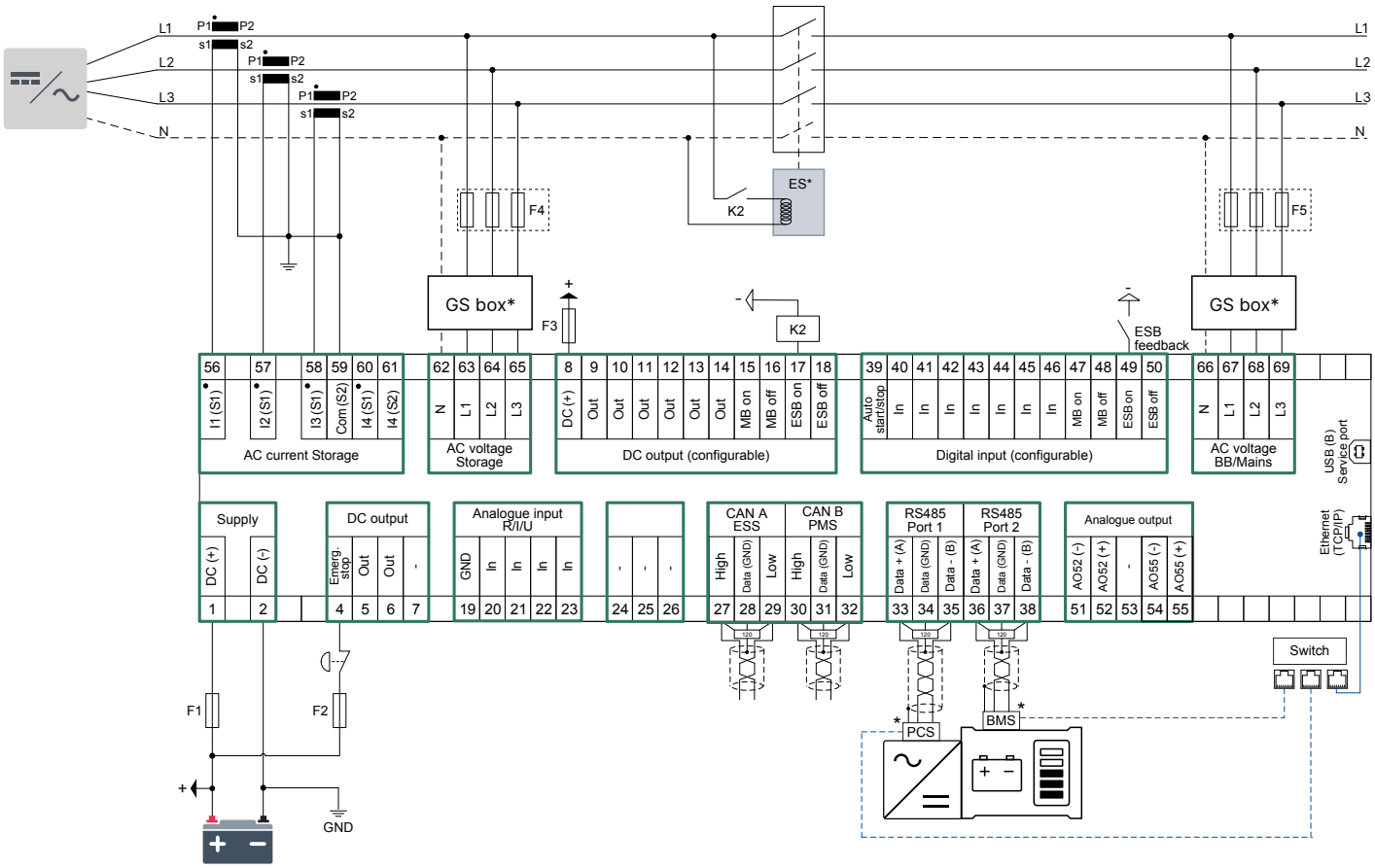
4.2.4 Engine Drive wiring



Fuses:

- F1: 2 A DC max. time-delay fuse/MCB, c-curve
- F2: 6 A DC max. time-delay fuse/MCB, c-curve

4.2.5 Battery controller wiring



NOTE * ES: Optional ES breaker.

* GS: One GS box provides galvanic separation for both sets of voltage measurements.

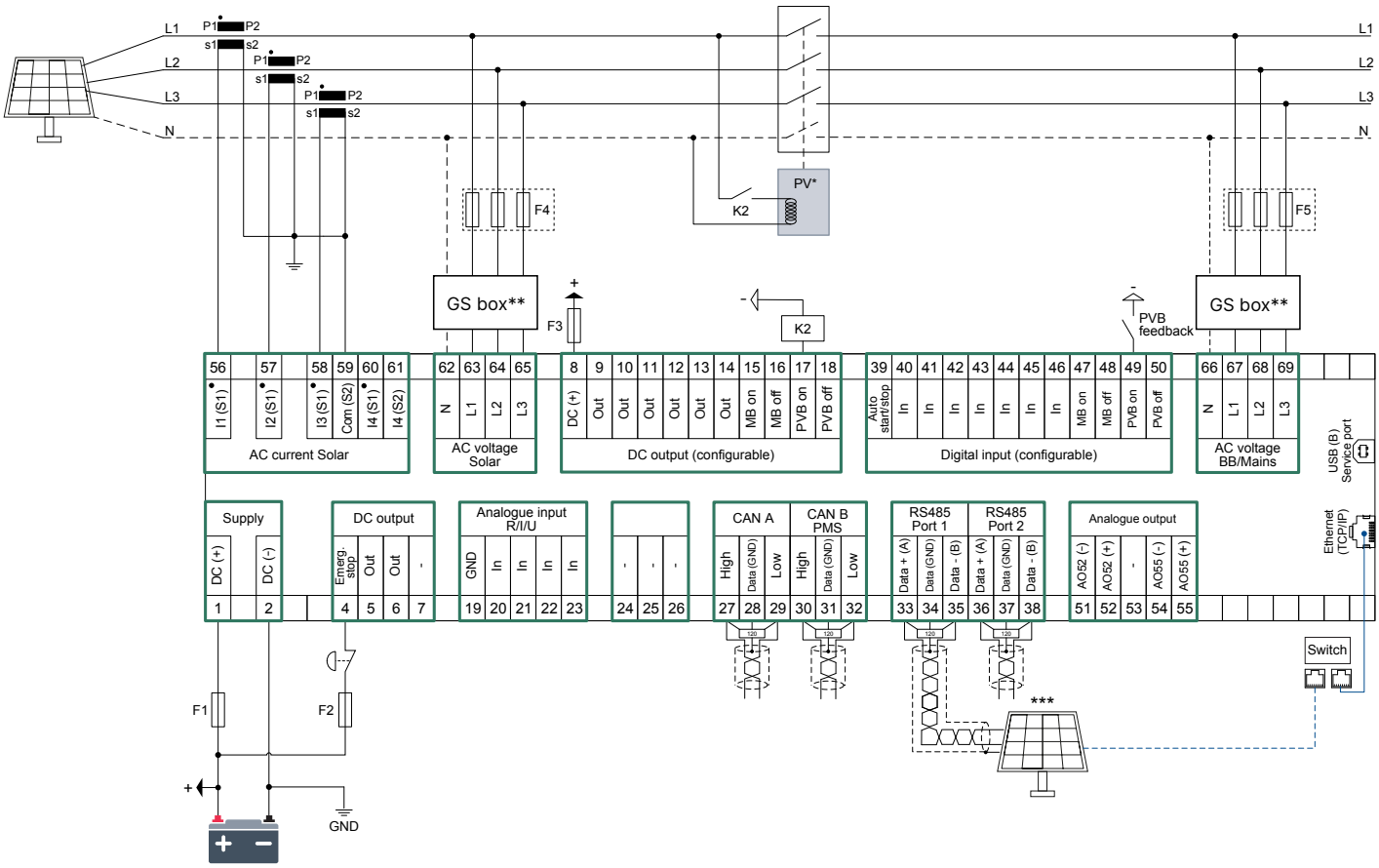
* BMS and PCS: The controller can use RS-485 or Ethernet communication. The RS-485 communication can be daisy chained from one port.

NOTE RS-485 port 1 has galvanic isolation, and RS-485 port 2 does not have galvanic isolation.

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

4.2.6 Solar controller wiring



NOTE * PV breaker: Optional PV breaker.
NOTE ** One GS box provides galvanic separation for both sets of voltage measurements.
NOTE *** Communication with PV inverter: The controller can use RS-485 or Ethernet communication.
NOTE RS-485 port 1 has galvanic isolation, and RS-485 port 2 does not have galvanic isolation. Port 1 is recommended for communication with the solar inverter.

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

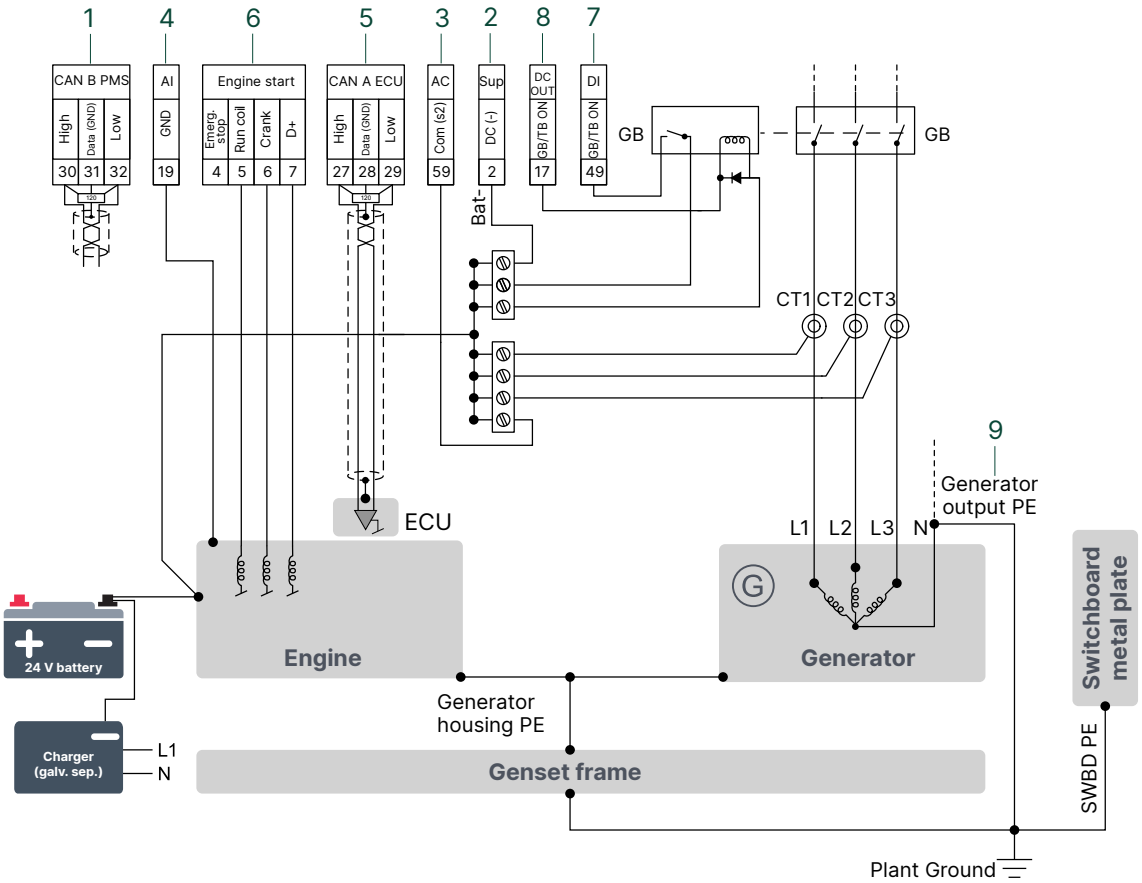
4.2.7 Wiring guidelines - best practice for grounding

On the controller, most input/output ports are not galvanically separated from the DC- (terminal 2). It is therefore important to follow these wiring guidelines to get:

- Reliable readings from the sensors.
- Precise measurement of AC voltage and current.
- Best protection from lightning (surge pulses) and other earth faults.

The inputs for AC voltage, AC current, and the analogue multi-inputs all have balanced measuring of the signals. To get reliable measurements, it is important to keep the potential difference low to DC- (terminal 2). If the potential difference is too high, the measurements can be inaccurate, and in severe cases damage the input circuitry.

Example: Typical grounding setup



1. CAN-B PMS port (terminals 30, 31 and 32) is normally used with long cables connecting many gensets.
   - Use a twisted pair CAN cable (120R) with shield.
   - Connect the shield to Data (GND) (terminal 31) on all controllers. CAN-B PMS has galvanic separation, so no ground loops are created.
   - Do not connect the shield to PE.
   - Do not install CAN cables as free hanging wires. Mount them as a fixed part of the installation, for example in cable trays.
2. Power supply DC- (terminal 2) must be connected to BAT- (in this example, the engine block).
3. COM S2 (terminal 59) is the common input for the current transformers. COM S2 (terminal 59) must be connected to BAT- or to the genset PE to keep the voltage difference to DC- (terminal 2) low (in this example, the CT's have the same BAT- connection point as terminal 2).
4. Analogue input GND (terminal 19) is the reference for the analogue input measurements. GND (terminal 19) must have a BAT-/PE connection point as the sensor ground. The potential difference to terminal 2 must be low (in this example, terminal 19 is connected to the engine block for best readings).
5. CAN A ECU port (terminals 27, 28 and 29) is normally connected to the engine ECU with a short cable. There is no galvanic separation on the CAN A ECU port.

- Use a twisted pair CAN cable (120R) with shield.
- Connect the shield to Data (GND) (terminal 28) to improve the immunity to burst transients (EFT).
- Connect the shield to the engine ECU, as described by the engine manufacturer.

6. The signals on Run Coil (terminal 5), Crank (terminal 6) and D+ (terminal 7) must be connected to BAT- on the engine block as reference. These terminals are not supplied internally, but via the Emergency stop. This means that BAT+ must be connected via the Emergency stop (terminal 4).
7. The digital inputs (terminals 39 to 50) must have BAT- as ground reference. The preferred connection point for the reference is close to the BAT- connection point for DC- (terminal 2).
8. The DC outputs (terminals 9 to 18) must have the same ground reference as the digital inputs.
9. Connect Neutral/PE of the generators directly to the plant ground. This prevents short circuits and high energy transients from the grid side to cause severe damage to the system.

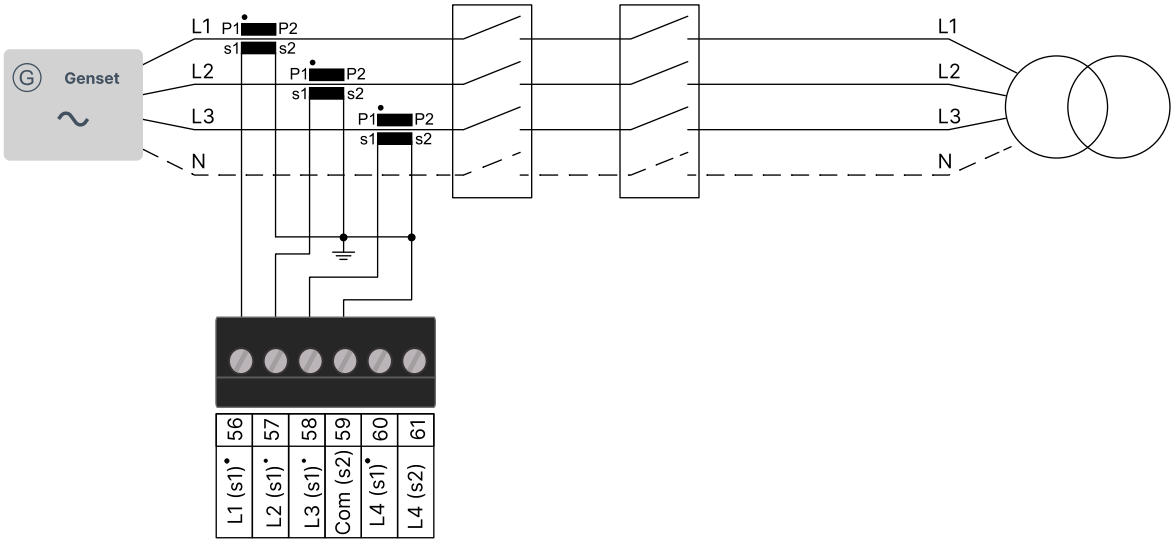
NOTE All PE and BAT- wiring must be made with thick and short wires.

4.3 AC wiring

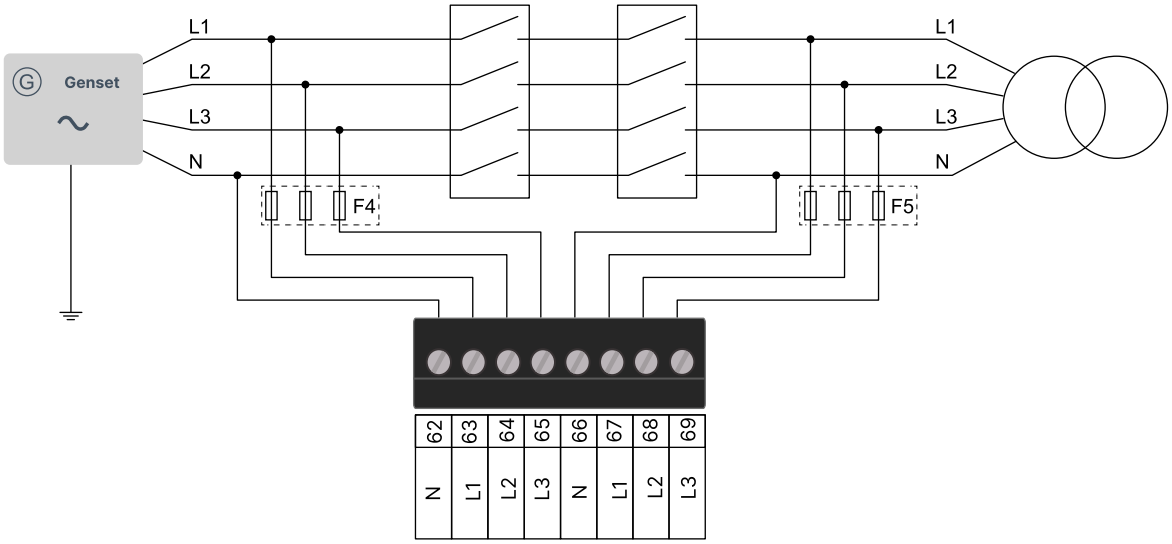
The controller can be wired up in three-phase, single phase or split phase configuration. The parameters for setting up the AC connection is found in `Settings > Basic settings > Measurement setup > Wiring connection > AC configuration`.

NOTE Contact the switchboard manufacturer for information about required wiring for the specific application. Wiring suggestions are shown below.

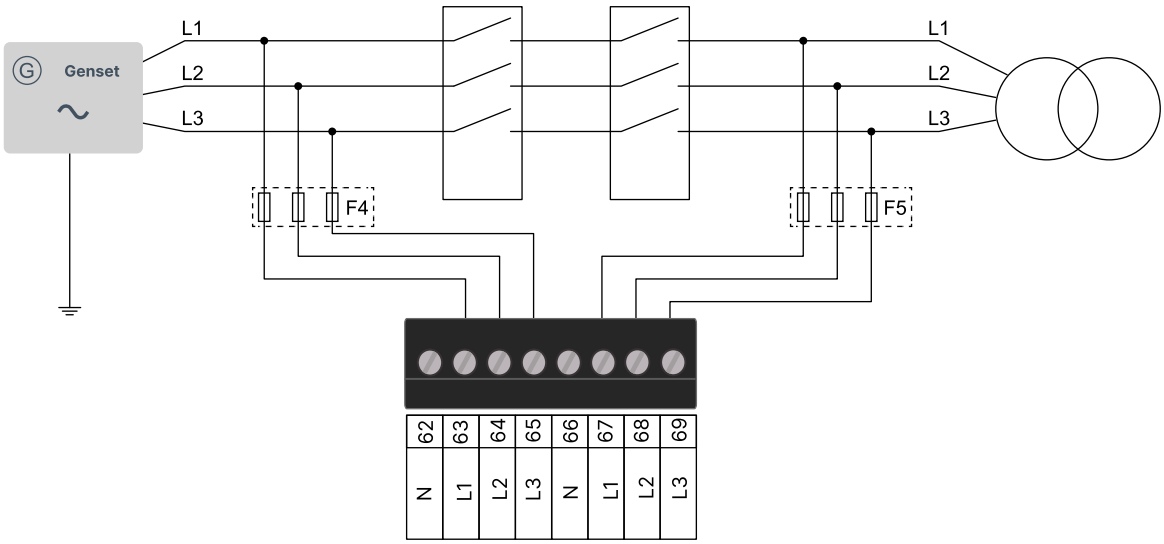
Current transformers for 3-phase application



Voltage measurements for 3-phase application (4 wires)

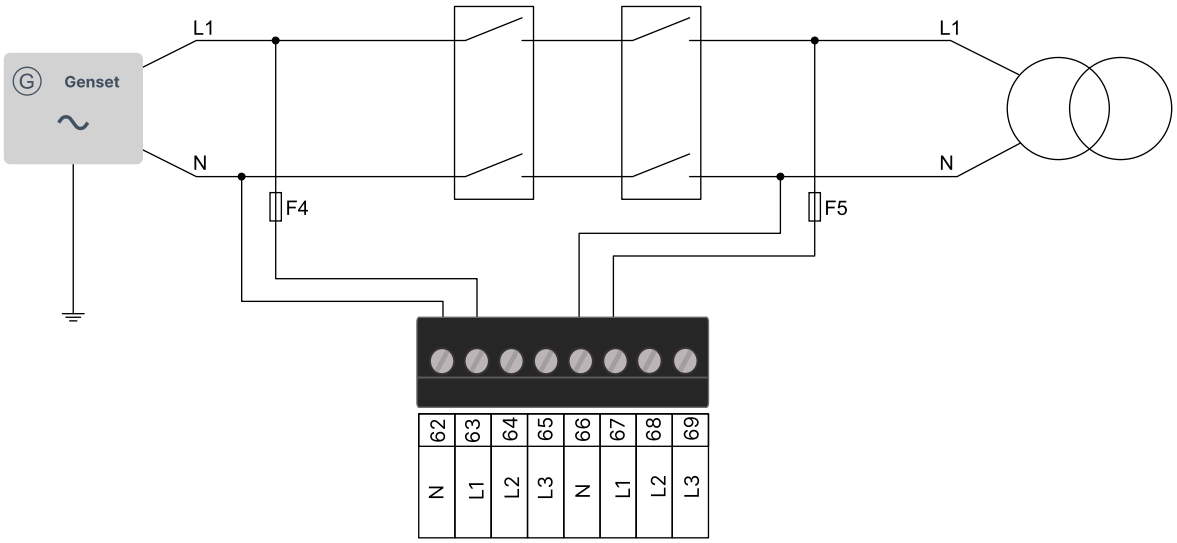


Voltage measurements for 3-phase application (3 wires)

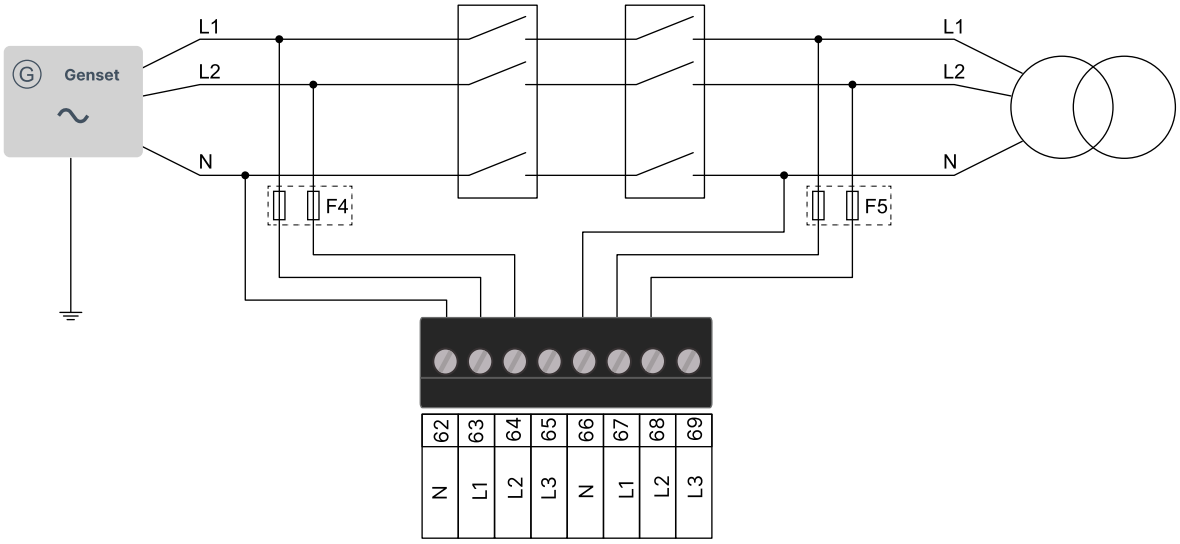


When three-phase distribution systems are used, the neutral line (N) is only necessary if it is a three-phase + neutral system. If the distribution system is a three-phase system without neutral, then do not connect the terminals 62 and 66.

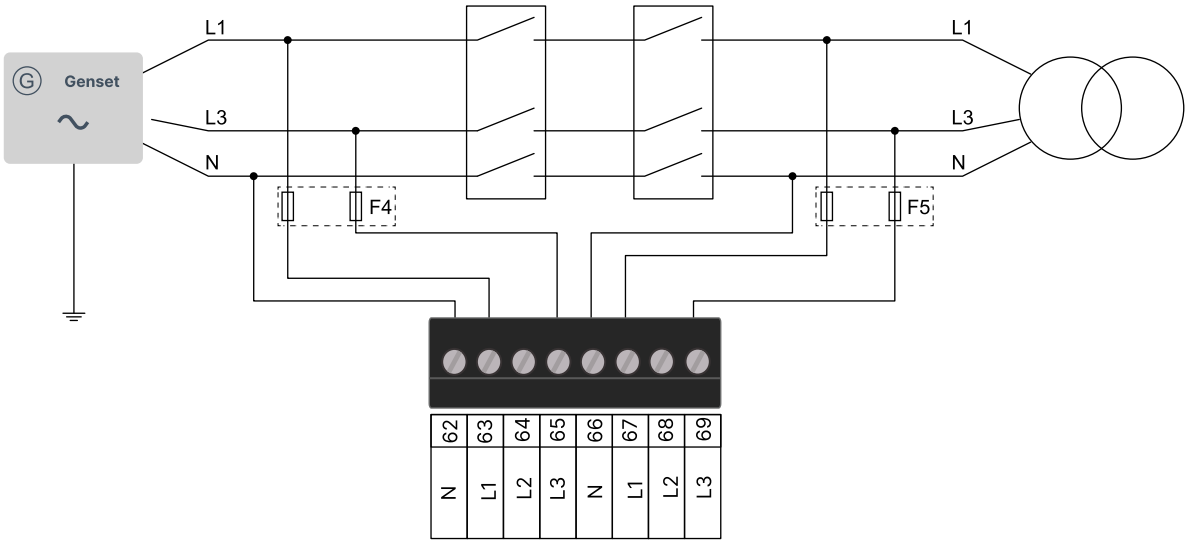
Voltage measurements for single-phase application



Voltage measurements for split phase L1/L2



Voltage measurements for split phase L1/L3

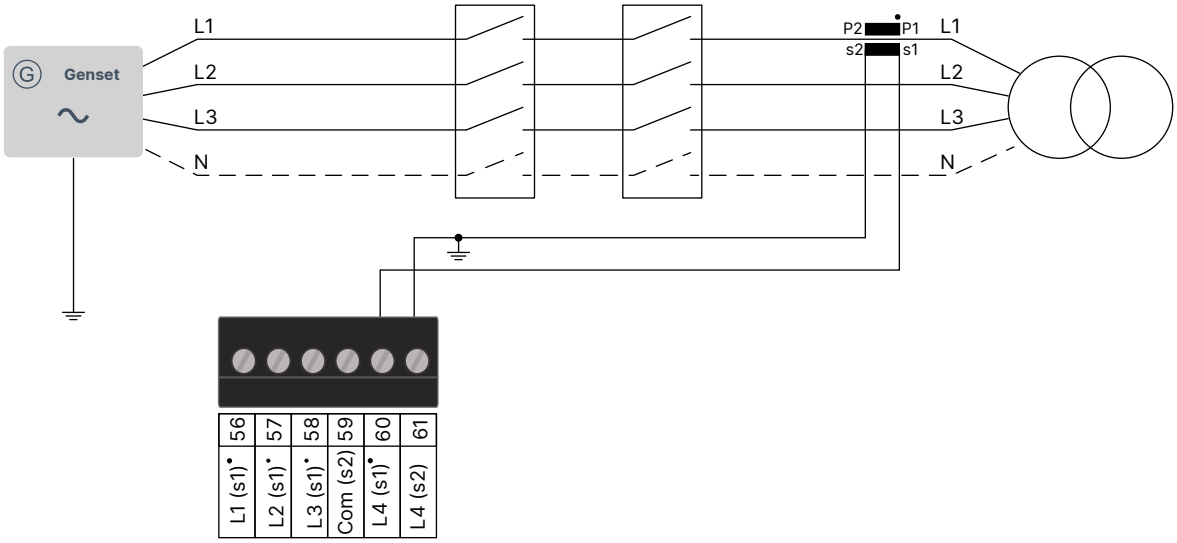


F4, F5: 2 A AC max. fuse/MCB, c-curve

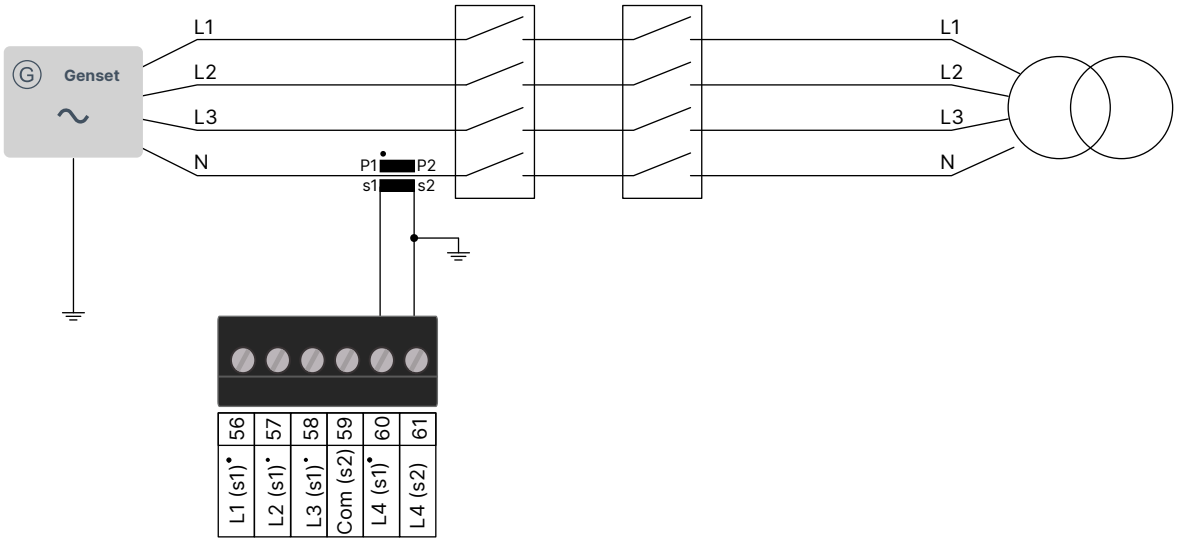
4.3.1 I4 current

The L4 terminals can be used to measure AC current.

Shore connection power



Neutral current



4.3.2 Current transformer ground

The current transformer ground connection must be made on the s2 connection.

DANGER!

Failure to ground a current transformer could lead to injury or death

Make sure that each current transformer is grounded.

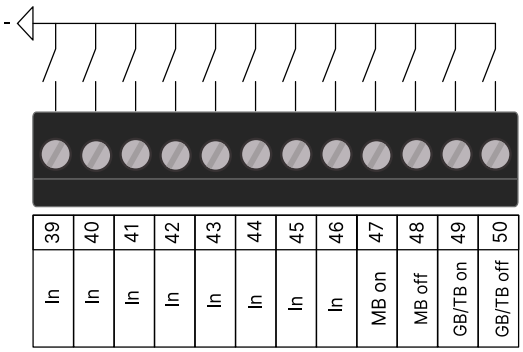
NOTE For measurement accuracy, the ground should be as close as possible to the current transformer.

4.3.3 Voltage measurement fuses

If the wires/cables must be protected with fuses, use max. 2 A time-delay fuses, dependent on the wires/cables to be protected.

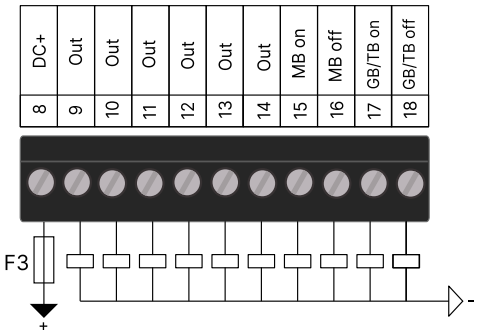
4.4 DC wiring

4.4.1 Digital inputs



To be EN60255 compliant, when wiring is more than 10 m, a 4007 diode must be connected on each input.

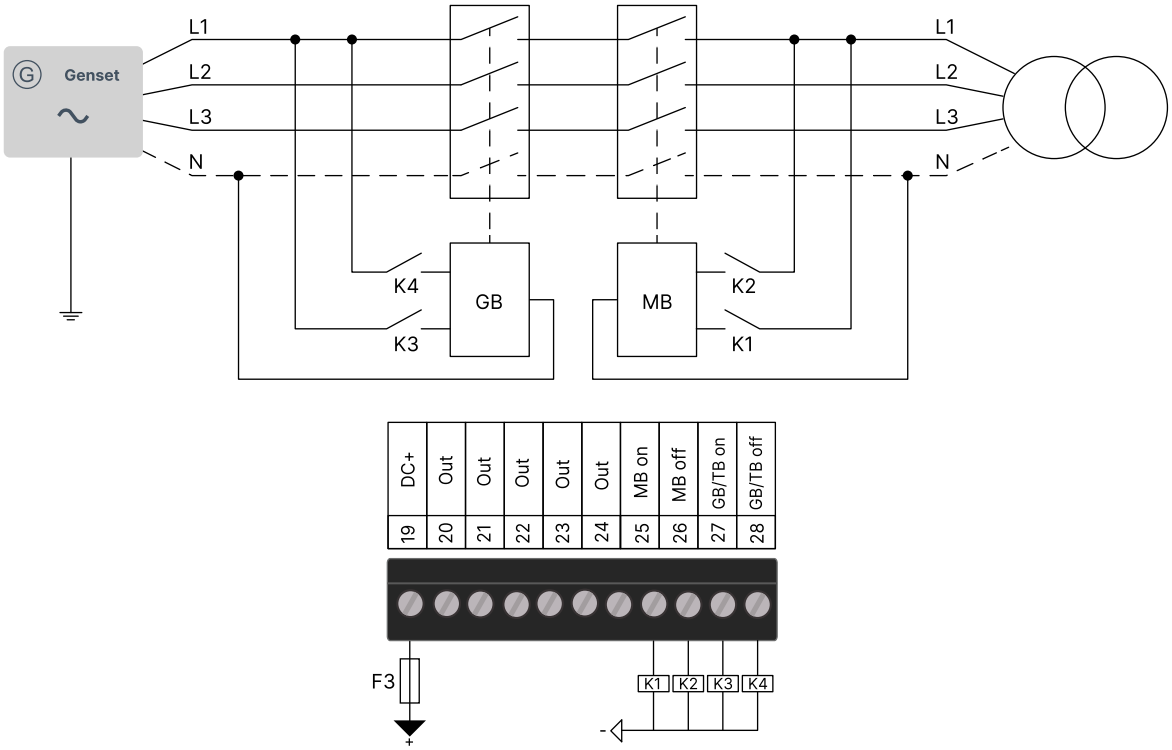
4.4.2 Digital outputs



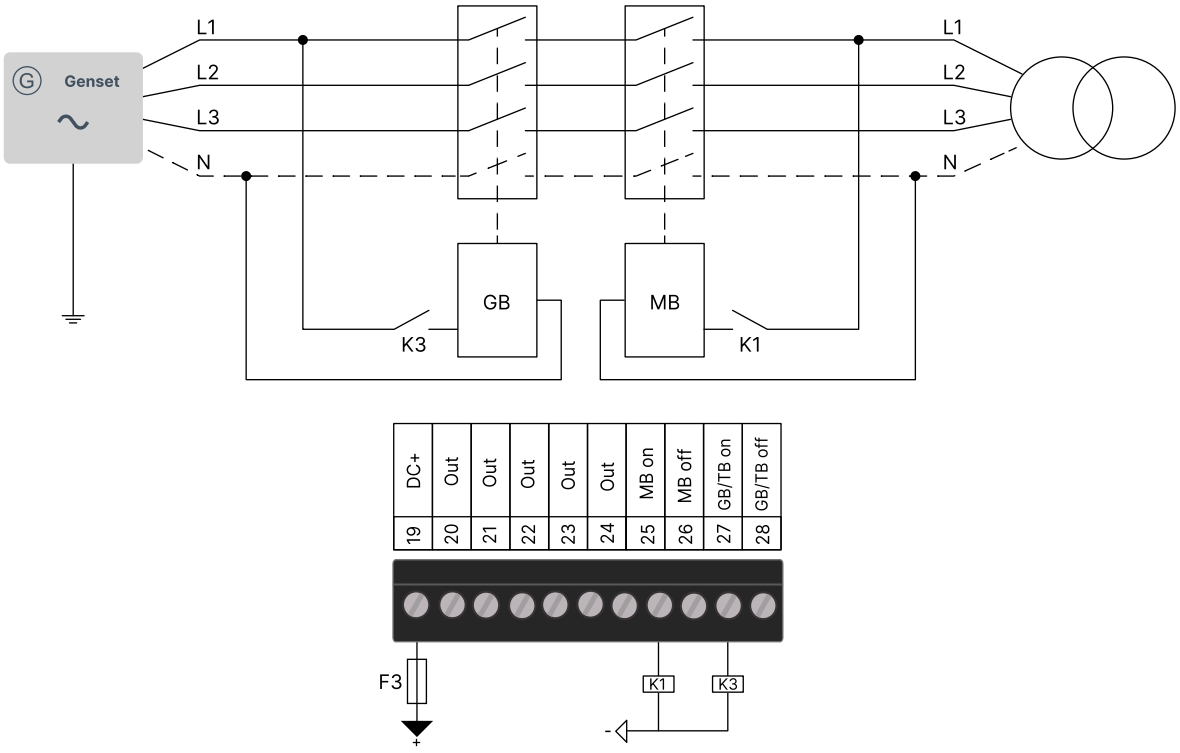
Fuse F3: 4 A DC max. time-delay fuse/MCB, b-curve

4.4.3 Breaker wiring

Pulse breaker wiring



Continuous breaker wiring



Fuse F3: 4 A DC max. time-delay fuse/MCB, b-curve

Breaker feedbacks

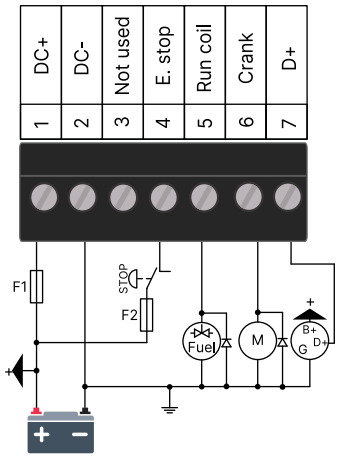
By default, the breaker feedback functions are assigned to specific digital inputs. For example, for a GENSET controller:

- Input 49 = GB Closed
- Input 50 = GB Open
- Input 47 = MB Closed (if there is a mains breaker on the application diagram)

- Input 48 = MB Open (if there is a mains breaker on the application diagram)

For all controllers, you can move any breaker feedback function to any available digital input. Alternatively, you can assign the breaker feedback function to a multi-input with the input type *Binary* (for wire break detection).

4.4.4 Power supply and start



Fuses

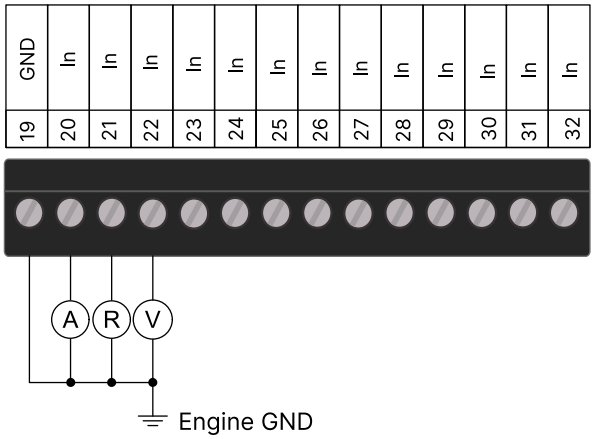
- F1: 2 A DC max. time-delay fuse/MCB, c-curve
- F2: 6 A AC max. time-delay fuse/MCB, c-curve

NOTE Remember to mount the freewheeling diodes.

4.4.5 Analogue inputs

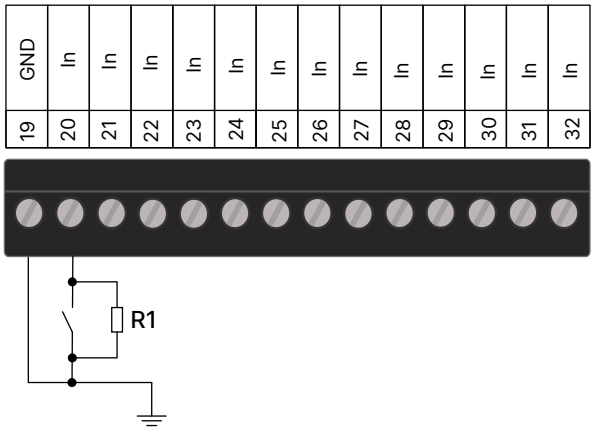
Analogue input

All sensors must be wired to the Engine GND.



NOTE For measurement accuracy, the ground should be as close as possible to the signal.

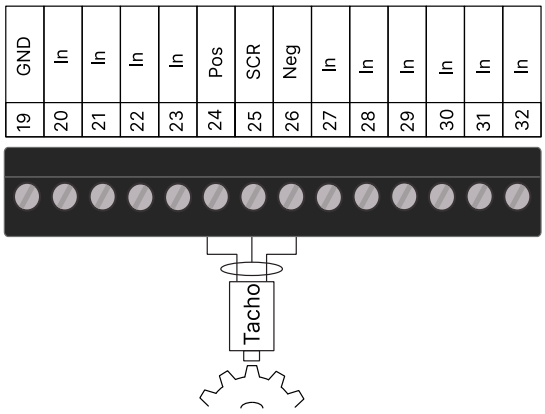
Supervised binary input with wire break detection



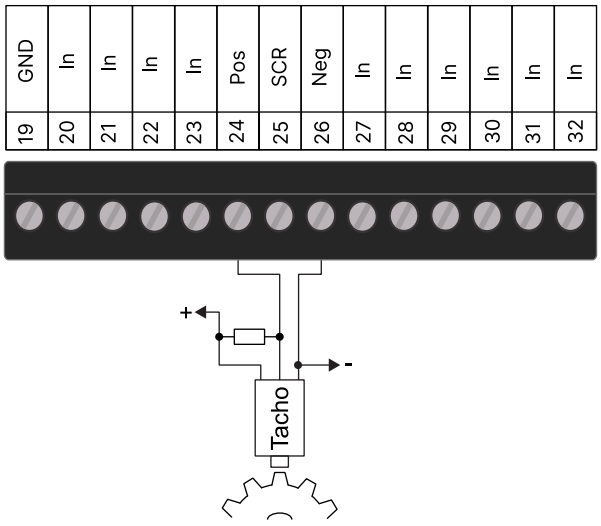
The resistor is only mounted if wire break detection is required. The value of the resistor should be 240 Ω ±10%. A wire break is detected if the resistance is more than 1 kΩ.

Tacho input (MPU)

Connect the cable shield to terminal 25 (SCR). Do not ground the cable.



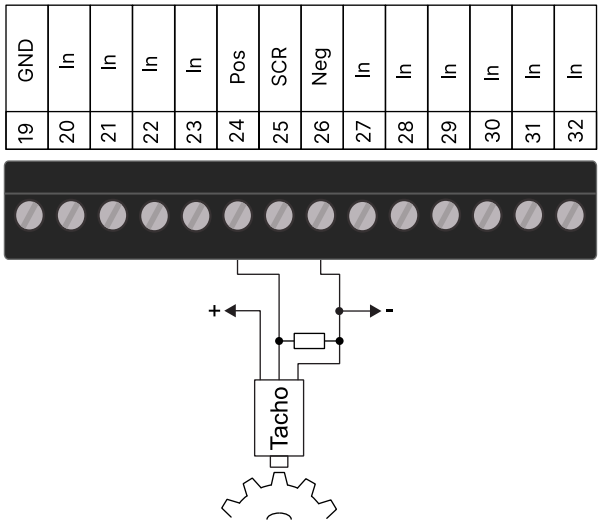
Tacho input (NPN)



For most 12 V systems use a resistor with a value between 1 kΩ and 2.2 kΩ.

For most 24 V systems use a resistor with a value 2.2 kΩ.

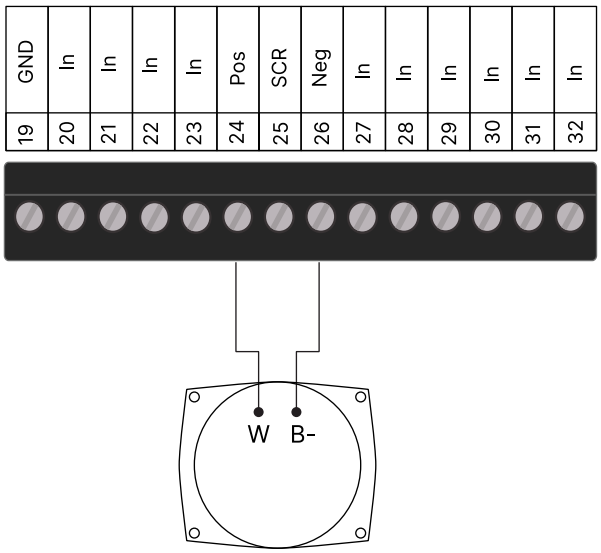
Tacho input (PNP)



For most 12 V systems use a resistor with a value between 1 kΩ and 2.2 kΩ.

For most 24 V systems use a resistor with a value 2.2 kΩ.

Analogue tacho input (W)



Charging alternator

4.5 Communication wiring

4.5.1 CAN bus and RS-485 cable recommendation

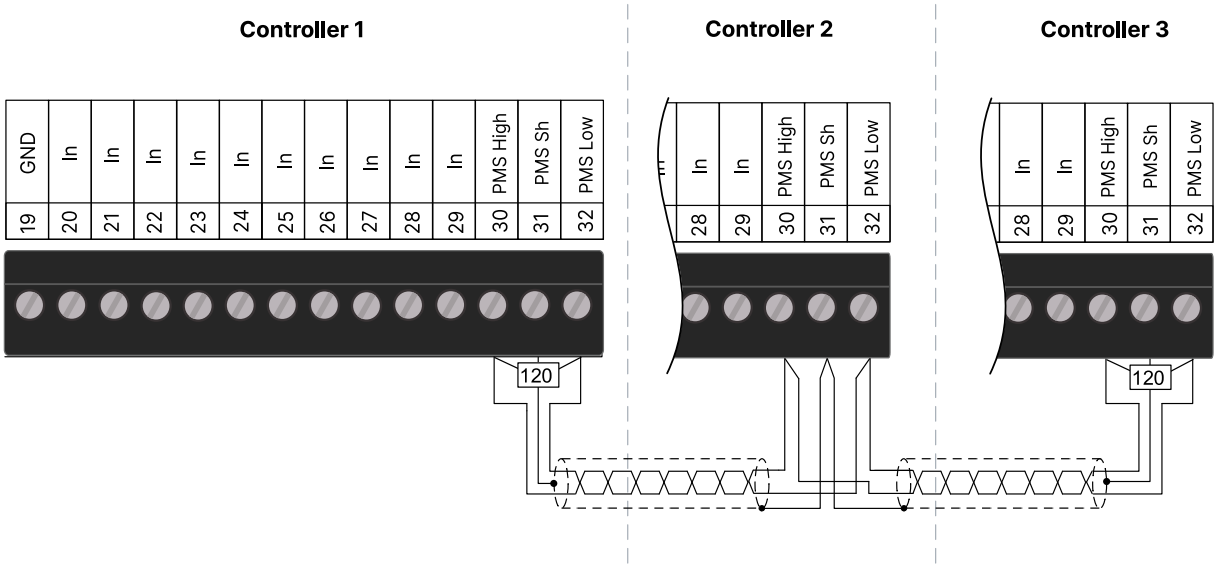
Use a shielded twisted cable. Use a 120 ohm resistor at each end. Wiring that uses a two-wire cable is acceptable. Wiring that uses a three-wire cable is best.

NOTE If the device terminals are not galvanically separated, ground the cable shield at that end.
NOTE The system must not have more than one ground for the cable shield.

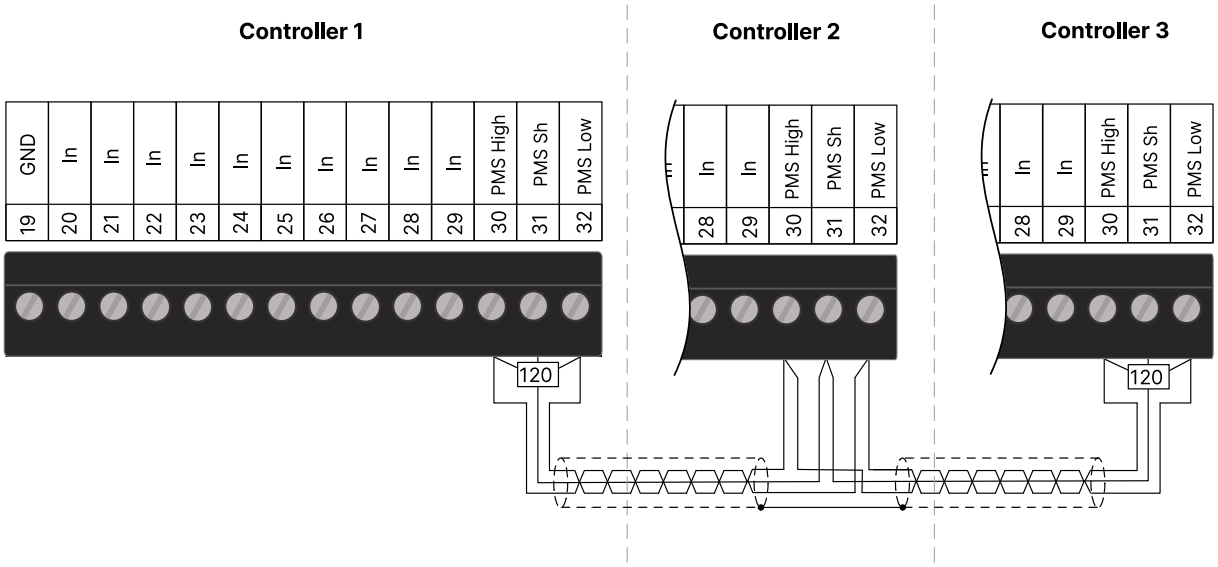
DEIF recommends this cable: Belden 3105A or equivalent. 22 AWG (0.6 mm ⌀, 0.33mm^2) twisted pair, shielded, <40 mΩ/m, min. 95 % shield coverage. The cable type is particularly important if the total line length is more than 30 m.

4.5.2 CAN bus power management system, CANshare, and PMS lite

Two-wire example



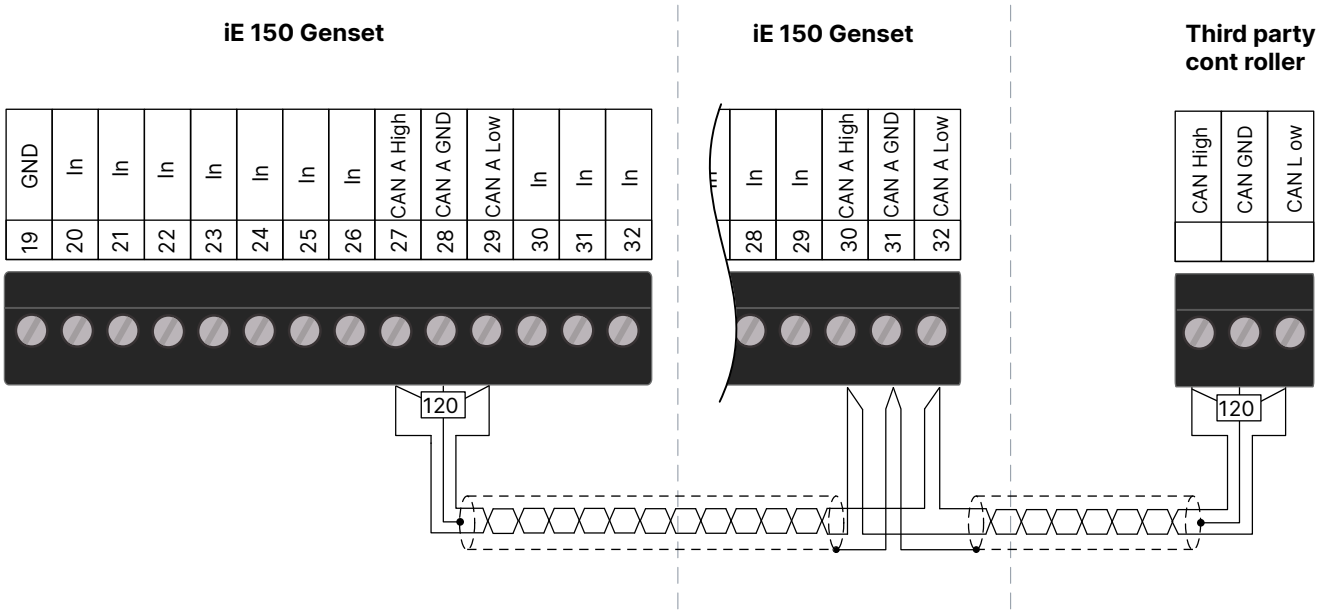
Three-wire example



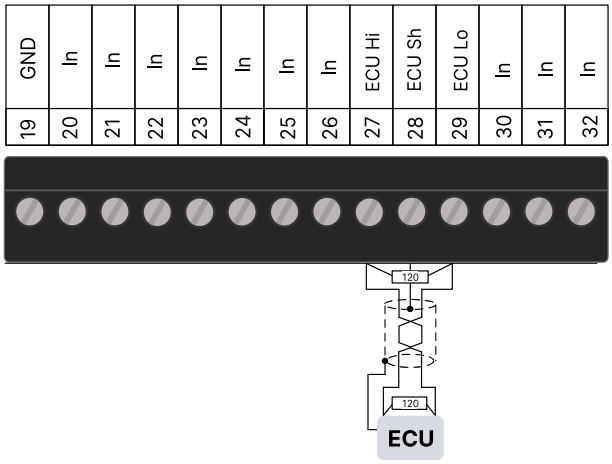
4.5.3 Third party digital load sharing

Use the CAN bus terminals to connect the iE 150 controllers and third party controllers in series for digital load sharing.

Third party digital load sharing using CAN bus interfaces example

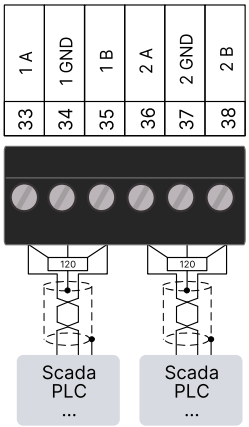


4.5.4 CAN bus engine communication



To be EN60255 compliant, when wiring is more than 10 m, terminal 28 must be connected to GND.

4.5.5 Modbus RS-485 (iE 150 is the server)

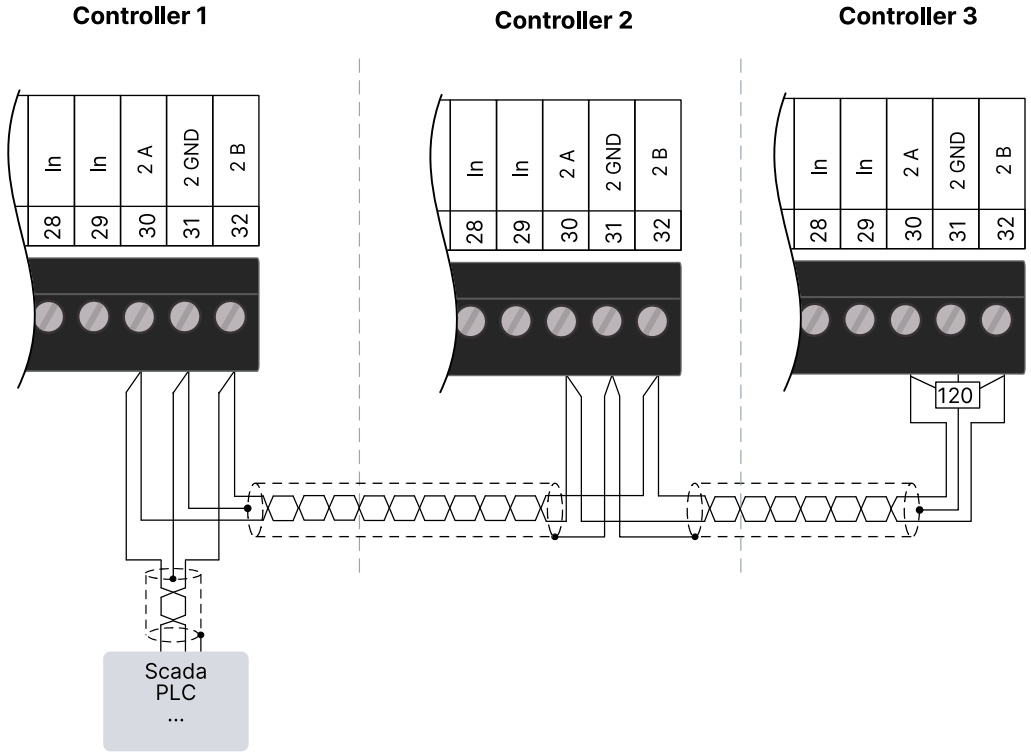


RS-485 port 1 has galvanic isolation, and RS-485 port 2 does not have galvanic isolation.

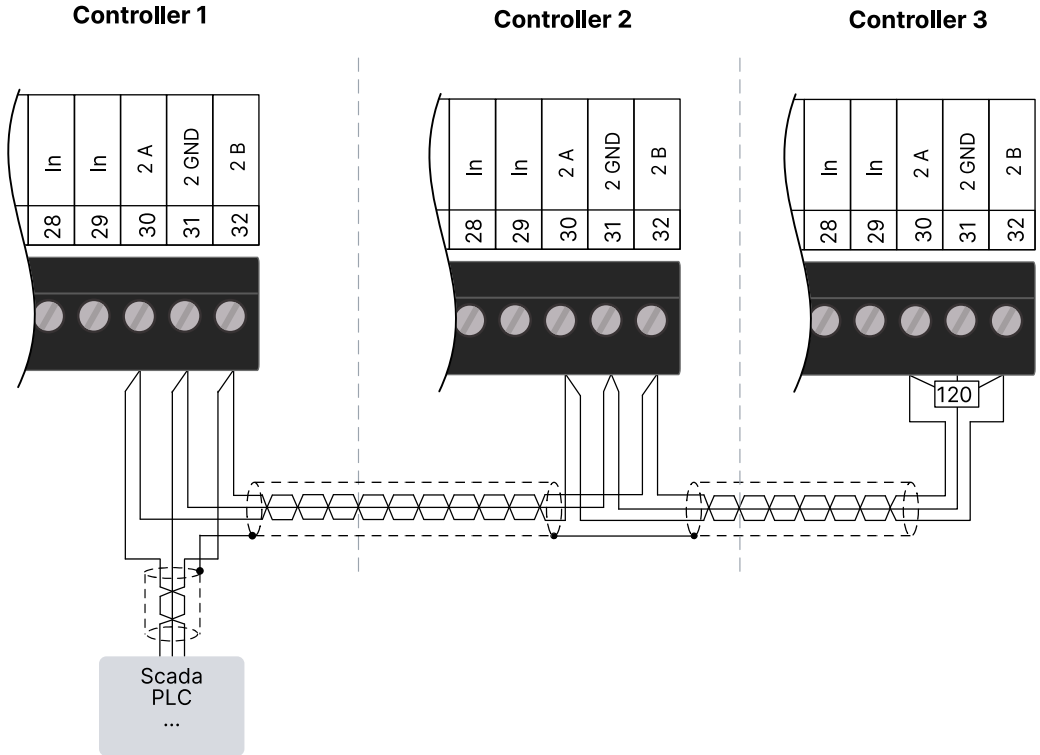
NOTE If there is no internal resistor across the *Scada/PLC/...* terminals, install an external 120 Ω resistor.

To be EN60255 compliant, when wiring is more than 10 m, terminals 34 and 37 must be connected to GND.

Multiple controllers connected to SCADA/PLC (2-wire)

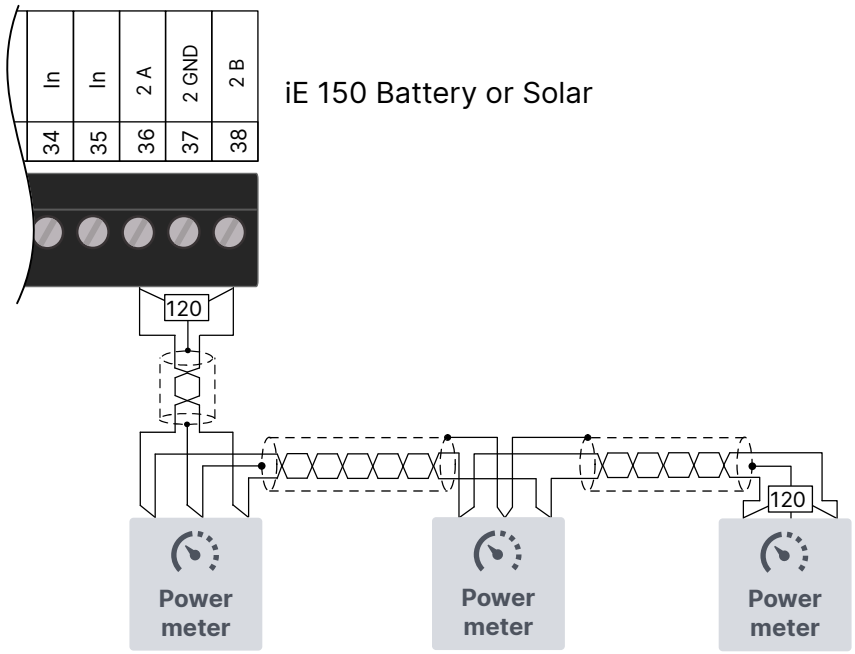


Multiple controllers connected to SCADA/PLC (3-wire)



4.5.6 Modbus RS-485 (iE 150 Battery or Solar is the client)

Power meter daisy chains



RS-485 port 1 has galvanic isolation, and RS-485 port 2 does not have galvanic isolation. Port 1 is recommended for communication with the power meters.

You can daisy chain power meters if they are the same type. You can include both genset* and mains power meters in the same daisy chain, even if they are different types.

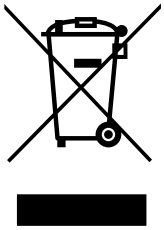
To be EN60255 compliant, when wiring is more than 10 m, terminals 34 and 37 must be connected to GND.

More information
* An external genset controller can also act as a power meter. See **Power measurements** in the **DEIF hybrid compatibility** application note for the compatible power meters and genset controllers.

5. End of life

5.1 Disposal of waste electrical and electronic equipment

WEEE symbol



All products that are marked with the crossed-out wheeled bin (the WEEE symbol) are electrical and electronic equipment (EEE). EEE contains materials, components and substances that can be dangerous and harmful to people's health and to the environment. Waste electrical and electronic equipment (WEEE) must therefore be disposed of properly. In the EU, the disposal of WEEE is governed by the WEEE directive issued by the European Parliament. DEIF complies with this directive.

You must not dispose of WEEE as unsorted municipal waste. Instead, WEEE must be collected separately, to minimise the load on the environment, and to improve the opportunities to recycle, reuse and/or recover the WEEE. In the EU, local governments are responsible for facilities to receive WEEE. If you need more information on how to dispose of DEIF WEEE, please contact DEIF.