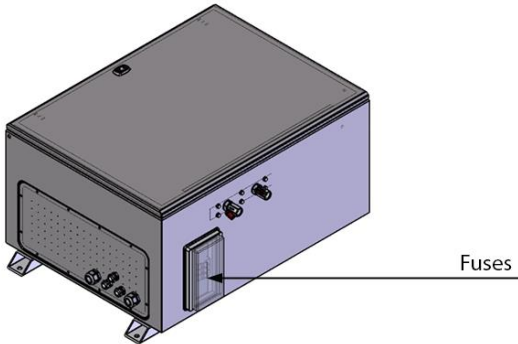
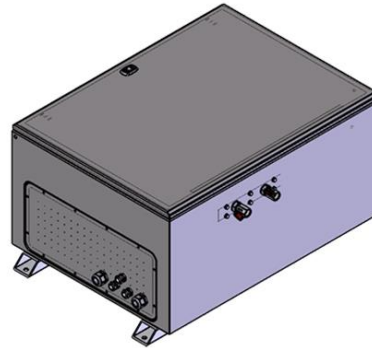


Data sheet

AFE and Grid



Product image: Grid



Product image: AFE

Typical applications

AFE:

Converts AC voltage to DC voltage. Used as a battery charger or to make a DC link on a cabled vehicle.

Grid:

Is suitable for local networks on ships or for setting up AC power supplies in stationary or mobile applications.

Requirements

The AFE requires a right rotating field as input.

More information

The AFEs and grids are also available with higher power. They can also be connected in parallel.

The LC and the transformer have integrated water cooling.

Two separate temperature sensors for the LC and the transformer are installed.

AFE:

There are no fuses installed.

Grid:

The following fuses are installed in the system.

- 11 kVA: 3B16
- 22 kVA: 3B32
- 44 kVA: 3B63
- 86 kVA: 3B125

Features

AFE:

The 3-phase AC mains is connected via a transformer.

The transformer acts as electrical insulation and, if required, as a step-down converter.

An LC filter works to smoothen the switched voltages.

The inverter works as an active rectifier and step-up converter to the DC voltage system (e.g. HV battery).

Grid:

The inverter works as a generator and as a step-down converter.

An LC filter works to smoothen the switched voltages.

The transformer works as electrical insulation and, if necessary, as a step-up converter.

The transformer output is 3-phase AC + N = neutral phase for asymmetrical load situation.

Integrated fuses are available.

Data sheet

AFE and Grid

Software functions

ARADEX offers the following software functions:

- SMARTDC
- External Precharge
- MasterSlave
- Premagnetizing

Accessories

Benefit from our commissioning tools VEConfig and Analyser for commissioning and analysis of your application.

Mating connector and connecting cable between device and notebook.

Cooling

Liquid cooling yes
 Coolant..... water and glycol
 Flow rate..... 8-10 l/min
 Pressure difference at 8 l/min approx. 275 mbar
 Pressure difference at 10 l/min approx. 410 mbar
 Maximum coolant pressure..... 6 bar
 Maximum temperature of the coolant..... 60°C
 Connection..... G 1/2"; internal thread

Requirements for the untreated water

Designation	Limit values
PH value	7.5 - 9
Total hardness	<22°dH
Conductivity	<800µS/cm
Coolant temperature	<60°C
Chlorides	<50mg/l
Oxygen	<10mg/l
Ammonium	not detectable
Germ count	<1000KbE/ml
Water pressure	<5bar
Nitrates	<10mg/l
Sulfates	<100mg/l
Insoluble substances	<250mg/l

Table 1: Limit values for untreated water

The following points must also be observed:

- As a rule, tap water meets these requirements. However, an anti-algae agent must be added.
- The water quality must be checked at regular intervals.
- The water should be free from solids.

The use of sea water and water from public waters is prohibited!

Data sheet

AFE and Grid

Location, dimensions and designation of the connections

All dimensions in the drawings are in millimeters. The drawings may show optional accessories.

AFE

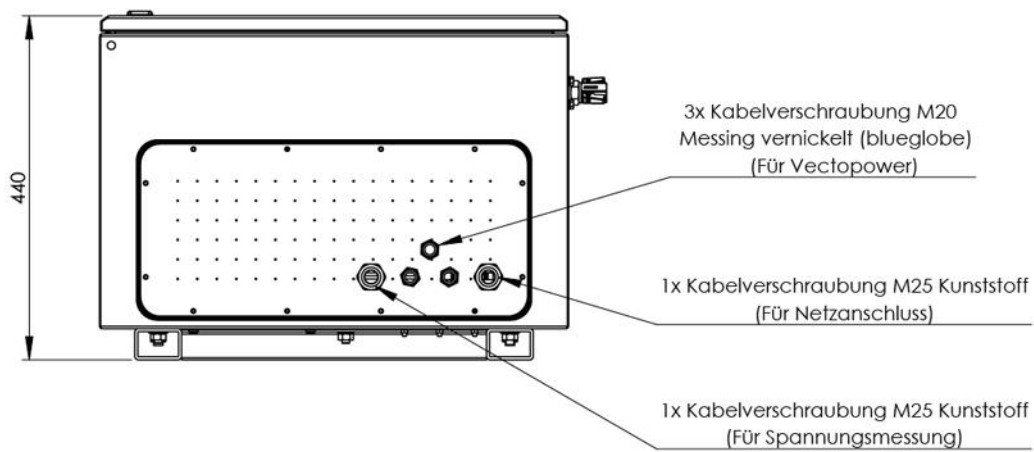


Figure 1: Front view, position of the connections

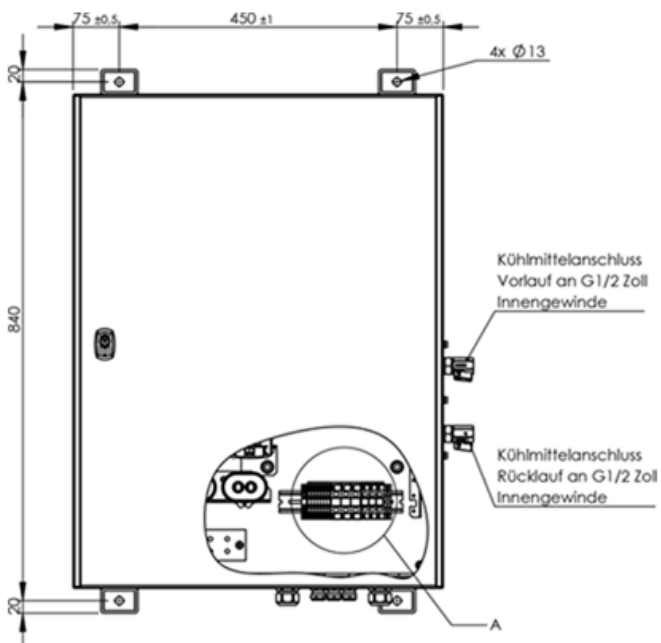


Figure 2: Coolant connections

Data sheet

AFE and Grid

Dimensions and weights

Type	Order number	DC link voltage	Dimensions LxBxH	Total weight [kg]
11 kW	VPGC_1.AFE.1100350	>=350	800x600x360	104
	VPGC_1.AFE.1100480	>=480	800x600x360	97
	VPGC_1.AFE.1100600	>=600	800x600x360	95
22 kW	VPGC_1.AFE.2200350	>=350	880x600x440	160
	VPGC_1.AFE.2200480	>=480	880x600x440	150
	VPGC_1.AFE.2200600	>=600	880x600x440	150
44 kW	VPGC_1.AFE.4400350	>=350	880x600x440	283
	VPGC_1.AFE.4400480	>=480	880x600x440	274
	VPGC_1.AFE.4400600	>=600	880x600x440	274
86 kW	VPGC_1.AFE.8600350	>=350	1110x800x450	426
	VPGC_1.AFE.8600480	>=480	1110x800x450	426
	VPGC_1.AFE.8600600	>=600	1110x800x450	396

Table 2: Dimensions AFE

Data sheet

AFE and Grid

Grid

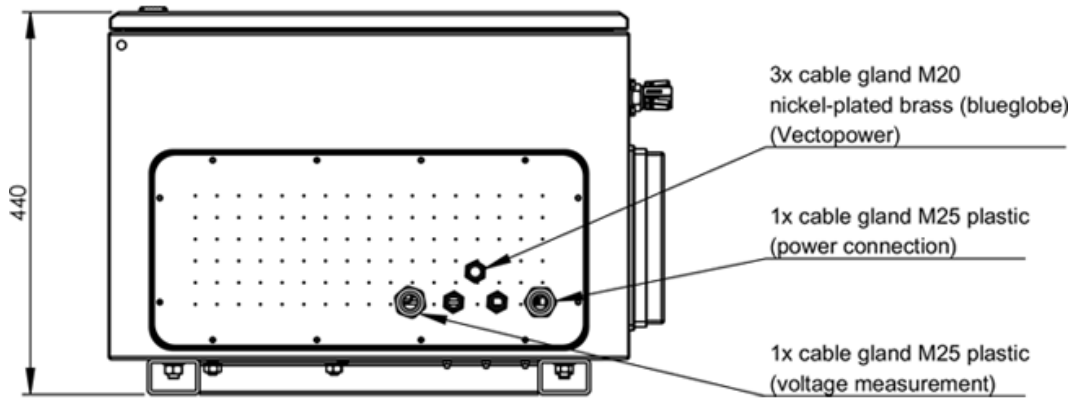


Figure 3: Front view, position of the connections

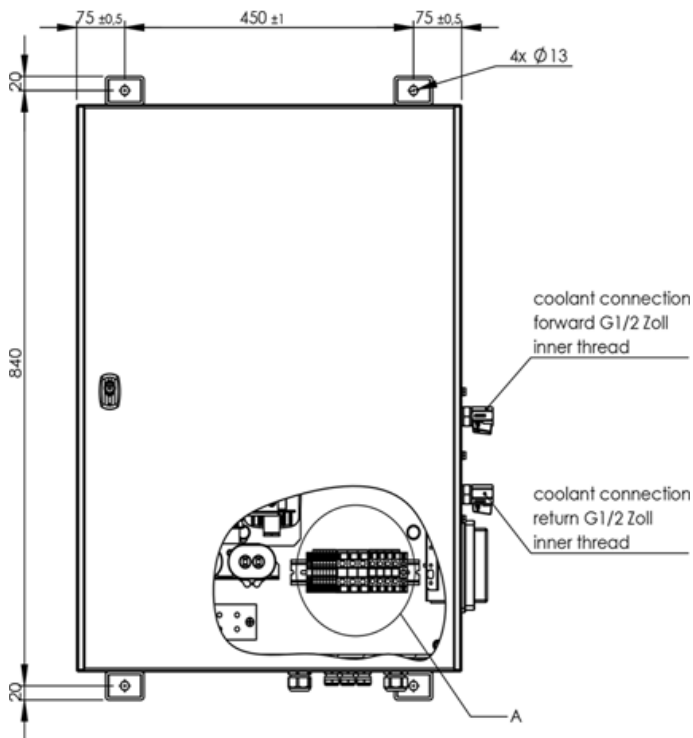


Figure 4: Coolant connections

Data sheet

AFE and Grid

Dimensions and weight

Type	Order number	DC link voltage	Dimensions LxBxH	Total weight [kg]
11 kW	VPGC_1.GRD.1100350	>=350	800x600x360	104
	VPGC_1.GRD.1100480	>=480	800x600x360	97
	VPGC_1.GRD.1100600	>=600	800x600x360	95
22 kW	VPGC_1.GRD.2200350	>=350	880x600x440	160
	VPGC_1.GRD.2200480	>=480	880x600x440	150
	VPGC_1.GRD.2200600	>=600	880x600x440	150
44 kW	VPGC_1.GRD.4400350	>=350	880x600x440	283
	VPGC_1.GRD.4400480	>=480	880x600x440	274
	VPGC_1.GRD.4400600	>=600	880x600x440	274
86 kW	n.a.	n.a.	n.a.	n.a.
	VPGC_1.GRD.8600480	>=480	1110x800x450	426
	VPGC_1.GRD.8600600	>=600	1110x800x450	396

Table 3: Dimensions Grid

Data sheet

AFE and Grid

Connections AFE and Grid

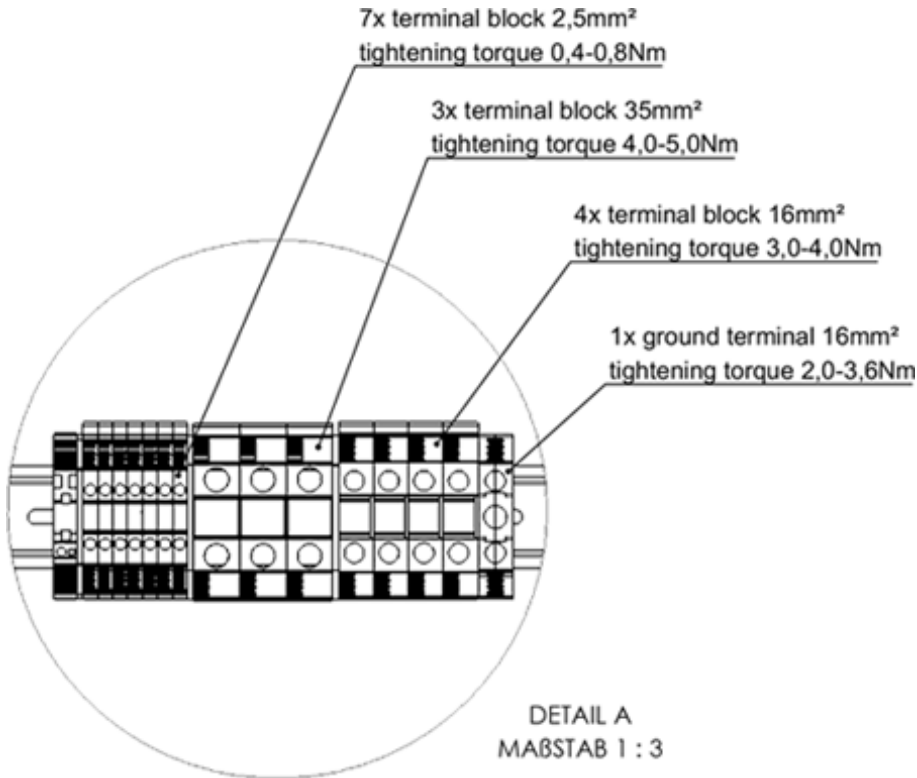


Figure 5: Connections terminal block

Name	Function	Designation	Terminal cross section
2U2	Voltage measurement	Connection to PIN 1 of the ST4 connector	2,5mm ²
2U2	Voltage measurement	Connection to PIN 2 of the ST4 connector	2,5mm ²
2U2	Voltage measurement	Connection to PIN 3 of the ST4 connector	2,5mm ²
PTC155	Temperature sensor	LC filter	2,5mm ²
PTC155	Temperature sensor	LC filter	2,5mm ²
PTC155	Temperature sensor	Transformer	2,5mm ²
PTC155	Temperature sensor	Transformer	2,5mm ²
1U	Phase U input from LC	Connection to Vectopower Phase U	35mm ²
1V	Phase V input from LC	Connection to Vectopower Phase V	35mm ²

Data sheet

AFE and Grid

Name	Function	Designation	Terminal cross section
1W	Phase W input from LC	Connection to Vectopower Phase W	35mm ²
2U2	Primary transformer Phase U	Connection to the mains or to the grid	16mm ²
2V2	Primary transformer Phase V	Connection to the mains or to the grid	16mm ²
2W2	Primary transformer Phase W	Connection to the mains or to the grid	16mm ²
N	Primary transformer N (Startpoint)		16mm ²
PE		Connection to the mains or to the grid	16mm ²

Table 4: Connections AFE and Grid

Data sheet

AFE and Grid

Temperature sensor

Type	2x PTC-155 • LC • Transformer
Warning level	140°C
Error level	160°C

Table 5: Characteristics temperature sensor

Typical characteristics

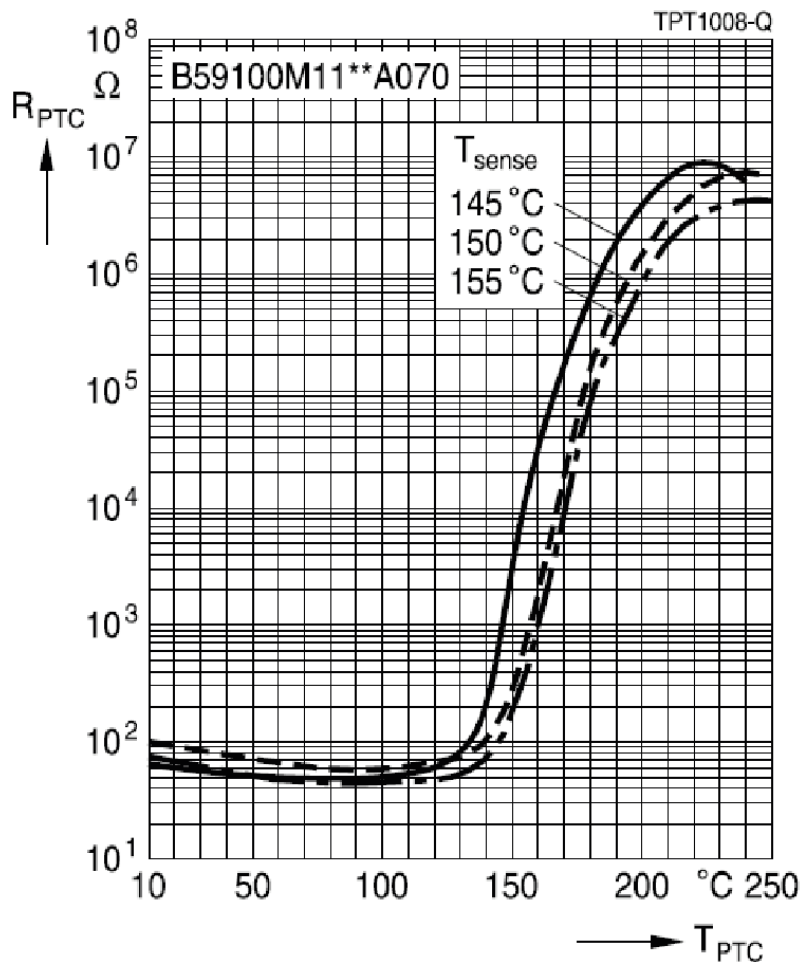


Figure 6: PTC resistance (R_{PTC}) versus PTC temperature (T_{PTC})

Data sheet

AFE and Grid

Wiring diagrams

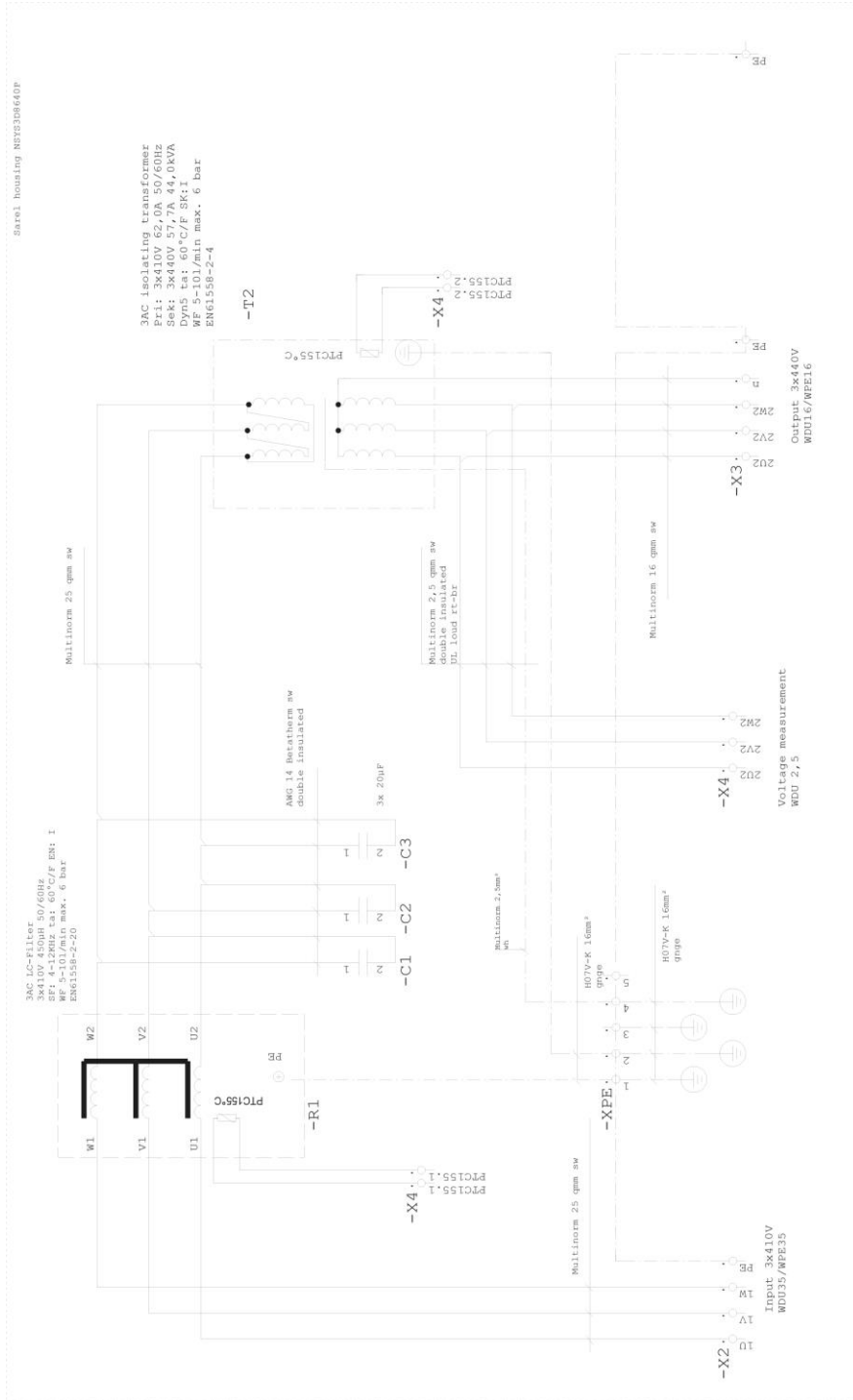


Figure 7: Wiring diagram AFE

