

Data Centers

Uptime is
paramount.

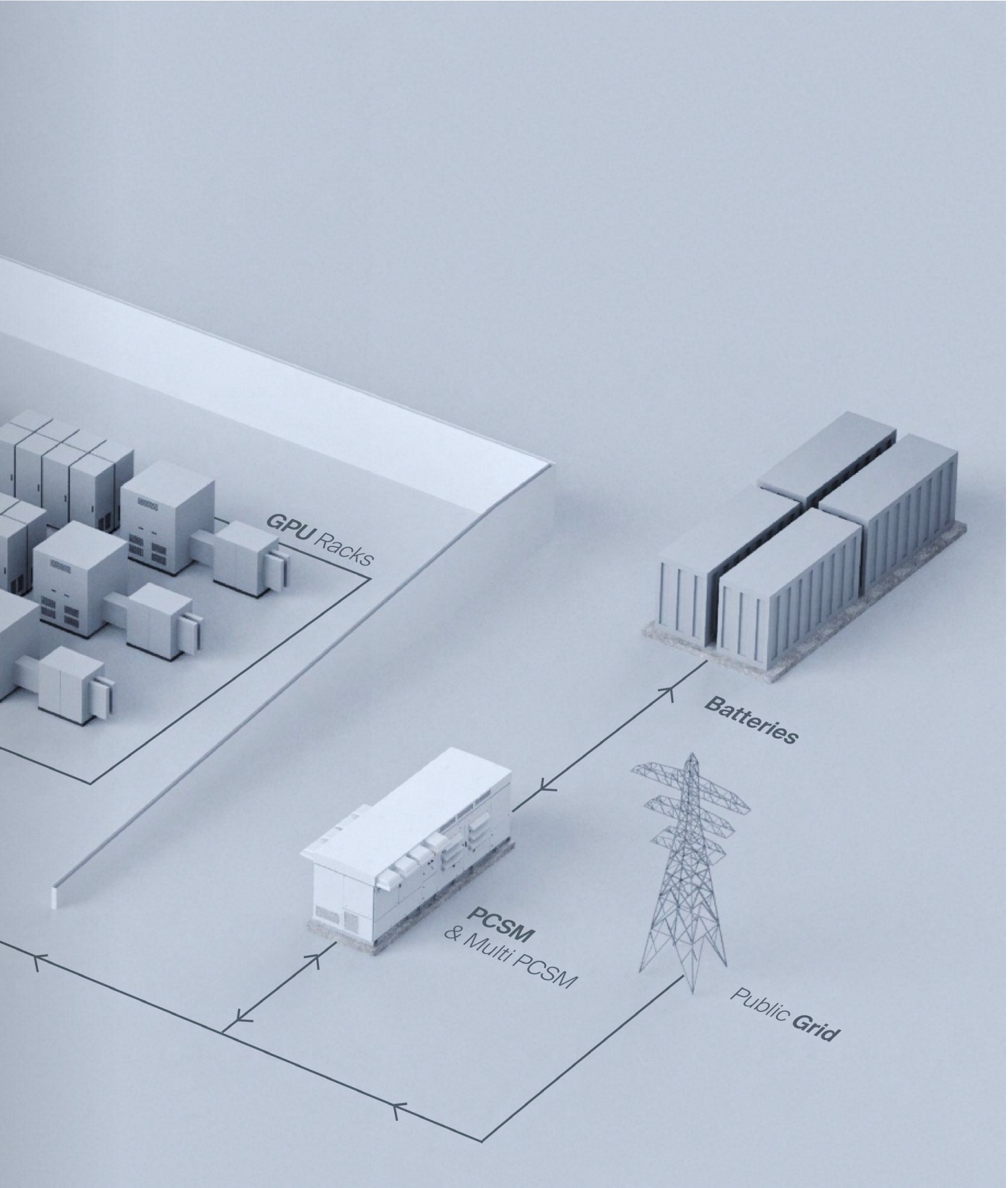
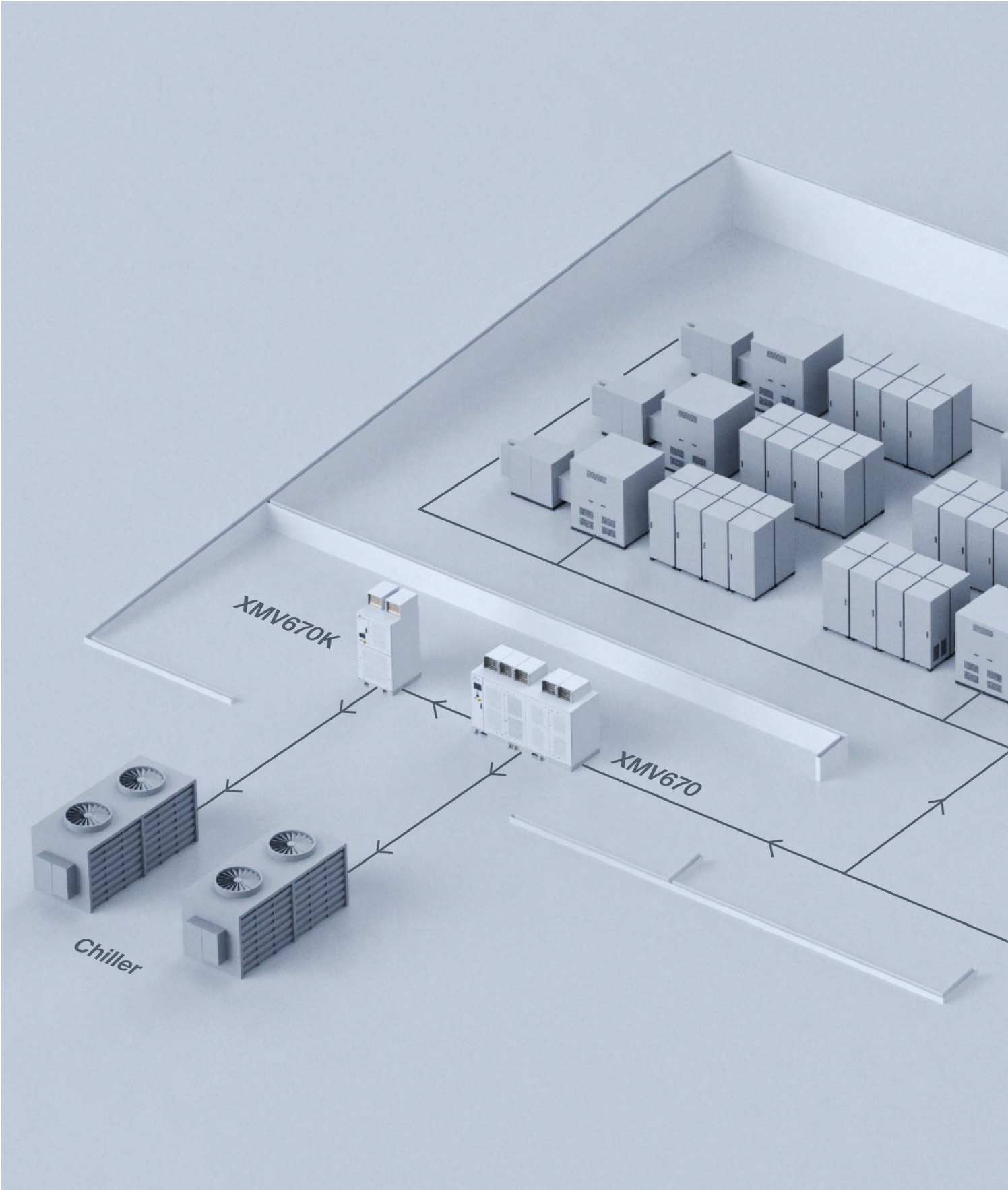
Our vertical integration gives us the flexibility and specialization to adapt our products according to market and customer requirements while still ensuring short delivery times.

As data centers evolve to meet the demands of artificial intelligence and high-performance computing, the challenge now includes not only reliable and efficient power solutions but also cooling systems capable of managing the increasing thermal load.

Battery inverters play a pivotal role in ensuring uninterrupted power supply, enabling seamless integration of renewable energy sources, and enhancing overall energy resilience.

Our latest range of advanced battery inverters, specifically engineered for data center environments, can deliver fast response, superior power quality, and scalable architectures to support the next generation of digital infrastructure.

In addition, our medium-voltage drives enable precise and efficient control of cooling systems, optimizing performance and reducing energy consumption.



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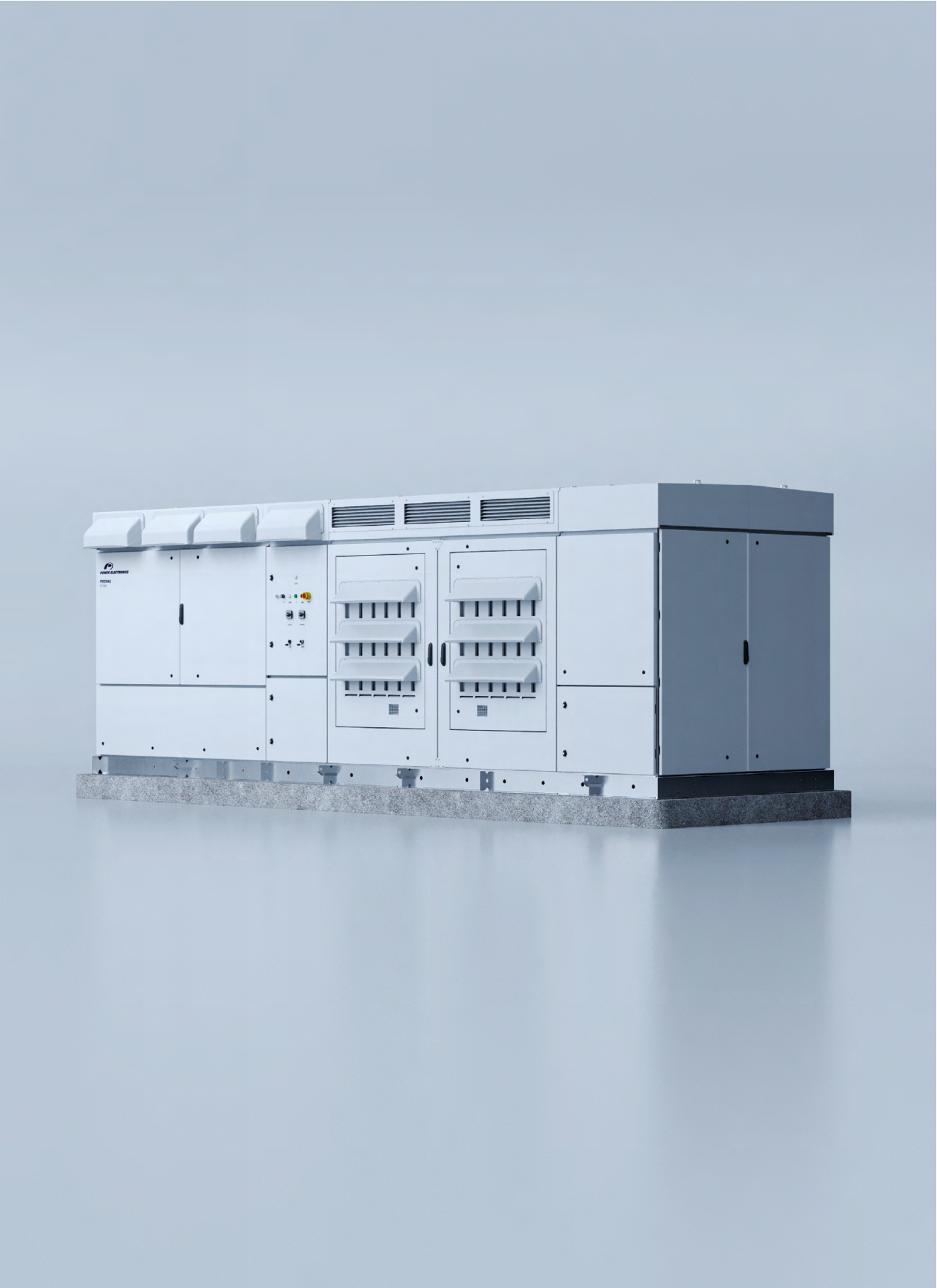
PCSM & Multi PCSM

Our biggest utility-scale MV battery inverter. Designed to last in all types of environments and compatible with all battery technologies.

PCSM & Multi PCSM

The all-in-one solution

- Integrated MV solution in the same enclosure.** The storage turn-key solution that simplifies the installation design.
- Modularity, synonymous with availability.** It allows the DC power redistribution when one module fails. Lower energy losses = higher availability and efficiency.
- Easy maintenance.** Designed to be easily replaceable on the field with a safe, reliable and fast Plug&Play assembly system. Includes 4 FRUs (Field Replaceable Units).
- iCOOL 4, the most innovative cooling system.** Our own air ventilation system provides a constant flow of clean air inside the equipment, without the need of liquid cooling.
- Three-level topology.** The three-level IGBT topology reduces power stage losses, increases inverter efficiency, and minimizes total harmonic distortion. High efficiency to deliver the lowest levelized cost of energy (LCOE).
- Advanced grid support.** Capable of operating on any power system. Different operation modes available depending on the application: grid forming or grid following.
- Adaptive capacity.** Choose your model depending on your requirements.
- Ultra-fast reaction time.** Instantaneous response minimizes downtime and safeguards critical operations during power fluctuations.



Easily replaceable power modules

Different models available to accurately match your BESS configuration

Up to 5150 kVA

Four different DC voltage windows

Full grid support capability

Ultra-fast Response

*Up to four independent BESS

*Only Multi PCSM



PCSK & Multi PCSK

Utility-scale battery inverters.
From one independent BESS with
PCSK, up to four independent
BESS with Multi PCSK.

PCSK & Multi PCSK

Powerful and flexible

- Easy maintenance.** Designed to be easily replaceable on the field with a safe, reliable, and fast Plug&Play assembly system. Includes up to four FRUs (Field Replaceable Units).
- Modularity, synonymous with availability.** It allows the DC power redistribution when one module fails. Lower energy losses = higher availability and efficiency.
- Advanced grid support.** Capable of operating on any power system. Different operation modes available depending on the application: grid forming or grid following.
- Three-level topology.** The three-level IGBT topology reduces power stage losses, increases inverter efficiency, and minimizes total harmonic distortion. High efficiency to deliver the lowest levelized cost of energy (LCOE).
- Adaptive capacity.** Choose your model depending on your requirements.
- Ultra-fast reaction time.** Instantaneous response minimizes downtime and safeguards critical operations during power fluctuations.



Easily replaceable power modules

Different models available to accurately match your BESS configuration

Up to 5150 kVA

Ten different DC voltage windows

Full grid support capability

Ultra-fast Response

*Up to four independent BESS

*Only Multi PCSK



Higher battery capacity due to the short-circuit withstand capability of each DC input.

Up to four more times than a single input.

Multiple power references allowing independent BESS control.

Higher availability since a battery fault will only remove the affected power modules from the system.

Only Multi PCSK



XMV670

Introducing Power Electronics' new medium-voltage solution: the XMV670 frequency drive. Engineered to be the foundation of energy efficiency in the most challenging environments, it combines robustness, reliability, and advanced multi-level technology to guarantee uninterrupted 24/7 performance.

XMV670

Extreme innovation,
now more kompakt.

Topology. XMV670 topology eliminates problematic voltage spikes at motor terminals, along with side effects such as excessive motor heating and common-mode currents through motor bearings.	
Maximum Motor Care. Power modules are connected in series to generate an almost sinusoidal voltage with low dV/dt, delivering sinusoidal current to the motor with negligible THDi. No additional filters required.	
Waveform Quality and Efficiency. This topology ensures compliance with the most demanding international standards for waveform quality (IEEE 519) and electromagnetic compatibility (EMC 2004/108/EC). The system delivers high overall efficiency, $\eta > 96\%$ (including transformer).	
Safety & Protection. XMV670 drive incorporates multiple hardware and software protections as standard, minimizing operational risks and ensuring maximum reliability for medium-voltage applications.	
Enhanced control and upgraded electronics.	Full front access for simplified maintenance.



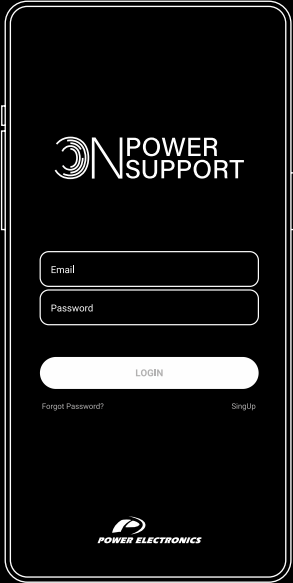


XMV670 drive enables higher power outputs in a more compact footprint, effectively covering the most common power ranges in medium-voltage applications.

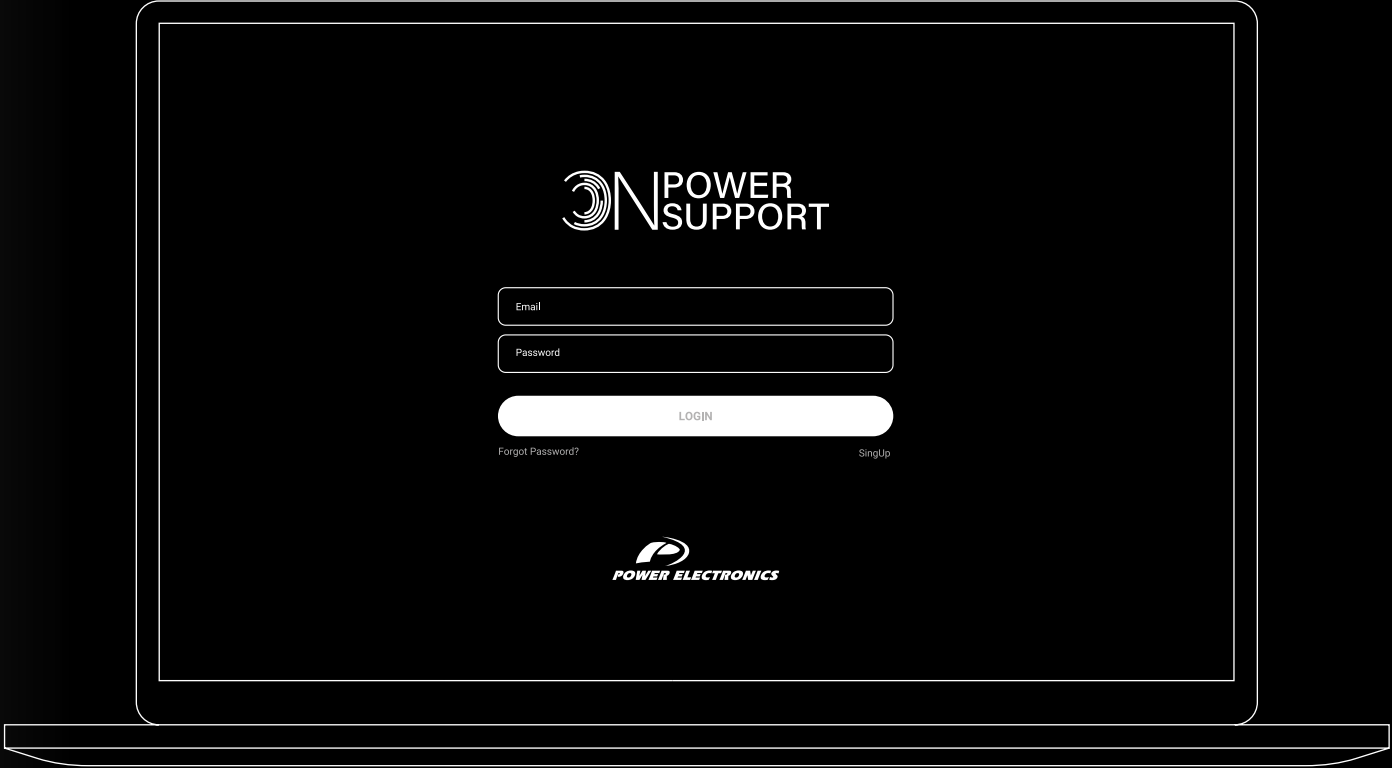
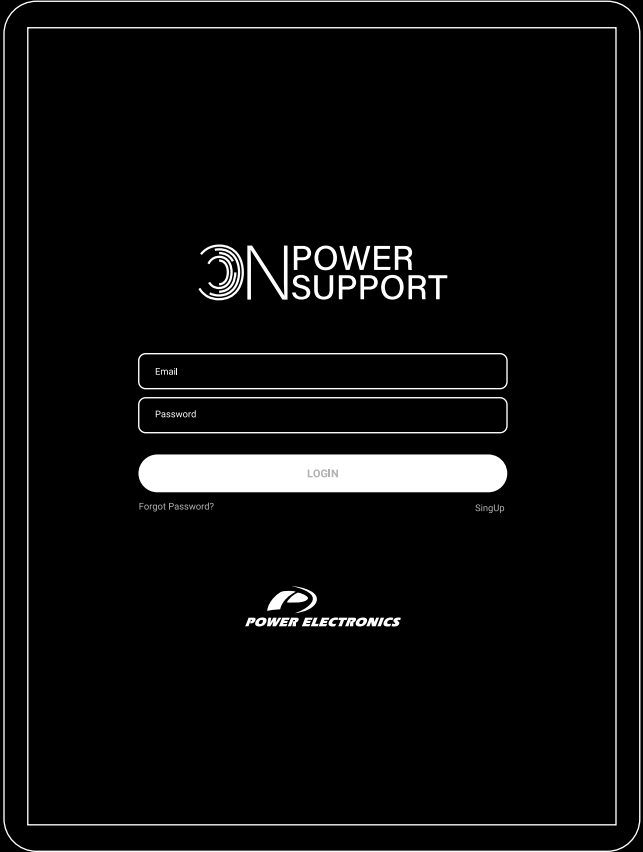
- Compact design
- Up to 13.8 kV
- Power range from 250 kW to 5 MW
- Low-voltage supply option
- Increased power density
- Full front access

Our secret. The key of our success for more than 38 years, our 24/7 after sales service, Power On Support.

Power ON Support



Download Power On Support from any device and get easily all the information about your equipment. Request assistance through the app and our team will be there in less than 48 hours. Stay updated on your assistance details and check the history of your assistance records.



We take care of the legacy generations. Each new generation of **inverters and variable speed drives** involves adapting the manufacturing lines to optimize the production of these new units. Power Electronics has optimized facilities for the production of previous generation units, where we manufacture ongoing subcomponents adapted to equipment that is no longer in production, allowing an extended life.

Long Term Service. We repair subcomponents or even manufacture equivalent units in our Dedicated Service Factory located near our Production Plant. Power Electronics has experience in repowering old photovoltaic plants, where we supply state-of-the-art equipment adapting its electrical characteristics to be compatible with the existing configuration, while providing all the advantages of the latest generation **inverters and variable speed drives.**



We are here
to help you

Vertical Integration throughout the entire process

Vertical integration is one of our key values. We look after the entire value chain, from design to the on-site commissioning of the products, ensuring the accurate development of all the power electronics inside our **inverters and variable speed drives.**

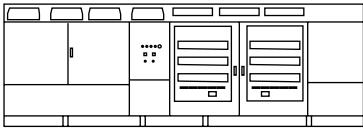
BEFORE COMMISSIONING	– Technical application & design requirement review. – Dedicated Project Management Support. – Hands-on functional & safety product training.
DURING COMMISSIONING	– Dedicated commissioning teams. – Rigorous execution through site operation.
AFTER COMMISSIONING	– Support 24/7, 365 days a year. – Full warranty coverage with options for extension and full preventative maintenance packages. – Advanced remote monitoring, detailed performance reporting, and interactive portals for tracking metrics directly with Power Electronics.

Datasheets

Find all the specifications of our products just here.



Freemaq PCSM
IEC | UL



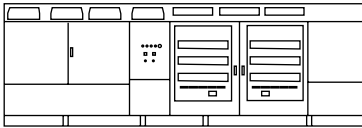
Preliminary					
REFERENCES		FP5020MU	FP5020MH	FP5021MH	FP5022MH
AC	AC Output Power (kVA/kW) @35 °C ^[1]	5020			
	AC Output Power (kVA/kW) @40 °C ^[1]	4800			
	AC Output Power (kVA/kW) @50 °C ^[1]	4360			
	Operating Grid Voltage (kV)	34.5 kV ±10%		33 kV ±10%	30 kV ±10%
	Operating Grid Frequency (Hz)	60 Hz		50 Hz	50 Hz
	Current Harmonic Distortion (THDi)	<3% per IEEE 519			
	Power Factor (CosPhi) ^[2]	0.5 leading ... 0.5 lagging			
DC	DC Voltage Range Full Power ^[3]	976 V – 1500 V			
	Maximum DC Voltage	1500 V			
	DC Voltage Ripple	<3%			
	Max. DC Continuous Current (A)	5248			
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms			
	Battery Technology	All type of batteries (BMS required)			
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)	98.00% including MV transformer			
	CEC (η)	97.53% including MV transformer			
CABINET	Dimensions [WxDxH] (ft)	21.3 x 6.5 x 7.7			
	Dimensions [WxDxH] (m)	6.5 x 2.0 x 2.3			
	Weight (lbs)	30865			
	Weight (kg)	14000			
	Type of Ventilation	Forced air cooling			
ENVIRONMENT	Degree of Protection	NEMA 3R	IP55		
	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >35 °C power derating			
	Operating Relative Humidity Range	From 4% to 100% non-condensing			
	Storage Temperature Range	From -40 °C to +60 °C			
	Max. Altitude (above sea level) ^[5]	1000 m			
CONTROL INTERFACE	Communication Protocol	Modbus TCP			
	Power Plant Controller	Optional			
	Keyed ON/OFF Switch	Standard			
PROTECTIONS	Ground Fault Protection	Insulation monitoring device			
	Humidity Control	Active heating			
	General AC Protection & Disconnection	38 kV MV switchgear (V)	36 kV MV switchgear (2L+V)		
	General DC Protection & Disconnection	High-speed fuses, Motorized DC disconnect switches ^[6]			
	Overvoltage Protection	Type 2 for AC and Type 1+2 for DC			
CERTIFICATIONS & STANDARDS	Safety	UL 1741 / CSA 22.2 No.107.1-16 / IEC 62109-1 / IEC 62109-2 / IEC 62477-1 / IEC 62477-2			
	Installation	NEC 2023			
	Utility Interconnect ^[7]	UL 1741 SA & SB / IEEE 1547.1 / IEC 62116 / / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549			

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.
[2] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²).
[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.
[4] Optional available for temperatures down to -35 °C.
[5] Consult Power Electronics for altitudes above 1000 m.
[6] Battery short circuit disconnection must be done on the battery side.
[7] Consult Power Electronics for other applicable standards / grid codes.

The content of this document is periodically updated. Power Electronics reserve the right to modify all or part of the contents of this document without previous notice.

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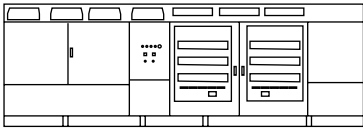
Preliminary					
REFERENCES		FP5150MU	FP5150MH	FP5151MH	FP5152MH
AC	AC Output Power (kVA/kW) @35 °C ^[1]	5150			
	AC Output Power (kVA/kW) @40 °C ^[1]	4940			
	AC Output Power (kVA/kW) @50 °C ^[1]	4520			
	Operating Grid Voltage (kV)	34.5 kV ±10%		33 kV ±10%	30 kV ±10%
	Operating Grid Frequency (Hz)	60 Hz		50 Hz	50 Hz
	Current Harmonic Distortion (THDi)	<3% per IEEE 519			
	Power Factor (CosPhi) ^[2]	0.5 leading ... 0.5 lagging			
	Reactive Power Compensation	Four quadrant operation			
DC	DC Voltage Range Full Power ^[3]	1019 V – 1500 V			
	Maximum DC Voltage	1500 V			
	DC Voltage Ripple	<3%			
	Max. DC Continuous Current (A)	5157			
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms			
	Battery Technology	All type of batteries (BMS required)			
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)	98.00% including MV transformer			
	CEC (η)	97.53% including MV transformer			
CABINET	Dimensions [WxDxH] (ft)	21.3 x 6.5 x 7.5			
	Dimensions [WxDxH] (m)	6.5 x 2.0 x 2.3			
	Weight (lbs)	30865			
	Weight (kg)	14000			
	Type of Ventilation	Forced air cooling			
ENVIRONMENT	Degree of Protection	NEMA 3R	IP55		
	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >35 °C power derating			
	Operating Relative Humidity Range	From 4% to 100% non-condensing			
	Storage Temperature Range	From -40 °C to +60 °C			
	Max. Altitude (above sea level) ^[5]	1000 m			
CONTROL INTERFACE	Communication Protocol	Modbus TCP			
	Power Plant Controller	Optional			
	Keyed ON/OFF Switch	Standard			
PROTECTIONS	Ground Fault Protection	Insulation monitoring device			
	Humidity Control	Active heating			
	General AC Protection & Disconnection	38 kV MV switchgear (V)	36 kV MV switchgear (2L+V)		
	General DC Protection & Disconnection	High-speed fuses, Motorized DC disconnect switches ^[6]			
	Overvoltage Protection	Type 2 for AC and Type 1+2 for DC			
CERTIFICATIONS & STANDARDS	Safety	UL 1741 / CSA 22.2 No.107.1-16 / IEC 62109-1 / IEC 62109-2 / IEC 62477-1 / IEC 62477-2			
	Installation	NEC 2023			
	Utility Interconnect ^[7]	UL 1741 SA & SB / IEEE 1547.1 / IEC 62116 / / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549			

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.
[2] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²).
[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.
[4] Optional available for temperatures down to -35 °C.
[5] Consult Power Electronics for altitudes above 1000 m.
[6] Battery short circuit disconnection must be done on the battery side.
[7] Consult Power Electronics for other applicable standards / grid codes.

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COMMON FEATURES		
AC	Current Harmonic Distortion (THDi)	<3% per IEEE 519
	Power Factor (cos phi) ^[2]	0.5 leading ... 0.5 lagging
	Reactive Power Compensation	Four quadrant operation
DC	Maximum DC Voltage	1500 V
	DC Voltage Ripple	<3%
	Max. DC Continuous Current (A)	4590
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms
	Battery Technology	All type of batteries (BMS required)
CABINET	Dimensions [WxDxH] (ft)	21.3 x 6.5 x 7.5
	Dimensions [WxDxH] (m)	6.5 x 2.0 x 2.3
	Weight (lbs)	30865
	Weight (kg)	14000
	Type of Ventilation	Forced air cooling
ENVIRONMENT	Degree of Protection	IP55
	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >40 °C power derating
	Operating Relative Humidity Range	From 4% to 100% non-condensing
	Storage Temperature Range	From -40 °C to +60 °C
CONTROL INTERFACE	Communication Protocol	Modbus TCP
	Power Plant Controller	Optional. Third party SCADA systems supported.
	Keyed ON/OFF Switch	Standard
PROTECTIONS	Ground Fault Protection	Insulation monitoring device
	Humidity Control	Active heating
	General AC Protection & Disconn.	MV switchgear (2L+V)
	General DC Protection & Disconn.	High-speed fuses, Motorized DC disconnect switches ^[6]
	Overvoltage Protection	Type II for AC and Type I+II for DC
CERTIFICATIONS & STANDARDS	Safety	IEC 62109-1 / IEC 62109-2 / IEC 62477-2

NOTES

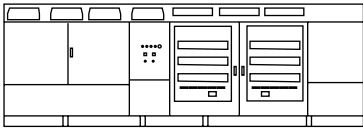
- [1] Values at 1.00·Vac nom and cosφ=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.
- [2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA)^2-P(kW)^2)}$.
- [3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.
- [4] Optional available for temperatures down to -35 °C.
- [5] Consult Power Electronics for altitudes above 1000 m.
- [6] Battery short circuit disconnection must be done on the battery side.

REFERENCES		FP4200MH	FP4203MH	FP4207MH
AC	AC Output Power (kVA/kW) @40 °C ^[1]	4200		
	AC Output Power (kVA/kW) @50 °C ^[1]	3900		
	Operating Grid Voltage (kV)	34.5 kV ±10%	33 kV ±10%	
	Operating Grid Frequency (Hz)	60 Hz	50 Hz	
DC	DC Voltage Range ^[3]	934 V - 1500 V		
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) (preliminary)	97.80% including MV transformer		
	Euroeta (η) (preliminary)	97.51% including MV transformer		
ENVIRONMENT	Max. Altitude (above sea level) ^[5]	2000 m	1000 m	2000 m
REFERENCES		FP4105MH		
AC	AC Output Power (kVA/kW) @40 °C ^[1]	4105		
	AC Output Power (kVA/kW) @50 °C ^[1]	3810		
	Operating Grid Voltage (kV)	34.5 kV ±10%		
	Operating Grid Frequency (Hz)	60 Hz		
DC	DC Voltage Range ^[3]	913 V - 1500 V		
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) (preliminary)	97.76% including MV transformer		
	Euroeta (η) (preliminary)	97.50% including MV transformer		
ENVIRONMENT	Max. Altitude (above sea level) ^[5]	2000 m		
REFERENCES		FP4101MH		
AC	AC Output Power (kVA/kW) @ 40°C ^[1]	4010		
	AC Output Power (kVA/kW) @ 50°C ^[1]	3720		
	Operating Grid Voltage (kV)	34.5 kV ±10%		
	Operating Grid Frequency (Hz)	60 Hz		
DC	DC Voltage Range ^[3]	891 V - 1500 V		
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) (preliminary)	97.75% including MV transformer		
	Euroeta (η) (preliminary)	97.48% including MV transformer		
ENVIRONMENT	Max. Altitude (above sea level) ^[5]	2000 m		

NOTES

- [1] Values at 1.00·Vac nom and cosφ=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.
- [2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA)^2-P(kW)^2)}$.
- [3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.
- [4] Optional available for temperatures down to -35 °C.
- [5] Consult Power Electronics for altitudes above 1000 m.
- [6] Battery short circuit disconnection must be done on the battery side.

Freemaq PCSM
UL



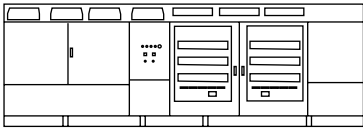
COMMON FEATURES		
AC	Operating Grid Frequency (Hz)	60Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE519
	Power Factor (CosPhi) ^[1]	0.5 leading ... 0.5 lagging
	Reactive Power Compensation	Four quadrant operation
DC	Maximum DC Voltage	1500V
	DC Voltage Ripple	< 3%
	Max. DC Continuous Current (A)	4590
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms
	Battery Technology	All type of batteries (BMS required)
CABINET	Dimensions [WxDxH] (ft)	21.3 x 6.5 x 7.5
	Dimensions [WxDxH] (m)	6.5 x 2.0 x 2.3
	Weight (lbs)	30865
	Weight (kg)	14000
	Type of Ventilation	Forced air cooling
ENVIRONMENT	Degree of Protection	NEMA 3R
	Operating Temperature Range ^[2]	From -25°C to +60°C, >40°C power derating
	Operating Relative Humidity Range	From 4% to 100% non-condensing
	Storage Temperature Range	From -40°C to +60°C
	Max. Altitude (above sea level) ^[3]	2000m
CONTROL INTERFACE	Communication Protocol	Modbus TCP
	Power Plant Controller	Optional. Third party SCADA systems supported.
	Keyed ON/OFF Switch	Standard
PROTECTIONS	Ground Fault Protection	Insulation monitoring device
	Humidity Control	Active heating
	General AC Protection & Disconn.	38 kV MV switchgear (20 or 25 kA)
	General DC Protection & Disconn. ^[4]	High-speed fuses, Motorized DC disconnect switches
	Overvoltage Protection	Type II for AC and Type I+II for DC
CERTIFICATIONS & STANDARDS	Safety	UL 1741 / CSA 22.2 No.1071-16
	Installation	NEC 2023
	Utility Interconnect ^[5]	UL 1741 SA & SB / RULE 21 / RULE 14H / IEEE 1547.1:2020

NOTES	[1] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²). [2] Optional available for temperatures down to -35°C. [3] Consult Power Electronics for altitudes above 1000m. [4] Battery short circuit disconnection must be done on the battery side. [5] Consult Power Electronics for other applicable standards / grid codes. [6] Values at 1.00-Vac nom and CosPhi=1. Consult Power Electronics for derating curves and overload capability in grid forming mode. [7] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.
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REFERENCES		FP4200M	FP4201M	FP4204M
AC	AC Output Power (kVA/kW) @40°C ^[6]	4200		
	AC Output Power (kVA/kW) @50°C ^[6]	3900		
	Operating Grid Voltage (kV)	34.5 kV ±10%	13.8 kV ±10%	12.47 kV ±10%
DC	DC Voltage Range ^[7]	934V - 1500V		
EFFICIENCY	Efficiency (Max) (η)	98.00% including MV transformer		
	CEC (η)	97.53% including MV transformer		
REFERENCES		FP4105M		
AC	AC Output Power (kVA/kW) @40°C ^[6]	4105		
	AC Output Power (kVA/kW) @50°C ^[6]	3810		
	Operating Grid Voltage (kV)	34.5kV ±10%		
DC	DC Voltage Range ^[7]	913V - 1500V		
EFFICIENCY	Efficiency (Max) (η)	97.93% including MV transformer		
	CEC (η)	97.50% including MV transformer		
REFERENCES		FP4010M		
AC	AC Output Power (kVA/kW) @40°C ^[6]	4010		
	AC Output Power (kVA/kW) @50°C ^[6]	3720		
	Operating Grid Voltage (kV)	34.5kV ±10%		
DC	DC Voltage Range ^[7]	891V - 1500V		
EFFICIENCY	Efficiency (Max) (η)	97.91% including MV transformer		
	CEC (η)	97.49% including MV transformer		

NOTES	[1] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²). [2] Optional available for temperatures down to -35°C. [3] Consult Power Electronics for altitudes above 1000m. [4] Battery short circuit disconnection must be done on the battery side. [5] Consult Power Electronics for other applicable standards / grid codes. [6] Values at 1.00-Vac nom and CosPhi=1. Consult Power Electronics for derating curves and overload capability in grid forming mode. [7] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.
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Preliminary					
REFERENCES	FP5020MU2		FP5020MH2	FP5020MU4	FP5020MH4
AC	AC Output Power (kVA/kW) @35 °C [1]		5020		
	AC Output Power (kVA/kW) @40 °C [1]		4800		
	AC Output Power (kVA/kW) @50 °C [1]		4360		
	Operating Grid Voltage (kV)		34.5 kV ±10%		
	Operating Grid Frequency (Hz)		60 Hz		
	Current Harmonic Distortion (THDi)		<3% per IEEE 519		
	Power Factor (CosPhi) [2]		0.5 leading ... 0.5 lagging		
	Reactive Power Compensation		Four quadrant operation		
DC	DC Voltage Range Full Power [3]		976 V – 1500 V		
	Maximum DC Voltage		1500 V		
	DC Voltage Ripple		<3%		
	Max. DC Continuous Current (A)		2624	1312	
	Max. DC Short Circuit Current (kA)		500 kA with a time constant of 1 ms		
	Battery Technology		All type of batteries (BMS required)		
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)		98.00% including MV transformer		
	CEC (η)		97.53% including MV transformer		
CABINET	Dimensions [WxDxH] (ft)		21.3 x 6.5 x 7.5		
	Dimensions [WxDxH] (m)		6.5 x 2.0 x 2.3		
	Weight (lbs)		30865		
	Weight (kg)		14000		
	Type of Ventilation		Forced air cooling		
ENVIRONMENT	Degree of Protection	NEMA 3R	IP55	NEMA 3R	IP55
	Operating Temperature Range [4]		From -25 °C to +60 °C, >35 °C power derating		
	Operating Relative Humidity Range		From 4% to 100% non-condensing		
	Storage Temperature Range		From -40 °C to +60 °C		
	Max. Altitude (above sea level) [5]		1000 m		
CONTROL INTERFACE	Communication Protocol		Modbus TCP		
	Power Plant Controller		Optional		
	Keyed ON/OFF Switch		Standard		
PROTECTIONS	Ground Fault Protection		Insulation monitoring device		
	Humidity Control		Active heating		
	General AC Protection & Disconnection	38 kV MV switchgear (V)	36 kV MV switchgear (2L+V)	38 kV MV switchgear (V)	36 kV MV switchgear (2L+V)
	General DC Protection & Disconnection		High-speed fuses, Motorized DC disconnect switches [6]		
	Overvoltage Protection		Type 2 for AC and Type 1+2 for DC		
CERTIFICATIONS & STANDARDS	Safety		UL 1741 / CSA 22.2 No.107.1-16 / IEC 62109-1 / IEC 62109-2 / IEC 62477-1 / IEC 62477-2		
	Installation		NEC 2023		
	Utility Interconnect [7]		UL 1741 SA & SB / IEEE 1547.1 / IEC 62116 / / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549		

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.

[2] Consult P-Q charts available: $Q(kVAr)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

[4] Optional available for temperatures down to -35 °C.

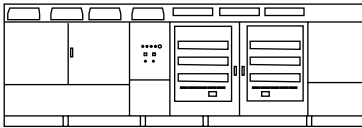
[5] Consult Power Electronics for altitudes above 1000 m.

[6] Battery short circuit disconnection must be done on the battery side.

[7] Consult Power Electronics for other applicable standards / grid codes.

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Freemaq Multi PCSM
IEC



Preliminary			
REFERENCES	FP5021MH2	FP5021MH4	
AC	AC Output Power (kVA/kW) @35 °C [1]		5020
	AC Output Power (kVA/kW) @40 °C [1]		4800
	AC Output Power (kVA/kW) @50 °C [1]		4360
	Operating Grid Voltage (kV)		33 kV ±10%
	Operating Grid Frequency (Hz)		50 Hz
	Current Harmonic Distortion (THDi)		<3% per IEEE 519
	Power Factor (CosPhi) [2]		0.5 leading ... 0.5 lagging
	Reactive Power Compensation		Four quadrant operation
DC	DC Voltage Range Full Power [3]		976 V – 1500 V
	Maximum DC Voltage		1500 V
	DC Voltage Ripple		<3%
	Max. DC Continuous Current (A)	2624	1312
	Max. DC Short Circuit Current (kA)		500 kA with a time constant of 1 ms
	Battery Technology		All type of batteries (BMS required)
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)		98.00% including MV transformer
	CEC (η)		97.53% including MV transformer
CABINET	Dimensions [WxDxH] (ft)		21.3 x 6.5 x 7.5
	Dimensions [WxDxH] (m)		6.5 x 2.0 x 2.3
	Weight (lbs)		30865
	Weight (kg)		14000
	Type of Ventilation		Forced air cooling
ENVIRONMENT	Degree of Protection		IP55
	Operating Temperature Range [4]		From -25 °C to +60 °C, >35 °C power derating
	Operating Relative Humidity Range		From 4% to 100% non-condensing
	Storage Temperature Range		From -40 °C to +60 °C
	Max. Altitude (above sea level) [5]		1000 m
CONTROL INTERFACE	Communication Protocol		Modbus TCP
	Power Plant Controller		Optional
	Keyed ON/OFF Switch		Standard
PROTECTIONS	Ground Fault Protection		Insulation monitoring device
	Humidity Control		Active heating
	General AC Protection & Disconnection	36 kV MV switchgear (2L+V)	
	General DC Protection & Disconnection	High-speed fuses, Motorized DC disconnect switches [6]	
	Overvoltage Protection		Type 2 for AC and Type 1+2 for DC
	Safety	IEC 62109-1 / IEC 62109-2 / IEC 62477-1 / IEC 62477-2	
CERTIFICATIONS & STANDARDS	Utility Interconnect [7]		IEC 62116 / / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.

[2] Consult P-Q charts available: $Q(kVAr)=\sqrt{(S(kVA))^2-P(kW)^2}$.

[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

[4] Optional available for temperatures down to -35 °C.

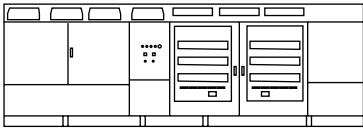
[5] Consult Power Electronics for altitudes above 1000 m.

[6] Battery short circuit disconnection must be done on the battery side.

[7] Consult Power Electronics for other applicable standards / grid codes.

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Freemaq Multi PCSM
IEC



Preliminary			
REFERENCES	FP5022MH2	FP5022MH4	
AC	AC Output Power (kVA/kW) @35 °C ^[1]	5020	
	AC Output Power (kVA/kW) @40 °C ^[1]	4800	
	AC Output Power (kVA/kW) @50 °C ^[1]	4360	
	Operating Grid Voltage (kV)	30 kV ±10%	
	Operating Grid Frequency (Hz)	50 Hz	
	Current Harmonic Distortion (THDi)	<3% per IEEE 519	
	Power Factor (CosPhi) ^[2]	0.5 leading ... 0.5 lagging	
	Reactive Power Compensation	Four quadrant operation	
DC	DC Voltage Range Full Power ^[3]	976 V – 1500 V	
	Maximum DC Voltage	1500 V	
	DC Voltage Ripple	<3%	
	Max. DC Continuous Current (A)	2624	1312
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms	
	Battery Technology	All type of batteries (BMS required)	
	Number of Separated DC Inputs	2	4
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)	98.00% including MV transformer	
	CEC (η)	97.53% including MV transformer	
CABINET	Dimensions [WxDxH] (ft)	21.3 x 6.5 x 7.5	
	Dimensions [WxDxH] (m)	6.5 x 2.0 x 2.3	
	Weight (lbs)	30865	
	Weight (kg)	14000	
	Type of Ventilation	Forced air cooling	
ENVIRONMENT	Degree of Protection	IP55	
	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >35 °C power derating	
	Operating Relative Humidity Range	From 4% to 100% non-condensing	
	Storage Temperature Range	From -40 °C to +60 °C	
	Max. Altitude (above sea level) ^[5]	1000 m	
CONTROL INTERFACE	Communication Protocol	Modbus TCP	
	Power Plant Controller	Optional	
	Keyed ON/OFF Switch	Standard	
PROTECTIONS	Ground Fault Protection	Insulation monitoring device	
	Humidity Control	Active heating	
	General AC Protection & Disconnection	36 kV MV switchgear (2L+V)	
	General DC Protection & Disconnection	High-speed fuses, Motorized DC disconnect switches ^[6]	
	Overvoltage Protection	Type 2 for AC and Type 1+2 for DC	
	Safety	IEC 62109-1 / IEC 62109-2 / IEC 62477-1 / IEC 62477-2	
	Utility Interconnect ^[7]	IEC 62116 / / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549	

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA)^2-P(kW)^2)}$.

[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

[4] Optional available for temperatures down to -35 °C.

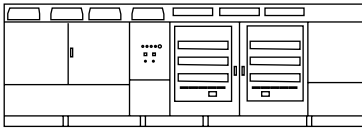
[5] Consult Power Electronics for altitudes above 1000 m.

[6] Battery short circuit disconnection must be done on the battery side.

[7] Consult Power Electronics for other applicable standards / grid codes.

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IEC | UL



Preliminary					
REFERENCES	FP5150MU2		FP5150MH2	FP5150MU4	FP5150MH4
AC	AC Output Power (kVA/kW) @35 °C ^[1]		5150		
	AC Output Power (kVA/kW) @40 °C ^[1]		4940		
	AC Output Power (kVA/kW) @50 °C ^[1]		4520		
	Operating Grid Voltage (kV)		34.5 kV ±10%		
	Operating Grid Frequency (Hz)		60 Hz		
	Current Harmonic Distortion (THDi)		< 3% per IEEE 519		
	Power Factor (CosPhi) ^[2]		0.5 leading ... 0.5 lagging		
	Reactive Power Compensation		Four quadrant operation		
DC	DC Voltage Range Full Power ^[3]		1019 V – 1500 V		
	Maximum DC Voltage		1500 V		
	DC Voltage Ripple		< 3%		
	Max. DC Continuous Current (A)	2579	1289		
	Max. DC Short Circuit Current (kA)		500 kA with a time constant of 1 ms		
	Battery Technology		All type of batteries (BMS required)		
EFFICIENCY & AUX. SUPPLY	Number of Separated DC Inputs		2	4	
	Efficiency (Max) (η)		98.00% including MV transformer		
CABINET	CEC (η)		97.53% including MV transformer		
	Dimensions [WxDxH] (ft)		21.3 x 6.5 x 7.5		
	Dimensions [WxDxH] (m)		6.5 x 2.0 x 2.3		
	Weight (lbs)		30865		
	Weight (kg)		14000		
	Type of Ventilation		Forced air cooling		
ENVIRONMENT	Degree of Protection	NEMA 3R	IP55	NEMA 3R	IP55
	Operating Temperature Range ^[4]		From -25 °C to +60 °C, >35 °C power derating		
	Operating Relative Humidity Range		From 4% to 100% non-condensing		
	Storage Temperature Range		From -40 °C to +60 °C		
	Max. Altitude (above sea level) ^[5]		1000 m		
CONTROL INTERFACE	Communication Protocol		Modbus TCP		
	Power Plant Controller		Optional		
	Keyed ON/OFF Switch		Standard		
PROTECTIONS	Ground Fault Protection		Insulation monitoring device		
	Humidity Control		Active heating		
	General AC Protection & Disconnection	38 kV MV switchgear (V)	36 kV MV switchgear (2L+V)	38 kV MV switchgear (V)	36 kV MV switchgear (2L+V)
	General DC Protection & Disconnection		High-speed fuses, Motorized DC disconnect switches ^[6]		
	Overvoltage Protection		Type 2 for AC and Type 1+2 for DC		
	Safety	UL 1741 / CSA 22.2 No.107.1-16 / IEC 62109-1 / IEC 62109-2 / IEC 62477-1 / IEC 62477-2			
	Installation	NEC 2023			
CERTIFICATIONS & STANDARDS	Utility Interconnect ^[7]		UL 1741 SA & SB / IEEE 1547.1 / IEC 62116 / / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549		

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA)^2-P(kW)^2)}$.

[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

[4] Optional available for temperatures down to -35 °C.

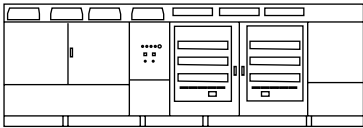
[5] Consult Power Electronics for altitudes above 1000 m.

[6] Battery short circuit disconnection must be done on the battery side.

[7] Consult Power Electronics for other applicable standards / grid codes.

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Preliminary			
REFERENCES	FP5151MH2	FP5151MH4	
AC	AC Output Power (kVA/kW) @35 °C ^[1]	5150	
	AC Output Power (kVA/kW) @40 °C ^[1]	4940	
	AC Output Power (kVA/kW) @50 °C ^[1]	4520	
	Operating Grid Voltage (kV)	33 kV ±10%	
	Operating Grid Frequency (Hz)	50 Hz	
	Current Harmonic Distortion (THDi)	< 3% per IEEE 519	
	Power Factor (CosPhi) ^[2]	0.5 leading ... 0.5 lagging	
	Reactive Power Compensation	Four quadrant operation	
DC	DC Voltage Range Full Power ^[3]	1019 V – 1500 V	
	Maximum DC Voltage	1500 V	
	DC Voltage Ripple	< 3%	
	Max. DC Continuous Current (A)	2579	1289
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms	
	Battery Technology	All type of batteries (BMS required)	
	Number of Separated DC Inputs	2	4
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)	98.00% including MV transformer	
	CEC (η)	97.53% including MV transformer	
CABINET	Dimensions [WxDxH] (ft)	21.3 x 6.5 x 7.5	
	Dimensions [WxDxH] (m)	6.5 x 2.0 x 2.3	
	Weight (lbs)	30865	
	Weight (kg)	14000	
	Type of Ventilation	Forced air cooling	
ENVIRONMENT	Degree of Protection	IP55	
	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >35 °C power derating	
	Operating Relative Humidity Range	From 4% to 100% non-condensing	
	Storage Temperature Range	From -40 °C to +60 °C	
	Max. Altitude (above sea level) ^[5]	1000 m	
CONTROL INTERFACE	Communication Protocol	Modbus TCP	
	Power Plant Controller	Optional	
	Keyed ON/OFF Switch	Standard	
PROTECTIONS	Ground Fault Protection	Insulation monitoring device	
	Humidity Control	Active heating	
	General AC Protection & Disconnection	36 kV MV switchgear (2L+V)	
	General DC Protection & Disconnection	High-speed fuses, Motorized DC disconnect switches ^[6]	
	Overvoltage Protection	Type 2 for AC and Type 1+2 for DC	
CERTIFICATIONS & STANDARDS	Safety	IEC 62109-1 / IEC 62109-2 / IEC 62477-1 / IEC 62477-2	
	Utility Interconnect ^[7]	IEC 62116 / / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549	

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.

[2] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²).

[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

[4] Optional available for temperatures down to -35 °C.

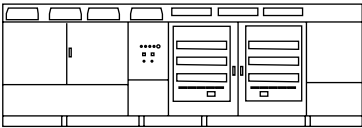
[5] Consult Power Electronics for altitudes above 1000 m.

[6] Battery short circuit disconnection must be done on the battery side.

[7] Consult Power Electronics for other applicable standards / grid codes.

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Preliminary			
REFERENCES	FP5152MH2	FP5152MH4	
AC	AC Output Power (kVA/kW) @35 °C ^[1]	5150	
	AC Output Power (kVA/kW) @40 °C ^[1]	4940	
	AC Output Power (kVA/kW) @50 °C ^[1]	4520	
	Operating Grid Voltage (kV)	30 kV ±10%	
	Operating Grid Frequency (Hz)	50 Hz	
	Current Harmonic Distortion (THDi)	<3% per IEEE 519	
	Power Factor (CosPhi) ^[2]	0.5 leading ... 0.5 lagging	
	Reactive Power Compensation	Four quadrant operation	
DC	DC Voltage Range Full Power ^[3]	1019 V – 1500 V	
	Maximum DC Voltage	1500 V	
	DC Voltage Ripple	<3%	
	Max. DC Continuous Current (A)	2579	1289
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms	
	Battery Technology	All type of batteries (BMS required)	
	Number of Separated DC Inputs	2	4
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)	98.00% including MV transformer	
	CEC (η)	97.53% including MV transformer	
CABINET	Dimensions [WxDxH] (ft)	21.3 x 6.5 x 7.5	
	Dimensions [WxDxH] (m)	6.5 x 2.0 x 2.3	
	Weight (lbs)	30865	
	Weight (kg)	14000	
	Type of Ventilation	Forced air cooling	
	Degree of Protection	IP55	
ENVIRONMENT	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >35 °C power derating	
	Operating Relative Humidity Range	From 4% to 100% non-condensing	
	Storage Temperature Range	From -40 °C to +60 °C	
	Max. Altitude (above sea level) ^[5]	1000 m	
	Communication Protocol	Modbus TCP	
CONTROL INTERFACE	Power Plant Controller	Optional	
	Keyed ON/OFF Switch	Standard	
	Ground Fault Protection	Insulation monitoring device	
PROTECTIONS	Humidity Control	Active heating	
	General AC Protection & Disconnection	36 kV MV switchgear (2L+V)	
	General DC Protection & Disconnection	High-speed fuses, Motorized DC disconnect switches ^[6]	
	Overvoltage Protection	Type 2 for AC and Type 1+2 for DC	
	CERTIFICATIONS & STANDARDS	Safety	IEC 62109-1 / IEC 62109-2 / IEC 62477-1 / IEC 62477-2
Utility Interconnect ^[7]		IEC 62116 / / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549	

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.

[2] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²).

[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

[4] Optional available for temperatures down to -35 °C.

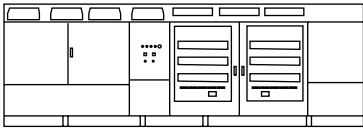
[5] Consult Power Electronics for altitudes above 1000 m.

[6] Battery short circuit disconnection must be done on the battery side.

[7] Consult Power Electronics for other applicable standards / grid codes.

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COMMON FEATURES		
AC	Current Harmonic Distortion (THDi)	<3% per IEEE 519
	Power Factor (cos phi) ^[2]	0.5 leading ... 0.5 lagging
	Reactive Power Compensation	Four quadrant operation
DC	Maximum DC Voltage	1500 V
	DC Voltage Ripple	<3%
	Max. DC Short Circuit Current per Input (kA)	500 kA with a time constant of 1 ms
	Battery Technology	All type of batteries (BMS required)
CABINET	Dimensions [WxDxH] (ft)	21.3 x 6.5 x 7.5
	Dimensions [WxDxH] (m)	6.5 x 2.0 x 2.3
	Weight (lbs)	30865
	Weight (kg)	14000
	Type of Ventilation	Forced air cooling
ENVIRONMENT	Degree of Protection	IP55
	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >40 °C power derating
	Operating Relative Humidity Range	From 4% to 100% non-condensing
	Storage Temperature Range	From -40 °C to +60 °C
CONTROL INTERFACE	Communication Protocol	Modbus TCP
	Power Plant Controller	Optional. Third party SCADA systems supported.
	Keyed ON/OFF Switch	Standard
PROTECTIONS	Ground Fault Protection	Insulation monitoring device
	Humidity Control	Active heating
	General AC Protection & Disconn.	MV switchgear (2L+V)
	General DC Protection & Disconn.	High-speed fuses, Motorized DC disconnect switches ^[6]
CERTIFICATIONS & STANDARDS	Overvoltage Protection	Type II for AC and Type I+II for DC
	Safety	IEC 62109-1 / IEC 62109-2 / IEC 62477-2

NOTES

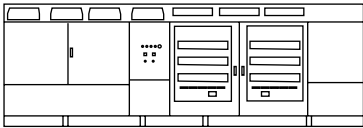
- [1] Values at 1.00-Vac nom and cosφ=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.
- [2] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²).
- [3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.
- [4] Optional available for temperatures down to -35 °C.
- [5] Consult Power Electronics for altitudes above 1000 m.
- [6] Battery short circuit disconnection must be done on the battery side.

REFERENCES		FP4200MH2	FP4203MH2	FP4207MH2	FP4200MH4	FP4203MH4	FP4207MH4
AC	AC Output Power (kVA/kW) @40 °C ^[1]	4200					
	AC Output Power (kVA/kW) @50 °C ^[1]	3900					
	Operating Grid Voltage (kV)	34.5 kV ±10%	33 kV ±10%		34.5 kV ±10%	33 kV ±10%	
	Operating Grid Frequency (Hz)	60 Hz	50 Hz		60 Hz	50 Hz	
DC	DC Voltage Range ^[3]	934 V - 1500 V					
	Max. DC Continuous Current per Input (A)	2295			1148		
	Number of Separate DC Inputs	2			4		
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) (preliminary)	97.80% including MV transformer					
	Euroeta (η) (preliminary)	97.51% including MV transformer					
ENVIRONMENT	Max. Altitude (above sea level) ^[5]	2000 m	1000 m	2000 m		1000 m	2000 m
REFERENCES		FP4105MH2			FP4105MH4		
AC	AC Output Power (kVA/kW) @40 °C ^[1]	4105					
	AC Output Power (kVA/kW) @50 °C ^[1]	3810					
	Operating Grid Voltage (kV)	34.5 kV ±10%					
	Operating Grid Frequency (Hz)	60 Hz					
DC	DC Voltage Range ^[3]	913 V - 1500 V					
	Max. DC Continuous Current per Input (A)	2295			1148		
	Number of Separate DC Inputs	2			4		
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) (preliminary)	97.76% including MV transformer					
	Euroeta (η) (preliminary)	97.50% including MV transformer					
ENVIRONMENT	Max. Altitude (above sea level) ^[5]	2000 m					
REFERENCES		FP4010MH2			FP4010MH4		
AC	AC Output Power (kVA/kW) @40 °C ^[1]	4010					
	AC Output Power (kVA/kW) @50 °C ^[1]	3720					
	Operating Grid Voltage (kV)	34.5 kV ±10%					
	Operating Grid Frequency (Hz)	60 Hz					
DC	DC Voltage Range ^[3]	891 V - 1500 V					
	Max. DC Continuous Current per Input (A)	2295			1148		
	Number of Separate DC Inputs	2			4		
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η) (preliminary)	97.75% including MV transformer					
	Euroeta (η) (preliminary)	97.48% including MV transformer					
ENVIRONMENT	Max. Altitude (above sea level) ^[5]	2000 m					

NOTES

- [1] Values at 1.00-Vac nom and cosφ=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.
- [2] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²).
- [3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.
- [4] Optional available for temperatures down to -35 °C.
- [5] Consult Power Electronics for altitudes above 1000 m.
- [6] Battery short circuit disconnection must be done on the battery side.

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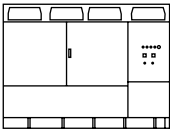
COMMON FEATURES		
AC	Operating Grid Frequency (Hz)	60Hz
	Current Harmonic Distortion (THDi)	< 3% per IEEE519
	Power Factor (CosPhi) ^[1]	0.5 leading ... 0.5 lagging
	Reactive Power Compensation	Four quadrant operation
DC	Maximum DC Voltage	1500V
	DC Voltage Ripple	< 3%
	Max. DC Short Circuit Current per Input (kA)	500 kA with a time constant of 1 ms
	Battery Technology	All type of batteries (BMS required)
CABINET	Dimensions [WxDxH] (ft)	21.3 x 6.5 x 7.5
	Dimensions [WxDxH] (m)	6.5 x 2.0 x 2.3
	Weight (lbs)	30865
	Weight (kg)	14000
	Type of Ventilation	Forced air cooling
ENVIRONMENT	Degree of Protection	NEMA 3R
	Operating Temperature Range ^[2]	From -25°C to +60°C, >40°C power derating
	Operating Relative Humidity Range	From 4% to 100% non-condensing
	Storage Temperature Range	From -40°C to +60°C
	Max. Altitude (above sea level) ^[3]	2000m
CONTROL INTERFACE	Communication Protocol	Modbus TCP
	Power Plant Controller	Optional. Third party SCADA systems supported.
	Keyed ON/OFF Switch	Standard
PROTECTIONS	Ground Fault Protection	Insulation monitoring device
	Humidity Control	Active heating
	General AC Protection & Disconn.	38 kV MV switchgear (20 or 25 kA)
	General DC Protection & Disconn. ^[4]	High-speed fuses, Motorized DC disconnect switches
	Overvoltage Protection	Type II for AC and Type I+II for DC
CERTIFICATIONS & STANDARDS	Safety	UL 1741 / CSA 22.2 No.1071-16
	Installation	NEC 2023
	Utility Interconnect ^[5]	UL 1741 SA & SB / RULE 21 / RULE 14H / IEEE 1547.1:2020

NOTES	[1] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²). [2] Optional available for temperatures down to -35°C. [3] Consult Power Electronics for altitudes above 1000m. [4] Battery short circuit disconnection must be done on the battery side. [5] Consult Power Electronics for other applicable standards / grid codes. [6] Values at 1.00-Vac nom and CosPhi=1. Consult Power Electronics for derating curves and overload capability in grid forming mode. [7] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.
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REFERENCES		FP4200M2	FP4201M2	FP4204M2	FP4200M4	FP4201M4	FP4204M4
AC	AC Output Power (kVA/kW) @40°C ^[6]	4200					
	AC Output Power (kVA/kW) @50°C ^[6]	3900					
	Operating Grid Voltage (kV)	34.5 kV ±10%	13.8 kV ±10%	12.47 kV ±10%	34.5 kV ±10%	13.8 kV ±10%	12.47 kV ±10%
DC	DC Voltage Range ^[7]	934V - 1500V					
	Max. DC Continuous Current per Input (A)	2295			1148		
	Number of Separate DC Inputs	2			4		
EFFICIENCY	Efficiency (Max) (η)	98.00% including MV transformer					
	CEC (η)	97.53% including MV transformer					
REFERENCES		FP4105M2			FP4105M4		
AC	AC Output Power (kVA/kW) @40°C ^[6]	4105					
	AC Output Power (kVA/kW) @50°C ^[6]	3810					
	Operating Grid Voltage (kV)	34.5kV ±10%			34.5kV ±10%		
DC	DC Voltage Range ^[7]	913V - 1500V					
	Max. DC Continuous Current per Input (A)	2295			1148		
	Number of Separate DC Inputs	2			4		
EFFICIENCY	Efficiency (Max) (η)	97.93% including MV transformer					
	CEC (η)	97.50% including MV transformer					
REFERENCES		FP4010M2			FP4010M4		
AC	AC Output Power (kVA/kW) @40°C ^[6]	4010					
	AC Output Power (kVA/kW) @50°C ^[6]	3720					
	Operating Grid Voltage (kV)	34.5kV ±10%					
DC	DC Voltage Range ^[7]	891V - 1500V					
	Max. DC Continuous Current per Input (A)	2295			1148		
	Number of Separate DC Inputs	2			4		
EFFICIENCY	Efficiency (Max) (η)	97.91% including MV transformer					
	CEC (η)	97.49% including MV transformer					

NOTES	[1] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²). [2] Optional available for temperatures down to -35°C. [3] Consult Power Electronics for altitudes above 1000m. [4] Battery short circuit disconnection must be done on the battery side. [5] Consult Power Electronics for other applicable standards / grid codes. [6] Values at 1.00-Vac nom and CosPhi=1. Consult Power Electronics for derating curves and overload capability in grid forming mode. [7] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.
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Freemaq PCSK



Preliminary		690 V		
FRAME		2	3	4
REFERENCES		FP2510K	FP3765K	FP5020K
AC	AC Output Power (kVA/kW) @35 °C ^[1]	2510	3765	5020
	AC Output Power (kVA/kW) @40 °C ^[1]	2400	3600	4800
	AC Output Power (kVA/kW) @50 °C ^[1]	2180	3270	4360
	Max. AC Output Current (A) @35 °C	2100	3150	4200
	Operating Grid Voltage (kV)	690 V ±10%		
	Operating Grid Frequency (Hz)	50 / 60 Hz		
	Current Harmonic Distortion (THDi)	<3% per IEEE 519		
	Power Factor (CosPhi) ^[2]	0.5 leading... 0.5 lagging		
	Reactive Power Compensation	Four quadrant operation		
	DC Voltage Range Full Power ^[3]	976 V – 1500 V		
DC	Maximum DC Voltage	1500 V		
	DC Voltage Ripple	<3%		
	Max. DC Continuous Current (A)	2624	3936	5248
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms		
	Battery Technology	All type of batteries (BMS required)		
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)	98.84%	98.87%	98.94%
	CEC (η)	98.34%	98.49%	98.51%
CABINET	Dimensions [WxDxH] (ft)	9.8 x 6.5 x 7.5		
	Dimensions [WxDxH] (m)	3.0 x 2.0 x 2.3		
	Weight (lbs)	8600	9700	10365
	Weight (kg)	3900	4400	4700
	Type of Ventilation	Forced air cooling		
ENVIRONMENT	Degree of Protection	NEMA 3R / IP55		
	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >35 °C power derating		
	Operating Relative Humidity Range	From 4% to 100% non-condensing		
	Storage Temperature Range	From -40 °C to +60 °C		
	Max. Altitude (above sea level) ^[5]	2000 m / >2000 m power derating (max. 4000 m)		
CONTROL INTERFACE	Communication Protocol	Modbus TCP		
	Power Plant Controller	Optional		
	Keyed ON/OFF Switch	Standard		
PROTECTIONS	Ground Fault Protection	Insulation monitoring device		
	Humidity Control	Active heating		
	General AC Protection & Disconnection	Circuit breaker		
	General DC Protection & Disconnection	High-speed fuses, Motorized DC disconnect switches ^[6]		
	Overvoltage Protection	Type 2 for AC and Type 1+2 for DC		
CERTIFICATIONS & STANDARDS	Safety	UL 1741 / CSA 22.2 No.107:1-16 / IEC 62109-1 / IEC 62109-2 / IEC 62477-1		
	Installation	NEC 2023		
	Utility Interconnect ^[7]	UL 1741 SA & SB / IEEE 1547:1 / IEC 62116 / / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549		

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.

[2] Consult P-Q charts available: Q(kVar)=√(S(kVA)²-P(kW)²).

[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

[4] Optional available for temperatures down to -35 °C.

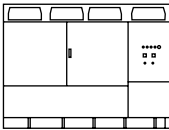
[5] Consult Power Electronics for altitudes above 1000 m.

[6] Battery short circuit disconnection must be done on the battery side.

[7] Consult Power Electronics for other applicable standards / grid codes.

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Freemaq PCSK



Preliminary		720 V		
FRAME		2	3	4
REFERENCES		FP2575K	FP3865K	FP5150K
AC	AC Output Power (kVA/kW) @35 °C ^[1]	2575	3865	5150
	AC Output Power (kVA/kW) @40 °C ^[1]	2470	3705	4940
	AC Output Power (kVA/kW) @50 °C ^[1]	2260	3390	4520
	Max. AC Output Current (A) @35 °C	2065	3097	4130
	Operating Grid Voltage (kV)	720 V ±10%		
	Operating Grid Frequency (Hz)	50 / 60 Hz		
	Current Harmonic Distortion (THDi)	<3% per IEEE 519		
	Power Factor (CosPhi) ^[2]	0.5 leading ... 0.5 lagging		
	Reactive Power Compensation	Four quadrant operation		
	DC Voltage Range Full Power ^[3]	1019 V – 1500 V		
DC	Maximum DC Voltage	1500 V		
	DC Voltage Ripple	<3%		
	Max. DC Continuous Current (A)	2579	3868	5157
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms		
	Battery Technology	All type of batteries (BMS required)		
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)	98.84%	98.87%	98.94%
	CEC (η)	98.34%	98.49%	98.51%
CABINET	Dimensions [WxDxH] (ft)	9.8 x 6.5 x 7.5		
	Dimensions [WxDxH] (m)	3.0 x 2.0 x 2.3		
	Weight (lbs)	8600	9700	10365
	Weight (kg)	3900	4400	4700
	Type of Ventilation	Forced air cooling		
ENVIRONMENT	Degree of Protection	NEMA 3R / IP55		
	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >35 °C power derating		
	Operating Relative Humidity Range	From 4% to 100% non-condensing		
	Storage Temperature Range	From -40 °C to +60 °C		
	Max. Altitude (above sea level) ^[5]	2000 m / >2000 m power derating (max. 4000 m)		
CONTROL INTERFACE	Communication Protocol	Modbus TCP		
	Power Plant Controller	Optional		
	Keyed ON/OFF Switch	Standard		
PROTECTIONS	Ground Fault Protection	Insulation monitoring device		
	Humidity Control	Active heating		
	General AC Protection & Disconnection	Circuit breaker		
	General DC Protection & Disconnection	High-speed fuses, Motorized DC disconnect switches ^[6]		
	Overvoltage Protection	Type 2 for AC and Type 1+2 for DC		
CERTIFICATIONS & STANDARDS	Safety	UL 1741 / CSA 22.2 No.107:1-16 / IEC 62109-1 / IEC 62109-2 / IEC 62477-1		
	Installation	NEC 2023		
	Utility Interconnect ^[7]	UL 1741 SA & SB / IEEE 1547:1 / IEC 62116 / / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549		

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.

[2] Consult P-Q charts available: Q(kVar)=√(S(kVA)²-P(kW)²).

[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

[4] Optional available for temperatures down to -35 °C.

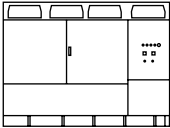
[5] Consult Power Electronics for altitudes above 1000 m.

[6] Battery short circuit disconnection must be done on the battery side.

[7] Consult Power Electronics for other applicable standards / grid codes.

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Freemaq PCSK



COMMON FEATURES PCSK		FRAME 2	FRAME 3	FRAME 4
AC	Max. AC Output Current (A) @40 °C	1837	2756	3674
	Operating Grid Frequency (Hz)	50/60 Hz		
	Current Harmonic Distortion (THDi)	<3% per IEEE519		
	Power Factor (CosPhi) ^[1]	0.5 leading ... 0.5 lagging		
	Reactive Power Compensation	Four quadrant operation		
DC	DC Voltage Ripple	<3%		
	Max. DC Continuous Current (A)	2295	3443	4590
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms		
	Battery Technology	All type of batteries (BMS required)		
CABINET	Dimensions [WxDxH] (ft)	9.8 x 6.5 x 7.5		
	Dimensions [WxDxH] (m)	3.0 x 2.0 x 2.3		
	Weight (lbs)	8600	9700	10365
	Weight (kg)	3900	4400	4700
	Type of Ventilation	Forced air cooling		
ENVIRONMENT	Degree of Protection	NEMA 3R / IP55		
	Operating Temperature Range ^[2]	From -25 °C to +60 °C, >40 °C power derating		
	Operating Relative Humidity Range	From 4% to 100% non-condensing		
	Storage Temperature Range	From -40 °C to +60 °C		
	Max. Altitude (above sea level)	2000 m / >2000 m power derating (Max. 4000 m)		
CONTROL INTERFACE	Communication Protocol	Modbus TCP		
	Power Plant Controller	Optional. Third party SCADA systems supported.		
	Keyed ON/OFF Switch	Standard		
PROTECTIONS	Ground Fault Protection	Insulation monitoring device		
	Humidity Control	Active heating		
	General AC Protection & Disconn.	Circuit breaker		
	General DC Protection & Disconn. ^[3]	High-speed fuses, Motorized DC disconnect switches		
	Overvoltage Protection	Type II for AC and Type I+II for DC		
CERTIFICATIONS & STANDARDS	Safety	UL 1741 / CSA 22.2 No.1071-16 / IEC 62109-1 / IEC 62109-2 / IEC 62477-1		
	Installation	NEC 2023 / IEC		
	Utility Interconnect ^[4]	IEEE 1547:2018 / UL 1741 SA & SB/ IEC 62116:2014		

NOTES

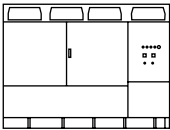
- [1] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²).
- [2] Optional available for temperatures down to -35°C.
- [3] Battery short circuit disconnection has to be done on the battery side.
- [4] Consult Power Electronics for other applicable standards/grid codes.
- [5] Values at 1.00-Vac nom and CosPhi=1. The maximum AC output power must be limited to meet the P-Q capability requirement at the inverter level of some grid codes. Consult Power Electronics for derating curves and overload capability in grid forming mode.
- [6] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

690 V				660 V			645 V			630 V					
FRAME	2	3	4	2	3	4	2	3	4	2	3	4			
REF.	FP2195K	FP3290K	FP4390K	FP2101K	FP3151K	FP4200K	FP2055K	FP3080K	FP4105K	FP2005K	FP3005K	FP4010K			
AC	AC Output Power (kVA/kW) @40 °C [5]	2195	3290	4390	2100	3150	4200	2055	3080	4105	2005	3005	4010		
	AC Output Power (kVA/kW) @50 °C [5]	2035	3055	4075	1950	2925	3900	1905	2855	3810	1860	2790	3720		
	Operating Grid Voltage (VAC)	690 V ±10%			660 V ±10%			645 V ±10%			630 V ±10%				
DC	DC Voltage Range [6]	976 V - 1500 V			934 V - 1500 V			913 V - 1500 V			891 V - 1500 V				
	Maximum DC Voltage	1500 V			1500 V			1500 V			1500 V				
EFFICIENCY	Efficiency (Max) (η)	98.84%	98.87%	98.94%	98.86%	98.89%	98.95%	98.85%	98.88%	98.81%	98.79%	98.82%	98.88%		
	Euroeta (η)	98.34%	98.49%	98.51%	98.36%	98.51%	98.53%	98.24%	98.39%	98.41%	98.28%	98.43%	98.45%		
615 V				600 V			530 V			500 V			480 V		
FRAME	2	3	4	2	3	4	2	3	4	2	3	4	2	3	4
REF.	FP1955K	FP2935K	FP3915K	FP1910K	FP2865K	FP3820K	FP1685K	FP2530K	FP3370K	FP1590K	FP2385K	FP3180K	FP1525K	FP2290K	FP3055K
AC	1955	2935	3915	1910	2865	3820	1685	2530	3370	1590	2385	3180	1525	2290	3055
	1815	2725	3635	1775	2660	3545	1565	2350	3130	1475	2215	2955	1415	2125	2840
	615 V ±10%			600 V ±10%			530 V ±10%			500 V ±10%			480V ±10%		
DC	870 V - 1500 V			849 V - 1500 V			750 V - 1300 V			708 V - 1250 V			679 V - 1200 V		
	1500 V			1500 V			1300 V			1250 V			1200 V		
EFFICIENCY	98.75%	98.78%	98.77%	98.82%	98.85%	98.78%	98.78% (preliminary)			98.78% (preliminary)			98.78% (preliminary)		
	98.20%	98.35%	98.37%	98.18%	98.33%	98.35%	98.35% (preliminary)			98.35% (preliminary)			98.35% (preliminary)		

NOTES

- [1] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²).
- [2] Optional available for temperatures down to -35°C.
- [3] Battery short circuit disconnection has to be done on the battery side.
- [4] Consult Power Electronics for other applicable standards/grid codes.
- [5] Values at 1.00-Vac nom and CosPhi=1. The maximum AC output power must be limited to meet the P-Q capability requirement at the inverter level of some grid codes. Consult Power Electronics for derating curves and overload capability in grid forming mode.
- [6] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

Freemaq Multi PCSK



Preliminary		690 V			
FRAME		2	3	4	
REFERENCES		FP2510K2	FP3765K3	FP5020K2	FP5020K4
AC	AC Output Power (kVA/kW) @35 °C ^[1]	2510	3765	5020	
	AC Output Power (kVA/kW) @40 °C ^[1]	2400	3600	4800	
	AC Output Power (kVA/kW) @50 °C ^[1]	2180	3270	4360	
	Max. AC Output Current (A) @35 °C	2100	3150	4200	
	Operating Grid Voltage (kV)	690 V ±10%			
	Operating Grid Frequency (Hz)	50 / 60 Hz			
	Current Harmonic Distortion (THDi)	<3% per IEEE 519			
	Power Factor (CosPhi) ^[2]	0.5 leading... 0.5 lagging			
	Reactive Power Compensation	Four quadrant operation			
DC	DC Voltage Range Full Power ^[3]	976 V – 1500 V			
	Maximum DC Voltage	1500 V			
	DC Voltage Ripple	<3%			
	Max. DC Continuous Current (A)	1312	1312	2624	1312
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms			
	Battery Technology	All type of batteries (BMS required)			
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)	98.84%	98.87%	98.94%	
	CEC (η)	98.34%	98.49%	98.51%	
CABINET	Dimensions [WxDxH] (ft)	9.8 x 6.5 x 7.5			
	Dimensions [WxDxH] (m)	3.0 x 2.0 x 2.3			
	Weight (lbs)	8600	9700	10365	
	Weight (kg)	3900	4400	4700	
	Type of Ventilation	Forced air cooling			
ENVIRONMENT	Degree of Protection	NEMA 3R / IP55			
	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >35 °C power derating			
	Operating Relative Humidity Range	From 4% to 100% non-condensing			
	Storage Temperature Range	From -40 °C to +60 °C			
	Max. Altitude (above sea level) ^[5]	2000 m / >2000 m power derating (max. 4000 m)			
CONTROL INTERFACE	Communication Protocol	Modbus TCP			
	Power Plant Controller	Optional			
	Keyed ON/OFF Switch	Standard			
PROTECTIONS	Ground Fault Protection	Insulation monitoring device			
	Humidity Control	Active heating			
	General AC Protection & Disconnection	Circuit breaker			
	General DC Protection & Disconnection	High-speed fuses, Motorized DC disconnect switches ^[6]			
	Overvoltage Protection	Type 2 for AC and Type 1+2 for DC			
CERTIFICATIONS & STANDARDS	Safety	UL 1741 / CSA 22.2 No.1071-16 / IEC 62109-1 / IEC 62109-2 / IEC 62477-1			
	Installation	NEC 2023			
	Utility Interconnect ^[7]	UL 1741 SA & SB / IEEE 1547.1 / IEC 62116 / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549			

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA)^2-P(kW)^2)}$.

[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

[4] Optional available for temperatures down to -35 °C.

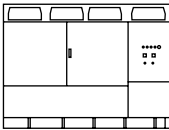
[5] Consult Power Electronics for altitudes above 1000 m.

[6] Battery short circuit disconnection must be done on the battery side.

[7] Consult Power Electronics for other applicable standards / grid codes.

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Freemaq Multi PCSK



Preliminary		720 V			
FRAME		2	3	4	
REFERENCES		FP2575K2	FP3865K3	FP5150K2	FP5150K4
AC	AC Output Power (kVA/kW) @35 °C ^[1]	2575	3865	5150	
	AC Output Power (kVA/kW) @40 °C ^[1]	2470	3705	4940	
	AC Output Power (kVA/kW) @50 °C ^[1]	2260	3390	4520	
	Max. AC Output Current (A) @35 °C	2065	3097	4130	
	Operating Grid Voltage (kV)	720 V ±10%			
	Operating Grid Frequency (Hz)	50 / 60 Hz			
	Current Harmonic Distortion (THDi)	<3% per IEEE 519			
	Power Factor (CosPhi) ^[2]	0.5 leading... 0.5 lagging			
	Reactive Power Compensation	Four quadrant operation			
DC	DC Voltage Range Full Power ^[3]	1019 V – 1500 V			
	Maximum DC Voltage	1500 V			
	DC Voltage Ripple	<3%			
	Max. DC Continuous Current (A)	1289	1289	2579	1289
	Max. DC Short Circuit Current (kA)	500 kA with a time constant of 1 ms			
	Battery Technology	All type of batteries (BMS required)			
EFFICIENCY & AUX. SUPPLY	Efficiency (Max) (η)	98.84%	98.87%	98.94%	
	CEC (η)	98.34%	98.49%	98.51%	
CABINET	Dimensions [WxDxH] (ft)	9.8 x 6.5 x 7.5			
	Dimensions [WxDxH] (m)	3.0 x 2.0 x 2.3			
	Weight (lbs)	8600	9700	10365	
	Weight (kg)	3900	4400	4700	
	Type of Ventilation	Forced air cooling			
ENVIRONMENT	Degree of Protection	NEMA 3R / IP55			
	Operating Temperature Range ^[4]	From -25 °C to +60 °C, >35 °C power derating			
	Operating Relative Humidity Range	From 4% to 100% non-condensing			
	Storage Temperature Range	From -40 °C to +60 °C			
	Max. Altitude (above sea level) ^[5]	2000 m / >2000 m power derating (max. 4000 m)			
CONTROL INTERFACE	Communication Protocol	Modbus TCP			
	Power Plant Controller	Optional			
	Keyed ON/OFF Switch	Standard			
PROTECTIONS	Ground Fault Protection	Insulation monitoring device			
	Humidity Control	Active heating			
	General AC Protection & Disconnection	Circuit breaker			
	General DC Protection & Disconnection	High-speed fuses, Motorized DC disconnect switches ^[6]			
	Overvoltage Protection	Type 2 for AC and Type 1+2 for DC			
CERTIFICATIONS & STANDARDS	Safety	UL 1741 / CSA 22.2 No.1071-16 / IEC 62109-1 / IEC 62109-2 / IEC 62477-1			
	Installation	NEC 2023			
	Utility Interconnect ^[7]	UL 1741 SA & SB / IEEE 1547.1 / IEC 62116 / G99 / VDE 4110-4120-4130 / CEI 0-16 / NTS 2.1 / EN 50549			

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1.
Consult Power Electronics for derating curves and overload capability in grid forming mode.

[2] Consult P-Q charts available: $Q(kVar)=\sqrt{(S(kVA)^2-P(kW)^2)}$.

[3] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

[4] Optional available for temperatures down to -35 °C.

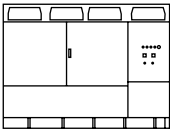
[5] Consult Power Electronics for altitudes above 1000 m.

[6] Battery short circuit disconnection must be done on the battery side.

[7] Consult Power Electronics for other applicable standards / grid codes.

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Freemaq Multi PCSK

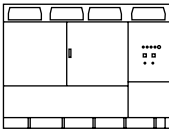


COMMON FEATURES MULTI PCSK		FRAME 2	FRAME 3	FRAME 4	
AC	Max. AC Output Current (A) @40 °C	1837	2756	3674	
	Operating Grid Frequency (Hz)	50/60 Hz			
	Current Harmonic Distortion (THDi)	<3% per IEEE519			
	Power Factor (CosPhi) ^[1]	0.5 leading... 0.5 lagging			
	Reactive Power Compensation	Four quadrant operation			
DC	DC Voltage Ripple	<3%			
	Max. DC Continuous Current per Input (A)	1148	1148	2295	1148
	Max. DC Short Circuit Current per Input (kA)	500 kA with a time constant of 1 ms			
	Battery Technology	All type of batteries (BMS required)			
	Number of Separate DC Inputs	2	3	2	4
CABINET	Dimensions [WxDxH] (ft)	9.8 x 6.5 x 7.5			
	Dimensions [WxDxH] (m)	3.0 x 2.0 x 2.3			
	Weight (lbs)	8600	9700	10365	
	Weight (kg)	3900	4400	4700	
	Type of Ventilation	Forced air cooling			
ENVIRONMENT	Degree of Protection	NEMA 3R / IP55			
	Operating Temperature Range ^[2]	From -25 °C to +60 °C, >40 °C power derating			
	Operating Relative Humidity Range	From 4% to 100% non-condensing			
	Storage Temperature Range	From -40 °C to +60 °C			
	Max. Altitude (above sea level)	2000m / >2000m power derating (Max. 4000m)			
CONTROL INTERFACE	Communication Protocol	Modbus TCP			
	Power Plant Controller	Optional. Third party SCADA systems supported			
	Keyed ON/OFF Switch	Standard			
PROTECTIONS	Ground Fault Protection	Insulation monitoring device			
	Humidity Control	Active heating			
	General AC Protection & Disconn.	Circuit breaker			
	General DC Protection & Disconn. ^[3]	High-speed fuses, Motorized DC disconnect switches			
	Overvoltage Protection	Type II for AC and Type I+II for DC			
CERTIFICATIONS & STANDARDS	Safety	UL 1741 / CSA 22.2 No.1071-16 / IEC 62109-1 / IEC 62109-2 / IEC 62477-1			
	Installation	NEC 2023			
	Utility Interconnect ^[4]	IEEE 1547:2018 / UL 1741 SA & SB/ IEC 62116:2014			

NOTES

- [1] Consult P-Q charts available: Q(kVAr)=√(S(kVA)²-P(kW)²).
- [2] Optional available for temperatures down to -35 °C.
- [3] Battery short circuit disconnection has to be done on the battery side.
- [4] Consult Power Electronics for other applicable standards/grid codes.

Freemaq Multi PCSK

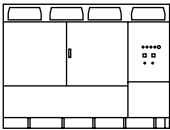


690 V		FRAME 2	FRAME 3	FRAME 4	
REFERENCES		FP2195K2	FP3290K3	FP4390K2	FP4390K4
AC	AC Output Power (kVA/kW) @40 °C ^[1]	2195	3290	4390	
	AC Output Power (kVA/kW) @50 °C ^[1]	2035	3055	4075	
	Operating Grid Voltage (VAC)			690 V ±10%	
DC	DC Voltage Range ^[2]			976 V - 1500 V	
	Maximum DC Voltage			1500 V	
	Number of Separate DC Inputs	2	3	2	4
EFFICIENCY	Efficiency (Max) (η)	98.84%	98.87%	98.94%	
	Euroeta (η)	98.34%	98.49%	98.51%	
660 V		FRAME 2	FRAME 3	FRAME 4	
REFERENCES		FP2101K2	FP3151K3	FP4200K2	FP4200K4
AC	AC Output Power (kVA/kW) @40 °C ^[1]	2100	3150	4200	
	AC Output Power (kVA/kW) @50 °C ^[1]	1950	2925	3900	
	Operating Grid Voltage (VAC)			660 V ±10%	
DC	DC Voltage Range ^[2]			934 V - 1500 V	
	Maximum DC Voltage			1500 V	
	Number of Separate DC Inputs	2	3	2	4
EFFICIENCY	Efficiency (Max) (η)	98.86%	98.89%	98.95%	
	Euroeta (η)	98.36%	98.51%	98.53%	
645 V		FRAME 2	FRAME 3	FRAME 4	
REFERENCES		FP2055K2	FP3080K3	FP4105K2	FP4105K4
AC	AC Output Power (kVA/kW) @40 °C ^[1]	2055	3080	4105	
	AC Output Power (kVA/kW) @50 °C ^[1]	1905	2855	3810	
	Operating Grid Voltage (VAC)			645 V ±10%	
DC	DC Voltage Range ^[2]			913 V - 1500 V	
	Maximum DC Voltage			1500 V	
	Number of Separate DC Inputs	2	3	2	4
EFFICIENCY	Efficiency (Max) (η)	98.85%	98.88%	98.81%	
	Euroeta (η)	98.24%	98.39%	98.41%	

NOTES

- [1] Values at 1.00-Vac nom and CosPhi=1. The maximum AC output power must be limited to meet the P-Q capability requirement at the inverter level of some grid codes. Consult Power Electronics for derating curves and overload capability in grid forming mode.
- [2] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

Freemaq Multi PCSK

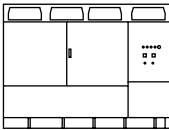


630 V		FRAME 2	FRAME 3	FRAME 4	
REFERENCES		FP2005K2	FP3005K3	FP4010K2	FP4010K4
AC	AC Output Power (kVA/kW) @40 °C ^[1]	2005	3005	4010	
	AC Output Power (kVA/kW) @50 °C ^[1]	1860	2790	3720	
	Operating Grid Voltage (VAC)	630 V ±10%			
DC	DC Voltage Range ^[2]	891 V - 1500 V			
	Maximum DC Voltage	1500 V			
	Number of Separate DC Inputs	2	3	2	4
EFFICIENCY	Efficiency (Max) (η)	98.79%	98.82%	98.88%	
	Euroeta (η)	98.28%	98.43%	98.45%	
615 V		FRAME 2	FRAME 3	FRAME 4	
REFERENCES		FP1955K2	FP2935K3	FP3915K2	FP3915K4
AC	AC Output Power (kVA/kW) @40 °C ^[1]	1955	2935	3915	
	AC Output Power (kVA/kW) @50 °C ^[1]	1815	2725	3635	
	Operating Grid Voltage (VAC)	615 V ±10%			
DC	DC Voltage Range ^[2]	870 V - 1500 V			
	Maximum DC Voltage	1500 V			
	Number of Separate DC Inputs	2	3	2	4
EFFICIENCY	Efficiency (Max) (η)	98.75%	98.78%	98.77%	
	Euroeta (η)	98.20%	98.35%	98.37%	
600 V		FRAME 2	FRAME 3	FRAME 4	
REFERENCES		FP1910K2	FP2865K3	FP3820K2	FP3820K4
AC	AC Output Power (kVA/kW) @40 °C ^[1]	1910	2865	3820	
	AC Output Power (kVA/kW) @50 °C ^[1]	1775	2660	3545	
	Operating Grid Voltage (VAC)	600 V ±10%			
DC	DC Voltage Range ^[2]	849 V - 1500 V			
	Maximum DC Voltage	1500 V			
	Number of Separate DC Inputs	2	3	2	4
EFFICIENCY	Efficiency (Max) (η)	98.82%	98.85%	98.78%	
	Euroeta (η)	98.18%	98.33%	98.35%	
530 V		FRAME 2	FRAME 3	FRAME 4	
REFERENCES		FP1685K2	FP2530K3	FP3370K2	FP3370K4
AC	AC Output Power (kVA/kW) @40 °C ^[1]	1685	2530	3370	
	AC Output Power (kVA/kW) @50 °C ^[1]	1565	2350	3130	
	Operating Grid Voltage (VAC)	530 V ±10%			
DC	DC Voltage Range ^[2]	750 V - 1300 V			
	Maximum DC Voltage	1300 V			
	Number of Separate DC Inputs	2	3	2	4
EFFICIENCY	Efficiency (Max) (η) (preliminary)	98.78%			
	Euroeta (η) (preliminary)	98.35%			

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1. The maximum AC output power must be limited to meet the P-Q capability requirement at the inverter level of some grid codes. Consult Power Electronics for derating curves and overload capability in grid forming mode.
[2] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

Freemaq Multi PCSK



500 V		FRAME 2	FRAME 3	FRAME 4	
REFERENCES		FP1590K2	FP2385K3	FP3180K2	FP3180K4
AC	AC Output Power (kVA/kW) @40 °C ^[1]	1590	2385	3180	
	AC Output Power (kVA/kW) @50 °C ^[1]	1475	2215	2955	
	Operating Grid Voltage (VAC)	500 V ±10%			
DC	DC Voltage Range ^[2]	708 V - 1250 V			
	Maximum DC Voltage	1250 V			
	Number of Separate DC Inputs	2	3	2	4
EFFICIENCY	Efficiency (Max) (η) (preliminary)	98.78%			
	Euroeta (η) (preliminary)	98.35%			
480 V		FRAME 2	FRAME 3	FRAME 4	
REFERENCES		FP1525K2	FP2290K3	FP3055K2	FP3055K4
AC	AC Output Power (kVA/kW) @40 °C ^[1]	1525	2290	3055	
	AC Output Power (kVA/kW) @50 °C ^[1]	1415	2125	2840	
	Operating Grid Voltage (VAC)	480 V ±10%			
DC	DC Voltage Range ^[2]	679 V - 1200 V			
	Maximum DC Voltage	1200 V			
	Number of Separate DC Inputs	2	3	2	4
EFFICIENCY	Efficiency (Max) (η) (preliminary)	98.78%			
	Euroeta (η) (preliminary)	98.35%			

NOTES

[1] Values at 1.00-Vac nom and CosPhi=1. The maximum AC output power must be limited to meet the P-Q capability requirement at the inverter level of some grid codes. Consult Power Electronics for derating curves and overload capability in grid forming mode.
[2] Consult Power Electronics for derating curves. In the event of overvoltage in the grid, the minimum DC voltage will vary proportionally with the AC voltage.

XMV670



INPUT	Input voltage (kV)	2.3 kV to 13.8 kV (±10%), 480 V ^[1]
	Frequency	50/60 Hz (±5%)
	Power factor	> 0.95 (over 20% load)
	THDi (%) current ^[2]	< 5%
	Power transformer	Phase-shift transformer, dry type (18 or 30)
	Overvoltage protection (optional)	Surge Arresters (Input cell or XMVK according to frame size)
	Overcurrent portection (optional)	Cell with circuit breaker or fuses
	Voltage dip	IEC/EN 61000-4-34
	Drive bypass	Optional bypass cabinet
OUTPUT	Technology	Multi-level, pulse-width modulation, low voltage power modules connected in series
	Output voltage (kV)	2.3 kV, 3 kV, 3.3 kV, 4.16 kV, 6k V, 6.6 kV
	Pulses / power modules in series	18p/3, 30p/5
	Power modules (A)/(V)	80 A, 150 A, 240 A @ 40 °C / 650 V - 825 V
	Overload capacity	120% Inom (60s/10min) 40 °C
		150% Inom (60s/10min) 50 °C
	Current harmonic distorsion THDi	< 5%
	Harmonic Voltage Factor (HVF)	< 2% (No motor derating required)
	Frequency	0.5 to 599 Hz ^[3] (0.01 Hz accuracy)
	Efficiency	≥96% (including transformer)
	Output voltage boosting	Transformer with adjustable taps
ENVIRONMENTAL RATINGS	Inductance (optional)	Input cell
	Operation conditions	Indoor, no caustic and volatile air, no dust
	Degree of protection	IP41, IP42
	Operation temperature	-20 °C to +50 °C; >40 °C power derating 2%/°C Pn
	Storage temperature	-25 °C to +70 °C
	Humidity	<95%, not condensing, optional heating
	Altitude	<1000 m; >1000 m power derating 1%/100 m. Max. 4000 m (optional > 4000 m with overvoltage protection)
	Seismicity	UBC4/High level IEEE 693:2018 ^[4]
	Ventilation	Forced, redundancy optional or channelling
CONTROL	Noise	< 80 dB at 1 m
	Control mode	Local control (Graphic display 2.8") + emergency switch Remote Control I/O (optional)
	Control method	V/Hz VECTOR CONTROL Open Loop: PMC speed / torque control, AVC speed / torque control Close Loop (Encoder): PMC speed / torque control, AVC speed / torque control
	Carrier frequency	381 - 1526 Hz
	Control power supply	External 220-230 Vac or 110-120 Vac + 2nd transformer MT
	Other characteristics	Voltage/Power ride through, quick setting and commissioning, master-slave synchronization, skip critical frequencies, delay-off IGBT, motor pre-magnetization, flux reduction at low load (energy saver), electric DC brake, multi-reference and speed ramp, Power PLC programming. Other consult Power Electronics.
	Display	Graphic display 2.8" TFT-LCF
	Connection	USB, 3 m
	Features	8GB microSD class 10, faults and events logs and notification, sabe and copy the parameters, coded access to parameters with password.
LOCAL CONTROL PANEL	Display LED	GREEN: Motor running Blinking GREEN: Warning RED: Fault

LOCAL CONTROL PANEL	Display information	Average current and 3-phase motor current, Average voltage and 3-phase motor voltage, 3-phase input voltage, Drive status, Speed, Torque, Power, Power factor of motor, Individual modules status, Register of total and partial drive energy consumption status (kWh) with reset function, Relay status, Digital inputs/PTC status, Output comparator status, Analogue inputs and sensor values, Analogue output value, Motor overload and equipment status, Drive and rectifier temperature, Fault history (last 6 faults).
	Visualization LEDs (optional)	GREEN: Running Blinking GREEN: Warning RED: Fault
	Push buttons (optional)	Green: Local start Red: Local stop White: Fault reset
USER INTERCONNECTION	Digital inputs	4 programmable, Active high (24 Vdc), Isolated power supply 5 pre-configured (Start/Stop, Reset, Control mode, Reference, spare) (optional) 1 PTC Input
	Analogue inputs	1 standard input + optional 2 programmable and differential (0–20 mA, 4–20 mA, 0–10 Vcc and ±10 Vcc). Optically isolated 8 RTD inputs (optional)
	Digital outputs	3 programmable changeover relays (250 Vca, 8 A o 30 Vcc, 8 A) 5 pre-configured contacts (Start/Stop, Warning, Fault, spare) (optional)
	Analogue outputs	1 standard output + optional 2 programmable isolated: 0 – 20 mA, 4 – 20 mA, 0 – 10 Vcc and ±10 Vcc
	Encoder (optional)	2 differential encoder input (process and vector control). Input signal from 5 to 24 Vdc
	Standard hardware	Ethernet, RS485
COMMUNICATIONS	Standard protocol	Modbus-RTU and Modbus-TCP
	Optional protocol	Profibus-DP, Profinet, Ethernet IP
PROTECTIONS	Motor protections	Rotor locked, Torque limit, Motor overload (thermal model), Output current limit, Phase current imbalance, Ground fault current, Phase voltage imbalance, Motor over-temperature (PTC), Speed limit, Excessive starting and stopping time.
	Drive protections	Input phase loss, Low input voltage, High input voltage, Maximum number os faulty modules, High input frequency, Low input frequency, Drive overload, Drive over-temperature, Analogue input signal loss (speed reference loss), communication loss (time-out), power supply fault, Emergency stop.
	Power modules protections	Input overcurrent (fuses), High and Low DC bus voltage, DC bus voltage instability, DC bus soft charge fault, Low input voltage, Fiber optics communication lost, Communication time overpassed (time-out), Control voltage lost, Gate drive fault, Power module overtemperature.
REGULATION	Electromagnetic compatibility	EMC 2014/30/EU IEC/EN 61800-3 IEEE 519
	VSD design and construction	IEC/EN 61800-2 General requirements IEC/EN 61800-5-1 Safety IEC/EN 60146-1-1 Semiconductor converters UL 347A MV drives (4,16 kV models only)
	MV Transformer	IEC/EN 60076 -1, -3, -11
		IEC/EN 61378-1

NOTES	[1] Low voltage input is only applicable to products up to 240 A. [2] Harmonics are below the limits defined in IEEE519 for all SC/IL. [3] For operational frequencies higher than 100 Hz, consult Power Electronics. [4] Need for specific anchors to the ground to meet this degree and installation conditions, without anchoring UBC3/Moderate Level IEEE 693.
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XMV670

CONFIGURATION TABLE

XMV670 Series	Topology		ND (40°) Active Power (kW)	A Max. Current Cells (ND 40°)		B Output Voltage (kV)		C Degree protection		D Input Voltage (kV)		E Extra Isolation (> 4000msnm)	
				A									
X67	S	Standard	0150	A	80 A	23	2.3	1	IP41/NEMA1	23	2.3	S	Not needed
	K	Kompakt	...	B	150 A	30	3.0	2	IP42	30	3.0	A	Needed
			1400	C	240 A	33	3.3			33	3.3		
			1500 ^[1]	D ^[1]	360 A	41	4.1			41	4.1		
			...	E ^[1]	480 A	60	6			60	6		
			9000 ^[1]			66	6.6			66	6.6		
						10 ^[1]	10			10 ^[1]	10		
						11 ^[1]	11			11 ^[1]	11		
						13 ^[1]	13.8			13 ^[1]	13.8		

DIMENSIONS

Format: Standard



Format: Kompakt



Output voltage	Input voltage	Format	Rated Current		Width W (mm)	Depth D (mm)	Height h (mm)	Height H (mm)	Weight (kg)
			40 °C Normal duty	50 °C Heavy duty					
4.16 kV	4.16 kV	Kompakt	< 80 A	< 60 A	1209	1249	2300	2709	2300
		Kompakt	81 A - 150 A	61 A - 120 A	1610	1249	2300	2785	3850
		Kompakt	151 A - 240 A	121 A - 192 A	1700	1500	2300	2737	4000
	10 - 13.8 kV	Standard	151 A - 240 A	121 A - 192 A	3000	1250	1930	2300	*
6.6 kV	6.6 kV	Kompakt	< 80 A	< 60 A	1610	1249	2785	2737	3415
		Kompakt	81 A - 150 A	61 A - 120 A	1991	1610	2709	2737	4800
		Standard	151 A - 240 A	121 A - 192 A	3500	1250	1930	2300	6460
	10 - 13.8 kV	Standard	151 A - 240 A	121 A - 192 A	4000	1250	1930	2300	*

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NOTES

WARRANTY

Power Electronics (the Seller) warrants that their Products are free of faults and defects for a period of 3 years, valid from the date of delivery to the Buyer. It shall be understood that a product is free of faults and defects when its condition and performance is in compliance with its specification.

The warranty shall not extend to any Products whose defects are due to (i) careless or improper use, (ii) failure to observe the Seller's instructions regarding the transport, installation, functioning, maintenance and the storage of the Products, (iii) repairs or modifications made by the Buyer or third party without prior written authorization of the Seller, (iv) negligence during the implementation of authorized repairs or modifications, (v) if serial numbers are modified or illegible, (vi) anomalies caused by, or connected to, the elements coupled directly by the Buyer or by the final customer, (vii) accidents or events that place the Product outside its storage and operational specification, (viii) continued use of the Products after identification of a fault or defect.

The warranty excludes components that must be replaced periodically such as fuses, lamps & air filters or consumable materials subject to normal wear and tear.

The warranty excludes external parts that are not manufactured by the Seller under the brand of Power Electronics.

The Seller undertakes to replace or to repair, himself, at their discretion, any Product or its part that demonstrates a fault or defect, which is in conformance with the aforementioned terms of the warranty. Reasonable costs associated with the disassembly/ assembly, transport and customs of equipment will also be undertaken by the Seller except in cases of approved intervention by the Buyer and/or their representative where cost allocation has been previously agreed.



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