

Brochure 21/22
Easy to drive

Medium Voltage

MME

DI

UIM

Page. 4 – 5

PE genetics

CONTENTS

Our products

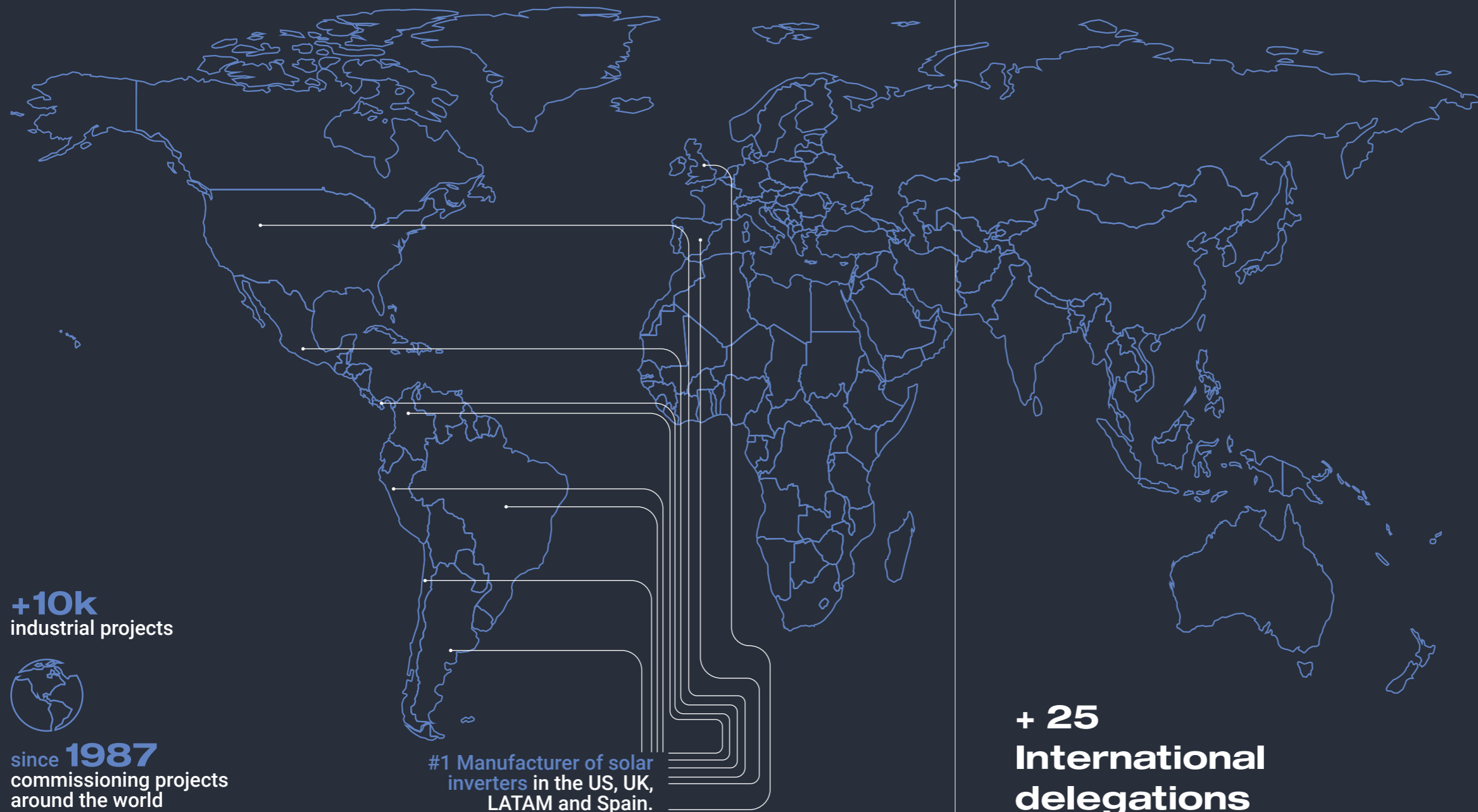
Page. 6 – 35

Page. 36 – 38

Our secret

Energy efficiency for every situation

We handle everything in-house: from design and manufacture to testing.



+10k
industrial projects



since **1987**
commissioning projects
around the world

#1 Manufacturer of solar
inverters in the US, UK,
LATAM and Spain.

+ 25
International
delegations

More than

+ 60 GW
of installed
AC power
Solar + Storage

+ 30 GW
of annual
production
capacity

+ 30
years of
excellence

MEDIUM VOLTAGE

**Boost
your
productivity**

**and energy
efficiency**

Page. 10 – 2

XMV660 **VARIABLE** **SPEED** **DRIVES**

XMV660

Extreme innovation for extreme environments



2,3kV - 13,8kV



50-60Hz



Up to 50°C

The XMV660 NEMA3R is the most innovative, rugged and reliable outdoor medium voltage drive ready for 24/7 operation under the most demanding environments.

1 Topology

The XMV660 topology eliminates problematic peak voltages at the motor terminals, and other side effects such as excessive motor heating and stray currents through to motor bearings.

2

Maximum Motor Care

Power modules of 700V are connected in series to generate a quasi sinusoidal voltage low in dV/dt, supplying sinusoidal current to the motor with negligible THDi. Additional output filters are not needed.

3 Power Quality and Efficiency

XMV660 topology meets the most stringent regulations regarding power quality (IEEE519) and electromagnetic compatibility (EMC 2004/108/EC).

High efficiency $\eta > 96\%$ above 40% load (Including transformer).

4

Regenerative Capacity

The Power Electronics XMV660 regenerative drive is a high-performance device.

It is applicable for "downhill" conveyor belts, lifting systems, winches and it is especially used to reverse the direction on high power fans or stopping large loads in highly reduced times such as in the case of centrifugal machines.

5 Safety & Protection

The XMV660 integrates built-in hardware and software protections that reduce the associated risk of medium voltage installations.

XMV660

Outdoor

The XMV660 NEMA3R is the most **innovative, rugged and reliable** outdoor medium voltage drive ready for 24/7 operation under the most demanding environments.

No need for an electrical room

LCD Display

No ambient noise inside facility



Reduced o&m - filterless system

No civil works associated

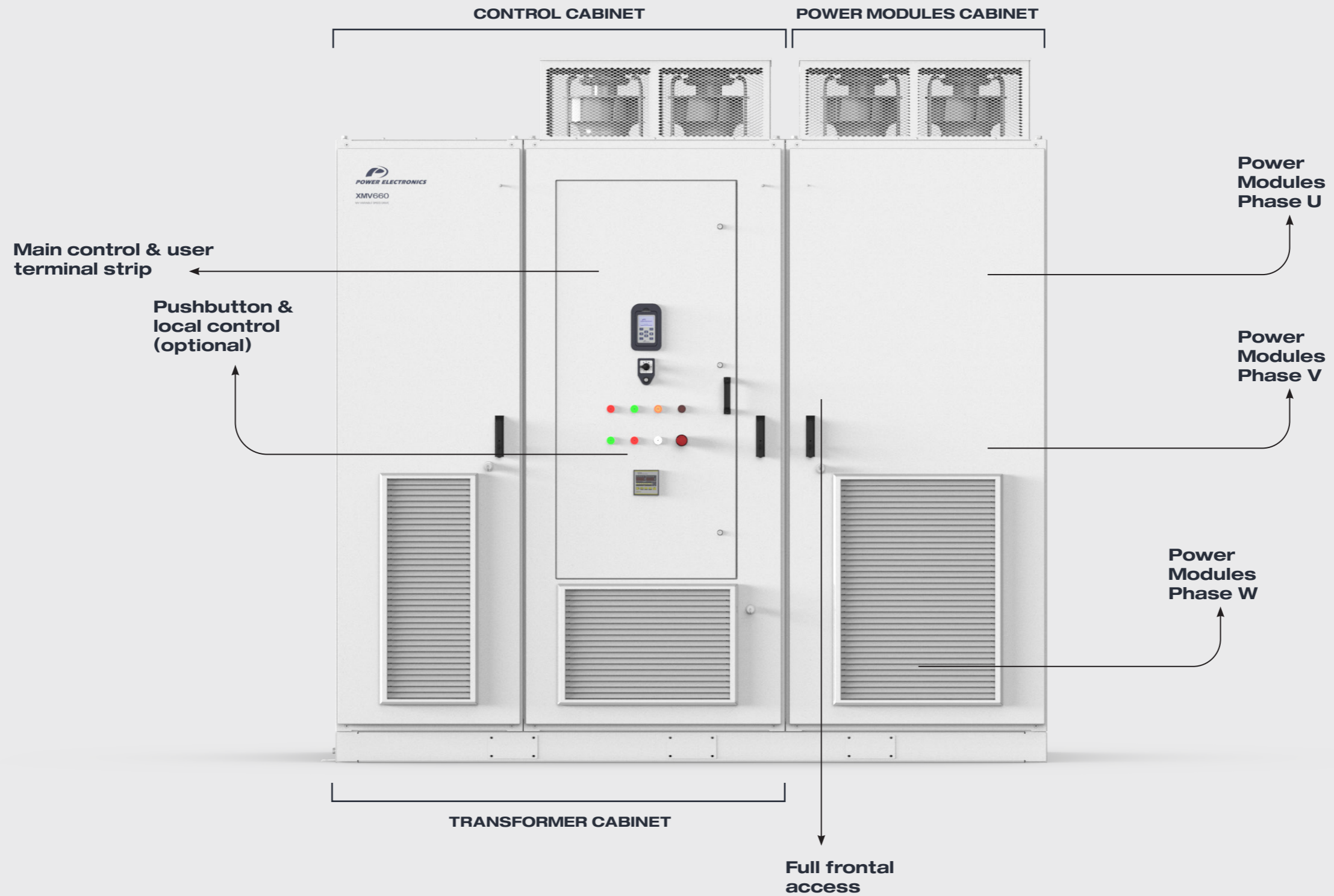
Innovative Cooling System

The innovative filter-less "cyclone drive" cooling system delivers a constant stream of clean air to the XMV660.

At the air intake, the labyrinth sifts the larger dust particles from the air stream, enabling the cyclone drive to eject the remaining contaminants, ensuring a constant flow of clean air into the electronics chamber and transformer cubicle without the need to maintain cumbersome dust filters.

XMV660 Indoor

The multistep quasi-sinusoidal output voltage produced by the cascaded H-bridge power modules is low in dV/dt and supplies sinusoidal current to the motor.



XMV660 OUTDOOR

INPUT	Input voltage (kV) ^[1]	2.3kV to 13.8kV (±10%)
	Frequency	50/60Hz (±10%)
	Power factor	> 0.95 (over 20% load)
	THDi (%) current ^[2]	< 5%
	Power transformer	Phase-shift transformer, dry type (Copper or aluminum)
	Voltage dip	Exceeds IEC/EN 61000-4-34
	Overvoltage protection	Surge Arresters
OUTPUT	Technology	Multi-level, pulse-width modulation, low voltage power modules connected in series
	Pulses / power modules in series	18p/3, 24p/4, 30p/5, 36p/6, 54p/9
	Power modules (A) / (V)	120A, 200A, 300A, 400A / 600V-700V
	Current harmonic distortion (THDi)	< 5%
	Harmonic voltage factor (HVF)	< 0.019 (No motor derating required)
	Efficiency	≥96% (including transformer) @Pn
	Tripless operation	Redundant Power System (RPS)
	Output voltage boosting	Transformer Tap Adjustment
	Degree of protection	(IEC60529) IP55, NEMA3R
	Operation temperature	-20°C to +50°C
ENVIRONMENTAL RATINGS	Storage temperature	-25°C to +55°C
	Humidity	< 95%, non condensing
	Altitude	<1000m; >1000m power derating 1%/100m. Max. 3000m Optional reinforced isolation for up to 4500m.
	Cooling	Forced air cooling, Self cleaning filters
	Control mode	Local control (Display and push-buttons) Remote control (I/O and communications), Web display (wifi)
CONTROL	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	1kHz
	Control power supply	Redundant 2x230Vac II P+N (1kVA), UPS integrated
	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.
	Digital inputs	5 programmable, Active high (24Vdc), Isolated power supply 5 pre-configured (Start/Stop ; Reset, control mode, reference) 1 PTC input
	Analogue inputs	3 programmable differential inputs. 0–20mA, 4–20mA, 0–10Vdc and ±10Vdc. (Optically isolated)
	Digital outputs	2 programmable changeover relays (250Vac, 8A or 30Vdc, 8A) 3 programmables NO contacts (250Vac, 8A or 30Vdc, 8A) 3 pre-configured contacts (Start/Stop, Warning, Failure)
	Analogue outputs	3 isolated programmable outputs: 0–20mA, 4–20mA, 0–10Vdc and ±10Vdc
	Encoder (optional)	2 differential encoders input (process and vector control). Input signal from 5 to 24Vdc
	COMMUNICATIONS	Standard Hardware	USB, RS232, RS485, Ethernet
Optional Hardware		Fiber optics, 9 Pin D-SUB, CAN
Standard Protocol		Modbus-RTU, Modbus TCP
Optional Protocol		Profibus-DP, Devicenet, CANopen, Ethernet IP and Profinet
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 of 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	Overcurrent (fuses), high DC bus voltage, Low DC bus voltage, DC bus voltage instability, low input voltage, fiber optics communication lost, communication time overpassed (time-out), control voltage lost, gate drive fault, power module overtemperature.
REGULATION	Electromagnetic compatibility	Directive EMC 2004/108/EC, IEC/EN 61800-3, IEEE 519-1992
	VSD design and construction	IEC/EN 61800-4 General requirements IEC/EN 61800-5-1 Safety IEC/EN 60146-1-1 Semiconductor converters
	MV transformer	IEC/EN 60076 -1, -11, IEC/EN 60146-1-3, IEC/EN 61378-1

CONFIGURATION TABLE

X66	1000	A	66	5	3	H						
XMV660 Series	Active Power (kW)	Cells Max. Amps	Output voltage (kV)	Overload	Degree of protection	Grid voltage (kV)						
X66	0150	150	A	120	23	2.3	2	120%	1	UL NEMA1	X	Low voltage
...	...	...	B	200	30	3	5	150%	3	UL NEMA3R	A	2.3
1000	1000	C	300	33	3.3	B	Starting Model	4	IEC IP41	B	3	
1100	1100	D	400	38	3.8	...	Under request	5	IEC IP54	C	3.3	
1200	1200	E	120NB	41	4.1	...	Under request	...	Under request	D	3.8	
...	...	F	200NB	60	6					E	4.1	
9000	9000	G	300NB	63	6.3					F	6	
10M0	10000	H	400NB	66	6.6					G	6.3	
12M5	12500	Regenerative		69	6.9					H	6.6	
24M5	24500	R	120	10	10					I	6.9	
...	Under request	S	200	11	11					J	10	
		T	300	13	13.8					K	11	
		U	400	...	Under request					L	13.8	
		V	120NB							M	15	
		W	200NB							...	Under request	
		X	300NB									
		Y	400NB									
		...	Under request									

Check the rated current of the motor nameplate and indicate the short circuit current to guarantee the compatibility with the selected drive. Consult configuration availabilities with Power Electronics.

STANDARD RATINGS

XMV660 4.16kV			
CODE	NOMINAL	MOTOR POWER	
	CURRENT (A)	kW	HP ^[1]
X660298A 41	50	298	400
X660336A 41	60	336	450
X660373A 41	70	373	500
X660447A 41	80	447	600
X660522A 41	90	522	700
X660597A 41	100	597	800
X660671A 41	120	671	900
X660746B 41	130	746	1000
X660932B 41	160	932	1250
X661119B 41	200	1119	1500
X661305C 41	230	1305	1750
X661491C 41	260	1491	2000
X661752C 41	300	1752	2350
X661864D 41	320	1864	2500
X662051D 41	360	2051	2750
X662237D 41	390	2237	3000
X662610D 41	450 ^[3]	2610	3500
X662983E 41	520 ^[3]	2983	4000
X663356E 41	580 ^[3]	3356	4500

XMV660 6.6kV			
CODE	NOMINAL	MOTOR POWER	
	CURRENT (A)	kW ^[2]	HP
X660400A 66	45	400	536
X660450A 66	50	450	603
X660500A 66	55	500	671
X660560A 66	60	560	751
X660630A 66	70	630	845
X660710A 66	80	710	952
X660800A 66	90	800	1073
X660900A 66	100	900	1207
X661000A 66	110	1000	1341
X661250B 66	140	1250	1676
X661400B 66	150	1400	1877
X661600B 66	180	1600	2146
X661800B 66	200	1800	2414
X662000C 66	220	2000	2682
X662500C 66	270	2500	3353
X662800C 66	300	2800	3755
X663150D 66	350	3150	4224
X663550D 66	390	3550	4761
X664000D 66	440 ^[3]	4000	5364
X664500E 66	500 ^[3]	4500	6035
X665000E 66	550 ^[3]	5000	6705

[1] Other configurations, consult Power Electronics.
[2] Harmonics are below the limits defined in IEEE519 for all I_{sc}/I_L.

[1] HP standard motor rated power (cos φ · Eff = 0.8, 4.16kV)
[2] kW standard motor rated power (cos φ · Eff = 0.8, 6.6kV)
2.3kV, 3kV, 3.3kV, 6kV, 10kV, 11kV, and 13.8kV Standard ratings available under request.
[3] Consult availability with Power Electronics.

XMV660 INDOOR

INPUT	Input voltage (kV) ^[1]	2.3kV to 13.8kV (±10%)	
	Frequency	50/60Hz (±10%)	
	Power factor	> 0.95 (over 20% load)	
	THDi (%) current ^[2]	< 5%	
	Power transformer	Phase-shift transformer, dry type (From 18 to 54)	
	Overvoltage protection	Surge Arresters	
	Voltage dip	Exceeds 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)	2.3kV, 3kV, 3.3kV, 4.16kV, 5kV, 5.5kV, 6kV, 6.6kV, 10kV, 11kV, 13.8kV
Pulses / power modules in series		18p/3, 24p/4, 30p/5, 36p/6, 54p/9	
Power modules (A) / (V)		120A, 200A, 300A - (400A, 630A Optional) / 600V-700V	
Overload capacity		150% (60s/10min)	
Current harmonic distortion (THDi)		< 5%	
dV/dt value		< 1000V/μs (Multi-level topology reduce peak voltages)	
Harmonic voltage factor (HVF)		< 0.019 (No motor derating required)	
Frequency		0.5 to 120Hz. (0.01Hz accuracy)	
Efficiency		≥96% (including transformer)	
Triplex operation		Redundant Power System (RPS)	
Output voltage boosting		Transformer Tap Adjustment	
ENVIRONMENTAL RATINGS	Operation conditions	Indoor, No caustic and volatile air, no dust	
	Degree of protection	IP41 (IEC60529)	
	Operation temperature	-20°C to +50°C; >50°C power derating 1%/°C Pn	
	Storage temperature	-25°C a +55°C	
	Humidity	< 95%, non condensing	
	Altitude	<1000m; >1000m power derating 1%/100m. Max. 3000m Optional reinforced isolation for up to 4500m	
	Cooling	Forced air cooling. Optional redundant	
CONTROL	Control mode	Local control (Graphic display 2.8") and push-button (optional) Remote control I/O	
	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	1kHz	
	Control power supply	Redundant 2x230Vac II P+N (3kVA), UPS integrated	
	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.	
	LOCAL CONTROL PANEL	Display	Graphic displayTFT-LCF 2.8"
		Connection	RJ45, 3m (5m Optional)
		Features	4Gb microSD card - Faults and events log and notification, save and copy the parameters. Quad Band GSM modem integrated to remote start, stop and notification by SMS. Ethernet switch with double connection RJ45 Self powered by RJ45, optional 5Vdc external power supply or batteries Comprehensive screens with built-in help system Coded access to parameters with password
Leds		Led ON: Control board is energized Led RUN: Motor receiving power supply Led FAULT: Flashing displays that a fault has occurred	
Display information		Average current and 3-phase motor current, Average voltage and 3-phase motor voltage, Average input voltage and 3-phase input voltage, 3-phase input and output frequency, Drive Status, Speed, Torque, Power, Power factor of motor, Individual Modules status, Register of total and partial drive running time with reset function. (hours), Register of total and partial drive energy consumption with reset function (kWh), 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)		RED: Running; GREEN: Stopped; AMBER:Warning; RED: Fault	
Push buttons (optional)		Control mode selector: local/stop/remote Emergency Stop Green: Local start push button Red: Local Stop push button White: Fault Reset	

USER INTERCONNECTION ^[1]	Digital inputs	9 programmable, Active high (24Vdc), Isolated power supply 5 pre-configured (Start/Stop ; Reset, control mode, reference) 1 PTC input
	Analogue inputs	3 programmable differential inputs. 0 – 20mA, 4 – 20mA, 0 – 10Vdc and ±10Vdc. (Optically isolated)
	Digital outputs	2 programmable changeover relays (250Vac, 8A or 30Vdc, 8A) 3 programmables NO contacts (250Vac, 8A or 30Vdc, 8A) 3 pre-configured contacts (Start/Stop, Warning, Failure)
	Analogue outputs	3 isolated programmable outputs: 0 – 20mA, 4 – 20mA, 0 – 10Vdc and ±10Vdc
	Encoder (optional)	2 differential encoders input (process y vector control). Input signal from 5 to 24Vdc
	COMMUNICATIONS	Standard hardware	USB, RS232, RS485, Ethernet
Optional hardware		Fiber optics, Ethernet, 9 Pin D-SUB, CAN, Ethernet
Standard protocol		Modbus-RTU, Modbus TCP
Optional protocol		Profibus-DP, DeviceNet, Ethernet IP, CANopen, Profinet
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 of 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	Overcurrent (fuses), high DC bus voltage, Low DC bus voltage, DC bus voltage instability, low input voltage, fibewr optics communication lost, communication time overpassed (time-out), control voltage lost, gate drive fault, power module overtemperature.
REGULATION	Electromagnetic compatibility	EMC 2004/108/EC IEC/EN 61800-3 IEEE 519-1992
	VSD design and construction	IEC/EN 61800-4 General requirements IEC/EN 61800-5-1 Safety IEC/EN 60146-1-1 Semiconductor converters UL 347A MV drives (4.16kV models only) UL 508C power conversion equipments (4.16kV models only)
	MV transformer	IEC/EN 60076 -1, -11 IEC/EN 60146-1-3 IEC/EN 61378-1 UL 1562 (4.16kV models only)

XMV660 INDOOR

CONFIGURATION TABLE

X66	1000		A		66		5		4		H	
XMV660 Series	Active Power (kW)		Cells Max. Amps		Output voltage (kV)		Overload		Degree of protection		Grid voltage (kV)	
X66	0150	150	A	120	23	2.3	2	120%	1	UL NEMA1	X	Low voltage
	...	...	B	200	30	3	5	150%	3	UL NEMA3R	A	2.3
	1000	1000	C	300	33	3.3	B	Starting Model	4	IEC IP41	B	3
	1100	1100	D	400	38	3.8	...	Under request	5	IEC IP54	C	3.3
	1200	1200	E	120NB	41	4.1			...	Under request	D	3.8
	...	...	F	200NB	60	6					E	4.1
	9000	9000	G	300NB	63	6.3					F	6
	10M0	10000	H	400NB	66	6.6					G	6.3
	12M5	12500	Regenerative		69	6.9					H	6.6
	24M5	24500	R	120	10	10					I	6.9
	...	Under request	S	200	11	11					J	10
			T	300	13	13.8					K	11
			U	400	...	Under request					L	13.8
			V	120NB							M	15
			W	200NB							...	Under request
			X	300NB								
			Y	400NB								
			...	Under request								

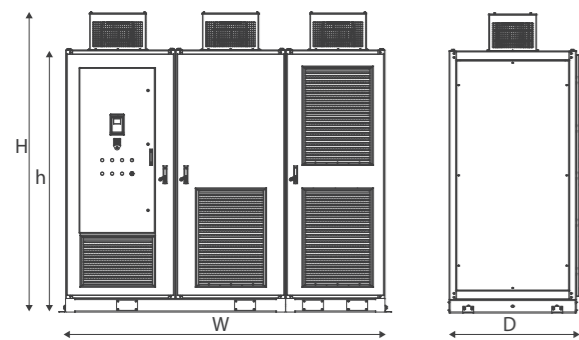
Check the rated current of the motor nameplate and indicate the short circuit current to guarantee the compatibility with the selected drive. Consult configuration availabilities with Power Electronics.

PROTECTION CELL XMV660 - CONFIGURATION TABLE

X66R	300		3		4		IA		F		O	
XMV660 Protection module	Rated current ^[1] (A)		Rated voltage (kV)		Degree of protection		Configuration		Earth switch and Fuses		Cables access	
X66R	045	45	1	3.6	1	NEMA1	CL	Fixed line contactor	O	-	O	Bottom
	050	50	2	4,76	3	NEMA3R	CX	Withdrawable line contactor	F	Fuses	T	Top input bottom output
	055	55	3	7.2	4	IEC IP44	XX	Line contactor and withdrawable bypass	E	Earth	U	Top both
	--	---	4	8.25	5	IEC IP54	IX	Withdrawable VCB	G	F+E	S	Side
	120	120	5	12	...	Under request	SI	On/Off/Earth input & output	I	On/Off/Earth input & output	B	Bus bars
	200	200	6	15			IA	Automatic circuit breaker	M	On/Off/Earth input & output	...	Under request
	300	300	7	17.5			SE	Disconnecter and Earth	...	Under request		
	450	450	...	Under request			BP	Line contactor and bypass				
	630	630					...	Under request				
	900	900										
	K00	1000										
	K25	1250										
	K50	1500										
	2K0	2000										
	...	Under request										

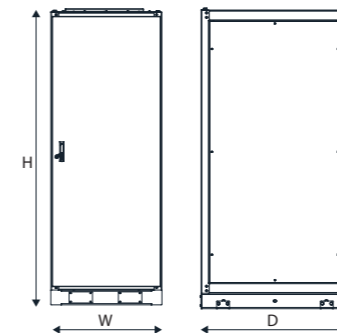
[1] Check the rated current of the motor nameplate and indicate the short circuit current to guarantee the compatibility with the selected protection module. Consult availability with Power Electronics. Please consult Power Electronics with your additional demands.

DIMENSIONS



Voltage	Rated Current		Width W (mm)	Depth D (mm)	Height h (mm)	Height H (mm)	Height RC ^[1] H (mm)	Weight ^[2] (kg)
	50°C Heavy duty	40°C Normal duty						
4.16kV	< 120A	<140A	2700	1200	2320	2650	2800	4900
	121A - 200A	141A-240A	4020	1425	2320	2650	2800	6900
	201A - 300A	241A-360A	4390	1425	2370	2790	2930	10600
	> 300A	>360	Under request					
6.6kV	< 120A	<140A	3420	1200	2320	2650	2800	5500
	121A - 200A	141A-240A	4580	1425	2320	2650	2800	7400
	201A - 300A	241A-360A	5685	1425	2370	2790	2900	11000
	> 300A	>360	Under request					

DIMENSIONS



Configuration	Width W (mm)	Depth D (mm)	Height H (mm)
Frame 1	715	1200/1425	2320/2370
Frame 2	900	1200/1425	2320/2370
Frame 3	995	1200/1425	2320/2370

[1] Total height with redundant cooling option (RC). Dimensions valid for aluminum transformer, A power module type and 120% overload.
[2] Final weight will depend about the options, power and transformer material.

[1] Check the rated current of the motor nameplate and indicate the short circuit current to guarantee the compatibility with the selected drive.
[2] Consult availability with Power Electronics. Please consult Power Electronics with your demands.

ELECTRONIC SOFT STARTERS

Page. 26 – 35

VS65

VS65

The most reliable and safe customer oriented solution



From 2,3kVca
to 13,8kVca



Up to 50°C

Power Electronics' VS65 medium voltage soft starter is the most reliable and safest solution, fully flexible with a customized arrangement of MV cells.

Applications range from 2.3kV to 13.8kV and the VS65 combines outstanding design and hardware under the most stringent IEC regulations, using advanced technology motor control and safety, allowing for smooth starts and stops under any circumstances.

1 Topology

Highest operation safety with internal arc approved.

2 Maximum safety

Maximum safety and outstanding features designed for the most demanding industry.

3 Maximum motor care

The VS65 soft starter includes built-in as standard the ultimate motor and soft starter protections, features that allow it to act as a motor protection relay.

4 Reliability

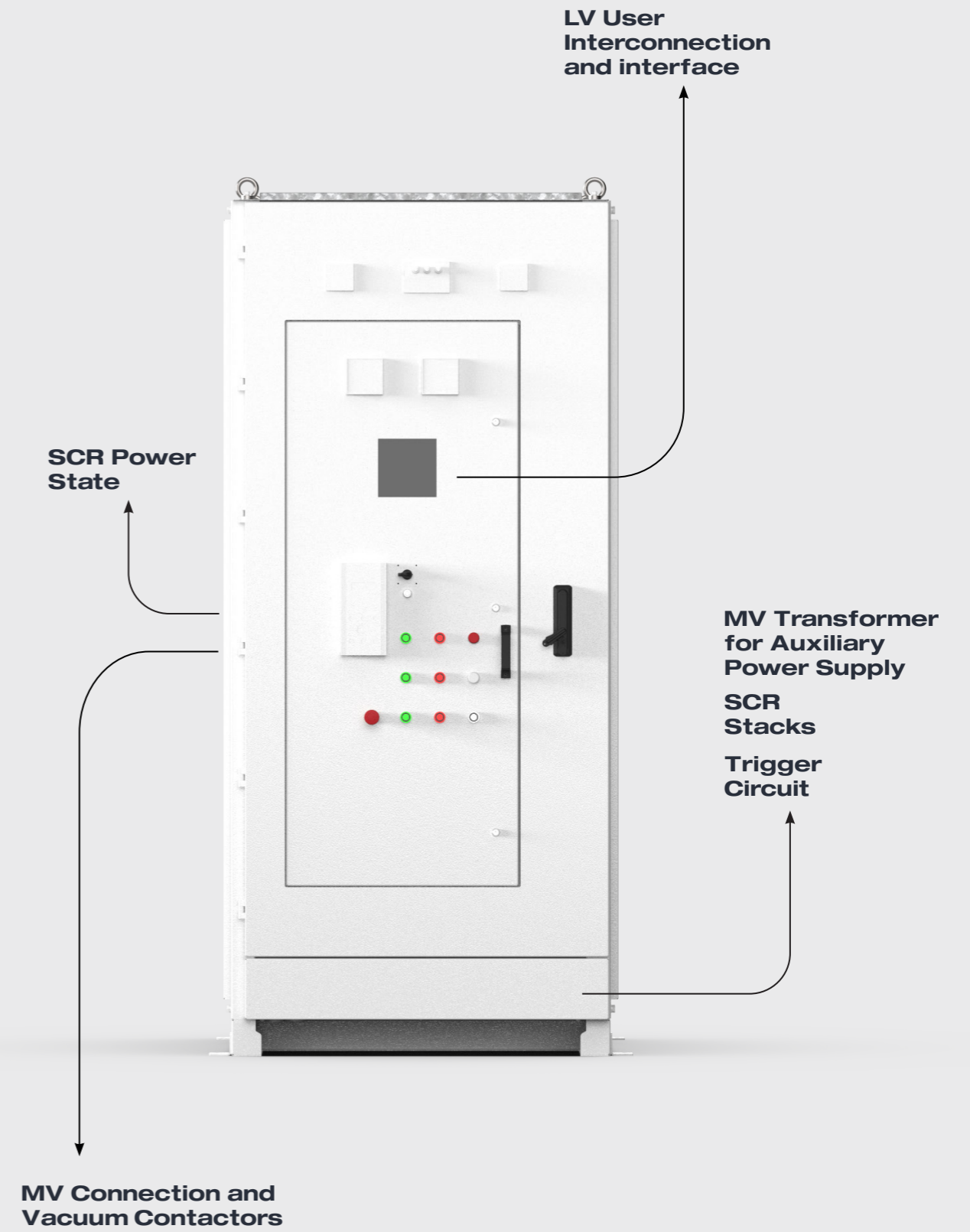
Our record in industrial technical service has set the boundaries to all of our designs in terms of reliability. Hence, we offer the most comprehensive and extended warranties of the market.

5 Multiple features

The VS65 soft starter gets the most from your facilities, by implementing the unique dynamic torque control algorithm (CDP) that offers an ultimate break away torque and starts the most demanding applications.

6 Easy to drive

The VS65 integrates an intuitive and dust resistant interface that includes backlit alphanumeric display with membrane keypad, status lights and pushbuttons that allow the user an easy operation and visualisation under the most demanding conditions.



VS65

INPUT	Input voltage ^[1]	2,3kVca, 3kVca-3.3kVca, 4.16kVca, 5kVac-5.5kVac, 6kVca-6.6kVac, 10kVca-11kVca, 13.8kVca ^[1]	
	Input frequency	47 ~ 62Hz	
	Control voltage ^[1]	230Vac ±10%, 50Hz / 110Vac ±10%, 50Hz	
	Phase sequence	Compatible with any phase sequence	
	Transitory over voltage protection	Snubber network / Optional Surge arresters	
OUTPUT	Efficiency (full load)	> 99.6%, 100% Bypass activated	
	Overload	125% of the continuous rated value 100% to 500% (during 1 ~ 60s configurable)	
	Bypass contactor	Capacity to start the motor in direct start mode	
ENVIRONMENTAL CONDITIONS	Protection degree	IP44, IP54 (optional)	
	Cooling system	Natural	
	Work temperature	0°C to +50°C	
	Storage temperature	-25°C to +55°C	
	Humidity	5% - 95%, non condensing	
	Altitude ^[1]	1000m, (reinforced isolation optional for 4500masl)	
	Painting ^[1]	RAL 7035, C4 corrosion (ISO 12944-2)	
INTERCONNECTION	Digital inputs	5 configurable input	
	Analogue inputs	2 analogue inputs of 0-20mA or 4-20mA, 0-10V	
	Output relays	3 switched relays (non-inductive 10A 250Vac)	
	Analogue outputs	1 configurable output 0-20mA or 4-20mA	
OPERATION MODES	Starting modes	Current limit starting	
		Current ramp and current limit starting	
		Dynamic torque control	
		Initial torque pulse starting	
		Direct starting	
	Stop modes	Spin stop	
		Stop by voltage ramp	
		Stop by water hammer control	
		Backlit, alphanumeric 2x16 characters	
		5 keys: start, stop, access and scroll menu	
KEYPAD AND CONTROL PUSH BUTTONS	Display	Status leds: ON: Green. Turned on indicates there is voltage in the control boards. RUN: Orange. Flashing shows when the motor accelerates or decelerates. When turned on indicates the motor is working. FAULT: Red. Indicates fault.	
		Door mounted indicators and buttons (soft starter)	3 push buttons: Start, Stop and emergency stop 1 starting mode selector 7 status pilots (running, stopped, ready, power supply, alarm, line contactor and bypass contactor)
		Door mounted indicators and buttons (Optional Input module)	7 status pilots (Power supply L1/L2/L3, MV switches status on/off/loaded control voltage supply) 3 push buttons: switch status, connection and disconnection 1 selector of MV locking
	Display information	Current of the three phases	
		Line average voltage	
		Digital inputs and relays status	
		Analogue inputs and outputs status	
		Power supply and motor frequency	
		Power factor	
		Motor torque and power	
Fault history (5 last faults)			
Total and partial starts number			
Total and partial operation hours			
Partial motor consumption (kWh)			

COMMUNICATIONS	Standard Hardware	RS232 / RS485
	Optional Hardware	Ethernet / 9-Pin D-SUB/F
	Standard Protocol	Modbus-RTU
	Optional Protocol	Profibus DP, Devicenet, Ethernet, IEC 61850
	Control modes	Local: from keyboard and pushbuttons Remote: from the digital and analogic inputs. PLC: start / stop
STANDARD MOTOR PROTECTIONS ^[1]	Input phases sequence	
	High voltage	
	Input low voltage	
	Start current limit	
	Rotor locked	
	Motor overload (thermal model)	
	Under load	
	Unbalanced phases	
	Shearpin current	
	Maximum number of starts/hour	
Other, consult Power Electronics		
SOFT STARTER PROTECTIONS	SCR overheat	
	Excessive start time (max 120s)	
	Input phase loss	
SOFT STARTER SETTINGS	Torque pulse	
	Initial torque	
	Initial torque time	
	Acceleration time	
	Current limit: 1to 5·In	
	Overload: 0.8 to 1.2·In, Overload curve: 0 to 10	
	Deceleration time / Spin stop	
	Slow Speed(1/7 fundamental frequency)	
	Dual setting	
	Number of Starts/hour allowed	
Torque control		
Water hammer control		
REGULATIONS	Certification	CE
	Designed as	EMC Directive (2004/108/CE) EN61000-6-2, -4
	Design and construction	EN62271-1,-200
		EN60071-1,-2

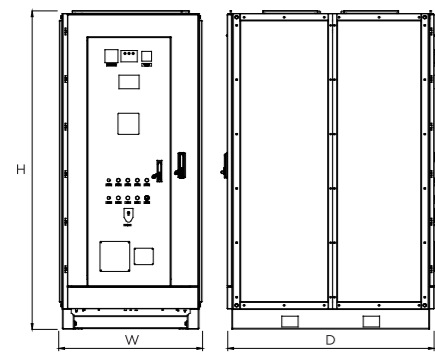
VS65

CONFIGURATION TABLE - VS65 SOFT STARTER MODULE

V65	200		4		4		CL		F		3		0	
VS65 Series	Rated output current ^[1] (A)		Rated input voltage (kV)		Degree of protection		Configuration		Earth switch + Fuses		Isolation (kV)		Power cable access	
V65	045	45	2	2.3	1	NEMA1	CL	Fixed - Line contactor	O	O	1	3.6	O	Bottom
	050	50	3	3/3.3	3	NEMA3R	CX	Withdrawable - Line contactor/ Fixed bypass	F	Fuses	2	4,76	T	Top input bottom output
	055	50	4	4.1	4	IEC IP41	XX	Line contactor and withdrawable bypass	S	On/Off/Earth	3	7.2	U	Top both
	...	...	5	5/5.5	5	IEC IP54	IA	Fixed - Line circuit breaker	E	Earth	4	8.25	S	Side
	120	120	6	6/6.3/6.6	...	Under request	IX	Withdrawable - Line circuit breaker	G	F+E	5	12	B	Bus bars
	200	200	8	10/11			...	Under request	H	F+S	6	15	...	Under request
	300	300	9	13.2/13.8					...	Under request	7	17.5		
	450	450	...	Under request							...	Under request		
	630	630												
	900	900												
	K00	1000												
	K25	1250												
	...	Under request												

Check the rated current of the motor nameplate and indicate the short circuit current to guarantee the compatibility with the selected soft starter. Consult configuration availabilities with Power Electronics.

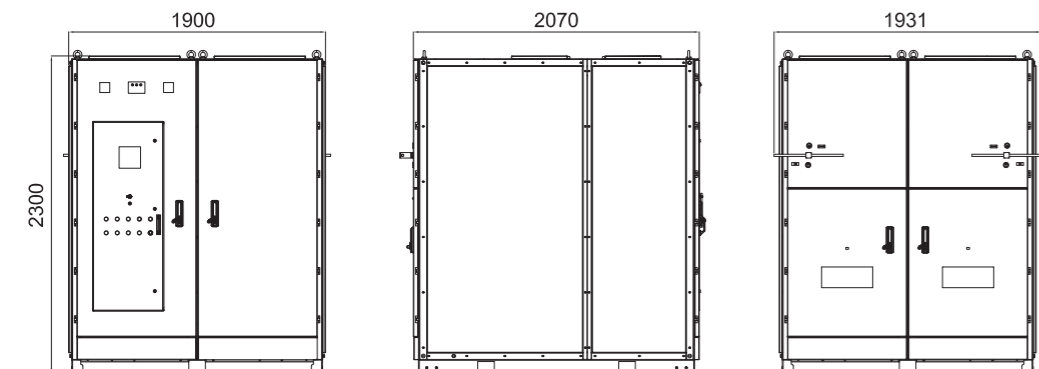
DIMENSIONS - VS65 SOFT STARTER MODULE - UP TO 6.6kV



VOLTAGE	CONFIGURATION	WIDTH W (mm)	DEPTH D (mm)	HEIGHT H (mm)
<4.16kV	CL, CL_F, CL_E	1050	1550	2300
	CL_S, CL_FS, CL_FE	1050	1820	2300
5kV-6.6kV	CL, CL_F	1050	1550	2300
	CL_E, CL_S	1050	1820	2300

NOTE Units In<300A. Other voltages and configurations consult Power Electronics.

DIMENSIONS - VS65 SOFT STARTER MODULE - UP TO 13.8kV

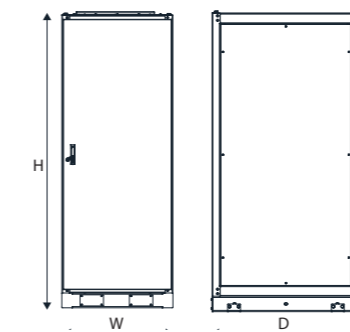


CONFIGURATION TABLE - PROTECTION CELL VS65R

V65R	300		3		4		IA		F		0	
VS65 Protection module	Rated current ^[1] (A)		Rated voltage (kV)		Degree of protection		Configuration		Earth switch and Fuses		Cables access	
V65R	045	45	1	3.6	4	IEC IP44	CL	Fixed line contactor	O	-	O	Bottom
	050	50	2	4,76	5	IEC IP54	CX	Withdrawable line contactor	F	Fuses	T	Top input bottom output
	055	55	3	7.2	...	Under request	XX	Line contactor and withdrawable bypass	E	Earth	U	Top both
	-	-	4	8.25			IX	Withdrawable VCB	G	F+E	S	Side
	120	120	5	12			SI	On/Off/Earth input & output	I	On/Off/Earth input & output	B	Bus bars
	200	200	6	15			IA	Automatic circuit breaker	M	On/Off/Earth input & output	...	Under request
	300	300	7	17.5			SE	Disconnecter and Earth	...	Under request		
	450	450	...	Under request			PF	Reactive power capacitors + Fuses + Contactor + Choke				
	630	630					BP	Line contactor and bypass				
	900	900					...	Under request				
	K00	1000										
	K25	1250										
	K50	1500										
	2K0	2000										
	...	Under request										

Check the rated current of the motor nameplate and indicate the short circuit current to guarantee the compatibility with the selected soft starter. Consult configuration availabilities with Power Electronics.

DIMENSIONS - PROTECTION CELL VS65R



CONFIGURATION	WIDTH W (mm)	DEPTH D (mm)	HEIGHT H (mm)
<7.2kV	900	1550/1820	2320
>7.2kV	1050	1550/1820	2300

VS65

STANDARD RATINGS

VS65 2.3kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER	
		(kW)	(HP) ^[1]
V65040 2	40	149	200
V65050 2	50	186	250
V65060 2	60	224	300
V65070 2	70	261	350
V65090 2	90	298	400
V65100 2	100	336	450
V65110 2	110	373	500
V65130 2	130	447	600
V65150 2	150	522	700
V65170 2	170	597	800
V65190 2	190	671	900
V65210 2	210	746	1000
V65270 2	270	932	1250
V65320 2	320	1119	1500
V65370 2	370	1305	1750
V65420 2	420	1491	2000
V65480 2	480	1678	2250
V65530 2	530	1864	2500
V65590 2	590	2051	2750

[1] HP standard motor rated power (cos φ = 0.88, 2.3kV)

VS65 3kV-3.3kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER	
		(kW) ^[2]	(HP)
V65040 3	40	200	268
V65050 3	50	250	335
V65060 3	60	315	422
V65070 3	70	355	476
V65080 3	80	400	536
V65090 3	90	450	603
V65100 3	100	500	670
V65110 3	110	560	751
V65120 3	120	630	845
V65140 3	140	710	952
V65160 3	160	800	1073
V65180 3	180	900	1207
V65200 3	200	1000	1341
V65250 3	250	1250	1676
V65280 3	280	1400	1877
V65320 3	320	1600	2145
V65360 3	360	1800	2413
V65400 3	400	2000	2681
V65450 3	450	2240	3003
V65500 3	500	2500	3352
V65560 3	560	2800	3754

[2] kW standard motor rated power (cos φ = 0.88, 3.3kV)

VS65 4.16kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER	
		(kW)	(HP) ^[3]
V65050 4	50	298	400
V65055 4	55	336	450
V65060 4	60	373	500
V65070 4	70	447	600
V65080 4	80	522	700
V65095 4	95	597	800
V65110 4	110	671	900
V65120 4	120	746	1000
V65150 4	150	932	1250
V65180 4	180	1119	1500
V65210 4	210	1305	1750
V65240 4	240	1491	2000
V65270 4	270	1678	2250
V65300 4	300	1864	2500
V65320 4	320	2051	2750
V65350 4	350	2237	3000
V65410 4	410	2610	3500
V65470 4	470	2983	4000
V65530 4	530	3356	4500
V65590 4	590	3728	5000

[3] HP standard motor rated power (cos φ = 0.88, 4.16kV)

VS65 5-5.5kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER	
		(kW) ^[4]	(HP)
V65050 5	50	400	536
V65055 5	55	450	603
V65060 5	60	500	671
V65065 5	65	560	751
V65075 5	75	630	845
V65085 5	85	710	952
V65095 5	95	800	1073
V65110 5	110	900	1207
V65120 5	120	1000	1341
V65150 5	150	1250	1676
V65170 5	170	1400	1877
V65190 5	190	1600	2146
V65220 5	220	1800	2414
V65240 5	240	2000	2682
V65270 5	270	2240	3004
V65300 5	300	2500	3353
V65330 5	330	2800	3755
V65380 5	380	3150	4224
V65420 5	420	3550	4761
V65480 5	480	4000	5364
V65540 5	540	4500	6035
V65600 5	600	5000	6705

[4] kW standard motor rated power (cos φ = 0.88, 5.5kV)

VS65 6kV – 6.6kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER	
		(kW) ^[5]	(HP)
V65040 6	40	400	536
V65045 6	45	450	603
V65050 6	50	500	671
V65055 6	55	560	751
V65060 6	60	630	845
V65070 6	70	710	952
V65080 6	80	800	1073
V65090 6	90	900	1207
V65100 6	100	1000	1341
V65125 6	125	1250	1676
V65140 6	140	1400	1877
V65160 6	160	1600	2146
V65180 6	180	1800	2414
V65200 6	200	2000	2682
V65220 6	220	2240	3004
V65250 6	250	2500	3353
V65280 6	280	2800	3755
V65300 6	300	3150	4224
V65350 6	350	3550	4761
V65400 6	400	4000	5364
V65450 6	450	4500	6035
V65500 6	500	5000	6705
V65560 6	560	5600	7510

[5] kW standard motor rated power (cos φ = 0.88, 6.6kV)

VS65 10kV – 11kV			
CODE	NOMINAL CURRENT (A)	MOTOR POWER	
		(kW) ^[6]	(HP)
V65020 8	20	355	476
V65025 8	25	400	536
V65030 8	30	500	671
V65035 8	35	630	845
V65040 8	40	710	952
V65050 8	50	800	1073
V65055 8	55	900	1207
V65060 8	60	1000	1341
V65075 8	75	1250	1676
V65085 8	85	1400	1877
V65095 8	95	1600	2146
V65110 8	110	1800	2414
V65120 8	120	2000	2682
V65135 8	135	2240	3004
V65150 8	150	2500	3353
V65170 8	170	2800	3755
V65190 8	190	3150	4224
V65210 8	210	3550	4761
V65240 8	240	4000	5364
V65270 8	270	4500	6035
V65300 8	300	5000	6705
V65340 8	340	5600	7510
V65380 8	380	6300	8449

[6] kW standard motor rated power (cos φ = 0.88, 11kV)

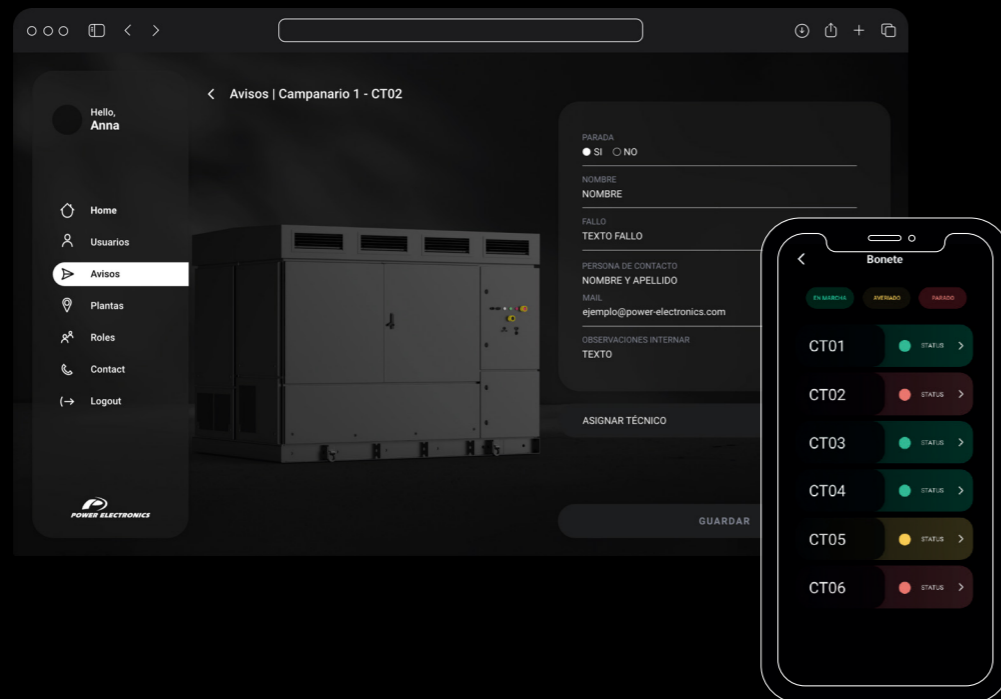
VS65 13.8kV - NEMA			
CODE	NOMINAL CURRENT (A)	MOTOR POWER	
		(kW) ^[7]	(HP)
V65040 138	40	746	1000
V65050 138	50	932	1250
V65060 138	60	1119	1500
V65070 138	70	1305	1750
V65080 138	80	1491	2000
V65090 138	90	1678	2250
V65100 138	100	1864	2500
V65120 138	120	2237	3000
V65140 138	140	2610	3500
V65160 138	160	2983	4000
V65180 138	180	3356	4500
V65200 138	200	3728	5000
V65220 138	220	4101	5500
V65240 138	240	4474	6000
V65270 138	270 ^[8]	5220	7000
V65310 138	310 ^[8]	5966	8000

[7] kW standard motor rated power (cos φ = 0.8, 13.8kV).

[8] Overload capacity limited.

POWER SUPPORT

BY POWER ELECTRONICS

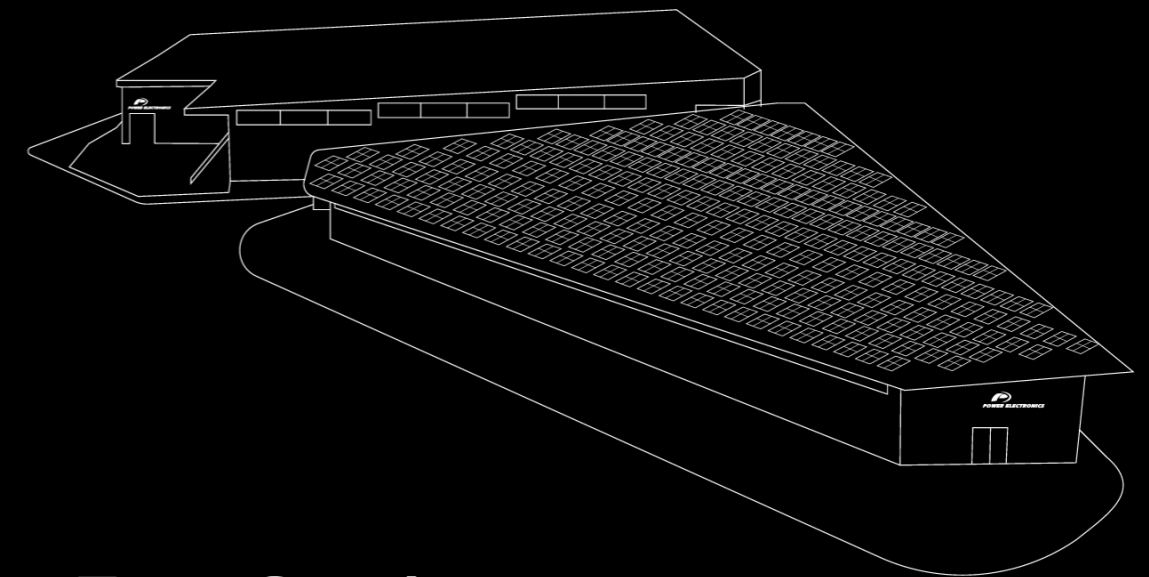
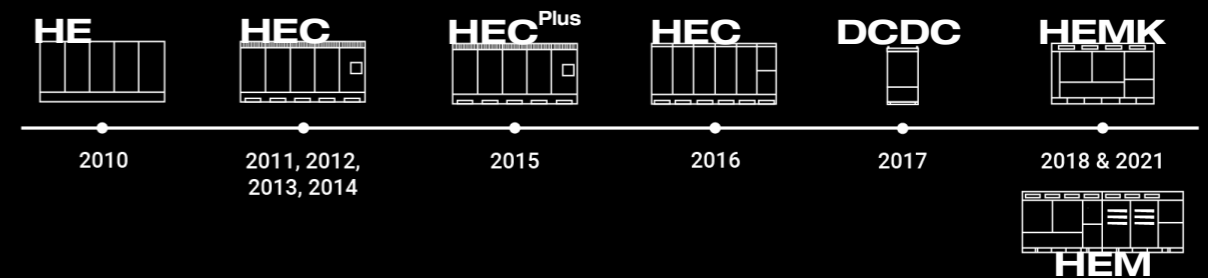


Our secret

The key of our success for more than **30 years**, our **24/7 after sales service**, **Power On Support**.

We take care of the legacy generations

Each new generation of inverters involves adapting the manufacturing lines to optimize the production of these new devices. Power Electronics has a facility optimized for the production of limited units from previous generations, where we manufacture current subcomponents adapted to equipment that is no longer in production, but which allows for 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.

Vertical Integration

throughout the entire process

We complement your spare parts strategy with our own thanks to our *Dedicated Service Factory* warehouse, informing you when any of them is going to be discontinued so you can plan accordingly.

↓ ↓ ↓
We are here to help you



Scan me!

Before commissioning

- Technical applications & design requirement review
- Dedicated Project Management Support
- Hands on functional & safety product training

During commissioning

- Dedicated commissioning teams
- Rigorous execution on 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 offerings for remote monitoring, detailed performance reporting, and interactive portals for tracking metrics direct with the PE Service Org

You have the control

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 + DC switch, 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.



HEADQUARTERS

SPAIN

Polígono Pla de Carrases
CV-35 Exit 30, 46160
Liria - Valencia - Spain
Tel. (+34) 96 136 65 57
Fax (+34) 96 131 82 01
24/7 Technical Assistance Service
Tel. (+34) 902 40 20 70

UNITED STATES

1510 N. Hobson Street, Gilbert
AZ – Phoenix 85233
Arizona, USA
Tel. 602-354-4890
sales@power-electronics.us

INTERNATIONAL

ARGENTINA

Arroyo 894, 5°
Oficina 10 Ciudad autónoma de
Buenos Aires

ASIA

30th Floor, CATIC Plaza, 8 Cau-
seway Road, Hong Kong SAR

AUSTRALIA

U6, 30-34 Octal St. Yatala, Brisbane,
Queensland 4118, Australia
(+61) 7 3386 1993
sales@power-electronics.com.au

BEIJING

Xiaoying Road Chaoyang, N°25,
Beijing City

BRAZIL

Avda. Robert Kennedy 2070. Sao Bernardo do
Campo. Sao Paulo
(+55) 11 5891 9612 / (+55) 11 5891 9762
brasil@power-electronics.com
Contact: Fabio Cinquini

CHILE

Av. Alonso de Córdova 5870, Of. 210-211
Las Condes, Santiago de Chile
(+56) 2 3223 8916
ventaschile@power-electronics.com

COLOMBIA

Cl 77 9-20 Bogotá DC
Colombia
(+57) 322 3464855
colombia@power-electronics.com
Contact: Héctor Nuñez

FRANCE

51 Rue Hoche, 94200 Ivry Sur Seine.
Paris (France)
+33(0)1 46 46 10 34
ventesfrance@power-electronics.com
Contact: Guillaume Mamy

GERMANY

deutschland@power-electronics.com

INDIA

Silver Jade, Off. No 03, G.F., A-Wing CTS NO.
-188, Behind Tarun Bharat Society, Chakala,
Andheri East, Mumbai, Maharashtra
(+91) 80 6569 0489
india@power-electronics.com

ITALIA

Piazzale Cadorna, 6, 20123.
Milán Italia
italy@power-electronics.com

JAPAN

Nishi-Shinbasi 2-17-2 HF Toranomon Bldg 5F.
105-0003 Minato-Ku Tokio
japan@power-electronics.com
Contact: Stanley Han

MALAYSIA

Level 7, Menara Milenium, Jalan Damanlela,
Pusat Bandar Damansara, Damansara
Heights, 50490 Kuala Lumpur W.P.
Malaysia
malaysia@power-electronics.com

MEXICO

Henry Ford n.3, Fraccionamiento Industrial
San Nicolás, Tlalnepantla, Estado de México
(+52) 1 55 4949 0830 / (+52) 539 08818
mexico@power-electronics.com
Contact: Manuel Garay

PERU

Avenida El Polo n° 670, Centro Comercial
El Polo II – Oficina 603, Piso 6°, Bloque C
Santiago de Surco, Lima
(+51) 979 749 772
ventasperu@power-electronics.com
Contact: Gustavo Priolé

GERMANY

Neuseser Strasse 15, 90455
Nürnberg. Germany
germany@power-electronics.com

SOUTH AFRICA

Central Office Park Unit 5
257 Jean Avenue – Centurion 0157
southafrica@power-electronics.com

UNITED KINGDOM

Chippenham Drive, Unit 2, Madingley Court.
Kingston, Milton Keynes.
MK10 0BZ, United Kingdom
uksales@power-electronics.com
Contact (Solar division): Juan Antonio Torres

PHILIPPINES

Unit 209 ZF Page 1 Bldg MBP
Ayala Alabang, Muntinlupa.

REPÚBLICA DOMINICANA

Ave. John F. Kennedy Núm. 7, Los Jardines,
Distrito Nacional, República Dominicana.

IRELAND

20 Harcourt Street Dublin,
D02 H364, Irlanda



December 2021

www.power-electronics.com

